



ダッシュボードサンプル for Edgecross

ユーザーズマニュアル

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ECP-EA1-W-DASHBOARD (サンプル品)



# 安全上のご注意

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(ご使用前に必ずお読みください)

本ソフトウェアのご使用に際しては、本マニュアルをよくお読みいただくと共に、安全に対して十分に注意を払って、正しい取扱いをしていただくようお願いいたします。

本マニュアルで示す注意事項は、本ソフトウェアに関するもののみについて記載したものです。

Edgecross 対応製品(ハードウェア、ソフトウェア)についてはそれぞれのマニュアルを参照してください。

この「安全上のご注意」では、安全注意事項のランクを「△警告」、「△注意」として区分してあります。

<b>△警告</b>	取扱いを誤った場合に、危険な状況が起こりえて、死亡または重傷を受ける可能性が想定される場合。
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<b>△注意</b>	取扱いを誤った場合に、危険な状況が起こりえて、中程度の傷害や軽傷を受ける可能性が想定される場合および物的損害だけの発生が想定される場合。
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なお、△注意に記載した事項でも、状況によっては重大な結果に結びつく可能性があります。

いずれも重要な内容を記載していますので必ず守ってください。

本マニュアルは必要なときに読めるよう大切に保管すると共に、必ず最終ユーザまでお届けいただくようお願いいたします。

## [設計上の注意事項]

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### △注意

- 本製品を搭載した産業用 PC の強制電源 OFF が実施されるような操作を行わないでください。  
本製品を搭載した産業用 PC の強制電源 OFF が実施されるような操作を行うと、データが不定となり、再設定・再反映が必要となります。また、本製品の誤動作の原因となります。
-

## 本ソフトウェアの適用について

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- (1) 本ソフトウェアをご使用いただくにあたりましては、万一ソフトウェアに不具合などが発生した場合でも重大な事故にいたらない用途であること、および不具合発生時にはバックアップやフェールセーフ機能が機器外部で系統的に実施されていることをご使用の条件とさせていただきます。
- (2) Edgecross コンソーシアムは、本ソフトウェア及び本ソフトウェアを使用した製品の品質、性能、安全に関する一切の責任（債務不履行責任、瑕疵担保責任、品質保証責任、不法行為責任、製造物責任を含むがそれらに限定されない）を負わないものとさせていただきます。

## 海外での使用につきまして

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海外（輸出するとき、海外に持ち出すとき、国内で非居住者に使用させるとき）で本ソフトウェアを使用する場合は、外国為替及び外国貿易法の規制、米国輸出管理規則など外国の輸出関連の各法令を遵守するとともに、各種手続きが必要となる場合があります。詳しくは、Edgecrossコンソーシアム事務局までお問い合わせください。

# はじめに

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本マニュアルは、ダッシュボードサンプル for Edgecross のご使用方法についてご理解いただくためのマニュアルです。

ご使用前に本マニュアルをよくお読みいただき、ダッシュボードサンプル for Edgecross の機能・性能を十分ご理解の上、正しくご使用くださるようお願いいたします。

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## 関連マニュアル

マニュアル名称[マニュアル番号]	内容	提供形態
ダッシュボードサンプル for Edgecross ユーザーズマニュアル [ECD-MA2-0006-02-JA] (本マニュアル)	ダッシュボードサンプル for Edgecrossの仕様、操作手順、機能、 トラブルシューティングなどについて記載しています。	PDF
Edgecross基本ソフトウェアWindows版ユ ーザーズマニュアル [ECD-MA1-0001-13-JA]	Edgecross基本ソフトウェアの仕様、運転までの手順、機能、トラ ブルシューティングなどについて記載しています。	PDF

※ Node-RED のマニュアルは下記を参照してください。

☞ <https://nodered.jp/docs/>

# 用語

本マニュアルでは、特に明記する場合を除き、下記の用語を使用して説明します。

用語	内容
Edgecross	エッジコンピューティングを核として、FAとITの連携による製造業のソリューションを実現するための仕様、コンセプトと、それを実装したソフトウェア・プラットフォームです。
Edgecross基本ソフトウェア	Edgecrossの機能を実装したソフトウェア製品名です。
エディタ	Node-REDでフローを作成するためのエディタを指しています。
ダッシュボード	Node-REDに入出力されたデータを可視化する画面を指しています。
データモデル管理	生産現場の機器・装置・ラインを抽象化し、階層的に管理する機能です。
Node-RED	フローベースのビジュアルプログラミングツールです。 Node-REDを用いることで、プログラミングの知識がなくても、簡単にダッシュボードなどのエッジアプリケーションを作成することができます。
マネジメントシェル	データモデル管理機能を実装したWindows版の製品名称です。
マネジメントシェルエクスプローラ	マネジメントシェルが管理するデータモデルの設定および参照を行うソフトウェアです。

# 1 ダッシュボードサンプル for Edgecrossとは

## 1.1 概要

ダッシュボードサンプル for Edgecross は、生産現場の可視化、データ診断を Edgecross 基本ソフトウェアと Node-RED を活用して体験するアプリケーションです。

生産現場データ（サンプルデータ）を、簡単にダッシュボード画面に表示し、収集したデータをもとに診断を行い、診断結果を表示します。指定したしきい値を超えた場合には警告を発生させ、警告一覧で内容を管理します。

## 1.2 ダッシュボードサンプル for Edgecrossの構成

### 構成ファイル

構成ファイルは下記のとおりです。

項目	内容
01. InstallBatch	Node-REDを実行するためのファイルを格納したフォルダ
lib	ツリー表示に必要なライブラリを格納したフォルダ
flow_install.bat	Node-REDの設定ファイルを読み込み、Node-REDを起動するためのbatファイル
flows.json	Node-REDの設定ファイル
npm.exe	ダッシュボードサンプル for Edgecross を動作させるために必要なNode-REDのモジュールを格納したファイル
npm_install.bat	ダッシュボードサンプル for Edgecrossを動作させるために必要なNode-REDのモジュールをインストールするためのbatファイル
settings.js	Node-REDの設定ファイル
02. SettingFile	マネジメントシェルの設定ファイル格納フォルダ
dashboard_setting_file.msf	ダッシュボードサンプル for Edgecross用のマネジメントシェルの設定ファイル
03. DataSource	ダッシュボードサンプル for Edgecrossが読み込むデータに関連するファイルを格納したフォルダ
DataSource.exe	現場から取得したと想定するデータをCSVファイルのデータとして出力するサンプルデータ発生プログラム
Monitoring_sample.csv	現場から取得したと想定するテストデータ
AnalyzeData_sample.csv	現場から取得したと想定するMT法用テストデータ

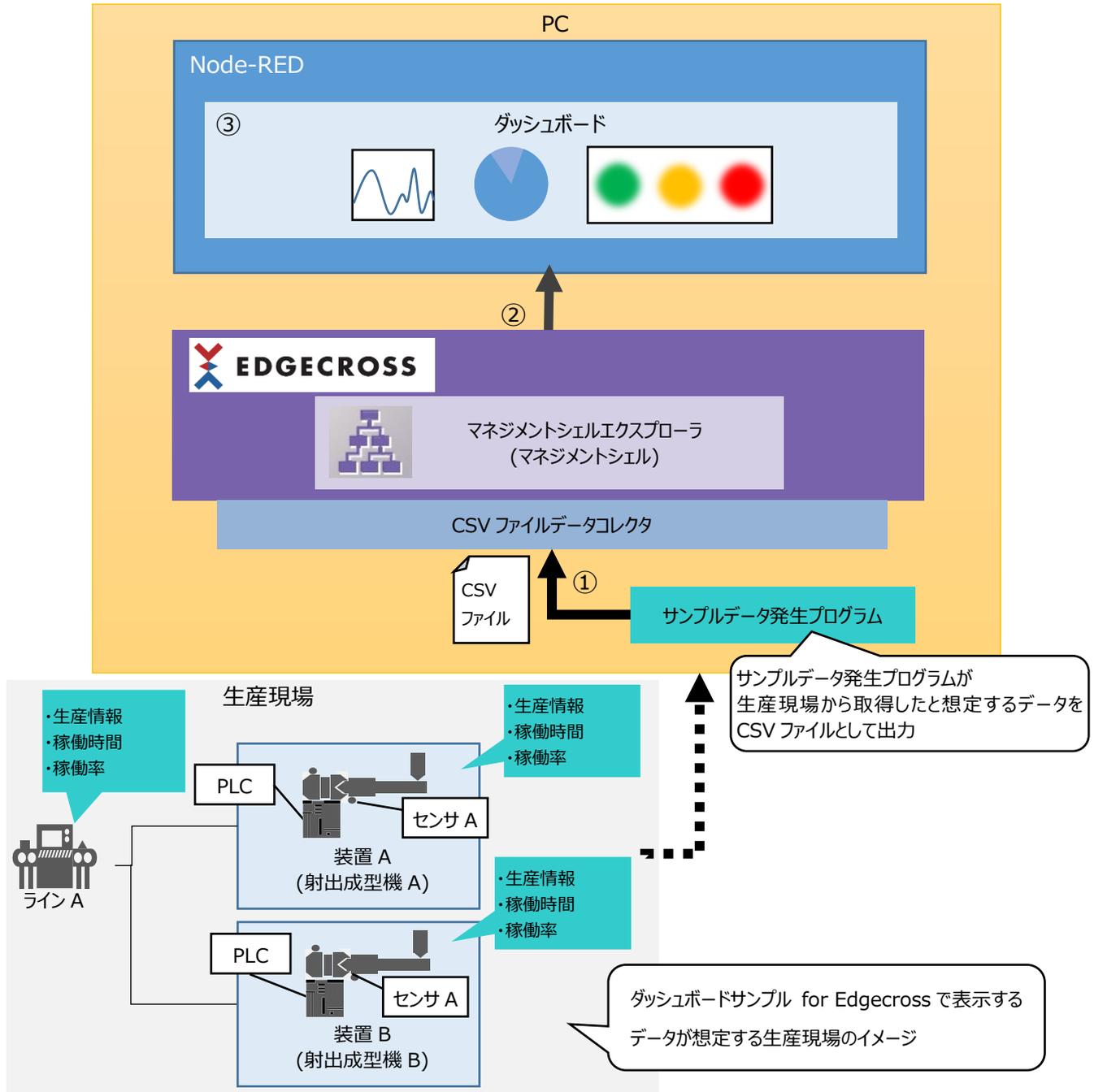
### 注意事項

- ・ 事前にEdgecross基本ソフトウェア Windows版(ver. 1.28以降の体験版、または製品版)をインストールしてください。  
 なお、Edgecross基本ソフトウェア Windows版の体験版はEdgecrossマーケットプレイス (<https://www.marketplace.edgecross.org/>) から、無料でダウンロードできます。

## 1.3 動作概要

ダッシュボードサンプル for Edgecross が Edgecross からデータを読み込む際の動作概要を示します。

設備稼働監視を使用するためには装置に搭載されている PLC にダッシュボードサンプル for Edgecross のモジュールが書き込まれている必要があります。



- ① サンプル発生プログラムが出力した CSV ファイルをマネジメントシェルエクスプローラに収集する。
- ② 収集したデータを Node-RED が読み込む。
- ③ ダッシュボードにデータを表示する。

## 2 仕様

### 2.1 機能仕様

ダッシュボードサンプル for Edgecross の機能仕様を示します。

項目	仕様	
対応インタフェース	<ul style="list-style-type: none"> <li>・ モデルアクセスI/F (OPC UA)</li> <li>・ データアクセスI/F (OPC UA)</li> </ul>	
対応ブラウザ[推奨バージョン]	<ul style="list-style-type: none"> <li>・ Google Chrome[84.0.4147.125以上]</li> <li>・ Firefox[78.0.2以上]</li> <li>・ Microsoft Edge[44.18362.449.0以上]</li> </ul>	
データの表示	アクセス可能なデータタグリソース数	最大101個
	データの読み込み	対応
	データの書き込み	非対応
	対応するデータ型	<ul style="list-style-type: none"> <li>・ BOOL</li> <li>・ INT</li> <li>・ UINT</li> <li>・ DINT</li> <li>・ UDINT</li> <li>・ LINT</li> <li>・ ULINT</li> <li>・ REAL</li> <li>・ LREAL</li> <li>・ STRING</li> <li>・ WSTRING</li> </ul>

## 3 利用手順

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ダッシュボードサンプル for Edgecross の導入、動作開始、停止の手順概要を記載します。

### (1) インストール・設定

ダッシュボードサンプル for Edgecrossの動作に必要なソフトウェアのインストールや各種ソフトウェアの設定を行ないます。

手順は下記を参照してください。

☞12ページ 4 インストール・設定手順

### (2) 動作開始

ダッシュボードサンプル for Edgecrossの動作を開始します。

手順は下記を参照してください。

➤ サンプルデータ発生プログラムを実行する

☞28ページ 5.1 サンプルデータ発生プログラムの実行手順

➤ 設備稼働監視のデータを確認する

☞32ページ 5.2 設備稼働監視の表示手順

➤ MT法のデータを確認する

☞36ページ 5.3 MT法の表示手順

➤ マネジメントシエルの階層構造を取得して確認する

☞43ページ 5.4 階層構造の表示手順

### (3) ダッシュボード画面の編集

(2)の動作開始後、ダッシュボード画面を編集して、表示する階層構造や監視するデータを変更する場合の手順は下記を参照してください。

☞47ページ 6 ダッシュボード画面の編集

### (4) 動作終了

ダッシュボードサンプル for Edgecrossの動作を終了します。

手順は下記を参照してください。

☞46ページ 5.4 停止手順

## 4 インストール・設定手順

### 4.1 マネジメントシェル設定手順

マネジメントシェルの設定を行います。

- (1) マネジメントシェルを**管理者権限**で起動します。

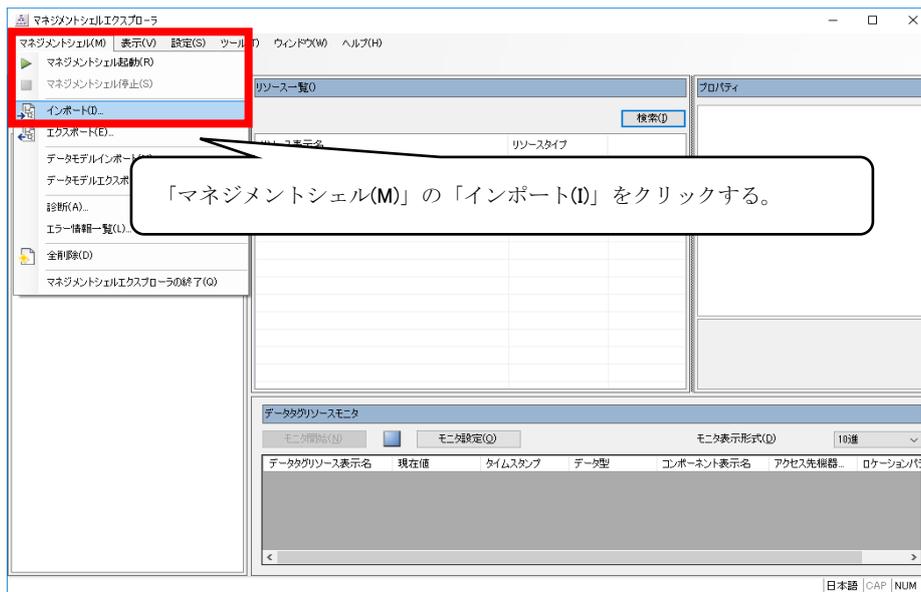
管理者権限での起動方法については下記を参照してください。

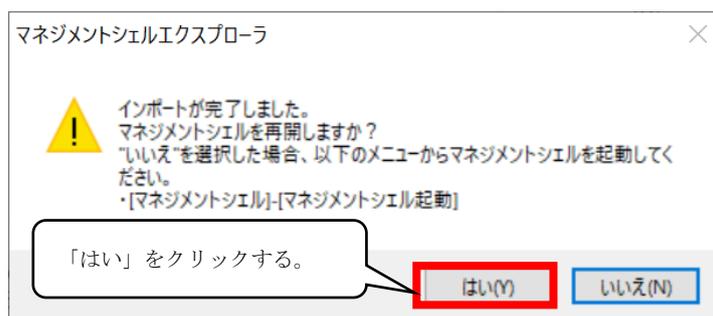
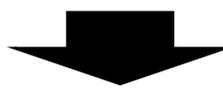
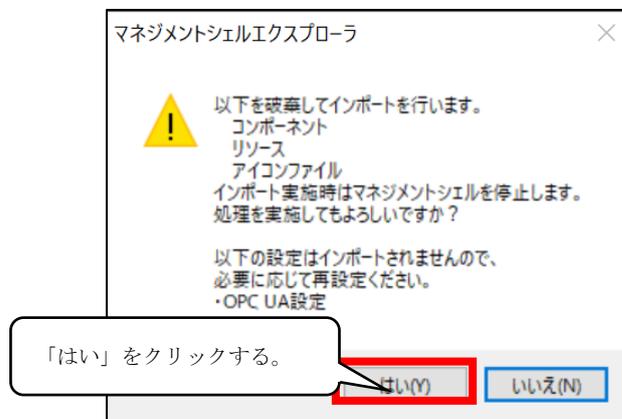
☞ Edgecross基本ソフトウェアWindows版ユーザーズマニュアル

> [7.2 マネジメントシェルエクスプローラ] > [管理者権限でのマネジメントシェルエクスプローラの起動について]

