EDGECROSS
CONSORTIUM

Edgecross Basic Software for Windows User's Manual

ECP-BS1-W (Edgecross Basic Software for Windows)

ECD-MA1-0001-15-EN

SAFETY PRECAUTIONS

(Read these precautions before using this product.)
Before using this software, please read this manual carefully and pay full attention to safety to handle it correctly.
The precautions given in this manual are concerned with this software only.
For details on Edgecross supported products (hardware and software), refer to their respective manuals.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

- To perform an operation, such as data change or operating status change, to running devices, such as a programmable controller, servo, robot, or server, from an industrial PC equipped with this product, configure an interlock circuit outside of the devices so that the entire system always operates to the safety side. Additionally, read this manual carefully and ensure the safety before operations.
  Especially, in the above mentioned operations that are performed from external devices through network, any problems on devices may not be dealt with promptly due to an abnormal data communication.
- Configure a safety circuit outside of an industrial PC equipped with this product so that the entire system operates to the safely side even when a fault occurs in the PC.
  Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠CAUTION

- Do not perform the operation that forcibly turns the industrial PC equipped with this product OFF.
  Otherwise, the data will be undefined and resetting and re-registering data will be required.
  Additionally, doing so may cause the malfunction of this product.

[Security Precautions]

⚠WARNING

- To maintain the security (confidentiality, integrity, and availability) of access target devices and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Startup and Maintenance Precautions]

⚠WARNING

- When performing the following operation, configure the system to ensure that Real-time Flow Manager will operate safely.
  Changing the operating status (RUN/STOP) of each process flow of Real-time Flow Manager

[Operating Precautions]

⚠CAUTION

- The diagnostic results of the data diagnostic function are not always guaranteed. When performing operations that affect the diagnostic target device by using device instructions or executing a program, ensure the safety before operations.

CONDITIONS OF USE FOR THIS SOFTWARE

(1) For using this software, even if a malfunction occurs in the software, it is an application that does not result in serious accidents, and backup and fail-safe functions are implemented systematically outside the device in case of malfunction What you have is the condition of use.

(2) The Edgecross Consortium assumes no responsibility for this software and the quality, performance, safety concerning products that use this software (including but not limited to non-performance of the main obligation, defect liability, quality assurance responsibility, quality assurance responsibility, tort liability, and product liability).

(3) The Edgecross Consortium shall have no responsibility or liability for any problems involving this software and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

USE OF THIS SOFTWARE OVERSEAS

When using this software overseas, such as exporting and taking-out overseas, or disclosing to non-residents in Japan, the restrictions by the Foreign Exchange and Foreign Trade Control Law and the applicable export control laws and regulations of other countries, such as the Export Administration Regulations in the United States, must be complied. In addition, various procedures may be required. Please consult the Edgecross Consortium for more information.

INTRODUCTION

Thank you for using Edgecross Basic Software. This manual describes the method for using this software.

Before using Edgecross Basic Software, please read this manual carefully, and develop familiarity with the functions and performance of this product to handle correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version. When reading this manual, replace the names and procedures with the applicable ones as necessary.

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Edgecross Basic Software for Windows User's Manual [ECD-MA1-0001] (this manual)	Specifications, procedure before operation, functions, and troubleshooting of Edgecross Basic Software	PDF

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Business system	A system that supports business management such as sales management and production management
Cloud	A form in which the user (usually company) does not manage IT systems but use various IT resources provided over the Internet on demand
Data collection	Processing to collect data to be diagnosed or analyzed
Data collector	A software component that collects data in production sites through each network. It is provided by vendors for each network and connection target devices.
Data diagnosis	Processing to diagnose if collected data matches preset conditions
Data diagnosis plug-in	A plug-in for data diagnosis
Data model management	A function that abstracts devices, equipment, and lines in the production site and hierarchically manages them
Data modification	Processing to modify collected data into a form suitable for analysis and diagnosis. Further modifications can also be made to the data modified once.
Data modification plug-in	A plug-in for data modification
Device instruction feedback	A function that updates data in a connected device via a data collector
Edge application	Software that performs various processing for data utilization in production sites using the functions provided by Edgecross in the edge computing area
Edge computing	An information processing method and area, for not only collecting and analyzing data in production sites in real-time, and feed backing the data, but summarizing the production site data and sharing information with IT systems efficiently with the hardware and software in production sites
Edgecross	A software platform that implements specifications and concepts for realizing manufacturing solutions by the FA-IT collaboration centering on the edge computing
Edgecross Basic Software	The name of the software product that implements the Edgecross function
Feedback	Processing to report a detection result when diagnosed data matches a condition
Industrial PC	A PC specialized for industrial use with features such as high reliability, environmental resistance, and long-term supply
IT gateway	A software component that communicates with external devices such as IT systems to utilize data in production sites. It is provided by vendors for communication destination external devices such as IT systems.
IT system	An area where business systems and applications on premise or in the cloud operate
Management Shell	The name of the Windows version product that implements the data model management function
Management Shell Explorer	Software that sets and references data models managed by Management Shell
MQTT	An abbreviation for MQ Telemetry Transport. MQ Telemetry Transport is a lightweight message communication protocol using TCP/IP, and the standard is published as an open protocol.
MQTT broker	An application that acts as an intermediary between applications that distribute messages and ones that receive the messages by using MQTT
N/A	An abbreviation for Not Available. It is displayed if a value such as a current value cannot be acquired when monitoring the current values of data tag resources.
Node	Each element created to build a hierarchical structure in Management Shell Explorer
On-premise	A form in which IT systems are introduced, installed, and operated in the facility managed by the user (usually company)
OPC	An interface standard for linking software that controls devices in factories
OPC UA	An abbreviation for OPC Unified Architecture. Platform independent service-oriented architecture that integrates all the functionality of each OPC Classic specification into an extensible framework.
Plug-in	Software that extends the real-time data processing function
Process	A generic term for the processing of data collection, data modification, data diagnosis, and feedback that compose a process flow
Process flow	An execution unit of sequential processing performed by Real-time Flow Manager, consisting of data collection, data modification, data diagnosis, and feedback
Process flow setting	Settings of the execution contents and execution order of the processing of data collection, data modification, data diagnosis, and feedback that compose a process flow
Real-time data processing	A function that realizes the real-time diagnosis and feedback of the production site data
Real-time Flow Designer	The name of the software component that performs operation setting of Real-time Flow Manager
Real-time Flow Manager	The name of the Windows version software component that implements the real-time data processing
Real-time Flow Manager Parameter	A generic term for settings required to run 'processes'

1 Edgecross Basic Software

Edgecross Basic Software is software that implements the Edgecross function.

1.1 Overview

Edgecross Basic Software consists of the software described in the following table.
By cooperating with edge applications, data in production sites can be analyzed and diagnosed. (☞ Page 13 Edge application)
In addition, data can be exchanged with on-premises or cloud IT systems by cooperating with IT gateways.
(☞ Page 13 IT gateway)

Software	Description
Real-time Flow Manager	Software that implements the functions to diagnose data in production sites in real time and provide feedback. Data in connected equipment, devices, or lines can be collected by using a data collector, and modified and analyzed. (☞ Page 13 Data collector) In addition, the functions can be extended by using a plug-in. (☞ Page 13 Plug-in)
Real-time Flow Designer	Software that implements the functions to create, save, and display various settings required for the operation of Real-time Flow Manager, start or stop its operation, and perform a diagnosis.
Management Shell	Software that models data in equipment, devices, or lines in production sites, manages it in a hierarchical structure, and runs in the background on Windows as a Windows service. Data in connected equipment, devices, or lines can be read and written by using a data collector. (☞ Page 13 Data collector) In addition, data models managed by Management Shell can be set and referenced by using Management Shell Explorer. (☞ Page 193 Management Shell Explorer)

Edge application

This is software for analyzing and diagnosing data in production sites by utilizing the functions provided by Edgecross Basic Software.
For details, refer to the manual for an edge application used.

IT gateway

This is software for communicating with external devices such as IT systems to utilize data in production sites.
For details, refer to the manual for an IT gateway used.

Data collector

This is software for collecting data in production sites via a network.
The following data collectors are pre-installed in Edgecross Basic Software.

- CSV File Data collector (☞ Page 294 CSV File Data collector)
- Management Shell Data collector (☞ Page 314 Management Shell Data collector)
- Dummy Data collector (☞ Page 327 Dummy Data collector)

Note that they cannot be uninstalled.
For details on other data collectors, refer to the manual for a data collector used.

Plug-in

This is software for extending the functions of Real-time Flow Manager.
It can be used for data modification and data diagnosis processes.
For details, refer to the manual for a plug-in used.

1.2 Supported Specification Versions

In Edgecross specifications, the specifications of various I/Fs for data exchange between Edgecross Basic Software and each piece of software[*1] are defined, and I/Fs are implemented in Edgecross Basic Software and each piece of software.

Each I/F has its own version. If a version of Edgecross Basic Software does not support a version of software, they may not run properly.

For the versions of Edgecross Basic Software supporting each piece of software, contact the developer of each piece of software.

[*1] Refers to data collectors, edge applications, plug-ins, and IT gateways.

Data collector specification version

The following table shows the data collector specification version supported by the Edgecross Basic Software version.

For the data collector specification version of each data collector, contact the developer of each data collector.

Edgecross Basic Software version	Data collector specification version
1.00 or later	1.00

Edge application I/F specification version

The following table shows the specification versions of an edge application I/F supported by each of the Edgecross Basic Software versions.

For the specification version of each edge application, contact the developer of each edge application.

Edgecross Basic Software version	Edge application I/F specification version						
	Model access I/F	Data access I/F	Historical data access I/F		Real-time data publishing I/F	Real-time data diagnosis I/F	
	OPC UA	OPC UA	DB	File	MQTT	MQTT	File
1.00	—	—	1.00	1.0	1.00	1.00	1.0
1.01					1.01[*2]	1.01[*2]	
1.10	1.00[*1]	1.00[*1]					
1.20, 1.21		1.01[*2]					
1.22 or later	1.01[*2]				1.03[*2]	1.02[*2]	

[*1] Cannot be used in combination with Edgecross Basic Software with version 1.00 or 1.01.

[*2] Can be used in combination with Edgecross Basic Software with version earlier than a supported one. However, the functions added in a version later than one used cannot be used.

Plug-in I/F specification version

The following table shows the specification version of a plug-in I/F supported by the Edgecross Basic Software version.

For the specification version of each plug-in, contact the developer of each plug-in.

Edgecross Basic Software version	Plug-in I/F specification version
1.00 or later	1.00

IT gateway specification version

The following table shows the specification versions of an IT gateway supported by each of the Edgecross Basic Software versions.

For the IT gateway specification version of each IT gateway, contact the developer of each IT gateway.

Edgecross Basic Software version	IT gateway specification version			
	Model access I/F-G	Data access I/F-G	Real-time data publishing I/F-G	Historical data file access I/F
1.10 or earlier	—	—	—	—
1.20 or later	1.00	1.00	1.00	1.00

2 SPECIFICATIONS

This chapter shows the specifications of Edgecross Basic Software.

2.1 Functional Specifications

This section shows the functional specifications of Edgecross Basic Software.

Real-time Flow Manager

The following shows the functional specifications of Real-time Flow Manager.

Common items for each function

Item	Specification
Number of units of available data	Up to 256 units
Available data size	Up to 4096 words
Available data size for the entire Real-time Flow Manager	Up to 131072 words
Period managed in Real-time Flow Manager	From the year 2000 to 2079

Data collection function

Item		Specification
Function type		Data collection using a data collector
Data collection using a data collector[*1,*2,*3]	Function of a data collector used	Data collection function

*1 CSV File Data collector and Management Shell Data collector are pre-installed in Edgecross Basic Software. (☞ Page 294 CSV File Data collector, ☞ Page 314 Management Shell Data collector)

*2 For the specifications of a data collector, refer to the manual for a data collector used.

*3 Up to 32 data collectors can be set in a process flow setting.

Data modification function

Item		Specification
Function type		• Data extraction • Character string data modification • Data modification plug-in run
Data extraction	Condition combination type	• AND combination • OR combination
	Monitoring target	Data output in a previous process
	Comparison condition	=, ≠, <, >, ≤, ≥
	Comparison target	• Data output in a previous process • Constant (integer, real number, character string (ASCII), character string (UNICODE))
	Number of available conditions	Up to 4 conditions
Character string data modification	Modification type	• No processing • Add to the start • Add to the end • Data extraction
	Added character string	• STRING: 1 to 32 characters • WSTRING: 1 to 16 characters
	Start position	• STRING: 1 to 32 • WSTRING: 1 to 16
	End position	• STRING: 1 to 32 • WSTRING: 1 to 16
Data modification plug-in run	Number of plug-ins that can be stored (including data diagnosis plug-ins)	100
	Start argument	Up to 127 characters

Data diagnosis function

Item		Specification
Function type		• Edge application cooperation (MQTT cooperation) • Edge application cooperation (file cooperation) • Data diagnosis plug-in run
Edge application cooperation (MQTT cooperation)	Supported MQTT protocol version	3.1.1
	Encryption protocol	TLS1.2
	QoS	2
	Client ID of Real-time Flow Manager	Any value can be set.
	Client ID of an edge application	Any value can be set.
	Topic name	• Publishing data topic name: Any value can be set. • Topic name other than a publishing data topic name: A value starting with Edgecross is automatically generated.
Edge application cooperation (file cooperation)	Target data	Refer to the following: ☞ Page 19 Data storing function
	Monitoring target (prefix of a response data file)	Up to 32 characters
Data diagnosis plug-in run	Number of plug-ins that can be stored (including data modification plug-ins)	100
	Start argument	Up to 127 characters

Feedback function

Item		Specification
Function type		• Device instruction feedback • Program execution feedback
Number of pieces of feedback that can be provided		Up to 4 pieces per flow
Execution condition[*1]	Condition combination type	• AND combination • OR combination
	Monitoring target	Response data
	Comparison condition	=, ≠, <, >, ≤, ≥
	Comparison target	• Response data • Constant (integer, real number, character string (ASCII), character string (UNICODE))
	Number of available conditions	Up to 4 conditions
Execution frequency		• Always run • Deterrence period specification
Deterrence period		• 1 to 60 minutes • 1 to 24 hours
Device instruction feedback	Available data collector[*2]	Refer to the manual for an installed data collector.
	Function of a data collector used	Data writing function
Program execution feedback	Execution program path	Up to 127 characters
	Program argument	Up to 300 characters
Setting value	Constant	Any constant
Maximum number of units of data per feedback		Up to 32 units

[*1] Feedback can also be provided without specifying an execution condition.
In this case, set feedback is always provided once response data is acquired.

[*2] Up to 32 data collectors can be set in a process flow setting.

Data storing function

Item			Specification
Function type			• File saving • DB saving
Type of a process in which data can be saved			• Data collection • Data modification • Data diagnosis
Number of functions that can be performed in one flow			Up to two functions including the data distribution function
File saving	Number of files that can be saved		Up to 6000 files
	File name prefix		Up to 32 characters
	File name sequence number		00000001 to FFFFFFFF
	Storage destination path length		Up to 205 characters
	File type		CSV file
	CSV file	Delimiter	Comma (,)
		Line feed code	CRLF (0x0D, 0x0A)
		Character code	• Shift JIS • UTF-8
		Extension	.csv
	Program execution after saving a file	Execution program path	Up to 127 characters
		Program argument	Up to 127 characters
DB saving	Database the operation of which has been checked		PostgreSQL version 10.3
	Supported standard		SQL99
	Number of records that can be stored		Refer to the manual for a database used.
	Data source name		ASCII (up to 32 characters)
	Password		ASCII (up to 32 characters)
	Table[*1]	Table name	Unicode Basic Multilingual Plane (up to 32 characters)
		Number of tables	Refer to the manual for a database used.
	Field	Field name[*2]	Unicode Basic Multilingual Plane (up to 32 characters)
		Number of fields	2 to 257 columns

*1 Data cannot be stored in a same table from multiple processes.

*2 A same name cannot be used in a same table.

Data distribution function

Item			Specification
Function type			• MQTT distribution • IT gateway distribution
Type of a process in which data can be distributed			• Data collection • Data modification • Data diagnosis
Number of functions that can be performed in one flow			Up to two functions including the data storing function
MQTT distribution	Communication specifications	Supported MQTT protocol version	3.1.1
		Encryption protocol	TLS1.2
		QoS	• 1 • 2
		Client ID of Real-time Flow Manager	Any value can be set.
		Topic name	Any value can be set.

Management Shell

The following shows the functional specifications of Management Shell.

Item		Specification
Access target device setting function	Maximum number of access target device settings that can be registered	100
	Maximum number of characters in a setting name	32
	Maximum number of characters in a comment	100
Component tree edit function	Maximum number of components that can be registered	1000
	Maximum number of hierarchies of a component that can be set	32
	Maximum number of characters in a component name	32
	Maximum number of characters in a component display name	64
Resource list edit function	Maximum number of resources that can be registered in a component	1000
	Maximum number of internal data tag resources (operation) that can be registered in Management Shell	500
	Maximum number of characters in a resource name	32
	Maximum number of characters in a resource display name	64
OPC UA connection function[*1]	Specifications of a supported OPC UA server	Refer to the following: ☞ Page 21 OPC UA server specifications
	Maximum number of edge applications that can be connected to Management Shell	64
	Maximum number of subscriptions[*2] that can be registered in each edge application connected to Management Shell	10
	Maximum number of monitoring target items[*3] that can be registered in each subscription[*2]	1000000
	Maximum number of monitoring target items that can be registered	1000000
	Sampling cycle of a monitoring target item[*4,*5]	• 100 (millisecond) • 200 (millisecond) • 500 (millisecond) • 1 (second) • 2 (second) • 5 (second) • 60 (second) • 3600 (second)
	Maximum number of units of data that can be temporarily accumulated for each monitoring target item	100
IT gateway cooperation function[*1]	Maximum number of IT gateway settings that can be registered	10
	Maximum number of characters in a setting name	32
	Maximum number of characters in a comment	100
One-shot collection function	Maximum number of one-shot collection settings that can be registered	32
	Maximum number of collection target resources that can be registered in a setting	1000

*1 Surrogate pair characters cannot be used.

*2 Refers to a registration destination for a monitoring target item.

*3 Attribute of a resource (node) registered as a monitoring target in Management Shell from an edge application. (An attribute refers to data included in a node.)
For the nodes and attributes that can be registered as monitoring targets, refer to the following:
☞ Page 22 Nodes and attributes that can be registered as monitoring targets

*4 A difference may occur between a set sampling cycle and an actual polling interval due to the effects of the processing of other software and an operating system.

*5 A time stamp is recorded at the time when a current value is acquired from a data collector. Therefore, a difference may occur even in time stamps of monitoring target items for which a same access target device or sampling cycle is set.

OPC UA server specifications

The following shows the specifications of an OPC UA server supported by Management Shell.

Point

For details on OPC UA specifications, refer to the following:

- opcfoundation.org

Item	Details
Discovery service set	FindServers
	GetEndpoints
SecureChannel service set	OpenSecureChannel
	CloseSecureChannel
Session service set	CreateSession
	ActivateSession
	CloseSession
View service set	Browse
	BrowseNext
	TranslateBrowsePathsToNodeIds
Attribute service set	Read
	Write
MonitoredItem service set	CreateMonitoredItems
	DeleteMonitoredItems
	ModifyMonitoredItems
	SetMonitoringMode
	SetTriggering
Subscription service set	CreateSubscription
	ModifySubscription
	SetPublishingMode
	Publish
	Republish
	DeleteSubscriptions

■Nodes and attributes that can be registered as monitoring targets

Node		Description	Attribute	
			Name	Content
Data tag resource	—	Node indicating a data tag resource	BrowseName	Data tag resource name
			DisplayName	Resource display name
			Value	Current value
			DataType	Data type in OPC UA specifications[*1] For the correspondence between data types in OPC UA specifications and those in Edgecross specifications, refer to the following: ☞ Correspondence between data types in OPC UA specifications and those in Edgecross specifications
			AccessLevel	Authority to read and write Value attributes of a data tag resource node[*2] • CurrentRead(1): Read authority only • CurrentWrite(2): Write authority only • CurrentRead(3), CurrentWrite(3): Read and write authority
			UserAccessLevel	
	DataType	Node indicating the data type of a data tag resource	BrowseName	"DataType"[*3]
			DisplayName	
			Value	Data type in Edgecross specifications (☞ Page 544 Data Used in Edgecross Basic Software)
			DataType	"UINT16"[*3] (data type in OPC UA specifications)
			AccessLevel	CurrentRead(1)[*3]: Read authority only
			UserAccessLevel	
	Length	Node indicating the number of characters in a data tag resource	BrowseName	"Length"[*3]
			DisplayName	
			Value	Number of characters
			DataType	"STRING"[*3] (data type in OPC UA specifications)
			AccessLevel	CurrentRead(1)[*3]: Read authority only
			UserAccessLevel	
File resource[*4]	—	Node indicating a file resource	—	—
	FilePath	Node indicating the file path of a file resource	BrowseName	"FilePath"[*3]
			DisplayName	
			Value	File path
			DataType	"STRING"[*3] (data type in OPC UA specifications)
			AccessLevel	CurrentRead(1)[*3]: Read authority only
			UserAccessLevel	
Folder resource[*5]	—	Node indicating a folder resource	—	—
	FolderPath	Node indicating the folder path of a folder resource	BrowseName	"FolderPath"[*3]
			DisplayName	
			Value	Folder path
			DataType	"STRING"[*3] (data type in OPC UA specifications)
			AccessLevel	CurrentRead(1)[*3]: Read authority only
			UserAccessLevel	

[*1] When acquiring a data type in Edgecross specifications, register a Value attribute of a DataType node as a monitoring target.

[*2] Matches the read and write authority defined in a data collector for each location of data tag resources set in Management Shell Explorer.

[*3] A fixed value

[*4] A file resource node cannot be registered as a monitoring target but a FilePath node under a file resource node can be registered.

[*5] A folder resource node cannot be registered as a monitoring target but a FolderPath node under a folder resource node can be registered.

- Correspondence between data types in OPC UA specifications and those in Edgecross specifications

Data type in OPC UA specifications	Data type in Edgecross specifications
BOOL (value: 1)	BOOL (value: 1)
INT16 (value: 4)	INT (value: 2)
UINT16 (value: 5)	UINT (value: 3)
INT32 (value: 6)	DINT (value: 4)
UINT32 (value: 7)	UDINT (value: 5)
INT64 (value: 8)	LINT (value: 6)
UINT64 (value: 9)	ULINT (value: 7)
FLOAT (value: 10)	REAL (value: 8)
DOUBLE (value: 11)	LREAL (value: 9)
STRING (value: 12)	STRING (value: 10)[*1]
	WSTRING (value: 11)[*1]

[*1] The STRING and WSTRING types are converted into STRING (UTF-8) in OPC UA specifications.

CSV File Data collector

The following table shows the functional specifications of CSV File Data collector.

Item		Specification
Supported function		• Data collection function • Data reading function
Data collection function	Collection target[*1]	• CSV file (ASCII or shift JIS[*2]) • Text file
	Available data type	• BOOL • UINT • UDINT • ULINT • INT • DINT • LINT • REAL • LREAL • STRING • WSTRING
	Number of columns in the data column[*3]	Up to 256 columns
	Monitoring folder path length[*4]	Up to 199 characters (including '\' at the end)
	Monitoring target file (prefix)	Up to 32 characters
Data reading function	Data reading target	• CSV file • Text file
	Available data type	• BOOL[*5] • UINT • UDINT • ULINT • INT • DINT • LINT • REAL • LREAL • STRING • WSTRING
	Number of columns in the data column	Up to 512 columns
	File size	Up to 16384 KB
	Monitoring folder path length	Up to 199 characters (including '\' at the end)
	Monitoring target file (prefix)	Up to 32 characters

[*1] CSV File Data collector runs normally even when deleting a character string in the date and time column of the data name information row.

[*2] Can be used only for the data name row.

[*3] The following column is not included.
Date and time column

[*4] The same folder path as the following folder cannot be specified.
Monitoring folder of CSV File Data collector used for data collection in another process flow

[*5] When using a character string as an identifier, use the STRING type or WSTRING type data.

Management Shell Data collector

The following table shows the functional specifications of Management Shell Data collector.

This Data collector is compliant with OPC UA 1.03 and later.

Item		Description
Access target device	Number of connectable devices	1 server per instance
	Connectable software	Management Shell only
Supported function		Data collection function
Data collection function	Collection interval	• 0.5 to 0.9 seconds (in 0.1-second increments) • 1 to 21,600 seconds (in 1-second increments)
	Available data type	• BOOL • INT • UINT • DINT • UDINT • LINT • ULINT • REAL • LREAL • WSTRING

Dummy Data collector

The following table shows the functional specifications of Dummy Data collector.

Item		Description
Access target device		Not set
Supported function		Data reading function
Data reading function	Available data type	• BOOL • INT • UINT • DINT • UDINT • LINT • ULINT • REAL • LREAL • STRING • WSTRING
	Location	Any character string can be specified.

3 FUNCTION LIST

This chapter shows the function list of Edgecross Basic Software.

3.1 Function List of Real-time Flow Manager

This section shows the function list of Real-time Flow Manager.

Function		Description	Reference
Data collection function		To collect data in connected equipment, devices, and lines via a data collector.	Page 36 Data Collection Function
Data modification function	Data extraction function	To extract data according to a specified condition.	Page 37 Data extraction function
	Character string data modification function	To modify character string data according to a specified condition.	Page 40 Character string data modification function
	Data modification plug-in run function	To run a data modification plug-in.	📖Manual for a plug-in used
Data diagnosis function	Edge application cooperation function	To distribute data (collected data and modified data) in Real-time Flow Manager to an edge application, and receive response data from the edge application.	Page 43 MQTT cooperation Page 52 File cooperation
	Data diagnosis plug-in run function	To run a data diagnosis plug-in.	📖Manual for a plug-in used
Feedback function	Device instruction feedback function	To update data in a connected device via a data collector.	Page 55 Device instruction feedback function
	Program execution feedback function	To run executable programs from a command line.	Page 55 Program execution feedback function
Data storing function	File saving function	To save data collected or modified in Real-time Flow Manager, or diagnosis result data to a file in a format specified in Real-time Flow Designer.	Page 60 File saving function
	DB saving function	To save (INSERT) data collected or modified in Real-time Flow Manager, or diagnosis result data to a database specified in Real-time Flow Designer.	Page 77 DB saving function
Data distribution function	MQTT distribution function	To distribute output of data collection, data modification, and data diagnosis processes to an edge application by using MQTT.	Page 80 MQTT distribution function
	IT gateway distribution function	To distribute output of data collection, data modification, and data diagnosis processes to an external device such as an IT system or mobile by using an IT gateway.	Page 85 IT gateway distribution function
Event history automatic output function		To automatically output event/error information, which is collected from Real-time Flow Manager, data collectors used in Real-time Flow Manager, and IT gateways, to a specified folder in a CSV file format.	Page 86 Event History Automatic Output Function
Command line interface function		To perform operations of Real-time Flow Manager on a command basis.	Page 92 Command Line Interface Function

3.2 Function List of Real-time Flow Designer

This section shows the function list of Real-time Flow Designer.

Function		Description	Reference
Access target device setting		To select a data collector to use and set an access target device.	Page 124 Access Target Device Setting
IT gateway setting		To select and set an IT gateway to use.	Page 127 IT Gateway Setting
Data logging flow setting		To configure the setting for a data logging flow.	Page 130 Data Logging Flow Setting
Data diagnosis flow setting		To configure the setting for a data diagnosis flow.	Page 134 Data Diagnosis Flow Setting
Move of a process flow		To change the type of a process flow.	Page 138 Move of a Process Flow
Data collection setting		To configure the setting for collecting data in an access target device.	Page 139 Data Collection Setting
Data storing setting	Data storing setting (file saving)	To configure the setting for outputting a result of a process in a file format.	Page 142 Data Storing Setting (File Saving)
	Data storing setting (DB saving)	To configure the setting for outputting a result of a process to a database.	Page 152 Data Storing Setting (DB Saving)
Data distribution setting	Data distribution setting (MQTT)	To configure the setting for distributing a result of a process to an edge application by using MQTT.	Page 158 Data Distribution Setting (MQTT)
	Data distribution setting (IT gateway)	To configure the setting for distributing a result of a process to an external device such as an IT system by using an IT gateway.	Page 163 Data Distribution Setting (IT Gateway)
Data extraction setting		To configure the setting for data extraction.	Page 169 Data Extraction Setting
Character string data modification setting		To configure the setting for character string data modification.	Page 170 Character String Data Modification Setting
Data modification plug-in setting		To configure the setting for a data modification plug-in.	Page 172 Data Modification Plug-in Setting
Edge application diagnosis setting	Edge application diagnosis (MQTT) setting	To configure the setting for sending a result of a process to an edge application and receiving a diagnosis result from the edge application by using MQTT.	Page 173 Edge Application Diagnosis (MQTT) Setting
	Edge application diagnosis (file) setting	To configure the setting for passing a result of a process to an edge application and acquiring response data from the edge application in a file format.	Page 178 Edge Application Diagnosis (File) Setting
Data diagnosis plug-in setting		To configure the setting for a data diagnosis plug-in.	Page 184 Data Diagnosis Plug-in Setting
Post-diagnosis feedback setting		To configure the setting for feedback provided when a diagnosis result of data diagnosis is received.	Page 185 Post-Diagnosis Feedback Setting
Real-time Flow Manager diagnosis		To switch and diagnose the operating status of a process flow.	Page 332 Real-time Flow Manager diagnosis

3.3 Function List of Management Shell

This section shows the function list of Management Shell.

Function	Description	Reference
Access target device setting function	To select a data collector to use and set an access target device by using Management Shell Explorer.	Page 220 Access Target Device Setting Function
Component tree edit function	To edit components or change the hierarchical structure of a component by using Management Shell Explorer.	Page 224 Component Tree Edit Function
Resource list edit function	To edit resources managed by a component by using Management Shell Explorer.	Page 235 Resource List Edit Function
OPC UA connection function	To enable Management Shell to run as an OPC UA server and provide a model access I/F and data access I/F for an edge application that is an OPC UA client.	Page 259 OPC UA Connection Function
IT gateway cooperation function	To respond to requests for data model reference, data reading, and data writing from an IT gateway, and perform these operations.	Page 265 IT Gateway Cooperation Function
One-shot collection function	To collect a value of a data tag resource specified as a collection target (collection target resource) and save it to a file or database when a value of a data tag resource specified as a monitoring target (monitoring target resource) changes.	Page 269 One-shot Collection Function
Event history automatic output function	To automatically output event/error information, which is collected from Management Shell, data collectors used in Management Shell, and IT gateways, to a specified folder in a CSV file format.	Page 289 Event History Automatic Output Function

3.4 Function List of CSV File Data collector

This section shows the function list of CSV File Data collector.

Function	Description	Reference
Data collection function	To collect data in a device via a monitoring target file.	Page 294 Data Collection Function
Data reading function	To read data in a device via a monitoring target file.	Page 297 Data Reading Function

3.5 Function List of Management Shell Data collector

This section shows the function list of Management Shell Data collector.

Function	Description	Reference
Data collection function	To collect data in Management Shell in a fixed cycle set in Real-time Flow Designer.	Page 317 Data Collection Function

3.6 Function List of Dummy Data collector

This section shows the function list of Dummy Data collector.

Function	Description	Reference
Data reading function	To read data according to a request from Edgecross Basic Software.	Page 327 Data Reading Function

4 PROCEDURES BEFORE OPERATION

This chapter shows the procedures from start-up to operation of Edgecross Basic Software.

When using Real-time Flow Manager

Operating procedure

1. Install Edgecross Basic Software on an industrial PC.

For the installation procedure and the operating environment of Edgecross Basic Software, refer to the following:

📖Edgecross Basic Software for Windows Installation Instructions

2. Install the following software on the industrial PC as necessary.

- Data collector
- Edge application
- IT gateway

For the installation method, refer to the manual for a data collector[*1], edge application, or IT gateway[*1] to be installed.

[*1] When installing it, change the operating statuses of all process flows to STOP and exit Real-time Flow Designer.
For changing the operating status of a process flow, refer to the following:
☞ Page 332 Real-time Flow Manager diagnosis
In addition, select [Management Shell] ⇨ [Management Shell Stop] in the menu of Management Shell Explorer to stop Management Shell.

3. Set a device supporting the data collector as necessary.

For the setting method, refer to the manual for a device used.

4. Set an external device such as an IT system supporting the IT gateway as necessary.

For the setting method, refer to the manual for an external device such as an IT system used.

5. When cooperating with an edge application installed on another industrial PC, make sure that the time is the same between an environment where Edgecross Basic Software runs and one where the edge application runs, then create a client certificate for the edge application as necessary.

6. Set parameters in Real-time Flow Designer and apply them to Real-time Flow Manager.

For details on Real-time Flow Designer, refer to the following:

☞ Page 107 Real-time Flow Designer

7. Set the edge application as necessary.

For the setting method, refer to the manual for an edge application used.

8. Change the operating status of a process flow to RUN.

For changing the operating status of a process flow, refer to the following:

☞ Page 333 "Process Flow Start/Stop" screen

Precautions

- To change parameters after starting the operation of Real-time Flow Manager, change the operating statuses of all process flows to STOP once.
- Before installing Edgecross Basic Software, disable the fast startup function. If it is enabled, an industrial PC is not shut down completely, and Real-time Flow Designer may not run properly when starting the industrial PC after shutdown. For the procedure for disabling the fast startup function, refer to the following:

☞ Page 114 Procedure for disabling the fast startup function

When using Management Shell

Operating procedure

1. Install Edgecross Basic Software on an industrial PC.

For the installation procedure and the operating environment of Edgecross Basic Software, refer to the following:

📖Edgecross Basic Software for Windows Installation Instructions

2. Install the following software on the industrial PC as necessary.

- Data collector
- Edge application
- IT gateway

For the installation method, refer to the manual for a data collector*1, edge application, or IT gateway*1 to be installed.

*1 When installing it, change the operating statuses of all process flows to STOP and exit Real-time Flow Designer.
For changing the operating status of a process flow, refer to the following:
☞ Page 332 Real-time Flow Manager diagnosis
In addition, select [Management Shell] ⇨ [Management Shell Stop] in the menu of Management Shell Explorer to stop Management Shell.

3. Set a device supporting the data collector as necessary.

For the setting method, refer to the manual for a device used.

4. Set an external device such as an IT system supporting the IT gateway as necessary.

For the setting method, refer to the manual for an external device such as an IT system used.

5. When cooperating with an edge application installed on another industrial PC, make sure that the time is the same between an environment where Edgecross Basic Software runs and one where the edge application runs, then create a client certificate for the edge application as necessary.

6. Start Management Shell Explorer with the administrator authority.

☞ Page 193 Startup method

7. Use Management Shell Explorer to create a data model managed by Management Shell.

For the method for creating data models, refer to the following:

☞ Page 191 Management Shell

8. Set the edge application as necessary.

For the setting method, refer to the manual for an edge application used.

When performing this step, steps 9 to 11 must be performed.

9. Use the edge application to connect to Management Shell.

Point

When selecting the checkbox of "Certificate Automatic Exchange" or selecting "None" for both "Security Policy" and "Security Mode" in the following section, the connection with Management Shell will succeed. In this case, steps 10 and 11 can be skipped.

☞ Page 261 Setting an OPC UA server

10. Use Management Shell Explorer to move the client certificate for the edge application from the reject list to the trust list.

☞ Page 263 Managing OPC UA client certificates

11. Use the edge application to reconnect to Management Shell.

5 Real-time Flow Manager

Real-time Flow Manager is software that implements the functions to diagnose data in production sites in real time and provide feedback.

It runs in the following three phases with different purposes to utilize data.

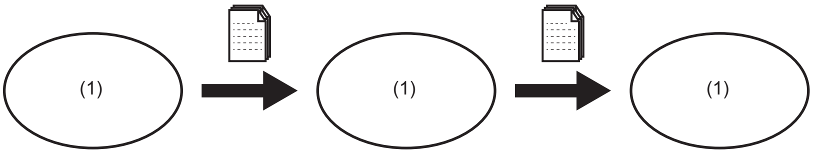
Phase	Purpose	Description
Data logging phase	To accumulate logging data for data analysis and data diagnosis phases	A data logging flow is performed.
Data analysis phase	To create basic diagnosis rules for data diagnosis	Data accumulated in a data logging flow is analyzed by using a data analysis tool.
Data diagnosis phase	To provide feedback to a system	A data diagnosis flow is performed according to the diagnosis rules, and the result is returned to a system.

Process flow

Each process is performed in a process flow by using data received from a system as input.

A result such as an error or a predictable error in a system detected in a process flow is returned to the system.

"Flow" means connection of a series of processes or a stream of data between processes intended for a particular purpose, and output data from a process in a flow becomes input data to the next process.



(1) Process

There are two types of process flows as follows:

Flow type	Purpose	Number of executable flows
Data logging flow	To collect data used for analysis.	32 in total
Data diagnosis flow	To diagnose collected data and return the result to a system.	

The following processes that can be performed by Real-time Flow Manager can be used for each flow.

Process type	Description	Corresponding function
Data collection	Data used for a data modification or data diagnosis process is collected.	☞ Page 36 Data Collection Function
Data modification	Collected data is modified.	☞ Page 37 Data Modification Function
Data diagnosis	Collected or modified data is diagnosed.	☞ Page 42 Data Diagnosis Function
Feedback	Feedback is provided to a system.	☞ Page 54 Feedback Function

Note that the number of processes that can be used differs for each flow.

The numbers of processes that can be used for each process flow are as follows:

Flow type	Data collection	Data modification	Data diagnosis	Feedback
Data logging flow	1 (required)	3	—	—
Data diagnosis flow	1 (required)	3	1 (required)	1 (required)

Precautions

- Process execution timing

A process starts running when receiving a notification from the previous process. However, it may be delayed in starting or cannot be started depending on the usage of the CPU or resources of the industrial PC.

Ex.

The time stamp of data collected in data collection is different from that of a file created by using the file saving function.

Data storing and data distribution

Data storing and data distribution can be performed up to two times in each flow to retain data flowing between processes in Real-time Flow Manager.

For data storing and data distribution, refer to the following:

☞ Page 59 Data Storing Function

☞ Page 80 Data Distribution Function

5.1 Operational Specifications

This section shows the operational specifications of Real-time Flow Manager.

Operating status of a process flow and process

The operating status of a process flow and process can be switched for each process flow in Real-time Flow Designer.
When switching the operating status to RUN or STOP, the process flow and process transition to any of the following states.
For the methods for switching the operating status, refer to the following:

☞ Page 333 "Process Flow Start/Stop" screen

State	Description	Condition for transitioning to the state
STOP state[1]	The process flow or process is stopped.	• The industrial PC is powered ON. • The operating status transitions from the STOP transition state to the STOP state.
RUN transition state[1]	The process flow or process is being started.	• The operating status is switched from STOP to RUN.
RUN state[1]	The process flow or process is running.	• The operating status transitions from the RUN transition state to the RUN state.
STOP transition state[1]	The process flow or process is being terminated.	• The operating status is switched from RUN to STOP. • A major error occurs, or a moderate error occurs in the process flow.

[1] Disable the fast startup function. If it is enabled, an industrial PC is not shut down completely, and a process flow may not run properly when starting the industrial PC after shutdown. For the procedure for disabling the fast startup function, refer to the following:
☞ Page 114 Procedure for disabling the fast startup function

Processing change depending on the status of Windows

If the operating status of each process flow and process is RUN, processing may be changed depending on the status of Windows®.

Status of Windows	Processing in the RUN state
Normal (signed in)	All process flows are running.
Locked	
Signed out	
Being restarted	All process flows are stopped. After Windows restarts, Real-time Flow Manager starts in a state set in the following: ☞ Page 113 Operation setting
Shut down	
Sleep (standby)[1]	Do not change the status to these states.
Hibernation	

[1] In an industrial PC on which Edgecross Basic Software is installed, Windows does not automatically switch to the sleep state even after a time set in 'Windows settings' elapses. However, if other software is installed on the industrial PC, Windows may switch to the sleep state. In this case, check the settings for other software and configure the settings to prevent Windows from switching to the sleep state.

If a process takes time to terminate

When communicating with an access target device in a process such as data collection or feedback, the process cannot be terminated until the device returns a response.
Calculate the maximum waiting time by the following formula:

- Maximum value of (timeout time × (1 + number of retries))

For the timeout time and the number of retries, refer to the manual for a data collector used or the following:

☞ Page 189 Instruction option

Consideration

The following shows the consideration when operating Real-time Flow Manager.

Sleep state on Windows

Do not change the mode to sleep in the Windows start menu.

Otherwise, an error may occur.

5.2 Data Collection Function

This section shows the function to collect data in equipment, devices, and lines connected to an industrial network, general-purpose Ethernet, or in serial communication, and data accumulated in a file by using a data collector.
All data in production sites can be collected by using the data collection function of a data collector.
The following Data collectors are pre-installed in Edgecross Basic Software: CSV File Data collector for collecting data via a monitoring target file and Management Shell Data collector for collecting data in data tag resources on Management Shell.
(☞ Page 294 CSV File Data collector, ☞ Page 314 Management Shell Data collector)
For data collection by using another data collector, refer to the manual for a data collector used.

Precautions

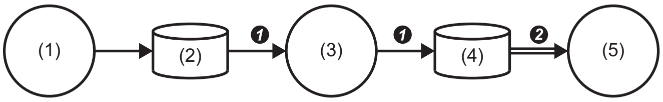
If an execution file of a set data collector does not exist or is corrupted, the corresponding data collector cannot be started and an error occurs.

Adding constants and fixed character strings

Constants or fixed character strings can be added to collected data.
By adding a fixed value such as a model number to collected data, the data collection source (device, equipment, or line) can be determined.
(Example) When distributing data collected from equipment A, the data can be determined to be collected from equipment A by adding the fixed character string 'equipment A' and distributing it.

5.3 Data Modification Function

This section shows the function to convert data into a form suitable for data diagnosis in a data diagnosis process.



(1) Data collection process
(2) Collected data
(3) Data modification process
(4) Modified data
(5) Data diagnosis process

❶ Data output in a data collection process is modified and the modified data is output.

❷ The modified data is passed to a data diagnosis process.

Point

Further modifications can also be made to the data modified once.

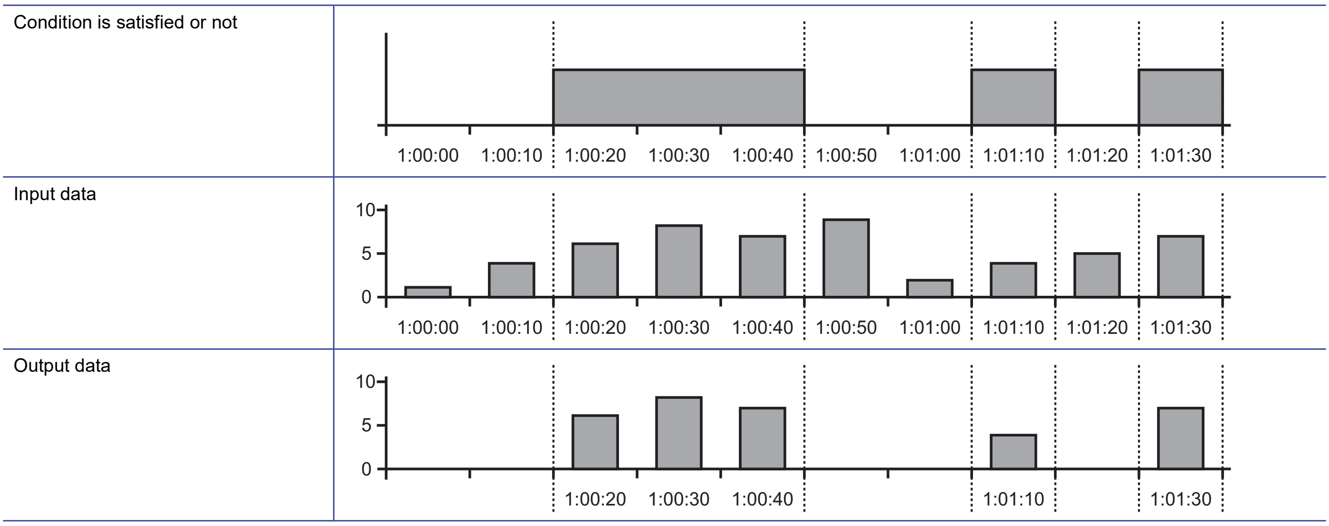
The data modification function has the following functions.

Function	Overview	Reference
Data extraction function	To extract data according to a specified condition.	Page 37 Data extraction function
Character string data modification function	To modify character string data according to a specified condition.	Page 40 Character string data modification function
Data modification plug-in run function	To run a data modification plug-in[*1].	📖Manual for a plug-in used

*1 It is read at the following timings:
When switching a process flow to RUN
When starting Real-time Flow Designer

Data extraction function

This function extracts data according to a specified condition to align the starting point of processing in a post-process. Input data is output as modified data while a condition is satisfied, otherwise, it is not output.



Combination of data types which can be compared

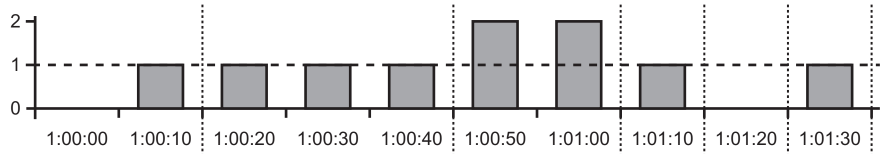
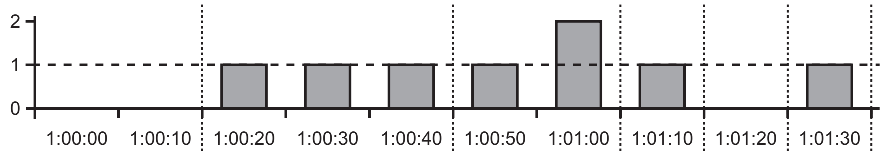
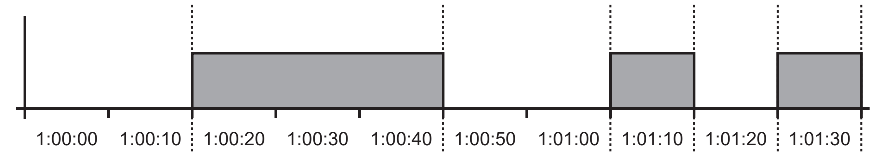
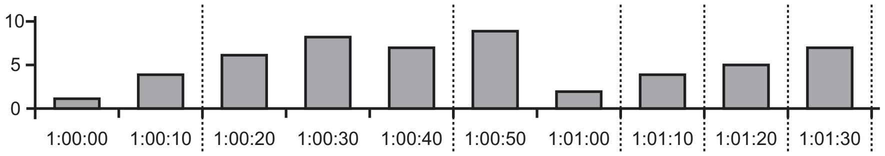
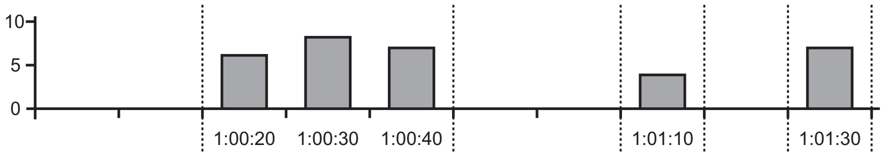
For details on the data types that can be compared, refer to the following:

☞ Page 550 Data comparison

Operation example of AND combination

The operation examples for the following settings are shown below.

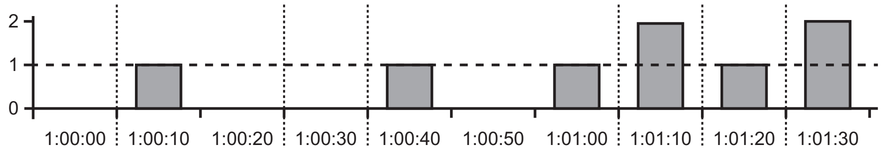
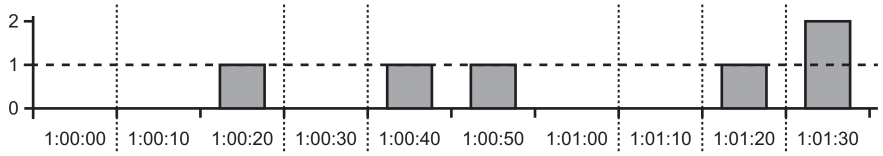
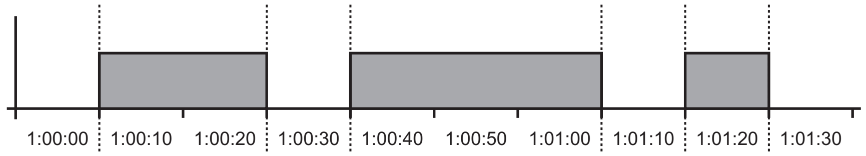
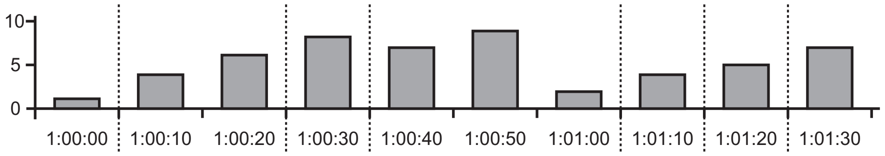
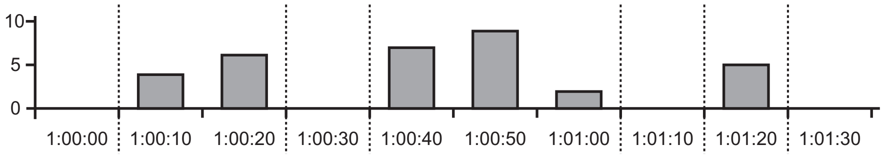
- Condition 1: Monitoring target data [A] = 1
- Condition 2: Monitoring target data [B] = 1

Item	Operation
Monitoring target data [A]	
Monitoring target data [B]	
Condition is satisfied or not	
Input data	
Output data	

Operation example of OR combination

The operation examples for the following settings are shown below.

- Condition 1: Monitoring target data [A] = 1
- Condition 2: Monitoring target data [B] = 1

Item	Operation
Monitoring target data [A]	
Monitoring target data [B]	
Condition is satisfied or not	
Input data	
Output data	

Character string data modification function

This function adds or extracts a character string to or from string type data according to a specified condition.

Adding a character string to the start

A specified character string can be added to the start of string type data.

If the number of characters in data after adding a character string exceeds its maximum[*1], the data will be output without adding a character string.[*2]

*1 STRING type: 32 characters
WSTRING type: 16 characters

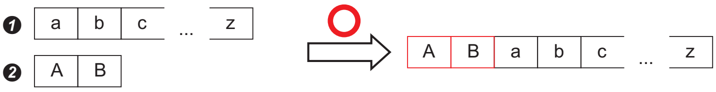
*2 A minor error occurs.

Ex.

Success

❶ Input data (STRING type): abc...z (26 characters)

❷ Specified character string: AB (2 characters)

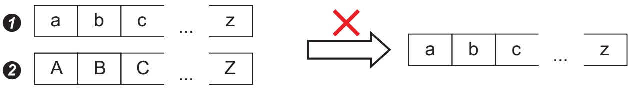


Ex.

Failure

❶ Input data (STRING type): abc...z (26 characters)

❷ Specified character string: AB...Z (26 characters)



Adding a character string to the end

A specified character string can be added to the end of string type data.

If the number of characters in data after adding a character string exceeds its maximum[*1], the data will be output without adding a character string.[*2]

*1 STRING type: 32 characters
WSTRING type: 16 characters

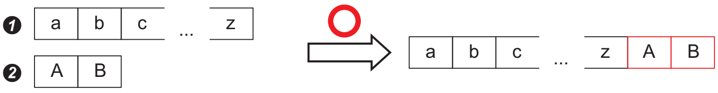
*2 A minor error occurs.

Ex.

Success

❶ Input data (STRING type): abc...z (26 characters)

❷ Specified character string: AB (2 characters)

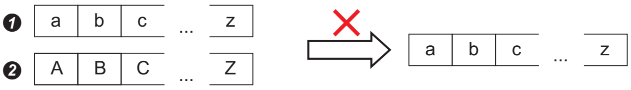


Ex.

Failure

❶ Input data (STRING type): abc...z (26 characters)

❷ Specified character string: AB...Z (26 characters)



Extracting data

String type data can be extracted according to a specified start position and end position.

If no character exists in the end position, the characters from the start position to the end are extracted.[*1]

If extraction fails, data will be output without extraction.[*2]

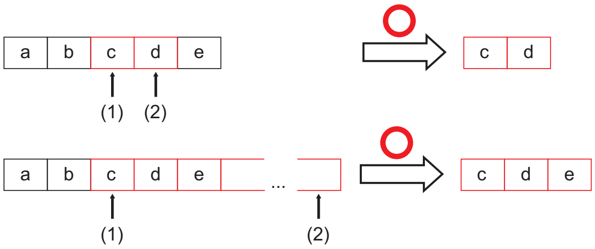
[*1] No error occurs.

[*2] A minor error occurs.

Ex.

Success

Input data (STRING type): abcde



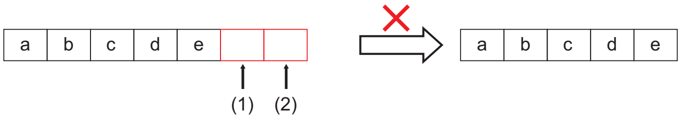
(1) Start position

(2) End position

Ex.

Failure

Input data (STRING type): abcde



(1) Start position

(2) End position

5.4 Data Diagnosis Function

This section shows the function to pass data received from a previous process (data collection or data modification) to data diagnosis software (plug-in or edge application), and diagnose the data.

This function receives a diagnosis result from data diagnosis software (plug-in or edge application) as a numerical value, and passes the result to the next process (feedback).

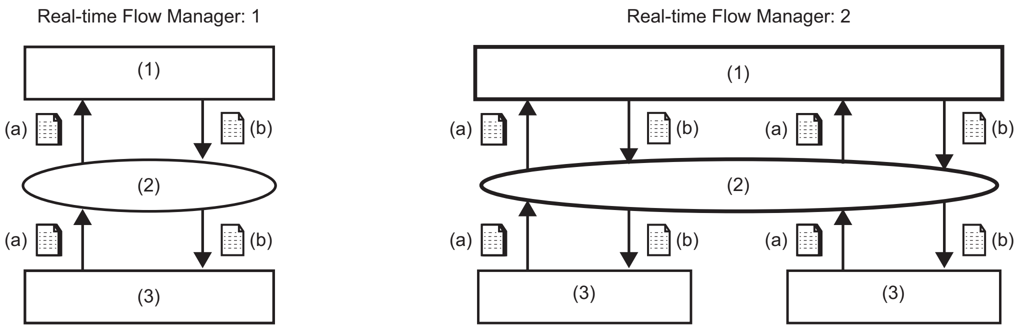
Function		Overview	Reference
Edge application cooperation function	—	To distribute data (collected data and modified data) in Real-time Flow Manager to an edge application, and receive response data from the edge application. An edge application performs processing based on received data, and outputs a diagnosis result to Real-time Flow Manager.	—
	MQTT cooperation	To input and output data in Real-time Flow Manager and an edge application via MQTT communication. Data is input and output via an MQTT broker.	Page 43 MQTT cooperation
	File cooperation	To input and output data in Real-time Flow Manager and an edge application by using a file.	Page 52 File cooperation
Data diagnosis plug-in run function		To run a data diagnosis plug-in[*1].	🕮Manual for a plug-in used

[*1] It is read at the following timings:
When switching a process flow to RUN
When starting Real-time Flow Designer

MQTT cooperation

Publishing data is distributed from Real-time Flow Manager to an edge application by using MQTT, and response data is received from the edge application.

Data is distributed and response data is received via an MQTT broker. By using MQTT cooperation, data can be distributed at high speed to an edge application supporting a real-time data diagnosis I/F (technology: MQTT).



(1) Edge application
(2) MQTT broker
(3) Real-time Flow Manager
(a) Publishing data
(b) Response data

For the considerations for MQTT cooperation, refer to the following:

☞ Page 49 Considerations

Publishing data

Output data of a data collection or data modification process can be selected as publishing data.

Publishing data definition file

This is a JSON file in which the definitions of publishing data, including the number of units of data, a data type, and a data name, output in Real-time Flow Manager, and the setting of MQTT communication are described.

An edge application performs MQTT communication according to the contents of a publishing data definition file.

If changing the setting in Real-time Flow Designer, a publishing data definition file must be output in Real-time Flow Designer and read to an edge application again.

A publishing data definition file exists for each MQTT cooperation. Therefore, it must be output for each MQTT cooperation when using MQTT cooperation in a different process flow.

Precautions

Rewriting a publishing data definition file is prohibited.

■File specification

Item		Description
File format		JSON file (.json)
File name		Arbitrary
File format	Character code	UTF-8 (without BOM)
	Field data	Compliant with RFC-7159

Response data

To receive response data in Real-time Flow Manager, the following items must be set in an edge application.

- Number of units of data
- Data type
- Data name

For the timing when response data is distributed, refer to the manual for an edge application used.

Response data definition file

This is a JSON file in which the definitions of response data, including the number of units of response data, a data name, and a data type, distributed by an edge application are described.

Real-time Flow Designer reads a response data definition file and sets response data.

A response data definition file exists for each MQTT cooperation. Therefore, it must be read for each MQTT cooperation when using MQTT cooperation in a different process flow.

For the procedure for preparing a response data definition file, refer to the manual for an edge application used.

■File specification

Refer to the following:

☞ Page 43 File specification

Distribution cycle

Real-time Flow Manager distributes multiple records to an edge application in a batch.

A record refers to all data acquired for each distribution cycle of data collection. (When using CSV File Data collector as a data collector, it refers to all data acquired for each row.)

The number of distribution records is a number of records included in one unit of publishing data.

The distribution cycle is determined according to the following distribution patterns:

Distribution pattern	Distribution cycle	Priority
The number of distribution records is specified in an edge application.[*1]	Determined according to a specified number of distribution records.	1
The previous process is a data modification process (data extraction).[*2]	Varies depending on each data extraction unit.	2
Others	100 ms[*3]	3

*1 If the number of records distributed to an edge application exceeds the maximum number of records that can be sent at a time, an error will occur and a process flow in which the corresponding MQTT cooperation is set will stop.
☞ Page 45 Maximum number of records that can be sent at a time

*2 If the number of records distributed to an edge application exceeds the maximum number of records that can be sent at a time, records will be distributed separately. In this case, the first records are sent when the maximum number of records is reached. Records that exceed the maximum number are distributed after the first records are distributed.
☞ Page 45 Maximum number of records that can be sent at a time

*3 Data is distributed at the time when the number of records distributed to an edge application reaches the maximum number of records that can be sent at a time.
☞ Page 45 Maximum number of records that can be sent at a time

■Maximum number of records that can be sent at a time

The following table shows the maximum number of records that can be sent at a time.

Number of units of data to output (column)	Maximum number of records that can be sent at a time (row)
1	256
2	128
3 to 4	64
5 to 8	32
9 to 16	16
17 to 32	8
33 to 64	4
65 to 128	2
129 to 256	1

MQTT broker

The following MQTT broker has been checked for its operation and can be used for MQTT cooperation.

Name	Provider	URL	Version
Eclipse Mosquitto	Eclipse Foundation	mosquitto.org	☞ Page 46 Version

■Version

The versions of an MQTT broker (Eclipse Mosquitto) the operation of which has been checked are as follows:

Item	Description
Product version	2.0.17 (64bit)[*1]
MQTT protocol version	3.1.1
License format	Eclipse Public License - v 2.0/Eclipse Distribution License - v 1.0
Pthread version	2.9.0
OpenSSL version	1.1.1u (64-bit)

[*1] Binary installation (file name: mosquitto-2.0.17-install-windows-x64.exe)

For setting up an MQTT broker (Eclipse Mosquitto) the operation of which has been checked, refer to the following:

☞ Page 504 MQTT Broker Setup

■Operating environment

It is recommended to operate an MQTT broker in an industrial PC on which Edgecross Basic Software is installed.

Even when using MQTT brokers that operate outside a recommended environment, MQTT cooperation is available, but the communication speed may be slower than when using them in a recommended environment.

Reconnection with an MQTT broker

When the communication with an MQTT broker is disconnected, Real-time Flow Manager attempts to reconnect the communication at one-second intervals.

If publishing data fails to be distributed, it is buffered in Real-time Flow Manager. When the reconnection succeeds, Real-time Flow Manager distributes the buffered data.

Alive check of an edge application

The status of an edge application can be monitored in Real-time Flow Manager.

The following statuses can be monitored.

If a state in which an edge application does not run or an error occurs in an edge application is detected, an error will occur in Real-time Flow Manager.

- Operating status of an edge application
- Error status of an edge application

Point

The status can be monitored only when an edge application supports alive check. For details, refer to the manual for an edge application used.

Precautions

If an edge application cannot be confirmed to be alive within the timeout time (five seconds), Real-time Flow Manager outputs an error.

Communication encryption

Communication using MQTT can be encrypted for MQTT cooperation.

■When both Edgecross Basic Software and an MQTT broker are installed on a same industrial PC

Communication encryption is not recommended because the communication rate may be lower than when not encrypted.

■When Edgecross Basic Software and an MQTT broker are installed on a different industrial PC

Encryption is recommended to prevent eavesdropping and falsification of data.

The following table shows the supported encryption method and data required for authentication.

Item		**Specification**
Encryption protocol		TLS 1.2
Encryption authentication method		• Server authentication method • Server authentication & client authentication method
Data required for authentication (server authentication method)	Real-time Flow Manager side	Certificate authority certificate
	MQTT broker side	• Certificate authority certificate • Server secret key • Server certificate
Data required for authentication (server authentication & client authentication method)	Real-time Flow Manager side	• Certificate authority certificate of a certificate authority that signed a server certificate • Client secret key • Client certificate
	MQTT broker side	• Certificate authority certificate of a certificate authority that signed a client certificate • Server secret key • Server certificate

Client IDs and a topic name

The following table shows the client IDs and topic name used in Real-time Flow Manager.

For the setting when connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker, refer to the following:

☞ Page 50 When connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker

Item	Description
Client ID of Real-time Flow Manager	Information for identifying Real-time Flow Manager in a connected MQTT broker. It is used for connecting Real-time Flow Manager to an MQTT broker. Set it in Real-time Flow Designer only if a client ID that follows a specific format is required, such as when using an MQTT broker provided by a cloud service. If not setting a client ID in Real-time Flow Designer, an automatically generated client ID is used for connecting to an MQTT broker. (A character string of a client ID is prefixed with 'Edgecross.'[*1])
Client ID of an edge application	Information for identifying an edge application in a connected MQTT broker and Real-time Flow Manager. It is used for connecting an edge application to an MQTT broker or receiving response data from an edge application in Real-time Flow Manager. Set it in Real-time Flow Designer if there are restrictions on available client IDs, such as when a client ID is specified in an edge application. If not setting a client ID in Real-time Flow Designer, an automatically generated client ID is used for creating a publishing data definition file. (A character string of a client ID is prefixed with 'Edgecross.'[*1]) When receiving response data from an edge application in Real-time Flow Manager, the client ID of the edge application is checked whether it is correct. If it is not correct, an error occurs.
Publishing data topic name	Information for identifying data that an edge application receives from a connected MQTT broker. It is used for distributing data from Real-time Flow Manager to an MQTT broker or receiving data from an MQTT broker in an edge application. Set it in Real-time Flow Designer if there are restrictions on available topic names, such as when a topic name is specified in an edge application. If not setting a publishing data topic name in Real-time Flow Designer, an automatically generated publishing data topic name is used for creating a publishing data definition file. (A character string of a publishing data topic name is prefixed with 'Edgecross.'[*1])

*1 When performing MQTT communication in an application other than Real-time Flow Manager and an edge application by using a client ID or topic name, do not prefix a character string of a client ID or topic name with 'Edgecross.'

Considerations

The following shows the considerations for MQTT cooperation.

■When starting MQTT cooperation

Make an edge application available for MQTT communication, then switch the operating status of a process flow to RUN. If switching the operating status to RUN first, communication with the edge application may not be established while configuring the setting for alive check of the edge application, which may cause an error in Real-time Flow Manager.

■When stopping MQTT cooperation

Switch the operating status of a process flow to STOP first. If stopping MQTT communication of an edge application first, communication with the edge application may not be established while configuring the setting for alive check of the edge application, which may cause an error in Real-time Flow Manager.

■When changing settings in an edge application

Read a response data definition file in Real-time Flow Designer again when changing response data in an edge application. Then, apply the set parameters to Real-time Flow Manager and switch the operating status of a process flow from STOP to RUN. Note that the operating statuses of all process flows must be switched to STOP once before applying the set parameters to Real-time Flow Manager.

■When connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker

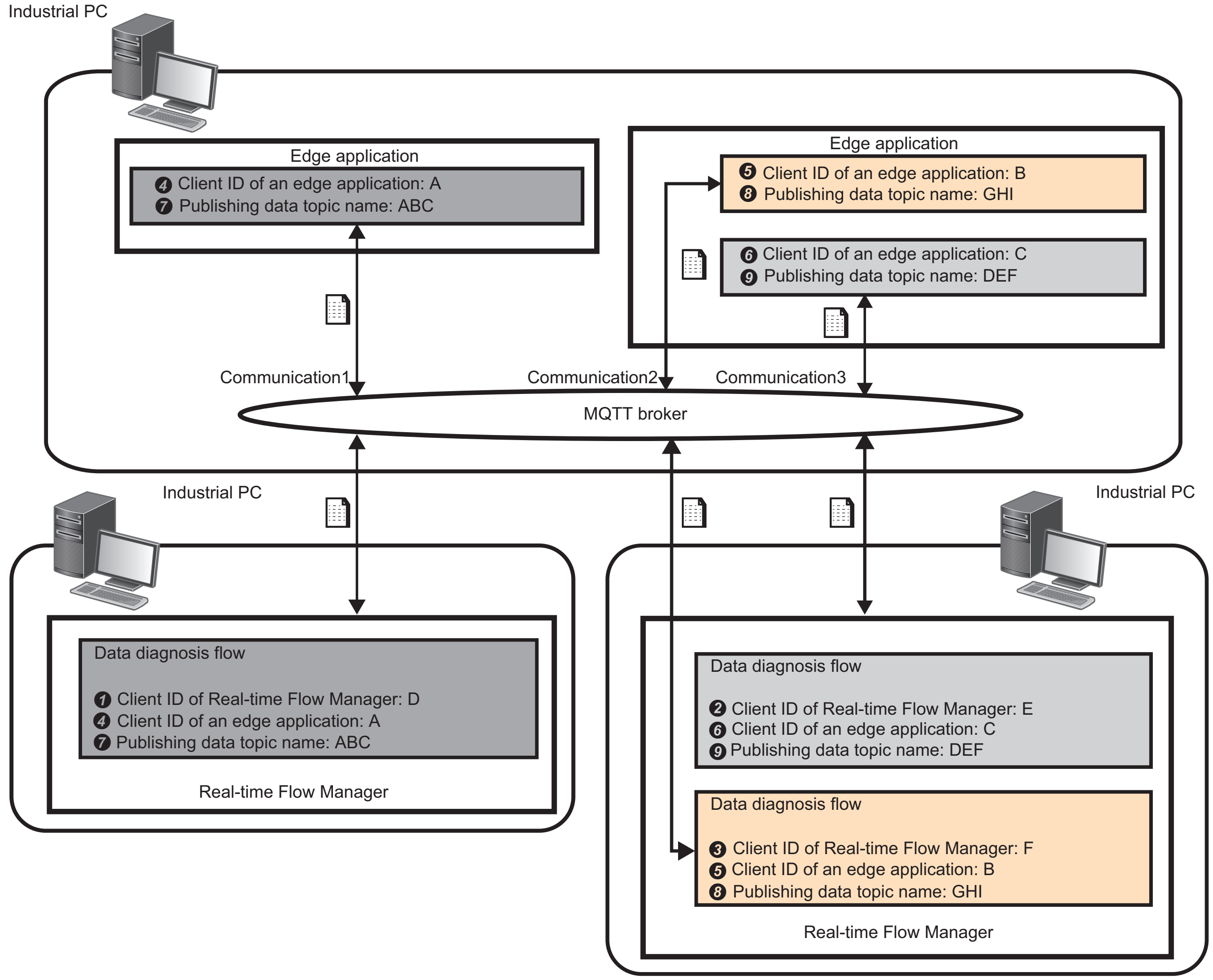
If using a client ID and topic name for identifying data in an MQTT broker and edge application, set them according to the following points.

Note that this setting is not required unless a client ID of Real-time Flow Manager, a client ID of an edge application, and a topic name are specified. (They are automatically set without duplication.)

(1) A client ID of Real-time Flow Manager must be different from any client IDs of other clients (including Real-time Flow Manager and edge applications) connected to the same MQTT broker. (Client IDs (❶❷❸) in the following figure)

(2) A client ID of an edge application must be different from any client IDs of other clients (including Real-time Flow Manager and edge applications) connected to the same MQTT broker; however, a client ID of an edge application set in Real-time Flow Designer must be the same as the one of a connected edge application. (Set client IDs (❹❺❻) in the following figure so that they are the same for each communication.)

(3) A publishing data topic name must be different for each edge application and communication; however, one set in Real-time Flow Designer must be the same as the one set in a connected edge application. (Set topic names (❼❽❾) in the following figure so that they are the same for each communication.)


Industrial PC
Edge application
❹ Client ID of an edge application: A
❼ Publishing data topic name: ABC
Edge application
❺ Client ID of an edge application: B
❽ Publishing data topic name: GHI
❻ Client ID of an edge application: C
❾ Publishing data topic name: DEF
Communication1
Communication2
Communication3
MQTT broker
Industrial PC
Industrial PC
Data diagnosis flow
❶ Client ID of Real-time Flow Manager: D
❹ Client ID of an edge application: A
❼ Publishing data topic name: ABC
Real-time Flow Manager
Data diagnosis flow
❷ Client ID of Real-time Flow Manager: E
❻ Client ID of an edge application: C
❾ Publishing data topic name: DEF
Data diagnosis flow
❸ Client ID of Real-time Flow Manager: F
❺ Client ID of an edge application: B
❽ Publishing data topic name: GHI
Real-time Flow Manager

For the client IDs and topic name used in Real-time Flow Manager, refer to the following:

☞ Page 48 Client IDs and a topic name

■If neither MQTT broker nor edge application is running on an industrial PC on which Real-time Flow Manager is running

When an MQTT broker, an edge application, and Real-time Flow Manager run on a different industrial PC, the processing performance will be lower due to communication delay compared with the case in which they run on a same industrial PC. Take corrective action such as extending the collection cycle or reducing the number of units of output data to avoid a buffer overflow in MQTT cooperation.

■When changing the setting for the number of distribution records in an edge application

Switch the operating status of a process flow to STOP once, then to RUN again. Note that the operating statuses of all process flows must be switched to STOP once before applying the set parameters to Real-time Flow Manager.

■If Edgecross Basic Software does not support the version of an edge application to be cooperated

An error occurs when configuring the setting or receiving response data from the edge application. If the corresponding error occurs, use an edge application supported by the version of Edgecross Basic Software used, or update Edgecross Basic Software according to an edge application used. (☞ Page 15 Edge application I/F specification version)

■If changing the setting or order of publishing data

If changing the setting or order of publishing data after reading a publishing data definition file in an edge application, output the publishing data definition file and read it in the edge application again. Otherwise, an error will occur in the edge application or data read in the edge application will be incorrect.

■Data distribution when Real-time Flow Manager is ended

When switching the operating status of a process flow to STOP, data distribution stops immediately. Data not distributed at this time will not be distributed.

File cooperation

Data in Real-time Flow Manager is distributed to an edge application by using a file and response data is received from the edge application.

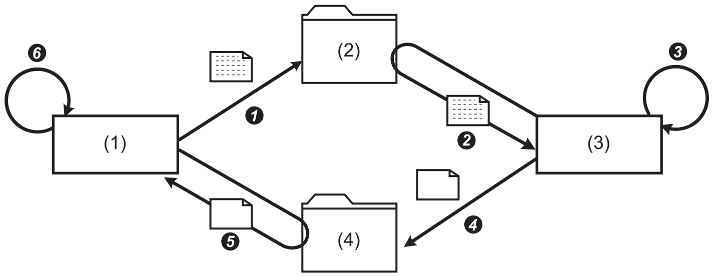
File cooperation enables cooperation with an edge application supporting a real-time data diagnosis I/F (technology: file).

Flow of data diagnosis

The following shows the flow of data diagnosis.

When diagnosing data with file cooperation, a publishing data file is created and data is diagnosed according to the diagnosis rules.

For creating diagnosis rules, refer to the manual for an edge application used.



(1) Real-time Flow Manager
(2) Output destination folder for a publishing data file
(3) Edge application
(4) Output destination folder for a response data file

❶ A publishing data file is output to a folder.
❷ The publishing data file is read.
❸ The file is diagnosed according to the diagnosis rule.
❹ A response data file is output to a folder when the diagnosis is completed.
❺ The response data file is read and response data is acquired. (The file is deleted after the reading is completed.)
❻ The response data is passed to the next process (feedback).

■Publishing data file

This file is output to distribute data to be diagnosed from Real-time Flow Manager to an edge application.

Immediately after a data modification process (data extraction), data while the data extraction condition is satisfied is output as a publishing data file. (The publishing data file switches after the data extraction period ends.)

■Publishing data definition file

This file stores the definition information of data such as a data name and a data type passed to an edge application from Real-time Flow Manager.

If it is necessary to provide an edge application with definition information of data in advance, settings for the edge application can be simplified by reading a publishing data definition file in the edge application.

■Response data file

This file is output when an edge application completes a diagnosis.

The file cooperation function detects the generation of a response data file, and passes response data to the feedback function.

The file cooperation function uses a file name (prefix) of a response data file to determine in which process flow the diagnosis is completed.

For response data files, refer to the manual for an edge application used.

When the file cooperation function reads response data from a response data file, a response data definition file is used.

■Response data definition file

This file defines information of response data such as a data name and a data type.

It is used for reading response data from a response data file.

Output a response data definition file in an edge application after setting the diagnosis, or create it according to the setting.

For response data definition files, refer to the manual for an edge application used.

Considerations

The following shows the considerations for file cooperation.

- The following setting must be same between an edge application and Real-time Flow Designer.
  Folder path of 'output destination folder for publishing data'
- For file cooperation in multiple process flows, set an output destination folder and a file name prefix without duplication in Real-time Flow Designer.
- When operating a publishing data file and response data file passed to an edge application, or creating a file other than one to be processed (a file the name of which matches the rules for the name of a file to be processed) in a folder to which the publishing data file and response data file are output, the operation is not guaranteed.
- When performing file cooperation, configure the setting so that an edge application can read a publishing data file in an output destination folder for a publishing data file. An edge application must start running within the timeout time (300 seconds). If it does not run, an error occurs.
- If Edgecross Basic Software does not support the version of an edge application to be cooperated, an error occurs when configuring the setting. If the corresponding error occurs, use an edge application supported by the version of Edgecross Basic Software used, or update Edgecross Basic Software according to an edge application used. (☞ Page 15 Edge application I/F specification version)
- If changing the setting or order of publishing data after reading a publishing data definition file in an edge application, output the publishing data definition file and read it in the edge application again. Otherwise, an error will occur in the edge application or data read in the edge application will be incorrect.
- When switching the operating status of a process flow to STOP, data output stops immediately. Data not output at this time will not be output.

5.5 Feedback Function

This section shows the function to perform processing (feedback) to notify external devices according to an execution condition specified by a user when response data is output.

The feedback function has the following functions.

Function	Description	Reference
Device instruction feedback function	To update data in a connected device via a data collector.	Page 55 Device instruction feedback function
Program execution feedback function	To run executable programs from a command line.	Page 55 Program execution feedback function

When the feedback function is performed, the accumulated number of feedback requests is stored in the Real-time Flow Manager status.

Events are stored in the event history.

Up to four pieces of feedback can be selected per detection. (Duplicated selections allowed.)

Up to 16 pieces of feedback can be provided. '16' is calculated by the following formula: the number of pieces of detected feedback (data diagnosis function: up to 4) × the number of pieces of feedback per detection (up to 4).

Whether feedback is completed normally is checked, and it is recorded in the event history. If it is not completed normally, an error occurs.

Precautions

- The order of feedback is not guaranteed in the following cases:
  Multiple pieces of feedback are set for one data diagnosis
  Multiple flows in which feedback is set exist
- If multiple pieces of feedback are set and execution conditions for each piece of feedback are satisfied at the same time, the simultaneous execution of each piece of feedback is not guaranteed.

Device instruction feedback function

This function updates data in connected devices via data collectors.
The data writing function of each data collector is used for device instruction feedback.
For details, refer to the manual for a data collector used.

Data assignment and the number of points

For availability of data assignment and the number of points for each update method and device type, refer to the manual for a data collector used.

Combination of data types of a device instruction target and a setting value

For combinations of data types of a device instruction target (device) and a setting value, refer to the following:
☞ Page 548 Data substitution

Program execution feedback function

This function runs executable programs from a command line.

Specifications of program execution commands

The specifications of each program execution command are as follows:

Item	Specification	Range
Execution command	Specify an execution program path and program arguments with character strings. • Execution program path + space + program arguments	255 characters in maximum
Execution program path[1]	Specify a program to execute in Real-time Flow Manager. Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be used.[2] (☞ Page 545 WSTRING type)	127 characters in maximum
Program argument[3,4]	Specify arguments to the execution program path. Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be used. (☞ Page 545 WSTRING type) A diagnosis result can be passed to a program by using a reserved word. For details on reserved words, refer to the following: ☞ Page 56 Reserved word	300 characters in maximum[5]

*1 When using a remote shared folder, refer to the following:
☞ Page 556 Using a shared folder without specifying a user account in Edgecross Basic Software
*2 Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)
*3 Arguments must be delimited by a space.
*4 When operating another file in an execution program, the work folder will be same as the execution program.
*5 Reserved words are counted as the number of characters.

■Reserved word

The '%Vnnn' format can be used as a reserved word for an execution program argument.

Specify a number (1 to 256) of response data for 'nnn' with zero padding. (Example: %V001)

When '%' is included in an argument, enter '%' twice consecutively.

When a space is included in response data, a reserved word must be enclosed in double quotes (").

The following table shows the correspondence between a data type and an argument character string of response data.

Data type	Expansion format	Number of characters after expansion
BOOL	• ON: 1 • OFF: 0	1
INT	Decimal format[*1,*2]	1 to 6
UINT	Decimal format[*1]	1 to 5
DINT	Decimal format[*1,*2]	1 to 11
UDINT	Decimal format[*1]	1 to 10
LINT	Decimal format[*1,*2]	1 to 21
ULINT	Decimal format[*1]	1 to 20
REAL[*3,*4]	• An absolute value is less than 1.000000E-04, or 1.000000E10 or more: Exponential format (number of digits in the mantissa is 10 digits)[*5,*6,*7,*8] • An absolute value is 1.000000E-04 or more, and less than 1.000000E10: Decimal format (number of significant digits: 10 digits)[*9]	1 to 16
LREAL[*3,*4]	• An absolute value is less than 1.000000E-04, or 1.000000E18 or more: Exponential format (number of digits in the mantissa is 18 digits)[*5,*6,*7,*8] • An absolute value is 1.000000E-04 or more, and less than 1.000000E18: Decimal format (number of significant digits: 18 digits)[*9]	1 to 25
STRING	• If a string terminator (0) is used halfway in the data, the subsequent data is not output. • A character other than a printable ASCII character (0x20 to 0x7E) and a double quote (") are replaced with a period (.).	1 to 32
WSTRING	• If a string terminator (0) is used halfway in the data, the subsequent data is not output. • A control character code, line feed code, and double quote (") are replaced with a period (.).	1 to 32

*1 '0' or a space is not added for padding.

*2 A sign is added for a minus value only.

*3 Feedback is not provided and an error is output in the following cases:
Data (non-numeric value) that cannot be represented in a type specified for the data type
It exceeds the upper limit of a positive value (represented as '+Inf').
It falls below the lower limit of a negative value (represented as '-Inf').

*4 If a value is in the range of '0' to the lower limit value of a positive value, '0' is output. If it is in the range of the lower limit value of a negative value to '0,' '-0' is output.

*5 'E' is displayed in uppercase.

*6 When the end of the mantissa is '0,' it is rounded down and output.

*7 '+' or '-' is added in front of an exponent.

*8 When an exponent is a single digit, it is displayed in double digits with zero padding.

*9 When the end of the decimal part is '0,' it is rounded down and output.

Point

- Up to 32 reserved words can be used.
- Even when there is a character other than a blank before and after a reserved word, a program is executed.

Precautions

- A program to be executed runs as a Windows service; therefore, any operation that requires a screen cannot be performed.
  (Example) Entering a login user or password
- A program runs as a Windows service; therefore, it is executed with the administrator authority by using the Windows account 'SYSTEM.' When setting program execution, note the following:
  Use a system environment variable. (An environment variable of the current user cannot be used.)
  A folder storing the program is set as a current folder.
  However, if the program is a batch file in a remote shared folder, the Windows directory of an industrial PC on which Real-time Flow Manager is installed is set as a current folder.
  A network drive (drive assigned by using a Windows function) cannot be used.
- If running an application, user program, or batch file that needs to be ended by an operation of a user, a process may remain incorrectly and system resources may be under pressure.
- If a program argument containing a space is not divided at the position of the space, enclose it in double quotes (").
  (Example) "C:\My Folder\out.dat"

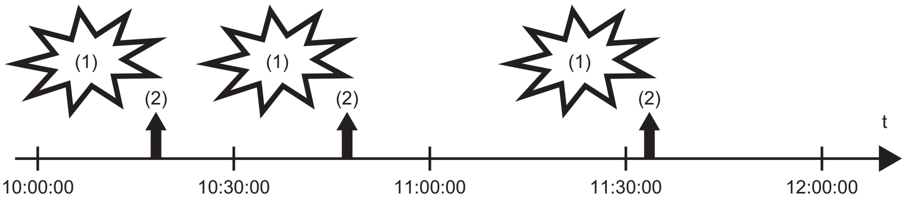
Feedback deterrence

A deterrence period can be set not to provide same feedback for a certain period once it is provided.

When feedback is always provided

Feedback is provided each time an error is detected.

Ex.



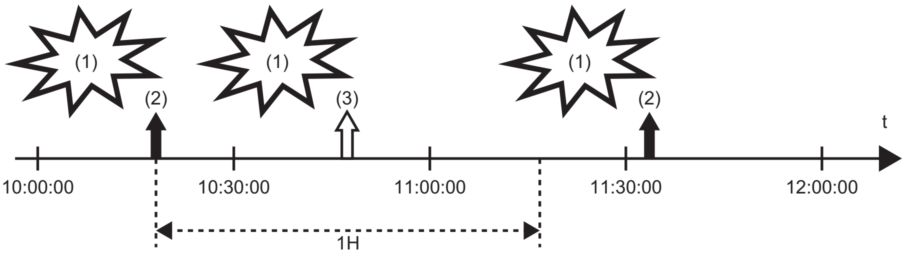
(1) An error is detected.
(2) Feedback is provided.

When a deterrence period is specified

Feedback is not provided until the execution deterrence period elapses.

Ex.

When one hour is set for a deterrence period



(1) An error is detected.
(2) Feedback is provided.
(3) Feedback is not provided, because a deterrence period does not elapse.

5.6 Data Storing Function

This section shows the function to save data collected or modified in Real-time Flow Manager, or response data received by using the data diagnosis function in a format specified in Real-time Flow Designer.

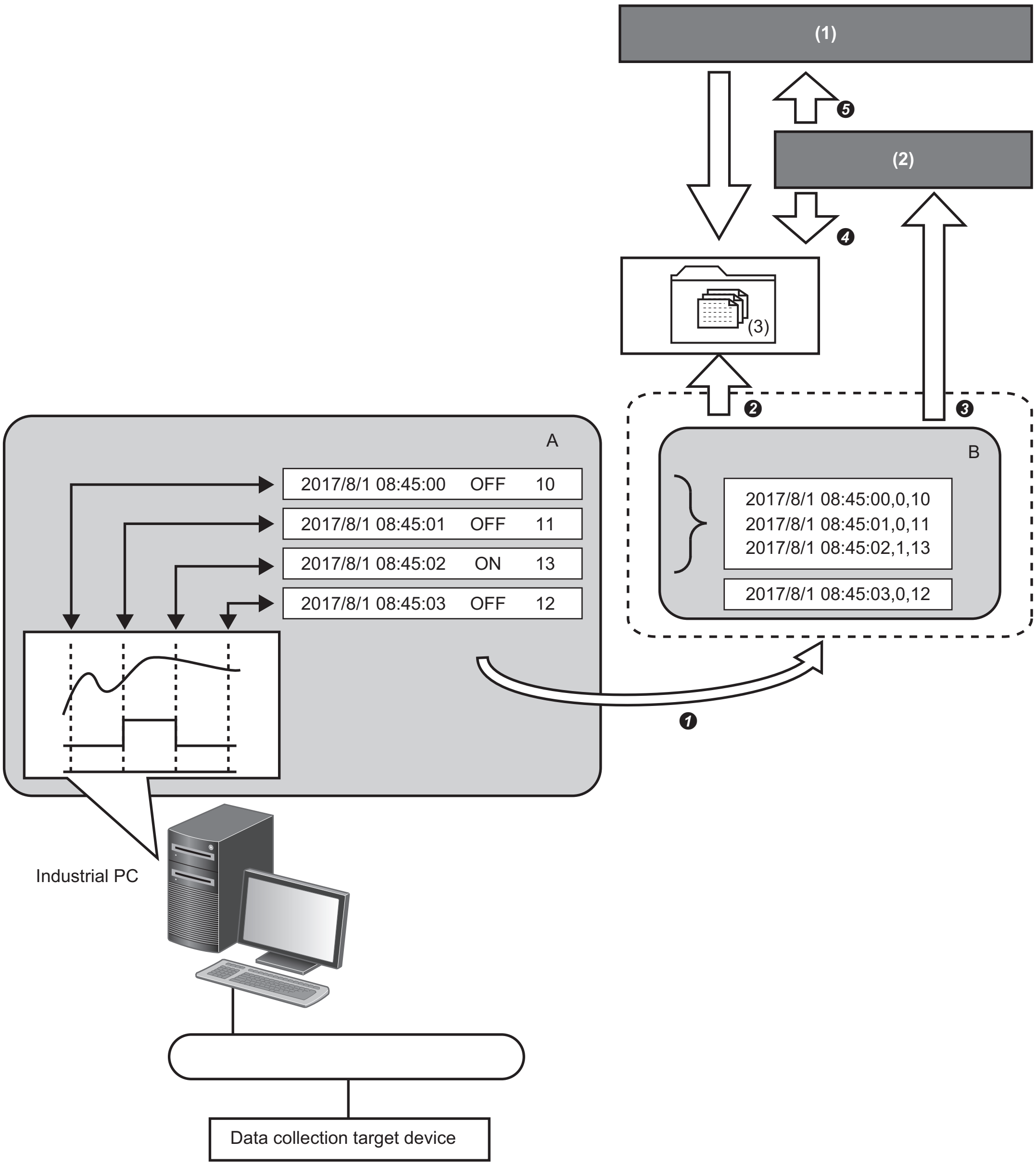
The following saving formats can be specified.

- File (☞ Page 60 File saving function)
- Database (☞ Page 77 DB saving function)

File saving function

This function saves data collected or modified in Real-time Flow Manager, or diagnosis result data to a file (historical data file) in a format of a historical data access I/F (technology: file).

In addition, any program can be run in Real-time Flow Manager after file saving. Therefore, a program that processes a historical data file can be run and used for cooperating with an edge application.



▢ : Functions of Edgecross Basic Software
⬚ : Range of the file saving function
■ : Functions other than one of Edgecross Basic Software
A: Data collection function, data modification function
B: File saving function
(1) Edge application
(2) Any program
(3) Historical data file

❶ Collected and modified data is sent.

❷ A historical data file is output.

❸ A program is run.

❹ Saved data is read from the program.

❺ Data read from the program to the edge application is sent.

Operational specifications

■File output

Data to be output is temporarily saved in an accumulating file in the temporary area in Real-time Flow Manager.

The size of an accumulating file increases over time, and the file switches when the number of rows specified in Real-time Flow Designer is reached.

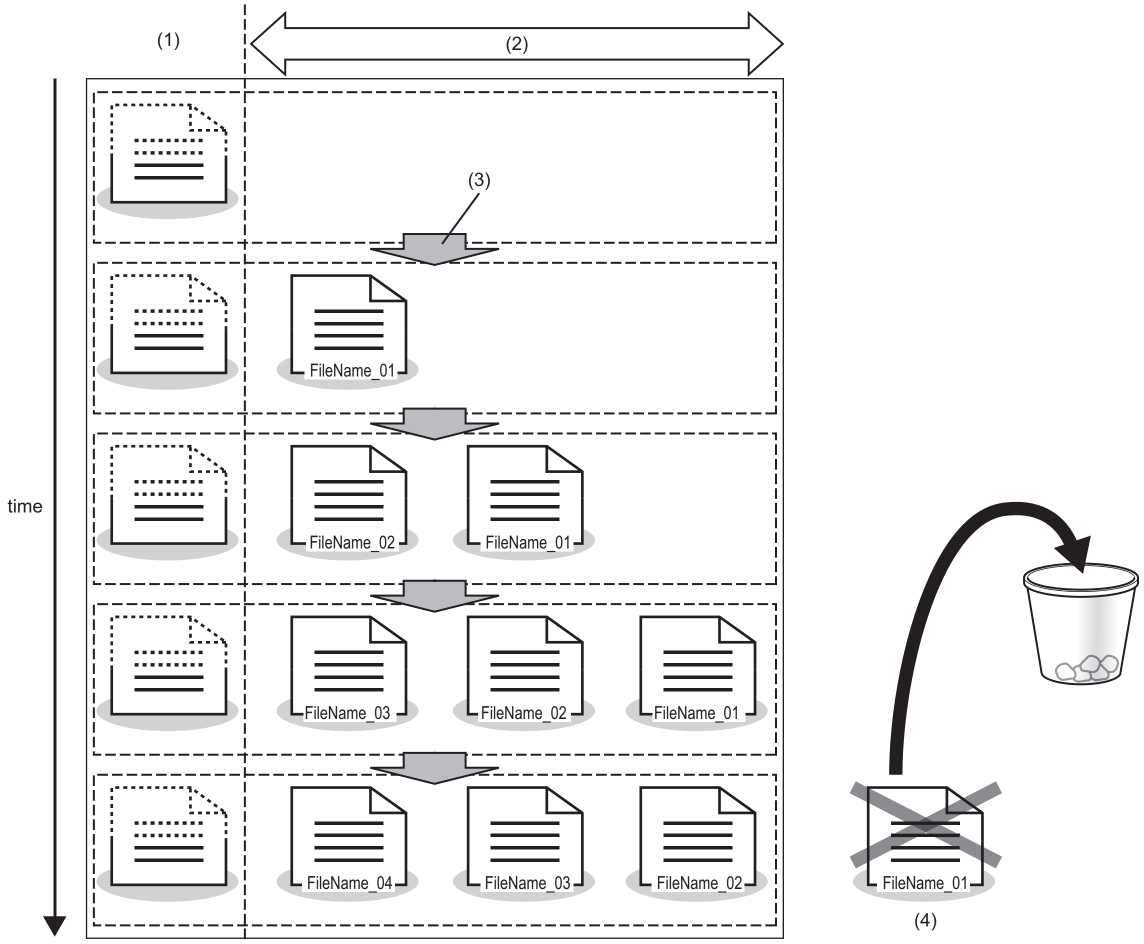
When selecting the checkbox of "Output in Data Extraction unit" in Real-time Flow Designer, data to be output is output to an accumulating file while a data extraction condition is satisfied, and the file switches when the condition is no longer satisfied. However, even while the condition is satisfied, the file switches if the number of rows specified in Real-time Flow Designer is reached.

File switching is to change the name of an accumulating file to that of a saved file, and move it to a save destination folder. (A new accumulating file is created after file switching.)

When a process flow stops running, an accumulating file switches to a saved file even if a specified number of rows is not reached. However, if there is no output data in the accumulating file, the file is deleted without switching.

If switching a file while a process flow is stopped, a new accumulating file is not created.

Saved files are saved up to a number of files specified in Real-time Flow Designer. If the specified number is exceeded, files are deleted in chronological order.



(1) Accumulating file
(2) Saved file (a file with a smaller number is an older one)
(3) File switching
(4) File to be deleted

Precautions

- If the number of rows specified in Real-time Flow Designer is small, the load on Windows increases because a saved file is frequently created. In this case, review the setting to lengthen the collection cycle or increase the maximum number of data rows output to a file.
- For specifying a folder with the encryption attribute enabled as a file output destination, refer to the following:

☞ Page 71 Using a folder with the encryption attribute enabled

- When specifying a folder with the compression attribute enabled for a save destination folder, the free space is determined to be temporarily insufficient and a file saving error may occur if the free space on the disk is low.
- When outputting real number type data to a file in a decimal format, it is output in an exponential format if the value applies to either of the following conditions. In this case, the number of digits in the mantissa is that of significant digits and '0' at the end of the decimal part is rounded down.
  REAL type: Less than 1.0E-4 (absolute value) or 1.0E+6 (absolute value) or more
  LREAL type: Less than 1.0E-4 (absolute value) or 1.0E+15 (absolute value) or more

■Historical data definition file output

A historical data definition file contains information such as a data name and a data type of collected or modified data and diagnosis result data.

It is output to the 'DATATYPE' folder in a save destination folder at the timing when a process flow switches from STOP to RUN. If there is no 'DATATYPE' folder, it is created when a historical data definition file is output.

A historical data definition file is created for each prefix of a file. When there is a historical data definition file with a same prefix in the 'DATATYPE' folder, the file is overwritten.

■Output in data extraction units

When the data extraction is set for a data modification process, output data is saved to a file in a set data extraction unit. (☞ Page 37 Data Modification Function)

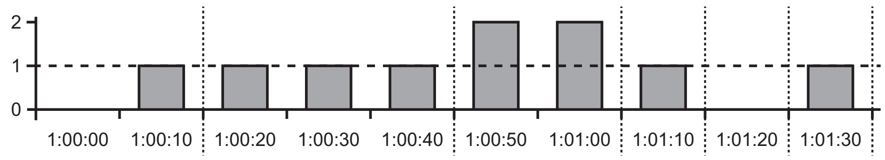
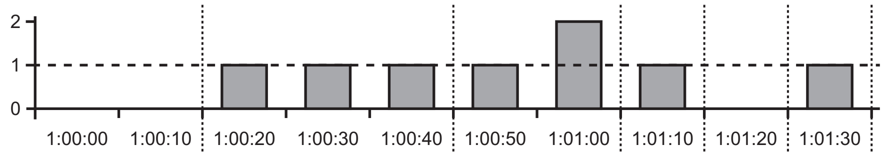
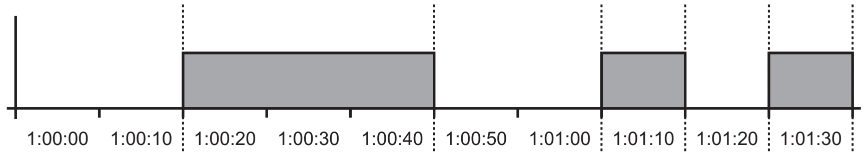
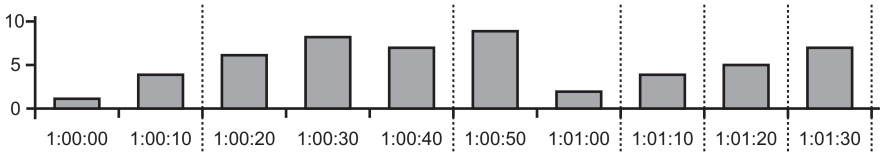
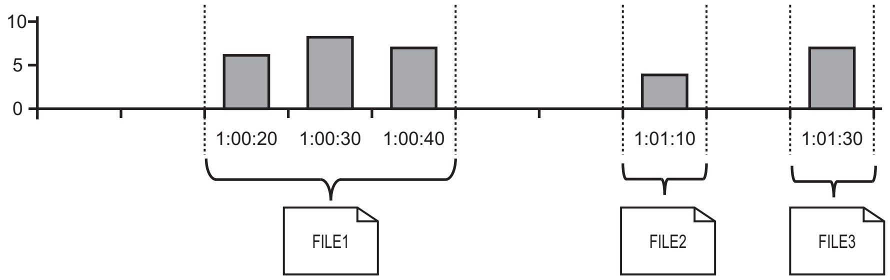
Output data is output to a file only while the condition is satisfied, and a file is switched when the period ends.

The following shows operation examples of AND combination and OR combination when selecting the checkbox of "Output in Data Extraction unit."

Operation example of AND combination

The operation examples for the following settings are shown below.

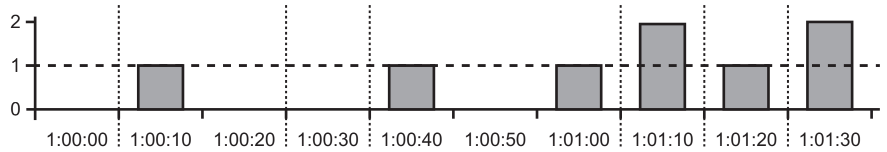
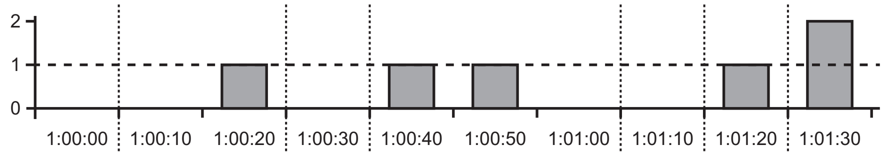
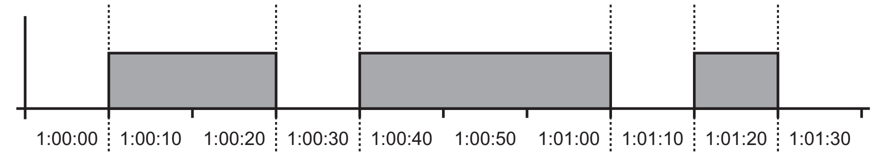
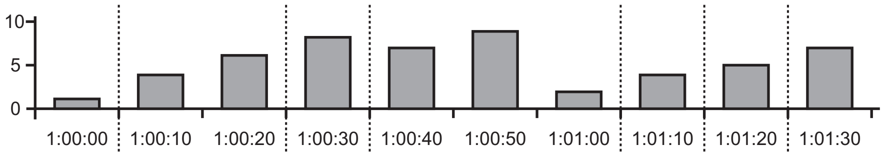
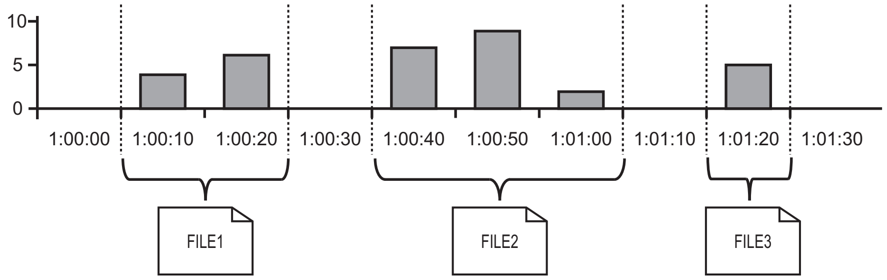
- Condition 1: Monitoring target data [A] = 1
- Condition 2: Monitoring target data [B] = 1

Item	Operation
Monitoring target data [A]	
Monitoring target data [B]	
Condition is satisfied or not	
Input data	
Output data (Output to a file)	 10 5 0 1:00:20 1:00:30 1:00:40 1:01:10 1:01:30 FILE1 FILE2 FILE3

Operation example of OR combination

The operation examples for the following settings are shown below.

- Condition 1: Monitoring target data [A] = 1
- Condition 2: Monitoring target data [B] = 1

Item	Operation
Monitoring target data [A]	
Monitoring target data [B]	
Condition is satisfied or not	
Input data	
Output data (Output to a file)	

Precautions

A maximum number of data rows specified in Real-time Flow Designer can be output to a file. If the number of data rows output while the data extraction condition is satisfied exceeds the maximum number, the file switches to a new one and remaining data is output to the new one.

■File deletion

If the number of output files reaches a specified number of files, files are deleted in chronological order.

Files are compared by using the eight-digit sequential number of the end of a file name, and deleted in ascending order.

■Historical data definition file deletion

A historical data definition file is not automatically deleted even when the setting of Real-time Flow Designer is changed. Delete it or move it to another folder as necessary.

■Data missing

No data is output while data missing is occurring.

When the file saving setting is configured in a data collection process, data missing information is output to a file as index information.

Point

Whether data missing occurred in a running process flow can be checked by monitoring the number of times of data missing in the process flow diagnostics or status memory monitor of Real-time Flow Designer.

☞ Page 337 Process flow diagnostics

☞ Page 340 Status memory monitor

☞ Page 433 Real-time Flow Manager Status

■File format

The following file formats are available to output data.

File format	Description
Shift JIS	Comma-delimited data is output with Shift JIS codes.
UTF-8	Comma-delimited data is output with UTF-8 codes (with BOM).

■Account to be used

When specifying a user account in Real-time Flow Designer, it is used. If not, the Windows account 'SYSTEM' is used.

By specifying a user account, a file can be output to a folder accessible to a specific user only.

For the method for specifying a user account, refer to the following:

☞ Page 147 Saved file

Precautions

When using a user account specified in Real-time Flow Designer, the authentication processing may take time due to a network load or failure.

If it takes five minutes or more, a moderate error occurs.

Data size

The following table shows the size of each unit of data to be output to a file.

Item name	Description		Size (byte)	
			CSV	
			Shift JIS	UTF-8
Data name row	Date and time column		32	32
	Data column		32	96
Data row	Date and time		32	32
	BOOL		1	1
	INT		6	6
	UINT	Integer format	5	5
		Hexadecimal format	4	4
	DINT		11	11
	UDINT	Integer format	10	10
		Hexadecimal format	8	8
	LINT		20	20
	ULINT	Integer format	19	19
		Hexadecimal format	16	16
	REAL LREAL	Decimal format	26	26
		Exponential format	22	22
	STRING		32	32
	WSTRING		—	48
Others	Line feed code (CRLF)		2	2
	BOM		0	3

■Disk space for saving files

Disk space required to save files is calculated by the following formulas based on the setting contents and the size of data.

Required file capacity = Sum of each <maximum size of items saved in a file>

<Maximum size of items saved in a file>*1 = <Size of one file> × (Upper limit of the number of saved files + 1)

<Size of one file> = Data name row size + (Data row size × Number of data rows) + (Line feed code size × Number of data rows) + BOM

*1 Files are output and accumulated in a temporary file until a specified number of rows is reached. Therefore, an area obtained by adding '1' to the upper limit of the number of saved files is required until immediately before output.

File name, save destination

The following shows the specifications of names and save destinations of a file output by performing the file saving function and a historical data definition file.

■File

Item	Specification		Range
File name	The format of a file name is 'Prefix_suffix.extension.'		14 to 45 characters
	Prefix	Characters that can be used for the WSTRING type[*1,*2] can be used.	1 to 32 characters
	Suffix	An eight-digit sequential number (hexadecimal) is added. (It is sequentially incremented from 00000001 to FFFFFFFF.) When saving a file with the prefix same as one saved in a save destination, the suffix is incremented from the maximum prefix.	8 characters (Fixed to 8 digits using 0 to 9 and A to F)
Save destination	A file can be saved to the following locations: • Local disk • Shared folder[*3, *4] Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be specified as the path to a save destination.[*2,*5] (☞ Page 545 WSTRING type)		Path length: 205 characters in maximum (Including the drive letter and '\' at the end of a path)
Maximum number of files created in a save destination	If a specified number of files is exceeded, files are deleted in chronological order.		1 to 6000

*1 Excluding the following characters:
\ (0x5C), / (0x2F), : (0x3A), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

*2 A space (0x20) and a period (0x2E) cannot be used for the first character.

*3 When using a remote shared folder, refer to the following:
☞ Page 553 Using a Remote Shared Folder

*4 A network drive (drive assigned by using a Windows function) cannot be used.

*5 Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

Precautions

If a file that is not created according to the specification is included in a save destination, the file is ignored.

■Historical data definition file

Item	Specification		Range
File name	The format of a file name is 'Prefix_suffix.extension.'		14 to 45 characters
	Prefix	Refer to 'Prefix' in the following: ☞ Page 67 File	1 to 32 characters
	Suffix	DATATYPE	8 characters
Save destination	A historical data definition file is saved in the 'DATATYPE' folder in a save destination folder described in the following section. If there is no 'DATATYPE' folder, it will be created when saving a file.[*1] ☞ Page 67 File		—
Maximum number of files created in a save destination	One file is created for one file name prefix. If the file name prefix is changed after a historical data definition file is output, the old historical data definition file will not be deleted.		1

*1 If a folder is not created even after the following time elapses, an error will occur.
When starting an industrial PC: 240 seconds after the startup of the industrial PC
When 240 or more seconds elapses after the startup of an industrial PC: 10 seconds

Program execution after file output

Executable programs can be executed from a command line when a file is output (without waiting for a response from the program).

- Specifications of program execution commands

The specifications of each program execution command are as follows:

Item	Specification	Range
Program path[*1]	Specify the absolute path of a program to execute in Real-time Flow Manager. Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be used.[*2] (☞ Page 545 WSTRING type)	127 characters in maximum
Program argument[*3]	Specify arguments to the program path. Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be used. (☞ Page 545 WSTRING type) The following reserved words can be specified. <FILE>: Absolute path string for output file	127 characters in maximum[*4]

*1 When using a remote shared folder, refer to the following:
☞ Page 556 Using a shared folder without specifying a user account in Edgecross Basic Software
*2 Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)
*3 Arguments must be delimited by a space.
*4 Reserved words are counted as the number of characters.

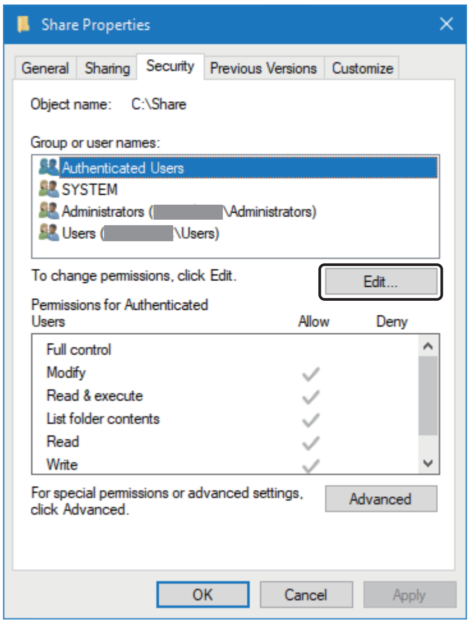
Precautions

- A program executed after a file is output runs as a Windows service; therefore, any operation that requires a screen cannot be performed.
  (Example) Entering a login user or password
- A program runs as a Windows service; therefore, it is executed with the administrator authority by using the Windows account 'SYSTEM.' When setting program execution, note the following:
  Use a system environment variable. (An environment variable of the current user cannot be used.)
  A folder storing the program is set as a current folder.
  However, if the program is a batch file in a remote shared folder, the Windows directory of an industrial PC on which Real-time Flow Manager is installed is set as a current folder.
  A network drive (drive assigned by using a Windows function) cannot be used.
- When specifying a user account and specifying a file output to a folder with restricted access or the encryption attribute enabled as an argument of a program, the program may not be able to access the output file due to the difference in authority.
- If a program argument containing a space is not divided at the position of the space, enclose it in double quotes (").
  (Example) "C:\My Folder\out.dat"

Using a local folder with restricted access

The following shows the procedure for setting a local folder that can be accessed only with a user account specified in Real-time Flow Designer as a save destination.

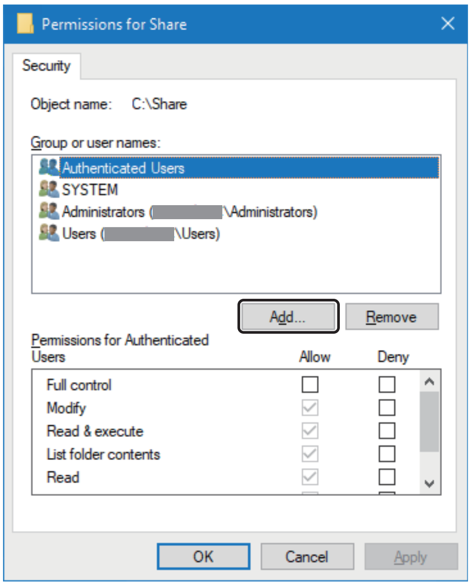
1. Click the [Edit] button in the [Security] tab in the properties of a save destination folder.



Object name: C:\Share

Authenticated Users
SYSTEM
Administrators ([redacted]\Administrators)
Users ([redacted]\Users)

2. Click the [Add] button.

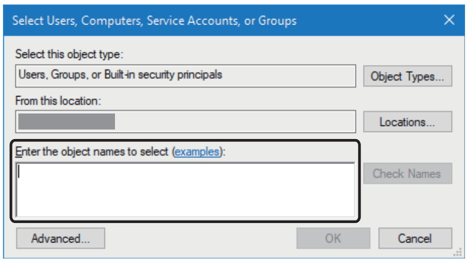


Object name: C:\Share

Authenticated Users
SYSTEM
Administrators ([redacted]\Administrators)
Users ([redacted]\Users)

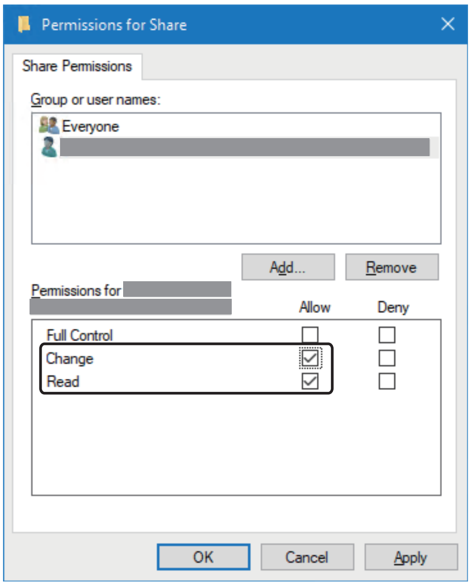
3. Enter a user account name in "Enter the object name to select."

4. Click the [OK] button.



Select this object type: Users, Groups, or Built-in security principals

From this location: [redacted]



Group or user names:

Everyone

[redacted]

Permissions for [redacted]

	Allow	Deny
Full Control	☐	☐
Change	☑	☐
Read	☑	☐

5. Select a user account to allow access, then select the checkboxes of "Change" and "Read" under "Allow" for "Permissions."

6. Click the [OK] button.

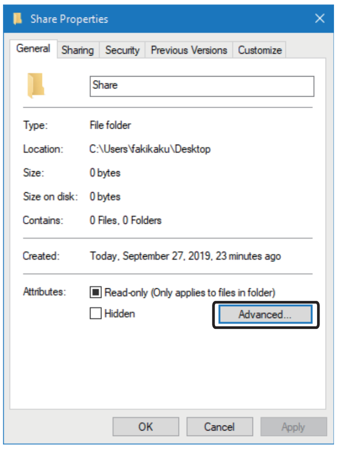
Using a folder with the encryption attribute enabled

By enabling the encryption attribute for a folder to which a file is output in Windows and specifying a user account in Edgecross Basic Software, information in the file can be protected from other users who use an industrial PC.

Note that an output destination folder must be a local folder.

The following shows the procedure for enabling the encryption attribute of a folder in Windows.

1. Click the [Advanced] button in the [General] tab in the properties of a folder.



Share

Type: File folder

Location: C:\Users\fakikaku\Desktop

Size: 0 bytes

Size on disk: 0 bytes

Contains: 0 Files, 0 Folders

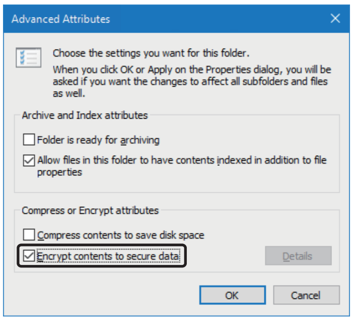
Created: Today, September 27, 2019, 23 minutes ago

Attributes: ■ Read-only (Only applies to files in folder)

☐ Hidden Advanced...

2. Select the checkbox of "Encrypt contents to secure data."[*1]

*1 To remove the encryption, unselect the checkbox.



Choose the settings you want for this folder.

When you click OK or Apply on the Properties dialog, you will be asked if you want the changes to affect all subfolders and files as well.

Archive and Index attributes

☐ Folder is ready for archiving

☑ Allow files in this folder to have contents indexed in addition to file properties

Compress or Encrypt attributes

☐ Compress contents to save disk space

☑ Encrypt contents to secure data

3. Click the [OK] button.

4. Close the properties of the folder.

Precautions

- Simply specifying a user account in Edgecross Basic Software does not enable the encryption attribute for a save destination folder, and an output file is not encrypted either.
- When not specifying a user account in Edgecross Basic Software, a file is output with the Windows account 'SYSTEM' instead of a user signed in to Windows. Therefore, a saved file cannot be opened in other software or with other user accounts. To set a folder with the encryption attribute enabled as a save destination, be sure to specify the user name and password of a user account in Edgecross Basic Software.
- If a save destination folder set in Edgecross Basic Software does not exist, a file is output with a specified user account after a folder is created. Note that the encryption attribute is not enabled for a created save destination folder and an output file is not encrypted either.
- If a historical data definition file with a same file name prefix saved with another user account already exists in a save destination folder with the encryption attribute enabled, an error may occur due to the difference in authority to the file. Specify a file name prefix different from a file already output.
- For the procedure for browsing files output to an encrypted folder with a user account other than one specified in Edgecross Basic Software, refer to the following:

☞ Page 72 Procedure for browsing files with a user account other than a specified one

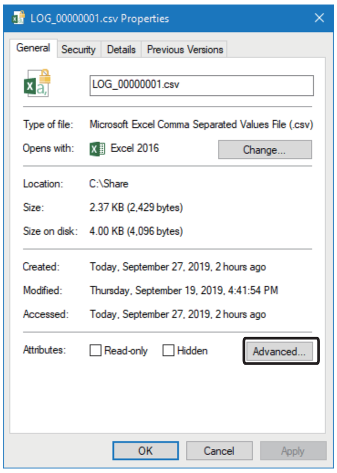
Procedure for browsing files with a user account other than a specified one

The following shows the procedure for browsing files output to an encrypted folder with a user account other than one specified in Edgecross Basic Software.

❶ Exporting the certificate of an encrypted file

1. Sign in to Windows as a specified user.

2. Click the [Advanced] button in the [General] tab in the properties of an encrypted and saved file.



LOG_00000001.csv

Type of file: Microsoft Excel Comma Separated Values File (.csv)

Opens with: Excel 2016

Location: C:\Share

Size: 2.37 KB (2,429 bytes)

Size on disk: 4.00 KB (4,096 bytes)

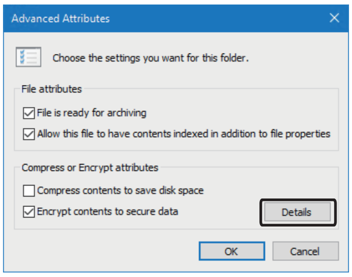
Created: Today, September 27, 2019, 2 hours ago

Modified: Thursday, September 19, 2019, 4:41:54 PM

Accessed: Today, September 27, 2019, 2 hours ago

Attributes: ☐ Read-only ☐ Hidden

3. Click the [Details] button.



Choose the settings you want for this folder.

File attributes

☑ File is ready for archiving

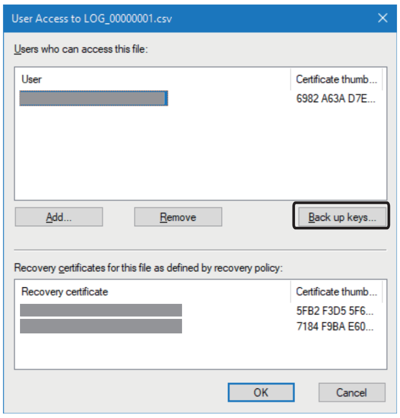
☑ Allow this file to have contents indexed in addition to file properties

Compress or Encrypt attributes

☐ Compress contents to save disk space

☑ Encrypt contents to secure data

4. Select a specified user in the user list, and click the [Back up keys] button.



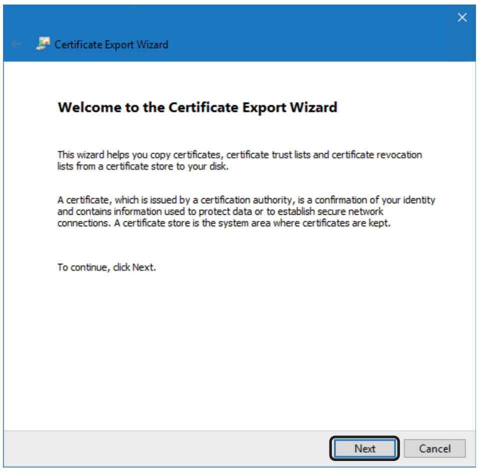
Users who can access this file:

User	Certificate thumb...
[redacted]	6982 A63A D7E...

Recovery certificates for this file as defined by recovery policy:

Recovery certificate	Certificate thumb...
[redacted]	5FB2 F3D5 5F6...
[redacted]	7184 F9BA E60...

5. Click the [Next] button.



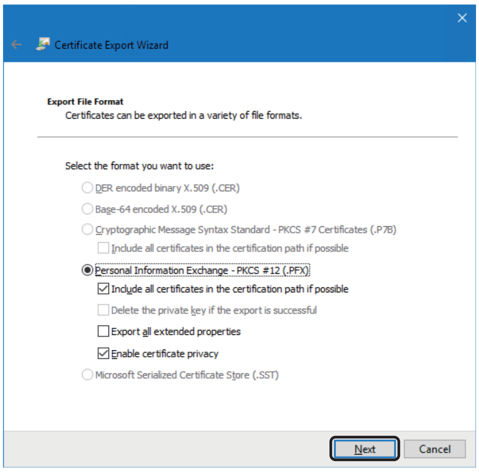
Welcome to the Certificate Export Wizard

This wizard helps you copy certificates, certificate trust lists and certificate revocation lists from a certificate store to your disk.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

To continue, click Next.

6. Click the [Next] button.

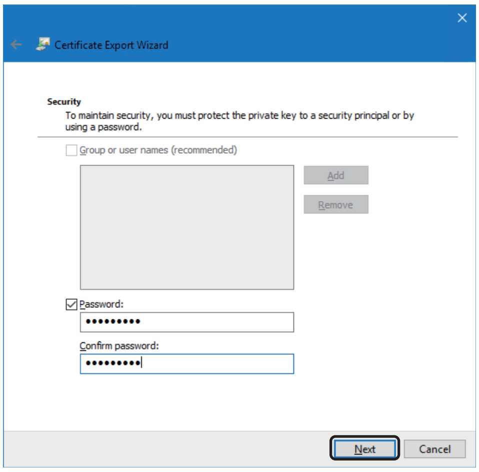


Export File Format
Certificates can be exported in a variety of file formats.

Select the format you want to use:

- ○ DER encoded binary X.509 (.CER)
- ○ Base-64 encoded X.509 (.CER)
- ○ Cryptographic Message Syntax Standard - PKCS #7 Certificates (.P7B)
  - ☐ Include all certificates in the certification path if possible
- ● Personal Information Exchange - PKCS #12 (.PFX)
  - ☑ Include all certificates in the certification path if possible
  - ☐ Delete the private key if the export is successful
  - ☐ Export all extended properties
  - ☑ Enable certificate privacy
- ○ Microsoft Serialized Certificate Store (.SST)

7. Select the checkbox of "Password" and set a password, then click the [Next] button.



Security
To maintain security, you must protect the private key to a security principal or by using a password.

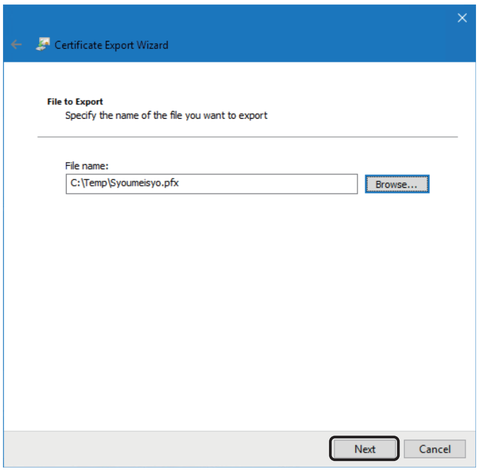
☐ Group or user names (recommended)

☑ Password:
•••••••••

Confirm password:
•••••••••

8. Set a save destination and file name of a certificate to export, and click the [Next] button.

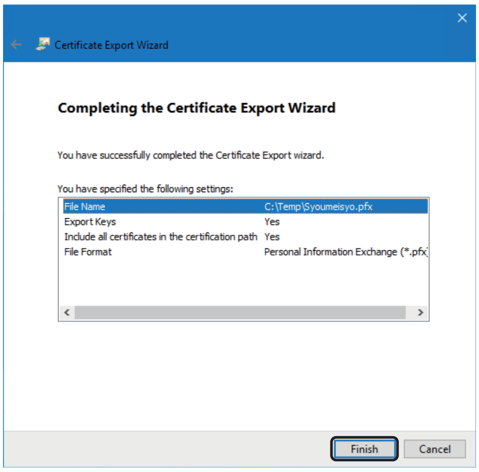
A save destination must be one that can be accessed by a user who browses a file.



File to Export
Specify the name of the file you want to export

File name:
C:\Temp\Syoumeisyo.pfx

9. Click the [Finish] button.



Completing the Certificate Export Wizard

You have successfully completed the Certificate Export wizard.

You have specified the following settings:

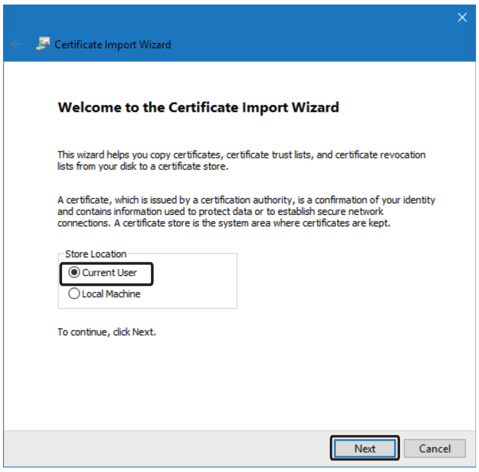
File Name	C:\Temp\Syoumeisyo.pfx
Export Keys	Yes
Include all certificates in the certification path	Yes
File Format	Personal Information Exchange (*.pfx

❷ Importing a certificate

1. Sign in to Windows with a user account that will be allowed to browse a file.

2. Double-click an exported certificate file (.pfx).

3. Select "Current User," and click the [Next] button.



Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

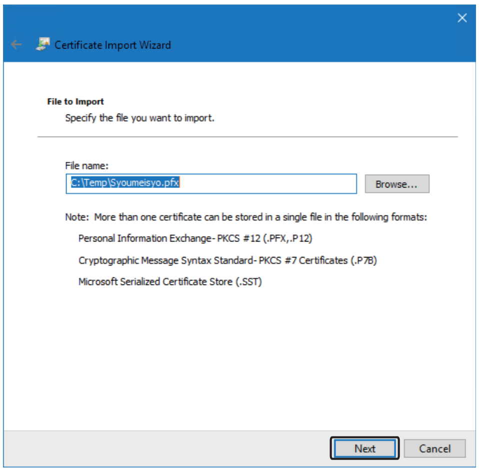
Store Location

● Current User

○ Local Machine

To continue, click Next.

4. Set the exported certificate file (.pfx) for "File name," and click the [Next] button.



File to Import

Specify the file you want to import.

File name: C:\Temp\Syoumeisyo.pfx

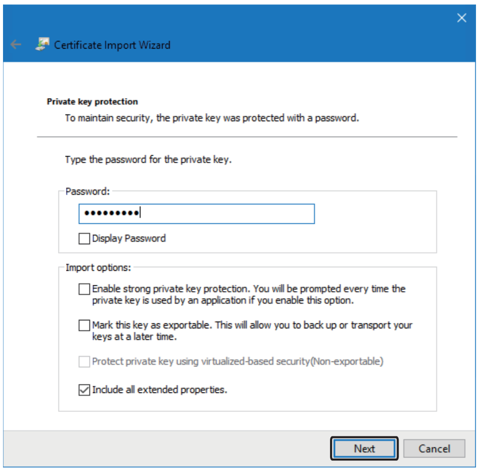
Note: More than one certificate can be stored in a single file in the following formats:

Personal Information Exchange- PKCS #12 (.PFX,.P12)

Cryptographic Message Syntax Standard- PKCS #7 Certificates (.P7B)

Microsoft Serialized Certificate Store (.SST)

5. Enter the password for the certificate file (.pfx), and click the [Next] button.



Private key protection

To maintain security, the private key was protected with a password.

Type the password for the private key.

Password:

•••••••••

☐ Display Password

Import options:

☐ Enable strong private key protection. You will be prompted every time the private key is used by an application if you enable this option.

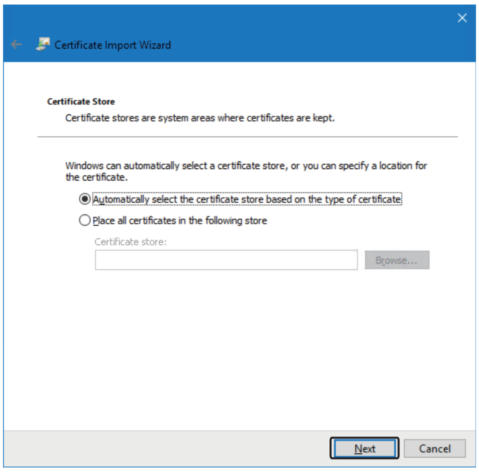
☐ Mark this key as exportable. This will allow you to back up or transport your keys at a later time.

☐ Protect private key using virtualized-based security(Non-exportable)

☑ Include all extended properties.

6. Click the [Next] button.

7. Click the [Finish] button.



Certificate Store

Certificate stores are system areas where certificates are kept.

Windows can automatically select a certificate store, or you can specify a location for the certificate.

● Automatically select the certificate store based on the type of certificate

○ Place all certificates in the following store

Certificate store:

Considerations

The following describes the considerations for file saving.

■Changing the setting or order of output data

When changing the setting or order of output data after reading a historical data definition file in an edge application, read the file in which the setting is applied in the edge application again. If not reading the file again, an error will occur in the edge application or data read in the edge application will be incorrect.

■The number of a file name suffix reaches 'FFFFFFFF'

When the file name suffix of a file being output reaches 'FFFFFFFF,' move all files in the save destination folder to another folder and restart the operation of Real-time Flow Manager, or set another path for the save destination folder again.

■Using the data distribution function to distribute data

When switching the operating status of a process flow to STOP, the data distribution function stops immediately and data not distributed at this time will not be distributed. If there is undistributed data, a difference occurs between distributed data and data output by using the file saving function.

■Using an IT gateway to save a file

An IT gateway runs as a Windows service; therefore, it is executed with the administrator authority by using the Windows account 'SYSTEM.' Files output to a folder with restricted access or the encryption attribute enabled by using a user account may not be saved due to the difference in authority. For the specifications of an IT gateway, refer to the manual for the IT gateway.

■Specifying a folder for which a search index is to be created as a save destination

When specifying a folder for which a Windows search index is to be created as a save destination folder and running a process flow for a long time, the amount of index information (Windows.edb file) becomes large. As a result, the free disk space on an industrial PC where Edgecross Basic Software is running may become insufficient. This can be avoided by either of the following methods:

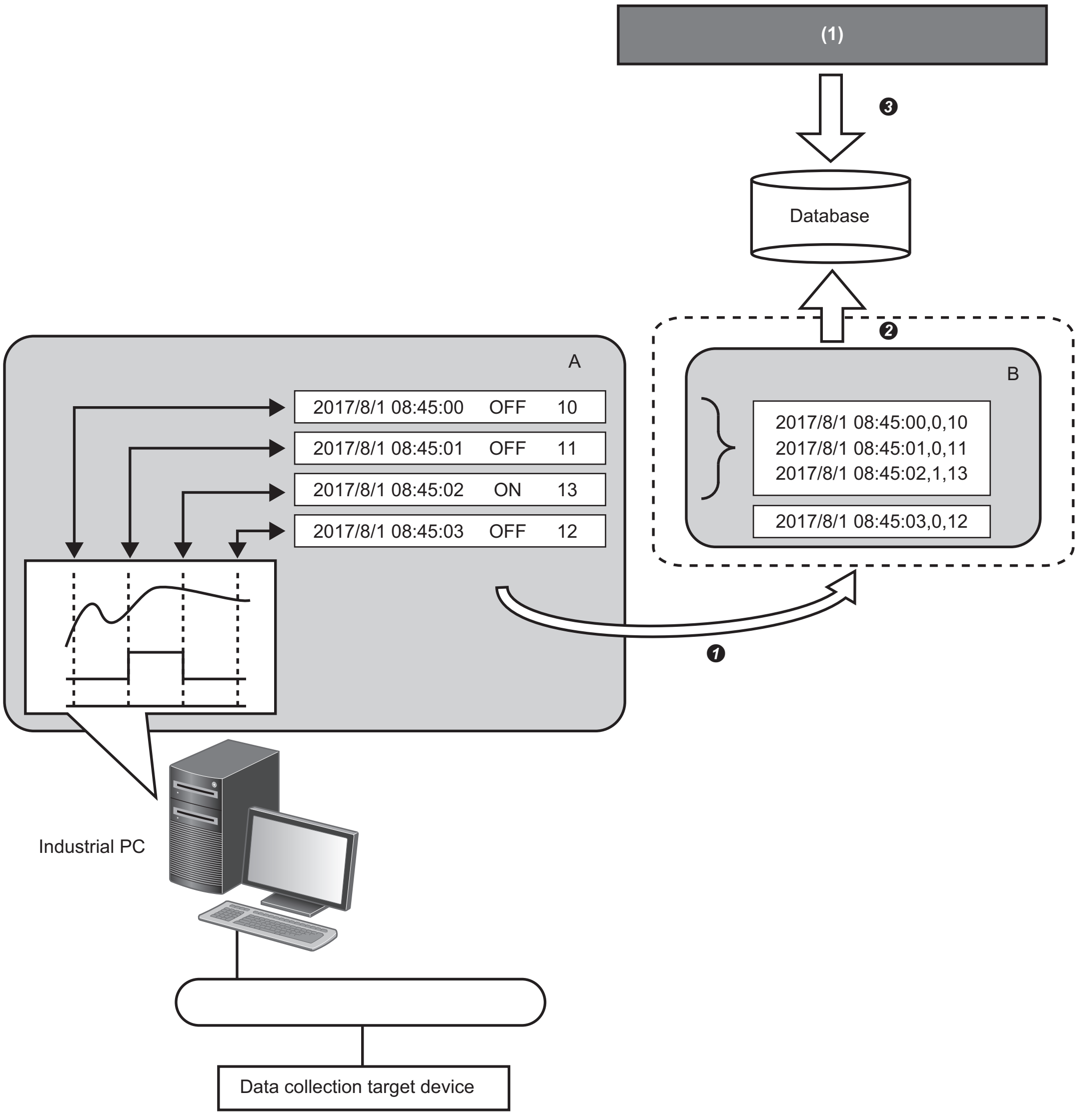
- Specify a folder other than one for which a search index is to be created as a save destination folder.
- Exclude the folder specified as a save destination folder from the search index target by the following procedure:
  ❶ Select [Search] ⇨ [Searching Windows] ⇨ "Classic" ⇨ "Customize search locations here" in Windows settings.
  ❷ Click the [Modify] button in the "Indexing Options" screen.
  ❸ Unselect the checkbox of the folder specified as a save destination folder in "Change selected locations" in the "Indexed Locations" screen, and click the [OK] button.

DB saving function

This function saves (INSERT) data collected or modified in Real-time Flow Manager, or diagnosis result data in a database specified in Real-time Flow Designer.

Saved data can be displayed and analyzed by using an edge application.

By using the DB saving function, cooperation with an edge application supporting a historical data access I/F (technology: DB) will be available.



▢ : Functions of Edgecross Basic Software
⬚ : Range of the file saving function
■ : Functions other than one of Edgecross Basic Software
A: Data collection function, data modification function
B: DB saving function
(1) Edge application

❶ Collected and modified data is sent.
❷ The data is saved (INSERT) to a database.
❸ The data in the database is displayed and analyzed by using an edge application.

Database

The following database has been checked for its operation and can be used for the DB saving function.

Database type	Software	Edition	Version	Provider	URL	Remarks
PostgreSQL	PostgreSQL	— (Single edition)	10.3	The PostgreSQL Global Development Group	www.postgresql.org	• 64-bit version only • Open source • Install it on an industrial PC where Edgecross Basic Software is installed.

Communication method

For communicating with a database, use ODBC to connect.

The DB saving function requests ODBC to execute an SQL statement (INSERT), then ODBC saves (INSERT) data to a database.

Procedure before using the DB saving function

The following shows the procedure before using the DB saving function when using PostgreSQL as a database.

Operating procedure

1. Install a database.

☞ Page 530 Installing PostgreSQL

2. Install the ODBC driver.

☞ Page 535 Installing the ODBC driver for PostgreSQL

3. Configure the ODBC setting.

☞ Page 536 ODBC setting

4. Configure the data storing setting (DB saving) in Real-time Flow Designer.

☞ Page 152 Data Storing Setting (DB Saving)

5. Use the DDL file output in step 4 to create a table in the database.

☞ Page 537 Creating a table by using a DDL

6. Change the operating status of a process flow to RUN.

☞ Page 332 Real-time Flow Manager diagnosis

Precautions

- When changing the setting or order of output data after outputting a DDL file, output the DDL file in Real-time Flow Designer and create the table in the database again. If the table is not created again, an error may occur when running Real-time Flow Manager or incorrect data may be stored in the database.
- When switching the operating status of a process flow to STOP while using the data distribution function to distribute data, the function stops immediately and data not distributed at this time will not be distributed. If there is undistributed data, a difference occurs between distributed data and data output by using the DB saving function.

Operational specifications

The DB saving function saves (INSERT) data to a database.

By setting each item to save data to a field of a table in a database in Real-time Flow Designer, the data is saved (INSERT) according to the setting.

A database is connected when switching the operating status of a process flow to RUN, and disconnected when switching it from RUN to STOP.

Point

- Up to 257 fields can be specified.
- SQL statements and data types of a database used for the DB saving function are compliant with SQL99 specifications.

Precautions

- If data is missing in one row, a minor error will be reported and the data in the row will not be saved (INSERT).
- Data cannot be saved (INSERT) to a same table from multiple process flows.

Table name and field name

The following table shows the specifications of a table name and a field name.

Item	Description
Number of characters	1 to 32
Available characters	Characters that can be used for the WSTRING type[*1] ☞ Page 545 WSTRING type

[*1] The following characters in the range of U+0000 to U+007F can be used.
0 to 9, A to Z, a to z, _ (U+005F)

Precautions

A same field name cannot be set in a same table.

Processing for a problem

If an error is detected while performing the DB saving function, the error is output. If the error occurs in ODBC, the ODBC error code is displayed in the detailed information in the error information list in the "Real-time Flow Manager Diagnostics" screen.

For details on the ODBC error codes, visit the following:

- docs.microsoft.com/en-us/sql/odbc/reference/appendixes/appendix-a-odbc-error-codes

Point

If there is no corresponding ODBC error code on Microsoft® home page, visit the following:

- www.postgresql.org/docs/10/static/errcodes-appendix.html

5.7 Data Distribution Function

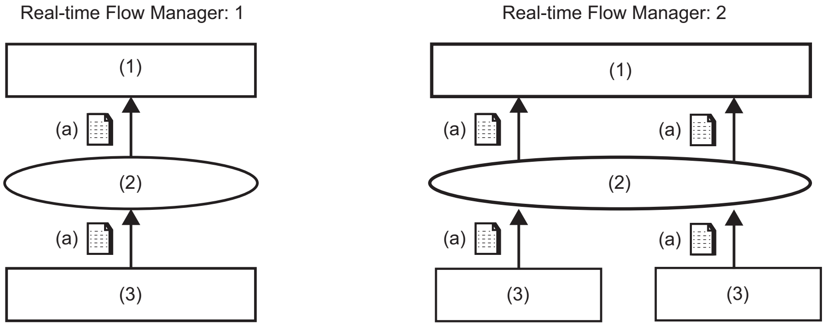
This section shows the function to distribute data (collected data, modification result data, and diagnosis result data) in Real-time Flow Manager to an edge application.

MQTT distribution function

This function distributes output of data collection, data modification, and data diagnosis processes to an edge application by using MQTT.

Publishing data is sent to an edge application via an MQTT broker according to the setting of Real-time Flow Manager. The MQTT distribution function runs even when an MQTT broker, edge application, and Edgecross Basic Software (Real-time Flow Manager) are each installed on a different industrial PC.

By using the MQTT distribution function, cooperation with an edge application supporting a real-time data publishing I/F (technology: MQTT) will be available.



(1) Edge application
(2) MQTT broker
(3) Real-time Flow Manager
(a) Publishing data

For the considerations for MQTT distribution, refer to the following:

☞ Page 82 Considerations

Publishing data

Output data of a data collection, data modification, or data diagnosis process can be selected as publishing data.

☞ Page 43 Publishing data

Publishing data definition file

This is a JSON file in which the definitions of publishing data (the number of units of data, a data type, and a data name) and the setting of MQTT communication are described.

An edge application performs MQTT communication according to the contents of a publishing data definition file.

If the setting is changed in Real-time Flow Designer, a publishing data definition file must be output in Real-time Flow Designer again.

A publishing data definition file exists for each MQTT distribution setting. Therefore, it must be output for each MQTT distribution when using MQTT distribution in a different process flow.

Distribution cycle

Real-time Flow Manager distributes multiple records to an edge application in a batch.

A record refers to all data acquired for each distribution cycle of data collection. (When using CSV File Data collector as a data collector, it refers to all data acquired for each row.)

The number of distribution records is a number of records included in one unit of publishing data.

The distribution cycle is determined according to the following distribution patterns:

Distribution pattern	Distribution cycle	Priority
The checkbox of "Output in Data Extraction unit" is selected.*1	Varies depending on each data extraction unit.	1
Others	100 ms*2	2

*1 If the number of records distributed to an edge application exceeds the maximum number of records that can be sent at a time, records will be distributed separately. In this case, the first records are sent when the maximum number of records is reached. Records that exceed the maximum number are distributed after the first records are distributed.
☞ Page 81 Maximum number of records that can be sent at a time

*2 Data is distributed when the number of records distributed to an edge application reaches the maximum number of distribution records.
☞ Page 81 Maximum number of records that can be sent at a time

■Maximum number of records that can be sent at a time

The following table shows the maximum number of records that can be sent at a time.

Number of units of data to output (column)	Maximum number of records (row)
1	256
2	128
3 to 4	64
5 to 8	32
9 to 16	16
17 to 32	8
33 to 64	4
65 to 128	2
129 to 256	1

MQTT broker

Refer to the following:

☞ Page 46 MQTT broker

Reconnection with an MQTT broker

Refer to the following:

☞ Page 46 Reconnection with an MQTT broker

Data missing

No data is distributed while data missing is occurring.

When the data distribution setting is configured in a data collection process, data missing information is reported to the distribution destination.

Point

Whether data missing occurred in a running process flow can be checked by monitoring the number of times of data missing in the process flow diagnostics or status memory monitor of Real-time Flow Designer.

☞ Page 337 Process flow diagnostics

☞ Page 340 Status memory monitor

☞ Page 433 Real-time Flow Manager Status

Communication encryption

Refer to the following:

☞ Page 47 Communication encryption

Client IDs and a topic name

Refer to the following. Note that a client ID of an edge application is not used in MQTT distribution.

☞ Page 48 Client IDs and a topic name

For the setting when connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker, refer to the following:

☞ Page 83 When connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker

Considerations

The following shows the considerations for MQTT distribution.

■When starting MQTT distribution

Make an edge application available for receiving data in MQTT communication first, then switch the operating status of a process flow to RUN. Otherwise, data distributed before that may not be distributed to the edge application.

■When stopping MQTT distribution

To stop the operation, switch the operating status of a process flow to STOP first. In addition, make sure that the operating status switches to STOP before stopping MQTT communication of an edge application.

■When connecting multiple pieces of Real-time Flow Manager and edge applications to a single MQTT broker

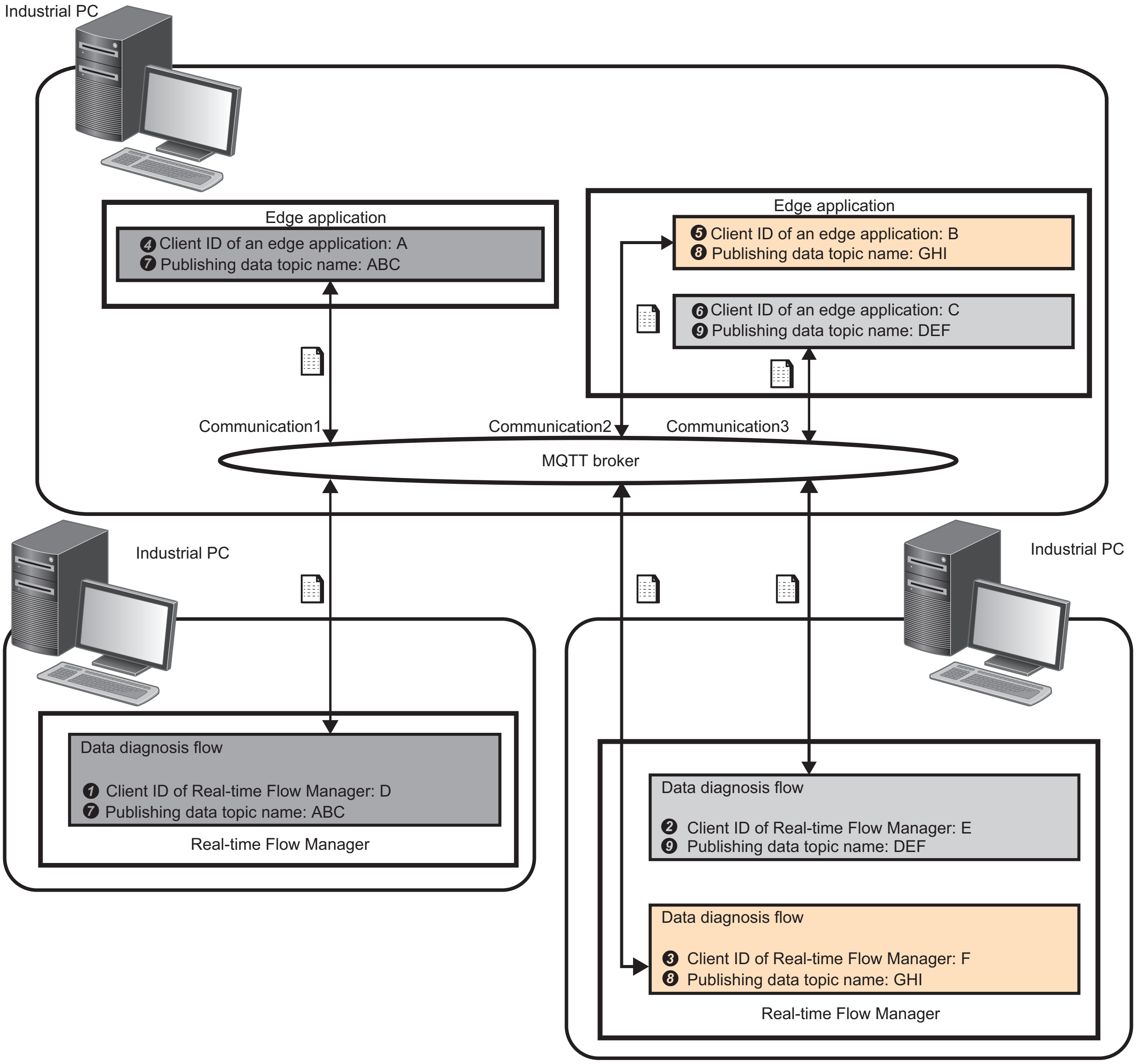
If using a client ID and topic name for identifying data in an MQTT broker and edge application, set them according to the following points.

Note that this setting is not required unless a client ID of Real-time Flow Manager and a topic name are specified. (They are automatically set without duplication.)

(1) A client ID of Real-time Flow Manager must be different from any client IDs of other clients (including Real-time Flow Manager and edge applications) connected to the same MQTT broker. (Client IDs (❶❷❸) in the following figure)

(2) A client ID of an edge application must be different from any client IDs of other clients (including Real-time Flow Manager and edge applications) connected to the same MQTT broker. (Client IDs (❹❺❻) in the following figure)

(3) A publishing data topic name must be different for each edge application and communication; however, one set in Real-time Flow Designer must be the same as the one set in a connected edge application. (Set topic names (❼❽❾) in the following figure so that they are the same for each communication.)


Industrial PC
Edge application
❹ Client ID of an edge application: A
❼ Publishing data topic name: ABC
Edge application
❺ Client ID of an edge application: B
❽ Publishing data topic name: GHI
❻ Client ID of an edge application: C
❾ Publishing data topic name: DEF
Communication1
Communication2
Communication3
MQTT broker
Industrial PC
Industrial PC
Data diagnosis flow
❶ Client ID of Real-time Flow Manager: D
❼ Publishing data topic name: ABC
Real-time Flow Manager
Data diagnosis flow
❷ Client ID of Real-time Flow Manager: E
❾ Publishing data topic name: DEF
Data diagnosis flow
❸ Client ID of Real-time Flow Manager: F
❽ Publishing data topic name: GHI
Real-time Flow Manager

For the client IDs and topic name used in Real-time Flow Manager, refer to the following. Note that a client ID of an edge application is not used in MQTT distribution.