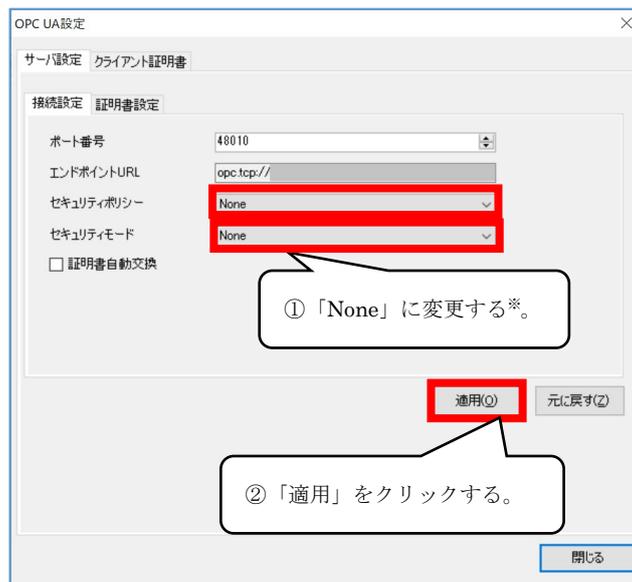
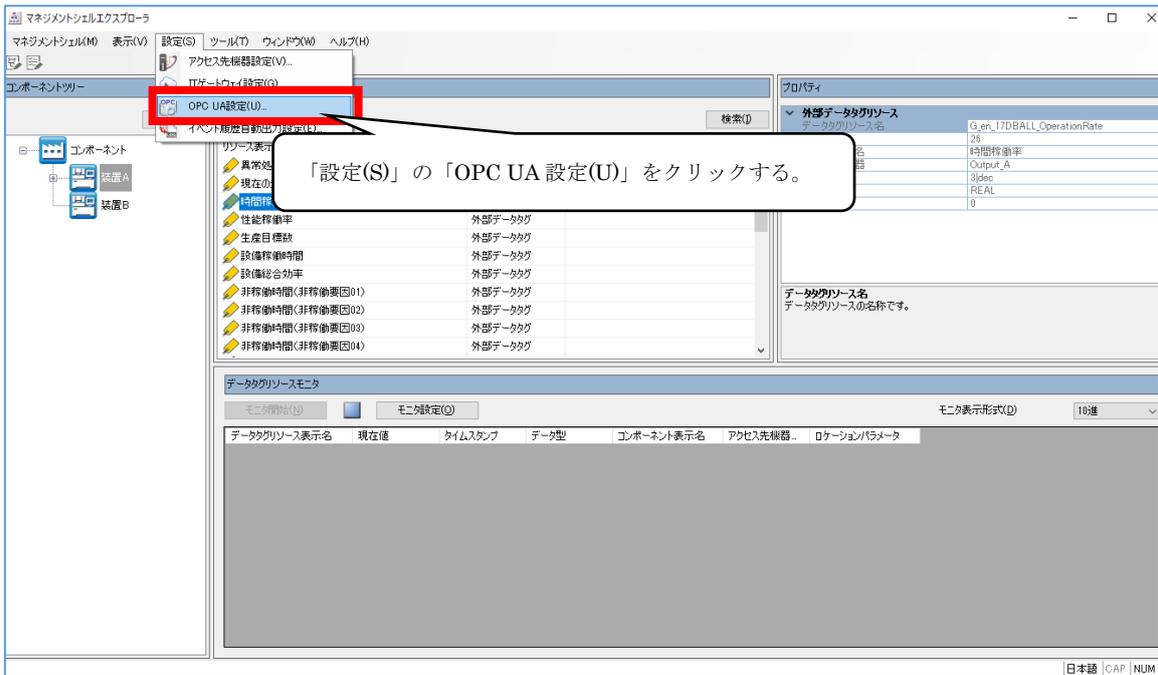


- (2) ダッシュボードサンプル for Edgecross用のマネジメントシェルの設定ファイルをインポートします。

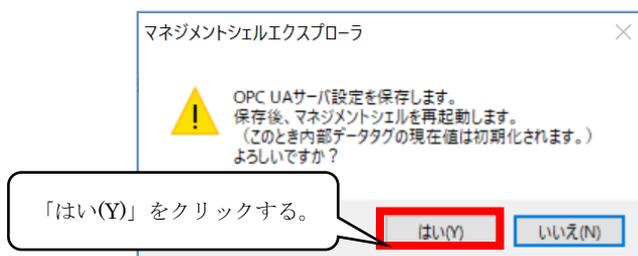


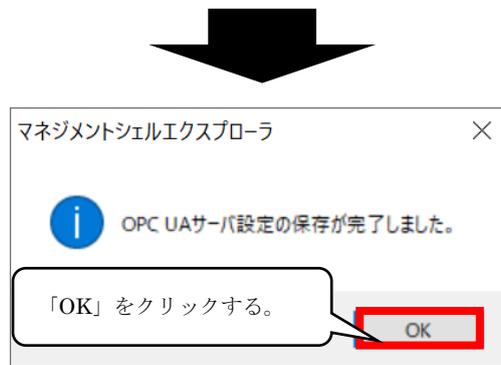


(3) OPC UAの設定をします。



※ダッシュボードサンプル for Edgexcross は OPC UA の暗号化通信に非対応なので上記のとおりを設定をします。

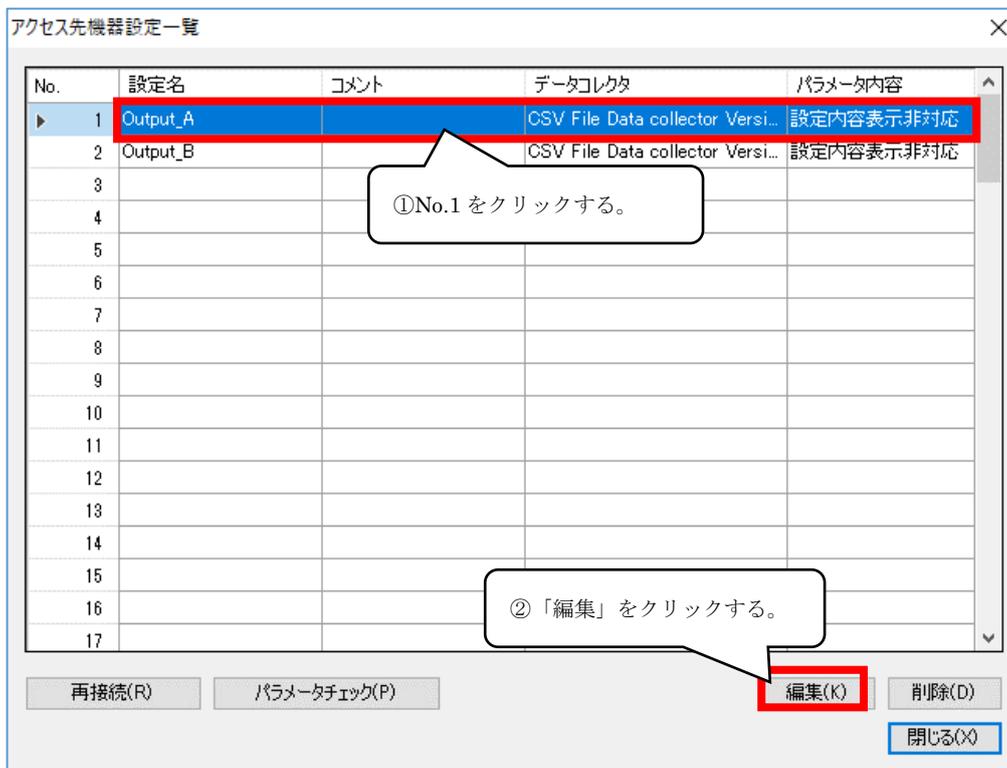
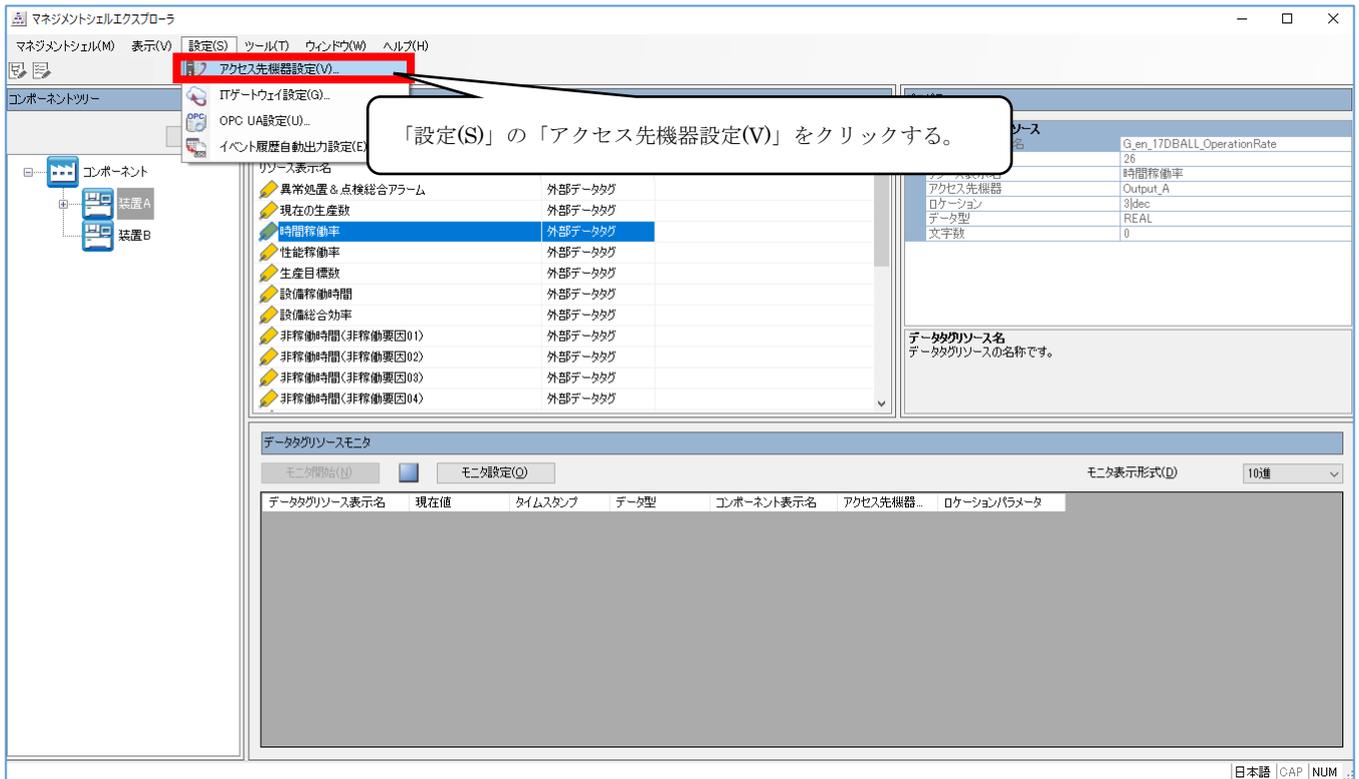


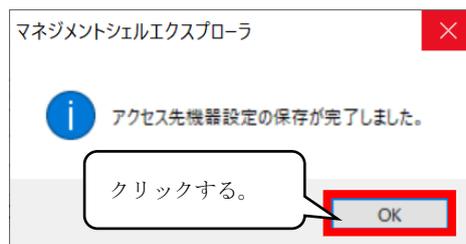
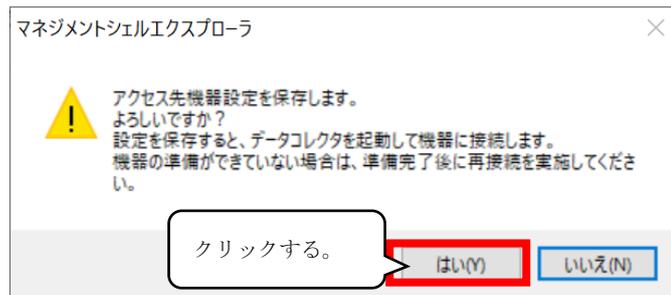
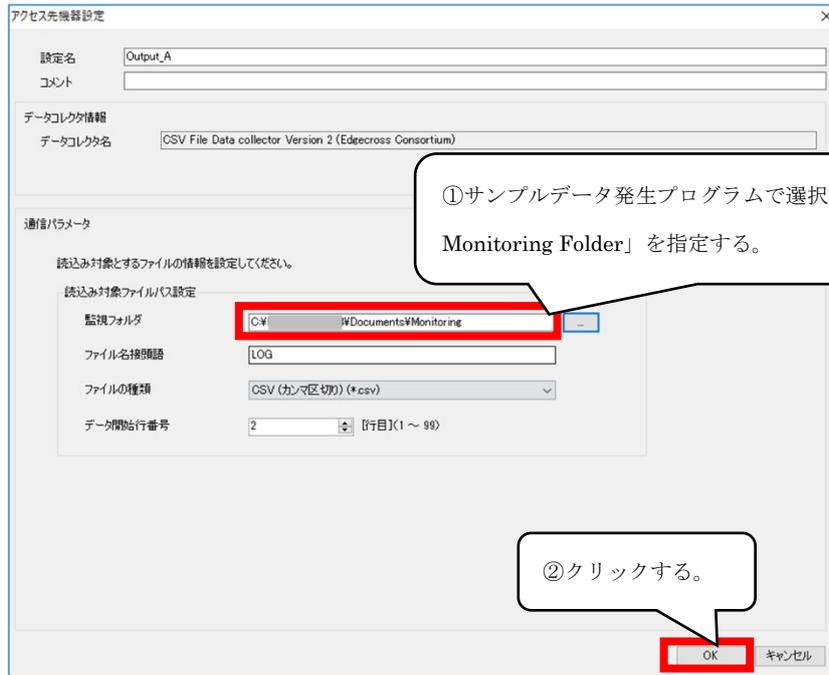


## 注意事項

- 後述の「5.1 サンプルデータ発生プログラムの実行手順」では、サンプルデータ発生プログラムの設定内容によってマネジメントシェルの設定を変更する必要があります。変更する場合は下記を参照し、マネジメントシェルの設定を変更してください。

■ サンプルデータ発生プログラムのManagementShell Monitoring Folderに伴うマネジメントシェルの設定変更





アクセス先機器設定一覧

No.	設定名	コメント	データコレクタ	パラメータ内容
▶ 1	Output_A		CSV File Data collector Versi...	設定内容表示非対応
2	Output_B		CSV File Data collector Versi...	設定内容表示非対応
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

再接続(R)    パラメータチェック(P)    編集(K)    削除(D)    **閉じる(X)**

クリックする。

## 4.2 Node-REDインストール手順

Node-RED をインストールします。

- (1) 以下のサイトから、「Node.js」のインストーラ(Windows Installer (.msi)の64-bit)をダウンロードしてインストールしてください。

<https://nodejs.org/ja/download/>

「Node.js」がインストール済みである場合、本手順は不要です。



node

ホーム | NODE.jsとは | ダウンロード | ドキュメント | 参加する | セキュリティ | ニュース | CERTIFICATION

### ダウンロード

最新のバージョン: 12.18.2 (同梱 npm 6.14.5)

Node.jsのソースコードをダウンロードするか、事前にビルドされたインストーラーを利用して、今日から開発を始めましょう。

**LTS**  
推奨版

**最新版**  
最新の機能

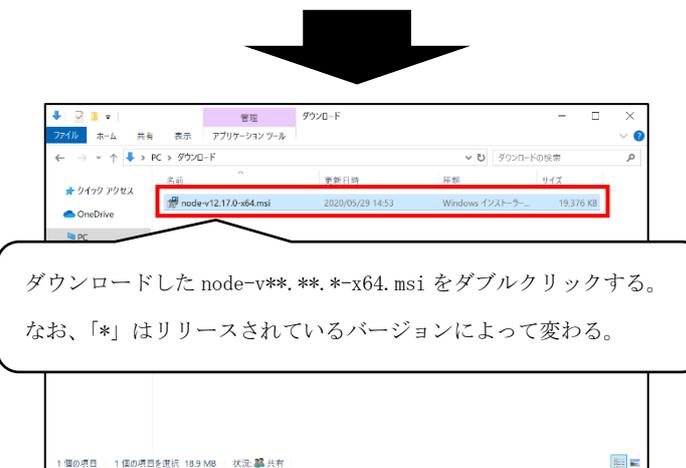
Windows Installer  
node-v12.18.2-x64.msi

macOS Installer  
node-v12.18.2.pkg

Source Code  
node-v12.18.2.tar.gz

Windows Installer (.msi)	32-bit	64-bit
Windows Binary (.zip)	32-bit	64-bit
macOS Installer (.pkg)		
macOS Binary (.tar.gz)		
Linux Binaries (x64)		
Linux Binaries (ARM)	ARMv7	
Source Code		node-v12.18.2.tar.gz

クリックする。



ダウンロードした node-v\*\*, \*\*, \*-x64.msi をダブルクリックする。  
なお、「\*」はリリースされているバージョンによって変わる。



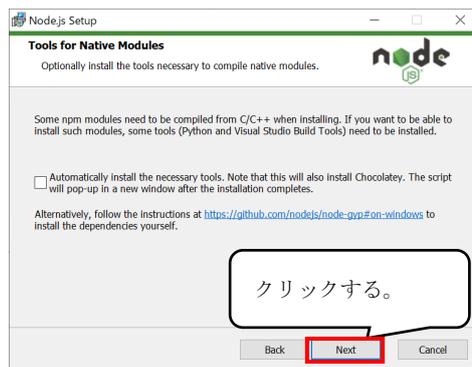
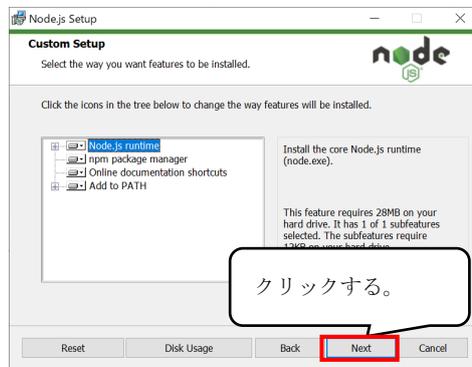
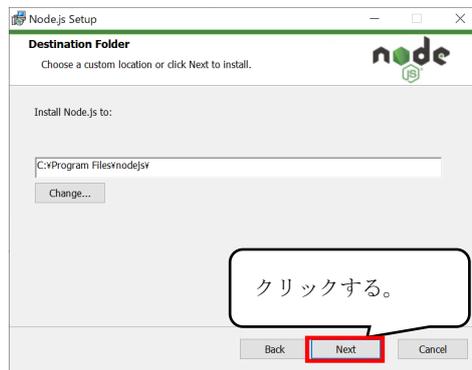
Node.js Setup

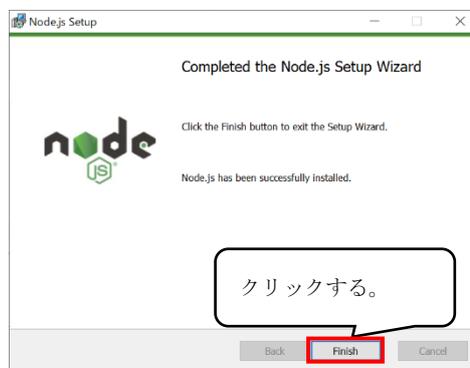
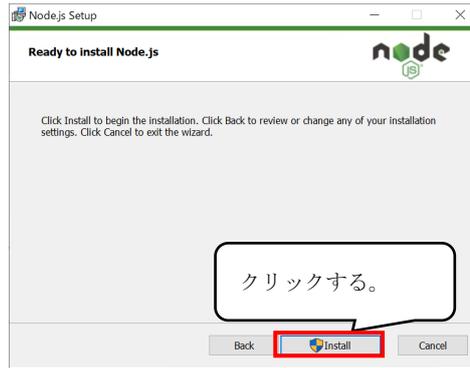
Welcome to the Node.js Setup Wizard

The Setup Wizard will install Node.js on your computer.

クリックする。

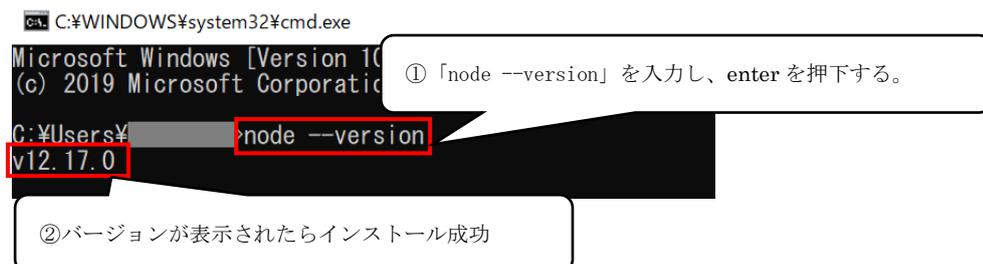
Back Next Cancel





**Point**

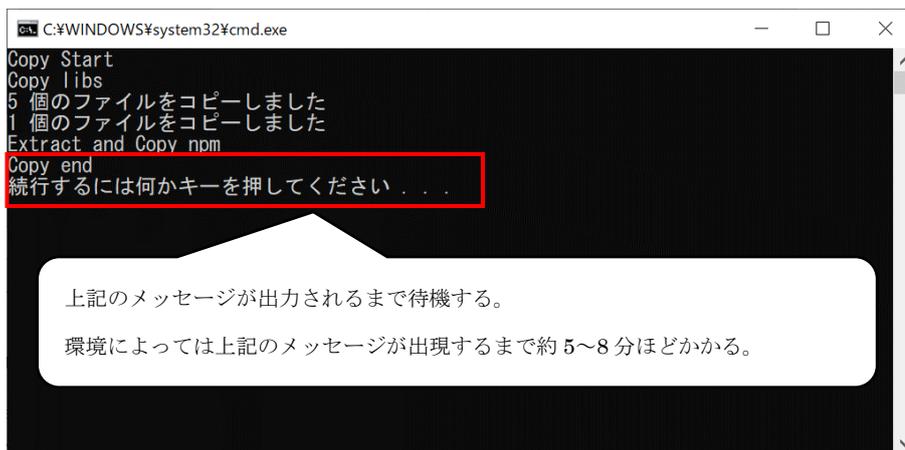
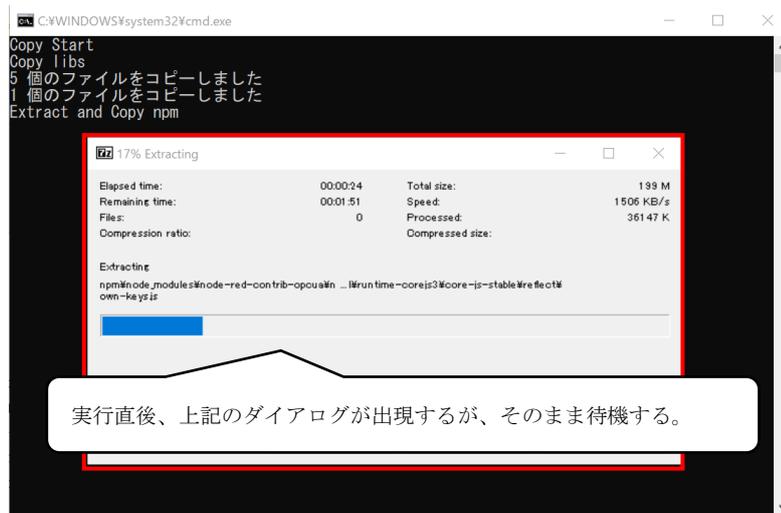
コマンドプロンプトを起動して「node --version」と入力して実行するとインストールが成功したかを確認することができます。



(2) (1)の手順にて「Node.js」をインストールした場合、「npm\_install.bat」を実行してください。

「npm\_install.bat」の格納場所は下記を参照してください。

8ページ 1.2 ダッシュボードサンプル for Edgexcrossの構成

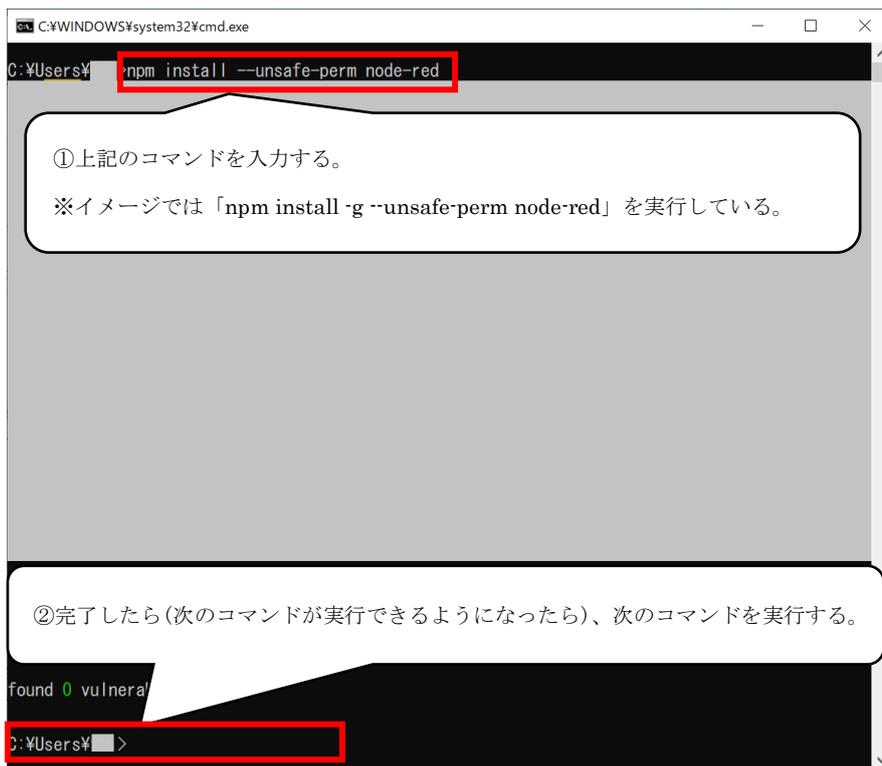


メッセージが出力されたら、何かキーを押して画面を閉じてください。

(1)の手順を実施せず、「Node.js」やnpmがインストール済みの場合、お使いの環境に合わせて下記のコマンドをそれぞれ実行して、パッケージをインストールしてください。

- npm install -g --unsafe-perm node-red
- npm install -g node-red-dashboard
- npm install -g node-red-contrib-opcua
- npm install -g node-red-contrib-ui-digital-display
- npm install -g node-red-contrib-ui-led

例)それぞれ下記のとおり実行してください。



```
C:\WINDOWS\system32\cmd.exe
C:\Users\%> npm install --unsafe-perm node-red
```

①上記のコマンドを入力する。  
※イメージでは「npm install -g --unsafe-perm node-red」を実行している。

②完了したら(次のコマンドが実行できるようになったら)、次のコマンドを実行する。

```
found 0 vulnera
C:\Users\%>
```

上記の操作をすべてのコマンドで実施してパッケージをインストールしてください。

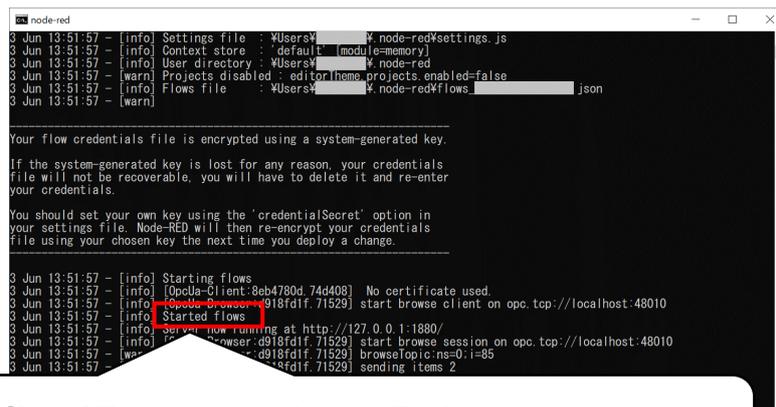
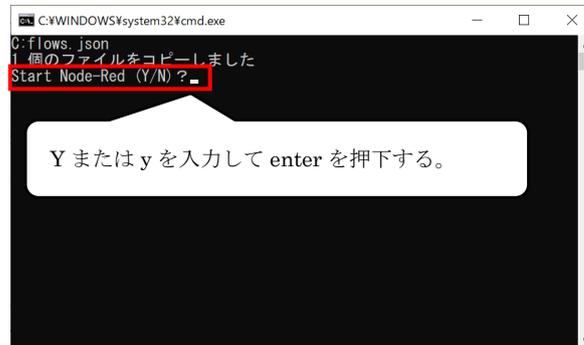
## 4.3 Node-RED設定手順

Node-REDの設定ファイルを読み込み、ダッシュボードサンプル for Edgecrossの設定を行います。

「flow\_install.bat」を実行してください。

「flow\_install.bat」の格納場所は下記を参照してください。

⇒8ページ 1.2 ダッシュボードサンプル for Edgecrossの構成



### 注意事項

- ・ 「flow\_install.bat」を実行したときにWindows Defenderファイアウォールのメッセージが出た場合、動作環境に合わせてブロックを解除してください。
- ・ ダッシュボードサンプル for EdgecrossはNode-REDが起動していないと動作しません。本項目内のPointを参考にNode-REDは必ず実行してください。