☞ Page 48 Client IDs and a topic name

■If neither MQTT broker nor edge application is running on an industrial PC on which Real-time Flow Manager is running

The processing performance will be lower due to communication delay compared with the case in which they run on a same industrial PC.

Take corrective action such as extending the collection cycle or reducing the number of units of output data to avoid a buffer overflow in MQTT distribution.

■If changing the setting or order of publishing data

If changing the setting or order of publishing data after reading a publishing data definition file in an edge application, output the publishing data definition file and read it in the edge application again. Otherwise, an error will occur in the edge application or data read in the edge application will be incorrect.

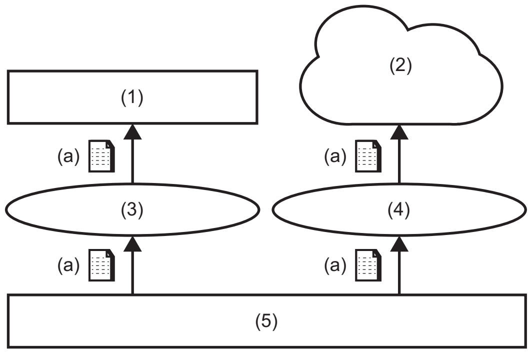
■Data distribution when Real-time Flow Manager is ended

When switching the operating status of a process flow to STOP, data distribution stops immediately. Data not distributed at this time will not be distributed.

IT gateway distribution function

This function distributes output of data collection, data modification, and data diagnosis processes to an external device such as an IT system by using an IT gateway.

For details on an IT gateway, refer to the manual for an IT gateway used.



(1) IT system
(2) Cloud service
(3) IT gateway 1
(4) IT gateway 2
(5) Real-time Flow Manager
(a) Publishing data

Data missing

Refer to the following:

☞ Page 81 Data missing

Considerations

- If the execution file of an IT gateway used does not exist or is corrupted, the IT gateway will not start and an error will occur.
- When switching the operating status of a process flow to STOP, an IT gateway stops running immediately. Data not distributed at this time will not be distributed.
  For the specifications when exiting an IT gateway, refer to the manual for the IT gateway.

5.8 Event History Automatic Output Function

This section shows the function to automatically output event/error information, which is collected from Real-time Flow Manager, data collectors used in Real-time Flow Manager, and IT gateways, to a specified folder in a CSV file format.

For the output setting, refer to the following:

☞ Page 118 Event history automatic output setting

With an operation check file that is automatically output, it can be confirmed that this function is running normally.

Event history file

The following shows the detailed specifications of an event history file.

Output targets

Output target events are as follows:

Item	Target
Event type	Operation, system, security
Status (severity)	Major, moderate, minor, warning, information
Problem function	Real-time Flow Manager Data collector IT gateway

Event history file format

The format of an event history file to be output is as follows:

■File format

Item	Description
File format	CSV file
Character code	UTF-8 with BOM
File name	"RealFlowLog.csv" After a file is backed up, the date and time information at the time of switching is added to the end of the above file name. Date and time information format: MMddHHmmss MM: Two-digit numerical value from 01 to 12 dd: Two-digit numerical value from 01 to 31 HH: Two-digit numerical value from 00 to 23 mm: Two-digit numerical value from 00 to 59 ss: Two-digit numerical value from 00 to 59 ■File name example RealFlowLog1203174055.csv For details on the backup operation, refer to the following: ☞ Page 89 Backing up an event history file
Extension	.csv
Information to be output	1st row: Header row 2nd and later rows: Data row Up to 39999 data rows are output. If it is exceeded, the first data row is deleted and the latest event is added to the end of the file. For details on the header row and each column, refer to the following: ☞ Page 87 Information output to an event history file

■Information output to an event history file

Colum n No.	Header row[1]	Data row
1	No.	The number (five digits) is output in order from acquired event information. (Example) For 1: 00001
2	Date and time of occurrence	The date and time is output in the following format: yyyy/MM/dd H:mm:ss.fff yyyy: Four-digit numerical value MM: Two-digit numerical value from 01 to 12 dd: Two-digit numerical value from 01 to 31 H: Numerical value from 0 to 23 mm: Two-digit numerical value from 00 to 59 ss: Two-digit numerical value from 00 to 59 fff: Three-digit numerical value from 000 to 999
3	Event code	An event code is output in a four-digit hexadecimal number.
4	Status	Information: 1 Warning: 2 Minor: 3 Moderate: 4 Major: 5
5	Problem function	An event occurrence source is output.[1]

[1] Output in English.

Ex.

Example for outputting an event history file

1	2	3	4	5
No.	Time and Date of Occurrence	Event Code	Status	Problem Function
00001	2021/04/09 9:05:50.012	8006	5	Management Shell
00002	2021/04/10 13:42:33.015	1001	3	CSV File Data collector Version 2 (Edgecross Consortium)
00003	2021/04/10 13:42:45.030	7028	2	Management Shell
00004	2021/04/10 19:21:27.123	8007	5	Management Shell

Output location

The output location of an event history file is as follows:

Item	Specification	Range
Output destination	An event history file can be saved to the following locations: • Local disk • Shared folder[1][2] A same save location can be specified for the event history automatic output function of Real-time Flow Manager and Management Shell. Characters in the Unicode Basic Multilingual Plane (only those that can be used for the WSTRING type) can be specified as the path to a save destination.[3][4] (☞ Page 545 WSTRING type)	Save destination path length: Up to 234 characters (Including characters from the drive letter to '\' at the end of the path)

[1] When using a remote shared folder, refer to the following:
☞ Page 553 Using a Remote Shared Folder

[2] A network drive (drive assigned by using a Windows function) cannot be used.

[3] Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

[4] A space (0x20) and a period (0x2E) cannot be used for the first character.

Operational specifications

The following shows the operational specifications for outputting an event history file.

■File output authority

A file is output with the Windows account 'SYSTEM' or a specified user account.

A user account used when outputting a file can be specified in the setting screen. By default, the Windows account 'SYSTEM' is used.

By specifying a user account for output, a file can be output to a folder accessible to a specific user only.

In addition, by outputting a file to a folder with the encryption enabled, the file can be browsed by a specific user only. For outputting a file to a remote shared folder or an encrypted folder, refer to either of the following:

☞ Page 553 Using a Remote Shared Folder

☞ Page 71 Using a folder with the encryption attribute enabled

When specifying a user account, the authentication processing may take time due to a network load or failure.

If it takes time and Windows times out, an error occurs.

■File output

An event history file is output at the following timings:

- Real-time Flow Manager is started.
- The event history automatic output setting is applied (excluding when changing 'enabled' to 'disabled' for output).
- An event occurs within the event history monitoring interval.

If a specified folder does not exist, a folder is created and an event history file is saved to the folder.

In addition, if a file with the same name exists, it is overwritten with the event history file.

If the event history file cannot be saved, the file saving is retried.

Events that occur during a retry are output together when they become available for saving.

If backup of an event history file fails, the file is not output until it succeeds. For details on backup of an event history file, refer to the following:

☞ Page 89 Backing up an event history file

■Backing up an event history file

A backup file starts being created when deleting an event history in the "Event History" screen of Real-time Flow Designer.[*1]

If an error occurs during backup, an event is registered.

For the event codes, refer to the following:

☞ Page 422 Codes for events that occur in Real-time Flow Manager

Backed up files are not deleted from Edgecross Basic Software. (The maximum number of files that can be backed up is determined by the file system.)

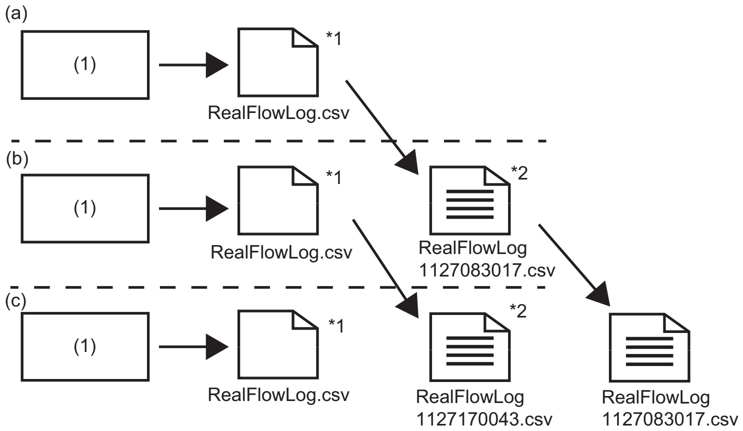
The date of backup is added to the file name of a backed up file.

For details on the file name, refer to the following:

☞ Page 86 File format

*1 The next time an event history file is output, it is backed up before output regardless of whether the event history file output setting is enabled or disabled when deleting an event history.
When changing the save destination folder before backup, an event history file in the folder after the change is backed up.

An example of backup operation is as follows:


(a)
(1)
*1
RealFlowLog.csv
(b)
(1)
*1
RealFlowLog.csv
*2
RealFlowLog 1127083017.csv
(c)
(1)
*1
RealFlowLog.csv
*2
RealFlowLog 1127170043.csv
RealFlowLog 1127083017.csv

(1) Real-time Flow Manager
(a) An event history is deleted in the "Event History" screen. (November 26th 12:45:22)
(b) An event history is deleted in the "Event History" screen. (November 27th 08:30:17)
(c) An event history is deleted in the "Event History" screen. (November 27th 17:00:43)

*1 The file name of the latest file is always 'RealFlowLog.csv.'
*2 A file is backed up when deleting an event history.

Operation check file

The following shows the detailed specifications of an operation check file.

Operation check file format

The format of an operation check file is as follows.

Note that an operation check file is not backed up, and one file is used continuously.

Item	Description
File format	Text
Character code	UTF-8 with BOM
File name	"RealFlowLogKeepAlive.dat"
Extension	.dat

Output location

An operation check file is saved to the same location as an event history file.

☞ Page 87 Output location

Operational specifications

The following shows the operational specifications for outputting an operation check file.

■File output authority

Refer to the following:

☞ Page 88 File output authority

■File output

If a specified path does not exist, a folder is created and an operation check file is saved to the folder.

If a file with the same name exists, it is overwritten with the operation check file.

An operation check file is updated at the same interval as an event history monitoring interval, but not updated in any of the following cases:

- The automatic output of an event history file is disabled in the setting.
- An event history file fails to be saved.
- An operation check file fails to be saved.
- The operation of this function is stopped.

Point

When this function is running normally, the update date and time of an operation check file is updated.

If it is not updated after a while, check if the event history automatic output setting is disabled or an error occurs.

Considerations

The following shows the considerations when using the event history automatic output function.

- When opening an event history file in another application while it is editable, the file may fail to be saved. To open the file in another application, copy and open it.
- When deleting an event history while an event history file cannot be accessed, data not output is deleted without being saved to the event history file.
- If the event history is updated frequently, such as if events occur frequently, it may take time to output an event history file. (This also applies to an operation check file.)
- If events occur consecutively at short intervals, the order of output to an event history file and the date and time of occurrence may change.
- When using a shared folder as a save destination, do not unshare the folder with the output setting enabled.
- Do not save a file with the same name as an event history file to a save destination path. If a file with the same name exists, it is overwritten with the event history file. (This also applies to an operation check file.)
- When outputting a file to a folder with the compression attribute enabled, the free space on Windows is determined to be temporarily insufficient and an error may occur if the free space on the disk is low.
- For outputting a file to a folder with the data encryption enabled, refer to the following: ☞ Page 71 Using a folder with the encryption attribute enabled

5.9 Command Line Interface Function

This section shows the function to perform operations of Real-time Flow Manager on a command basis.
By using this function, Real-time Flow Manager can be operated in an application other than Edgecross Basic Software (hereinafter referred to as 'external software').
This function runs by specifying an argument and executing an execution file (.exe) in external software.

Precautions

- This function runs only on an industrial PC where Edgecross Basic Software is installed.
- This function cannot be started multiple times at the same time. If started, the functions started later are terminated with outputting an error (2001).
- Perform this function with a Windows user account that has accepted the software license agreement for Edgecross Basic Software.

Version specifications

The version of the command line interface function supported by that of Edgecross Basic Software is as follows:

Edgecross Basic Software version	Command line interface function version
1.26	1
1.27	
1.28 or later	2

Operational specifications

This function requests Real-time Flow Manager to perform processing specified with a command and argument (option), then returns the result (execution result and exit code).

Item	Description
Command	Specify 'EdgecrossCLI.exe.'[*1]
Option	Specify a command line argument passed when executing 'EdgecrossCLI.exe.' For details on the options, refer to the following: ☞ Page 97 Option specifications
Execution result	Details on the result for a request to Real-time Flow Manager are returned. An execution result can be acquired from the standard output in a character string format. 'CRLF' is used as a line feed code in and at the end of a character string. Details on an execution result differ depending on the first option specified for an option. For details, refer to the following: ☞ Page 98 Option details
Exit code	The success or failure of a request to Real-time Flow Manager is returned. • 0: Success • Non-0: Failure For details on the exit codes, refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

[*1] '.exe' is optional.

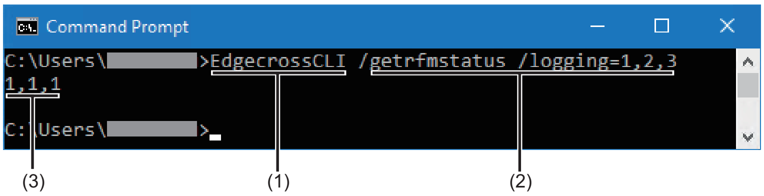
Precautions

- An execution result is returned as a character string; therefore, it is always displayed with the same content regardless of the execution environment (GUI) for a console application.
- An exit code is returned as a numerical value; therefore, a numerical value different from the exit codes (hexadecimal) listed in the following section may be displayed depending on the execution environment (GUI) for a console application. (☞ Page 432 Exit Code List for the Command Line Interface Function)

Execution examples

The following shows execution examples when using the command prompt.

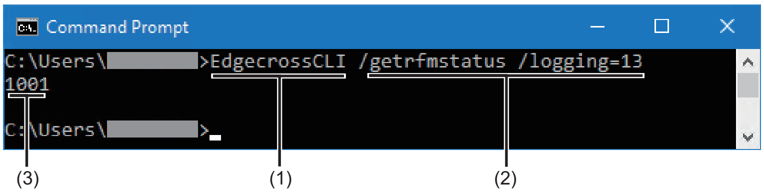
■Success example



```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /logging=1,2,3
1,1,1

C:\Users\[redacted]>_
```

(1) Command
(2) Option
(3) Execution result

■Failure example



```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /logging=13
1001

C:\Users\[redacted]>_
```

(1) Command
(2) Option
(3) Execution result (exit code)

Execution methods

The following explains the methods for performing this function.

It can be performed by using either of the following:

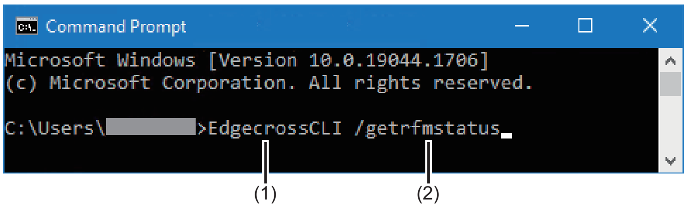
- Command prompt (☞ Page 94 Using the command prompt)
- User program (☞ Page 96 Using a user program)

Using the command prompt

The following shows the flow of performing this function when using the command prompt (a standard Windows function) as external software.

1. Start the command prompt.

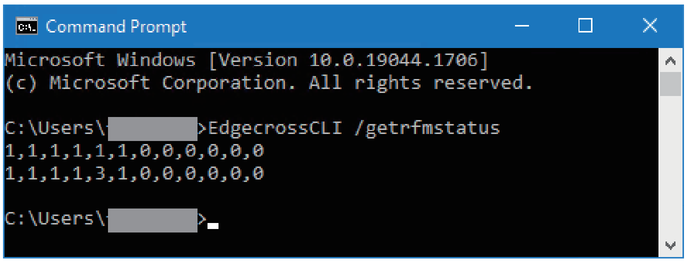
2. Enter a (1) command and (2) option to be executed at the command prompt, and press the Enter key.



```
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>EdgecrossCLI /getrfmstatus_
```

3. Real-time Flow Manager is requested to perform processing and returns an execution result.

4. The execution result is output to the standard output.



```
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>EdgecrossCLI /getrfmstatus
1,1,1,1,1,1,0,0,0,0,0,0
1,1,1,1,3,1,0,0,0,0,0,0

C:\Users\[redacted]>_
```

For details on the execution results, refer to the following:

☞ Page 98 Option details

5. An exit code is stored in the environment variable 'errorlevel' defined in Windows.

■Example of creating a batch file and the execution result

The following shows an example of creating a batch file and the execution result.

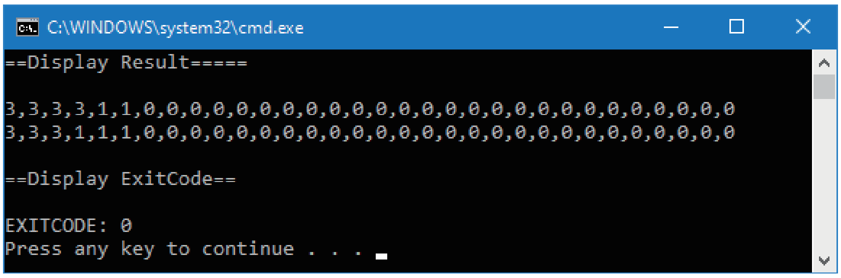
- Example of creating a batch file

In the following example, an exit code is displayed in decimal because it is displayed on the command prompt.

An exit code for a process performed immediately before is stored in the system environment variable 'errorlevel.'

```
@echo off
rem Describes the command.
SET CUI="EdgecrossCLI"

rem Describes an option.
SET ARGUMENTS=/getrfmstatus /all

echo ==Display Result=====
echo;

rem Performs the command line interface function and displays its result.
%CUI% %ARGUMENTS%

echo;
echo ==Display ExitCode==
echo;

rem Displays an exit code.
echo EXITCODE: %errorlevel%

pause
```

- Execution result



```
==Display Result=====

3,3,3,3,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
3,3,3,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

==Display ExitCode==

EXITCODE: 0
Press any key to continue . . .
```

Using a user program

The following shows the flow of performing this function when using a user program as external software.

1. Run a user program created in any programming language.
2. Specify and execute a command and option in the user program.
3. Real-time Flow Manager is requested to perform processing and returns an execution result.
4. The execution result is output to the standard output.

For details on the execution results, refer to the following:

☞ Page 98 Option details

5. The result in the standard output is read in the user program, and the execution result and exit code are acquired.

■Example of creating a user program

The following shows an example of creating a user program by using C#.

```
using System;
using System.Diagnostics;

namespace sample
{
    class Program
    {
        static void Main(string[] args)
        {
            // Uses ProcessStartInfo class of System.Diagnostics class.
            var processInfo = new System.Diagnostics.ProcessStartInfo();    // Creates an object.

            processInfo.FileName = "EdgecrossCLI.exe";    // Command line interface function name
            processInfo.Arguments = "/getrfmstatus /all";    // Specifies an option.
            // Since the following two lines redirect the content of the standard output output by executing 'EdgecrossCLI.exe' to the user program side,
            // configures this setting to acquire the standard output output by executing 'EdgecrossCLI.exe.'
            processInfo.UseShellExecute = false;
            processInfo.RedirectStandardOutput = true;    // Redirects the standard output of a command.
            processInfo.CreateNoWindow = true;    // Whether to start a process in the window

            var process = Process.Start(processInfo);    // Executes the command and writes the execution result to the standard output.
            process.WaitForExit();    // Waits until the process ends.

            int exitcode = process.ExitCode;    // Acquires a command exit code.

            if (0 == exitcode)
            {
                // Processing on success
                // Since the execution result is stored in the standard output stream,
                // analyzes the content stored in the variable 'output' and performs processing according to the result.
                // Reads the redirected standard output on the user program side after the process ends.
                var output = process.StandardOutput.ReadToEnd();    // Reads the standard output.
                Console.WriteLine(output);    // Displays the command execution result.
            }else{
                // Processing on failure
                // Displays a message indicating that the processing has failed.
                Console.WriteLine ("An error has occurred. {0:x}", exitcode);
            }
            process.Close();    // Performs Close of the process.
        }
    }
}
```

Option specifications

The following explains the specifications of options specified as arguments.

Specify options according to the following format:

- EdgecrossCLI.exe(space)[first option](space)[second option](space)[third option...]

Item	Description
EdgecrossCLI.exe	The command for performing the command line interface function. '.exe' is optional.
[First option][1] (required item)	The name of processing requested from Real-time Flow Manager. For the option list, refer to the following: ☞ Page 97 First option list
[Second option] and later[1]	The second option and later must be specified according to the first option. The number of options specified for the second option and later differs depending on the content of the first option. For details, refer to the specifications of a specified first option.

*1 Case-sensitive

First option list

The following table lists the first options that can be specified.

Option	Operation name	Description	Reference
/?	Help	Help on the method for using the command line interface function is returned.	Page 98 Help (/?)
/ver	Function version acquisition	The version of the command line interface function is returned.	Page 99 Function version acquisition (/ver)
/getrfmstatus	Process flow operating status acquisition	The operating status of a specified process flow is acquired from Real-time Flow Manager.	Page 100 Process flow operating status acquisition (/getrfmstatus)
/runrfm	Process flow operation start	Real-time Flow Manager is requested to start a specified process flow.	Page 103 Process flow operation start (/runrfm)
/stoprfm	Process flow operation stop	Real-time Flow Manager is requested to stop a specified process flow.	Page 105 Process flow operation stop (/stoprfm)

Option details

The following explains the option details.

Help (/?)

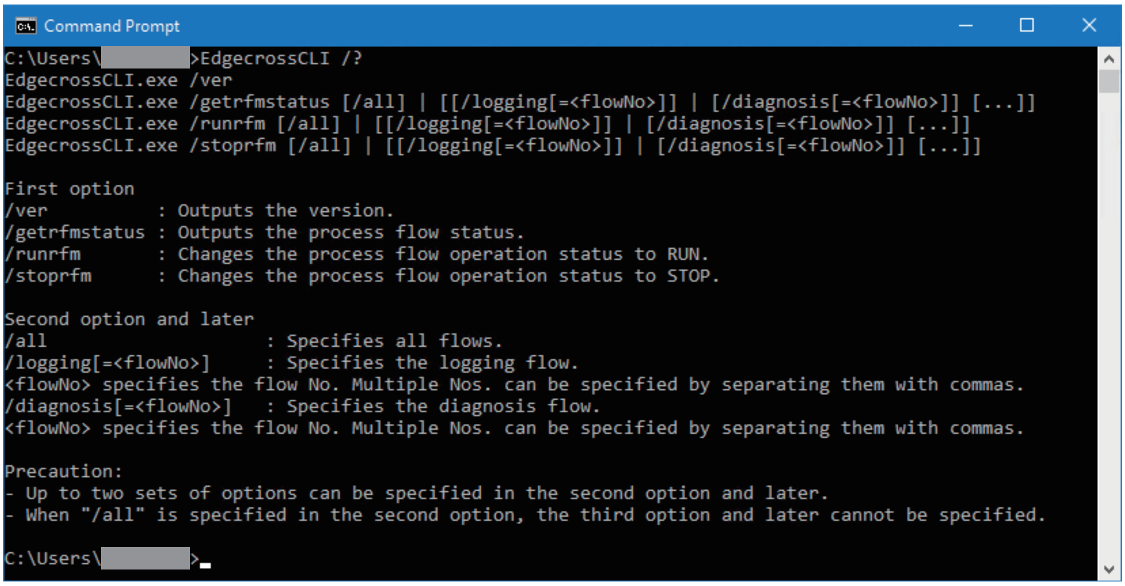
The following explains the specifications and an execution example of this operation.

■Specifications

Item	Description
Operation name	Help
Overview	Help on the method for using the command line interface function is returned.
First option	/?
Execution result	■On success Help on the method for using the command line interface function is returned. ■On failure An exit code is returned.
Exit code	The exit codes when performing this operation are as follows: • 0: Succeeded • Non-0: Error occurred ■If a second option or later error (1001H) occurs This error occurs when the second option is specified. Do not specify an option for the second option and later. ■If an error other than a second option or later error (1001H) occurs Refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

■Execution example

The following shows an execution example when using the command prompt.



```
C:\Users\[redacted]>EdgecrossCLI /?
EdgecrossCLI.exe /ver
EdgecrossCLI.exe /getrfmstatus [/all] | [[/logging[=<flowNo>]] | [/diagnosis[=<flowNo>]] [...]]
EdgecrossCLI.exe /runrfm [/all] | [[/logging[=<flowNo>]] | [/diagnosis[=<flowNo>]] [...]]
EdgecrossCLI.exe /stoprfm [/all] | [[/logging[=<flowNo>]] | [/diagnosis[=<flowNo>]] [...]]

First option
/ver          : Outputs the version.
/getrfmstatus : Outputs the process flow status.
/runrfm       : Changes the process flow operation status to RUN.
/stoprfm      : Changes the process flow operation status to STOP.

Second option and later
/all                    : Specifies all flows.
/logging[=<flowNo>]     : Specifies the logging flow.
<flowNo> specifies the flow No. Multiple Nos. can be specified by separating them with commas.
/diagnosis[=<flowNo>]   : Specifies the diagnosis flow.
<flowNo> specifies the flow No. Multiple Nos. can be specified by separating them with commas.

Precaution:
- Up to two sets of options can be specified in the second option and later.
- When "/all" is specified in the second option, the third option and later cannot be specified.

C:\Users\[redacted]>_
```

Function version acquisition (/ver)

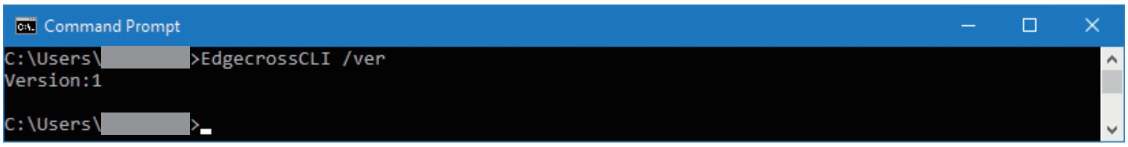
The following explains the specifications and an execution example of this operation.

■Specifications

Item	Description
Operation name	Function version acquisition
Overview	The version of the command line interface function is returned. For the version of the command line interface function supported by that of Edgecross Basic Software, refer to the following: ☞ Page 92 Version specifications
First option	/ver
Execution result	■On success The version of the command line interface function is returned. ■On failure An exit code is returned.
Exit code	The exit codes when performing this operation are as follows: • 0: Succeeded • Non-0: Error occurred ■If a second option or later error (1001H) occurs This error occurs when the second option is specified. Do not specify an option for the second option and later. ■If an error other than a second option or later error (1001H) occurs Refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

■Execution example

The following shows an execution example when using the command prompt.



```
C:\Users\[redacted]>EdgecrossCLI /ver
Version:1

C:\Users\[redacted]>_
```

Process flow operating status acquisition (/getrfmstatus)

The following explains the specifications and execution examples of this operation.

■Specifications

Item	Description
Operation name	Process flow operating status acquisition
Overview	The operating status of a specified process flow is acquired from Real-time Flow Manager.
First option	/getrfmstatus
Second option	Specify any of the following for a target process flow type and process flow number. • /all: All process flow types and process flow numbers • /logging={0}[*1,*2]: Data logging flow • /diagnosis={0}[*1,*2]: Data diagnosis flow When not specifying any item for the second option, '/all' is regarded as specified.
Third option	Specify a target process flow type and process flow number only when specifying '/logging={0}' or '/diagnosis={0}' for the second option. ■When specifying '/logging={0}' for the second option Only '/diagnosis={0}' can be specified.[*1,*2] ■When specifying '/diagnosis={0}' for the second option Only '/logging={0}' can be specified.[*1,*2]
Execution result	■On success The operating status of a specified process flow type is returned. When specifying multiple process flow types, the operating statuses are returned in the following order regardless of a specified order. First line: Data logging flow Second line: Data diagnosis flow In addition, the operating statuses of process flows are returned with delimited by commas in ascending order of specified process flow numbers. 0: Not set 1: STOP state 2: In transition to RUN 3: RUN state 4: In transition to STOP ■On failure An exit code is returned.
Exit code	The exit codes when performing this operation are as follows: • 0: Succeeded • Non-0: Error occurred ■If a second option or later error (1001H) occurs Refer to the following: ☞ If "1001" is displayed for the exit code ■If an error other than a second option or later error (1001H) occurs Refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

*1 For {0}, specify a process flow number in decimal.
When specifying '/logging' or '/diagnosis' only, all data logging flows or data diagnosis flows are regarded as specified.

*2 When specifying multiple process flow numbers, use a comma as a delimiter.

Precautions

- If "1001" is displayed for the exit code, the following are the possible causes. Specify a correct option or value.

Exit code	Error name	Error description
1001H	Second option or later error	An item other than '/all,' '/logging={0},' and '/diagnosis={0}' is specified for the second option.
		'/logging={0}' is specified for the second option and an item other than '/diagnosis={0}' is specified for the third option.
		'/diagnosis={0}' is specified for the second option and an item other than '/logging={0}' is specified for the third option.
		'/all' is specified for the second option and any item is specified for the third option.
		'/logging={0}' or '/diagnosis={0}' is specified, but no process flow number is specified for {0}.
		Any item is specified for the fourth option.
		Two or more same process flow numbers are specified for {0}.
		'0' or less or '33' or more is specified as a process flow number for {0}.
		Process flow numbers for {0} are not specified with numbers or commas.

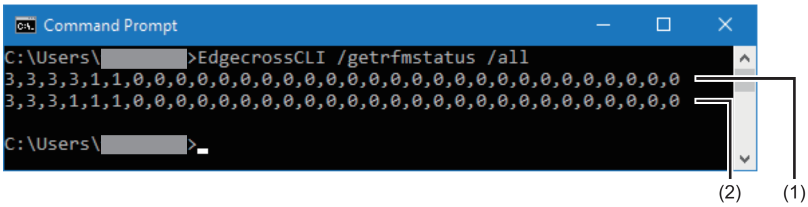
■Execution examples

The following shows execution examples when using the command prompt if the operating statuses of process flows are as follows:

The operating statuses of data logging flows: No.1 to 4 are RUN, No.5 and 6 are STOP, and No.7 to 32 are not set.

The operating statuses of data diagnosis flows: No.1 to 3 are RUN, No.4 to 6 are STOP, and No.7 to 32 are not set.

- When specifying '/all' for the second option

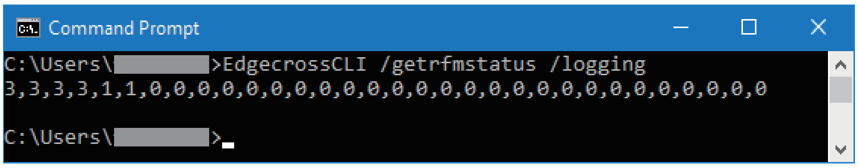


```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /all
3,3,3,3,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
3,3,3,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

C:\Users\[redacted]>_
```

(1) Data logging flow

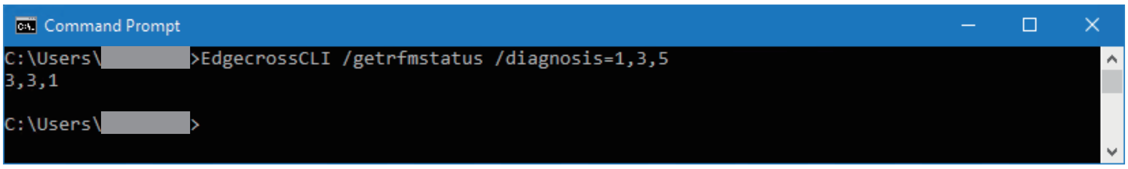
(2) Data diagnosis flow

- When specifying '/logging' for the second option



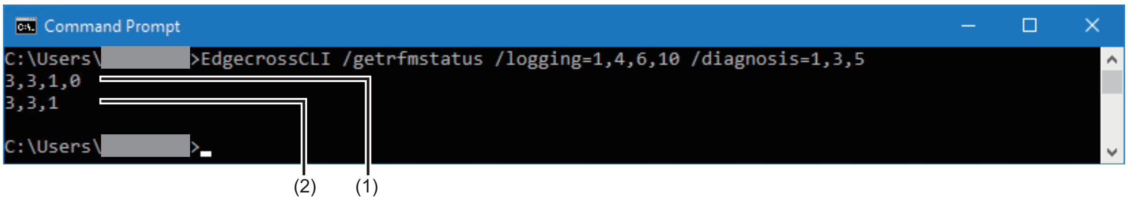
```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /logging
3,3,3,3,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

C:\Users\[redacted]>_
```

- When specifying '/diagnosis=1,3,5' for the second option



```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /diagnosis=1,3,5
3,3,1

C:\Users\[redacted]>
```

- When specifying '/logging=1,4,6,10' for the second option and '/diagnosis=1,3,5' for the third option



```
C:\Users\[redacted]>EdgecrossCLI /getrfmstatus /logging=1,4,6,10 /diagnosis=1,3,5
3,3,1,0
3,3,1

C:\Users\[redacted]>_
```

(1) Data logging flow

(2) Data diagnosis flow

Process flow operation start (/runrfm)

The following explains the specifications and an execution example of this operation.

■Specifications

Item	Description
Operation name	Process flow operation start
Overview	Real-time Flow Manager is requested to start a specified process flow.
First option	/runrfm
Second option	Specify any of the following for a target process flow type and process flow number. • /all: All process flow types and process flow numbers • /logging={0}[*1,*2]: Data logging flow • /diagnosis={0}[*1,*2]: Data diagnosis flow When not specifying any item for the second option, '/all' is regarded as specified.
Third option	Specify a target process flow type and process flow number only when specifying '/logging={0}' or '/diagnosis={0}' for the second option. ■When specifying '/logging={0}' for the second option Only '/diagnosis={0}' can be specified.[*1,*2] ■When specifying '/diagnosis={0}' for the second option Only '/logging={0}' can be specified.[*1,*2]
Execution result	■On success '0000' is returned. ■On failure An exit code is returned.
Exit code	The exit codes when performing this operation are as follows: • 0: Succeeded • Non-0: Error occurred ■If a second option or later error (1001H) occurs Refer to the following: ☞ If "1001" is displayed for the exit code ■If an error other than a second option or later error (1001H) occurs Refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

*1 For {0}, specify a process flow number in decimal.
When specifying '/logging' or '/diagnosis' only, all data logging flows or data diagnosis flows are regarded as specified.

*2 When specifying multiple process flow numbers, use a comma as a delimiter.

Precautions

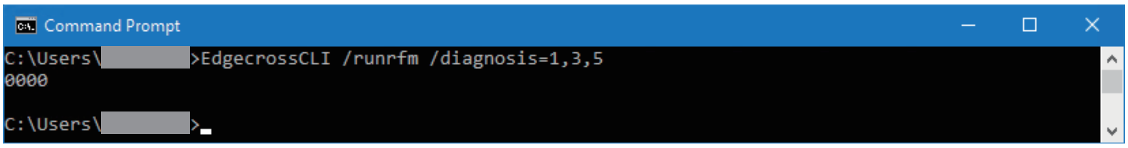
- This operation returns only the result of whether a request to change the operating status to RUN succeeds; therefore, a time lag occurs before the operating status of a specified process flow switches to RUN. After performing this operation, execute the operating status acquisition command to monitor and check whether the operating status has actually switched to RUN.
- If "1001" is displayed for the exit code, the following are the possible causes. Specify a correct option or value.

Exit code	Error name	Error description
1001H	Second option or later error	An item other than '/all,' '/logging={0},' and '/diagnosis={0}' is specified for the second option.
		'/logging={0}' is specified for the second option and an item other than '/diagnosis={0}' is specified for the third option.
		'/diagnosis={0}' is specified for the second option and an item other than '/logging={0}' is specified for the third option.
		'/all' is specified for the second option and any item is specified for the third option.
		'/logging={0}' or '/diagnosis={0}' is specified, but no process flow number is specified for {0}.
		Any item is specified for the fourth option.
		Two or more same process flow numbers are specified for {0}.
		'0' or less or '33' or more is specified as a process flow number for {0}.
		Process flow numbers for {0} are not specified with numbers or commas.

■Execution example

The following shows an execution example when using the command prompt.

- When specifying '/diagnosis=1,3,5' for the second option



```
C:\Users\[redacted]>EdgecrossCLI /runrfm /diagnosis=1,3,5
0000

C:\Users\[redacted]>_
```

Process flow operation stop (/stoprfm)

The following explains the specifications and an execution example of this operation.

■Specifications

Item	Description
Operation name	Process flow operation stop
Overview	Real-time Flow Manager is requested to stop a specified process flow.
First option	/stoprfm
Second option	Specify any of the following for a target process flow type and process flow number. • /all: All process flow types and process flow numbers • /logging={0}[*1,*2]: Data logging flow • /diagnosis={0}[*1,*2]: Data diagnosis flow When not specifying any item for the second option, '/all' is regarded as specified.
Third option	Specify a target process flow type and process flow number only when specifying '/logging={0}' or '/diagnosis={0}' for the second option. ■When specifying '/logging={0}' for the second option Only '/diagnosis={0}' can be specified.[*1,*2] ■When specifying '/diagnosis={0}' for the second option Only '/logging={0}' can be specified.[*1,*2]
Execution result	■On success '0000' is returned. ■On failure An exit code is returned.
Exit code	The exit codes when performing this operation are as follows: • 0: Succeeded • Non-0: Error occurred ■If a second option or later error (1001H) occurs Refer to the following: ☞ If "1001" is displayed for the exit code ■If an error other than a second option or later error (1001H) occurs Refer to the following: ☞ Page 432 Exit Code List for the Command Line Interface Function

*1 For {0}, specify a process flow number in decimal.
When specifying '/logging' or '/diagnosis' only, all data logging flows or data diagnosis flows are regarded as specified.

*2 When specifying multiple process flow numbers, use a comma as a delimiter.

Precautions

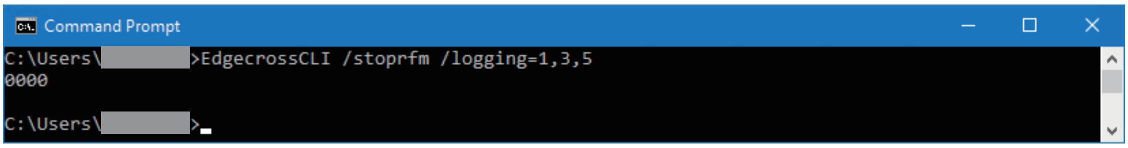
- This operation returns only the result of whether a request to change the operating status to STOP succeeds; therefore, a time lag occurs before the operating status of a specified process flow switches to STOP. After performing this operation, execute the operating status acquisition command to monitor and check whether the operating status has actually switched to STOP.
- If "1001" is displayed for the exit code, the following are the possible causes. Specify a correct option or value.

Exit code	Error name	Error description
1001H	Second option or later error	An item other than '/all,' '/logging={0},' and '/diagnosis={0}' is specified for the second option.
		'/logging={0}' is specified for the second option and an item other than '/diagnosis={0}' is specified for the third option.
		'/diagnosis={0}' is specified for the second option and an item other than '/logging={0}' is specified for the third option.
		'/all' is specified for the second option and any item is specified for the third option.
		'/logging={0}' or '/diagnosis={0}' is specified, but no process flow number is specified for {0}.
		Any item is specified for the fourth option.
		Two or more same process flow numbers are specified for {0}.
		'0' or less or '33' or more is specified as a process flow number for {0}.
		Process flow numbers for {0} are not specified with numbers or commas.

■Execution example

The following shows an execution example when using the command prompt.

- When specifying '/logging=1,3,5' for the second option



```
C:\Users\[redacted]>EdgecrossCLI /stoprfm /logging=1,3,5
0000

C:\Users\[redacted]>
```

6 Real-time Flow Designer

Real-time Flow Designer is software that sets parameters of Real-time Flow Manager.

6.1 Overview

This section shows the startup method and screen configuration of Real-time Flow Designer.

Startup method

Operating procedure

1. Perform either of the following operations:

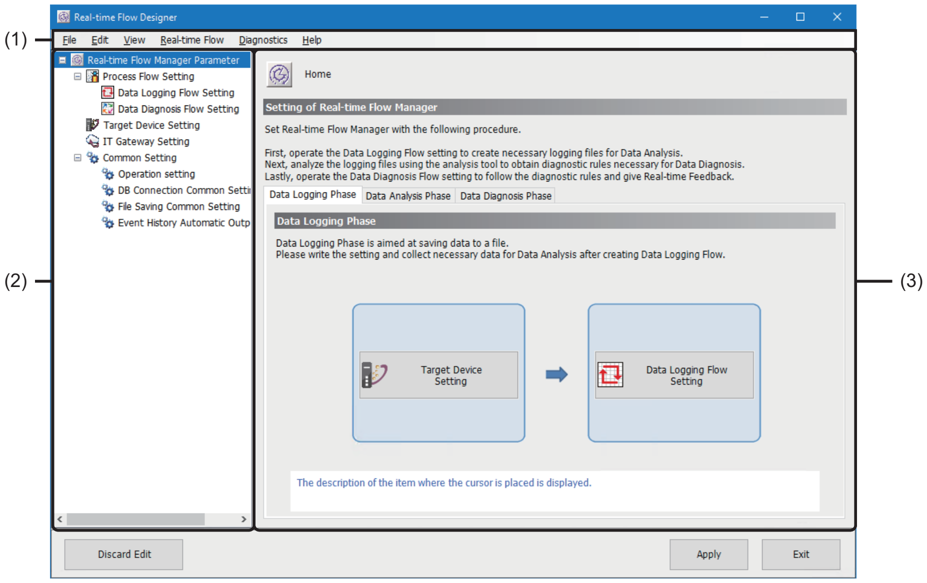
- Start Real-time Flow Designer from "Edgecross Basic Software" in Windows Start.
- Double-click the shortcut icon of 'Real-time Flow Designer' on the desktop.

Parameters of Real-time Flow Manager are read and applied to Real-time Flow Designer when starting Real-time Flow Designer.

Point

When starting Real-time Flow Designer for the first time, the screen to confirm the software license agreement appears. (It will not appear if the license agreement has already been accepted in Management Shell Explorer.)

Screen configuration



Setting of Real-time Flow Manager

Set Real-time Flow Manager with the following procedure.

First, operate the Data Logging Flow setting to create necessary logging files for Data Analysis.
Next, analyze the logging files using the analysis tool to obtain diagnostic rules necessary for Data Diagnosis.
Lastly, operate the Data Diagnosis Flow setting to follow the diagnostic rules and give Real-time Feedback.

Data Logging Phase

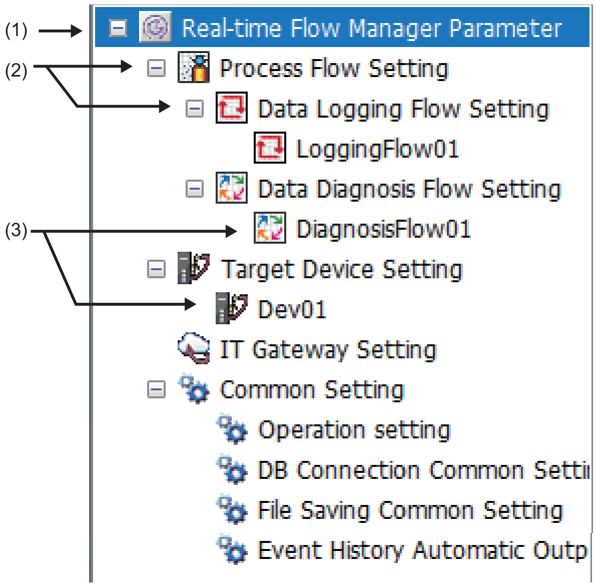
Data Logging Phase is aimed at saving data to a file.
Please write the setting and collect necessary data for Data Analysis after creating Data Logging Flow.

The description of the item where the cursor is placed is displayed.

(1) Menu bar
(2) Edit item tree
(3) Setting edit screen

Operations in the edit item tree

Setting contents of each screen are displayed in a tree in the edit item tree.


(1)
(2)
(3)
Real-time Flow Manager Parameter
Process Flow Setting
Data Logging Flow Setting
LoggingFlow01
Data Diagnosis Flow Setting
DiagnosisFlow01
Target Device Setting
Dev01
IT Gateway Setting
Common Setting
Operation setting
DB Connection Common Setti
File Saving Common Setting
Event History Automatic Outp

(1) Root
(2) Setting category
(3) Item

■Selecting an item

Items are displayed by double-clicking each setting category.

Selecting a displayed item shows its edit screen in the setting edit screen.

■Adding an item

Select and right-click a setting category or item, and select [Add Item].

When an item is successfully added, it is automatically selected and its edit screen appears.

■Deleting an item

Select and right-click an item to delete, and select [Delete Item].

To delete all items included in a setting category, select and right-click the setting category, and select [Delete Item].

■Initializing parameter settings

To initialize parameter settings, select and right-click the root and select [Initialize All Settings.].

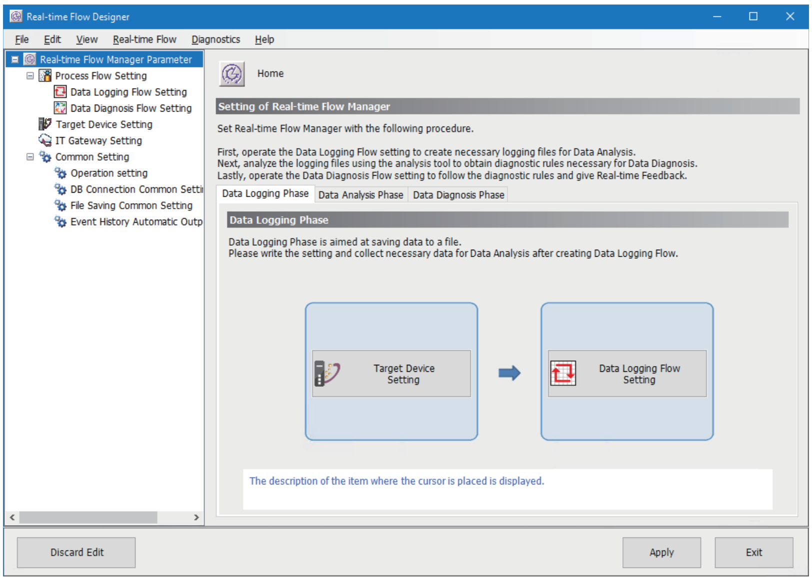
Home screen

This screen appears when starting Real-time Flow Designer.

All setting items are displayed.

Window

Select "Real-time Flow Manager Parameter" in the edit item tree.



Setting of Real-time Flow Manager

Set Real-time Flow Manager with the following procedure.

First, operate the Data Logging Flow setting to create necessary logging files for Data Analysis.
Next, analyze the logging files using the analysis tool to obtain diagnostic rules necessary for Data Diagnosis.
Lastly, operate the Data Diagnosis Flow setting to follow the diagnostic rules and give Real-time Feedback.

Data Logging Phase

Data Logging Phase is aimed at saving data to a file.
Please write the setting and collect necessary data for Data Analysis after creating Data Logging Flow.

The description of the item where the cursor is placed is displayed.

Displayed items

■Menu configuration

Menu name			Description	Reference
File	Read from File		To read setting information saved as a setting file.[*1,*2,*3,*4]	—
	Save in File		To save the current setting status as a setting file.[*5,*6,*7]	—
	Exit Real-time Flow Designer		To exit Real-time Flow Designer.	—
Edit	Add Item		To add an item to a setting selected in the edit item tree.	—
	Delete Item		To delete an item selected in the edit item tree.	—
View	Switch Display Language		To switch the display languages of Real-time Flow Designer and Management Shell Explorer for the next startup (Japanese/English/Simplified Chinese).	—
Real-time Flow	Process Flow Start/Stop		To switch the operating status of a process flow of Real-time Flow Manager.	Page 333 "Process Flow Start/Stop" screen
Diagnostics	Real-time Flow Manager Diagnostics		To monitor the operating status of Real-time Flow Manager.	Page 332 Real-time Flow Manager diagnosis
Help	Data collector		To display the list of installed data collectors.	Page 120 Data collector list
	IT Gateway List		To display the list of installed IT gateways.	Page 121 IT gateway list
	Manual	Edgecross Basic Software User's Manual	To display the manual (Edgecross Basic Software for Windows User's Manual) in PDF format.	—
	Version Information		To display the version information and license information of Real-time Flow Designer.	—

*1 When a password is set for a file, the file can be read by entering the password in the displayed "Password input" screen.

*2 If the MAC address of a network adapter for an industrial PC when reading a setting file is different from the one when the setting file is saved, the data distribution setting (MQTT) or edge application diagnosis (MQTT) setting must be configured again by the procedure shown below.

The following are the cases:

- Reading a setting file saved to an industrial PC in another industrial PC
- Changing a network device for an industrial PC

Reconfiguration procedure

❶ Output a publishing data definition file in the [Definition Output] tab in the "Data Distribution Setting" or "Edge Application Diagnosis Setting" screen. (☞ Page 158 Data Distribution Setting (MQTT), Page 173 Edge Application Diagnosis (MQTT) Setting)

❷ Click the [OK] button to fix the setting.

❸ Click the [OK] button in the process flow setting to fix the setting. (☞ Page 132 Data logging flow setting screen, Page 136 Data diagnosis flow setting screen)

❹ Click the [Apply] button.

❺ Use the output publishing data definition file to set the connected edge application again.

Parameters of Real-time Flow Manager are updated by the above procedure.

This update is not applied to the original setting file.

Select [File] ⇨ [Save in File] to save the setting file again as necessary.

*3 If a value is set for "Client ID at sending" or "Publishing Data topic name" in the data distribution setting (MQTT) or edge application diagnosis (MQTT) setting, change the set value after reading a setting file. (A same value cannot be set for Real-time Flow Manager installed on an industrial PC in which a setting file is saved and that installed on one in which the setting file is read.)

*4 When importing a setting file, which is saved in Real-time Flow Designer with Edgecross Basic Software version 1.23 or earlier, into Real-time Flow Designer in which the event history automatic output setting is configured, the setting is deleted.

*5 A password can be set in the displayed "Password setting" screen. This can prevent leakage of the information in a setting file.

*6 Up to 200 characters can be set for the file path of a file name.

*7 Depending on a data collector used, some setting information may not be saved. For details, refer to the manual for a data collector used.

■Screen configuration

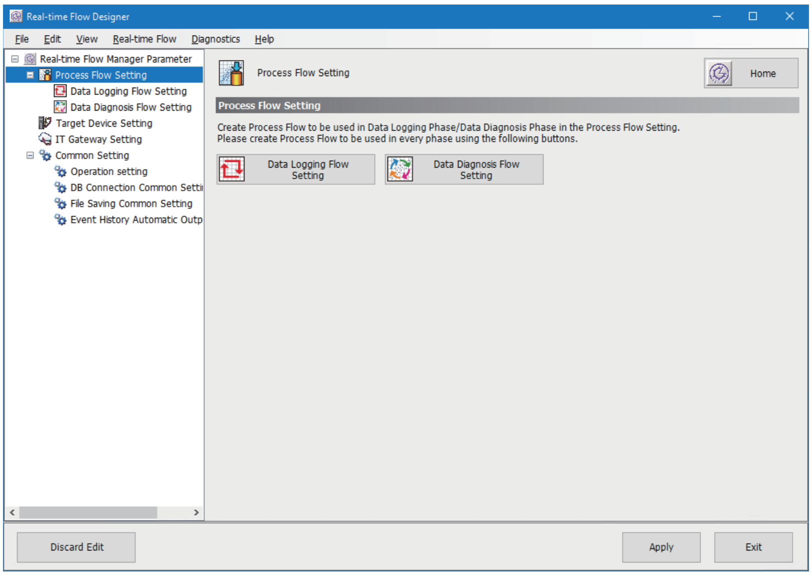
Item		Description	Reference
[Data Logging Phase] tab	[Target Device Setting] button	Click this to display the access target device setting list.	Page 124 Access target device setting list
	[Data Logging Flow Setting] button	Click this to display the data logging flow setting list.	Page 131 Data logging flow setting list
[Data Diagnosis Phase] tab	[Data Diagnosis Flow Setting] button	Click this to display the data diagnosis flow setting list.	Page 134 Data diagnosis flow setting list
[Discard Edit] button		Click this to discard the settings in Real-time Flow Designer.	—
[Apply] button		Click this to update the parameters of Real-time Flow Manager with the settings of Real-time Flow Designer.	—

Process flow setting

The following shows the screen for setting each process flow.

Window

Select "Process Flow Setting" in the edit item tree.



Create Process Flow to be used in Data Logging Phase/Data Diagnosis Phase in the Process Flow Setting.
Please create Process Flow to be used in every phase using the following buttons.

Displayed items

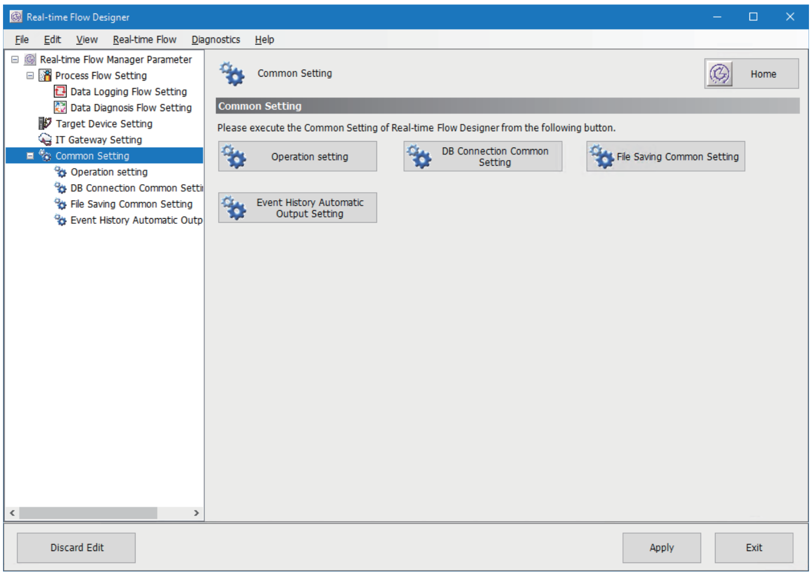
Item	Description
[Home] button	Click this to display the home screen. ☞ Page 109 Home screen
[Data Logging Flow Setting] button	Click this to display the data logging flow setting list. ☞ Page 131 Data logging flow setting list
[Data Diagnosis Flow Setting] button	Click this to display the data diagnosis flow setting list. ☞ Page 134 Data diagnosis flow setting list

Common setting

The following shows the common settings of Real-time Flow Designer.

Window

Select "Common Setting" in the edit item tree.



Real-time Flow Designer
File
Edit
View
Real-time Flow
Diagnostics
Help
Real-time Flow Manager Parameter
Process Flow Setting
Data Logging Flow Setting
Data Diagnosis Flow Setting
Target Device Setting
IT Gateway Setting
Common Setting
Operation setting
DB Connection Common Setti
File Saving Common Setting
Event History Automatic Outp
Common Setting
Home
Common Setting
Operation setting
DB Connection Common Setting
File Saving Common Setting
Event History Automatic Output Setting
Discard Edit
Apply
Exit

Please execute the Common Setting of Real-time Flow Designer from the following button.

Displayed items

Item	Description
[Home] button	Click this to display the home screen. ☞ Page 109 Home screen
[Operation setting] button	Click this to display the "Operation setting" screen. ☞ Page 113 Operation setting
[DB Connection Common Setting] button	Click this to display the "DB Connection Common Setting" screen. ☞ Page 116 DB connection common setting
[File Saving Common Setting] button	Click this to display the "File Saving Common Setting" screen. ☞ Page 117 File saving common setting
[Event History Automatic Output Setting] button	Click this to display the "Event History Automatic Output Setting" screen. ☞ Page 118 Event history automatic output setting

Operation setting

The following shows the procedure for setting the operating status of all process flows of Real-time Flow Manager to RUN or STOP when starting an industrial PC.

Operating procedure

1. Click the [Operation setting] button in the "Common Setting" screen.
2. Set the operating status of all process flows.
3. Click the [OK] button.

Precautions

- When changing the operating status after applying parameters of Real-time Flow Manager, switch it in Real-time Flow Designer. (☞ Page 332 Real-time Flow Manager diagnosis)
- Set the operating status of all process flows when starting an industrial PC to RUN in either of the following cases only:
  Executing a data logging flow only
  Using only the data diagnosis plug-in run function as a data diagnosis function
- When performing data diagnosis such as MQTT cooperation for which the order of startup is determined between an edge application and Real-time Flow Manager, do not set the operating status of all process flows when starting an industrial PC to RUN.
  If the operating status is in the RUN state but an edge application for data diagnosis cannot perform real-time data diagnosis, an error occurs.
- The time until the operating status of a process flow switches to RUN increases in proportion to the number of process flows. In addition, the timing of switching to RUN varies widely.
  When adding a process flow, check if there is any problem, for example, with the timing of cooperating with an edge application when starting an industrial PC.
- Disable the fast startup function. If it is enabled, an industrial PC is not shut down completely, and a process flow may not run properly when starting the industrial PC after shutdown. For the procedure for disabling the fast startup function, refer to the following:

☞ Page 114 Procedure for disabling the fast startup function

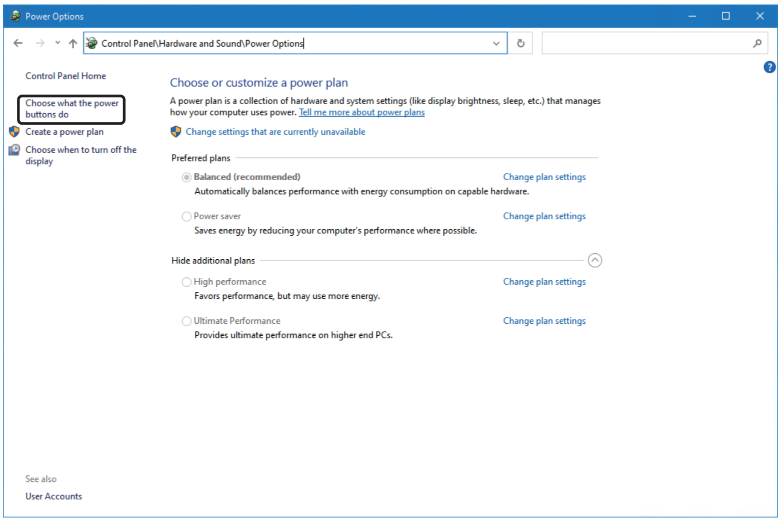
■Procedure for disabling the fast startup function

The following shows the procedure for disabling the fast startup function.

Operating procedure

1. Open the "Power Options" screen, and click [Choose what the power button does].

[Control Panel] ⇨ [System and Security] ⇨ [Power Options]



Choose or customize a power plan

A power plan is a collection of hardware and system settings (like display brightness, sleep, etc.) that manages how your computer uses power. Tell me more about power plans

Change settings that are currently unavailable

Preferred plans

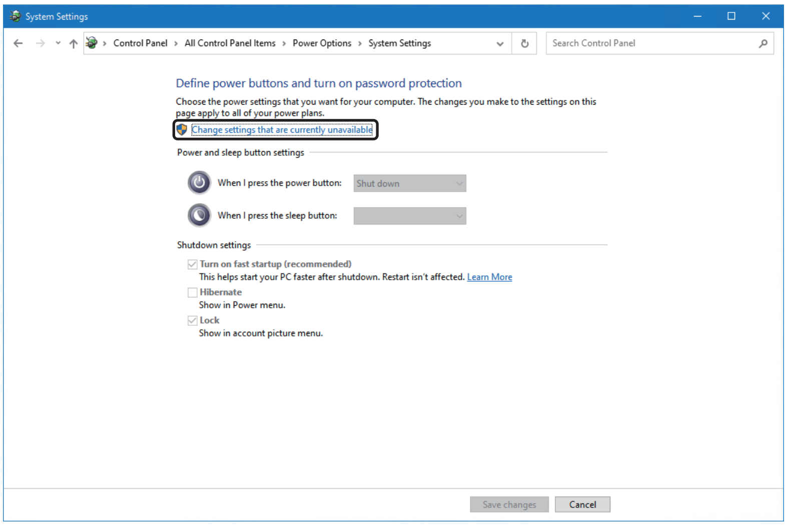
● Balanced (recommended)
Automatically balances performance with energy consumption on capable hardware.

○ Power saver
Saves energy by reducing your computer's performance where possible.

○ High performance
Favors performance, but may use more energy.

○ Ultimate Performance
Provides ultimate performance on higher end PCs.

2. Click [Change settings that are currently unavailable].


System Settings
Control Panel › All Control Panel Items › Power Options › System Settings
Search Control Panel
Save changes
Cancel

Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes you make to the settings on this page apply to all of your power plans.

Change settings that are currently unavailable

Power and sleep button settings

When I press the power button: Shut down

When I press the sleep button:

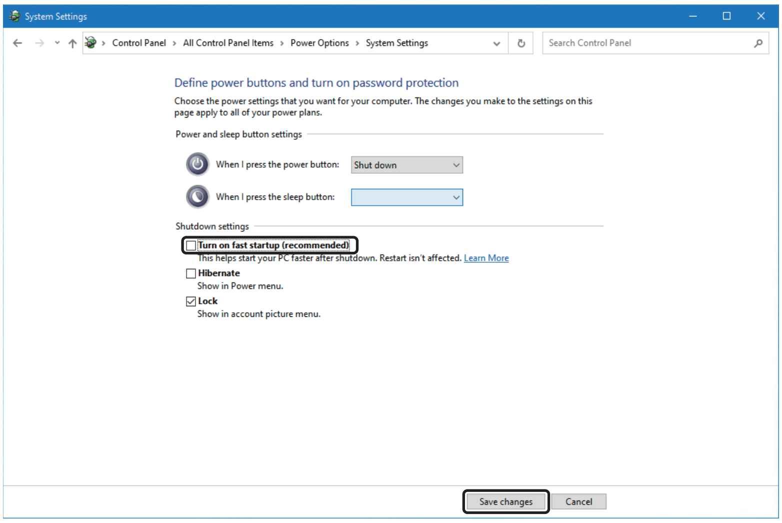
Shutdown settings

☑ Turn on fast startup (recommended)
This helps start your PC faster after shutdown. Restart isn't affected. Learn More

☐ Hibernate
Show in Power menu.

☑ Lock
Show in account picture menu.

3. Unselect the checkbox of "Turn on fast startup" under "Shutdown settings," and click the [Save changes] button.


System Settings
Control Panel › All Control Panel Items › Power Options › System Settings
Search Control Panel
Save changes
Cancel

Define power buttons and turn on password protection

Choose the power settings that you want for your computer. The changes you make to the settings on this page apply to all of your power plans.

Power and sleep button settings

When I press the power button: Shut down

When I press the sleep button:

Shutdown settings

☐ **Turn on fast startup (recommended)**
This helps start your PC faster after shutdown. Restart isn't affected. Learn More

☐ **Hibernate**
Show in Power menu.

☑ **Lock**
Show in account picture menu.

DB connection common setting

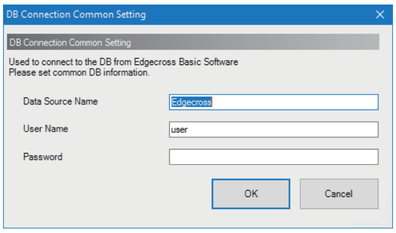
The following shows the screen for setting the common settings when connecting to a database.

To set the DB connection common setting, a database must be set in advance.

☞ Page 529 Database Setup

Window

Click the [DB Connection Common Setting] button in the "Common Setting" screen.



DB Connection Common Setting

DB Connection Common Setting

Used to connect to the DB from Edgecross Basic Software
Please set common DB information.

Data Source Name: Edgecross

User Name: user

Password:

Displayed items

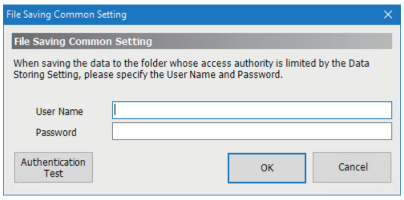
Item	Description
Data Source Name	Set the data source name of a database (1 to 32 characters).
User Name	Set the user name of a database (1 to 32 characters).
Password	Set the password for a database (6 to 32 characters).

File saving common setting

The following shows the screen for setting a user name and password used for accessing a folder with restricted access.

Window

Click the [File Saving Common Setting] button in the "Common Setting" screen.



When saving the data to the folder whose access authority is limited by the Data Storing Setting, please specify the User Name and Password.

Displayed items

Item	Description
User Name[*1][*2]	Set a Windows user account (up to 127 characters). By entering it in either of the following formats, a domain name can be included.[*3][*4] • [Domain name]\[User name] • [User name]@[Domain name] When specifying a local user of an industrial PC on which Edgecross Basic Software is installed, set it in any of the following formats: • [Computer name]\[User name] • .\[User name] • [User name]
Password[*1][*2]	Set a password to authenticate a Windows user account (up to 127 characters).
[Authentication Test] button	Click this to perform the authentication test for a user account to Windows by using a set user name and password.

*1 If changing a set password for a user account in Windows, set it again.

*2 To prevent eavesdropping and falsification of data, it is recommended to use a user account with a password satisfying complexity requirements.
The complexity requirements can be checked by the following procedure:
❶ Start the local security policy of Windows.
❷ Double-click [Security Settings] ⇨ [Account Policies] ⇨ [Password Policy] ⇨ [Password must meet complexity requirements].
❸ Select the [Explain] tab in the "Password must meet complexity requirements Properties" screen.

*3 When '@' and '\' are included, the format is determined as [User name]@[Domain name].
When multiple pieces of '@' or '\' are included, the first '@' ('\' if there is no '@') is used as a delimiter between a domain name and a user name.

*4 Do not specify a local user of another industrial PC on the network.

Precautions

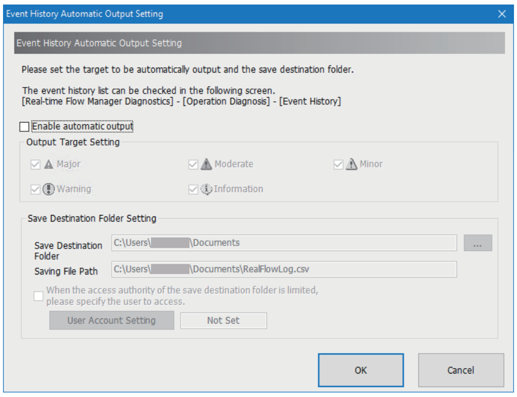
- When exporting a setting file while a local user of an industrial PC is set for "User Name" and importing the setting file in another industrial PC, the local user may not be authenticated in the import destination industrial PC. Set it again after import as necessary.
- The authentication test is performed on a local computer. Therefore, even when specifying another industrial PC on the network for a save destination folder, the test is not performed on the industrial PC.
- When repeating the following operations if a password is incorrect, a user account may be locked out. If an error occurs due to these operations, check if a password is correct.
  - Apply the setting.
  - Start Real-time Flow Manager or start the operation.
  - Perform the authentication test.

Event history automatic output setting

The following shows the screen for settings required to automatically output an event history.

Window

Click the [Event History Automatic Output Setting] button in the "Common Setting" screen.


Event History Automatic Output Setting
Event History Automatic Output Setting
Output Target Setting
Save Destination Folder Setting
...
User Account Setting
OK
Cancel

Please set the target to be automatically output and the save destination folder.

The event history list can be checked in the following screen.
[Real-time Flow Manager Diagnostics] - [Operation Diagnosis] - [Event History]

☐ Enable automatic output

☑ Major ☑ Moderate ☑ Minor
☑ Warning ☑ Information

Save Destination Folder: C:\Users\[redacted]\Documents
Saving File Path: C:\Users\[redacted]\Documents\RealFlowLog.csv

☐ When the access authority of the save destination folder is limited, please specify the user to access.

Not Set

Displayed items

Item		Description
Enable automatic output		Select the checkbox to automatically output an event history to a file.[*1]
Output Target Setting[*2]		Select the checkbox of an event to be output.
Save Destination Folder Setting	Save Destination Folder[*2]	Set a save destination folder (1 to 233 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.
	Saving File Path	The saving file path based on the setting for "Save Destination Folder" is displayed.
	When the access authority of the save destination folder is limited, please specify the user to access.[*2]	Select the checkbox if access is granted to the save destination folder for an event history file.[*1]
	[User Account Setting] button[*3]	Click this to display the "User Account Setting" screen. ☞ Page 119 User account setting screen The setting status of the "User Account Setting" screen is displayed to the right of this button.

[*1] When fixing the settings without selecting the checkbox, the settings in the "User Account Setting" screen are deleted.

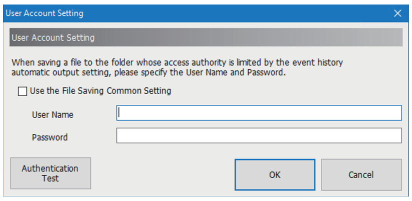
[*2] Can be selected or set when selecting the checkbox of "Enable automatic output."

[*3] Can be clicked when selecting the checkboxes of "Enable automatic output" and "When the access authority of the save destination folder is limited, please specify the user to access."

■User account setting screen

The following shows the screen for setting a user name and password used for accessing a folder with restricted access.

Window



When saving a file to the folder whose access authority is limited by the event history automatic output setting, please specify the User Name and Password.

Displayed items

Refer to the following:

☞ Page 149 User account setting

Precautions

Refer to the following:

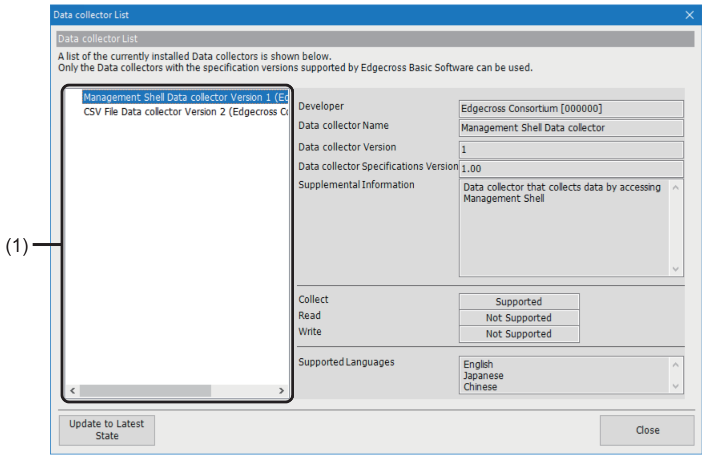
☞ Page 149 User account setting

Data collector list

The following shows the screen for displaying the list of installed data collectors.

Window

Select [Help] ⇨ [Data collector].


Data collector List
Data collector List
Management Shell Data collector Version 1 (Ed
CSV File Data collector Version 2 (Edgecross C
(1)
Update to Latest State
Close

A list of the currently installed Data collectors is shown below.
Only the Data collectors with the specification versions supported by Edgecross Basic Software can be used.

Developer: Edgecross Consortium [000000]
Data collector Name: Management Shell Data collector
Data collector Version: 1
Data collector Specifications Version: 1.00
Supplemental Information: Data collector that collects data by accessing Management Shell
Collect: Supported
Read: Not Supported
Write: Not Supported
Supported Languages: English, Japanese, Chinese

Displayed items

Item	Description
(1) Data collector list	Information on all installed data collectors is displayed.
Developer	The developer of a data collector is displayed.
Data collector Name	The name of a data collector is displayed.
Data collector Version	The data collector version of a data collector is displayed.
Data collector Specifications Version	The data collector specification version of a data collector is displayed. (Third decimal place and the subsequent ones are rounded down.)
Supplemental Information	The supplementary information on a data collector is displayed.
Collect	The availability of data collection in a data collector is displayed. • Supported: Collectible • Not Supported: Uncollectible
Read	The availability of data reading in a data collector is displayed. • Supported: Readable • Not Supported: Unreadable
Write	The availability of data writing in a data collector is displayed. • Supported: Writable • Not Supported: Unwritable
Supported Languages	Languages that are supported by a data collector are displayed.
[Update to Latest State] button	Click this to update the "Data collector List" screen.

Point

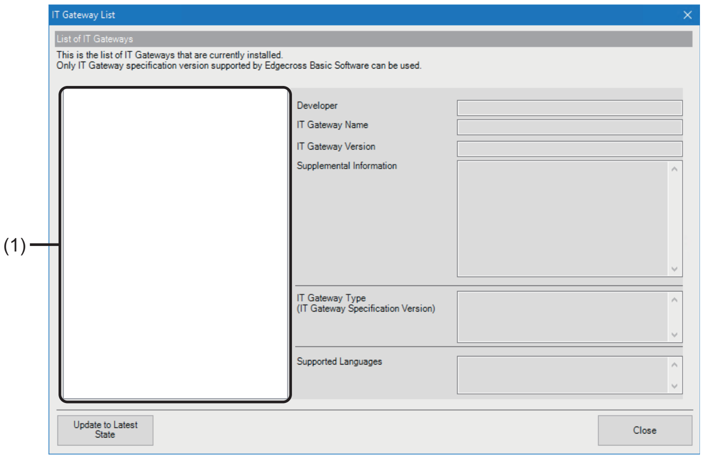
- When multiple data collectors with different data collector versions are installed, only a data collector with the latest data collector version is displayed.
- By clicking the [Update to Latest State] button, the access target device information can be updated with the latest data collector contents.

IT gateway list

The following shows the screen for displaying the list of installed IT gateways.

Window

Select [Help] ⇨ [IT Gateway List].



This is the list of IT Gateways that are currently installed.
Only IT Gateway specification version supported by Edgecross Basic Software can be used.

Displayed items

Item	Description
(1) IT gateway list	Information on all installed IT gateways is displayed.
Developer	The developer of an IT gateway is displayed.
IT Gateway Name	The name of an IT gateway is displayed.
IT Gateway Version	The IT gateway version of an IT gateway is displayed.
Supplemental Information	The supplementary information on an IT gateway is displayed.
IT Gateway Type (IT Gateway Specification Version)	The IT gateway type and IT gateway specification version of an IT gateway are displayed. (Third decimal place and the subsequent ones are rounded down.)
Supported Languages	The display languages that are supported by an IT gateway are displayed.
[Update to Latest State] button	Click this to update the "IT Gateway List" screen.

Point

By clicking the [Update to Latest State] button, the IT gateway setting information can be updated with the latest IT gateway contents.

Location of use search result screen

The locations where setting items (access target device settings or IT gateway settings) are used are displayed in a list.

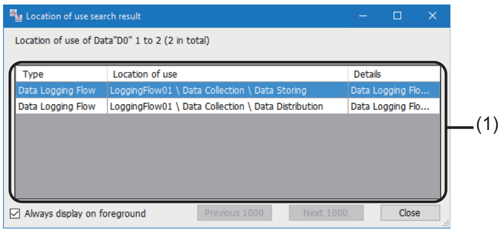
Window

■For searching for the location of use for an access target device setting

Select and right-click a row in the "Target Device Setting List" screen, and select [Search of the location of use for Target Device setting].

■For searching for the location of use for an IT gateway setting

Select and right-click a row in the "IT Gateway Setting List" screen, then select [Search of the location of use for IT Gateway setting].



Location of use of Data"D0" 1 to 2 (2 in total)

Type	Location of use	Details
Data Logging Flow	LoggingFlow01 \ Data Collection \ Data Storing	Data Logging Flo...
Data Logging Flow	LoggingFlow01 \ Data Collection \ Data Distribution	Data Logging Flo...

☑ Always display on foreground

Displayed items

Item		Description
(1) List of locations of use[1]	Type	The type of the location where the setting item is used is displayed.
	Location of use	The location where the setting item is used is displayed.
	Details	The detail of the location where the setting item is used is displayed.
Always display on foreground		Select the checkbox to display this screen in the foreground. If multiple applications to be displayed in the foreground are running, one of them is displayed in the foreground.

*1 By double-clicking a row, the location where the setting item is used can be referenced.

Point

- Only the 1000 displayed items can be sorted.
- The display language of this screen is the same as that of Real-time Flow Designer or Management Shell Explorer when displaying this screen for searching for the location of use.

Precautions

- If a setting item is being edited, it may not be searched for properly or its location of use may not be referenced properly.
- This screen can be displayed only one. If searching for another location of use in Real-time Flow Designer or Management Shell Explorer when this screen is already displayed, the display contents will be updated.
- Even if switching the display language of Real-time Flow Designer or Management Shell Explorer while this screen is displayed, that of this screen is not switched.

Common operation

The following shows the common operations of Real-time Flow Designer.

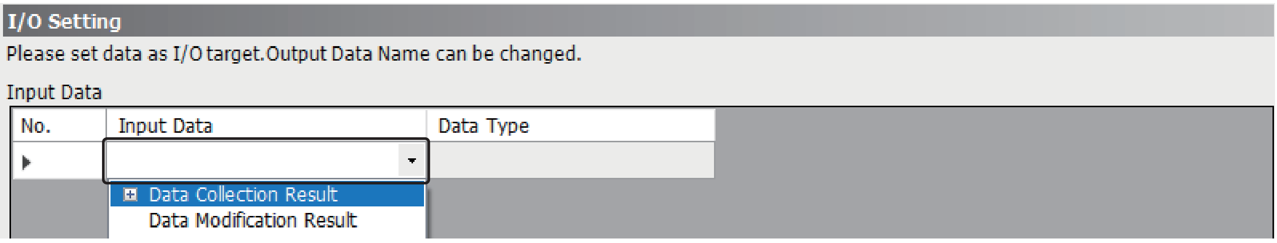
Data setting in the data selection control tree

The following shows the procedure for easily assigning data to a single item such as a data collection result or constant.

Operating procedure

1. Click the data entry cell.

(Example) "Data Extraction Setting" screen



I/O Setting

Please set data as I/O target.Output Data Name can be changed.

Input Data

2. Select data to set.

Item			Description
Data Collection Result	(Process name of data collection)[1]	(Name of collection data)[2]	Set selected data.
Data Modification Result	(Process name of data modification)[1]	(Name of output data)[2]	Set selected data.
Data Diagnosis Result	(Process name of data diagnosis)[1]	(Name of output data)[2]	Set selected data.
Constant[2]	[Integer]		The "Integer Type Constant Setting" screen appears.
	[Float]		The "Float Type Constant Setting" screen appears.
	[String [ASCII]]		The "String [ASCII] Type Constant Setting" screen appears.
	[String [UNICODE]]		The "String [UNICODE] Type Constant Setting" screen appears.

*1 Not displayed if the process name of the previous process is not set.

*2 Not displayed if a data type that cannot be combined is selected.

■Setting constants

The following shows the procedure for setting a constant to use as data.

Operating procedure

1. Click "[Integer]," "[Float]," "[String [ASCII]]," or "[String [UNICODE]]" in the data selection control tree.

2. Enter a setting value, and click the [OK] button.

6.2 Access Target Device Setting

This section shows the procedure and screen for selecting a data collector to use and setting an access target device.

Operating procedure

1. Select "Target Device Setting" in the edit item tree.

The access target device setting list appears. (☞ Page 124 Access target device setting list)

2. Select a row in which the access target device setting is not configured in the access target device setting list, and click the [Edit] button.

The "Select Data collector" screen appears. (☞ Page 125 Data collector selection screen)

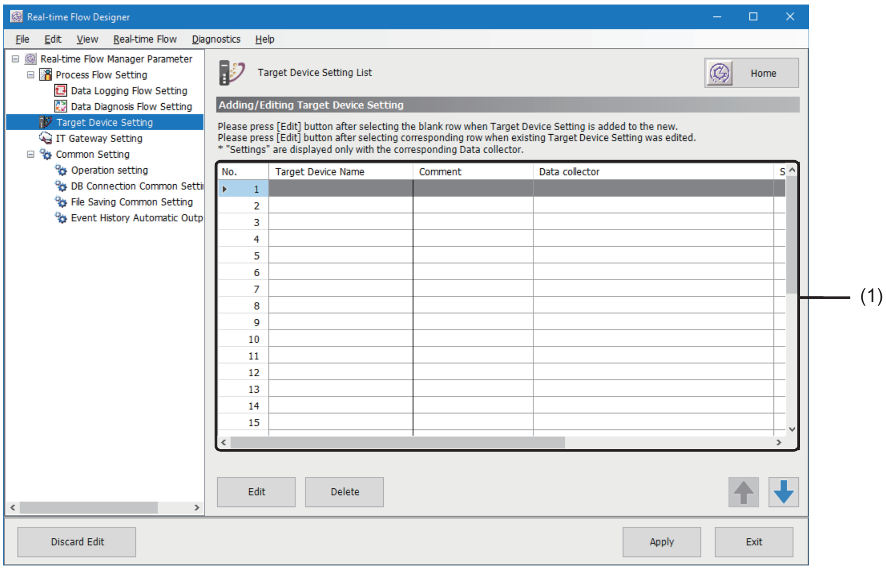
Point

When selecting a row in which the access target device setting is configured, the "Target Device Setting" screen appears instead of the "Select Data collector" screen.

3. Select a data collector to use in the "Select Data collector" screen, and click the [OK] button.

The "Target Device Setting" screen appears. (☞ Page 126 Access target device setting screen)

Access target device setting list



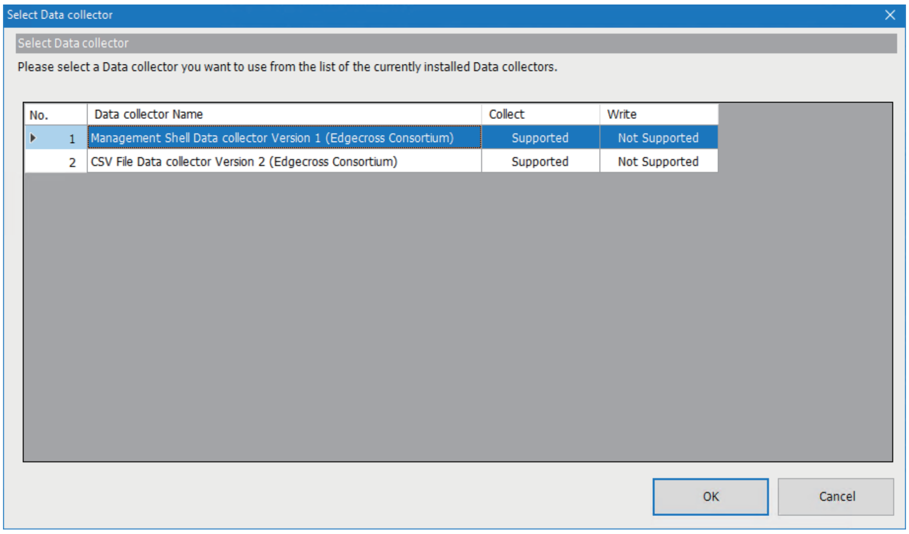
Please press [Edit] button after selecting the blank row when Target Device Setting is added to the new.
Please press [Edit] button after selecting corresponding row when existing Target Device Setting was edited.
* "Settings" are displayed only with the corresponding Data collector.

Displayed items

Item		Description
[Home] button		Click this to display the home screen. ☞ Page 109 Home screen
(1) Access target device setting list[*1]	Target Device Name	The name of an access target device set in the "Target Device Setting" screen is displayed.
	Comment	A comment set in the "Target Device Setting" screen is displayed.
	Data collector	The name of a data collector selected in the "Select Data collector" screen is displayed.
	Settings	The setting contents of a data collector set in the "Target Device Setting" screen are displayed.
[Edit] button		Click this to display the "Select Data collector" screen when selecting a row in which the access target device setting is not configured. ☞ Page 125 Data collector selection screen Click this to display the "Target Device Setting" screen when selecting a row in which the access target device setting is configured. ☞ Page 126 Access target device setting screen
[Delete] button		Click this to delete the setting of a selected row.

*1 The location where the access target device setting of a selected row is used can be checked in the "Location of use search result" screen displayed by selecting and right-clicking the row then selecting [Search of the location of use for Target Device setting].
☞ Page 122 Location of use search result screen

Data collector selection screen



Select Data collector

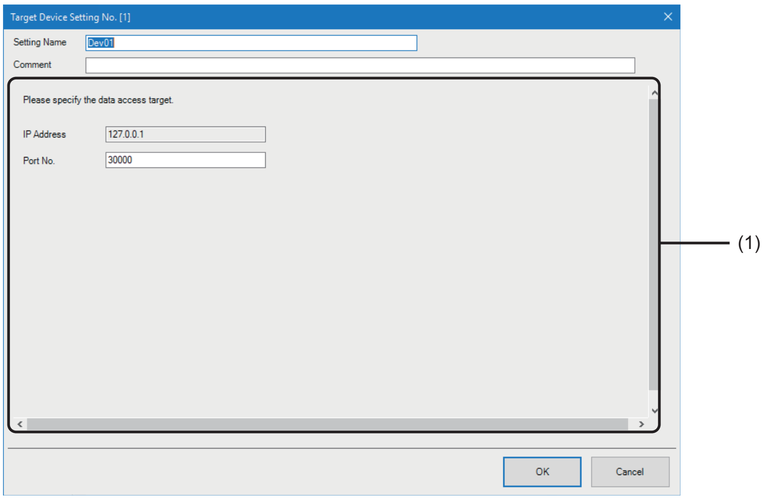
Please select a Data collector you want to use from the list of the currently installed Data collectors.

No.	Data collector Name	Collect	Write
1	Management Shell Data collector Version 1 (Edgecross Consortium)	Supported	Not Supported
2	CSV File Data collector Version 2 (Edgecross Consortium)	Supported	Not Supported

Displayed items

Item	Description
Data collector Name	A data collector name, data collector version, and developer are displayed.
Collect	The availability of data collection in a data collector is displayed. • Supported: Collectible • Not Supported: Uncollectible
Write	The availability of data writing in a data collector is displayed. • Supported: Writable • Not Supported: Unwritable
[OK] button	Click this to display the "Target Device Setting" screen. ☞ Page 126 Access target device setting screen

Access target device setting screen



Target Device Setting No. [1]

Setting Name: Dev01

Comment:

Please specify the data access target.

IP Address: 127.0.0.1

Port No.: 30000

Displayed items

Item	Description
Setting Name[*1]	Set the name of an access target device setting (1 to 32 characters). • The following are displayed to avoid name duplication by default. Dev01, Dev02, Dev03, ...
Comment	Set a comment (up to 100 characters).
(1) Access target device setting information	Set communication parameters. For details, refer to the manual for a data collector used.

[*1] The same name as that of an access target device setting already set cannot be used.

6.3 IT Gateway Setting

This section shows the procedure and screen for selecting and setting an IT gateway to use.

Operating procedure

1. Select "IT Gateway Setting" in the edit item tree.

The IT gateway setting list appears. (☞ Page 127 IT gateway setting list)

2. Select a row in which the IT gateway setting is not configured in the IT gateway setting list, and click the [Edit] button.

The "IT Gateway Selection" screen appears. (☞ Page 128 IT gateway selection screen)

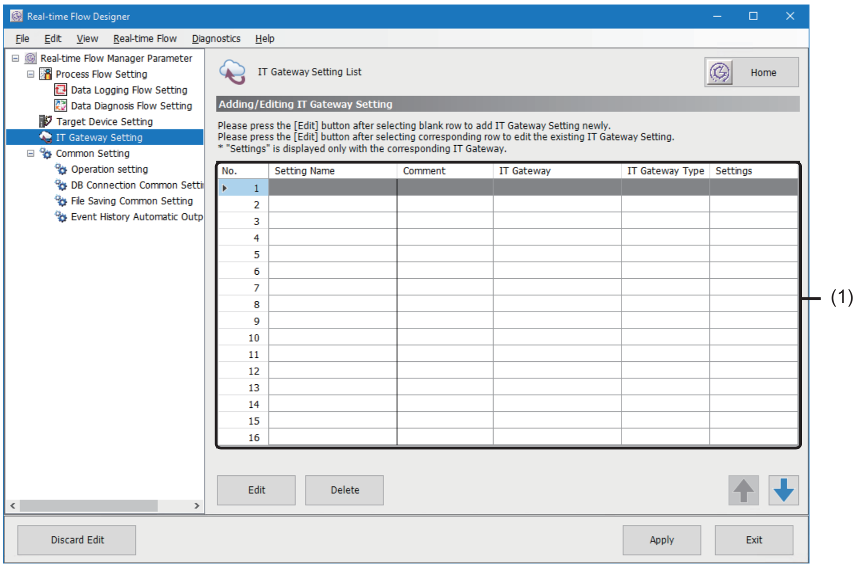
Point

When selecting a row in which the IT gateway setting is configured, the "IT Gateway Setting" screen appears instead of the "IT Gateway Selection" screen.

3. Select an IT gateway to use in the "IT Gateway Selection" screen, and click the [OK] button.

The "IT Gateway Setting" screen appears. (☞ Page 129 IT gateway setting screen)

IT gateway setting list



Please press the [Edit] button after selecting blank row to add IT Gateway Setting newly.
Please press the [Edit] button after selecting corresponding row to edit the existing IT Gateway Setting.
* "Settings" is displayed only with the corresponding IT Gateway.

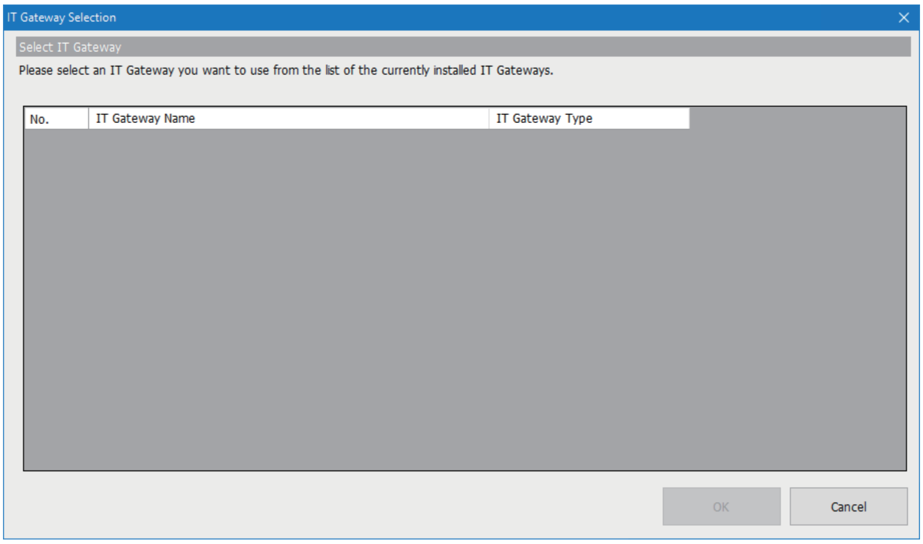
No.	Setting Name	Comment	IT Gateway	IT Gateway Type	Settings
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Displayed items

Item		Description
[Home] button		Click this to display the home screen. ☞ Page 109 Home screen
(1) IT gateway setting list[*1]	Setting Name	A setting name set in the "IT Gateway Setting" screen is displayed.
	Comment	A comment set in the "IT Gateway Setting" screen is displayed.
	IT Gateway	The name of an IT gateway selected in the "IT Gateway Selection" screen is displayed.
	IT Gateway Type	The type of an IT gateway selected in the "IT Gateway Selection" screen is displayed.
	Settings	The setting contents of an IT gateway set in the "IT Gateway Setting" screen are displayed.
[Edit] button		Click this to display the "IT Gateway Selection" screen when selecting a row in which the IT gateway setting is not configured. ☞ Page 128 IT gateway selection screen Click this to display the "IT Gateway Setting" screen when selecting a row in which the IT gateway setting is configured. ☞ Page 129 IT gateway setting screen
[Delete] button		Click this to delete the setting of a selected row.

*1 The location where the IT gateway setting of a selected row is used can be checked in the "Location of use search result" screen displayed by selecting and right-clicking the row then selecting [Search of the location of use for IT Gateway setting].
☞ Page 122 Location of use search result screen

IT gateway selection screen



Please select an IT Gateway you want to use from the list of the currently installed IT Gateways.

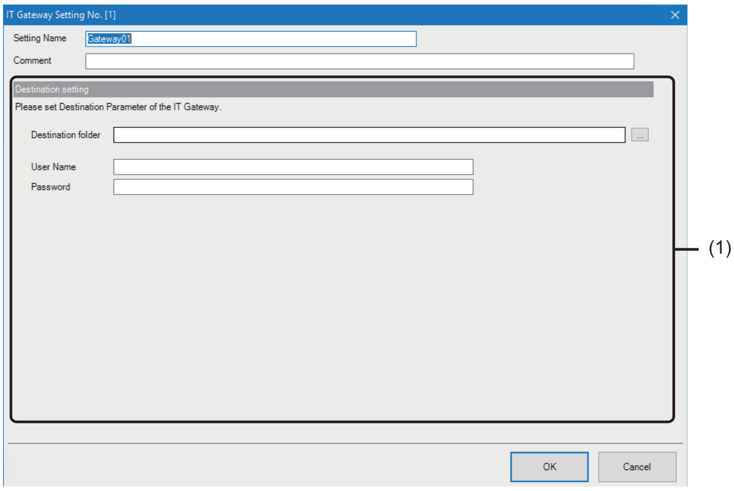
Displayed items

Item	Description
IT Gateway Name	An IT gateway name, IT gateway version, and developer are displayed.
IT Gateway Type*1	Select an IT gateway type.
[OK] button*2	Click this to display the "IT Gateway Setting" screen. ☞ Page 129 IT gateway setting screen

*1 Depending on a supported IT gateway I/F, any of the following items can be selected.
Historical data file access I/F: Data Storing
Real-time data publishing I/F-G: Data Distribution
Model access I/F-G or data access I/F-G: Model Data Access

*2 Cannot be clicked when selecting "Model Data Access" for "IT Gateway Type."

IT gateway setting screen



Setting Name: Gateway01

Please set Destination Parameter of the IT Gateway.

Displayed items

Item	Description
Setting Name[*1]	Set the name of an IT gateway setting (1 to 32 characters). • The following are displayed to avoid name duplication by default. Gateway01, Gateway02, Gateway03, ...
Comment	Set a comment (up to 100 characters).
(1) Destination parameter setting	Set destination parameters. For details, refer to the manual for an IT gateway used.

[*1] The same name as that of an IT gateway setting already set cannot be used.

6.4 Data Logging Flow Setting

This section shows the procedure and screen for setting a data logging flow.

Operating procedure

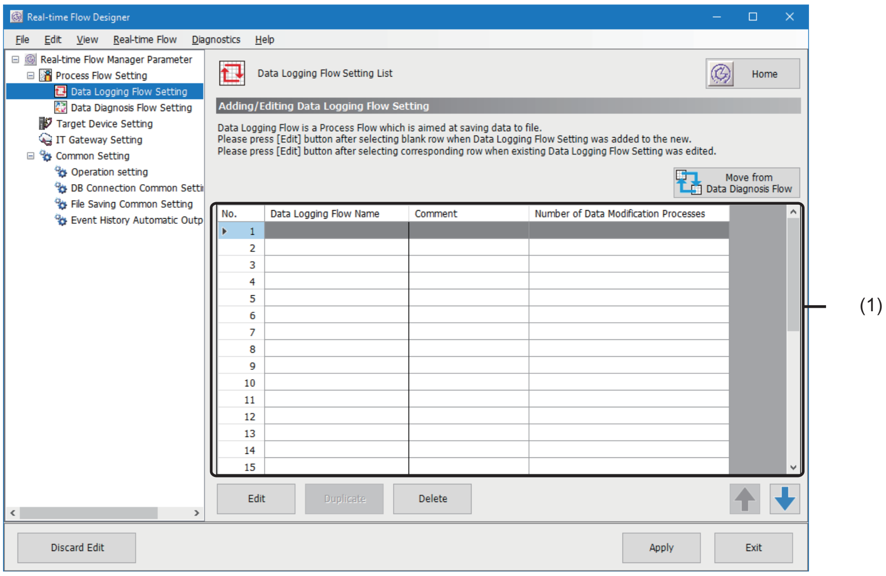
1. Select "Data Logging Flow Setting" in the edit item tree.

The data logging flow setting list appears. (☞ Page 131 Data logging flow setting list)

2. Click the [Edit] button in the data logging flow setting list.

The "Data Logging Flow Setting" screen appears. (☞ Page 132 Data logging flow setting screen)

Data logging flow setting list

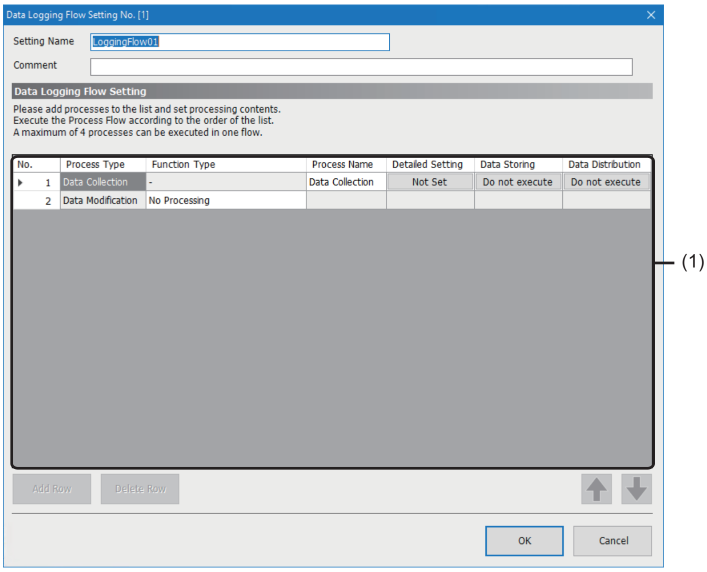

Real-time Flow Designer
File
Edit
View
Real-time Flow
Diagnostics
Help
Real-time Flow Manager Parameter
Process Flow Setting
Data Logging Flow Setting
Data Diagnosis Flow Setting
Target Device Setting
IT Gateway Setting
Common Setting
Operation setting
DB Connection Common Setti
File Saving Common Setting
Event History Automatic Outp
Data Logging Flow Setting List
Home
Adding/Editing Data Logging Flow Setting
Move from Data Diagnosis Flow
No.
Data Logging Flow Name
Comment
Number of Data Modification Processes
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Edit
Duplicate
Delete
Discard Edit
Apply
Exit
(1)

Data Logging Flow is a Process Flow which is aimed at saving data to file.
Please press [Edit] button after selecting blank row when Data Logging Flow Setting was added to the new.
Please press [Edit] button after selecting corresponding row when existing Data Logging Flow Setting was edited.

Displayed items

Item		Description
[Home] button		Click this to display the home screen. ☞ Page 109 Home screen
[Move from Data Diagnosis Flow] button		Click this to display the "Move Process Flow" screen. ☞ Page 138 Move of a Process Flow
(1) Data logging flow setting list	Data Logging Flow Name	The name of a data logging flow set in the "Data Logging Flow Setting" screen is displayed.
	Comment	A comment set in the "Data Logging Flow Setting" screen is displayed.
	Number of Data Modification Processes	The number of data modification processes set in the "Data Logging Flow Setting" screen is displayed.
[Edit] button		Click this to display the "Data Logging Flow Setting" screen of a selected row. ☞ Page 132 Data logging flow setting screen
[Duplicate] button		Click this to duplicate the setting of a selected row. • A sequential number '_number' is added to the end of a data logging flow name. (Example) LoggingFlow01_2 • When duplicating a setting that includes a data storing setting (file saving), a sequential number '(number)' is added to the end of a file name prefix. (Example) LOG(2) • When duplicating a setting that includes a data storing setting (DB saving), a sequential number '_number' is added to the end of a table name. (Example) LOG_2 • When duplicating a setting that includes a data distribution setting in which a publishing data topic name is specified, it is duplicated without setting the publishing data topic name. • When duplicating a setting that includes a data distribution setting in which a client ID is specified, it is duplicated without setting the client ID. • When duplicating a setting that includes a data collection setting in which CSV File Data collector is selected as a data collector, a sequential number '(number)' is added to the end of a monitoring folder. (Example) C:\Users\SampleUser\Documents(2) • To apply a setting of "File Name Prefix" in the [Save File] tab in the data storing setting (file saving) to the file transmission setting, perform the following procedure. ➊ Click the [File Transmission Setting] button in the [Save File] tab. ➋ Click the [OK] button in the "IT Gateway Transmission Setting" screen.
[Delete] button		Click this to delete the setting of a selected row.

Data logging flow setting screen



Setting Name: LoggingFlow01

Comment:

Data Logging Flow Setting

Please add processes to the list and set processing contents.
Execute the Process Flow according to the order of the list.
A maximum of 4 processes can be executed in one flow.

No.	Process Type	Function Type	Process Name	Detailed Setting	Data Storing	Data Distribution
1	Data Collection	-	Data Collection	Not Set	Do not execute	Do not execute
2	Data Modification	No Processing				

Displayed items

Item		Description
Setting Name*1		Set the name of a data logging flow setting (up to 32 characters). • The following are displayed to avoid name duplication by default. LoggingFlow 01, LoggingFlow 02, LoggingFlow 03, ...
Comment		Set a comment (up to 100 characters).
(1) Process list	Process Type	The type of a process is displayed.
	Function Type	Select a function type corresponding to the process type.
	Process Name	Set a name to identify a process (1 to 100 characters). • It is displayed by default as follows: When "Data Collection" is displayed in the "Process Type" column: "Data Collection" When an item other than "Data Collection" is displayed in the "Process Type" column: Content of its function type
	Detailed Setting	Click a cell, and each setting screen corresponding to a process type and a function type appears. • When the process type is "Data Collection" ☞ Page 139 Data Collection Setting • When the process type is "Data Modification" and the function type is "Data Extraction" ☞ Page 169 Data Extraction Setting • When the process type is "Data Modification" and the function type is "Character String Data Modification" ☞ Page 170 Character String Data Modification Setting • When the process type is "Data Modification" and the function type is a data modification plug-in name ☞ Page 172 Data Modification Plug-in Setting
	Data Storing	Click a cell, and the "Data Storing Setting" screen appears. • When saving data to a file ☞ Page 142 Data Storing Setting (File Saving) • When saving data to a database ☞ Page 152 Data Storing Setting (DB Saving)
	Data Distribution	Click a cell, and the "Data Distribution Setting" screen appears. • For distributing data by using MQTT ☞ Page 158 Data Distribution Setting (MQTT) • For distributing data by using an IT gateway ☞ Page 163 Data Distribution Setting (IT Gateway)
[Add Row] button		Click this to add a row the process type of which is "Data Modification" immediately under a selected row.*2,*3
[Delete Row] button*4		Click this to delete the process in a selected row.

*1 The same name as that of a data logging flow setting or data diagnosis flow setting already set cannot be used.

*2 Can be added in the following cases:
The process type of a selected row is "Data Collection" and the function type of a row immediately under the selected row (its process type is "Data Modification") is an item other than "No Processing."
The process type of a selected row is "Data Modification" and the function type is an item other than "No Processing."

*3 The following are displayed for the process name of an added row to avoid name duplication.
(Contents of the function type)002, (Content of the function type)003

*4 Cannot be used when the process type of a selected row is "Data Collection."

6.5 Data Diagnosis Flow Setting

This section shows the procedure and screen for setting a data diagnosis flow.

Operating procedure

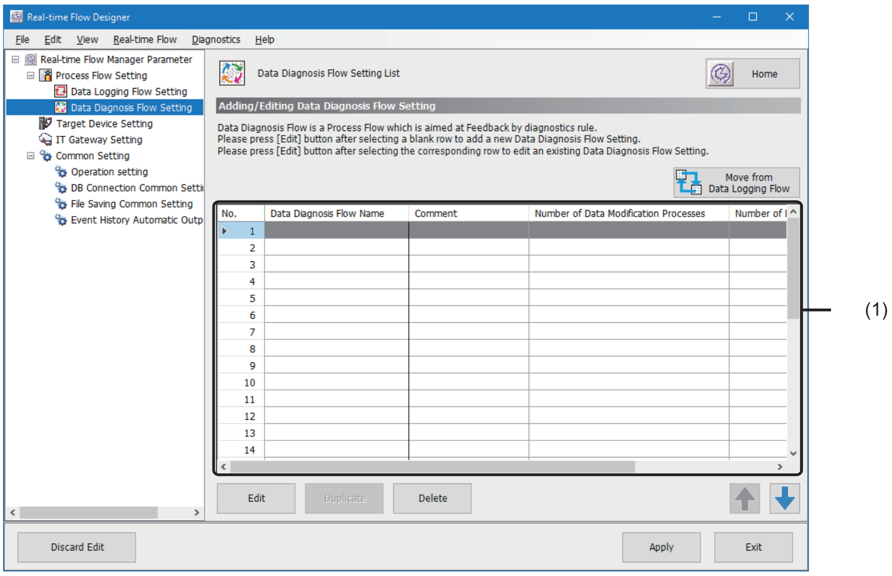
1. Select "Data Diagnosis Flow Setting" in the edit item tree.

The data diagnosis flow setting list appears. (☞ Page 134 Data diagnosis flow setting list)

2. Click the [Edit] button in the data diagnosis flow setting list.

The "Data Diagnosis Flow Setting" screen appears. (☞ Page 136 Data diagnosis flow setting screen)

Data diagnosis flow setting list


Real-time Flow Designer
File
Edit
View
Real-time Flow
Diagnostics
Help
Real-time Flow Manager Parameter
Process Flow Setting
Data Logging Flow Setting
Data Diagnosis Flow Setting
Target Device Setting
IT Gateway Setting
Common Setting
Operation setting
DB Connection Common Setti
File Saving Common Setting
Event History Automatic Outp
Data Diagnosis Flow Setting List
Home
Adding/Editing Data Diagnosis Flow Setting
Move from Data Logging Flow
No.
Data Diagnosis Flow Name
Comment
Number of Data Modification Processes
Number of I
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Edit
Duplicate
Delete
Discard Edit
Apply
Exit
(1)

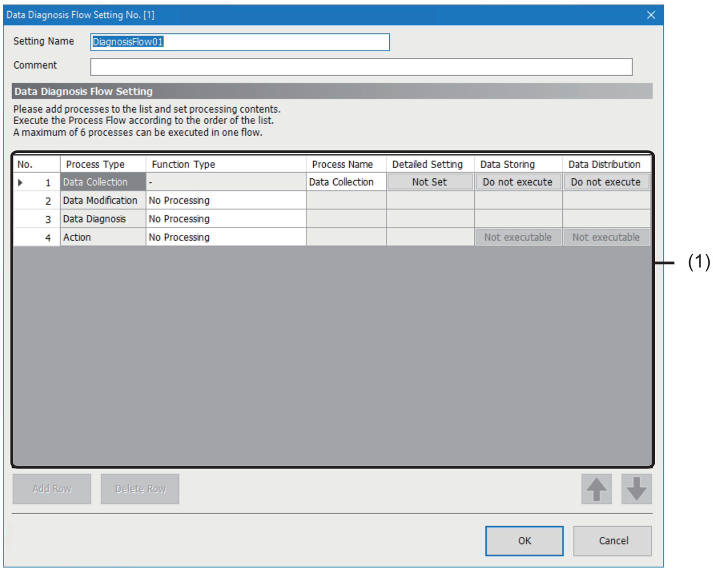
Data Diagnosis Flow is a Process Flow which is aimed at Feedback by diagnostics rule.
Please press [Edit] button after selecting a blank row to add a new Data Diagnosis Flow Setting.
Please press [Edit] button after selecting the corresponding row to edit an existing Data Diagnosis Flow Setting.

Displayed items

Item		Description
[Home] button		Click this to display the home screen. ☞ Page 109 Home screen
[Move from Data Logging Flow] button		Click this to display the "Move Process Flow" screen. ☞ Page 138 Move of a Process Flow
(1) Data diagnosis flow setting list	Data Diagnosis Flow Name	The name of a data diagnosis flow set in the "Data Diagnosis Flow Setting" screen is displayed.
	Comment	A comment set in the "Data Diagnosis Flow Setting" screen is displayed.
	Number of Data Modification Processes	The number of data modification processes set in the "Data Diagnosis Flow Setting" screen is displayed.
	Number of Data Diagnosis Processes	The number of data diagnosis processes set in the "Data Diagnosis Flow Setting" screen is displayed.
[Edit] button		Click this to display the "Data Diagnosis Flow Setting" screen of a selected row. ☞ Page 136 Data diagnosis flow setting screen

Item	Description
[Duplicate] button	Click this to duplicate the setting of a selected row. • A sequential number '_number' is added to the end of a data diagnosis flow name. (Example) DiagnosisFlow01_2 • When duplicating a setting that includes a data storing setting (file saving) or an edge application diagnosis (file) setting, a sequential number '(number)' is added to the end of a file name prefix. (Example) LOG(2) • When duplicating a setting that includes a data storing setting (DB saving), a sequential number '_number' is added to the end of a table name. (Example) LOG_2 • When duplicating a setting that includes a data distribution setting in which a publishing data topic name is specified, it is duplicated without setting the publishing data topic name. • When duplicating a setting that includes an edge application diagnosis (MQTT) setting in which a publishing data topic name is specified, it is duplicated without setting the publishing data topic name. • When duplicating a setting that includes a data distribution setting in which a client ID is specified, it is duplicated without setting the client ID. • When duplicating a setting that includes an edge application diagnosis (MQTT) setting in which a client ID is specified, it is duplicated without setting the client ID. • When duplicating a setting that includes a data collection setting in which CSV File Data collector is selected as a data collector, a sequential number '(number)' is added to the end of a monitoring folder. (Example) C:\Users\SampleUser\Documents(2) • To apply a setting of "File Name Prefix" in the [Save File] tab in the data storing setting (file saving) to the file transmission setting, perform the following procedure. ❶ Click the [File Transmission Setting] button in the [Save File] tab. ❷ Click the [OK] button in the "IT Gateway Transmission Setting" screen.
[Delete] button	Click this to delete the setting of a selected row.

Data diagnosis flow setting screen



Data Diagnosis Flow Setting No. [1]

Setting Name: DiagnosisFlow01

Comment:

Data Diagnosis Flow Setting

Please add processes to the list and set processing contents.
Execute the Process Flow according to the order of the list.
A maximum of 6 processes can be executed in one flow.

No.	Process Type	Function Type	Process Name	Detailed Setting	Data Storing	Data Distribution
1	Data Collection	-	Data Collection	Not Set	Do not execute	Do not execute
2	Data Modification	No Processing				
3	Data Diagnosis	No Processing				
4	Action	No Processing			Not executable	Not executable

Displayed items

Item	Description
Setting Name*1	Set the name of a data diagnosis flow setting (up to 32 characters). • The following are displayed to avoid name duplication by default. DiagnosisFlow01, DiagnosisFlow02, DiagnosisFlow03, ...
Comment	Set a comment (up to 100 characters).

Item		Description
(1) Process list	Process Type	The type of a process is displayed.
	Function Type	Select a function type corresponding to the process type.
	Process Name	Set a name to identify a process (1 to 100 characters). • It is displayed by default as follows: When "Data Collection" is displayed in the "Process Type" column: "Data Collection" When an item other than "Data Collection" is displayed in the "Process Type" column: Content of its function type
	Detailed Setting	Click a cell, and each setting screen corresponding to a process type and a function type appears. • When the process type is "Data Collection" ☞ Page 139 Data Collection Setting • When the process type is "Data Modification" and the function type is "Data Extraction" ☞ Page 169 Data Extraction Setting • When the process type is "Data Modification" and the function type is "Character String Data Modification" ☞ Page 170 Character String Data Modification Setting • When the process type is "Data Modification" and the function type is a data modification plug-in name ☞ Page 172 Data Modification Plug-in Setting • When the process type is "Data Diagnosis" and the function type is "Edge Application Diagnosis (MQTT)" ☞ Page 173 Edge Application Diagnosis (MQTT) Setting • When the process type is "Data Diagnosis" and the function type is "Edge Application Diagnosis (file)" ☞ Page 178 Edge Application Diagnosis (File) Setting • When the process type is "Data Diagnosis" and the function type is a data diagnosis plug-in name ☞ Page 184 Data Diagnosis Plug-in Setting • When the process type is "Feedback" and the function type is "Post-Diagnosis Feedback" ☞ Page 185 Post-Diagnosis Feedback Setting
	Data Storing[*2]	Click a cell, and the "Data Storing Setting" screen appears. • When saving data to a file ☞ Page 142 Data Storing Setting (File Saving) • When saving data to a database ☞ Page 152 Data Storing Setting (DB Saving)
	Data Distribution[*2]	Click a cell, and the "Data Distribution Setting" screen appears. • For distributing data by using MQTT ☞ Page 158 Data Distribution Setting (MQTT) • For distributing data by using an IT gateway ☞ Page 163 Data Distribution Setting (IT Gateway)
[Add Row] button		Click this to add a row the process type of which is "Data Modification" immediately under a selected row.[*3,*4]
[Delete Row] button[*5]		Click this to delete the process in a selected row.

*1 The same name as that of a data logging flow setting or data diagnosis flow setting already set cannot be used.

*2 Cannot be used in the following case:
The process type of a selected row is "Feedback."

*3 Can be added in the following cases:
The process type of a selected row is "Data Collection" and the function type of a row immediately under the selected row (its process type is "Data Modification") is an item other than "No Processing."
The process type of a selected row is "Data Modification" and the function type is an item other than "No Processing."

*4 The following are displayed for the process name of an added row to avoid name duplication.
(Contents of the function type)002, (Content of the function type)003

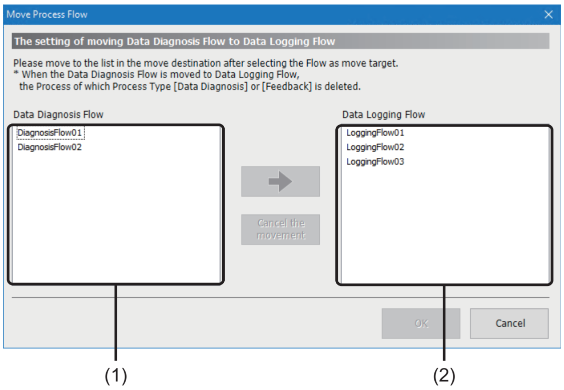
*5 Cannot be used when the process type of a selected row is "Data Collection."

6.6 Move of a Process Flow

This section shows the screen for changing the type of a process flow.

Window

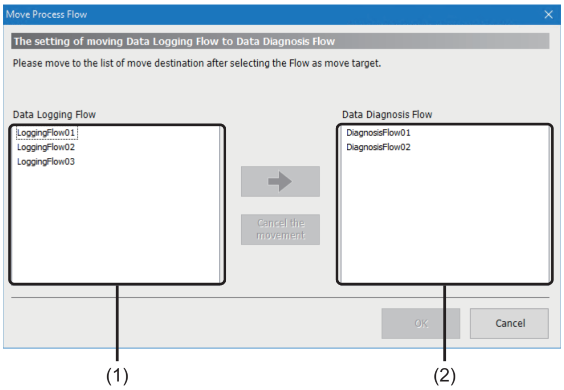
- Click the [Move from Data Diagnosis Flow] button in the "Data Logging Flow Setting List" screen.
- Click the [Move from Data Logging Flow] button in the "Data Diagnosis Flow Setting List" screen.



Move Process Flow

The setting of moving Data Diagnosis Flow to Data Logging Flow

Please move to the list in the move destination after selecting the Flow as move target.
* When the Data Diagnosis Flow is moved to Data Logging Flow,
the Process of which Process Type [Data Diagnosis] or [Feedback] is deleted.



Move Process Flow

The setting of moving Data Logging Flow to Data Diagnosis Flow

Please move to the list of move destination after selecting the Flow as move target.

Displayed items

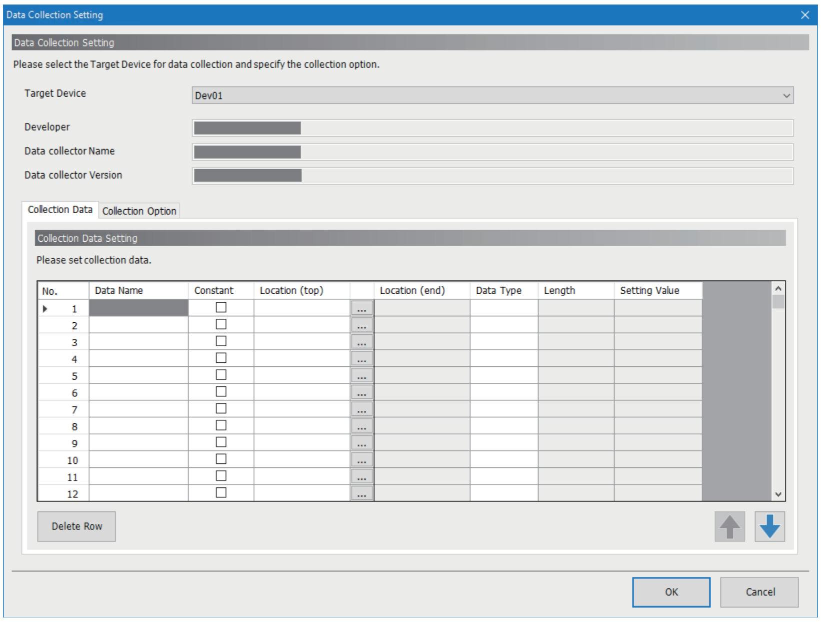
Item	Description
(1) Move source flow list	Move source flow settings are displayed in a list.
(2) Move destination flow list	Move destination flow settings are displayed in a list. A flow setting moved by clicking the [⇨] button is added to the end of the list, and displayed in bold.
[⇨] button	Click this to move a flow setting selected in the move source flow list to the move destination flow list.
[Cancel the movement] button	Click this to return a moved flow setting selected in the move destination flow list to the move source flow list.

6.7 Data Collection Setting

This section shows the screen for setting to collect data in an access target device.

Window

Click the cell in the "Detailed Setting" column for which "Data Collection" is displayed in the "Process Type" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.



Data Collection Setting

Please select the Target Device for data collection and specify the collection option.

Target Device: Dev01

Developer:

Data collector Name:

Data collector Version:

Collection Data | Collection Option

Collection Data Setting

Please set collection data.

No.	Data Name	Constant	Location (top)		Location (end)	Data Type	Length	Setting Value
1		☐		...				
2		☐		...				
3		☐		...				
4		☐		...				
5		☐		...				
6		☐		...				
7		☐		...				
8		☐		...				
9		☐		...				
10		☐		...				
11		☐		...				
12		☐		...				

Point

When an access target device for collecting data is not set, the "Select Data collector" screen to add an access target device appears.

☞ Page 125 Data collector selection screen

Displayed items

Item	Description	Reference
Target Device[*1]	Select a device for collecting data. The "Select Data collector" screen appears when selecting "[Adding]," and the "Target Device Setting" screen appears after selecting a data collector. ☞ Page 125 Data collector selection screen ☞ Page 126 Access target device setting screen	—
Developer	The developer of a data collector used for an access target device for collecting data is displayed.	—
Data collector Name	The name of a data collector used for an access target device for collecting data is displayed.	—
Data collector Version	The version of a data collector used for an access target device for collecting data is displayed.	—
[Collection Data] tab	Set data to be collected. When using CSV File Data collector as a data collector, the screen shown in the following section appears. ☞ Page 310 Data Collection Setting (CSV File Data collector)	Page 140 Collection data
[Collection Option] tab[*2]	Set collection parameters. For details, refer to the manual for a data collector used.	—

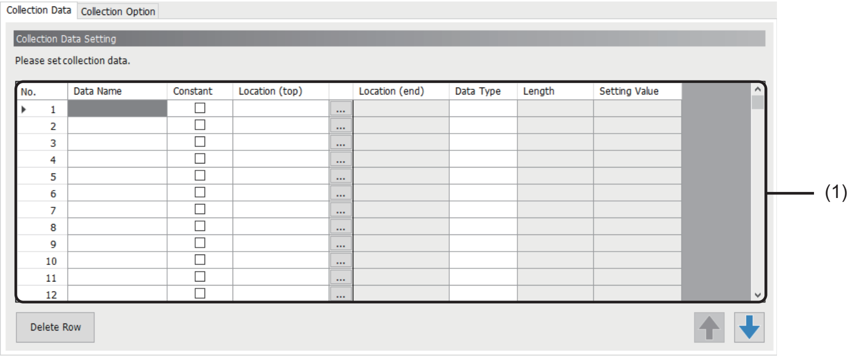
*1 An access target device for which a data collector that does not support the data collection function is set cannot be selected.

*2 Does not appear in the following cases:
Using CSV File Data collector
Using a data collector that has no settings related to collection parameters

Collection data

The following shows the screen for setting data to be collected.

Window



Please set collection data.

No.	Data Name	Constant	Location (top)		Location (end)	Data Type	Length	Setting Value
1		☐		...				
2		☐		...				
3		☐		...				
4		☐		...				
5		☐		...				
6		☐		...				
7		☐		...				
8		☐		...				
9		☐		...				
10		☐		...				
11		☐		...				
12		☐		...				

Displayed items

Item		Description
(1) Collection data list	Data Name	Set a data name (up to 32 characters). • If the data name is blank when setting the location (start), the contents of the location (start) are displayed for the data name. However, if the number of characters in the contents of the location (start) exceeds 32, inhibited characters are included, or the contents of a data name are duplicated, the following are displayed. (Example) Data001, Data002, Data003, ... • If nothing is displayed in the "Data Name" column when selecting the checkbox of "Constant," the following are displayed. (Example) ConstantData001, ConstantData002, ConstantData003, ...
	Constant	Select the checkbox to add a constant value or fixed character string to collection data. ■When selecting the checkbox The settings other than those set for "Data Name" will be deleted, and the following items are set: • Data Type: STRING • Length: 32 • Setting Value: Blank ■When unselecting the checkbox The settings other than those set for "Data Name" will be deleted.
	Location (top)[*1]	Set the start location of a data collection target (up to 300 characters). Depending on a data collector used, location parameters can be set in the "Location Setting" screen displayed by clicking the [...] button.[*2] For details on the setting method, refer to the manual for a data collector used.
	Location (end)	The end location acquired from a data collector is displayed. If a data collector does not return the end location, the cell will be blank.
	Data Type	Select the data type of a location to access.[*3]
	Length	■When not selecting the checkbox of "Constant" Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 1 to 32 • WSTRING: 1 to 16 ■When selecting the checkbox of "Constant" Either of the following numbers of characters is set when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 32 • WSTRING: 16
	Setting Value[*4,*5]	Set a constant value or fixed character string to add to collection data. The available number of characters differs depending on the data type. For details, refer to the following: ☞ Page 544 Values that can be entered in the screen
[Delete Row] button		Click this to delete the collection target data in a selected row.

*1 Can be set when not selecting the checkbox of "Constant."

*2 The "Location Setting" screen does not appear when using a data collector for which location parameters cannot be set in the screen.

*3 The data types to be displayed are as follows:
When not selecting the checkbox of "Constant": Depends on a data collector used.
When selecting the checkbox of "Constant": ☞ Page 544 Data type and value range

*4 Can be set when both of the following conditions are satisfied:
The checkbox of "Constant" is selected.
A data type is set.

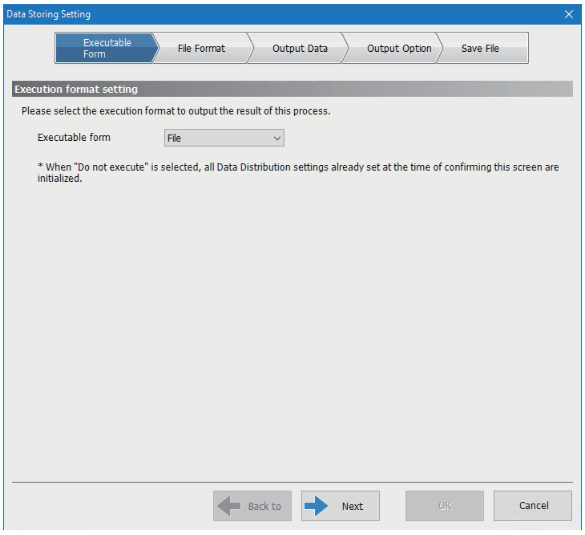
*5 When changing the data type, the value is changed as shown in the following:
☞ Page 546 Value after changing the data type

6.8 Data Storing Setting (File Saving)

This section shows the screen for setting to output a result of a process in a file format.

Window

Click a cell in the "Data Storing" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.



Execution format setting

Please select the execution format to output the result of this process.

Executable form: File

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

Displayed items

Item	Description	Reference
[Executable Form] tab	Set an executable form.	Page 143 Executable form
[File Format] tab	Set a file format to output data.	Page 144 File format
[Output Data] tab	Set data to output to a file.	Page 145 Output data
[Output Option] tab	Set output options for a saved file.	Page 146 Output option
[Save File] tab	Set the save destination, name, and switching operation of a file.	Page 147 Saved file
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

Point

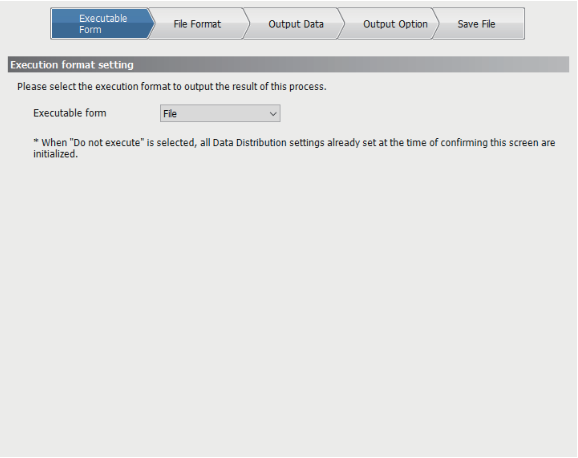
The setting screen can be switched by directly clicking a tab already set.

The check mark (✓) appears on a set tab.

Executable form

The following shows the screen for setting an executable form.

Window



Execution format setting

Please select the execution format to output the result of this process.

Executable form: File

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

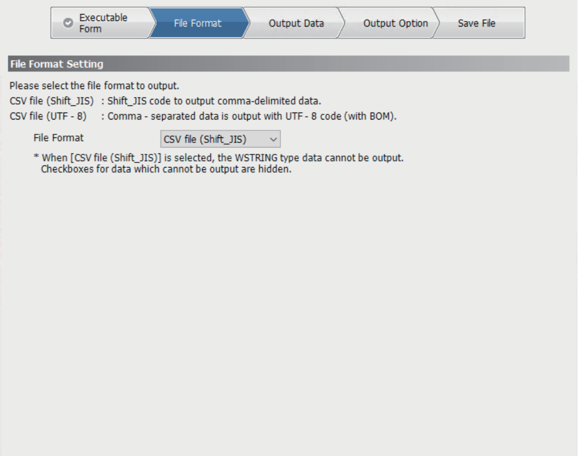
Displayed items

Item	Description
Executable form	Select "File."

File format

The following shows the screen for setting a file format to output data.

Window



File Format Setting

Please select the file format to output.

CSV file (Shift_JIS) : Shift_JIS code to output comma-delimited data.

CSV file (UTF - 8) : Comma - separated data is output with UTF - 8 code (with BOM).

File Format: CSV file (Shift_JIS)

* When [CSV file (Shift_JIS)] is selected, the WSTRING type data cannot be output.
Checkboxes for data which cannot be output are hidden.

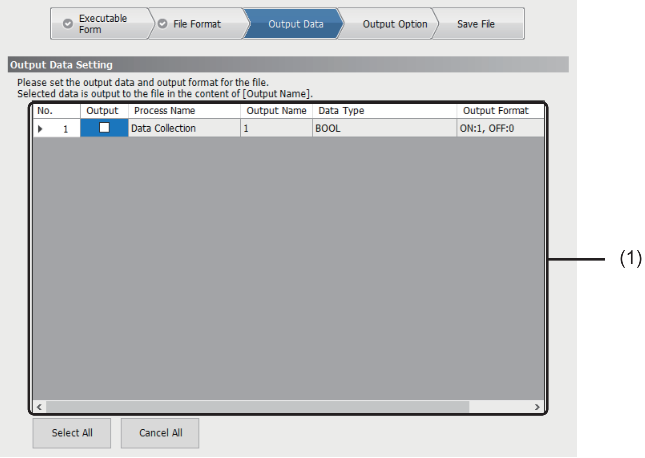
Displayed items

Item	Description
File Format	Select the format of a file to output.

Output data

The following shows the screen for setting data to output to a file.

Window



Output Data Setting

Please set the output data and output format for the file.
Selected data is output to the file in the content of [Output Name].

No.	Output	Process Name	Output Name	Data Type	Output Format
1	☐	Data Collection	1	BOOL	ON:1, OFF:0

Displayed items

Item		Description
(1) Output contents list	Output[*1]	Select the checkbox of data to output to a file.
	Process Name	A process name to which an output value belongs is displayed.
	Output Name	The name of an output value of a process to be saved to a file is displayed.
	Data Type	The data type of output data is displayed.
	Output Format	The output format of output data is displayed. It can be changed in the "Output Format" screen displayed by clicking the [...] button on the right of the entry field.[*2] ☞ Page 145 Output format
[Select All] button		Click this to select the checkboxes of all data.
[Cancel All] button		Click this to unselect the checkboxes of all data.

[*1] The checkbox does not appear in the following case, and the data cannot be output to a file. For outputting WSTRING type data, select "CSV file (UTF-8)" for "File Format."
"WSTRING" is displayed in "Data Type" and "CSV file (Shift_JIS)" is selected for "File Format."

[*2] The output format can be changed for the following data types.
UINT, UDINT, ULINT, REAL, LREAL

Output format

The following shows the procedure for specifying a format when outputting data to a file.

Operating procedure

1. Click the [...] button in the [Output Format] tab.
2. Specify an output format in the "Output Format (Integer)" or "Output Format (Float)" screen, and click the [OK] button.

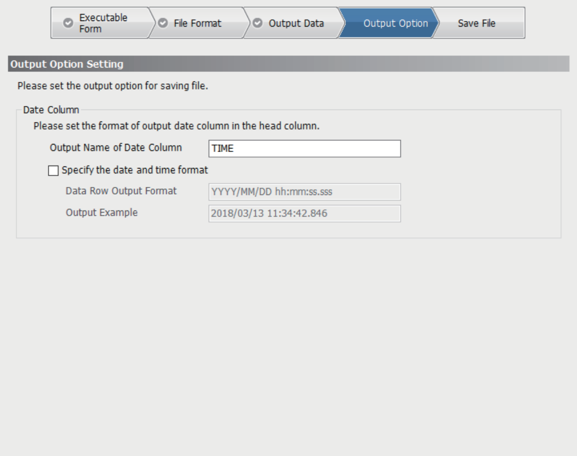
Point

A value smaller than the number of digits specified for "Digit of decimal" in the "Output Format (Float)" screen is rounded down.

Output option

The following shows the screen for setting output options for a saved file.

Window



Output Option Setting

Please set the output option for saving file.

Date Column

Please set the format of output date column in the head column.

Output Name of Date Column: TIME

☐ Specify the date and time format

Data Row Output Format: YYYY/MM/DD hh:mm:ss.sss

Output Example: 2018/03/13 11:34:42.846

Displayed items

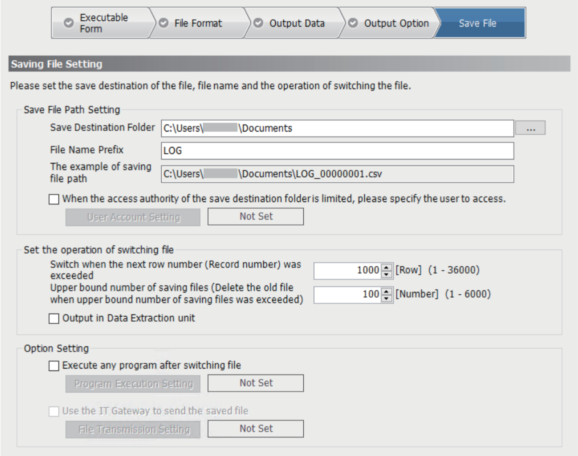
Item		Description
Date Column	Output Name of Date Column	Set a character string to output to the date and time column of the data name row (1 to 32 characters).
	Specify the date and time format	Select the checkbox to specify the format of date and time data.
	Data Row Output Format	Set the output format of the date and time column (1 to 32 characters). The following reserved words[1] can be specified. YYYY: Year (4 digits) YY : Year (2 digits) MM : Month (2 digits) DD : Day (2 digits) hh : Hour (2 digits) mm : Minute (2 digits) ss : Second (2 digits) ms : Millisecond (3 digits) us : Microsecond (6 digits) ns : Nanosecond (9 digits) .s to .sssssssss: Digits after the decimal point in seconds (1 to 9 digits)
	Output Example	An output example of the date and time column according to the current setting is displayed.

[1] Case-sensitive

Saved file

The following shows the screen for setting the save destination, name, and switching operation of a file.

Window



Saving File Setting

Please set the save destination of the file, file name and the operation of switching the file.

Save File Path Setting

Save Destination Folder: C:\Users\[redacted]\Documents

File Name Prefix: LOG

The example of saving file path: C:\Users\[redacted]\Documents\LOG_00000001.csv

☐ When the access authority of the save destination folder is limited, please specify the user to access.

Not Set

Set the operation of switching file

Switch when the next row number (Record number) was exceeded: 1000 [Row] (1 - 36000)

Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded): 100 [Number] (1 - 6000)

☐ Output in Data Extraction unit

Option Setting

☐ Execute any program after switching file

Not Set

☐ Use the IT Gateway to send the saved file

Not Set

Displayed items

Item		Description
Save File Path Setting	Save Destination Folder	Set the save destination for a file (1 to 204 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.
	File Name Prefix	Set the prefix of a saved file name (1 to 32 characters).
	The example of saving file path	The saving file path based on the settings for "Save Destination Folder" and "File Name Prefix" is displayed.
	When the access authority of the save destination folder is limited, please specify the user to access.	Select the checkbox to save a file to a folder with restricted access. When fixing the settings without selecting the checkbox, the settings in the "User Account Setting" screen are deleted.
	[User Account Setting] button[1]	Click this to display the "User Account Setting" screen. ☞ Page 149 User account setting The setting status of the "User Account Setting" screen is displayed to the right of this button.
Set the operation of switching file	Switch when the next row number (Record number) was exceeded[2]	Set the number of data rows to store in one file. If it is exceeded, a file will be output.
	Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded)	Set the maximum number of files stored in one folder. If it is exceeded, files will be deleted in chronological order.
	Output in Data Extraction unit[3]	Select the checkbox to output data in data extraction units.
Option Setting	Execute any program after switching file	Select the checkbox to run any program after file switching. For details on program execution after a file is output, refer to the following: ☞ Page 68 Program execution after file output
	[Program Execution Setting] button[4]	Click this to display the "Program Execution Setting" screen. ☞ Page 150 Program execution setting The setting status of the "Program Execution Setting" screen is displayed to the right of this button.
	Use the IT Gateway to send the saved file[5]	Select the checkbox to send a saved file to an external device such as an IT system by using an IT gateway.
	[File Transmission Setting] button[6]	Click this to display the "IT Gateway Transmission Setting" screen.[7] ☞ Page 151 IT gateway transmission setting The setting status of the "IT Gateway Transmission Setting" screen is displayed to the right of this button.[8]

[1] Can be clicked when selecting the checkbox of "When the access authority of the save destination folder is limited, please specify the user to access."

[2] If the number of rows specified in Real-time Flow Designer is small, the load on Windows increases because a saved file is frequently created. In this case, review the setting to lengthen the collection cycle or increase the maximum number of data rows output to a file.

[3] Can be selected when selecting "Data Extraction" for "Function Type."

[4] Can be clicked when selecting the checkbox of "Execute any program after switching file."

[5] Can be selected when an IT gateway with "Data Storing" selected for "IT Gateway Type" is installed.
☞ Page 121 IT gateway list

[6] Can be clicked when selecting the checkbox of "Use the IT Gateway to send the saved file."

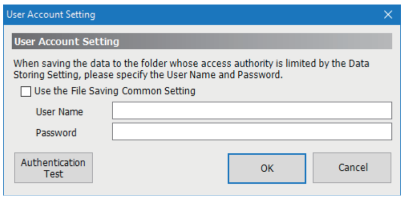
[7] If the IT gateway setting is not configured for an IT gateway with "Data Storing" selected for "IT Gateway Type," the "IT Gateway Selection" screen appears. By selecting an IT gateway in this screen, the "IT Gateway Setting" screen appears and the "IT Gateway Transmission Setting" screen appears once the setting is completed. (An IT gateway other than one with "Data Storing" selected for "IT Gateway Type" cannot be selected in the "IT Gateway Selection" screen.)
☞ Page 128 IT gateway selection screen, Page 129 IT gateway setting screen

[8] If changing the contents in "Save Destination Folder" or "File Name Prefix" after setting items in the "IT Gateway Transmission Setting" screen, "to be confirmed" will be displayed.

User account setting

The following shows the screen for setting a user name and password used for accessing a folder with restricted access.

Window



When saving the data to the folder whose access authority is limited by the Data Storing Setting, please specify the User Name and Password.

Displayed items

Item	Description
Use the File Saving Common Setting	Select the checkbox to use a file saving common setting configured in the following: ☞ Page 117 File saving common setting
User Name[*1][*2][*3]	Set a user name used for file output (up to 127 characters). When specifying a domain, set it in either of the following formats:[*4][*5] • [Domain name]\[User name] • [User name]@[Domain name] When specifying a local user of an industrial PC on which Edgecross Basic Software is installed, set it in any of the following formats: • [Computer name]\[User name] • .\[User name] • [User name]
Password[*1][*2][*3]	Set a password used for accessing a folder (up to 127 characters).
[Authentication Test] button[*1]	Click this to perform the authentication test for a user account to Windows by using a set user name and password.

*1 Can be set when not selecting the checkbox of "Use the File Saving Common Setting."

*2 If changing a set password for a user account in Windows, set it again.

*3 To prevent eavesdropping and falsification of data, it is recommended to use a user account with a password satisfying complexity requirements.
The complexity requirements can be checked by the following procedure:
❶ Start the local security policy of Windows.
❷ Double-click [Security Settings] ⇨ [Account Policies] ⇨ [Password Policy] ⇨ [Password must meet complexity requirements].
❸ Select the [Explain] tab in the "Password must meet complexity requirements Properties" screen.

*4 When '@' and '\' are included, the format is determined as [User name]@[Domain name].
When multiple pieces of '@' or '\' are included, the first '@' ('\' if there is no '@') is used as a delimiter between a domain name and a user name.

*5 Do not specify a local user of another industrial PC on the network.

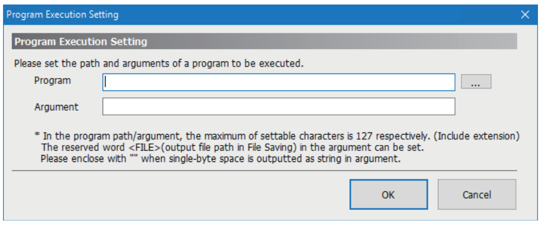
Precautions

- When exporting a setting file while a local user of an industrial PC is set for "User Name" and importing the setting file in another industrial PC, the local user may not be authenticated in the import destination industrial PC. Set it again after import as necessary.
- The authentication test is performed on a local computer. Therefore, even when specifying another industrial PC on the network for a save destination folder, the test is not performed on the industrial PC.
- When repeating the following operations if a password is incorrect, a user account may be locked out. If an error occurs due to these operations, check if a password is correct.
  - Apply the setting.
  - Start Real-time Flow Manager or start the operation.
  - Perform the authentication test.

Program execution setting

The following shows the screen for setting a program executed after file switching.

Window



Please set the path and arguments of a program to be executed.

* In the program path/argument, the maximum of settable characters is 127 respectively. (Include extension)
The reserved word <FILE>(output file path in File Saving) in the argument can be set.
Please enclose with "" when single-byte space is outputted as string in argument.

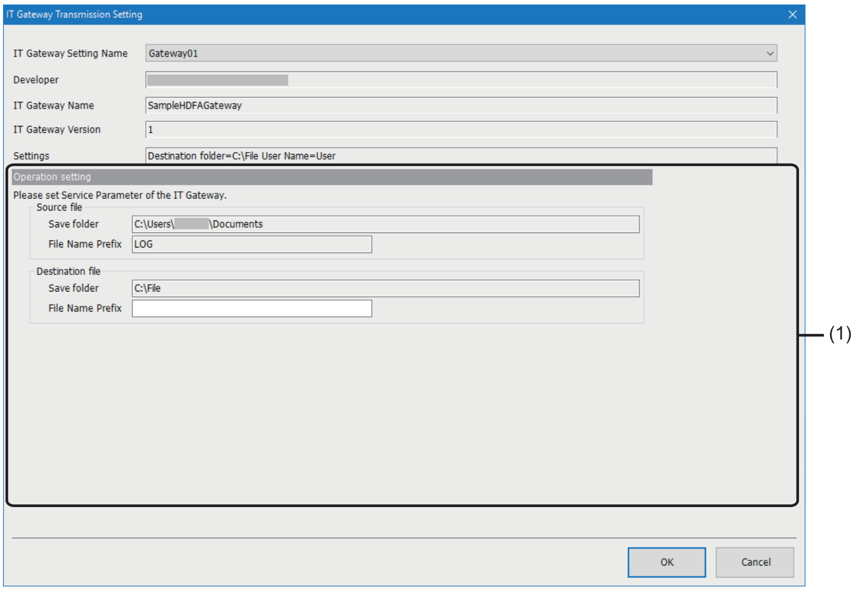
Displayed items

Item	Description
Program	Set the path of a program to execute asynchronously after file switching (up to 127 characters). It can also be set in the "Execution file Selection" screen displayed by clicking the [...] button.
Argument	Set an argument to specify for a program to execute (up to 127 characters).

IT gateway transmission setting

The following shows the screen for setting a destination and operation for IT gateway transmission.

Window



IT Gateway Setting Name: Gateway01

Developer: [redacted]

IT Gateway Name: SampleHDFAGateway

IT Gateway Version: 1

Settings: Destination folder=C:\File User Name=User

Please set Service Parameter of the IT Gateway.

Source file

Save folder: C:\Users\[redacted]\Documents

File Name Prefix: LOG

Destination file

Save folder: C:\File

File Name Prefix:

Displayed items

Item	Description
IT Gateway Setting Name	Select the IT gateway setting of an IT gateway with "Data Storing" selected for "IT Gateway Type." The "IT Gateway Selection" screen appears when selecting "[Adding]," and the "IT Gateway Setting" screen appears after selecting an IT gateway[*1]. ☞ Page 128 IT gateway selection screen, Page 129 IT gateway setting screen
Developer	The developer of an IT gateway used is displayed.
IT Gateway Name	The name of an IT gateway used is displayed.
IT Gateway Version	The version of an IT gateway used is displayed.
Settings	The setting content of an IT gateway used is displayed.
(1) Service parameter setting	Set service parameters. For details, refer to the manual for an IT gateway used.

[*1] An IT gateway other than one with "Data Storing" selected for "IT Gateway Type" cannot be selected.

6.9 Data Storing Setting (DB Saving)

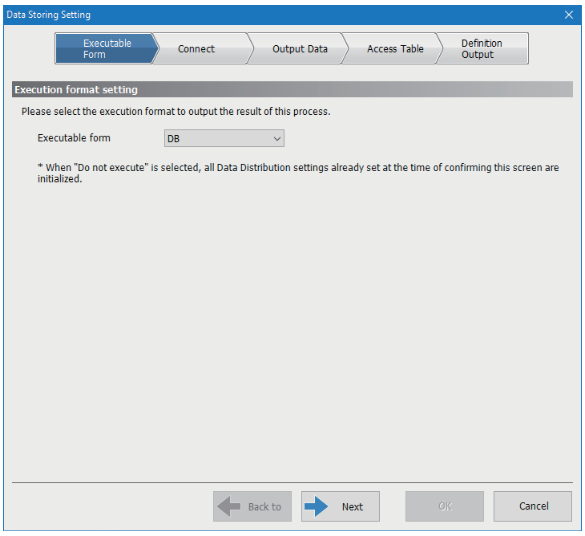
This section shows the screen for setting to output a result of a process to a database.

When setting the data storing setting (DB saving), a database must be set in advance.

☞ Page 529 Database Setup

Window

Click a cell in the "Data Storing" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.



Please select the execution format to output the result of this process.

Executable form: DB

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

Displayed items

Item	Description	Reference
[Executable Form] tab	Set an executable form.	Page 153 Executable form
[Connect] tab	Set information required for connecting with a database.	Page 154 Connection
[Output Data] tab	Set data to output to a database.	Page 155 Output data
[Access Table] tab	Set an access table.	Page 156 Access table
[Definition Output] tab	Output a DDL file.	Page 157 Definition output
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

Point

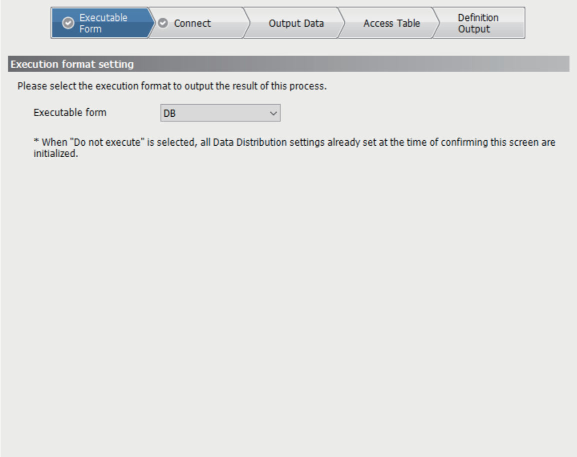
The setting screen can be switched by directly clicking a tab already set.

The check mark (✓) appears on a set tab.

Executable form

The following shows the screen for setting an executable form.

Window



Execution format setting

Please select the execution format to output the result of this process.