「flow\_install.bat」を一度実行すると、次回以降、下記のとおりコマンドプロンプトに直接「node-red」と入力して実行することでNode-REDを起動できます。

```

node-red
Microsoft Windows [Version 10.0.18362.836]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\%username% >node-red
9 Jul 16:31:19 - [info]

Welcome to Node-RED
-----

9 Jul 16:31:19 - [info] Node-RED version: v1.1.0
9 Jul 16:31:19 - [info] Node.js version: v12.17.0
9 Jul 16:31:19 - [info] Windows_NT 10.0.18362 x64 LE
9 Jul 16:31:22 - [info] Loading palette nodes
9 Jul 16:31:33 - [info] Dashboard version 2.22.1 started at /ui
9 Jul 16:31:34 - [info] Settings file : %userprofile%\node-red\settings.js
9 Jul 16:31:34 - [info] Context store : 'default' [module=memory]
9 Jul 16:31:34 - [info] User directory : %userprofile%\node-red
9 Jul 16:31:34 - [warn] Projects disabled : editorTheme.projects.enabled=false
9 Jul 16:31:34 - [info] Flows file : %userprofile%\node-red\flows_%.json
9 Jul 16:31:34 - [info] Server now running at http://127.0.0.1:1880/
9 Jul 16:31:34 - [warn]

-----

Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file. Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
-----

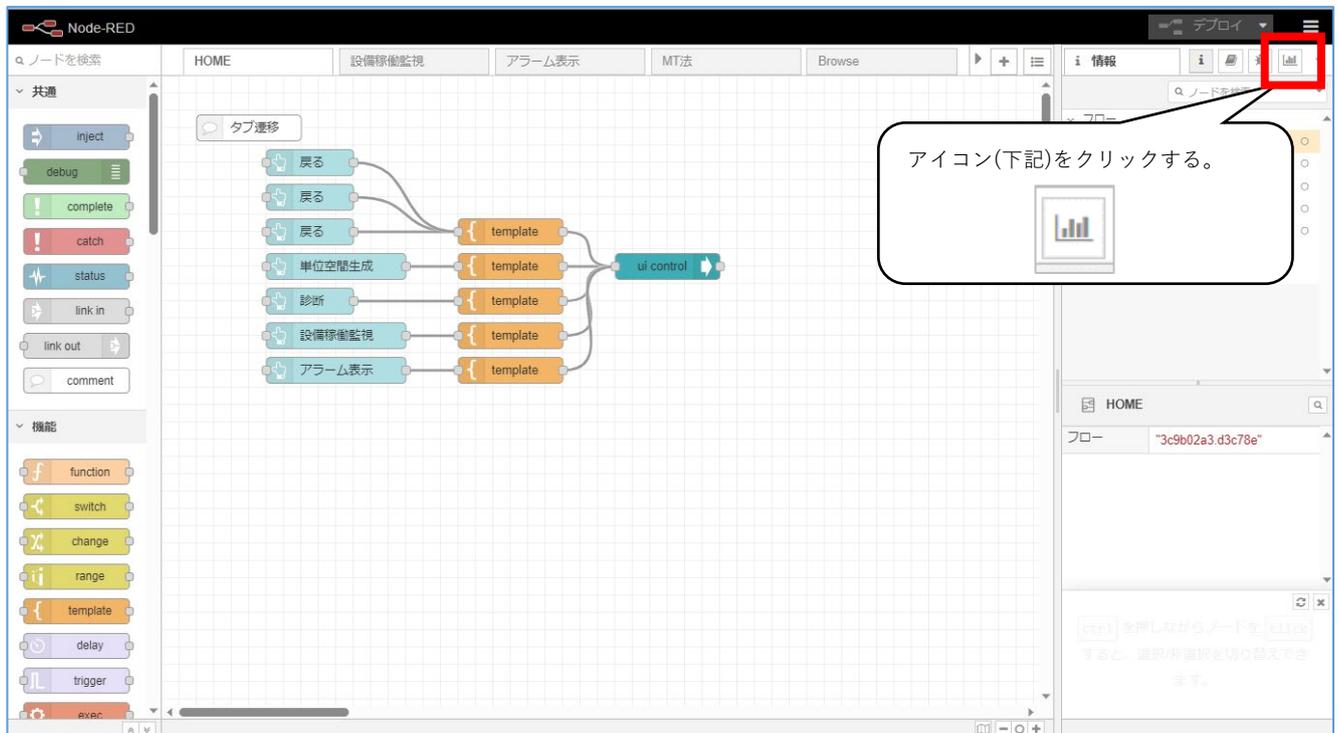
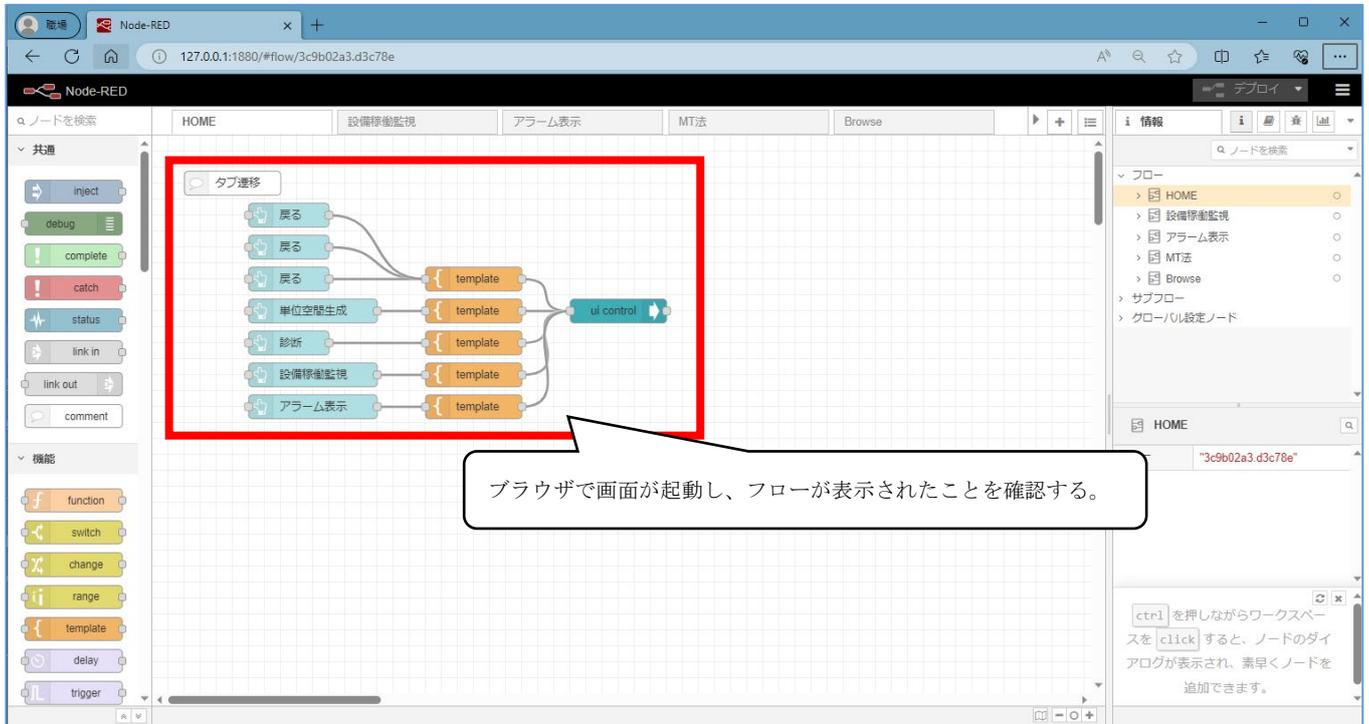
9 Jul 16:31:34 - [info] Starting flows
9 Jul 16:31:34 - [info] [OpcUa-Client:8eb4780d.74d408] No certificate used.
9 Jul 16:31:34 - [info] [OpcUa-Browser:d918fd1f.71529] start browse client on opc.tcp://localhost:48010
9 Jul 16:31:34 - [info] Started flows
9 Jul 16:31:34 - [info] [OpcUa-Browser:d918fd1f.71529] start browse session on opc.tcp://localhost:48010
9 Jul 16:31:34 - [warn] [OpcUa-Browser:d918fd1f.71529] browseTopic:ns=0;i=85
9 Jul 16:31:34 - [warn] [OpcUa-Browser:d918fd1f.71529] sending items 2

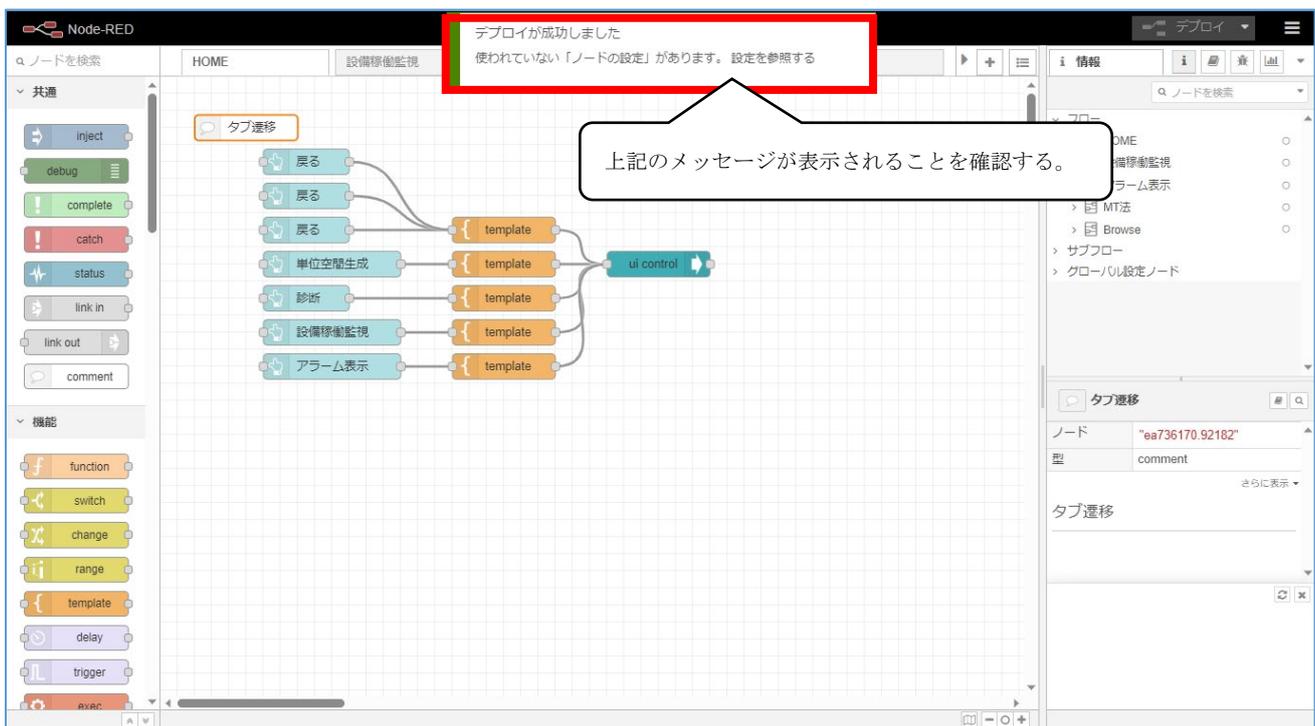
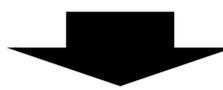
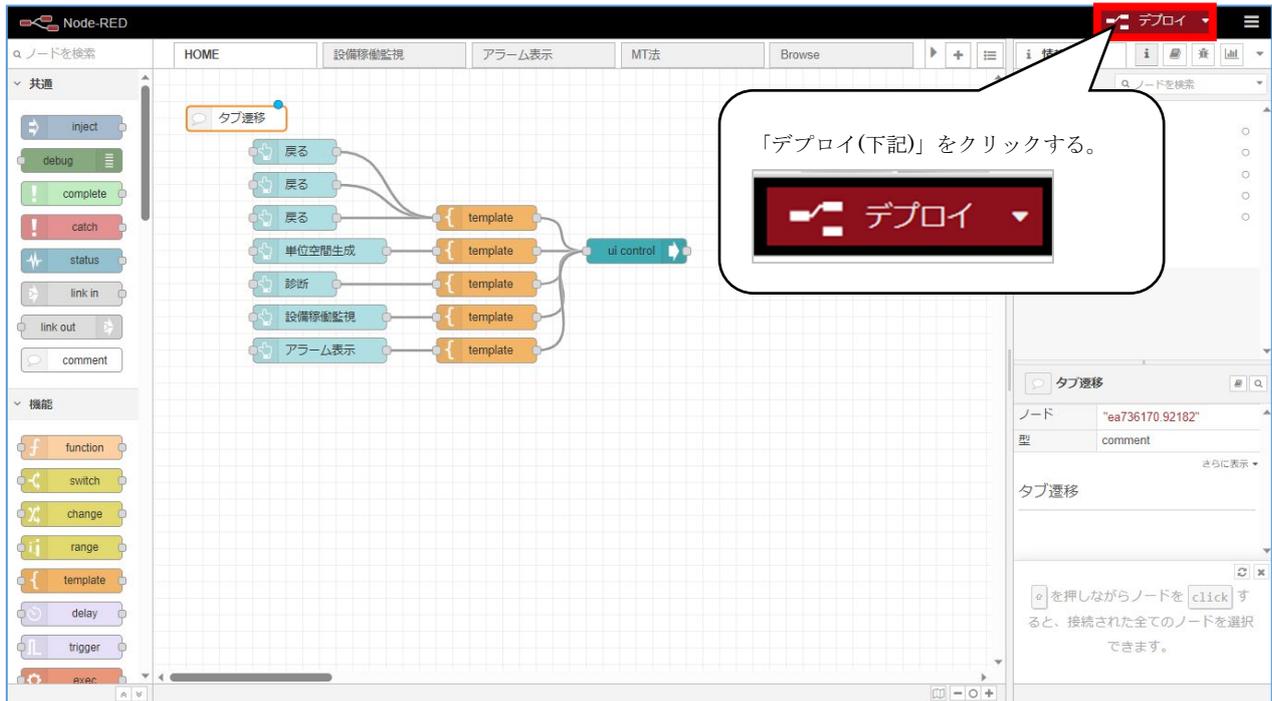
```

## 4.4 Node-RED起動確認

Node-REDの画面を起動し、設定を反映します。

ブラウザで「<http://127.0.0.1:1880/>」を入力し、実行します。





## 注意事項

- ・ 対応ブラウザを使用して起動してください。  
対応ブラウザについては下記を参照してください。  
👉10ページ [2.1 機能仕様]>[対応ブラウザ]

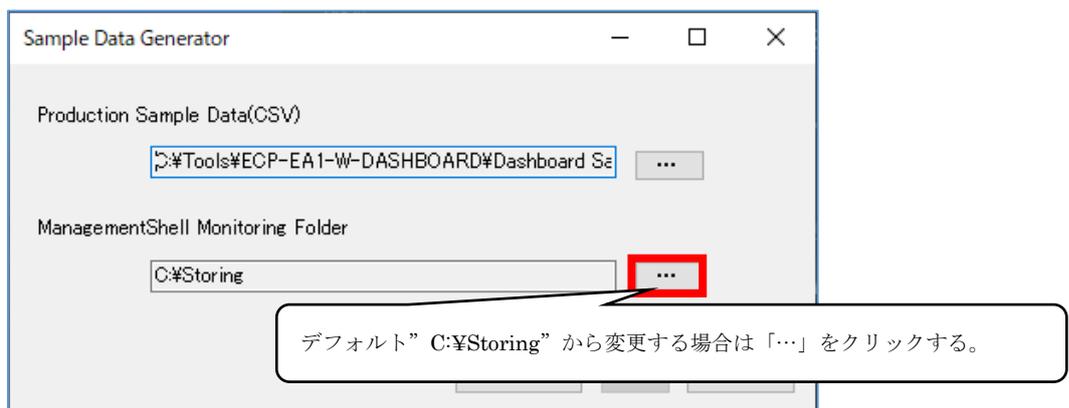
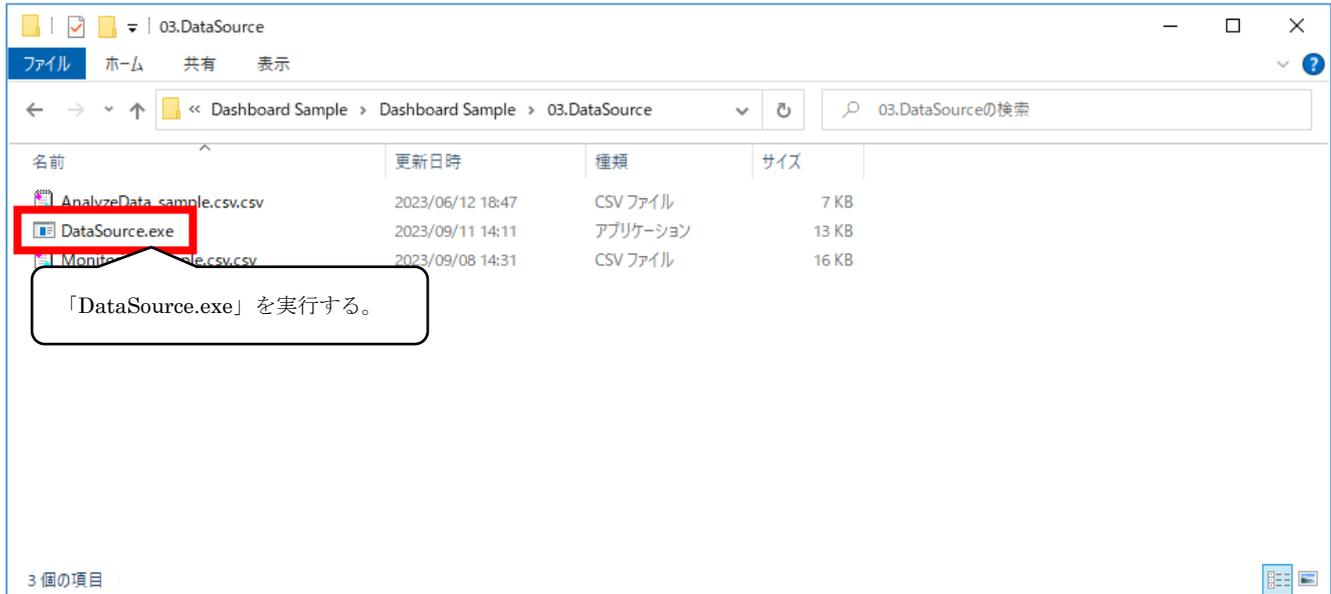
## 5 動作手順

### 5.1 サンプルデータ発生プログラムの実行手順

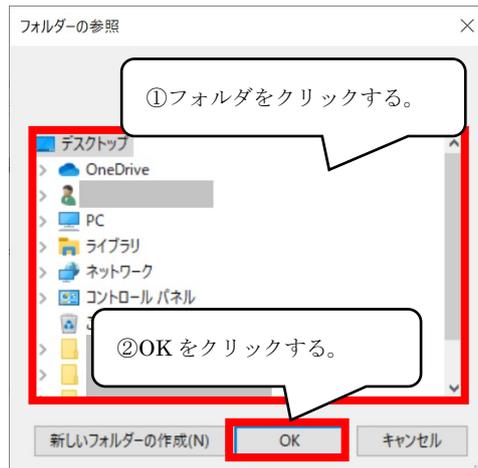
Edgecross (CSV ファイルデータコレクタ) が読み込める形式の CSV ファイルを出力します。

- (1) 「03.DataSource」フォルダ内の「DataSource.exe」を実行します。

8 ページ 1.2 ダッシュボードサンプル for Edgecross の構成

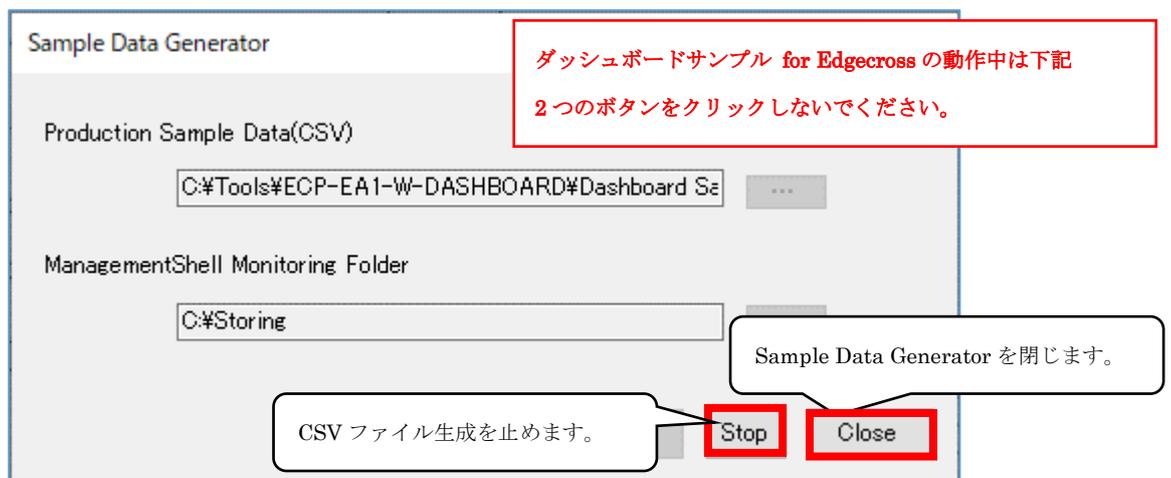
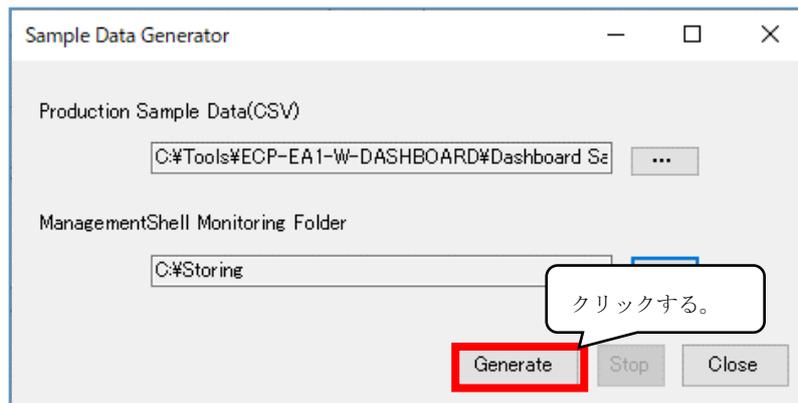


■ フォルダを選択する場合



■ フォルダを選択しない場合(デフォルトの場合)

” C:%Storing ” のフォルダは自動で作成されるため次の手順を実施してください。



注意事項

- ・ 「DataSource.exe」を実行したときにWindows Defender及びウイルス対策ソフトウェアにて警告メッセージが表示され

る場合があります。表示されたときには実行を許可してください。

- ・ データ出力中は出力されたファイルを開かないでください。
- ・ ManagementShell Monitoring Folderを変更した場合は、マネジメントシェルで設定を変更する必要があります。  
変更する設定の詳細は下記を参照してください。

12ページ 4.1 マネジメントシェル設定手順

**Point**

生産現場データサンプルの仕様は下記のとおりです。

列番号	名称	内容	データ型	最大値
1	設備総合効率	時間稼働率 × 性能稼働率 × 良品率	REAL	
2	時間稼働率	設備稼働時間 ÷ 負荷時間 ※生産数 ≥ 25 でアラーム発生のため、単調に減少する。	REAL	
3	性能稼働率	正味稼働時間 ÷ 設備稼働時間	REAL	
4	良品率	良品数 ÷ 生産数	REAL	
5	設備稼働時間	設備稼働時間 - 停止ロス (ここでは非稼働時間01が該当)	REAL	
6	非稼働時間 (非稼働要因01)		REAL	
7	非稼働時間 (非稼働要因02)		REAL	
8	非稼働時間 (非稼働要因03)	定数 (0)	REAL	
9	非稼働時間 (非稼働要因04)		REAL	
10	非稼働時間 (非稼働要因05)		REAL	
11	非稼働時間 (非稼働要因06)	定数 (0)	REAL	
12	非稼働時間 (非稼働要因07)	定数 (0)	REAL	
13	非稼働時間 (非稼働要因08)	定数 (0)	REAL	
14	非稼働時間 (非稼働要因09)	定数 (0)	REAL	
15	非稼働時間 (非稼働要因10)	定数 (0)	REAL	
16	非稼働時間 (非稼働要因11)	定数 (0)	REAL	
17	非稼働時間 (非稼働要因12)	定数 (0)	REAL	
18	非稼働時間 (非稼働要因13)	定数 (0)	REAL	
19	非稼働時間 (非稼働要因14)	定数 (0)	REAL	
20	非稼働時間 (非稼働要因15)	定数 (0)	REAL	
21	非稼働時間 (非稼働要因16)	定数 (0)	REAL	
22	品種No.	定数 (1)	UDINT	
23	品種コメント	文字列 (00_R61P)	STRING (32)	-
24	生産数	一定周期 (※1) で増加する。ただし、アラーム (No. 25) 発生時には増加しない。	UDINT	
25	目標数	定数 (50)	UDINT	50
26	異常処置 & 点検総合アラーム	生産数 ≥ 25 でON	BOOL	-
27	CHNo.		UINT	
28	アラームコード		UDINT	

列番号	名称	内容	データ型	最大値
29	アラーム発生日時 (年)		UINT	
30	アラーム発生日時 (月)		UINT	
31	アラーム発生日時 (日)		UINT	

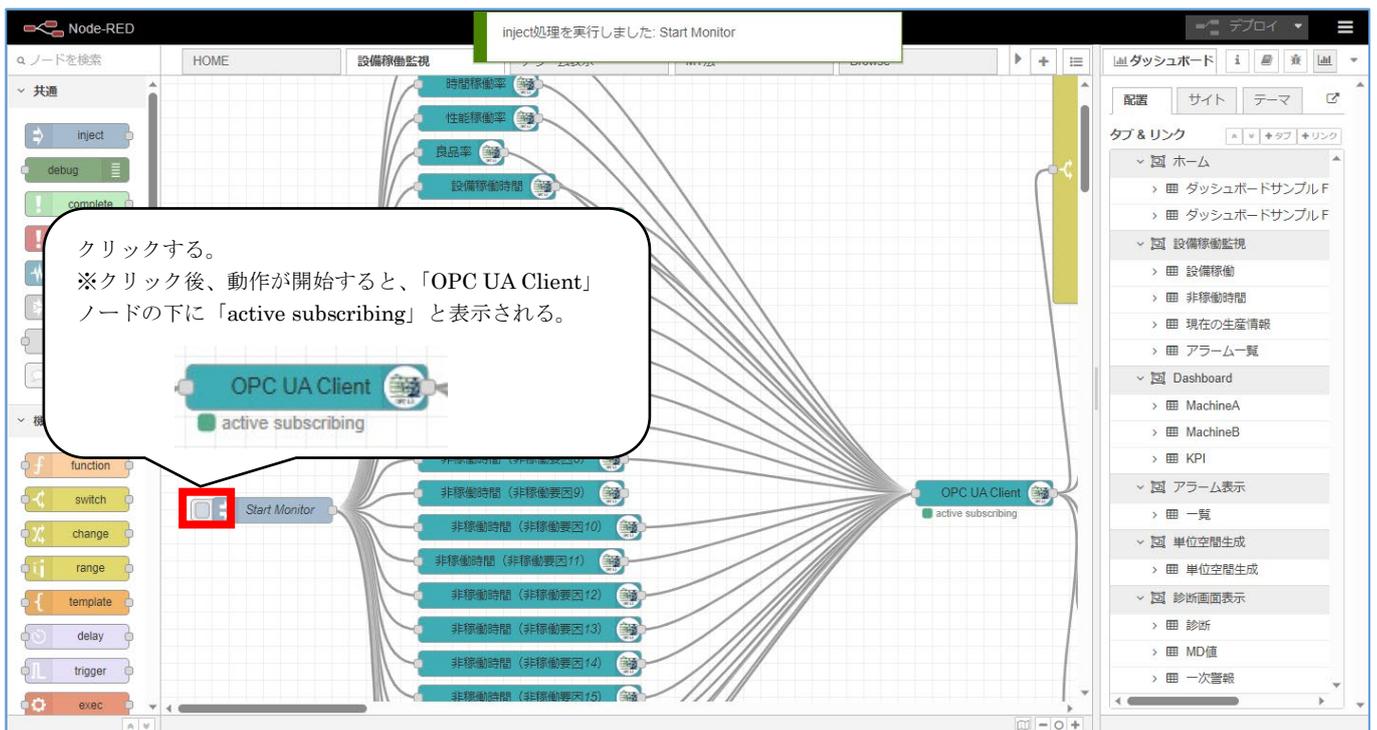
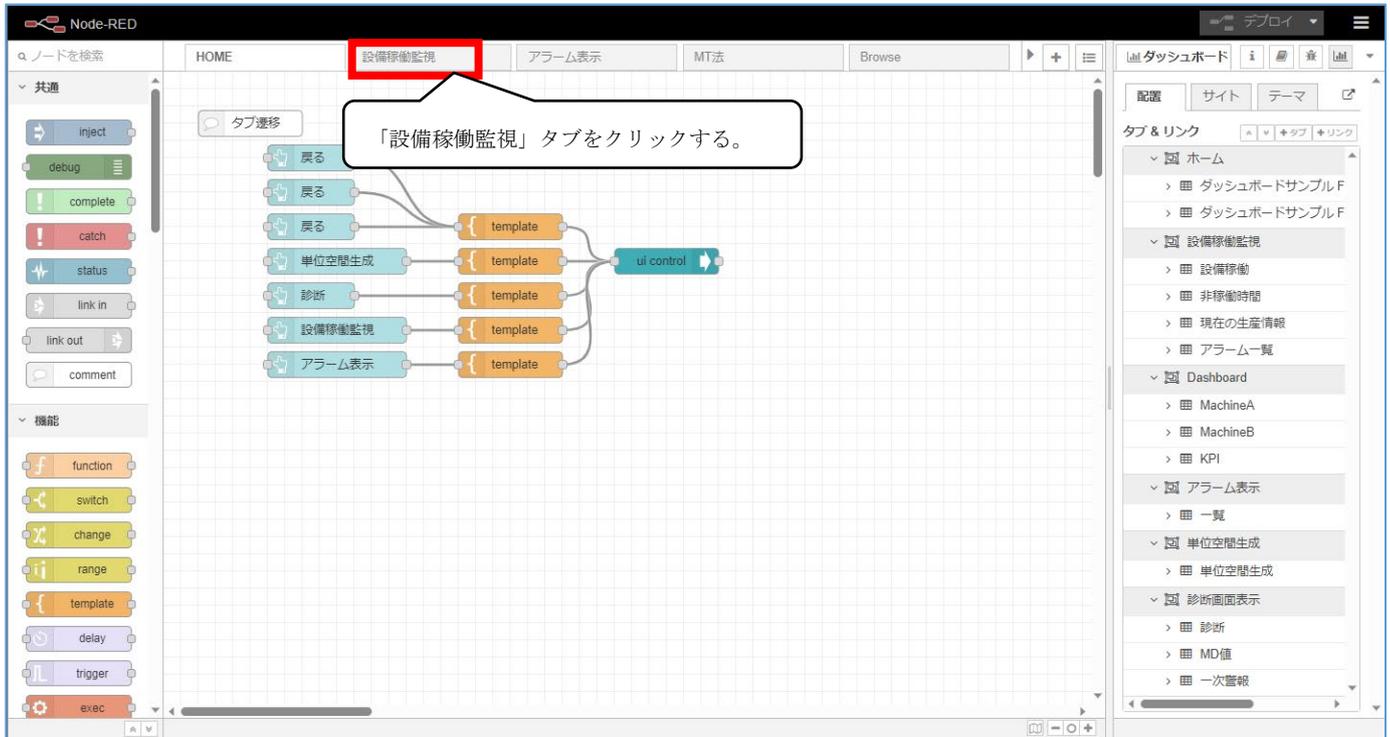
---

## 5.2 設備稼働監視の表示手順

設備稼働監視のデータ収集を開始し、ダッシュボードにデータを表示する手順を示します。

「4.3 Node-RED 設定手順」を実行しており、Node-RED が起動していることを確認します。

- (1) ブラウザで「<http://127.0.0.1:1880/>」を入力し、実行します
- (2) 「設備稼働監視」タブを選択し、動作を開始します。





アイコン(下記)をクリックする。



アイコン(下記)をクリックする。



≡ ホーム

ダッシュボードサンプル For Edgecross 設備稼働監視

ダッシュボードサンプル For Edgecross MT法

設備稼働監視

単位空間生成

アラーム表示

診断

クリックする。



≡ 設備稼働監視

設備稼働

設備総合効率

57.1

時間稼働率

1000

性能稼働率

42.9

良品率

1000

戻る

非稼働時間

- 設備稼働時間
- 非稼働時間 (非稼働要因1)
- 非稼働時間 (非稼働要因2)
- 非稼働時間 (非稼働要因3)
- 非稼働時間 (非稼働要因4)
- 非稼働時間 (非稼働要因5)
- 非稼働時間 (非稼働要因6)
- 非稼働時間 (非稼働要因7)
- 非稼働時間 (非稼働要因8)
- 非稼働時間 (非稼働要因9)
- 非稼働時間 (非稼働要因10)
- 非稼働時間 (非稼働要因11)
- 非稼働時間 (非稼働要因12)
- 非稼働時間 (非稼働要因13)
- 非稼働時間 (非稼働要因14)
- 非稼働時間 (非稼働要因15)
- 非稼働時間 (非稼働要因16)

現在の生産情報

品種 1

品名 00\_R61P

生産数 100

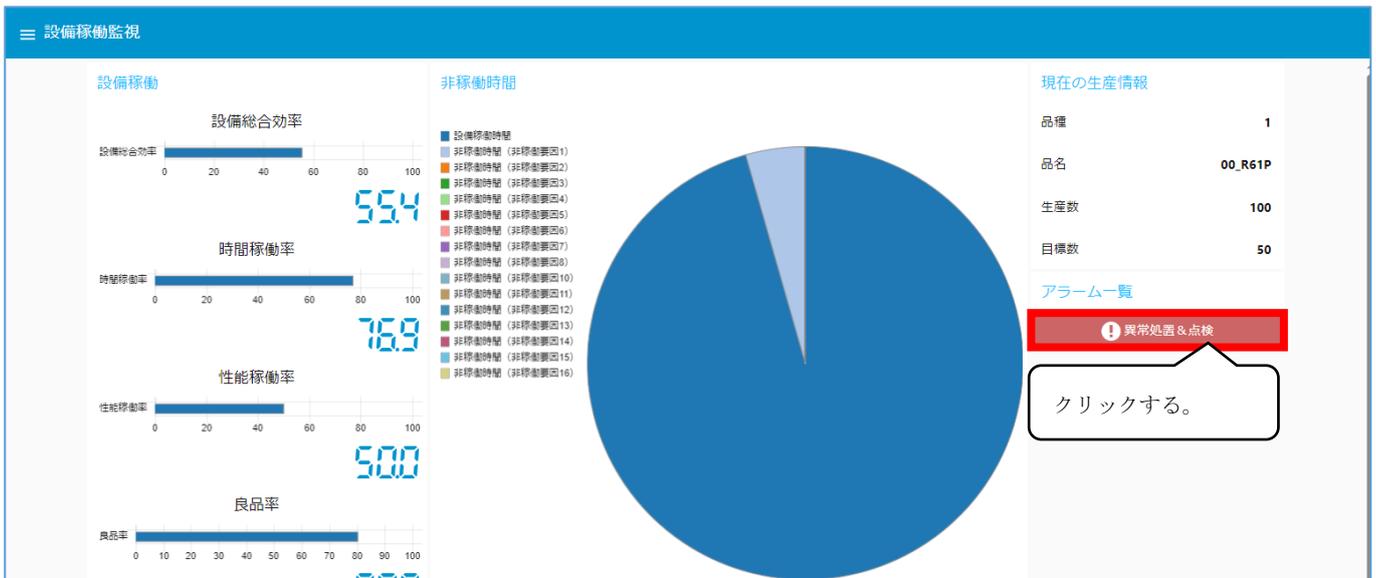
目標数 7

アラーム一覧

異常処置 & 点検

非稼働時間 (非稼働要因1)					
非稼働時間 (非稼働要因2)					

(3) 「異常処置 & 点検」 ボタンを押下し、アラーム一覧を確認します。



### アラーム表示

モニタ開始

発生日時	状態	CHno	登録no	アラームコード	重要度	アラーム名
23/7/12 10:1:20	発生中	1	50	2	軽度	CH01-Alarm
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				

戻る

クリックする。



### アラーム表示

モニタ開始

発生日時	状態	CHno	登録no	アラームコード	重要度	アラーム名
23/7/12 10:1:20	発生中	1	50	2	軽度	CH01-Alarm0050
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				
null/null/nu	●	null:null:nul				

発生しているアラームが一覧表示される。

戻る

## 5.3 MT法の表示手順

MT法のデータ収集を開始し、ダッシュボードにデータを表示する手順を示します。

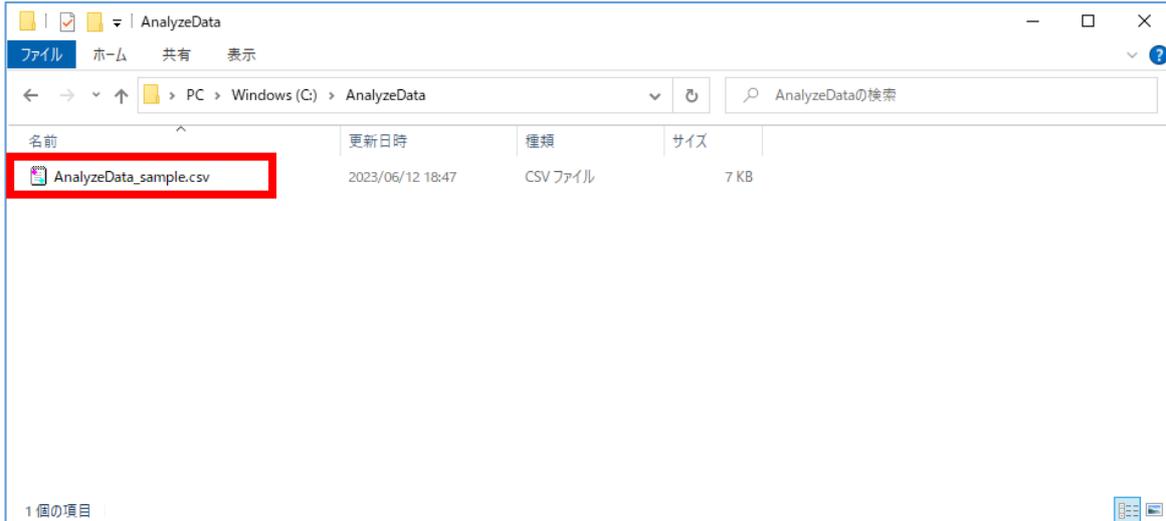
「4.3 Node-RED 設定手順」を実行しており、Node-RED が起動していることを確認します。

(1) Cドライブ直下に「AnalyzeData」フォルダを作成し、「03.DataSource」フォルダに格納されている

「AnalyzeData\_sample.csv」を格納します。

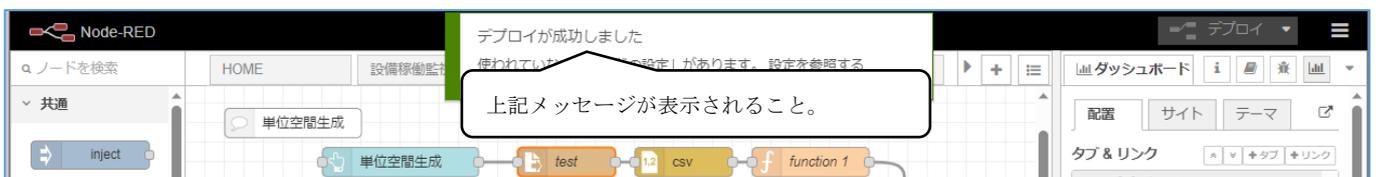
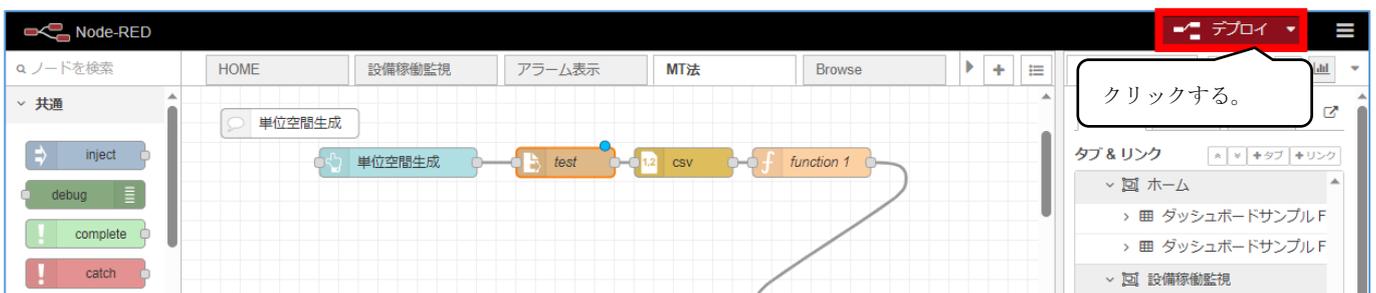
「03.DataSource」フォルダ構成は以下を参照してください。