Executable form: DB

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

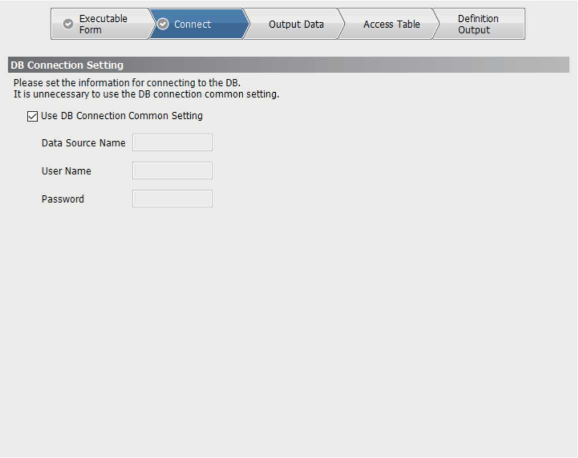
Displayed items

Item	Description
Executable form	Select "DB."

Connection

The following shows the screen for setting information required for connecting with a database.

Window



DB Connection Setting

Please set the information for connecting to the DB.
It is unnecessary to use the DB connection common setting.

☑ Use DB Connection Common Setting

Data Source Name

User Name

Password

Displayed items

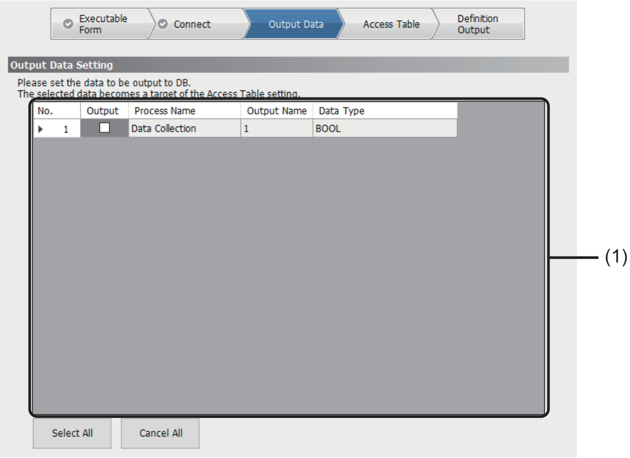
Item	Description
Use DB Connection Common Setting	Select the checkbox to use the DB connection common setting. ☞ Page 116 DB connection common setting
Data Source Name*1	Set the data source name of a database (1 to 32 characters).
User Name*1	Set the user name of a database (1 to 32 characters).
Password*1	Set the password for a database (6 to 32 characters).

*1 Cannot be set when selecting the checkbox of "Use DB Connection Common Setting."

Output data

The following shows the screen for setting data to output to a database.

Window



Output Data Setting

Please set the data to be output to DB.
The selected data becomes a target of the Access Table setting.

No.	Output	Process Name	Output Name	Data Type
1	☐	Data Collection	1	BOOL

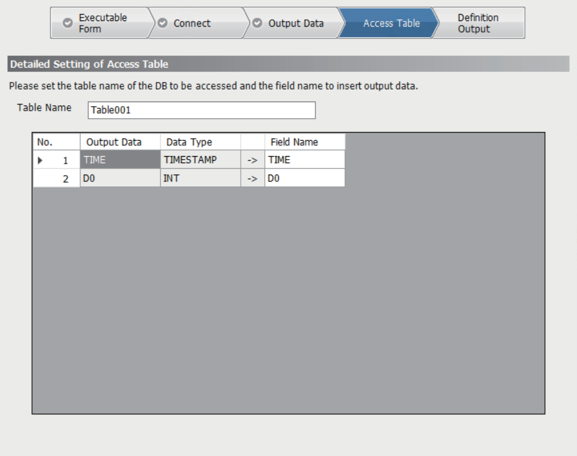
Displayed items

Item		Description
(1) Output contents list	Output	Select the checkbox of data to output to a database.
	Process Name	A process name to which an output value belongs is displayed.
	Output Name	The name of an output value of a process to be saved to a database is displayed.
	Data Type	The data type of output data is displayed.
[Select All] button		Click this to select the checkboxes of all data.
[Cancel All] button		Click this to unselect the checkboxes of all data.

Access table

The following shows the screen for setting an access table.

Window



Detailed Setting of Access Table

Please set the table name of the DB to be accessed and the field name to insert output data.

Table Name: Table001

No.	Output Data	Data Type		Field Name
1	TIME	TIMESTAMP	->	TIME
2	D0	INT	->	D0

Displayed items

Item	Description
Table Name	Set the table name of a database to access (1 to 32 characters). • It is displayed by default as follows: "(process flow name)_(process name)"[*1] However, if inhibited characters are included in a process flow name or a process name, the following are displayed to avoid name duplication. (Example) Table001, Table002, Table003, ...
Output Data	The data name of output data set in a field of a table to be accessed is displayed. The data name 'TIME' of the date and time column is always displayed in the first row.
Data Type	The data type of output data set in a field of a table to be accessed is displayed. The data type 'TIMESTAMP' of the date and time column is always displayed in the first row.
Field Name	Set the field name of a table to access (1 to 32 characters)[*2]. • The content of output data is displayed by default. However, if inhibited characters are included, the following are displayed to avoid name duplication. (Example) Field001, Field002, Field003, ...

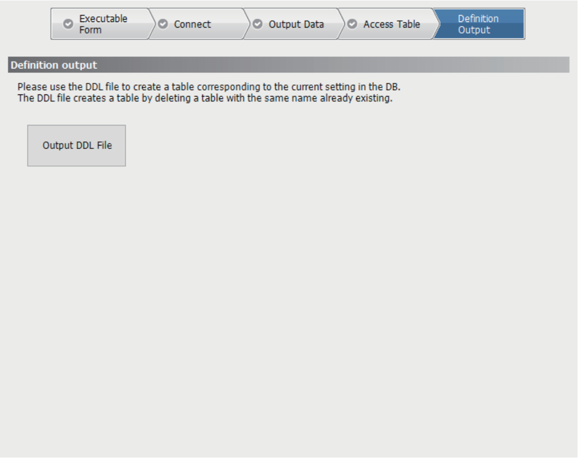
[*1] If it exceeds 32 characters, a character will be deleted in order from the end.

[*2] A set field name may not be used depending on a database used even within the number of characters that can be set. In this case, change the field name by further shortening it.
(Example) PostgreSQL (version 10.3): 64 or more bytes of characters cannot be used for a field name.

Definition output

The following shows the screen for outputting a DDL file.

Window



Please use the DDL file to create a table corresponding to the current setting in the DB.
The DDL file creates a table by deleting a table with the same name already existing.

Displayed items

Item	Description
[Output DDL File] button	Click this to output a DDL file in which table information required for saving output data is defined. Note that a DDL file must be output to the hard disk of an industrial PC, not to a network drive or removal disk.

Point

When changing the data storing setting after outputting a DDL file and setting a DB once, output the DDL file and set the DB again.

6.10 Data Distribution Setting (MQTT)

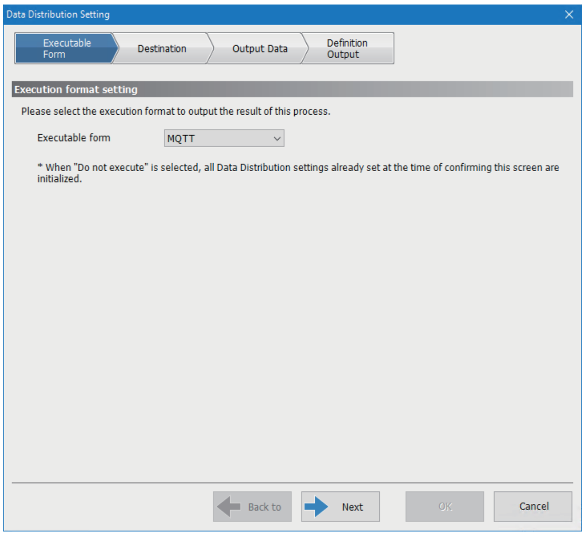
This section shows the screen for setting for distributing a result of a process to an edge application by using MQTT.

To set the data distribution setting, an MQTT broker must be set up in advance.

☞ Page 504 MQTT Broker Setup

Window

Click a cell in the "Data Distribution" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.



Execution format setting

Please select the execution format to output the result of this process.

Executable form: MQTT

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

Displayed items

Item	Description	Reference
[Executable Form] tab	Set an executable form.	Page 159 Executable form
[Destination] tab	Set information required for MQTT communication.	Page 160 Destination
[Output Data] tab	Set data to output.	Page 161 Output data
[Definition Output] tab	Output a publishing data definition file.	Page 162 Definition output
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

Point

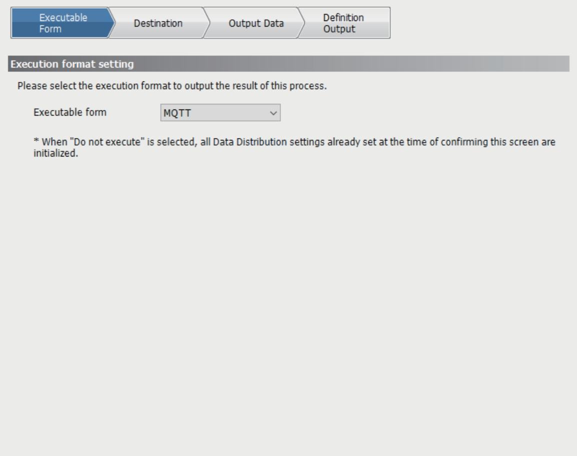
The setting screen can be switched by directly clicking a tab already set.

The check mark (✓) appears on a set tab.

Executable form

The following shows the screen for setting an executable form.

Window



Execution format setting

Please select the execution format to output the result of this process.

Executable form: MQTT

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

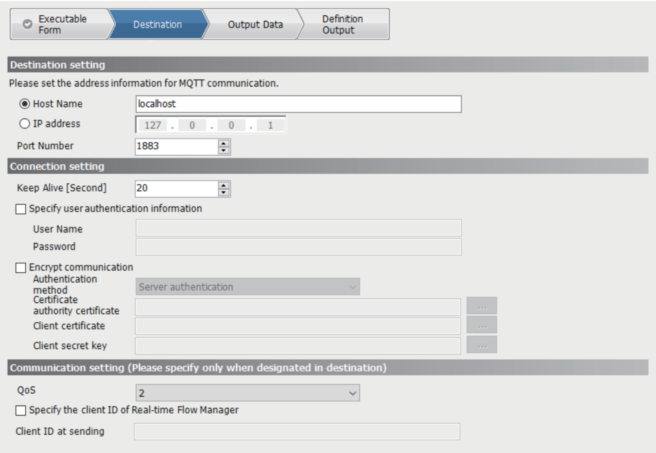
Displayed items

Item	Description
Executable form	Select "MQTT."

Destination

The following shows the screen for setting information required for MQTT communication.

Window



Destination setting

Please set the address information for MQTT communication.

● Host Name: localhost

○ IP address: 127 . 0 . 0 . 1

Port Number: 1883

Connection setting

Keep Alive [Second]: 20

☐ Specify user authentication information

User Name:

Password:

☐ Encrypt communication

Authentication method: Server authentication

Certificate authority certificate: ...

Client certificate: ...

Client secret key: ...

Communication setting (Please specify only when designated in destination)

QoS: 2

☐ Specify the client ID of Real-time Flow Manager

Client ID at sending:

Displayed items

Item	Description
Host Name	Select this for communication by specifying a host name, and set a host name (1 to 255 characters).
IP address	Select this for communication by specifying an IP address, and set an IP address.
Port Number	Set a port number (1 to 65535).
Keep Alive [Second]	Set a keep alive time for MQTT communication (20 to 3600 seconds).
Specify user authentication information	Select the checkbox to authenticate a user.
User Name[*1]	Set a user name (6 to 64 characters).
Password[*1]	Set a password (6 to 512 characters).
Encrypt communication	Select the checkbox to encrypt communication.
Authentication method[*2]	Select an authentication method. • Server authentication • Server authentication & client authentication
Certificate authority certificate[*2]	Set the file path of a certificate authority certificate (up to 259 characters). It can also be selected in the "Certificate authority certificate selection" screen displayed by clicking the [...] button.
Client certificate[*3]	Set the file path of a client certificate (up to 259 characters). It can also be selected in the "Client certificate selection" screen displayed by clicking the [...] button.
Client secret key[*3]	Set the file path of a client secret key (up to 259 characters). It can also be selected in the "Client secret key selection" screen displayed by clicking the [...] button.
QoS	Select QoS (1 or 2) for MQTT communication. When "1" is specified for a connected edge application, select "1."
Specify the client ID of Real-time Flow Manager	Select the checkbox only if a client ID[*4] that follows a specific format is required, such as when using an MQTT broker provided by a cloud service. Do not select the checkbox when using an MQTT broker shown in the following: ☞ Page 46 MQTT broker For details on a client ID of Real-time Flow Manager, refer to the following: ☞ Page 82 Client IDs and a topic name
Client ID at sending[*5]	Set the client ID[*4] of Real-time Flow Manager (1 to 1024 characters).

[*1] Can be set when selecting the checkbox of "Specify user authentication information."

[*2] Can be set when selecting the checkbox of "Encrypt communication."

[*3] Can be set when both of the following conditions are satisfied:
The checkbox of "Encrypt communication" is selected.
"Server authentication & client authentication" is selected for "Authentication method."

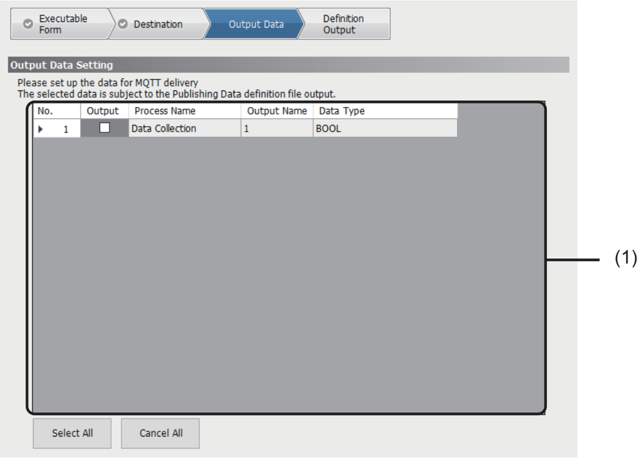
[*4] Information used by an MQTT broker to identify Real-time Flow Manager

[*5] Can be set when selecting the checkbox of "Specify the client ID of Real-time Flow Manager."

Output data

The following shows the screen for setting data to output.

Window



Output Data Setting

Please set up the data for MQTT delivery
The selected data is subject to the Publishing Data definition file output.

No.	Output	Process Name	Output Name	Data Type
1	☐	Data Collection	1	BOOL

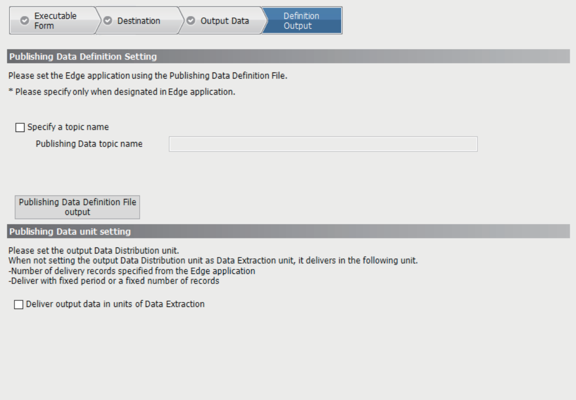
Displayed items

Item		Description
(1) Output contents list	Output	Select the checkbox of data to output.
	Process Name	A process name to which an output value belongs is displayed.
	Output Name	The name of an output value of a process to be sent is displayed.
	Data Type	The data type of output data is displayed.
[Select All] button		Click this to select the checkboxes of all data.
[Cancel All] button		Click this to unselect the checkboxes of all data.

Definition output

The following shows the screen for outputting a publishing data definition file.

Window


Executable Form
Destination
Output Data
Definition Output
Publishing Data Definition Setting
Publishing Data Definition File output
Publishing Data unit setting

Please set the Edge application using the Publishing Data Definition File.

* Please specify only when designated in Edge application.

☐ Specify a topic name

Publishing Data topic name

Please set the output Data Distribution unit.
When not setting the output Data Distribution unit as Data Extraction unit, it delivers in the following unit.
-Number of delivery records specified from the Edge application
-Deliver with fixed period or a fixed number of records

☐ Deliver output data in units of Data Extraction

Displayed items

Item	Description
Specify a topic name	Select the checkbox if there are restrictions on available topic names, such as when a topic name is specified in an edge application. Do not select the checkbox when an edge application has a function to read a publishing data definition file or a topic name is not specified in an edge application. For details on a topic name, refer to the following: ☞ Page 82 Client IDs and a topic name
Publishing Data topic name[*1]	Set a publishing data topic name[*2] (up to 64 characters).
[Publishing Data Definition File output] button	Click this to output a JSON file in which output data information required for MQTT distribution is defined.[*3]
Deliver output data in units of Data Extraction[*4]	Select the checkbox to distribute output data in data extraction units.

*1 Can be set when selecting the checkbox of "Specify a topic name."

*2 Information for identifying data exchanged in MQTT communication.

*3 If selecting "1" for "QoS" in the [Destination] tab in the edge application diagnosis (MQTT) setting, reading an output publishing data definition file may fail in an edge application not supporting QoS1. In this case, select "2" for "QoS" to output. (☞ Page 160 Destination)

*4 Appears only when selecting "Data Extraction" for "Function Type."

Point

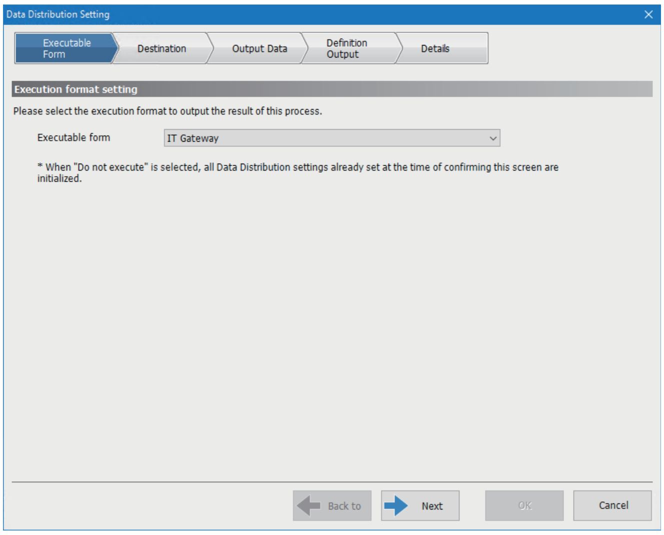
When changing the data distribution setting after outputting a publishing data definition file and setting an edge application once, output the publishing data definition file and set the edge application again.

6.11 Data Distribution Setting (IT Gateway)

This section shows the screen for setting for distributing a result of a process to an external device such as an IT system by using an IT gateway.

Window

Click a cell in the "Data Distribution" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.



Please select the execution format to output the result of this process.

Executable form: IT Gateway

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

Displayed items

Item	Description	Reference
[Executable Form] tab	Set an executable form.	Page 164 Executable form
[Destination] tab*1	Set information required for data distribution using an IT gateway.	Page 165 Destination
[Output Data] tab	Set data to output.	Page 166 Output data
[Definition Output] tab*2	Set the unit of data distribution.	Page 167 Definition output
[Details] tab	Set details on an IT gateway used for data distribution.	Page 168 Details
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

*1 If the IT gateway setting is not configured for an IT gateway with "Data Distribution" selected for "IT Gateway Type," the "IT Gateway Selection" screen appears before the [Destination] tab is displayed. By selecting an IT gateway in this screen, the "IT Gateway Setting" screen appears and the [Destination] tab is displayed once the setting is completed. (An IT gateway other than one with "Data Distribution" selected for "IT Gateway Type" cannot be selected in the "IT Gateway Selection" screen.)
☞ Page 128 IT gateway selection screen, Page 129 IT gateway setting screen

*2 Appears only when clicking a cell in the "Data Distribution" column in a row with "Data Extraction" selected for "Function Type."

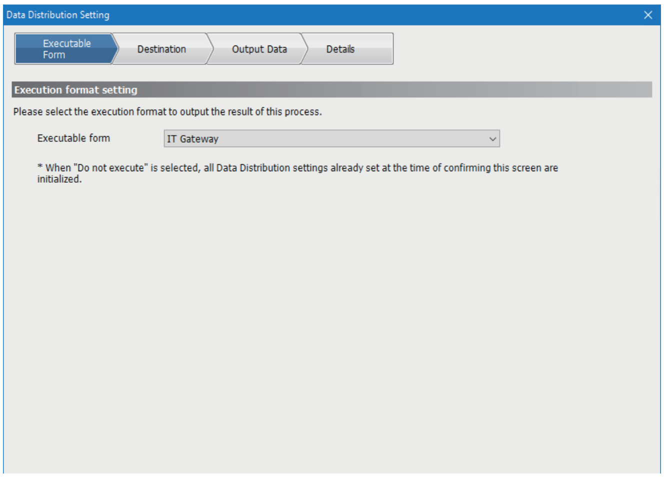
Point

The setting screen can be switched by directly clicking a tab already set.
The check mark (✓) appears on a set tab.

Executable form

The following shows the screen for setting an executable form.

Window



Execution format setting

Please select the execution format to output the result of this process.

Executable form: IT Gateway

* When "Do not execute" is selected, all Data Distribution settings already set at the time of confirming this screen are initialized.

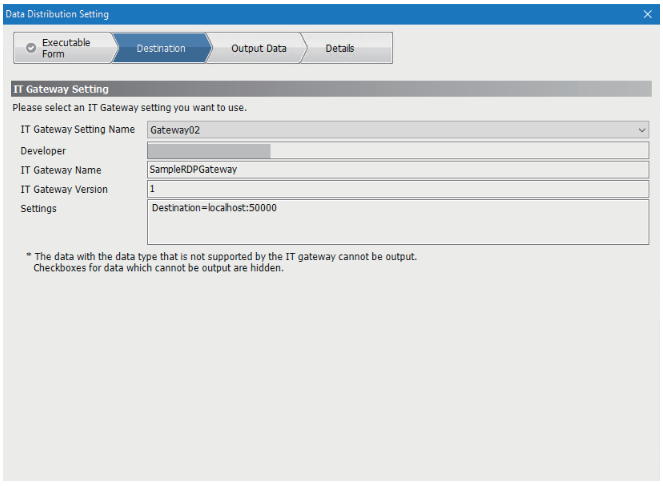
Displayed items

Item	Description
Executable form	Select "IT Gateway."

Destination

The following shows the screen for setting information required for data distribution using an IT gateway.

Window



IT Gateway Setting

Please select an IT Gateway setting you want to use.

IT Gateway Setting Name: Gateway02
Developer: [redacted]
IT Gateway Name: SampleRDPGateway
IT Gateway Version: 1
Settings: Destination=localhost:50000

* The data with the data type that is not supported by the IT gateway cannot be output.
Checkboxes for data which cannot be output are hidden.

Displayed items

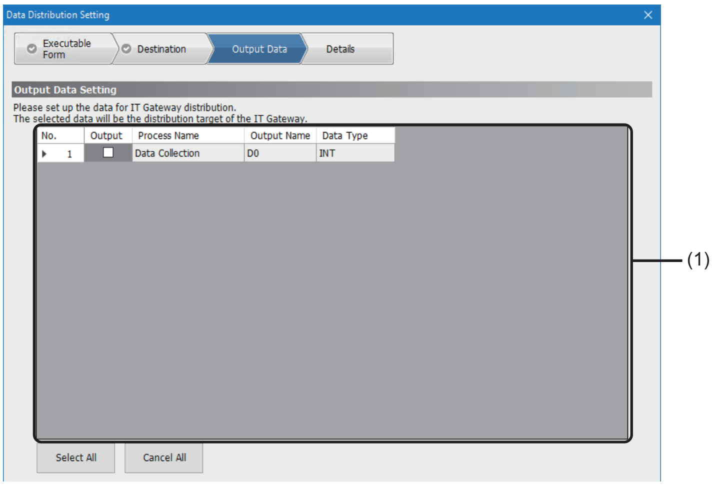
Item	Description
IT Gateway Setting Name	Select the IT gateway setting of an IT gateway with "Data Distribution" selected for "IT Gateway Type." The "IT Gateway Selection" screen appears when selecting "[Adding]," and the "IT Gateway Setting" screen appears after selecting an IT gateway[1]. ☞ Page 128 IT gateway selection screen, Page 129 IT gateway setting screen
Developer	The developer of an IT gateway used is displayed.
IT Gateway Name	The name of an IT gateway used is displayed.
IT Gateway Version	The version of an IT gateway used is displayed.
Settings	The setting content of an IT gateway used is displayed.

[1] An IT gateway other than one with "Data Distribution" selected for "IT Gateway Type" cannot be selected.

Output data

The following shows the screen for setting data to output.

Window



Please set up the data for IT Gateway distribution.
The selected data will be the distribution target of the IT Gateway.

No.	Output	Process Name	Output Name	Data Type
1	☐	Data Collection	D0	INT

Displayed items

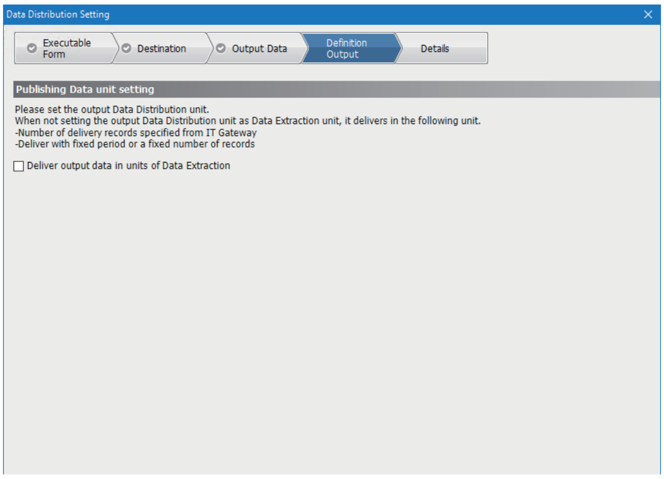
Item		Description
(1) Output contents list	Output	Select the checkbox of data to output.[*1]
	Process Name	A process name to which an output value belongs is displayed.
	Output Name	The name of an output value of a process to be sent is displayed.
	Data Type	The data type of output data is displayed.
[Select All] button		Click this to select the checkboxes of all data.
[Cancel All] button		Click this to unselect the checkboxes of all data.

*1 If the data type of data is not supported by an IT gateway used, the checkbox does not appear and the data cannot be output to a file. For details, refer to the manual for an IT gateway used.

Definition output

The following shows the screen for setting the unit of data distribution.

Window



Publishing Data unit setting

Please set the output Data Distribution unit.
When not setting the output Data Distribution unit as Data Extraction unit, it delivers in the following unit.
-Number of delivery records specified from IT Gateway
-Deliver with fixed period or a fixed number of records

☐ Deliver output data in units of Data Extraction

Displayed items

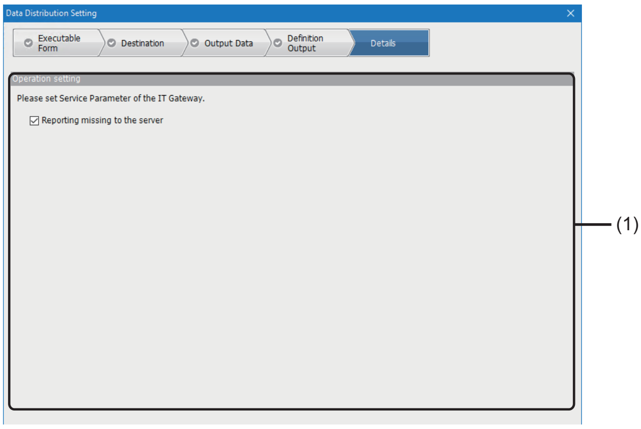
Item	Description
Deliver output data in units of Data Extraction*1	Select the checkbox to distribute output data in data extraction units.

*1 Can be selected when selecting an IT gateway that supports data distribution in units of data extraction. For details, refer to the manual for the IT gateway.

Details

The following shows the screen for setting details on an IT gateway used for data distribution.

Window



Please set Service Parameter of the IT Gateway.

☑ Reporting missing to the server

Displayed items

Item	Description
(1) Service parameter setting	Set service parameters. For details, refer to the manual for an IT gateway used.

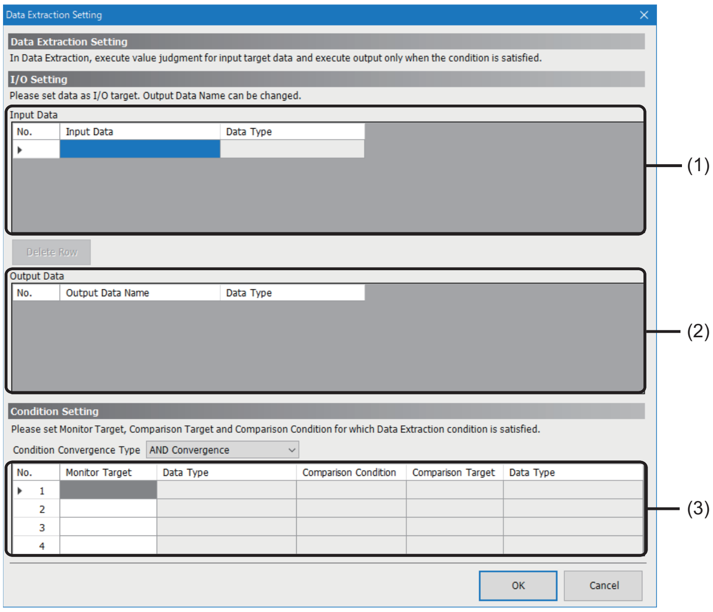
6.12 Data Extraction Setting

This section shows the screen for setting data extraction.

Window

1. Select "Data Extraction" for "Function Type" in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.

2. Click the cell in the "Detailed Setting" column.



In Data Extraction, execute value judgment for input target data and execute output only when the condition is satisfied.

Please set data as I/O target. Output Data Name can be changed.

Please set Monitor Target, Comparison Target and Comparison Condition for which Data Extraction condition is satisfied.

Condition Convergence Type: AND Convergence

Displayed items

Item		Description
(1) Input data list	Input Data	Set data for input. ☞ Page 123 Data setting in the data selection control tree
	Data Type	The data type of input data is displayed.
[Delete Row] button		Click this to delete the input data in a selected row.
(2) Output data list	Output Data Name	Set the name of data for output (1 to 32 characters). • A name corresponding to input data is displayed. (Example) When input data is '[COLLECT] data collection.temperature,' 'temperature' is displayed. • A sequential number '_number'[*1] is added to the end of an output data name to avoid name duplication. (Example) temperature_002
	Data Type	The data type of output data is displayed.
Condition Convergence Type		Select a combination type for each condition. • AND Convergence: Data is output when all conditions are satisfied, and not output if any of them is not satisfied. • OR Convergence: Data is output when any of the conditions is satisfied, and not output if all of them are not satisfied.
(3) Condition list	Monitor Target	Set monitoring target data. ☞ Page 123 Data setting in the data selection control tree
	Data Type	The data type of a monitoring target is displayed.
	Comparison Condition	Select a comparison condition.
	Comparison Target	Specify data to compare. ☞ Page 123 Data setting in the data selection control tree
	Data Type	The data type of a comparison target is displayed.

*1 If the number of characters in an output data name including a sequential number exceeds 32, a character will be deleted in order from the end.

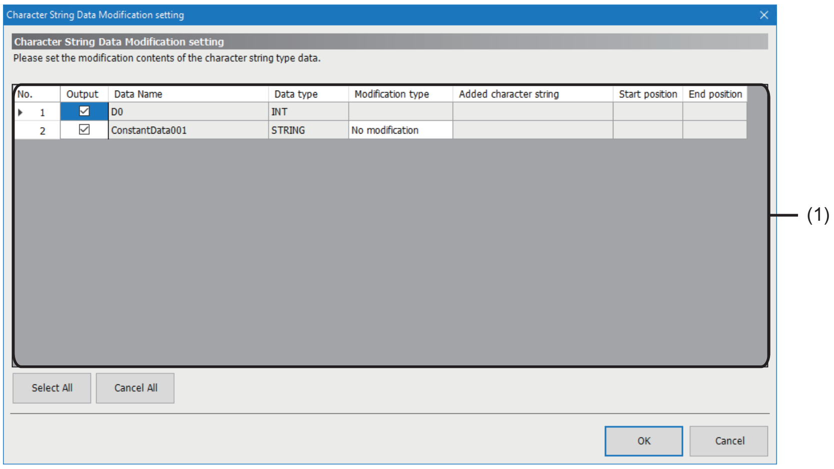
6.13 Character String Data Modification Setting

This section shows the screen for setting character string data modification.

Window

1. Select "Character String Data Modification" for "Function Type" in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.

2. Click the cell in the "Detailed Setting" column.



Character String Data Modification setting

Character String Data Modification setting

Please set the modification contents of the character string type data.

No.	Output	Data Name	Data type	Modification type	Added character string	Start position	End position
1	☑	D0	INT				
2	☑	ConstantData001	STRING	No modification			

Displayed items

Item		Description
(1) Character string data modification setting list[*1]	Output	Select the checkbox of data to output to the next process.
	Data Name	The name[*2] of input data is displayed.
	Data Type	The data type of input data is displayed.
	Modification type[*3]	Select a modification type. • Add to the start: Select this to add the content set for "Added character string" to the start of input data. • Add to the end: Select this to add the content set for "Added character string" to the end of input data. • Extraction: Select this to extract a character string from the start position to the end position of input data. For details on each type of processing, refer to the following: ☞ Page 40 Character string data modification function
	Added character string[*4]	Set an added character string specified for "Add to the start" or "Add to the end" for "Modification type." ■Available number of characters • "STRING" is displayed in "Data type": 1 to 32 characters • "WSTRING" is displayed in "Data type": 1 to 16 characters
	Start position[*5]	Set the start position for extraction specified for "Extraction" for "Modification type." ■Available value range • "STRING" is displayed in "Data type": 1 to 32 • "WSTRING" is displayed in "Data type": 1 to 16
	End position[*5]	Set the end position for extraction specified for "Extraction" for "Modification type." ■Available value range • "STRING" is displayed in "Data type": 1 to 32 • "WSTRING" is displayed in "Data type": 1 to 16
[Select All] button		Click this to select the checkboxes of all data.
[Cancel All] button		Click this to unselect the checkboxes of all data.

[*1] The order is changed accordingly when that of output data of the previous process is changed.

[*2] Changed accordingly when the setting of output data of the previous process is changed.

[*3] Can be set only when both of the following conditions are satisfied:
The checkbox of "Output" is selected.

"STRING" or "WSTRING" is displayed in "Data type."

*4 Can be set only when "Add to the start" or "Add to the end" is selected for "Modification type."

*5 Can be set only when "Extraction" is selected for "Modification type."

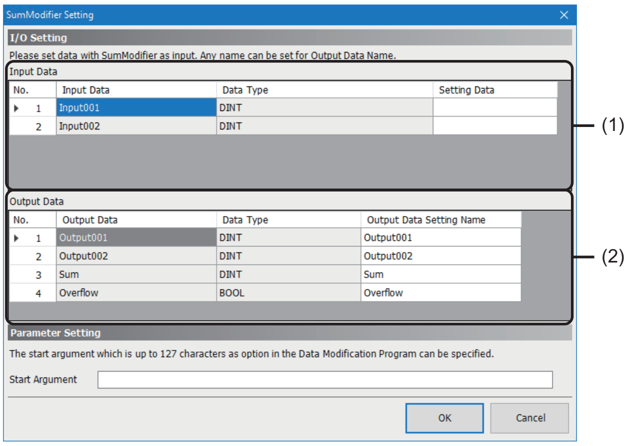
6.14 Data Modification Plug-in Setting

This section shows the screen for setting a data modification plug-in.

Window

1. Select a data modification plug-in name for "Function Type" in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen.

2. Click the cell in the "Detailed Setting" column.



I/O Setting

Please set data with SumModifier as input. Any name can be set for Output Data Name.

Input Data

No.	Input Data	Data Type	Setting Data
1	Input001	DINT	
2	Input002	DINT	

Output Data

No.	Output Data	Data Type	Output Data Setting Name
1	Output001	DINT	Output001
2	Output002	DINT	Output002
3	Sum	DINT	Sum
4	Overflow	BOOL	Overflow

Parameter Setting

The start argument which is up to 127 characters as option in the Data Modification Program can be specified.

Start Argument

Displayed items

Item		Description
(1) Input data list	Input Data	The name of input data defined in a data modification plug-in is displayed.
	Data Type	The data type of input data is displayed.
	Setting Data	Set data to specify for input data. Up to 16 units of identical data can be set. ☞ Page 123 Data setting in the data selection control tree
(2) Output data list	Output Data	The name of output data defined in a data modification plug-in is displayed.
	Data Type	The data type of output data is displayed.
	Output Data Setting Name	Set a name to set for output data (1 to 32 characters). • The content of output data is displayed by default. However, if inhibited characters are included, the following are displayed to avoid name duplication. Output001, Output002, Output003...
Start Argument		Set a start argument to specify for a data modification plug-in (up to 127 characters).

6.15 Edge Application Diagnosis (MQTT) Setting

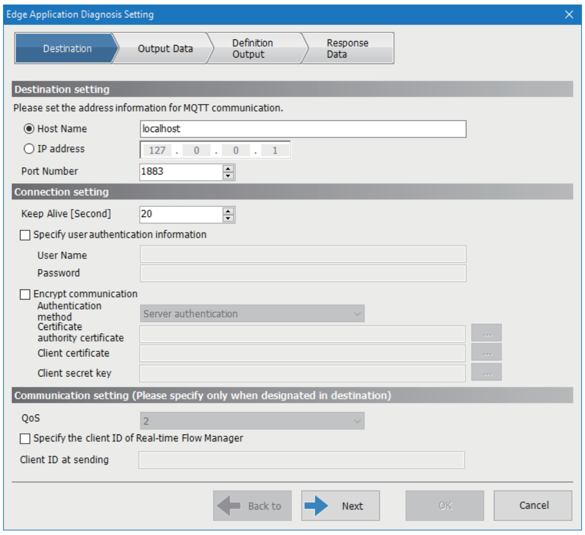
This section shows the screen for setting to send an output result of a process to an edge application, and receive response data from the edge application by using MQTT.

To set the edge application diagnosis (MQTT) setting, an MQTT broker must be set up in advance.

☞ Page 504 MQTT Broker Setup

Window

1. Select "Edge Application Diagnosis (MQTT)" for "Function Type" in the "Data Diagnosis Flow Setting" screen.
2. Click the cell in the "Detailed Setting" column.



Destination setting

Please set the address information for MQTT communication.

● Host Name: localhost

○ IP address: 127 . 0 . 0 . 1

Port Number: 1883

Connection setting

Keep Alive [Second]: 20

☐ Specify user authentication information

User Name:

Password:

☐ Encrypt communication

Authentication method: Server authentication

Certificate authority certificate:

Client certificate:

Client secret key:

Communication setting (Please specify only when designated in destination)

QoS: 2

☐ Specify the client ID of Real-time Flow Manager

Client ID at sending:

Displayed items

Item	Description	Reference
[Destination] tab	Set information required for MQTT communication.	Page 174 Destination
[Output Data] tab	Set data to output.	Page 175 Output data
[Definition Output] tab	Output a publishing data definition file.	Page 176 Definition output
[Response Data] tab	Set response data.	Page 177 Response data
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

Point

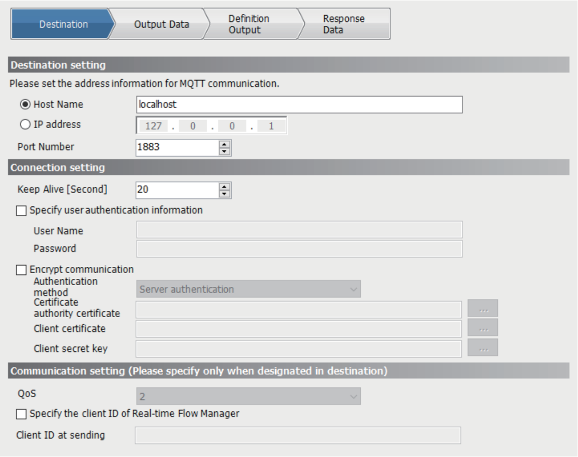
The setting screen can be switched by directly clicking a tab already set.

The check mark (✓) appears on a set tab.

Destination

The following shows the screen for setting information required for MQTT communication.

Window



Destination setting

Please set the address information for MQTT communication.

● Host Name: localhost

○ IP address: 127 . 0 . 0 . 1

Port Number: 1883

Connection setting

Keep Alive [Second]: 20

☐ Specify user authentication information

User Name:

Password:

☐ Encrypt communication

Authentication method: Server authentication

Certificate authority certificate:

Client certificate:

Client secret key:

Communication setting (Please specify only when designated in destination)

QoS: 2

☐ Specify the client ID of Real-time Flow Manager

Client ID at sending:

Displayed items

Item	Description
Host Name	Select this for communication by specifying a host name, and set a host name (1 to 255 characters).
IP address	Select this for communication by specifying an IP address, and set an IP address.
Port Number	Set a port number (1 to 65535).
Keep Alive [Second]	Set a keep alive time for MQTT communication (20 to 3600 seconds).
Specify user authentication information	Select the checkbox to authenticate a user.
User Name[*1]	Set a user name (6 to 64 characters).
Password[*1]	Set a password (6 to 512 characters).
Encrypt communication	Select the checkbox to encrypt communication.
Authentication method[*2]	Select an authentication method. • Server authentication • Server authentication & client authentication
Certificate authority certificate[*2]	Set the file path of a certificate authority certificate (up to 259 characters). It can also be selected in the "Certificate authority certificate selection" screen displayed by clicking the [...] button.
Client certificate[*3]	Set the file path of a client certificate (up to 259 characters). It can also be selected in the "Client certificate selection" screen displayed by clicking the [...] button.
Client secret key[*3]	Set the file path of a client secret key (up to 259 characters). It can also be selected in the "Client secret key selection" screen displayed by clicking the [...] button.
QoS	"2" is displayed (fixed).
Specify the client ID of Real-time Flow Manager	Select the checkbox only if a client ID[*4] that follows a specific format is required, such as when using an MQTT broker provided by a cloud service. Do not select the checkbox when using an MQTT broker shown in the following: ☞ Page 46 MQTT broker For details on a client ID of Real-time Flow Manager, refer to the following: ☞ Page 48 Client IDs and a topic name
Client ID at sending[*5]	Set the client ID[*4] of Real-time Flow Manager (1 to 1024 characters).

*1 Can be set when selecting the checkbox of "Specify user authentication information."

*2 Can be set when selecting the checkbox of "Encrypt communication."

*3 Can be set when both of the following conditions are satisfied:
The checkbox of "Encrypt communication" is selected.
"Server authentication & client authentication" is selected for "Authentication method."

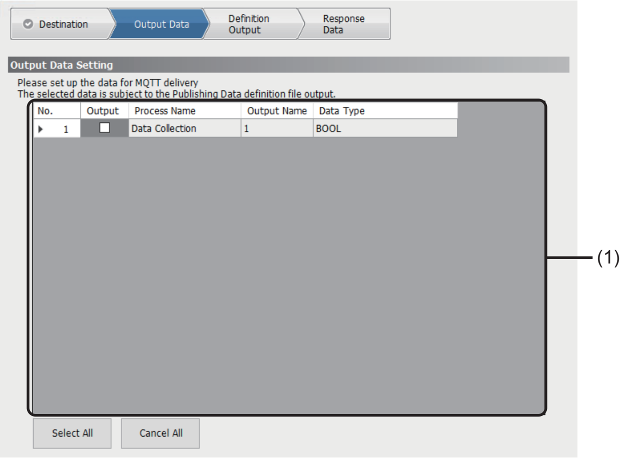
*4 Information used by an MQTT broker to identify Real-time Flow Manager

*5 Can be set when selecting the checkbox of "Specify the client ID of Real-time Flow Manager."

Output data

The following shows the screen for setting data to output.

Window



Output Data Setting

Please set up the data for MQTT delivery
The selected data is subject to the Publishing Data definition file output.

No.	Output	Process Name	Output Name	Data Type
1	☐	Data Collection	1	BOOL

Displayed items

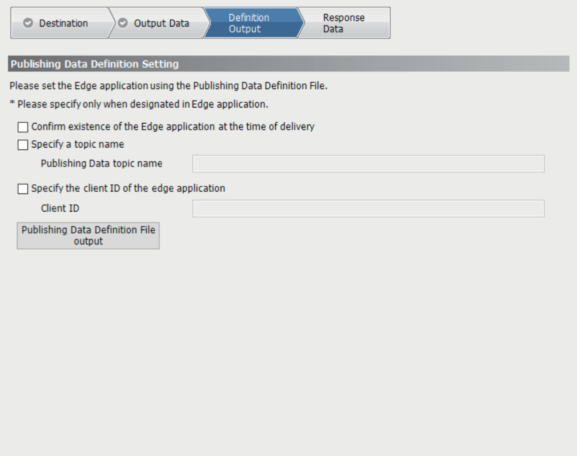
Refer to the following:

☞ Page 161 Output data

Definition output

The following shows the screen for outputting a publishing data definition file.

Window


Destination
Output Data
Definition Output
Response Data
Publishing Data Definition Setting
Publishing Data topic name
Client ID
Publishing Data Definition File output

Please set the Edge application using the Publishing Data Definition File.

* Please specify only when designated in Edge application.

☐ Confirm existence of the Edge application at the time of delivery

☐ Specify a topic name

☐ Specify the client ID of the edge application

Displayed items

Item	Description
Confirm existence of the Edge application at the time of delivery	Select the checkbox to check the existence of an edge application when distributing.
Specify a topic name	Select the checkbox if there are restrictions on available topic names, such as when a topic name is specified in an edge application. Do not select the checkbox when an edge application has a function to read a publishing data definition file or a topic name is not specified in an edge application. For details on a topic name, refer to the following: ☞ Page 48 Client IDs and a topic name
Publishing Data topic name[*1]	Set a publishing data topic name[*2] (up to 64 characters).
Specify the client ID of the edge application	Select the checkbox if there are restrictions on available client IDs, such as when a client ID is specified in an edge application. Do not select the checkbox when an edge application has a function to read a publishing data definition file or a client ID is not specified in an edge application. For details on a client ID of an edge application, refer to the following: ☞ Page 48 Client IDs and a topic name
Client ID[*3]	Set the client ID[*4] of an edge application (1 to 64 characters).
[Publishing Data Definition File output] button	Click this to output a JSON file in which output data information required for edge application diagnosis (MQTT) is defined.

[*1] Can be set when selecting the checkbox of "Specify a topic name."

[*2] Information for identifying data exchanged in MQTT communication.

[*3] Can be set when selecting the checkbox of "Specify the client ID of the edge application."

[*4] Information for identifying an edge application with which Real-time Flow Manager communicates.

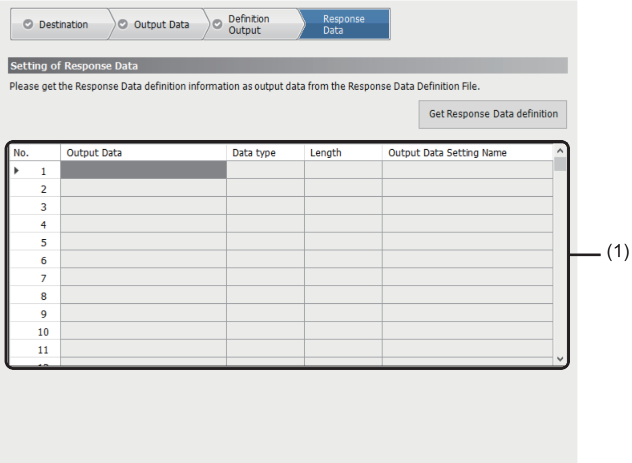
Point

When changing the edge application diagnosis setting after outputting a publishing data definition file and setting an edge application once, output the publishing data definition file and set the edge application again.

Response data

The following shows the screen for setting response data.

Window



Setting of Response Data

Please get the Response Data definition information as output data from the Response Data Definition File.

Displayed items

Item		Description
[Get Response Data definition] button		Click this to select a response data definition file[*1] and acquire the definition information of the response data. A response data definition file can be selected in the "Select Response Data Definition File" screen displayed by clicking this button.
(1) Output data list	Output Data	The data name of output data acquired from the definition information of response data is displayed.
	Data type	The data type of output data acquired from the definition information of response data is displayed.
	Length	The number of characters in output data acquired from the definition information of response data is displayed.
	Output Data Setting Name	Set the name for output data (1 to 32 characters). • The content of output data is displayed by default. However, if inhibited characters are included or the content is duplicated, the following are displayed. Output001, Output002, Output003...

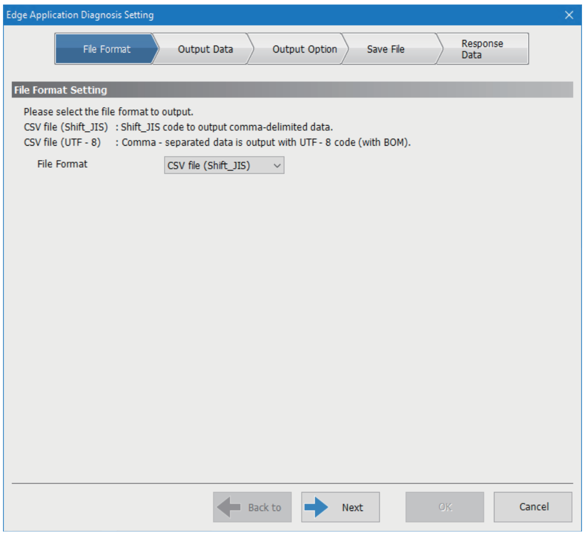
*1 For response data definition files, refer to the following:
☞ Page 44 Response data definition file

6.16 Edge Application Diagnosis (File) Setting

This section shows the screen for setting to pass a result of a process to an edge application, and acquire response data from the edge application in a file format.

Window

1. Select "Edge Application Diagnosis (file)" for "Function Type" in the "Data Diagnosis Flow Setting" screen.
2. Click the cell in the "Detailed Setting" column.



File Format Setting

Please select the file format to output.
CSV file (Shift_JIS) : Shift_JIS code to output comma-delimited data.
CSV file (UTF - 8) : Comma - separated data is output with UTF - 8 code (with BOM).

File Format: CSV file (Shift_JIS)

Displayed items

Item	Description	Reference
[File Format] tab	Set a file format to output data.	Page 179 File format
[Output Data] tab	Set data to output to a file.	Page 180 Output data
[Output Option] tab	Set output options for a saved file.	Page 181 Output option
[Save File] tab	Set the save destination, name, and switching operation of a file.	Page 182 Saved file
[Response Data] tab	Set details on response data.	Page 183 Response data
[Back to] button	Click this to move to the previous setting screen.	—
[Next] button	Click this to move to the next setting screen.	—

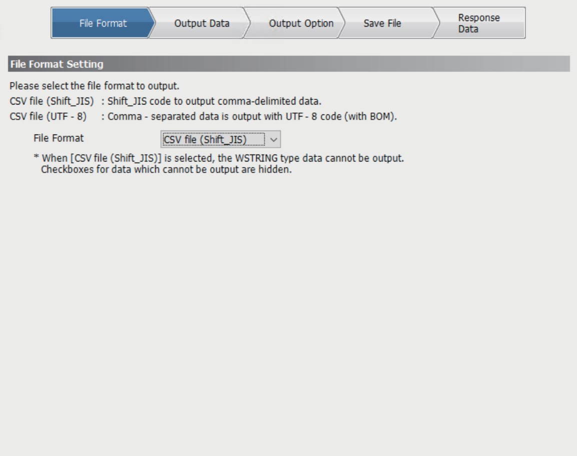
Point

The setting screen can be switched by directly clicking a tab already set.
The check mark (✓) appears on a set tab.

File format

The following shows the screen for setting a file format to output data.

Window



File Format Setting

Please select the file format to output.

CSV file (Shift_JIS) : Shift_JIS code to output comma-delimited data.

CSV file (UTF - 8) : Comma - separated data is output with UTF - 8 code (with BOM).

File Format: CSV file (Shift_JIS)

* When [CSV file (Shift_JIS)] is selected, the WSTRING type data cannot be output. Checkboxes for data which cannot be output are hidden.

Displayed items

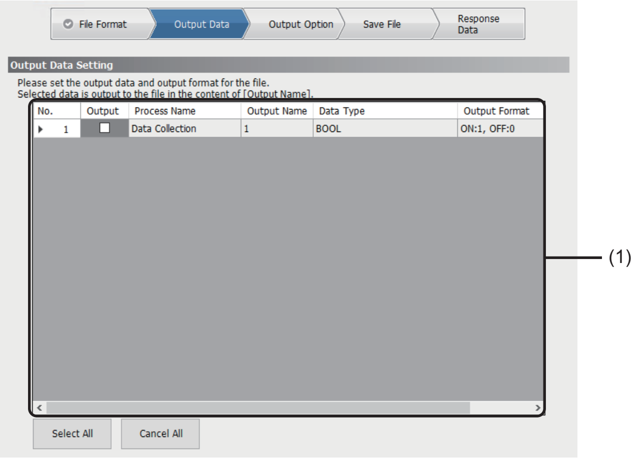
Refer to the following:

☞ Page 144 File format

Output data

The following shows the screen for setting data to output to a file.

Window



Output Data Setting

Please set the output data and output format for the file.
Selected data is output to the file in the content of [Output Name].

No.	Output	Process Name	Output Name	Data Type	Output Format
1	☐	Data Collection	1	BOOL	ON:1, OFF:0

Displayed items

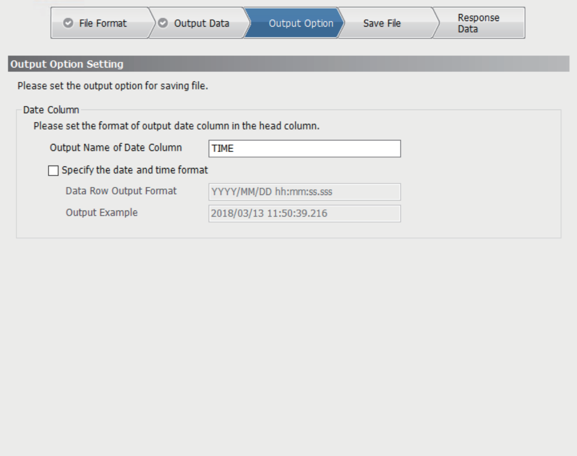
Refer to the following:

☞ Page 145 Output data

Output option

The following shows the screen for setting output options for a saved file.

Window



Output Option Setting

Please set the output option for saving file.

Date Column

Please set the format of output date column in the head column.

Output Name of Date Column: TIME

☐ Specify the date and time format

Data Row Output Format: YYYY/MM/DD hh:mm:ss.sss

Output Example: 2018/03/13 11:50:39.216

Displayed items

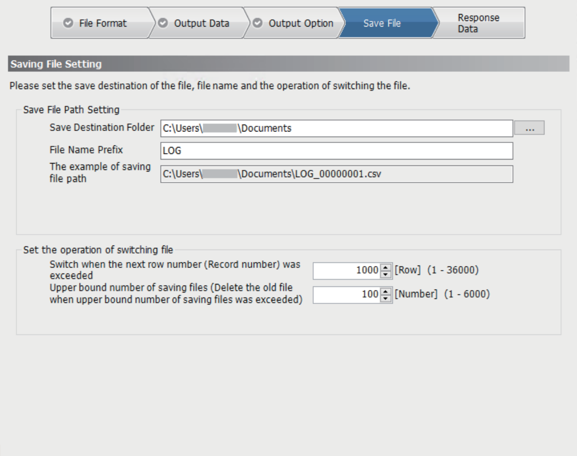
Refer to the following:

☞ Page 146 Output option

Saved file

The following shows the screen for setting the save destination, name, and switching operation of a file.

Window



Saving File Setting

Please set the save destination of the file, file name and the operation of switching the file.

Save File Path Setting

Save Destination Folder: C:\Users\[redacted]\Documents

File Name Prefix: LOG

The example of saving file path: C:\Users\[redacted]\Documents\LOG_00000001.csv

Set the operation of switching file

Switch when the next row number (Record number) was exceeded: 1000 [Row] (1 - 36000)

Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded): 100 [Number] (1 - 6000)

Displayed items

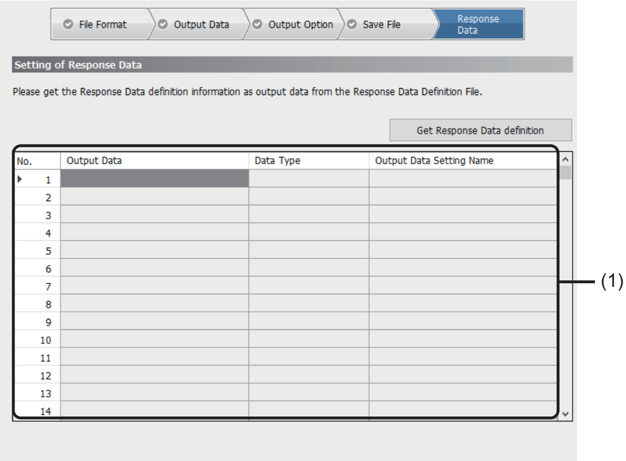
Item		Description
Save File Path Setting	Save destination folder	Set the save destination for a file (1 to 204 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.
	File name prefix	Set the prefix of a saved file name (1 to 32 characters).
	The example of saving file path	The saving file path based on the settings for "Save Destination Folder" and "File Name Prefix" is displayed.
Set the operation of switching file	Switch when the next row number (Record number) was exceeded[*1]	Set the number of data rows to store in one file. If it is exceeded, a file will be output.
	Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded)	Set the maximum number of files stored in one folder. If it is exceeded, files will be deleted in chronological order.

[*1] If the number of rows specified in Real-time Flow Designer is small, the load on Windows increases because a saved file is frequently created. In this case, review the setting to lengthen the collection cycle or increase the maximum number of data rows output to a file.

Response data

The following shows the screen for setting response data.

Window



Please get the Response Data definition information as output data from the Response Data Definition File.

Displayed items

Item		Description
[Get Response Data definition] button		Click this to select a response data definition file[*1] and acquire the definition information of the response data. A response data definition file can be selected in the "Select Response Data Definition File" screen displayed by clicking this button.
(1) Output data list	Output Data	The data name of output data acquired from the definition information of response data is displayed.
	Data type	The data type of output data acquired from the definition information of response data is displayed.
	Output Data Setting Name	Set the name for output data (1 to 32 characters). • The content of output data is displayed by default. However, if inhibited characters are included or the content is duplicated, the following are displayed. Output001, Output002, Output003...

[*1] For response data definition files, refer to the following:
☞ Page 53 Response data definition file

Point

When acquiring the definition information of response data, the character code is determined depending on whether the response data definition file has BOM or not.

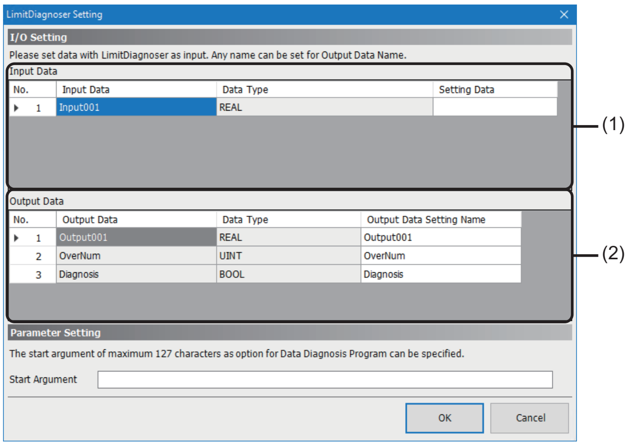
- With BOM: Determined as UTF-8 (with BOM).
- Without BOM: Determined as Shift JIS.

6.17 Data Diagnosis Plug-in Setting

This section shows the screen for setting a data diagnosis plug-in.

Window

1. Select a data diagnosis plug-in name for "Function Type" in the "Data Diagnosis Flow Setting" screen.
2. Click the cell in the "Detailed Setting" column.



Please set data with LimitDiagnoser as input. Any name can be set for Output Data Name.

No.	Input Data	Data Type	Setting Data
1	Input001	REAL	

No.	Output Data	Data Type	Output Data Setting Name
1	Output001	REAL	Output001
2	OverNum	UINT	OverNum
3	Diagnosis	BOOL	Diagnosis

The start argument of maximum 127 characters as option for Data Diagnosis Program can be specified.

Displayed items

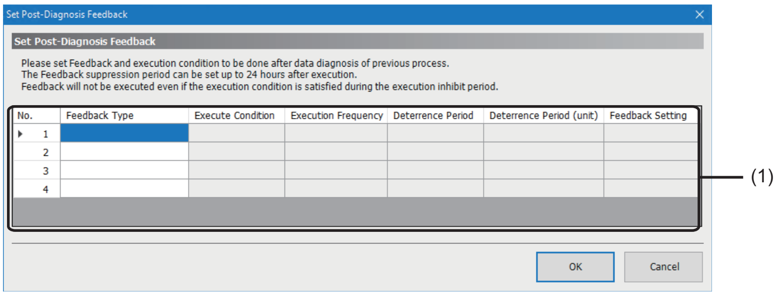
Item		Description
(1) Input data list	Input Data	The name of input data defined in a data diagnosis plug-in is displayed.
	Data Type	The data type of input data is displayed.
	Setting Data	Set data to specify for input data. Up to 16 units of identical data can be set. ☞ Page 123 Data setting in the data selection control tree
(2) Output data list	Output Data	The name of output data defined in a data diagnosis plug-in is displayed.
	Data Type	The data type of output data is displayed.
	Output Data Setting Name	Set a name to set for output data (1 to 32 characters). • The content of output data is displayed by default. However, if inhibited characters are included, the following are displayed to avoid name duplication. Output001, Output002, Output003...
Start Argument		Set a start argument to specify for a data diagnosis plug-in (up to 127 characters).

6.18 Post-Diagnosis Feedback Setting

This section shows the screen for setting feedback provided when a diagnosis result of a data diagnosis process is received.

Window

1. Select "Post-Diagnosis Feedback" for "Function Type" in the "Data Diagnosis Flow Setting" screen.
2. Click the cell in the "Detailed Setting" column.



Please set Feedback and execution condition to be done after data diagnosis of previous process.
The Feedback suppression period can be set up to 24 hours after execution.
Feedback will not be executed even if the execution condition is satisfied during the execution inhibit period.

No.	Feedback Type	Execute Condition	Execution Frequency	Deterrence Period	Deterrence Period (unit)	Feedback Setting
1						
2						
3						
4						

Displayed items

Item		Description
(1) Feedback setting list	Feedback Type	Select the type of feedback provided after data diagnosis.
	Execution Condition	Click a cell, and the "Execution condition setting" screen appears. ☞ Page 186 Execution condition setting
	Execution Frequency	Select a frequency of feedback.
	Deterrence Period	Set a period to limit feedback (1 to 60 minutes or 1 to 24 hours).
	Deterrence Period (unit)	Select the unit of a period to limit feedback (in minutes or in hours).
	Feedback Setting	Click a cell, and each setting screen corresponding to a feedback type appears. • When the feedback type is "Instruction Feedback" ☞ Page 187 Device instruction feedback setting • When the feedback type is "Feedback of Program Execution" ☞ Page 190 Program execution feedback setting

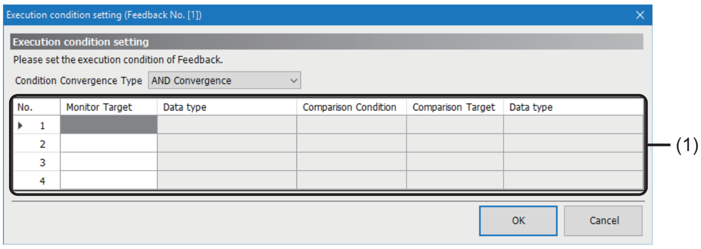
Point

By selecting a blank for "Feedback Type," the setting of the row can be deleted.

Execution condition setting

The following shows the screen for setting an execution condition for feedback.

Window



Execution condition setting (Feedback No. [1])

Execution condition setting

Please set the execution condition of Feedback.

Condition Convergence Type: AND Convergence

Displayed items

Item		Description
Condition Convergence Type		Select a combination type for each condition. • AND Convergence: Feedback is provided when all conditions are satisfied, and not provided if any of them is not satisfied. • OR Convergence: Feedback is provided when any of the conditions is satisfied, and not provided if all of them are not satisfied.
(1) Execution condition list	Monitor Target	Select monitoring target data. ☞ Page 123 Data setting in the data selection control tree
	Data Type	The data type of a monitoring target is displayed.
	Comparison Condition	Select a comparison condition.
	Comparison Target	Select data to compare. ☞ Page 123 Data setting in the data selection control tree
	Data Type	The data type of a comparison target is displayed. When data selected for "Comparison Target" is a constant, nothing is displayed.

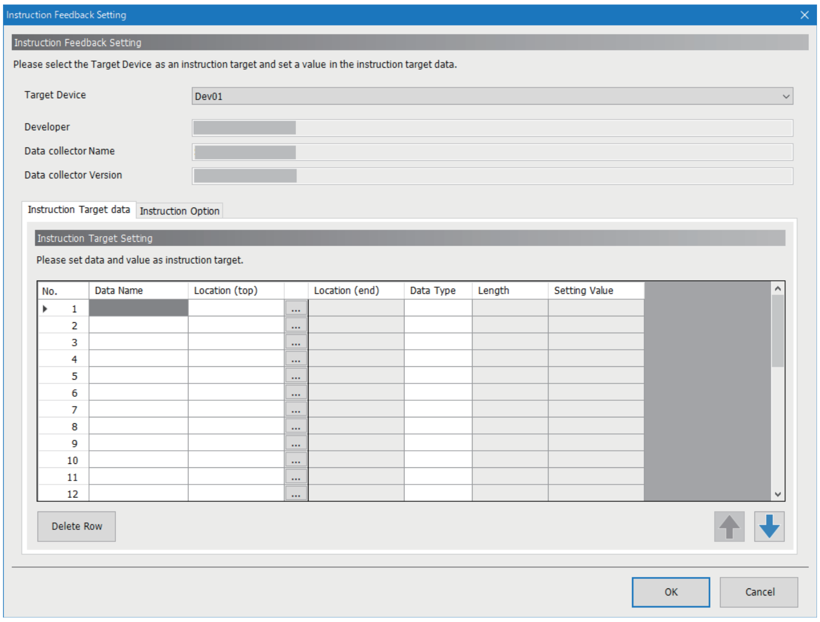
Device instruction feedback setting

The following shows the screen for setting data to issue an instruction to an access target device.

Window

1. Select "Instruction Feedback" for "Feedback Type" in the "Post-Diagnosis Feedback Setting" screen.

2. Click the cell in the "Feedback Setting" column.



Instruction Feedback Setting

Instruction Feedback Setting

Please select the Target Device as an instruction target and set a value in the instruction target data.

Target Device: Dev01

Developer

Data collector Name

Data collector Version

Instruction Target Setting

Please set data and value as instruction target.

No.	Data Name	Location (top)	Location (end)	Data Type	Length	Setting Value
1		...				
2		...				
3		...				
4		...				
5		...				
6		...				
7		...				
8		...				
9		...				
10		...				
11		...				
12		...				

Point

When an access target device to which an instruction is issued is not set, the "Select Data collector" screen appears to add an access target device.

☞ Page 125 Data collector selection screen

Displayed items

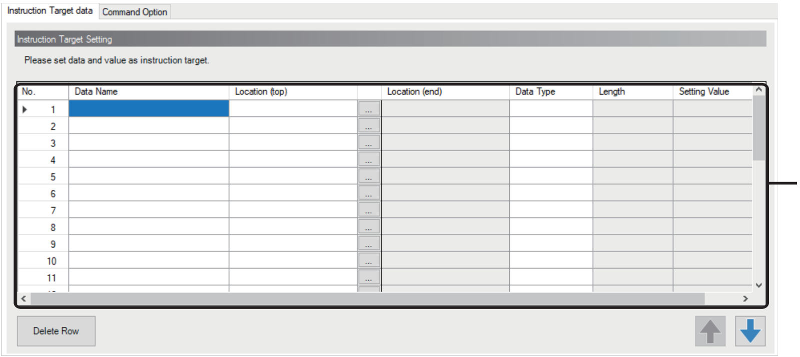
Item	Description	Reference
Target Device[*1]	Select a device to issue an instruction. The "Select Data collector" screen appears when selecting "[Adding]," and the "Target Device Setting" screen appears after selecting a data collector. ☞ Page 125 Data collector selection screen ☞ Page 126 Access target device setting screen	—
Developer	The developer of a data collector used for an access target device that is an instruction target is displayed.	—
Data collector Name	The name of a data collector used for an access target device that is an instruction target is displayed.	—
Data collector Version	The version of a data collector used for an access target device that is an instruction target is displayed.	—
[Instruction Target data] tab	Set data to issue an instruction.	Page 188 Instruction target data
[Instruction Option] tab	Set an instruction option.	Page 189 Instruction option

[*1] An access target device for which a data collector that does not support the data writing function is set cannot be selected.

Instruction target data

The following shows the screen for setting data to issue an instruction.

Window



Please set data and value as instruction target.

Displayed items

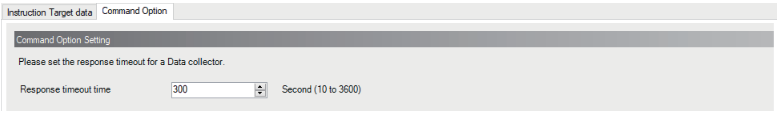
Item		Description
(1) Instruction target data list	Data Name	Set a data name (up to 32 characters). • If the data name is blank when setting the location (start), the contents of the location (start) are displayed for the data name. However, if the number of characters in the contents of the location (start) exceeds 32, inhibited characters are included, or the contents of a data name are duplicated, the following are displayed. (Example) Data001, Data002, Data003, ...
	Location (top)	Set the start location of an instruction target (up to 300 characters). Depending on a data collector used, location parameters can be set in the "Location Setting" screen displayed by clicking the [...] button.*1 For details on the setting method, refer to the manual for a data collector used.
	Location (end)	The end location acquired from a data collector is displayed. If a data collector does not return the end location, the cell will be blank.
	Data Type	Select the data type of a location to access.
	Length	Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 1 to 32 • WSTRING: 1 to 16
	Setting Value	Set a value to substitute for an instruction target location. ☞ Page 123 Data setting in the data selection control tree
[Delete Row] button		Click this to delete the instruction target data in a selected row.

*1 When using a data collector the location parameters of which cannot be set in the "Location Setting" screen, the "Location Setting" screen does not appear.

Instruction option

The following shows the screen for setting an instruction option.

Window



Please set the response timeout for a Data collector.

Response timeout time 300 Second (10 to 3600)

Displayed items

Item	Description
Response timeout time	Set a response timeout time from a data collector.

Program execution feedback setting

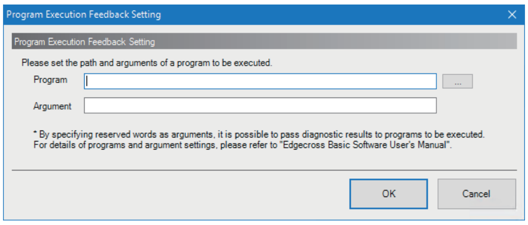
The following shows the screen for setting the feedback function to execute a program (exe or bat) when a result of diagnosis processing in a data diagnosis process is received.

For details on the program execution, refer to the following:

☞ Page 55 Program execution feedback function

Window

1. Select "Feedback of Program Execution" for "Feedback Type" in the "Post-Diagnosis Feedback Setting" screen.
2. Click the cell in the "Feedback Setting" column.


Program Execution Feedback Setting
Program Execution Feedback Setting
Program
...
Argument
OK
Cancel

Please set the path and arguments of a program to be executed.

* By specifying reserved words as arguments, it is possible to pass diagnostic results to programs to be executed.
For details of programs and argument settings, please refer to "Edgecross Basic Software User's Manual".

Displayed items

Item	Description
Program	Set the path of a program to execute (up to 127 characters). It can also be selected in the "Selection of execution program" screen displayed by clicking the [...] button.
Argument	Set an argument to specify for a program (up to 300 characters).

7 Management Shell

Management Shell is software that models data in equipment, devices, or lines in production sites, manages it in a hierarchical structure, and runs in the background on Windows as a Windows service. In addition, it reads and writes data in connected equipment, devices, or lines by using a data collector.

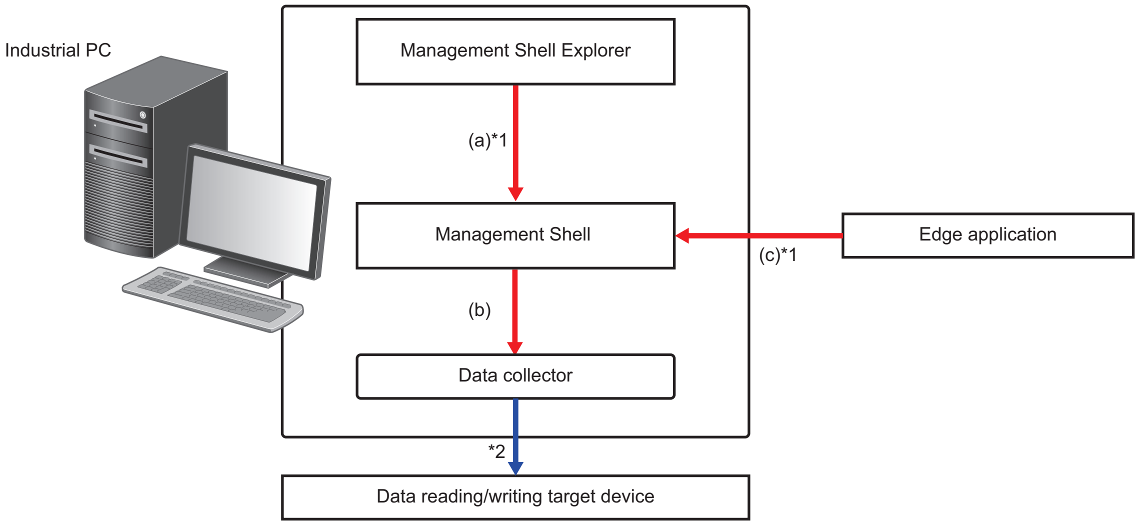
For the data models managed by Management Shell, refer to the following:

☞ Page 192 Data Model

Data models managed by Management Shell are set and referenced by using Management Shell Explorer.

For the startup method, screen configuration, and others of Management Shell Explorer, refer to the following:

☞ Page 193 Management Shell Explorer



(a) Data models are set and referenced.
(b) Data reading or writing is requested.
(c) Data models are referenced or the current value of a data tag resource is acquired or changed.

*1 Communication times out in 30 seconds.
*2 Communication timeout time depends on the setting of a data collector. For details, refer to the manual for a data collector used.

Precautions

Even when exiting Management Shell Explorer, Management Shell and a data collector do not stop. To stop Management Shell, perform the following operation.

- Select [Management Shell] ⇨ [Management Shell Stop].

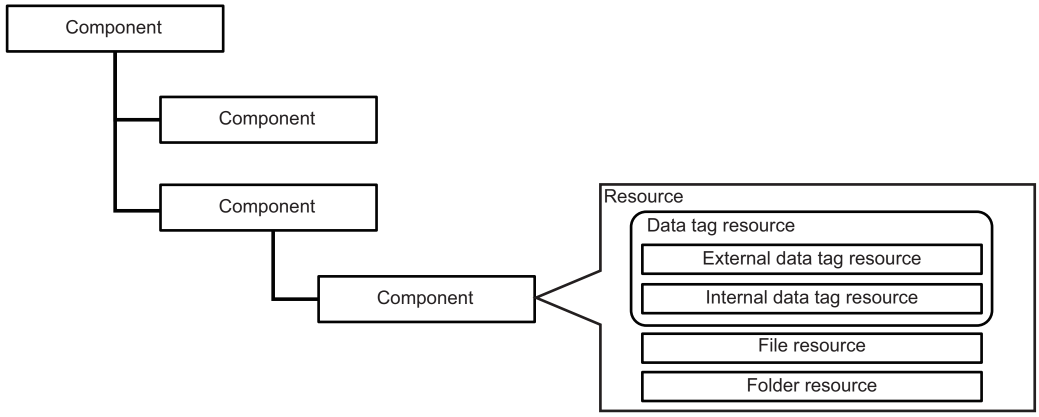
Connection to, disconnection from, and reconnection to an access target device

A data collector connects to, disconnects from, and reconnects to an access target device in response to the following operations:

Behavior of a data collector	Operation
Connect	Start Management Shell by either of the following operations: • Start Windows. • Select [Management Shell] ⇨ [Management Shell Start].
	Add an access target device setting.
Disconnect	Stop Management Shell by either of the following operations: • Shut down Windows. • Select [Management Shell] ⇨ [Management Shell Stop].
	Delete an access target device setting.
Reconnect (Disconnect → connect)	Change the contents of an access target device setting.
	Click the [Reconnect] button in the "Target Device Setting List" screen.

7.1 Data Model

This section shows the configuration elements of a data model managed by Management Shell.



Configuration element			Description
Component			An element for representing equipment, devices, or lines, and their hierarchical relations in production sites.
Resource	—		An element for representing data in equipment, devices, or lines in production sites (data in production sites, manual data, and program data) included in a component and managed.
	Data tag resource	External data tag resource	An element for representing data existing outside of Edgecross Basic Software. Use this to manage the internal memory and sensor inputs of equipment, devices, or lines in production sites.
		Internal data tag resource	An element for defining data in Edgecross Basic Software. It is retained in Edgecross Basic Software. Values can be read from an external device such as an edge application or IT system. The following setting methods are available for internal data tag resources. • Value: A setting method by writing data from an external device such as an edge application or IT system. Use this method to manage fixed value information such as a product model name and production number. • Operation: A setting method by writing the result of a four arithmetic or logical operation performed on a value of an external data tag resource or a constant as data. Use this method to modify data represented by an external data tag resource. An internal data tag resource set by using this method cannot be written from an external device such as an edge application or IT system (read-only).
	File resource		An element for representing file data. Use this to manage files such as manual data or program data. No restrictions on file types that can be managed.
	Folder resource		An element for representing folder data. Use this to manage folders.

7.2 Management Shell Explorer

Management Shell Explorer is software that sets and references data models managed by Management Shell. In addition, it can monitor and change current values of data in production sites managed by Management Shell.

Startup method

Operating procedure

1. Perform either of the following operations:

- Start Management Shell Explorer from "Edgecross Basic Software" in Windows Start.
- Double-click the shortcut icon of 'Management Shell Explorer' on the desktop.

When starting Management Shell Explorer, the contents that were set last time is applied.

Point

When starting Management Shell Explorer for the first time, the screen to confirm the software license agreement appears. (It will not appear if the license agreement has already been accepted in Real-time Flow Designer.)

Starting Management Shell Explorer with the administrator authority

When performing an operation by using any of the following menus, it is necessary to start Management Shell Explorer with the administrator authority.

- [Management Shell] ⇨ [Management Shell Start]
- [Management Shell] ⇨ [Management Shell Stop]
- [Management Shell] ⇨ [Import]
- [Management Shell] ⇨ [Delete All]
- [Setting] ⇨ [OPC UA Setting]

■Procedure for starting it with the administrator authority

1. Perform either of the following operations:

- Right-click Management Shell Explorer and select [More] ⇨ [Run as administrator] in "Edgecross Basic Software" in Windows Start.
- Right-click the shortcut icon of 'Management Shell Explorer' on the desktop, and select [Run as administrator].

2. Click the [Yes] button in the "User Account Control" screen.

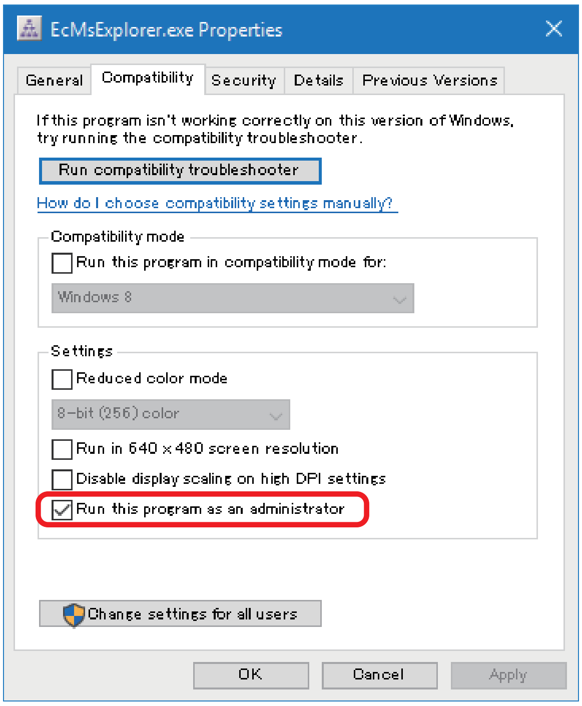
Point

By performing the following operations, Management Shell Explorer can be started with the administrator authority without selecting [Run as administrator].

❶ Right-click the following file and select [Properties].

(Installation destination of Edgecross Basic Software)\Management Shell\Explorer\EcMsExplorer.exe

❷ Select the checkbox of "Run this program as an administrator" in the [Compatibility] tab, and click the [OK] button.


EcMsExplorer.exe Properties
General
Compatibility
Security
Details
Previous Versions
Run compatibility troubleshooter
How do I choose compatibility settings manually?
Compatibility mode
Settings
Change settings for all users
OK
Cancel
Apply

If this program isn't working correctly on this version of Windows, try running the compatibility troubleshooter.

☐ Run this program in compatibility mode for: Windows 8

☐ Reduced color mode: 8-bit (256) color

☐ Run in 640 x 480 screen resolution

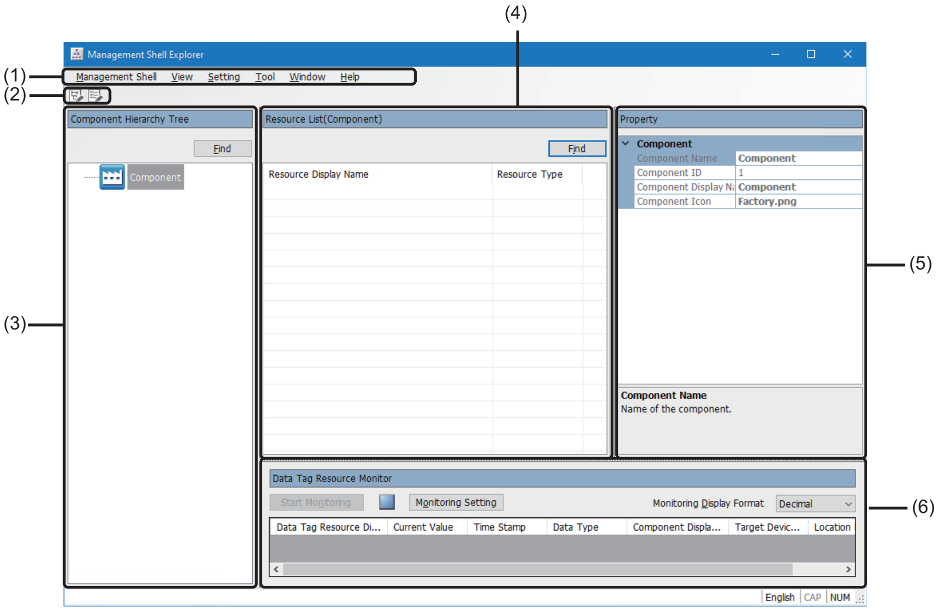
☐ Disable display scaling on high DPI settings

☑ Run this program as an administrator

Precautions

If a user without the administrator authority starts Management Shell Explorer with the administrator authority, a password for a user with the administrator authority is required. Therefore, it is recommended to log in to Windows as a user with the administrator authority.

Screen configuration



Component
Component Name: Component
Component ID: 1
Component Display Na: Component
Component Icon: Factory.png

Component Name
Name of the component.

(1) Menu bar
(2) Toolbar
(3) Component tree window
(4) Resource list window
(5) Property window
(6) Data tag resource monitor window

■Menu configuration

Menu item			Description	Reference
Management Shell	Management Shell Start[*1]		To switch Management Shell that runs as a Windows service to the operating state.[*3]	—
	Management Shell Stop[*2]		To switch Management Shell that runs as a Windows service to the stop state.[*3]	
	Import		To import a setting file saved by using the [Export] menu into Management Shell Explorer and Management Shell, and restore it.[*4,*5,*6,*7,*8]	—
	Export		To save the following information as a setting file (extension: .msf)[*9].[*10,*11,*12] • Access target device settings, IT gateway settings, and icon files set in Management Shell Explorer • Data models (components and resources) managed by Management Shell • One-shot collection setting[*13] • Event history automatic output setting An execution environment may be damaged; therefore, it is recommended to export a setting file for backup.	—
	Data Model Import[*14]		To import the following information in a file[*15] saved by using the [Data Model Export] menu into Management Shell Explorer and Management Shell, and restore it.[*16,*17,*18] • Data model (component[*19], resource[*20]) • Access target device setting[*21] An imported data model is added under a selected component. In addition, the import behavior differs depending on the format of a file to be imported. For details, refer to the following: ☞ Page 200 Behavior of data model import	—
	Data Model Export[*22]		To save the following information in the file format (extension: dmf).[*12] • Selected component and resources in the component[*20,*23,*24] • Access target device setting used in a data tag resource to be saved By using this menu, a data model can partially be utilized or duplicated. (It can also be utilized in another industrial PC.) For duplicating a data model, refer to the following: ☞ Page 201 Duplicating a data model	—
	Diagnosis	OPC UA Diagnosis	To display the "OPC UA Diagnosis" screen.	Page 341 OPC UA diagnosis
	Error Information List		To display the "Error Information List" screen.	Page 343 Displaying error information in a list
	Check Number of Model Configurations		To display the "Check Number of Model Configurations" screen.	Page 206 "Check Number of Model Configurations" screen
	Delete All		To return the following information to the default.[*4] • Access target device settings, IT gateway settings, and one-shot collection settings configured in Management Shell Explorer • Data models (components and resources) managed by Management Shell	—
	Exit Management Shell Explorer		To exit Management Shell Explorer.	—
View	Switch Display Language		To switch the display languages of Real-time Flow Designer and Management Shell Explorer for the next startup (Japanese/English/Simplified Chinese)[*25].	—

Menu item			Description	Reference
Setting	Target Device Setting		To display the "Target Device Setting List" screen.	Page 220 Access target device setting list screen
	IT Gateway Setting		To display the "IT Gateway Setting List" screen.	Page 266 IT gateway setting list screen
	OPC UA Setting		To display the "OPC UA Setting" screen.	Page 261 Setting an OPC UA server Page 263 Managing OPC UA client certificates
	Event History Automatic Output Setting		To display the "Event History Automatic Output Setting" screen.	Page 292 Event history automatic output setting screen
Tool	Option		To display the "Options" screen.	Page 216 Option setting
	One-Shot Collection Setting		To display the "One-Shot Collection Setting" screen.	Page 281 One-shot collection setting screen
	Target Device Setting Batch Replacement		To display the "Target Device Setting Batch Replacement" screen.	Page 217 Access target device setting batch replacement
Window	Component Hierarchy Tree Edit*26		To display the component tree edit dialog.	—
	Resource List Edit*26		To display the resource list edit dialog.	—
	Return to Initial Layout		To return the layout of the screen set in Management Shell Explorer to the default.	—
Help	Data Collector List		To display the list of installed data collectors.	Page 120 Data collector list
	IT Gateway List		To display the list of installed IT gateways.	Page 121 IT gateway list
	Manual	Edgecross Basic Software User's Manual	To display the manual (Edgecross Basic Software for Windows User's Manual) in PDF format.*27	—
	Version Information		To display the version information and license information of Management Shell Explorer.	—

*1 Cannot be selected when Management Shell is running.

*2 Cannot be selected when Management Shell is stopped.

*3 To restart Management Shell when initializing setting information or registering components or resources fail.

*4 Not available while the "One-Shot Collection Setting" screen is open.

*5 When a password is set for a file, the file can be read by entering the password in the displayed "Password input" screen.

*6 When importing a setting file saved in Management Shell Explorer with Edgecross Basic Software version 1.21 or earlier, data tag resources are imported as external data tag resources.

*7 When importing a setting file, which is saved in Management Shell Explorer with Edgecross Basic Software version 1.22 or earlier, into Management Shell Explorer in which a one-shot collection setting is configured, the setting is deleted.

*8 When importing a setting file, which is saved in Management Shell Explorer with Edgecross Basic Software version 1.23 or earlier, into Management Shell Explorer in which the event history automatic output setting is configured, the setting is deleted.

*9 Do not use surrogate pair characters for a file name.

*10 A password can be set in the displayed "Password setting" screen. This can prevent leakage of the information in a setting file.

*11 The following settings are not exported; therefore, they are not applied to Management Shell Explorer even when importing the exported file. Set them again as necessary after importing the file.
OPC UA setting
Client certificate

*12 Depending on a data collector used, some setting information may not be saved. For details, refer to the manual for a data collector used.

*13 A setting file can be exported even while editing a one-shot collection setting; however, only applied items are exported.

*14 Also available by selecting and right-clicking a component then selecting [Data Model Import].

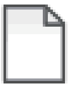
*15 For editing a file, refer to the following:
📖Edgecross data model file maker user's manual [ECD-MA1-0004]

*16 If the data collector version of a data collector used in an imported access target device setting is different from that of one installed on an import destination, perform any of the following operations to update the version to that of installed one.
Click the [Update to Latest State] button in the "Data collector List" screen.
Restart Management Shell.
Restart Management Shell Explorer.

*17 A warning or error may occur during import. If an error occurs, import fails. The content of a warning or error can be checked in the "Import error list" screen displayed after import.
☞ Page 204 Import error list screen

*18 When monitoring is being performed in the data tag resource monitor window, it stops. (Monitoring restarts after import is completed.)

*19 If the icon file does not exist in a file path set for "Component Icon," it is displayed as the following icon. Note that the content of "Component Icon" in the property item is not changed.



*20 An internal data tag resource (operation) is not a target for data model export and import. After importing a data model, set it again in an import destination as necessary.

*21 If an access target device setting to be imported overlaps with any of the access target device settings in an import destination, select another access target device setting in the "Target Device setting import" screen displayed during import.
☞ Page 203 Target device setting import screen

*22 Also available by selecting and right-clicking a component then selecting [Data Model Export].

*23 For the icon file of a component, only the file path is exported. (A file itself is not exported.)

*24 Components and their resources under a selected component are also saved.

*25 The default display language depends on an operating system and package languages. (It is set to English when the language setting of Windows is not Japanese, English, or Simplified Chinese.)

*26 Can be selected only when selecting the checkbox of "Enable Editing Component Hierarchy Tree Window and Resource List Window" in the "Options" screen.
☞ Page 216 Option setting

*27 If the manual is not displayed, refer to the following:
☞ Page 355 Troubleshooting on basic operations

■Toolbar configuration

Character string for the tooltip display	Description
Component Hierarchy Tree Edit[*1]	To display the component tree edit dialog.
Resource List Edit[*1]	To display the resource list edit dialog.

*1 Can be selected only when selecting the checkbox of "Enable Editing Component Hierarchy Tree Window and Resource List Window" in the "Options" screen.
☞ Page 216 Option setting

■Component tree window

The component tree is displayed.

Components are sorted in ascending order of their display names by comparing character strings and displayed in a same hierarchy.

For editing the component tree, refer to the following:

☞ Page 224 Component Tree Edit Function

Point

- A component with the following property items is added to the component tree window at the first startup.
  Component Name: Component
  Component Display Name: Component
  Component Icon: Factory.png
- Clicking the [Find] button in the component tree window displays the "Component Find" screen. For details on the screen items, refer to the following:

☞ Page 233 Searching for a component

- Select and right-click a component while the "Detailed Setting" screen of the one-shot collection function opens, and select [Register to one-shot collection setting: Collect] to register a data tag resource in the selected component as a collection target resource. For details, refer to the following:

☞ Page 269 One-shot Collection Function

■Resource list window

Information on a resource that belongs to a component selected in the component tree window is displayed.

Clicking the header of each column can sort items in ascending or descending order by comparing character strings.

For editing the resource list, refer to the following:

☞ Page 235 Resource List Edit Function

Point

- Clicking the [Find] button in the resource list window displays the "Resource Find" screen. For details on the screen items, refer to the following:

☞ Page 256 Searching for a resource

- Select and right-click a data tag resource while the "Detailed Setting" screen of the one-shot collection function opens, and select [Register to one-shot collection setting: Collect], [Register to one-shot collection setting: Monitor], or [Register to one-shot collection setting: Notify] to register the selected data tag resource as a collection, monitoring, or notification target resource. For details, refer to the following:

☞ Page 269 One-shot Collection Function

■Property window

The contents set in the following properties are displayed.

- Component selected in the component tree window
- Resource selected in the resource list window[1]

[1] When selecting multiple resources in the resource list window, nothing is displayed.

■Data tag resource monitor window

The current value of a registered data tag resource can be monitored and changed.

For monitoring and changing current values of data tag resources, refer to the following:

☞ Page 207 Monitoring and changing current values of data tag resources

Behavior of data model import

In data model import, the behavior differs depending on the format of a file to be imported.

Format	Behavior
DMF format (.dmf)	A data model is imported with specifying an access target device setting to be assigned when importing an external data tag resource.
XML format (.xml)[*1]	A data model is imported without specifying an access target device setting to be assigned when importing an external data tag resource. An access target device setting[*2] in which Dummy Data collector is used is assigned to an external data tag resource to be imported. (☞ Page 327 Dummy Data collector)

*1 For details on the format of an XML format file, contact the Edgecross Consortium.

*2 The following setting names are set to avoid name duplication.
Dev001, Dev002, Dev003, ...

Data model import in XML format files

When importing a data model in an XML format file, replace an assigned access target device setting (Dummy Data collector) with a proper one in the "Target Device Setting Batch Replacement" screen after the import.

☞ Page 217 Access target device setting batch replacement

If there are multiple proper access target device settings, it is recommended to prepare an XML format file for each access target device setting, then import a data model multiple times.

When importing a data model without separating files for each access target device setting, it is necessary to replace the setting with a proper one for each data tag resource after the import.

For a replacement example, refer to the following:

☞ Page 219 Replacement example when importing a data model in an XML format file

Duplicating a data model

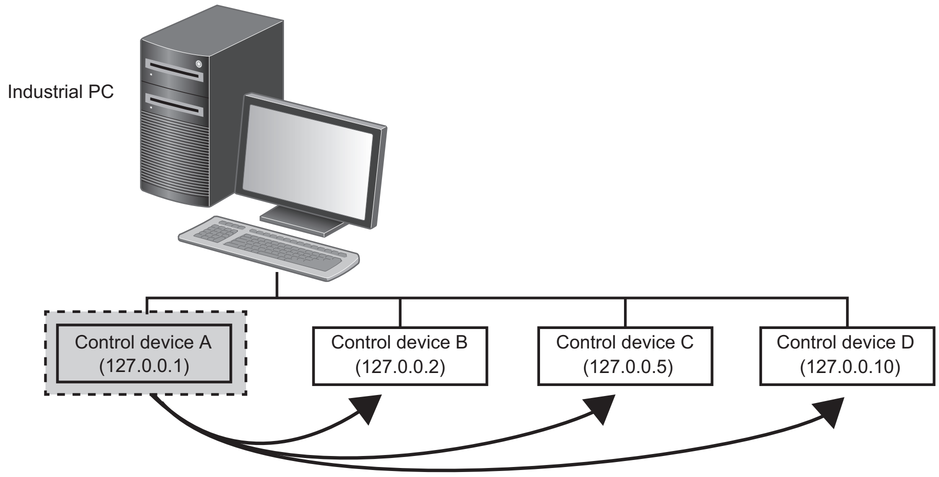
For duplicating a data model, the setting must be changed in the "Target Device setting import" screen according to a data model to create. (☞ Page 203 Target device setting import screen)

The following shows the setting examples in the "Target Device setting import" screen.

Setting example 1

■Data model to create

Data model with a different access target device setting shown below (duplicating a shaded data model)

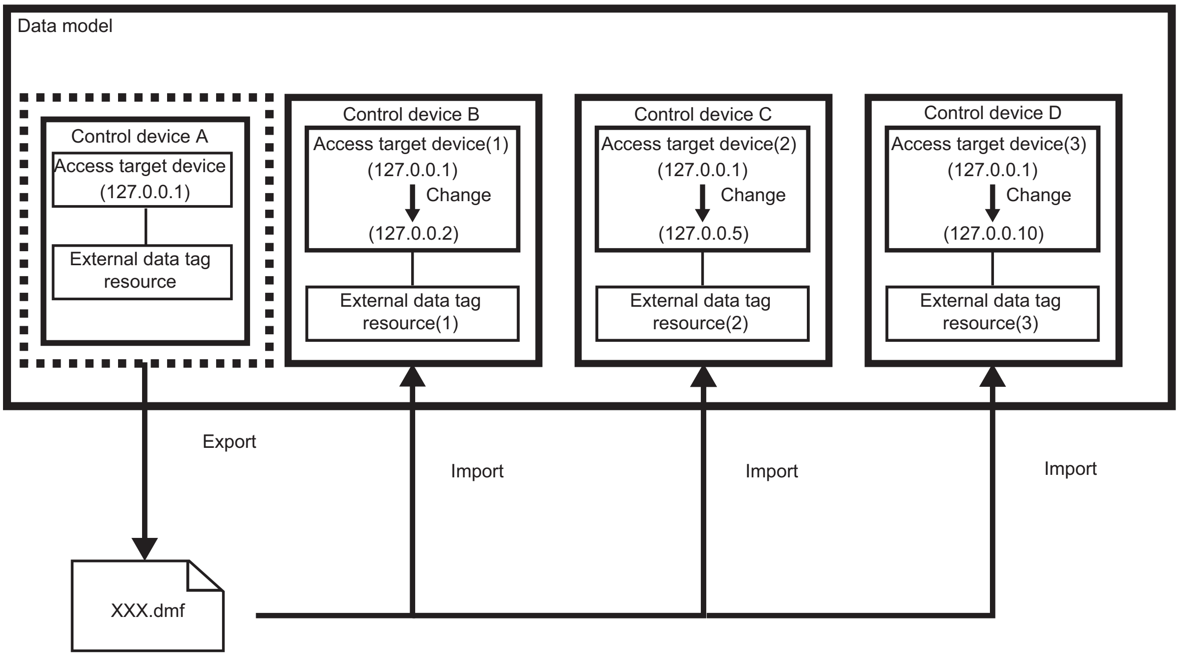


■Setting

Select the checkbox in the "Add" column of an access target device setting. The access target device setting is renamed and imported.

■After import

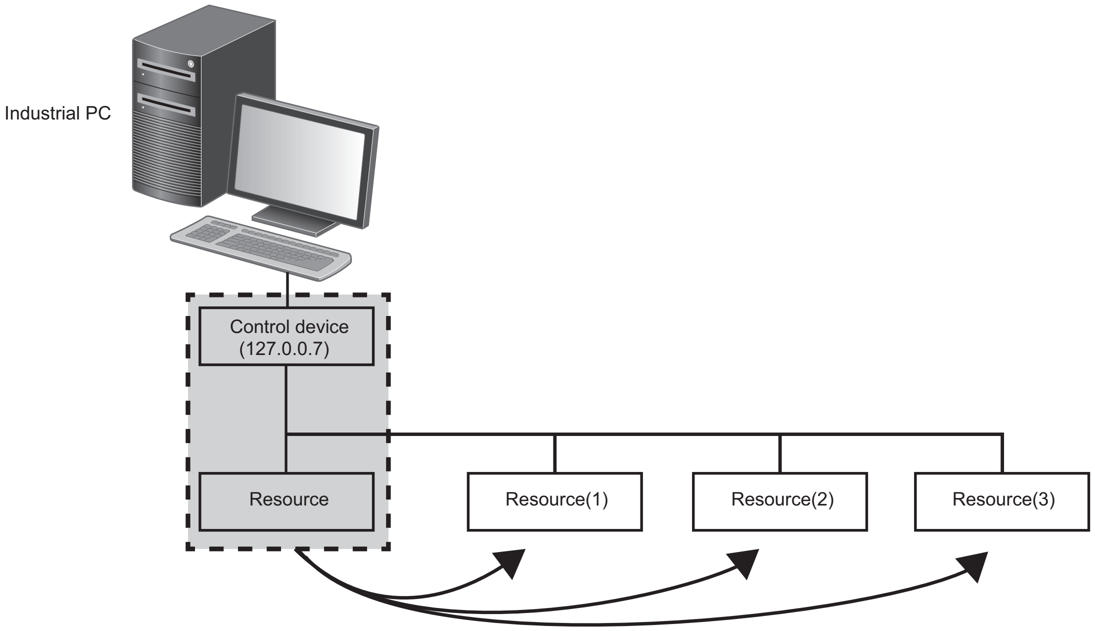
The renamed and imported access target device setting can be edited individually.



Setting example 2

■Data model to create

Data model with the same access target device setting shown below (duplicating a shaded data model)

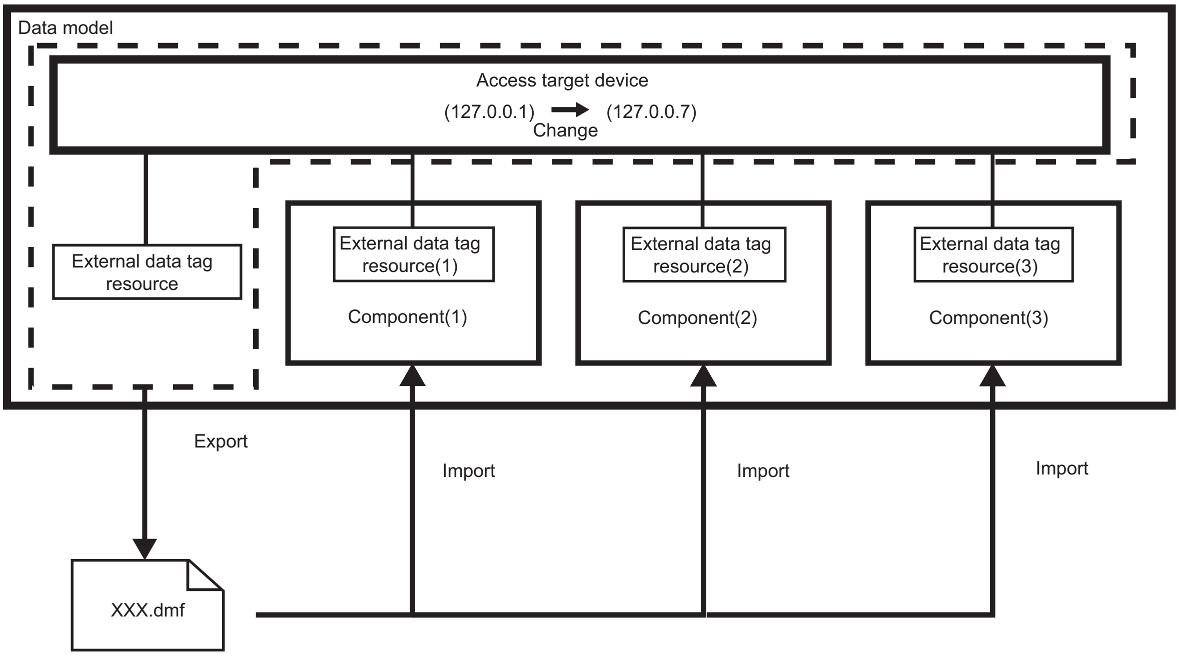


■Setting

Unselect the checkbox in the "Add" column of an access target device setting. A new access target device setting is not imported.

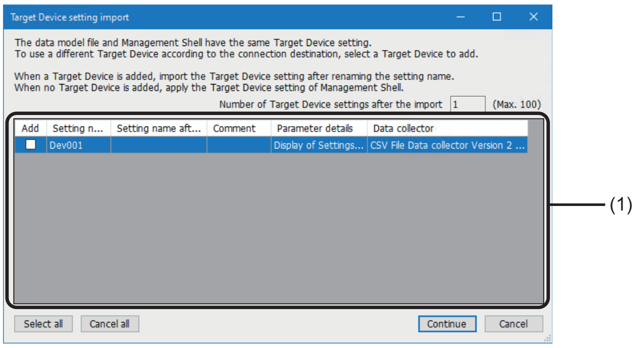
■After import

The access target device setting can be edited for multiple data models in a batch.



Target device setting import screen

Window



The data model file and Management Shell have the same Target Device setting.
To use a different Target Device according to the connection destination, select a Target Device to add.

When a Target Device is added, import the Target Device setting after renaming the setting name.
When no Target Device is added, apply the Target Device setting of Management Shell.

Number of Target Device settings after the import 1 (Max. 100)

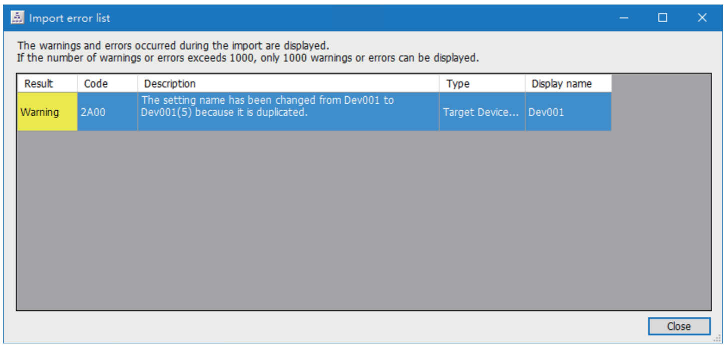
Add	Setting n...	Setting name aft...	Comment	Parameter details	Data collector
☐	Dev001			Display of Settings...	CSV File Data collector Version 2 ...

Displayed items

Item		Description
Number of Target Device settings after the import		The number of access target device settings after import is displayed.
(1) List of duplicate access target device settings	Add	Select the checkbox of an access target device setting to import.
	Setting Name	The name of an access target device setting is displayed.
	Setting name after renamed	When selecting the checkbox of "Add," the name of an access target device setting after import is set in the following format: • "Setting name"(n) n: A number of 1 or more that is set to avoid name duplication with an access target device setting in an import destination.
	Comment	The comment set for an access target device setting is displayed.
	Parameter details	The parameter set for an access target device setting is displayed.
	Data collector	The data collector name, data collector version, and developer of a data collector used for an access target device setting are displayed.
[Select all] button		Click this to select all the checkboxes in the "Add" column of the access target device settings.
[Cancel all] button		Click this to unselect all the checkboxes in the "Add" column of the access target device settings.
[Continue] button		Click this to import a selected access target device setting.

Import error list screen

Window



The warnings and errors occurred during the import are displayed.
If the number of warnings or errors exceeds 1000, only 1000 warnings or errors can be displayed.

Result	Code	Description	Type	Display name
Warning	2A00	The setting name has been changed from Dev001 to Dev001(5) because it is duplicated.	Target Device...	Dev001

Displayed items

Item	Description
Result	"Warning" or "Error" is displayed.
Code	A four-digit code (hexadecimal) indicating a warning or error is displayed. (☞ Page 424 Code List for Data Model Import)
Description	Causes and corrective actions of a warning or error are displayed.
Type	The type of a warning or error is displayed.
Display name	The name of a setting in which a warning or error has occurred is displayed.

Precautions

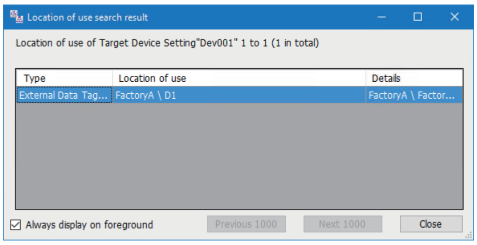
Only 1000 warnings and errors are displayed.

Location of use search result screen

The locations where setting items (access target device settings) are used are displayed in a list.

Window

Select and right-click a row in the "Target Device Setting List" screen, and select [Search of the location of use for Target Device setting].



Location of use of Target Device Setting"Dev001" 1 to 1 (1 in total)

Type	Location of use	Details
External Data Tag...	FactoryA \ D1	FactoryA \ Factor...

☑ Always display on foreground

Displayed items

Refer to the following:

☞ Page 122 Location of use search result screen

Precautions

Refer to the following:

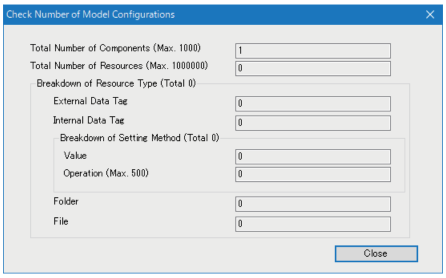
☞ Page 122 Location of use search result screen

"Check Number of Model Configurations" screen

The following shows the screen for displaying the total number and breakdowns of data models (components and resources) registered in Management Shell.

Window

Select [Management Shell] ⇨ [Check Number of Model Configurations].



Total Number of Components (Max. 1000): 1
Total Number of Resources (Max. 1000000): 0
Breakdown of Resource Type (Total 0)
External Data Tag: 0
Internal Data Tag: 0
Breakdown of Setting Method (Total 0)
Value: 0
Operation (Max. 500): 0
Folder: 0
File: 0

Displayed items

Item			Description
Total Number of Components			The total number of components registered in Management Shell is displayed.
Total Number of Resources			The total number of resources registered in Management Shell is displayed.
Breakdown of Resource Type[*1]	External Data Tag		The total number of external data tag resources registered in Management Shell is displayed.
	Internal Data Tag		The total number of internal data tag resources registered in Management Shell is displayed.
	Breakdown of Setting Method[*2]	Value	The total number of internal data tag resources for which "Value" is selected for the setting method is displayed.
		Operation	The total number of internal data tag resources for which "Operation" is selected for the setting method is displayed.
	Folder		The total number of folder resources registered in Management Shell is displayed.
	File		The total number of file resources registered in Management Shell is displayed.

[*1] A numerical value for "Total Number of Resources" is displayed for "Total."

[*2] A numerical value for "Internal Data Tag" is displayed for "Total."

Monitoring and changing current values of data tag resources

Current values of data tag resources registered in a component can be monitored and changed in the data tag resource monitor window.

For the screen configuration of the data tag resource monitor window, refer to the following:

☞ Page 207 Data tag resource monitor window

The data reading function of a data collector is used to monitor current values of data tag resources, and the data writing function is used to change them.

Point

It is necessary to edit the resource list before monitoring and changing current values of data tag resources.

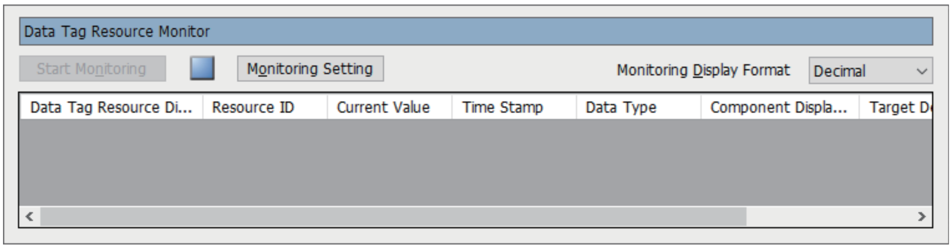
☞ Page 235 Resource List Edit Function

Precautions

When using a data collector that does not support the data writing function, current values cannot be changed.

For details, refer to the manual for a data collector used.

Data tag resource monitor window



Monitoring Display Format: Decimal

Displayed items

Item	Description
[Start Monitoring]/[Stop Monitoring] button	Click this to start or stop monitoring.
[Monitoring Setting] button*1	Click this to change a monitoring update interval.
Monitoring Display Format	Switch "Decimal" or "Hexadecimal" for the display format of a current value.
Data Tag Resource Display Name*2	The resource display name set for a data tag resource is displayed.
Resource ID*3	The resource ID of a data tag resource is displayed.
Current Value*4,*5,*6,*7	The current value of a data tag resource is displayed.
Time Stamp*4,*5,*8,*9	The update date and time of the current value of a data tag resource is displayed (YYYY/MM/DD HH:FF:SS.XXX). • YYYY: Year • MM: Month • DD: Day • HH: Hour • FF: Minute • SS: Second • XXX: Millisecond
Data Type	The data type set for a data tag resource is displayed.
Component Display Name	The display name of a component to which a data tag resource belongs is displayed.
Target Device Setting Name*10	The name of an access target device setting set for a data tag resource is displayed.
Location Parameter*10	The location parameter of a data collector assigned to a data tag resource is displayed.

*1 Cannot be clicked during monitoring.

*2 Displayed in red when "N/A" is displayed in "Current Value."

*3 Hidden when Management Shell Explorer is started.
Can be displayed by right-clicking the column header of the monitoring items and selecting "Resource ID." (☞ Page 210 Switching to show or hide)

*4 "N/A" is displayed while monitoring is stopped.

*5 "N/A" remains displayed until monitoring is started and the current value is updated.

*6 "N/A" is displayed if acquiring a current value fails.

*7 The display order cannot be sorted in ascending or descending order according to this item.

[8] A date and time in the range from 0:00 on January 1st, 1980 to 23:59 on December 31st, 2099 is displayed.

[9] It may be updated at a different timing from a monitoring update interval depending on the performance of a data collector used and the communication status.

[10] "-" is displayed when internal data tag resources are monitored.

Monitoring current values of data tag resources

Current values of data tag resources can be monitored.

■Registering a data tag resource

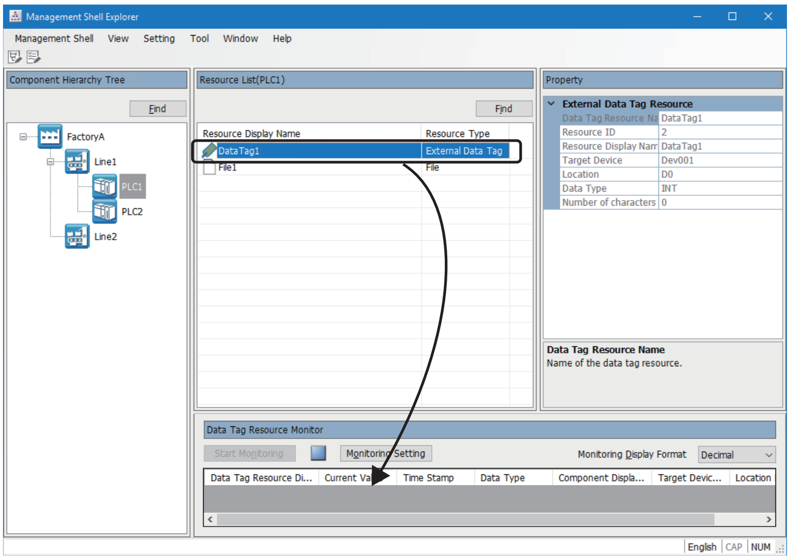
The following shows the procedure for registering a data tag resource in the data tag resource monitor window.

Operating procedure

1. Select a data tag resource in the resource list window[1], and drag and drop it onto the data tag resource monitor window.

[1] Multiple data tag resources can be selected.

The data tag resource is registered, and monitoring starts.



Resource Display Name	Resource Type
DataTag1	External Data Tag
File1	File

External Data Tag Resource

Data Tag Resource Na	DataTag1
Resource ID	2
Resource Display Nam	DataTag1
Target Device	Dev001
Location	D0
Data Type	INT
Number of characters	0

Data Tag Resource Name
Name of the data tag resource.

Point

- Up to 256 data tag resources can be registered in the data tag resource monitor window.
- Data tag resources that belong to different components can also be registered.
- When restarting Management Shell Explorer, the screen opens with the data tag resource that was registered last time registered in the data tag resource monitor window.
- Contents changed in the resource list edit dialog are applied to a data tag resource registered in the data tag resource monitor window when registering a resource in the resource list edit dialog.

■Canceling registration of a data tag resource

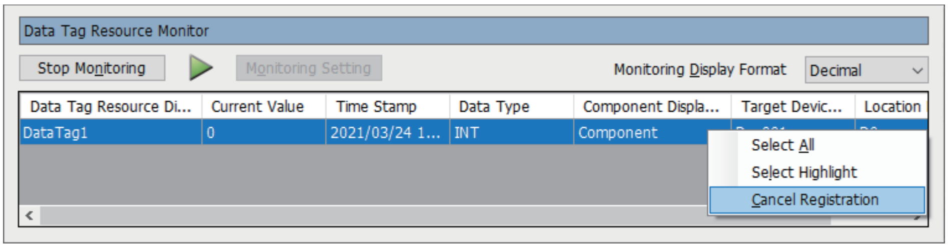
The following shows the procedure for canceling registration of a data tag resource in the data tag resource monitor window.

Operating procedure

1. Select[1] and right-click a data tag resource the registration of which is to be canceled, and select [Cancel Registration].

[1] Multiple data tag resources can be selected.

Registration of the selected data tag resource is canceled.



Data Tag Resource Di...	Current Value	Time Stamp	Data Type	Component Displa...	Target Devic...	Location
DataTag1	0	2021/03/24 1...	INT	Component		

Point

If the registrations of all data tag resources are canceled during monitoring, monitoring will stop.

■Switching to show or hide

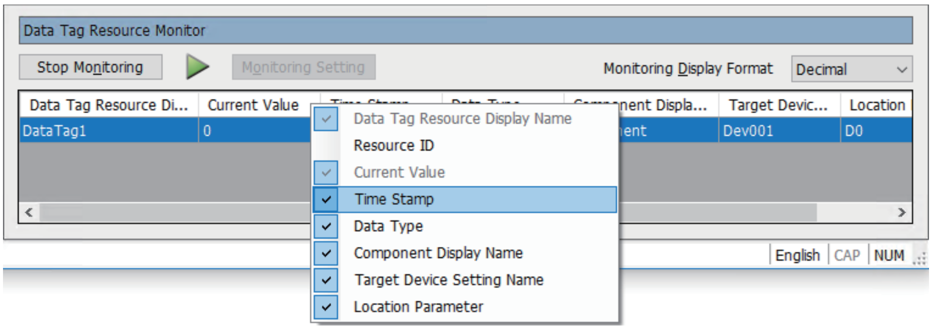
The following shows the procedure for switching the monitoring item column to show or hide.

However, the columns of "Data Tag Resource Display Name" and "Current Value" cannot be hidden.

Operating procedure

1. Right-click the column header of the monitoring items, and unselect the checkbox of a monitoring item to hide.

The monitoring item is switched to hide.



■Switching the display format

The following shows the procedure for switching the display format of a current value (decimal or hexadecimal).

The data types the display format of a current value of which can be switched are as follows:

- INT
- DINT
- LINT
- UINT
- UDINT
- ULINT

For the data types, refer to the following:

☞ Page 544 Data type and value range

Operating procedure

1. Select a display format of the current value for "Monitoring Display Format."

The display format of the current value is switched to the selected one.

Point

- When restarting Management Shell Explorer, it opens with the display format set in decimal.
- Hexadecimal numbers are displayed with zero padding according to the number of bits.
- Negative values in hexadecimal are represented by complements of '2.'

■Changing a monitoring update interval

The following shows the procedure for changing a monitoring update interval.

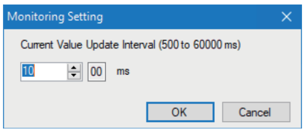
Operating procedure

1. Stop monitoring if it is in progress.

☞ Page 213 Stopping monitoring

2. Click the [Monitoring Setting] button.

3. Set an update interval for "Current Value Update Interval," and click the [OK] button.



Monitoring Setting

Current Value Update Interval (500 to 60000 ms)

10 00 ms

Point

The monitoring update interval is set to 1000 ms by default.

Precautions

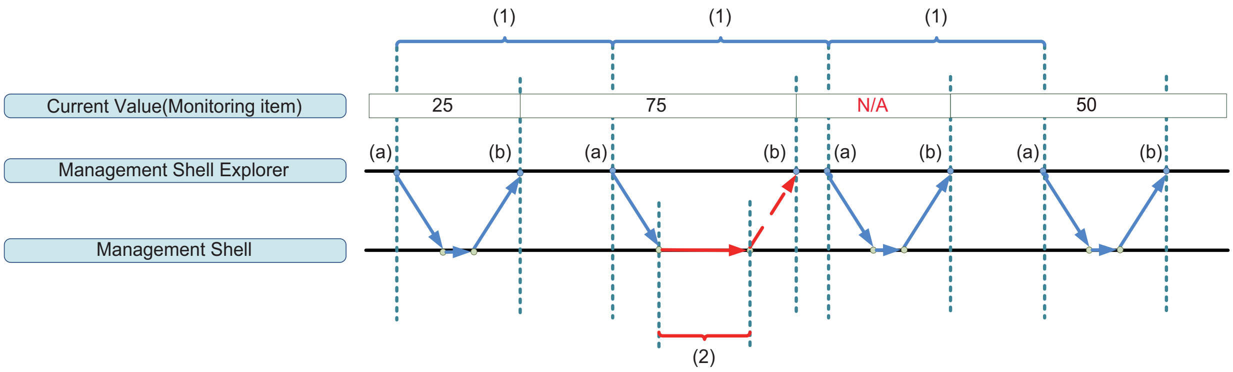
Management Shell Explorer requests Management Shell to provide information on data tag resources (such as current values) for each monitoring update interval, and updates the information in the data tag resource monitor window when receiving the result from Management Shell.

However, if it cannot receive the result from Management Shell within a monitoring update interval due to a timeout[*1] or others, the information in the data tag resource monitor window is not updated and the previous information remains displayed.

[*1] If a response is not returned after 30 seconds elapses, it will be determined as a timeout.

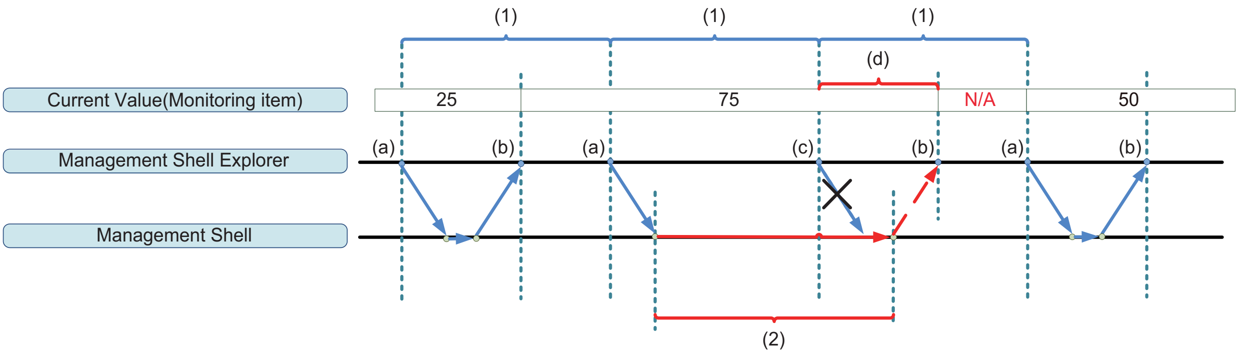
The following shows the flows of updating information in the data tag resource monitor window when a timeout time (30 seconds) is shorter or longer than a monitoring update interval.

- When a timeout time is shorter than a monitoring update interval



(1) Monitoring update interval
(2) Timeout time
(a) Request
(b) Response

- When a timeout time is longer than a monitoring update interval



(1) Monitoring update interval
(2) Timeout time
(a) Request
(b) Response
(c) Management Shell Explorer does not send a request because it does not receive the response result from Management Shell.
(d) Information in the data tag resource monitor window is not updated.

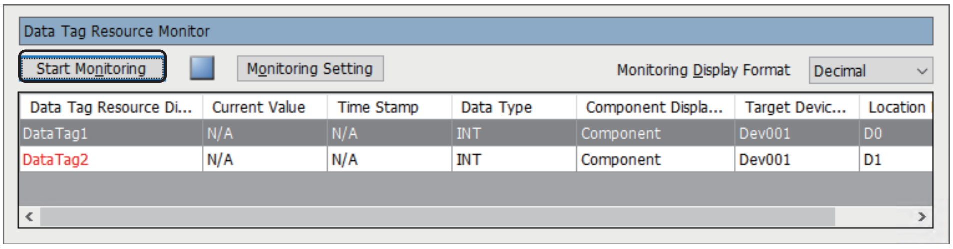
■Starting monitoring

The following shows the procedure for starting monitoring when it is stopped.

Operating procedure

1. Click the [Start Monitoring] button.

Monitoring a registered data tag resource is started, and current data is displayed for each monitoring item.



Data Tag Resource Di...	Current Value	Time Stamp	Data Type	Component Displa...	Target Devic...	Location
DataTag1	N/A	N/A	INT	Component	Dev001	D0
DataTag2	N/A	N/A	INT	Component	Dev001	D1

Point

- When a data tag resource registered in the data tag resource monitor window is deleted in the resource list edit dialog, it is also deleted from the data tag resource monitor window. If all of them are deleted, monitoring stops.
- When restarting Management Shell Explorer, the screen opens with monitoring stopped.

Precautions

If any of the following operations is performed during monitoring, monitoring will stop.

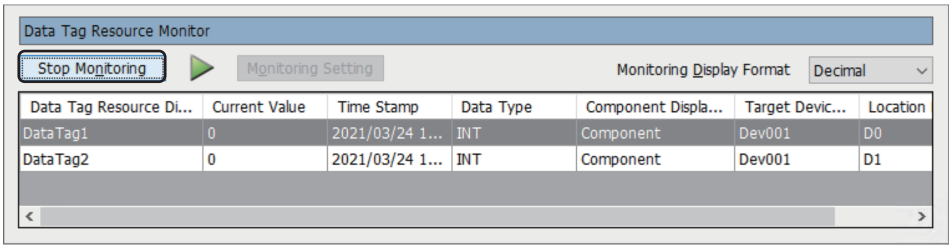
- [Management Shell Stop]
- [Import]
- [Delete All]
- OPC UA server setting (☞ Page 261 Setting an OPC UA server)

■Stopping monitoring

The following shows the procedure for stopping monitoring while the monitoring is in progress.

Operating procedure

1. Click the [Stop Monitoring] button.



Data Tag Resource Di...	Current Value	Time Stamp	Data Type	Component Displa...	Target Devic...	Location
DataTag1	0	2021/03/24 1...	INT	Component	Dev001	D0
DataTag2	0	2021/03/24 1...	INT	Component	Dev001	D1

Point

- "N/A" is displayed in "Current Value" and "Time Stamp" while monitoring is stopped.
- When restarting Management Shell Explorer, the screen opens with monitoring stopped.

Changing current values of data tag resources

Current values of data tag resources being monitored can be changed.

However, they cannot be changed while monitoring is stopped.

Operating procedure

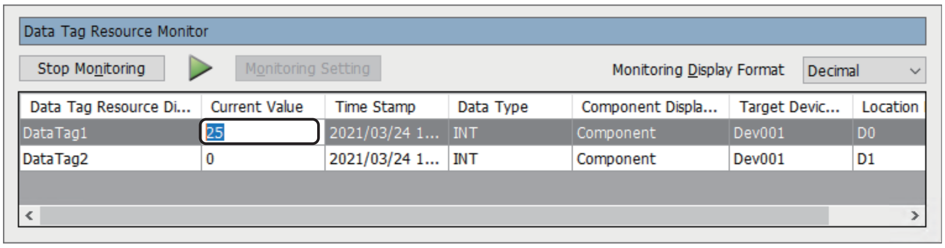
1. Select and click a cell in "Current Value" of a data tag resource.

2. Change the current value of the data tag resource.

A range of values that can be entered for the current value depends on each data type.

For details, refer to the following:

☞ Page 215 Range of available values



Monitoring Display Format: Decimal

Data Tag Resource Di...	Current Value	Time Stamp	Data Type	Component Displa...	Target Devic...	Location
DataTag1	25	2021/03/24 1...	INT	Component	Dev001	D0
DataTag2	0	2021/03/24 1...	INT	Component	Dev001	D1

Precautions

If a response is not returned after 30 seconds elapses, it will be determined as a timeout and an error message will appear.

■Range of available values

The following table shows the ranges of values that can be entered for each data type.

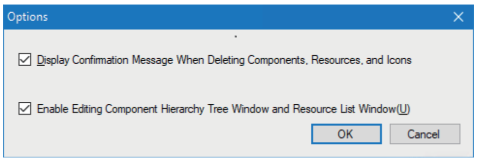
Data type	Range of available values
BOOL	0, 1
INT	• For a display format in decimal -32768 to 32767 • For a display format in hexadecimal H8000 to H7FFF
UINT	• For a display format in decimal 0 to 65535 • For a display format in hexadecimal H0000 to HFFFF
DINT	• For a display format in decimal -2147483648 to 2147483647 • For a display format in hexadecimal H8000 0000 to H7FFF FFFF
UDINT	• For a display format in decimal 0 to 4294967295 • For a display format in hexadecimal H0000 0000 to HFFFF FFFF
LINT	• For a display format in decimal -9223372036854775808 to 9223372036854775807 • For a display format in hexadecimal H8000 0000 0000 0000 to H7FFF FFFF FFFF FFFF
ULINT	• For a display format in decimal 0 to 18446744073709551615 • For a display format in hexadecimal H0000 0000 0000 0000 to HFFFF FFFF FFFF FFFF
REAL	0, ±1.401298E-45 to ±3.402823E+38 (number of significant digits: 7)
LREAL	0, ±4.94065645841247E-324 to ±1.79769313486231E+308 (number of significant digits: 15)
STRING	ASCII (0 to 32 characters)
WSTRING	UTF-16LE (0 to 16 characters)

Option setting

The following shows the procedure for setting options when using Management Shell Explorer.

Operating procedure

1. Select [Tool] ⇨ [Option].
2. Select the checkbox of an option item, and click the [OK] button.



☑ Display Confirmation Message When Deleting Components, Resources, and Icons

☑ Enable Editing Component Hierarchy Tree Window and Resource List Window(U)

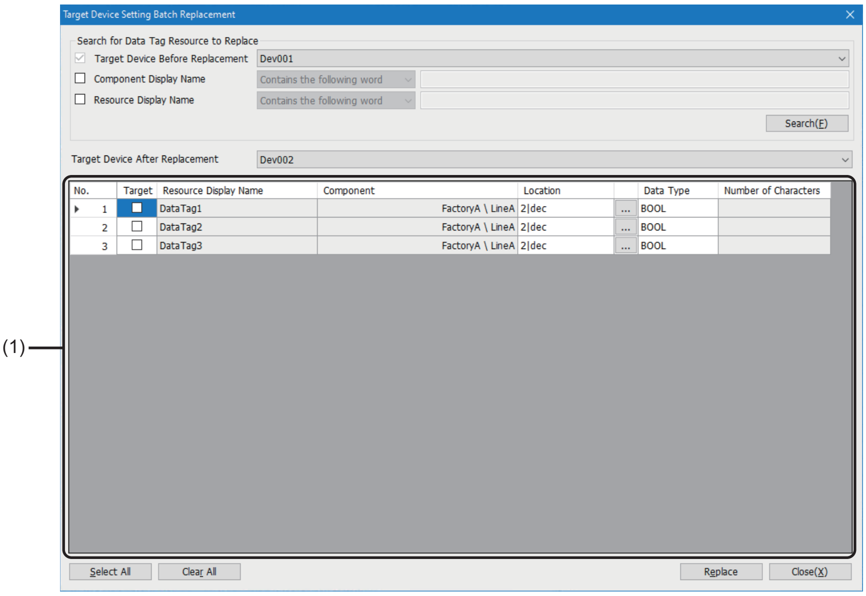
Item	Description
Display Confirmation Message When Deleting Components, Resources, and Icons	Set whether to display a confirmation message when deleting a resource or others.
Enable Editing Component Hierarchy Tree Window and Resource List Window	Set whether to enable component tree editing or resource list editing.

Access target device setting batch replacement

The following shows the screen for replacing access target device settings to configure for a data tag resource in a batch.

Window

Select [Tool] ⇨ [Target Device Setting Batch Replacement].



Search for Data Tag Resource to Replace

☑ Target Device Before Replacement: Dev001

☐ Component Display Name: Contains the following word

☐ Resource Display Name: Contains the following word

Target Device After Replacement: Dev002

No.	Target	Resource Display Name	Component	Location		Data Type	Number of Characters
1	☐	DataTag1	FactoryA \ LineA	2|dec	...	BOOL	
2	☐	DataTag2	FactoryA \ LineA	2|dec	...	BOOL	
3	☐	DataTag3	FactoryA \ LineA	2|dec	...	BOOL	

Displayed items

Item		Description
Search for Data Tag Resource to Replace	Target Device Before Replacement	Select the setting name of an access target device setting before replacement.
	Component Display Name	Select the checkbox to search for a data tag resource by using its component display name, and specify a search condition and search character string (up to 64 characters)[*1].
	Resource Display Name	Select the checkbox to search for a data tag resource by using its resource display name, and specify a search condition and search character string (up to 64 characters)[*1].
	[Search] button	Click this to search for a data tag resource under a specified condition.
Target Device After Replacement[*2]		Select the setting name of an access target device setting after replacement.
(1) Data tag resource list	—	The list of found data tag resources is displayed.
	Target[*3]	Select the checkbox of a data tag resource for replacement.
	Resource Display Name	The resource display name of a data tag resource is displayed.
	Component	The path to a component display name to which the data tag resource belongs is displayed.
	Location[*3]	Set the location of a data collector (up to 300 characters). Location parameters can be set in the "Location Setting" screen displayed by clicking the [...] button depending on an access target device setting (data collector) selected for "Target Device After Replacement."[*4] For details on the setting method, refer to the manual for a data collector used.
	Data Type[*3]	Set the data type of a data tag resource.[*5]
	Number of Characters[*3]	When setting "STRING" or "WSTRING" for "Data Type," set the number of characters within the following ranges: • STRING: 1 to 32 • WSTRING: 1 to 16
[Select All] button[*3]		Click this to select the checkboxes of all data tag resources in the list.
[Clear All] button[*3]		Click this to unselect the checkboxes of all data tag resources in the list.

Item	Description
[Replace] button[3]	Click this to update the following information of a data tag resource with its checkbox selected in the "Target" column with set contents. • Access target device • Location • Data type • Number of characters

[1] Not case-sensitive

[2] Can be selected when one or more data tag resources are displayed in the data tag resource list.

[3] Can be set or clicked when selecting an access target device setting for "Target Device After Replacement."

[4] The "Location Setting" screen does not appear when using a data collector for which location parameters cannot be set in the screen.

[5] A displayed data type differs depending on an access target device setting (data collector) selected for "Target Device After Replacement."

Replacement example when importing a data model in an XML format file

When importing a data model in an XML format file, replace an assigned access target device setting (Dummy Data collector) with a proper one in the "Target Device Setting Batch Replacement" screen after the import. (☞ Page 200 Behavior of data model import)

If there are multiple proper access target device settings, it is recommended to prepare an XML format file for each access target device setting, then import a data model multiple times.

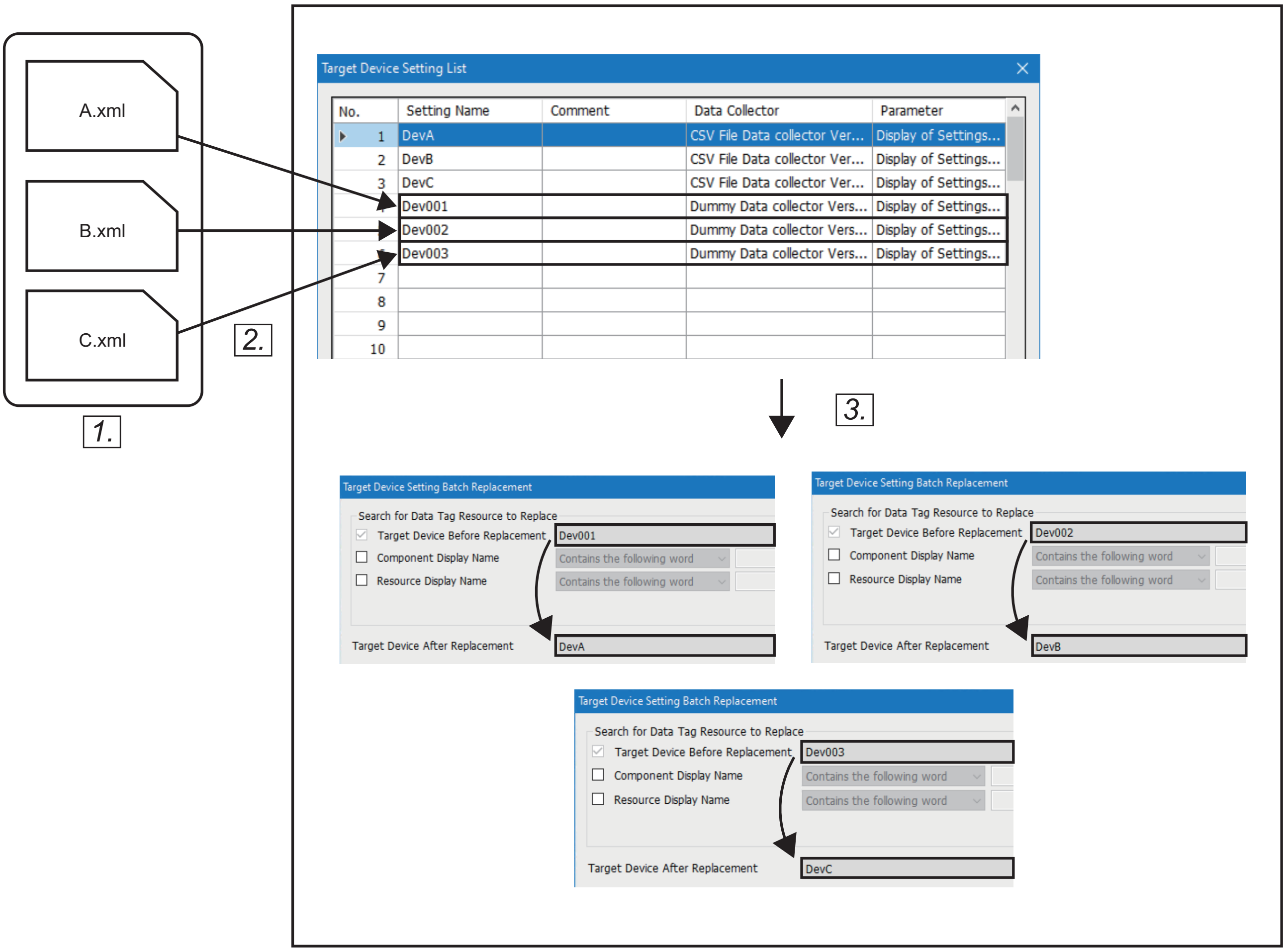
When importing a data model without separating files for each access target device setting, it is necessary to replace the setting with a proper one for each data tag resource after the import.

Ex.

When there are three access target device settings A, B, and C after replacement:

Prepare three XML format files for access target device settings A, B, and C, and import a data model three times.

Then, specify each of three assigned access target device settings (Dummy Data collector) for "Target Device Before Replacement" in the "Target Device Setting Batch Replacement" screen to replace them with any of the access target device settings A, B, or C. (Three replacement operations are required.)



Target Device Setting List

No.	Setting Name	Comment	Data Collector	Parameter
1	DevA		CSV File Data collector Ver...	Display of Settings...
2	DevB		CSV File Data collector Ver...	Display of Settings...
3	DevC		CSV File Data collector Ver...	Display of Settings...
4	Dev001		Dummy Data collector Vers...	Display of Settings...
5	Dev002		Dummy Data collector Vers...	Display of Settings...
6	Dev003		Dummy Data collector Vers...	Display of Settings...
7				
8				
9				
10				

Target Device Setting Batch Replacement

Search for Data Tag Resource to Replace
☑ Target Device Before Replacement: Dev001
☐ Component Display Name: Contains the following word
☐ Resource Display Name: Contains the following word
Target Device After Replacement: DevA

Target Device Setting Batch Replacement

Search for Data Tag Resource to Replace
☑ Target Device Before Replacement: Dev002
☐ Component Display Name: Contains the following word
☐ Resource Display Name: Contains the following word
Target Device After Replacement: DevB

Target Device Setting Batch Replacement

Search for Data Tag Resource to Replace
☑ Target Device Before Replacement: Dev003
☐ Component Display Name: Contains the following word
☐ Resource Display Name: Contains the following word
Target Device After Replacement: DevC

1. Prepare three XML format files (A.xml, B.xml, and C.xml) for access target device settings A, B, and C.
2. Import a data model three times. (Access target device settings (Dummy Data collector) Dev001, Dev002, and Dev003 are generated.)
3. Replace each of three assigned access target device settings (Dummy Data collector) with any of the access target device settings A, B, or C. (Perform a replacement operation three times.)

7.3 Access Target Device Setting Function

This section shows the function to select data collectors to use and set access target devices by using Management Shell Explorer.

For the timing when a data collector connects to, disconnects from, and reconnects to an access target device, refer to the following:

☞ Page 191 Connection to, disconnection from, and reconnection to an access target device

Operating procedure

1. Select [Setting] ⇨ [Target Device Setting].

The "Target Device Setting List" screen appears. (☞ Page 220 Access target device setting list screen)

2. Select a row in which the access target device setting is not configured in the access target device setting list, and click the [Edit] button.

The "Select Data collector" screen appears. (☞ Page 222 Data collector selection screen)

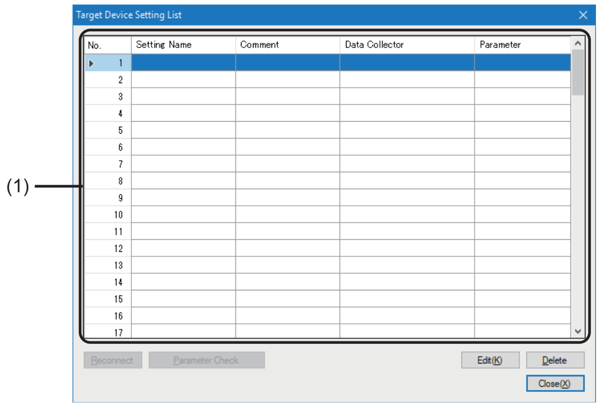
Point

When selecting a row in which the access target device setting is configured, the "Target Device Setting" screen appears instead of the "Select Data collector" screen.

3. Select a data collector to use in the "Select Data collector" screen, and click the [OK] button.

The "Target Device Setting" screen appears. (☞ Page 223 Access target device setting screen)

Access target device setting list screen



Displayed items

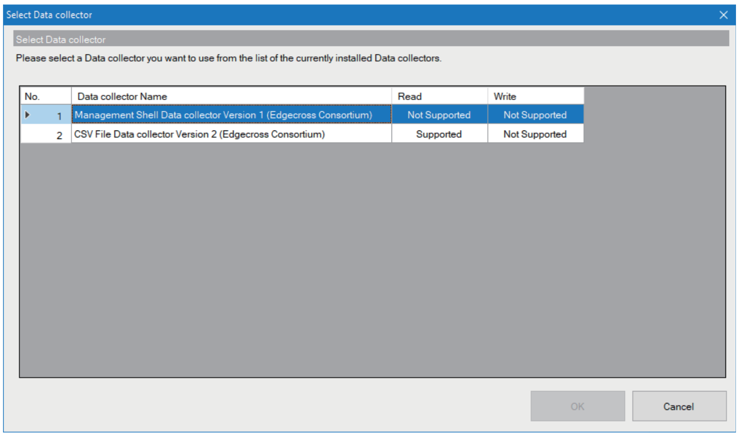
Item		Description
(1) Access target device setting list[*1]	Setting Name	The name of an access target device set in the "Target Device Setting" screen is displayed.
	Comment	A comment set in the "Target Device Setting" screen is displayed.
	Data Collector	The name of a data collector set in the "Target Device Setting" screen is displayed.
	Parameter	Communication parameters of a data collector set in the "Target Device Setting" screen are displayed.
[Reconnect] button		Click this to restart a data collector set in the access target device setting of a selected row and reconnect to the access target device.
[Parameter Check] button		Click this to check the consistency of the location of an external data tag resource linked to the access target device setting of a selected row.
[Edit] button		Click this to display the "Select Data collector" screen when selecting a row in which the access target device setting is not configured. ☞ Page 222 Data collector selection screen Click this to display the "Target Device Setting" screen when selecting a row in which the access target device setting is configured. ☞ Page 223 Access target device setting screen

Item	Description
[Delete] button	Click this to delete the setting of a selected row.

*1 An external data tag resource in which the access target device setting of a selected row is used can be checked in the "Location of use search result" screen displayed by selecting and right-clicking the row then selecting [Search of the location of use for Target Device setting].

☞ Page 205 Location of use search result screen

Data collector selection screen



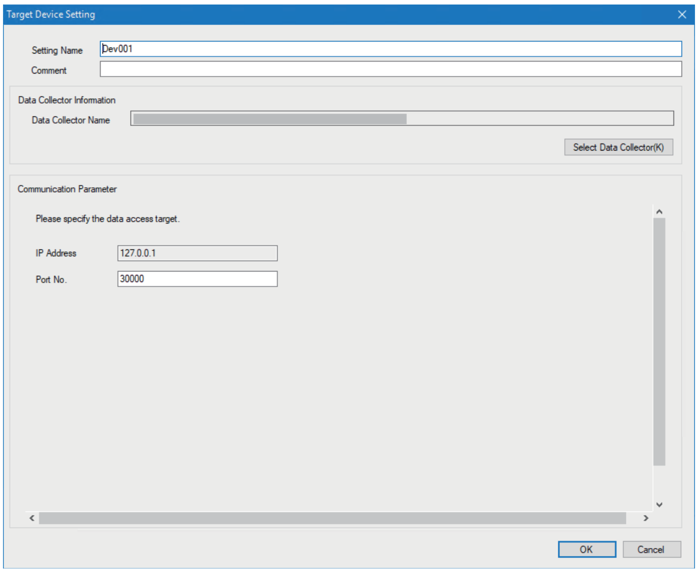
Please select a Data collector you want to use from the list of the currently installed Data collectors.