☞8ページ 1.2 ダッシュボードサンプル for Edgecrossの構成



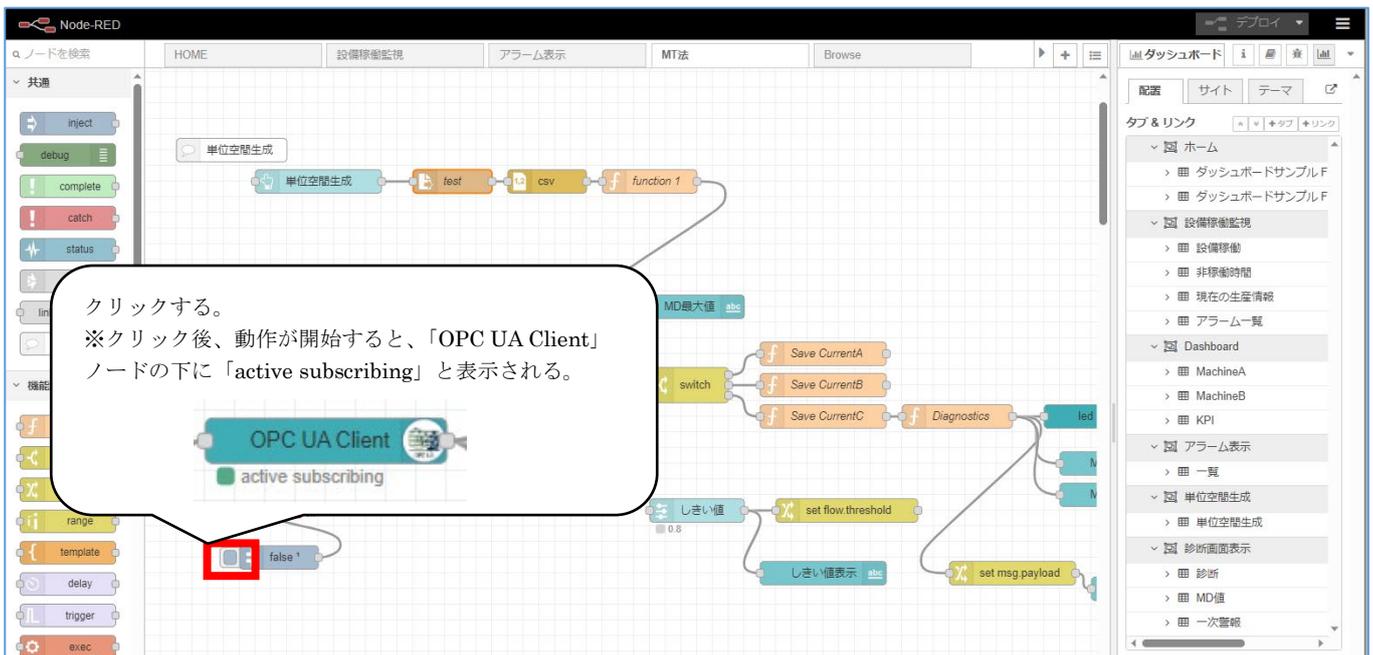
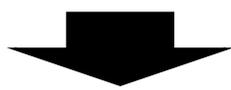
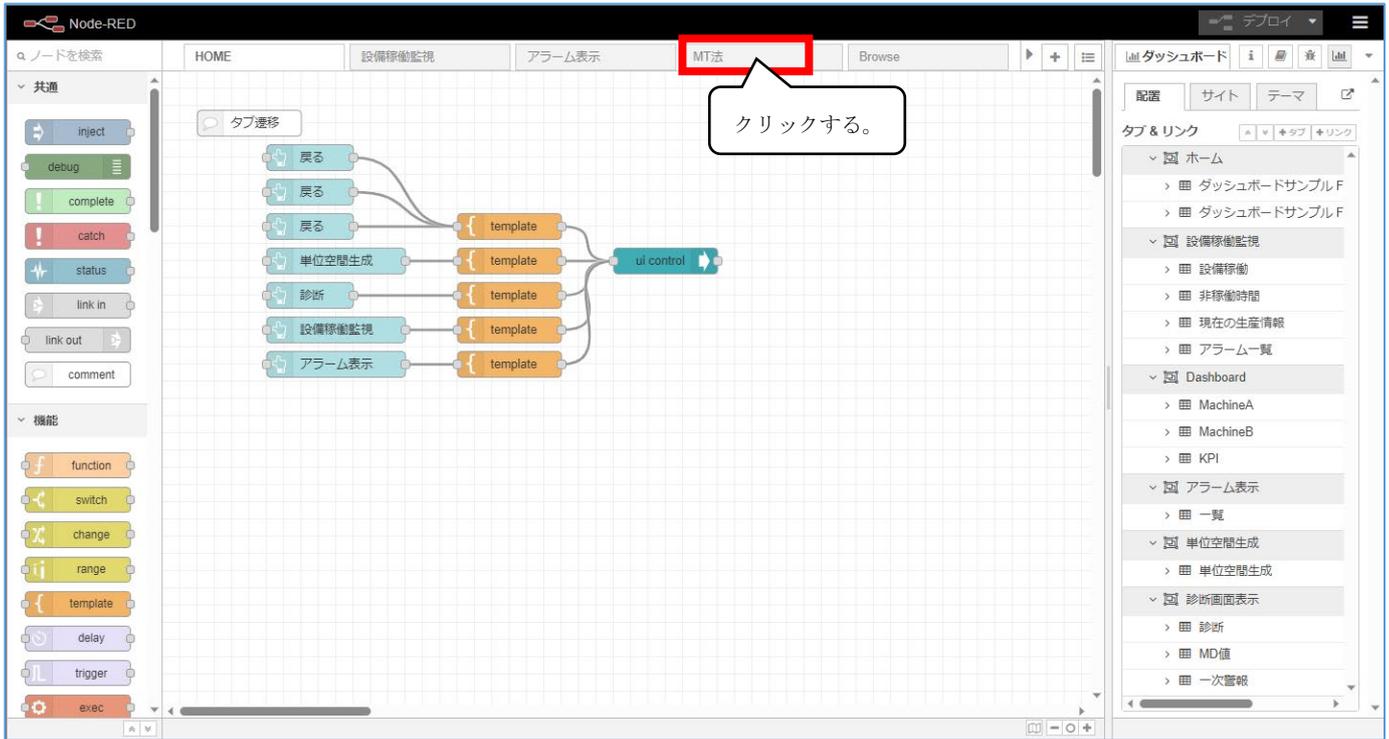
Point

単位空間生成用の「AnalyzeData\_sample.csv」ファイルを格納するフォルダを変更する場合は以下を参照してください。



(2) ブラウザで「<http://127.0.0.1:1880/>」を入力し、実行します

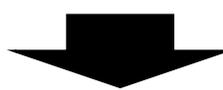
(3) 「MT法」タブを選択し、動作を開始します



アイコン(下記)をクリックする。



アイコン(下記)をクリックする。



ホーム

ダッシュボードサンプル For Edgecross 設備稼働監視	ダッシュボードサンプル For Edgecross MT法
設備稼働監視	単位空間生成
アラーム表示	診断

クリックする。



単位空間生成

単位空間生成

単位空間生成

戻る

クリックする。



☰ 単位空間生成

単位空間生成

単位空間生成

戻る

クリックする。



☰ ホーム

ダッシュボードサンプル For Edgecross 設備稼働監視

ダッシュボードサンプル For Edgecross MT法

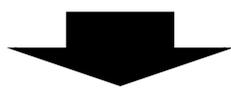
設備稼働監視

単位空間生成

アラーム表示

診断

クリックする。



☰ 診断画面表示

①スライダーを動かし、任意のしきい値を設定する。

MD最大値 3.004

しきい値

MD測定値

MD最大値

1.1

診断開始

②クリックする。

診断結果

戻る

診断トレンド

一次警報

モニタ開始

状態

MD値(閾値)

n回超過/m回中(閾値)

n回超過/m回中

累計超過数

発生日時



☰ 診断画面表示

**診断**

MD最大値 **3.004**

しきい値

1.4

診断結果 ●

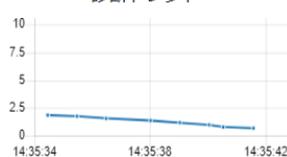
戻る

**MD値**

MD測定値 **0.7255842256161734**

MD最大値 **1.8139171798613665**

診断トレンド



**一次警報**

モニタ開始

状態

MD値(閾値)

n回超過/m回中(閾値) /

n回超過/m回中 /

累計超過数

発生日時

診断結果が表示される。

診断結果が設定したしきい値を超えると診断結果が赤色に変化します。

☰ 診断画面表示

**診断**

MD最大値 **3.004**

しきい値

MD測定値が指定したしきい値を超えると赤に変わる。

診断結果 ●

戻る

**MD値**

MD測定値 **1.9007746062442783**

MD最大値 **11.618950038622252**

診断トレンド



**一次警報**

モニタ開始

状態

MD値(閾値)

n回超過/m回中(閾値) /

n回超過/m回中 /

累計超過数

発生日時

(4) 一次警報モニタを開始します。

☰ 診断画面表示

**診断**

MD最大値 **3.004**

しきい値

1.4

診断開始

診断結果

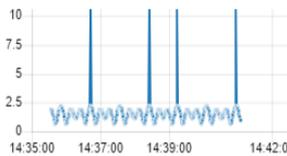
戻る

**MD値**

MD測定値 **1.0000948856067284**

MD最大値 **11.618950038622252**

**診断トレンド**



**一次警報**

モニタ開始

状態

MD値(閾値) 89

n回超過/m回中(閾値) /

n回超過/m回中 0 /

累計超過数

発生日時

クリックする。



☰ 診断画面表示

**診断**

MD最大値 **3.004**

しきい値

1.4

診断開始

診断結果

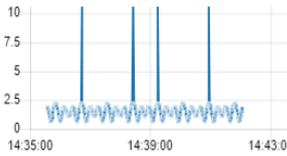
戻る

**MD値**

MD測定値 **1.7193054203**

MD最大値 **11.618950038622252**

**診断トレンド**



状態

MD値(閾値) 89

n回超過/m回中(閾値) /

n回超過/m回中 0 /

累計超過数

発生日時

累計超過などが表示される。

状態

MD値(閾値) 89

n回超過/m回中(閾値) /

n回超過/m回中 0 /

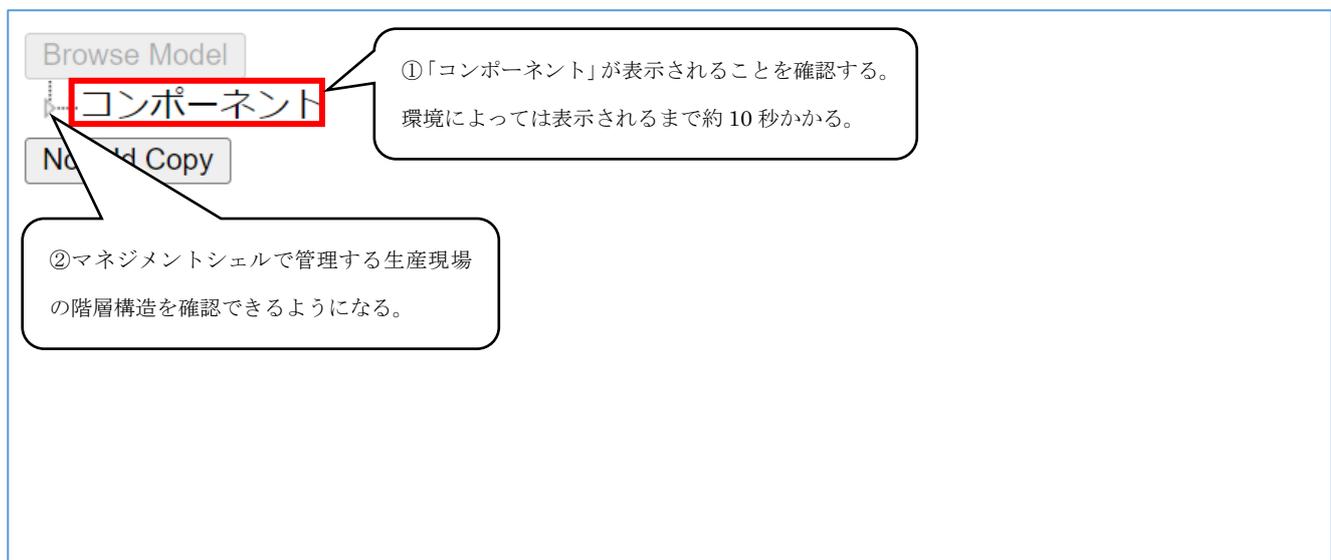
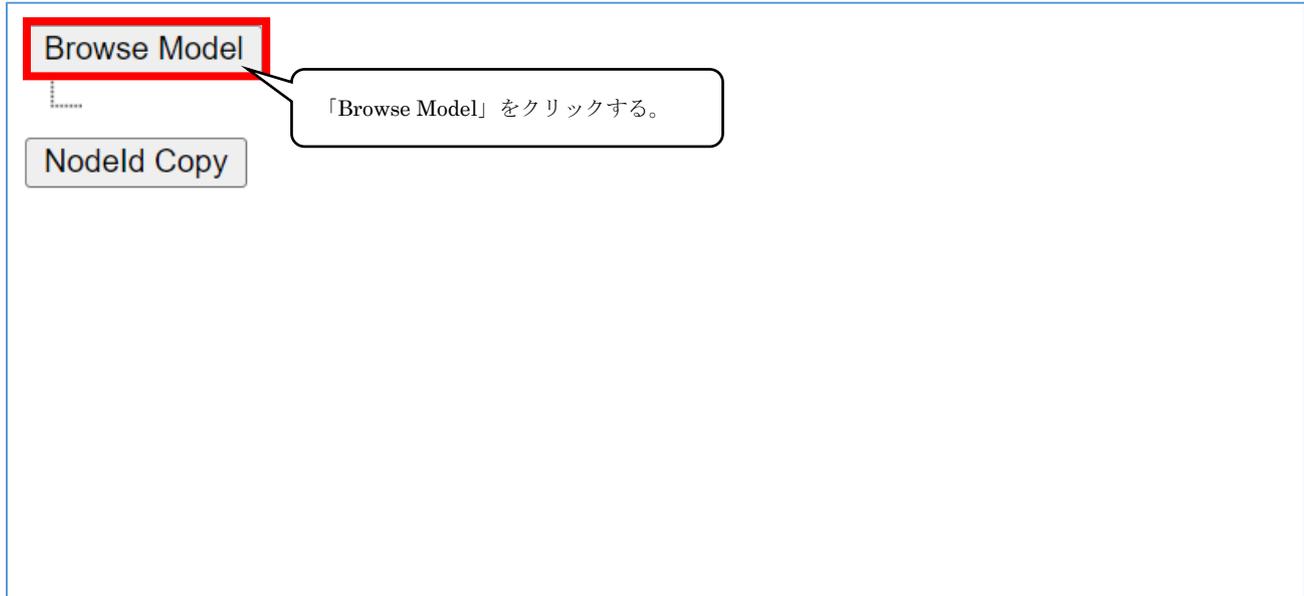
累計超過数

発生日時

## 5.4 階層構造の表示手順

マネジメントシェルで管理されている生産現場の階層構造（モデル情報）を取得し、表示します。

ブラウザで「<http://127.0.0.1:1880/datamodel/>」を入力し、実行します。



### 注意事項

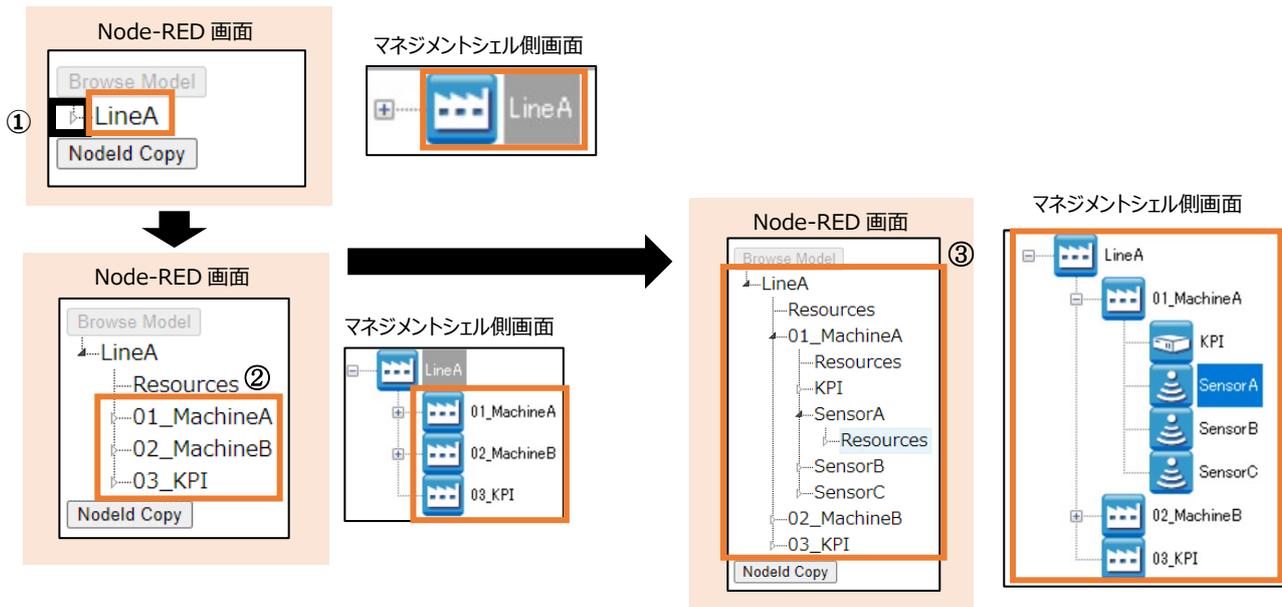
- ・ 対応ブラウザを使用して起動してください。  
対応ブラウザについては下記を参照してください。  
⇒10ページ [2.1 機能仕様]>[対応ブラウザ]