No.	Data collector Name	Read	Write
1	Management Shell Data collector Version 1 (Edgecross Consortium)	Not Supported	Not Supported
2	CSV File Data collector Version 2 (Edgecross Consortium)	Supported	Not Supported

Displayed items

Item	Description
Data Collector Name	A data collector name, version, and developer are displayed.
Read	The availability of data reading in a data collector is displayed. • Supported: Readable • Not Supported: Unreadable
Write	The availability of data writing in a data collector is displayed. • Supported: Writable • Not Supported: Unwritable
[OK] button	Click this to display the "Target Device Setting" screen. ☞ Page 223 Access target device setting screen

Access target device setting screen



Target Device Setting

Setting Name: Dev001

Comment:

Data Collector Information

Data Collector Name:

Communication Parameter

Please specify the data access target.

IP Address: 127.0.0.1

Port No.: 30000

Displayed items

Item		Description
Setting Name[*1]		Set the name of an access target device setting (1 to 32 characters). • The following are displayed to avoid name duplication by default. Dev001, Dev002, Dev003, ...
Comment		Set a comment (up to 100 characters).
Data Collector Information	Data Collector Name	The name of a data collector set in the "Select Data collector" screen is displayed.
	[Select Data Collector] button[*2]	Click this to display the "Select Data collector" screen. ☞ Page 222 Data collector selection screen
Communication Parameter		Set communication parameters. For details, refer to the manual for a data collector used.

[*1] The same name as that of an access target device setting already set cannot be used.

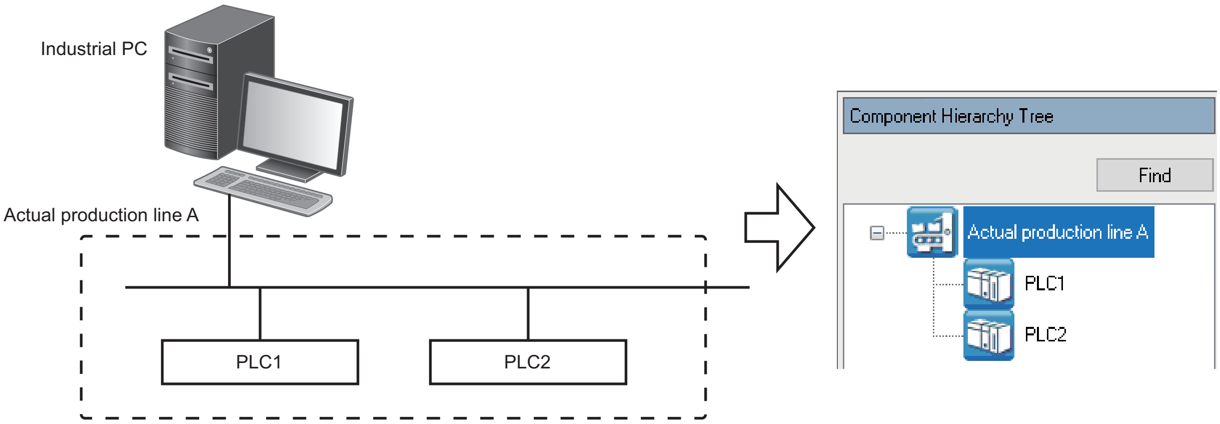
[*2] Appears when opening the "Target Device Setting" screen by performing the following operation.
Click the [Edit] button in the "Target Device Setting List" screen.

7.4 Component Tree Edit Function

This section shows the function to edit components or change the hierarchical structure of a component by using Management Shell Explorer.

A component is created by default when starting Management Shell Explorer for the first time.

A hierarchical relation same as an actual production line can be displayed and managed in a tree.



Components can be edited and the hierarchical structure of a component can be changed in the component tree edit dialog.

The following shows the procedure for displaying the component tree edit dialog.

Operating procedure

1. Select [Window] ⇨ [Component Hierarchy Tree Edit].

Configuration element of a component

A component consists of the following elements.

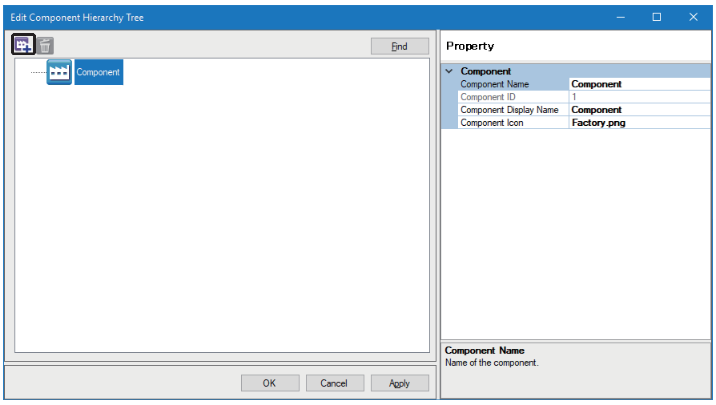
Element	Description
Property	The property of a component. For editing properties, refer to the following: ☞ Page 226 Editing component properties
Resource list	Resources managed by a component. For editing resources, refer to the following: ☞ Page 235 Resource List Edit Function

Adding a component

The following shows the procedure for adding a component to the hierarchy one level below a selected component.

Operating procedure

1. Select a component, then select the icon for adding a component (⊞).



Property

Component	
Component Name	Component
Component ID	1
Component Display Name	Component
Component Icon	Factory.png

Component Name
Name of the component.

Point

When adding a new component, the component display name is displayed in red.

Precautions

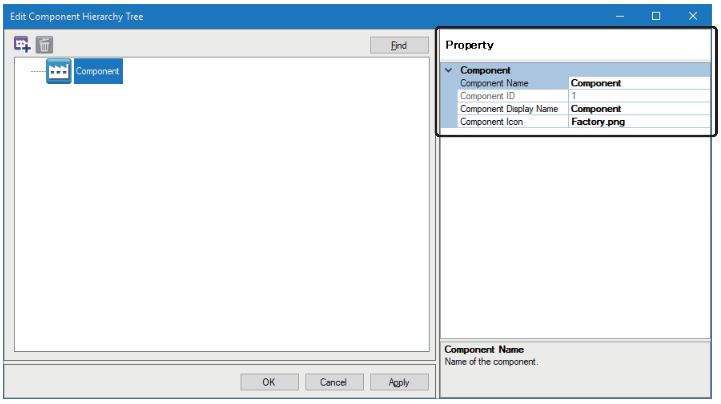
- This function will not be performed if the maximum number of components or the maximum number of hierarchies of a component is exceeded.
- If components with the same component display name exist in the same hierarchy, the display order may differ between the component tree window and the component tree edit dialog. In this case, check the component name in the property window before operation.

Editing component properties

The following shows the procedure for editing the property of a created component.

Operating procedure

1. Select a component, and edit each item in the property.



Property

Component

Component Name	Component
Component ID	1
Component Display Name	Component
Component Icon	Factory.png

Component Name
Name of the component.

Item	Setting content
Component Name[*1]	Set the name of a component (up to 32 characters). When adding a component, the following are displayed to avoid name duplication by default. Component1, Component2, Component3, ...
Component ID[*2]	The ID of a component is displayed (not editable). An ID is automatically assigned when registering a component.
Component Display Name	Set the display name of a component (up to 64 characters). When adding a component, "New Component" is displayed by default. However, if there is another component with the component display name of "New Component" in a same hierarchy, the following are displayed to avoid name duplication. New Component (1), New Component (2), New Component (3), ...
Component Icon	Set the path of an icon file that represents a component (up to 255 characters including the extension). An icon file can be selected in the "Icon Setting" screen displayed by clicking the [...] button. It can also be added and deleted in the "Icon Setting" screen. ☞ Page 227 Adding an icon, Page 227 Deleting an icon

*1 Used to identify a component.

*2 Used for referencing Management Shell from an edge application.

Point

When editing a property item of a component, the component display name is displayed in red.

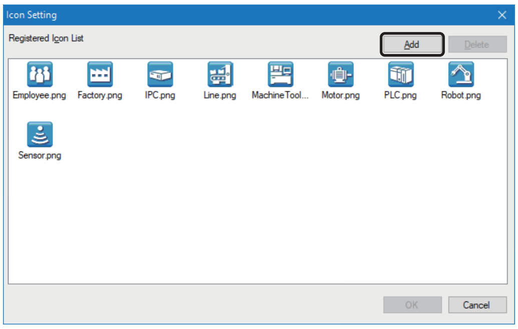
Precautions

If a file set for "Component Icon" does not exist in '(installation destination of Edgecross Basic Software)\Management Shell\Explorer\icon,' it is displayed as the following icon.

■Adding an icon

Operating procedure

1. Click the [Add] button.



2. Select an icon to add.

Point

- File names are not case-sensitive.
- An icon file with the extension .bmp, .png, .jpg, .gif, or .ico can be added.
- Up to 247 icon files can be added.

Precautions

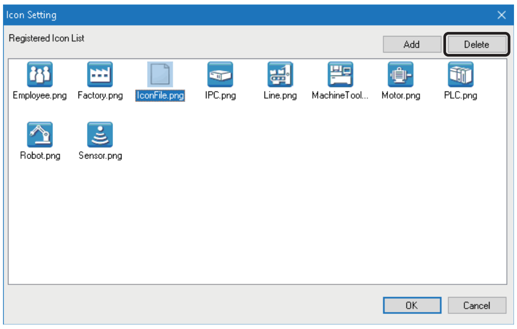
- Be sure to add icons in the "Icon Setting" screen.
- An icon file in a shared folder cannot be added.
- If selecting an icon file with a same name as an icon[*1] already registered, the existing file will be overwritten.

*1 Excluding the icons provided by default.

■Deleting an icon

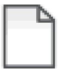
Operating procedure

1. Select an icon file, and click the [Delete] button.



Precautions

- Be sure to delete icons in the "Icon Setting" screen.
- Icons provided by default cannot be deleted.
- If the icon of a component being used is deleted, the component will be displayed with the following icon. However, the content of "Component Icon" that is a property item of the component are not changed.

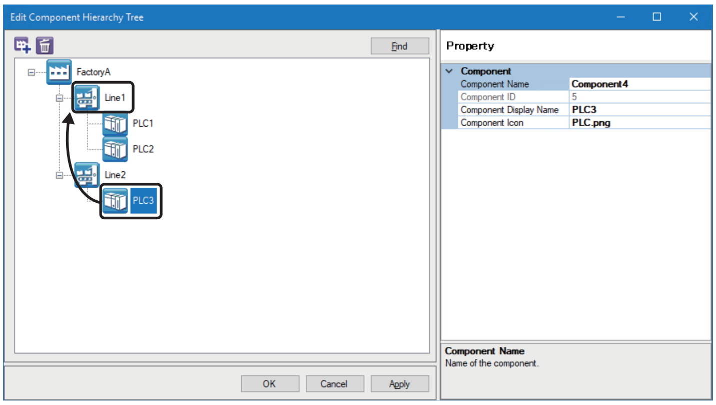


Moving a component

The following shows the procedure for moving a component.

Operating procedure

1. Select a component, and drag and drop it onto a move destination component.



Component
Component Name: Component4
Component ID: 5
Component Display Name: PLC3
Component Icon: PLC.png

Component Name
Name of the component.

Point

The component in the hierarchy under a selected component is also moved at the same time.

Precautions

If the component display name or component name of a moved component overlaps with one in a same hierarchy, each name of the moved component is displayed as follows:

- Component display name (XXX)
- Component name_XXX

XXX is numbered in order from 1 to avoid name duplication in the same hierarchy. However, if the number of characters in the name including (XXX) or _XXX exceeds its maximum number, the component cannot be moved.

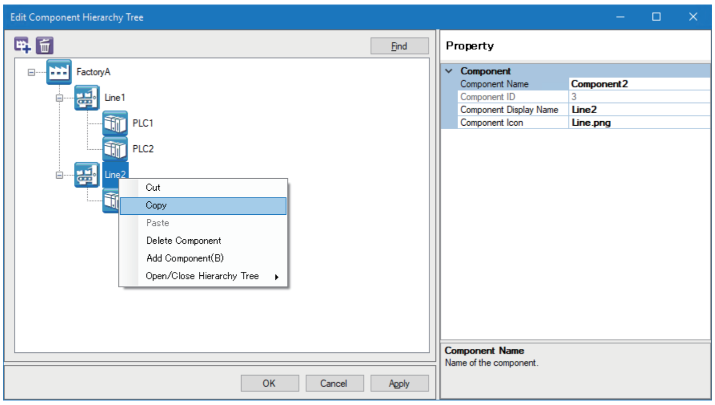
Copying a component

The following shows the procedure for copying a component.

Operating procedure

1. Select and right-click a component, and select [Copy].

A selected component is copied to the clipboard.



Component	
Component Name	Component2
Component ID	3
Component Display Name	Line2
Component Icon	Line.png

Component Name
Name of the component.

Point

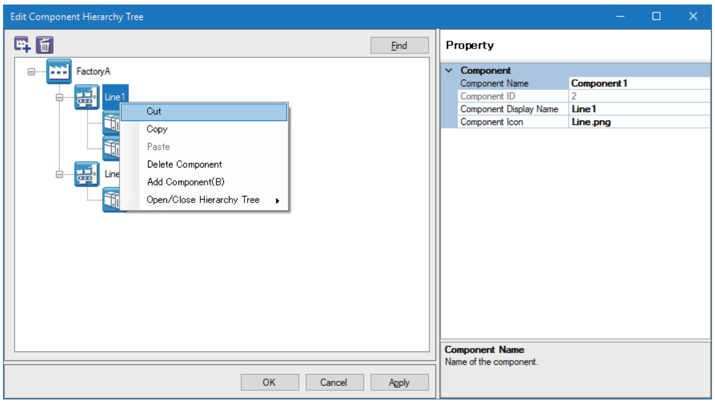
The component in the hierarchy under a selected component is also copied at the same time.

Cutting a component

The following shows the procedure for cutting a component.

Operating procedure

1. Select and right-click a component, and select [Cut].



Component	
Component Name	Component1
Component ID	2
Component Display Name	Line1
Component Icon	Line.png

Component Name
Name of the component.

Point

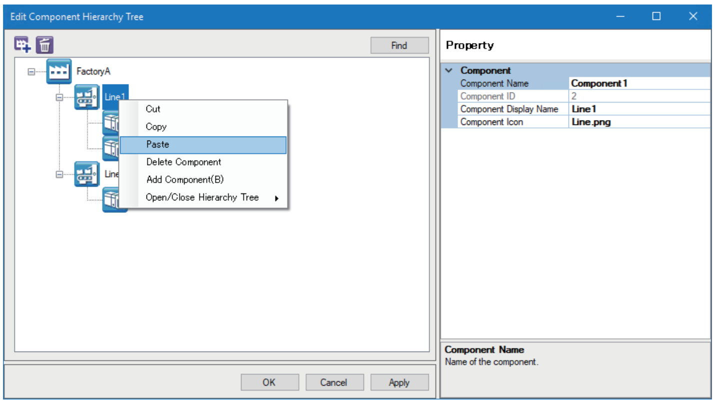
- The component in the hierarchy under a selected component is also cut at the same time.
- A cut component is shaded, and deleted after pasted.

Pasting a component

The following shows the procedure for pasting a copied or cut component to a hierarchy under another component.

Operating procedure

1. Select and right-click a component, and select [Paste].



Component	
Component Name	Component1
Component ID	2
Component Display Name	Line1
Component Icon	Line.png

Component Name
Name of the component.

Precautions

If the component display name or component name of a pasted component overlaps with one in a same hierarchy, each name of the pasted component is displayed as follows:

- Component display name (XXX)
- Component name_XXX

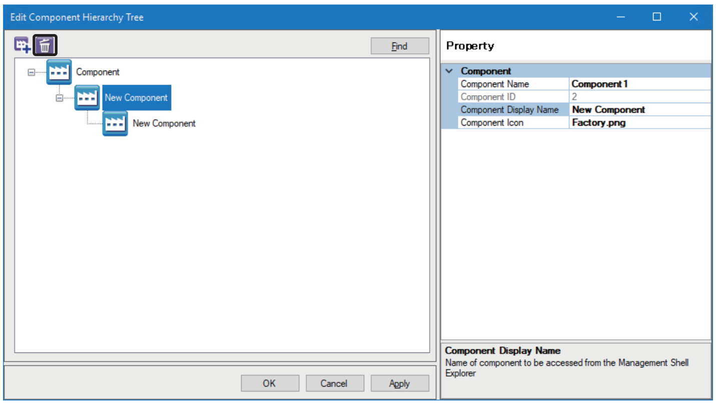
XXX is numbered in order from 1 to avoid name duplication in the same hierarchy. However, if the number of characters in the name including (XXX) or _XXX exceeds its maximum number, the component cannot be pasted.

Deleting a component

The following shows the procedure for deleting a component.

Operating procedure

1. Select a component, then select the icon for deleting a component (🗑).



Component	
Component Name	Component 1
Component ID	2
Component Display Name	New Component
Component Icon	Factory.png

Component Display Name
Name of component to be accessed from the Management Shell Explorer

Point

The component in the hierarchy under a selected component is also deleted.

Precautions

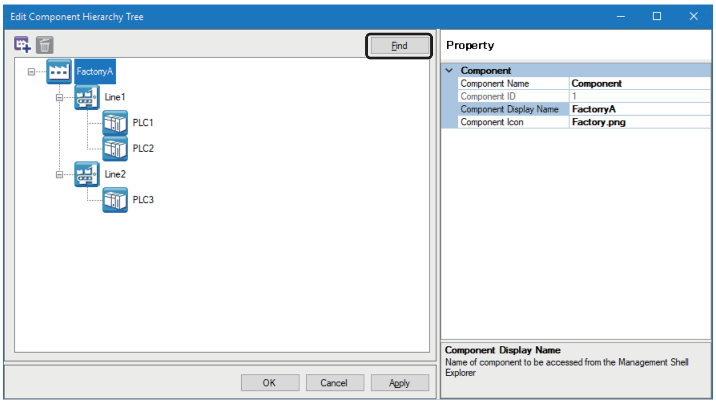
The top component cannot be deleted.

Searching for a component

The following shows the procedure for searching for a component.

Operating procedure

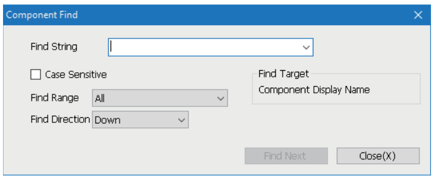
1. Click the [Find] button.



Component
Component Name: Component
Component ID: 1
Component Display Name: FactoryA
Component Icon: Factory.png

Component Display Name
Name of component to be accessed from the Management Shell Explorer

2. Enter a search character string for "Find String" (up to 64 characters).



Find String:
☐ Case Sensitive
Find Range: All
Find Direction: Down
Find Target: Component Display Name

3. Set search options as necessary, and click the [Find Next] button.

Item	Setting content
Case Sensitive	Select the checkbox to distinguish between upper-case and lower-case characters included in a search character string.
Find Range	Specify a range to search for a component. • All: The entire component tree is searched. • Below Selected Hierarchy: A selected component and one(s) in its hierarchy are searched.
Find Direction[*1]	Select a direction to search for a component. • Down: Components are searched downward from a selected one. • Up: Components are searched upward from a selected one.

[*1] When selecting "Below Selected Hierarchy" for "Find Range," only "Down" can be selected.

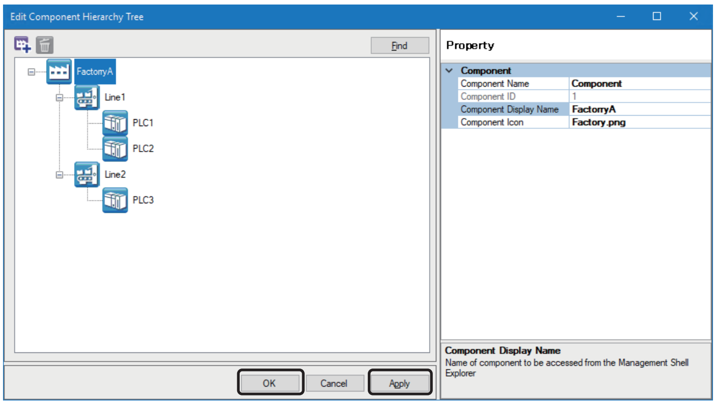
Registering a component

The following shows the procedure for registering the component tree that is edited.

Operating procedure

1. Click the [OK] or [Apply] button.

A registered component tree appears in the component tree window.



Component

Component Name	Component
Component ID	1
Component Display Name	FactoryA
Component Icon	Factory.png

Component Display Name

Name of component to be accessed from the Management Shell Explorer

Point

- When clicking the [Apply] button, the component tree edit dialog does not close even after registration.
- After registration, components are sorted in ascending order of their display names by comparing character strings and displayed in a same hierarchy.

7.5 Resource List Edit Function

This section shows the function to edit resources managed by a component by using Management Shell Explorer.

The resource list can be edited in the resource list edit dialog.

The following shows the procedure for displaying the resource list edit dialog.

Operating procedure

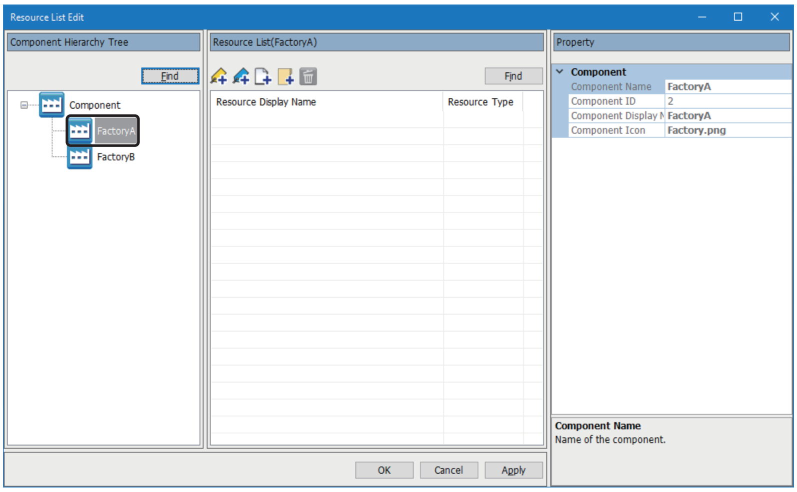
1. Select [Window] ⇨ [Resource List Edit].

Adding a data tag resource

The following shows the procedure for adding a data tag resource.

Operating procedure

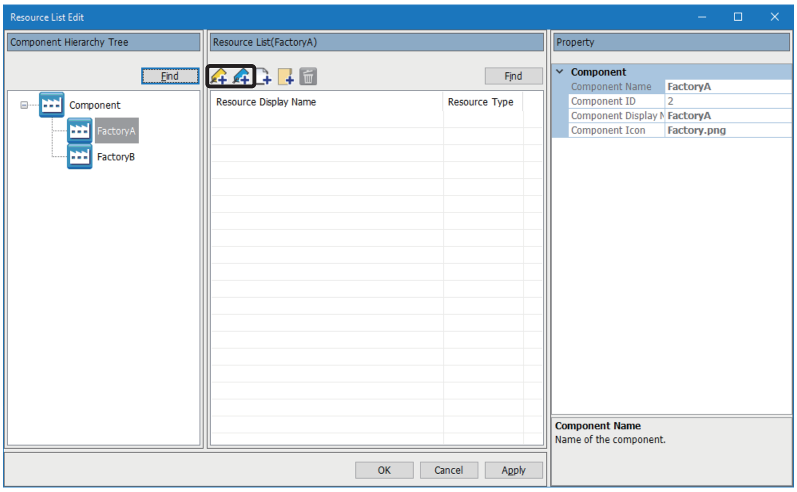
1. Select a component to which a data tag resource is added.



Component Name	FactoryA
Component ID	2
Component Display N	FactoryA
Component Icon	Factory.png

Component Name
Name of the component.

2. Select the icon for adding an external data tag resource () or the icon for adding an internal data tag resource ().

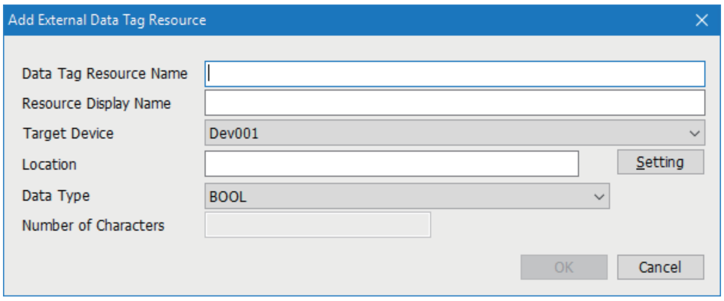


Component Name	FactoryA
Component ID	2
Component Display N	FactoryA
Component Icon	Factory.png

Component Name
Name of the component.

3. Set each item in the "Add External Data Tag Resource" or "Add Internal Data Tag Resource" screen, and click the [OK] button.

- "Add External Data Tag Resource" screen



Target Device: Dev001

Data Type: BOOL

Item	Setting content
Data Tag Resource Name[*1]	Set the name of an external data tag resource (up to 32 characters).
Resource Display Name	Set the display name of an external data tag resource (up to 64 characters).

Item	Setting content
Target Device	Select an access target device for an external data tag resource. The "Select Data collector" screen appears when selecting "[Add]," and the "Target Device Setting" screen appears after selecting a data collector. ☞ Page 222 Data collector selection screen ☞ Page 223 Access target device setting screen
Location	Set the location[2] of a data collector (up to 300 characters). Depending on a data collector used, location parameters can be set in the "Location Setting" screen displayed by clicking the [Setting] button.[3] For details on the setting method, refer to the manual for a data collector used.
Data Type	Select the data type of an external data tag resource.[4]
Number of Characters	Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 1 to 32 • WSTRING: 1 to 16

[1] Used to identify a resource.

[2] Information of a device connected to a data collector.

[3] The [Setting] button does not appear when a data collector in which location parameters cannot be set in the "Location Setting" screen is used.

[4] The data type to be displayed varies depending on a data collector used.

Point

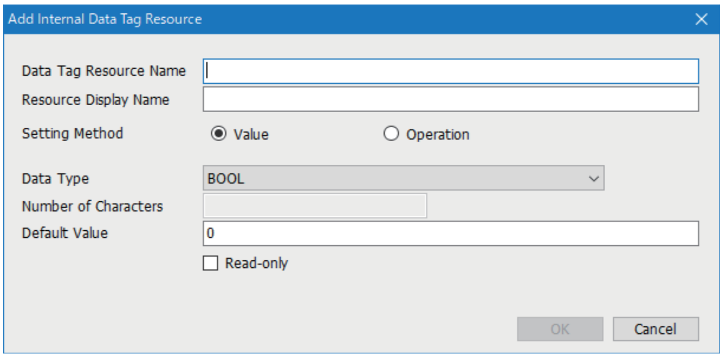
- If no access target device is set, the "Select Data collector" screen appears when selecting the icon for adding an external data tag resource (+).

☞ Page 222 Data collector selection screen

- When adding a new external data tag resource, the resource display name is displayed in red.
- When adding an external data tag resource to a component, the component display name is displayed in red.
- After adding an external data tag resource, click the [Parameter Check] button in the "Target Device Setting List" screen to check the location consistency.

☞ Page 220 Access target device setting list screen

- "Add Internal Data Tag Resource" screen (setting method: value)



Add Internal Data Tag Resource

Data Tag Resource Name

Resource Display Name

Setting Method ● Value ○ Operation

Data Type BOOL

Number of Characters

Default Value 0

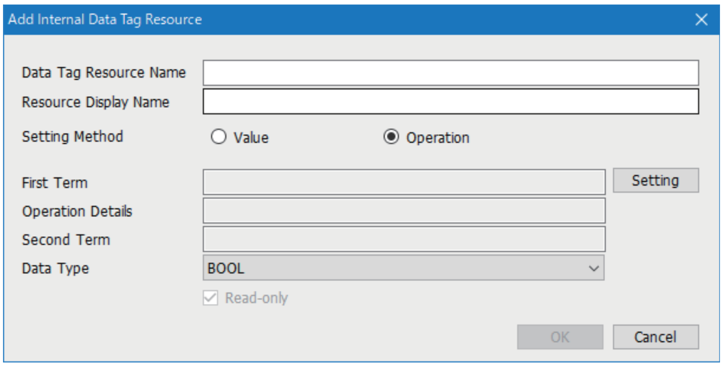
☐ Read-only

Item	Setting content
Data Tag Resource Name[1]	Set the name of an internal data tag resource (up to 32 characters).
Resource Display Name	Set the display name of an internal data tag resource (up to 64 characters).
Setting Method	Select "Value."
Data Type	Select the data type of an internal data tag resource.
Number of Characters	Set the number of characters within the following ranges when selecting "STRING" or "WSTRING" for "Data Type." • STRING: 1 to 32 • WSTRING: 1 to 16
Default Value	Set a value to set for the current value of an internal data tag resource when either of the following operations was performed: • Starting Management Shell • Adding or editing an internal data tag resource The range of values that can be set as the default value and the number of characters that can be entered differ for each data type. For details, refer to the following: ☞ Page 544 Values that can be entered in the screen ☞ Page 544 Data type and value range

Item	Setting content
Read-only	Select the checkbox to set an internal data tag resource to read-only.

*1 Used to identify a resource.

- "Add Internal Data Tag Resource" screen (setting method: operation)



Add Internal Data Tag Resource

Data Tag Resource Name

Resource Display Name

Setting Method ○ Value ● Operation

First Term

Operation Details

Second Term

Data Type BOOL

☑ Read-only

Item	Setting content
Data Tag Resource Name[1]	Set the name of an internal data tag resource (up to 32 characters).
Resource Display Name	Set the display name of an internal data tag resource (up to 64 characters).
Setting Method	Select "Operation."
First Term	The contents set in the "Operation Expression Setting" screen are displayed.[2]
[Setting] button	Click this to display the "Operation Expression Setting" screen. ☞ Page 240 "Operation Expression Setting" screen
Operation Details	The operator of an operation expression set in the "Operation Expression Setting" screen is displayed.
Second Term	The contents set in the "Operation Expression Setting" screen are displayed.[2]
Data Type	Select the data type of an internal data tag resource. Data types that can be specified differ depending on an operator and data types set in the "Operation Expression Setting" screen. For details, refer to the following: ☞ Page 242 Combinations of data types that can be specified for each operator

[1] Used to identify a resource.

[2] After applying the setting, if an external data tag resource specified in the "Select Data Tag Resource" screen no longer exists in the reference (an external data tag resource that matches 'full path of the name of a component to which the external data tag resource belongs\external data tag resource name' specified when applying the setting no longer exists) by performing an operation such as the following ones, the message "No data tag resource is found" appears. Set the reference again.
(Example) Changing the name of the external data tag resource
(Example) Changing the name of a component to which the external data tag resource belongs

Point

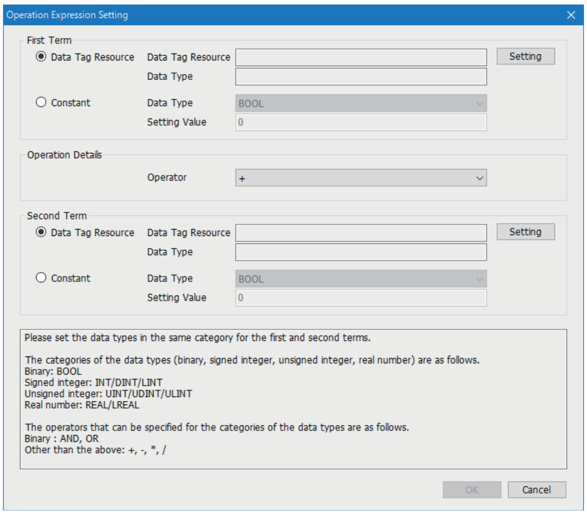
- When adding a new internal data tag resource, the resource display name is displayed in red.
- When adding an internal data tag resource to a component, the component display name is displayed in red.

■"Operation Expression Setting" screen

The following shows the screen for setting an operation expression for an internal data tag resource (operation) to be added or edited.

Window

Select "Operation" for "Setting Method" in the "Add Internal Data Tag Resource" screen, and click the [Setting] button.



First Term
● Data Tag Resource — Data Tag Resource: , Data Type:
○ Constant — Data Type: BOOL, Setting Value: 0

Operation Details
Operator: +

Second Term
● Data Tag Resource — Data Tag Resource: , Data Type:
○ Constant — Data Type: BOOL, Setting Value: 0

Please set the data types in the same category for the first and second terms.

The categories of the data types (binary, signed integer, unsigned integer, real number) are as follows.
Binary: BOOL
Signed integer: INT/DINT/LINT
Unsigned integer: UINT/UDINT/ULINT
Real number: REAL/LREAL

The operators that can be specified for the categories of the data types are as follows.
Binary : AND, OR
Other than the above: +, -, *, /

Item			Setting content
First Term	Data Tag Resource	Data Tag Resource	An external data tag resource selected in the "Select Data Tag Resource" screen is displayed as follows:*1 • Full path of the display name of a component to which the external data tag resource belongs + '\' + external data tag resource display name
		[Setting] button	Click this to display the "Select Data Tag Resource" screen. For the method for selecting an external data tag resource, refer to the following: ☞ Page 241 "Select Data Tag Resource" screen
		Data Type	The data type of an external data tag resource selected in the "Select Data Tag Resource" screen is displayed.*2
	Constant	Data Type	Select the data type of a constant.*2,*3
		Setting Value	Set a constant value. The range of values that can be set and the number of characters that can be entered differ for each data type. For details, refer to the following: ☞ Page 544 Values that can be entered in the screen ☞ Page 544 Data type and value range
Operation Details	Operator		Select an operator used in an operation expression. The following operators can be used: • Logical operations (AND, OR) • Four arithmetic operations (+, -, *, /) Operators that can be specified differ depending on the data type. For details, refer to the following: ☞ Page 242 Combinations of data types that can be specified for each operator
Second Term	Data Tag Resource	Data Tag Resource	An external data tag resource selected in the "Select Data Tag Resource" screen is displayed as follows:*1 • Full path of the display name of a component to which the external data tag resource belongs + '\' + external data tag resource display name
		[Setting] button	Click this to display the "Select Data Tag Resource" screen. For the method for selecting an external data tag resource, refer to the following: ☞ Page 241 "Select Data Tag Resource" screen
		Data Type	The data type of an external data tag resource selected in the "Select Data Tag Resource" screen is displayed.*2
	Constant	Data Type	Select the data type of a constant.*2,*3
		Setting Value	Set a constant value. The range of values that can be set and the number of characters that can be entered differ for each data type. For details, refer to the following: ☞ Page 544 Values that can be entered in the screen ☞ Page 544 Data type and value range

*1 After applying the setting, if an external data tag resource specified in the "Select Data Tag Resource" screen no longer exists in the reference (an external data tag resource that matches 'full path of the name of a component to which the external data tag resource belongs\external data tag resource name' specified when applying the setting no longer exists) by performing an operation such as the following ones, the message "No data tag resource is found" appears. Set the reference again.
(Example) Changing the name of the external data tag resource
(Example) Changing the name of a component to which the external data tag resource belongs

*2 For the combinations of data types that can be specified for the first and second terms, refer to the following:
☞ Page 242 Combinations of data types that can be specified for each operator

*3 If "Constant" is selected for both the first and second terms, an error occurs. Select "Data Tag Resource" for either one.

■"Select Data Tag Resource" screen

Select an external data tag resource to use in the "Operation Expression Setting" screen.

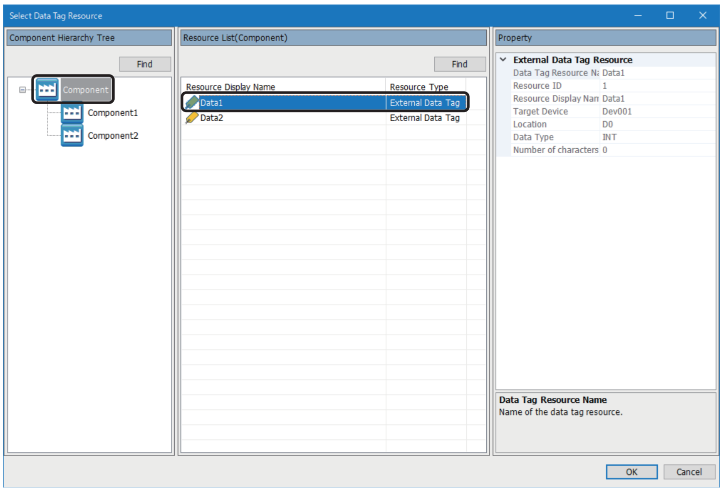
Operating procedure

1. Click the [Setting] button in the "Operation Expression Setting" screen to open the "Select Data Tag Resource" screen.

2. Select a component to be referenced in the component tree window.

External data tag resources with data types other than STRING and WSTRING that belong to the selected component are displayed in the resource list window.

3. Select an external data tag resource to be referenced in the resource list window.



Resource Display Name	Resource Type
Data1	External Data Tag
Data2	External Data Tag

External Data Tag Resource

Data Tag Resource Na	Data1
Resource ID	1
Resource Display Nan	Data1
Target Device	Dev001
Location	D0
Data Type	INT
Number of characters	0

Data Tag Resource Name
Name of the data tag resource.

The data type of an external data tag resource that can be specified differs depending on the combinations of an operator and data types specified in the "Operation Expression Setting" screen. For details, refer to the following:
☞ Page 242 Combinations of data types that can be specified for each operator

4. Click the [OK] button.

Point

- Clicking the [Find] button in the component tree window displays the "Component Find" screen. For the operation method, refer to the following:
☞ Page 233 Searching for a component
- Clicking the [Find] button in the resource list window displays the "Resource Find" screen. For the operation method, refer to the following:
☞ Page 256 Searching for a resource

■Combinations of data types that can be specified for each operator

The following table shows the data types that can be specified for each operator in the "Add Internal Data Tag Resource" screen (setting method: operation) and "Operation Expression Setting" screen.

Operator	Data type of an internal data tag resource (operation)	Data types for the first and second terms
Logical operations (AND, OR)	BOOL (binary (0 or 1))	BOOL (binary (0 or 1))
Four arithmetic operations (+, -, *, /)[*1]	INT/DINT/LINT (signed integer)[*2]	INT/DINT/LINT (signed integer)[*2]
	UINT/UDINT/ULINT (unsigned integer)[*2]	UINT/UDINT/ULINT (unsigned integer)[*2]
	REAL/LREAL (real number)[*3,*4]	REAL/LREAL (real number)[*3,*4]

*1 A combination of signed integers, unsigned integers, and real numbers cannot be used in one operation expression.

*2 For division, values after the decimal point are rounded down.

*3 Depending on the value in the operation term, an error may occur due to rounding values less than the number of significant digits, underflow, loss of trailing digits, and loss of significant digits.

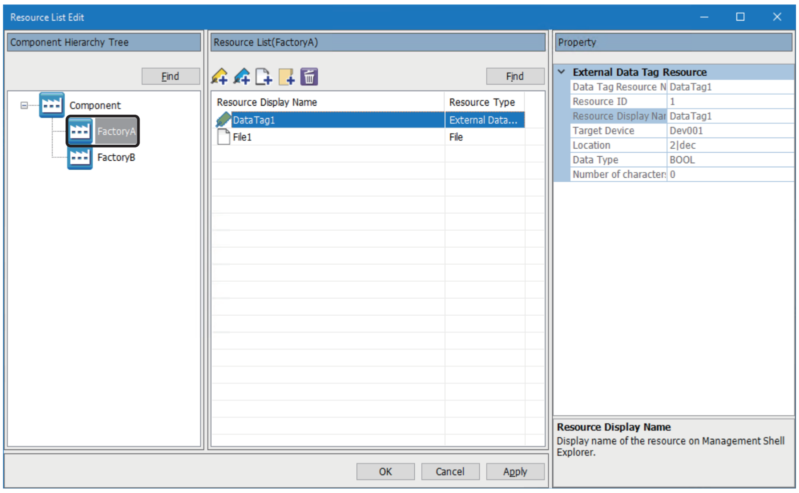
*4 When using an operation term the data type of which is REAL, the accuracy of the REAL type is applied even when the data type of an internal data tag resource (operation) is LREAL. To apply that of the LREAL type, use only an operation term the data type of which is LREAL.

Editing data tag resource properties

The following shows the procedure for editing the property of a data tag resource.

Operating procedure

1. Select a component for which a data tag resource is edited.



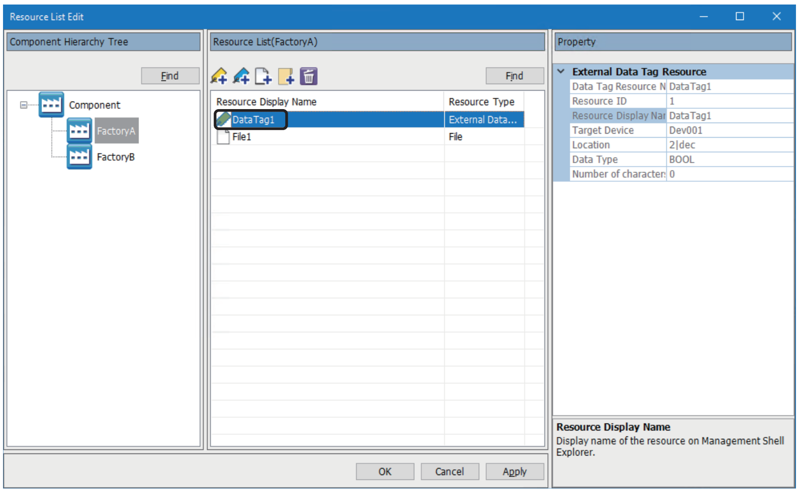
Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character:	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

2. Double-click a data tag resource.



Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character:	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

3. Edit each item in the "Edit External Data Tag Resource" or "Edit Internal Data Tag Resource" screen, and click the [OK] button.

For the items to edit, refer to the following:

☞ Page 236 Adding a data tag resource

Point

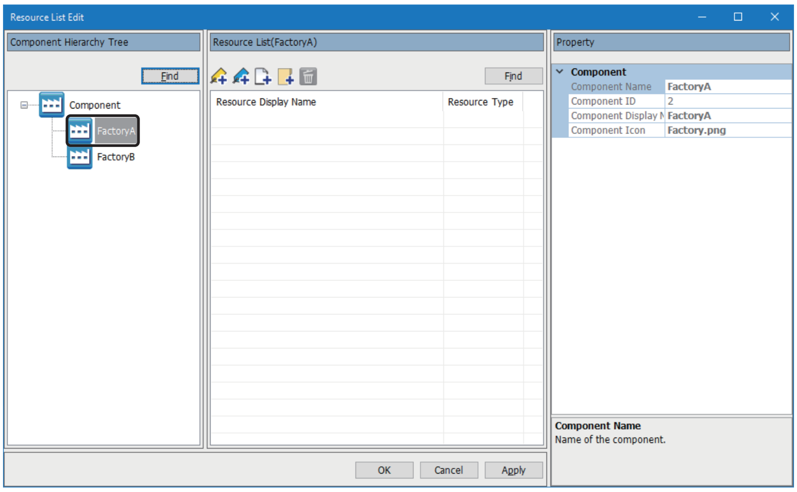
- Resource IDs cannot be edited. IDs are automatically assigned when registering data tag resources. (Resource IDs are used to identify resources.)
- When editing a property item of a data tag resource, the resource display name is displayed in red.
- When editing a data tag resource of a component, the component display name is displayed in red.

Adding a file resource

The following shows the procedure for adding a file resource.

Operating procedure

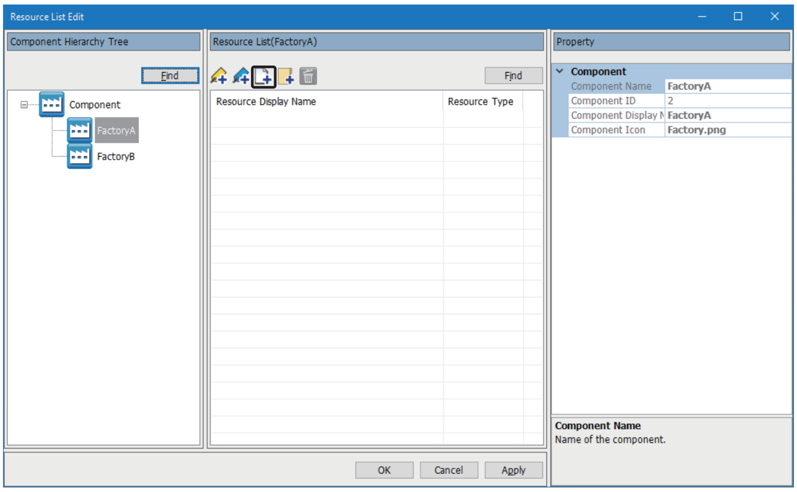
1. Select a component to which a file resource is added.



Component Name: FactoryA
Component ID: 2
Component Display N: FactoryA
Component Icon: Factory.png

Component Name
Name of the component.

2. Select the icon for adding a file resource ().



Component Name: FactoryA
Component ID: 2
Component Display N: FactoryA
Component Icon: Factory.png

Component Name
Name of the component.

Point

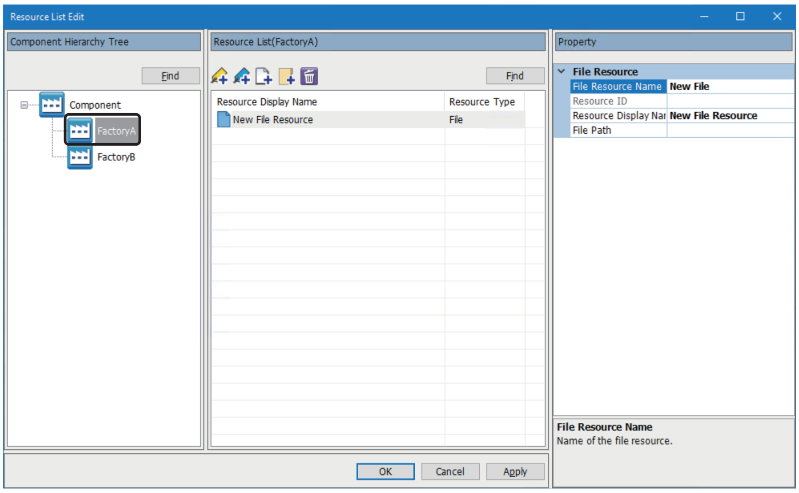
- When adding a new file resource, the resource display name is displayed in red.
- When adding a file resource to a component, the component display name is displayed in red.

Editing file resource properties

The following shows the procedure for editing the properties of a file resource.

Operating procedure

1. Select a component for which a file resource is edited.

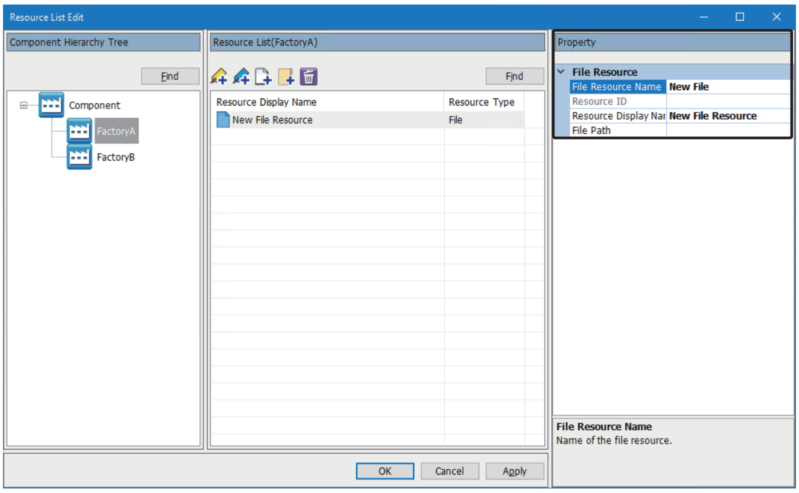


Resource Display Name	Resource Type
New File Resource	File

File Resource
File Resource Name: New File
Resource ID
Resource Display Name: New File Resource
File Path

File Resource Name
Name of the file resource.

2. Select a file resource, and edit each item in the property.



Resource Display Name	Resource Type
New File Resource	File

File Resource
File Resource Name: New File
Resource ID
Resource Display Name: New File Resource
File Path

File Resource Name
Name of the file resource.

Item	Setting content
File Resource Name[*1]	Set the name of a file resource (up to 32 characters). When adding a file resource, "New File" is displayed by default. However, if there is another resource the resource name of which is "New File," the following are displayed to avoid name duplication. New File(1), New File(2), New File(3), ...
Resource ID[*1]	The ID of a file resource is displayed (not editable). An ID is automatically assigned when registering a resource.
Resource Display Name	Set the display name of a file resource (up to 64 characters). When adding a file resource, "New File Resource" is displayed by default. However, if there is another resource the resource display name of which is "New File Resource," the following are displayed to avoid name duplication. New File Resource(1), New File Resource(2), New File Resource(3), ...
File Path	Set the path of a file to manage as a file resource (up to 259 characters).[*2,*3,*4] A file path can be selected in the "Open" screen displayed by clicking the [...] button.

*1 Used to identify a resource.
*2 A file in a shared folder can also be specified.
*3 Only one file can be specified.
*4 A folder cannot be specified.

Point

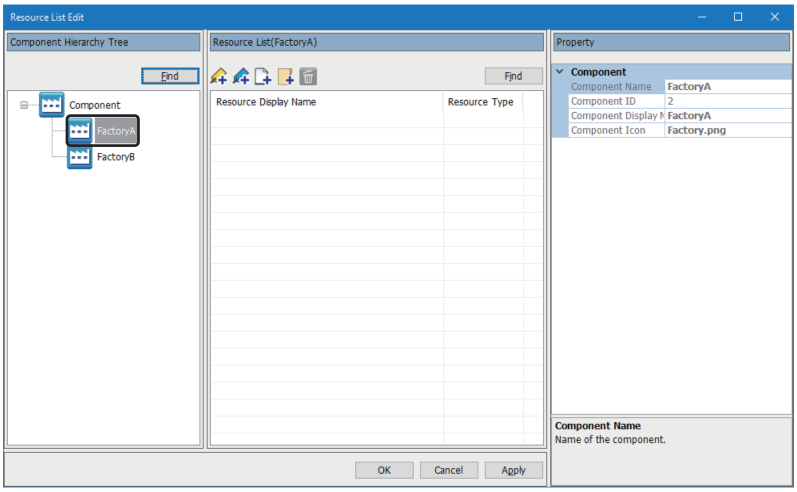
- When editing a property item of a file resource, the resource display name is displayed in red.
- When editing a file resource of a component, the component display name is displayed in red.

Adding a folder resource

The following shows the procedure for adding a folder resource.

Operating procedure

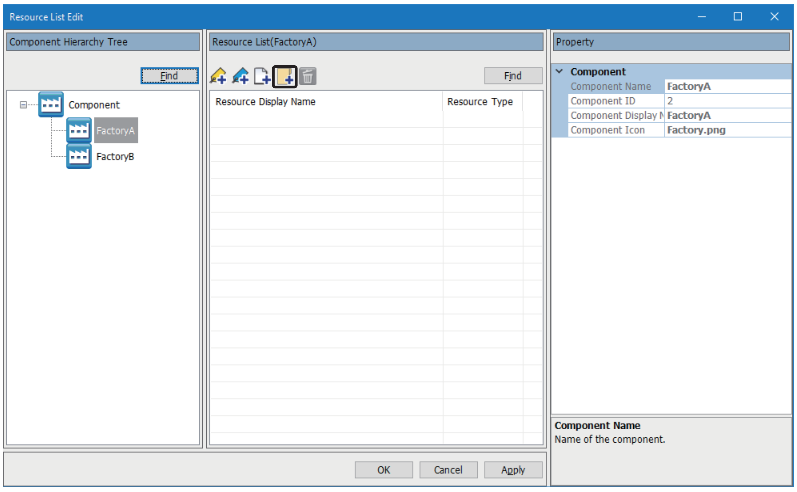
1. Select a component to which a folder resource is added.



Component
Component Name FactoryA
Component ID 2
Component Display N FactoryA
Component Icon Factory.png

Component Name
Name of the component.

2. Select the icon for adding a folder resource ( ).



Component
Component Name FactoryA
Component ID 2
Component Display N FactoryA
Component Icon Factory.png

Component Name
Name of the component.

Point

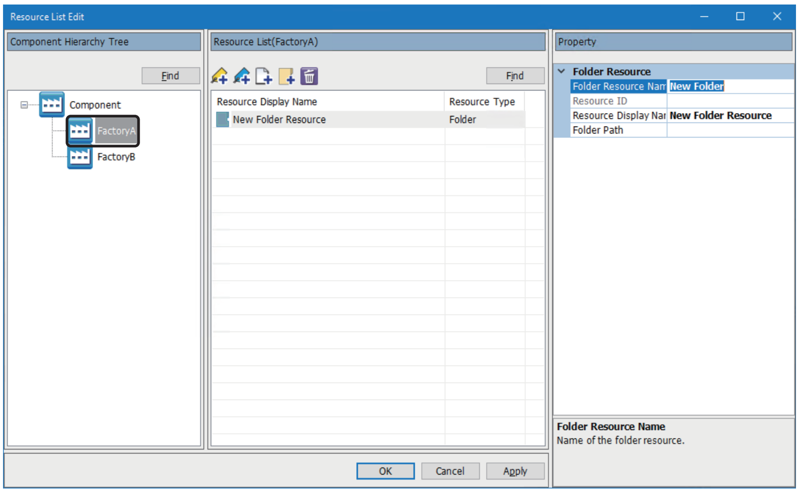
- When adding a new folder resource, the resource display name is displayed in red.
- When adding a folder resource to a component, the component display name is displayed in red.

Editing folder resource properties

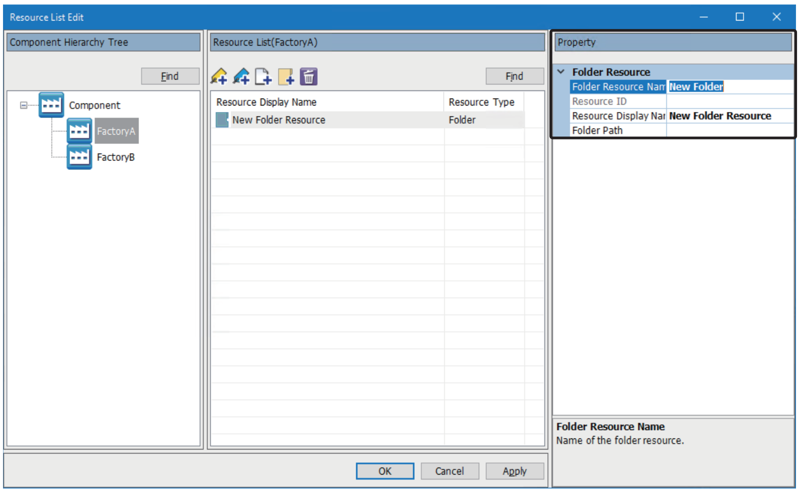
The following shows the procedure for editing the properties of a folder resource.

Operating procedure

1. Select a component for which a folder resource is edited.



2. Select a folder resource, and edit each item in the property.



Item	Setting content
Folder Resource Name[*1]	Set the name of a folder resource (up to 32 characters). When adding a folder resource, "New Folder" is displayed by default. However, if there is another resource the resource name of which is "New Folder," the following are displayed to avoid name duplication. New Folder(1), New Folder(2), New Folder(3), ...
Resource ID[*1]	The ID of a folder resource is displayed (not editable). An ID is automatically assigned when registering a resource.
Resource Display Name	Set the display name of a folder resource (up to 64 characters). When adding a folder resource, "New Folder Resource" is displayed by default. However, if there is another resource the resource display name of which is "New Folder Resource," the following are displayed to avoid name duplication. New Folder Resource(1), New Folder Resource(2), New Folder Resource(3), ...
Folder Path	Set the path of a folder managed as a folder resource (up to 247 characters).[*2,*3] A folder path can be selected in the "Select Folder" screen displayed by clicking the [...] button.

*1 Used to identify a resource.
*2 A shared folder can also be set.
*3 Only one folder can be set.

Point

- When editing a property item of a folder resource, the resource display name is displayed in red.
- When editing a folder resource of a component, the component display name is displayed in red.

Moving a resource

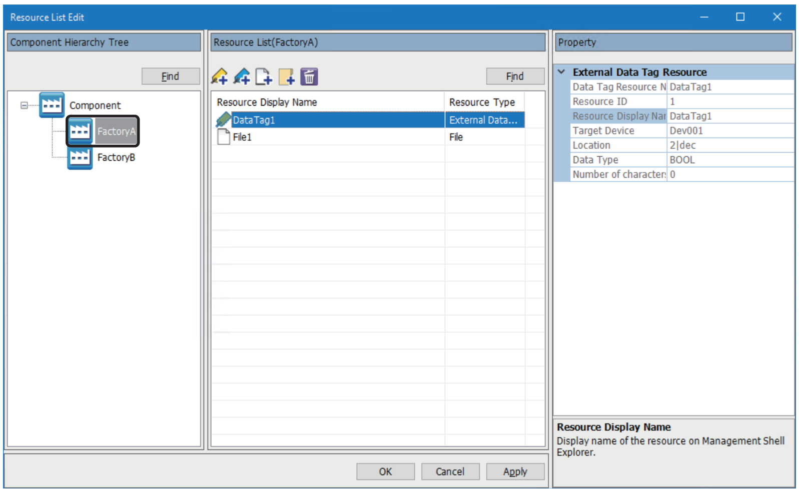
The following shows the procedures for moving a resource to another component.

■Cut → paste

The procedure is as follows:

Operating procedure

1. Select a component from which a resource is moved.



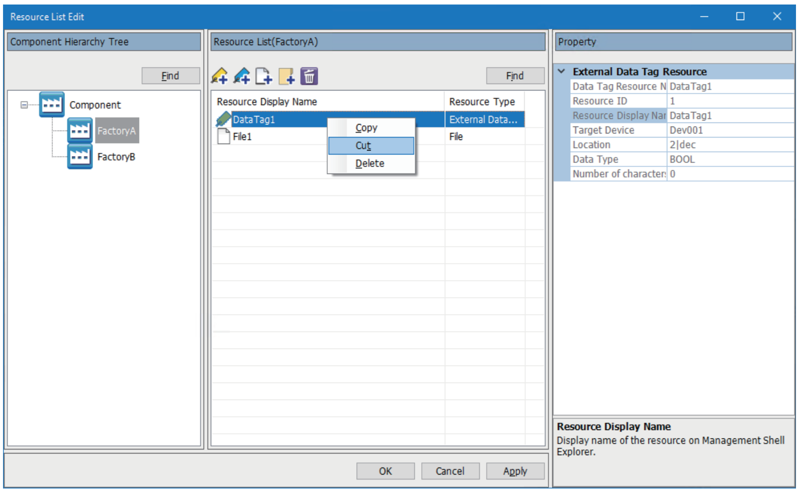
Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

2. Select and right-click a resource, and select [Cut].



Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

3. Perform the procedure shown in the following section to paste the resource to a move destination component.

☞ Page 253 Pasting a resource

Point

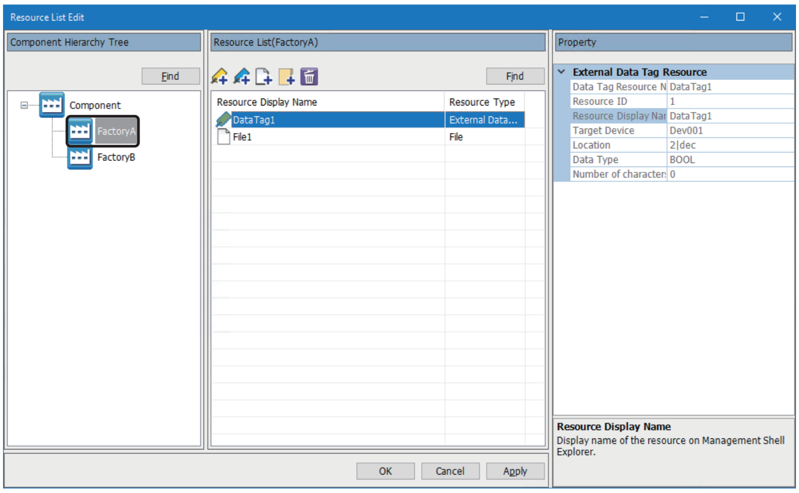
- Multiple resources can be moved together.
- A cut resource is shaded, and deleted after pasted.

■Drag and drop

The procedure is as follows:

Operating procedure

1. Select a component from which a resource is moved.



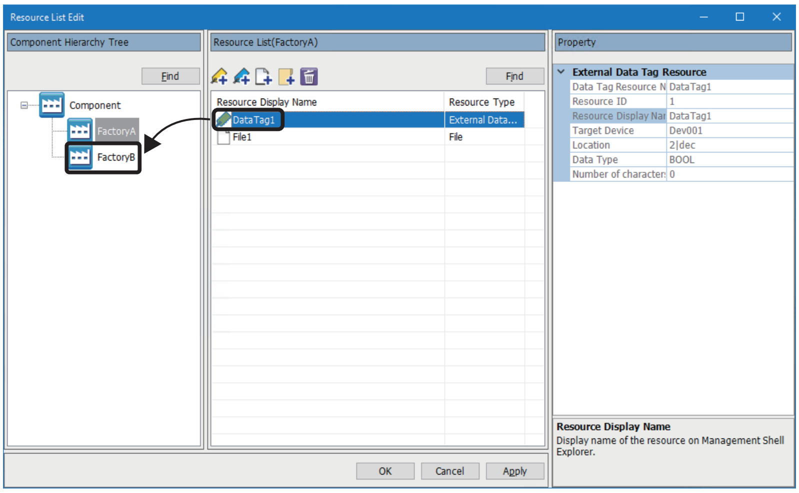
Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character:	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

2. Select a resource, and drag and drop it onto a move destination component.



Resource Display Name	Resource Type
DataTag1	External Data...
File1	File

External Data Tag Resource

Data Tag Resource N	DataTag1
Resource ID	1
Resource Display Nar	DataTag1
Target Device	Dev001
Location	2|dec
Data Type	BOOL
Number of character:	0

Resource Display Name
Display name of the resource on Management Shell Explorer.

Point

- Multiple resources can be moved together.
- When moving a resource, the resource display name is displayed in red.
- When moving a resource to/from a component, the component display names of the destination and source are displayed in red.

Precautions

If there is any resource with the same resource name or resource display name, each name of a moved resource is displayed as follows:

- Resource name (XXX)[*1]
- Resource display name (XXX)[*2]

[*1] XXX is numbered in order from 1 to avoid name duplication in the move destination and source components. However, if the number of characters in the name including (XXX) exceeds its maximum number, the resource cannot be moved.

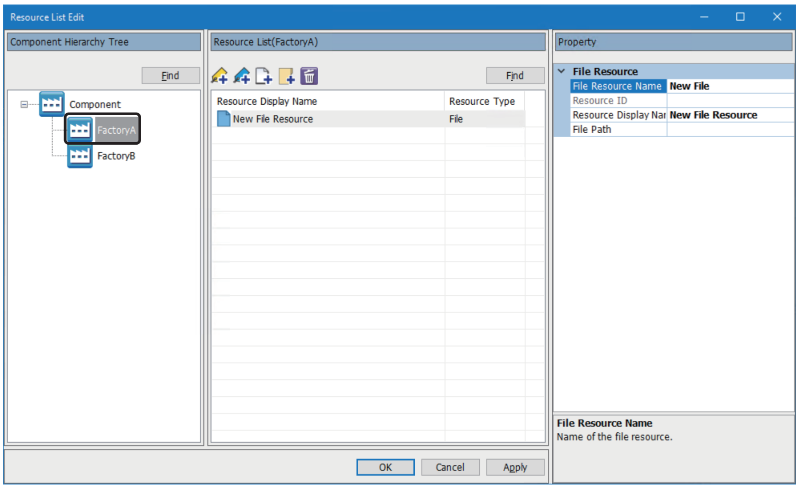
[*2] XXX is numbered in order from 1 to avoid name duplication in the move destination component. However, if the number of characters in the name including (XXX) exceeds its maximum number, the resource cannot be moved.

Copying a resource

The following shows the procedure for copying a resource.

Operating procedure

1. Select a component from which a resource is copied.

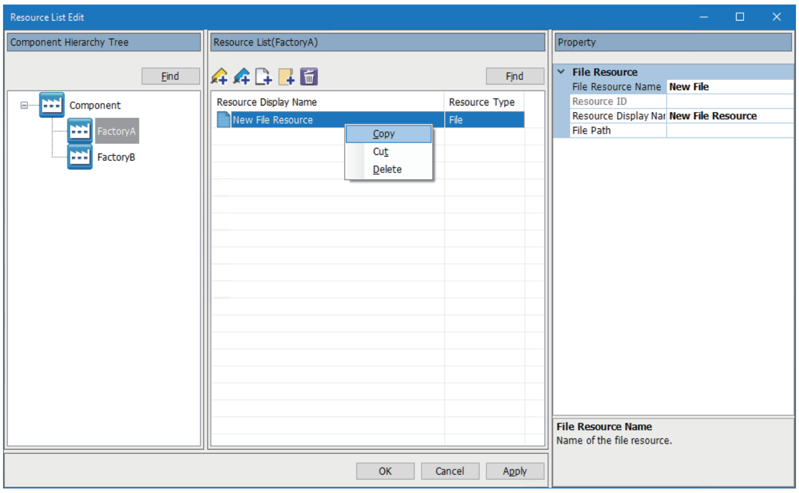


Resource Display Name	Resource Type
New File Resource	File

File Resource
File Resource Name: New File
Resource ID:
Resource Display Name: New File Resource
File Path:

File Resource Name
Name of the file resource.

2. Select and right-click a resource, and select [Copy].



Resource Display Name	Resource Type
New File Resource	File

File Resource
File Resource Name: New File
Resource ID:
Resource Display Name: New File Resource
File Path:

File Resource Name
Name of the file resource.

Point

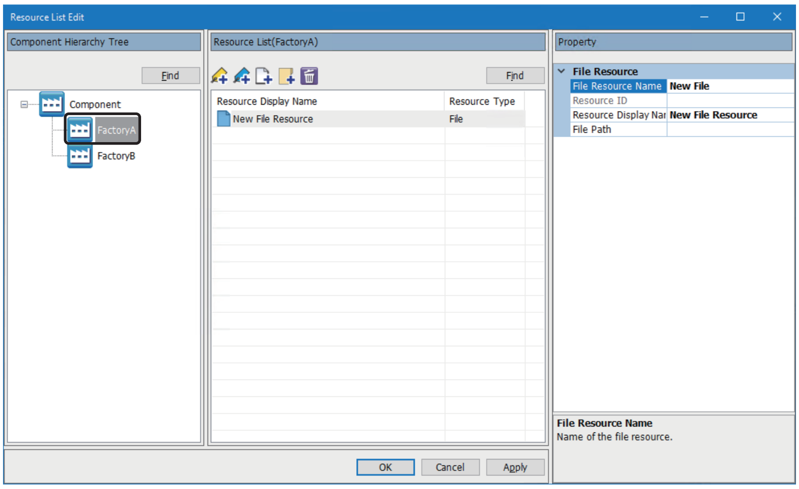
Multiple resources can be copied together.

Pasting a resource

The following shows the procedure for pasting a copied or cut resource.

Operating procedure

1. Select a component to which a resource is pasted.

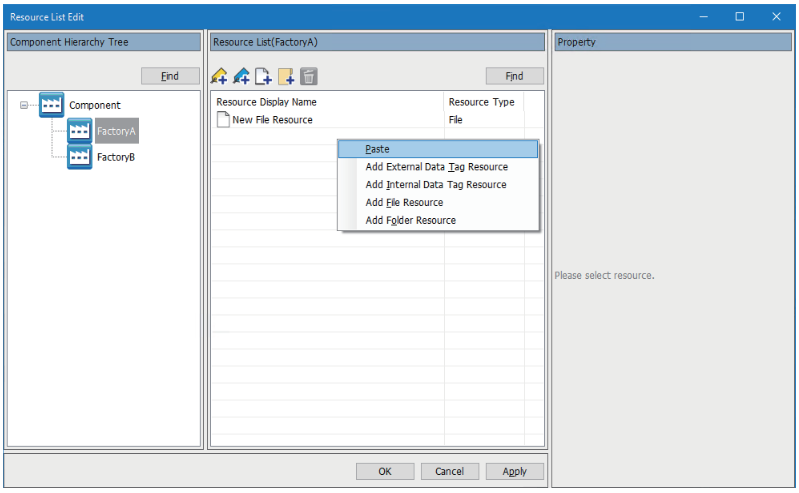


Resource Display Name	Resource Type
New File Resource	File

File Resource
- File Resource Name: New File
- Resource ID
- Resource Display Name: New File Resource
- File Path

File Resource Name
Name of the file resource.

2. Select and right-click a blank row, and select [Paste].



Point

- When pasting a resource, the resource display name is displayed in red.
- When pasting a resource to a component, the component display name is displayed in red. (When pasting it by cutting → pasting, the component display name of the cut source is also displayed in red.)

Precautions

If there is any resource with the same resource name or resource display name, each name of a pasted resource is displayed as follows:

- Resource name (XXX)*1
- Resource display name (XXX)*2

*1 XXX is numbered in order from 1 to avoid name duplication in the paste destination component (and the cut source component when pasting a resource by cutting → pasting). However, if the number of characters in the name including (XXX) exceeds its maximum number, the resource cannot be pasted.

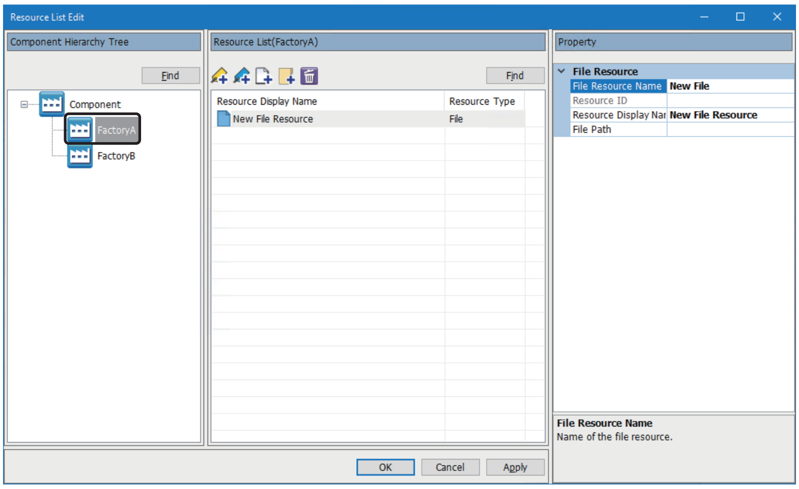
*2 XXX is numbered in order from 1 to avoid name duplication in the paste destination component. However, if the number of characters in the name including (XXX) exceeds its maximum number, the resource cannot be pasted.

Deleting a resource

The following shows the procedure for deleting a resource.

Operating procedure

1. Select a component from which a resource is deleted.

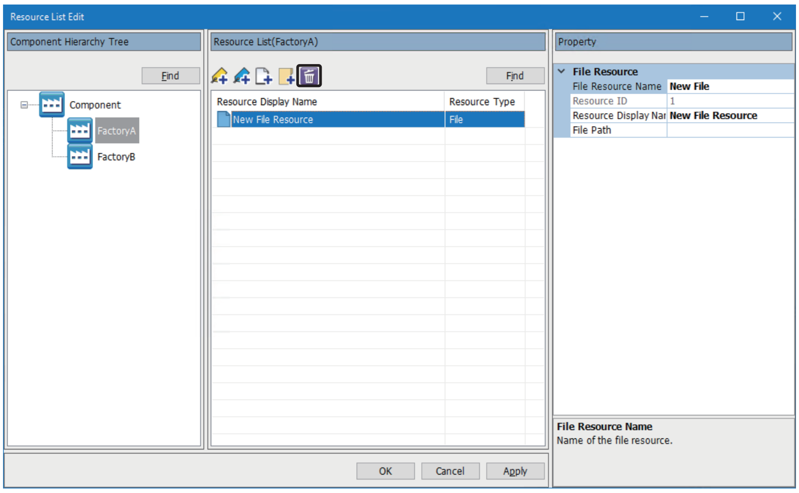


New File Resource | File

File Resource Name: New File
Resource ID:
Resource Display Name: New File Resource
File Path:

File Resource Name
Name of the file resource.

2. Select a resource, then select the icon for deleting a resource (🗑).



New File Resource | File

File Resource Name: New File
Resource ID: 1
Resource Display Name: New File Resource
File Path:

File Resource Name
Name of the file resource.

Point

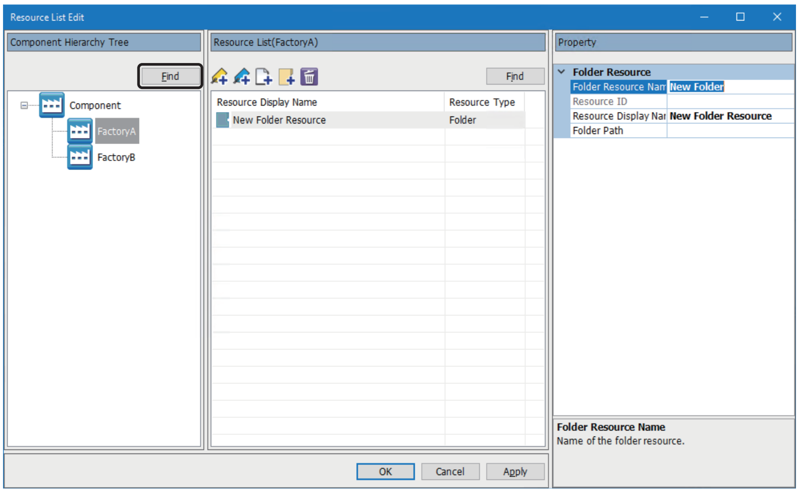
When deleting a resource from a component, the component display name is displayed in red.

Searching for a component

The following shows the procedure for searching for a component.

Operating procedure

1. Click the [Find] button.

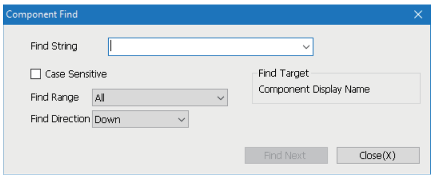


New Folder Resource Folder

Folder Resource Nam New Folder
Resource ID
Resource Display Nai New Folder Resource
Folder Path

Folder Resource Name
Name of the folder resource.

2. Enter a search character string for "Find String" (up to 64 characters).



Find Range: All
Find Direction: Down
Find Target: Component Display Name

3. Set search options as necessary, and click the [Find Next] button.

Item	Setting content
Case Sensitive	Select the checkbox to distinguish between upper-case and lower-case characters included in a search character string.
Find Range	Specify a range to search for a component. • All: The entire component tree is searched. • Below Selected Hierarchy: A selected component and one(s) in its hierarchy are searched.
Find Direction[*1]	Select a direction to search for a component. • Down: Components are searched downward from a selected one. • Up: Components are searched upward from a selected one.

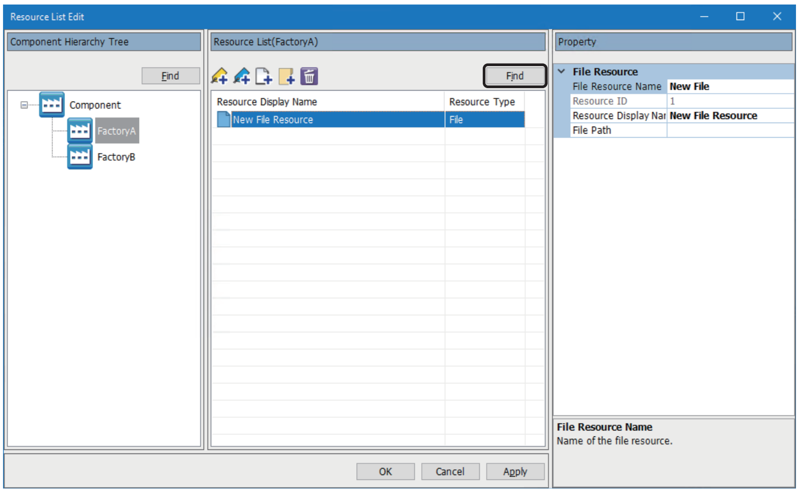
*1 When selecting "Below Selected Hierarchy" for "Find Range," only "Down" can be selected.

Searching for a resource

The following shows the procedure for searching for a resource.

Operating procedure

1. Click the [Find] button.

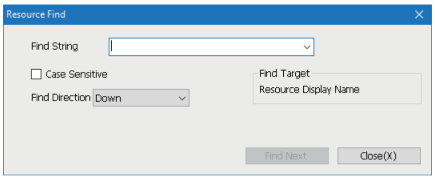


Resource Display Name	Resource Type
New File Resource	File

File Resource
File Resource Name: New File
Resource ID: 1
Resource Display Name: New File Resource
File Path:

File Resource Name
Name of the file resource.

2. Enter a search character string for "Find String" (up to 64 characters).



Find String:
☐ Case Sensitive
Find Direction: Down
Find Target: Resource Display Name

3. Set search options as necessary, and click the [Find Next] button.

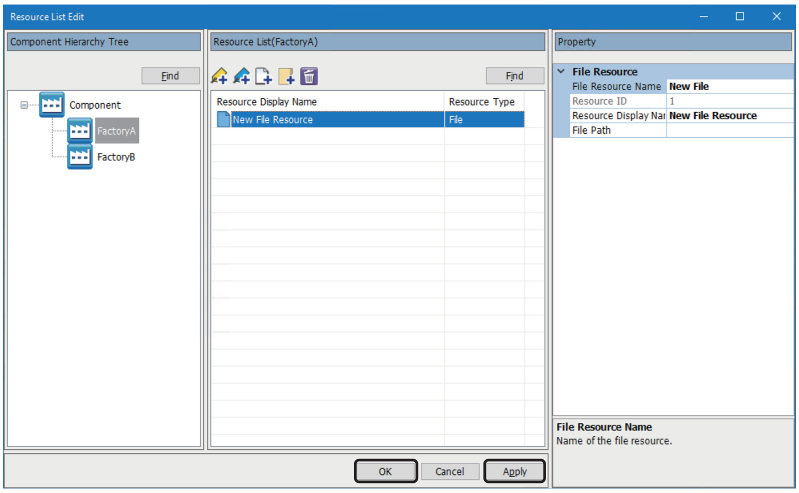
Item	Setting content
Case Sensitive	Specify whether to distinguish between upper-case and lower-case characters included in a search character string.
Find Direction	Select a direction to search for a resource. • Down: Resources are searched downward from a selected one. • Up: Resources are searched upward from a selected one.

Registering a resource

The following shows the procedure for registering an edited resource.

Operating procedure

1. Click the [OK] or [Apply] button.



Resource Display Name	Resource Type
New File Resource	File

File Resource
- File Resource Name: New File
- Resource ID: 1
- Resource Display Nar: New File Resource
- File Path:

File Resource Name
Name of the file resource.

Point

- When clicking the [Apply] button, the resource list edit dialog does not close even after registration.
- When deleting, editing, or moving a data tag resource registered in the data tag resource monitor, the operation is also applied to the data tag resource monitor.

Starting a file resource

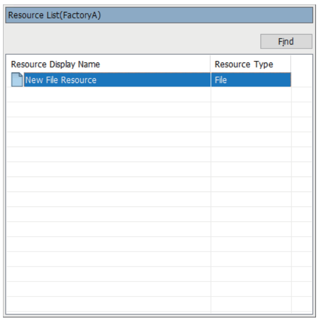
The following shows the procedure for starting a file resource.

Starting a file resource opens the file in an application associated with it in Windows. If the file resource fails to start, check if the application is associated with the file.

Note that a file may not be opened in some applications even if it is associated with an application.

Operating procedure

1. Double-click a file resource in the resource list window.



Resource Display Name	Resource Type
New File Resource	File

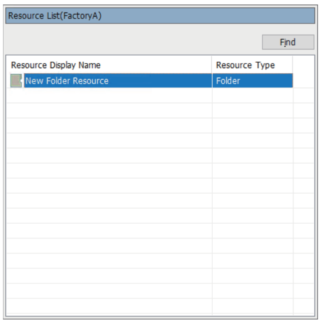
Starting a folder resource

The following shows the procedure for starting a folder resource.

Starting a folder resource opens the folder in Windows Explorer.

Operating procedure

1. Double-click a folder resource in the resource list window.



Resource Display Name	Resource Type
New Folder Resource	Folder

7.6 OPC UA Connection Function

This section shows the function to enable Management Shell to run as an OPC UA server and provide an edge application that is an OPC UA client with a model access I/F and a data access I/F.

By connecting an edge application that supports a model access I/F (technology: OPC UA) or a data access I/F (technology: OPC UA) with Management Shell, the following operations can be performed. For details, refer to the manual for an edge application used.

- Referencing data models managed by Management Shell
- Reading and writing data in equipment, devices, or lines in production sites via Management Shell
- Monitoring data in equipment, devices, or lines in production sites via Management Shell

For the overviews of data reading and writing and data monitoring, refer to the following:

☞ Page 260 Overviews of data reading and writing and data monitoring

Point

When connecting to Management Shell, which is an OPC UA server, from an edge application on an industrial PC other than one on which Edgecross Basic Software is installed, it is required to set communication connections to Management Shell to be allowed.

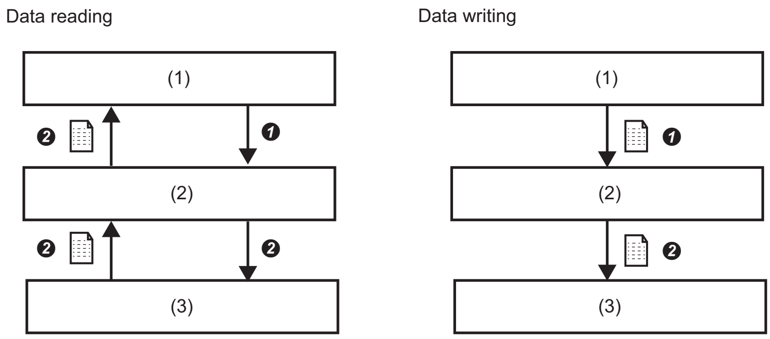
For the setting method, refer to the following:

☞ Page 560 Allowing Communication Connections between Industrial PCs

Overviews of data reading and writing and data monitoring

The following shows the overviews of data reading and writing and data monitoring.

■Data reading and writing

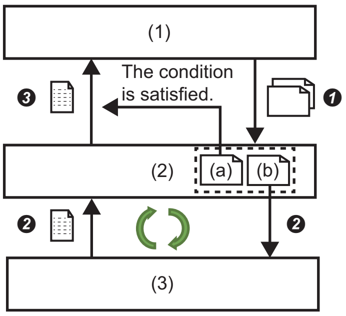


(1) Edge application
(2) Management Shell
(3) Target device

❶ A data reading or writing request is sent at the timing when data is read or written.

❷ Data is read or written in response to the request.

■Data monitoring



(1) Edge application
(2) Management Shell
(3) Target device
(a) Notification condition
(b) Monitoring target data information

❶ Register monitoring target data and a notification condition in advance.

❷ The data registered in step ❶ is monitored periodically.

❸ The data is sent when the notification condition registered in step ❶ is satisfied.

Setting an OPC UA server

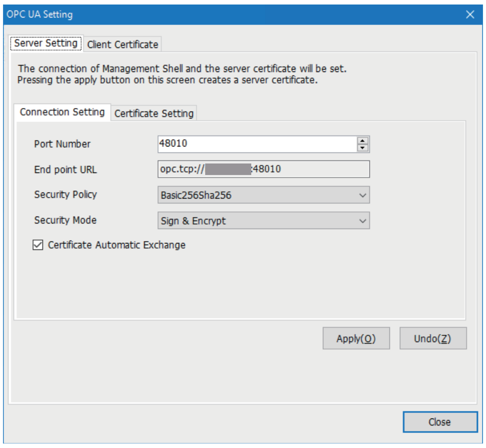
The following shows the procedure and screen for setting the connection and a server certificate for Management Shell that runs as an OPC UA server by using Management Shell Explorer.
Management Shell starts as an OPC UA server and creates a server certificate according to contents set in Management Shell Explorer.

Operating procedure

1. Select [Setting] ⇨ [OPC UA Setting].

2. Select the [Server Setting] tab, and then select the [Connection Setting] tab.

3. Set each item.



The connection of Management Shell and the server certificate will be set.
Pressing the apply button on this screen creates a server certificate.

Port Number: 48010
End point URL: opc.tcp://[redacted]:48010
Security Policy: Basic256Sha256
Security Mode: Sign & Encrypt
☑ Certificate Automatic Exchange

Item	Setting content
Port Number	Set the port number of an OPC UA server (1024 to 65535).
End point URL[*1]	The endpoint URL of an OPC UA server is displayed in the following format. • opc.tcp://[industrial PC host name]:[port number]
Security Policy[*1]	Select a security policy. • None: No security • Basic128Rsa15 (Not recommended)[*2]: 128-bit encryption • Basic256 (Not recommended)[*2]: 256-bit encryption • Basic256Sha256: 256-bit encryption (using Sha256 algorithm)
Security Mode[*1]	Select a security mode. • None: No security • Sign: Adding a signature to data • Sign & Encrypt: Adding a signature and encrypt the data
Certificate Automatic Exchange	Select the checkbox to exchange certificates automatically.[*3,*4] Note that a certificate is not confirmed by a user when data in Management Shell is read and written in an edge application if selecting the checkbox.

[*1] Configure the same setting for an edge application.
For the setting method, refer to the manual for an edge application used.

[*2] Not recommended in the OPC UA specifications, because it is considered less secure.

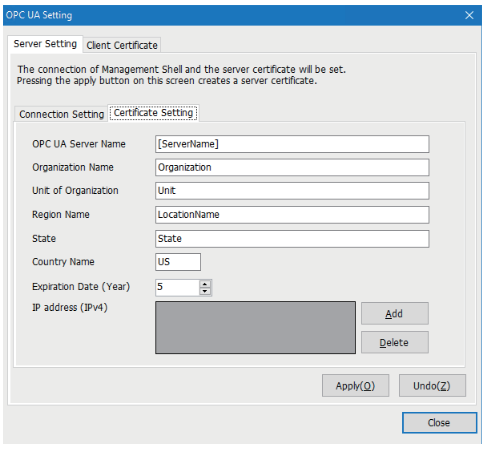
[*3] Not recommended in an open network environment such as the Internet or an intranet because all clients are allowed to connect.

[*4] When selecting the checkbox, the connection with Management Shell will succeed.
When not selecting the checkbox, the client certificate for an edge application is registered in the reject list in Management Shell and the connection with Management Shell will fail. In this case, register the client certificate in the trust list, then connect to Management Shell again.

☞ Page 263 Managing OPC UA client certificates

4. Select the [Certificate Setting] tab.

5. Set each item, and click the [Apply] button.



The connection of Management Shell and the server certificate will be set.
Pressing the apply button on this screen creates a server certificate.

OPC UA Server Name: [ServerName]
Organization Name: Organization
Unit of Organization: Unit
Region Name: LocationName
State: State
Country Name: US
Expiration Date (Year): 5
IP address (IPv4):

Item	Setting content
OPC UA Server Name*1	Set the name of an OPC UA server (1 to 64 characters). It is automatically replaced with the host name*2 of an industrial PC when a server certificate is generated, if a value is set for "[ServerName]."
Organization Name	Set the name of an organization (1 to 64 characters).
Unit of Organization	Set the unit of an organization (1 to 64 characters).
Region Name	Set the name of a region (1 to 128 characters).
State	Set a state (1 to 128 characters).
Country Name	Set the abbreviation of a country name (2 characters).
Expiration Date (Year)	Set the effective period of a client certificate (1 to 20 years).
IP address (IPv4)	Set the IP address (IPv4) for an environment where an OPC UA server operates. It must be set when specifying the IP address instead of the computer name as the endpoint URL of an OPC UA server for connection. (Example) When the IP address of an OPC UA server is 192.168.0.1, set this item to 192.168.0.1 to connect the client side to a server with specifying 'opc.tcp://192.168.0.1:48010' as the endpoint URL. If not setting any IP address for this item, a server is connected with specifying 'opc.tcp://PC1075:48010' as the computer name. By clicking the [Add] button, an IP address can be added (up to 2). The default setting is 127.0.0.1 and can be changed within the range of 0.0.0.0 to 255.255.255.255. In addition, by clicking the [Delete] button, a selected IP address can be deleted.

*1 Recommended to combine an application name and a computer name. (Example: ManagementShell_PC1)

*2 When setting either of the following types of computer names not recommended by Microsoft, Management Shell may not run properly.
- Computer name that has 16 characters or more
- Computer name that has characters other than alphanumeric ones or '-'

Precautions

- An IP address set for "IP address (IPv4)" is set for the subject alternative name of a server certificate.
- "IP address (IPv4)" must be set to the same value as the IP address of an industrial PC on which Management Shell runs. When changing the IP address, change the value accordingly. However, if the IP address is set to change dynamically, such as DHCP, a server may not be connected even if the IP address is specified.

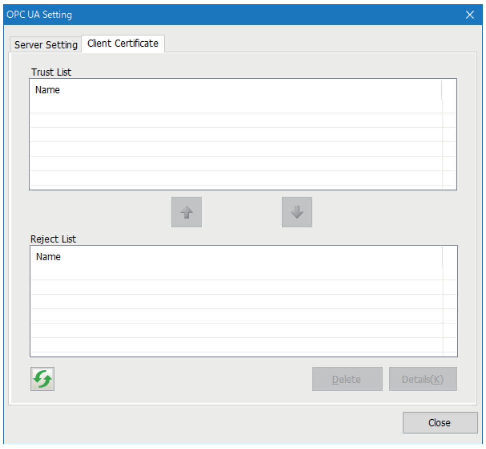
Managing OPC UA client certificates

The following shows the procedure and screen for displaying certificates in a list, moving them to the trust or reject list, and displaying the detailed information by using Management Shell Explorer.

Operating procedure

1. Select [Setting] ⇨ [OPC UA Setting].

2. Select the [Client Certificate] tab, and move a certificate to the trust or reject list.



Item	Setting content
Trust List	The names of client certificates registered in the trust list are displayed in a list. Double-clicking a selected client certificate displays the "Certificate" screen. For a display example of the "Certificate" screen, refer to the following: ☞ Page 264 Certificate screen
↑	Click this to move a client certificate selected in the reject list to the trust list (multiple selections allowed). When moving an OPC UA client certificate to the trust list, the certificate authentication is allowed.[*1]
↓	Click this to move a client certificate selected in the trust list to the reject list (multiple selections allowed). When moving an OPC UA client certificate to the reject list, the certificate authentication is denied.[*2]
Reject List	Client certificates registered in the reject list are displayed in a list. Double-clicking a selected client certificate displays the "Certificate" screen. For a display example of the "Certificate" screen, refer to the following: ☞ Page 264 Certificate screen
⟳	Click this to update the contents in the trust list and reject list.
[Delete] button	Click this to delete a selected client certificate.
[Details] button	Click this to display the "Certificate" screen. (Details on a selected client certificate are displayed.[*3]) For a display example of the "Certificate" screen, refer to the following: ☞ Page 264 Certificate screen

*1 The connection between the OPC UA client and Management Shell will be enabled.

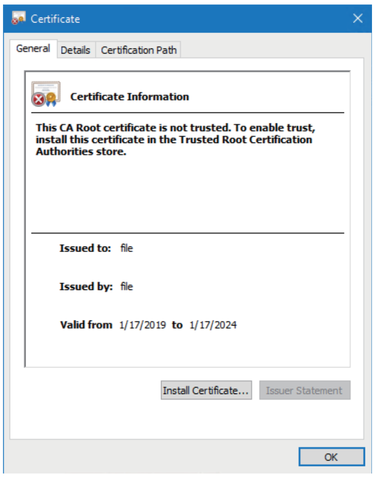
*2 The connection between the OPC UA client and Management Shell will be disabled.

*3 When selecting multiple client certificates, the details on the top client certificate in the list are displayed.

■Certificate screen

The following shows a display example of the "Certificate" screen. When clicking the [Install Certificate] button, the certificate is installed on Windows.[*1]

[*1] It does not affect the operation of Management Shell.



Certificate Information

This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store.

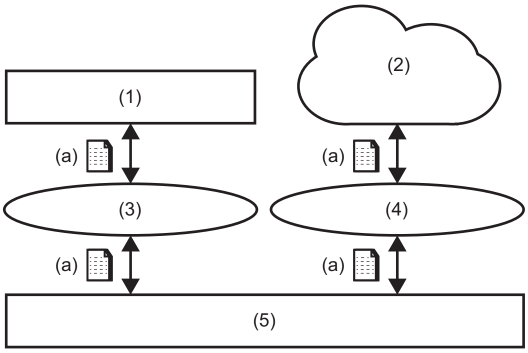
Issued to: file

Issued by: file

Valid from 1/17/2019 **to** 1/17/2024

7.7 IT Gateway Cooperation Function

This section shows the function to respond to requests for data model reference, data reading, and data writing from an IT gateway, and perform these operations.
For details on an IT gateway, refer to the manual for an IT gateway used.



(1) IT system
(2) Cloud service
(3) IT gateway 1
(4) IT gateway 2
(5) Management Shell
(a) Data models are referenced or the current value of a data tag resource is acquired or changed.

Starting, stopping, and restarting an IT gateway

An IT gateway starts, stops, and restarts in response to the following operations:

Behavior of an IT gateway	Operation
Start	Start Management Shell by either of the following operations: • Start Windows. • Select [Management Shell] ⇨ [Management Shell Start].
	Add an IT gateway setting.
Stop	Stop Management Shell by either of the following operations: • Shut down Windows. • Select [Management Shell] ⇨ [Management Shell Stop].
	Delete an IT gateway setting.
Restart (Stop → start)	Change an IT gateway setting.
	Click the [Restart] button in the "IT Gateway Setting List" screen.

Considerations

If the execution file of an IT gateway used does not exist or is corrupted, the IT gateway will not start and an error will occur.

Procedure for setting an IT gateway

The following shows the procedure for setting an IT gateway.

Operating procedure

1. Select [Setting] ⇨ [IT Gateway Setting].

The "IT Gateway Setting List" screen appears. (☞ Page 266 IT gateway setting list screen)

2. Select a row in which the IT gateway setting is not configured in the IT gateway setting list, and click the [Edit] button.

The "IT Gateway Selection" screen appears. (☞ Page 267 IT gateway selection screen)

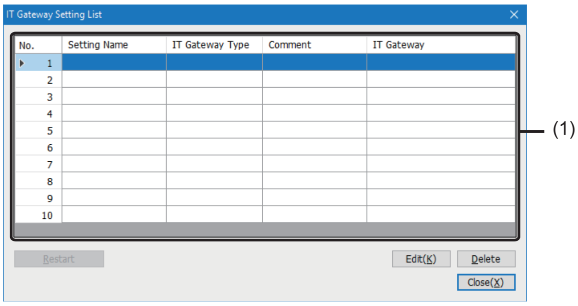
Point

When selecting a row in which the IT gateway setting is configured, the "IT Gateway Setting" screen appears instead of the "IT Gateway Selection" screen.

3. Select an IT gateway to use in the "IT Gateway Selection" screen, and click the [OK] button.

The "IT Gateway Setting" screen appears. (☞ Page 268 IT gateway setting screen)

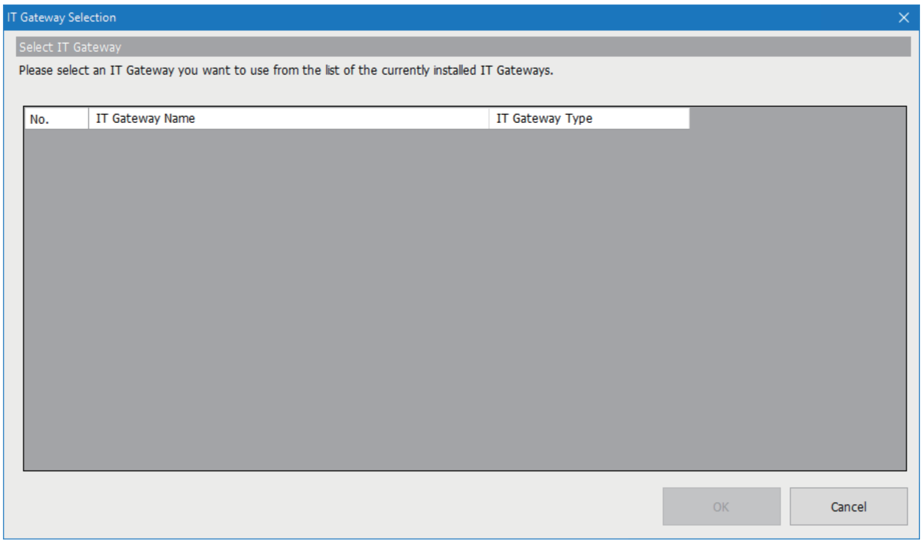
IT gateway setting list screen



Displayed items

Item		Description
(1) IT gateway setting list	Setting Name	A setting name set in the "IT Gateway Setting" screen is displayed.
	IT Gateway Type	The type of an IT gateway selected in the "IT Gateway Selection" screen is displayed.
	Comment	A comment set in the "IT Gateway Setting" screen is displayed.
	IT Gateway	The name of an IT gateway selected in the "IT Gateway Selection" screen is displayed.
[Restart] button		Click this to restart an IT gateway set in the IT gateway setting of a selected row.
[Edit] button		Click this to display the "IT Gateway Selection" screen when selecting a row in which the IT gateway setting is not configured. ☞ Page 267 IT gateway selection screen Click this to display the "IT Gateway Setting" screen when selecting a row in which the IT gateway setting is configured. ☞ Page 268 IT gateway setting screen
[Delete] button		Click this to delete the setting of a selected row.

IT gateway selection screen



Please select an IT Gateway you want to use from the list of the currently installed IT Gateways.

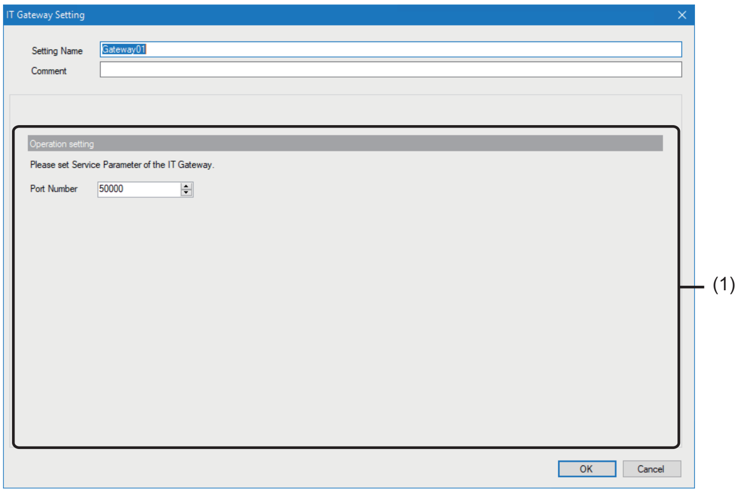
Displayed items

Item	Description
IT Gateway Name	An IT gateway name, version, and developer are displayed.
IT Gateway Type[*1]	Select an IT gateway type.
[OK] button[*2]	Click this to display the "IT Gateway Setting" screen. ☞ Page 268 IT gateway setting screen

*1 Depending on a supported IT gateway I/F, any of the following items can be selected.
Historical data file access I/F: Data Storing
Real-time data publishing I/F-G: Data Distribution
Model access I/F-G or data access I/F-G: Model Data Access

*2 Cannot be clicked when selecting "Data Storing" or "Data Distribution" for "IT Gateway Type."

IT gateway setting screen


IT Gateway Setting

Setting Name: Gateway01

Comment:

Operation setting

Please set Service Parameter of the IT Gateway.

Port Number: 50000

Displayed items

Item	Description
Setting Name[*1]	Set the name of an IT gateway setting (1 to 32 characters). • The following are displayed to avoid name duplication by default. Gateway01, Gateway02, Gateway03, ...
Comment	Set a comment (up to 100 characters).
(1) Service parameter setting	Set service parameters. For details, refer to the manual for an IT gateway used.

[*1] The same name as that of an IT gateway setting already set cannot be used.

7.8 One-shot Collection Function

This section shows the function to collect a value of a data tag resource specified as a collection target (collection target resource) and save it to a file or database when a value of a data tag resource specified as a monitoring target (monitoring target resource) changes.

By using this function, the load can be reduced compared to collecting at regular intervals.

In addition, saving completion can be reported. This supports communication with equipment that changes a value of a monitoring target resource. (For example, a value of a monitoring target resource can be changed when a process is completed and the process can be restarted when data saving is completed.)

This function runs as an edge application connected to Management Shell while the "One-Shot Collection Setting" screen is open; therefore, one of the maximum number of edge applications that can be connected to Management Shell is consumed.

(☞ Page 281 One-shot collection setting screen)

Edge application information for the one-shot collection function is displayed in the "OPC UA Diagnosis" screen as follows:

(☞ Page 341 OPC UA diagnosis)

Item	Description
Application Name	OneShotUtility
Connection source information[*1][*2]	urn:[computer name]:EdgecrossConsortium:OneShotUtility
Number of monitoring target items	Number of one-shot collection settings for which "RUN" is displayed

[*1] If a computer name has 16 characters or more, the first 15 characters are displayed.

[*2] When setting either of the following types of computer names not recommended by Microsoft, Management Shell may not run properly.
- Computer name that has 16 characters or more
- Computer name that has characters other than alphanumeric ones or '-'

Operational specifications

The following shows the operational specifications of the one-shot collection function.

Data collection function

A value of a collection target resource is collected by setting the rise (0 → 1) of a value of a monitoring target resource as a trigger.[*1]

[*1] A monitoring target resource is monitored at one-second intervals, and data collection starts after the rise of the value of the monitoring target resource is detected; therefore, an actual collected value may differ from one at the time of rise.

The collected value is saved to a file or database. (☞ Page 272 File saving function, Page 275 DB saving function)

After the value is saved, either of the following types of completion notification is sent to any data tag resource (notification target resource) or the monitoring target resource.

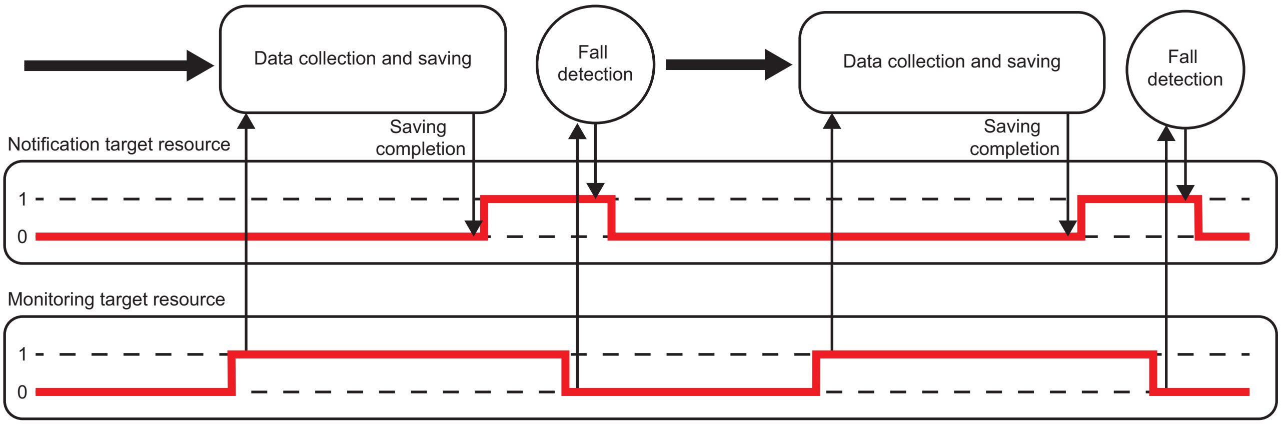
The notification destination of completion can be set in the "Detailed Setting" screen. (☞ Page 282 Detailed setting screen)

■Completion notification when a notification target resource is set as a notification destination

The value of the notification target resource changes to '1.'

It changes to '0' again after the fall (1 → 0) of the value of the monitoring target resource is detected. (The value of the monitoring target resource must be manually changed to '0.')

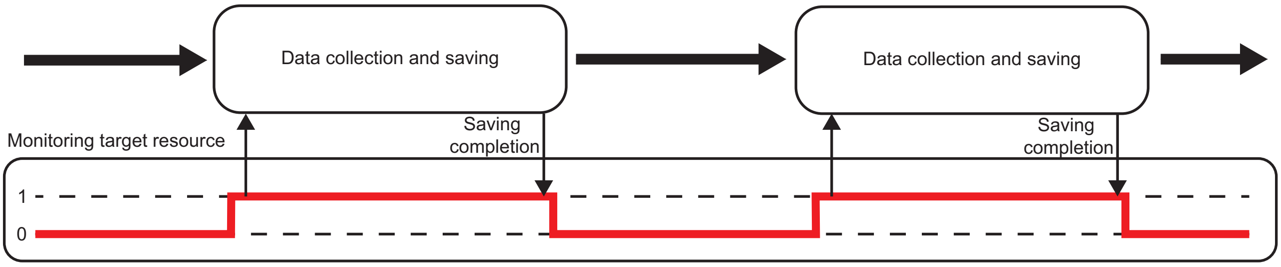
The following shows the flow of the behavior of the one-shot collection function when a notification target resource is set as the notification destination. Before changing the value of the monitoring target resource to '1' again, make sure that the value of the notification target resource is '0.'


Data collection and saving
Fall detection
Data collection and saving
Fall detection
Notification target resource
Saving completion
Saving completion
1
0
Monitoring target resource
1
0

■Completion notification when a monitoring target resource is set as a notification destination

The value of the monitoring target resource changes to '0.'

The following shows the flow of the behavior of the one-shot collection function when a monitoring target resource is set as the notification destination. Before changing the value of the monitoring target resource to '1' again, make sure that the value is '0' and wait for two seconds or more. However, depending on the operating status of the system, data saving may not be started and the value may not change to '0' because the rise of the value cannot be detected. In this case, wait longer or change the notification destination from the monitoring target resource to a notification target resource.


Data collection and saving
Data collection and saving
Monitoring target resource
Saving completion
Saving completion
1
0

■Collection target resource

Up to 1000 collection target resources can be registered.

However, data tag resources without read authority cannot be specified.

■Monitoring target resource

One BOOL type data tag resource can be specified as a monitoring target resource.

However, the same data tag resource cannot be specified in multiple one-shot collection settings.

In addition, there are restrictions on data tag resources that can be specified depending on the notification destination of completion as follows:

- Monitoring target resource: Data tag resources without write authority cannot be specified.
- Notification target resource: Data tag resources without read authority cannot be specified.

■Notification target resource

One BOOL type data tag resource with write authority can be specified as a notification target resource.

However, the same data tag resource cannot be specified in multiple one-shot collection settings.

■Considerations

The following shows the considerations for the data collection function.

- When editing a data tag resource used for the one-shot collection function, an abnormal value may be acquired or an error may occur. Make sure that the data tag resource is not used for the one-shot collection function before editing it.
- Even if a value of a monitoring target resource changes while being saved, the one-shot collection function does not detect the value change.
- When a monitoring target resource is set as a notification destination, a value of the monitoring target resource is overwritten to '0' after data saving is completed; therefore, writing a value to the monitoring target resource in the data tag resource monitor or an edge application may cause a malfunction or an error. Write a value of the monitoring target resource after data saving is completed. Completion of data saving can be checked when the value of the monitoring target resource changes to '0.'
- The one-shot collection function must be used to write values to a notification target resource.
- Make sure that values of a monitoring and notification target resources are '0' before starting the operation.
- When using a data collector that does not support the data writing function, set a notification target resource as a notification destination. Saving completion can be detected by setting an external data tag resource the value of which changes (0 → 1) as a monitoring target resource and any internal data tag resource that is not read-only as a notification target resource.
- When changing the time and date of Windows, an error may occur during communication with Management Shell. Do not change them while the one-shot collection function is running.
- When a minor error occurs during data collection or data saving, the completion notification is sent and the operation continues. However, the collected data may not be saved in this case.

File saving function

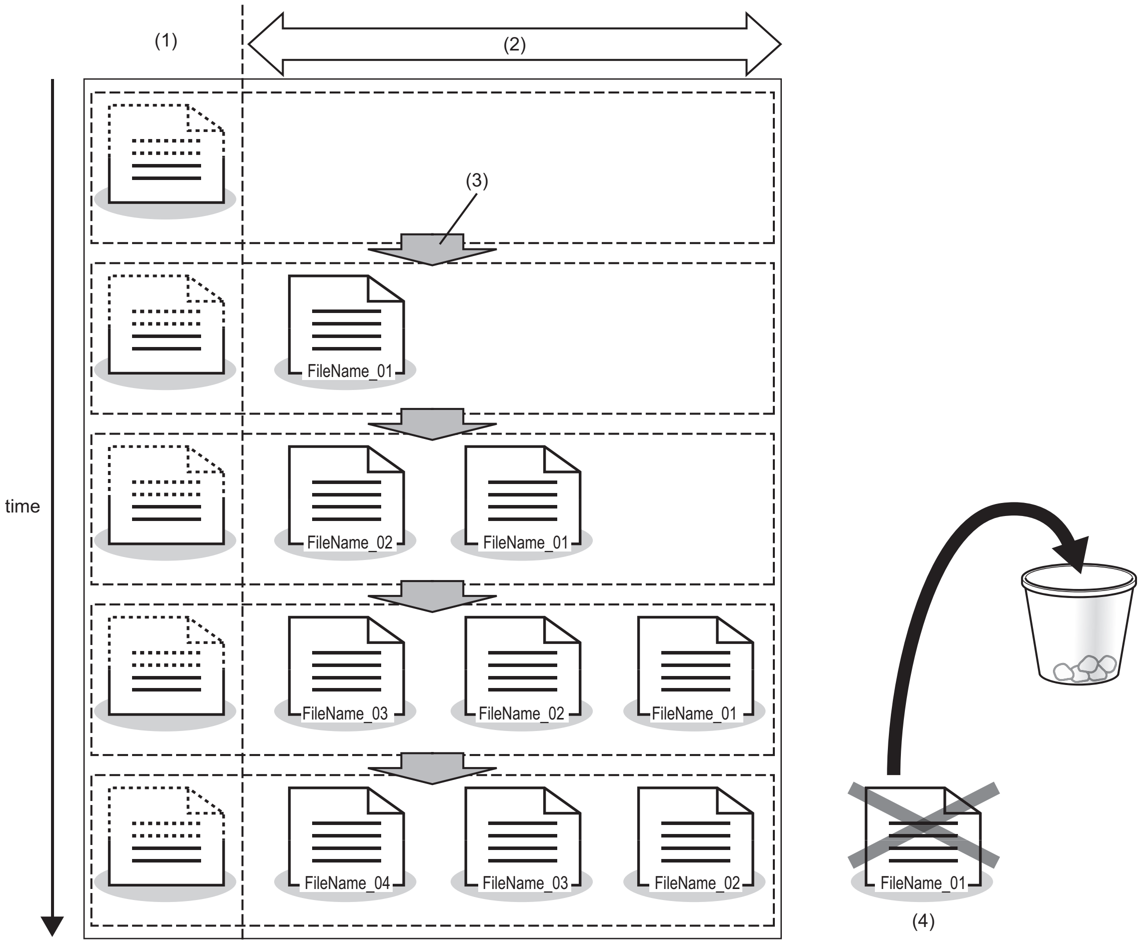
Data collected by using the data collection function can be saved to a file.

■File output

Data to be output is temporarily saved as an accumulating file to the TMP folder[*1] in a save destination folder.

[*1] Created when the one-shot collection function starts running.

The size of an accumulating file increases over time; therefore, the file switches when a specified number of rows is reached.
File switching is to change the file name of an accumulating file to that of a saved file and move it to the save destination folder. (A new accumulating file is created after file switching.)
Note that if the one-shot collection function stops running, an accumulating file switches to a saved file even if a specified number of rows is not reached. (A new accumulating file is not created.)
However, if there is no output data in the accumulating file, the file is deleted without switching.
Up to a specified number of files are saved. If the specified number is exceeded, files are deleted in chronological order.



(1) Accumulating file
(2) Saved file (a file with a smaller number is an older one)
(3) File switching
(4) File to be deleted

■File deletion

Refer to the following:

☞ Page 65 File deletion

■File format

Refer to the following:

☞ Page 65 File format

■Data size

Refer to the following:

☞ Page 66 Data size

■File name, save destination

Refer to the following:

☞ Page 67 File

■Considerations

The following shows the considerations for the file saving function.

- When setting a folder with restricted access as a save destination folder, make sure that a user account that starts Management Shell Explorer is allowed to change, read, and write.
- Do not allow other applications to access accumulating or saved files; otherwise, creating or updating files may fail and cause an error.
- Make sure that the settings of a file name prefix and save destination folder do not overlap with those of the file saving function of Real-time Flow Manager; otherwise, the one-shot collection function and Real-time Flow Manager may interfere with each other, and a malfunction or an error may occur. (☞ Page 60 File saving function, Page 142 Data Storing Setting (File Saving))
- When the file name suffix of a file being output reaches 'FFFFFFFF,' stop the one-shot collection function and take any of the following corrective actions:
  - Move all files in the save destination folder to another folder, or delete files and restart the one-shot collection function.
  - Set another path for the save destination folder.
  - Change the file name prefix.
- Do not save a large number of files or folders to a save destination folder; otherwise, starting the operation may take time or fail.
- If there is data that failed to be acquired in output data, an error is reported and the operation continues without saving data in the row.
- When specifying a folder with the compression attribute enabled for a save destination folder, the free space is determined to be temporarily insufficient and a file saving error may occur if the free space on the disk is low.
- When enabling the encryption attribute of an output destination folder for a file in Windows, the file is output with the authority of a user who starts Management Shell Explorer. This can protect information in the file from being accessed by other users who use the industrial PC.
  However, an output destination folder must be a local folder.
  The procedure for enabling the encryption attribute is same as that shown in the following:

☞ Page 71 Using a folder with the encryption attribute enabled

- The procedure for browsing files output to an encrypted folder with a user other than one who starts Management Shell Explorer is same as that shown in the following:

☞ Page 72 Procedure for browsing files with a user account other than a specified one

- If a saved file with the same file name prefix saved by a different user account already exists in a save destination folder with the encryption attribute enabled, an error may occur due to the difference in authority to the file. Change the save destination folder or file name prefix to another one.
- When specifying a folder for which a Windows search index is to be created as a save destination folder and running a process flow for a long time, the amount of index information (Windows.edb file) becomes large. As a result, the free disk space on an industrial PC where Edgecross Basic Software is running may become insufficient. This can be avoided by either of the following methods:
  - Specify a folder other than one for which a search index is to be created as a save destination folder.
  - Exclude the folder specified as a save destination folder from the search index target by the following procedure:

  ❶ Select [Search] ⇨ [Searching Windows] ⇨ "Classic" ⇨ "Customize search locations here" in Windows settings.
  ❷ Click the [Modify] button in the "Indexing Options" screen.
  ❸ Unselect the checkbox of the folder specified as a save destination folder in "Change selected locations" in the "Indexed Locations" screen, and click the [OK] button.

DB saving function

Data collected by using the data collection function can be saved to a database.

By setting each item to save data to a field of a table in a database in the one-shot collection setting, the data is saved (INSERT) according to the setting.

A database is connected when switching the operating status of the one-shot collection function to RUN, and disconnected when switching it from RUN to STOP.

Note that only saving (INSERT) data to a database is available in the one-shot collection function.

Point

- Up to 1000 units of data can be specified as a collection target.
- SQL statements and data types of a database used for the DB saving function are compliant with SQL99 specifications.

Precautions

- If data is missing in one row for saving (INSERT) data to a database, an error will be reported and the data in the row will not be saved (INSERT), and the operation continues.
- Data cannot be saved (INSERT) to a same table in multiple one-shot collection settings.
- Make sure that an access target table set in the one-shot collection setting does not overlap with one of another application.
- A database can only be used if it is installed on the industrial PC same as Edgecross Basic Software.

■Table name and column name

The following table shows the specifications of a table name and column name.

Item	Description
Number of character bytes that can be set[1]	1 to 63[2]
Available characters	Characters that can be used for the WSTRING type[3] ☞ Page 545 WSTRING type

*1 The number of available characters can be calculated based on the number of bytes in UTF-8.
Examples of typical characters and their numbers of bytes are as follows:
- 0 to 9, A to Z, a to z, _ (U+005F): 1 byte
- Greek, etc.: 2 bytes
- Hiragana, katakana, kanji (excluding some), etc.: 3 bytes

*2 For 63 bytes or more, a setting name may be truncated and a table or column name may be duplicated.

*3 The following characters in the range of U+0000 to U+007F can be used.
0 to 9, A to Z, a to z, _ (U+005F)

Precautions

Column names cannot be duplicated in the same table.

■Database

Refer to the following:

☞ Page 78 Database

■Communication method

Refer to the following:

☞ Page 78 Communication method

■Processing for a problem

If an error is detected while performing the DB saving function, the error is output. If the error occurs in ODBC, the ODBC error code is displayed in the "Error Details" screen. For details on the error codes, visit the following:

docs.microsoft.com/en-us/sql/odbc/reference/appendixes/appendix-a-odbc-error-codes

Point

If there is no corresponding ODBC error code on Microsoft home page, visit the following:

www.postgresql.org/docs/10/static/errcodes-appendix.html

Setting procedure

The following shows the procedure for configuring the setting for the one-shot collection function.

Whether the setting is correct can be checked by clicking the [Collection Saving Test] button.

To save data to a database, perform the procedure shown in the following section in advance.

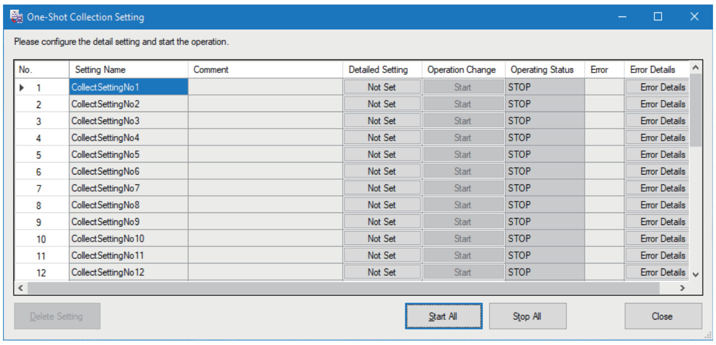
☞ Page 280 Pre-configuration for saving data to a database

1. Select [Tool] ⇨ [One-Shot Collection Setting].

The "One-Shot Collection Setting" screen appears. (☞ Page 281 One-shot collection setting screen)

2. Click the cell in the "Detailed Setting" column.

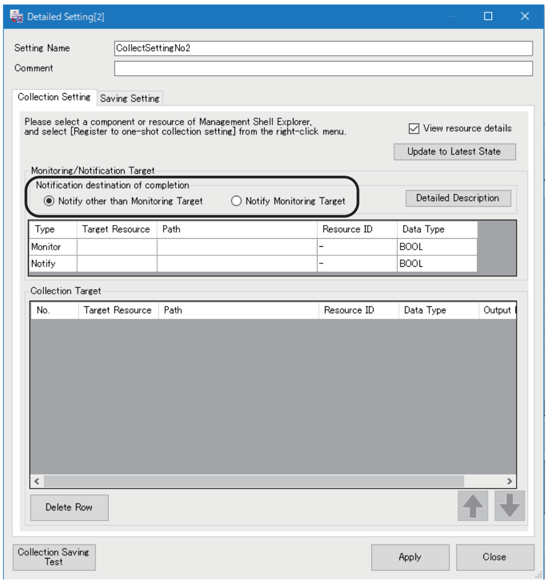
The "Detailed Setting" screen appears. (☞ Page 282 Detailed setting screen)



Please configure the detail setting and start the operation.

No.	Setting Name	Comment	Detailed Setting	Operation Change	Operating Status	Error	Error Details
1	CollectSettingNo1		Not Set	Start	STOP		Error Details
2	CollectSettingNo2		Not Set	Start	STOP		Error Details
3	CollectSettingNo3		Not Set	Start	STOP		Error Details
4	CollectSettingNo4		Not Set	Start	STOP		Error Details
5	CollectSettingNo5		Not Set	Start	STOP		Error Details
6	CollectSettingNo6		Not Set	Start	STOP		Error Details
7	CollectSettingNo7		Not Set	Start	STOP		Error Details
8	CollectSettingNo8		Not Set	Start	STOP		Error Details
9	CollectSettingNo9		Not Set	Start	STOP		Error Details
10	CollectSettingNo10		Not Set	Start	STOP		Error Details
11	CollectSettingNo11		Not Set	Start	STOP		Error Details
12	CollectSettingNo12		Not Set	Start	STOP		Error Details

3. Select the [Collection Setting] tab to select a notification destination of completion.



Setting Name: CollectSettingNo2

Comment:

Please select a component or resource of Management Shell Explorer, and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Notification destination of completion

● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor			-	BOOL
Notify			-	BOOL

Collection Target

No.	Target Resource	Path	Resource ID	Data Type	Output

4. Register a collection, monitoring, or notification target resource in the component tree or resource list window while the "Detailed Setting" screen opens.

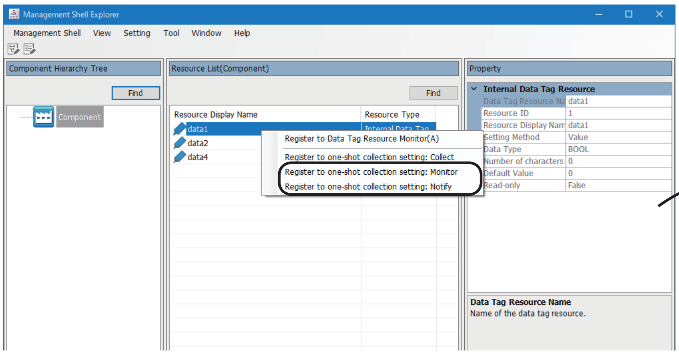
- Registering a monitoring or notification target resource

Select and right-click a resource in the resource list window, and select any of the following items.

The selected resource is registered as a monitoring or notification target resource.

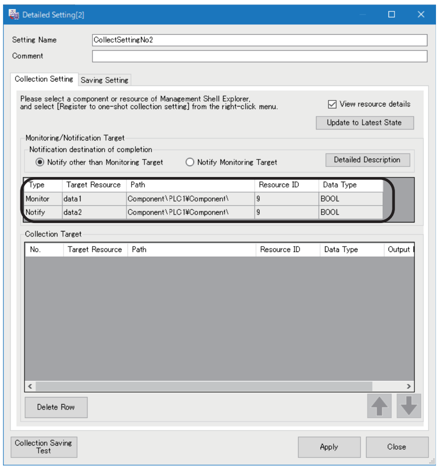
[Register to one-shot collection setting: Monitor]: To register a resource as a monitoring target resource.

[Register to one-shot collection setting: Notify]: To register a resource as a notification target resource.


Management Shell Explorer
Management Shell
View
Setting
Tool
Window
Help
Component Hierarchy Tree
Find
Component
Resource List(Component)
Find
Resource Display Name
Resource Type
data1
Internal Data Tag
data2
data4
Register to Data Tag Resource Monitor(A)
Register to one-shot collection setting: Collect
Register to one-shot collection setting: Monitor
Register to one-shot collection setting: Notify
Property

Internal Data Tag Resource	
Data Tag Resource Na	data1
Resource ID	1
Resource Display Nam	data1
Setting Method	Value
Data Type	BOOL
Number of characters	0
Default Value	0
Read-only	False

Data Tag Resource Name
Name of the data tag resource.



Setting Name: CollectSettingNo2

Comment:

Please select a component or resource of Management Shell Explorer,
and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Monitoring/Notification Target

Notification destination of completion

● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor	data1	Component\ PLC1¥Component\	9	BOOL
Notify	data2	Component\ PLC1¥Component\	9	BOOL

Collection Target

No.	Target Resource	Path	Resource ID	Data Type	Output

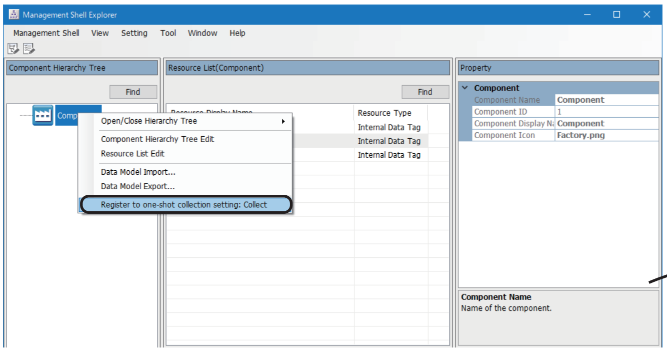
- Registering a collection target resource

Register a resource in the component tree or resource list window.

<u>For registering a resource in the component window</u>

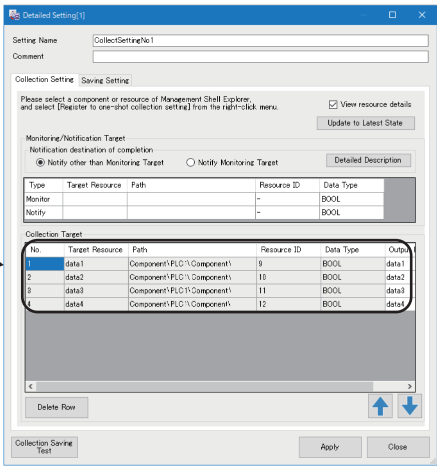
Select and right-click a component, and select [Register to one-shot collection setting: Collect].

All data tag resources registered in the selected component are registered as collection target resources.



Component	
Component Name	Component
Component ID	1
Component Display Na	Component
Component Icon	Factory.png

Component Name
Name of the component.



Setting Name: CollectSettingNo1

Comment:

Please select a component or resource of Management Shell Explorer,
and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Monitoring/Notification Target

Notification destination of completion

● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor			-	BOOL
Notify			-	BOOL

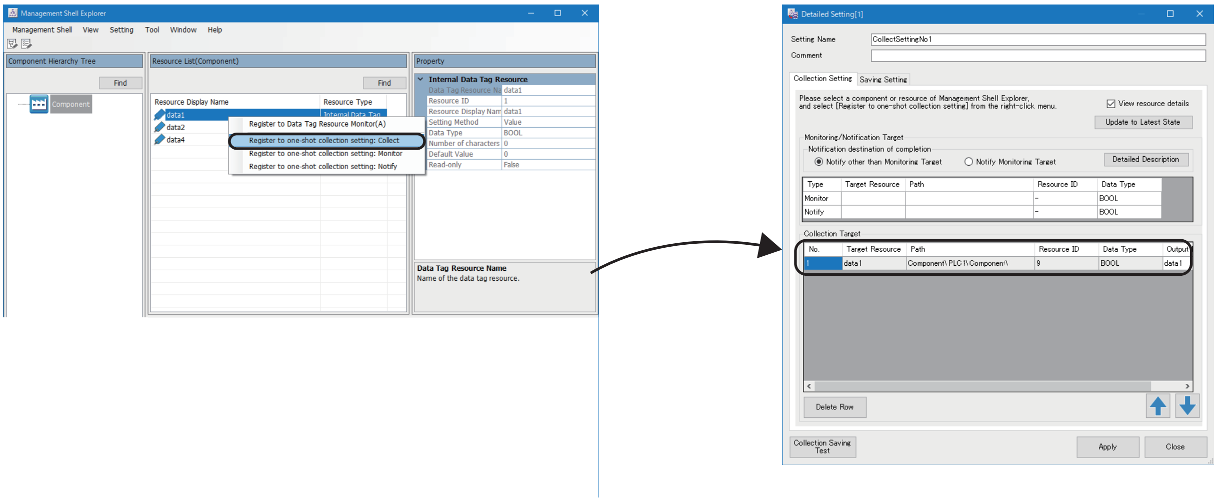
Collection Target

No.	Target Resource	Path	Resource ID	Data Type	Outpu
1	data1	Component\ PLC1\ Component\	9	BOOL	data1
2	data2	Component\ PLC1\ Component\	10	BOOL	data2
3	data3	Component\ PLC1\ Component\	11	BOOL	data3
4	data4	Component\ PLC1\ Component\	12	BOOL	data4

For registering a resource in the resource list window

Select and right-click a resource, and select [Register to one-shot collection setting: Collect].

The selected resource is registered as a collection target resource.



Resource Display Name	Resource Type
data1	Internal Data Tag
data2	
data4	

Internal Data Tag Resource

Data Tag Resource Na	data1
Resource ID	1
Resource Display Nam	data1
Setting Method	Value
Data Type	BOOL
Number of characters	0
Default Value	0
Read-only	False

Data Tag Resource Name
Name of the data tag resource.

Setting Name: CollectSettingNo1
Comment:

Please select a component or resource of Management Shell Explorer, and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Monitoring/Notification Target
Notification destination of completion
● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor			-	BOOL
Notify			-	BOOL

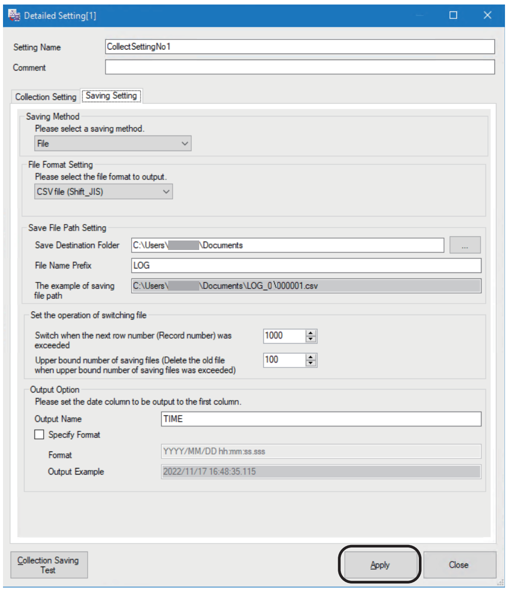
Collection Target

No.	Target Resource	Path	Resource ID	Data Type	Output
1	data1	Component\PLC1\Componen\	9	BOOL	data1

5. Select the [Saving Setting] tab.

6. Enter each item, and click the [Apply] button.

- When saving data to a file: ☞ Page 286 File saving setting
- When saving data to a database: ☞ Page 287 DB saving setting



Setting Name: CollectSettingNo1
Comment:

Saving Method
Please select a saving method.
File

File Format Setting
Please select the file format to output.
CSV file (Shift_JIS)

Save File Path Setting
Save Destination Folder: C:\Users\[redacted]\Documents
File Name Prefix: LOG
The example of saving file path: C:\Users\[redacted]\Documents\LOG_0\000001.csv

Set the operation of switching file
Switch when the next row number (Record number) was exceeded: 1000
Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded): 100

Output Option
Please set the date column to be output to the first column.
Output Name: TIME
☐ Specify Format
Format: YYYY/MM/DD hh:mm:ss.sss
Output Example: 2022/11/17 16:48:35.115

7. When saving data to a database, use an output DDL file to create a table in the database.

☞ Page 537 Creating a table by using a DDL

8. To save data to the database, set a privilege for the table created in step 7.

☞ Page 538 Setting a privilege to a table

9. When performing the test of the one-shot collection function, click the [Collection Saving Test] button.

A value of the collection target resource is collected and saved to a file or database. When saving it to a file, the file switches for each row. When saving it to a database, the database is connected when performing the test and disconnected when the saving is completed.

The test result is displayed in the "Error Details" screen. If an error occurs, check the error list and detailed information, and review the setting. (☞ Page 288 Error details screen)

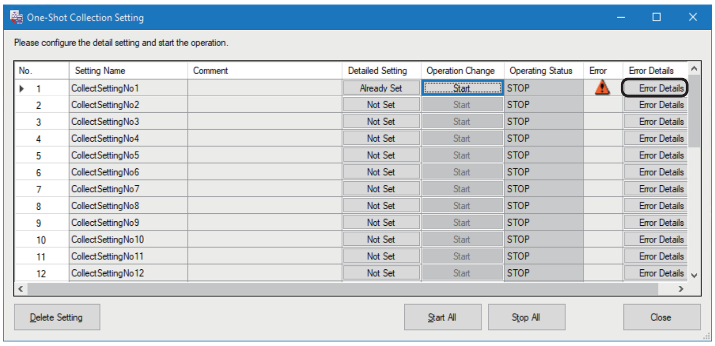
10. Click the [Start] button in the "Operation Change" column in the "One-Shot Collection Setting" screen.

When the one-shot collection function starts running normally, "RUN" is displayed in "Operating Status" and the cell is displayed in green.

Point

Clicking the [Start All] button can switch the operating statuses to "RUN" for all set one-shot collection settings.

11. If an icon appears in the "Error" column, check the error list and detailed information in the "Error Details" screen displayed by clicking the [Error Details] button, and take corrective action. (☞ Page 288 Error details screen)



Please configure the detail setting and start the operation.

No.	Setting Name	Comment	Detailed Setting	Operation Change	Operating Status	Error	Error Details
1	CollectSettingNo1		Already Set	Start	STOP	⚠	Error Details
2	CollectSettingNo2		Not Set	Start	STOP		Error Details
3	CollectSettingNo3		Not Set	Start	STOP		Error Details
4	CollectSettingNo4		Not Set	Start	STOP		Error Details
5	CollectSettingNo5		Not Set	Start	STOP		Error Details
6	CollectSettingNo6		Not Set	Start	STOP		Error Details
7	CollectSettingNo7		Not Set	Start	STOP		Error Details
8	CollectSettingNo8		Not Set	Start	STOP		Error Details
9	CollectSettingNo9		Not Set	Start	STOP		Error Details
10	CollectSettingNo10		Not Set	Start	STOP		Error Details
11	CollectSettingNo11		Not Set	Start	STOP		Error Details
12	CollectSettingNo12		Not Set	Start	STOP		Error Details

12. To stop the operation of the one-shot collection function, click the [Stop] button in the "Operation Change" column.

Point

Clicking the [Stop All] button can switch the operating status to "STOP" for a one-shot collection setting for which "RUN" is displayed.

Precautions

■When performing the test

No notification of saving completion is sent regardless of the notification destination of completion.

■When saving data to a database

When changing the setting of output data after outputting a DDL file, output the DDL file and create the table in the database again. If the table is not created again, an error may occur when starting the operation or incorrect data may be stored in the database.

Pre-configuration for saving data to a database

The following procedure must be performed in advance when saving data to a database.

Operating procedure

1. Install a database.

☞ Page 530 Installing PostgreSQL

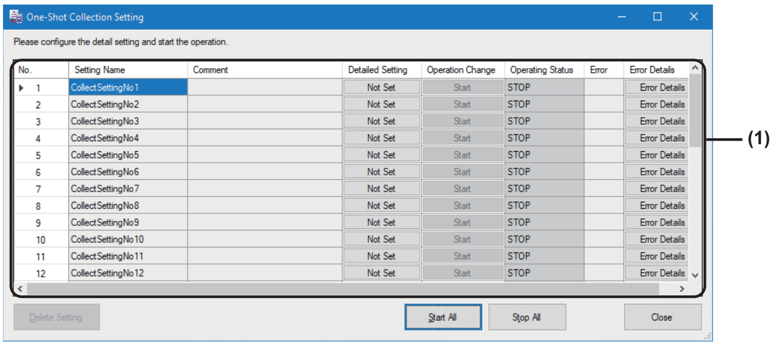
2. Install the ODBC driver.

☞ Page 535 Installing the ODBC driver for PostgreSQL

3. Configure the ODBC setting.

☞ Page 536 ODBC setting

One-shot collection setting screen



Please configure the detail setting and start the operation.

No.	Setting Name	Comment	Detailed Setting	Operation Change	Operating Status	Error	Error Details
1	CollectSettingNo1		Not Set	Start	STOP		Error Details
2	CollectSettingNo2		Not Set	Start	STOP		Error Details
3	CollectSettingNo3		Not Set	Start	STOP		Error Details
4	CollectSettingNo4		Not Set	Start	STOP		Error Details
5	CollectSettingNo5		Not Set	Start	STOP		Error Details
6	CollectSettingNo6		Not Set	Start	STOP		Error Details
7	CollectSettingNo7		Not Set	Start	STOP		Error Details
8	CollectSettingNo8		Not Set	Start	STOP		Error Details
9	CollectSettingNo9		Not Set	Start	STOP		Error Details
10	CollectSettingNo10		Not Set	Start	STOP		Error Details
11	CollectSettingNo11		Not Set	Start	STOP		Error Details
12	CollectSettingNo12		Not Set	Start	STOP		Error Details

Item		Description
(1) Collection setting list[*1]	Setting Name	A collection setting name set in the "Detailed Setting" screen is displayed. (☞ Page 282 Detailed setting screen)
	Comment	A comment set in the "Detailed Setting" screen is displayed. (☞ Page 282 Detailed setting screen)
	Detailed Setting	Clicking a cell in this column displays the "Detailed Setting" screen. (☞ Page 282 Detailed setting screen)
	Operation Change[*2]	The operation for a one-shot collection setting can be switched.
	Operating Status[*3]	"RUN" or "STOP" is displayed for the operating status for the one-shot collection setting. When "RUN" is displayed, the cell is displayed in green.
	Error	If an error occurs, its type is displayed. • ⚠ : A minor error has occurred. • ⚠ : A moderate error has occurred.
	[Error Details] button	Click this to display the "Error Details" screen. (☞ Page 288 Error details screen) This screen appears even if there are no errors.
[Start All] button[*4]		Click this to switch the operating statuses to RUN for all set one-shot collection settings.
[Stop All] button		Click this to switch the operating status to STOP for a one-shot collection setting for which "RUN" is displayed.
[Close] button[*5]		Click this to close the screen.
[Delete Setting] button[*6,*7]		Click this to delete a selected setting from the list. Only one setting can be deleted at a time.

*1 Up to 32 one-shot collection settings can be set.

*2 Can be switched when a target one-shot collection setting is completed.

*3 Remains RUN even if a moderate error occurs.

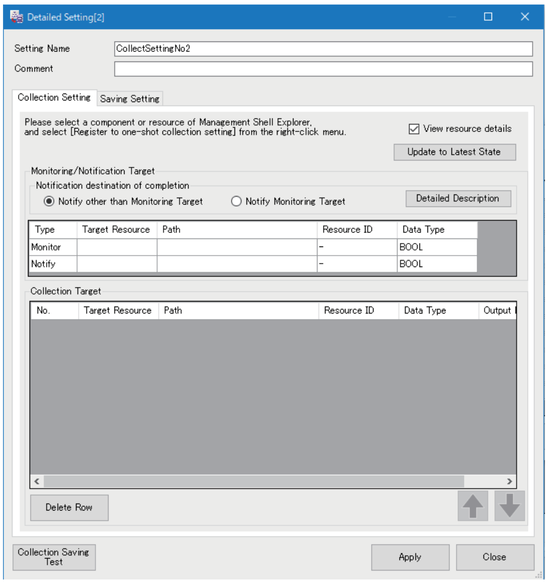
*4 The operating status is not switched for a one-shot collection setting for which "RUN" is already displayed.

*5 Can be clicked when "STOP" is displayed for the operating statuses for all one-shot collection settings.

*6 Can be clicked when both of the following conditions are satisfied:
A target one-shot collection setting is completed.
"STOP" is displayed for the operating status for a target one-shot collection setting.

*7 If an error occurs, the error is not cleared even if the setting is deleted.

Detailed setting screen



Setting Name: CollectSettingNo2

Comment:

Please select a component or resource of Management Shell Explorer,
and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Monitoring/Notification Target

Notification destination of completion

● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor			-	BOOL
Notify			-	BOOL

Collection Target

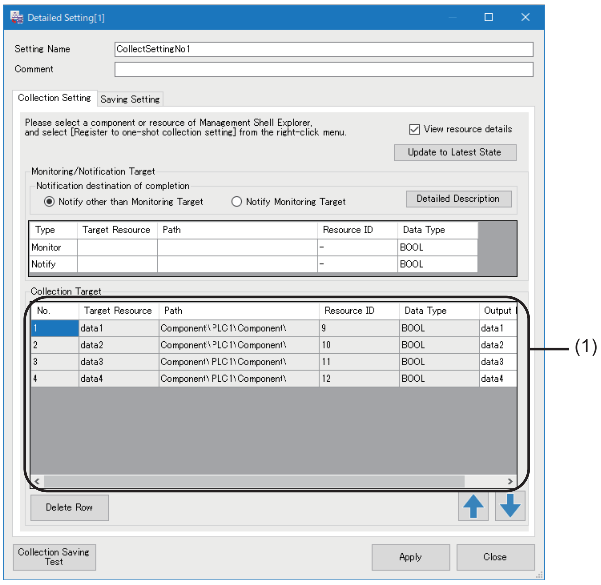
No.	Target Resource	Path	Resource ID	Data Type	Output

Item	Description
Setting Name[*1]	Set the name of a one-shot collection setting (1 to 32 characters). A name duplicated with another one-shot collection setting cannot be set. • By default, it is displayed as follows: "CollectSettingNoXX" (XX is a setting number.)
Comment[*1]	Set a comment (up to 100 characters).
[Collection Setting] tab	Set each item for the data collection function. ☞ Page 283 Collection setting
[Saving Setting] tab	Set each item for the file saving function or DB saving function. ☞ Page 286 File saving setting ☞ Page 287 DB saving setting
[Collection Saving Test] button[*1]	Click this to perform the test of the one-shot collection function. Note that the following items are not checked during the collection saving test. • Duplicate setting name • Duplicate monitoring and notification target resources
[Apply] button[*1,*2]	Click this to apply the setting. If there is any incorrect item, the row is displayed in yellow.

*1 Can be changed or clicked when "STOP" is displayed for the operating status for a target one-shot collection setting.

*2 The setting cannot be applied if WSTRING type data is included in the collection target resource when selecting "File" for "Saving Method" and "CSV file (Shift_JIS)" for "File Format Setting."
☞ Page 286 File saving setting

■Collection setting



Setting Name: CollectSettingNo1

Comment:

Please select a component or resource of Management Shell Explorer, and select [Register to one-shot collection setting] from the right-click menu.

☑ View resource details

Notification destination of completion

● Notify other than Monitoring Target ○ Notify Monitoring Target

Type	Target Resource	Path	Resource ID	Data Type
Monitor			-	BOOL
Notify			-	BOOL

No.	Target Resource	Path	Resource ID	Data Type	Output
1	data1	Component\PLC1\Component\	9	BOOL	data1
2	data2	Component\PLC1\Component\	10	BOOL	data2
3	data3	Component\PLC1\Component\	11	BOOL	data3
4	data4	Component\PLC1\Component\	12	BOOL	data4

Item		Description
View resource details		Select the checkbox to display the resource IDs of a collection, monitoring, and notification target resource.
[Update to Latest State] button[*1]		Click this to update information on registered collection, monitoring, and notification target resources. If an incorrect setting is included in a resource after an update, the cell is displayed in yellow.
Notification destination of completion[*1,*2]		Select either one for the notification destination of saving completion. Details can be checked in the "Detailed Description" screen displayed by clicking the [Detailed Description] button[*1]. (A notification destination can also be selected in the "Detailed Description" screen.)
Type		The type of a resource is displayed ("Monitor" or "Notify").
Target Resource		The resource display name of a data tag resource registered as a monitoring or notification target resource is displayed. When registering a new monitoring or notification target resource, the existing one is overwritten. In addition, when registering a new monitoring or notification target resource while the cell is yellow, it returns to white.
Path		The path to a data tag resource registered as a monitoring or notification target resource is displayed.
Resource ID[*3]		The resource ID of a data tag resource registered as a monitoring or notification target resource is displayed.
Data Type		The data type of a data tag resource registered as a monitoring or notification target resource is displayed.
(1) Collection target resource list[*4]	Target Resource	The resource display name of a data tag resource registered as a collection target resource is displayed.
	Path	The path to a data tag resource registered as a collection target resource is displayed.
	Resource ID[*3]	The resource ID of a data tag resource registered as a collection target resource is displayed.
	Data Type	The data type of a data tag resource registered as a collection target resource is displayed.
	Output Name[*1]	Set the output name when saving data (63 bytes or less).[*5] • For file saving: Set the column name. • For DB saving: Set the column name. By default, the resource display name of a registered data tag resource is displayed. However, it is blank in the following cases: The resource display name is duplicated. An invalid character is included in the resource display name.
[Delete Row] button[*1]		Click this to delete a selected collection target resource from the list.

*1 Can be changed or clicked when "STOP" is displayed for the operating status for a target one-shot collection setting.

*2 A value is retained until the screen is closed when "Notify Monitoring Target" is selected for "Notification destination of completion" and the value is set as the notification target resource before changing to "Notify Monitoring Target."

*3 Appears when selecting the checkbox of "View resource details."

*4 A collection target resource can be moved to a specified row in the "Move to the specified No." screen displayed by selecting and right-clicking the resource and selecting [Move to the specified No.]. This menu can be selected only when "STOP" is displayed for the operating status for the target one-shot collection setting.

*5 The number of available characters can be calculated based on the number of bytes in UTF-8.
Examples of typical characters and their numbers of bytes are as follows:

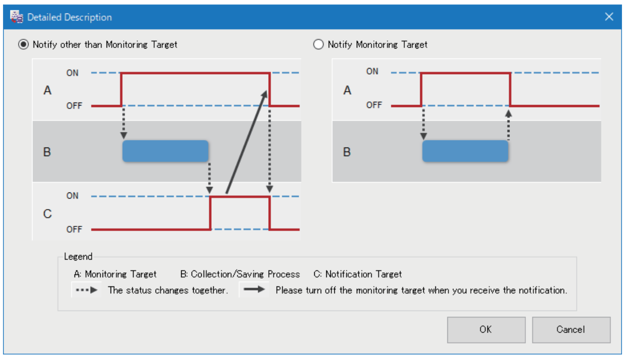
- 0 to 9, A to Z, a to z, _ (U+005F): 1 byte
- Greek, etc.: 2 bytes
- Hiragana, katakana, kanji (excluding some), etc.: 3 bytes

Point

If "STOP" is displayed for the operating status and each item is already set for a target one-shot collection setting, information on registered collection, monitoring, and notification target resources is updated to the latest when opening the "Detailed Setting" screen. However, if an incorrect setting is included in any of the resources after the update, the cell is displayed in yellow.