## ダッシュボードサンプル for Edgecross に表示されるマネジメントシェルの階層構造について

ダッシュボードサンプル for Edgecross はマネジメントシェルで管理されているモデル情報(コンポーネントの情報、リソースの情報)を取得します。

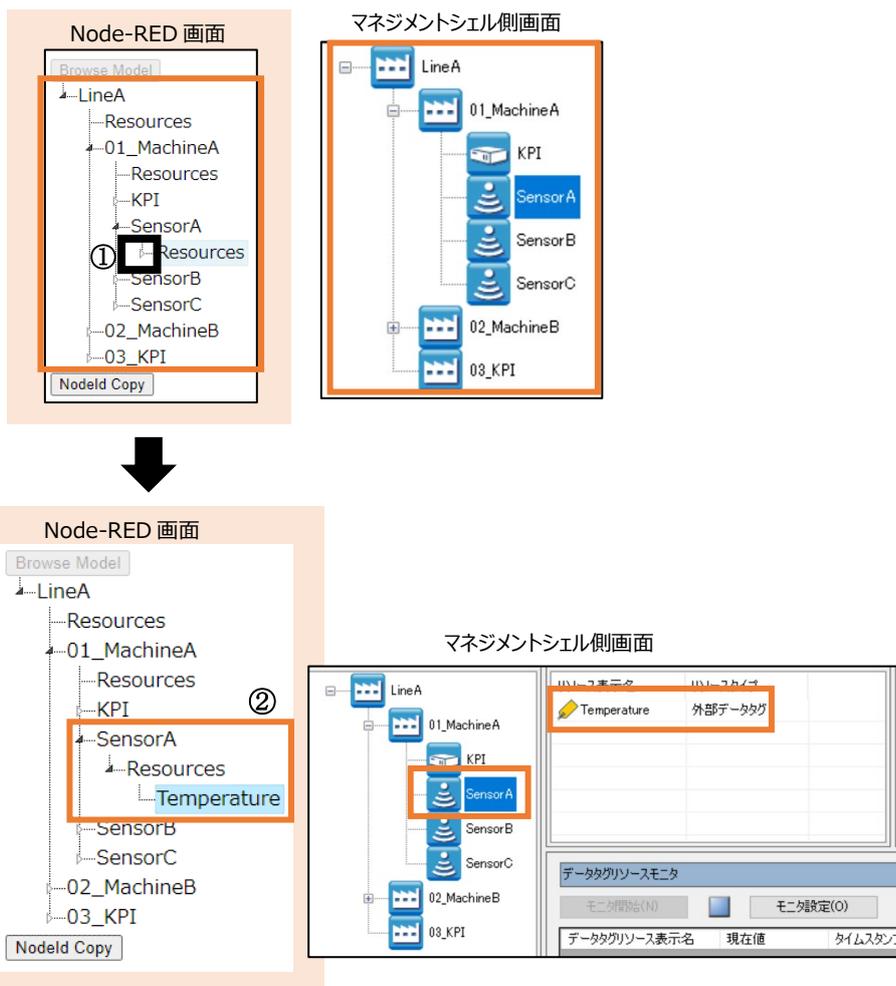
本項目では、「1.2 ダッシュボードサンプル for Edgecross の構成」に記載された「dashboard\_setting\_file.msf」に設定されている階層構造を読みだした Node-RED の画面とマネジメントシェルエクスプローラの画面を対比させ、コンポーネントとリソースの表示方法をそれぞれ記載します。

### ■コンポーネントの表示方法



- ① コンポーネントについているアイコン(  )をクリックする。
- ② ①のコンポーネントに属するコンポーネントが表示される。
- ③ ①②を繰り返し、下層のコンポーネントが表示される。

■ リソースの表示方法



- ① 「Resources」についているアイコン(🏠)をクリックする。
- ② コンポーネントに登録されたリソースが表示される。

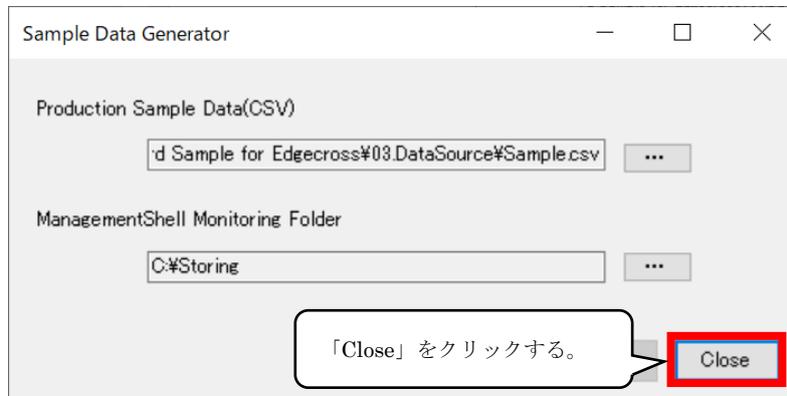
## 5.5 停止手順

ダッシュボードサンプル for Edgecross の動作を停止します。

### Node-RED の停止手順

- (1) Node-REDの画面を開いているブラウザを閉じます。
- (2) 「4.3 Node-RED設定手順」で起動していたコマンドプロンプトの画面を閉じます。

### サンプルデータ発生プログラムの停止手順



### マネジメントシェルの停止手順

マネジメントシェルの停止方法は下記を参照してください。

☞ Edgecross基本ソフトウェアWindows版ユーザーズマニュアル

## 6 ダッシュボード画面の編集

ダッシュボード画面を編集(階層構造の変更や、監視データの追加または変更)します。  
下記の順番で設定を行ってください。

- 6.1 監視対象データの追加
- 6.2 階層構造の表示
- 6.3 ダッシュボード画面の編集

本手順は下記を前提条件とします。

- マネジメントシェルを起動し、「1.2 ダッシュボードサンプル for Edgecrossの構成」に記載された「dashboard\_setting\_file.msf」がインポートされていること。  
起動とインポートの手順は下記を参照してください。  
⇒12ページ 4.1 マネジメントシェル設定手順
- 監視するデータとして「1.2 ダッシュボードサンプル for Edgecrossの構成」に記載された「dashboard\_setting\_file.msf」に設定されているデータタグリソースを使用する場合は「5.1 サンプルデータ発生プログラムの実行手順」が実行されていること。
- 「4.3 Node-RED設定手順」で起動したコマンドプロンプト画面が閉じていないこと。  
閉じていた場合はコマンドプロンプトにて下記のとおり実行してください。



- 「4.4 Node-RED起動確認」で起動した画面が閉じていないこと。  
閉じていた場合は、再度「4.4 Node-RED起動確認」を参考に画面を起動してください。

## 6.1 監視対象データの追加

---

「1.2 ダッシュボードサンプル for Edgecross の構成」に記載されたマネジメントシェルの構成を変更し、監視対象データを追加します。

(1) 階層構造を変更する場合、変更方法は下記を参照してください。

☞Edgecross基本ソフトウェアWindows版ユーザーズマニュアル

(2) 監視するデータを追加する場合、データタグリソースを追加します。

追加方法は下記を参照してください。

☞Edgecross基本ソフトウェアWindows版ユーザーズマニュアル

## 6.2 階層構造の表示

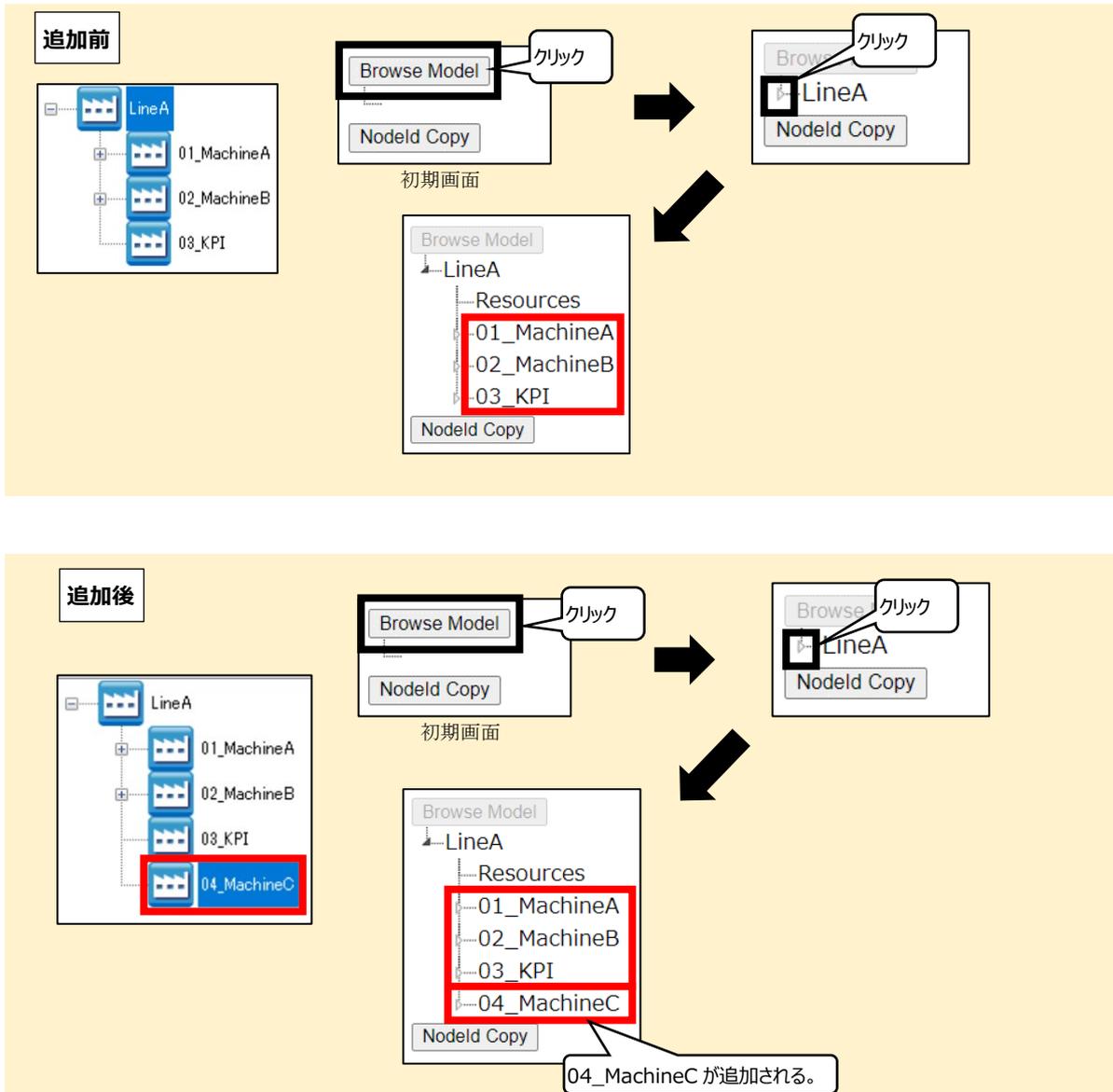
変更した階層構造をダッシュボード画面で確認します。

(1) 階層構造を表示します。

実行の手順は下記を参照してください。

☞36ページ 5.4 階層構造の表示手順

例) LineAに04\_MachineCのコンポーネントを追加した場合



### Point

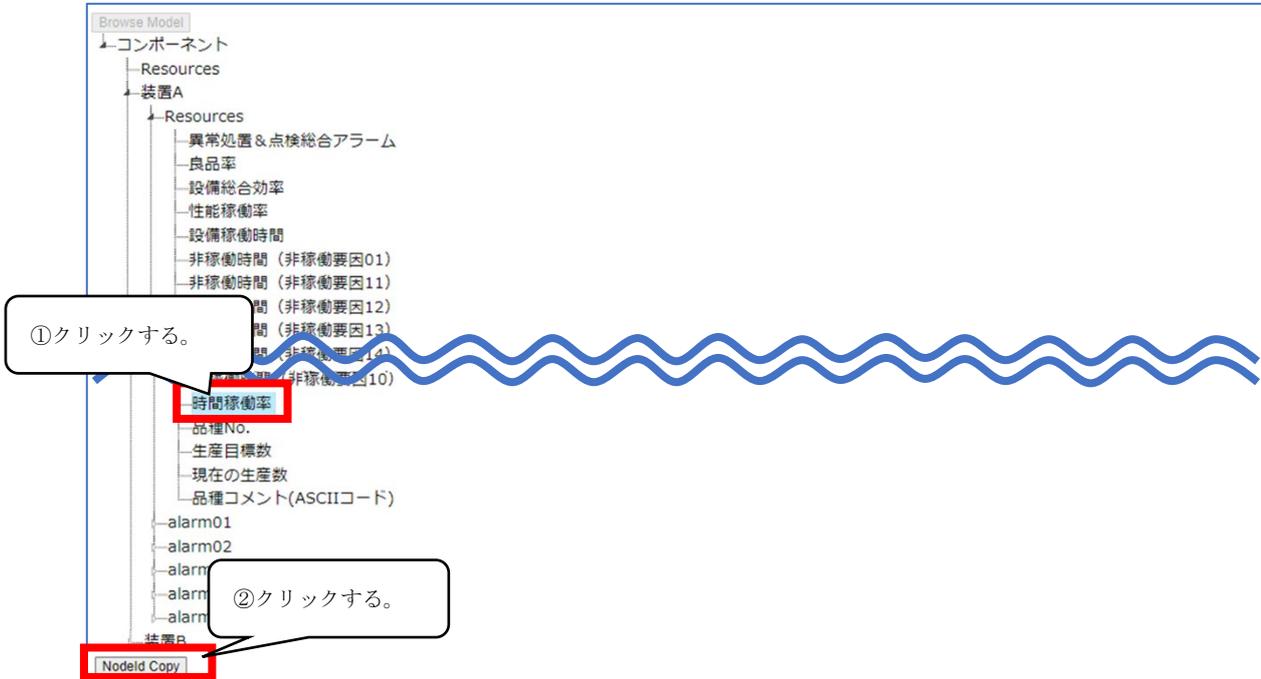
ブラウザで階層構造を開いたまま、マネジメントシェルエクスプローラで階層構造を変更した場合、ブラウザの画面を更新すると、変更した階層構造が反映されます。