- Detailed description screen

  A notification destination selected in this screen is applied to the "Detailed Setting" screen.

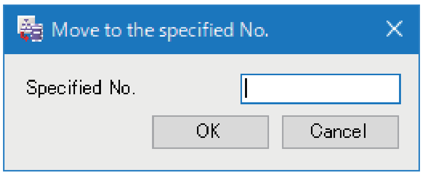


● Notify other than Monitoring Target
○ Notify Monitoring Target

Legend
A: Monitoring Target B: Collection/Saving Process C: Notification Target
The status changes together.
Please turn off the monitoring target when you receive the notification.

Item	Description
Notify other than Monitoring Target	Select this to set a notification target resource as a notification destination of saving completion.
Notify Monitoring Target	Select this to set a monitoring target resource as a notification destination of saving completion.

- "Move to the specified No." screen



Item	Description
Specified No.	Specify the row of a destination.[*1] When selecting multiple rows, they are moved based on the following: ■If a specified row is above the selected range of rows The selected rows are moved so that the one with the smallest number is in the specified row. ■If a specified row is in the selected range of rows The row is not moved. ■If a specified row is below the selected range of rows The selected rows are moved so that the one with the largest number is in the specified row.

[*1] If a collection target resource does not exist in a specified row, a selected collection target resource is moved to the bottom row. (Example) If '4' is specified when the bottom collection target resource is in the third row, a selected collection target resource is moved to the third row.

Ex.

The following shows examples when selecting No.3 and No.4 in the collection target resource list.

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_c
4	Resource_d
5	Resource_e
6	Resource_f

Specified No. is 1

No.	Target resource
1	Resource_c
2	Resource_d
3	Resource_a
4	Resource_b
5	Resource_e
6	Resource_f

Specified No. is 2

No.	Target resource
1	Resource_a
2	Resource_c
3	Resource_d
4	Resource_b
5	Resource_e
6	Resource_f

Specified No. is 3

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_c
4	Resource_d
5	Resource_e
6	Resource_f

Specified No. is 4

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_c
4	Resource_d
5	Resource_e
6	Resource_f

Specified No. is 5

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_e
4	Resource_c
5	Resource_d
6	Resource_f

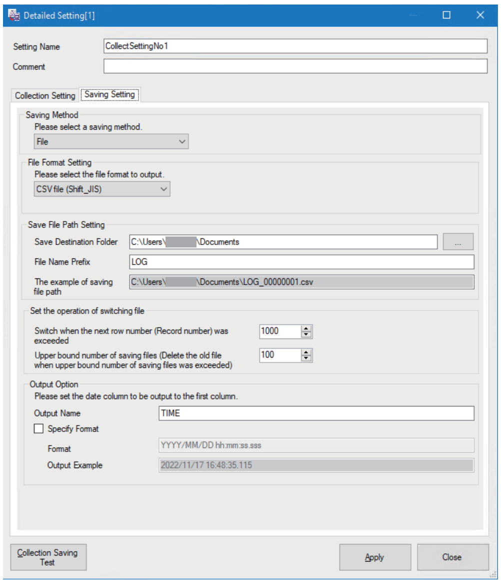
Specified No. is 6

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_e
4	Resource_f
5	Resource_c
6	Resource_d

Specified No. is 7

No.	Target resource
1	Resource_a
2	Resource_b
3	Resource_e
4	Resource_f
5	Resource_c
6	Resource_d

■File saving setting



Setting Name: CollectSettingNo1

Comment:

Saving Method

Please select a saving method.

File

File Format Setting

Please select the file format to output.

CSV file (Shift_JIS)

Save File Path Setting

Save Destination Folder: C:\Users\[redacted]\Documents

File Name Prefix: LOG

The example of saving file path: C:\Users\[redacted]\Documents\LOG_00000001.csv

Set the operation of switching file

Switch when the next row number (Record number) was exceeded: 1000

Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded): 100

Output Option

Please set the date column to be output to the first column.

Output Name: TIME

☐ Specify Format

Format: YYYY/MM/DD hh:mm:ss.sss

Output Example: 2022/11/17 16:48:35.115

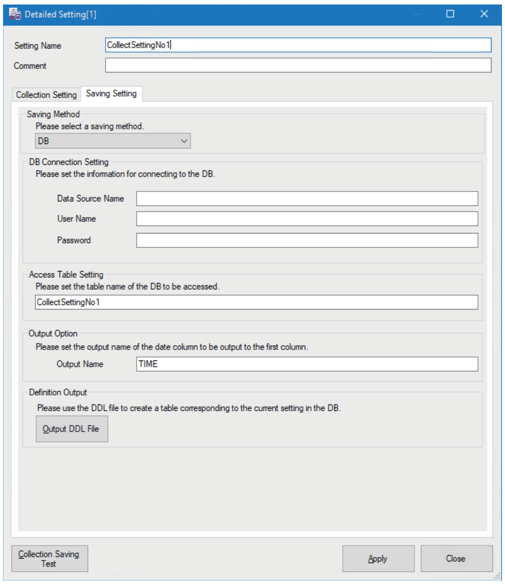
Item		Description
Saving Method[*1]		Select "File."
File Format Setting[*1]		Select the format of a file for saving data.
Save File Path Setting[*1]	Save Destination Folder	Set the save destination for a file (1 to 204 characters). It can also be set in the "Save File Path Setting" screen displayed by clicking the [...] button.
	File Name Prefix	Set the prefix of a saved file name (1 to 32 characters).
	The example of saving file path	The saving file path based on the settings for "Save Destination Folder" and "File Name Prefix" is displayed.
Set the operation of switching file[*1]	Switch when the next row number (Record number) was exceeded	Set the number of data rows stored in one file (1 to 9000). If it is exceeded, a file will be output.
	Upper bound number of saving files (Delete the old file when upper bound number of saving files was exceeded)	Set the maximum number of files stored in one folder (1 to 100). If it is exceeded, files will be deleted in chronological order.
Output Option[*1]	Output Name	Set a character string to output to the date and time column (63 bytes or less).[*2]
	Specify Format	Select the checkbox to specify the format of date and time data.
	Format	Set the output format of the date and time column (1 to 32 characters). The following reserved words[*3] can be specified. YYYY: Year (4 digits) YY : Year (2 digits) MM : Month (2 digits) DD : Day (2 digits) hh : Hour (2 digits) mm : Minute (2 digits) ss : Second (2 digits) ms : Millisecond (3 digits) us : Microsecond (6 digits) ns : Nanosecond (9 digits) .s to .sssssssss: Digits after the decimal point in seconds (1 to 9 digits)
	Output Example	An output example of the date and time column according to the current setting is displayed.

*1 Can be changed or clicked when "STOP" is displayed for the operating status for a target one-shot collection setting.

*2 The number of available characters can be calculated based on the number of bytes in UTF-8.
Examples of typical characters and their numbers of bytes are as follows:
- 0 to 9, A to Z, a to z, _ (U+005F): 1 byte
- Greek, etc.: 2 bytes
- Hiragana, katakana, kanji (excluding some), etc.: 3 bytes

*3 Case-sensitive

■DB saving setting



Setting Name: CollectSettingNo1
Comment:

Saving Method
Please select a saving method.
DB

DB Connection Setting
Please set the information for connecting to the DB.
Data Source Name:
User Name:
Password:

Access Table Setting
Please set the table name of the DB to be accessed.
CollectSettingNo1

Output Option
Please set the output name of the date column to be output to the first column.
Output Name: TIME

Definition Output
Please use the DDL file to create a table corresponding to the current setting in the DB.

Item		**Description**
Saving Method[*1]		Select "DB."
DB Connection Setting[*1]	Data Source Name	Set the data source name of a database (1 to 32 characters).
	User Name	Set the user name of a database (1 to 32 characters).
	Password	Set the password for a database (6 to 32 characters).
Access Table Setting[*1]		Set the table name[*2] of a database to access (1 to 63 bytes).[*3] • By default, the setting name of a one-shot collection setting is displayed. However, it is blank in the following cases: An inhibited character is included. The setting name overlaps with the table name of another access table setting.
Output Option[*1]	Output Name	Set a character string to output to the date and time column (63 bytes or less).[*3]
[Output DDL File] button[*1]		Click this to output a DDL file with set contents. Note that a DDL file must be output to the hard disk of an industrial PC, not to a network drive or removal disk.

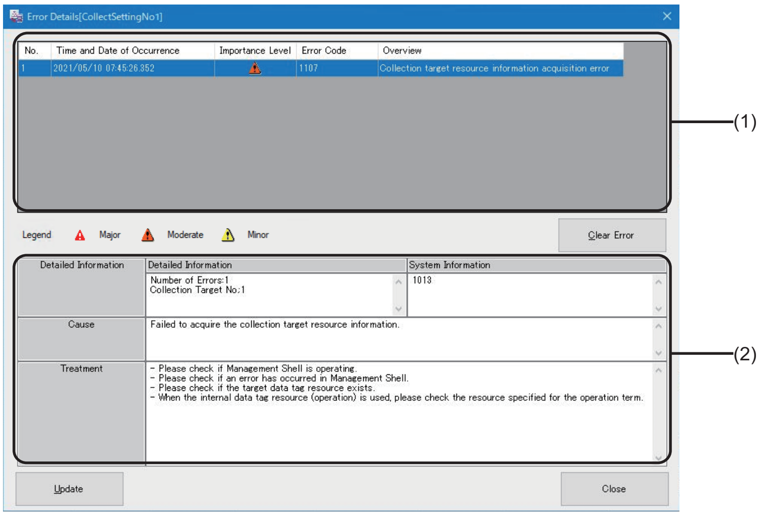
[*1] Can be changed or clicked when "STOP" is displayed for the operating status for a target one-shot collection setting.

[*2] Not case-sensitive

[*3] The number of available characters can be calculated based on the number of bytes in UTF-8.
Examples of typical characters and their numbers of bytes are as follows:
- 0 to 9, A to Z, a to z, _ (U+005F): 1 byte
- Greek, etc.: 2 bytes
- Hiragana, katakana, kanji (excluding some), etc.: 3 bytes

Error details screen

Details on an error that occurred can be checked for each one-shot collection setting. Up to 16 errors are displayed.



No.	Time and Date of Occurrence	Importance Level	Error Code	Overview
1	2021/05/10 07:45:26.352	⚠	1107	Collection target resource information acquisition error

Detailed Information	Detailed Information	System Information
	Number of Errors:1 Collection Target No:1	1013
Cause	Failed to acquire the collection target resource information.	
Treatment	- Please check if Management Shell is operating. - Please check if an error has occurred in Management Shell. - Please check if the target data tag resource exists. - When the internal data tag resource (operation) is used, please check the resource specified for the operation term.	

Item		Description
(1) Error information list	Time and Date of Occurrence	The year, month, day, and time when an error occurs are displayed.
	Importance Level	The severity of an error is displayed. ■⚠ (Minor): Even if this type of error occurs, the one-shot collection function continues running. (Example) Errors that occur when a value of a collection target resource cannot be read ■⚠ (Moderate): If this type of error occurs, the operation of the one-shot collection function is interrupted. (Example) Errors in OPC UA connection or file saving
	Error Code	The code for an error that occurs when using the one-shot collection function is displayed. (☞ Page 429 Error Code List for the One-shot Collection Function)
	Overview	The overview of an error that is occurring is displayed.
[Clear Error] button[*1]		Click this to delete minor errors displayed in the error information list in a batch.
(2) Error detailed information	Detailed Information	Detailed information of an error is displayed.[*2]
	Cause	An error cause is displayed.
	Treatment	A corrective action for an error is displayed.
[Update] button[*1]		Click this to update the error display.

[*1] Cannot be clicked if this screen is displayed by performing the test.

[*2] Depending on the error type, the total number of collection target resources in which an error has occurred is displayed. In addition, the number of a collection target resource in which an error has occurred is displayed. Note that if 11 or more errors occur, the 11th and later ones are not displayed.

Point

When closing the "One-Shot Collection Setting" screen, errors are cleared.

Precautions

If a moderate error is included in the error information list, the displayed errors cannot be cleared.

7.9 Event History Automatic Output Function

This section shows the function to automatically output event/error information, which is collected from Management Shell, data collectors used in Management Shell, and IT gateways, to a specified folder in a CSV file format.
For the output setting, refer to the following:
☞ Page 292 Event history automatic output setting screen
With an operation check file that is automatically output, it can be confirmed that this function is running normally.

Event history file

The following shows the detailed specifications of an event history file.

Output targets

Output target events are as follows:

Item	Target
Event type	Operation, system, security
Status (severity)	Major, moderate, minor, warning, information
Problem function	Management Shell Data collector IT gateway

Event history file format

The format of an event history file to be output is as follows:

■File format

Item	Description
File format	CSV file
Character code	UTF-8 with BOM
File name	"MgtShellLog.csv" After a file is backed up, the date and time information at the time of switching is added to the end of the above file name. Date and time information format: MMddHHmmss MM: Two-digit numerical value from 01 to 12 dd: Two-digit numerical value from 01 to 31 HH: Two-digit numerical value from 00 to 23 mm: Two-digit numerical value from 00 to 59 ss: Two-digit numerical value from 00 to 59 ■File name example MgtShellLog1203174055.csv For details on the backup operation, refer to the following: ☞ Page 290 Backing up an event history file
Extension	.csv
Information to be output	1st row: Header row 2nd and later rows: Data row Up to 39999 data rows are output. If it is exceeded, the first data row is deleted and the latest event is added to the end of the file. For details on the header row and each column, refer to the following: ☞ Page 87 Information output to an event history file

■Information output to an event history file

Refer to the following:
☞ Page 87 Information output to an event history file

Output location

Refer to the following:
☞ Page 87 Output location

Operational specifications

The following shows the operational specifications for outputting an event history file.

■File output authority

Refer to the following:

☞ Page 88 File output authority

■File output

An event history file is output at the following timings:

- Management Shell is started.
- The event history automatic output setting is applied (excluding when changing 'enabled' to 'disabled' for output).
- An event occurs within the event history monitoring interval.

If a specified folder does not exist, a folder is created and an event history file is saved to the folder.

In addition, if a file with the same name exists, it is overwritten with the event history file.

If the event history file cannot be saved, the file saving is retried.

Events that occur during a retry are output together when they become available for saving.

If backup of an event history file fails, the file is not output until it succeeds. For details on backup of an event history file, refer to the following:

☞ Page 290 Backing up an event history file

■Backing up an event history file

A backup file starts being created when deleting an event history in the "Event History" screen of Management Shell Explorer.[*1]

If an error occurs during backup, an event is registered.

For the event codes, refer to the following:

☞ Page 422 Codes for events that occur in Management Shell

Backed up files are not deleted from Edgecross Basic Software. (The maximum number of files that can be backed up is determined by the file system.)

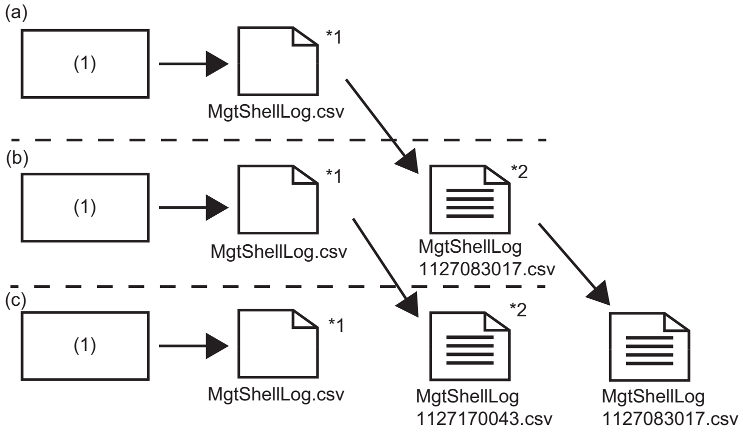
The date of backup is added to the file name of a backed up file.

For details on the file name, refer to the following:

☞ Page 289 File format

[*1] The next time an event history file is output, it is backed up before output regardless of whether the event history file output setting is enabled or disabled when deleting an event history.
When changing the save destination folder before backup, an event history file in the folder after the change is backed up.

An example of backup operation is as follows:



(1) Management Shell
(a) An event history is deleted in the "Event History" screen. (November 26th 12:45:22)
(b) An event history is deleted in the "Event History" screen. (November 27th 08:30:17)
(c) An event history is deleted in the "Event History" screen. (November 27th 17:00:43)

*1 The file name of the latest file is always 'MgtShellLog.csv.'
*2 A file is backed up when deleting an event history.

Operation check file

The following shows the detailed specifications of an operation check file.

Operation check file format

The format of an operation check file is as follows.

Note that an operation check file is not backed up, and one file is used continuously.

Item	Description
File format	Text
Character code	UTF-8 with BOM
File name	"MgtShellLogKeepAlive.dat"
Extension	.dat

Output location

An operation check file is saved to the same location as an event history file.

☞ Page 87 Output location

Operational specifications

Refer to the following:

☞ Page 90 Operational specifications

Considerations

Refer to the following:

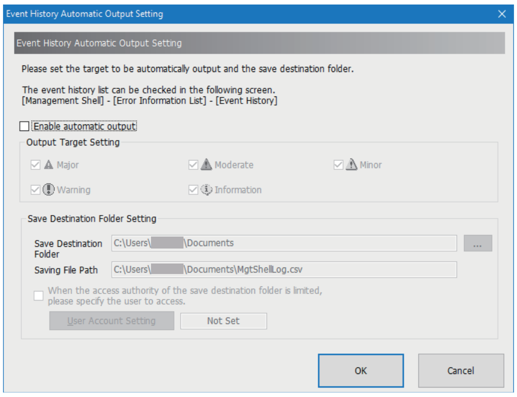
☞ Page 91 Considerations

Event history automatic output setting screen

The following shows the screen for settings required to automatically output an event history.

Window

Select [Setting] ⇨ [Event History Automatic Output Setting].


Event History Automatic Output Setting
Event History Automatic Output Setting
Output Target Setting
Save Destination Folder Setting
User Account Setting
OK
Cancel

Please set the target to be automatically output and the save destination folder.

The event history list can be checked in the following screen.
[Management Shell] - [Error Information List] - [Event History]

☐ Enable automatic output

☑ Major ☑ Moderate ☑ Minor
☑ Warning ☑ Information

Save Destination Folder: C:\Users\[redacted]\Documents

Saving File Path: C:\Users\[redacted]\Documents\MgtShellLog.csv

☐ When the access authority of the save destination folder is limited, please specify the user to access.

Not Set

Displayed items

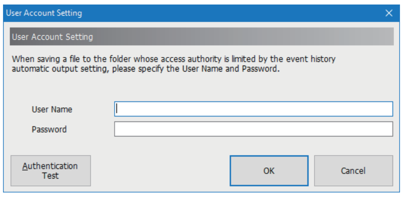
Item		Description
Enable automatic output		Select the checkbox to automatically output an event history to a file.[*1]
Output Target Setting[*2]		Select the checkbox of an event to be output.
Save Destination Folder Setting	Save Destination Folder[*2]	Set a save destination folder (1 to 233 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.
	Saving File Path	The saving file path based on the setting for "Save Destination Folder" is displayed.
	When the access authority of the save destination folder is limited, please specify the user to access.[*2]	Select the checkbox if access is granted to the save destination folder for an event history file.[*1]
	[User Account Setting] button[*3]	Click this to display the "User Account Setting" screen. ☞ Page 293 User account setting screen The setting status of the "User Account Setting" screen is displayed to the right of this button.

*1 When fixing the settings without selecting the checkbox, the settings in the "User Account Setting" screen are deleted.
*2 Can be selected or set when selecting the checkbox of "Enable automatic output."
*3 Can be clicked when selecting the checkboxes of "Enable automatic output" and "When the access authority of the save destination folder is limited, please specify the user to access."

User account setting screen

The following shows the screen for setting a user name and password used for accessing a folder with restricted access.

Window



When saving a file to the folder whose access authority is limited by the event history automatic output setting, please specify the User Name and Password.

Displayed items

Item	Description
User Name[*1,*2]	Set a user name used for file output (up to 127 characters). When specifying a domain, set it in either of the following formats:[*3*4] • [Domain name]\[User name] • [User name]@[Domain name] When specifying a local user of an industrial PC on which Edgecross Basic Software is installed, set it in any of the following formats: • [Computer name]\[User name] • .\[User name] • [User name]
Password[*1,*2]	Set a password used for accessing a folder (up to 127 characters).
[Authentication Test] button	Click this to perform the authentication test for a user account to Windows by using a set user name and password.

*1 If changing a set password for a user account in Windows, set it again.

*2 To prevent eavesdropping and falsification of data, it is recommended to use a user account with a password satisfying complexity requirements.
The complexity requirements can be checked by the following procedure:
❶ Start the local security policy of Windows.
❷ Double-click [Security Settings] ⇨ [Account Policies] ⇨ [Password Policy] ⇨ [Password must meet complexity requirements].
❸ Select the [Explain] tab in the "Password must meet complexity requirements Properties" screen.

*3 When '@' and '\' are included, the format is determined as [User name]@[Domain name].
When multiple pieces of '@' or '\' are included, the first '@' ('\' if there is no '@') is used as a delimiter between a domain name and a user name.

*4 Do not specify a local user of another industrial PC on the network.

Precautions

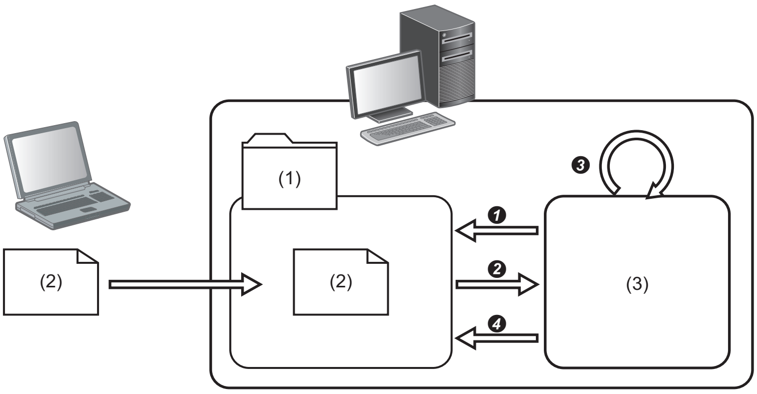
- When exporting a setting file while a local user of an industrial PC is set for "User Name" and importing the setting file in another industrial PC, the local user may not be authenticated in the import destination industrial PC. Set it again after import as necessary.
- The authentication test is performed on a local computer. Therefore, even when specifying another industrial PC on the network for a save destination folder, the test is not performed on the industrial PC.
- When repeating the following operations if a password is incorrect, a user account may be locked out. If an error occurs due to these operations, check if a password is correct.
  - Apply the setting.
  - Start Management Shell.
  - Perform the authentication test.

8 CSV File Data collector

CSV File Data collector is a software component that collects or reads data in devices via a monitoring target file (CSV file or text file).

8.1 Data Collection Function

This section shows the function to collect data in a device via a monitoring target file.
The following shows the behavioral flow of the data collection function.



(1) Monitoring folder
(2) Monitoring target file
(3) CSV File Data collector

❶ A monitoring folder is monitored periodically.
❷ A monitoring target file is read when it is stored in the monitoring folder.
❸ Data is collected from the read monitoring target file and passed to the next process.
❹ The monitoring target file is deleted after the data is passed.

Operational specifications

The following shows the operational specifications of the data collection function.

Folder monitoring

Whether there is a monitoring target file stored in a specified monitoring folder is monitored periodically, and a file is imported when it is detected that the file has been stored.

If multiple monitoring target files exist in a monitoring folder, they are imported in the following order:
❶ Update date/time (processed in order from the oldest file)
❷ File name (when the update date/time is the same)

The following table shows the specifications of a monitoring folder and monitoring target file.

Item name	Description
Monitoring folder[*1,*2,*3]	Set the full path to a folder to monitor. • A path to a folder on the local disk or to a shared folder can be set. • Up to 199 characters can be set for a path (including the drive letter and '\' at the end). • Monitoring targets are immediately under a specified monitoring folder. • A same monitoring folder cannot be specified for multiple CSV File Data collectors. • When importing a large monitoring target file, a 'csv' folder for temporary work may be created in a monitoring folder.
Monitoring target file	The target is a file with the prefix exactly matching a file name prefix specified in Real-time Flow Designer. • Up to 32 characters can be set for the prefix. • Only ASCII characters can be used for characters (suffix) after the prefix.[*4] • The target is a file with the extension matching the type of a file (.csv or .txt) specified in Real-time Flow Designer. • Up to 256 characters can be set for the path to a monitoring target file.

*1 When using a remote shared folder, refer to the following:
☞ Page 556 Using a shared folder without specifying a user account in Edgecross Basic Software
*2 Do not specify a folder with the encryption attribute enabled.
Otherwise, the encryption cannot be disabled due to the difference in access rights and files in the folder are treated as ones that cannot

be read or written.
For collection processing of files that cannot be read or written, refer to the following:
☞ Page 306 File processing order when files that cannot be read or written are included
For details on a folder with the encryption attribute enabled, refer to the following:
☞ Page 71 Using a folder with the encryption attribute enabled

*3 If the existence of a folder cannot be confirmed after the following time elapses, an error will occur.
When starting an industrial PC: 240 seconds after the startup of the industrial PC
When 240 or more seconds elapses after the startup of an industrial PC: 10 seconds

*4 Delimit the prefix and the suffix by '_.'

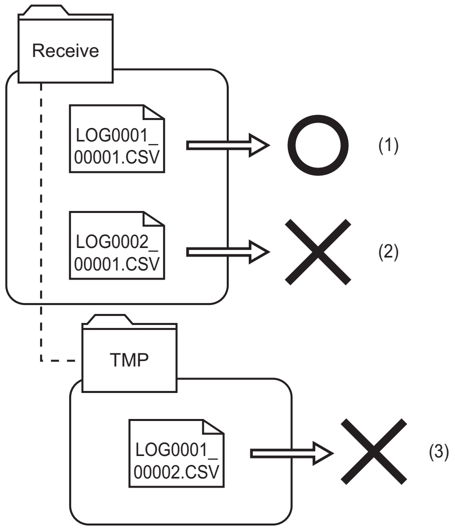
■File collection example

An example of file collection when specifying the following items is shown below.

Monitoring folder: C:\Receive

File name prefix: LOG0001

Monitoring target file: LOG0001*.CSV



(1) A file is imported when it is detected that the file has been stored.
(2) A file is not imported even when it is stored due to the difference in file name prefixes.
(3) A file is not imported even if it is stored, because the file is stored in a folder other than one immediately under a monitoring folder.

Precautions

If the collection cycle must be reviewed, such as when the message is displayed for "Treatment" in the "Event History" screen, take the following actions:

☞ Page 335 Event history

- Reduce the number of files stored at the same time.
- Reduce the frequency of storing monitoring target files in a monitoring folder.
- Reduce the number of rows in a monitoring target file.

Collection process overview

A monitoring target file is imported by using the definition information of collection data (file information, data name information, and data type information) set in Real-time Flow Designer.
Read data other than the header information is passed to the next process.

Monitoring target file after collection processing

The following shows a monitoring target file after collection processing.

■Normal situation

A monitoring target file that is successfully collected will be deleted from a monitoring target folder.

■Abnormal situation

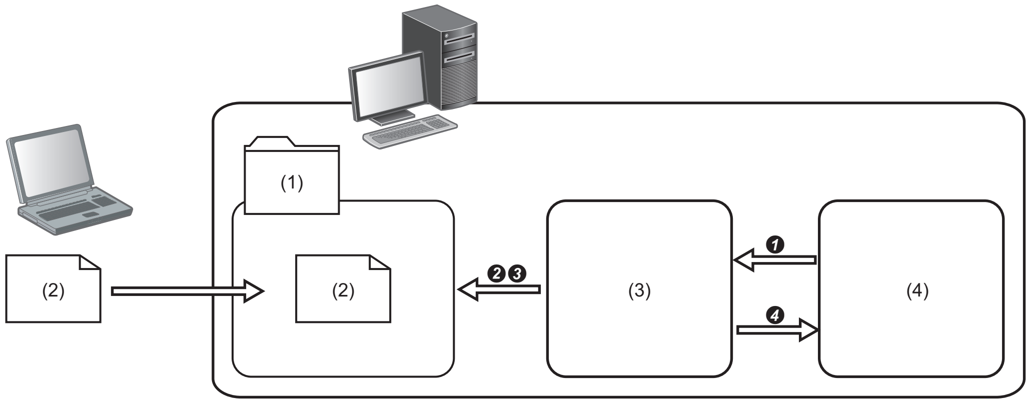
If an error occurs while importing a file, an 'Error' folder is created in a monitoring folder and an imported monitoring target file is moved to the folder.

The file in the Error folder is not deleted automatically.

8.2 Data Reading Function

This section shows the function to read data in a device via a monitoring target file.

The following shows the behavioral flow of the data reading function.



(1) Monitoring folder
(2) Monitoring target file
(3) CSV File Data collector
(4) Management Shell

❶ A data reading request is received from Management Shell.

❷ A monitoring target file with the latest update date and time is searched for among the monitoring target files stored in a monitoring folder.

❸ Data is read from the last row of the searched monitoring target file.

❹ The read data is returned.

Operational specifications

The following shows the operational specifications of the data reading function.

Reading a monitoring target file

A monitoring target file with the latest update date and time is searched for among the monitoring target files stored in a monitoring folder.

If there are multiple monitoring target files with a same update date and time, their file names are sorted in the order of signs defined in UTF-8 and the last sorted file is read.

The following table shows the specifications of a monitoring folder and monitoring target file.

Item name	Description
Monitoring folder[*1,*2]	Set the full path to a folder to monitor. • A path to a folder on the local disk or to a shared folder can be set. • Up to 199 characters can be set for a path (including the drive letter and '\' at the end). • Monitoring targets are immediately under a specified monitoring folder.
Monitoring target file[*3,*4]	The target is a file with the prefix exactly matching a file name prefix specified in Management Shell Explorer. • Up to 32 characters can be set for the prefix. • Only ASCII characters can be used for characters (suffix) after the prefix.[*5] • The target is a file with the extension matching the type of a file (.csv or .txt) specified in Management Shell Explorer. • Up to 256 characters can be set for the path to a monitoring target file.

*1 When using a remote shared folder, refer to the following:
☞ Page 556 Using a shared folder without specifying a user account in Edgecross Basic Software

*2 If a folder does not exist, an error will occur.

*3 An error occurs in any of the following cases:
No file exists.
The size is 0 bytes.
A target file cannot be opened with SYSTEM account, because the encryption attribute is enabled for the monitoring folder.
The access right is not granted.
A file is used in another process (prohibited from being read and written).

*4 A read-only file can be set.

*5 Delimit the prefix and the suffix by '_.'

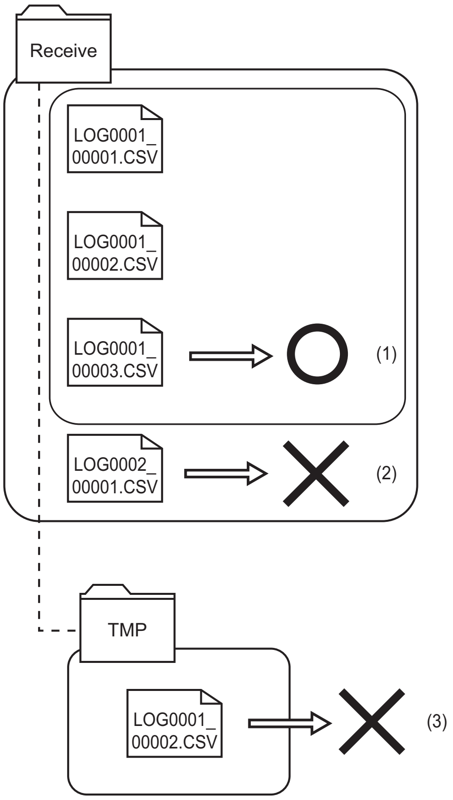
■Example of file reading

An example of file reading when specifying the following items is shown below.

Monitoring folder: C:\Receive

File name prefix: LOG0001

Monitoring target file: LOG0001*.CSV



(1) A file with the latest update date and time is read. (If there are multiple files with a same update date and time, their file names are sorted in the order of signs defined in UTF-8 and the last sorted file is read.)
(2) A file is not read even when it is stored due to the difference in file name prefixes.
(3) A file is not read even if it is stored, because the file is stored in a folder other than one immediately under a monitoring folder.

Data reading

Data in a column specified in Management Shell Explorer is read from the last row of a monitoring target file. If a row specified for the data start row number and subsequent ones do not exist or the number of columns is insufficient, an error will occur.

In addition, read data is converted according to the corresponding data type. If data type conversion fails, such as when a value out of the range of the data type is used, an error will occur.

Monitoring target file after data reading processing

The following shows a monitoring target file after data reading processing.

■Normal situation

A monitoring target file that is successfully read will not be deleted from a monitoring target folder.

■Abnormal situation

If an error occurs, a monitoring target file is not deleted or moved. (CSV File Data collector continues reading target files until a new monitoring target file is stored in the monitoring folder.)

8.3 Detailed Specifications

Specifications of a monitoring target file

The following tables show the format specifications of a monitoring target file.

Use in Real-time Flow Manager

Item name	**Description**	
	CSV file	**Text file**
Extension	csv	txt
Delimiter	Comma (,)[*4,*5]	Tab (\t)[*6,*7]
Line feed code[*1]	CRLF (0x0D, 0x0A) Enter a line feed code in the end of every row (excluding the end of a file).	
Character code	Shift JIS or UTF-8 (with BOM)	UTF-8 (with BOM) or UTF-16LE (with BOM)
Header information	Rows immediately before a data start row number specified in a collection data definition file are treated as header information. The header information is optional and its content can be set arbitrarily.	
Field data[*2,*3]	• Double quotes (") cannot be used. • Commas (,) can be used for the date and time column only.[*4,*5]	• Double quotes (") cannot be used. • Tabs (\t) cannot be used. • Commas (,) can be used for the date and time column only.
Column type	• Date and time column[*8]: Time stamp of collected data[*9] • Data column: Value of collected data[*10,*11]	
Number of columns[*12]	Up to 257 columns • Date and time column[*13]: 1 column • Data column: 256 columns	

*1 CSV File Data collector also runs normally for the following line feed codes:
CR only
LF only
Blank + CRLF
Horizontal TAB + CRLF

*2 If the data type is one other than STRING and WSTRING, consecutive spaces at the start and end of data are not collected.

*3 If data does not match the 'format specification string representing ON' or 'format specification string representing OFF' set in the following section when the data type is BOOL or BIT, the corresponding process flow will be stopped.
☞ Page 304 Additional information character string

*4 Use the same number of commas (,) in all the rows.

*5 No error occurs when using a comma (,) at the end of a row or if there is more data included in a monitoring target file than data defined in a collection data definition file; however, an error occurs if there is less data.

*6 Use the same number of tabs (\t) in all the rows.

*7 No error occurs when using a tab (\t) at the end of a row or if there is more data included in a monitoring target file than data defined in a collection data definition file; however, an error occurs if there is less data.

*8 It must be the first column of a monitoring target file.

*9 The time stamp in the date and time column of a monitoring target file is displayed in local time. When using data out of the range of 2000/1/1 0:00 to 2079/12/31 23:59 (UTC), the time stamp may not be displayed properly.

*10 For REAL or LREAL type data, a value smaller than the minimum value of an absolute value is rounded to '0.'

*11 For LREAL type data, a value greater than the maximum value or smaller than the minimum one is rounded to the maximum or minimum value respectively.

*12 If it exceeds the number of columns set in Real-time Flow Designer, an error will occur and the corresponding process flow will stop.

*13 If a comma (,) is used, it is not counted.

Use in Management Shell

Item name	Description	
	CSV file	**Text file**
Extension	csv	txt
Delimiter	Comma (,)	Tab (\t)
Line feed code[*1]	CRLF (0x0D, 0x0A) Enter a line feed code in the end of every row (excluding the end of a file).	
Character code	Shift JIS or UTF-8 (with BOM)	UTF-8 (with BOM) or UTF-16LE (with BOM)
Header information	Rows immediately before a data start row number specified in the "Target Device Setting" screen are treated as header information. The header information is optional and its content can be set arbitrarily.	
Field data	• Double quotes (") cannot be used. • Commas (,) cannot be used.	• Double quotes (") cannot be used. • Tabs (\t) cannot be used.
Column type	• Date and time column[*2]: Time stamp of collected data • Data column: Value of collected data	
Number of columns	512 columns in maximum	

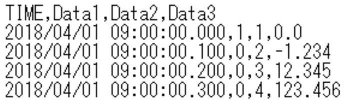
[*1] CSV File Data collector also runs normally for the following line feed codes:
CR only
LF only

[*2] Data in a column other than a specified one in the last row is not read; therefore, the date and time column does not need to be the first column.
To read the date and time column, set STRING or WSTRING for the data type of a reading target, and specify the date and time column for the column of the reading target.

Examples of monitoring target files to be collected

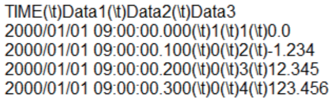
The following shows examples of monitoring target files to be collected.

- CSV file



```
TIME,Data1,Data2,Data3
2018/04/01 09:00:00.000,1,1,0.0
2018/04/01 09:00:00.100,0,2,-1.234
2018/04/01 09:00:00.200,0,3,12.345
2018/04/01 09:00:00.300,0,4,123.456
```

- Text file (Tabs are represented as the control character (\t).)



```
TIME(\t)Data1(\t)Data2(\t)Data3
2000/01/01 09:00:00.000(\t)1(\t)1(\t)0.0
2000/01/01 09:00:00.100(\t)0(\t)2(\t)-1.234
2000/01/01 09:00:00.200(\t)0(\t)3(\t)12.345
2000/01/01 09:00:00.300(\t)0(\t)4(\t)123.456
```

Specifications of a collection data definition file

The following table shows the format specifications of a collection data definition file.

Item name	Description	
	CSV file	**Text file**
Extension	csv[*1]	txt[*1]
Delimiter	Comma (,)[*3,*4]	Tab (\t)[*5,*6]
Line feed code[*2]	CRLF (0x0D, 0x0A) Enter a line feed code in the end of every header row.	
Character code	Shift JIS or UTF-8 (with BOM)	UTF-8 (with BOM) or UTF-16LE (with BOM)
Header information	☞ Page 302 Header information of a collection data definition file	
Field data	• Double quotes (") cannot be used. • Commas (,) can be used for the date and time column only.[*3,*4]	• Double quotes (") cannot be used. • Tabs (\t) cannot be used. • Commas (,) can be used for the date and time column only.
Column type	Not specified	
Number of columns[*7]	Up to 257 columns • Date and time column[*8]: 1 column • Data column: 256 columns	

*1 The extension of a file to be collected and that of a collection data definition file do not need to be the same.
(Example) Create a collection data definition file as a CSV file (*.csv), and collect a text file (*.txt).

*2 CSV File Data collector also runs normally for the following line feed codes:
CR only
LF only

*3 Use the same number of commas (,) in all the rows.

*4 No error occurs when using a comma (,) at the end of a row or if there is more data included in a monitoring target file than data defined in a collection data definition file; however, an error occurs if there is less data.

*5 Use the same number of tabs (\t) in all the rows.

*6 No error occurs when using a tab (\t) at the end of a row or if there is more data included in a monitoring target file than data defined in a collection data definition file; however, an error occurs if there is less data.

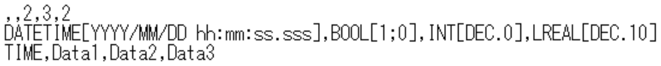
*7 If it exceeds the number of columns set in Real-time Flow Designer, an error will occur and the corresponding process flow will stop.

*8 If a comma (,) is used, it is not counted.

Examples of collection data definition files

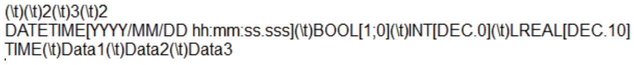
The following shows examples of collection data definition files.

- CSV file



```
,,2,3,2
DATETIME[YYYY/MM/DD hh:mm:ss.sss],BOOL[1;0],INT[DEC.0],LREAL[DEC.10]
TIME,Data1,Data2,Data3
```

- Text file (Tabs are represented as the control character (\t).)



```
(\t)(\t)2(\t)3(\t)2
DATETIME[YYYY/MM/DD hh:mm:ss.sss](\t)BOOL[1;0](\t)INT[DEC.0](\t)LREAL[DEC.10]
TIME(\t)Data1(\t)Data2(\t)Data3
```

Header information of a collection data definition file

The following shows the configuration of the header information of a collection data definition file.

Row No.	Item	Description
1	File information row	The following information is included as entire file information • File type • File version • Row position information
Any number	Data type information row	Data type information of data in each column. The data type information row consists of 'data type character string + additional information character string.'
Any number	Data name information row	Data name information of data in each column. Use it as a data name in each column of Real-time Flow Designer.

File information row

Column No.	Item	Description
1	File type	Any character string. (It can be blank, but cannot be omitted.)
2	File version	Any character string of a monitoring target file output source. (It can be blank, but cannot be omitted.)
3	Data type information row number	The number of a row in which the data type information is described in a collection data definition file.
4	Data name information row number	The number of a row in which the data name information is described in a collection data definition file.
5	Data starting row number	The start position of a data row in a monitoring target file to be collected (up to 65535).

Data type information row

The data type information row consists of 'data type character string + additional information character string.'

■Data type character string

The following table shows the data type character strings to be collected.

Data type character strings that are not listed in the following table are not collected.

Column name	Data type character string[*1]	Display in Real-time Flow Designer	Description
Date and time column	DATETIME	—	The date and time column. It is used as a time stamp of collected data.[*2]
Data column	BOOL	BOOL	The data column for 'Bit'
	BIT		
	INT	INT	The data column for 'Signed 16-bit integer'
	SHORT		
	UINT	UINT	The data column for 'Unsigned 16-bit integer'
	USHORT		
	DINT	DINT	The data column for 'Signed 32-bit integer'
	LONG		
	UDINT	UDINT	The data column for 'Unsigned 32-bit integer'
	ULONG		
	LINT	LINT	The data column for 'Signed 64-bit integer'
	ULINT	ULINT	The data column for 'Unsigned 64-bit integer'
	REAL	REAL	The data column for '32-bit real number'
	FLOAT		
	LREAL	LREAL	The data column for '64-bit real number'
	DOUBLE		
	STRING	STRING	The data column for 'Character string (ASCII)'
	WSTRING	WSTRING	The data column for 'Character string (UNICODE)'

[*1] For details on available data, refer to the following:

☞ Page 544 Data type and value range

[*2] Use data which results in 2000/1/1 0:00 to 2079/12/31 23:59(UTC) taking the set time zone into consideration. If data outside the range is used, time stamps may not be collected correctly.

Point

- If an unnecessary data column is included in a collection data definition file, it can be excluded from the collection target by changing the data type character string to either of the following:
  CSV file: ,,(blank)
  Text file: \t\t(blank)
- If a data column, for which a data type character string that is not a collection target is specified, is included, delete the data column or exclude the data type character string from the collection target.

■Additional information character string

Column name		Description	Details	Example
Date and time column		Indicates the date and time column format.	[Combination of the following character strings[*1,*2,*3]] YYYY: Year (4 digits) YY : Year (2 digits) MM : Month (2 digits) DD : Day (2 digits) hh : Hour (2 digits) mm : Minute (2 digits) ss : Second (2 digits) ms : Millisecond (3 digits) us : Microsecond (6 digits) ns : Nanosecond (9 digits) .s to .sssssssss: Digits after the decimal point in seconds (1 to 9 digits)	DATETIME[YYYY/MM/DD hh:mm:ss.sss]
Data column	BOOL BIT	Indicates the identification characters for ON and OFF.	[{Format specification string representing ON};{Format specification string representing OFF}][*4] Format specification string: Any characters (1 to 16 characters)[*5,*6]	BOOL[1;0] BOOL[ON;OFF] BIT[1;0] BIT[ON;OFF]
	UINT USHORT UDINT ULONG ULINT	Indicates the identification characters for the display format.	[{Format specification string}.{Number of digits}] • Decimal format Format specification string: DEC Number of digits: 0 • Hexadecimal format Format specification string: HEX Periods (.) and the number of digits are not specified.	UINT[DEC.0] UINT[HEX] USHORT[DEC.0] USHORT[HEX][*7] UDINT[DEC.0] UDINT[HEX] ULONG[DEC.0] ULONG[HEX][*7] ULINT[DEC.0] ULINT[HEX]
	INT SHORT DINT LONG LINT		[{Format specification string}.{Number of digits}] • Decimal format Format specification string: DEC Number of digits: 0	INT[DEC.0] SHORT[DEC.0] DINT[DEC.0] LONG[DEC.0] LINT[DEC.0]
	REAL		[{Format specification string}.{Number of digits}] • Decimal format Format specification string: DEC Number of digits: 0 to 8 • Exponential format Format specification string: EXP Number of digits: 0 to 8	REAL[DEC.5] REAL[EXP.6]
	FLOAT		[{Format specification string}.{Number of digits}] • Decimal format Format specification string: DEC Number of digits: 0 to 16[*8] • Exponential format Format specification string: EXP Number of digits: 0 to 16[*8]	FLOAT[DEC.7] FLOAT[EXP.8]
	LREAL DOUBLE		[{Format specification string}.{Number of digits}] • Decimal format Format specification string: DEC Number of digits: 0 to 16 • Exponential format Format specification string: EXP Number of digits: 0 to 16	LREAL[DEC.10] LREAL[EXP.11] DOUBLE[DEC.12] DOUBLE[EXP.13]
	STRING	Indicates the number of characters.	Number of characters: 1 to 32	STRING[32]
	WSTRING		Number of characters: 1 to 16	WSTRING[16]

[*1] Up to 32 characters can be specified.

[*2] 'Year,' 'Month,' and 'Day' are required.
'Hour' is required when specifying 'Minute.'
'Hour' and 'Minute' are required when specifying 'Second.'
'Hour,' 'Minute,' and 'Second' are required when specifying 'Millisecond,' 'Microsecond,' and 'Nanosecond.'

*3 Overlapped character strings cannot be used.
(Example) 'YYYY' and 'YY,' '.s' and '.ms,' etc.
*4 A same character string cannot be used for character strings representing ON and OFF.
*5 Available characters are as follows (excluding semicolons (;)):
Character code for a collection data definition file is Shift JIS: Available Shift JIS characters (excluding 0x00 to 0x1F, and 0x7F)
Character code for a collection data definition file is UTF-8 (with BOM) or UTF-16LE (with BOM): ☞ Page 545 WSTRING type
*6 Spaces cannot be used for the start and end character string.
*7 If the data type character string is USHORT or ULONG, it can be used even when the additional information character string is [HEX.0].
*8 Digits in the decimal part that are not included in the ranges described for the data type 'REAL' are not read.

Data name information row

Set 'date and time column' and 'data name column' from the left in the data name information row.

Column name	Description	Details
Date and time column	Arbitrary	Same as the data name in each data column.
Data column	Data name in each data column	• A data name must be unique. • For the character string length of a data name, 1 to 32 characters can be set. • Available characters are as follows: Character code for a collection data definition file is Shift JIS: Available Shift JIS characters (excluding 0x00 to 0x1F, and 0x7F) Character code for a collection data definition file is UTF-8 (with BOM) or UTF-16LE (with BOM): ☞ Page 545 WSTRING type

8.4 Considerations

This section shows the considerations when using CSV File Data collector.

Use in Real-time Flow Manager

Setting monitoring folders, file name prefixes, and file types

When using CSV File Data collector also in Management Shell, avoid duplication of the following items set in Real-time Flow Designer and Management Shell Explorer.

- Monitoring folder
- File name prefix
- File type

File processing order when files that cannot be read or written are included

If a monitoring target file cannot be read or written[*1], import is suspended, including files with a newer update date and time than the target file. When reading and writing the file are available, the import resumes.

*1 In any of the following cases:
A file is opened in another Windows process.
A file is read-only.
The file size is 0 bytes.
The encryption attribute is enabled.

Avoid a situation in which a file cannot be read or written for a long time; otherwise, monitoring target files continue being accumulated and the disk space may be too much occupied.

Judgment on file transfer completion

The completion of file transfer is determined by checking whether a monitoring target file is used in another Windows process. When transfer of a monitoring target file is detected, whether the file is used in another Windows process is checked. If the file is not used, it will be imported.

If the file is being used by another Windows process, this function checks if it is still in use at an interval of one second.

A monitoring folder cannot be confirmed

If a specified monitoring folder cannot be confirmed due to folder deletion, folder name change, or network disconnection, a monitoring target file cannot be imported and a continuation error will occur.

In this case, whether the monitoring folder exists is checked every 30 seconds, and if it exists, it is monitored again.

Time stamp displayed in the date and time column

A local time is used for the time stamp displayed in the date and time column of a monitoring target file.

A process flow stops

If a process flow stops while a monitoring target file is being imported, the importing will be discontinued but the monitoring target file will remain in the monitoring folder to avoid data missing. Therefore, collected data may overlap when the process flow restarts.

The time stamp in the date and time column is displayed in daylight saving time

When the time stamp displayed in the date and time column is adjusted for daylight saving time, it will be different from that of the collected data.

Processing time for data collection

When the size of a monitoring target file is large or the load on Windows is high, collection processing may take time.

For the processing time for data collection using CSV File Data collector, refer to the following:

☞ Page 586 Data collection using CSV File Data collector

Switching the operating status of a process flow during data collection

When switching the operating status of a process flow to STOP then RUN again while a monitoring target file is being collected, data is collected in order from the first row of the monitoring target file.

Adding constants and fixed character strings

Constants and fixed character strings cannot be added.

Use in Management Shell

Setting monitoring folders, file name prefixes, and file types

When using CSV File Data collector also in Real-time Flow Manager, avoid duplication of the following items set in Real-time Flow Designer and Management Shell Explorer.

- Monitoring folder
- File name prefix
- File type

Monitoring folder

If a monitoring folder does not exist or it cannot be accessed due to network failure, an error will occur.

Time stamp displayed in the date and time column

A time when data is read is treated as a time stamp, not the date and time column of a monitoring target file.

Management Shell stops

If Management Shell stops, CSV File Data collector also stops running. In this case, all data and resources retained in the CSV File Data collector are discarded or released.

Restarting CSV File Data collector during file reading

When restarting CSV File Data collector while a monitoring target file is being read, the CSV File Data collector stops running. In this case, no response is returned to Management Shell and data reading fails.

When reading data after restarting CSV File Data collector, the latest file in a monitoring folder is read.

Processing when there is a lot of data to be read

CSV File Data collector responds sequentially to data reading requests from Management Shell; therefore, if there is a lot of data to be read at the same time or the load on Windows is high, the processing may take time.

For the processing time for data reading using CSV File Data collector, refer to the following:

☞ Page 594 Data reading using CSV File Data collector

REAL type and LREAL type data

REAL type and LREAL type data (char) are converted into a real number (float, double) at the time of reading. However, string type data is converted into an approximate value, this may cause a difference in values between the data and the reading result.

Values out of the range of the following significant digits are not guaranteed.

REAL type: Approximately 7 digits in decimal (24 digits in binary)

LREAL type: Approximately 15 digits in decimal (53 digits in binary)

8.5 Procedures before Using CSV File Data collector

Use in Real-time Flow Manager

When using CSV File Data collector in Real-time Flow Manager, collection target data is identified by the CSV File Data collector based on the definition information (file information, data name information, and data type information) of the data.
Therefore, the definition information of collection data must be acquired in Real-time Flow Designer.
To acquire it, create a 'collection data definition file' in which the information of collection data is defined in advance.

1. Configure an access target device setting in which CSV File Data collector is used.

☞ Page 124 Access Target Device Setting

2. Specify a monitoring folder.

3. Specify the prefix of a file name to monitor.

4. Specify the type of a file to monitor.

5. Acquire the definition information of collection data.

For the method for acquiring a monitoring folder, the prefix of a file name, file type, and the definition information of collection data, refer to the following:

☞ Page 310 Data Collection Setting (CSV File Data collector)

6. Change the operating status of a process flow to the RUN state.

For changing the operating status of a process flow, refer to the following:

☞ Page 332 Real-time Flow Manager diagnosis

Use in Management Shell

1. Configure an access target device setting in which CSV File Data collector is used.

☞ Page 311 Access Target Device Setting (CSV File Data collector)

2. Add an external data tag resource in Management Shell Explorer.

☞ Page 236 Adding a data tag resource

Select the access target device setting configured in step 1 for "Target Device."

Set the column number and integer format of a reading target for "Location."

☞ Page 312 Location Setting (CSV File Data collector)

3. Register the external data tag resource in the data tag resource monitor window.

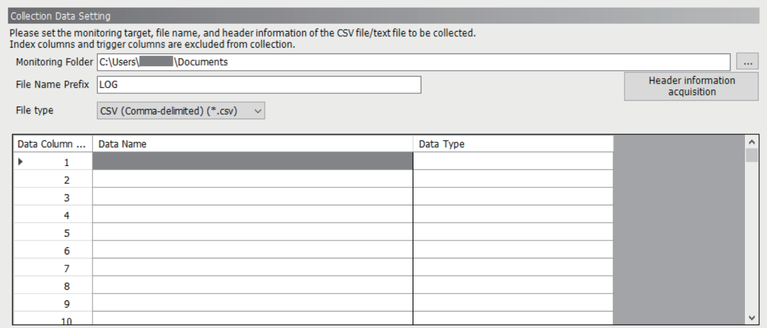
☞ Page 208 Registering a data tag resource

8.6 Data Collection Setting (CSV File Data collector)

This section shows the screen for setting for collecting data output in the CSV file format or text file format.

Window

Click the cell in the "Detailed Setting" column for which "Data Collection" is displayed in the "Process Type" column in the "Data Logging Flow Setting" or "Data Diagnosis Flow Setting" screen of Real-time Flow Designer.



Please set the monitoring target, file name, and header information of the CSV file/text file to be collected.
Index columns and trigger columns are excluded from collection.

Monitoring Folder C:\Users\[redacted]\Documents

File Name Prefix LOG

File type CSV (Comma-delimited) (*.csv)

Displayed items

Item	Description	Reference
Monitoring folder	Set the path to a monitoring folder (up to 198 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.	—
File name prefix	Set the file name prefix of a monitoring target file (1 to 32 characters).	—
[Header information acquisition] button	Click this to acquire the header information of a collection data definition file[1]. Select a collection data definition file in the "Header information file selection" screen displayed by clicking the [Header information acquisition] button.	—
File type	Select a file type.	—
Data Name	The column data name of a monitoring target file is displayed. However, if a column data name contains inhibited characters, it is displayed as follows: Output001, Output002, Output003...	—
Data Type	The data type of data is displayed.	—

*1 For collection data definition files, refer to the following:
☞ Page 301 Specifications of a collection data definition file

Point

When acquiring the header information, the character code is determined depending on whether the collection data definition file has BOM or not.

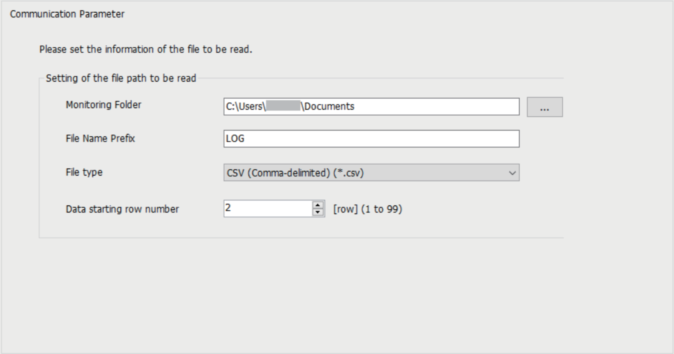
- With BOM: Determined as UTF-8 (with BOM).
- Without BOM: Determined as Shift JIS.

8.7 Access Target Device Setting (CSV File Data collector)

This section shows the screen for setting a monitoring folder, file name prefix, file type, and data starting row number.

Window

"Target Device Setting" screen of Management Shell Explorer



Communication Parameter

Please set the information of the file to be read.

Setting of the file path to be read

Monitoring Folder: C:\Users\[redacted]\Documents

File Name Prefix: LOG

File type: CSV (Comma-delimited) (*.csv)

Data starting row number: 2 [row] (1 to 99)

Displayed items

Item	Description	Reference
Monitoring Folder	Set the path to a monitoring folder (up to 198 characters). It can also be set in the "Select Folder" screen displayed by clicking the [...] button.	—
File Name Prefix	Set the file name prefix of a monitoring target file (1 to 32 characters).	—
File type	Select a file type.	—
Data starting row number	Specify the start position of a data row in a monitoring target file.	—

8.8 Location Setting (CSV File Data collector)

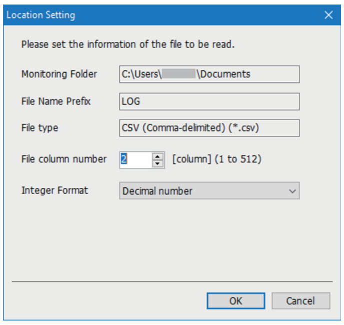
This section shows the methods for setting a column number and integer format to be read.

Setting in the location setting screen

The following shows the screen for setting reading target column numbers and integer formats in the "Location Setting" screen.

Window

Click the [Setting] button in the "Add External Data Tag Resource" or "Edit External Data Tag Resource" screen of Management Shell Explorer.



Please set the information of the file to be read.

Monitoring Folder C:\Users\[redacted]\Documents

File Name Prefix LOG

File type CSV (Comma-delimited) (*.csv)

File column number 2 [column] (1 to 512)

Integer Format Decimal number

Displayed items

Item	Description	Reference
Monitoring Folder	The path to a monitoring folder set in the access target device setting is displayed.	—
File Name Prefix	The prefix of a monitoring target file name set in the access target device setting is displayed.	—
File type	The type of a file set in the access target device setting is displayed.	—
File column number	Set the column number of reading target data.	—
Integer Format[*1]	Set the integer format of data to be read.	—

[*1] Not apply to BOOL, REAL, LREAL, STRING, or WSTRING type data.

Entering directly

A column number and integer format to be read can be entered directly for "Location" in the "Add External Data Tag Resource" or "Edit External Data Tag Resource" screen of Management Shell Explorer.

Input format for a location

Enter a location in the following format:

- Column number|Integer format

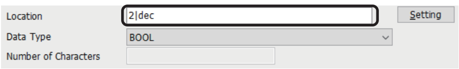
Item	Description
Column number	Set the column number of reading target data (1 to 512).
Integer format[*1]	Set the integer format of data to be read. • Decimal: dec • Hexadecimal: hex

*1 Not apply to BOOL, REAL, LREAL, STRING, or WSTRING type data.

Ex.

A setting example when entering the following items is shown below.

- Column number: 2
- Integer format: dec



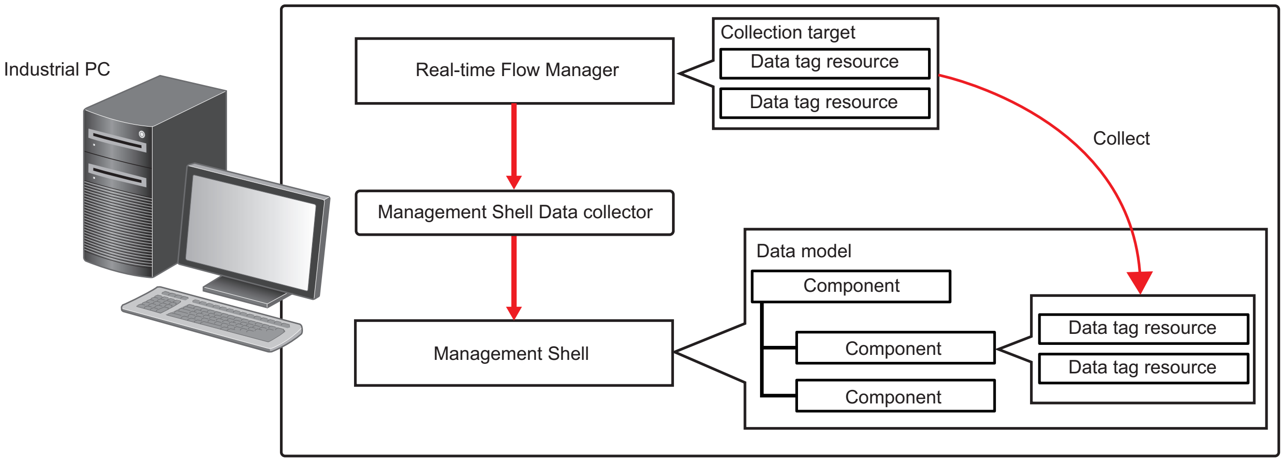
Location: 2|dec

Data Type: BOOL

Number of Characters:

9 Management Shell Data collector

Management Shell Data collector is a software component that collects data in data tag resources in Management Shell by connecting as an OPC UA client to Management Shell that runs as an OPC UA server.
It is used to handle data tag resources set in Management Shell as collection data in Real-time Flow Manager.



In addition, it runs as an OPC UA client connected to Management Shell; therefore, one of the maximum number of OPC UA clients that can be connected to Management Shell is consumed during connection. (One is consumed per instance.) It is also consumed at the following timings:

- The access target device setting screen opens.
- Connection information is created in the access target device setting screen (the [Creation] button is clicked).
- The location setting screen is displayed.

Management Shell Data collector is displayed in the "OPC UA Diagnosis" screen as follows: (☞ Page 341 OPC UA diagnosis)

Item	Description
Application Name	"Management Shell Data Collector"
Connection source information[*1][*2]	"urn:{0}:EdgecrossConsortium:Management Shell Data Collector" {0}: Computer name

*1 If a computer name has 16 characters or more, the first 15 characters are displayed.

*2 When setting either of the following types of computer names not recommended by Microsoft, Management Shell may not run properly.
- Computer name that has 16 characters or more
- Computer name that has characters other than alphanumeric ones or '-'

Precautions

- Management Shell Data collector can only be connected to Management Shell installed on the same industrial PC.
- Management Shell Data collector cannot be used in Management Shell.
- Information on all connected Management Shell Data collectors is displayed in the "OPC UA Diagnosis" screen.
- When changing the OPC UA setting of Management Shell, the access target device setting must be configured again.
- When saving a setting of Real-time Flow Designer to a file and reading it in another industrial PC, the access target device setting must be reconfigured (to save the setting as an external file).

Restrictions on the file saving and file reading functions of Real-time Flow Designer

The following table shows whether restrictions apply or not when using a setting that includes Management Shell Data collector for the file saving/file reading functions of Real-time Flow Designer.

○: Without restrictions, △: With restrictions

Edgecross Basic Software version	Importing a file in the same industrial PC as the one which exported the file	Importing a file in a different industrial PC from the one which exported the file
1.24	○	△[1]

[1] An error occurs in starting Management Shell since a target device setting where Management Shell Data collector is set is not available. In this case, set the target device setting again in the "Target Device Setting" screen, and the error will be removed.

9.1 Operational Specifications

This section shows the operational specifications of Management Shell Data collector.

Operating status

The status of Management Shell Data collector varies for each access target and is determined according to the communication status with the targets.
The communication status with access targets can be checked in Edgecross Basic Software.

Status of Management Shell Data collector	Description	Communication status with an access target
Data is being read from an access target.	Data Collector and the access target are connected normally. (It will be in this state when the connection processing succeeds.)	Connected
Data is not being read from an access target. (Reconnection is in progress.)	Data collector and the access target are disconnected. (It will be in this state when the connection processing fails.)	Disconnected

Behavior when an error occurs

When Management Shell Data collector detects an error, the following operations are performed according to the error type.

Error type	Status of Management Shell Data collector	Behavior of Management Shell Data collector
Data collector operation stop error	• Operations according to the specifications cannot be guaranteed due to a hard disk error in an industrial PC of the installation destination or a failure of resource securing. • An error cannot be corrected even by changing the network configuration due to an incorrect parameter setting (device type out of range, for example).	• Discards collected data when this error occurs during data collection. • Stops fixed cycle data collection and data reading on request and reports this error to Edgecross Basic Software.
Data collector operation continuation error	• Operations such as a program execution or data communication cannot be continued due to temporary network failure. • An error may be corrected by changing the network configuration even though there is no communication due to a mismatch between the parameter settings and the network configuration.	• Discards collected data when this error occurs during data collection. • Continues fixed cycle data collection and data reading on request even after reporting this error to Edgecross Basic Software.

Point

The error types reported to Edgecross Basic Software are as follows:
- Data collector operation stop error: Moderate error
- Data collector operation continuation error: Minor error

9.2 Data Collection Function

This section shows the function to collect data in Management Shell in a fixed cycle set in Real-time Flow Designer.
The first data collection starts when a set cycle time elapses after the operating status of Edgecross Basic Software switches to the RUN state. After that, data is collected for each specified cycle.
If the first data collection fails and an error occurs, data reading is repeated until the data collection succeeds if the error is a minor one.

Collection processing time notification

When an enabled data collection setting is included and the operating status of Edgecross Basic Software switches from RUN to STOP, the software is notified of the collection processing times (maximum and minimum)*1 in the RUN state as events.
However, when no data is collected while Edgecross Basic Software is in the RUN state, the maximum and minimum collection processing times are reported as '0.'

*1 The range of collection processing time is 0 to 4294967295 microseconds, and an event is notified in milliseconds (three decimal places).

Error notification in processing

If collected data fails to be read from Management Shell, Edgecross Basic Software is notified of an error according to the cause.*1

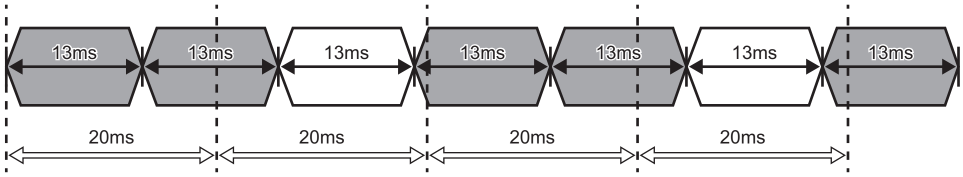
*1 The following errors are not reported again after cleared. Take corrective action for the errors, then clear them.
To check if an error occurs after taking corrective action, switch Real-time Flow Manager to RUN again.
Collection error (Management Shell connection failure) (error code: 2012H)
Collection error (access to a non-existent tag) (error code: 2013H)
Collection error (error detected in Management Shell) (error code: 2016H)

If the data type set in the location setting does not correspond to the one set in Management Shell, Edgecross Basic Software is notified of a collection error (data type mismatch) (error code: 2015H). Set a corresponding data type according to the following table:

Data type in Management Shell	Data type in the location setting
BOOL	BOOL
INT	INT
DINT	DINT
LINT	LINT
UINT	UINT
UDINT	UDINT
ULINT	ULINT
REAL	REAL
LREAL	LREAL
STRING	WSTRING (STRING type data tag resources are used as WSTRING type ones in Management Shell Data collector. (The STRING type is not supported and cannot be used.))
WSTRING	WSTRING

Precautions

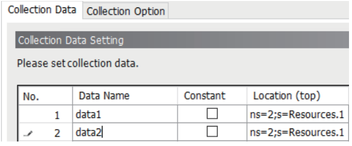
- An OPC UA server itself collects data periodically. Therefore, some data collected by Management Shell may not be acquired as a collection result of Management Shell Data collector if the collection cycle of Management Shell Data collector is longer than that of Management Shell. To acquire all the data, it is recommended to set the collection cycle of Management Shell Data collector shorter than that of Management Shell.
  In addition, the collection cycle of Management Shell depends on its performance.



⬢: Data is being collected.
⬡: Data is not collected.
⟷: Collection cycle of Management Shell
⇔: Collection cycle of Management Shell Data collector

- Management Shell Data collector checks the connection status with Management Shell for each collection cycle and attempts to reconnect if it is disconnected. If the reconnection fails, the status remains disconnected until the connection status check at the next collection timing.
- Reading character strings including surrogate pairs is not supported.
- When the same location is set for some data in one flow, values of the collected data may not match.

Ex.



Collection Data Setting

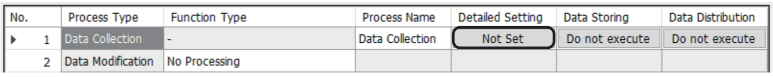
Please set collection data.

No.	Data Name	Constant	Location (top)
1	data1	☐	ns=2;s=Resources.1
2	data2	☐	ns=2;s=Resources.1

- To match a data value collected by Management Shell Data collector with the current value of an access target device, set both the polling cycle of Management Shell and collection cycle of Management Shell Data collector shorter.
- Collection data consistency is not checked in Management Shell Data collector when setting parameters. Therefore, if a setting in the "Location Setting" screen is changed or deleted in Management Shell, an error occurs when this Data collector starts running.
- If an error is reported from Management Shell, collected data will be missing.
- When the communication between Management Shell and an access target device is disconnected at a short interval, Management Shell Data collector may not be notified of an error even if the error is detected in Management Shell depending on the error detection timing.
- When collecting data, if there is a difference between the collection start time and the previous one by the allowable collection processing delay time (250 milliseconds) or more, the collection cycle is exceeded. In this case, an exceeded collection cycle event (event code: F800H) is reported and the collected data will be missing.
  The time used for the processing references the current time in an industrial PC on which this product is running. Do not change the current time when collecting data.

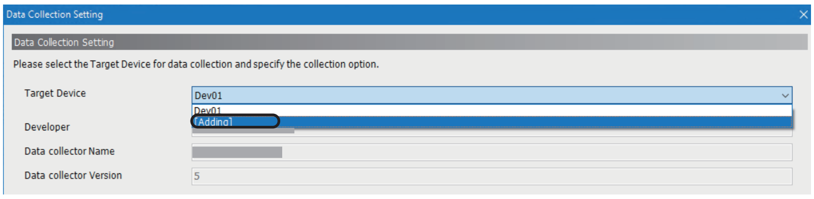
9.3 Setting Procedure

1. Create a new process flow, and open the screen for setting a data collection process.



No.		Process Type	Function Type	Process Name	Detailed Setting	Data Storing	Data Distribution
▸	1	Data Collection	-	Data Collection	Not Set	Do not execute	Do not execute
	2	Data Modification	No Processing				

2. Select [Adding] for "Target Device" in the "Data Collection Setting" screen. (☞ Page 139 Data Collection Setting)



Data Collection Setting

Please select the Target Device for data collection and specify the collection option.

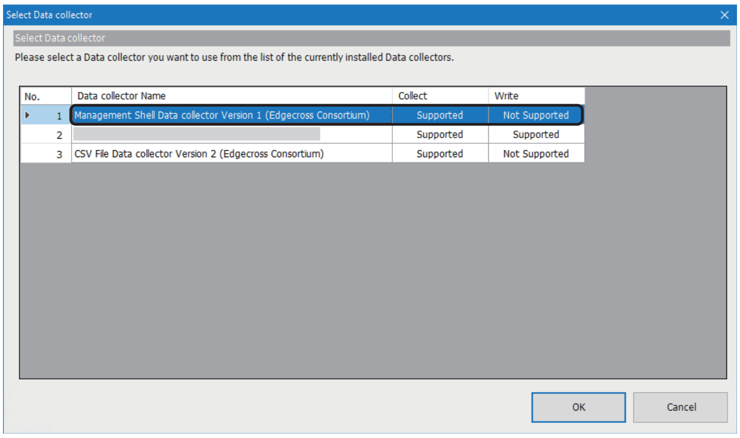
Target Device: Dev01

Developer

Data collector Name

Data collector Version: 5

3. Select Management Shell Data collector in the "Select Data collector" screen. (☞ Page 125 Data collector selection screen)



Select Data collector

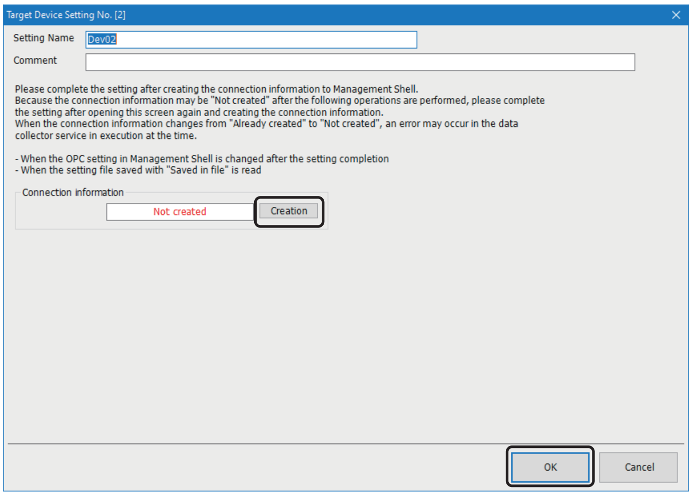
Please select a Data collector you want to use from the list of the currently installed Data collectors.

No.		Data collector Name	Collect	Write
▸	1	Management Shell Data collector Version 1 (Edgecross Consortium)	Supported	Not Supported
	2		Supported	Supported
	3	CSV File Data collector Version 2 (Edgecross Consortium)	Supported	Not Supported

4. Click the [Creation] button in the "Target Device Setting" screen. (☞ Page 325 Access Target Device Setting (Management Shell Data collector))

Connection information to Management Shell is created.

5. Click the [OK] button.



Target Device Setting No. [2]

Setting Name: Dev02

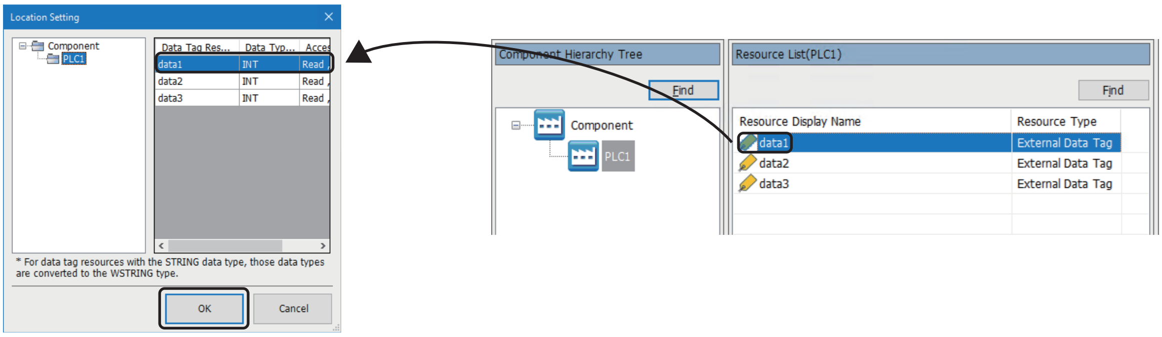
Comment

Please complete the setting after creating the connection information to Management Shell.
Because the connection information may be "Not created" after the following operations are performed, please complete the setting after opening this screen again and creating the connection information.
When the connection information changes from "Already created" to "Not created", an error may occur in the data collector service in execution at the time.

- When the OPC setting in Management Shell is changed after the setting completion
- When the setting file saved with "Saved in file" is read

Connection information: Not created

6. Select a data tag resource to be collected in the "Location Setting" screen, and click the [OK] button. (☞ Page 326 Location Setting (Management Shell Data collector))



Data Tag Res...	Data Typ...	Acces
data1	INT	Read
data2	INT	Read
data3	INT	Read

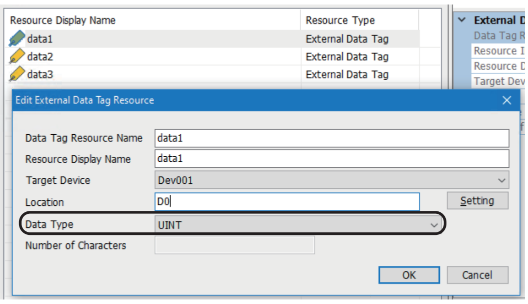
* For data tag resources with the STRING data type, those data types are converted to the WSTRING type.

Resource Display Name	Resource Type
data1	External Data Tag
data2	External Data Tag
data3	External Data Tag

Changing the setting of a data tag resource to be collected

When changing the setting of a data tag resource to be collected in Management Shell Explorer after setting Management Shell Data collector, and collecting data according to the new setting, change the collection data setting in Real-time Flow Designer. The following shows the procedure for changing the data type of a data tag resource as an example.

1. Change the data type in Management Shell Explorer, and apply it to Management Shell.

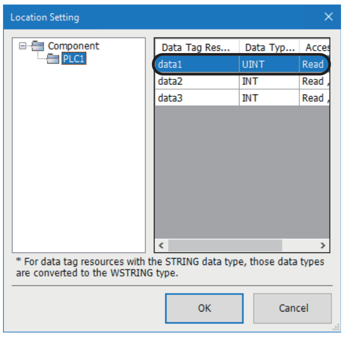


Resource Display Name	Resource Type
data1	External Data Tag
data2	External Data Tag
data3	External Data Tag

Data Tag Resource Name: data1
Resource Display Name: data1
Target Device: Dev001
Location: D0
Data Type: UINT
Number of Characters:

2. Perform either of the following operations:

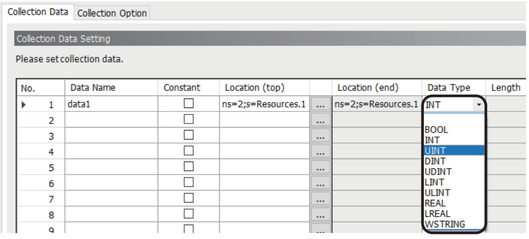
- Reselect the data tag resource the data type of which is changed in the "Location Setting" screen of Real-time Flow Designer. (☞ Page 326 Location Setting (Management Shell Data collector))



Data Tag Res...	Data Typ...	Acces
data1	UINT	Read
data2	INT	Read
data3	INT	Read

* For data tag resources with the STRING data type, those data types are converted to the WSTRING type.

- Change the data type in the "Data Collection Setting" screen of Real-time Flow Designer. (☞ Page 139 Data Collection Setting)



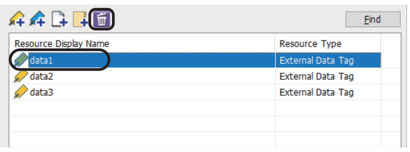
Please set collection data.

No.	Data Name	Constant	Location (top)		Location (end)	Data Type	Length
1	data1	☐	ns=2;s=Resources.1	...	ns=2;s=Resources.1	INT	
2		☐		...			
3		☐		...			
4		☐		...			
5		☐		...			
6		☐		...			
7		☐		...			
8		☐		...			
9		☐		...			

Deleting a data tag resource to be collected

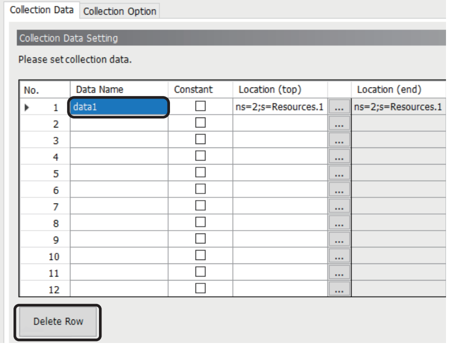
When deleting a data tag resource to be collected in Management Shell Explorer after setting Management Shell Data collector, perform the following procedure:

1. Delete a data tag resource in Management Shell Explorer, and apply it to Management Shell.



Resource Display Name	Resource Type
data1	External Data Tag
data2	External Data Tag
data3	External Data Tag

2. Select a target data tag resource in the "Data Collection Setting" screen of Real-time Flow Designer, and click the [Delete Row] button. (☞ Page 139 Data Collection Setting)



Collection Data Setting

Please set collection data.

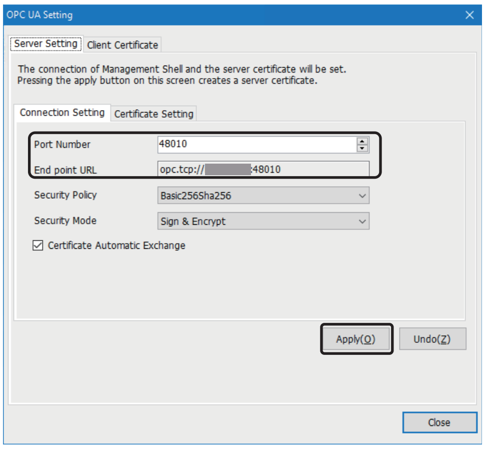
No.	Data Name	Constant	Location (top)	Location (end)
1	data1	☐	ns=2;s=Resources.1	ns=2;s=Resources.1
2		☐		
3		☐		
4		☐		
5		☐		
6		☐		
7		☐		
8		☐		
9		☐		
10		☐		
11		☐		
12		☐		

Changing the OPC UA setting (OPC UA server setting)

When changing the OPC UA setting (OPC UA server setting) in Management Shell Explorer after setting Management Shell Data collector, perform the following procedure:

1. Change the setting in the "OPC UA Setting" screen of Management Shell Explorer, and click the [Apply] button. (☞ Page 261 Setting an OPC UA server)

(Example) Changing the port number (endpoint URL)



The connection of Management Shell and the server certificate will be set.
Pressing the apply button on this screen creates a server certificate.

Port Number: 48010

End point URL: opc.tcp://[redacted]:48010

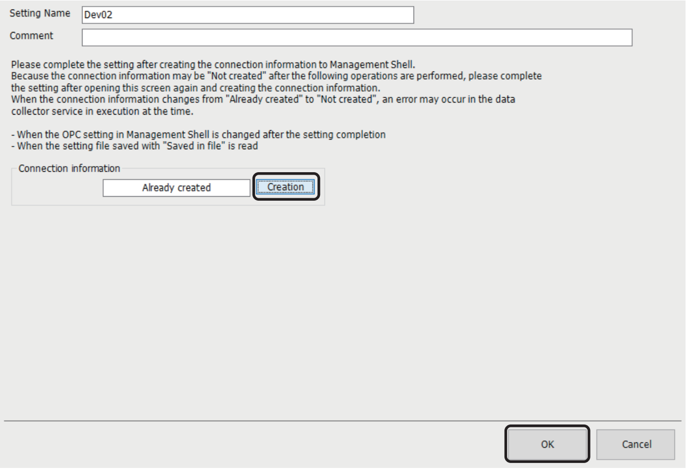
Security Policy: Basic256Sha256

Security Mode: Sign & Encrypt

☑ Certificate Automatic Exchange

2. In Real-time Flow Designer, create connection information to Management Shell again in all access target device settings in which Management Shell Data collector is set.

- Click the [Creation] button in the "Target Device Setting" screen, and click the [OK] button. (☞ Page 325 Access Target Device Setting (Management Shell Data collector))



Setting Name: Dev02

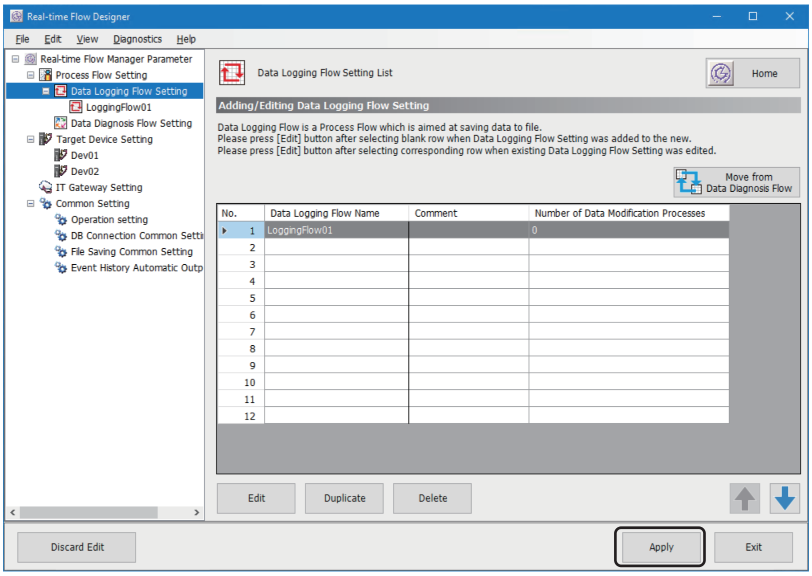
Comment:

Please complete the setting after creating the connection information to Management Shell.
Because the connection information may be "Not created" after the following operations are performed, please complete the setting after opening this screen again and creating the connection information.
When the connection information changes from "Already created" to "Not created", an error may occur in the data collector service in execution at the time.

- When the OPC setting in Management Shell is changed after the setting completion
- When the setting file saved with "Saved in file" is read

Connection information: Already created

3. Apply the setting to Real-time Flow Manager.


Real-time Flow Designer
File
Edit
View
Diagnostics
Help
Real-time Flow Manager Parameter
Process Flow Setting
Data Logging Flow Setting
LoggingFlow01
Data Diagnosis Flow Setting
Target Device Setting
Dev01
Dev02
IT Gateway Setting
Common Setting
Operation setting
DB Connection Common Setti
File Saving Common Setting
Event History Automatic Outp
Data Logging Flow Setting List
Home
Move from Data Diagnosis Flow
Edit
Duplicate
Delete
Discard Edit
Apply
Exit

Adding/Editing Data Logging Flow Setting

Data Logging Flow is a Process Flow which is aimed at saving data to file.
Please press [Edit] button after selecting blank row when Data Logging Flow Setting was added to the new.
Please press [Edit] button after selecting corresponding row when existing Data Logging Flow Setting was edited.

No.	Data Logging Flow Name	Comment	Number of Data Modification Processes
1	LoggingFlow01		0
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Moving the Edgecross Basic Software setting to another industrial PC

When moving the Edgecross Basic Software setting to another industrial PC after setting Management Shell Data collector, perform the following procedure:

1. Save a setting file of Real-time Flow Designer or Management Shell Explorer.

Real-time Flow Designer: Select [File] ⇨ [Save in File].

Management Shell Explorer: Select [Management Shell] ⇨ [Export].

2. Move the setting file saved in step 1 to a destination industrial PC.

3. Read the moved file in the destination industrial PC.

Real-time Flow Designer: Select [File] ⇨ [Read from File].

Management Shell Explorer: Select [Management Shell] ⇨ [Import].

4. Perform steps 2 and later in the following:

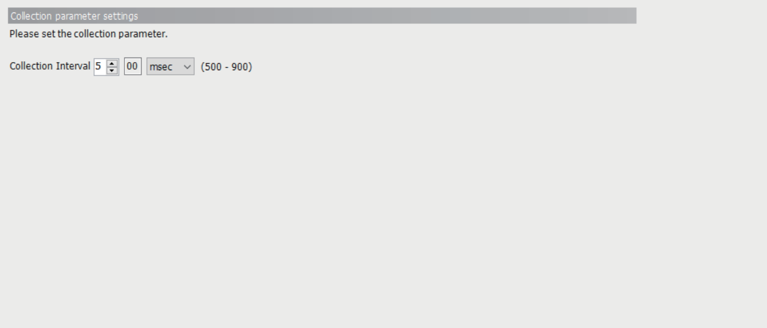
☞ Page 322 Changing the OPC UA setting (OPC UA server setting)

9.4 Data Collection Setting (Management Shell Data collector)

This section shows the screen for setting on data collection in Management Shell Data collector.

Window

[Collection Option] tab in the "Data Collection Setting" screen of Real-time Flow Designer



Please set the collection parameter.

Collection Interval 5 00 msec (500 - 900)

Displayed items

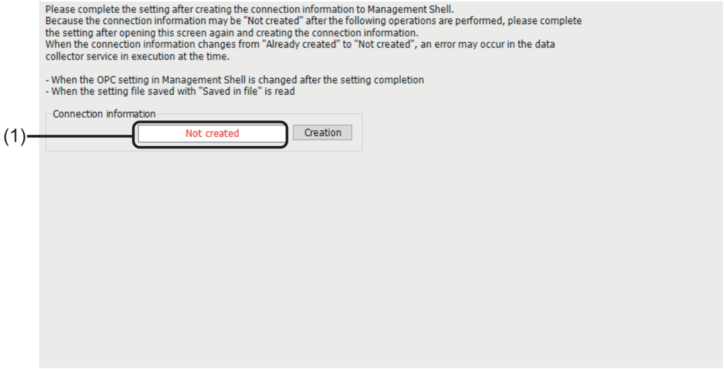
Item	Description
Collection Interval	Set an interval and the unit for collecting data.

9.5 Access Target Device Setting (Management Shell Data collector)

This section shows the screen for setting access target information to Management Shell to collect data.

Window

"Target Device Setting" screen of Real-time Flow Designer



Please complete the setting after creating the connection information to Management Shell.
Because the connection information may be "Not created" after the following operations are performed, please complete the setting after opening this screen again and creating the connection information.
When the connection information changes from "Already created" to "Not created", an error may occur in the data collector service in execution at the time.

- When the OPC setting in Management Shell is changed after the setting completion
- When the setting file saved with "Saved in file" is read

Displayed items

Item	Description
(1) Creation status of connection information	The creation status of connection information is displayed.
[Creation] button	Click this to create connection information.

Precautions

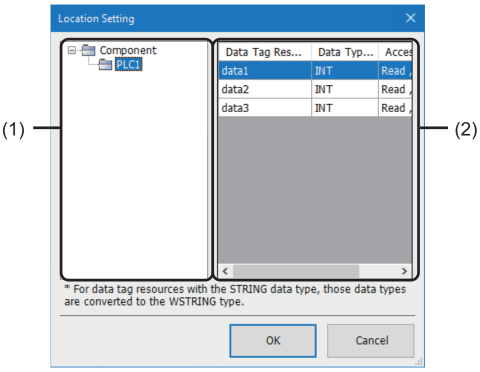
- Do not change the OPC UA setting for Management Shell while the "Target Device Setting" screen is displayed.
- When moving a setting file of Edgecross Basic Software, which includes an access target device setting in which Management Shell Data collector is used, to another industrial PC, reconfigure the access target device setting.

9.6 Location Setting (Management Shell Data collector)

This section shows the screen for setting a location by selecting a hierarchy in the tree view and a data tag resource to be collected in the displayed list.

Window

Click the [...] button in the [Collection Data] tab in the "Data Collection Setting" screen of Real-time Flow Designer.



Data Tag Res...	Data Typ...	Acces
data1	INT	Read ,
data2	INT	Read ,
data3	INT	Read ,

* For data tag resources with the STRING data type, those data types are converted to the WSTRING type.

Displayed items

Item		Description
(1) Tree view		The component tree of Management Shell is displayed.[*1] Select a component including a data tag resource to register the location. Note that multiple components cannot be selected.
(2) Data tag resource list	Data Tag Resource Name	The resource display name of a data tag resource, which belongs to a component selected in the tree view, is displayed. Select a resource display name and click the [OK] button to register the location. Note that multiple rows cannot be selected.
	Data Type	The data type of a data tag resource, which belongs to a component selected in the tree view, is displayed.
	Access Direction	Whether a data tag resource, which belongs to a component selected in the tree view, can be read/written is displayed as follows: • "Read, Write": Readable/writable • "Read": Readable • "Write": Writable

[*1] Each component is displayed with its component display name.

Point

When clicking the [OK] button in this screen, a value is set in "Location (top)" in the "Data Collection Setting" screen according to a selected data tag resource as follows:

"ns=2;s=Resources.{0}"

{0}: Resource ID of a selected data tag resource

Precautions

When editing a component or resource in Management Shell while this screen is displayed, the display contents may not match the settings in Management Shell. Do not edit any setting in Management Shell while this screen is displayed.

10 Dummy Data collector

Dummy Data collector is a software component that does not communicate with external devices.
Use this for Management Shell when setting a temporary data collector to create a data model in advance if a data collector to be used has not been determined.

10.1 Data Reading Function

The data reading function reads data according to a request from Edgecross Basic Software.
Note that data is not read from external devices but a fixed value is read for each data type as follows:

Data type	Fixed value
BOOL	0
INT	
UINT	
DINT	
UDINT	
LINT	
ULINT	
REAL	
LREAL	
STRING	Null character
WSTRING	

10.2 Parameter Setting

In Dummy Data collector, a screen for setting parameters is not included.

MEMO

11 TROUBLESHOOTING

11.1 Checking Methods for Error Descriptions

The following are the methods for checking error descriptions.

Checking method	Details
Real-time Flow Designer	Error codes and error occurrence sources can be checked in the "Real-time Flow Manager Diagnostics" screen. ☞ Page 332 Real-time Flow Manager diagnosis
Management Shell Explorer	Error codes and error occurrence sources can be checked in the "Error Information List" screen. ☞ Page 343 Displaying error information in a list

Point

- If multiple errors occur at the same time, take corrective action for the errors in chronological order.
- When an error occurs due to a location parameter setting in Management Shell Data collector, the location causing the error can be confirmed in the detailed information for the error code[*1].

[*1] If the number of characters in the location is 67 or more, it will be displayed as follows. (A surrogate pair character is counted as two characters.)
(The first 30 characters)...(the last 36 characters)

Error code system

The error code system differs for each error occurrence source.

Real-time Flow Manager

The following table shows the error code system when an error occurs in Real-time Flow Manager.
Error codes are represented in four-digit hexadecimal numbers (unsigned 16-bit integers).

Error code range	Error type	Description
1000H to 4FFFH	—	System area
5000H to 5FFFH	Minor error	A process flow does not stop even if this error occurs. This error indicates the state in which an error occurs but a process flow continues running, or a process flow automatically recovers once the error cause is removed.
	Moderate error	A process flow stops if this error occurs. This error indicates the state in which a process flow cannot continue running due to this error but it restarts running once the error cause is removed and the operating status of the process flow is changed from STOP to RUN.
6000H to 6FFFH	Major error	This error indicates the state in which all process flows cannot continue running due to an error in the operating status of a program or process and there is no recovery method other than restarting an industrial PC that runs the program or process.
7000H to FFFFH	—	System area

Point

Real-time Flow Manager determines whether a process flow can automatically recover when registering an error. Depending on the result, the error type may be different even for the same error code.

Precautions

If a process flow stops due to an error, data not output to the outside by saving to a file or using the device instruction feedback may be lost.

■Timings for clearing errors

The following table shows the timings and operations for clearing errors for each error type.

Timing	Minor error	Moderate error	Major error
Starting an industrial PC	Cleared.		
Switching the operating status ☞ Page 333 "Process Flow Start/Stop" screen	■Errors occurred in a location other than a process flow Cleared by switching the operating statuses of all process flows to STOP then switching any of them from STOP to RUN. ■Errors occurred in a specific process flow Cleared by switching the operating status of the process flow from STOP to RUN.		Not cleared.
Applying the parameters of Real-time Flow Manager ☞ Page 109 Home screen	Cleared.		Not cleared.
Clearing errors ☞ Page 334 Operation diagnosis	Cleared.		Not cleared.

Precautions

If a major error is included in errors occurred, none of these errors are cleared. Restart an industrial PC on which Real-time Flow Manager is running.
To clear a major error, disable the fast startup function. If it is enabled, an industrial PC is not shut down completely, and the major error may not be cleared when starting the industrial PC after shutdown. For the procedure for disabling the fast startup function, refer to the following:
☞ Page 114 Procedure for disabling the fast startup function

Data collector

The error code system when an error occurs in a data collector is as follows:

■Management Shell Data collector

There are two types of errors for Management Shell Data collector: moderate error and minor error.

■Other data collectors

Refer to the manual for a data collector used.

IT gateway

For the error code system when an error occurs in an IT gateway, refer to the manual for an IT gateway used.

11.2 Checking the Status of a Process Flow

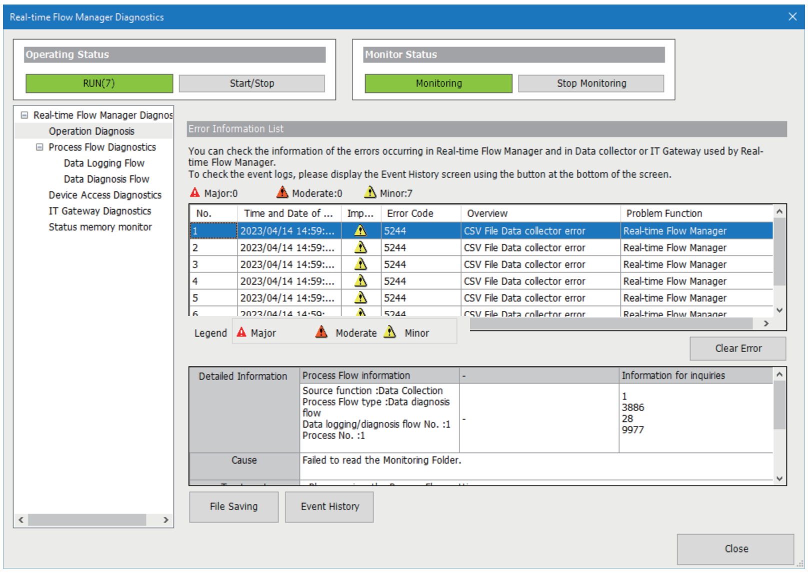
This section shows the method for checking the operating status of a process flow.

Real-time Flow Manager diagnosis

The operating status of a process flow can be switched and diagnosed.
In addition, errors and events occurred in a data collector or an IT gateway used in Real-time Flow Manager can be diagnosed.

Window

Select [Diagnostics] ⇨ [Real-time Flow Manager Diagnostics].



You can check the information of the errors occurring in Real-time Flow Manager and in Data collector or IT Gateway used by Real-time Flow Manager.
To check the event logs, please display the Event History screen using the button at the bottom of the screen.

Major:0 Moderate:0 Minor:7

No.	Time and Date of ...	Imp...	Error Code	Overview	Problem Function
1	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
2	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
3	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
4	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
5	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
6	2023/04/14 14:59:	⚠	5244	CSV File Data collector error	Real-time Flow Manager

Detailed Information	Process Flow information	-	Information for inquiries
	Source function :Data Collection Process Flow type :Data diagnosis flow Data logging/diagnosis flow No. :1 Process No. :1	-	1 3886 28 9977
Cause	Failed to read the Monitoring Folder.		

Displayed items

Item		Description	Reference
Operating Status		The operating status of process flows is displayed.[*1,*2,*3] Click the [Start/Stop] button to open the "Process Flow Start/Stop" screen, and switch the operating status of each process flow.	Page 333 "Process Flow Start/Stop" screen
Monitor Status		The monitoring status is displayed.[*4] Click the [Start Monitoring]/[Stop Monitoring] button to start or stop monitoring.	—
Real-time Flow Manager Diagnostics	Operation Diagnosis	To display information on an error occurred in Real-time Flow Manager and a data collector or an IT gateway used in Real-time Flow Manager.	Page 334 Operation diagnosis
	Process Flow Diagnostics	To diagnose the execution status of a data logging flow and a data diagnosis flow, and the latest error.	Page 337 Process flow diagnostics
	Device Access Diagnostics	To diagnose the connection status between Real-time Flow Manager and an access target device, and the latest error.	Page 338 Device access diagnosis
	IT Gateway Diagnostics	To diagnose the connection status between Real-time Flow Manager and a communication destination of an IT gateway, and the latest error.	Page 339 IT gateway diagnosis
	Status memory monitor	To monitor the Real-time Flow Manager status. For the Real-time Flow Manager status, refer to the following: ☞ Page 433 Real-time Flow Manager Status	Page 340 Status memory monitor

*1 "-" is displayed when "Stopping" is displayed under "Monitor Status."

*2 "RUN" is displayed if there is at least one process flow for which "RUN" is displayed for the operating status in the "Process Flow Start/Stop" screen. The number in the parentheses indicates the total number of process flows for which "RUN" is displayed for the operating status.

*3 "STOP" is displayed in either of the following cases:
There is no process flow for which "RUN" is displayed for the operating status.
There is no process flow.

*4 "Stopping" is displayed while the "Process Flow Start/Stop" screen is open.

"Process Flow Start/Stop" screen

The operating status of each process flow can be controlled.

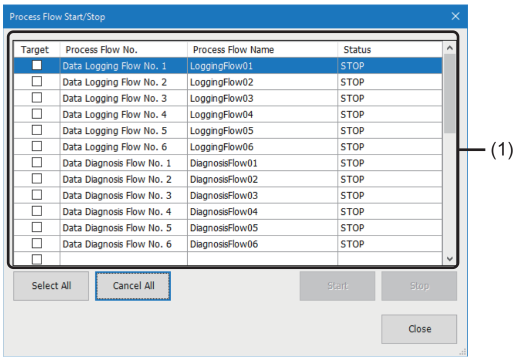
Point

- If a moderate or higher error occurs while a process flow is running, the operating status of the process flow switches to STOP.
- Check the error occurrence status of Real-time Flow Manager in the following cases. (☞ Page 334 Operation diagnosis)
  - The operating status of a process flow switches to STOP even though a stop operation is not performed.
  - The operating status of a process flow does not switch to RUN even though a start operation is performed (immediately returns to STOP).
- The time until the operating status switches to RUN increases in proportion to the number of process flows to be switched at the same time. In addition, the timing of switching to RUN varies widely.

To avoid these symptoms, switch the operating statuses multiple times to reduce the number of target process flows.

Window

- Click the [Start/Stop] button in the "Real-time Flow Manager Diagnostics" screen.
- Select [Real-time Flow] ⇨ [Process Flow Start/Stop].



Target	Process Flow No.	Process Flow Name	Status
☐	Data Logging Flow No. 1	LoggingFlow01	STOP
☐	Data Logging Flow No. 2	LoggingFlow02	STOP
☐	Data Logging Flow No. 3	LoggingFlow03	STOP
☐	Data Logging Flow No. 4	LoggingFlow04	STOP
☐	Data Logging Flow No. 5	LoggingFlow05	STOP
☐	Data Logging Flow No. 6	LoggingFlow06	STOP
☐	Data Diagnosis Flow No. 1	DiagnosisFlow01	STOP
☐	Data Diagnosis Flow No. 2	DiagnosisFlow02	STOP
☐	Data Diagnosis Flow No. 3	DiagnosisFlow03	STOP
☐	Data Diagnosis Flow No. 4	DiagnosisFlow04	STOP
☐	Data Diagnosis Flow No. 5	DiagnosisFlow05	STOP
☐	Data Diagnosis Flow No. 6	DiagnosisFlow06	STOP
☐			

Displayed items

Item		Description
(1) Process flow list	Target	Select the checkbox of a process flow to start or stop.
	Process Flow No.	A process flow type and process flow number are displayed.
	Process Flow Name	A process flow name is displayed.
	Status	The operating status of a process flow is displayed.
[Select All] button		Click this to select the checkboxes of all process flows in the list.
[Cancel All] button		Click this to unselect the checkboxes of all process flows in the list.
[Start] button		Click this to start the operation of a process flow with its checkbox selected in the "Target" column.
[Stop] button		Click this to stop the operation of a process flow with its checkbox selected in the "Target" column.

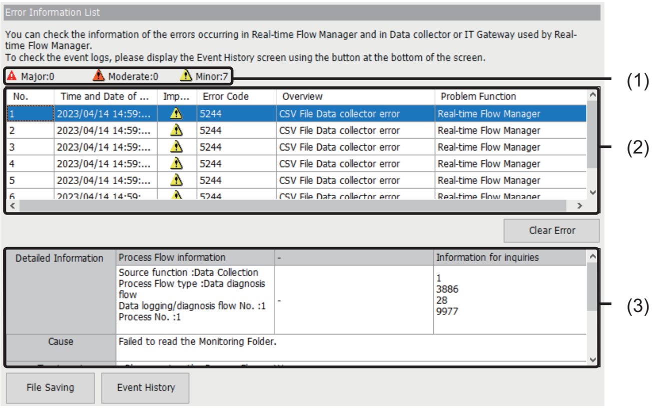
Operation diagnosis

Information on an error occurred in Real-time Flow Manager and a data collector or an IT gateway used in Real-time Flow Manager is acquired, and the history, detailed information, cause, and corrective action are displayed as diagnosis information.

If a moderate error occurs, the process flow stops running.

Window

Select "Real-time Flow Manager Diagnostics" ⇨ "Operation Diagnosis" in the "Real-time Flow Manager Diagnostics" screen.



You can check the information of the errors occurring in Real-time Flow Manager and in Data collector or IT Gateway used by Real-time Flow Manager.
To check the event logs, please display the Event History screen using the button at the bottom of the screen.

No.	Time and Date of ...	Imp...	Error Code	Overview	Problem Function
1	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
2	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
3	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
4	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
5	2023/04/14 14:59:...	⚠	5244	CSV File Data collector error	Real-time Flow Manager
6	2023/04/14 14:59:	⚠	5244	CSV File Data collector error	Real-time Flow Manager

Detailed Information	Process Flow information	-	Information for inquiries
	Source function :Data Collection Process Flow type :Data diagnosis flow Data logging/diagnosis flow No. :1 Process No. :1	-	1 3886 28 9977
Cause	Failed to read the Monitoring Folder.		

Displayed items

Item		Description
(1) Number of errors		The number of errors by severity is displayed.
(2) Error information list	Time and Date of Occurrence	The year, month, day, and time when an error occurs are displayed.
	Importance Level	The severity of an error is displayed.
	Error Code	An error code acquired from Real-time Flow Manager is displayed. For an error occurred in a data collector or an IT gateway, an error code defined in the data collector or IT gateway is displayed. For details, refer to the manual for the data collector or IT gateway.
	Overview	The overview of an error that is occurring is displayed.
	Problem Function	An error occurrence source is displayed.
[Clear Error] button		Click this to delete minor and moderate errors displayed in the error information list in a batch.
(3) Error detailed information	Detailed Information	Detailed information of an error is displayed.
	Cause	An error cause is displayed.
	Treatment	When the classification of an event is "Error," the corrective action for the event is displayed.
[File Saving] button		Click this to save the display contents to a CSV file.
[Event History] button		Click this to display the "Event History" screen. ☞ Page 335 Event history

Point

- Error information is also stored in the Real-time Flow Manager status.
- Up to 64 errors are displayed.
- The history of an error occurred can also be checked in the event history.
- If monitoring is stopped, the contents when the monitoring is stopped will remain displayed.

Precautions

- If a major error occurs, other errors cannot be deleted.
- Minor and moderate errors are deleted in a batch; therefore, unintended errors may also be deleted.
- Even if an error is deleted from the error information list, it is not deleted from the event history.
- Even if an error is deleted from the error information list, its cause is not removed; therefore, the same error may occur again.

Event history

Information on an event that occurs in Real-time Flow Manager and a data collector or IT gateway used in Real-time Flow Manager is acquired, and the history, detailed information, cause, and corrective action are displayed as diagnosis information.

The event history is saved even after turning OFF an industrial PC that runs Real-time Flow Manager. Therefore, it can be checked after restarting the industrial PC and used for identifying the cause of a problem by checking the operation information before and after the event. It can also be used when the error code cannot be checked if an error occurs.

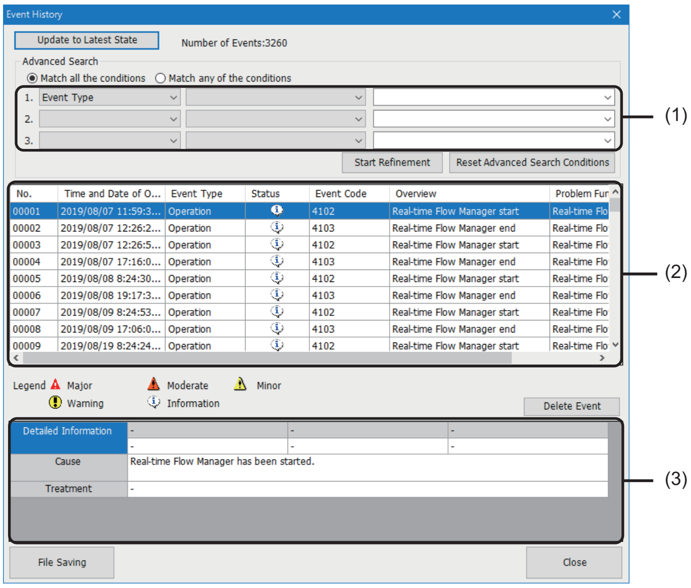
However, if errors and events occur consecutively at short intervals, they may not be displayed in chronological order in the event history.

For details on saving an event history, refer to the following:

☞ Page 336 Saving event histories

Window

Click the [Event History] button.



No.	Time and Date of O...	Event Type	Status	Event Code	Overview	Problem Fun
00001	2019/08/07 11:59:3...	Operation	ℹ	4102	Real-time Flow Manager start	Real-time Flo
00002	2019/08/07 12:26:2...	Operation	ℹ	4103	Real-time Flow Manager end	Real-time Flo
00003	2019/08/07 12:26:5...	Operation	ℹ	4102	Real-time Flow Manager start	Real-time Flo
00004	2019/08/07 17:16:0...	Operation	ℹ	4103	Real-time Flow Manager end	Real-time Flo
00005	2019/08/08 8:24:30...	Operation	ℹ	4102	Real-time Flow Manager start	Real-time Flo
00006	2019/08/08 19:17:3...	Operation	ℹ	4103	Real-time Flow Manager end	Real-time Flo
00007	2019/08/09 8:24:53...	Operation	ℹ	4102	Real-time Flow Manager start	Real-time Flo
00008	2019/08/09 17:06:0...	Operation	ℹ	4103	Real-time Flow Manager end	Real-time Flo
00009	2019/08/19 8:24:24...	Operation	ℹ	4102	Real-time Flow Manager start	Real-time Flo

Detailed Information	-	-	-
	-	-	-
Cause	Real-time Flow Manager has been started.		
Treatment	-		

Displayed items

Item		Description
[Update to Latest State] button		Click this to update the event history list.
Advanced Search	Match all the conditions	Select this to display an event that satisfies all specified narrowing-down conditions.
	Match any of the conditions	Select this to display an event that satisfies any of the specified narrowing-down conditions.
	(1) Narrowing-down condition	Specify a narrowing-down condition.[*1] Up to three narrowing-down conditions can be set.
	[Start Refinement] button	Click this to narrow down events under a specified condition.
	[Reset Advanced Search Conditions] button	Click this to initialize narrowing-down conditions.
(2) Event history list	Time and Date of Occurrence	The year, month, day, and time when an event occurs are displayed.
	Event Type	The type of an event is displayed.
	Status	The status of an event is displayed.
	Event Code	The code for an event is displayed.
	Overview	The overview of an event is displayed.
	Problem Function	The occurrence source of an event is displayed.
(3) Event detailed information	Detailed Information	Detailed information of an event is displayed.
	Cause	When the classification of an event is "Error," the cause of the event is displayed.
	Treatment	When the classification of an event is "Error," the corrective action for the event is displayed.
[Delete Event] button		Click this to delete an event history.

Item	Description
[File Saving] button	Click this to save the display contents to a CSV file.

*1 Up to 32 characters can be set when specifying character strings for a narrowing-down condition.

Point

For events output by Windows as a standard, use the Windows standard event function.

■Saving event histories

Event information collected from Real-time Flow Manager and a data collector or IT gateway used in Real-time Flow Manager can be saved.

- Number of events that can be saved as an event history

39999 events can be saved. If it is exceeded, registered events will be deleted in chronological order.

- Environment where an event history can be collected

An event history can be collected regardless of the operating status. However, if a major error occurs or Windows stops the operation, an event history may not be collected.

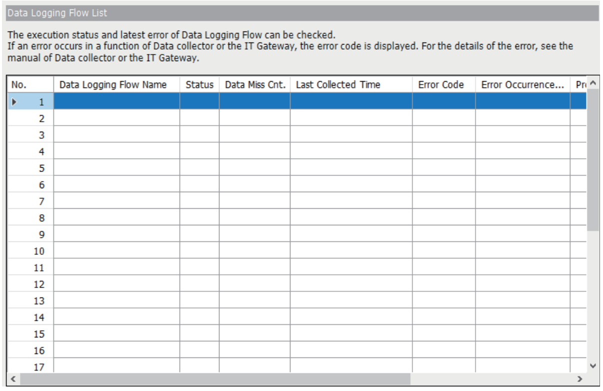
Process flow diagnostics

The following shows the screen for displaying the execution status of a data logging flow and data diagnosis flow, and the latest error.

If an error occurs while Real-time Flow Manager is running, the process flow and the process name of the occurrence source are displayed. If the error is a moderate or major one, Real-time Flow Manager will stop the process flow.

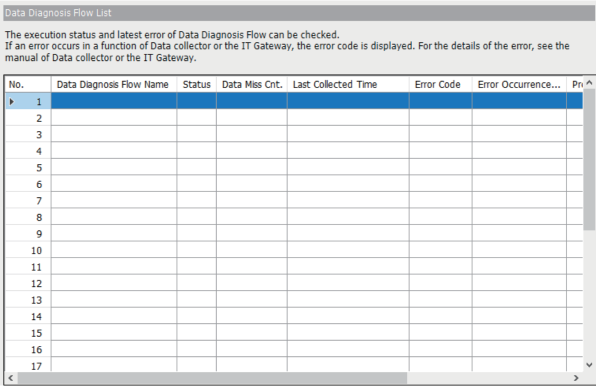
Window

Select "Real-time Flow Manager Diagnostics" ⇨ "Process Flow Diagnostics" ⇨ "Data Logging Flow" or "Data Diagnosis Flow" in the "Real-time Flow Manager Diagnostics" screen.



Data Logging Flow List

The execution status and latest error of Data Logging Flow can be checked.
If an error occurs in a function of Data collector or the IT Gateway, the error code is displayed. For the details of the error, see the manual of Data collector or the IT Gateway.



Data Diagnosis Flow List

The execution status and latest error of Data Diagnosis Flow can be checked.
If an error occurs in a function of Data collector or the IT Gateway, the error code is displayed. For the details of the error, see the manual of Data collector or the IT Gateway.

Displayed items

Item	Description
Data Logging Flow Name Data Diagnosis Flow Name	The name of each process flow is displayed.
Status	The execution status of each process flow is displayed.
Data Miss Cnt.[1]	The number of times of data missing for each process flow is displayed.
Last Collected Time[1][2]	The last data collection time for each process flow is displayed. The time zone corresponds to the local time of the system. When changing the time zone setting of the system while Real-time Flow Designer is running, the change is applied at the next startup of Real-time Flow Designer. "N/A" remains displayed until the first data is collected for each process flow.
Error Code	The code for an error occurred in each process flow is displayed.
Error Occurrence Process Name	The name of an error occurrence process of each process flow is displayed.
Problem Function	An error occurrence source is displayed.

[1] Not updated when only data collection is set in a data logging flow (excluding when using CSV File Data collector).

[2] Updated with the time of last data collection from a data collector, regardless of whether data missing occurs.

Point

- If monitoring is stopped, the contents when the monitoring is stopped will remain displayed.
- Each item is updated in a one-second cycle.

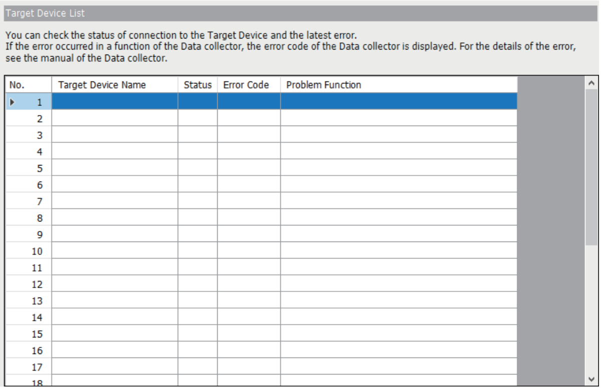
Device access diagnosis

The following shows the screen for displaying the connection status between Real-time Flow Manager and an access target device, and the latest error.

If an error occurs after running a process flow, an error occurred in an access target device is displayed.

Window

Select "Real-time Flow Manager Diagnostics" ⇨ "Device Access Diagnostics" in the "Real-time Flow Manager Diagnostics" screen.



Target Device List

You can check the status of connection to the Target Device and the latest error.
If the error occurred in a function of the Data collector, the error code of the Data collector is displayed. For the details of the error, see the manual of the Data collector.

Displayed items

Item	Description
Target Device Name	An access target device set in the access target device setting in Real-time Flow Designer is displayed. (☞ Page 124 Access Target Device Setting)
Status	The connection status with an access target device is displayed. • Connection: Connected to an access target device • Disconnection: Not connected to an access target device[1]
Error Code	The code for an error occurred in accessing an access target device is displayed.
Problem Function	An error occurrence source is displayed.

[1] When the status of a process flow transitions from the RUN state to the STOP state, "Disconnection" is displayed for all access target devices connected in the process flow.

Point

- If monitoring is stopped, the contents when the monitoring is stopped will remain displayed.
- The cell is blank in either of the following cases:
  An access target device is set in the access target device setting in Real-time Flow Designer but not set in the data collection setting or device instruction feedback setting.
  CSV File Data collector is used as a data collector in an access target device set in the access target device setting.

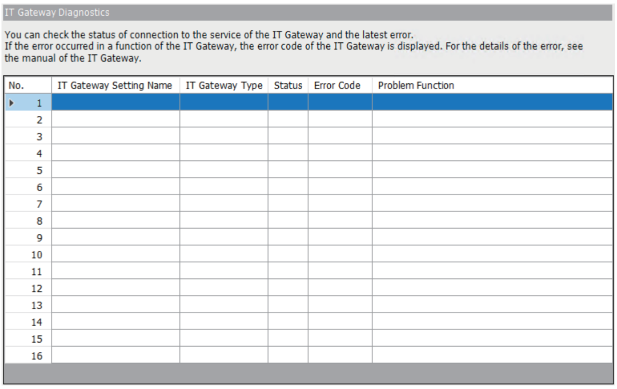
IT gateway diagnosis

The following shows the screen for displaying the connection status between Real-time Flow Manager and a communication destination of an IT gateway, and the latest error.

If an error occurs after running a process flow, an error occurred in an IT gateway is displayed.

Window

Select "Real-time Flow Manager Diagnostics" ⇨ "IT Gateway Diagnostics" in the "Real-time Flow Manager Diagnostics" screen.



IT Gateway Diagnostics

You can check the status of connection to the service of the IT Gateway and the latest error.
If the error occurred in a function of the IT Gateway, the error code of the IT Gateway is displayed. For the details of the error, see the manual of the IT Gateway.

No.	IT Gateway Setting Name	IT Gateway Type	Status	Error Code	Problem Function
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Displayed items

Item	Description
IT Gateway Setting Name	The name of an IT gateway setting configured in Real-time Flow Designer is displayed. (☞ Page 127 IT Gateway Setting)
IT Gateway Type	An IT gateway type is displayed.
Status	The connection status with an IT gateway is displayed. • Connection: Connected to an IT gateway • Disconnection: Not connected to an IT gateway[*1]
Error Code	The code for an error occurred in accessing a communication destination of an IT gateway is displayed.
Problem Function	An error occurrence source is displayed.

[*1] When the status of a process flow transitions from the RUN state to the STOP state, "Disconnection" is displayed for all IT gateways connected in the process flow.

Point

- If an IT gateway is set in the IT gateway setting in Real-time Flow Designer but not set in the data storing setting or data distribution setting, the cell is blank.

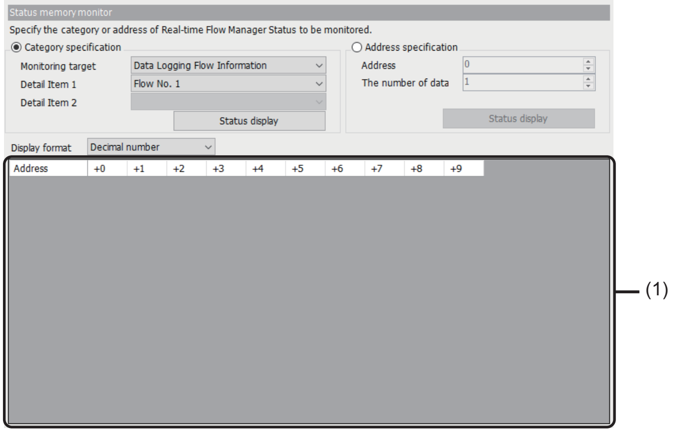
Status memory monitor

The following shows the screen for monitoring the Real-time Flow Manager status.

☞ Page 433 Real-time Flow Manager Status

Window

Select "Status memory monitor" in the "Real-time Flow Manager Diagnostics" screen.



Status memory monitor

Specify the category or address of Real-time Flow Manager Status to be monitored.

● Category specification

Monitoring target: Data Logging Flow Information

Detail Item 1: Flow No. 1

Detail Item 2:

○ Address specification

Address: 0

The number of data: 1

Display format: Decimal number

Displayed items

Item		Description
Category specification	Monitoring target	Specify a category of the Real-time Flow Manager status to monitor. For the combinations of selectable items, refer to the following: ☞ Page 340 Combinations of selectable items
	Detail Item 1	
	Detail Item 2	
	[Status display] button	Click this to display the Real-time Flow Manager status of a category specified in "Category specification."
Address specification	Address	Specify an address of the Real-time Flow Manager status to monitor (0 to 420999).[1]
	The number of data	Specify the number of words to display the Real-time Flow Manager status to monitor (1 to 500).[1]
	[Status display] button	Click this to display the Real-time Flow Manager status from an address specified for "Address" to one for the number of words specified for "The number of data."
Display format		Select a display format of the displayed Real-time Flow Manager status.
(1) Real-time Flow Manager status list		Real-time Flow Manager status is displayed in a list.

[1] Specify it in decimal.

Point

If monitoring is stopped, the contents when the monitoring is stopped will remain displayed.

■Combinations of selectable items

Monitoring target	Detail Item 1	Detail Item 2
Data Logging Flow Information	Flow No.1 to 32	—
Data Diagnosis Flow Information	Flow No.1 to 32	—
Data Logging Flow Process Information	Flow No.1 to 32	Process No.1 to 4
Data Diagnosis Flow Process Information	Flow No.1 to 32	Process No.1 to 6
Error Log Information	—	—
Error Information	Error No.1 to 64	—
Target Device Information	Target Device No.1 to 32	—
IT Gateway Diagnosis Information	IT Gateway No.1 to 16	—

11.3 Checking the Status of Management Shell

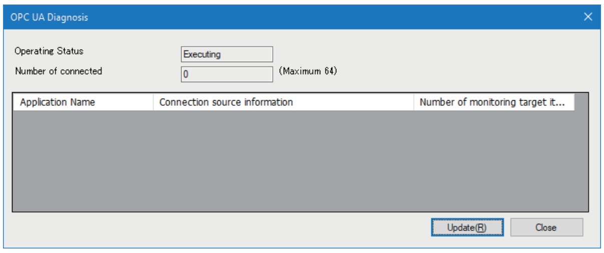
This section shows the method for checking the operating status of Management Shell.

OPC UA diagnosis

The following shows the screen for displaying the operating status of Management Shell and OPC UA diagnosis information.

Window

Select [Management Shell] ⇨ [Diagnosis] ⇨ [OPC UA Diagnosis].


OPC UA Diagnosis
Application Name
Connection source information
Number of monitoring target it...
Update(R)
Close

Operating Status: Executing

Number of connected: 0 (Maximum 64)

Displayed items

Item	Description
Operating Status	The operating status of Management Shell is displayed.
Number of connected[*1]	The number of applications connected to Management Shell is displayed.
Application Name[*2,*3]	The name of an application connected to Management Shell is displayed.
Connection source information[*2,*4]	The information on an application connected to Management Shell is displayed. For the displayed information, refer to the manual for the application.
Number of monitoring target items[*2,*5]	The number of monitoring target items[*6] for an application connected to Management Shell is displayed.
[Update] button[*7]	Click this to update the screen.

*1 "-" is displayed in either of the following cases:
"Stop" is displayed for "Operating Status."
Acquisition failed.

*2 Nothing is displayed when "Stop" is displayed for "Operating Status."

*3 "Unknown" is displayed in either of the following cases:
Acquisition failed.
An acquired application name is blank.

*4 "Unknown" is displayed in either of the following cases:
Acquisition failed.
Acquired connection source information is blank.

*5 "-" is displayed if acquisition fails.

*6 Attribute of a resource (node) registered as a monitoring target in Management Shell from an application (An attribute refers to data included in a node.)
For the nodes and attributes that can be registered as monitoring targets, refer to the following:
☞ Page 22 Nodes and attributes that can be registered as monitoring targets

*7 Cannot be clicked when "Stop" is displayed for "Operating Status."

Point

- An application in the "OPC UA Diagnosis" screen refers to an edge application connected as an OPC UA client to Management Shell that is an OPC UA server.
- To reduce the number of connected applications, disconnect or stop a connected application.
- To reduce the number of monitoring target items, delete an unnecessary item set as a monitoring target in a connected application.

Precautions

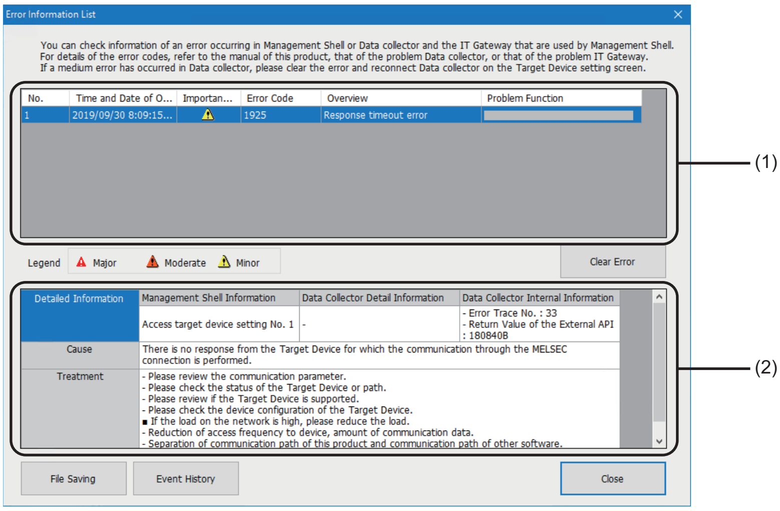
- Even when disconnecting an application, some applications may remain connected in the background on Windows. In this case, the number of applications displayed for "Number of connected" includes these applications.
- A number displayed in "Number of monitoring target items" may differ from one set or displayed in a connected application.
- A number displayed in "Number of monitoring target items" increases in proportion to one set in an application.
- If a number displayed in "Number of monitoring target items" exceeds the maximum number of monitoring target items that can be registered (1000000 points), an error may occur in an application. In this case, reduce the number set in the application. For the setting method, refer to the manual for each application.
- If the number of applications displayed for "Number of connected" exceeds the maximum number of connectable applications, an error may occur in an application. In this case, reduce the number of connected applications, such as stopping an application. For the method for stopping an application, refer to the manual for each application.
- A name displayed in "Application Name" may differ from the product name of an application. For displayed names, refer to the manual for each application.

Displaying error information in a list

The following shows the screen for displaying the list of information on an error that occurs in Management Shell and a data collector or IT gateway used in Management Shell.

Window

Select [Management Shell] ⇨ [Error Information List].



You can check information of an error occurring in Management Shell or Data collector and the IT Gateway that are used by Management Shell.
For details of the error codes, refer to the manual of this product, that of the problem Data collector, or that of the problem IT Gateway.
If a medium error has occurred in Data collector, please clear the error and reconnect Data collector on the Target Device setting screen.

No.	Time and Date of O...	Importan...	Error Code	Overview	Problem Function
1	2019/09/30 8:09:15...	⚠	1925	Response timeout error	

Detailed Information	Management Shell Information	Data Collector Detail Information	Data Collector Internal Information
	Access target device setting No. 1	-	- Error Trace No. : 33 - Return Value of the External API : 180840B
Cause	There is no response from the Target Device for which the communication through the MELSEC connection is performed.		
Treatment	- Please review the communication parameter. - Please check the status of the Target Device or path. - Please review if the Target Device is supported. - Please check the device configuration of the Target Device. ■ If the load on the network is high, please reduce the load. - Reduction of access frequency to device, amount of communication data. - Separation of communication path of this product and communication path of other software.		

Displayed items

Item		Description
(1) Error information list	Time and Date of Occurrence	The year, month, day, and time when an error occurs are displayed.
	Importance Level	The severity of an error is displayed.
	Error Code	An error code acquired from Management Shell is displayed. For an error occurred in a data collector or an IT gateway, an error code defined in each data collector or IT gateway is displayed. For details, refer to the manual for each data collector or IT gateway.
	Overview	The overview of an error that is occurring is displayed.
	Problem Function	An error occurrence source is displayed.
[Clear Error] button		Click this to delete minor errors displayed in the error information list in a batch.
(2) Error detailed information	Detailed Information	Detailed information of an error is displayed.
	Cause	An error cause is displayed.
	Treatment	When the classification of an event is "Error," the corrective action for the error is displayed.
[File Saving] button		Click this to save the display contents to a CSV file.
[Event History] button		Click this to display the "Event History" screen. ☞ Page 344 Event history

Point

- Up to 50 errors are displayed.
- An error history can be cleared by performing the following procedure:

❶ Select [Management Shell] ⇨ [Management Shell Stop].
❷ Select [Management Shell] ⇨ [Management Shell Start].

Precautions

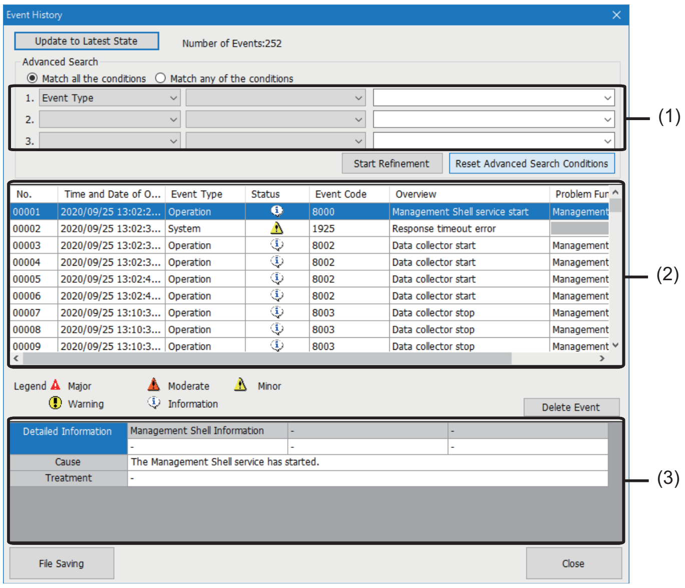
- If an error other than a minor error is also displayed in the error information list, the minor error cannot be deleted.
- Minor errors are deleted in a batch; therefore, unintended errors may also be deleted.
- Even if a minor error is deleted from the error information list, it is not deleted from the event history.
- Even if a minor error is deleted from the error information list, its cause is not removed; therefore, the same error may occur again.

Event history

Information on an event that occurs in Management Shell and a data collector or IT gateway used in Management Shell is acquired, and the history, detailed information, cause, and corrective action are displayed as diagnosis information.

Window

Click the [Event History] button in the "Error Information List" screen.



No.	Time and Date of O...	Event Type	Status	Event Code	Overview	Problem Fur
00001	2020/09/25 13:02:2...	Operation	ⓘ	8000	Management Shell service start	Management
00002	2020/09/25 13:02:3...	System	⚠	1925	Response timeout error	
00003	2020/09/25 13:02:3...	Operation	ⓘ	8002	Data collector start	Management
00004	2020/09/25 13:02:3...	Operation	ⓘ	8002	Data collector start	Management
00005	2020/09/25 13:02:4...	Operation	ⓘ	8002	Data collector start	Management
00006	2020/09/25 13:02:4...	Operation	ⓘ	8002	Data collector start	Management
00007	2020/09/25 13:10:3...	Operation	ⓘ	8003	Data collector stop	Management
00008	2020/09/25 13:10:3...	Operation	ⓘ	8003	Data collector stop	Management
00009	2020/09/25 13:10:3...	Operation	ⓘ	8003	Data collector stop	Management

Detailed Information	Management Shell Information	-	-
	-	-	-
Cause	The Management Shell service has started.		
Treatment	-		

Displayed items

Refer to the following:

☞ Page 335 Event history

11.4 Troubleshooting by Symptom

If a function of Edgecross Basic Software does not run properly, check the applicable items in the following and troubleshoot the error.

If each troubleshooting does not solve the problem, consult the Edgecross Consortium.

For other troubleshooting, refer to the manual for each industrial PC or data collector, or visit the Microsoft website.

Precautions

Do not start or terminate processes or services of Edgecross Basic Software from the task manager. Otherwise, Edgecross Basic Software may not run properly. If it stops, restart an industrial PC.

Real-time Flow Manager

A process flow does not run properly

Check the following items:

■Common item for each function

Symptom	Check item	Corrective action
The same error occurs even after the corrective action was taken.	Is antivirus software installed?	In the antivirus software settings, exclude the following folders from the monitoring targets. For the setting method, refer to the manual for antivirus software. • Installation destination folder for Edgecross Basic Software • Installation destination folder for an MQTT broker (☞ Page 507 Installing Eclipse Mosquitto) • Save destination folder specified in the data storing setting (file saving) (☞ Page 147 Saved file) • Folder in which a certificate authority certificate specified in the data distribution setting is stored (☞ Page 160 Destination) • Folder in which a certificate authority certificate specified in the edge application diagnosis (MQTT) setting is stored (☞ Page 174 Destination) • Save destination folder specified in the edge application diagnosis (file) setting (☞ Page 182 Saved file) • Monitoring folder specified in the data collection setting (CSV File Data collector) (☞ Page 310 Data Collection Setting (CSV File Data collector)) • Save destination folder specified in the file saving setting of the one-shot collection function (☞ Page 286 File saving setting) • Save destination folder specified in the save destination folder setting for the event history automatic output function (☞ Page 118 Event history automatic output setting, Page 292 Event history automatic output setting screen)
The operating status of a process flow differs between when starting an industrial PC and after restarting it.	Is the fast startup function of Windows enabled?	Refer to the following section to review the settings of the fast startup function. ☞ Page 114 Procedure for disabling the fast startup function
A major error occurred before restarting an industrial PC is not cleared even after restarting it.	Is the fast startup function of Windows enabled?	Refer to the following section to review the settings of the fast startup function. ☞ Page 114 Procedure for disabling the fast startup function
It takes time to switch the operating status of a process flow.	Are the operating statuses of multiple process flows switched at the same time?	Switch the operating statuses multiple times.
	Has a Real-time Flow Manager timeout occurred?	Check the corrective action for the error in the "Real-time Flow Manager Diagnostics" screen, and take the action.
There is a large variation in the timing of completion of switching the operating status of a process flow.	Are the operating statuses of multiple process flows switched at the same time?	Switch the operating statuses multiple times.
An out of memory error occurs when switching the operating status of a process flow from the STOP state to the RUN state.	Is free space on the memory low?	• Reduce the memory usage amount, such as by closing other applications. • Increase the free space on the system drive. • Review the collection cycle, number of data collection points, processing contents, and number of process flows to reduce the memory usage amount. • Increase the memory.

Symptom	Check item	Corrective action
Fails to connect to an access target device when switching the operating status of a process flow from the STOP state to the RUN state after reading a setting file saved in another industrial PC.	Is the access target device in the read setting properly set for an industrial PC in which the setting file is read?	Correct the access target device setting according to the industrial PC in which the setting file is read. For details, refer to the manual for a data collector used.

■Data collection function

Symptom	Check item	Corrective action
A symptom caused by data missing occurs in an edge application.	Has an error occurred in the data collector in a process flow that links the edge application with Real-time Flow Manager?	Perform the following procedure to avoid data missing. ❶ Check the number of times of data missing in the process flow diagnostics of Real-time Flow Designer, and identify a process flow in which the data missing occurs. (☞ Page 337 Process flow diagnostics) ❷ Check if an error occurs in the data collector set in the process flow in which the data missing occurs in the operation diagnosis, and take corrective action if it does. (☞ Page 334 Operation diagnosis) ❸ Refer to the manual for the data collector and review the setting to avoid data missing.
	Is the operation delayed due to high load on the system?	The load on the system is high. Review the setting to reduce the load (lengthen the collection cycle or reduce the number of data collection points, etc.).

■Edge application cooperation function (MQTT cooperation)

Symptom	Check item	Corrective action
Data received in an edge application is incorrect.	Is the content of a publishing data setting configured in Real-time Flow Designer different from that of a publishing data definition file read in the edge application?	Output the publishing data definition file again, and read it to the edge application.
	Is a topic name that is used in Real-time Flow Manager and the edge application used in another application?	Set a publishing data topic name so that it is not duplicated with one used in another application.
Data is not received in an edge application.	Is an IP address, host name, or port number set correctly?	Set a correct IP address, host name, or port number.
	Is the connection allowed to a connected MQTT broker on another industrial PC?	Allow the connection. For the setting method, refer to the following: ☞ Page 528 Configuring the settings for connection from another industrial PC
	Is the content of a publishing data setting configured in Real-time Flow Designer different from that of a publishing data definition file read in the edge application?	Output the publishing data definition file again, and read it to the edge application.
	Does the communication encryption setting match that of a connected MQTT broker?	Set the encryption setting according to that of the connected MQTT broker.
	Does a client ID of Real-time Flow Manager set in Real-time Flow Designer match a specified one if it is specified in a connected MQTT broker?	In Real-time Flow Designer, set the client ID specified in the connected MQTT broker.
	Does a publishing data topic name set in Real-time Flow Designer match a specified one if it is specified in the edge application?	In Real-time Flow Designer, set the publishing data topic name specified in the edge application.
	Does a client ID of the edge application set in Real-time Flow Designer match a specified one if it is specified in the edge application?	In Real-time Flow Designer, set the client ID specified in the edge application.
	Is a setting file that is saved in another industrial PC and has no specified publishing data topic name read?	Set the following settings again in the edge application diagnosis (MQTT) screen. • Output a publishing data definition file, then read it in the edge application. • After outputting a publishing data definition file, click the [OK] button to close the edge application diagnosis (MQTT) screen, then click the [OK] button to close the process flow setting screen.

Symptom	Check item	Corrective action
An edge application acquires the same data multiple times and does not run properly.	Is an industrial PC on which Real-time Flow Manager is running disconnected from a network and reconnected to it?	• Prevent network disconnection. • Reduce the load on the network.
	Is the load on a network high?	
Data received in an edge application is missing. An edge application is connected and disconnected repeatedly.	Is a same client ID used for connecting multiple edge applications and a single MQTT broker?	Change the client ID settings for the applicable edge applications. Then, output a publishing data definition file and read it in the edge application.

■Edge application cooperation function (file cooperation)

Symptom	Check item	Corrective action
Diagnosis is not performed even when switching a process flow to RUN.	Is an edge application in a state in which diagnosis can be performed?	Set the edge application to a state in which diagnosis can be performed.
Data received in an edge application is incorrect.	Is the content of a publishing data setting configured in Real-time Flow Designer different from that of a publishing data definition file read in the edge application?	Output the publishing data definition file again, and read it to the edge application.

■Data storing function (file saving function)

Symptom	Check item	Corrective action
A file is not saved even when data collection has been completed.	Has the number of times of data collection increased in the Real-time Flow Manager status?	The load on the system is high. Review the setting to reduce the load (lengthen the collection cycle or reduce the number of data collection points, etc.).
	Has the number of times of data missing increased in the process flow diagnostics?	• Check if an error occurs in a data collector set in the process flow in which data missing occurs, and take corrective action displayed in the diagnostics screen if it does. • Refer to the manual for the data collector and review the setting to avoid data missing. • The load on the system is high. Review the setting to reduce the load (lengthen the collection cycle or reduce the number of data collection points, etc.).
	Does the number of the file name suffix reach 'FFFFFFFF'?	Move all files in a save destination folder to another folder and restart the operation of Real-time Flow Manager, or set another path for the save destination folder.
The time stamp of a saved file is different from that of the last record in a file.	Is the time stamp of a record in the last row in the saved file significantly different from the update date/time of the file in the Windows Explorer screen?	The load on the system is high. Review the setting to reduce the load (lengthen the collection cycle or reduce the number of data collection points, etc.).
Data received in an edge application is incorrect.	Is the content of a file saving setting configured in Real-time Flow Designer different from that of a data definition file read in the edge application?	Output the data definition file again, and read it to the edge application.
Unable to browse a saved file.	Is the encryption attribute enabled for the save destination folder set in Real-time Flow Designer?	• Check the user name and password of a user account for outputting the saved file, and change them to those of a user account for browsing the file. • Sign in again to Windows with a user account set as one for outputting the saved file in Real-time Flow Designer.
Unable to send files by using an IT gateway (data storing).	Is the encryption attribute enabled for the save destination folder set in Real-time Flow Designer?	A file output to a folder with the encryption attribute enabled may not be sent by using an IT gateway (type: data storing). Change the save destination folder to another one with the encryption attribute disabled, or take corrective action according to the manual for the IT gateway.
Fails to save a file to a folder with the encryption attribute enabled.	Is there a historical data definition file with the same prefix created by another user account in the save destination folder?	A historical data definition file cannot be overwritten due to the difference in authority, such as when a user account to output a saved file is different from one that created the existing historical data definition file. Perform any of the following operations: • Change the prefix to one different from that of the existing historical data definition file. • Change the save destination folder to another one. • Delete the historical data definition file if possible.

Symptom	Check item	Corrective action
Fails to save a file by specifying a user account.	Is the user account specified in Real-time Flow Designer locked out?	• Wait until the user account is unlocked, or set another user account that is not locked out. • Make sure that the authentication test for a user account can be performed properly.
Fails to save a file by specifying a user account for which no password is set.	Is "Enabled" selected for "Accounts: Limit local account use of blank passwords to console logon only"[*1] on an industrial PC?	• Use a user account for which a password is set. • Select "Disabled" for "Accounts: Limit local account use of blank passwords to console logon only"[*1] on the industrial PC.[*2] • Allow access to the shared folder with a blank password on the personal computer side on which the shared folder is published.[*2]
	Is access to a shared folder allowed with a blank password on the personal computer side on which the shared folder is published when a save destination is a remote shared folder?	

[*1] Can be checked by the following procedure:
❶ Start the local security policy of Windows.
❷ Select [Security Settings] ⇨ [Local Policies] ⇨ [Security Options].

[*2] Not recommended because users, who can access industrial PCs and personal computers on which shared folders are published, can log on with a user account for which no password is set.

■Data storing function (DB saving function)

Symptom	Check item	Corrective action
Fails to save (INSERT) data to a database.	Is the connection setting for the database configured correctly?	Review the ODBC setting and the data storing setting (DB saving) for Real-time Flow Designer. Also, check the ODBC error code in the detailed information in the error information list in the "Real-time Flow Manager Diagnostics" screen of Real-time Flow Designer, and take corrective action.
Incorrect data is stored in a DB.	Is the table setting configured in Real-time Flow Designer different from the one configured in the DB?	Output the DDL file and create the table in the DB again.
A 'DB reception of data missing' error occurs when switching the operating status of a process flow from STOP to RUN.	Does a 'DB reception of data missing' error appear in the "Real-time Flow Manager Diagnostics" screen?	• Review the collection cycle, number of data collection points, processing contents, and number of process flows to reduce the load. • Reduce the load on Windows by closing other applications.
	Is the load on Windows high by setting a large number of process flows?	

■Data distribution function

Symptom	Check item	Corrective action
Data received in an edge application is incorrect.	Is the content of a publishing data setting configured in Real-time Flow Designer different from that of a publishing data definition file read in the edge application?	Output the publishing data definition file again, and read it to the edge application.
	Is a topic name that is used in Real-time Flow Manager and the edge application used in another application?	Set a publishing data topic name so that it is not duplicated with one used in another application.

Symptom	Check item	Corrective action
Data is not received in an edge application.	Is an IP address, host name, or port number set correctly?	Set a correct IP address, host name, or port number.
	Is the connection allowed to a connected MQTT broker on another industrial PC?	Allow the connection. For the setting method, refer to the following: ☞ Page 528 Configuring the settings for connection from another industrial PC
	Is the content of a publishing data setting configured in Real-time Flow Designer different from that of a publishing data definition file read in the edge application?	Output the publishing data definition file again, and read it to the edge application.
	Does the communication encryption setting match that of a connected MQTT broker?	Set the encryption setting according to that of the connected MQTT broker.
	Is '1' set for QoS in Real-time Flow Designer when connecting to an MQTT broker that does not support QoS2?	Set '1' for QoS.
	Does a client ID of Real-time Flow Manager set in Real-time Flow Designer match a specified one if it is specified in a connected MQTT broker?	In Real-time Flow Designer, set the client ID specified in the connected MQTT broker.
	Does a publishing data topic name set in Real-time Flow Designer match a specified one if it is specified in the edge application?	In Real-time Flow Designer, set the publishing data topic name specified in the edge application.
	Has the number of times of data missing increased in the process flow diagnostics?	• Check if an error occurs in a data collector set in the process flow in which data missing occurs, and take corrective action displayed in the diagnostics screen if it does. • Refer to the manual for the data collector and review the setting to avoid data missing. • The load on the system is high. Review the setting to reduce the load (lengthen the collection cycle or reduce the number of data collection points, etc.).
	Is a setting file that is saved in another industrial PC and has no specified publishing data topic name read?	Set the following settings again in the data distribution setting screen. • Output a publishing data definition file, then read it in the edge application. • After outputting a publishing data definition file, click the [OK] button to close the data distribution setting screen, then click the [OK] button to close the process flow setting screen.
An edge application acquires the same data multiple times and does not run properly.	Are both of the following satisfied? • '1' is set for QoS. • QoS1 is not supported by an edge application.	Set '2' for QoS.
	Is an industrial PC on which Real-time Flow Manager is running disconnected from a network and reconnected to it?	• Prevent network disconnection. • Reduce the load on the network.
	Is the load on a network high?	
Unable to read a publishing data definition file in an edge application. An error occurs when data is received in an edge application.	Is '1' set for QoS?	Set '2' for QoS.

■Common items for a data collector and IT gateway

Symptom	Check item	Corrective action
The following error occurs: • Data collector service corruption error (error code: 5021H)	Is an access target device setting of Real-time Flow Manager parameter updated after updating a data collector?	Update the version of a data collector for an access target device setting by performing either of the following operations: • Start Real-time Flow Designer. • Click the [Update to Latest State] button in the "Data collector List" screen of Real-time Flow Designer running. When the confirmation message indicating whether to update the version appears, select [Yes]. Then, apply the setting and switch the operating status of a process flow to RUN. If the same error occurs again after the operation, the data collector may be corrupted. In this case, contact the developer of the data collector.

Symptom	Check item	Corrective action
The following error occurs: • IT Gateway service corruption error (error code: 5027H)	Is an IT gateway setting of Real-time Flow Manager parameter updated after updating an IT gateway?	Update the version of an IT gateway for an IT gateway setting by performing either of the following operations: • Start Real-time Flow Designer. • Click the [Update to Latest State] button in the "IT Gateway List" screen of Real-time Flow Designer running. When the confirmation message indicating whether to update the version appears, select [Yes]. Then, apply the setting and switch the operating status of a process flow to RUN. If the same error occurs again after the operation, the IT gateway may be corrupted. In this case, contact the developer of the IT gateway.

A file/folder cannot be accessed

Check the following items:

Check item	Corrective action
Is there any free space on the drive to write?	• Secure free space by deleting files in the drive to write. • Change the drive to write to another one.
Is there an application using a target file?	Stop an application using a target file.
Is a file or a folder written to Windows system drive?	Change the writing destination drive.
Is required access granted to a user who accesses a target file and folder?	Grant required access.

Real-time Flow Designer

The select folder screen is frequently updated and it cannot be operated

Check the following item:

Check item	Corrective action
Is Real-time Flow Manager stopped?	Stop Real-time Flow Manager then operate the "Select Folder" screen.

Contents in the screen are not displayed properly

Check the following item:

Check item	Corrective action
Is a value other than 100% set for "Change the size of text, apps, and other items" in Windows?	• Change the value to 100% for "Change the size of text, apps, and other items." • For Windows 10 (version 1703 or later) or later[*1], the display of Real-time Flow Designer can be enlarged with high DPI scaling by using a Windows function.[*2] ❶ Select 'ProcessDesigner.exe'[*3], then select [Properties] on the right-click menu. ❷ Select the checkbox of "Override high DPI scaling behavior. Scaling performed by:" in the [Compatibility] tab, then select "System" from the pull-down list. ❸ Click the [OK] button.

*1 The Windows version can be checked by the following procedure:
❶ Enter "winver" in the search box of Windows, and select it from the menu.
❷ Check the version in the displayed screen.

*2 The display of Real-time Flow Designer will be blurred by enlarging.
The following lists the setting values for "Change the size of text, apps, and other items" and the recommended display resolution for each setting value in Windows 10 or later.
Setting value: 100%, display resolution: 1024 × 768 dots or more
Setting value: 125%, display resolution: 1900 × 1200 dots or more
Setting value: 150%, display resolution: 1900 × 1200 dots or more
Setting value: 175%, display resolution: 2880 × 1620 dots or more
Setting value: 200%, display resolution: 2880 × 1620 dots or more
Setting value: 225%, display resolution: 3840 × 2160 dots or more
Setting value: 250%, display resolution: 3840 × 2160 dots or more

*3 'ProcessDesigner.exe' is stored in the folder in which Edgecross Basic Software is installed.
The following is an example of a storage location.
(Example) When starting the operating system on the C drive and setting the installation destination folder as the default
C:\Edgecross\Edgecross Basic Software\Real-timeFlowDesigner\ProcessDesigner.exe

The same error occurs even after the corrective action was taken

Check item	Corrective action
Is antivirus software installed?	In the antivirus software settings, exclude the following folders from the monitoring targets. For the setting method, refer to the manual for antivirus software. • Installation destination folder for Edgecross Basic Software • Installation destination folder for an MQTT broker (☞ Page 507 Installing Eclipse Mosquitto) • Save destination folder specified in the data storing setting (file saving) (☞ Page 147 Saved file) • Folder in which a certificate authority certificate specified in the data distribution setting is stored (☞ Page 160 Destination) • Folder in which a certificate authority certificate specified in the edge application diagnosis (MQTT) setting is stored (☞ Page 174 Destination) • Save destination folder specified in the edge application diagnosis (file) setting (☞ Page 182 Saved file) • Monitoring folder specified in the data collection setting (CSV File Data collector) (☞ Page 310 Data Collection Setting (CSV File Data collector)) • Save destination folder specified in the file saving setting of the one-shot collection function (☞ Page 286 File saving setting) • Save destination folder specified in the save destination folder setting for the event history automatic output function (☞ Page 118 Event history automatic output setting, Page 292 Event history automatic output setting screen)

Setting contents cannot be opened

If such a message appears, check the following item:

Check item	Corrective action
Are the version of Real-time Flow Designer in which a read setting file was created and that of running Real-time Flow Designer same or the latest one?	Install the latest version of Edgecross Basic Software.

Authentication test by specifying a user account for which no password is set fails

Check item	Corrective action
Is "Enabled" selected for "Accounts: Limit local account use of blank passwords to console logon only"[*1] on an industrial PC?	• Use a user account for which a password is set. • Select "Disabled" for "Accounts: Limit local account use of blank passwords to console logon only"[*1] on the industrial PC.[*2]

*1 Can be checked by the following procedure:
❶ Start the local security policy of Windows.
❷ Select [Security Settings] ⇨ [Local Policies] ⇨ [Security Options].

*2 Not recommended because users, who can access industrial PCs and personal computers on which shared folders are published, can log on with a user account for which no password is set.

Reading setting contents fails at the time of startup

If such a message appears, check the following items:

Check item	Corrective action
Is an industrial PC restarted after installing Edgecross Basic Software or installing over it?	Restart the industrial PC.
Is the fast startup function disabled?	Disable the fast startup function, then restart the industrial PC. ☞ Page 114 Procedure for disabling the fast startup function

Operations cannot be performed when applying the setting

If such a message appears, check the following items:

Check item	Corrective action
Is a user operating Real-time Flow Designer granted the write authority in the installation folder for Edgecross Basic Software?	Grant the authority to the user.
Is Edgecross Basic Software installed in a target folder for the user account control (UAC) (Program Files, etc.)?	• Start Real-time Flow Designer with the administrator authority. • Reinstall Edgecross Basic Software in a folder other than the targets.

A file/folder cannot be accessed

Refer to the following:

☞ Page 350 A file/folder cannot be accessed

Management Shell

Troubleshooting on the startup

Check the following items:

Symptom	Check item	Corrective action
Display contents are not displayed on the screen of Management Shell Explorer.	Is Management Shell running?	• Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start]. • If it is not solved after performing the above procedure, perform either of the following operations: Import a setting file. (Select [Management Shell] ⇨ [Import].) Return the setting to the default. (Select [Management Shell] ⇨ [Delete All].)
	Was the following message notified? "OPC UA Setting" has not been performed. Please display and set the OPC UA setting from the following menu. • [Setting] - [OPC UA Setting]	Select [Setting] ⇨ [OPC UA Setting], and set each item in the [Server Setting] tab in the "OPC UA Setting" screen. ☞ Page 261 Setting an OPC UA server
	Is Management Shell Explorer started from a shortcut in which a work folder is not specified?	Reinstall Edgecross Basic Software and start Management Shell Explorer from the shortcut created by the installer.
	Is Management Shell Explorer started from the command prompt?	
	Does the following message appear? 'Failed to connect to Management Shell. Please restart Management Shell Explorer with the administrator authority.'	Start Management Shell Explorer with the administrator authority. ☞ Page 194 Procedure for starting it with the administrator authority
	Has an industrial PC been restarted with the fast startup function enabled after Management Shell stopped?	Disable the fast startup function.
	Does a user have the access right to the folder*1 in which Management Shell is stored?	Perform the following procedure: ❶ Right-click a folder*1 in which Management Shell is stored. ❷ Select [Properties], and click the [Security] tab. ❸ Click the [Edit] button. ❹ Click the name of a logged in user. ❺ Select the checkbox under "Allow" for "Permissions."
A message indicating that processing is not completed appears when starting Management Shell Explorer.	Is a user operating Management Shell Explorer granted the write authority in the installation folder for Edgecross Basic Software?	Grant the authority to the user.
	Is Edgecross Basic Software installed in a target folder for the user account control (UAC) (Program Files, etc.)?	• Start Management Shell Explorer with the administrator authority. ☞ Page 194 Procedure for starting it with the administrator authority • Reinstall Edgecross Basic Software in a folder other than the targets.

*1 Stored in the folder in which Edgecross Basic Software is installed.
The following is an example of a storage location.
(Example) When starting the operating system on the C drive and setting the installation destination folder as the default
C:\Edgecross\Edgecross Basic Software\Management Shell

Troubleshooting on basic operations

Check the following items:

Symptom	Check item	Corrective action
Export fails.	Is there any space left on the disk?	Secure free space on the disk, and execute it again.
	Can Management Shell be stopped or started?	• Restart the industrial PC. • Reinstall Edgecross Basic Software.
Import fails.	Is there any space left on the disk?	Secure free space on the disk, and execute it again.
	Is a setting file or icon file open in another program?	Close a program locking the file, and execute it again.
	Can Management Shell be stopped or started?	• Restart the industrial PC. • Reinstall Edgecross Basic Software.
Fails to connect to an access target device after importing a data model exported from another industrial PC.	Is the access target device properly set for the import destination industrial PC?	Correct the access target device setting according to the import destination industrial PC. For details, refer to the manual for a data collector used.
All deletion fails.	Is Management Shell running?	Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start].
Display contents are not displayed on the screen of Management Shell Explorer.	Is Management Shell running?	Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start].
Unable to display the manual by using the [Help] menu.	Is Management Shell Explorer started with the administrator authority?	• Restart the industrial PC, and start Management Shell Explorer without the administrator authority. • Change the application associated with the extension of PDF.

Troubleshooting on monitoring and changing of current values of data tag resources

Check the following items:

Symptom	Check item	Corrective action
"N/A" is displayed in "Current Value."	Is monitoring started in the data tag resource monitor window?	Click the [Start Monitoring] button in the data tag resource monitor window.
	Is Management Shell running?	Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start].
	Are the contents in the "Error Information List" screen checked?	Take corrective action according to the contents displayed in the "Error Information List" screen.
	Is a data collector installed?	Reinstall the data collector.
	Is the response time of a data collector exceeded?	Check the status of the access target device and the communication route with the access target device.
	Is a compatible data collector installed?	Check the version of the data collector in Management Shell Explorer. If the version has been updated, display the "Target Device Setting" screen and upgrade the parameters.
A current value does not change.	Is the update interval of a current value set correctly?	Set the update interval of the current value again. ☞ Page 211 Changing a monitoring update interval
Unable to change a current value.	Is a data collector supporting the data writing function used?	Check if the data collector referenced by a data tag resource to change the current value supports the data writing function.

Troubleshooting on OPC UA connection

Check the following items:

Symptom	Check item	Corrective action
Unable to connect to an OPC UA server from an edge application.	Has an error occurred in the edge application?	Check the error and take corrective action.
	Is the setting of an OPC UA server connected to an edge application correct?	Review the setting of the OPC UA server connected to the edge application.
	Is there any device to which a same IP address is set on the same network?	• Do not use a device to which a same IP address is set on the same network. • Set an IP address for a device without duplication.
	Are communication connections to the OPC UA server allowed by a firewall?	Allow the communication connections to Management Shell in the firewall setting of an industrial PC on which Management Shell is running. For the setting method, refer to the following: ☞ Page 560 Allowing Communication Connections between Industrial PCs
	Are they correct, the OPC UA server setting configured in Management Shell Explorer and the security setting of the edge application?	Review these settings.
	Are they correct, the OPC UA server setting configured in Management Shell Explorer and the expiration date of the certificate for the edge application?	Check them and take corrective action.
	Is the time when the certificate was created in the edge application later than the current system time in the environment where Management Shell Explorer is running?	Make sure that the system time is the same in the environment where Management Shell Explorer is running and the environment where the edge application is running, and create the certificate again.
	Is a computer name of the industrial PC on which Management Shell is running changed?	Perform the following procedure: ❶ Start Management Shell Explorer.*1 ❷ Review the endpoint URL of the OPC UA server connected to the edge application.
	Is an incorrect IP address specified as the endpoint URL of the connection destination server on the edge application side?	Perform the following procedure: ❶ Review the setting on the edge application side if the IP address specified as the endpoint URL of the connection destination server differs from the one set for "IP address (IPv4)" in the [Certificate Setting] tab in the [Server Setting] tab in the "OPC UA Setting" screen of Management Shell Explorer. ❷ Check if the IP address in ❶ is that of an industrial PC on which Management Shell is running (IP address of a network adapter that can be accessed from the edge application side), and correct it if necessary.
	Is an IP address specified as the endpoint URL of the connection destination server and a proxy server used on the edge application side?	When a proxy server is not required for the IP address of an industrial PC on which Management Shell is running, exclude it from the proxy settings in the internet options by the following procedure: ❶ Select [Internet Options] in the control panel of Windows. ❷ Click the [Connections] tab. ❸ Click the [LAN settings] button. ❹ Click the [Advanced] button. ❺ Specify the IP address specified as the endpoint URL in "Exceptions."
	Does the number of applications connected to Management Shell exceed the maximum number of connectable ones?	Check the number for "Number of connected" in the "OPC UA Diagnosis" screen. If it reaches its maximum number, reduce the number of applications connected to the OPC UA server. ☞ Page 341 OPC UA diagnosis

Symptom	Check item	Corrective action
Fails to add monitoring target items and change their settings in an edge application.	Is there enough free space in the memory of the industrial PC on which Management Shell is running?	• Reduce the number of monitoring target items in the edge application. • Close other applications on the industrial PC on which Management Shell is running to secure free space. • Increase the memory of the industrial PC on which Management Shell is running.
	Is a resource that can be monitored specified?	Specify a resource that can be monitored.
A setting value of a data tag resource in a data model is not updated.	Has an error occurred in an access target device of the target data tag resource?	• Check the error and take corrective action. • Check the status of the access target device and the communication route with the device.
	Is a data collector installed?	Reinstall the data collector.
	Has an error occurred in a data collector?	Take corrective action according to the contents displayed in the "Error Information List" screen.
	Is a data collector that does not support the data reading function set for an access target device of a data tag resource to be monitored?	Set a data collector that supports the data reading function for the access target device of the data tag resource to be monitored.
A value set in an edge application is not applied to the setting value of a data tag resource in a data model.	Has an error occurred in an access target device of the target data tag resource?	Check the error and take corrective action.
Data in a resource cannot be read or written properly in an edge application.[2]	Has a data model been changed in Management Shell Explorer after the information of the data model was acquired in the edge application?	Reacquire the information of the data model in the edge application.
	Does the resource specified in the edge application exist in Management Shell?	
	Is the resource set as a monitoring target deleted from Management Shell?	• Delete the monitoring target item in which an error occurs from all edge applications. • Restart Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Stop]. ❷ Select [Management Shell] ⇨ [Management Shell Start].
	Is the information on the resource set as a monitoring target changed in Management Shell?	If an error occurs in an internal data tag resource (operation) set as a monitoring target item, open the "Operation Expression Setting" screen to review the setting.
A timeout occurs when a value is acquired.	Does an access target device of a data tag resource reference a data tag resource of Management Shell installed in an industrial PC being used?	Review the configuration so that the data tag resource of Management Shell is not referenced.

[1] The settings are rebuilt.

[2] If changing a data model in Management Shell Explorer after acquiring the information of the data model, an error may occur or data in another data tag resource may be read or written depending on changed contents.

Troubleshooting on component tree editing

Check the following items:

Symptom	Check item	Corrective action
Display contents are not displayed in the component tree window.	Is Management Shell running?	• Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start]. • If it is not solved after performing the above procedure, perform either of the following operations: Import a setting file. (Select [Management Shell] ⇨ [Import].) Return the setting to the default. (Select [Management Shell] ⇨ [Delete All].)

Symptom	Check item	Corrective action
Unable to open the component tree edit dialog.	Does an error message appear when the component tree edit dialog is displayed?	• Restart the industrial PC. • Reinstall Edgecross Basic Software. • Restart Management Shell by either of the following procedures: ■When Management Shell is stopped ❶ Select [Management Shell] ⇨ [Management Shell Start]. ■When Management Shell is running ❶ Select [Management Shell] ⇨ [Management Shell Stop]. ❷ Select [Management Shell] ⇨ [Management Shell Start].
Unable to register the component tree.	Is Management Shell running?	Discard the edited contents, and start Management Shell by the following procedure after closing the component tree edit dialog. ❶ Select [Management Shell] ⇨ [Management Shell Start].
	Are there sufficient memory and system resources on the industrial PC?	• Close unnecessary applications. • Restart the industrial PC.
Fails to add an icon.	Is a file other than an image file selected?	Select a image file.
	Does a user have the access right to a selected file?	• Perform the following procedure: ❶ Right-click the selected file. ❷ Select [Properties], and click the [Security] tab. ❸ Click the [Edit] button. ❹ Click the name of a logged in user. ❺ Select the checkbox under "Allow" for "Permissions."
	Are there sufficient memory and system resources on the industrial PC?	• Close unnecessary applications. • Restart the industrial PC.
	Is a file in a copy destination directory selected? (Copy destination directory: (installation destination folder for Edgecross Basic Software)\Management Shell\Explorer\icon)	Specify a file other than one in a copy destination directory.

Troubleshooting on resource list editing

Check the following items:

Symptom	Check item	Corrective action
Display contents are not displayed in the resource list window.	Is Management Shell running?	• Start Management Shell by the following procedure: ❶ Select [Management Shell] ⇨ [Management Shell Start]. • If it is not solved after performing the above procedure, perform either of the following operations: Import a setting file. (Select [Management Shell] ⇨ [Import].) Return the setting to the default. (Select [Management Shell] ⇨ [Delete All].)
A file does not open even when double-clicking the file resource.	Is a file set for the resource?	Set a file for the resource. ☞ Page 245 Editing file resource properties
	Is a tool required for starting a file installed?	Install a tool required for starting a file.
	Is a tool required for starting a file set as a program to open a file in Windows?	Set a program to open a file in Windows by the following procedure: ❶ Right-click a file to open. ❷ Click [Open with] ⇨ [Choose another app]. ❸ Select a program to open a file, click the [OK] button.
	Does a user have the access right to the selected file?	Perform the following procedure: ❶ Right-click the selected file. ❷ Select [Properties], and click the [Security] tab. ❸ Click the [Edit] button. ❹ Click the name of a logged in user. ❺ Select the checkbox under "Allow" for "Permissions."
	Is a file in a shared folder set?	• Check the connection route for any problems. • Perform user authentication required to access the shared folder.
	Are there sufficient memory and system resources on the industrial PC?	• Close unnecessary applications. • Restart the industrial PC.
A folder does not open even when double-clicking the folder resource.	Does a user have the access right to the selected folder?	Perform the following procedure: ❶ Right-click the selected folder. ❷ Select [Properties], and click the [Security] tab. ❸ Click the [Edit] button. ❹ Click the name of a logged in user. ❺ Select the checkbox under "Allow" for "Permissions."
	Is a shared folder set?	• Check the connection route for any problems. • Perform user authentication required to access the shared folder.
	Are there sufficient memory and system resources on the industrial PC?	• Close unnecessary applications. • Restart the industrial PC.
Unable to open the resource list edit dialog.	Does an error message appear when the resource list edit dialog is displayed?	• Restart the industrial PC. • Reinstall Edgecross Basic Software. • Restart Management Shell by either of the following procedures: ■When Management Shell is stopped ❶ Select [Management Shell] ⇨ [Management Shell Start]. ■When Management Shell is running ❶ Select [Management Shell] ⇨ [Management Shell Stop]. ❷ Select [Management Shell] ⇨ [Management Shell Start].
Unable to add a resource.	Does the number of resources in the resource list edit dialog reach the upper limit (1000)?	Delete unnecessary resources. ☞ Page 254 Deleting a resource

Symptom	Check item	Corrective action
Unable to register a resource.	Is Management Shell running?	Discard the edited contents, and start Management Shell by the following procedure after closing the resource list edit dialog. ❶ Select [Management Shell] ⇨ [Management Shell Start].
	Are there sufficient memory and system resources on the industrial PC?	• Close unnecessary applications. • Restart the industrial PC.
Unable to add a data tag resource.	Does the number of resources in the resource list edit dialog reach the upper limit (1000)?	Delete unnecessary resources. ☞ Page 254 Deleting a resource
	Does the following error message appear when adding a data tag resource? 'Unable to confirm parameter editing because the following warning has been reported during the check performed by the data collector.'	• Check the data collector name and error code in the message. • Check the error cause in the manual for the data collector, and take corrective action accordingly. • Reinstall the data collector as necessary.
After editing the location setting of a data tag resource, a message appears indicating that the setting cannot be saved. In addition, troubleshooting described in the message does not solve the problem.	Is the latest version of data collector used?	• Install the latest version of the data collector. • If the above operation does not solve the problem, contact the developer of the data collector.

Troubleshooting on display language switching

Check the following items:

Symptom	Check item	Corrective action
The display language is not switched.	Has Management Shell Explorer been restarted after switching the display language?	Restart Management Shell Explorer.
	Is "Match Windows display language (recommended)" selected under "Format" in the [Formats] tab in the screen displayed by selecting [Change date, time, or number formats] in the control panel of Windows?	Select "Match Windows display language (recommended)" under "Format."

Troubleshooting on the one-shot collection function

Check the following items:

Symptom	Check item	Corrective action
Unable to browse a saved file.	Is the encryption attribute enabled for the save destination folder?	• Change the save destination folder to another one with the encryption attribute disabled. • Open the file with the user account used for starting Management Shell Explorer. • Import the certificate. For the import procedure, refer to the following: ☞ Page 72 Procedure for browsing files with a user account other than a specified one
Fails to save a file. (A file saving error or an accumulating file error occurs.)	Is the network disconnected and reconnected during operation?	• Check if the network is disconnected. • Set a local folder as the save destination folder.
A saved file is lost.	Are the settings of the file name prefix and the save destination folder same as those of Real-time Flow Manager?	Change the save destination folder or the file name prefix.
	Does the number of saved files in the save destination folder exceed its upper limit?	• Increase the maximum number of saved files. • Move the saved file. • Change the save destination folder or the file name prefix.
The operating status does not switch to RUN.	Are there a large number of files or folders in the save destination folder?	• Change the save destination folder. • Move or delete files/folders in the save destination folder.
No change in a value of a monitoring target resource is detected. (Saving processing is not performed/a value of a notification target resource does not change to '0.')	Has the value of the monitoring target resource changed?	Check if the value of the monitoring target resource has changed in the data tag resource monitor. ☞ Page 207 Monitoring and changing current values of data tag resources
	Is the value of the monitoring target resource changed frequently?	After changing the value of the monitoring target resource, wait for a while and change the value again.
	Is the operation delayed due to high load on the system?	Reduce the load on Windows, such as closing other applications.
	Is the operating status RUN?	• Check if the operating status is RUN when the value of the monitoring target resource changes. • After the value of the monitoring target resource changes, check if the operating status is switched to STOP before an event is reported.
	Has the value of the monitoring target resource changed during data saving?	Check that the saving is completed, then change the value of the monitoring target resource.
	Has an error occurred in Management Shell?	Take corrective action according to the contents displayed in the "Error Information List" screen. ☞ Page 343 Displaying error information in a list
Fails to read/write a data tag resource.	Has the data tag resource been deleted during operation (including a case in which it is deleted once then created again)?	Stop the operation and set the data tag resource again.
Fails to save (INSERT) data to a database.	Is the connection setting for the database configured correctly?	Review the ODBC setting and the DB saving setting for the one-shot collection function. Also, check the ODBC error code in the detailed information in the "Error Details" screen of the one-shot collection setting, and take corrective action.

Symptom	Check item	Corrective action
Incorrect data is stored in a DB.	Is the access table setting configured in the saving setting different from the table setting configured in the DB?	Output the DDL file and create the table in the DB again.
	Does the access table setting configured in the saving setting overlap with the access target table of another application?	Change the access table setting, then output the DDL file and create the table in the DB again.

Troubleshooting on using a data collector and IT gateway

Check the following items:

Symptom	Check item	Corrective action
The following error occurs: • Data collector service corruption error (error code: 5021H)	Is an access target device setting updated after updating a data collector?	Update the version of a data collector for an access target device setting by performing either of the following operations: • Start Management Shell Explorer. • Click the [Update to Latest State] button in the "Data collector List" screen of Management Shell Explorer running. When the confirmation message indicating whether to update the version appears, select [Yes]. Then, restart Management Shell. If the same error occurs again after the operation, the data collector may be corrupted. In this case, contact the developer of the data collector.
The following error occurs: • IT Gateway service corruption error (error code: 5030H)	Is an IT gateway setting updated after updating an IT gateway?	Update the version of an IT gateway for an IT gateway setting by performing either of the following operations: • Start Management Shell Explorer. • Click the [Update to Latest State] button in the "IT Gateway List" screen of Management Shell Explorer running. When the confirmation message indicating whether to update the version appears, select [Yes]. Then, restart Management Shell. If the same error occurs again after the operation, the IT gateway may be corrupted. In this case, contact the developer of the IT gateway.

A file/folder cannot be accessed

Refer to the following:

☞ Page 350 A file/folder cannot be accessed

CSV File Data collector

Check the following items:

Symptom	Check item	Corrective action
CSV File Data collector does not start.	Does the execution file (CSVReader.exe) of CSV File Data collector exist in the following folder? • (Installation destination of Edgecross Basic Software)\Management Shell\Service\bin	Install the latest version of Edgecross Basic Software.
Fails to collect a monitoring target file.	Is the number of units of data set in Real-time Flow Designer different from that of columns in the monitoring target file?	Match the number of columns between a collection data definition file and the monitoring target file.
	Is a data type set in Real-time Flow Designer different from the data contents of the monitoring target file?	Match the data type in the collection data definition file with the data contents of the monitoring target file.
Data is not collected even when a monitoring target file is stored in a monitoring folder.	Is a file name prefix set in Real-time Flow Designer different from the prefix of the monitoring target file stored in the monitoring folder?	Match the file name prefix set in Real-time Flow Designer with the data contents of the monitoring target file.
	Is the type of a file set in Real-time Flow Designer different from the extension of the monitoring target file stored in the monitoring folder?	Match the type (CSV file or text file) of the file set in Real-time Flow Designer with the extension of the monitoring target file.
	Are the prefix and the subsequent character string of the name of the monitoring target file stored in the monitoring folder delimited by '_'?	Delimit the file name prefix and the other character strings by '_' (Example) LOG_00000001.csv
	Is the monitoring target file opened in another Windows process?	Close the open monitoring target file.
	Is the read-only attribute enabled for the monitoring target file?	Disable the read-only attribute.
	Is the monitoring target file with a size of 0 bytes?	Delete the monitoring target file with a size of 0 bytes from the monitoring folder.
	Is the encryption attribute enabled for the monitoring folder set in Real-time Flow Designer?	Change the monitoring folder to another one with the encryption attribute disabled.
Some data is not collected.	Is a data type outside the collection target used?	Use a data type that can be collected.

Management Shell Data collector

Troubleshooting on the Management Shell Data collector startup

Check the following item:

Symptom	Check item	Corrective action
Management Shell Data collector is not recognized at the Edgecross Basic Software start.	Does a signed-in user who started Edgecross Basic Software have the access right to a folder in which Management Shell Data collector is stored?	• Sign in as a user with the access right to the folder in which Management Shell Data collector is stored, and start Edgecross Basic Software. • Grant the user access to the folder in which Management Shell Data collector is stored.

Troubleshooting on data collection

Check the following items:

Symptom	Check item	Corrective action
Fails to connect with Management Shell.	Is any of the following settings changed in the OPC UA setting in Management Shell Explorer? • "End point URL" in the [Connection Setting] tab • "Security Policy" in the [Connection Setting] tab • "Security Mode" in the [Connection Setting] tab	Configure all the access target device settings again in Real-time Flow Designer, then apply the settings to Real-time Flow Manager.
	Is any setting other than the following ones changed in the OPC UA setting in Management Shell Explorer? • "End point URL" in the [Connection Setting] tab • "Security Policy" in the [Connection Setting] tab • "Security Mode" in the [Connection Setting] tab	Reconfigure any of the access target device settings in Real-time Flow Designer, then switch Real-time Flow Manager to RUN again.
	Is a setting file of Edgecross Basic Software imported in another industrial PC?	Configure all the access target device settings again in Real-time Flow Designer, then apply the settings to Real-time Flow Manager.
	Is the date and time in an industrial PC changed?	• Reconfigure any of the access target device settings in Real-time Flow Designer, then switch Real-time Flow Manager to RUN again. • If the above operation does not solve the problem, perform the following procedure: ❶ Change and apply the settings other than the following ones in the OPC UA setting in Management Shell Explorer. • "End point URL" in the [Connection Setting] tab • "Security Policy" in the [Connection Setting] tab • "Security Mode" in the [Connection Setting] tab ❷ Reconfigure any of the access target device settings in Real-time Flow Designer, then switch Real-time Flow Manager to RUN again.

Symptom	Check item	Corrective action
Fails to connect with Management Shell.	Is Real-time Flow Manager switched to the RUN state while Management Shell is stopped, or is Management Shell stopped while Real-time Flow Manager is in RUN?	Start Management Shell, then switch Real-time Flow Manager to RUN again.
	Is the maximum number of applications connectable to Management Shell reached?	Reduce the number of connected applications.
	Is Management Shell temporarily stopped? (Is the "Data model import" screen displayed?)	Close the "Data model import" screen, then switch Real-time Flow Manager to RUN again.
	Is the creation status changed to "Not created" due to an error caused when clicking the [Creation] button even though an access target device setting with "Already created" displayed in the connection information is reconfigured? (After that, "Already created" has never been displayed in any of the access target device settings.)	Reconfigure any of the access target device settings properly in Real-time Flow Designer, then switch Real-time Flow Manager to RUN again.
A collection cycle is exceeded.	Does the maximum collection processing time of a collection processing time event exceed the collection cycle?	• Review the collection setting to reduce the load on the system (lengthen the collection cycle or reduce the number of data collection points, etc.). • Reduce the load on Windows, such as closing other applications.
The time (time stamp) of collected data does not match the collection cycle.	Is the current time changed by the automatic time adjustment of Windows?	Set "Set time automatically" to OFF in the "Date & time" setting in Windows.
	Is the current time in Windows changed?	Do not change the current time in Windows.

Troubleshooting on Edgecross Basic Software

Check the following item:

Symptom	Check item	Corrective action
An error caused by Management Shell Data collector has been detected in Edgecross Basic Software.	Has a data collector startup error been detected in Edgecross Basic Software?	Reinstall Edgecross Basic Software since the file may have been moved or deleted.

11.5 Error Code List

This section shows the codes for errors that occur in Edgecross Basic Software.

Codes for errors that occur in Real-time Flow Manager

The following table shows the codes for errors that occur in Real-time Flow Manager.

Error code	Error name	Error description	Corrective action
5020H	Real-Time Flow Manager timeout	The response of Real-time Flow Manager for RUN operation delays. Failed to start Real-time Flow Manager, Data collector, or the IT Gateway within the specified time.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • Please reduce the load on Windows by closing other applications. • If the Target Device setting No. or the Data collector file name is displayed in the detail information, please contact the developer of Data collector. • If the IT Gateway setting No. or the IT Gateway file name is displayed in the detail information, please contact the developer of the IT Gateway.
5021H	Data Collector damaged error	The Data Collector service file is corrupted or the Data Collector version stored at the Real-time Flow Manager parameter setting is inconsistent with the currently stored Data Collector version.	• After storing the Data collector file again according to the manual of Data collector where the problem occurred, specify Data collector again on the Target Device setting screen of Real-time Flow Designer, and then apply the setting. • If the same error occurs again, please contact the developer of Data collector.
5022H	Data Collector startup error	No execution file of Data collector exists.	Please store the Data collector execution file again according to the manual of Data collector where the problem occurred.
5023H	Data Collector error completion	Data collector has stopped the operation.	• Please check if there is any other error. • If the same error occurs again, please contact the developer of Data collector.
5024H	Real-time flow manager internal communication timeout	Timeout occurred in the internal communication of the real-time flow manager.	• Please reduce the load on Windows by closing other applications. • Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please check if there is any other error. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode.
5025H	Real-Time Flow Manager timeout	The response of Real-time Flow Manager for STOP operation delays. Failed to stop Real-time Flow Manager, Data collector, or the IT Gateway within the specified time.	• Please check if there is any other error. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • Please reduce the load on Windows by closing other applications. • If the Target Device setting No. or the Data collector file name is displayed in the detail information, please contact the developer of Data collector. • If the IT Gateway setting No. or the IT Gateway file name is displayed in the detail information, please contact the developer of the IT Gateway.
5026H	Data collector internal communication timeout	A timeout occurred in the internal communication of Data collector.	• Please reduce the load on Windows by closing other applications. • Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please eliminate other currently occurring errors. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • If the same error occurs again, please contact the developer of Data collector.

Error code	Error name	Error description	Corrective action
5027H	IT Gateway corruption error	The IT Gateway file is corrupted, or the version of the IT Gateway stored at the Real-time Flow Manager Parameter setting and the one of the IT Gateway currently stored do not match.	• After storing the IT Gateway file again according to the manual of the IT Gateway where the problem occurred, specify the IT Gateway again on the IT Gateway setting screen of Real-time Flow Designer, and then apply the setting. • If the same error occurs again, please contact the developer of the IT Gateway.
5028H	IT Gateway startup error	No execution file of the IT Gateway exists.	Please store the IT Gateway execution file again according to the manual of the IT Gateway where the problem occurred.
5029H	IT Gateway error completion	The IT Gateway has stopped the operation.	• Please check if there is any other error. • If the same error occurs again, please contact the developer of the IT Gateway.
502AH	IT Gateway internal communication timeout	A timeout occurred in the internal communication of the IT Gateway.	• Please reduce the load on Windows by closing other applications. • Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please eliminate other currently occurring errors. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • If the same error occurs again, please contact the developer of the IT Gateway.
502BH	Internal communication error	Real-time Flow Manager has failed to communicate with Data collector.	• Please check if there is any other error. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • If the same error occurs again, please contact the developer of Data collector.
502CH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
502DH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product. • If the same error occurs again, please contact the developer of Data collector.
502EH	Internal communication error	Real-time Flow Manager has failed to communicate with the IT Gateway.	• Please check if there is any other error. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • If the same error occurs again, please contact the developer of the IT Gateway.
502FH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
5030H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product. • If the same error occurs again, please contact the developer of the IT Gateway.
5050H	Real-Time Flow Designer communication error	The Real-Time Flow Manager could not allocate the port number to use for communication with the Real-Time Flow Designer.	Confirm that there is enough available communication port number and restart the Real-Time Flow Manager.
5070H	Status memory update error	An error occurred in the status memory update processing.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.
50A8H	Error in Real-Time Flow Manager Parameter	Real-Time Flow Manager Parameter has not been written, or is damaged.	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please delete unnecessary files to allocate free space.
50A9H	Error in Real-Time Flow Manager Parameter	Real-Time Flow Manager Parameter has not been written, or is damaged.	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please delete unnecessary files to allocate free space.
50AAH	Error in Real-Time Flow Manager Parameter	Real-Time Flow Manager Parameters that are written were created by an old version of the Real-Time Flow Designer.	Please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.

Error code	Error name	Error description	Corrective action
50ABH	Real-time Flow Manager Parameter read error	Real-time Flow Manager parameter setting is invalid.	Please review the settings for the problem function of the Process Flow information of the parameter acquisition error which is output subsequently.
5100H	Real-time flow manager internal communication timeout	Timeout occurred in the internal communication of the real-time flow manager.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.
5128H	Process data buffer overflow	Data buffering has overflowed.	• Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please consider in specifying a deterrence period in post-diagnosis feedback setting. • Please reduce the load on Windows by closing other applications.
51D4H	Data Collector startup error	An error occurred in the startup processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D5H	Data collector collection data send error	An error occurred in the collection data send processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D6H	Data collector collection data send error	An error occurred in the collection data send processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D7H	Data collector access request check error	An error occurred in the access request check processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D8H	Data collector access request acquisition error	An error occurred in the access request acquisition processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.

Error code	Error name	Error description	Corrective action
51D9H	Data collector access request acquisition error	An error occurred in the access request acquisition processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DAH	Data collector access result report error	An error occurred in the access result report processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DBH	Data collector access result report error	An error occurred in the access result report processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DCH	Data collector error report failure	The error report processing of Data collector failed.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DDH	Data collector communication status report error	An error occurred in the communication status report processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DEH	Process data buffer overflow	Data buffering has overflowed.	• Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please reduce the load on Windows by closing other applications.
51DFH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
51E1H	Data collector parameter read error	Failed to read the character code of the Data collector parameter.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.

Error code	Error name	Error description	Corrective action
51E2H	Data collector event report error	An error occurred in the event report processing of Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51E3H	Character error outside specification range	Character string acquired from Data collector contains characters out of the specification.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51E4H	Error exceeding number of characters	The number of characters in the string acquired from Data collector exceeds the maximum number.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51E5H	Data collector error event information read error	Failed to read the detail information of the error report or event report from Data collector.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51E6H	Internal process error	An error occurred in the communication processing with the Data Collector.	• Please check if there is any other error. • Please reduce the load on Windows by closing other applications.
51E7H	Data collector setting error	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5239H	CSV file data collector setting error	The Monitoring Folder setting is incorrect.	There is an error in the setting of the monitoring folder, so please review it.
5240H	CSV File Data collector error	There is an error in the collection data setting.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
5241H	CSV File Data collector error	Failed to delete the CSV file/text file that was successfully read.	• Please check whether the CSV file/text file can be deleted. • Please check whether other applications or others are accessing the CSV file/text file stored in the monitoring folder. • Please check whether the CSV file/text file moved during operation. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5242H	CSV File Data collector error	Failed to move the CSV file/text file that could not be read to the error folder.	• Please check whether the CSV file/text file can be moved. • Please check whether other applications or others are accessing the CSV file/text file stored in the monitoring folder. • Please check whether the CSV file/text file moved during operation. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.

Error code	Error name	Error description	Corrective action
5243H	CSV File Data collector error	The Error Folder could not be created in the Monitoring Folder.	• Please check the access right or others of the monitoring folder. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5244H	CSV File Data collector error	Failed to read the Monitoring Folder.	• Please review the Process Flow setting. • Please check the access right or others of the monitoring folder. • Please check whether other applications or others are accessing the CSV file/text file stored in the monitoring folder. • Please check whether there is a CSV file/text file that cannot be read or written from or to the monitoring folder. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5245H	CSV File Data collector error	Failed to read the CSV file/text file due to the error in it.	• Please make sure that the data type and number of columns set in the CSV file/text file collection data definition file are correct. • Please check whether there is data outside the data type range in the CSV file/text file. • Please check whether there are any lines that have insufficient number of data in the CSV file/text file. • Please check the character code of the CSV file/text file. • Please check the delimiter in the CSV file/text file.
5246H	CSV File Data collector error	Failed to read the CSV file/text file due to the error in its date column.	Please review the date column of the CSV file/text file since there is an error.
5247H	CSV File Data collector error	Failed to acquire the number of records in the CSV file/text file.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
5248H	CSV File Data collector error	The number of data in the CSV file/text file is invalid.	• Please check the number of data per record in the CSV file/text file. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error occurs again, please consult the Edgecross Consortium.
5310H	Error in Data Extraction setting	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5311H	Error in Data Extraction setting	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5313H	Error in execution of output process of Data Modification Plug-in	An error occurred during execution of the output process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5314H	Exception error in the initialization process of Data Modification Plug-in	An exception occurred during the initialization process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5315H	Timeout error during the initialization process of Data Modification Plug-in	There is no response from the initialization process of Data Modification Plug-in.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5316H	Failure in the initialization process of Data Modification Plug-in	The initialization and acquisition processes of Data Modification Plug-in has failed.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5317H	Mismatch error in the number of input data columns for Data Modification Plug-in	The number of input data columns for Data Modification Plug-in is different from the number of input data columns for the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
5318H	Mismatch error in the number of output data columns for Data Modification Plug-in	The number of output data columns for Data Modification Plug-in is different from the number of output data columns for the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
5319H	Timeout error during the termination process of Data Modification Plug-in	There is no response from the termination process of Data Modification Plug-in.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
531AH	Failure in the termination process of Data Modification Plug-in	Termination Process of Data Modification Plug-in has failed.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
531BH	Duplication of Data Modification Plug-in error	Program names of the Data Modification Plug-in are duplicated.	Please delete Plug-in whose program name is duplicate from the plug-in storage folder.
531CH	Failure in the acquisition process of Data Modification Plug-in	Failure occurred in the process to acquire the program name of Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
531DH	Timeout error during the acquisition process of Data Modification Plug-in	There is no response from the process to acquire the program name of Data Modification Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
531EH	Error in the number of characters for Data Modification Plug-in name	The number of characters in the program name of Data Modification Plug-in exceeds the number of settable characters in Real-time Flow Designer.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
531FH	Exception error in the termination process of Data Modification Plug-in	An exception occurred during the termination process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5321H	Data Modification Plug-in Input data string exceeded number error	The number of input data columns for Data Modification Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5322H	Total number of bytes in the input data column for Data Modification Plug-in exceeded error	Total number of bytes in the input data column for Data Modification Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5323H	Number of output data columns for Data Modification Plug-in exceeded error	The number of output data columns for Data Modification Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5324H	Total number of bytes in the output data column for Data Modification Plug-in exceeded error	Total number of bytes in the output data column for Data Modification Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5325H	Data Modification Plug-in storage error	Data Modification Plug-in does not exist in the storage folder. Or, the storage folder cannot be accessed.	• Please place the Data Modification Plug-in in the Plug-in storage folder. • Please check whether the Plug-in storage folder exists. • Please check the access right of the Plug-in storage folder.
5327H	Timeout error while reading Data Modification Plug-in	There is no response when reading the Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5328H	Number of Data Modification Plug-in exceeded error	The number of plug-in programs (number of classes) has exceeded its specified upper limit.	• Please reinstall Plug-in. • If the same error occurs again, please contact the developer of Plug-in.
532BH	Failed to acquire the input data column for Data Modification Plug-in	Failed to acquire the input data column information for Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
532CH	Timeout error while acquiring the input data column for Data Modification Plug-in	There was no response when attempting to acquire the input data column information for Data Modification Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
532DH	Error in the setting for the input data column for Data Modification Plug-in	The input data column for Data Modification Plug-in has not been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
532FH	Data type of the input data column information for Data Modification Plug-in incorrect error	Data type of the input data column information for Data Modification Plug-in is incorrect.	• Please use Real-time Flow Designer to reinstall Data Modification Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
5330H	Data name of the input data column information for Data Modification Plug-in incorrect error	Data name of the input data column information for Data Modification Plug-in is incorrect.	• Please use Real-time Flow Designer to reinstall Data Modification Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
5331H	Exception error in processing of Data Modification Plug-in	An exception occurred during the modification process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5332H	Timeout error while processing Data Modification Plug-in	There is no response from the modification process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5333H	Failure in processing of Data Modification Plug-in	Failure occurred in the modification process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5334H	Failure in the acquisition process of the output data column for Data Modification Plug-in	Failed to acquire the output data column information for Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5335H	Timeout error during the acquisition process of the output data column for Data Modification Plug-in	There was no response when attempting to acquire the output data column information for Data Modification Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5336H	Error in the setting for the output data column for Data Modification Plug-in	The output data column for Data Modification Plug-in has not been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5338H	Data type of the output data column information for Data Modification Plug-in incorrect error	Data type of the output data column information for Data Modification Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5339H	Data name of the output data column information for Data Modification Plug-in incorrect error	Data name of the output data column information for Data Modification Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
533AH	Exception error in the acquisition process of Data Modification Plug-in name	An exception occurred when reading the Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
533BH	Number of stored Data Modification Plug-in exceeded error	The number of Plug-in stored in the Plug-in storage folder has exceeded the storage upper limit.	The number of Plug-in in the Plug-in storage folder should be below or equal to 100.
533CH	NULL Output data of Data Modification Plug-in error	NULL is included in the output data information in the modification processing of Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
533DH	Mismatch error in the number of output data for Data Modification Plug-in	The number of output data in the modification process of Data Modification Plug-in is different from the number of output data that is set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
533EH	Mismatch error in the output data type for Data Modification Plug-in	Data type of the output data information in the modification process of Data Modification Plug-in is different from the data type of output data information that is set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.
533FH	NULL value error in the output data for Data Modification Plug-in	NULL is included in the output data information in the modification processing of Data Modification Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5340H	Error in execution of output process of Data Modification Plug-in	An error occurred during execution of the output process of Data Modification Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5341H	Mismatch error in the number of output data columns for Data Modification Plug-in	The number of output data in the modification process of Data Modification Plug-in is different from the number of output data that is set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the modification setting. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5342H	Column number for Data Modification Plug-in out of range error	Column number that is out of the specified range has been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5343H	Time stamp for Data Modification Plug-in out of range error	Time stamp that is out of the specified range has been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5344H	Data processing record line number acquisition processing timeout error	Data processing There is no response from the record number acquisition process.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5345H	Data processing record row count acquisition processing failure	Data processing record line number acquisition processing failed.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5350H	Character string data modification setting error	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5351H	Error exceeding number of characters	The number of characters after the character string data modification exceeds the upper limit.	Please check the data where the error has occurred and review the setting of the character string data modification so that the number of characters after the character string data modification does not exceed the upper limit.
5352H	Character string extraction acquisition error	Failed to extract the character string.	Please check the data where the error has occurred and review the setting of the character string data modification so that the extraction start position is within the range of the character string before modified.
5353H	Character string data modification status memory update error	Failed to update the data modification type or the number of modification failure records of the character string data modification.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.
5510H	Error in Data Diagnosis Plug-in setting	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5511H	Error in Data Diagnosis Plug-in setting	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5513H	Timeout error while processing Data Diagnosis Plug-in	There is no response from the diagnosis process of Data Diagnosis Plug-in.	• Please revise the collection cycle, the number of collection data or processing contents in order to lower the load. • Please reduce the load on Windows by closing other applications. • If the same error occurs again, please contact the developer of Plug-in.
5516H	Failure in processing of Data Diagnosis Plug-in	Failure occurred in the diagnosis process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5517H	Error in storage of Data Diagnosis Plug-in	Data Diagnosis Plug-in does not exist in the storage folder. Or, the storage folder cannot be accessed.	• Please place the Data Diagnosis Plug-in in the Plug-in storage folder. • Please check whether the Plug-in storage folder exists. • Please check the access right of the Plug-in storage folder.
5518H	Failed to acquire the input data column for Data Diagnosis Plug-in	Failed to acquire the input data column information for Data Diagnosis Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5519H	Timeout error while acquiring the input data column for Data Diagnosis Plug-in	There was no response when attempting to acquire the input data column information for Data Diagnosis Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
551AH	Failure in the acquisition process of the output data column for Data Diagnosis Plug-in	Failed to acquire the output data column information for Data Diagnosis Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
551BH	Timeout error during the acquisition process of the output data column for Data Diagnosis Plug-in	There was no response when attempting to acquire the output data column information for Data Diagnosis Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
551CH	Error in the setting for the output data column for Data Diagnosis Plug-in	The output data column for Data Diagnosis Plug-in has not been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
551DH	Mismatch error in the output data type for Data Diagnosis Plug-in	Data type of the output data information in the diagnosis process of Data Diagnosis Plug-in is different from the data type of output data information that is set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.
551EH	Data name of the output data column information for Data Diagnosis Plug-in incorrect error	Data name of the output data column information for Data Diagnosis Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
551FH	Error in the setting for the input data column for Data Diagnosis Plug-in	The input data column for Data Diagnosis Plug-in has not been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5520H	Data type of the input data column information for Data Diagnosis Plug-in incorrect error	Data type of the input data column information for Data Diagnosis Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5521H	Data name of the input data column information for Data Diagnosis Plug-in incorrect error	Data name of the input data column information for Data Diagnosis Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5523H	Timeout error while reading Data Diagnosis Plug-in	There is no response when reading the Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5524H	Number of stored Data Diagnosis Plug-in exceeded error	The number of Plug-in stored in the Plug-in storage folder has exceeded the storage upper limit.	The number of Plug-in in the Plug-in storage folder should be below or equal to 100.

Error code	Error name	Error description	Corrective action
5525H	Exception error in the acquisition process of Data Diagnosis Plug-in name	An exception occurred when reading the Data Diagnosis Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5527H	Number of input data columns for Data Diagnosis Plug-in exceeded error	The number of input data columns for Data Diagnosis Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5528H	Total number of bytes in the input data column for Data Diagnosis Plug-in exceeded error	Total number of bytes in the input data column for Data Diagnosis Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5529H	Number of output data columns for Data Diagnosis Plug-in exceeded error	The number of output data columns for Data Diagnosis Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552AH	Total number of bytes in the output data column for Data Diagnosis Plug-in exceeded error	Total number of bytes in the output data column for Data Diagnosis Plug-in has exceeded its specified upper limit.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552BH	Exception error in processing of Data Diagnosis Plug-in	An exception occurred during the diagnosis process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552CH	Error in execution of output process of Data Diagnosis Plug-in	An error occurred during execution of the output process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552DH	Exception error in the initialization process of Data Diagnosis Plug-in	An exception occurred during the initialization process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552EH	Timed out during the initialization process of Data Diagnosis Plug-in error	There is no response from the initialization process of Data Diagnosis Plug-in.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
552FH	Failure in the initialization process of Data Diagnosis Plug-in	The initialization and acquisition processes of Data Diagnosis Plug-in has failed.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5530H	Mismatch error in the number of input data columns for Data Diagnosis Plug-in	The number of input data columns for Data Diagnosis Plug-in is different from the number of input data columns for the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.
5531H	Mismatch error in the number of output data columns for Data Diagnosis Plug-in	The number of output data columns for Data Diagnosis Plug-in is different from the number of output data columns for the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
5532H	Timeout error during the termination process of Data Diagnosis Plug-in	There is no response from the termination process of Data Diagnosis Plug-in.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5533H	Failure in the termination process of Data Diagnosis Plug-in	Termination Process of Data Diagnosis Plug-in has failed.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5534H	Duplication of Data Diagnosis Plug-in error	Program names of the Data Diagnosis Plug-in are duplicated.	Please delete Plug-in whose program name is duplicate from the plug-in storage folder.
5535H	Failure in the acquisition process of Data Diagnosis Plug-in	Failure occurred in the process to acquire the program name of Data Diagnosis Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5536H	Timeout error during the acquisition process of Data Diagnosis Plug-in	There is no response from the process to acquire the program name of Data Diagnosis Plug-in.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5537H	Error in the number of characters for Data Diagnosis Plug-in name	Number of characters of the program name of the Data Diagnosis Plug-in is incorrect.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5538H	Exception error in the termination process of Data Diagnosis Plug-in	An exception occurred during the termination process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5539H	Number of Data Diagnosis Plug-in exceeded error	The number of plug-in (number of classes) has exceeded its specified upper limit.	• Please reinstall Plug-in. • If the same error occurs again, please contact the developer of Plug-in.
553AH	NULL Output data of Data Diagnosis Plug-in error	Output data received from Data Diagnosis Plug-in is NULL.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
553BH	Mismatch error in the number of output data for Data Diagnosis Plug-in	The number of output data in the diagnosis process of Data Diagnosis Plug-in is different from the number of output data that has been set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.
553CH	NULL value in the output data for Data Diagnosis Plug-in error	NULL value is included in the output data information in the diagnosis process of Data Diagnosis Plug-in.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
553DH	Error in execution of output process of Data Diagnosis Plug-in	An error occurred during execution of the output process of Data Diagnosis Plug-in.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.

Error code	Error name	Error description	Corrective action
553EH	Mismatch error in the number of output data columns for Data Diagnosis Plug-in	The number of output data columns in the diagnosis process of Data Diagnosis Plug-in is different from the number of output data columns that has been set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.
553FH	Mismatch error in the output data type for Data Diagnosis Plug-in	Data type of the output data information in the diagnosis process of Data Diagnosis Plug-in is different from the data type of output data information that is set in the Real-Time Flow Designer.	• Please use Real-time Flow Designer to reinstall Plug-in and perform the diagnosis setting. • If the same error occurs again, please contact the developer of Plug-in.
5540H	Column number for Data Diagnosis Plug-in out of range error	Column number that is out of the specified range has been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5541H	Time stamp for Data Diagnosis Plug-in out of range error	Time stamp that is out of the specified range has been set.	• Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5542H	Data diagnostic record line number acquisition processing timeout error	There is no response from the data diagnostic record line number acquisition processing.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5543H	Data diagnostic record count acquisition process failure	The data diagnostic record count acquisition process failed.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please reinstall Plug-in. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Plug-in.
5600H	Real-time flow manager parameter error[data diagnosis (sending)]	An incompatible version of the Real-time Flow Manager parameter was written.	Please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.
5601H	MQTT communication error[data diagnosis (sending)]	An error occurred in the MQTT communication.	• Please check whether there is any problem in the MQTT communication settings, and restart the operation of Real-time Flow Manager. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • For the settings to encrypt the communication, please check if the hostname of the destination setting matches the one of the certificate authority certificate. • For the settings to encrypt the communication, please check whether the certificate authority certificate, client certificate, and client secret key are correct. Also, please check whether they are in the specified path, whether there is any problem in the connection path, and whether the network drive is specified. • Please check whether the MQTT communication settings match the MQTT broker settings. • Please check whether any client ID of Real-time Flow Manager is duplicate in the connection destination MQTT broker. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5602H	MQTT edge application status structure abnormality[data diagnosis (sending)]	The structure of the edge application status data is invalid.	• Please review the setting of Edge Application Diagnosis. • Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.

Error code	Error name	Error description	Corrective action
5603H	MQTT broker connection failure[data diagnosis (sending)]	The real-time flow manager can not connect with the MQTT broker.	• Please check whether the MQTT broker is operating properly. • Please check whether there is any problem in the communication setting/communication path with the MQTT broker. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5604H	MQTT edge application stop error[data diagnosis (sending)]	The edge application is stopped, or the real-time flow manager operation started before the edge application started up.	• Please check whether the publishing data definition file output with the edge application diagnosis setting and the publishing data definition file specified by the edge application match. • Please stop the operation of the edge application and Real-time Flow Manager. Then, please start the edge application before starting the Real-time Flow Manager operation. • Make sure there is no problem with the communication between the edge application and the MQTT broker. • If the same error occurs again, please contact the developer of the Edge Application.
5605H	MQTT edge application internal error[data diagnosis (sending)]	An internal error of the edge application was detected.	• Restart the Edge Application and restart the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5606H	MQTT edge application definition mismatch[data diagnosis (sending)]	The contents of the distribution data from the edge application and the distribution data definition file do not match.	• Please check whether the publishing data definition file output with the edge application diagnosis setting and the publishing data definition file specified by the edge application match. • Please stop the operation of the edge application and Real-time Flow Manager. Then, please start the edge application before starting the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5607H	MQTT edge application delivery data erasure error[data diagnosis (sending)]	Loss of delivery data was detected in edge application.	• Restart the Edge Application and restart the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5608H	MQTT delivery data row count out of range error[data diagnosis (sending)]	The fixed number of rows notified from the edge application is out of range.	• Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
5609H	MQTT transmission data overflow error[data diagnosis (sending)]	A buffer overflow occurred waiting for transmission of delivery data to be sent to the edge application.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
560AH	MQTT edge application incompatible version detection error[data diagnosis (sending)]	The Real-time Flow Manager detected that it is a non-compliant version Edge Application.	Please check the version of the Edgecross Basic Software or Edge Application.
560BH	MQTT broker encryption connection failure[data diagnosis (sending)]	Unable to establish the encryption connection with the MQTT broker.	• Please check if the hostname of the destination setting matches the one of the certificate authority certificate. • Please check if the certificate authority certificate is correct. • For the settings to encrypt the communication using the client authentication method, please check if the client certificate and client secret key are correct. • Please check if the certificate authority certificate set in the MQTT broker is correct.
5632H	Real-time flow manager parameter error[data diagnosis (receiving)]	An incompatible version of the Real-time Flow Manager parameter was written.	Please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.

Error code	Error name	Error description	Corrective action
5633H	MQTT communication error[data diagnosis (receiving)]	An error occurred in the MQTT communication.	• Please check whether there is any problem in the MQTT communication settings, and restart the operation of Real-time Flow Manager. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • For the settings to encrypt the communication, please check if the hostname of the destination setting matches the one of the certificate authority certificate. • For the settings to encrypt the communication, please check whether the certificate authority certificate, client certificate, and client secret key are correct. Also, please check whether they are in the specified path, whether there is any problem in the connection path, and whether the network drive is specified. • Please check whether the MQTT communication settings match the MQTT broker settings. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5634H	MQTT broker connection failure[data diagnosis (receiving)]	The real-time flow manager can not connect with the MQTT broker.	• Please check whether the MQTT broker is operating properly. • Please check whether there is any problem in the communication setting/communication path with the MQTT broker. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5635H	MQTT response data structure abnormality	The structure of the response data received from the edge application is illegal.	• Please review the setting of Edge Application Diagnosis. • Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
5636H	MQTT response data erasure error	Response data from the edge application was lost. This error can be output Breaking of response data continuity because of restart or disconnect of the edge application can cause this error.	• Please stop the operation of the edge application and Real-time Flow Manager. Then, please start the edge application before starting the Real-time Flow Manager operation. • Make sure there is no problem with the communication between the edge application and the MQTT broker. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5637H	MQTT response data edge application incorrect	The client ID of the response data received from the edge application is invalid.	• Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
5638H	MQTT response data definition mismatch	The contents of the response data received from the edge application and the response data definition file do not match.	• Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
5639H	MQTT response data version incompatible error	Received response data of unsupported version.	Please check the version of the Edgecross Basic Software or Edge Application.
563AH	MQTT response data out of range specification character error	The response data contains characters outside the specification range.	• Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
563BH	MQTT broker encryption connection failure[data diagnosis (receiving)]	Unable to establish the encryption connection with the MQTT broker.	• Please check if the hostname of the destination setting matches the one of the certificate authority certificate. • Please check if the certificate authority certificate is correct. • For the settings to encrypt the communication using the client authentication method, please check if the client certificate and client secret key are correct. • Please check if the certificate authority certificate set in the MQTT broker is correct.

Error code	Error name	Error description	Corrective action
5700H	Error in Feedback execution setting	Real-time Flow Manager Parameter is damaged.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5703H	Feedback execution request excessive error	The requested Feedback was unable to be executed, because the execution process could not catch up with the Feedback executing frequency.	Please set the deterrence period to reduce the feedback execution frequency.
5704H	Data collector response incorrect error	An invalid value was used for the Data Collector's response to the Feedback request.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
5705H	Feedback response timeout error	Response from the Data Collector timed out when the Feedback was executed.	• Please lengthen the Response timeout time of the Command Option. • Please review the setting of the Edge Application. • Please reduce the load on Windows by closing other applications.
5706H	Feedback function start failure	The real-time flow manager failed to start the operation of the feedback function.	• Please check if there is any other error. • Please reduce the load on Windows by closing other applications.
57A1H	Program argument check error	Invalid character is included in argument used in program execution feedback.	Make sure that the argument of program execution feedback is correctly entered.
57A2H	Reserved word out of range error	Arguments used in program execution feedback include reserved words outside the range.	• Check whether the range of reserved words specified in the argument of program execution feedback is correct. • Check whether the number of reserved words specified in the argument of program execution feedback exceeds the upper limit.
57A3H	Specified program execution failure error	The program specified for program execution feedback could not be executed.	• Please check whether the setting of the program to be executed by the program execution feedback is correct. • Please check the access right to the program to be executed by the program execution feedback. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
57A4H	Character error outside specification range	Characters outside the specification range are included in response data handled by program execution feedback.	Please check the response data handled by program execution feedback.
5802H	Error in edge application cooperation	Failure occurred in the process to judge the operation of edge application.	• Check whether the edge application correctly reads the CSV file, which is output by the File Saving setting. • Check that the file name and the save destination folder is set correctly.
5809H	Edge Application Diagnosis error	The monitor target folder path is incorrect.	• Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
580AH	Edge Application Diagnosis error	The file name prefix is invalid.	• Please review the setting of Edge Application Diagnosis. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error occurs again, please consult the Edgecross Consortium.
580BH	Edge Application Diagnosis error	Real-Time Flow Manager Parameter is incorrect.	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.

Error code	Error name	Error description	Corrective action
580DH	Edge Application Diagnosis error	The response data is invalid.	• Please review and correct the response data setting. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error occurs again, please consult the Edgecross Consortium.
580EH	Edge Application Diagnosis error	Failed to delete the response data file that was successfully read.	• Please check whether the same prefix is used for multiple flows. • Please check whether other applications, etc., are making access to the Response Data File that is stored in the monitoring folder. • Please check whether the Response Data File had been moved during operation. • Please check whether the Response Data File can be deleted.
580FH	Edge Application Diagnosis error	Collection-failed Response Data file could not be loaded into error folder.	• Please check whether other applications, etc., are making access to the Response Data File that is stored in the monitoring folder. • Please check whether the Response Data File had been moved during operation. • Please check whether the Response Data File can be moved.
5810H	Edge Application Diagnosis error	The Error Folder could not be created in the Monitoring Folder.	Please check the access right or others of the monitoring folder.
5811H	Edge Application Diagnosis error	Failed to read the Monitoring Folder.	• Please review the Process Flow setting. • Please check the access right or others of the monitoring folder. • Please check whether other applications, etc., are making access to the CSV file that is stored in the monitoring folder. • Please check, in the monitoring folder, whether there is a CSV file that cannot be read or written.
5812H	Edge Application Diagnosis error	Reading failed due to abnormality in the CSV file.	• Please make sure that the data type and number of columns set in the Response Data file collection data definition file is correct. • Please check whether there is data outside the data type range in the Response Data file. • Please check if there are any lines in the Response Data file that are short of data. • Please check the character code of the Response Data file. • Please review the setting of the Edge Application. • If the same error occurs again, please contact the developer of the Edge Application.
5813H	Edge Application Diagnosis error	Reading failed due to abnormality in the Date Column of Response Data file.	Please review the date column of the Response Data file because there is an error.
5814H	Edge Application Diagnosis error	Failed to acquire number of records in Response Data file.	• Please review and correct the response data setting. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error occurs again, please consult the Edgecross Consortium.
5815H	Edge Application Diagnosis error	The number of data in the Response Data file is invalid.	• Please review and correct the response data setting. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error occurs again, please consult the Edgecross Consortium.
5860H	File Saving error	Program execution has failed after switching file.	• Please check whether the path of the program to be executed is correct. • Please check the access right to the program to be executed. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.

Error code	Error name	Error description	Corrective action
5861H	File Saving error	Historical Data Definition File or Historical Data File could not be output.	• Please check whether the setting for the save destination folder is correct. • Please check the access authority of the save destination folder. • Please check whether the number of files in the save destination folder has exceeded the upper limit. • Please check whether other applications or others are accessing the historical data definition file in the save destination folder. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5862H	File Saving error	Failed to write the file because there is not enough free space available.	Please delete unnecessary files to allocate free space.
5863H	File Saving error	Failed to write the file.	• Please review the setting so that the data size of the file to be saved will be smaller. • Please review the setting so that the cycles (e.g. collection cycle) will be longer. • Please review the save destination folder and prefix of the file name, and set the length of the file saving path within the number of maximum characters. • Please check whether the file saving setting is correct. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5864H	Saved file numbers exceeded	Suffix of the file name of the saving file has exceeded FFFFFFFF.	• Please change the destination folder or file name prefix. • Delete all saved files in the Save Destination Folder.
5865H	Number of accumulated files exceeded	The number of accumulated files has exceeded its maximum number.	• Please check whether any stored file in the TMP folder in the save destination folder is being accessed. • Please change the destination folder or file name prefix. • Please stop the operation of Real-time Flow Manager and delete all the stored files in the TMP folder in the save destination folder.
5866H	File Saving error	Failed to write the file with the specified user account.	• Please check whether the user name and password of the user account set in the file saving setting are correct. • Please check whether there is any problem in the connection path of the network used for authenticating user accounts. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5867H	File Saving error	Failed to save the file. The authentication processing for the set user account was delayed or there was not enough memory available to perform the internal communication.	• Please check whether the user name and password of the user account set in the file saving setting are correct. • Please check whether there is any problem in the connection path of the network used for authenticating user accounts. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
5880H	DB setting error	DB connection setting parameter is invalid.	• Please check if the setting of DB saving is correct. • Check the ODBC error code.
5881H	DB connection error	DB connection failed.	• Please check if the setting of DB saving is correct. • Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.
5882H	DB connection error	DB connection failed.	• Please check if the setting of DB saving is correct. • Please make sure the ODBC settings are correct. • Check the ODBC error code.
5883H	DB SQL execution error	Execution of SQL failed.	• Please check if the setting of DB saving is correct. • Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.

Error code	Error name	Error description	Corrective action
5884H	DB SQL execution error	Execution of SQL failed.	• Please check if the setting of DB saving is correct. • Please make sure the ODBC settings are correct. • Check the ODBC error code.
5885H	DB disconnection error	Failed to disconnect the DB.	• Please check if the setting of DB saving is correct. • Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications.
5886H	DB disconnection error	Failed to disconnect the DB.	• Please check if the setting of DB saving is correct. • Please make sure the ODBC settings are correct. • Check the ODBC error code.
5887H	Data Storing / Data Distribution processing request excessive error	Data Storing / Data Distribution process could not be performed because the execution process is not catching up with request for Data Storing / Data Distribution process.	Please review the collection cycle to reduce the frequency of Data Storing / Data Distribution processing. Also, if there are other errors occurring, please check them together.
5888H	DB reception of data missing	It has received a data missing from Data Collector.	• Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please check the manual of Data collector.
588AH	IT Gateway internal communication error	Failed to execute the internal communication with the IT Gateway. The IT Gateway is not operated or there is not enough memory available to execute this operation.	• Please check if there is any other error. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please store the IT Gateway execution file again according to the manual of the IT Gateway. • If the same error occurs again, please contact the developer of the IT Gateway.
588BH	IT Gateway internal communication error	Failed to execute the internal communication with the IT Gateway. The IT Gateway is not operated or there is not enough memory available to execute this operation.	• Please check if there is any other error. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please store the IT Gateway execution file again according to the manual of the IT Gateway. • If the same error occurs again, please contact the developer of the IT Gateway.
588CH	Data Diagnosis processing request excessive error	Execution process is not catching up with request for Data Diagnosis process.	• Please check whether error is registered from Data Diagnosis processing. If it is registered, please take the corrective action of the event displayed in error description. • Please check whether Data Diagnosis processing output data. • Please review collection cycle to lower frequency of request for Data Diagnosis process.
588DH	Data Storing processing request excessive error	Execution process is not catching up with request for Data Storing process.	• Please check whether error is registered from Data Storing processing. If it is registered, please take the corrective action of the event displayed in error description. • Please check whether Data Storing processing output data. • Please review collection cycle to lower frequency of request for Data Storing process.
588EH	Data Distribution processing request excessive error	Execution process is not catching up with request for Data Distribution process.	• Please check whether error is registered from Data Distribution processing. If it is registered, please take the corrective action of the event displayed in error description. • Please check whether Data Distribution processing output data. • Please review collection cycle to lower frequency of request for Data Distribution process.

Error code	Error name	Error description	Corrective action
5960H	Edge Application Diagnosis file saving error	Program execution has failed after switching file.	• Please check whether the setting of the program to be executed after switching the file specified in the file save setting of the edge application diagnosis is correct. • Please check the access right to the program to be executed after file switching. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5961H	Edge Application Diagnosis file saving error	Publishing Data Definition File or Publishing Data File could not be output.	• Please check whether the file saving setting of the edge application diagnosis is correct. • Please check the access authority of the save destination folder. • Please check whether the number of files in the save destination folder has exceeded the upper limit. • Please check whether other applications or others are accessing the publishing data definition file in the save destination folder. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network and whether the network drive is specified. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5962H	Edge Application Diagnosis file saving error	Failed to write the file because there is not enough free space available.	Please delete unnecessary files to allocate free space.
5963H	Edge Application Diagnosis file saving error	Failed to write the file.	• Please check whether the file saving setting of the edge application diagnosis is correct. • Please review the setting so that the data size of the file to be saved will be smaller. • Please review the setting so that the cycles (e.g. collection cycle) will be longer. • Please review the save destination folder and prefix of the file name, and set the length of the file saving path within the number of maximum characters. • When the remote shared folder is used, please check whether there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5964H	Edge Application Diagnosis Publishing Data File number over	File name suffix of saved file exceeded FFFFFFFF.	• Please change the destination folder or file name prefix. • Please delete all Publishing Data Files from the Save Destination Folder of Edge Application Diagnostics.
5965H	Number of files being accumulated of the Edge Application Diagnosis over	The number of accumulated files has exceeded its maximum number.	• Please check whether any stored file in the TMP folder in the save destination folder is being accessed. • Please change the destination folder or file name prefix. • Please stop the operation of Real-time Flow Manager and delete all the stored files in the TMP folder in the save destination folder.
5966H	Error in edge application cooperation	Old file was deleted because it exceeded the maximum number of saved files of edge application diagnostics.	• Make sure the edge application is running. • Make sure that the edge application is reading the CSV file outputted by the file save setting correctly. (Is the file name correct? / Save the file in the correct location) • Please reconsider file switching operation setting of file save setting.
5C00H	Real-time flow manager parameter error[data distribution]	An incompatible version of the Real-time Flow Manager parameter was written.	Please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.

Error code	Error name	Error description	Corrective action
5C01H	MQTT communication error[data distribution]	An error occurred in the MQTT communication.	• Please check whether there is any problem in the MQTT communication settings, and restart the operation of Real-time Flow Manager. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • For the settings to encrypt the communication, please check if the hostname of the destination setting matches the one of the certificate authority certificate. • For the settings to encrypt the communication, please check whether the certificate authority certificate, client certificate, and client secret key are correct. Also, please check whether they are in the specified path, whether there is any problem in the connection path, and whether the network drive is specified. • Please check whether the MQTT communication settings match the MQTT broker settings. • Please check whether any client ID of Real-time Flow Manager is duplicate in the connection destination MQTT broker. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5C02H	MQTT edge application status structure abnormality[data distribution]	The structure of the edge application status data is invalid.	• Please review the setting of Edge Application Diagnosis. • Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.
5C03H	MQTT broker connection failure[data distribution]	The real-time flow manager can not connect with the MQTT broker.	• Please check whether the MQTT broker is operating properly. • Please check whether there is any problem in the communication setting/communication path with the MQTT broker. • For the settings to specify the user authentication information, please check whether the user name and password are correct. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5C04H	MQTT edge application stop error[data distribution]	The edge application is stopped, or the real-time flow manager operation started before the edge application started up.	• Please stop the operation of the edge application and Real-time Flow Manager. Then, please start the edge application before starting the Real-time Flow Manager operation. • Make sure there is no problem with the communication between the edge application and the MQTT broker. • If the same error occurs again, please contact the developer of the Edge Application.
5C05H	MQTT edge application internal error[data distribution]	An internal error of the edge application was detected.	• Restart the Edge Application and restart the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5C06H	MQTT edge application definition mismatch[data distribution]	The contents of the distribution data from the edge application and the distribution data definition file do not match.	• Please check whether the publishing data definition file output with the edge application diagnosis setting and the publishing data definition file specified by the edge application match. • Please stop the operation of the edge application and Real-time Flow Manager. Then, please start the edge application before starting the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5C07H	MQTT edge application delivery data erasure error[data distribution]	Loss of delivery data was detected in edge application.	• Restart the Edge Application and restart the Real-time Flow Manager operation. • If the same error occurs again, please contact the developer of the Edge Application.
5C08H	MQTT delivery data row count out of range error[data distribution]	The fixed number of rows notified from the edge application is out of range.	• Please review the setting of the edge application. Then, please restart the edge application and start the Real-time Flow Manager operation again. • If the same error occurs again, please contact the developer of the Edge Application.

Error code	Error name	Error description	Corrective action
5C09H	MQTT transmission data overflow error[data distribution]	A buffer overflow occurred waiting for transmission of delivery data to be sent to the edge application.	• Please check if there is any other error. • Please review the collection cycle, number of collected data, and processing contents to reduce the load. • Please reduce the load on Windows by closing other applications. • Please reduce the load on the network by reducing the frequency of accessing the connection destination.
5C0AH	MQTT edge application incompatible version detection error[data distribution]	The Real-time Flow Manager detected that it is a non-compliant version Edge Application.	Please check the version of the Edgecross Basic Software or Edge Application.
5C0BH	MQTT broker encryption connection failure[data distribution]	Unable to establish the encryption connection with the MQTT broker.	• Please check if the hostname of the destination setting matches the one of the certificate authority certificate. • Please check if the certificate authority certificate is correct. • For the settings to encrypt the communication using the client authentication method, please check if the client certificate and client secret key are correct. • Please check if the certificate authority certificate set in the MQTT broker is correct.
5C20H	IT Gateway startup error	An error occurred in the IT Gateway start processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C21H	IT Gateway communication status report error	An error occurred in the IT Gateway communication status report processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C22H	IT Gateway error report failure	The IT Gateway error report processing has failed.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C23H	IT Gateway event report error	An error occurred in the IT Gateway event report processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.

Error code	Error name	Error description	Corrective action
5C24H	IT Gateway initialization error	An error occurred in the IT Gateway initialization processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C25H	IT Gateway parameter read error	Failed to read the character code of the IT Gateway parameter.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C26H	IT Gateway error information read error	Failed to read the detail information of the error report from the IT Gateway.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C27H	IT Gateway event information read error	Failed to read the detail information of the event report from the IT Gateway.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C28H	IT Gateway data reception error	An error occurred in the IT Gateway data reception processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C29H	IT Gateway status memory update error	An error occurred in the IT Gateway status memory update processing.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5C2AH	Internal processing error	An error occurred in the communication processing with the IT Gateway.	• Please check if there is any other error. • Please reduce the load on Windows by closing other applications.
5C2BH	Internal processing error	An error occurred in the communication processing with the IT Gateway.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.

Error code	Error name	Error description	Corrective action
5C2CH	IT Gateway startup error	An error occurred in the IT Gateway start processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C2DH	IT Gateway communication status report error	An error occurred in the IT Gateway communication status report processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C2EH	IT Gateway error report failure	The IT Gateway error report processing has failed.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C2FH	IT Gateway event report error	An error occurred in the IT Gateway event report processing.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C30H	IT Gateway parameter read error	Failed to read the character code of the IT Gateway parameter.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C31H	IT Gateway error information read error	Failed to read the detail information of the error report from the IT Gateway.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.

Error code	Error name	Error description	Corrective action
5C32H	IT Gateway event information read error	Failed to read the detail information of the event report from the IT Gateway.	• Please check if an error is registered from the IT Gateway where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5C33H	IT Gateway status memory update error	An error occurred in the IT Gateway status memory update processing.	• Please reduce the load on Windows by closing other applications. • Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5C34H	Internal processing error	An error occurred in the communication processing with the IT Gateway.	• Please check if there is any other error. • Please reduce the load on Windows by closing other applications.
5C35H	Internal processing error	An error occurred in the communication processing with the IT Gateway.	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
5D00H	Event history automatic output function Setting error	Failed to start the operation because the format of the event history automatic output setting is not supported.	Please configure the event history automatic output setting again.
5D01H	Event history automatic output function File open error	Failed to open the event history file.	• Please check if the event history file is open. • When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please check the access authority of the save destination folder. • Please check that the event history file is not read-only. • Please change the save destination of the event history file. • Please restart the industrial PC running this product.
5D02H	Event history automatic output function File saving error	Failed to save the event history file.	• When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please reduce the load on the access to the storage of the save destination folder. • Please delete unnecessary files to allocate free space. • Please change the save destination of the event history file.
5D03H	Event history automatic output function File backup error	Failed to backup the event history file.	• When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please reduce the load on the access to the storage of the save destination folder. • Please check the access authority of the save destination folder. • Please check if any file with the same name as the backup file of the event history file is open. • Please delete unnecessary files to allocate free space.
5D04H	Event history automatic output function Memory insufficient error	Failed to allocate the memory required for the operation.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
5D05H	Event history automatic output function Memory insufficient error	Failed to allocate the memory required for the operation.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
5D06H	Event history automatic output function Internal processing error	Failed to perform the internal processing of the event history automatic output function.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please restart the industrial PC after reinstalling Edgecross Basic Software.

Error code	Error name	Error description	Corrective action
5D07H	Event history automatic output function Internal processing error	Failed to perform the internal processing of the event history automatic output function.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please restart the industrial PC after reinstalling Edgecross Basic Software.
5D08H	Event history automatic output function User account authentication setting error	Failed to authenticate the user account.	• Please review the user account setting of the save destination folder. Then, Please apply the setting. • Please unlock the user account.
5D09H	Event history automatic output function Error at user account authentication	Failed to execute the user account authentication.	Please check if there is any problem in the connection path of the network to the remote shared folder. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
5D0AH	Event history automatic output function Event history access error	Failed to acquire the event history information because the update frequency of the event history was high.	Please check that the event history file has been updated because it might not be. Please perform the following when it has not been updated. • Please check if there is any event that occurs continuously and take corrective action on the event. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
6010H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6011H	System error	An error occurred in an internal processing of the Real-Time Flow Manager.	• Please close other applications. • Please restart the industrial PC running this product.
6012H	Real-Time Flow Manager timeout	An error occurred in an initialization processing of the Real-Time Flow Manager.	• Please close other applications. • Please restart the industrial PC running this product.
6014H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6015H	Real-Time Flow Manager communication error between internal processes	A communication error occurred between internal processes of the Real-Time Flow Manager.	• Please check if there is any other error. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6018H	Abnormal termination of internal process of Real-Time Flow Manager	Operation of the internal process of Real-Time Flow Manager has stopped.	• Please restart the industrial PC running this product. • If the IPC goes to sleep / hibernation mode, please exit other application controlling sleep / hibernation state. Also, please do not conduct sleep entering operation. • If the same error occurs again, please consult the Edgecross Consortium.
6019H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
601AH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
6060H	Error in Real-Time Flow Manager Parameter	Real-Time Flow Manager Parameters that are written were created by an old version of the Real-Time Flow Designer.	Please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.
6061H	Error in Real-Time Flow Manager Parameter	Unable to access to the Real-Time Flow Manager Parameter, which is included in the Edgecross Basic Software.	• Please restart the industrial PC running this product. • Please reinstall the Edgecross Basic Software.
6070H	Parameter version error	Parameter whose setting is not supported by Real-time Flow Manager is used.	Please update Edgecross Basic Software to the latest version. Or, please create Real-time Flow Manager Parameter by Real-time Flow Designer with the same version as Real-time Flow Manager, and then apply the setting.
6071H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
6072H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
6082H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6084H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6085H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6086H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6087H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6088H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6089H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
608AH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
608BH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
608CH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.

Error code	Error name	Error description	Corrective action
608DH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6090H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6091H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6093H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6095H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6096H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6097H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6098H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6099H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
609AH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
609BH	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
609CH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
609EH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.

Error code	Error name	Error description	Corrective action
60B0H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
60B1H	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60B2H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
60C9H	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60CAH	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60CBH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
60CFH	System error	—	• Please change the setting not to use the multithread processing by Plug-in. • Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60E0H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
60E1H	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60E3H	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60E7H	System error	—	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60ECH	Failed to register error	Since many errors occurred in a short time, error detection has failed.	After removing the cause of the error that occurred, reset the system of this product.
60EDH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
60EEH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
60EFH	Failed to register event	Since many events occurred in a short time, event registration has failed.	• Please set the deterrence period to reduce the feedback execution frequency. • Please restart the industrial PC running this product.
60F8H	Abnormal termination of internal process of Real-Time Flow Manager	Operation of the internal process of Real-Time Flow Manager has stopped.	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60F9H	Failed to start internal process of Real-Time Flow Manager	Failed to start the internal process of Real-Time Flow Manager.	• Please delete unnecessary files to allocate free space. • Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
60FAH	System error	—	• Please restart the Industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6128H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product.

Error code	Error name	Error description	Corrective action
614CH	Internal processing error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6181H	System error	—	Please consult the Edgecross Consortium.
6183H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product.
6250H	Initialization error	An error occurred while initializing the Data Modification function.	• Please restart the Industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6251H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6253H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product.
6254H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6255H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6256H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6257H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6258H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6259H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
625AH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
6260H	System error	An error occurred in an internal processing of the Real-Time Flow Manager.	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6261H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
63D0H	Initialization error	An error occurred while initializing Data Diagnosis.	• Please restart the industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.

Error code	Error name	Error description	Corrective action
63D1H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
63D2H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
63D3H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
63D4H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
63D5H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
63D6H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
63D7H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
63DAH	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
63DBH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
63DCH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
63DDH	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
63DEH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6541H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6542H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6543H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
65A1H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
65A2H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
65A3H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6611H	Initialization error	—	Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting.
6650H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • If the same error is displayed, please consult the Edgecross Consortium.
6651H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6652H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6654H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • If the same error is displayed, please consult the Edgecross Consortium.
6656H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
6670H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6671H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6672H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6673H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
6674H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6750H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • If the same error is displayed, please consult the Edgecross Consortium.
6751H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
6756H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the industrial PC running this product.
67C0H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
67C1H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.
67E0H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product.
67E1H	Internal processing error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
67E2H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product.
67E3H	Internal processing error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C24H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C2AH	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C66H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C77H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C78H	Out of memory / File write failure error	There is not enough memory available to execute this operation. Or, access to the file is prohibited.	• Please close other applications. • Please release the read-only setting of the file and folder of this product. • If the file in the installation folder of this product is opened with other applications, please close it. • Please restart the Industrial PC running this product.
6C79H	Resource contention error	Resource contention has occurred between Real-time Flow Manager and other applications.	• Please close other applications. • Please restart the Industrial PC running this product.
6C7AH	Event history file creation failure	Failed to write the file because there is not enough free space available.	Please delete unnecessary files from industrial PC where real time flow manager is running.

Error code	Error name	Error description	Corrective action
6C80H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C81H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C82H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C83H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C84H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C85H	System error	—	• Please restart the Industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6C86H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the Industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C87H	System error	—	• Please restart the Industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6C88H	System error	—	• Please restart the Industrial PC running this product. • If the same error occurs again, please consult the Edgecross Consortium.
6C89H	System error	—	• Please delete Process Flow where the error has occurred and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6C8AH	System error	—	• Please restart the industrial PC running this product. • If the same error occurs, consult the Edgecross Consortium.
6D40H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6D41H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
6D50H	System error	—	• Please delete all Process Flow and create new Process Flow again. Then, please apply the setting. • Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.
6D51H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.

Codes for errors that occur in Management Shell

The following table shows the codes for errors that occur in Management Shell.

Error code	Error name	Error description	Corrective action
1000H	CSV File Data collector error	Failed to read the folder specified in the target device setting.	• Please review the target device setting. • Please check the existence and access authority of the folder.
1001H	CSV File Data collector error	Failed to open the file specified in the target device setting.	• Please review the target device setting. • Please check the existence and access authority of the file. • Please check if the other applications have not accessed the file.
1002H	CSV File Data collector error	The number of columns in the file to be read is less than the ones specified in the location setting.	• Please review the location setting. • Please check the number of columns in the file to be read.
1003H	CSV File Data collector error	The character code of the file to be read is incorrect.	• Please review the target device setting. • Please check the character code of the file to be read.
1004H	CSV File Data collector error	Failed to read the data.	• Please review the target device setting. • Please review the location setting. • Please check that the value of the data is within the range of the maximum/minimum value of the data type. • Please check if the data contains characters out of the specification range.
1005H	CSV File Data collector error	The number of row in the file to be read is less than the Data starting row number specified in the target device setting.	• Please review the target device setting. • Please check the number of row in the file to be read.
4000H	Management Shell configuration error	The Management Shell setting is written in an unmatched version.	• Please delete all from the menu of Management Shell Explorer and reset the Management Shell setting. • If the problem is not resolved, please contact the Edgecross Consortium.
5021H	Data collector service corruption error	The Data collector service file is corrupted or the version of Data collector stored at the target device setting and the one of Data collector currently stored do not match.	• Please match the version of Data collector stored at the Target Device setting and the one of Data collector currently stored. • If there is no problem in the version of Data collector, please install Data collector and then set Target Device again. • If the same error occurs again, please contact the developer of Data collector.
5022H	Data collector service start error	No executable file of Data collector exists.	Please reinstall Data collector.
5023H	Data collector service start error	Failed to start the Data collector service because starting of it competed with editing of the target device setting.	Please reconnect on the target device setting list screen.
5024H	Data collector service start error	Failed to start the Data collector service due to the data corruption in the target device setting.	After deleting all from the menu of Management Shell Explorer, please set the target device.
5025H	Data collector service start error	Failed to start Data collector.	• Please check that the Target Device has started. • Please check the path to Target Device. • Please check if the Target Device setting is correct.
5026H	Data collector service start error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
5027H	Data collector service start error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.

Error code	Error name	Error description	Corrective action
5028H	Data collector service start error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D4H	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D8H	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51D9H	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DAH	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DBH	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
51DCH	Data collector interface error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
5200H	Data collector service operation error	An error occurred in Data collector.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
5300H	IT Gateway service corruption error	The IT Gateway service file is broken or the version of the IT Gateway stored at the IT Gateway setting and the one of the IT Gateway currently stored do no match.	• Please match the version of the IT Gateway stored at the IT Gateway setting and the one of the IT Gateway currently stored. • If there is no problem in the version of the IT Gateway, please install and set the IT Gateway again. • If the same error occurs again, please contact the developer of the IT Gateway.
5301H	IT Gateway service start error	No executable file of IT Gateway exists.	Please reinstall the IT Gateway.

Error code	Error name	Error description	Corrective action
5302H	IT Gateway service start error	Failed to start the IT Gateway service because starting of the IT Gateway service competed with editing of the IT Gateway setting.	Please perform a restart on the IT Gateway setting list screen.
5303H	IT Gateway service start error	Failed to start the IT Gateway service due to the data corruption in the IT Gateway setting.	After deleting all from the menu of Management Shell Explorer, please set the IT Gateway again.
5304H	IT Gateway service start error	An error occurred in the IT Gateway.	• Please check that the IT Gateway has started. • Please check if the IT Gateway setting is correct.
5305H	IT Gateway service start error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5306H	IT Gateway service start error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5307H	IT Gateway service stop error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5400H	IT Gateway interface error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5401H	IT Gateway interface error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5402H	IT Gateway interface error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5500H	IT Gateway service operation error	An error occurred in the IT Gateway.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall the IT Gateway. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of the IT Gateway.
5600H	Internal data tag resource current value storage area allocation error	Failed to allocate the current value storage area of the internal data tag resource.	• Please delete the internal data tag resource. • Please close other applications. • Please restart the industrial PC running this product.
614CH	Resource contention error	A CPU resource contention has occurred between the other application and Management Shell.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
614DH	Resource contention error	A resource contention has occurred between the other application and the Management Shell service.	• Please restart the industrial PC running this product. • Please close other applications.
7000H	Current value read error	Failed to read the current value because Data collector did not respond.	• Please check if there is any other error. • Please reduce the data number to be read at one time. • Please refer to the Data collector manual and check if the Target Device setting and data tag resource setting are correct again. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
7001H	Current value read error	Failed to read the current value because Data collector returned an error.	• Please check if there is any other error. • Please refer to the Data collector manual and check if the Target Device setting and data tag resource setting are correct again. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
7002H	Management Shell internal error(Current value read)	Failed to read the current value due to an error in Management Shell.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error reoccurs, please contact the Edgecross Consortium.
7003H	Current value read error	Failed to read the current value because no data tag resource existed.	• Please refer to the Data collector manual and check that the Target Device setting and data tag resource setting are correct again. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
7004H	Current value read error	Failed to read the current value because the data tag resource had no read authority.	Please set the location where the data tag resource has the read authority.
7005H	Data collector stop error(Current value read)	Failed to read the current value because the Data collector service was stopped.	• Please check if there is any other error. • Please select the target where an error has occurred and press the reconnect button on the target device setting list screen. • Please check if the data tag resource setting is correct. • If the problem persists, please contact the developer of Data collector.
7006H	Current value read error	Failed to read the current value because the current value contains characters out of the specification range.	The current value contains characters out of the specification range. Please check that the data tag resource setting is correct.
7101H	Current value write error	Failed to write the current value because Data collector did not respond.	• Please check if there is any other error. • Please reduce the data number to be written at one time. • Please select the target where an error has occurred and press the reconnect button on the target device setting list screen. • Please check if the data tag resource setting is correct. • If the problem persists, please contact the developer of Data collector.
7102H	Current value write error	Failed to write the current value because Data collector returned an error.	• Please check if there is any other error. • Please select the target where an error has occurred and press the reconnect button on the target device setting list screen. • Please check if the data tag resource setting is correct. • If the problem persists, please contact the developer of Data collector.

Error code	Error name	Error description	Corrective action
7103H	Management Shell internal error(Current value write)	Failed to write the current value due to an error in Management Shell.	• Please check if there is any other error. • Please import the setting file of Management Shell again. • Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error reoccurs, please contact the Edgecross Consortium.
7104H	Current value write error	Failed to write the current value because no data tag resource existed.	Please check if the target data tag resource exists.
7105H	Current value write error	Failed to write the current value because the data tag resource had no write authority.	Please set the location where the data tag resource has the write authority.
7106H	Current value write error	Failed to write the current value because other than the data tag resource was specified as the current value write destination.	Please check if the target data tag resource exists.
7107H	Current value write error	Failed to write the current value because the specified string exceeded the maximum number of characters of the data tag resource.	The specified value exceeds the character string length set in the data tag resource. Please check the number of characters set in the data tag resource.
7108H	Current value write error	Failed to write the current value because the data type of the specified value and the one of the data tag resource did not match.	Please match the data type of the specified value and the one of the data tag resource.
7109H	Data collector stop error(Current value write)	Failed to write the current value because the Data collector service was stopped.	• Refer to the data collector manual and reconnect with the access destination device setting list screen. • If the problem persists, please contact the developer of Data collector.
7110H	Current value write error	Failed to write the current value because the specified string contains characters out of the specification range.	The specified value contains characters out of the specification range. Please check the specified value.
7200H	Current value read error	Failed to read the current value because Data collector did not respond.	• Please check if there is any other error. • Please reduce the data number to be read at one time. • Please refer to the Data collector manual and check if the Target Device setting and data tag resource setting are correct again. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
7201H	Current value read error	Failed to read the current value because Data collector returned an error.	• Please check if an error is registered from Data collector where the problem occurred. If the error is registered, please execute the measure described in the error details. • Please refer to the Data collector manual and check if the Target Device setting and Data tag resource setting are correct again. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the developer of Data collector.
7205H	Data collector stop error(Current value read)	Failed to read the current value because the Data collector service was stopped.	• Please check if there is any other error. • Please select the target where an error has occurred and press the reconnect button on the target device setting list screen. • Please check if the data tag resource setting is correct. • If the problem persists, please contact the developer of Data collector.
7206H	Current value read error	Failed to read the current value because the current value contains characters out of the specification range.	The current value contains characters out of the specification range. Please check that the data tag resource setting is correct.
7207H	Data collector request send error(Current value read)	Failed to send a request to the Data collector service.	• Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error reoccurs, please contact the Edgecross Consortium.

Error code	Error name	Error description	Corrective action
7208H	Data collector connection error(Current value read)	Failed to connect to the Data collector service.	• Please restart the industrial PC running this product. • Please reinstall Data collector. • Please reinstall Edgecross Basic Software. • If the same error reoccurs, please contact the Edgecross Consortium.
7300H	Internal data tag resource current value read error	Failed to read the current value because allocating the current value storage area of the internal data tag resource failed.	• Please delete the internal data tag resource. • Please close other applications. • Please restart the industrial PC running this product.
7301H	Internal data tag resource (operation) current value read error	Failed to read the current value because the resource used for the operation term does not exist.	Please check the resource specified for the operation term.
7302H	Internal data tag resource (operation) current value read error	Failed to read the current value because a resource other than external data tag resource is used for the operation term.	Please check the resource specified for the operation term.
7303H	Internal data tag resource (operation) current value read error	Failed to read the current value because data types other than BOOL is used for the logical operation.	• Please check data types of target data tag resource and the operation term. • Please check the operator of the operation expression.
7304H	Internal data tag resource (operation) current value read error	Failed to read the current value because data types other than signed integer, unsigned integer, or real number is used for the four arithmetic operations.	• Please check data types of target data tag resource and the operation term. • Please check the operator of the operation expression.
7305H	Internal data tag resource (operation) current value read error	Failed to read the current value because data types of signed integer, unsigned integer, and real number coexist in the operation expression.	Please check data types of the target operation term.
7306H	Internal data tag resource (operation) current value read error	Failed to read the current value because a data type other than BOOL is specified for the internal data tag resource (operation) for the BOOL operation.	Please check data types of target data tag resource and the operation term.
7307H	Internal data tag resource (operation) current value read error	Failed to read the current value because a data type other than the unsigned integer is specified for the internal data tag resource (operation) for the operation of the unsigned integer.	Please check data types of target data tag resource and the operation term.
7308H	Internal data tag resource (operation) current value read error	Failed to read the current value because a data type other than the signed integer is specified for the internal data tag resource (operation) for the operation of the signed integer.	Please check data types of target data tag resource and the operation term.
7309H	Internal data tag resource (operation) current value read error	Failed to read the current value because a data type other than the real number is specified for the internal data tag resource (operation) for the operation of the real number.	Please check data types of target data tag resource and the operation term.
7310H	Internal data tag resource (operation) current value read error	Failed to read the current value because the operation expression is incorrect (division by zero).	Please check the value of the resource specified for the operation term.
7311H	Internal data tag resource (operation) current value read error	Failed to read the current value because the operation result is incorrect (NaN, ±∞).	Please execute the following measures as necessary. • Please check the value of the resource specified for the operation term. • Please check data types of target data tag resource and the operation term. • Please check the operator of the operation expression.
7312H	Internal data tag resource (operation) current value read error	Failed to read the current value because the operation results overflow.	Please execute the following measures as necessary. • Please check the value of the resource specified for the operation term. • Please check data types of target data tag resource and the operation term. • Please check the operator of the operation expression.
7400H	Internal data tag resource current value write error	Failed to write the current value because allocating the current value storage area of the internal data tag resource failed.	• Please delete the internal data tag resource. • Please close other applications. • Please restart the industrial PC running this product.
7401H	Internal data tag resource current value write error	Failed to write the current value because the internal data tag resource had no write authority.	Please set the internal data tag resource with the write authority.

Error code	Error name	Error description	Corrective action
7402H	Internal data tag resource current value write error	Failed to write the current value because the specified character string exceeded the maximum number of characters of the internal data tag resource.	The specified value exceeds the character string length set in the internal data tag resource. Please check the number of characters set in the internal data tag resource.
7403H	Internal data tag resource current value write error	Failed to write the current value because the data type of the specified value and the one of the data tag resource did not match.	Please match the data type of the specified value and the one of the internal data tag resource.
7404H	Internal data tag resource current value write error	Failed to write the current value to the internal data tag resource because the specified character string contains characters out of the specification range.	The specified value contains characters out of the specification range. Please check the specified value.
7500H	Event history automatic output function Setting error	Failed to start the operation because the format of the event history automatic output setting is not supported.	Please configure the event history automatic output setting again.
7501H	Event history automatic output function File open error	Failed to open the event history file.	• Please check if the event history file is open. • When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please check the access authority of the save destination folder. • Please check that the event history file is not read-only. • Please change the save destination of the event history file. • Please restart the industrial PC running this product.
7502H	Event history automatic output function File saving error	Failed to save the event history file.	• When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please reduce the load on the access to the storage of the save destination folder. • Please delete unnecessary files to allocate free space. • Please change the save destination of the event history file.
7503H	Event history automatic output function File backup error	Failed to backup the event history file.	• When a remote shared folder is set as the save destination folder, please check if there is any problem in the connection path of the network. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination. • Please reduce the load on the access to the storage of the save destination folder. • Please check the access authority of the save destination folder. • Please check if any file with the same name as the backup file of the event history file is open. • Please delete unnecessary files to allocate free space.
7504H	Event history automatic output function Memory insufficient error	Failed to allocate the memory required for the operation.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
7505H	Event history automatic output function Memory insufficient error	Failed to allocate the memory required for the operation.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
7506H	Event history automatic output function Internal processing error	Failed to perform the internal processing of the event history automatic output function.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please restart the industrial PC after reinstalling Edgecross Basic Software.
7507H	Event history automatic output function Internal processing error	Failed to perform the internal processing of the event history automatic output function.	• Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product. • Please restart the industrial PC after reinstalling Edgecross Basic Software.
7508H	Event history automatic output function User account authentication setting error	Failed to authenticate the user account.	• Please review the user account setting of the save destination folder. • Please unlock the user account.

Error code	Error name	Error description	Corrective action
7509H	Event history automatic output function Error at user account authentication	Failed to execute the user account authentication.	Please check if there is any problem in the connection path of the network to the remote shared folder. Also, please reduce the load on the network by reducing the frequency of accessing the connection destination.
750AH	Event history automatic output function Event history access error	Failed to acquire the event history information because the update frequency of the event history was high.	Please check that the event history file has been updated because it might not be. Please perform the following when it has not been updated. • Please check if there is any event that occurs continuously and take corrective action on the event. • Please reduce the load on Windows by closing other applications. • Please restart the industrial PC running this product.
F001H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F002H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F003H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F004H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F005H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F006H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F007H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F008H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F009H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F00AH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F00BH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F00CH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F00DH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F00EH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F00FH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• Carry out review to lower the load caused by collection cycle, number of collections, and contents of processing. • Lower the load on Windows by closing other applications or by other means. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F010H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F011H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F012H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F013H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F100H	Error in the initialization process of Data Collector	An error occurred in the initialization process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F104H	Error in the initialization process of Data Collector	An error occurred in the initialization process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F105H	Error in the initialization process of Data Collector	An error occurred in the initialization process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F106H	Error in the collection process of Data Collector	An error occurred in the collection process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F107H	Error in the read process of Data Collector	An error occurred in the read process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F108H	Error in the write process of Data Collector	An error occurred in the write process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F109H	Error in the read process of Data Collector	An error occurred in the read process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F10AH	Error in the write process of Data Collector	An error occurred in the write process.	• Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F200H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F205H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F207H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20AH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20BH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20CH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20DH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20EH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F20FH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F212H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F217H	Error in module reference	An error occurred when the module (JSON parser) was referenced.	• Please reinstall Data Collector. • If the same error recurs, please consult with the Data Collector developer.
F218H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F219H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F21AH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F21BH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F21CH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F21EH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F221H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F223H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F227H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F228H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F229H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F22AH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F22BH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F22DH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F22FH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F232H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F233H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.
F234H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • Please check if the combination of the specification versions of Edgecross Basic Software and Data Collector is available. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F240H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F242H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F244H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F245H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F247H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F248H	Data reference error in Data Collector	An error occurred when the argument of the communication parameter acquisition was referenced.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F249H	Data reference error in Data Collector	An error occurred when the argument of the collection parameter acquisition was referenced.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F24AH	Data reference error in Data Collector	An error occurred when the argument of the data parameter acquisition was referenced.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F24CH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F24DH	Process data buffer overflow in Data Collector	Data buffering has overflowed.	• Carry out review to lower the load caused by collection cycle, number of collections, and contents of processing. • Lower the load on Windows by closing other applications or by other means.

Error code	Error name	Error description	Corrective action
F24EH	Process data buffer overflow in Data Collector	Data buffering has overflowed.	• Carry out review to lower the load caused by collection cycle, number of collections, and contents of processing. • Lower the load on Windows by closing other applications or by other means.
F260H	Error: Character is out of range	The character string acquired from the Data Collector contains characters out of range.	Please do not set characters out of range to collected STRING type character string.
F261H	Error: Character is out of range	The character string acquired from the Data Collector contains characters out of range.	Please do not set characters out of range to read STRING type character string.
F262H	Error: Number of characters exceeded	It exceeds the maximum number of character string acquired from the Data Collector.	• Please review the location parameter so that the number of characters in the collected STRING type character string does not exceed the maximum number. • Please review the target device value so that the number of characters in the collected STRING type character string does not exceed the maximum number.
F263H	Error: Number of characters exceeded	It exceeds the maximum number of character string acquired from the Data Collector.	• Please review the location parameter so that the number of characters in the read STRING type character string does not exceed the maximum number. • Please review the target device value so that the number of characters in the read STRING type character string does not exceed the maximum number.
F264H	Error: Character is out of range	The character string acquired from the Data Collector contains characters out of range.	Please do not set characters out of range to collected WSTRING type character string.
F265H	Error: Character is out of range	The character string acquired from the Data Collector contains characters out of range.	Please do not set characters out of range to read WSTRING type character string.
F266H	Error: Number of characters exceeded	It exceeds the maximum number of character string acquired from the Data Collector.	• Please review the location parameter so that the number of characters in the collected WSTRING type character string does not exceed the maximum number. • Please review the target device value so that the number of characters in the collected WSTRING type character string does not exceed the maximum number.
F267H	Error: Number of characters exceeded	It exceeds the maximum number of character string acquired from the Data Collector.	• Please review the location parameter so that the number of characters in the read WSTRING type character string does not exceed the maximum number. • Please review the target device value so that the number of characters in the read WSTRING type character string does not exceed the maximum number.
F268H	Invalid real number data	The real number acquired from the Data Collector is invalid(NaN, ±∞).	Please do not set invalid value(NaN, ±∞) to read REAL type real number.
F269H	Invalid real number data	The real number acquired from the Data Collector is invalid(NaN, ±∞).	Please do not set invalid value(NaN, ±∞) to read LREAL type real number.
F280H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F281H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F282H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F283H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F284H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F2C5H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F2C6H	Process data buffer overflow in Data Collector	Data buffering has overflowed.	• Carry out review to lower the load caused by collection cycle, number of collections, and contents of processing. • Lower the load on Windows by closing other applications or by other means.
F300H	Error: Not enough memory	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC.
F303H	Error: Not enough memory	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC.
F306H	Error: Not enough memory	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC.
F30EH	Error: Not enough memory	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the Industrial PC.
F380H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F382H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F383H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F386H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Error code	Error name	Error description	Corrective action
F387H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F388H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F389H	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F38AH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F38BH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F38DH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.
F38FH	Data Collector internal error	An unexpected error occurred inside this product.	• If Real-time Flow Manager is used, please write the Data Collector parameter again. • Please restart the Industrial PC. • Please reinstall Data Collector. • Please reinstall Edgecross Basic Software. • If the same error recurs, please consult with the Data Collector developer.

Codes for errors that occur in Management Shell Data collector

The following table shows the codes for errors that occur in Management Shell Data collector.

Error code	Error name	Error description	Corrective action
2001H	Data Collection Setting Error	The Data Collection setting is incorrect.	Please review and correct the Data Collection setting.
2002H	Management Shell connection error (Connection failure)	Failed to connect to Management Shell.	• Please check that Management Shell has started. • Please reduce the number of OPC UA clients to be connected to Management Shell. • Please set the Target Device again. • Please lower the load on Windows by closing other applications.
2003H	Management Shell connection error (Session establishment failure)	Failed to establish the session with Management Shell.	• Please check that Management Shell has started. • Please reduce the number of OPC UA clients to be connected to Management Shell. • Please set the Target Device again. • Please lower the load on Windows by closing other applications.
2004H	Connection information read error	Failed to read the connection information.	Please set the Target Device again.
2007H	Data Collector internal error	An unexpected error occurred inside this product.	• Please set the Target Device again. • Please write Real-time Flow Manager Parameter again. • Please set it on the OPC UA setting screen of Management Shell Explorer. • Please check if there is any other error. • Please restart the industrial PC running this product. • Please reinstall this product.
2008H	Target Device setting error	The Target Device setting information does not exist.	Please set the Target Device again.
2011H	Management Shell communication timeout error	The communication with Management Shell has timed out.	• Please check that Management Shell has started. • Please refer to the error information list of Management Shell Explorer to check if an error has occurred. • Please lower the load on Windows by closing other applications. • Please reduce the number of OPC UA clients to be connected to Management Shell. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again.
2012H	Collection error (Management Shell connection failure)	Failed to collect the data because the connection with Management Shell was lost.	• Please check that Management Shell has started. • Please refer to the error information list of Management Shell Explorer to check if an error has occurred. • Please lower the load on Windows by closing other applications. • Please reduce the number of OPC UA clients to be connected to Management Shell. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again.
2013H	Collection error (Access to a non-existent tag)	Failed to collect the data because collection was performed on a tag which did not exist in Management Shell.	• Please review the location setting or Management Shell setting so that the tag of the location setting exists in Management Shell. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again.
2014H	Collection error (Incorrect access direction)	Failed to collect the data because collection was performed on a tag which was set to unreadable in Management Shell.	• Please review the location setting or Management Shell setting so that the access direction of the tag of the location setting becomes Read or Read/Write. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again.
2015H	Collection error (Data type mismatch)	The settings for the data types of the tag of the location setting and Management Shell are different.	• Please review the location setting or Management Shell setting so that the data types of the tag of the location setting and Management Shell match. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again.

Error code	Error name	Error description	Corrective action
2016H	Collection error (Error detected in Management Shell)	Failed to collect the data because an error was detected in Management Shell.	• Please refer to the error information list of Management Shell Explorer to check if an error has occurred. • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again. • If the status code is displayed in the Data collector internal information, please contact Edgecross Consortium.

Codes for errors that occur in Dummy Data collector

The following table shows the codes for errors that occur in Dummy Data collector.

Error code	Error name	Error description	Corrective action
F001H to F004H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• Please restart the Industrial PC. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.
F007H to F00AH	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• Please restart the Industrial PC. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.
F012H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• Please restart the Industrial PC. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.
F200H	Data Collector internal error	An unexpected error occurred inside this product.	• Please restart the Industrial PC. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.
F217H	Error in module reference	An error occurred when the module (JSON parser) was referenced.	• Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.
F234H	Data Collector I/F error	An error occurred during the access to Edgecross Basic Software.	• Please restart the Industrial PC. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please contact the Edgecross Consortium.

11.6 Event Code List

This section shows the codes for events that occur in Edgecross Basic Software.

Codes for events that occur in Real-time Flow Manager

The following table shows the codes for events that occur in Real-time Flow Manager.

Event code	Event type	Event	Description
0770H	Operation	Feedback execution success	Feedback execution succeeded.
0771H	Operation	Feedback execution failure	Feedback execution failed.
4102H	Operation	Real-time Flow Manager start	Real-time Flow Manager has been started.
4103H	Operation	Real-time Flow Manager end	Real-time Flow Manager has been ended.
4200H	Operation	Event history file clear	Event history file clear was executed.
4250H	Operation	Error clear success	Error clear has been executed.
4251H	Operation	Error clear failure	Error clear has failed due to a major error.
4300H	Operation	Operation status switching executed	The operation status switching has been executed.
8000H	Operation	Invalid real number data	Since the real number data is invalid (NaN, ±∞), the record was deleted.
8001H	Operation	Invalid real number data	Since the real number data is invalid (NaN, ±∞), the feedback execution request was canceled.
8002H	Operation	Invalid real number data	Since the real number data is invalid (NaN, ±∞), the corresponding record was not saved in the file.

Codes for events that occur in Management Shell

The following table shows the codes for events that occur in Management Shell.

Event code	Event type	Event	Description	Corrective action
2000H	Operation	Read processing time	Measurement of Read processing time has been completed.	—
8000H	Operation	Management Shell service start	The Management Shell service has started.	—
8001H	Operation	Management Shell service stop	The Management Shell service has stopped.	—
8002H	Operation	Data collector start	The Data collector service has started.	—
8003H	Operation	Data collector stop	The Data collector service has stopped.	—
8004H	Operation	IT Gateway start	The IT Gateway service has started.	—
8005H	Operation	IT Gateway stop	The IT Gateway service has stopped.	—
8006H	Operation	Event history file clear	Event history file clear was executed.	—
8007H	Operation	Error clear success	Error clear has been executed.	—
8008H	Operation	Error clear failure	Error clear has failed.	—
8500H	Operation	Monitoring target item registration failure	Failed to register the monitoring target item due to insufficient memory.	• Please reduce the number of monitoring target items. • Close other applications on the industrial PC on which Management Shell is running to secure free space. • Increase the memory of the industrial PC on which Management Shell is running.
F800H	Warning	Exceeded collection cycle	Collection process was not completed within the collection cycle.	—

Codes for events that occur in Management Shell Data collector

The following table shows the codes for events that occur in Management Shell Data collector.

Event code	Event type	Event	Description
9000H	Information	Collection processing time	Measurement of collection processing time has been completed.
F800H	Warning	Exceeded collection cycle	Collection process was not completed within the collection cycle.

11.7 Code List for Data Model Import

This section shows the codes for warnings and errors that occur during data model import.

Code	Result	Type	Cause	Corrective action
2400H	Error	Component	No component name is set.	Please set a component name within 1 to 32 characters.
2401H	Error	Component	No component display name is set.	Please set a component display name within 1 to 64 characters.
2402H	Error	Component	The component name contains input prohibited characters.	Please configure the component name using only the following characters that can be input. • Alphanumeric characters • "_" "-"
2403H	Error	Component	The component display name contains input prohibited characters.	Please remove the following input prohibited characters from the component display name. • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029)
2404H	Error	Component	The component name exceeds the maximum number of characters.	Please set a component name within 1 to 32 characters.
2405H	Error	Component	The component display name exceeds the maximum number of characters.	Please set a component display name within 1 to 64 characters.
2406H	Error	Component	The number of components exceeds the maximum number by {0}. • {0}: Number of components exceeding the maximum number	Please set the number of components to 999 or less.
2407H	Error	Component	The number of layers of the component exceeds the maximum number by {0}. • {0}: Number of layers exceeding the maximum number	Please set the number of layers of the component to 31 or less.
2408H	Error	Component	The component names of the components defined in the same layer are duplicated.	Please set a component name which does not duplicate with others.
2409H	Error	Component	The icon file path contains input prohibited characters.	Please remove the following input prohibited characters from the icon file name. • "\" "/" ":" "*" "?" """ "<" ">" "|"
240AH	Error	Component	The icon file name exceeds the maximum number of characters.	Please set the icon file name within 1 to 255 characters.
240BH	Error	Component	No icon file name is set.	Please set the icon file name within 1 to 255 characters.
240CH	Error	Component	The file format that cannot be used for the icon is set.	Please set the extension of the icon file to any of the following. • .png, .bmp, .jpg, .ico, .gif
2500H	Error	Resource	No resource name is set.	Please set a resource name within 1 to 32 characters.
2501H	Error	Resource	No resource display name is set.	Please set a resource display name within 1 to 64 characters.
2507H	Error	Resource	The resource name contains input prohibited characters.	Please configure the resource name using only the following characters that can be input. • Single-byte alphanumeric characters excluding ".", "/", and "\"
2508H	Error	Resource	The resource display name contains input prohibited characters.	Please remove the following input prohibited characters from the resource display name. • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029)
2509H	Error	Resource	No location of the external data tag resource is set.	When a Data collector other than the CSV File Data collector is used, set the location with one or more characters.
250CH	Error	Resource	The external data tag resource location contains input prohibited characters.	Please remove the following input prohibited characters from the location. • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029)

Code	Result	Type	Cause	Corrective action
250DH	Error	Resource	The file path of the file resource contains input prohibited characters.	Please remove the following input prohibited characters from the file path. • Characters that cannot be used for the file path of Windows ("*", "?", """, "<", ">", "|")
250EH	Error	Resource	The resource name exceeds the maximum number of characters.	Please set a resource name within 1 to 32 characters.
250FH	Error	Resource	The resource display name exceeds the maximum number of characters.	Please set a resource display name within 1 to 64 characters.
2510H	Error	Resource	The data type of the data tag resource exceeds the maximum number of characters.	Please set the data type within 1 to 11.
2511H	Error	Resource	A value outside the range is set to the number of characters of the data tag resource.	Please set 1 to 32 characters for the STRING type, 1 to 16 characters for the WSTRING type, and 0 for other data types.
2513H	Error	Resource	The location of the external data tag resource exceeds the maximum number of characters.	Please set the location within 300 characters or less.
2514H	Error	Resource	The file path of the file resource exceeds the maximum number of characters.	Please set the file path within 259 characters or less.
2515H	Error	Resource	The number of resources defined in the same layer exceeds the maximum number by {0}. • {0}: Number of resources exceeding the maximum number	Please set the number of resources to be defined in the same layer to 1000 or less.
2517H	Error	Resource	The folder path of the folder resource contains input prohibited characters.	Please remove the following input prohibited characters from the folder path. • Characters that cannot be used for the file path of Windows ("*", "?", """, "<", ">", "|")
2518H	Error	Resource	The folder path of the folder resource exceeds the maximum number of characters.	Please set the file path within 247 characters or less.
251AH	Error	Resource	The Target Device setting information that is used by the external data tag resource does not exist.	Please set the same value as the ID for any of the Target Device settings to the ID.
2520H	Error	Resource	The resource names of the resources defined in the same layer are duplicated.	Please set a resource name which does not duplicate with others.
2521H	Error	Resource	A value that does not exist is set to the access authority to the resource.	Please specify one of the following values for the access authority to the resource. • Read only: 1 • Readable/writable: 3
2522H	Error	Resource	An invalid value is set to the initial value of the resource.	Please set a value and character that can be entered to each data type.
2525H	Error	Resource	A relative path is set for the file path of the resource.	Please set an absolute path for the file path of the resource.
2526H	Error	Resource	A relative path is set for the folder path of the resource.	Please set an absolute path for the folder path of the resource.
2527H	Error	Resource	The description of the Target Device setting is incorrect.	• Please set the <AccessConfigs> element to <AccessConfigs />. • Please set "0" for the ID of the external data tag resource.
2600H	Error	Access target device setting	The setting name contains input prohibited characters.	Please remove the following input prohibited characters from the setting name. • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029)
2601H	Error	Access target device setting	The comment contains input prohibited characters.	Please remove the following input prohibited characters from the comment. • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029)
2602H	Error	Access target device setting	The setting name exceeds the maximum number of characters.	Please set the setting name within 1 to 32 characters.
2603H	Error	Access target device setting	The comment exceeds the maximum number of characters.	Please set the comment within 100 characters or less.
2604H	Error	Access target device setting	The number of Target Device settings exceeds the maximum number by {0}. • {0}: Number of access target device settings exceeding the maximum number	Please set the number of Target Device settings to 100 or less.

Code	Result	Type	Cause	Corrective action
2605H	Error	Access target device setting	No setting name is set.	Please set a setting name of the Target Device setting within 1 to 32 characters.
2606H	Error	Access target device setting	The ID has been changed.	Please do not change the ID. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
2607H	Error	Access target device setting	The developer company code has been changed.	Please do not change the developer company code. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
2608H	Error	Access target device setting	The developer has been changed.	Please do not change the developer. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
2609H	Error	Access target device setting	The data collector name has been changed.	Please do not change the data collector name. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
260AH	Error	Access target device setting	The data collector version has been changed.	Please do not change the data collector version. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
260BH	Error	Access target device setting	The Data collector that is used by the Target Device setting has not been installed.	After installing the following Data collector, please update to the latest installation status in the Data collector list screen. {0} Version {1} ({2}) • {0}: Data collector name • {1}: Data collector version (integer without zero padding (up to 4 digits)) • {2}: Developer
260CH	Error	Access target device setting	The setting names are duplicated.	Please set a setting name which does not duplicate with others.
261EH	Error	Access target device setting	The parameter has been changed.	Please do not change the parameter. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
261FH	Error	Access target device setting	The IDs are duplicated.	Please do not change the ID. • When the ID has been changed, please perform data model export of Management Shell Explorer, and edit it in the output data model file again.
2700H	Error	Others	The path of the data model file is incorrect.	• Please check if the data model file that does not exist is not selected. • Please set the full path of the file within 1 to 242 characters.
2701H	Error	Others	An unexpected error occurred while opening the data model file.	• Please perform partial export of Management Shell Explorer, and read the data model file again. • If the problem is not resolved, please contact the Edgecross Consortium.
2702H	Error	Others	SupplementalData.acd is corrupted.	When SupplementalData.acd is changed, it may not be read. Perform either of the following. • Read the same data model file again. • Read other data model file.
2703H	Error	Others	An unexpected error occurred during the analysis of the XML file.	• Please perform partial export of Management Shell Explorer, and read the data model file again. • If the problem is not resolved, please contact the Edgecross Consortium.

Code	Result	Type	Cause	Corrective action
2704H	Error	Others	Incorrect definition was detected during the verification of the XML file.	• Please check if the format of the data model file is correct. • Please select other data model file and execute it again.
2705H	Error	Others	The component of the data model file is incorrect.	• Please check if the following folder exists after the data model file is opened. - DataModelFiles • Please check if the following files exist in the DataModelFiles folder after the data model file is opened. - DataModel.xml - SupplementalData.acd • Please check if there are no unnecessary files or folders after the data model file is opened.
2706H	Error	Others	The version of the data model file is not supported.	• Please check if the version of the data model file is 1.00 or later and earlier than 2.00.
2707H	Error	Others	The version of the XML specifications described in the XML file is not supported.	Please check if the XML file is described using XML 1.0.
2708H	Error	Others	The character code of the XML file is not supported.	Please check if the character code of the XML file is UTF-8.
2709H	Error	Others	DTD is prohibited by the specifications of the XML file.	Please remove the description of DTD from the XML file.
2800H	Warning	Component	The component name has been changed from {0} to {1} because it is duplicated. • {0}: Component name before change • {1}: Component name after change	—
2901H	Warning	Resource	The following message has been reported during the check performed by the data collector.	Please check the message or data collector manual, and then confirm whether there are any problems with the current setting. {0} {1} Version {2} ({3}) • {0}: Message returned from the data collector • {1}: Data collector name • {2}: Data collector version (integer without zero padding (up to 4 digits)) • {3}: Developer
2902H	Warning	Resource	The location has been changed from {0} to {1} during the check performed by the data collector. {2} Version {3} ({4}) • {0}: Location before change • {1}: Location after change • {2}: Data collector name • {3}: Data collector version (integer without zero padding (up to 4 digits)) • {4}: Developer	—
2903H	Warning	Resource	The data type has been changed from {0} to {1} during the check performed by the data collector.\n {2} Version {3} ({4}) • {0}: Location before change • {1}: Location after change • {2}: Data collector name • {3}: Data collector version (integer without zero padding (up to 4 digits)) • {4}: Developer	—
2904H	Warning	Resource	The number of characters has been changed from {0} to {1} during the check performed by the data collector.\n {2} Version {3} ({4}) • {0}: Location before change • {1}: Location after change • {2}: Data collector name • {3}: Data collector version (integer without zero padding (up to 4 digits)) • {4}: Developer	—

Code	Result	Type	Cause	Corrective action
2A00H	Warning	Access target device setting	The setting name has been changed from {0} to {1} because it is duplicated. • {0}: Setting name before change • {1}: Setting name after change	—
2A01H	Warning	Access target device setting	The Target Device setting "{0}" using a dummy data collector has been generated. • {0}: Generated access target device setting name	To change the Target Device setting to the one using another data collector, please replace the Target Device setting in the Target Device setting batch replacement screen.
2C00H	Error	Component	The number of components exceeds the maximum number by {0}. • {0}: Number of components exceeding the maximum number	Please set the total of the components stored in the data model file and the ones that Management Shell has to 1000 or less.
2C01H	Error	Component	The number of layers of the component exceeds the maximum number by {0}. • {0}: Number of layers exceeding the maximum number	Please set the total of the layers when the components stored in the data model file are added to the component tree of Management Shell to 32 or less.
2C02H	Error	Component	The icon file name exceeds the maximum number of characters by {0}. • {0}: Number of characters exceeding the maximum number	Please change the icon file name exceeding the maximum number of characters to a different file name.
2D00H	Error	Resource	The following message has been reported from the check by the Data collector.	Please refer to the Data collector manual and check if the Data collector supports the data model import function. If it is supported, please correct the message contents.\n {0} {1} Version {2} ({3}) • {0}: Message returned from the data collector • {1}: Data collector name • {2}: Data collector version (integer without zero padding (up to 4 digits)) • {3}: Developer
2D03H	Error	Resource	The data collector to be used does not satisfy the implementation requirements of the Edgecross specifications.	Please contact the developer of the data collector.\n {0} Version {1} ({2}) • {0}: Data collector name • {1}: Data collector version (integer without zero padding (up to 4 digits)) • {2}: Developer
2E00H	Error	Access target device setting	The setting name exceeds the maximum number of characters by {0} when it is automatically renamed. • {0}: Number of characters exceeding the maximum number	Please change the duplicated setting name to a different setting name.
2E01H	Error	Access target device setting	The number of Target Device settings after the import exceeds the maximum number by {0}. • {0}: Number of access target device settings exceeding the maximum number	Please set the total number of Target Device settings to 100 or less.
2E02H	Error	Access target device setting	The number of Target Device settings after the import exceeds the maximum number.	Please try again after deleting at least one Target Device setting.
2F00H	Error	Others	Management Shell is stopped.	Please start Management Shell.
2FFFH	Error	Others	An unexpected error occurred during import.	Please try again after restarting Management Shell.

11.8 Error Code List for the One-shot Collection Function

This section shows the error code list for the one-shot collection function.

Error code	Error name	Error description	Corrective action
1000H	Management Shell event registration error	Failed to register the event of Management Shell.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please lower the load on Windows by closing other applications. • Please restart the one-shot collection setting. • When the time and date of Windows were changed, please restart Management Shell.
1001H	Management Shell event clearing error	Failed to clear the event of Management Shell.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please lower the load on Windows by closing other applications. • Please restart the one-shot collection setting. • When the time and date of Windows were changed, please restart Management Shell.
1002H	Management Shell communication error	Failed to communicate with Management Shell.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please lower the load on Windows by closing other applications. • Please restart the one-shot collection setting. • When the time and date of Windows were changed, please restart Management Shell.
1100H	Collection target resource reading error	Failed to read the collection target resource.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • Please check if the collection target resource has read authority. • When the internal data tag resource (operation) is used, please check the resource specified for the operation term. • Please set the collection target resource again. • Please lower the load on Windows by closing other applications.
1101H	Collection target resource type definition mismatch error	A data type mismatch of the collection target resource was detected.	• Please check if the target data tag resource has been changed. • Please set the collection target resource again.
1102H	Monitoring target resource reading error	Failed to read the monitoring target resource.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • Please check if the monitoring target resource has read authority. • When the internal data tag resource (operation) is used, please check the resource specified for the operation term. • Please set the monitoring target resource again. • Please lower the load on Windows by closing other applications.
1103H	Monitoring target resource writing error	Failed to write the monitoring target resource.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • Please check if the monitoring target resource has write authority. • Please set the monitoring target resource again. • Please lower the load on Windows by closing other applications.
1104H	Monitoring target resource type definition mismatch error	A data type mismatch of the monitoring target resource was detected.	• Please check if the target data tag resource has been changed. • Please set the monitoring target resource again.
1105H	Notification target resource writing error	Failed to write the notification target resource.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • Please check if the notification target resource has write authority. • Please set the notification target resource again. • Please lower the load on Windows by closing other applications.
1106H	Notification target resource type definition mismatch error	A data type mismatch of the notification target resource was detected.	• Please check if the target data tag resource has been changed. • Please set the notification target resource again.

Error code	Error name	Error description	Corrective action
1107H	Collection target resource information acquisition error	Failed to acquire the collection target resource information.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • When the internal data tag resource (operation) is used, please check the resource specified for the operation term.
1108H	Monitoring target resource information acquisition error	Failed to acquire the monitoring target resource information.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists. • When the internal data tag resource (operation) is used, please check the resource specified for the operation term.
1109H	Notification target resource information acquisition error	Failed to acquire the notification target resource information.	• Please check if Management Shell is operating. • Please check if an error has occurred in Management Shell. • Please check if the target data tag resource exists.
1110H	Collection target resource reading authority error	The collection target resource does not have read authority.	• Please check if the collection target resource has read authority. • Please set the collection target resource again.
1111H	Monitoring target resource reading authority error	The monitoring target resource does not have read authority.	• Please check if the monitoring target resource has read authority. • Please set the monitoring target resource again.
1112H	Monitoring target resource writing authority error	The monitoring target resource does not have write authority.	• Please check if the monitoring target resource has write authority. • Please set the monitoring target resource again.
1113H	Notification target resource writing authority error	The notification target resource does not have write authority.	• Please check if the notification target resource has write authority. • Please set the notification target resource again.
1200H	Detailed setting error	The detailed setting has not been written or has been damaged.	Please configure the detailed setting again.
1300H	Output name duplication error	The output names of the collection target in the collection setting and the date column in the saving setting are duplicated in the detail setting.	Please check the output name setting in the detail setting.
2000H	File saving error	Failed to write the file because there is not enough free space available.	Please delete unnecessary files to allocate free space.
2001H	File saving error	Failed to write the file.	• Please check the access authority of the save destination folder. • When a folder on the network is set to the save destination folder, Please check if there is any problem in the connection path of the network and whether the network drive is specified. • Please check if the other applications have not accessed the saved file. • Please check if the saving settings are duplicated with those of Real-time Flow Manager. • Please change the save destination folder or the prefix of the file name. • Please lower the load on Windows by closing other applications.
2002H	Save file number error	The file name suffix of the save file has reached FFFFFFFF.	• Please change the save destination folder or the prefix of the file name. • Please delete all the save files from the save destination folder.
2003H	Stored file error	Failed to output the stored file.	• Please check the access authority of the save destination folder. • When a folder on the network is set to the save destination folder, Please check if there is any problem in the connection path of the network and whether the network drive is specified. • Please check if the other applications have not accessed the saved file. • Please check if the save settings are duplicated with those of Real-time Flow Manager. • Please change the save destination folder or the prefix of the file name. • Please delete all the stored files. • Please lower the load on Windows by closing other applications.
2004H	File saving error	Failed to delete the files.	• Please check the access authority of the save destination folder. • When a folder on the network is set to the save destination folder, Please check if there is any problem in the connection path of the network and whether the network drive is specified. • Please check if the other applications have not accessed the saved file. • Please check if the save settings are duplicated with those of Real-time Flow Manager. • Please change the save destination folder or the prefix of the file name. • Please lower the load on Windows by closing other applications.
3000H	Out of memory error	There is not enough memory available to execute this operation.	• Please close other applications. • Please restart the industrial PC running this product.

Error code	Error name	Error description	Corrective action
3001H	DB setting error	DB connection setting parameter is invalid.	• Make sure the DB save setting is correct. • Check the ODBC error code.
3002H	DB connection error	DB connection failed.	• Please check if the setting of DB saving is correct. • Please lower the load by reducing the number of collection target resources. • If the operation statuses of other settings are RUN, please stop the operation to lower the load. • Please lower the load on Windows by closing other applications.
3003H	DB connection error	DB connection failed.	• Please make sure the DB save setting is correct. • Please make sure the ODBC settings are correct. • Please check the ODBC error code.
3004H	DB SQL execution error	Execution of SQL failed.	• Please check if the setting of DB saving is correct. • Please lower the load by reducing the number of collection target resources. • If the operation statuses of other settings are RUN, please stop the operation to lower the load. • Please lower the load on Windows by closing other applications.
3005H	DB SQL execution error	Failed to execute SQL because the output data amount has exceeded 8160 bytes.	• Please reduce the number of collection target resources. • Please check the ODBC error code.
3006H	DB SQL execution error	Execution of SQL failed.	• Please make sure the DB save setting is correct. • Please make sure the ODBC settings are correct. • Please check the ODBC error code.
3007H	DB disconnection error	Failed to disconnect the DB.	• Please check if the setting of DB saving is correct. • Please lower the load by reducing the number of collection target resources. • If the operation statuses of other settings are RUN, please stop the operation to lower the load. • Please lower the load on Windows by closing other applications.
3008H	DB disconnection error	Failed to disconnect the DB.	• Please make sure the DB save setting is correct. • Please make sure the ODBC settings are correct. • Please check the ODBC error code.

11.9 Exit Code List for the Command Line Interface Function

This section shows the exit code list for the command line interface function.

Exit code	Error name	Error description	Corrective action
1000H	First option error	• A character string not defined in the first option is specified. • No option is specified.	Check the option specifications, and specify a correct first option. ☞ Page 98 Option details
1001H	Second option or later error	The second option or later is not correct.	Check the cause in the exit code column of the option, then enter a correct option. • Help function: ☞ Page 98 Specifications • Function version acquisition: ☞ Page 99 Specifications • Process flow operating status acquisition: ☞ If "1001" is displayed for the exit code • Process flow operation start: ☞ If "1001" is displayed for the exit code • Process flow operation stop: ☞ If "1001" is displayed for the exit code
2000H	License agreement error	The license agreement for Edgecross Basic Software is not accepted.	Start Real-time Flow Designer or Management Shell Explorer to accept the license agreement.
2001H	Multiple startup error	EdgecrossCLI has already been started.	Check if EdgecrossCLI has already been started. If started, close then start it.
2002H	Simultaneous execution error	The operating status is changed or the parameters of Real-time Flow Manager are applied at the same time as the following operations in Real-time Flow Designer: • RUN request (/runrfm) • STOP request (/stoprfm)	• Perform these operations after changing the operating status is completed in Real-time Flow Designer. • Perform these operations after applying the parameters is completed in Real-time Flow Designer.
3000H	Internal communication error	Internal communication with Real-time Flow Manager has failed. The response of Real-time Flow Manager for the command execution is delayed.	• Please check if there is any other error. • Please reduce the load on Windows by closing other applications. • Start Real-time Flow Designer, and review the collection cycle, number of collected data, and processing contents to reduce the load. • If the industrial PC enters the sleep or pause mode, please close other applications that control the sleep or pause mode. Please do not perform operations that enter the sleep mode. • Please restart the Industrial PC running this product.
3001H	Real-time Flow Manager start operation error	A previously accepted start operation is still being performed by Real-time Flow Manager.	Perform a new start operation after changing the operating status of the previous start operation is completed.
3002H	Real-time Flow Manager stop operation error	A previously accepted stop operation is still being performed by Real-time Flow Manager.	Perform a new stop operation after changing the operating status of the previous stop operation is completed.
3003H	Maximum number of simultaneous requests exceeded error for Real-time Flow Manager operating status switching	The number of same type of operations for changing the operating status (a start or stop operation) previously accepted by Real-time Flow Manager has reached its maximum number (a start or stop operation is performed too frequently).	• Perform a new start or stop operation after changing the operating status of the previous start or stop operation is completed. • If this error occurs again, reduce the frequency of performing start and stop operations.
4000H	Internal processing error	An unexpected error occurred in internal processing.	• Please restart the industrial PC running this product. • Please reinstall Edgecross Basic Software. • If the same error occurs again, please consult the Edgecross Consortium.

APPENDIX

Appendix 1 Real-time Flow Manager Status

This section shows the Real-time Flow Manager status of Real-time Flow Manager.
Refer to the Real-time Flow Manager status when acquiring the status of a process flow.

Address assignment

The following table shows the address assignment of the Real-time Flow Manager status.

Address	Name
0 to 399999	Basic area
400000 to 409799	Data collector area
409800 to 420999	IT gateway area

Real-time Flow Manager status list

The following shows the Real-time Flow Manager status list of Real-time Flow Manager.

Basic area

The following table shows the Real-time Flow Manager status list in the basic area (0 to 399999).

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
0 (0H)	Data Logging Flow No.1	Status	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
1 (1H)		Error code	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
2 to 34 (2H to 22H)		Setting name	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	
35 to 135 (23H to 87H)		Error occurrence process name	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
136 (88H)		Problem function		
137 to 201 (89H to C9H)		Data collector file name or IT gateway file name		
202 to 234 (CAH to EAH)		Data collector name or IT gateway name		
235 to 299 (EBH to 12BH)		Developer name		
300 (12CH)		Data collector specification version (integer part) or IT gateway specification version (integer part)		
301 (12DH)		Data collector specification version (decimal part) or IT gateway specification version (decimal part)		
302 to 305 (12EH to 131H)		Data collector version or IT gateway version		
306 to 337 (132H to 151H)		System area		
338 (152H)		Process data buffer usage rate	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	Reading
339 to 353 (153H to 161H)		System area		
354 to 355 (162H to 163H)		Number of times of data missing	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	Reading
356 (164H)		Last data collection time (year)		Reading
357 (165H)		Last data collection time (month · day)		Reading
358 (166H)		Last data collection time (hour · minute)		Reading
359 (167H)		Last data collection time (second · millisecond)	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	Reading
360 to 399 (168H to 18FH)		System area		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
400 to 799 (190H to 31FH)	Data Logging Flow No.2	Same as Data Logging Flow No.1 (0 to 399 (0H to 18FH))		
800 to 1199 (320H to 4AFH)	Data Logging Flow No.3			
1200 to 1599 (4B0H to 63FH)	Data Logging Flow No.4			
1600 to 1999 (640H to 7CFH)	Data Logging Flow No.5			
2000 to 2399 (7D0H to 95FH)	Data Logging Flow No.6			
2400 to 2799 (960H to AEFH)	Data Logging Flow No.7			
2800 to 3199 (AF0H to C7FH)	Data Logging Flow No.8			
3200 to 3599 (C80H to E0FH)	Data Logging Flow No.9			
3600 to 3999 (E10H to F9FH)	Data Logging Flow No.10			
4000 to 4399 (FA0H to 112FH)	Data Logging Flow No.11			
4400 to 4799 (1130H to 12BFH)	Data Logging Flow No.12			
4800 to 5199 (12C0H to 144FH)	Data Logging Flow No.13			
5200 to 5599 (1450H to 15DFH)	Data Logging Flow No.14			
5600 to 5999 (15E0H to 176FH)	Data Logging Flow No.15			
6000 to 6399 (1770H to 18FFH)	Data Logging Flow No.16			

A

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
6400 to 6799 (1900H to 1A8FH)	Data Logging Flow No.17	Same as Data Logging Flow No.1 (0 to 399 (0H to 18FH))		
6800 to 7199 (1A90H to 1C1FH)	Data Logging Flow No.18			
7200 to 7599 (1C20H to 1DAFH)	Data Logging Flow No.19			
7600 to 7999 (1DB0H to 1F3FH)	Data Logging Flow No.20			
8000 to 8399 (1F40H to 20CFH)	Data Logging Flow No.21			
8400 to 8799 (20D0H to 225FH)	Data Logging Flow No.22			
8800 to 9199 (2260H to 23EFH)	Data Logging Flow No.23			
9200 to 9599 (23F0H to 257FH)	Data Logging Flow No.24			
9600 to 9999 (2580H to 270FH)	Data Logging Flow No.25			
10000 to 10399 (2710H to 289FH)	Data Logging Flow No.26			
10400 to 10799 (28A0H to 2A2FH)	Data Logging Flow No.27			
10800 to 11199 (2A30H to 2BBFH)	Data Logging Flow No.28			
11200 to 11599 (2BC0H to 2D4FH)	Data Logging Flow No.29			
11600 to 11999 (2D50H to 2EDFH)	Data Logging Flow No.30			
12000 to 12399 (2EE0H to 306FH)	Data Logging Flow No.31			
12400 to 12799 (3070H to 31FFH)	Data Logging Flow No.32			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
12800 to 13199 (3200H to 338FH)	Data Diagnosis Flow No.1	Same as Data Logging Flow No.1 (0 to 399 (0H to 18FH))		
13200 to 13599 (3390H to 351FH)	Data Diagnosis Flow No.2			
13600 to 13999 (3520H to 36AFH)	Data Diagnosis Flow No.3			
14000 to 14399 (36B0H to 383FH)	Data Diagnosis Flow No.4			
14400 to 14799 (3840H to 39CFH)	Data Diagnosis Flow No.5			
14800 to 15199 (39D0H to 3B5FH)	Data Diagnosis Flow No.6			
15200 to 15599 (3B60H to 3CEFH)	Data Diagnosis Flow No.7			
15600 to 15999 (3CF0H to 3E7FH)	Data Diagnosis Flow No.8			
16000 to 16399 (3E80H to 400FH)	Data Diagnosis Flow No.9			
16400 to 16799 (4010H to 419FH)	Data Diagnosis Flow No.10			
16800 to 17199 (41A0H to 432FH)	Data Diagnosis Flow No.11			
17200 to 17599 (4330H to 44BFH)	Data Diagnosis Flow No.12			
17600 to 17999 (44C0H to 464FH)	Data Diagnosis Flow No.13			
18000 to 18399 (4650H to 47DFH)	Data Diagnosis Flow No.14			
18400 to 18799 (47E0H to 496FH)	Data Diagnosis Flow No.15			
18800 to 19199 (4970H to 4AFFH)	Data Diagnosis Flow No.16			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
19200 to 19599 (4B00H to 4C8FH)	Data Diagnosis Flow No.17	Same as Data Logging Flow No.1 (0 to 399 (0H to 18FH))		
19600 to 19999 (4C90H to 4E1FH)	Data Diagnosis Flow No.18			
20000 to 20399 (4E20H to 4FAFH)	Data Diagnosis Flow No.19			
20400 to 20799 (4FB0H to 513FH)	Data Diagnosis Flow No.20			
20800 to 21199 (5140H to 52CFH)	Data Diagnosis Flow No.21			
21200 to 21599 (52D0H to 545FH)	Data Diagnosis Flow No.22			
21600 to 21999 (5460H to 55EFH)	Data Diagnosis Flow No.23			
22000 to 22399 (55F0H to 577FH)	Data Diagnosis Flow No.24			
22400 to 22799 (5780H to 590FH)	Data Diagnosis Flow No.25			
22800 to 23199 (5910H to 5A9FH)	Data Diagnosis Flow No.26			
23200 to 23599 (5AA0H to 5C2FH)	Data Diagnosis Flow No.27			
23600 to 23999 (5C30H to 5DBFH)	Data Diagnosis Flow No.28			
24000 to 24399 (5DC0H to 5F4FH)	Data Diagnosis Flow No.29			
24400 to 24799 (5F50H to 60DFH)	Data Diagnosis Flow No.30			
24800 to 25199 (60E0H to 626FH)	Data Diagnosis Flow No.31			
25200 to 25599 (6270H to 63FFH)	Data Diagnosis Flow No.32			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
25600 (6400H)	Data Logging Flow No.1 Process No.1	Status	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
25601 (6401H)		Error code	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
25602 to 25604 (6402H to 6404H)		System area		
25605 to 25705 (6405H to 6469H)		Setting name	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
25706 (646AH)		Problem function	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
25707 to 25771 (646BH to 64ABH)		Data collector file name or IT gateway file name		
25772 to 25804 (64ACH to 64CCH)		Data collector name or IT gateway name		
25805 to 25869 (64CDH to 650DH)		Developer name		
25870 (650EH)		Data collector specification version (integer part) or IT gateway specification version (integer part)		
25871 (650FH)		Data collector specification version (decimal part) or IT gateway specification version (decimal part)		
25872 to 25875 (6510H to 6513H)		Data collector version or IT gateway version		
25876 to 25929 (6514H to 6549H)		System area		
25930 to 26009 (654AH to 6599H)		Information of each process only	☞ Process information of the data collection function ☞ Process information of the data modification function	Reading
26010 to 26054 (659AH to 65C6H)		Data storing information	☞ Data storing information	
26055 to 26099 (65C7H to 65F3H)		Data distribution information	☞ Data distribution information	
26100 to 27599 (65F4H to 6BCFH)	Data Logging Flow No.1 Process No.2 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.1 Process No.2: 26100 to 26599 (65F4H to 67E7H) Data Logging Flow No.1 Process No.3: 26600 to 27099 (67E8H to 69DBH) Data Logging Flow No.1 Process No.4: 27100 to 27599 (69DCH to 6BCFH)		
27600 to 29599 (6BD0H to 739FH)	System area			
29600 to 31599 (73A0H to 7B6FH)	Data Logging Flow No.2 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.2 Process No.1: 29600 to 30099 (73A0H to 7593H) Data Logging Flow No.2 Process No.2: 30100 to 30599 (7594H to 7787H) Data Logging Flow No.2 Process No.3: 30600 to 31099 (7788H to 797BH) Data Logging Flow No.2 Process No.4: 31100 to 31599 (797CH to 7B6FH)		
31600 to 33599 (7B70H to 833FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
33600 to 35599 (8340H to 8B0FH)	Data Logging Flow No.3 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.3 Process No.1: 33600 to 34099 (8340H to 8533H) Data Logging Flow No.3 Process No.2: 34100 to 34599 (8534H to 8727H) Data Logging Flow No.3 Process No.3: 34600 to 35099 (8728H to 891BH) Data Logging Flow No.3 Process No.4: 35100 to 35599 (891CH to 8B0FH)		
35600 to 37599 (8B10H to 92DFH)	System area			
37600 to 39599 (92E0H to 9AAFH)	Data Logging Flow No.4 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.4 Process No.1: 37600 to 38099 (92E0H to 94D3H) Data Logging Flow No.4 Process No.2: 38100 to 38599 (94D4H to 96C7H) Data Logging Flow No.4 Process No.3: 38600 to 39099 (96C8H to 98BBH) Data Logging Flow No.4 Process No.4: 39100 to 39599 (98BCH to 9AAFH)		
39600 to 41599 (9AB0H to A27FH)	System area			
41600 to 43599 (A280H to AA4FH)	Data Logging Flow No.5 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.5 Process No.1: 41600 to 42099 (A280H to A473H) Data Logging Flow No.5 Process No.2: 42100 to 42599 (A474H to A667H) Data Logging Flow No.5 Process No.3: 42600 to 43099 (A668H to A85BH) Data Logging Flow No.5 Process No.4: 43100 to 43599 (A85CH to AA4FH)		
43600 to 45599 (AA50H to B21FH)	System area			
45600 to 47599 (B220H to B9EFH)	Data Logging Flow No.6 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.6 Process No.1: 45600 to 46099 (B220H to B413H) Data Logging Flow No.6 Process No.2: 46100 to 46599 (B414H to B607H) Data Logging Flow No.6 Process No.3: 46600 to 47099 (B608H to B7FBH) Data Logging Flow No.6 Process No.4: 47100 to 47599 (B7FCH to B9EFH)		
47600 to 49599 (B9F0H to C1BFH)	System area			
49600 to 51599 (C1C0H to C98FH)	Data Logging Flow No.7 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.7 Process No.1: 49600 to 50099 (C1C0H to C3B3H) Data Logging Flow No.7 Process No.2: 50100 to 50599 (C3B4H to C5A7H) Data Logging Flow No.7 Process No.3: 50600 to 51099 (C5A8H to C79BH) Data Logging Flow No.7 Process No.4: 51100 to 51599 (C79CH to C98FH)		
51600 to 53599 (C990H to D15FH)	System area			
53600 to 55599 (D160H to D92FH)	Data Logging Flow No.8 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.8 Process No.1: 53600 to 54099 (D160H to D353H) Data Logging Flow No.8 Process No.2: 54100 to 54599 (D354H to D547H) Data Logging Flow No.8 Process No.3: 54600 to 55099 (D548H to D73BH) Data Logging Flow No.8 Process No.4: 55100 to 55599 (D73CH to D92FH)		
55600 to 57599 (D930H to E0FFH)	System area			
57600 to 59599 (E100H to E8CFH)	Data Logging Flow No.9 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.9 Process No.1: 57600 to 58099 (E100H to E2F3H) Data Logging Flow No.9 Process No.2: 58100 to 58599 (E2F4H to E4E7H) Data Logging Flow No.9 Process No.3: 58600 to 59099 (E4E8H to E6DBH) Data Logging Flow No.9 Process No.4: 59100 to 59599 (E6DCH to E8CFH)		
59600 to 61599 (E8D0H to F09FH)	System area			
61600 to 63599 (F0A0H to F86FH)	Data Logging Flow No.10 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.10 Process No.1: 61600 to 62099 (F0A0H to F293H) Data Logging Flow No.10 Process No.2: 62100 to 62599 (F294H to F487H) Data Logging Flow No.10 Process No.3: 62600 to 63099 (F488H to F67BH) Data Logging Flow No.10 Process No.4: 63100 to 63599 (F67CH to F86FH)		
63600 to 65599 (F870H to 1003FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
65600 to 67599 (10040H to 1080FH)	Data Logging Flow No.11 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.11 Process No.1: 65600 to 66099 (10040H to 10233H) Data Logging Flow No.11 Process No.2: 66100 to 66599 (10234H to 10427H) Data Logging Flow No.11 Process No.3: 66600 to 67099 (10428H to 1061BH) Data Logging Flow No.11 Process No.4: 67100 to 67599 (1061CH to 1080FH)		
67600 to 69599 (10810H to 10FDFH)	System area			
69600 to 71599 (10FE0H to 117AFH)	Data Logging Flow No.12 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.12 Process No.1: 69600 to 70099 (10FE0H to 111D3H) Data Logging Flow No.12 Process No.2: 70100 to 70599 (111D4H to 113C7H) Data Logging Flow No.12 Process No.3: 70600 to 71099 (113C8H to 115BBH) Data Logging Flow No.12 Process No.4: 71100 to 71599 (115BCH to 117AFH)		
71600 to 73599 (117B0H to 11F7FH)	System area			
73600 to 75599 (11F80H to 1274FH)	Data Logging Flow No.13 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.13 Process No.1: 73600 to 74099 (11F80H to 12173H) Data Logging Flow No.13 Process No.2: 74100 to 74599 (12174H to 12367H) Data Logging Flow No.13 Process No.3: 74600 to 75099 (12368H to 1255BH) Data Logging Flow No.13 Process No.4: 75100 to 75599 (1255CH to 1274FH)		
75600 to 77599 (12750H to 12F1FH)	System area			
77600 to 79599 (12F20H to 136EFH)	Data Logging Flow No.14 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.14 Process No.1: 77600 to 78099 (12F20H to 13113H) Data Logging Flow No.14 Process No.2: 78100 to 78599 (13114H to 13307H) Data Logging Flow No.14 Process No.3: 78600 to 79099 (13308H to 134FBH) Data Logging Flow No.14 Process No.4: 79100 to 79599 (134FCH to 136EFH)		
79600 to 81599 (136F0H to 13EBFH)	System area			
81600 to 83599 (13EC0H to 1468FH)	Data Logging Flow No.15 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.15 Process No.1: 81600 to 82099 (13EC0H to 140B3H) Data Logging Flow No.15 Process No.2: 82100 to 82599 (140B4H to 142A7H) Data Logging Flow No.15 Process No.3: 82600 to 83099 (142A8H to 1449BH) Data Logging Flow No.15 Process No.4: 83100 to 83599 (1449CH to 1468FH)		
83600 to 85599 (14690H to 14E5FH)	System area			
85600 to 87599 (14E60H to 1562FH)	Data Logging Flow No.16 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.16 Process No.1: 85600 to 86099 (14E60H to 15053H) Data Logging Flow No.16 Process No.2: 86100 to 86599 (15054H to 15247H) Data Logging Flow No.16 Process No.3: 86600 to 87099 (15248H to 1543BH) Data Logging Flow No.16 Process No.4: 87100 to 87599 (1543CH to 1562FH)		
87600 to 89599 (15630H to 15DFFH)	System area			
89600 to 91599 (15E00H to 165CFH)	Data Logging Flow No.17 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.17 Process No.1: 89600 to 90099 (15E00H to 15FF3H) Data Logging Flow No.17 Process No.2: 90100 to 90599 (15FF4H to 161E7H) Data Logging Flow No.17 Process No.3: 90600 to 91099 (161E8H to 163DBH) Data Logging Flow No.17 Process No.4: 91100 to 91599 (163DCH to 165CFH)		
91600 to 93599 (165D0H to 16D9FH)	System area			
93600 to 95599 (16DA0H to 1756FH)	Data Logging Flow No.18 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.18 Process No.1: 93600 to 94099 (16DA0H to 16F93H) Data Logging Flow No.18 Process No.2: 94100 to 94599 (16F94H to 17187H) Data Logging Flow No.18 Process No.3: 94600 to 95099 (17188H to 1737BH) Data Logging Flow No.18 Process No.4: 95100 to 95599 (1737CH to 1756FH)		
95600 to 97599 (17570H to 17D3FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
97600 to 99599 (17D40H to 1850FH)	Data Logging Flow No.19 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.19 Process No.1: 97600 to 98099 (17D40H to 17F33H) Data Logging Flow No.19 Process No.2: 98100 to 98599 (17F34H to 18127H) Data Logging Flow No.19 Process No.3: 98600 to 99099 (18128H to 1831BH) Data Logging Flow No.19 Process No.4: 99100 to 99599 (1831CH to 1850FH)		
99600 to 101599 (18510H to 18CDFH)	System area			
101600 to 103599 (18CE0H to 194AFH)	Data Logging Flow No.20 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.20 Process No.1: 101600 to 102099 (18CE0H to 18ED3H) Data Logging Flow No.20 Process No.2: 102100 to 102599 (18ED4H to 190C7H) Data Logging Flow No.20 Process No.3: 102600 to 103099 (190C8H to 192BBH) Data Logging Flow No.20 Process No.4: 103100 to 103599 (192BCH to 194AFH)		
103600 to 105599 (194B0H to 19C7FH)	System area			
105600 to 107599 (19C80H to 1A44FH)	Data Logging Flow No.21 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.21 Process No.1: 105600 to 106099 (19C80H to 19E73H) Data Logging Flow No.21 Process No.2: 106100 to 106599 (19E74H to 1A067H) Data Logging Flow No.21 Process No.3: 106600 to 107099 (1A068H to 1A25BH) Data Logging Flow No.21 Process No.4: 107100 to 107599 (1A25CH to 1A44FH)		
107600 to 109599 (1A450H to 1AC1FH)	System area			
109600 to 111599 (1AC20H to 1B3EFH)	Data Logging Flow No.22 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.22 Process No.1: 109600 to 110099 (1AC20H to 1AE13H) Data Logging Flow No.22 Process No.2: 110100 to 110599 (1AE14H to 1B007H) Data Logging Flow No.22 Process No.3: 110600 to 111099 (1B008H to 1B1FBH) Data Logging Flow No.22 Process No.4: 111100 to 111599 (1B1FCH to 1B3EFH)		
111600 to 113599 (1B3F0H to 1BBBFH)	System area			
113600 to 115599 (1BBC0H to 1C38FH)	Data Logging Flow No.23 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.23 Process No.1: 113600 to 114099 (1BBC0H to 1BDB3H) Data Logging Flow No.23 Process No.2: 114100 to 114599 (1BDB4H to 1BFA7H) Data Logging Flow No.23 Process No.3: 114600 to 115099 (1BFA8H to 1C19BH) Data Logging Flow No.23 Process No.4: 115100 to 115599 (1C19CH to 1C38FH)		
115600 to 117599 (1C390H to 1CB5FH)	System area			
117600 to 119599 (1CB60H to 1D32FH)	Data Logging Flow No.24 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.24 Process No.1: 117600 to 118099 (1CB60H to 1CD53H) Data Logging Flow No.24 Process No.2: 118100 to 118599 (1CD54H to 1CF47H) Data Logging Flow No.24 Process No.3: 118600 to 119099 (1CF48H to 1D13BH) Data Logging Flow No.24 Process No.4: 119100 to 119599 (1D13CH to 1D32FH)		
119600 to 121599 (1D330H to 1DAFFH)	System area			
121600 to 123599 (1DB00H to 1E2CFH)	Data Logging Flow No.25 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.25 Process No.1: 121600 to 122099 (1DB00H to 1DCF3H) Data Logging Flow No.25 Process No.2: 122100 to 122599 (1DCF4H to 1DEE7H) Data Logging Flow No.25 Process No.3: 122600 to 123099 (1DEE8H to 1E0DBH) Data Logging Flow No.25 Process No.4: 123100 to 123599 (1E0DCH to 1E2CFH)		
123600 to 125599 (1E2D0H to 1EA9FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
125600 to 127599 (1EAA0H to 1F26FH)	Data Logging Flow No.26 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.26 Process No.1: 125600 to 126099 (1EAA0H to 1EC93H) Data Logging Flow No.26 Process No.2: 126100 to 126599 (1EC94H to 1EE87H) Data Logging Flow No.26 Process No.3: 126600 to 127099 (1EE88H to 1F07BH) Data Logging Flow No.26 Process No.4: 127100 to 127599 (1F07CH to 1F26FH)		
127600 to 129599 (1F270H to 1FA3FH)	System area			
129600 to 131599 (1FA40H to 2020FH)	Data Logging Flow No.27 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.27 Process No.1: 129600 to 130099 (1FA40H to 1FC33H) Data Logging Flow No.27 Process No.2: 130100 to 130599 (1FC34H to 1FE27H) Data Logging Flow No.27 Process No.3: 130600 to 131099 (1FE28H to 2001BH) Data Logging Flow No.27 Process No.4: 131100 to 131599 (2001CH to 2020FH)		
131600 to 133599 (20210H to 209DFH)	System area			
133600 to 135599 (209E0H to 211AFH)	Data Logging Flow No.28 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.28 Process No.1: 133600 to 134099 (209E0H to 20BD3H) Data Logging Flow No.28 Process No.2: 134100 to 134599 (20BD4H to 20DC7H) Data Logging Flow No.28 Process No.3: 134600 to 135099 (20DC8H to 20FBBH) Data Logging Flow No.28 Process No.4: 135100 to 135599 (20FBCH to 211AFH)		
135600 to 137599 (211B0H to 2197FH)	System area			
137600 to 139599 (21980H to 2214FH)	Data Logging Flow No.29 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.29 Process No.1: 137600 to 138099 (21980H to 21B73H) Data Logging Flow No.29 Process No.2: 138100 to 138599 (21B74H to 21D67H) Data Logging Flow No.29 Process No.3: 138600 to 139099 (21D68H to 21F5BH) Data Logging Flow No.29 Process No.4: 139100 to 139599 (21F5CH to 2214FH)		
139600 to 141599 (22150H to 2291FH)	System area			
141600 to 143599 (22920H to 230EFH)	Data Logging Flow No.30 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.30 Process No.1: 141600 to 142099 (22920H to 22B13H) Data Logging Flow No.30 Process No.2: 142100 to 142599 (22B14H to 22D07H) Data Logging Flow No.30 Process No.3: 142600 to 143099 (22D08H to 22EFBH) Data Logging Flow No.30 Process No.4: 143100 to 143599 (22EFCH to 230EFH)		
143600 to 145599 (230F0H to 238BFH)	System area			
145600 to 147599 (238C0H to 2408FH)	Data Logging Flow No.31 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.31 Process No.1: 145600 to 146099 (238C0H to 23AB3H) Data Logging Flow No.31 Process No.2: 146100 to 146599 (23AB4H to 23CA7H) Data Logging Flow No.31 Process No.3: 146600 to 147099 (23CA8H to 23E9BH) Data Logging Flow No.31 Process No.4: 147100 to 147599 (23E9CH to 2408FH)		
147600 to 149599 (24090H to 2485FH)	System area			
149600 to 151599 (24860H to 2502FH)	Data Logging Flow No.32 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 (25600 to 26099 (6400H to 65F3H)) Data Logging Flow No.32 Process No.1: 149600 to 150099 (24860H to 24A53H) Data Logging Flow No.32 Process No.2: 150100 to 150599 (24A54H to 24C47H) Data Logging Flow No.32 Process No.3: 150600 to 151099 (24C48H to 24E3BH) Data Logging Flow No.32 Process No.4: 151100 to 151599 (24E3CH to 2502FH)		
151600 to 153599 (25030H to 257FFH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
153600 (25800H)	Data Diagnosis Flow No.1 Process No.1	Status	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
153601 (25801H)		Error code	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
153602 to 153604 (25802H to 25804H)		System area		
153605 to 153705 (25805H to 25869H)		Setting name	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
153706 (2586AH)		Problem function	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
153707 to 153771 (2586BH to 258ABH)		Data collector file name or IT gateway file name		
153772 to 153804 (258ACH to 258CCH)		Data collector name or IT gateway name		
153805 to 153869 (258CDH to 2590DH)		Developer name		
153870 (2590EH)		Data collector specification version (integer part) or IT gateway specification version (integer part)		
153871 (2590FH)		Data collector specification version (decimal part) or IT gateway specification version (decimal part)		
153872 to 153875 (25910H to 25913H)		Data collector version or IT gateway version		
153876 to 153929 (25914H to 25949H)		System area		
153930 to 154009 (2594AH to 25999H)		Information of each process only	☞ Process information of the data collection function ☞ Process information of the data modification function ☞ Process information of the data diagnosis function ☞ Process information of the feedback function	Reading
154010 to 154054 (2599AH to 259C6H)		Data storing information	☞ Data storing information	
154055 to 154099 (259C7H to 259F3H)		Data distribution information	☞ Data distribution information	

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
154100 to 156599 (259F4H to 263B7H)	Data Diagnosis Flow No.1 Process No.2 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.1 Process No.2: 154100 to 154599 (259F4H to 25BE7H) Data Diagnosis Flow No.1 Process No.3: 154600 to 155099 (25BE8H to 25DDBH) Data Diagnosis Flow No.1 Process No.4: 155100 to 155599 (25DDCH to 25FCFH) Data Diagnosis Flow No.1 Process No.5: 155600 to 156099 (25FD0H to 261C3H) Data Diagnosis Flow No.1 Process No.6: 156100 to 156599 (261C4H to 263B7H)		
156600 to 157599 (263B8H to 2679FH)	System area			
157600 to 160599 (267A0H to 27357H)	Data Diagnosis Flow No.2 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.2 Process No.1: 157600 to 158099 (267A0H to 26993H) Data Diagnosis Flow No.2 Process No.2: 158100 to 158599 (26994H to 26B87H) Data Diagnosis Flow No.2 Process No.3: 158600 to 159099 (26B88H to 26D7BH) Data Diagnosis Flow No.2 Process No.4: 159100 to 159599 (26D7CH to 26F6FH) Data Diagnosis Flow No.2 Process No.5: 159600 to 160099 (26F70H to 27163H) Data Diagnosis Flow No.2 Process No.6: 160100 to 160599 (27164H to 27357H)		
160600 to 161599 (27358H to 2773FH)	System area			
161600 to 164599 (27740H to 282F7H)	Data Diagnosis Flow No.3 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.3 Process No.1: 161600 to 162099 (27740H to 27933H) Data Diagnosis Flow No.3 Process No.2: 162100 to 162599 (27934H to 27B27H) Data Diagnosis Flow No.3 Process No.3: 162600 to 163099 (27B28H to 27D1BH) Data Diagnosis Flow No.3 Process No.4: 163100 to 163599 (27D1CH to 27F0FH) Data Diagnosis Flow No.3 Process No.5: 163600 to 164099 (27F10H to 28103H) Data Diagnosis Flow No.3 Process No.6: 164100 to 164599 (28104H to 282F7H)		
164600 to 165599 (282F8H to 286DFH)	System area			
165600 to 168599 (286E0H to 29297H)	Data Diagnosis Flow No.4 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.4 Process No.1: 165600 to 166099 (286E0H to 288D3H) Data Diagnosis Flow No.4 Process No.2: 166100 to 166599 (288D4H to 28AC7H) Data Diagnosis Flow No.4 Process No.3: 166600 to 167099 (28AC8H to 28CBBH) Data Diagnosis Flow No.4 Process No.4: 167100 to 167599 (28CBCH to 28EAFH) Data Diagnosis Flow No.4 Process No.5: 167600 to 168099 (28EB0H to 290A3H) Data Diagnosis Flow No.4 Process No.6: 168100 to 168599 (290A4H to 29297H)		
168600 to 169599 (29298H to 2967FH)	System area			
169600 to 172599 (29680H to 2A237H)	Data Diagnosis Flow No.5 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.5 Process No.1: 169600 to 170099 (29680H to 29873H) Data Diagnosis Flow No.5 Process No.2: 170100 to 170599 (29874H to 29A67H) Data Diagnosis Flow No.5 Process No.3: 170600 to 171099 (29A68H to 29C5BH) Data Diagnosis Flow No.5 Process No.4: 171100 to 171599 (29C5CH to 29E4FH) Data Diagnosis Flow No.5 Process No.5: 171600 to 172099 (29E50H to 2A043H) Data Diagnosis Flow No.5 Process No.6: 172100 to 172599 (2A044H to 2A237H)		
172600 to 173599 (2A238H to 2A61FH)	System area			
173600 to 176599 (2A620H to 2B1D7H)	Data Diagnosis Flow No.6 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.6 Process No.1: 173600 to 174099 (2A620H to 2A813H) Data Diagnosis Flow No.6 Process No.2: 174100 to 174599 (2A814H to 2AA07H) Data Diagnosis Flow No.6 Process No.3: 174600 to 175099 (2AA08H to 2ABFBH) Data Diagnosis Flow No.6 Process No.4: 175100 to 175599 (2ABFCH to 2ADEFH) Data Diagnosis Flow No.6 Process No.5: 175600 to 176099 (2ADF0H to 2AFE3H) Data Diagnosis Flow No.6 Process No.6: 176100 to 176599 (2AFE4H to 2B1D7H)		
176600 to 177599 (2B1D8H to 2B5BFH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
177600 to 180599 (2B5C0H to 2C177H)	Data Diagnosis Flow No.7 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.7 Process No.1: 177600 to 178099 (2B5C0H to 2B7B3H) Data Diagnosis Flow No.7 Process No.2: 178100 to 178599 (2B7B4H to 2B9A7H) Data Diagnosis Flow No.7 Process No.3: 178600 to 179099 (2B9A8H to 2BB9BH) Data Diagnosis Flow No.7 Process No.4: 179100 to 179599 (2BB9CH to 2BD8FH) Data Diagnosis Flow No.7 Process No.5: 179600 to 180099 (2BD90H to 2BF83H) Data Diagnosis Flow No.7 Process No.6: 180100 to 180599 (2BF84H to 2C177H)		
180600 to 181599 (2C178H to 2C55FH)	System area			
181600 to 184599 (2C560H to 2D117H)	Data Diagnosis Flow No.8 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.8 Process No.1: 181600 to 182099 (2C560H to 2C753H) Data Diagnosis Flow No.8 Process No.2: 182100 to 182599 (2C754H to 2C947H) Data Diagnosis Flow No.8 Process No.3: 182600 to 183099 (2C948H to 2CB3BH) Data Diagnosis Flow No.8 Process No.4: 183100 to 183599 (2CB3CH to 2CD2FH) Data Diagnosis Flow No.8 Process No.5: 183600 to 184099 (2CD30H to 2CF23H) Data Diagnosis Flow No.8 Process No.6: 184100 to 184599 (2CF24H to 2D117H)		
184600 to 185599 (2D118H to 2D4FFH)	System area			
185600 to 188599 (2D500H to 2E0B7H)	Data Diagnosis Flow No.9 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.9 Process No.1: 185600 to 186099 (2D500H to 2D6F3H) Data Diagnosis Flow No.9 Process No.2: 186100 to 186599 (2D6F4H to 2D8E7H) Data Diagnosis Flow No.9 Process No.3: 186600 to 187099 (2D8E8H to 2DADBH) Data Diagnosis Flow No.9 Process No.4: 187100 to 187599 (2DADCH to 2DCCFH) Data Diagnosis Flow No.9 Process No.5: 187600 to 188099 (2DCD0H to 2DEC3H) Data Diagnosis Flow No.9 Process No.6: 188100 to 188599 (2DEC4H to 2E0B7H)		
188600 to 189599 (2E0B8H to 2E49FH)	System area			
189600 to 192599 (2E4A0H to 2F057H)	Data Diagnosis Flow No.10 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.10 Process No.1: 189600 to 190099 (2E4A0H to 2E693H) Data Diagnosis Flow No.10 Process No.2: 190100 to 190599 (2E694H to 2E887H) Data Diagnosis Flow No.10 Process No.3: 190600 to 191099 (2E888H to 2EA7BH) Data Diagnosis Flow No.10 Process No.4: 191100 to 191599 (2EA7CH to 2EC6FH) Data Diagnosis Flow No.10 Process No.5: 191600 to 192099 (2EC70H to 2EE63H) Data Diagnosis Flow No.10 Process No.6: 192100 to 192599 (2EE64H to 2F057H)		
192600 to 193599 (2F058H to 2F43FH)	System area			
193600 to 196599 (2F440H to 2FFF7H)	Data Diagnosis Flow No.11 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.11 Process No.1: 193600 to 194099 (2F440H to 2F633H) Data Diagnosis Flow No.11 Process No.2: 194100 to 194599 (2F634H to 2F827H) Data Diagnosis Flow No.11 Process No.3: 194600 to 195099 (2F828H to 2FA1BH) Data Diagnosis Flow No.11 Process No.4: 195100 to 195599 (2FA1CH to 2FC0FH) Data Diagnosis Flow No.11 Process No.5: 195600 to 196099 (2FC10H to 2FE03H) Data Diagnosis Flow No.11 Process No.6: 196100 to 196599 (2FE04H to 2FFF7H)		
196600 to 197599 (2FFF8H to 303DFH)	System area			
197600 to 200599 (303E0H to 30F97H)	Data Diagnosis Flow No.12 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.12 Process No.1: 197600 to 198099 (303E0H to 305D3H) Data Diagnosis Flow No.12 Process No.2: 198100 to 198599 (305D4H to 307C7H) Data Diagnosis Flow No.12 Process No.3: 198600 to 199099 (307C8H to 309BBH) Data Diagnosis Flow No.12 Process No.4: 199100 to 199599 (309BCH to 30BAFH) Data Diagnosis Flow No.12 Process No.5: 199600 to 200099 (30BB0H to 30DA3H) Data Diagnosis Flow No.12 Process No.6: 200100 to 200599 (30DA4H to 30F97H)		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
200600 to 201599 (30F98H to 3137FH)	System area			
201600 to 204599 (31380H to 31F37H)	Data Diagnosis Flow No.13 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.13 Process No.1: 201600 to 202099 (31380H to 31573H) Data Diagnosis Flow No.13 Process No.2: 202100 to 202599 (31574H to 31767H) Data Diagnosis Flow No.13 Process No.3: 202600 to 203099 (31768H to 3195BH) Data Diagnosis Flow No.13 Process No.4: 203100 to 203599 (3195CH to 31B4FH) Data Diagnosis Flow No.13 Process No.5: 203600 to 204099 (31B50H to 31D43H) Data Diagnosis Flow No.13 Process No.6: 204100 to 204599 (31D44H to 31F37H)		
204600 to 205599 (31F38H to 3231FH)	System area			
205600 to 208599 (32320H to 32ED7H)	Data Diagnosis Flow No.14 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.14 Process No.1: 205600 to 206099 (32320H to 32513H) Data Diagnosis Flow No.14 Process No.2: 206100 to 206599 (32514H to 32707H) Data Diagnosis Flow No.14 Process No.3: 206600 to 207099 (32708H to 328FBH) Data Diagnosis Flow No.14 Process No.4: 207100 to 207599 (328FCH to 32AEFH) Data Diagnosis Flow No.14 Process No.5: 207600 to 208099 (32AF0H to 32CE3H) Data Diagnosis Flow No.14 Process No.6: 208100 to 208599 (32CE4H to 32ED7H)		
208600 to 209599 (32ED8H to 332BFH)	System area			
209600 to 212599 (332C0H to 33E77H)	Data Diagnosis Flow No.15 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.15 Process No.1: 209600 to 210099 (332C0H to 334B3H) Data Diagnosis Flow No.15 Process No.2: 210100 to 210599 (334B4H to 336A7H) Data Diagnosis Flow No.15 Process No.3: 210600 to 211099 (336A8H to 3389BH) Data Diagnosis Flow No.15 Process No.4: 211100 to 211599 (3389CH to 33A8FH) Data Diagnosis Flow No.15 Process No.5: 211600 to 212099 (33A90H to 33C83H) Data Diagnosis Flow No.15 Process No.6: 212100 to 212599 (33C84H to 33E77H)		
212600 to 213599 (33E78H to 3425FH)	System area			
213600 to 216599 (34260H to 34E17H)	Data Diagnosis Flow No.16 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.16 Process No.1: 213600 to 214099 (34260H to 34453H) Data Diagnosis Flow No.16 Process No.2: 214100 to 214599 (34454H to 34647H) Data Diagnosis Flow No.16 Process No.3: 214600 to 215099 (34648H to 3483BH) Data Diagnosis Flow No.16 Process No.4: 215100 to 215599 (3483CH to 34A2FH) Data Diagnosis Flow No.16 Process No.5: 215600 to 216099 (34A30H to 34C23H) Data Diagnosis Flow No.16 Process No.6: 216100 to 216599 (34C24H to 34E17H)		
216600 to 217599 (34E18H to 351FFH)	System area			
217600 to 220599 (35200H to 35DB7H)	Data Diagnosis Flow No.17 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.17 Process No.1: 217600 to 218099 (35200H to 353F3H) Data Diagnosis Flow No.17 Process No.2: 218100 to 218599 (353F4H to 355E7H) Data Diagnosis Flow No.17 Process No.3: 218600 to 219099 (355E8H to 357DBH) Data Diagnosis Flow No.17 Process No.4: 219100 to 219599 (357DCH to 359CFH) Data Diagnosis Flow No.17 Process No.5: 219600 to 220099 (359D0H to 35BC3H) Data Diagnosis Flow No.17 Process No.6: 220100 to 220599 (35BC4H to 35DB7H)		
220600 to 221599 (35DB8H to 3619FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
221600 to 224599 (361A0H to 36D57H)	Data Diagnosis Flow No.18 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.18 Process No.1: 221600 to 222099 (361A0H to 36393H) Data Diagnosis Flow No.18 Process No.2: 222100 to 222599 (36394H to 36587H) Data Diagnosis Flow No.18 Process No.3: 222600 to 223099 (36588H to 3677BH) Data Diagnosis Flow No.18 Process No.4: 223100 to 223599 (3677CH to 3696FH) Data Diagnosis Flow No.18 Process No.5: 223600 to 224099 (36970H to 36B63H) Data Diagnosis Flow No.18 Process No.6: 224100 to 224599 (36B64H to 36D57H)		
224600 to 225599 (36D58H to 3713FH)	System area			
225600 to 228599 (37140H to 37CF7H)	Data Diagnosis Flow No.19 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.19 Process No.1: 225600 to 226099 (37140H to 37333H) Data Diagnosis Flow No.19 Process No.2: 226100 to 226599 (37334H to 37527H) Data Diagnosis Flow No.19 Process No.3: 226600 to 227099 (37528H to 3771BH) Data Diagnosis Flow No.19 Process No.4: 227100 to 227599 (3771CH to 3790FH) Data Diagnosis Flow No.19 Process No.5: 227600 to 228099 (37910H to 37B03H) Data Diagnosis Flow No.19 Process No.6: 228100 to 228599 (37B04H to 37CF7H)		
228600 to 229599 (37CF8H to 380DFH)	System area			
229600 to 232599 (380E0H to 38C97H)	Data Diagnosis Flow No.20 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.20 Process No.1: 229600 to 230099 (380E0H to 382D3H) Data Diagnosis Flow No.20 Process No.2: 230100 to 230599 (382D4H to 384C7H) Data Diagnosis Flow No.20 Process No.3: 230600 to 231099 (384C8H to 386BBH) Data Diagnosis Flow No.20 Process No.4: 231100 to 231599 (386BCH to 388AFH) Data Diagnosis Flow No.20 Process No.5: 231600 to 232099 (388B0H to 38AA3H) Data Diagnosis Flow No.20 Process No.6: 232100 to 232599 (38AA4H to 38C97H)		
232600 to 233599 (38C98H to 3907FH)	System area			
233600 to 236599 (39080H to 39C37H)	Data Diagnosis Flow No.21 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.21 Process No.1: 233600 to 234099 (39080H to 39273H) Data Diagnosis Flow No.21 Process No.2: 234100 to 234599 (39274H to 39467H) Data Diagnosis Flow No.21 Process No.3: 234600 to 235099 (39468H to 3965BH) Data Diagnosis Flow No.21 Process No.4: 235100 to 235599 (3965CH to 3984FH) Data Diagnosis Flow No.21 Process No.5: 235600 to 236099 (39850H to 39A43H) Data Diagnosis Flow No.21 Process No.6: 236100 to 236599 (39A44H to 39C37H)		
236600 to 237599 (39C38H to 3A01FH)	System area			
237600 to 240599 (3A020H to 3ABD7H)	Data Diagnosis Flow No.22 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.22 Process No.1: 237600 to 238099 (3A020H to 3A213H) Data Diagnosis Flow No.22 Process No.2: 238100 to 238599 (3A214H to 3A407H) Data Diagnosis Flow No.22 Process No.3: 238600 to 239099 (3A408H to 3A5FBH) Data Diagnosis Flow No.22 Process No.4: 239100 to 239599 (3A5FCH to 3A7EFH) Data Diagnosis Flow No.22 Process No.5: 239600 to 240099 (3A7F0H to 3A9E3H) Data Diagnosis Flow No.22 Process No.6: 240100 to 240599 (3A9E4H to 3ABD7H)		
240600 to 241599 (3ABD8H to 3AFBFH)	System area			
241600 to 244599 (3AFC0H to 3BB77H)	Data Diagnosis Flow No.23 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.23 Process No.1: 241600 to 242099 (3AFC0H to 3B1B3H) Data Diagnosis Flow No.23 Process No.2: 242100 to 242599 (3B1B4H to 3B3A7H) Data Diagnosis Flow No.23 Process No.3: 242600 to 243099 (3B3A8H to 3B59BH) Data Diagnosis Flow No.23 Process No.4: 243100 to 243599 (3B59CH to 3B78FH) Data Diagnosis Flow No.23 Process No.5: 243600 to 244099 (3B790H to 3B983H) Data Diagnosis Flow No.23 Process No.6: 244100 to 244599 (3B984H to 3BB77H)		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
244600 to 245599 (3BB78H to 3BF5FH)	System area			
245600 to 248599 (3BF60H to 3CB17H)	Data Diagnosis Flow No.24 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.24 Process No.1: 245600 to 246099 (3BF60H to 3C153H) Data Diagnosis Flow No.24 Process No.2: 246100 to 246599 (3C154H to 3C347H) Data Diagnosis Flow No.24 Process No.3: 246600 to 247099 (3C348H to 3C53BH) Data Diagnosis Flow No.24 Process No.4: 247100 to 247599 (3C53CH to 3C72FH) Data Diagnosis Flow No.24 Process No.5: 247600 to 248099 (3C730H to 3C923H) Data Diagnosis Flow No.24 Process No.6: 248100 to 248599 (3C924H to 3CB17H)		
248600 to 249599 (3CB18H to 3CEFFH)	System area			
249600 to 252599 (3CF00H to 3DAB7H)	Data Diagnosis Flow No.25 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.25 Process No.1: 249600 to 250099 (3CF00H to 3D0F3H) Data Diagnosis Flow No.25 Process No.2: 250100 to 250599 (3D0F4H to 3D2E7H) Data Diagnosis Flow No.25 Process No.3: 250600 to 251099 (3D2E8H to 3D4DBH) Data Diagnosis Flow No.25 Process No.4: 251100 to 251599 (3D4DCH to 3D6CFH) Data Diagnosis Flow No.25 Process No.5: 251600 to 252099 (3D6D0H to 3D8C3H) Data Diagnosis Flow No.25 Process No.6: 252100 to 252599 (3D8C4H to 3DAB7H)		
252600 to 253599 (3DAB8H to 3DE9FH)	System area			
253600 to 256599 (3DEA0H to 3EA57H)	Data Diagnosis Flow No.26 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.26 Process No.1: 253600 to 254099 (3DEA0H to 3E093H) Data Diagnosis Flow No.26 Process No.2: 254100 to 254599 (3E094H to 3E287H) Data Diagnosis Flow No.26 Process No.3: 254600 to 255099 (3E288H to 3E47BH) Data Diagnosis Flow No.26 Process No.4: 255100 to 255599 (3E47CH to 3E66FH) Data Diagnosis Flow No.26 Process No.5: 255600 to 256099 (3E670H to 3E863H) Data Diagnosis Flow No.26 Process No.6: 256100 to 256599 (3E864H to 3EA57H)		
256600 to 257599 (3EA58H to 3EE3FH)	System area			
257600 to 260599 (3EE40H to 3F9F7H)	Data Diagnosis Flow No.27 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.27 Process No.1: 257600 to 258099 (3EE40H to 3F033H) Data Diagnosis Flow No.27 Process No.2: 258100 to 258599 (3F034H to 3F227H) Data Diagnosis Flow No.27 Process No.3: 258600 to 259099 (3F228H to 3F41BH) Data Diagnosis Flow No.27 Process No.4: 259100 to 259599 (3F41CH to 3F60FH) Data Diagnosis Flow No.27 Process No.5: 259600 to 260099 (3F610H to 3F803H) Data Diagnosis Flow No.27 Process No.6: 260100 to 260599 (3F804H to 3F9F7H)		
260600 to 261599 (3F9F8H to 3FDDFH)	System area			
261600 to 264599 (3FDE0H to 40997H)	Data Diagnosis Flow No.28 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.28 Process No.1: 261600 to 262099 (3FDE0H to 3FFD3H) Data Diagnosis Flow No.28 Process No.2: 262100 to 262599 (3FFD4H to 401C7H) Data Diagnosis Flow No.28 Process No.3: 262600 to 263099 (401C8H to 403BBH) Data Diagnosis Flow No.28 Process No.4: 263100 to 263599 (403BCH to 405AFH) Data Diagnosis Flow No.28 Process No.5: 263600 to 264099 (405B0H to 407A3H) Data Diagnosis Flow No.28 Process No.6: 264100 to 264599 (407A4H to 40997H)		
264600 to 265599 (40998H to 40D7FH)	System area			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
265600 to 268599 (40D80H to 41937H)	Data Diagnosis Flow No.29 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.29 Process No.1: 265600 to 266099 (40D80H to 40F73H) Data Diagnosis Flow No.29 Process No.2: 266100 to 266599 (40F74H to 41167H) Data Diagnosis Flow No.29 Process No.3: 266600 to 267099 (41168H to 4135BH) Data Diagnosis Flow No.29 Process No.4: 267100 to 267599 (4135CH to 4154FH) Data Diagnosis Flow No.29 Process No.5: 267600 to 268099 (41550H to 41743H) Data Diagnosis Flow No.29 Process No.6: 268100 to 268599 (41744H to 41937H)		
268600 to 269599 (41938H to 41D1FH)	System area			
269600 to 272599 (41D20H to 428D7H)	Data Diagnosis Flow No.30 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.30 Process No.1: 269600 to 270099 (41D20H to 41F13H) Data Diagnosis Flow No.30 Process No.2: 270100 to 270599 (41F14H to 42107H) Data Diagnosis Flow No.30 Process No.3: 270600 to 271099 (42108H to 422FBH) Data Diagnosis Flow No.30 Process No.4: 271100 to 271599 (422FCH to 424EFH) Data Diagnosis Flow No.30 Process No.5: 271600 to 272099 (424F0H to 426E3H) Data Diagnosis Flow No.30 Process No.6: 272100 to 272599 (426E4H to 428D7H)		
272600 to 273599 (428D8H to 42CBFH)	System area			
273600 to 276599 (42CC0H to 43877H)	Data Diagnosis Flow No.31 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.31 Process No.1: 273600 to 274099 (42CC0H to 42EB3H) Data Diagnosis Flow No.31 Process No.2: 274100 to 274599 (42EB4H to 430A7H) Data Diagnosis Flow No.31 Process No.3: 274600 to 275099 (430A8H to 4329BH) Data Diagnosis Flow No.31 Process No.4: 275100 to 275599 (4329CH to 4348FH) Data Diagnosis Flow No.31 Process No.5: 275600 to 276099 (43490H to 43683H) Data Diagnosis Flow No.31 Process No.6: 276100 to 276599 (43684H to 43877H)		
276600 to 277599 (43878H to 43C5FH)	System area			
277600 to 280599 (43C60H to 44817H)	Data Diagnosis Flow No.32 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099 (25800H to 259F3H)) Data Diagnosis Flow No.32 Process No.1: 277600 to 278099 (43C60H to 43E53H) Data Diagnosis Flow No.32 Process No.2: 278100 to 278599 (43E54H to 44047H) Data Diagnosis Flow No.32 Process No.3: 278600 to 279099 (44048H to 4423BH) Data Diagnosis Flow No.32 Process No.4: 279100 to 279599 (4423CH to 4442FH) Data Diagnosis Flow No.32 Process No.5: 279600 to 280099 (44430H to 44623H) Data Diagnosis Flow No.32 Process No.6: 280100 to 280599 (44624H to 44817H)		
280600 to 289999 (44818H to 46CCFH)	System area			
290000 (46CD0H)	Error Log Information	Number of error occurrences	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
290001 (46CD1H)		Latest error log number		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
290002 (46CD2H)	Error Log 1	Error code (error log 1)	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)[*1] • When switching the operating status of a process flow (switching any of the process flows to RUN while all the process flows are STOP)[*2]	Reading
290003 to 290004 (46CD3H to 46CD4H)		System area		
290005 to 290012 (46CD5H to 46CDCH)		Error occurrence date and time (error log 1)	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)[*1] • When switching the operating status of a process flow (switching any of the process flows to RUN while all the process flows are STOP)[*2]	Reading
290013 (46CDDH)		Problem function		
290014 to 290078 (46CDEH to 46D1EH)		Data collector file name or IT gateway file name		
290079 to 290111 (46D1FH to 46D3FH)		Data collector name or IT gateway name		
290112 to 290176 (46D40H to 46D80H)		Developer name		
290177 (46D81H)		Data collector specification version (integer part) or IT gateway specification version (integer part)		
290178 (46D82H)		Data collector specification version (decimal part) or IT gateway specification version (decimal part)		
290179 to 290182 (46D83H to 46D86H)		Data collector version or IT gateway version		
290183 to 290251 (46D87H to 46DCBH)		System area		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
290252 to 290501 (46DCCH to 46EC5H)	Error Log 2	Same as Error Log 1 (290002 to 290251 (46CD2H to 46DCBH))		
290502 to 290751 (46EC6H to 46FBFH)	Error Log 3			
290752 to 291001 (46FC0H to 470B9H)	Error Log 4			
291002 to 291251 (470BAH to 471B3H)	Error Log 5			
291252 to 291501 (471B4H to 472ADH)	Error Log 6			
291502 to 291751 (472AEH to 473A7H)	Error Log 7			
291752 to 292001 (473A8H to 474A1H)	Error Log 8			
292002 to 292251 (474A2H to 4759BH)	Error Log 9			
292252 to 292501 (4759CH to 47695H)	Error Log 10			
292502 to 292751 (47696H to 4778FH)	Error Log 11			
292752 to 293001 (47790H to 47889H)	Error Log 12			
293002 to 293251 (4788AH to 47983H)	Error Log 13			
293252 to 293501 (47984H to 47A7DH)	Error Log 14			
293502 to 293751 (47A7EH to 47B77H)	Error Log 15			
293752 to 294001 (47B78H to 47C71H)	Error Log 16			
294002 to 294251 (47C72H to 47D6BH)	Error Log 17			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
294252 to 294501 (47D6CH to 47E65H)	Error Log 18	Same as Error Log 1 (290002 to 290251 (46CD2H to 46DCBH))		
294502 to 294751 (47E66H to 47F5FH)	Error Log 19			
294752 to 295001 (47F60H to 48059H)	Error Log 20			
295002 to 295251 (4805AH to 48153H)	Error Log 21			
295252 to 295501 (48154H to 4824DH)	Error Log 22			
295502 to 295751 (4824EH to 48347H)	Error Log 23			
295752 to 296001 (48348H to 48441H)	Error Log 24			
296002 to 296251 (48442H to 4853BH)	Error Log 25			
296252 to 296501 (4853CH to 48635H)	Error Log 26			
296502 to 296751 (48636H to 4872FH)	Error Log 27			
296752 to 297001 (48730H to 48829H)	Error Log 28			
297002 to 297251 (4882AH to 48923H)	Error Log 29			
297252 to 297501 (48924H to 48A1DH)	Error Log 30			
297502 to 297751 (48A1EH to 48B17H)	Error Log 31			
297752 to 298001 (48B18H to 48C11H)	Error Log 32			
298002 to 298251 (48C12H to 48D0BH)	Error Log 33			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
298252 to 298501 (48D0CH to 48E05H)	Error Log 34	Same as Error Log 1 (290002 to 290251 (46CD2H to 46DCBH))		
298502 to 298751 (48E06H to 48EFFH)	Error Log 35			
298752 to 299001 (48F00H to 48FF9H)	Error Log 36			
299002 to 299251 (48FFAH to 490F3H)	Error Log 37			
299252 to 299501 (490F4H to 491EDH)	Error Log 38			
299502 to 299751 (491EEH to 492E7H)	Error Log 39			
299752 to 300001 (492E8H to 493E1H)	Error Log 40			
300002 to 300251 (493E2H to 494DBH)	Error Log 41			
300252 to 300501 (494DCH to 495D5H)	Error Log 42			
300502 to 300751 (495D6H to 496CFH)	Error Log 43			
300752 to 301001 (496D0H to 497C9H)	Error Log 44			
301002 to 301251 (497CAH to 498C3H)	Error Log 45			
301252 to 301501 (498C4H to 499BDH)	Error Log 46			
301502 to 301751 (499BEH to 49AB7H)	Error Log 47			
301752 to 302001 (49AB8H to 49BB1H)	Error Log 48			
302002 to 302251 (49BB2H to 49CABH)	Error Log 49			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
302252 to 302501 (49CACH to 49DA5H)	Error Log 50	Same as Error Log 1 (290002 to 290251 (46CD2H to 46DCBH))		
302502 to 302751 (49DA6H to 49E9FH)	Error Log 51			
302752 to 303001 (49EA0H to 49F99H)	Error Log 52			
303002 to 303251 (49F9AH to 4A093H)	Error Log 53			
303252 to 303501 (4A094H to 4A18DH)	Error Log 54			
303502 to 303751 (4A18EH to 4A287H)	Error Log 55			
303752 to 304001 (4A288H to 4A381H)	Error Log 56			
304002 to 304251 (4A382H to 4A47BH)	Error Log 57			
304252 to 304501 (4A47CH to 4A575H)	Error Log 58			
304502 to 304751 (4A576H to 4A66FH)	Error Log 59			
304752 to 305001 (4A670H to 4A769H)	Error Log 60			
305002 to 305251 (4A76AH to 4A863H)	Error Log 61			
305252 to 305501 (4A864H to 4A95DH)	Error Log 62			
305502 to 305751 (4A95EH to 4AA57H)	Error Log 63			
305752 to 306001 (4AA58H to 4AB51H)	Error Log 64			
306002 to 399999 (4AB52H to 61A7FH)	System area			

[1] The log of an error occurred in a process flow with its operating status switched is cleared.
Then, the remaining error logs are stored again in order of registration from 'Error log 1' and the number of the last registered error log is stored in 'Latest error log number.'

[2] The log of an error occurred in a location other than a process flow is cleared.
Then, the remaining error logs are stored again in order of registration from 'Error log 1' and the number of the last registered error log is stored in 'Latest error log number.'

Data collector area

The following table shows the Real-time Flow Manager status list in the data collector area (400000 to 409799).

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
400000 to 400099 (61A80H to 61AE3H)	System area			
400100 (61AE4H)	Target Device No.1	Setting enable flag	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
400101 (61AE5H)		Connection status	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	
400102 (61AE6H)		Error code	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
400103 (61AE7H)		Problem function		
400104 to 400168 (61AE8H to 61B28H)		Data collector file name		
400169 to 400201 (61B29H to 61B49H)		Data collector name		
400202 to 400266 (61B4AH to 61B8AH)		Developer name		
400267 (61B8BH)		Data collector specification version (integer part)		
400268 (61B8CH)		Data collector specification version (decimal part)		
400269 to 400272 (61B8DH to 61B90H)		Data collector version		
400273 to 400399 (61B91H to 61C0FH)		System area		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
400400 to 400699 (61C10H to 61D3BH)	Target Device No.2	Same as Target Device No.1 (400100 to 400399 (61AE4H to 61C0FH))		
400700 to 400999 (61D3CH to 61E67H)	Target Device No.3			
401000 to 401299 (61E68H to 61F93H)	Target Device No.4			
401300 to 401599 (61F94H to 620BFH)	Target Device No.5			
401600 to 401899 (620C0H to 621EBH)	Target Device No.6			
401900 to 402199 (621ECH to 62317H)	Target Device No.7			
402200 to 402499 (62318H to 62443H)	Target Device No.8			
402500 to 402799 (62444H to 6256FH)	Target Device No.9			
402800 to 403099 (62570H to 6269BH)	Target Device No.10			
403100 to 403399 (6269CH to 627C7H)	Target Device No.11			
403400 to 403699 (627C8H to 628F3H)	Target Device No.12			
403700 to 403999 (628F4H to 62A1FH)	Target Device No.13			
404000 to 404299 (62A20H to 62B4BH)	Target Device No.14			
404300 to 404599 (62B4CH to 62C77H)	Target Device No.15			
404600 to 404899 (62C78H to 62DA3H)	Target Device No.16			
404900 to 405199 (62DA4H to 62ECFH)	Target Device No.17			

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
405200 to 405499 (62ED0H to 62FFBH)	Target Device No.18	Same as Target Device No.1 (400100 to 400399 (61AE4H to 61C0FH))		
405500 to 405799 (62FFCH to 63127H)	Target Device No.19			
405800 to 406099 (63128H to 63253H)	Target Device No.20			
406100 to 406399 (63254H to 6337FH)	Target Device No.21			
406400 to 406699 (63380H to 634ABH)	Target Device No.22			
406700 to 406999 (634ACH to 635D7H)	Target Device No.23			
407000 to 407299 (635D8H to 63703H)	Target Device No.24			
407300 to 407599 (63704H to 6382FH)	Target Device No.25			
407600 to 407899 (63830H to 6395BH)	Target Device No.26			
407900 to 408199 (6395CH to 63A87H)	Target Device No.27			
408200 to 408499 (63A88H to 63BB3H)	Target Device No.28			
408500 to 408799 (63BB4H to 63CDFH)	Target Device No.29			
408800 to 409099 (63CE0H to 63E0BH)	Target Device No.30			
409100 to 409399 (63E0CH to 63F37H)	Target Device No.31			
409400 to 409699 (63F38H to 64063H)	Target Device No.32			
409700 to 409799 (64064H to 640C7H)	System area			

IT gateway area

The following table shows the Real-time Flow Manager status list in the IT gateway area (409800 to 420999).

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
409800 (640C8H)	IT Gateway Diagnosis Information No.1	Setting enable flag	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager	Reading
409801 (640C9H)		Connection status	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	
409802 (640CAH)		Error code	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	
409803 (640CBH)		Problem function		
409804 to 409868 (640CCH to 6410CH)		IT gateway file name		
409869 to 409901 (6410DH to 6412DH)		IT gateway name		
409902 to 409966 (6412EH to 6416EH)		Developer name		
409967 (6416FH)		IT gateway specification version (integer part)		
409968 (64170H)		IT gateway specification version (decimal part)		
409969 to 409972 (64171H to 64174H)		IT gateway version		
409973 to 410006 (64175H to 64196H)		System area		
410007 (64197H)		IT gateway type	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)	Reading
410008 to 410099 (64198H to 641F3H)		System area		
410100 to 410103 (641F4H to 641F7H)		IT system connection status of Data Logging Flow No.1 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410104 to 410105 (641F8H to 641F9H)		System area		
410106 to 410109 (641FAH to 641FDH)		IT system connection status of Data Logging Flow No.2 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410110 to 410111 (641FEH to 641FFH)	IT Gateway Diagnosis Information No.1	System area		
410112 to 410115 (64200H to 64203H)		IT system connection status of Data Logging Flow No.3 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410116 to 410117 (64204H to 64205H)		System area		
410118 to 410121 (64206H to 64209H)		IT system connection status of Data Logging Flow No.4 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410122 to 410123 (6420AH to 6420BH)		System area		
410124 to 410127 (6420CH to 6420FH)		IT system connection status of Data Logging Flow No.5 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410128 to 410129 (64210H to 64211H)		System area		
410130 to 410133 (64212H to 64215H)		IT system connection status of Data Logging Flow No.6 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410134 to 410135 (64216H to 64217H)		System area		
410136 to 410139 (64218H to 6421BH)		IT system connection status of Data Logging Flow No.7 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410140 to 410141 (6421CH to 6421DH)		System area		
410142 to 410145 (6421EH to 64221H)		IT system connection status of Data Logging Flow No.8 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410146 to 410147 (64222H to 64223H)		System area		
410148 to 410151 (64224H to 64227H)		IT system connection status of Data Logging Flow No.9 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410152 to 410153 (64228H to 64229H)	IT Gateway Diagnosis Information No.1	System area		
410154 to 410157 (6422AH to 6422DH)		IT system connection status of Data Logging Flow No.10 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410158 to 410159 (6422EH to 6422FH)		System area		
410160 to 410163 (64230H to 64233H)		IT system connection status of Data Logging Flow No.11 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410164 to 410165 (64234H to 64235H)		System area		
410166 to 410169 (64236H to 64239H)		IT system connection status of Data Logging Flow No.12 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410170 to 410171 (6423AH to 6423BH)		System area		
410172 to 410175 (6423CH to 6423FH)		IT system connection status of Data Logging Flow No.13 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410176 to 410177 (64240H to 64241H)		System area		
410178 to 410181 (64242H to 64245H)		IT system connection status of Data Logging Flow No.14 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410182 to 410183 (64246H to 64247H)		System area		
410184 to 410187 (64248H to 6424BH)		IT system connection status of Data Logging Flow No.15 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410188 to 410189 (6424CH to 6424DH)		System area		
410190 to 410193 (6424EH to 64251H)		IT system connection status of Data Logging Flow No.16 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410194 to 410195 (64252H to 64253H)	IT Gateway Diagnosis Information No.1	System area		
410196 to 410199 (64254H to 64257H)		IT system connection status of Data Logging Flow No.17 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410200 to 410201 (64258H to 64259H)		System area		
410202 to 410205 (6425AH to 6425DH)		IT system connection status of Data Logging Flow No.18 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410206 to 410207 (6425EH to 6425FH)		System area		
410208 to 410211 (64260H to 64263H)		IT system connection status of Data Logging Flow No.19 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410212 to 410213 (64264H to 64265H)		System area		
410214 to 410217 (64266H to 64269H)		IT system connection status of Data Logging Flow No.20 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410218 to 410219 (6426AH to 6426BH)		System area		
410220 to 410223 (6426CH to 6426FH)		IT system connection status of Data Logging Flow No.21 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410224 to 410225 (64270H to 64271H)		System area		
410226 to 410229 (64272H to 64275H)		IT system connection status of Data Logging Flow No.22 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410230 to 410231 (64276H to 64277H)		System area		
410232 to 410235 (64278H to 6427BH)		IT system connection status of Data Logging Flow No.23 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410236 to 410237 (6427CH to 6427DH)	IT Gateway Diagnosis Information No.1	System area		
410238 to 410241 (6427EH to 64281H)		IT system connection status of Data Logging Flow No.24 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410242 to 410243 (64282H to 64283H)		System area		
410244 to 410247 (64284H to 64287H)		IT system connection status of Data Logging Flow No.25 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410248 to 410249 (64288H to 64289H)		System area		
410250 to 410253 (6428AH to 6428DH)		IT system connection status of Data Logging Flow No.26 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410254 to 410255 (6428EH to 6428FH)		System area		
410256 to 410259 (64290H to 64293H)		IT system connection status of Data Logging Flow No.27 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410260 to 410261 (64294H to 64295H)		System area		
410262 to 410265 (64296H to 64299H)		IT system connection status of Data Logging Flow No.28 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410266 to 410267 (6429AH to 6429BH)		System area		
410268 to 410271 (6429CH to 6429FH)		IT system connection status of Data Logging Flow No.29 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410272 to 410273 (642A0H to 642A1H)		System area		
410274 to 410277 (642A2H to 642A5H)		IT system connection status of Data Logging Flow No.30 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410278 to 410279 (642A6H to 642A7H)	IT Gateway Diagnosis Information No.1	System area		
410280 to 410283 (642A8H to 642ABH)		IT system connection status of Data Logging Flow No.31 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410284 to 410285 (642ACH to 642ADH)		System area		
410286 to 410289 (642AEH to 642B1H)		IT system connection status of Data Logging Flow No.32 Process No.1 to No.4	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410290 to 410291 (642B2H to 642B3H)		System area		
410292 to 410296 (642B4H to 642B8H)		IT system connection status of Data Diagnosis Flow No.1 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410297 (642B9H)		System area		
410298 to 410302 (642BAH to 642BEH)		IT system connection status of Data Diagnosis Flow No.2 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410303 (642BFH)		System area		
410304 to 410308 (642C0H to 642C4H)		IT system connection status of Data Diagnosis Flow No.3 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410309 (642C5H)		System area		
410310 to 410314 (642C6H to 642CAH)		IT system connection status of Data Diagnosis Flow No.4 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410315 (642CBH)		System area		
410316 to 410320 (642CCH to 642D0H)		IT system connection status of Data Diagnosis Flow No.5 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410321 (642D1H)	IT Gateway Diagnosis Information No.1	System area		
410322 to 410326 (642D2H to 642D6H)		IT system connection status of Data Diagnosis Flow No.6 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410327 (642D7H)		System area		
410328 to 410332 (642D8H to 642DCH)		IT system connection status of Data Diagnosis Flow No.7 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410333 (642DDH)		System area		
410334 to 410338 (642DEH to 642E2H)		IT system connection status of Data Diagnosis Flow No.8 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410339 (642E3H)		System area		
410340 to 410344 (642E4H to 642E8H)		IT system connection status of Data Diagnosis Flow No.9 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410345 (642E9H)		System area		
410346 to 410350 (642EAH to 642EEH)		IT system connection status of Data Diagnosis Flow No.10 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410351 (642EFH)		System area		
410352 to 410356 (642F0H to 642F4H)		IT system connection status of Data Diagnosis Flow No.11 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410357 (642F5H)		System area		
410358 to 410362 (642F6H to 642FAH)		IT system connection status of Data Diagnosis Flow No.12 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410363 (642FBH)		System area		
410364 to 410368 (642FCH to 64300H)		IT system connection status of Data Diagnosis Flow No.13 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410369 (64301H)		System area		
410370 to 410374 (64302H to 64306H)		IT system connection status of Data Diagnosis Flow No.14 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410375 (64307H)	IT Gateway Diagnosis Information No.1	System area		
410376 to 410380 (64308H to 6430CH)		IT system connection status of Data Diagnosis Flow No.15 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410381 (6430DH)		System area		
410382 to 410386 (6430EH to 64312H)		IT system connection status of Data Diagnosis Flow No.16 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410387 (64313H)		System area		
410388 to 410392 (64314H to 64318H)		IT system connection status of Data Diagnosis Flow No.17 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410393 (64319H)		System area		
410394 to 410398 (6431AH to 6431EH)		IT system connection status of Data Diagnosis Flow No.18 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410399 (6431FH)		System area		
410400 to 410404 (64320H to 64324H)		IT system connection status of Data Diagnosis Flow No.19 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410405 (64325H)		System area		
410406 to 410410 (64326H to 6432AH)		IT system connection status of Data Diagnosis Flow No.20 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410411 (6432BH)		System area		
410412 to 410416 (6432CH to 64330H)		IT system connection status of Data Diagnosis Flow No.21 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410417 (64331H)		System area		
410418 to 410422 (64332H to 64336H)		IT system connection status of Data Diagnosis Flow No.22 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410423 (64337H)		System area		
410424 to 410428 (64338H to 6433CH)		IT system connection status of Data Diagnosis Flow No.23 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410429 (6433DH)	IT Gateway Diagnosis Information No.1	System area		
410430 to 410434 (6433EH to 64342H)		IT system connection status of Data Diagnosis Flow No.24 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410435 (64343H)		System area		
410436 to 410440 (64344H to 64348H)		IT system connection status of Data Diagnosis Flow No.25 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410441 (64349H)		System area		
410442 to 410446 (6434AH to 6434EH)		IT system connection status of Data Diagnosis Flow No.26 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410447 (6434FH)		System area		
410448 to 410452 (64350H to 64354H)		IT system connection status of Data Diagnosis Flow No.27 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410453 (64355H)		System area		
410454 to 410458 (64356H to 6435AH)		IT system connection status of Data Diagnosis Flow No.28 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410459 (6435BH)		System area		
410460 to 410464 (6435CH to 64360H)		IT system connection status of Data Diagnosis Flow No.29 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410465 (64361H)		System area		
410466 to 410470 (64362H to 64366H)		IT system connection status of Data Diagnosis Flow No.30 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410471 (64367H)		System area		
410472 to 410476 (64368H to 6436CH)		IT system connection status of Data Diagnosis Flow No.31 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410477 (6436DH)		System area		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410478 to 410482 (6436EH to 64372H)	IT Gateway Diagnosis Information No.1	IT system connection status of Data Diagnosis Flow No.32 Process No.1 to No.5	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (RUN → STOP)	Reading
410483 to 410499 (64373H to 64383H)		System area		

Address in decimal (hexadecimal)	Category name	Name	Initialization timing	Reading or writing
410500 to 411199 (64384H to 6463FH)	IT Gateway Diagnosis Information No.2	Same as IT Gateway Diagnosis Information No.1 (409800 to 410499 (640C8H to 64383H))		
411200 to 411899 (64640H to 648FBH)	IT Gateway Diagnosis Information No.3			
411900 to 412599 (648FCH to 64BB7H)	IT Gateway Diagnosis Information No.4			
412600 to 413299 (64BB8H to 64E73H)	IT Gateway Diagnosis Information No.5			
413300 to 413999 (64E74H to 6512FH)	IT Gateway Diagnosis Information No.6			
414000 to 414699 (65130H to 653EBH)	IT Gateway Diagnosis Information No.7			
414700 to 415399 (653ECH to 656A7H)	IT Gateway Diagnosis Information No.8			
415400 to 416099 (656A8H to 65963H)	IT Gateway Diagnosis Information No.9			
416100 to 416799 (65964H to 65C1FH)	IT Gateway Diagnosis Information No.10			
416800 to 417499 (65C20H to 65EDBH)	IT Gateway Diagnosis Information No.11			
417500 to 418199 (65EDCH to 66197H)	IT Gateway Diagnosis Information No.12			
418200 to 418899 (66198H to 66453H)	IT Gateway Diagnosis Information No.13			
418900 to 419599 (66454H to 6670FH)	IT Gateway Diagnosis Information No.14			
419600 to 420299 (66710H to 669CBH)	IT Gateway Diagnosis Information No.15			
420300 to 420999 (669CCH to 66C87H)	IT Gateway Diagnosis Information No.16			

Real-time Flow Manager status details

The following shows the Real-time Flow Manager status details of Real-time Flow Manager.

Basic area

The following tables show the Real-time Flow Manager status details in the basic area (0 to 399999).

■Data Logging Flow No.1 (0 to 399) to No.32 (12400 to 12799)

Information of a data logging flow is stored.

Address	Name		Description
0	Data Logging Flow No.1	Status	The operating status of a data logging flow is stored. • 0: Not used • 1: STOP • 2: In transition to RUN • 3: RUN • 4: In transition to STOP
1		Error code	An error code is stored.
2 to 34		Setting name	A setting name is stored.
35 to 135		Error occurrence process name	The name of a process in which an error occurred is stored. (If there are multiple process names, the latest one is stored.) However, if an error not related to a process occurs, it will be blank.
136		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector • 2: IT gateway If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
137 to 201		Data collector file name or IT gateway file name	The file name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
202 to 234		Data collector name or IT gateway name	The data collector name of a data collector or the IT gateway name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
235 to 299		Developer name	The developer name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
300		Data collector specification version (integer part) or IT gateway specification version (integer part)	The specification version (integer part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
301		Data collector specification version (decimal part) or IT gateway specification version (decimal part)	The specification version (decimal part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
302 to 305		Data collector version or IT gateway version	The data collector version of a data collector or the IT gateway version of an IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
306 to 337		System area	
338		Process data buffer usage rate	The buffer usage rate in a process of the data logging flow is stored.[1] Range: 0 to 100 [unit: %] (Digits after the decimal point are rounded up.)
339 to 353		System area	
354 to 355		Number of times of data missing[2]	The number of times of data missing that occurs while the data logging flow is running is stored. (When the number of times of data missing reaches the upper limit, a value of the upper limit is stored.)
356		Last data collection time (year)[2][3]	The year of the time (UTC) of last data collection from a data collector is stored.
357		Last data collection time (month · day)[2][3]	The month/day of the time (UTC) of last data collection from a data collector is stored. (Example) December 3rd → 1203 (decimal)
358		Last data collection time (hour · minute)[2][3]	The hour/minute of the time (UTC) of last data collection from a data collector is stored. (Example) 12:34 → 1234 (decimal)
359		Last data collection time (second · millisecond)[2][3]	The second/millisecond of the time (UTC) of last data collection from a data collector is stored. (Example) 56.789 → 56789 (decimal)
360 to 399		System area	

Address	Name	Description
400 to 799	Data Logging Flow No.2	Same as Data Logging Flow No.1 (0 to 399)
⋮	⋮	
12400 to 12799	Data Logging Flow No.32	Same as Data Logging Flow No.1 (0 to 399)

*1 The value is updated every one second.

*2 Not updated when only data collection is set in a data logging flow (excluding when using CSV File Data collector).

*3 Updated with the time of last data collection from a data collector, regardless of whether data missing occurs.

■Data Diagnosis Flow No.1 (12800 to 13199) to No.32 (25200 to 25599)

Information of a data diagnosis flow is stored.

Address	Name		Description
12800	Data Diagnosis Flow No.1	Status	The operating status of a data diagnosis flow is stored. • 0: Not used • 1: STOP • 2: In transition to RUN • 3: RUN • 4: In transition to STOP
12801		Error code	An error code is stored.
12802 to 12834		Setting name	A setting name is stored.
12835 to 12935		Error occurrence process name	The name of a process in which an error occurred is stored. (If there are multiple process names, the latest one is stored.) However, if an error not related to a process occurs, it will be blank.
12936		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector • 2: IT gateway If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
12937 to 13001		Data collector file name or IT gateway file name	The file name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13002 to 13034		Data collector name or IT gateway name	The data collector name of a data collector or the IT gateway name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13035 to 13099		Developer name	The developer name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13100		Data collector specification version (integer part) or IT gateway specification version (integer part)	The specification version (integer part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13101		Data collector specification version (decimal part) or IT gateway specification version (decimal part)	The specification version (decimal part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13102 to 13105		Data collector version or IT gateway version	The data collector version of a data collector or the IT gateway version of an IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
13106 to 13137		System area	
13138		Process data buffer usage rate	The buffer usage rate in a process of the data diagnosis flow is stored.[*1] Range: 0 to 100 [unit: %] (Digits after the decimal point are rounded up.)
13139 to 13153		System area	
13154 to 13155		Number of times of data missing	The number of times of data missing that occurs while the data diagnosis flow is running is stored. (When the number of times of data missing reaches the upper limit, a value of the upper limit is stored.)
13156		Last data collection time (year)[*2]	The year of the time (UTC) of last data collection from a data collector is stored.
13157		Last data collection time (month · day)[*2]	The month/day of the time (UTC) of last data collection from a data collector is stored. (Example) December 3rd → 1203 (decimal)
13158		Last data collection time (hour · minute)[*2]	The hour/minute of the time (UTC) of last data collection from a data collector is stored. (Example) 12:34 → 1234 (decimal)
13159		Last data collection time (second · millisecond)[*2]	The second/millisecond of the time (UTC) of last data collection from a data collector is stored. (Example) 56.789 → 56789 (decimal)
13160 to 13199		System area	

Address	Name	Description
13200 to 13599	Data Diagnosis Flow No.2	Same as Data Diagnosis Flow No.1 (12800 to 13199)
⋮	⋮	
25200 to 25599	Data Diagnosis Flow No.32	Same as Data Diagnosis Flow No.1 (12800 to 13199)

*1 The value is updated every one second.

*2 Updated with the time of last data collection from a data collector, regardless of whether data missing occurs.

■Data Logging Flow No.1 Process No.1 (25600 to 26099) to Data Logging Flow No.32 Process No.4 (151100 to 151599)

Process information of a data logging flow is stored.

The process number of each flow corresponds to the number in the "Data Logging Flow Setting" screen. Process No.3 and No.4 are added when a row is added in the "Data Logging Flow Setting" screen. (☞ Page 130 Data Logging Flow Setting)

Address	Name		Description
25600	Data Logging Flow No.1 Process No.1	Status	The operating status of a process is stored. • 0: Not used • 1: STOP • 2: In transition to RUN • 3: RUN • 4: In transition to STOP
25601		Error code	An error code is stored.
25602 to 25604		System area	
25605 to 25705		Setting name	A setting name is stored.
25706		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector • 2: IT gateway If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
25707 to 25771		Data collector file name or IT gateway file name	The file name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25772 to 25804		Data collector name or IT gateway name	The data collector name of a data collector or the IT gateway name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25805 to 25869		Developer name	The developer name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25870		Data collector specification version (integer part) or IT gateway specification version (integer part)	The specification version (integer part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25871		Data collector specification version (decimal part) or IT gateway specification version (decimal part)	The specification version (decimal part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25872 to 25875		Data collector version or IT gateway version	The data collector version of a data collector or the IT gateway version of an IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
25876 to 25929		System area	
25930 to 26009		Information of each process only	Process information corresponding to a process type is stored. ☞ Process information of the data collection function ☞ Process information of the data modification function
26010 to 26054		Data storing information	The operating information of data storing set in a process is stored. ☞ Data storing information
26055 to 26099		Data distribution information	The operating information of data distribution set in a process is stored. ☞ Data distribution information
⋮	⋮		
27100 to 27599	Data Logging Flow No.1 Process No.4		Same as Data Logging Flow No.1 Process No.1 (25600 to 26099)
27600 to 29599	System area		
⋮	⋮		

Address	Name	Description
151100 to 151599	Data Logging Flow No.32 Process No.1 to No.4	Same as Data Logging Flow No.1 Process No.1 to No.4 (25600 to 27599)

● Process information of the data collection function

Offset indicates the relative position from 'Information of each process only' of each data logging flow.

Offset	Name	Description	Initialization timing
0	Process type	1 (the data collection function) is stored.	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
1	Function type of data collection	The type of data collection is stored. • 0: Not set • 1: Data collector • 4: CSV File Data collector	
2 to 3	Number of times of collection	The number of times of data collection is stored. It is incremented per collection. (When the number of times of collection reaches the upper limit, it is incremented from '0' again.)	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
4 to 5	Collection processing time (maximum)	The maximum processing time is stored.[*3,*4] (In microseconds, 32-bit)	
6 to 7	Collection processing time (minimum)	The minimum processing time is stored.[*3,*4] (In microseconds, 32-bit)	
8 to 9	Collection processing time (latest)	The latest processing time is stored.[*3,*4] (In microseconds, 32-bit)	
10 to 79	Dedicated to processing	Information corresponding to a data collection type is stored.[*4] ☞ CSV file collection	Differs depending on processing.

*1 The value is initialized to '0.'

*2 The contents of parameters are applied.

*3 The value is updated every one second in the shortest.

*4 When the data collection type is '1' (data collector), '0' is stored.

- CSV file collection (Data collection type: 4)

Offset indicates the relative position from 'Dedicated to processing' of a data collection process.

Offset	Name	Description	Initialization timing
0 to 1	Number of successful files	The cumulative number of times of successful CSV file collection is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
2 to 3	Number of failed files	The cumulative number of times of failed CSV file collection is stored.	
4	CSV file collection start time (on success)	• b0 to b7: UTC offset (-48 to 52)[*1] • b8 to b15: (Not used)	
5		• b0 to b7: Year (00h to 99h)[*2] • b8 to b15: Month (01h to 12h)	
6		• b0 to b7: Day (01h to 31h) • b8 to b15: Hour (01h to 23h)	
7		• b0 to b7: Minute (01h to 59h) • b8 to b15: Second (01h to 59h)	
8		• b0 to b7: Day of the week (00h: Sunday, 01h: Monday, 02h: Tuesday, 03h: Wednesday, 04h: Thursday, 05h: Friday, 06h: Saturday) • b8 to b15: Year (00h to 99h)[*3]	
9		• b0 to b7: Upper milliseconds (00h to 09h)[*4] • b8 to b15: Lower milliseconds (00h to 99h)	
10		• b0 to b7: Upper microseconds (00h to 09h)[*4] • b8 to b15: Lower microseconds (00h to 99h)	
11		• b0 to b7: Upper nanoseconds (00h to 09h)[*4] • b8 to b15: Lower nanoseconds (00h to 99h)	

*1 Specify it within the following ranges. (In decimal, in 15 minutes)
-48: -12:00 to 52: +13:00

*2 The last two digits of the year

*3 The first two digits of the year

*4 The hundreds place

● Process information of the data modification function

Offset indicates the relative position from 'Information of each process only' of each data logging flow.

Offset	Name	Description	Initialization timing
0	Process type	2 (the data modification function) is stored.	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
1	Data modification type	A data modification type is stored. • 0: Not set • 1: Data extraction processing • 2: Program execution for data modification • 3: Character string data modification processing	
2 to 79	Dedicated to processing	Information corresponding to a data modification type is stored. ☞ Program processing for data modification ☞ Character string data modification processing	Differs depending on processing.

*1 The value is initialized to '0.'

*2 The contents of parameters are applied.

- Program processing for data modification (data modification type: 2)

Offset indicates the relative position from 'Dedicated to processing' of a data modification process.

Offset	Name	Description	Initialization timing
0	Operating status of a data modification plug-in	The running status of a data modification plug-in is stored. • 0: A data modification plug-in is not run. • 1: A data modification plug-in is being run.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
1	System area		
2 to 3	Running time for a data modification plug-in (latest)	The latest value of running time for a data modification plug-in is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
4 to 5	Running time for a data modification plug-in (minimum)	The minimum value of running time for a data modification plug-in is stored.	
6 to 7	Running time for a data modification plug-in (maximum)	The maximum value of running time for a data modification plug-in is stored.	
8 to 27	System area		
28 to 31	Number of accumulated input records after starting operation	After starting operation, the accumulated number of records entered in a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
32 to 39	System area		
40 to 43	Number of accumulated output records after starting operation	After starting operation, the accumulated number of records output from a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)

- Character string data modification processing (data modification type: 3)

Offset indicates the relative position from 'Dedicated to processing' of a data modification process.

Offset	Name	Description	Initialization timing
0 to 1	Number of modification failure records	The accumulated number of records that failed to be modified in character string data modification is stored. When it reaches the upper limit, it is fixed to the upper limit value.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
2 to 43	System area		

■Data Diagnosis Flow No.1 Process No.1 (153600 to 154099) to Data Diagnosis Flow No.32 Process No.6 (280100 to 280599)

Process information of a data diagnosis flow is stored.

The process number corresponds to the number in the "Data Diagnosis Flow Setting" screen. Process No.5 and No.6 are added when a row is added in the "Data Diagnosis Flow Setting" screen. (☞ Page 134 Data Diagnosis Flow Setting)

Address	Name		Description
153600	Data Diagnosis Flow No.1 Process No.1	Status	The operating status of a process is stored. • 0: Not used • 1: STOP • 2: In transition to RUN • 3: RUN • 4: In transition to STOP
153601		Error code	An error code is stored.
153602 to 153604		System area	
153605 to 153705		Setting name	A setting name is stored.
153706		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector • 2: IT gateway If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
153707 to 153771		Data collector file name or IT gateway file name	The file name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153772 to 153804		Data collector name or IT gateway name	The data collector name of a data collector or the IT gateway name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153805 to 153869		Developer name	The developer name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153870		Data collector specification version (integer part) or IT gateway specification version (integer part)	The specification version (integer part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153871		Data collector specification version (decimal part) or IT gateway specification version (decimal part)	The specification version (decimal part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153872 to 153875		Data collector version or IT gateway version	The data collector version of a data collector or the IT gateway version of an IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
153876 to 153929		System area	
153930 to 154009		Information of each process only	Process information corresponding to a process type is stored. ☞ Process information of the data collection function ☞ Process information of the data modification function ☞ Process information of the data diagnosis function ☞ Process information of the feedback function
154010 to 154054		Data storing information	The operating information of data storing set in a process is stored. ☞ Data storing information
154055 to 154099		Data distribution information	The operating information of data distribution set in a process is stored. ☞ Data distribution information
⋮	⋮		
156100 to 156599	Data Diagnosis Flow No.1 Process No.6		Same as Data Diagnosis Flow No.1 Process No.1 (153600 to 154099)
156600 to 157599	System area		

Address	Name	Description
⋮	⋮	
277600 to 280599	Data Diagnosis Flow No.32 Process No.1 to No.6	Same as Data Diagnosis Flow No.1 Process No.1 to No.6 (153600 to 156599)

● Process information of the data collection function

Offset indicates the relative position from 'Information of each process only' of each data diagnosis flow.

Offset	Name	Description	Initialization timing
0	Process type	1 (the data collection function) is stored.	• When starting an industrial PC*1 • When applying the parameters of Real-time Flow Manager*1 • When switching the operating status of a process flow (STOP → RUN)*2
1	Function type of data collection	The type of data collection is stored. • 0: Not set • 1: Data collector • 4: CSV File Data collector	
2 to 3	Number of times of collection	The number of times of data collection is stored. It is incremented per collection. (When the number of times of collection reaches the upper limit, it is incremented from '0' again.)	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
4 to 5	Collection processing time (maximum)	The maximum processing time is stored.*3,*4 (In microseconds, 32-bit)	
6 to 7	Collection processing time (minimum)	The minimum processing time is stored.*3,*4 (In microseconds, 32-bit)	
8 to 9	Collection processing time (latest)	The latest processing time is stored.*3,*4 (In microseconds, 32-bit)	
10 to 79	Dedicated to processing	Information corresponding to a data collection type is stored.*4 ☞ CSV file collection	Differs depending on processing.

*1 The value is initialized to '0.'

*2 The contents of parameters are applied.

*3 The value is updated every one second in the shortest.

*4 When the data collection type is '1' (data collector), '0' is stored.

- CSV file collection (Data collection type: 4)

Offset indicates the relative position from 'Dedicated to processing' of a data collection process.

Offset	Name	Description	Initialization timing
0 to 1	Number of successful files	The cumulative number of times of successful CSV file collection is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
2 to 3	Number of failed files	The cumulative number of times of failed CSV file collection is stored.	
4	CSV file collection start time (on success)	• b0 to b7: UTC offset (-48 to 52)*1 • b8 to b15: (Not used)	
5		• b0 to b7: Year (00h to 99h)*2 • b8 to b15: Month (01h to 12h)	
6		• b0 to b7: Day (01h to 31h) • b8 to b15: Hour (01h to 23h)	
7		• b0 to b7: Minute (01h to 59h) • b8 to b15: Second (01h to 59h)	
8		• b0 to b7: Day of the week (00h: Sunday, 01h: Monday, 02h: Tuesday, 03h: Wednesday, 04h: Thursday, 05h: Friday, 06h: Saturday) • b8 to b15: Year (00h to 99h)*3	
9		• b0 to b7: Upper milliseconds (00h to 09h)*4 • b8 to b15: Lower milliseconds (00h to 99h)	
10		• b0 to b7: Upper microseconds (00h to 09h)*4 • b8 to b15: Lower microseconds (00h to 99h)	
11		• b0 to b7: Upper nanoseconds (00h to 09h)*4 • b8 to b15: Lower nanoseconds (00h to 99h)	

*1 Specify it within the following ranges. (In decimal, in 15 minutes)
-48: -12:00 to 52: +13:00

*2 The last two digits of the year

*3 The first two digits of the year

*4 The hundreds place

● Process information of the data modification function

Offset indicates the relative position from 'Information of each process only' of each data diagnosis flow.

Offset	Name	Description	Initialization timing
0	Process type	2 (the data modification function) is stored.	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
1	Data modification type	A data modification type is stored. • 0: Not set • 1: Data extraction processing • 2: Program execution for data modification • 3: Character string data modification processing	
2 to 79	Dedicated to processing	Information corresponding to a data modification type is stored. ☞ Program processing for data modification ☞ Character string data modification processing	Differs depending on processing.

*1 The value is initialized to '0.'

*2 The contents of parameters are applied.

• Program processing for data modification (data modification type: 2)

Offset indicates the relative position from 'Dedicated to processing' of a data modification process.

Offset	Name	Description	Initialization timing
0	Operating status of a data modification plug-in	The running status of a data modification plug-in is stored. • 0: A data modification plug-in is not run. • 1: A data modification plug-in is being run.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
1	System area		
2 to 3	Running time for a data modification plug-in (latest)	The latest value of running time for a data modification plug-in is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
4 to 5	Running time for a data modification plug-in (minimum)	The minimum value of running time for a data modification plug-in is stored.	
6 to 7	Running time for a data modification plug-in (maximum)	The maximum value of running time for a data modification plug-in is stored.	
8 to 27	System area		
28 to 31	Number of accumulated input records after starting operation	After starting operation, the accumulated number of records entered in a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
32 to 39	System area		
40 to 43	Number of accumulated output records after starting operation	After starting operation, the accumulated number of records output from a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)

• Character string data modification processing (data modification type: 3)

Offset	Name	Description	Initialization timing
0 to 1	Number of modification failure records	The accumulated number of records that failed to be modified in character string data modification is stored. When it reaches the upper limit, it is fixed to the upper limit value.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
2 to 43	System area		

● Process information of the data diagnosis function

Offset indicates the relative position from 'Information of each process only' of each data diagnosis flow.

Offset	Name	Description	Initialization timing
0	Process type	3 (the data diagnosis function) is stored.	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
1	Data diagnosis type	A data diagnosis type is stored. • 0: Not set • 2: Data diagnosis plug-in running • 3: Edge application diagnosis (file) • 4: Edge application diagnosis (MQTT)	
2 to 79	Dedicated to processing	Information corresponding to a data diagnosis type is stored. ☞ Program processing for data diagnosis ☞ Edge application diagnosis (file) ☞ Edge application diagnosis (MQTT)	Differs depending on processing.

[*1] The value is initialized to '0.'

[*2] The contents of parameters are applied.

• Program processing for data diagnosis (Data diagnosis type: 2)

Offset indicates the relative position from 'Dedicated to processing' of a data diagnosis process.

Offset	Name	Description	Initialization timing
0	Operating status of a data diagnosis plug-in	The operating status of a data diagnosis plug-in is stored. • 0: A data diagnosis plug-in is not run. • 1: A data diagnosis plug-in is being run.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
1	System area		
2 to 3	Running time for a data diagnosis plug-in (latest)	The latest value of running time for a data diagnosis plug-in is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
4 to 5	Running time for a data diagnosis plug-in (minimum)	The minimum value of running time for a data diagnosis plug-in is stored.	
6 to 7	Running time for a data diagnosis plug-in (maximum)	The maximum value of running time for a data diagnosis plug-in is stored.	
8 to 27	System area		
28 to 31	Number of accumulated input records after starting operation	After starting operation, the accumulated number of records entered in a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
32 to 39	System area		
40 to 43	Number of accumulated output records after starting operation	After starting operation, the accumulated number of records output from a program is stored. (Unsigned, 64-bit) When it reaches the upper limit of a numerical value, it is counted from '0' again.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)

• Edge application diagnosis (file) (Data diagnosis type: 3)

Offset indicates the relative position from 'Dedicated to processing' of a data diagnosis process.

Offset	Name	Description	Initialization timing
0	Operating status of an edge application diagnosis	The operating status of an edge application is stored.[*1,*2] • 0: Stopped • 1: Running	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
1		The detection status is stored. • 0: Normal • 1: Error detected	
2		The total number of times that an error is detected is stored.	
3 to 77	System area		

[*1] The value is updated once per second.

[*2] After switching the operating status of a process flow to RUN, "0" (stopped) remains stored until the first publishing data file is output then deleted.

- Edge application diagnosis (MQTT) (Data diagnosis type: 4)

Offset indicates the relative position from 'Dedicated to processing' of a data diagnosis process.

Offset	Name	Description	Initialization timing
0	Operating status of an edge application diagnosis	The operating status of an edge application is stored.[*1] • 0: Stopped • 1: Running	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
1		The distribution pattern is stored. • 0: Sending in a fixed cycle • 1: Sending with a variable number of records • 2: Sending with a fixed number of records	
2 to 3		The number of distribution records is stored.[*2]	
4		The upper limit of the number of publishing data stored in a buffer is stored.	
5		The current number of publishing data stored in a buffer is stored.	
6		The maximum number of publishing data stored in a buffer is stored.	
7		System area	
8 to 11		The accumulated number of sent packets is stored.	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
12 to 15		The accumulated number of received packets is stored.	
16 to 77		System area	

[*1] Stored only when selecting the checkbox of "Confirm existence of the Edge application at the time of delivery" in the "Definition Output" tab in the "Edge Application Diagnosis (MQTT) Setting" screen.

[*2] Stored only when the distribution pattern is 'sending with a fixed number of records.'

●Process information of the feedback function

Offset indicates the relative position from 'Information of each process only' of each data diagnosis flow.

Offset	Name	Description	Initialization timing
0	Process type	4 (feedback function) is stored.	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
1 to 15		System area	
16	Operating status of feedback 1	The type of feedback is stored. • 0: Not set • 1: Device instruction feedback • 2: Program execution feedback	• When starting an industrial PC[*1] • When applying the parameters of Real-time Flow Manager[*1] • When switching the operating status of a process flow (STOP → RUN)[*2]
17		Deterrence period determination is stored.[*3] • 0: Not during a deterrence period • 1: During a deterrence period	• When starting an industrial PC • When applying the parameters of Real-time Flow Manager • When switching the operating status of a process flow (STOP → RUN)
18		Accumulated number of requests for feedback (0 to 39999)	
19 to 31		System area	
32 to 47	Operating status of feedback 2	Same as the operating status of feedback 1	Same as the operating status of feedback 1
48 to 63	Operating status of feedback 3		
64 to 79	Operating status of feedback 4		

[*1] The value is initialized to '0.'

[*2] The contents of parameters are applied.

[*3] The value is updated at the timing when the feedback function runs.

●Data storing information

Offset	Name	Description	Initialization timing
0	Data storing function type	The type of the data storing function is stored. • 1: File • 2: DB	• When starting an industrial PC[1] • When applying the parameters of Real-time Flow Manager[1] • When switching the operating status of a process flow (STOP → RUN)[2]
1 to 44	System area		

[1] The value is initialized to '0.'

[2] The contents of parameters are applied.

●Data distribution information

Offset	Name	Description	Initialization timing
0	Data distribution function type	The type of the data distribution function is stored. • 1: MQTT • 2: IT gateway	• When starting an industrial PC[1] • When applying the parameters of Real-time Flow Manager[1] • When switching the operating status of a process flow (STOP → RUN)[2]
1 to 44	System area		

[1] The value is initialized to '0.'

[2] The contents of parameters are applied.

■Error Log Information (290000 to 290001)

Address	Name	Description
290000	Number of error occurrences	The number of times of error occurrences in a process flow is stored.
290001	Latest error log number	The number of an error log storing the latest error code among error logs 1 to 64 is stored.

■Error Log 1 (290002 to 290251) to Error Log 64 (305752 to 306001)

Address	Name		Description
290002	Error Log 1	Error code (error log 1)	An error code is stored.
290003 to 290004		System area	
290005		Error occurrence date and time	• b0 to b7: UTC offset (-48 to 52)[*1] • b8 to b15: (Not used)
290006			• b0 to b7: Year (00h to 99h)[*2] • b8 to b15: Month (01h to 12h)
290007			• b0 to b7: Day (01h to 31h) • b8 to b15: Hour (01h to 23h)
290008			• b0 to b7: Minute (01h to 59h) • b8 to b15: Second (01h to 59h)
290009			• b0 to b7: Day of the week (00h: Sunday, 01h: Monday, 02h: Tuesday, 03h: Wednesday, 04h: Thursday, 05h: Friday, 06h: Saturday) • b8 to b15: Year (00h to 99h)[*3]
290010			• b0 to b7: Upper milliseconds (00h to 09h)[*4] • b8 to b15: Lower milliseconds (00h to 99h)
290011			• b0 to b7: Upper microseconds (00h to 09h)[*4] • b8 to b15: Lower microseconds (00h to 99h)
290012			• b0 to b7: Upper nanoseconds (00h to 09h)[*4] • b8 to b15: Lower nanoseconds (00h to 99h)
290013		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector • 2: IT gateway If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
290014 to 290078		Data collector file name or IT gateway file name	The file name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290079 to 290111		Data collector name or IT gateway name	The data collector name of a data collector or the IT gateway name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290112 to 290176		Developer name	The developer name of a data collector or IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290177		Data collector specification version (integer part) or IT gateway specification version (integer part)	The specification version (integer part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290178		Data collector specification version (decimal part) or IT gateway specification version (decimal part)	The specification version (decimal part) of a data collector or IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290179 to 290182		Data collector version or IT gateway version	The data collector version of a data collector or the IT gateway version of an IT gateway in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
290183 to 290251		System area	

Address	Name	Description
290252 to 290501	Error Log 2	Same as Error Log 1 (290002 to 290251)
⋮	⋮	
305752 to 306001	Error Log 64	Same as Error Log 1 (290002 to 290251)

*1 Specify it within the following ranges. (In decimal, in 15 minutes)
-48: -12:00 to 52: +13:00
*2 The last two digits of the year
*3 The first two digits of the year
*4 The hundreds place

Data collector area

The following table shows the Real-time Flow Manager status details in the data collector area (400100 to 409799).

■Target Device No.1 (400100 to 400399) to Target Device No.32 (409400 to 409699)

Device information of an access target is stored.

Address	Name		Description
400100	Target Device No.1	Setting enable flag	The setting enable flag of an access target device is stored. • 0: Not set • 1: Set
400101		Connection status	The connection status with an access target device is stored. • 0: Disconnected • 1: Connected
400102		Error code	The code for an error occurred in an access target device is stored.
400103		Problem function	An error occurrence source is stored. • 0: Real-time Flow Manager • 1: Data collector If an error occurs in CSV File Data collector, "Real-time Flow Manager" will be displayed for "Problem Function."
400104 to 400168		Data collector file name	The file name of a data collector in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400169 to 400201		Data collector name	The data collector name of a data collector in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400202 to 400266		Developer name	The developer name of a data collector in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400267		Data collector specification version (integer part)	The specification version (integer part) of a data collector in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400268		Data collector specification version (decimal part)	The specification version (decimal part) of a data collector in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400269 to 400272		Data collector version	The data collector version of a data collector in which an error occurred is stored. However, if an error occurs in Real-time Flow Manager or CSV File Data collector, it will be blank.
400273 to 400399		System area	
⋮	⋮		
409400 to 409699	Target Device No.32		Same as Target Device No.1 (400100 to 400399)

Point

Information is stored only when an access target device setting satisfies both of the following conditions:

- It is used for data collection or feedback.
- A data collector other than CSV File Data collector is used.

IT gateway area

The following table shows the Real-time Flow Manager status details in the IT gateway area (409800 to 420999).

■IT Gateway Diagnosis Information No.1 (409800 to 410499) to IT Gateway Diagnosis Information No.16 (420300 to 420999)

IT gateway diagnosis information is stored.

Address	Name		Description
409800	IT Gateway Diagnosis Information No.1	Setting enable flag	The setting enable flag of an IT gateway is stored. • 0: Not set • 1: Set
409801		Connection status	The connection status with an external device such as an IT system is stored. • 0: Disconnected • 1: Connected
409802		Error code	The code for an error occurred in an IT gateway is stored.
409803		Problem function	An error occurrence source is stored. • 0: No error • 2: IT gateway
409804 to 409868		IT gateway file name	The file name of an IT gateway in which an error occurred is stored in UTF-16LE. The termination character is also stored but not the extension.
409869 to 409901		IT gateway name	The name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character.
409902 to 409966		Developer name	The developer name of an IT gateway in which an error occurred is stored in UTF-16LE. It is stored in English and includes the termination character.
409967		IT gateway specification version (integer part)	The specification version (integer part) of an IT gateway in which an error occurred is stored.
409968		IT gateway specification version (decimal part)	The specification version (decimal part) of an IT gateway in which an error occurred is stored.
409969 to 409972		IT gateway version	The IT gateway version of an IT gateway in which an error occurred is stored.
409973 to 410006		System area	
410007		IT gateway type	Type of an IT gateway • 1: Data storing • 2: Data distribution
410008 to 410099		System area	
410100 to 410103		IT system connection status of Data Logging Flow No.1 Process No.1 to No.4	The connection status with an external device such as an IT system is stored. • 0: Disconnected • 1: Connected
410104 to 410105		System area	
⋮		⋮	⋮
410286 to 410289		IT system connection status of Data Logging Flow No.32 Process No.1 to No.4	Same as the IT system connection status of Data Logging Flow No.1 Process No.1 to No.4 (410100 to 410103)
410290 to 410291		System area	
410292 to 410296		IT system connection status of Data Diagnosis Flow No.1 Process No.1 to No.5	Same as the IT system connection status of Data Logging Flow No.1 Process No.1 to No.4 (410100 to 410103)
410297		System area	
⋮		⋮	
410478 to 410482		IT system connection status of Data Diagnosis Flow No.32 Process No.1 to No.5	Same as the IT system connection status of Data Logging Flow No.1 Process No.1 to No.4 (410100 to 410103)
410483 to 410499		System area	
⋮	⋮		
420300 to 420999	IT Gateway Diagnosis Information No.16		Same as IT Gateway Diagnosis Information No.1 (409800 to 410499)

Point

Information is stored only when an IT gateway setting is used for data storing or data distribution.

Real-time Flow Manager status initialization

The following table shows the initialization timing and overview of the Real-time Flow Manager status.

Timing		Overview
When starting an industrial PC		All information in each area is initialized. • Product information area: Initialized with the product information at startup. • Setting information area: Initialized with the setting contents of parameters (adding and deleting settings are also applied[*1]). • Operating information area: Cleared (padded with '0'). • Error information area: Cleared (padded with '0'). • Connection status area: Cleared (not connected). • System area: Cleared (padded with '0').
When applying the parameters of Real-time Flow Manager		All information in each area is initialized. • Setting information area: Initialized with the setting contents of parameters (adding and deleting settings are also applied[*1]). • Operating information area: Cleared (padded with '0'). • Error information area: Cleared (padded with '0')[*2].
When switching the operating status of a process flow	STOP → RUN	The area of a process flow with its operating status switched is initialized. • Setting information area: Initialized with the setting contents of parameters (adding and deleting settings are also applied[*1]). • Operating information area: Cleared (padded with '0'). • Error information area: Cleared (padded with '0').
	RUN → STOP	The area of a process flow with its operating status switched is initialized. • Connection status area: Cleared (not connected).
When clearing an error		Information on an error in each area is initialized. • Error information area: Cleared (padded with '0').

[*1] In some areas, it is initialized with the setting contents of parameters when switching the operating status of a process flow from STOP to RUN, not when starting an industrial PC or applying the parameters of Real-time Flow Manager.

[*2] Excluding major errors.

Point

For the initialization timing for each area, refer to the following:

☞ Page 434 Real-time Flow Manager status list

Appendix 2 Available Characters

Real-time Flow Designer

The following table shows the characters that can be used in Real-time Flow Designer.

Screen	Item	Available/invalid character	Reference
Password input	Password	■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	—
Password setting	Password	■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	—
	Confirmation password		
Float Type Constant Setting Integer Type Constant Setting	—	■Available characters Refer to the following: ☞ Page 544 Values that can be entered in the screen	Page 123 Setting constants
DB Connection Common Setting	Data Source Name	■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	Page 116 DB connection common setting
	User Name		
	Password		
File Saving Common Setting	User Name	■Available characters • Printable ASCII characters (0x20 to 0x7E)	Page 117 File saving common setting
	Password	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
Event History Automatic Output Setting	Save Destination Folder	■Available characters • Characters that can be used as the WSTRING type[*1][*3] ☞ Page 545 WSTRING type	Page 118 Event history automatic output setting
User Account Setting	User Name	■Available characters • Printable ASCII characters (0x20 to 0x7E)	Page 119 User account setting screen
	Password	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
Target Device Setting	Setting Name	■Invalid characters • Space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	Page 124 Access Target Device Setting
	Comment	■Invalid characters • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	

Screen	Item	Available/invalid character	Reference
IT Gateway Setting	Setting Name	■Invalid characters • Space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	Page 127 IT Gateway Setting
	Comment	■Invalid characters • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	
Data Logging Flow Setting Data Diagnosis Flow Setting	Setting Name	■Invalid characters • Space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	Page 130 Data Logging Flow Setting Page 134 Data Diagnosis Flow Setting
	Comment	■Invalid characters • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	
	Process Name	■Invalid characters • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	
Data Collection Setting ([Collection Data] tab)	Data Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 140 Collection data
	Location (top)	■Invalid characters • U+0000 to U+001F, U+007F to U+009F	
	Length	■Available characters • Numerals (decimal)	
	Setting Value	■Available characters Refer to the following: ☞ Page 544 Values that can be entered in the screen	
Data Collection Setting (CSV File Data collector)	Monitoring Folder	■Available characters • Characters in the Unicode Basic Multilingual Plane (only characters that can be used as the WSTRING type)[*1] ☞ Page 545 WSTRING type	Page 310 Data Collection Setting (CSV File Data collector)
	File Name Prefix	■Available characters • Characters that can be used as the WSTRING type[*2,*3] ☞ Page 545 WSTRING type	
	Data Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029) • Surrogate pair characters (U+10000 to U+10FFFF)	

Screen	Item	Available/invalid character	Reference
Data Storing Setting (File Saving) ([Output Option] tab)	Output Name of Date Column	■Available characters Refer to the following:[*4] ☞ Page 496 Data source, user, password, and output name of the date and time column	Page 146 Output option
	Data Row Output Format	■Available characters • Alphanumeric characters • Symbols other than " (double quote), ; (semicolon), and , (comma) (including spaces)	
Data Storing Setting (File Saving) ([Save File] tab)	Save Destination Folder	■Available characters Refer to the following: ☞ Page 67 File	Page 147 Saved file
	File Name Prefix		
User Account Setting	User Name	■Available characters • Printable ASCII characters (0x20 to 0x7E)	Page 149 User account setting
	Password	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
Program Execution Setting	Program	■Available characters Refer to the following: ☞ Page 68 Program execution after file output	Page 150 Program execution setting
	Argument		
Data Storing Setting (DB Saving) ([Connect] tab)	Data Source Name	■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	Page 154 Connection
	User Name		
	Password		
Data Storing Setting (DB Saving) ([Access Table] tab)	Table Name	■Available characters Refer to the following: ☞ Page 79 Table name and field name	Page 156 Access table
	Field Name		
Data Distribution Setting ([Destination] tab)	Host Name	■Available characters • Alphanumeric characters • . (period), - (hyphen)	Page 160 Destination
	User Name	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
	Password	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
	Certificate authority certificate	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client certificate	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client secret key	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client ID at sending	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
Data Distribution Setting ([Definition Output] tab)	Publishing Data topic name	■Available characters Printable ASCII characters (0x20 to 0x7E) excluding '#' and '+'	Page 162 Definition output
Data Extraction Setting	Output Data Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 169 Data Extraction Setting

Screen	Item	Available/invalid character	Reference
Character String Data Modification setting	Added character string	■Available characters Refer to the following: ☞ Page 545 Available characters	Page 170 Character String Data Modification Setting
	Start position	■Available characters • Numerals (decimal)	
	End position	■Available characters • Numerals (decimal)	
Data Modification Plug-in Setting	Output Data Setting Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 172 Data Modification Plug-in Setting
	Start Argument	■Available characters • Characters that can be used as the WSTRING type ☞ Page 545 WSTRING type	
Edge Application Diagnosis (file) Setting ([Output Option] tab)	Output Name of Date Column	■Available characters Refer to the following:[*4] ☞ Page 496 Data source, user, password, and output name of the date and time column	Page 181 Output option
	Data Row Output Format	■Available characters • Alphanumeric characters • Symbols other than " (double quote), ; (semicolon), and , (comma) (including spaces)	
Edge Application Diagnosis (file) Setting ([Save File] tab)	Save Destination Folder	■Available characters • Characters available for file paths in Windows	Page 182 Saved file
	File Name Prefix	■Available characters Refer to the following: ☞ Page 67 File	
Edge Application Diagnosis (file) Setting ([Response Data] tab)	Output Data Setting Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 183 Response data
Edge Application Diagnosis (MQTT) Setting ([Destination] tab)	Host Name	■Available characters • Alphanumeric characters • . (period), - (hyphen)	Page 174 Destination
	User Name	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
	Password	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
	Certificate authority certificate	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client certificate	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client secret key	■Available characters • Printable ASCII characters (0x20 to 0x7E)[*5]	
	Client ID at sending	■Available characters • Printable ASCII characters (0x20 to 0x7E)	
Edge Application Diagnosis (MQTT) Setting ([Definition Output] tab)	Publishing Data topic name	■Available characters • Printable ASCII characters (0x20 to 0x7E) excluding '#' and '+'	Page 176 Definition output
	Client ID	■Available characters • Printable ASCII characters (0x20 to 0x7E)	

Screen	Item	Available/invalid character	Reference
Edge Application Diagnosis (MQTT) Setting ([Response Data] tab)	Output Data Setting Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 177 Response data
Data Diagnosis Plug-in Setting	Output Data Setting Name	■Invalid characters • , (comma), space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 184 Data Diagnosis Plug-in Setting
	Start Argument	■Available characters • Characters that can be used as the WSTRING type ☞ Page 545 WSTRING type	
Post-Diagnosis Feedback Setting	Deterrence Period	■Available characters • Numerals (decimal)	Page 185 Post-Diagnosis Feedback Setting
Instruction Feedback Setting	Data Name	■Invalid characters • , (comma), space • ASCII control code (U+0000 to U+001F), DEL(U+007F)	Page 188 Instruction target data
	Location (top)	■Invalid characters • U+0000 to U+001F, U+007F to U+009F	
	Length	■Available characters • Numerals (decimal)	
Program Execution Feedback Setting	Program	■Available characters Refer to the following: ☞ Page 55 Specifications of program execution commands	Page 190 Program execution feedback setting
	Argument		

*1 Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

*2 Excluding the following characters:
\ (0x5C), / (0x2F), : (0x3A), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

*3 A space (0x20) and a period (0x2E) cannot be used for the first character.

*4 A comma and a space cannot be entered.

*5 In the range from 0x20 to 0x7E excluding the following:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

Data source, user, password, and output name of the date and time column

The following ASCII characters can be used for a data source name, user name, password name, and output name of the date and time column.

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	‘	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	˜
F			/	?	O	_	o	

Management Shell Explorer

The following table shows the characters that can be used in Management Shell Explorer.

Screen	Item		Available/invalid character	Reference
Password input	Password		■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	—
Password setting	Password		■Available characters Refer to the following: ☞ Page 496 Data source, user, password, and output name of the date and time column	—
	Confirmation password			
Monitoring Setting	Current Value Update Interval		■Available characters • Characters	Page 211 Changing a monitoring update interval
Data tag resource monitor window	Current Value	For BOOL type	■Available characters • 0, 1	Page 214 Changing current values of data tag resources
		For INT type	■Available characters For a display format in decimal • 0 to 9, - (hyphen) For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For UINT type	■Available characters For a display format in decimal • 0 to 9 For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For DINT type	■Available characters For a display format in decimal • 0 to 9, - (hyphen) For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For UDINT type	■Available characters For a display format in decimal • 0 to 9 For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For LINT type	■Available characters For a display format in decimal • 0 to 9, - (hyphen) For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For ULINT type	■Available characters For a display format in decimal • 0 to 9 For a display format in hexadecimal • 0 to 9, A to F, a to f[1], h[1,2], H[2]	
		For REAL type	■Available characters 0 to 9, E, e[3], - (hyphen), + (plus), . (period)	
		For LREAL type	■Available characters 0 to 9, E, e[3], - (hyphen), + (plus), . (period)	
		For STRING type	■Available characters Refer to the following: ☞ Page 545 STRING type	
		For WSTRING type	■Available characters[8] Refer to the following: ☞ Page 545 WSTRING type	

Screen	Item		Available/invalid character	Reference
Target Device Setting Batch Replacement	Search for Data Tag Resource to Replace	Component Display Name	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	Page 217 Access target device setting batch replacement
		Resource Display Name		
	Data tag resource list	Location	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+009F) • Surrogate pair characters[*6]	
		Number of Characters	■Available characters • Numerals	
OPC UA Setting ([Server Setting] tab)	([Connection Setting] tab)	Port Number	■Available characters • Characters	Page 261 Setting an OPC UA server
	([Certificate Setting] tab)	OPC UA Server Name	■Available characters[*4] • Alphanumeric characters • _ (underscore)	
		Organization Name	■Available characters • Alphanumeric characters	
		Unit of Organization	■Available characters • Alphanumeric characters	
		Region Name	■Available characters • Alphanumeric characters	
		State	■Available characters • Alphanumeric characters	
		Country Name	■Available characters • Alphabetical characters	
		Expiration Date (Year)	■Available characters • Numerals	
		IP address (IPv4)	■Available characters • Numerals • . (period)	
Target Device Setting	Setting Name[*5]		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	Page 223 Access target device setting screen
	Comment		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
Target Device Setting (CSV File Data collector)	Monitoring Folder		■Available characters • Characters in the Unicode Basic Multilingual Plane (only characters that can be used as the WSTRING type)[*10] ☞ Page 545 WSTRING type	Page 311 Access Target Device Setting (CSV File Data collector)
	File Name Prefix		■Available characters • Characters that can be used as the WSTRING type[*11,*12] ☞ Page 545 WSTRING type	

Screen	Item	Available/invalid character	Reference
IT Gateway Setting	Setting Name[*5]	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	Page 268 IT gateway setting screen
	Comment	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
Component Find Dialog Resource Find Dialog	Find String	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	Page 233 Searching for a component Page 255 Searching for a component Page 256 Searching for a resource
Property Window (When selecting a component)	Component Name	■Available characters • Alphanumeric characters[*7] • _ (underscore), - (hyphen)	Page 226 Editing component properties
	Component Display Name	■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	

Screen	Item		Available/invalid character	Reference
Add External Data Tag Resource Edit External Data Tag Resource	Data Tag Resource Name		■Available characters • Alphanumeric characters and symbols[*7,*9]	Page 236 Adding a data tag resource Page 243 Editing data tag resource properties
	Resource Display Name		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+009F) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
	Location Information		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+009F) • Surrogate pair characters[*6]	
	Number of Characters		■Available characters • Numerals	
Add Internal Data Tag Resource Edit Internal Data Tag Resource	Data Tag Resource Name		■Available characters • Alphanumeric characters and symbols[*7,*9]	
	Resource Display Name		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
	Number of Characters		■Available characters • Numerals	
	Default Value	For BOOL type	■Available characters • 0, 1	
		For INT type	■Available characters • 0 to 9, - (hyphen)	
		For UINT type	■Available characters • 0 to 9	
		For DINT type	■Available characters • 0 to 9, - (hyphen)	
		For UDINT type	■Available characters • 0 to 9	
		For LINT type	■Available characters • 0 to 9, - (hyphen)	
		For ULINT type	■Available characters • 0 to 9	
		For REAL type	■Available characters • 0 to 9, E, e, - (hyphen), + (plus), . (period)	
		For LREAL type	■Available characters • 0 to 9, E, e, - (hyphen), + (plus), . (period)	
		For STRING type	■Available characters Refer to the following: ☞ Page 545 STRING type	
		For WSTRING type	■Available characters[*8] Refer to the following: ☞ Page 545 WSTRING type	
Operation Expression Setting	Setting Value		■Available characters Same as those shown in the following: ☞ Default Value	Page 240 "Operation Expression Setting" screen

Screen	Item		Available/invalid character	Reference
Property Window (When selecting a file resource)	File Resource Name		■Available characters • Alphanumeric characters and symbols[*7,*9]	Page 245 Editing file resource properties
	Resource Display Name		■Invalid characters • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
	File Path		■Available characters[*8] • Characters available for file paths in Windows	
Property Window (When selecting a folder resource)	Folder Resource Name		■Available characters • Alphanumeric characters and symbols[*7,*9]	Page 248 Editing folder resource properties
	Resource Display Name		■Invalid characters[*8] • Control character codes (U+0000 to U+001F, U+007F to U+00A0, U+00AD) • Line feed codes (U+2028, U+2029) • Surrogate pair characters[*6]	
	Folder Path		■Available characters[*8] • Characters available for file paths in Windows	
Detailed Setting	Setting Name		■Invalid characters • Space • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	Page 282 Detailed setting screen
	Comment		■Invalid characters • Unavailable characters (U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, U+2029)	
Detailed Setting ([Collection Setting] tab)	Output Name		■Invalid characters[*13] • Unavailable characters (U+0080 to U+00A0, U+00AD, U+2028, U+2029)	Page 283 Collection setting
Move to the specified No.	Specified No.		■Available characters • Numerals	"Move to the specified No." screen
Detailed Setting ([Saving Setting] tab)	Save File Path Setting	Save Destination Folder	■Available characters • Characters available for file paths in Windows[*10,*12]	Page 286 File saving setting
		File Name Prefix	■Available characters • Characters that can be used as the WSTRING type[*11] ☞ Page 545 WSTRING type	
	Output Option	Output Name	■Invalid characters[*13] • Unavailable characters (U+0080 to U+00A0, U+00AD, U+2028, U+2029)	Page 286 File saving setting Page 287 DB saving setting
		Format	■Available characters • Alphanumeric characters • Symbols other than " (double quote), ; (semicolon), and , (comma) (including spaces)	Page 286 File saving setting
	DB Connection Setting	Data Source Name	■Available characters Refer to the following: ☞ Page 503 Data source name	Page 287 DB saving setting
		User Name	■Available characters Refer to the following: ☞ Page 503 User name and password name	
		Password		
	Access Table Setting		■Available characters Refer to the following: ☞ Page 275 Table name and column name	

Screen	Item	Available/invalid character	Reference
Event History Automatic Output Setting	Save Destination Folder	■Available characters[*8*10*12] • Characters that can be used as the WSTRING type ☞ Page 545 WSTRING type	Page 292 Event history automatic output setting screen
User Account Setting	User Name	■Available characters[*7*8] • Printable ASCII characters (0x20 to 0x7E)	Page 293 User account setting screen
	Password	■Available characters[*8] • Printable ASCII characters (0x20 to 0x7E)	

*1 Converted into the upper-case characters (A to F, H) when displayed.

*2 Can be entered only at the beginning of a character string.

*3 Converted into the upper-case character (E) when displayed.

*4 Both '[' and ']' can be entered only when setting a value for "[ServerName]."

*5 Case-sensitive and regarded as input of a different character.

*6 Note that no error message will be output even if entering them.

*7 Not case-sensitive and regarded as input of a same character.

*8 Do not enter surrogate pair characters. (Note that no error message will be output even if entering them.)

*9 Excluding the following characters:
. (period), / (slash), \ (backslash)

*10 Excluding the following characters that cannot be used for file paths of Windows:
/ (0x2F), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

*11 Excluding the following characters:
\ (0x5C), / (0x2F), : (0x3A), * (0x2A), ? (0x3F), " (0x22), < (0x3C), > (0x3E), | (0x7C)

*12 A space (0x20) and a period (0x2E) cannot be used for the first character.

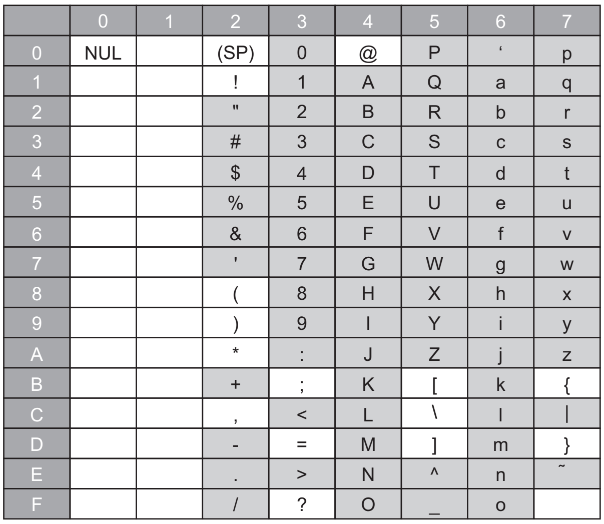
*13 The following characters in the range of U+0000 to U+007F can be used.
0 to 9, A to Z, a to z, _ (U+005F)

Data source name, user name, and password name

The following ASCII characters can be used for a data source name, user name, and password name.

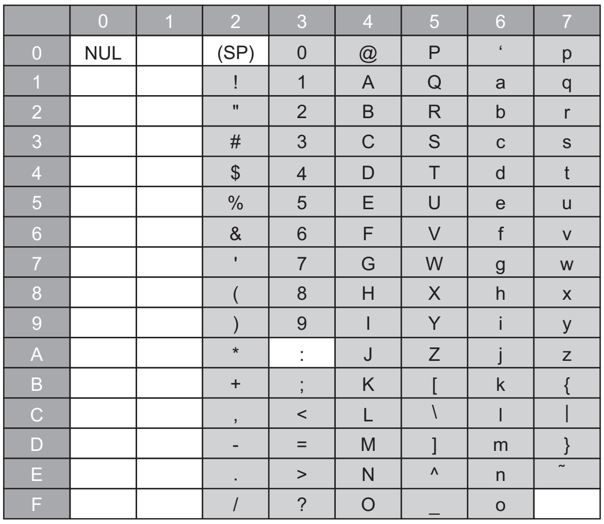
Characters in the shaded area can be used.

■Data source name



	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	‘	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

■User name and password name



	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	‘	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

Appendix 3 MQTT Broker Setup

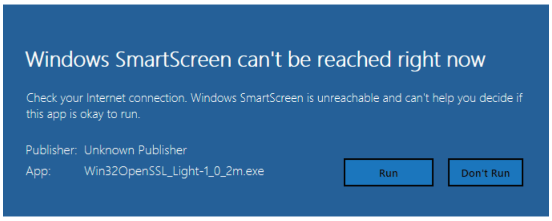
This section shows the considerations and procedure for setting up an MQTT broker (Eclipse Mosquitto) the operation of which has been checked.

For an MQTT broker the operation of which has been checked, refer to the following:

☞ Page 46 MQTT broker

Considerations for setup

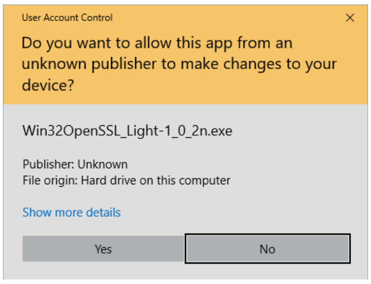
- When the following screens appear during installation, check that the file is downloaded from an appropriate website then click the [Run] and [Yes] buttons.



Windows SmartScreen can't be reached right now

Check your Internet connection. Windows SmartScreen is unreachable and can't help you decide if this app is okay to run.

Publisher: Unknown Publisher
App: Win32OpenSSL_Light-1_0_2m.exe



User Account Control

Do you want to allow this app from an unknown publisher to make changes to your device?

Win32OpenSSL_Light-1_0_2n.exe

Publisher: Unknown
File origin: Hard drive on this computer

- When installing a new version of Eclipse Mosquitto in an environment where Eclipse Mosquitto with version 1.6.x or earlier was used with an anonymous user, settings for using it with anonymous users may be required. (☞ Page 514 Using Eclipse Mosquitto with anonymous users)

Setup procedure

The following shows the procedure for setting up Eclipse Mosquitto with version 2.0.17 (64-bit).

1. Install OpenSSL.

☞ Page 505 Installing OpenSSL

2. Install Eclipse Mosquitto.

☞ Page 507 Installing Eclipse Mosquitto

3. Install Pthread.

☞ Page 508 Installing Pthread

4. Start Eclipse Mosquitto.

☞ Page 509 Starting Eclipse Mosquitto

5. Set access control.

☞ Page 510 Setting access control

6. Set a port number when using a port number other than the default value (1883).

☞ Page 515 Setting a port number

7. Set communication encryption as necessary.

☞ Page 516 Setting communication encryption

8. Configure the settings for connection from another industrial PC as necessary.

☞ Page 528 Configuring the settings for connection from another industrial PC

Installing OpenSSL

The following shows the procedure for installing OpenSSL.

Operating procedure

1. Access the following website, and download the installer of OpenSSL.

- slproweb.com/products/Win32OpenSSL.html

Point

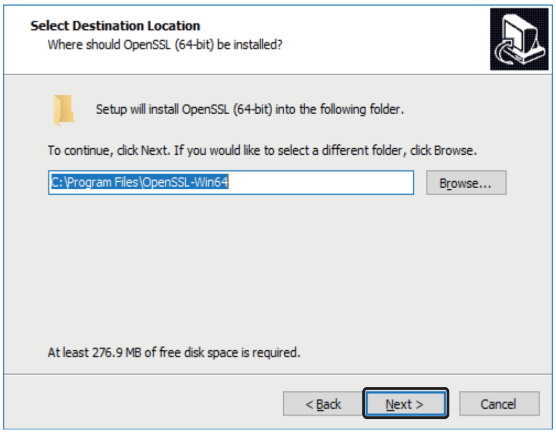
The installer can also be downloaded from the following website:

- www.edgecross.org

2. Run the installer.

3. Check the license terms and select "I accept the agreement," and click the [Next>] button.

4. Select an installation destination folder, and click the [Next>] button.



Select Destination Location

Where should OpenSSL (64-bit) be installed?

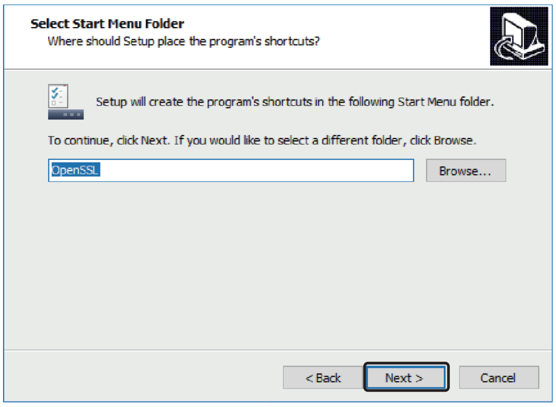
Setup will install OpenSSL (64-bit) into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Program Files\OpenSSL-Win64

At least 276.9 MB of free disk space is required.

5. Select a folder name to add to the start menu, and click the [Next>] button.



Select Start Menu Folder

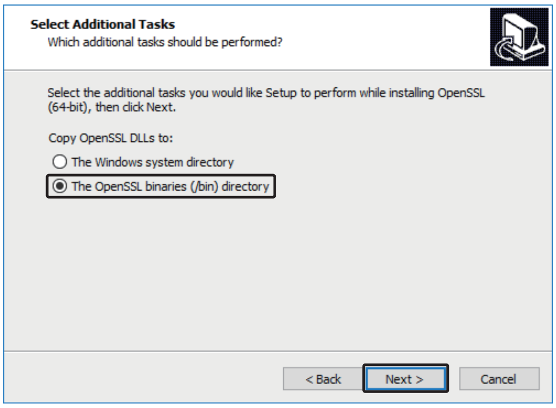
Where should Setup place the program's shortcuts?

Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

OpenSSL

6. Select "The OpenSSL binaries (/bin) directory," and click the [Next>] button.



Select Additional Tasks
Which additional tasks should be performed?

Select the additional tasks you would like Setup to perform while installing OpenSSL (64-bit), then click Next.

Copy OpenSSL DLLs to:

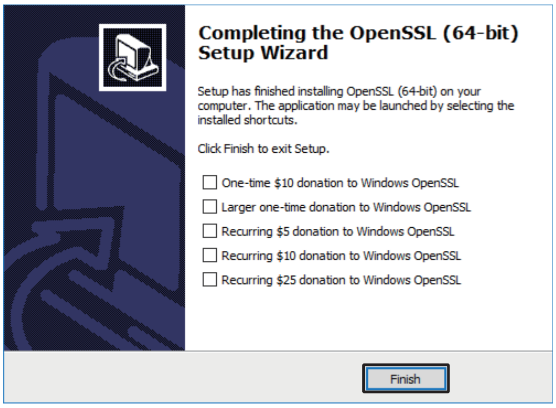
○ The Windows system directory

● The OpenSSL binaries (/bin) directory

7. Click the [Install] button.

8. Select or unselect an amount to donate[*1], and click the [Finish] button.

[*1] When selecting a checkbox and clicking the [Finish] button, the site for donation opens. If it is selected by mistake, close the window to cancel.



Completing the OpenSSL (64-bit) Setup Wizard

Setup has finished installing OpenSSL (64-bit) on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

☐ One-time $10 donation to Windows OpenSSL

☐ Larger one-time donation to Windows OpenSSL

☐ Recurring $5 donation to Windows OpenSSL

☐ Recurring $10 donation to Windows OpenSSL

☐ Recurring $25 donation to Windows OpenSSL

Installing Eclipse Mosquitto

The following shows the procedure for installing Eclipse Mosquitto.

Operating procedure

1. Access the following website, and download the installer of Eclipse Mosquitto.

- mosquitto.org

Point

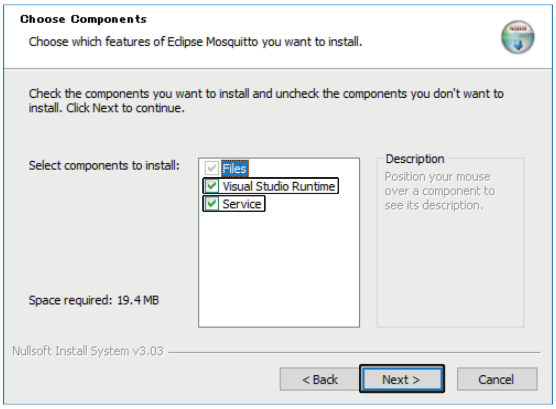
The installer can also be downloaded from the following website:

- www.edgecross.org

2. Run the installer.

3. Click the [Next>] button.

4. Make sure that the checkboxes of "Visual Studio Runtime" and "Service" are selected, and click the [Next>] button.



Choose Components

Choose which features of Eclipse Mosquitto you want to install.

Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.

Select components to install:

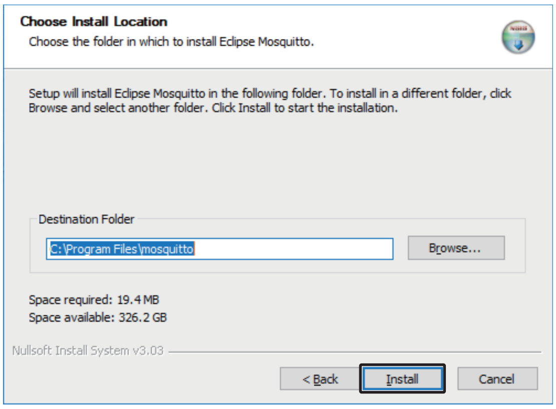
☑ Files
☑ Visual Studio Runtime
☑ Service

Description
Position your mouse over a component to see its description.

Space required: 19.4 MB

Nullsoft Install System v3.03

5. Select an installation destination folder, and click the [Install] button.



Choose Install Location

Choose the folder in which to install Eclipse Mosquitto.

Setup will install Eclipse Mosquitto in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.

Destination Folder: C:\Program Files\mosquitto

Space required: 19.4 MB
Space available: 326.2 GB

Nullsoft Install System v3.03

Point

When selecting a folder that requires the administrator authority (example: Program Files) as an installation destination folder, it is necessary to start a text editor with the administrator authority in advance and open the setting file for performing the following operations. To perform them without the administrator authority, use a folder that does not require it.

☞ Page 513 Applying to an MQTT broker
☞ Page 514 Using Eclipse Mosquitto with anonymous users
☞ Page 515 Setting a port number
☞ Page 516 Setting communication encryption

6. Click the [Finish] button.

Installing Pthread

The following shows the procedure for installing Pthread.

Operating procedure

1. Access the following website, and download Pthread.

- ftp://sources.redhat.com/pub/pthreads-win32/dll-latest/dll/x86/

2. Copy 'pthreadVC2.dll' to the installation folder for Eclipse Mosquitto.

Point

Pthread can also be downloaded from the following website:

- www.edgecross.org

Starting Eclipse Mosquitto

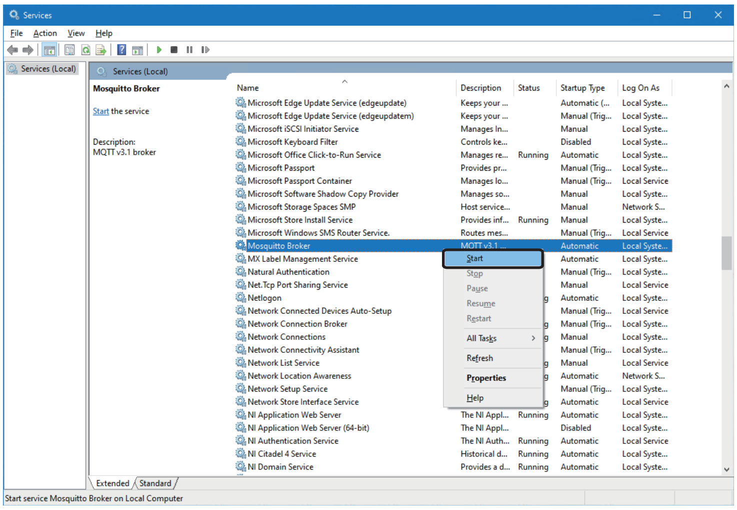
The following shows the procedure for starting Eclipse Mosquitto.

Operating procedure

1. Open the "Administrative Tools" screen, and start the service.

[Control Panel] ⇨ [System and Security] ⇨ [Administrative Tools] ⇨ "Services"

2. Right-click "Mosquitto Broker," and click [Start].



Mosquitto Broker

Start the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...		Manual (Trig...	Local Service
Mosquitto Broker	MQTT v3.1 ...		Automatic	Local Syste...
MX Label Management Service			Automatic	Local Syste...
Natural Authentication			Manual (Trig...	Local Syste...
Net.Tcp Port Sharing Service			Manual	Local Service
Netlogon			Automatic	Local Syste...
Network Connected Devices Auto-Setup			Manual (Trig...	Local Service
Network Connection Broker			Manual (Trig...	Local Syste...
Network Connections			Manual	Local Syste...
Network Connectivity Assistant			Manual (Trig...	Local Syste...
Network List Service			Manual	Local Service
Network Location Awareness			Automatic	Network S...
Network Setup Service			Manual (Trig...	Local Syste...
Network Store Interface Service			Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Start service Mosquitto Broker on Local Computer

Setting access control

The setting differs depending on users using Eclipse Mosquitto.

User using Eclipse Mosquitto	Setting procedure
Specific user	Page 510 Setting a user name and password
Anonymous user	■When setting the port number and communication encryption[*1] Page 514 Using Eclipse Mosquitto with anonymous users ■When not setting the port number or communication encryption[*1] The setting is not required.

*1 For details, refer to the following:
☞ Page 515 Setting a port number
☞ Page 516 Setting communication encryption

Setting a user name and password

The following shows the procedure for setting a user name and password used for user authentication.

Operating procedure

1. Create a password file.

☞ Page 511 Creating a password file

2. Add/delete a user to/from the password file as necessary.

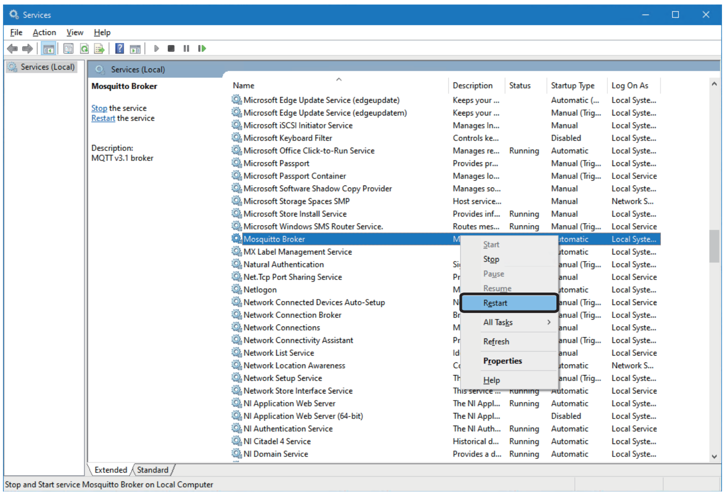
☞ Page 512 Adding/deleting a user to/from a password file

3. Apply the set password file to an MQTT broker.

☞ Page 513 Applying to an MQTT broker

4. Start the service.

5. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		utomatic	Local Syste...
MX Label Management Service			utomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		utomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	Cc		utomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

■Creating a password file

The following shows the procedure for creating a password file.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (arbitrary storage destination)\mosquitto

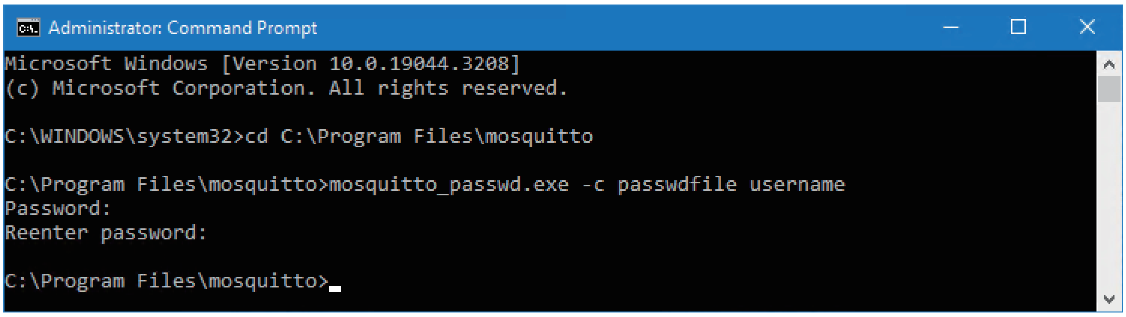
2. Execute the following:

mosquitto_passwd.exe -c passwdfile username

- passwdfile: Name of a password file to create
- username: Name of a user to create (6 to 64 characters)

3. Specify a password for "Password" (6 to 512 characters).

4. Specify the same password for "Reenter password."



```
Microsoft Windows [Version 10.0.19044.3208]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Program Files\mosquitto

C:\Program Files\mosquitto>mosquitto_passwd.exe -c passwdfile username
Password:
Reenter password:

C:\Program Files\mosquitto>_
```

■Adding/deleting a user to/from a password file

The following shows the procedure for adding/deleting a user to/from a password file.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

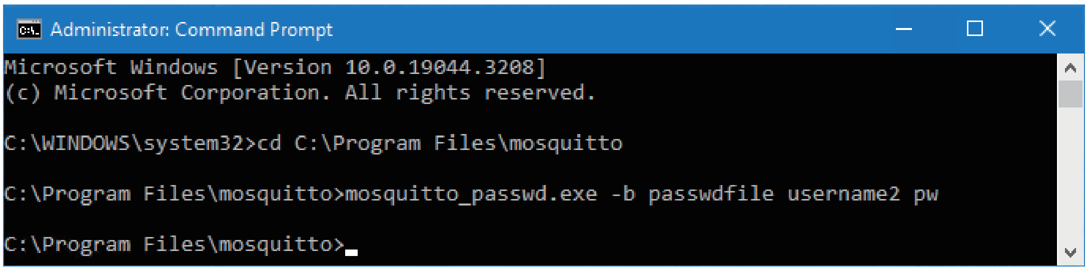
cd (arbitrary storage destination)\mosquitto

2. Execute either of the following:

For addition

mosquitto_passwd.exe -b passwdfile username2 pw

- passwdfile: Name of a password file to which a user is added
- username2: Name of a user to add (6 to 64 characters)
- pw: Password (6 to 512 characters)

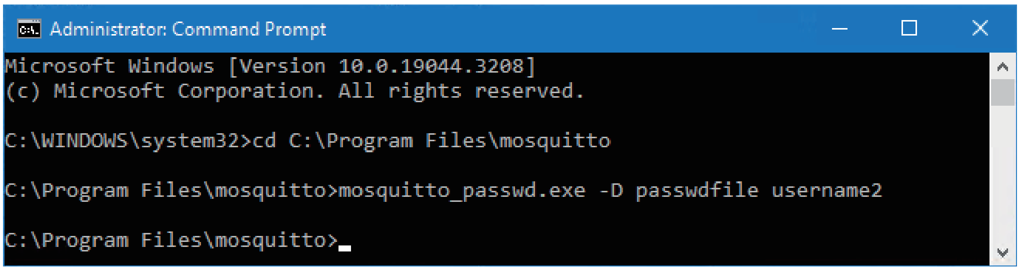


```
Microsoft Windows [Version 10.0.19044.3208]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Program Files\mosquitto

C:\Program Files\mosquitto>mosquitto_passwd.exe -b passwdfile username2 pw

C:\Program Files\mosquitto>_
```

For deletion

mosquitto_passwd.exe -D passwdfile username2

- passwdfile: Name of a password file from which a user is deleted
- username2: Name of a user to delete



```
Microsoft Windows [Version 10.0.19044.3208]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Program Files\mosquitto

C:\Program Files\mosquitto>mosquitto_passwd.exe -D passwdfile username2

C:\Program Files\mosquitto>_
```

■Applying to an MQTT broker

The following shows the procedure for applying a set password file to an MQTT broker.

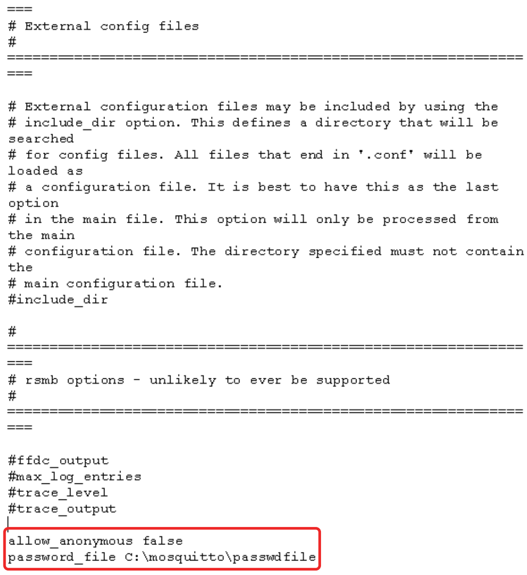
Precautions

If the installation directory for Eclipse Mosquitto requires the administrator authority for editing, etc., it is necessary to start a text editor with the administrator authority in advance and open 'mosquitto.conf.'

Operating procedure

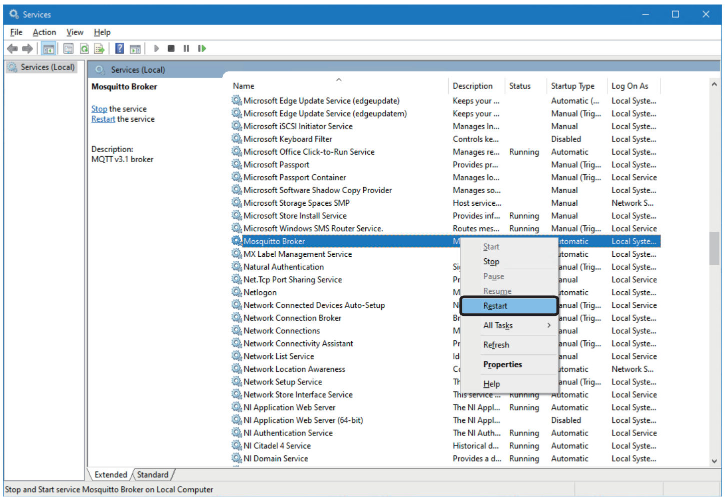
1. Open 'mosquitto.conf' in the installation folder for Eclipse Mosquitto.
2. Add the following to the end in the file.

- allow_anonymous false
- password_file (full path of a password file)



```
===
# External config files
#
============================================================
===

# External configuration files may be included by using the
# include_dir option. This defines a directory that will be
searched
# for config files. All files that end in '.conf' will be
loaded as
# a configuration file. It is best to have this as the last
option
# in the main file. This option will only be processed from
the main
# configuration file. The directory specified must not contain
the
# main configuration file.
#include_dir

#
============================================================
===
# rsmb options - unlikely to ever be supported
#
============================================================
===

#ffdc_output
#max_log_entries
#trace_level
#trace_output

allow_anonymous false
password_file C:\mosquitto\passwdfile
```

3. Start the service.
4. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		tomatic	Local Syste...
MX Label Management Service			tomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		tomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	Co		tomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

Using Eclipse Mosquitto with anonymous users

The following shows the procedure for using Eclipse Mosquitto with anonymous users.

Precautions

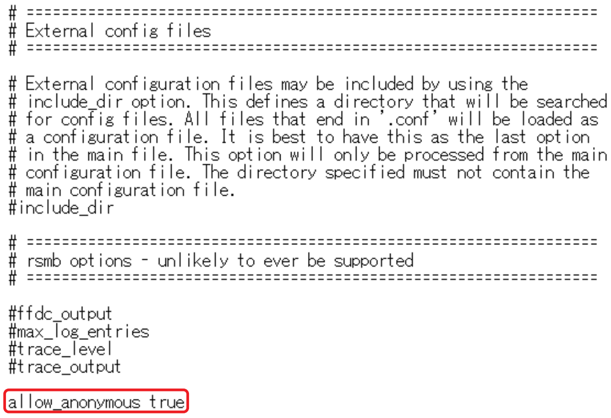
If the installation directory for Eclipse Mosquitto requires the administrator authority for editing, etc., it is necessary to start a text editor with the administrator authority in advance and open 'mosquitto.conf.'

Operating procedure

1. Open 'mosquitto.conf' in the installation folder for Eclipse Mosquitto.

2. Add the following to the end in the file.

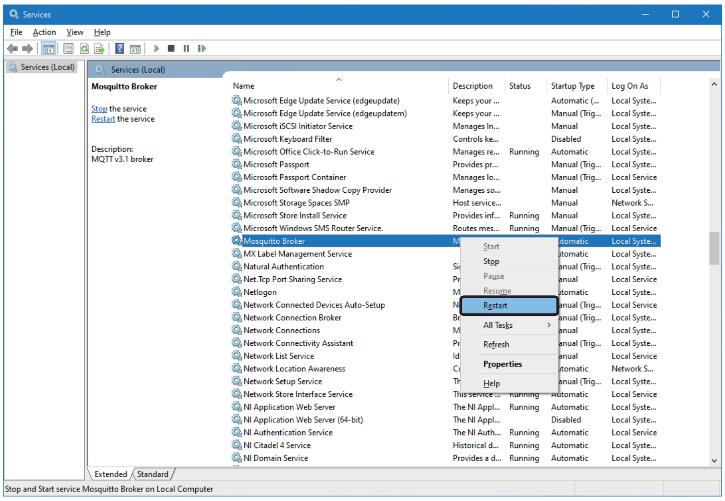
- allow_anonymous true



```
# =================================================================
# External config files
# =================================================================

# External configuration files may be included by using the
# include_dir option. This defines a directory that will be searched
# for config files. All files that end in '.conf' will be loaded as
# a configuration file. It is best to have this as the last option
# in the main file. This option will only be processed from the main
# configuration file. The directory specified must not contain the
# main configuration file.
#include_dir

# =================================================================
# rsmb options - unlikely to ever be supported
# =================================================================

#ffdc_output
#max_log_entries
#trace_level
#trace_output

allow_anonymous true
```

3. Start the service.

4. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		tomatic	Local Syste...
MX Label Management Service			tomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		tomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	Cc		tomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

Setting a port number

The following shows the procedure for setting a port number when using a port number other than the default value (1883).

Precautions

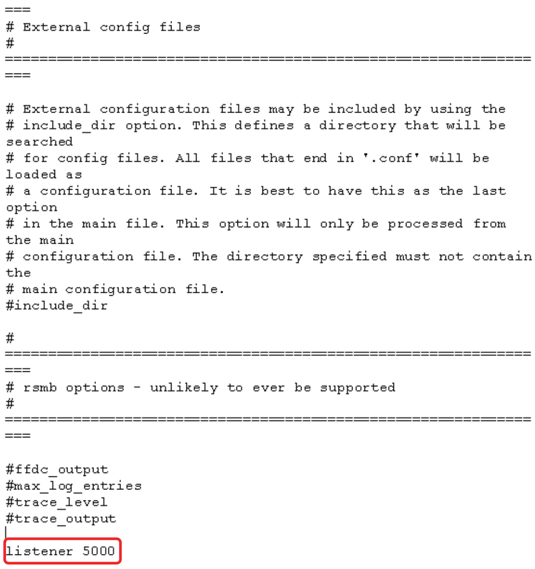
If the installation directory for Eclipse Mosquitto requires the administrator authority for editing, etc., it is necessary to start a text editor with the administrator authority in advance and open 'mosquitto.conf.'

Operating procedure

1. Open 'mosquitto.conf' in the installation folder for Eclipse Mosquitto.

2. Add the following to the end in the file.

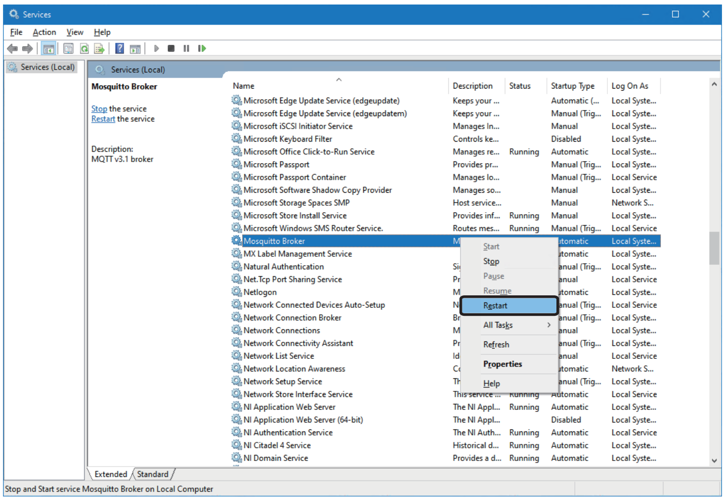
- listener Port number



```
===
# External config files
#
=============================================================
===

# External configuration files may be included by using the
# include_dir option. This defines a directory that will be
searched
# for config files. All files that end in '.conf' will be
loaded as
# a configuration file. It is best to have this as the last
option
# in the main file. This option will only be processed from
the main
# configuration file. The directory specified must not contain
the
# main configuration file.
#include_dir

#
=============================================================
===
# rsmb options - unlikely to ever be supported
#
=============================================================
===

#ffdc_output
#max_log_entries
#trace_level
#trace_output

listener 5000
```

3. Start the service.

4. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		tomatic	Local Syste...
MX Label Management Service			tomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		tomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	Co		tomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

Setting communication encryption

The following shows the procedures for setting communication encryption by using each authentication method.

Server authentication

The following shows the procedure for setting communication encryption by using server authentication.

Operating procedure

1. Create a certificate.

For using a self-signed certificate for certificate authority certificate, refer to steps 1 to 4 shown in the following:

☞ Page 519 Creating a certificate (self-signed certificate for certificate authority certificate)

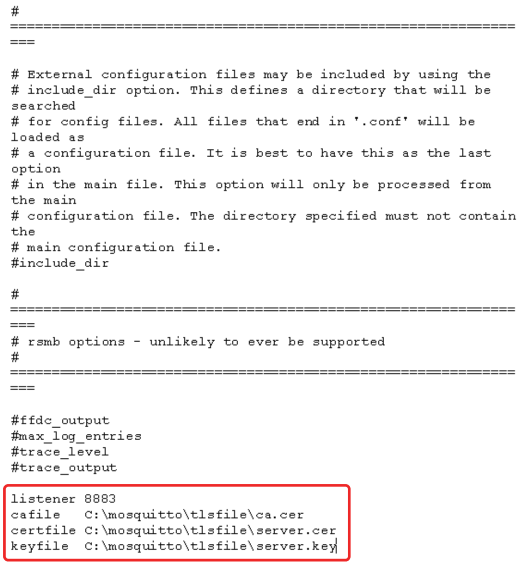
When requesting a signature from an external authority, create a certificate according to the procedure of each authority.

2. Open 'mosquitto.conf' in the installation folder for Eclipse Mosquitto.

If the installation directory for Eclipse Mosquitto requires the administrator authority for editing, etc., it is necessary to start a text editor with the administrator authority in advance and open 'mosquitto.conf.'

3. Add the following to the end in the file.

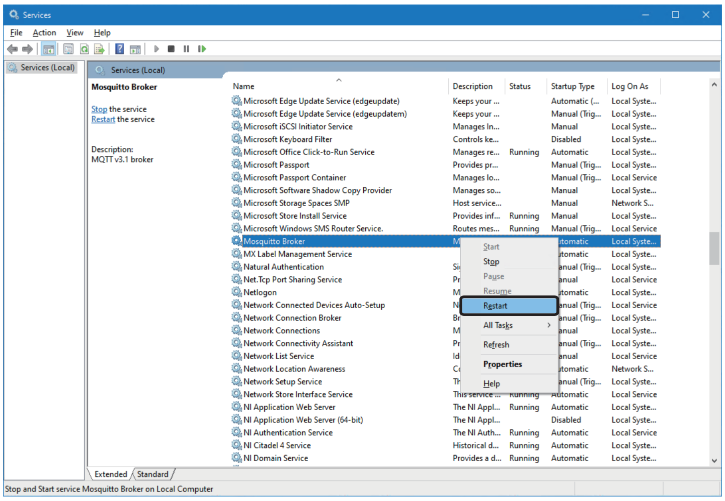
- listener 8883
- cafile Full path of a self-signed certificate
- certfile Full path of a server certificate
- keyfile Full path of a server secret key



```
#
==============================================================
===

# External configuration files may be included by using the
# include_dir option. This defines a directory that will be
searched
# for config files. All files that end in '.conf' will be
loaded as
# a configuration file. It is best to have this as the last
option
# in the main file. This option will only be processed from
the main
# configuration file. The directory specified must not contain
the
# main configuration file.
#include_dir

#
==============================================================
===
# rsmb options - unlikely to ever be supported
#
==============================================================
===

#ffdc_output
#max_log_entries
#trace_level
#trace_output

listener 8883
cafile   C:\mosquitto\tlsfile\ca.cer
certfile C:\mosquitto\tlsfile\server.cer
keyfile  C:\mosquitto\tlsfile\server.key
```

4. Start the service.

5. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		utomatic	Local Syste...
MX Label Management Service			utomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		utomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	Co		utomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

Server authentication & client authentication

The following shows the procedure for setting communication encryption by using server authentication & client authentication.

Operating procedure

1. Create a certificate.

For using a self-signed certificate for certificate authority certificate, refer to the following:

☞ Page 519 Creating a certificate (self-signed certificate for certificate authority certificate)

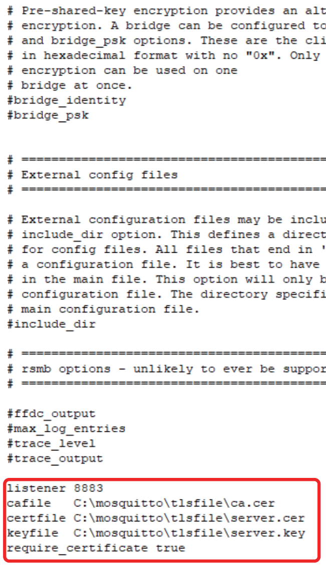
When requesting a signature from an external authority, create a certificate according to the procedure of each authority.

2. Open 'mosquitto.conf' in the installation folder for Eclipse Mosquitto.

If the installation directory for Eclipse Mosquitto requires the administrator authority for editing, etc., it is necessary to start a text editor with the administrator authority in advance and open 'mosquitto.conf.'

3. Add the following to the end in the file.

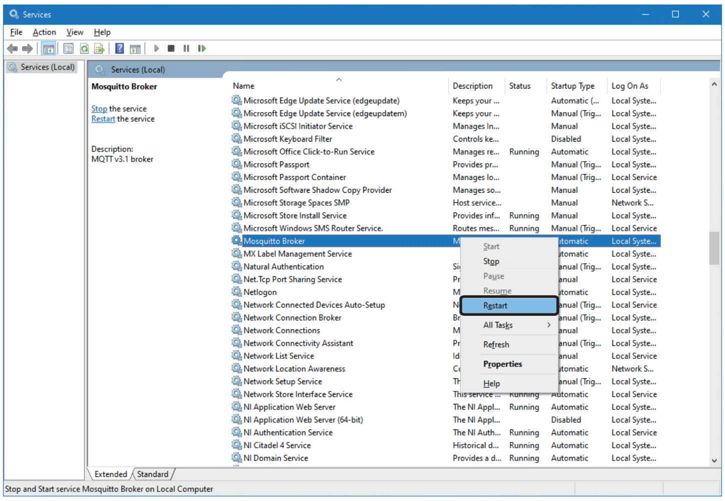
- listener 8883
- cafile Full path of a self-signed certificate
- certfile Full path of a server certificate
- keyfile Full path of a server secret key
- require_certificate true



```
# Pre-shared-key encryption provides an alternative to certificate based
# encryption. A bridge can be configured to use PSK with the bridge_identity
# and bridge_psk options. These are the client PSK identity, and pre-shared-key
# in hexadecimal format with no "0x". Only one of certificate and PSK based
# encryption can be used on one
# bridge at once.
#bridge_identity
#bridge_psk


# =================================================================
# External config files
# =================================================================

# External configuration files may be included by using the
# include_dir option. This defines a directory that will be searched
# for config files. All files that end in '.conf' will be loaded as
# a configuration file. It is best to have this as the last option
# in the main file. This option will only be processed from the main
# configuration file. The directory specified must not contain the
# main configuration file.
#include_dir

# =================================================================
# rsmb options - unlikely to ever be supported
# =================================================================

#ffdc_output
#max_log_entries
#trace_level
#trace_output

listener 8883
cafile   C:\mosquitto\tlsfile\ca.cer
certfile C:\mosquitto\tlsfile\server.cer
keyfile  C:\mosquitto\tlsfile\server.key
require_certificate true
```

4. Start the service.

5. Right-click "Mosquitto Broker," and click [Restart].



Mosquitto Broker

Stop the service
Restart the service

Description:
MQTT v3.1 broker

Name	Description	Status	Startup Type	Log On As
Microsoft Edge Update Service (edgeupdate)	Keeps your ...		Automatic (...	Local Syste...
Microsoft Edge Update Service (edgeupdatem)	Keeps your ...		Manual (Trig...	Local Syste...
Microsoft iSCSI Initiator Service	Manages In...		Manual	Local Syste...
Microsoft Keyboard Filter	Controls ke...		Disabled	Local Syste...
Microsoft Office Click-to-Run Service	Manages re...	Running	Automatic	Local Syste...
Microsoft Passport	Provides pr...		Manual (Trig...	Local Syste...
Microsoft Passport Container	Manages lo...		Manual (Trig...	Local Service
Microsoft Software Shadow Copy Provider	Manages so...		Manual	Local Syste...
Microsoft Storage Spaces SMP	Host service...		Manual	Network S...
Microsoft Store Install Service	Provides inf...	Running	Manual	Local Syste...
Microsoft Windows SMS Router Service.	Routes mes...	Running	Manual (Trig...	Local Service
Mosquitto Broker	M		tomatic	Local Syste...
MX Label Management Service			tomatic	Local Syste...
Natural Authentication	Si		anual (Trig...	Local Syste...
Net.Tcp Port Sharing Service	Pr		anual	Local Service
Netlogon	M		tomatic	Local Syste...
Network Connected Devices Auto-Setup	N		anual (Trig...	Local Service
Network Connection Broker	Br		anual (Trig...	Local Syste...
Network Connections	M		anual	Local Syste...
Network Connectivity Assistant	Pr		anual (Trig...	Local Syste...
Network List Service	Id		anual	Local Service
Network Location Awareness	C		tomatic	Network S...
Network Setup Service	Th		anual (Trig...	Local Syste...
Network Store Interface Service	This service ...	Running	Automatic	Local Service
NI Application Web Server	The NI Appl...	Running	Automatic	Local Syste...
NI Application Web Server (64-bit)	The NI Appl...		Disabled	Local Syste...
NI Authentication Service	The NI Auth...	Running	Automatic	Local Service
NI Citadel 4 Service	Historical d...	Running	Automatic	Local Syste...
NI Domain Service	Provides a d...	Running	Automatic	Local Syste...

Stop and Start service Mosquitto Broker on Local Computer

Creating a certificate (self-signed certificate for certificate authority certificate)

The following shows the procedure for creating a certificate when using a self-signed certificate for certificate authority certificate.

Operating procedure

1. Create a self-signed certificate and a CA secret key.

☞ Page 520 Creating a self-signed certificate and a CA secret key

2. Create a server secret key.

☞ Page 521 Creating a server secret key

3. Create a certificate signing request for a server certificate.

☞ Page 522 Creating a certificate signing request (server certificate)

4. Create a server certificate.

☞ Page 523 Creating a server certificate

5. Create a client secret key.

☞ Page 524 Creating a client secret key

6. Create a certificate signing request for a client certificate.

☞ Page 525 Creating a certificate signing request (client certificate)

7. Create a client certificate.

☞ Page 527 Creating a client certificate

■Creating a self-signed certificate and a CA secret key

The following shows the procedure for creating a self-signed certificate and a CA secret key.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe req -new -x509 -days 365 -keyout ca.key -out ca.cer

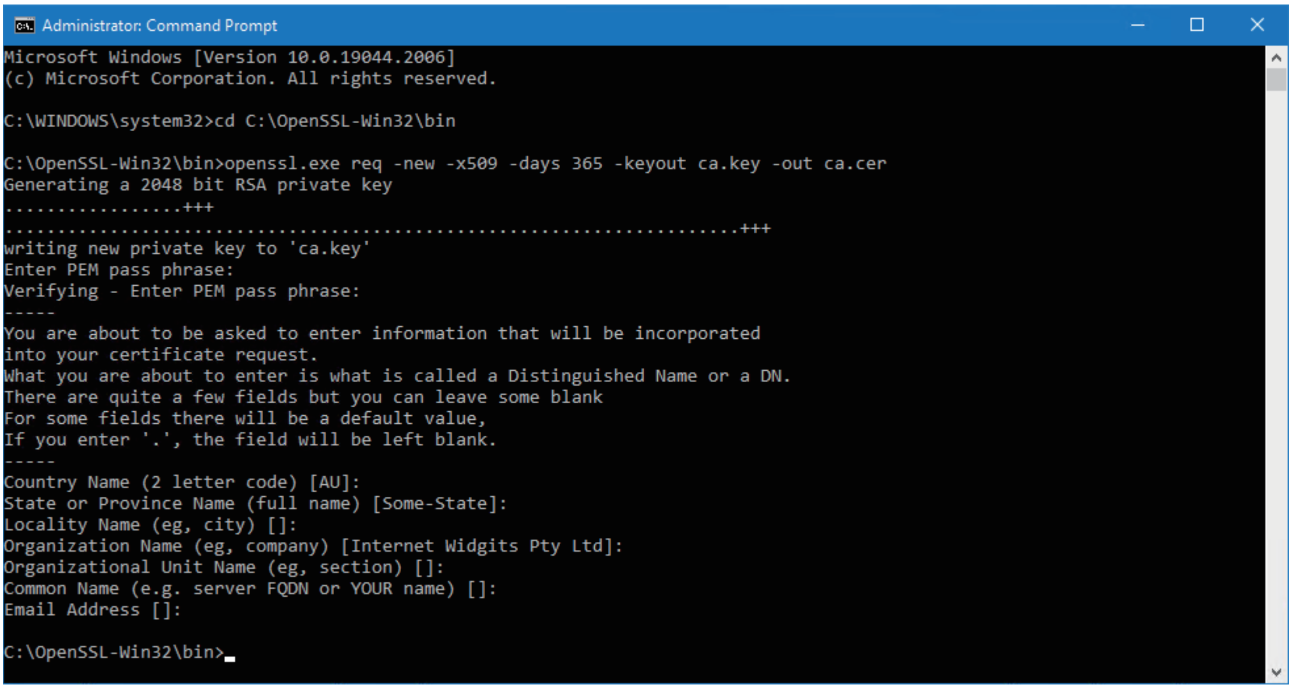
- 365: Number of valid days
- ca.key: Name of a CA secret key file to create
- ca.cer: Name of a self-signed certificate file to create

3. Enter the following items:

Item	Description
Enter PEM pass phrase	PEM passphrase
Verifying - Enter PEM pass phrase	PEM passphrase (confirmation)[*1]
Country Name (2 letter code)[*2]	Country name
State or Province Name (full name) [Some-State][*2]	Prefecture name
Locality Name (eg, city) [][*2]	Municipality name
Organization Name (eg, company) [Internet Widgits Pty Ltd][*2]	Organization name
Organizational Unit Name (eg, section) [][*2]	Department name
Common Name (e.g. server FQDN or YOUR name) [][*2]	Host name
Email Address [][*2]	E-mail address

*1 Enter a PEM passphrase entered for "Enter PEM pass phrase" again for confirmation.

*2 Optional



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe req -new -x509 -days 365 -keyout ca.key -out ca.cer
Generating a 2048 bit RSA private key
.................+++
.......................................................................+++
writing new private key to 'ca.key'
Enter PEM pass phrase:
Verifying - Enter PEM pass phrase:
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:
Email Address []:

C:\OpenSSL-Win32\bin>_
```

Precautions

All of the following items cannot be the same as those entered when creating a certificate signing request. (☞ Page 522 Creating a certificate signing request (server certificate), Page 525 Creating a certificate signing request (client certificate))

- Country Name (2 letter code)
- State or Province Name (full name) [Some-State]
- Locality Name (eg, city) []
- Organization Name (eg, company) [Internet Widgits Pty Ltd]
- Organizational Unit Name (eg, section) []
- Common Name (e.g. server FQDN or YOUR name) []
- Email Address []

■Creating a server secret key

The following shows the procedure for creating a server secret key.

Operating procedure

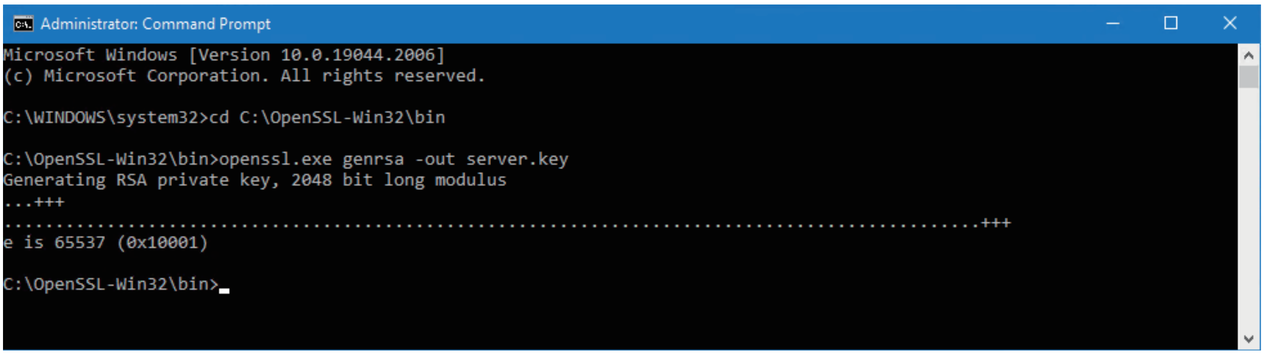
1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe genrsa -out server.key

- server.key: Name of a server secret key file to create



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe genrsa -out server.key
Generating RSA private key, 2048 bit long modulus
...+++
...............................................................................................+++
e is 65537 (0x10001)

C:\OpenSSL-Win32\bin>_
```

■Creating a certificate signing request (server certificate)

The following shows the procedure for creating a certificate signing request.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe req -out server.csr -key server.key -new

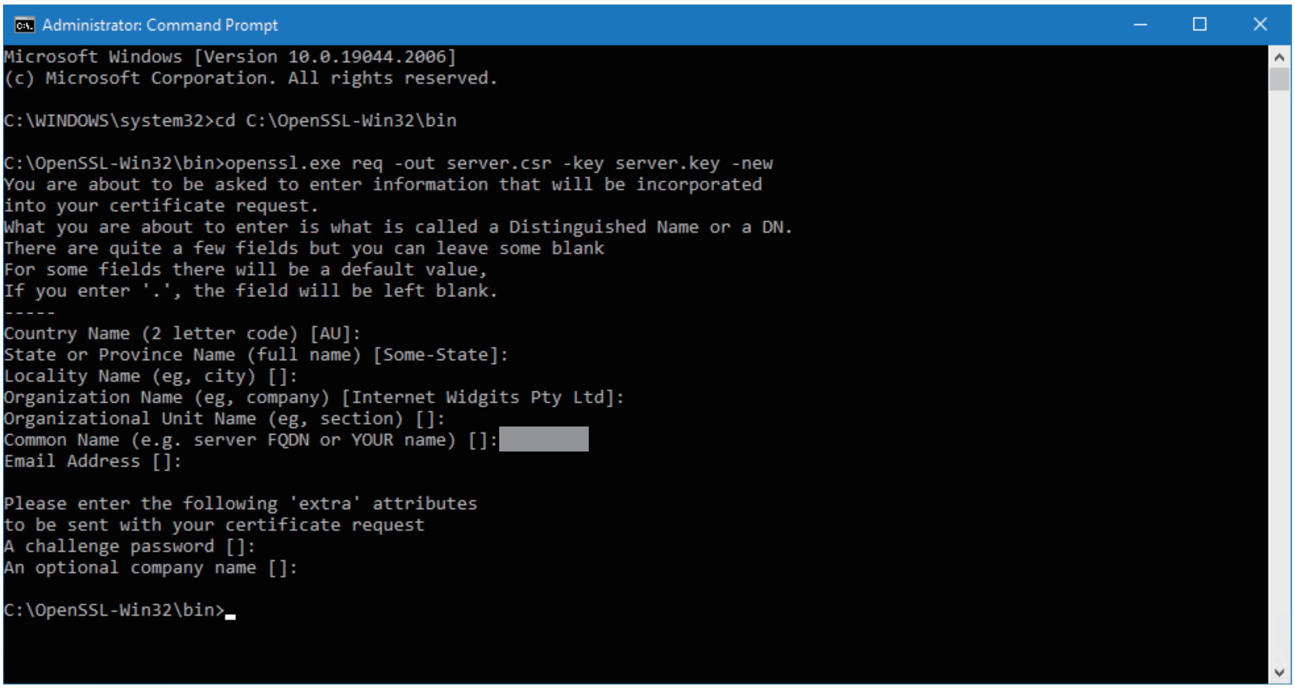
- server.csr: Name of a certificate signing request file to create
- server.key: Name of a server secret key file created in the following:

☞ Page 521 Creating a server secret key

3. Enter the following items:

Item	Description
Country Name (2 letter code)[*1]	Country name
State or Province Name (full name) [Some-State][*1]	Prefecture name
Locality Name (eg, city) [][*1]	Municipality name
Organization Name (eg, company) [Internet Widgits Pty Ltd][*1]	Organization name
Organizational Unit Name (eg, section) [][*1]	Department name
Common Name (e.g. server FQDN or YOUR name) []	Host name (machine name of a server)
Email Address [][*1]	E-mail address

*1 Optional



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe req -out server.csr -key server.key -new
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:[redacted]
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:

C:\OpenSSL-Win32\bin>_
```

Precautions

All of the following items cannot be the same as those entered when creating a self-signed certificate and a CA secret key.
(☞ Page 520 Creating a self-signed certificate and a CA secret key)

- Country Name (2 letter code)
- State or Province Name (full name) [Some-State]
- Locality Name (eg, city) []
- Organization Name (eg, company) [Internet Widgits Pty Ltd]
- Organizational Unit Name (eg, section) []
- Common Name (e.g. server FQDN or YOUR name) []
- Email Address []

■Creating a server certificate

The following shows the procedure for creating a server certificate.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe x509 -req -in server.csr -CA ca.cer -CAkey ca.key -CAcreateserial -out server.cer -days 365

- server.csr: Name of a certificate signing request file created in the following:

☞ Page 522 Creating a certificate signing request (server certificate)

- ca.cer: Name of a self-signed certificate file created in the following:

☞ Page 520 Creating a self-signed certificate and a CA secret key

- ca.key: Name of a CA secret key file created in the following:

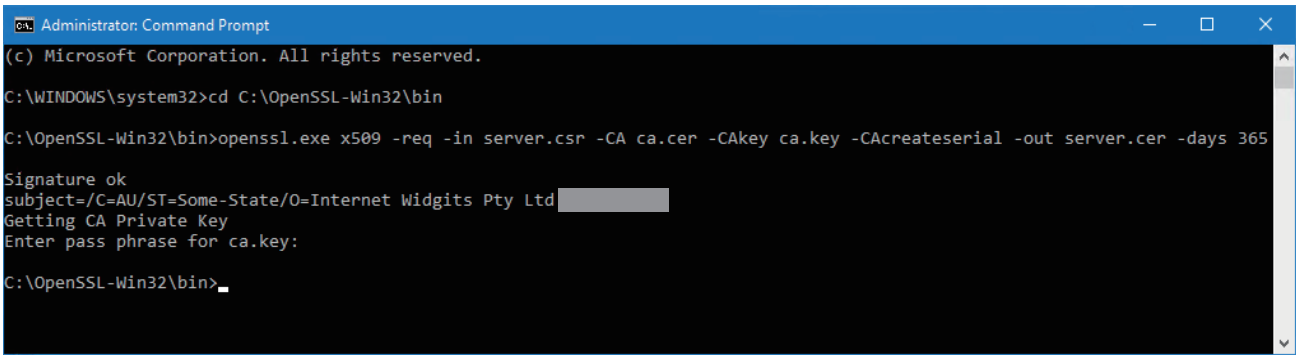
☞ Page 520 Creating a self-signed certificate and a CA secret key

- server.cer: Name of a server certificate file to create
- 365: Number of valid days

3. Enter the following item:

Item	Description
Enter pass phrase for (CA secret key file name).key	Passphrase of a CA secret key[*1]

[*1] Enter the same content as that of "Enter PEM pass phrase" entered in the following:
☞ Page 520 Creating a self-signed certificate and a CA secret key



```
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe x509 -req -in server.csr -CA ca.cer -CAkey ca.key -CAcreateserial -out server.cer -days 365

Signature ok
subject=/C=AU/ST=Some-State/O=Internet Widgits Pty Ltd [redacted]
Getting CA Private Key
Enter pass phrase for ca.key:

C:\OpenSSL-Win32\bin>_
```

■Creating a client secret key

The following shows the procedure for creating a client secret key.

Operating procedure

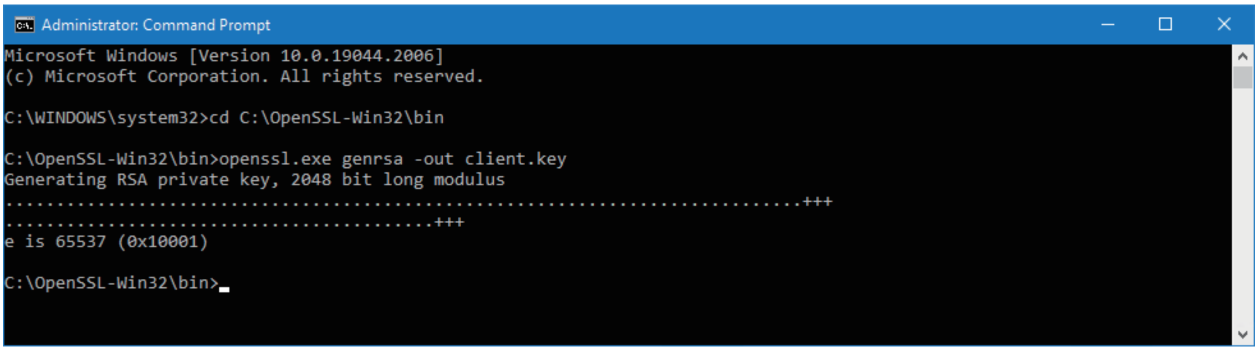
1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe genrsa -out client.key

- client.key: Name of a client secret key file to create



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe genrsa -out client.key
Generating RSA private key, 2048 bit long modulus
...............................................................................+++
...........................................+++
e is 65537 (0x10001)

C:\OpenSSL-Win32\bin>_
```

■Creating a certificate signing request (client certificate)

The following shows the procedure for creating a certificate signing request.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe req -out client.csr -key client.key -new

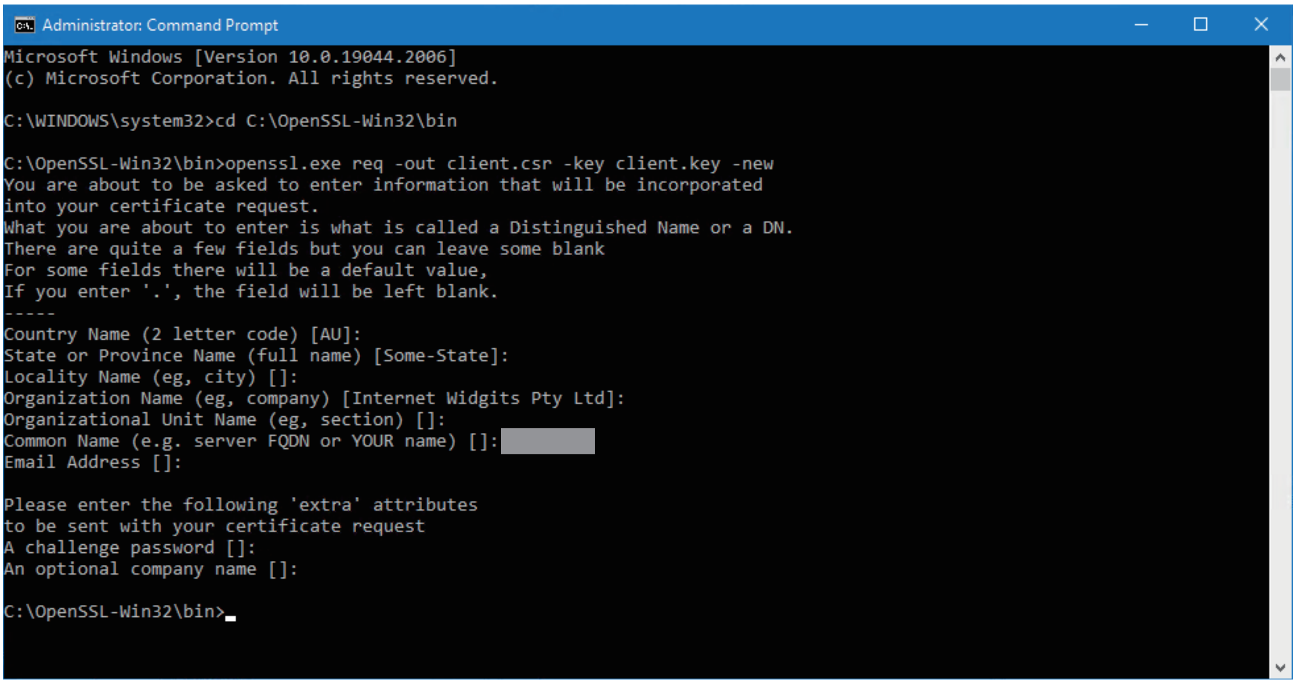
- client.csr: Name of a certificate signing request file to create
- client.key: Name of a client secret key file created in the following:

☞ Page 524 Creating a client secret key

3. Enter the following items:

Item	Description
Country Name (2 letter code)*1	Country name
State or Province Name (full name) [Some-State]*1	Prefecture name
Locality Name (eg, city) []*1	Municipality name
Organization Name (eg, company) [Internet Widgits Pty Ltd]*1	Organization name
Organizational Unit Name (eg, section) []*1	Department name
Common Name (e.g. server FQDN or YOUR name) []	Host name (machine name of a client)
Email Address []*1	E-mail address

*1 Optional



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe req -out client.csr -key client.key -new
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:
State or Province Name (full name) [Some-State]:
Locality Name (eg, city) []:
Organization Name (eg, company) [Internet Widgits Pty Ltd]:
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:[redacted]
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:

C:\OpenSSL-Win32\bin>_
```

Precautions

All of the following items cannot be the same as those entered when creating a self-signed certificate and a CA secret key.
(☞ Page 520 Creating a self-signed certificate and a CA secret key)

- Country Name (2 letter code)
- State or Province Name (full name) [Some-State]
- Locality Name (eg, city) []
- Organization Name (eg, company) [Internet Widgits Pty Ltd]
- Organizational Unit Name (eg, section) []
- Common Name (e.g. server FQDN or YOUR name) []
- Email Address []

■Creating a client certificate

The following shows the procedure for creating a client certificate.

Operating procedure

1. Open the command prompt with the administrator authority, and execute the following:

cd (installation folder for OpenSSL)\bin

2. Execute the following:

openssl.exe x509 -req -in client.csr -CA ca.cer -CAkey ca.key -CAcreateserial -out client.cer -days 365

- client.csr: Name of a certificate signing request file created in the following:

☞ Page 525 Creating a certificate signing request (client certificate)

- ca.cer: Name of a self-signed certificate file created in the following:

☞ Page 520 Creating a self-signed certificate and a CA secret key

- ca.key: Name of a CA secret key file created in the following:

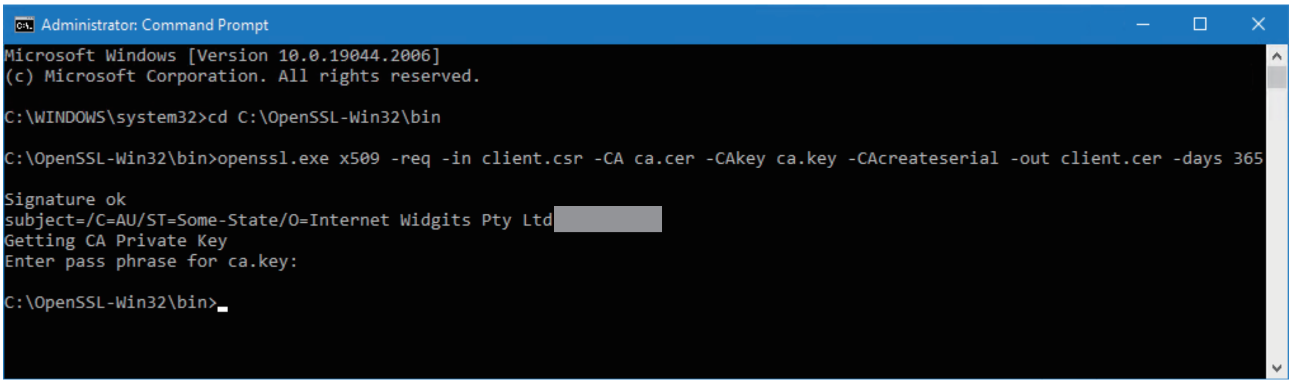
☞ Page 520 Creating a self-signed certificate and a CA secret key

- client.cer: Name of a client certificate file to create
- 365: Number of valid days

3. Enter the following item:

Item	Description
Enter pass phrase for (CA secret key file name).key	Passphrase of a CA secret key[*1]

[*1] Enter the same content as that of "Enter PEM pass phrase" entered in the following:
☞ Page 520 Creating a self-signed certificate and a CA secret key



```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\OpenSSL-Win32\bin

C:\OpenSSL-Win32\bin>openssl.exe x509 -req -in client.csr -CA ca.cer -CAkey ca.key -CAcreateserial -out client.cer -days 365

Signature ok
subject=/C=AU/ST=Some-State/O=Internet Widgits Pty Ltd[redacted]
Getting CA Private Key
Enter pass phrase for ca.key:

C:\OpenSSL-Win32\bin>_
```

Configuring the settings for connection from another industrial PC

The following shows the setting procedure for connection from an industrial PC other than one on which Eclipse Mosquitto is running.

Operating procedure

1. Set access control for connection from another industrial PC.

☞ Page 528 Setting access control

2. Set a port number used for connection from another industrial PC.

☞ Page 528 Setting a port number

3. Set a firewall.

☞ Page 528 Setting a firewall

Setting access control

For access control for connection from another industrial PC, refer to the following:

☞ Page 510 Setting access control

Setting a port number

Set a port number used for connection from another industrial PC.

This setting is required even when using the default value (1883).

Operating procedure

1. Open "mosquitto.conf" in the installation directory for Eclipse Mosquitto in a text editor.

If the installation directory for Eclipse Mosquitto is one such as Program Files that requires the administrator authority, start a text editor with the administrator authority in advance and open "mosquitto.conf."

2. Add the following to the end in the file.

- listener Port number used for connection with another industrial PC

Setting a firewall

Set a firewall.

Communication connections to Eclipse Mosquitto must be allowed in the firewall of an industrial PC on which Eclipse Mosquitto is running.

Refer to the following to change the firewall setting.

☞ Page 560 Allowing Communication Connections between Industrial PCs

Appendix 4 Database Setup

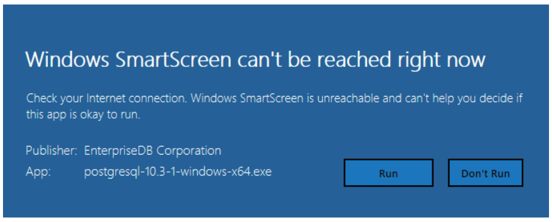
This section shows the consideration and procedure for setting up a database (PostgreSQL) the operation of which has been checked.

For a database the operation of which has been checked, refer to the following:

☞ Page 78 Database

Consideration for setup

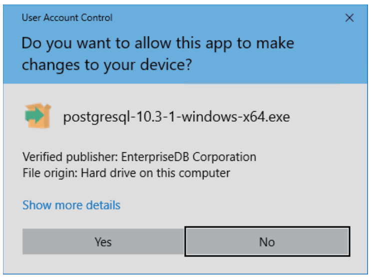
When the following screens appear during installation, check that the file is downloaded from an appropriate website then click the [Run] and [Yes] buttons.



Windows SmartScreen can't be reached right now

Check your Internet connection. Windows SmartScreen is unreachable and can't help you decide if this app is okay to run.

Publisher: EnterpriseDB Corporation
App: postgresql-10.3-1-windows-x64.exe



User Account Control

Do you want to allow this app to make changes to your device?

postgresql-10.3-1-windows-x64.exe

Verified publisher: EnterpriseDB Corporation
File origin: Hard drive on this computer

Setup procedure

The following shows the procedure for setting up PostgreSQL.

1. Install PostgreSQL.

☞ Page 530 Installing PostgreSQL

2. Connect to PostgreSQL.

☞ Page 532 Connecting to PostgreSQL

3. When using an account other than the 'postgres' account[*1] which is a superuser, create an account.

*1 Automatically created when installing PostgreSQL.

☞ Page 533 Creating an account for PostgreSQL

4. Install the ODBC driver for PostgreSQL.

☞ Page 535 Installing the ODBC driver for PostgreSQL

5. Configure the ODBC setting.

☞ Page 536 ODBC setting

6. Create a table by using a DDL.

☞ Page 537 Creating a table by using a DDL

7. Set a privilege to a table.

☞ Page 538 Setting a privilege to a table

Installing PostgreSQL

The following shows the procedure for installing PostgreSQL.

Operating procedure

1. Access the following website, and download the installer of PostgreSQL.

- www.postgresql.org

Point

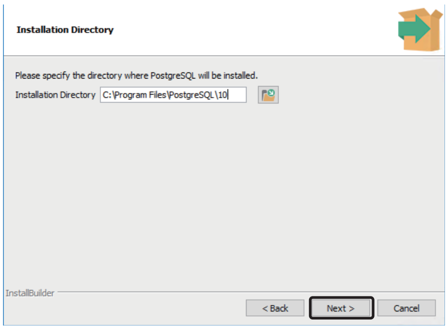
The installer can also be downloaded from the following website:

- www.edgecross.org

2. Run the installer.

3. Click the [Next>] button.

4. Select an installation folder, and click the [Next>] button.



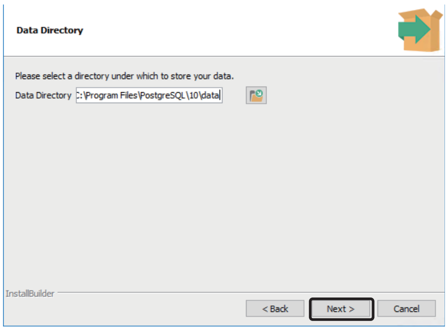
Installation Directory

Please specify the directory where PostgreSQL will be installed.

Installation Directory C:\Program Files\PostgreSQL\10

5. Click the [Next>] button.

6. Select a data directory, and click the [Next>] button.



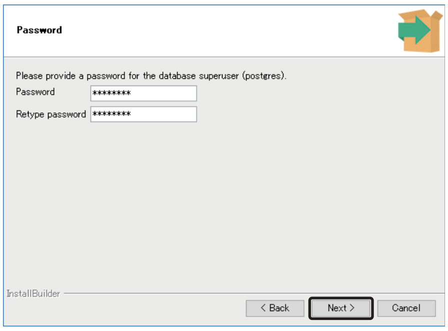
Data Directory

Please select a directory under which to store your data.

Data Directory C:\Program Files\PostgreSQL\10\data

7. Set a password[*1] for the 'postgres' account that is a superuser, and click the [Next>] button.

[*1] Must be set to 6 to 32 characters when using the 'postgres' account.



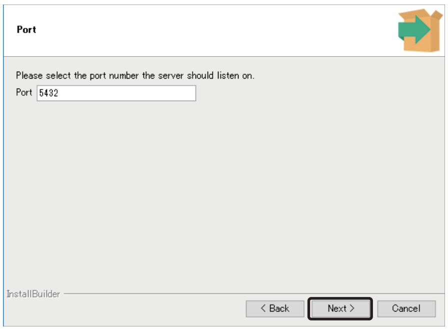
Password

Please provide a password for the database superuser (postgres).

Password ********

Retype password ********

8. Set a port number for "Port," and click the [Next>] button.

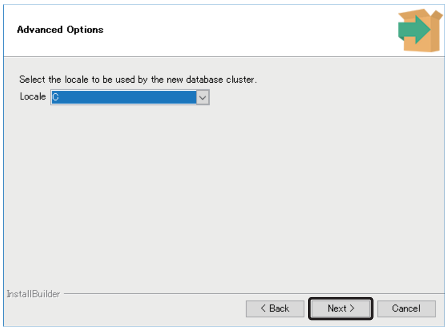


Port

Please select the port number the server should listen on.

Port 5432

9. Select "C" for "Locale," and click the [Next>] button.



Advanced Options

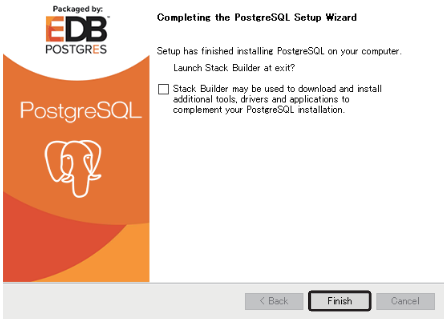
Select the locale to be used by the new database cluster.

Locale C

10. Click the [Next>] button.

11. Click the [Next>] button.

12. Unselect the checkbox in the screen, and click the [Finish] button.



Completing the PostgreSQL Setup Wizard

Setup has finished installing PostgreSQL on your computer.

Launch Stack Builder at exit?

☐ Stack Builder may be used to download and install additional tools, drivers and applications to complement your PostgreSQL installation.

Connecting to PostgreSQL

The following shows the procedure for connecting to PostgreSQL.

Precautions

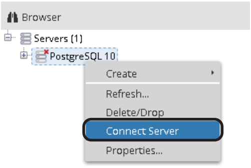
Depending on an industrial PC used[*1], starting pgAdmin may fail. In this case, restart pgAdmin or refer to the following:

*1 Industrial PC in which Atom is used for a CPU or the load is high

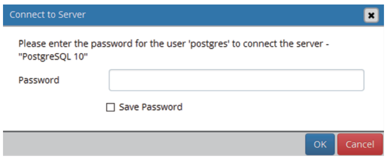
☞ Page 540 Setup procedure using a batch file

Operating procedure

1. Start pgAdmin 4 from "PostgreSQL 10" in Windows Start.
2. Right-click "PostgreSQL 10" and select [Connect Server].



3. Set a password for the 'postgres' account.



Please enter the password for the user 'postgres' to connect the server - "PostgreSQL 10"

4. Click the [OK] button.

Creating an account for PostgreSQL

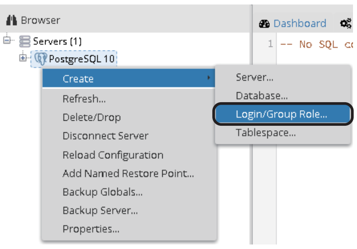
The following shows the procedure for creating an account for PostgreSQL.
When using the 'postgres' account[*1] which is a superuser, this procedure is not required.

*1 Automatically created when installing PostgreSQL.

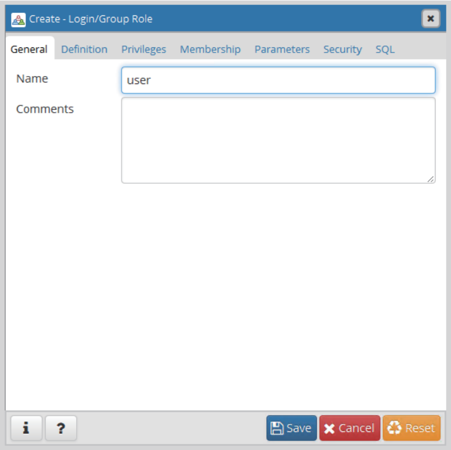
Operating procedure

1. Start pgAdmin 4 from "PostgreSQL 10" in Windows Start.

2. Right-click "PostgreSQL 10" and select [Create] ⇨ [Login/Group Role...].

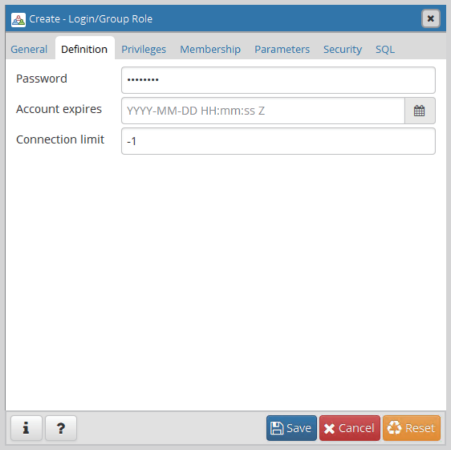


3. Set a user name for "Name" in the [General] tab (1 to 32 characters).



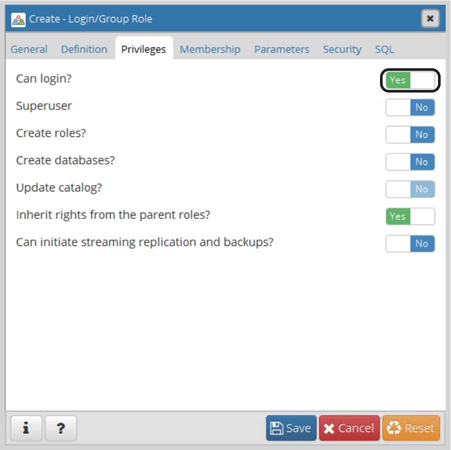
Name: user

4. Set a password for "Password" in the [Definition] tab (6 to 32 characters).



Password: ••••••••
Account expires: YYYY-MM-DD HH:mm:ss Z
Connection limit: -1

5. Select "Yes" for "Can login?" in the [Privileges] tab.



Can login? Yes
Superuser No
Create roles? No
Create databases? No
Update catalog? No
Inherit rights from the parent roles? Yes
Can initiate streaming replication and backups? No

6. Click the [Save] button.

Installing the ODBC driver for PostgreSQL

The following shows the procedure for installing the ODBC driver for PostgreSQL.

Operating procedure

1. Access the following website, and download the installer of the ODBC driver for PostgreSQL.

- www.postgresql.org

Point

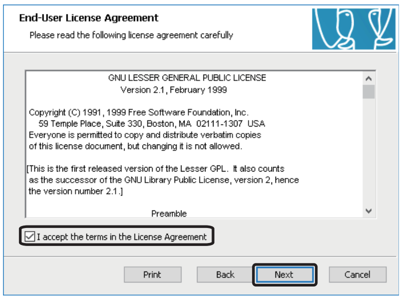
The installer can also be downloaded from the following website:

- www.edgecross.org

2. Run the installer.

3. Click the [Next] button.

4. Select the checkbox of "I accept the terms in the License Agreement," and click the [Next] button.



End-User License Agreement

Please read the following license agreement carefully

GNU LESSER GENERAL PUBLIC LICENSE
Version 2.1, February 1999

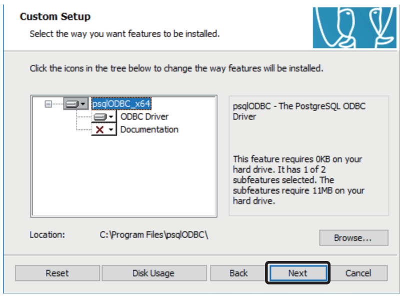
Copyright (C) 1991, 1999 Free Software Foundation, Inc.
59 Temple Place, Suite 330, Boston, MA 02111-1307 USA
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts
as the successor of the GNU Library Public License, version 2, hence
the version number 2.1.]

Preamble

☑ I accept the terms in the License Agreement

5. Check that 'ODBC Driver' is an installation target, and click the [Next] button.



Custom Setup

Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

psqlODBC - The PostgreSQL ODBC Driver

This feature requires 0KB on your hard drive. It has 1 of 2 subfeatures selected. The subfeatures require 11MB on your hard drive.

Location: C:\Program Files\psqlODBC\

6. Click the [Install] button.

7. Click the [Finish] button.

ODBC setting

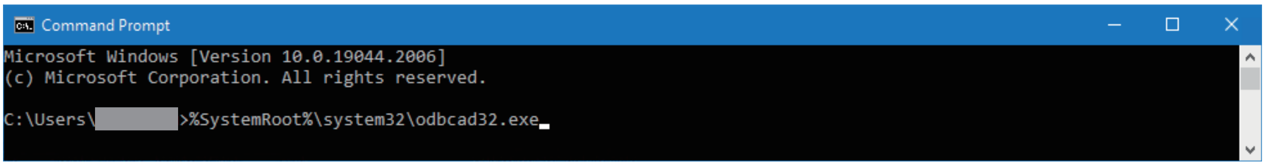
The following shows the procedure for setting ODBC.

Operating procedure

1. Open the command prompt, and execute the following file.

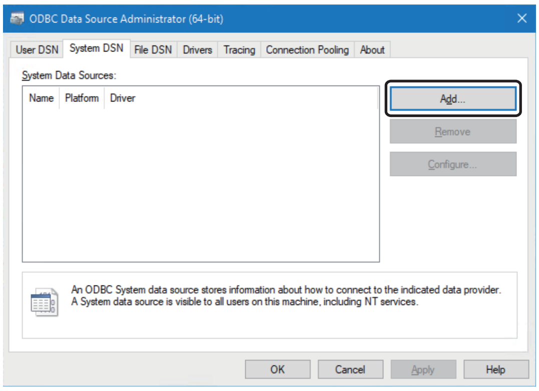
ODBC Data Source Administrator starts.

- "%SystemRoot%\system32\odbcad32.exe"



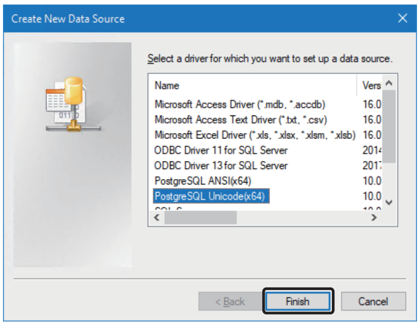
```
Microsoft Windows [Version 10.0.19044.2006]
(c) Microsoft Corporation. All rights reserved.

C:\Users\[redacted]>%SystemRoot%\system32\odbcad32.exe_
```

2. Select the [System DSN] tab, and click the [Add] button.



An ODBC System data source stores information about how to connect to the indicated data provider. A System data source is visible to all users on this machine, including NT services.

3. Select "PostgreSQL Unicode(x64)," and click the [Finish] button.

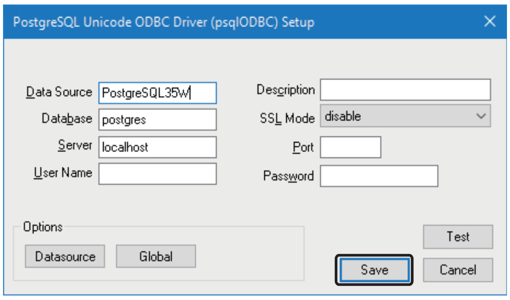


Select a driver for which you want to set up a data source.

Name	Vers
Microsoft Access Driver (*.mdb, *.accdb)	16.0
Microsoft Access Text Driver (*.txt, *.csv)	16.0
Microsoft Excel Driver (*.xls, *.xlsx, *.xlsm, *.xlsb)	16.0
ODBC Driver 11 for SQL Server	2014
ODBC Driver 13 for SQL Server	2017
PostgreSQL ANSI(x64)	10.0
PostgreSQL Unicode(x64)	10.0

4. Set each item, and click the [Save] button.[*1]

*1 Set "localhost" for "Server" and the name of a database to save data for "Database."



Data Source: PostgreSQL35W

Database: postgres

Server: localhost

User Name:

Description:

SSL Mode: disable

Port:

Password:

5. Click the [OK] button.

Creating a table by using a DDL

The following shows the procedure for creating a table by using a DDL.

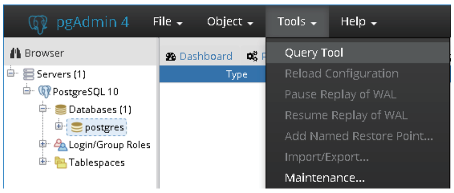
Precautions

If there is another table with a same name, the existing table will be deleted and a new one will be created. Therefore, data stored in the existing table will also be deleted.

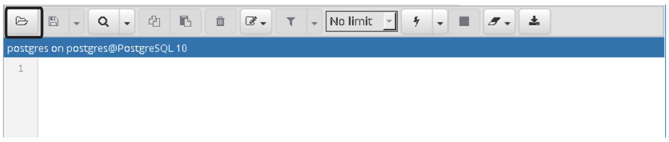
Operating procedure

1. Start pgAdmin 4 from "PostgreSQL 10" in Windows Start.

2. Select a database to use, and select [Tools] ⇨ [Query Tool].



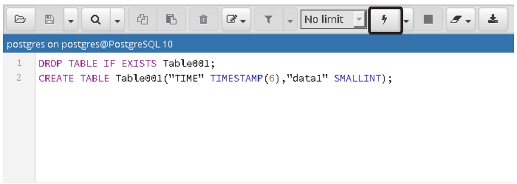
3. Click 📂.



4. Select an SQL file (output DDL file[*1]), and click the [Select] button.

[*1] A DDL file must be output to the hard disk of an industrial PC, not to a network drive or removal disk.
For outputting a DDL file, refer to the following:
Real-time Flow Designer: ☞ Page 157 Definition output
Management Shell Explorer: ☞ Page 287 DB saving setting

5. Click ⚡.



```sql
DROP TABLE IF EXISTS Table001;
CREATE TABLE Table001("TIME" TIMESTAMP(6),"data1" SMALLINT);
```

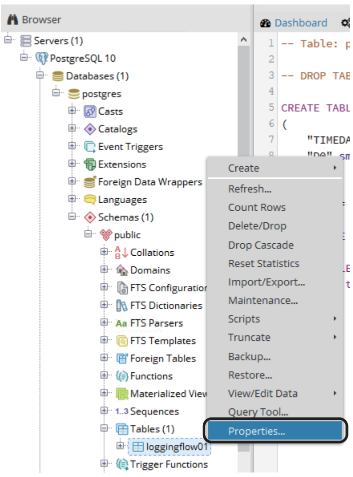
Setting a privilege to a table

The following shows the procedure for setting a privilege to a table.

Operating procedure

1. Right-click a table set in the following section, and select [Properties].

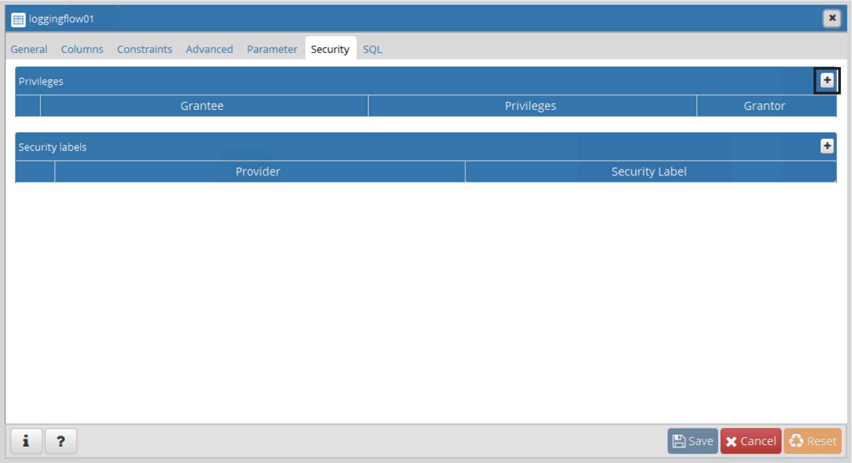
☞ Page 537 Creating a table by using a DDL



```
-- Table: p

-- DROP TAB

CREATE TABL
(
    "TIMEDA
```

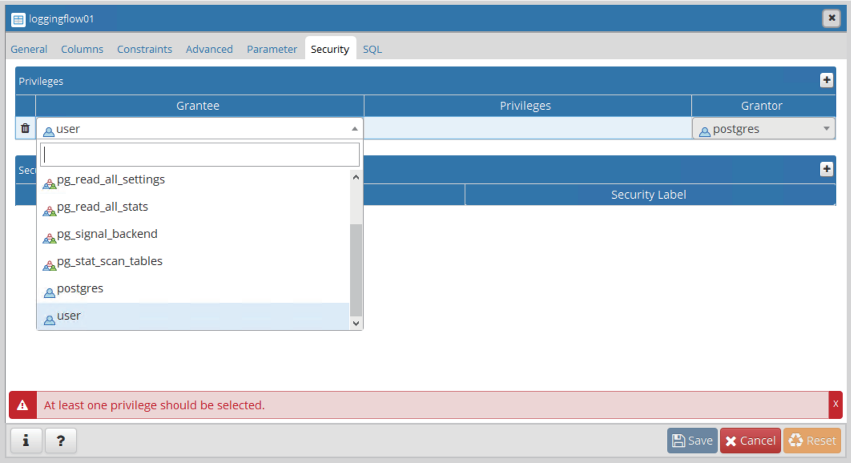
2. Select the [Security] tab.

3. Click the [+] button of "Privileges."



4. Select an account set in the following section under "Grantee."

☞ Page 533 Creating an account for PostgreSQL

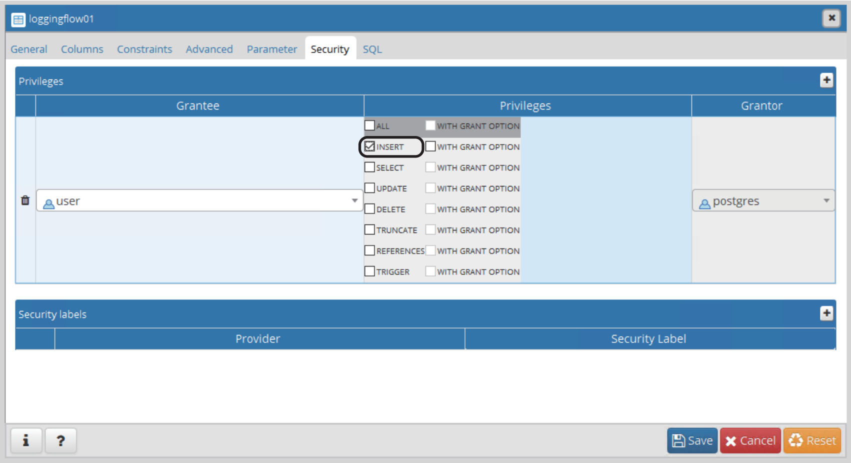


Grantee: user

Grantor: postgres

At least one privilege should be selected.

5. Select the checkbox of "INSERT" under "Privileges."



Grantee	Privileges		Grantor
user	☐ ALL	☐ WITH GRANT OPTION	postgres
	☑ INSERT	☐ WITH GRANT OPTION	
	☐ SELECT	☐ WITH GRANT OPTION	
	☐ UPDATE	☐ WITH GRANT OPTION	
	☐ DELETE	☐ WITH GRANT OPTION	
	☐ TRUNCATE	☐ WITH GRANT OPTION	
	☐ REFERENCES	☐ WITH GRANT OPTION	
	☐ TRIGGER	☐ WITH GRANT OPTION	

6. Click the [Save] button.

Setup procedure using a batch file

The following shows the procedure for setting up PostgreSQL by using a batch file.

If starting pgAdmin fails, set up PostgreSQL by using a batch file.

When pgAdmin starts successfully, perform the operations in steps 2 and later described in the following:

☞ Page 529 Setup procedure

Operating procedure

1. Perform either of the following operations:

- When using the 'postgres' account[*1] or a created account: ☞ Page 541 Creating a table by using a batch file
- When using an account other than the 'postgres' account[*1] or creating a new account: (☞ Page 542 Creating a user and table by using a batch file)

[*1] Automatically created when installing PostgreSQL.

2. Install the ODBC driver for PostgreSQL.

☞ Page 535 Installing the ODBC driver for PostgreSQL

3. Configure the ODBC setting.

☞ Page 536 ODBC setting

Creating a table by using a batch file

The following shows the procedure for creating a table by using a batch file.

Precautions

- When using an account other than the 'postgres' account or creating a new account, create a user and table by using a batch file. (☞ Page 542 Creating a user and table by using a batch file)
- If there is another table with a same name, the existing table will be deleted and a new one will be created. Therefore, data stored in the existing table will also be deleted.
- Do not use double-byte characters for a table name and field name. (☞ Page 156 Access table)

Operating procedure

1. Create a batch file ((any file name).bat) as shown below, and save it to any folder.

```
@echo off

SET SERVER=localhost
SET DB=postgres
SET PORT=(Port Number*1)
SET USER=(User Name*2)

echo CREATE TABLE
"(Installation folder*3)\bin\psql.exe" ^
-f "(Path of a DDL file*4)" ^
-h %SERVER% -U %USER% -d %DB% -p %PORT%

pause
```

*1 Specify a port number set in the following:
☞ Page 530 Installing PostgreSQL
*2 Specify the name of a user set for a database. When using a superuser, specify 'postgres.'
*3 Specify an installation folder selected in the following:
☞ Page 530 Installing PostgreSQL
*4 A DDL file must be output to the hard disk of an industrial PC, not to a network drive or removal disk.
For outputting a DDL file, refer to the following:
Real-time Flow Designer: ☞ Page 157 Definition output
Management Shell Explorer: ☞ Page 287 DB saving setting

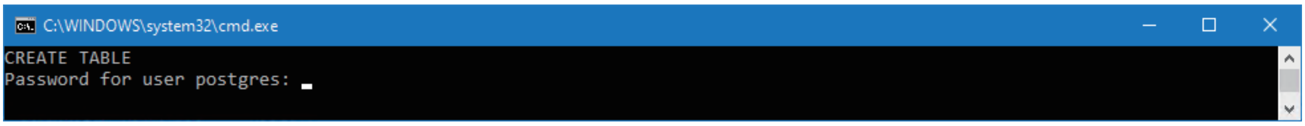
Point

The following shows an example of creating a batch file.

```
@echo off

SET SERVER=localhost
SET DB=postgres
SET PORT=5432
SET USER=postgres

echo CREATE TABLE
"C:\Program Files\PostgreSQL\10\bin\psql.exe" ^
-f "C:\test\test2.sql" ^
-h %SERVER% -U %USER% -d %DB% -p %PORT%

pause
```

2. Execute the created batch file.

3. Enter the password for a user entered in step 1.



```
CREATE TABLE
Password for user postgres: _
```

4. Press any key to end.

Creating a user and table by using a batch file

The following shows the procedure for creating a user and table by using a batch file.

Precautions

- When using the 'postgres' account or a created account, create only a table by using a batch file. (☞ Page 541 Creating a table by using a batch file)
- If there is another table with a same name, the existing table will be deleted and a new one will be created. Therefore, data stored in the existing table will also be deleted.
- Do not use double-byte characters for a table name and field name. (☞ Page 156 Access table)

Operating procedure

1. Create a batch file ((any file name).bat) as shown below, and save it to any folder.

```
@echo off

SET SERVER=localhost
SET DB=postgres
SET PORT=(Port Number*1)
SET SUPERUSER=postgres

SET USER=(User Name*2)
SET PASS=(Password*3)

echo CREATE USER
"(Installation folder*4)\10\bin\psql.exe" ^
-c "CREATE USER %USER% PASSWORD '%PASS%';" -h %SERVER% -U %SUPERUSER% -d %DB% -p %PORT%

echo CREATE TABLE
"(Installation folder*4)\bin\psql.exe" ^
-f "(Path of a DDL file*5)" ^
-h %SERVER% -U %USER% -d %DB% -p %PORT%

pause
```

*1 Specify a port number set in the following:
☞ Page 530 Installing PostgreSQL
*2 Specify the name of a user to create in a database (1 to 32 characters).
*3 Specify the password for a user to create in a database (6 to 32 characters).
*4 Specify an installation folder selected in the following:
☞ Page 530 Installing PostgreSQL
*5 A DDL file must be output to the hard disk of an industrial PC, not to a network drive or removal disk.
For outputting a DDL file, refer to the following:
Real-time Flow Designer: ☞ Page 157 Definition output
Management Shell Explorer: ☞ Page 287 DB saving setting

Point

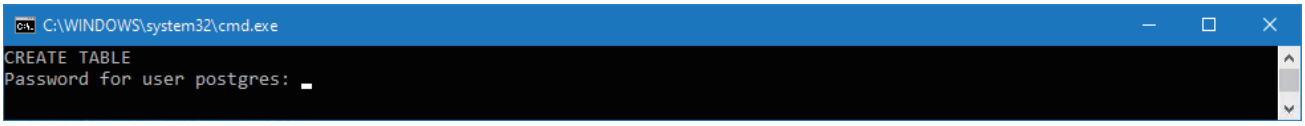
The following shows an example of creating a batch file.

```
@echo off

SET SERVER=localhost
SET DB=postgres
SET PORT=5432
SET SUPERUSER=postgres

SET USER=edgecross
SET PASS=password

echo CREATE USER
"C:\Program Files\PostgreSQL\10\bin\psql.exe" ^
-c "CREATE USER %USER% PASSWORD '%PASS%';" -h %SERVER% -U %SUPERUSER% -d %DB% -p %PORT%

echo CREATE TABLE
"C:\Program Files\PostgreSQL\10\bin\psql.exe" ^
-f "C:\test\test.sql" ^
-h %SERVER% -U %USER% -d %DB% -p %PORT%

pause
```

2. Execute the created batch file.

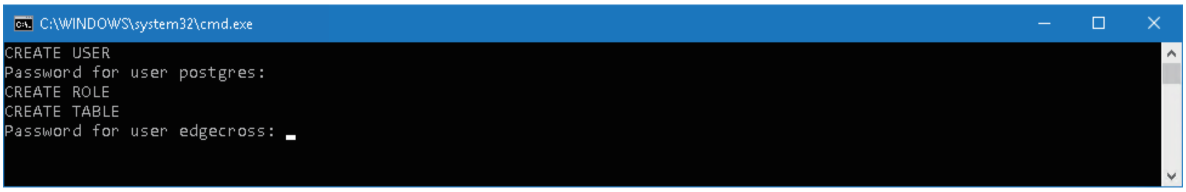
3. Enter the password for the 'postgres' account set in the following:

☞ Page 530 Installing PostgreSQL



```
CREATE TABLE
Password for user postgres: _
```

4. Enter the password entered in step 1.



```
CREATE USER
Password for user postgres:
CREATE ROLE
CREATE TABLE
Password for user edgecross: _
```

5. Press any key to end.

Appendix 5 Data Used in Edgecross Basic Software

This section shows the data used in Edgecross Basic Software.

Data type and value range

The following table shows the data types and ranges of values used in Edgecross Basic Software.

Data type	Description	Value range
BOOL	Binary (0 or 1)	0, 1
INT	Signed 16-bit integer	-32768 to 32767
UINT	Unsigned 16-bit integer	0 to 65535
DINT	Signed 32-bit integer	-2147483648 to 2147483647
UDINT	Unsigned 32-bit integer	0 to 4294967295
LINT	Signed 64-bit integer	-9223372036854775808 to 9223372036854775807
ULINT	Unsigned 64-bit integer	0 to 18446744073709551615
REAL	32-bit real number[1,2]	• 0 • 1.40129846E-45 (absolute value) to 3.40282346E38 (absolute value)
LREAL	64-bit real number[1,2]	• 0 • 4.9406564584124654E-324 (absolute value) to 1.7976931348623158E308 (absolute value)
STRING	Character string (ASCII)[3,4,5]	0 to 32 characters
WSTRING	Character string (Unicode)[3,4,5]	0 to 16 characters

[1] Real numbers are floating-point numbers compliant with IEEE 754.

[2] Numerical values entered in the screen of Edgecross Basic Software are converted into floating point numbers compliant with IEEE 754; therefore, enter numerical values in the following range so that entered values are retained.
REAL: 0, 1.17550E-38 (absolute value) to 3.40282E38 (absolute value)
LREAL: 0, 2.22507385850721E-308 (absolute value) to 1.79769313486231E308 (absolute value)

[3] When a terminator is contained, the string from the leading character through the character immediately before the terminator is valid.

[4] For available characters, refer to the following section. However, character strings of the actual data are not checked whether they are available or not.
☞ Page 545 Available characters

[5] The data size is a variable length.

Values that can be entered in the screen

The following table shows the values that can be entered in the screen of Edgecross Basic Software.

Type	Available character	Data type		Default value	Range of the number of characters
Integer	-, +, [0 to 9]	Binary (0 or 1)	BOOL	0	1 to 21 characters
		Signed	INT	0	
			DINT	0	
			LINT	0	
		Unsigned	UINT	0	
			UDINT	0	
			ULINT	0	
Real number[1]	-, +, e, E, . (decimal point), [0 to 9]	Single-precision real number (32-bit)	REAL	0.0	1 to 12 characters (significant digits of mantissa: 6 digits)
		Double-precision real number (64-bit)	LREAL	0.0	1 to 22 characters (significant digits of mantissa: 15 digits)
Character string (ASCII)[2]	Same as the STRING type. ☞ Page 545 STRING type	ASCII	STRING	Blank	0 to 32 characters
Character string (UNICODE)[2]	Same as the WSTRING type. ☞ Page 545 WSTRING type	Unicode	WSTRING	Blank	0 to 16 characters

[1] For a numeric string starting with "0" at the leftmost position, the portion from the first non-zero figure to the end is treated as mantissa.
(Example) 0.000123456 is valid.

[2] Escape sequence (such as \n and \u000A) are handled without converting into control characters.

Available characters

STRING type

The following lists the available characters.

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	‘	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

Point

If an unavailable character is output, the character will be replaced with a period (.). However, if a string terminator (0) is used halfway in the data, the string terminator (0) is not replaced with a period (.) and the subsequent data is not output.

WSTRING type

Characters defined by Unicode can be used. However, U+0000 to U+001F, U+007F to U+00A0, U+00AD, U+2028, and U+2029 cannot be used.

When using combining characters, a character before combining is counted as one character.

Ex.

A combining character 'à' composed of a character 'a' (U+0061) and a grave accent '̀' (U+0300)

It is displayed as one character in the screen but it is counted as two characters.

Point

If a string terminator (0) is used halfway in the data, the subsequent data is not output.

Value after changing the data type

If the data type is changed when a value is set for data, the value will be changed as shown in the following table:

Data type		Value after change
Before change	After change	
Integer type[1]	Integer type[1]	• A set value is within the range of data types after change[2]: Not changed • A set value is out of the range of data types after change[2]: 0
	Real number type[3]	0.0
	String type[4]	Blank
Real number type[3]	Integer type[1]	0
	Real number type[3]	• A set value is within the range of data types after change[2]: Not changed • A set value is out of the range of data types after change[2]: 0.0
	String type[4]	Blank
String type (STRING)	Integer type[1]	0
	Real number type[3]	0.0
	String type (STRING)	Not changed
	String type (WSTRING)	Blank
String type (WSTRING)	Integer type[1]	0
	Real number type[3]	0.0
	String type (STRING)	Blank
	String type (WSTRING)	Not changed

[1] Refers to BOOL, INT, UINT, UDINT, LINT, or ULINT.

[2] For the data types and ranges of values, refer to the following:
☞ Page 544 Data type and value range

[3] Refers to REAL or LREAL.

[4] Refers to STRING or LSTRING.

Data assignment

In data collection and feedback, data assignment means to assign input and output data to the data in the target system.

Data assignment availability

The following shows the availability of data type assignment in CSV File Data collector.

For other data collectors, refer to the manual for a data collector used.

When the target data type is integer

○: Assignment available, ×: Assignment unavailable

Function	**Target data type**						
	BOOL	**UINT**	**UDINT**	**ULINT**	**INT**	**DINT**	**LINT**
CSV File Data collector	○	○	○	○	○	○	○

When the target data type is real

○: Assignment available, ×: Assignment unavailable

Function	**Target data type**	
	REAL	**LREAL**
CSV File Data collector	○	○

When the target data type is string

○: Assignment available, ×: Assignment unavailable

Function	**Target data type**	
	STRING	**WSTRING**
CSV File Data collector	×	×

■Number of points for data assignment

CSV File Data collector performs file input and output. The number of points for data assignment is not required to be considered.

For other data collectors, refer to the manual for a data collector used.

Data substitution

Data substitution means for converting the data type of output data of a process to the data type of input data of a process.

Data flow between processes

The following shows availability of data substitution between processes.

○: Substitution available, ×: Substitution unavailable

Output data from previous process	Input data to next process										
	BOOL	**UINT**	**INT**	**UDINT**	**DINT**	**REAL**	**ULINT**	**LINT**	**LREAL**	**STRING**	**WSTRING**
BOOL	○	○[1]	○[1]	○[1]	○[1]	○[1]	○[1]	○[1]	○[1]	×	×
UINT	×	○	×	○	×	○	○	○	○	×	×
INT	×	×	○	×	○	○	×	○	○	×	×
UDINT	×	×	×	○	×	○[2]	○	○	○	×	×
DINT	×	×	×	×	○	○[2]	×	○	○	×	×
REAL	×	×	×	×	×	○	×	×	○	×	×
ULINT	×	×	×	×	×	×	○	×	○[2]	×	×
LINT	×	×	×	×	×	×	×	○	○[2]	×	×
LREAL	×	×	×	×	×	×	×	×	○	×	×
STRING	×	×	×	×	×	×	×	×	×	○[3]	×
WSTRING	×	×	×	×	×	×	×	×	×	×	○[3]

[1] Substituted as bit OFF (0) and ON (1).

[2] There will be an error with the value.

[3] If the string size of the input data to the next process is smaller than that of the output data from the previous process, the string is truncated before substitution.

Data substitution by feedback

Response data and constant values can be returned back to the system by providing feedback.

The following shows availability of data substitution for each substitution target data type.

When the target data type is integer

○: Substitution available, ×: Substitution unavailable

Setting value		Target data type						
		BOOL	UINT	INT	UDINT	DINT	ULINT	LINT
Response data		○	○	○	○	○	○	○
Constant	Integer	○[1]	○	○	○	○	○	○
	Real number	×	×	×	×	×	×	×
	Character string (ASCII)	×	×	×	×	×	×	×
	Character string (UNICODE)	×	×	×	×	×	×	×

[1] "0" is substituted as bit OFF and other than "0" as bit ON.

When the target data type is real

○: Substitution available, ×: Substitution unavailable

Setting value		Target data type	
		REAL	LREAL
Response data		○	○
Constant	Integer	×	×
	Real number	○	○
	Character string (ASCII)	×	×
	Character string (UNICODE)	×	×

When the target data type is string

○: Substitution available, ×: Substitution unavailable

Setting value		Target data type	
		STRING	WSTRING
Response data		○[1]	○
Constant	Integer	×	×
	Real number	×	×
	Character string (ASCII)	○[1]	×
	Character string (UNICODE)	×	○[1]

[1] If the string size of the substitution target is smaller than the actual string size, the string is truncated before substitution.

Data comparison

Data can be compared, for example, as a condition for segmenting data in data processing.
Significance and equality of values can be compared.

Significance comparison

The following shows availability of significance comparison for each data type.

When the comparison target is an integer

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target						
	BOOL	UINT	INT	UDINT	DINT	ULINT	LINT
BOOL	×	×	×	×	×	×	×
UINT	×	○	○	○	○	○	○
INT	×	○	○	○	○	○	○
UDINT	×	○	○	○	○	○	○
DINT	×	○	○	○	○	○	○
ULINT	×	○	○	○	○	○	○
LINT	×	○	○	○	○	○	○
REAL	×	○	○	○	○	○*1	○*1
LREAL	×	○	○	○	○	○*1	○*1
STRING	×	×	×	×	×	×	×
WSTRING	×	×	×	×	×	×	×

*1 There is a difference in the accuracy of the data type to be compared. Therefore, values may not be compared correctly when they are close to each other.

When the comparison target is a real number or string

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target			
	REAL	LREAL	STRING	WSTRING
BOOL	×	×	×	×
UINT	○	○	×	×
INT	○	○	×	×
UDINT	○	○	×	×
DINT	○	○	×	×
ULINT	○*1	○*1	×	×
LINT	○*1	○*1	×	×
REAL	○	○*2	×	×
LREAL	○*2	○	×	×
STRING	×	×	×	×
WSTRING	×	×	×	×

*1 There is a difference in the accuracy of the data type to be compared. Therefore, values may not be compared correctly when they are close to each other.

*2 Since real numbers are compared for equality in a binary comparison, a single-precision real number may not be compared with a double-precision real number correctly when numbers to be compared are close or equal to each other.

When the comparison target is a constant

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target			
	Constant (integer)	Constant (real number)	Constant (ASCII)	Constant (UNICODE)
BOOL	×	×	×	×
UINT	○	×	×	×
INT	○	×	×	×
UDINT	○	×	×	×
DINT	○	×	×	×

Comparison source	Comparison target			
	Constant (integer)	Constant (real number)	Constant (ASCII)	Constant (UNICODE)
ULINT	○	×	×	×
LINT	○	×	×	×
REAL	×	○[1]	×	×
LREAL	×	○	×	×
STRING	×	×	×	×
WSTRING	×	×	×	×

[1] Since real numbers are compared for equality in a binary comparison, a single-precision real number may not be compared with a double-precision real number correctly when numbers to be compared are close or equal to each other. (A constant (real number) is regarded as a double-precision real number.)

Equality comparison

The following shows availability of equality comparison for each data type.

When the comparison target is an integer

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target						
	BOOL	UINT	INT	UDINT	DINT	ULINT	LINT
BOOL	○	○[1]	○[1]	○[1]	○[1]	○[1]	○[1]
UINT	○[1]	○	○	○	○	○	○
INT	○[1]	○	○	○	○	○	○
UDINT	○[1]	○	○	○	○	○	○
DINT	○[1]	○	○	○	○	○	○
ULINT	○[1]	○	○	○	○	○	○
LINT	○[1]	○	○	○	○	○	○
REAL	×	×	×	×	×	×	×
LREAL	×	×	×	×	×	×	×
STRING	×	×	×	×	×	×	×
WSTRING	×	×	×	×	×	×	×

[1] A bit is compared as an integer. (OFF: 0, ON: 1)

When the comparison target is a real number or string

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target			
	REAL	LREAL	STRING	WSTRING
BOOL	×	×	×	×
UINT	×	×	×	×
INT	×	×	×	×
UDINT	×	×	×	×
DINT	×	×	×	×
ULINT	×	×	×	×
LINT	×	×	×	×
REAL	○[1]	○[1]	×	×
LREAL	○[1]	○[1]	×	×
STRING	×	×	○[2]	×
WSTRING	×	×	×	○[2]

[1] Since real numbers are compared for equality in a binary comparison, a single-precision real number may not be compared with a double-precision real number correctly.

[2] Equality is compared with actual strings. (Comparison is allowed if the character size for the data type differs from each other.)

When the comparison target is a constant

○: Comparison available, ×: Comparison unavailable

Comparison source	Comparison target			
	Constant (integer)	Constant (real number)	Constant (ASCII)	Constant (UNICODE)
BOOL	○[1]	×	×	×

Comparison source	Comparison target			
	Constant (integer)	Constant (real number)	Constant (ASCII)	Constant (UNICODE)
UINT	○	×	×	×
INT	○	×	×	×
UDINT	○	×	×	×
DINT	○	×	×	×
ULINT	○	×	×	×
LINT	○	×	×	×
REAL	×	○[*2]	×	×
LREAL	×	○[*2]	×	×
STRING	×	×	○[*3]	×
WSTRING	×	×	×	○[*3]

*1 A bit is compared as an integer. (OFF: 0, ON: 1)

*2 Since real numbers are compared for equality in a binary comparison, a single-precision real number may not be compared with a double-precision real number correctly. (A constant (real number) is regarded as a double-precision real number.)

*3 Equality is compared with actual strings. (Comparison is allowed if the character size for the data type differs from each other.)

Data missing

Data missing means that collected data is lacking and not continuous.

When the data storing (file saving) function or the data distribution (MQTT distribution) function is performed in a data collection process, data missing information is output. However, it will not be output after a data modification process.

For the output method of data missing information, refer to the following:

- For data storing (file saving)

☞ Page 65 Data missing

- For data distribution (MQTT distribution)

☞ Page 81 Data missing

Point

Whether data missing occurred in a running process flow can be checked by monitoring the number of times of data missing in the process flow diagnostics or status memory monitor of Real-time Flow Designer.

☞ Page 337 Process flow diagnostics

☞ Page 340 Status memory monitor

☞ Page 433 Real-time Flow Manager Status

Appendix 6 Using a Remote Shared Folder

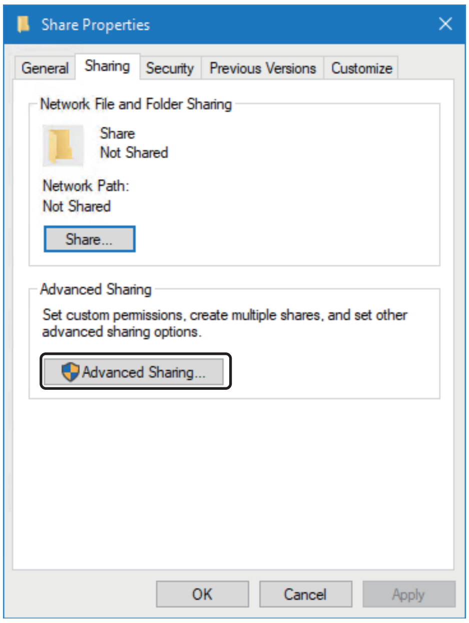
This section shows the settings required for setting a remote shared folder.
Note that a network drive (drive assigned by using a Windows function) cannot be used.

Using a shared folder with specifying a user account in Edgecross Basic Software

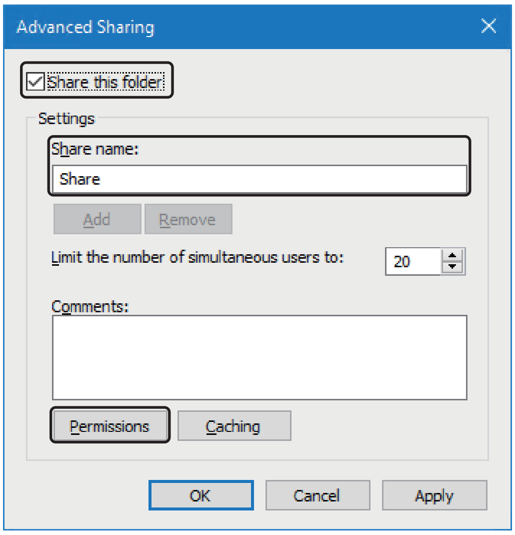
The following shows the setting procedures for using a remote shared folder by specifying a user account in Edgecross Basic Software.

Setting a shared folder

The following shows the procedure for setting a shared folder.
Create a folder to publish as a shared folder in an industrial PC on which Edgecross Basic Software is installed, and configure the sharing settings.
The following shows a setting example for Windows 10.
For other operating systems, refer to the manual or online help for an operating system used.



1. Click the [Advanced Sharing] button in the [Sharing] tab in the properties of a folder.



☑ Share this folder

Share name: Share

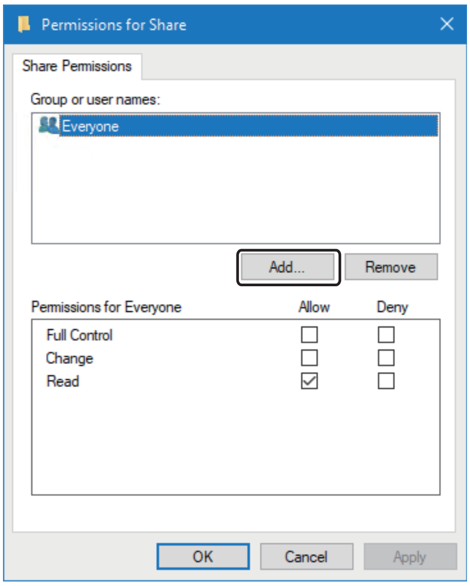
Limit the number of simultaneous users to: 20

2. Select the checkbox of "Share this folder."

3. Set a share name.

4. Click the [Permissions] button.

5. Click the [Add] button.

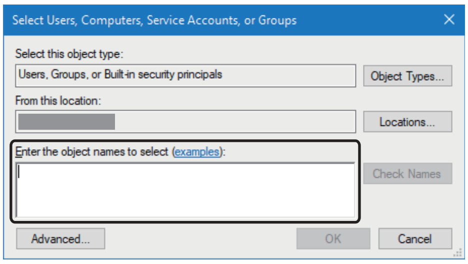


Group or user names:
Everyone

Permissions for Everyone	Allow	Deny
Full Control	☐	☐
Change	☐	☐
Read	☑	☐

6. Enter the account name of a user account specified in Edgecross Basic Software in "Enter the object names to select."

7. Click the [OK] button.



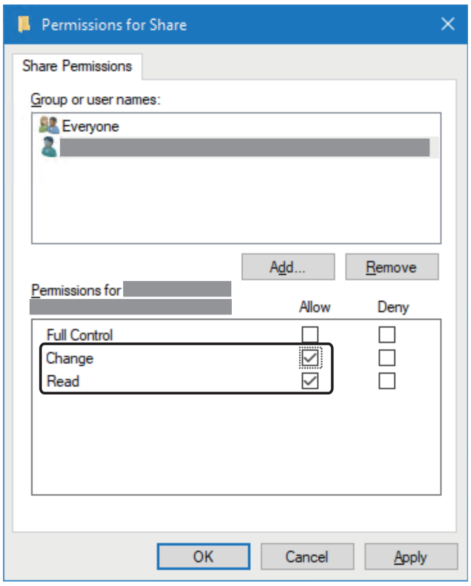
Select this object type:
Users, Groups, or Built-in security principals

From this location:
[redacted]

Enter the object names to select (examples):

8. Select the checkboxes of "Change" and "Read" for the permissions for the user account specified in Edgecross Basic Software.

9. Click the [OK] button.



Group or user names:
Everyone
[redacted]

Permissions for [redacted]	Allow	Deny
Full Control	☐	☐
Change	☑	☐
Read	☑	☐

Setting for accessing a shared folder with a user account without the access right

The following shows the setting procedure for accessing a shared folder by specifying a user account without the access right in Edgecross Basic Software.

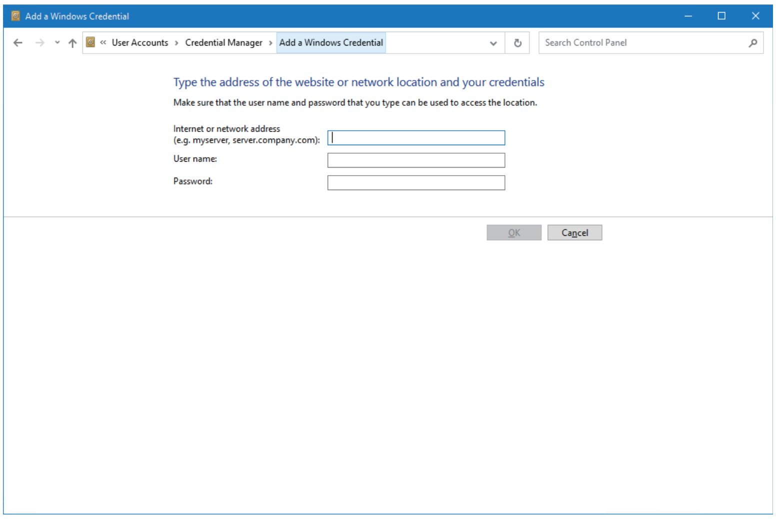
If a user account with the access right is specified, this setting is not required.

Operating procedure

1. Sign in to an industrial PC with a user account specified in Edgecross Basic Software.

2. Open the "Add a Windows Credential" screen to set the following items required for accessing a shared folder.

[Control Panel] ⇨ [User Accounts] ⇨ [Manage Windows Credentials] ⇨ [Add a Windows credential]


Add a Windows Credential
User Accounts › Credential Manager › Add a Windows Credential
Search Control Panel
OK
Cancel

Type the address of the website or network location and your credentials

Make sure that the user name and password that you type can be used to access the location.

Internet or network address (e.g. myserver, server.company.com):

User name:

Password:

Item name	Setting
Internet or network address	Address of a personal computer on which a shared folder is located
User name	User name of a user account with the access right to a shared folder
Password	Password for a user account with the access right to a shared folder

Consideration

Specify the path name of a shared folder specified in Edgecross Basic Software in UNC format.

(Example 1) \\(IP address)\share_folder

(Example 2) \\file_server\share_folder

When a remote shared folder (example: 'PC name: Edgecross, shared folder name: KYOUYUU') is assigned to a network drive (example: 'Z:'), set '\\Edgecross\KYOUYUU.' ('Z:\' cannot be set.)

Using a shared folder without specifying a user account in Edgecross Basic Software

The following shows the setting procedure for using a remote shared folder without specifying a user account in Edgecross Basic Software.

Setting a shared folder

The following shows the procedure for setting a shared folder.

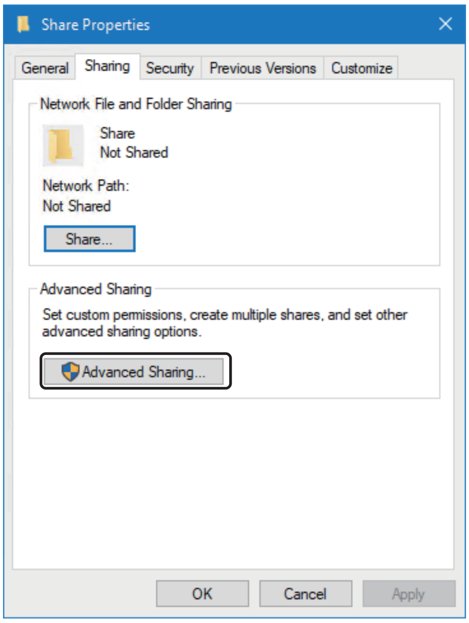
Note that this setting is not recommended because users, who can access a personal computer on which a shared folder is published, can access the shared folder without any restrictions.

Create a folder to publish as a shared folder in an industrial PC on which Edgecross Basic Software is installed, and configure the sharing settings.

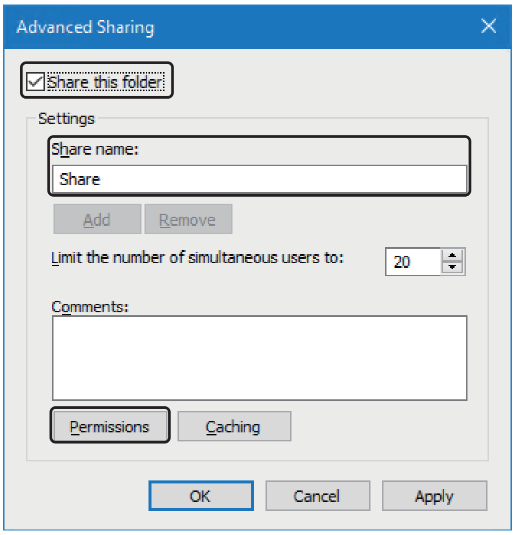
Permissions must be granted for Everyone and ANONYMOUS LOGON of Windows to a shared folder. If there are security concerns, enable Windows Firewall to restrict access.

The following shows a setting example for Windows 10.

For other operating systems, refer to the manual or online help for an operating system used.



1. Click the [Advanced Sharing] button in the [Sharing] tab in the properties of a folder.



☑ Share this folder

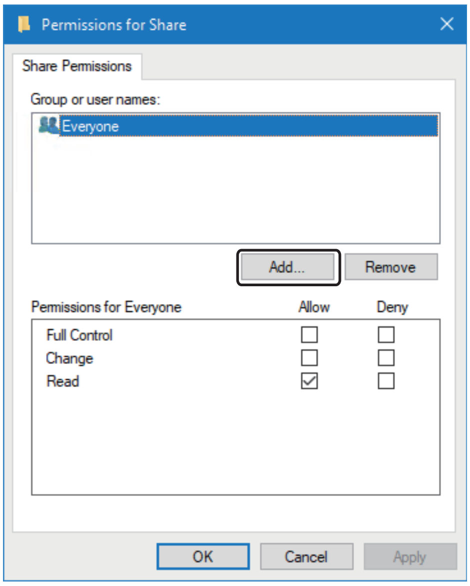
Share name: Share

Limit the number of simultaneous users to: 20

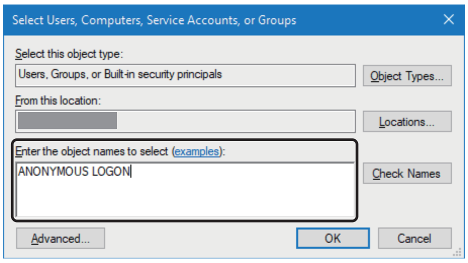
2. Select the checkbox of "Share this folder."

3. Set a share name.

4. Click the [Permissions] button.



5. Click the [Add] button.

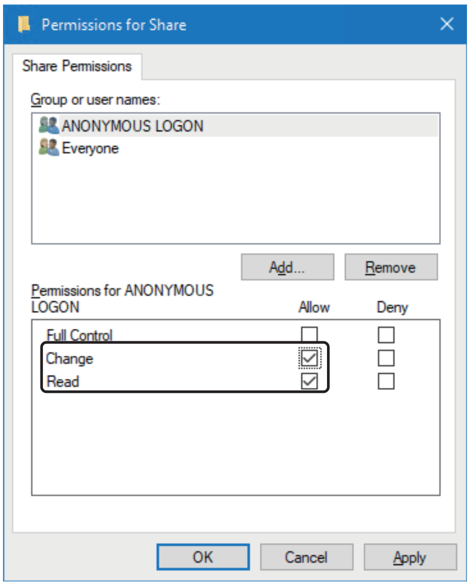


Select this object type: Users, Groups, or Built-in security principals

Enter the object names to select (examples): ANONYMOUS LOGON

6. Enter 'ANONYMOUS LOGON' in "Enter the object names to select."

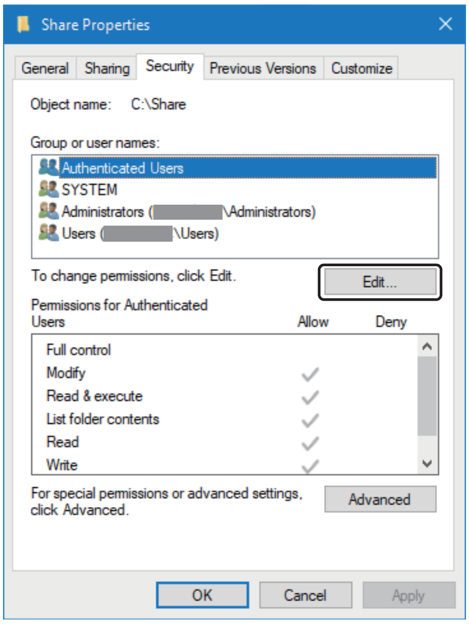
7. Click the [OK] button.



8. Select the checkboxes of "Change" and "Read" for the permissions for ANONYMOUS LOGON and Everyone.

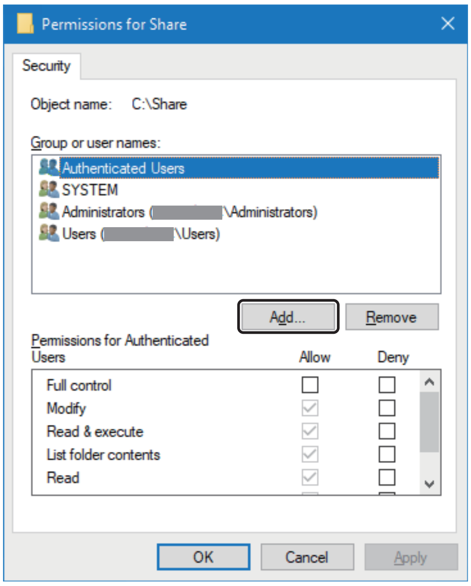
9. Click the [OK] button.

10. Click the [Edit] button in the [Security] tab in the properties of the folder.



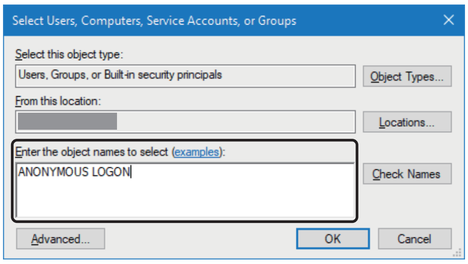
Object name: C:\Share

11. Click the [Add] button.



Object name: C:\Share

12. Add 'ANONYMOUS LOGON' and 'Everyone' as in steps 6 and 7.



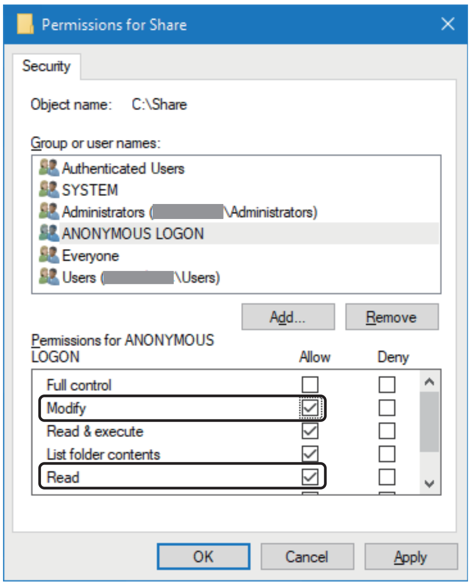
Select this object type: Users, Groups, or Built-in security principals

Enter the object names to select: ANONYMOUS LOGON

13. Select the checkboxes of "Modify" and "Read" for the permissions for ANONYMOUS LOGON and Everyone.

14. Click the [OK] button.

15. Close the properties of the folder.



Permissions for Share

Security

Object name: C:\Share

Group or user names:

- Authenticated Users
- SYSTEM
- Administrators ([redacted]\Administrators)
- ANONYMOUS LOGON
- Everyone
- Users ([redacted]\Users)

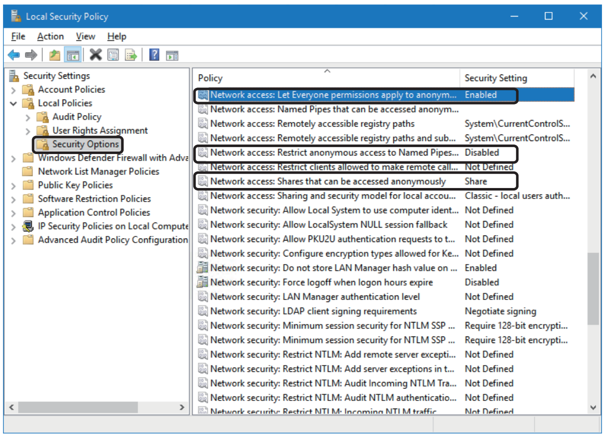
Permissions for ANONYMOUS LOGON

	Allow	Deny
Full control	☐	☐
Modify	☑	☐
Read & execute	☑	☐
List folder contents	☑	☐
Read	☑	☐

16. Start the local security policy of Windows.

17. Select [Security Settings] ⇨ [Local Policies] ⇨ [Security Options].

18. Set the following items:



Local Security Policy

File
Action
View
Help
Security Settings
Account Policies
Local Policies
Audit Policy
User Rights Assignment
Security Options
Windows Defender Firewall with Adva
Network List Manager Policies
Public Key Policies
Software Restriction Policies
Application Control Policies
IP Security Policies on Local Compute
Advanced Audit Policy Configuration

Policy	Security Setting
Network access: Let Everyone permissions apply to anonym...	Enabled
Network access: Named Pipes that can be accessed anonym...	
Network access: Remotely accessible registry paths	System\CurrentControlS...
Network access: Remotely accessible registry paths and sub...	System\CurrentControlS...
Network access: Restrict anonymous access to Named Pipes...	Disabled
Network access: Restrict clients allowed to make remote call...	Not Defined
Network access: Shares that can be accessed anonymously	Share
Network access: Sharing and security model for local accou...	Classic - local users auth...
Network security: Allow Local System to use computer ident...	Not Defined
Network security: Allow LocalSystem NULL session fallback	Not Defined
Network security: Allow PKU2U authentication requests to t...	Not Defined
Network security: Configure encryption types allowed for Ke...	Not Defined
Network security: Do not store LAN Manager hash value on ...	Enabled
Network security: Force logoff when logon hours expire	Disabled
Network security: LAN Manager authentication level	Not Defined
Network security: LDAP client signing requirements	Negotiate signing
Network security: Minimum session security for NTLM SSP ...	Require 128-bit encrypti...
Network security: Minimum session security for NTLM SSP ...	Require 128-bit encrypti...
Network security: Restrict NTLM: Add remote server excepti...	Not Defined
Network security: Restrict NTLM: Add server exceptions in t...	Not Defined
Network security: Restrict NTLM: Audit Incoming NTLM Tra...	Not Defined
Network security: Restrict NTLM: Audit NTLM authenticatio...	Not Defined
Network security: Restrict NTLM: Incoming NTLM traffic	Not Defined

Item name	Setting
Network access: Let Everyone permissions apply to anonymous users	Enabled (Default: Disabled)
Network access: Shares that can be accessed anonymously	Add a shared folder name.
Network access: Restrict anonymous access to Named Pipes and Shares	Disabled (Default: Enabled)

Consideration

Refer to the following:

☞ Page 555 Consideration

Appendix 7 Allowing Communication Connections between Industrial PCs

This section shows the setting methods for allowing communication connections between industrial PCs by using the firewall function of Windows, 'Windows Defender Firewall'[*1].

In communications between an industrial PC on which Edgecross Basic Software is installed and another one, communication connections may fail if a firewall is enabled.

[*1] 'Windows Firewall' for some Windows versions

Precautions

- Security measures such as firewalls may be taken by other security measure software or devices in some operating environments. In this case, take measures to allow communication connections according to an operating environment.
- This section shows only the minimum required settings. By using the firewall function, allowing communication connections can be set more strictly, such as allowing connections from specific computers only. To maintain system security, it is recommended to configure the setting as strict as possible.

Cases and settings

The following shows the cases in which communication connections must be allowed and settings for allowing them.

Precautions

Even when adding a rule for allowing communication connections to 'Windows Defender Firewall,' communication connections may be denied by another rule that is already set. In this case, perform either of the following:

- Review the rule condition that denies the communication connections so that they are enabled under the added rule condition.
- Review the Edgecross Basic Software setting so that the communication connections can be established under a condition where they are not denied.

Ex.

When adding a rule for allowing communication connections with a port number specified in the OPC UA setting for OPC UA connection with Management Shell but they cannot be established due to another rule that denies them with the same port number, perform either of the following:

- Change the rule condition that denies the communication connections so that the port number used for them is not denied.
- Change the port number set for the OPC UA connection with Management Shell so that the communication connections can be established with another port number.

Real-time Flow Manager

The following shows the case in which communication connections must be allowed and settings for allowing them for Real-time Flow Manager.

■Case in which communication connections must be allowed

For the following functions, when cooperating with an edge application on an industrial PC other than one on which Edgecross Basic Software is installed via an MQTT broker, it is required to set communication connections to the MQTT broker to be allowed.

- Edge application cooperation function (MQTT cooperation) (☞ Page 43 MQTT cooperation)
- Data distribution function (☞ Page 80 Data Distribution Function)

Precautions

When using Eclipse Mosquitto as an MQTT broker, it is also required to change the settings for Eclipse Mosquitto.

Refer to the following to change the settings.

☞ Page 528 Configuring the settings for connection from another industrial PC

For MQTT brokers other than Eclipse Mosquitto, their own settings may also be required.

For the necessary settings, refer to the manual, etc. for an MQTT broker used.

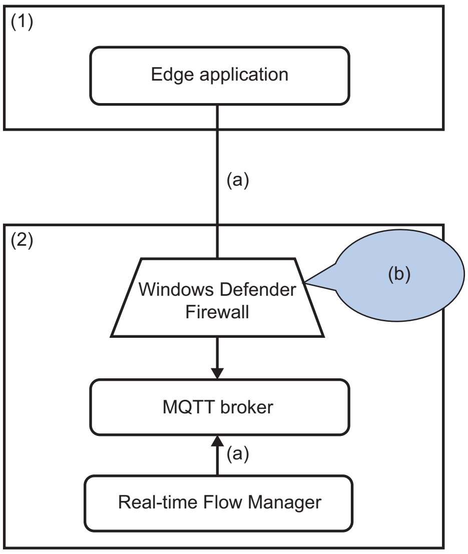
■Settings for allowing communication connections

- Setting targets

Add an inbound rule with specifying a program (MQTT broker) and port number that allow communication connections to the firewall of an industrial PC on which a connected MQTT broker is running.

Ex.

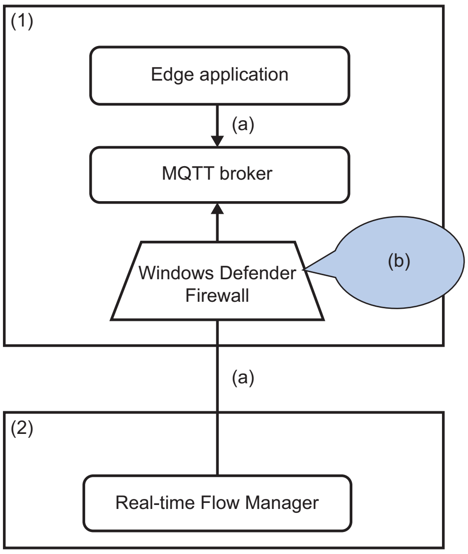
For MQTT cooperation by connecting to an MQTT broker running on an industrial PC on which Edgecross Basic Software is installed



(1) Industrial PC on which an edge application is installed
(2) Industrial PC on which Edgecross Basic Software is installed
(a) Connect to an MQTT broker in (2).
(b) Add an inbound rule for the firewall.

Ex.

For MQTT cooperation by connecting to an MQTT broker running on an industrial PC other than one on which Edgecross Basic Software is installed



(1) Industrial PC on which an edge application is installed
(2) Industrial PC on which Edgecross Basic Software is installed
(a) Connect to an MQTT broker in (1).
(b) Add an inbound rule for the firewall.

- Setting example

The following shows a setting example in Windows Defender Firewall.

Add the following rule to the inbound rule.

Item		Description
Rule Type		Select "Custom."
Program		Select "This program path" and enter the path to an MQTT broker. When using Eclipse Mosquitto as an MQTT broker, enter the path as follows: • (Arbitrary storage destination)\mosquitto\mosquitto.exe Do not specify a service to which this rule applies.
Protocol and Ports	Protocol type	Select "TCP."
	Protocol number	A default fixed value
	Local port	Select "Specific Ports" and enter the port number (default is 1883) to connect to an MQTT broker.
	Remote port	Set this as necessary. When not specifying a port used for OPC UA connection in an edge application, select "All Ports." Otherwise, select "Specific Ports" and enter the port number.
	Internet Control Message Protocol (ICMP) settings	Not required.
Scope	Local IP address	Set these as necessary. When not specifying the IP address of a personal computer on the edge application side, select "Any IP address." Otherwise, select "These IP addresses," and enter the IP address in the "IP Address" screen displayed by clicking the [Add...] button.
	Remote IP address	
Action		Select "Allow the connection."
Profile		Select any of the items according to the network environment for the industrial PC.
Name		Enter any name.

Point

The above items and setting methods are for adding a setting in the "New Inbound Rule Wizard" screen.

Management Shell

The following shows the case in which communication connections must be allowed and settings for allowing them for Management Shell.

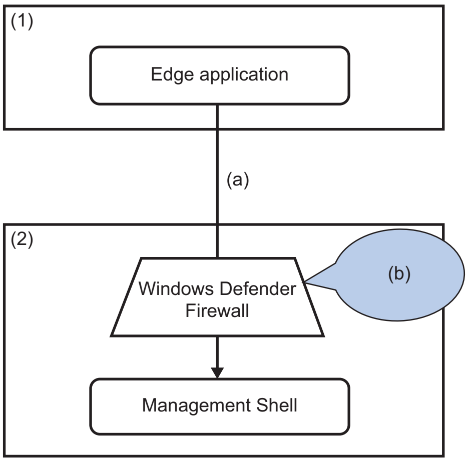
■Case in which communication connections must be allowed

When connecting to Management Shell, which is an OPC UA server, from an edge application on an industrial PC other than one on which Edgecross Basic Software is installed, it is required to set communication connections to Management Shell to be allowed.

■Settings for allowing communication connections

- Setting targets

Add an inbound rule with specifying a program (Management Shell) and port number that allow communication connections to the firewall on the industrial PC side on which Edgecross Basic Software is installed.



(1) Industrial PC on which an edge application is installed
(2) Industrial PC on which Edgecross Basic Software is installed
(a) Establish an OPC UA connection to Management Shell in (2).
(b) Add an inbound rule for the firewall.

- Setting example

The following shows a setting example in Windows Defender Firewall.

Add the following rule to the inbound rule.

Item		Description
Rule Type		Select "Custom."
Program		Select "This program path" and enter the path to Management Shell. For the default installation path, enter the following path: • C:\Edgecross\Edgecross Basic Software\Management Shell\Service\bin\EcMsService.exe Do not specify a service to which this rule applies.
Protocol and Ports	Protocol type	Select "TCP."
	Protocol number	A default fixed value
	Local port	Select "Specific Ports" and enter the port number (default is 48010) specified in the OPC UA setting for Management Shell.
	Remote port	Set this as necessary. When not specifying a port used for OPC UA connection in an edge application, select "All Ports." Otherwise, select "Specific Ports" and enter the port number.
	Internet Control Message Protocol (ICMP) settings	Not required.
Scope	Local IP address	Set these as necessary. When not specifying the IP address of a personal computer on the edge application side, select "Any IP address." Otherwise, select "These IP addresses," and enter the IP address in the "IP Address" screen displayed by clicking the [Add...] button.
	Remote IP address	
Action		Select "Allow the connection."
Profile		Select any of the items according to the network environment for the industrial PC.
Name		Enter any name.

Point

The above items and setting methods are for adding a setting in the "New Inbound Rule Wizard" screen.

Procedure for adding a rule for Windows Defender Firewall

The following shows the procedure for adding a rule for Windows Defender Firewall.

Operating procedure

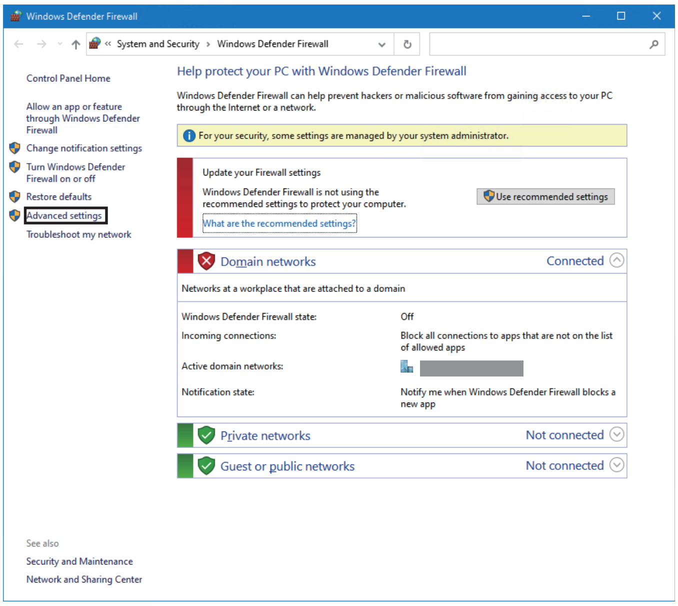
1. Open the "Windows Defender Firewall" screen.

Search for "Windows Defender Firewall"[*1] in the search box of Windows.

*1 'Windows Firewall' for some Windows versions

2. Open the "Windows Defender Firewall with Advanced Security" screen.

Click [Advanced settings] in the "Windows Defender Firewall" screen.



Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

For your security, some settings are managed by your system administrator.

Update your Firewall settings

Windows Defender Firewall is not using the recommended settings to protect your computer.

Networks at a workplace that are attached to a domain

Windows Defender Firewall state: Off

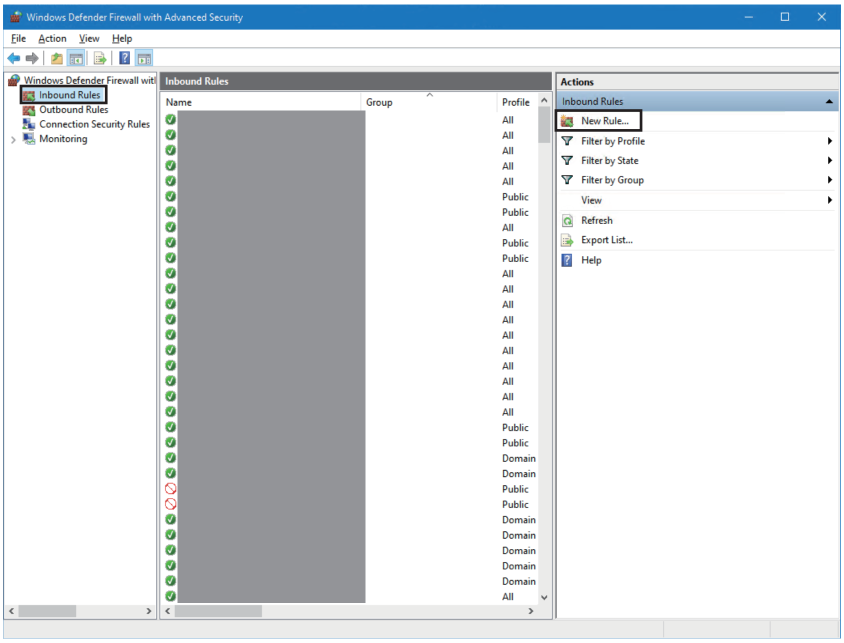
Incoming connections: Block all connections to apps that are not on the list of allowed apps

Active domain networks: [redacted]

Notification state: Notify me when Windows Defender Firewall blocks a new app

3. Open the "New Inbound Rule Wizard" screen.

Click [Inbound Rules] in the "Windows Defender Firewall with Advanced Security" screen.
Then, click [New Rule...] under "Actions" on the right of the screen.

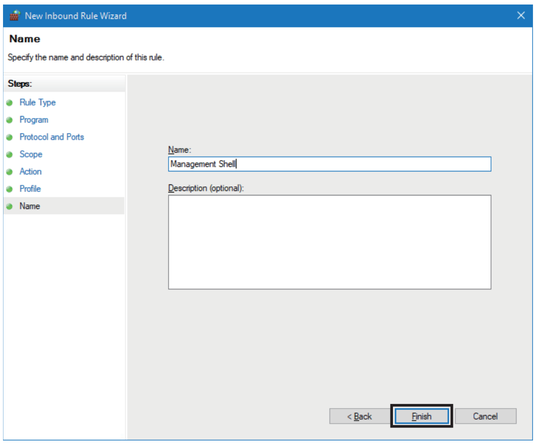


4. Set a rule for allowing communication connections.

Follow the display contents in the "New Inbound Rule Wizard" screen and refer to the setting examples in the following to set each item.

Then, click the [Finish] button on the last page of the wizard screen.

- For Real-time Flow Manager: ☞ Page 561 Settings for allowing communication connections
- For Management Shell: ☞ Page 563 Settings for allowing communication connections



Name

Specify the name and description of this rule.

Name: Management Shell

Description (optional):

Point

This setting is added to the list with the name entered for "Inbound Rules" in the "Windows Defender Firewall with Advanced Security" screen, and its contents can be changed by selecting it from the list.

Appendix 8 Processing Performance and Processing Time

This section shows the processing performance and processing time of Real-time Flow Manager and Management Shell.
The performance specifications described in this section are measured in the following operating environment.

Real-time Flow Manager

The following shows the processing performance and processing time of Real-time Flow Manager.

Operating environment 1

Item	Description
MPU	Intel® Core™ i3
Memory	8 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 2

Item	Description
MPU	Intel Atom™
Memory	4 GB
Storage	60 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 3

Item	Description
MPU	Intel Atom
Memory	4 GB
Storage	60 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 4

Item	Description
MPU	Intel Core i7
Memory	16 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 5

Item	Description
MPU	12th generation Intel Core i7
Memory	16 GB
Storage	512 GB (free space: 64 GB or more)
OS	Windows 11 Pro

Precautions

The processing time of Real-time Flow Manager may vary due to interruption of processing of other software and Windows.

Processing performance of a process flow

The following shows the performance with which a process data buffer overflow error does not occur in a data logging flow and data diagnosis flow.

■Data logging flow

The following shows the number of collections and collection cycle with which a process data buffer overflow error does not occur in a data logging flow.

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[*1]
		Number of units of collection data	Refer to each 'Number of units of collection data per process flow.'
		Data type	UINT type
		Collection cycle	Measured from 1 ms.
	File saving	File format	CSV file (UTF-8)
		Output data	All collection data
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files

*1 Contact the Edgecross Consortium to obtain it.

- Processing performance

For 1 process flow setting

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
32	32	1	2	1
64	64	1	2	1
128	128	1	3	1
256	256	1	3	1

For 8 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
32	4	2	8	2
64	8	2	8	2
128	16	2	9	2
256	32	3	9	2
512	64	3	10	2
1024	128	3	12	3
2048	256	3	16	3

For 16 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
1024	64	3	—[*1]	3
2048	128	3	—[*1]	3
4096	256	3	—[*1]	3

*1 Cannot be measured due to an error.

For 32 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
2048	64	4	—[*1]	3
4096	128	4	—[*1]	3
8192	256	4	—[*1]	3

*1 Cannot be measured due to an error.

■Data diagnosis flow

The following shows the number of units of collection data and collection cycle that do not cause any process data buffer overflow error in a data diagnosis flow.

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	Refer to each 'Number of units of collection data per process flow.'
		Data type	UINT type
		Collection cycle	Measured from 1 ms.
	File saving (data collection)	File format	CSV file (UTF-8)
		Output data	All collection data
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files
	Data diagnosis	Edge application used	Application distributed by the Edgecross Consortium[1]
		Input data	All collection data
		Output data	Same data as all input data
	Feedback	Execution condition	Not set
		Execution frequency	Deterrence period: 1 minute
		Feedback type	Device instruction feedback
		Data collector used	Same as data collection
		Setting value for data for feedback	Specify all output data of data diagnosis within the range of the number of units of data available for feedback (32 × 4 = 128).
		Timeout time	10 seconds

[1] Contact the Edgecross Consortium to obtain it.

- Processing performance

For 1 process flow setting

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
256	256	2	40	2

For 4 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
512	128	3	50	2
1024	256	4	60	2

For 16 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
2048	128	—[1]	—[1]	2
4096	256	—[1]	—[1]	2

[1] Cannot be measured due to an error.

For 32 process flow settings

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
4096	128	—[*1]	—[*1]	3
8192	256	—[*1]	—[*1]	3

[*1] Cannot be measured due to an error.

■Using data logging flows and data diagnosis flows in combination

The following shows the number of units of collection data and the collection cycle that do not cause any process data buffer overflow error when using data logging flows and data diagnosis flows in combination.

- Parameter setting value

Parameter type	Setting item			Setting content
Real-time Flow Manager parameter	Data Logging Flow	Number of settings		8 flows
		Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[*1]
			Number of units of collection data	Refer to each 'Number of units of collection data per process flow.'
			Data type	UINT type
			Collection cycle	Measured from 1 ms.
		File saving (data collection)	File format	CSV file (UTF-8)
			Output data	All collection data
			Number of record rows for switching	1000 rows
			Maximum number of files to be saved	100 files
		Data modification 1 to 3 (data extraction)	Input data	All collection data
			Output data	All input data
			Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
		File saving (data modification 3)	Same as items for file saving (data collection) listed above	
	Data Diagnosis Flow	Number of settings		4 flows
		Data collection	Same as data collection in data logging flow	
		File saving (data collection)	Same as file saving (data collection) in data logging flow	
		Data diagnosis	Edge application used	Edge application distributed by the Edgecross Consortium[*1]
			Input data	All output data of data modification
			Output data	Same data as input data
		File saving (data diagnosis)	Same as file saving (data collection) in data logging flow	
		Feedback	Execution condition	Not set
			Execution frequency	Deterrence period: 1 minute
			Feedback type	Device instruction feedback
			Data collector used	Same as data collection
			Setting value for data for feedback	Specify all output data of data diagnosis within the range of the number of units of data available for feedback (32 × 4 = 128).
			Timeout time	10 seconds

[*1] Contact the Edgecross Consortium to obtain it.

- Processing performance

Number of units of collection data	Number of units of collection data per process flow	Cycle specification (ms) (Operating environment 1)	Cycle specification (ms) (Operating environment 2)	Cycle specification (ms) (Operating environment 5)
3072	256	40	300	2

CPU usage rate and memory usage amount while a process flow is running

To run Edgecross Basic Software stably, it is recommended to set each process flow so that the CPU and memory usage rates of the entire industrial PC are limited to approximately 60% on average for each.

The following shows the CPU usage rate[1] and memory usage amount while a process flow is running.

[1] An average value obtained by measuring the CPU usage rate of the entire industrial PC, where Edgecross Basic Software, a data collector, and an edge application are running, for 10 minutes.

■CPU usage rate and memory usage amount for each number of units of collection data when using one data logging flow only

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	Refer to each 'Number of units of collection data.'
		Data type	• UINT type • WSTRING type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
	File saving (data modification)	File format	CSV file (UTF-8)
		Output data	All collection data
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files

[1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

The data type of collection data is UINT (operating environment 1)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	5	5	5
64	1	5	5	5
256	1	5	5	5

The data type of collection data is WSTRING (operating environment 1)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	5	5	5
64	1	5	5	5
256	1	5	5	5

The data type of collection data is UINT (operating environment 2)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	30	25	25
64	1	35	25	25
256	1	40	30	30

The data type of collection data is WSTRING (operating environment 2)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	30	25	25
64	1	40	25	25
256	1	80	30	30

The data type of collection data is UINT (operating environment 5)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	15	15	15
64	1	15	15	15
256	1	15	15	15

The data type of collection data is WSTRING (operating environment 5)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	15	15	15
64	1	15	15	15
256	1	15	15	15

- Memory usage amount

The data type of collection data is UINT (operating environment 1)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is WSTRING (operating environment 1)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is UINT (operating environment 2)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is WSTRING (operating environment 2)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is UINT (operating environment 5)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	6000	6000	6000
64	1	6000	6000	6000
256	1	6000	6000	6000

The data type of collection data is WSTRING (operating environment 5)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	6000	6000	6000
64	1	6000	6000	6000
256	1	6000	6000	6000

■CPU usage rate and memory usage amount for each number of units of collection data when using one data diagnosis flow only

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	Refer to each 'Number of units of collection data.'
		Data type	• UINT type • WSTRING type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
	Data diagnosis	Edge application used	Edge application distributed by the Edgecross Consortium[1]
		Input data	All output data of data modification
		Output data	Same data as input data
	File saving (data diagnosis)	File format	CSV file (UTF-8)
		Output data	All output data of data diagnosis
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files
	Feedback	Execution condition	Not set
		Execution frequency	Deterrence period: 1 minute
		Feedback type	Device instruction feedback
		Data collector used	Same as data collection
		Setting value for data for feedback	Specify all output data of data diagnosis within the range of the number of units of data available for feedback (32 × 4 = 128).
		Timeout time	10 seconds

[1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

The data type of collection data is UINT (operating environment 1)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	5	2	2
64	1	5	3	3
256	1	10	5	5

The data type of collection data is WSTRING (operating environment 1)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	5	2	2
64	1	10	3	3
256	1	20	5	5

The data type of collection data is UINT (operating environment 2)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	30	20	20
64	1	35	20	20
256	1	40	30	30

The data type of collection data is WSTRING (operating environment 2)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	30	20	20
64	1	40	30	30
256	1	80	30	30

The data type of collection data is UINT (operating environment 5)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	10	10	10
64	1	10	10	10
256	1	10	10	10

The data type of collection data is WSTRING (operating environment 5)

Number of units of collection data	Number of executed flows	CPU usage rate [%]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	10	10	10
64	1	10	10	10
256	1	10	10	10

- Memory usage amount

The data type of collection data is UINT (operating environment 1)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is WSTRING (operating environment 1)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is UINT (operating environment 2)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is WSTRING (operating environment 2)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	3000	3000	3000
64	1	3000	3000	3000
256	1	3000	3000	3000

The data type of collection data is UINT (operating environment 5)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	6000	6000	6000
64	1	6000	6000	6000
256	1	6000	6000	6000

The data type of collection data is WSTRING (operating environment 5)

Number of units of collection data	Number of executed flows	Memory usage amount [MB]		
		Collection cycle: 10 ms	Collection cycle: 100 ms	Collection cycle: 1000 ms
16	1	6000	6000	6000
64	1	6000	6000	6000
256	1	6000	6000	6000

■CPU usage rate and memory usage amount for each number of data logging flows when the total number of units of collection data is fixed

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	Refer to each 'Number of units of collection data per flow.'
		Data type	UINT type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
	File saving (data modification)	File format	CSV file (UTF-8)
		Output data	All collection data
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files

[1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

Number of executed flows	CPU usage rate [%]			Number of units of collection data per flow
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	5	30	10	256
4	15	40	10	64
8	15	—[1]	10	32
16	15	—[1]	10	16
32	15	—[1]	10	8

[1] Cannot be measured due to an error.

- Memory usage amount

Number of executed flows	Memory usage amount [MB]			Number of units of collection data per flow
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	3000	3000	6000	256
4	3400	3400	6400	64
8	3800	—[1]	6800	32
16	4400	—[1]	7400	16
32	6200	—[1]	9200	8

[1] Cannot be measured due to an error.

■CPU usage rate and memory usage amount for each number of data diagnosis flows when the total number of units of collection data is fixed

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	Refer to each 'Number of units of collection data.'
		Data type	UINT type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Mandatory condition × 4 (AND combination)
	Data diagnosis	Edge application used	Edge application distributed by the Edgecross Consortium[1]
		Input data	All output data of data modification
		Output data	Same data as input data
	File saving (data diagnosis)	File format	CSV file (UTF-8)
		Output data	All output data of data diagnosis
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files
	Feedback	Execution condition	Not set
		Execution frequency	Deterrence period: 1 minute
		Feedback type	Device instruction feedback
		Data collector used	Same as data collection
		Setting value for data for feedback	Specify all output data of data diagnosis within the range of the number of units of data available for feedback (32 × 4 = 128).
		Timeout time	10 seconds

[1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

Number of executed flows	CPU usage rate [%]			Number of units of collection data per flow
	(Operating environment 1) (Collection cycle: 100 ms)	(Operating environment 2) (Collection cycle: 100 ms)	(Operating environment 5) (Collection cycle: 100 ms)	
1	5	15	10	256
4	5	15	10	64
8	5	—[1]	10	32
16	10	—[1]	10	16
32	15	—[1]	10	8

[1] Cannot be measured due to an error.

- Memory usage amount

Number of executed flows	Memory usage amount [MB]			Number of units of collection data per flow
	(Operating environment 1) (Collection cycle: 100 ms)	(Operating environment 2) (Collection cycle: 100 ms)	(Operating environment 5) (Collection cycle: 100 ms)	
1	3000	3000	6000	256
4	3500	3500	6500	64
8	4000	—[1]	7000	32
16	4900	—[1]	7900	16
32	6500	—[1]	9500	8

[1] Cannot be measured due to an error.

■CPU usage rate and memory usage amount for each number of data logging flows when the number of units of collection data per flow is fixed

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[1]
		Number of units of collection data	256
		Data type	• UINT type • WSTRING type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
	File saving (data modification)	File format	CSV file (UTF-8)
		Output data	All collection data
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files

[1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

The data type of collection data is UINT

Number of executed flows	CPU usage rate [%]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	5	20	10	256
4	5	30	10	1024
8	5	—[1]	10	2048
16	5	—[1]	10	4096
32	10	—[1]	10	8192

[1] Cannot be measured due to an error.

The data type of collection data is WSTRING

Number of executed flows	CPU usage rate [%]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	5	25	10	256
4	5	40	10	1024
8	5	—[1]	10	2048
16	30	—[1]	10	4096
32	30	—[1]	10	8192

[1] Cannot be measured due to an error.

- Memory usage amount

The data type of collection data is UINT

Number of executed flows	Memory usage amount [MB]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	3000	3000	6000	256
4	3400	3400	6400	1024
8	3800	—[1]	6800	2048
16	4600	—[1]	7600	4096
32	6200	—[1]	9200	8192

[1] Cannot be measured due to an error.

The data type of collection data is WSTRING

Number of executed flows	Memory usage amount [MB]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 10 ms)	Operating environment 2 (collection cycle: 10 ms)	Operating environment 5 (collection cycle: 10 ms)	
1	3000	3000	6000	256
4	3400	3400	6400	1024
8	3800	—[1]	6800	2048
16	4600	—[1]	7600	4096
32	6200	—[1]	9200	8192

[1] Cannot be measured due to an error.

■CPU usage rate and memory usage amount for each number of data diagnosis flows when the number of units of collection data per flow is fixed

- Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[*1]
		Number of units of collection data	256
		Data type	• UINT type • WSTRING type
		Collection cycle	Refer to each 'Collection cycle.'
	Data modification	Function type	Data extraction
		Input data	All collection data
		Output data	All input data
		Condition setting	Condition to be necessarily satisfied × 4 (AND combination)
	Data diagnosis	Edge application used	Edge application distributed by the Edgecross Consortium[*1]
		Input data	All output data of data modification
		Output data	Same number of units of data as input data
	File saving (data diagnosis)	File format	CSV file (UTF-8)
		Output data	All output data of data diagnosis
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files
	Feedback	Execution condition	Not set
		Execution frequency	Deterrence period: 1 minute
		Feedback type	Device instruction feedback
		Data collector used	Same as data collection
		Setting value for data for feedback	Specify all output data of data diagnosis within the range of the number of units of data available for feedback (32 × 4 = 128).
		Timeout time	10 seconds

[*1] Contact the Edgecross Consortium to obtain it.

- CPU usage rate

The data type of collection data is UINT

Number of executed flows	CPU usage rate [%]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 100 ms)	Operating environment 2 (collection cycle: 100 ms)	Operating environment 5 (collection cycle: 100 ms)	
1	5	15	10	256
4	5	—[*1]	10	1024
8	5	—[*1]	10	2048
16	—[*1]	—[*1]	10	4096
32	—[*1]	—[*1]	10	8192

[*1] Cannot be measured due to an error.

The data type of collection data is WSTRING

Number of executed flows	CPU usage rate [%]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 100 ms)	Operating environment 2 (collection cycle: 100 ms)	Operating environment 5 (collection cycle: 100 ms)	
1	5	15	10	256
4	10	—[*1]	10	1024
8	20	—[*1]	10	2048
16	—[*1]	—[*1]	10	4096
32	—[*1]	—[*1]	10	8192

[*1] Cannot be measured due to an error.

- Memory usage amount

The data type of collection data is UINT

Number of executed flows	Memory usage amount [MB]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 100 ms)	Operating environment 2 (collection cycle: 100 ms)	Operating environment 5 (collection cycle: 100 ms)	
1	3000	3000	6000	256
4	5000	—[1]	8000	1024
8	6000	—[1]	9000	2048
16	—[1]	—[1]	14000	4096
32	—[1]	—[1]	16000	8192

[1] Cannot be measured due to an error.

The data type of collection data is WSTRING

Number of executed flows	Memory usage amount [MB]			Number of data collection points 256 points × Number of flows
	Operating environment 1 (collection cycle: 100 ms)	Operating environment 2 (collection cycle: 100 ms)	Operating environment 5 (collection cycle: 100 ms)	
1	3000	3000	6000	256
4	5000	—[1]	8000	1024
8	6000	—[1]	9000	2048
16	—[1]	—[1]	14000	4096
32	—[1]	—[1]	16000	8192

[1] Cannot be measured due to an error.

DB saving function

The following shows the performance with which a process buffer overflow error does not occur when setting the DB saving in the data storing function.

■Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Data collector used	Data collector distributed by the Edgecross Consortium[*1]
		Data type	UINT type
		Cycle system	Cycle specification
	DB saving	Output data	All collection data
		Output name of the date and time column	TIME

[*1] Contact the Edgecross Consortium to obtain it.

■Processing performance

Number of units of collection data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)
16	3	3
32	3	3
64	3	3
128	4	4
256	5	5

Event history automatic output function

The following shows the processing performance of the event history automatic output function.

■Parameter setting value

Setting item	Setting content
Output target setting	Major, moderate, minor, warning, information
Save destination folder	Any local folder
User account setting	Not set

■Processing performance

The following shows the time for each operating environment from the occurrence of a new event to the update of an event history file when 10000 events are accumulated.

- Operating environment 1: 4 seconds
- Operating environment 3: 5 seconds
- Operating environment 4: 4 seconds

Precautions

The performance value may vary depending on processing of other functions or software, etc.

If events occur frequently or when using a shared folder as an output destination, it may take longer than the performance value.

The time of an event history monitoring interval is included in the performance value.

Data collection using CSV File Data collector

The following shows the processing performance in data collection using CSV File Data collector.

■Parameter setting value

Parameter type	Setting item		Setting content
Real-time Flow Manager parameter	Data collection	Monitoring folder	Local path
		File name prefix	LOG
		Type of collection data	INT type
	Data extraction	Input data	All collection data
		Output data	All collection data
		Condition setting	Conditions that are always true
	File saving	File format	CSV file
		Output data	All collection data
		Output name of the date and time column	TIME
		Data row output format	YYYY/MM/DD hh:mm:ss.sss
		Saving file path	Local path
		File name prefix	LOG
		Number of record rows for switching	1000 rows
		Maximum number of files to be saved	100 files

■Processing performance

Number of units of collection data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)
16	2.0	3.0
32	2.0	3.0
64	2.0	3.0
128	2.1	4.0
256	2.3	4.0

Considerations

■Effect of error detection frequency on processing performance

If errors are frequently detected, the overall performance of a process flow will be deteriorated and a process data buffer overflow error may occur even when the current configuration satisfies the processing performance requirements.

In this case, set a deterrence period for feedback to reduce the frequency of feedback.

■Effect of other software or Windows processing

Processing of Edgecross Basic Software may be delayed due to interruption of other software or Windows processing.

■Effect of switching the operating status

Depending on the setting contents of a process flow and the number of process flows in the RUN states, the load on Windows increases and an error may occur when switching the operating status of the process flow from STOP to RUN. If an error occurs, review the collection cycle, number of data collection points, processing contents, and number of process flows in the RUN states to reduce the load.

■Effect of using the DB saving function

Depending on the setting contents of a process flow and the number of process flows in the RUN states, the load on Windows increases and an error may occur when using the DB saving function. If an error occurs, refer to the following to take corrective action:

☞ Page 348 Data storing function (DB saving function)

■Recommended settings for process flows

To run Edgecross Basic Software stably, set each process flow so that the CPU and memory usage rates of the entire industrial PC are limited to approximately 60% on average for each. For the CPU usage rate and memory usage amount while a process flow is running, refer to the following:

☞ Page 573 CPU usage rate and memory usage amount while a process flow is running

Management Shell

The following shows the processing performance and processing time of Management Shell.

Operating environment 1

Item	Description
MPU	Intel® Core-i7
Memory	16 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 2

Item	Description
MPU	Intel® Core-i3
Memory	8 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 3

Item	Description
MPU	Intel® Atom™
Memory	4 GB
Storage	60 GB
OS	Windows 10 (IoT Enterprise)

OPC UA connection function

The following shows the processing performance when performing the following operations in an edge application that supports a data access I/F (technology: OPC UA).

- Reading and writing data in equipment, devices, or lines in production sites via Management Shell
- Monitoring data in equipment, devices, or lines in production sites via Management Shell

■Reading and writing data in equipment, devices, or lines in production sites via Management Shell

- Parameter setting value

Setting item	Setting content
Number of data tag resources in a data model	256
Data collector used	Data collector distributed by the Edgecross Consortium[*1]
Data type	UINT type

[*1] Contact the Edgecross Consortium to obtain it.

- Processing performance (when 256 external data tag resources or internal data tag resources (value) are registered)

Function	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
Data reading	112	97	157
Data writing	112	97	157

- Processing performance (when 256 internal data tag resources (operation) are registered)

Function	Hierarchy of a component to which an operation term (external data tag resource) belongs	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
Data reading	20 hierarchies	638	824	3261

■Monitoring data in equipment, devices, or lines in production sites via Management Shell

- Parameter setting value

Setting item	Setting content
Access target device setting	1
Data collector used	A data collector with the following performance for the data reading function in each operating environment • Operating environment 1: 380 ms[1] • Operating environment 2: 400 ms[1] • Operating environment 3: 750 ms[1]
Number of connected edge applications	1
Number of subscriptions	1

[1] A performance value when the number of data tag resources to be read is '2048'

- Processing performance

Sampling cycle (ms)	Index value (number of external data tag resources or internal data tag resources (value)[1])			Index value (number of internal data tag resources (operation)[2])		
	(Operating environment 1)	(Operating environment 2)	(Operating environment 3)	(Operating environment 1)	(Operating environment 2)	(Operating environment 3)
100	—	—	—	—	—	—
200	—	—	—	—	—	—
500	3000	2500	1000	1500	1250	500
1000	6000	5000	2000	3000	2500	1000
2000	12000	10000	4000	6000	5000	2000
5000	30000	25000	10000	15000	12500	5000
60000	—	—	—	—	—	—
3600000	—	—	—	—	—	—

[1] Number of external data tag resources or internal data tag resources (value) for which data can be monitored periodically without missing data

[2] Number of internal data tag resources (operation) for which data can be monitored periodically without missing data

One-shot collection function

The following shows the processing performance of the one-shot collection function.

There is a time lag between when a value of a monitoring target resource changes from '0' to '1' and when the one-shot collection function detects the value change. It is included in the performance value.

■File saving

- Parameter setting value

Setting item			Setting content
Collection setting	Notification destination of completion		Notify monitoring target
	Monitoring target resource	Data type	BOOL type
		Resource type	External data tag resource
		Data collector used	Data collector distributed by the Edgecross Consortium[*1]
	Collection target resource	Data type	INT type
		Resource type	External data tag resource
		Data collector used	Data collector distributed by the Edgecross Consortium[*1]
Saving setting	Saving method		File
	File format		CSV file
	Save destination folder		Local path
	File name prefix		LOG
	Number of rows for file switching		1000 rows
	Maximum number of files to be saved		100 files

[*1] Contact the Edgecross Consortium to obtain it.

- Processing performance (number of one-shot collection settings: 1)

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	2000	2000	2000
256	3000	3000	3000
1000	3000	3000	4000

- Processing performance (number of one-shot collection settings: 12)

The following table shows the times required to complete processing for all one-shot collection settings after changing the value of a monitoring target resource for each one-shot collection setting from '0' to '1' at the same time.

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	3000	3000	3000
256	5000	5000	8000
1000	7000	8000	30000

- Processing performance (number of one-shot collection settings: 32)

The following table shows the times required to complete processing for all one-shot collection settings after changing the value of a monitoring target resource for each one-shot collection setting from '0' to '1' at the same time.

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	4000	4000	4000
256	6000	7000	11000
1000	12000	14000	33000

Point

The time required for file output when the number of rows for file switching is reached is also included.

■DB saving

- Parameter setting value

Setting item			Setting content
Collection setting	Notification destination of completion		Notify monitoring target
	Monitoring target resource	Data type	BOOL type
		Resource type	External data tag resource
		Data collector used	Data collector distributed by the Edgecross Consortium[*1]
	Collection target resource	Data type	INT type
		Resource type	External data tag resource
		Data collector used	Data collector distributed by the Edgecross Consortium[*1]
Saving setting	Saving method		DB
	DB connection setting		Any connectable setting
	Access table setting		Any name

*1 Contact the Edgecross Consortium to obtain it.

- Processing performance (number of one-shot collection settings: 1)

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	2000	3000	3000
256	3000	3000	3000
1000	3000	4000	6000

- Processing performance (number of one-shot collection settings: 12)

The following table shows the times required to complete processing for all one-shot collection settings after changing the value of a monitoring target resource for each one-shot collection setting from '0' to '1' at the same time.

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	4000	4000	8000
256	4000	5000	17000
1000	7000	9000	20000

- Processing performance (number of one-shot collection settings: 32)

The following table shows the times required to complete processing for all one-shot collection settings after changing the value of a monitoring target resource for each one-shot collection setting from '0' to '1' at the same time.

Number of units of output data	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
1	4000	4000	8000
256	7000	8000	22000
1000	12000	16000	62000

Event history automatic output function

The following shows the processing performance of the event history automatic output function.

■Parameter setting value

Setting item	Setting content
Output target setting	Major, moderate, minor, warning, information
Save destination folder	Any local folder
User account setting	Not set

■Processing performance

The following shows the time for each operating environment from the occurrence of a new event to the update of an event history file when 10000 events are accumulated.

- Operating environment 1: 4 seconds
- Operating environment 2: 4 seconds
- Operating environment 3: 5 seconds

Precautions

The performance value may vary depending on processing of other functions or software, etc.

If events occur frequently or when using a shared folder as an output destination, it may take longer than the performance value.

The time of an event history monitoring interval is included in the performance value.

Data reading using CSV File Data collector

The following shows the processing performance in data reading using CSV File Data collector.

■Parameter setting value

Setting item		Setting content
Number of data tag resources registered for each component[*1]		512 items
Data type		INT type
Monitoring folder		Local folder
File to be read[*2]	File type	CSV file
	Number of data rows	1000 rows
	Number of columns	512 columns

*1 The following items differ depending on a component.
Access target device registered in a data tag resource
Monitoring folder
File name prefix

*2 Updated to a new file in a cycle shorter than a sampling cycle.

■Processing performance

Number of monitored data points	Sampling cycle (ms)	Number of CSV File Data collectors used	Operating environment 1		Operating environment 2		Operating environment 3	
			Performance value (ms)	CPU usage rate (%)	Performance value (ms)	CPU usage rate (%)	Performance value (ms)	CPU usage rate (%)
256	500	1	234	38	275	25	819	57
512	1000	1	540	35	664	28	1991	59
1024	2000	2	584	24	742	26	2284	98
2048	5000	4	848	22	1130	25	4078	91
4096	60000	8	1598	6	2224	4	8724	18

Management Shell Explorer

The following shows the processing performance and processing time of Management Shell Explorer.

Operating environment 1

Item	Description
MPU	Intel® Core-i7
Memory	16 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 2

Item	Description
MPU	Intel® Core-i3
Memory	8 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 3

Item	Description
MPU	Intel® Atom™
Memory	4 GB
Storage	60 GB
OS	Windows 10 (IoT Enterprise)

Precautions

Processing of Management Shell may be delayed depending on an operating environment. For the operating environment 3 mentioned above, it is recommended to set the number of components to 100 or less, and that of resources to 300 or less per component to run Management Shell.

Data model import and data model export

The following shows the processing performance in data model import and data model export.

■Parameter setting value

Setting item	Setting content
Number of data tag resources to be imported	• For operating environment 1 or 2: 999000 • For operating environment 3: 30000
Number of data tag resources to be exported	
Data collector used	Data collector distributed by the Edgecross Consortium[*1]

[*1] Contact the Edgecross Consortium to obtain it.

■Processing performance

Function	Performance value (second) (Operating environment 1)	Performance value (second) (Operating environment 2)	Performance value (second) (Operating environment 3)
Data model import	340	599	84
Data model export	98	172	15

Monitoring and changing current values of data tag resources

The following shows the processing performance when monitoring and changing current values of data tag resources.

■Parameter setting value

Setting item	Setting content
Number of data tag resources registered in the data tag resource monitor window	256
Data collector used	Data collector distributed by the Edgecross Consortium[*1]
Data type	UINT type

[*1] Contact the Edgecross Consortium to obtain it.

■Processing performance

Function	Performance value (ms) (Operating environment 1)	Performance value (ms) (Operating environment 2)	Performance value (ms) (Operating environment 3)
Monitoring current values of data tag resources	410	390	460
Changing current values of data tag resources	70	250	320

Management Shell Data collector

The following shows the processing performance and processing time of Management Shell Data collector.

Operating environment 1

Item	Description
MPU	Intel® Core-i7
Memory	16 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 2

Item	Description
MPU	Intel® Core-i3
Memory	8 GB
Storage	64 GB
OS	Windows 10 (IoT Enterprise)

Operating environment 3

Item	Description
MPU	Intel® Atom™
Memory	4 GB
Storage	60 GB
OS	Windows 10 (IoT Enterprise)

Data collection function

The following shows the processing performance capable of collecting all data in a specified cycle per collection processing time (single collection cycle).

■Parameter setting value

Setting item	Setting content
Collection cycle	500 ms (If an exceeded collection cycle error occurs, increment the collection interval in 100 milliseconds to avoid the error.)
Collection target	■For 256 or more collection data tag resources Internal data tag resource (operation) (INT) × Number of collection data tag resources ■For 512 or more collection data tag resources Internal data tag resource (operation) (INT) × 500 External data tag resource (INT) × (Number of collection data tag resources - 500) (An internal data tag resource (operation) is set to use two external data tag resources for the operation term.)

■Operating environment 1

Number of collection data tag resources	Performance value (ms)[1]	CPU usage rate (%)[2]	
		Minimum value	Maximum value
256	500	Less than 0.1	0.5
512	500	Less than 0.1	0.5
1024	500	Less than 0.1	0.5
2048	500	Less than 0.1	1.0
3072	500	Less than 0.1	1.0

[1] With this value, data can be collected without causing any errors. (The minimum value is 500 milliseconds, which is the minimum collection interval.)

[2] Total value of each instance if multiple instances are required

■Operating environment 2

Number of collection data tag resources	Performance value (ms)[*1]	CPU usage rate (%)[*2]	
		Minimum value	Maximum value
256	500	Less than 0.1	0.2
512	500	Less than 0.1	0.2
1024	500	Less than 0.1	0.2
2048	500	Less than 0.1	0.4
3072	500	Less than 0.1	0.4

*1 With this value, data can be collected without causing any errors. (The minimum value is 500 milliseconds, which is the minimum collection interval.)

*2 Total value of each instance if multiple instances are required

■Operating environment 3

Number of collection data tag resources	Performance value (ms)[*1]	CPU usage rate (%)[*2]	
		Minimum value	Maximum value
256	500	Less than 0.1	0.6
512	500	Less than 0.1	0.6
1024	500	Less than 0.1	0.9
2048	500	Less than 0.1	1.2
3072	500	Less than 0.1	1.2

*1 With this value, data can be collected without causing any errors. (The minimum value is 500 milliseconds, which is the minimum collection interval.)

*2 Total value of each instance if multiple instances are required

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Appendix 10 Using a Setting File in a Different Version

This section explains the considerations for using a setting file in a different version of Edgecross Basic Software from the one with which the setting file was created.

Real-time Flow Designer

Using a setting file in an earlier version

■Using a setting file, which was created in version 1.10 or later, in version 1.01 or earlier

Function	Consideration
Data storing setting (file saving)	If there is output target data that satisfies either of the following conditions in the [Output Data] tab, a setting file cannot be read in version 1.01 or earlier. • The data type is REAL and the output format is the decimal format (6 digits or more after the decimal point). • The data type is LREAL and the output format is the decimal format (15 digits or more after the decimal point).
Edge application diagnosis (file) setting	If there is output target data that satisfies either of the following conditions in the [Output Data] tab, a setting file cannot be read in version 1.01 or earlier. • The data type is REAL and the output format is the decimal format (6 digits or more after the decimal point). • The data type is LREAL and the output format is the decimal format (15 digits or more after the decimal point).

■Using a setting file, which was created in version 1.20 or later, in version 1.10 or earlier

Function	Consideration
Data logging flow setting Data diagnosis flow setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a data modification plug-in name or data diagnosis plug-in name selected for "Function Type," a setting file cannot be read in version 1.10 or earlier.
Data extraction setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Output Data Name," a setting file cannot be read in version 1.10 or earlier.
Edge application diagnosis (MQTT) setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Output Data Setting Name" in the [Response Data] tab, a setting file cannot be read in version 1.10 or earlier.
Edge application diagnosis (file) setting Data storing setting (file saving)	If either of the following characters is included in a prefix set for "File Name Prefix" in the [Save File] tab, a setting file cannot be read in version 1.10 or earlier. • Unicode Basic Multilingual Plane outside the ASCII range (0x007F to 0xFFFF) • Surrogate pair characters (U+10000 to U+10FFFF)
Data storing setting (file saving)	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Output Name" in the [Output Data] tab, a setting file cannot be read in version 1.10 or earlier.
Data storing setting (DB saving)	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Table Name" or "Field Name" in the [Access Table] tab, a setting file cannot be read in version 1.10 or earlier.
Data modification plug-in setting Data diagnosis plug-in setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Output Data Setting Name," a setting file cannot be read in version 1.10 or earlier.
	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Output Data Setting Name," a setting file cannot be read in version 1.10 or earlier.
Data collection setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Data Name" in the [Collection Data] tab, a setting file cannot be read in version 1.10 or earlier.
Data collection setting (CSV File Data collector)	• If a surrogate pair character (U+10000 to U+10FFFF) is included in a prefix set for "File Name Prefix" or a name set for "Data Name," a setting file cannot be read in version 1.10 or earlier. • If either of the following data types is set for "Data Type," a setting file cannot be read in version 1.10 or earlier. STRING WSTRING • If data that satisfies both of the following conditions is set as a collection target, a setting file cannot be read in version 1.10 or earlier. The data type is BIT. A character string representing ON is not '1,' or one representing OFF is not '0.'
Device instruction feedback setting	If a surrogate pair character (U+10000 to U+10FFFF) is included in a name set for "Data Name" in the [Instruction Target data] tab, a setting file cannot be read in version 1.10 or earlier.
Execution condition setting	If a data diagnosis result is set as multiple monitoring targets, a setting file cannot be read in version 1.10 or earlier.
IT gateway setting	If an IT gateway setting is created, a setting file cannot be read in version 1.10 or earlier.

■Using a setting file, which was created in version 1.22 or later, in version 1.21 or earlier

A setting file cannot be read in version 1.21 or earlier.

■Using a setting file, which was created in version 1.24 or later, in version 1.23 or earlier

Function	Consideration
Access target device setting	If there is any access target device setting in which Management Shell Data collector is set, a setting file cannot be read in version 1.23 or earlier.

■Using a setting file, which was created in version 1.26 or later, in version 1.25 or earlier

A setting file cannot be read in version 1.25 or earlier.

■Using a setting file, which was created in version 1.27 or later, in version 1.26 or earlier

Function	Consideration
Data distribution setting (MQTT) Edge application diagnosis (MQTT) setting	If the number of characters in a client ID set for "Client ID at sending" in the [Destination] tab is 65 characters or more, a setting file cannot be read in version 1.26 or earlier.

■Using a setting file, which was created in version 1.28 or later, in version 1.27 or earlier

A setting file cannot be read in version 1.27 or earlier.

Using a setting file in a later version

■Using a setting file, which was created in version 1.21 or earlier, in version 1.22 or later

Function	Consideration
Data extraction setting Execution condition setting	If output data set as a monitoring or comparison target satisfies both of the following conditions, the number of characters in the data is changed to the maximum number[*1]. • The data type is STRING or WSTRING. • The number of characters is less than the maximum number[*1]. When it is changed to the maximum number[*1], the comparison method for a character string is also changed. For details, refer to the following: ☞ Page 627 Change of the comparison method for a character string

*1 STRING type: 32 characters
WSTRING type: 16 characters

■Change of the comparison method for a character string

When the number of characters in data set as a monitoring or comparison target is changed to the maximum number, the comparison method is changed as follows:

Before change

When a character string to be compared begins with a character string to be monitored, it is determined to be a match.

Examples of comparison results are shown below.

Comparison target	Monitoring target	Comparison result
ABC	ABC	Match
ABCDE	ABC	Match

After change

When a character string to be compared is the same as a character string to be monitored, it is determined to be a match.

Examples of comparison results are shown below.

Comparison target	Monitoring target	Comparison result
ABC	ABC	Match
ABCDE	ABC	Mismatch

Management Shell Explorer

Using a setting file in an earlier version

■Using a setting file, which was created in version 1.22 or later, in version 1.21 or earlier

Function	Consideration
Component tree edit	If another component with a same name exists in another hierarchy, a setting file cannot be read in version 1.21 or earlier.
Resource list edit	If an internal data tag resource or folder resource is added, a setting file cannot be read in version 1.21 or earlier.

■Using a setting file, which was created in version 1.23 or later, in version 1.22 or earlier

Function	Consideration
Resource list edit	If an internal data tag resource (operation) is added, a setting file cannot be read in version 1.22 or earlier.

■Using a setting file, which was created in version 1.25 or later, in version 1.24 or earlier

Function	Consideration
One-shot collection	If there are 13 or more one-shot collection settings, a setting file cannot be read in version 1.24 or earlier.

■Using a setting file, which was created in version 1.27 or later, in version 1.26 or earlier

Function	Consideration
Access target device setting	If Dummy Data collector is used in an access target device setting, a setting file cannot be read in version 1.26 or earlier.
One-shot collection	If a one-shot collection setting is newly added or updated, a setting file cannot be read in version 1.26 or earlier.

Using a setting file in a later version

■Using a setting file, which was created in version 1.21 or earlier, in version 1.22 or later

Function	Consideration
Resource list edit	Added data tag resources are changed to external data tag resources.

Appendix 11 Added and Changed Functions

This section shows the added and changed functions of Edgecross Basic Software.

Added/changed contents	Version	Reference
Management Shell is added.	1.10	Page 191 Management Shell
The IT gateway function is added.	1.20	Page 85 IT gateway distribution function Page 147 Saved file Page 163 Data Distribution Setting (IT Gateway) Page 265 IT Gateway Cooperation Function
■Real-time Flow Designer • Errors can be cleared.		Page 334 Operation diagnosis
■Management Shell • Data in devices, equipment, or lines in production sites can be monitored.		Page 260 Data monitoring
■Management Shell • OPC UA diagnosis can be performed.		Page 341 OPC UA diagnosis
■Management Shell • Event histories can be displayed.		Page 344 Event history
The location of use can be searched for.	1.22	Page 122 Location of use search result screen Page 205 Location of use search result screen
The display language switched in either Real-time Flow Designer or Management Shell Explorer also applies to the other.		Page 109 Menu configuration Page 196 Menu configuration
■Real-time Flow Manager/Real-time Flow Designer • The maximum numbers of executable data logging flows and data diagnosis flows are increased.		Page 32 Process flow
■Real-time Flow Manager/Real-time Flow Designer • Files can be saved to a folder with the access right set.		Page 60 File saving function Page 147 Saved file
■Real-time Flow Manager/Real-time Flow Designer • The character string data modification function is added.		Page 40 Character string data modification function Page 170 Character String Data Modification Setting
■Real-time Flow Manager/Real-time Flow Designer • Constants and fixed character strings can be added to collection data.		Page 36 Adding constants and fixed character strings Page 140 Collection data
■Real-time Flow Designer Multiple pieces of identical data can be set for a data modification plug-in setting.		Page 172 Data Modification Plug-in Setting
■Real-time Flow Designer • The MQTT communication function is extended.		Page 158 Data Distribution Setting (MQTT) Page 173 Edge Application Diagnosis (MQTT) Setting
■Management Shell • Data models can be imported and exported.		Page 196 Menu configuration
■Management Shell • Folder resources can be added.		Page 192 Data Model Page 247 Adding a folder resource Page 248 Editing folder resource properties
■Management Shell • Internal data tag resources can be added.		Page 192 Data Model Page 236 Adding a data tag resource Page 243 Editing data tag resource properties
■CSV File Data collector • The data reading function is added.		Page 297 Data Reading Function
■CSV File Data collector • A text file is added.		Page 299 Specifications of a monitoring target file
■Management Shell • The operation function for an internal data tag resource is added.	1.23	Page 236 Adding a data tag resource
■Management Shell • The one-shot collection function is added.		Page 269 One-shot Collection Function

Added/changed contents	Version	Reference
■Real-time Flow Designer • The number of times of data missing can be displayed in the process flow diagnostics.	1.24	Page 337 Process flow diagnostics
Management Shell Data collector is added.		Page 314 Management Shell Data collector
The event history automatic output function is added.		Page 86 Event History Automatic Output Function Page 118 Event history automatic output setting Page 289 Event History Automatic Output Function
■Management Shell • The maximum number of settings for the one-shot collection function is increased. 12 → 32	1.25	Page 20 Management Shell Page 269 One-shot Collection Function
■Management Shell • A resource can be moved between components.		Page 250 Moving a resource
■Real-time Flow Manager/Real-time Flow Designer • Switching to RUN or STOP is available for each process flow.	1.26	Page 34 Operational Specifications Page 333 "Process Flow Start/Stop" screen
■Real-time Flow Manager • The command line interface function is added.		Page 92 Command Line Interface Function
Dummy Data collector is added.	1.27	Page 327 Dummy Data collector
■Management Shell • A data model can be imported without specifying an access target device.		Page 200 Behavior of data model import
■Management Shell • An access target device setting can be replaced.		Page 217 Access target device setting batch replacement
■Management Shell • The output name of the date and time column can be set in the detailed setting of the one-shot collection setting.		Page 286 File saving setting Page 287 DB saving setting
■Real-time Flow Manager The number of flows is increased.	1.28	Page 16 Common items for each function Page 32 Real-time Flow Manager Page 433 Real-time Flow Manager Status
Windows 11 is supported.		📖Edgecross Basic Software for Windows Installation Instructions
■Management Shell IP addresses are supported.		Page 261 Setting an OPC UA server

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REVISIONS

*The document code is given on the bottom right of the front cover of this manual.

Revision date	*Document code	Description
May 2018	ECD-MA1-0001-01-EN	First edition
May 2018	ECD-MA1-0001-02-EN	Partial correction
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