## 6.3 ダッシュボード画面の編集

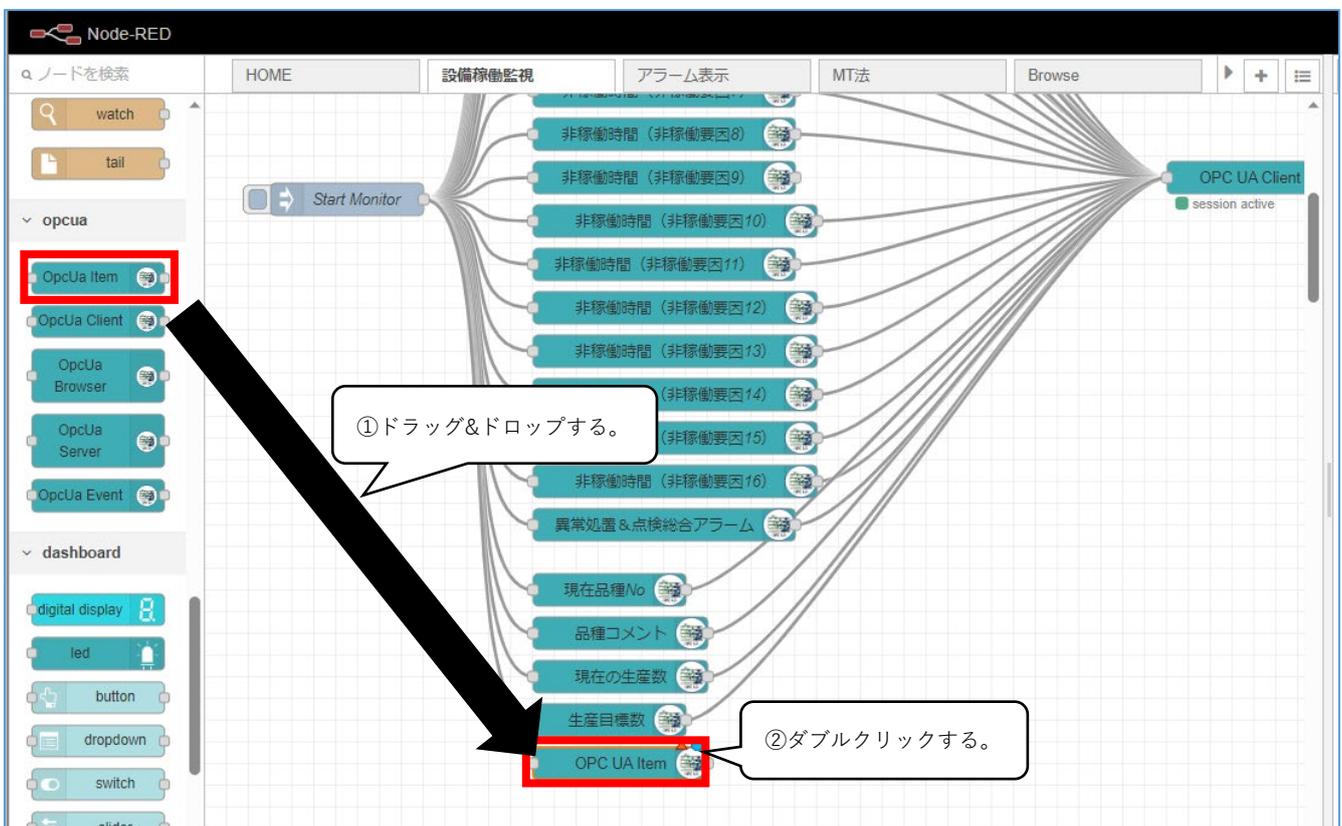
ダッシュボードに監視するデータを追加します。

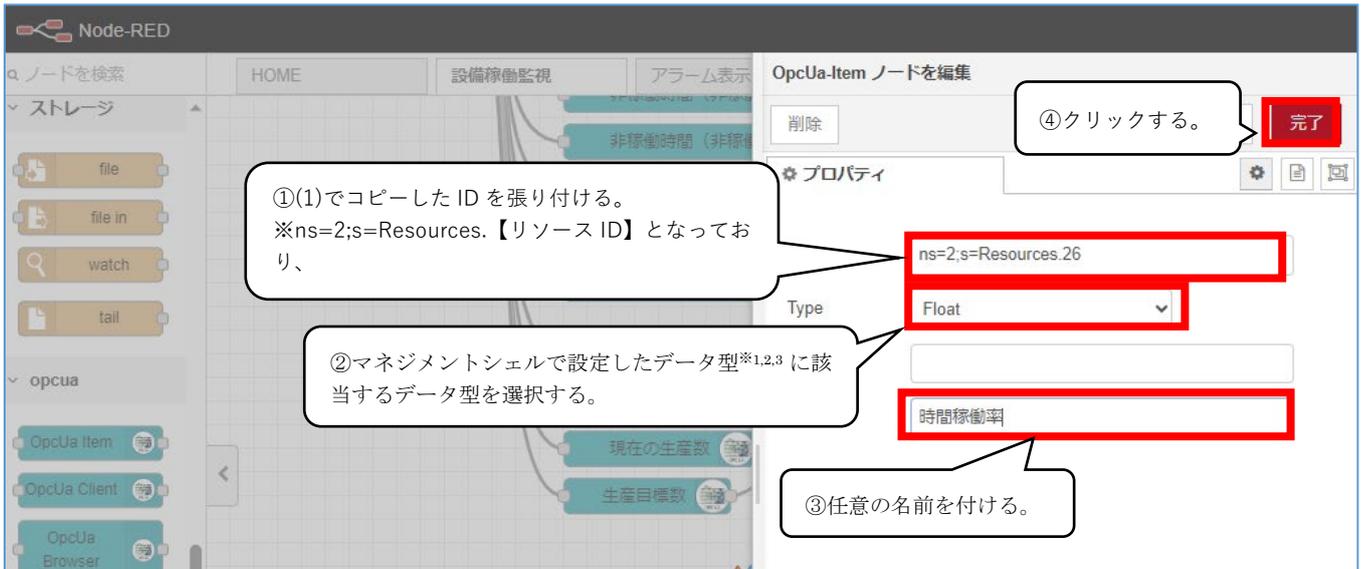
(1) 監視するデータをクリックします。

本書では[設備稼働監視]>[装置A]に登録されているデータタグリソース「時間稼働率」を使用して説明します。



(2) Node-REDのエディタ画面を開いて監視するデータのノードを追加します。





※1 マネジメントシェルで設定したデータ型と Node-RED で設定するデータ型の対応表は下記のとおりです。

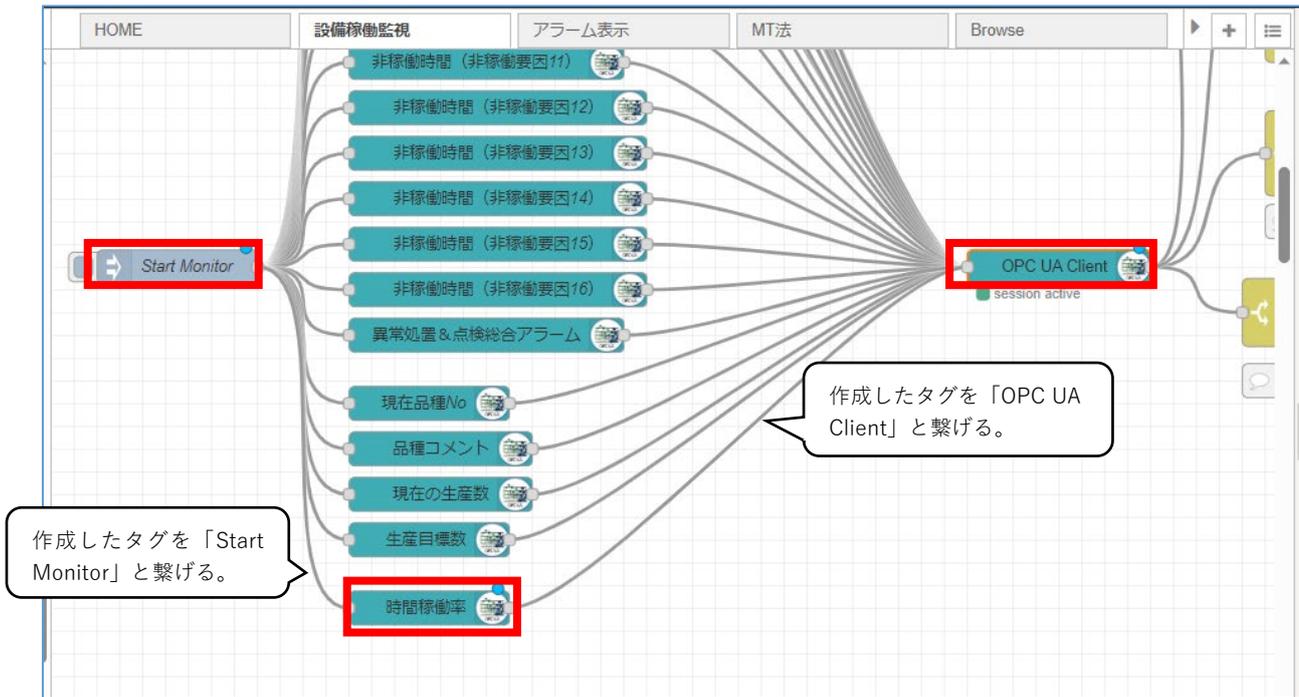
マネジメントシェルのデータ型	Node-REDのデータ型
BOOL	Boolean
INT	Int16
UINT	UInt16
DINT	Int32
UDINT	UInt32
REAL	Float
LREAL	Double
STRING	String
WSTRING	String

※2 マネジメントシェルで設定したデータ型を確認する場合は、「6.1 監視対象データの追加」から確認してください。

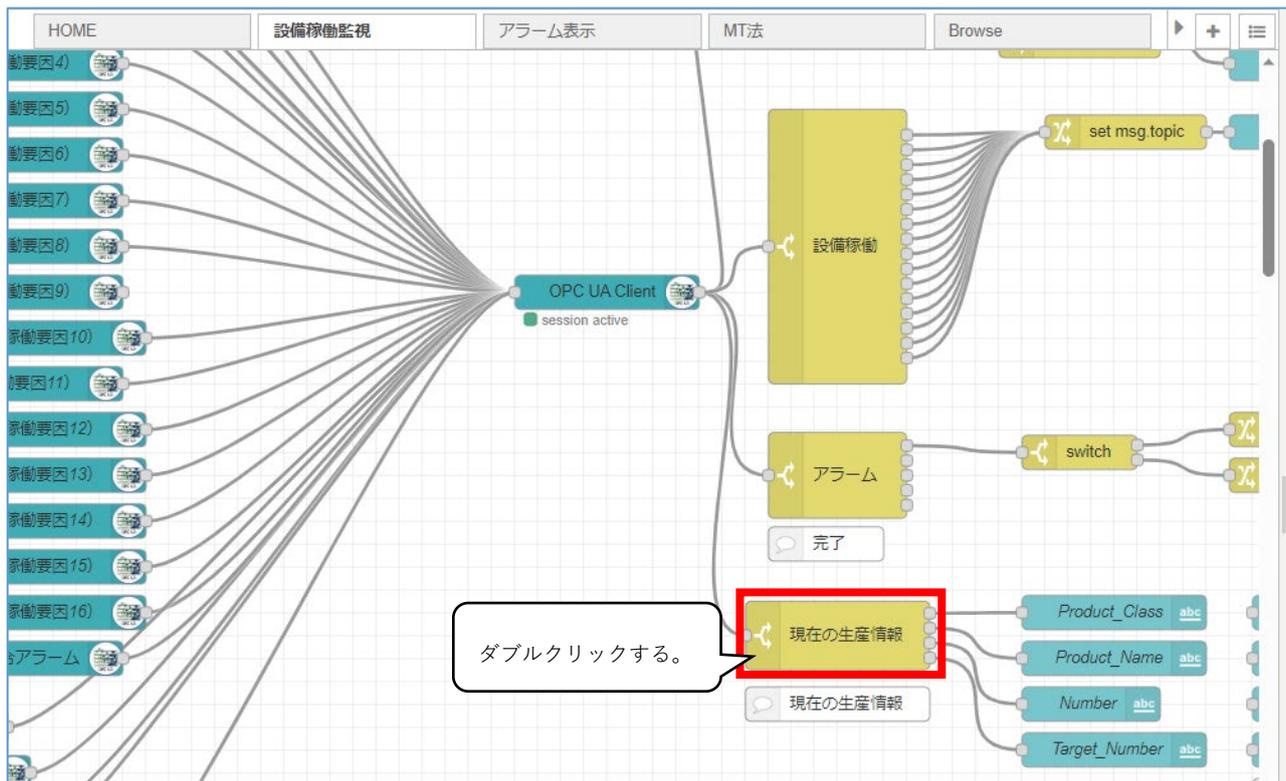
※3 「1.2 ダッシュボードサンプル for Edgecross の構成」に記載された「Monitoring\_sample.csv」を使用する場合、データ型は下記の手順内に記載していますので参照してください。

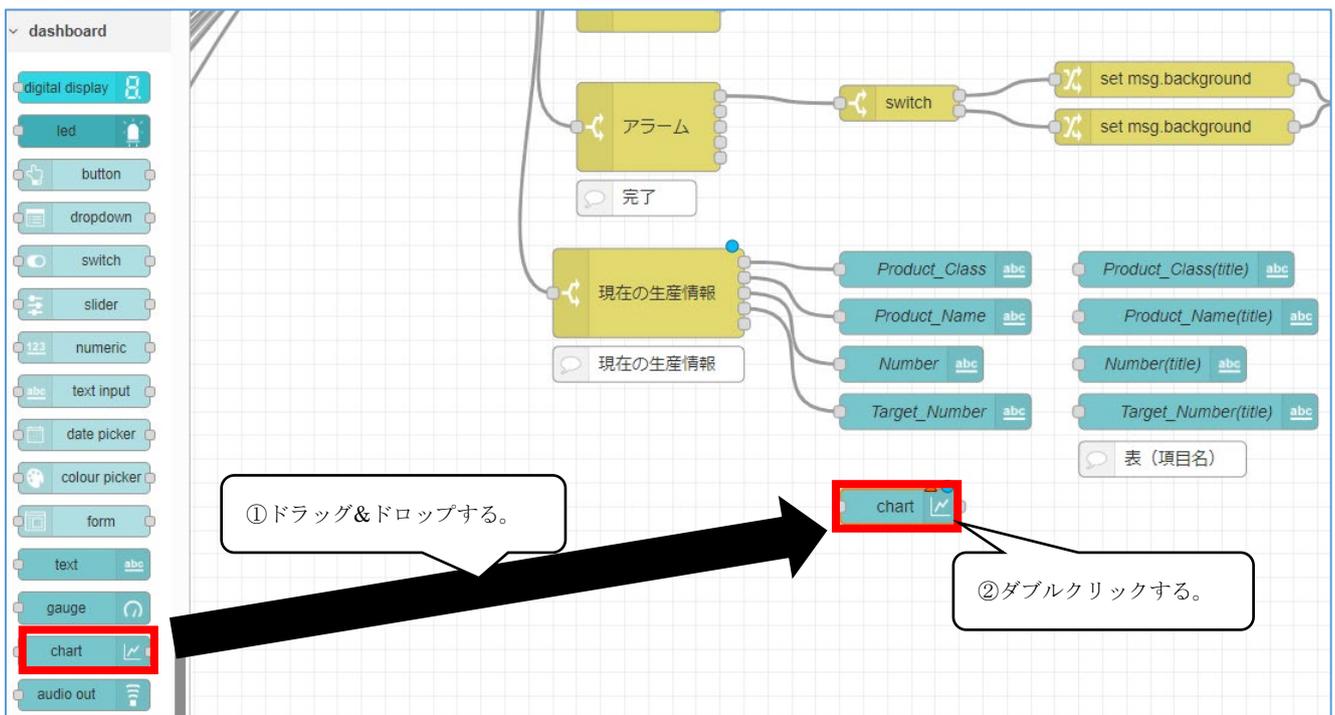
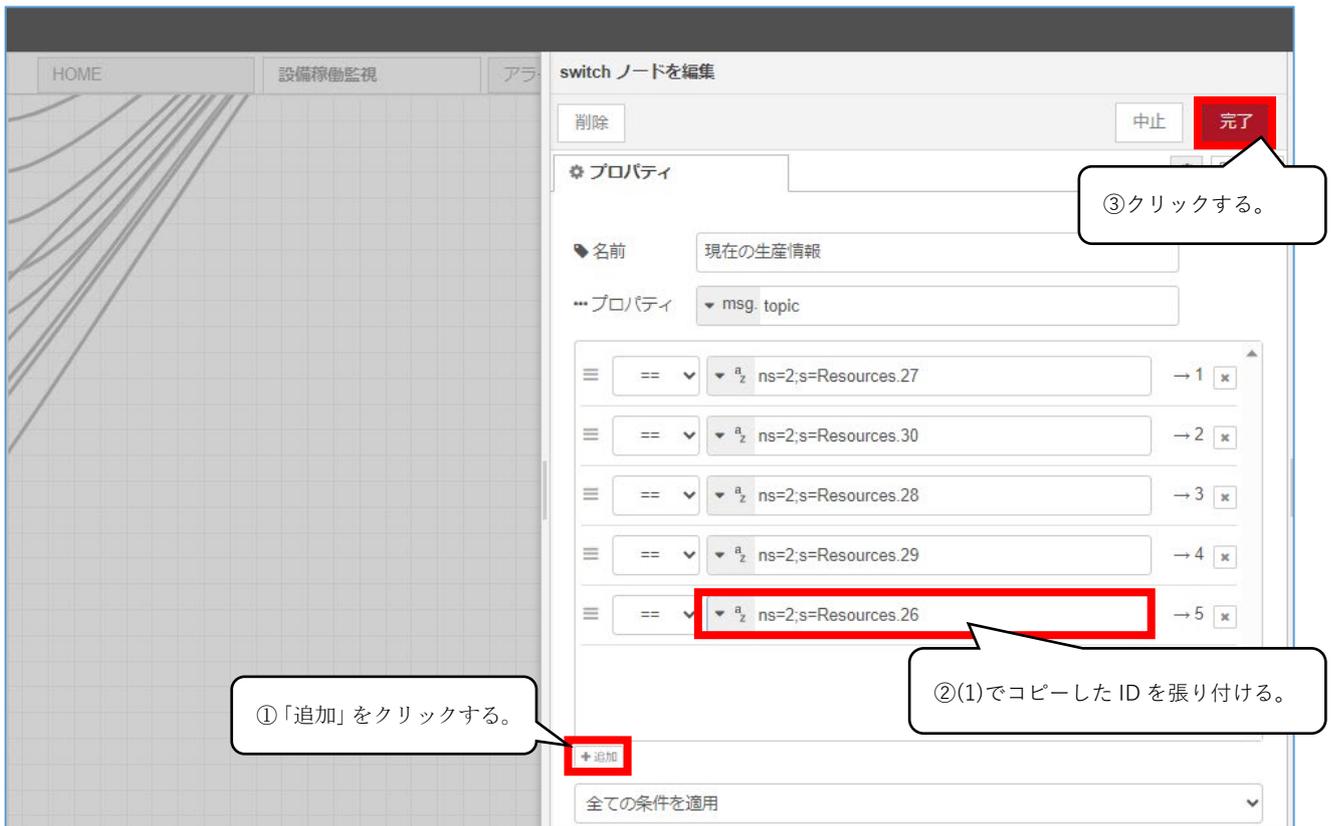
☞28ページ 5.1 サンプルデータ発生プログラムの実行





(3) ダッシュボードにデータを表示するためのノードを追加します。





※本手順では「chart」ノードを使用する手順を記載します。

その他のノードについては、Node-RED のウェブページから、仕様を確認してください。



※ここでは chart のプロパティを変更できます。

点線吹出しの設定は例ですので、詳細は Node-RED のウェブページを確認してください。

① Group から「[設備稼働監視] 現在の生産情報」を選択する。

② 「時間稼働率」というリソース表示名のため Label を変更

③ 過去 10 分間、もしくは 100 点のデータを表示するように横軸(時間)の X-axis を変更

④ 「正味稼働時間」が 1~100 の範囲であるため、縦軸(値)の Y-axis を変更

⑤ Interpolate を「step」に変更

⑥ クリックする。



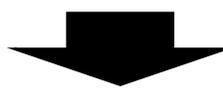
作成したタグを「現在の生産情報」と繋げる。



クリックする。



クリックする。  
 ※クリック後、動作が開始すると、「OPC UA Client」ノードの下に「active subscribing」と表示されます。



設備稼働監視

設備稼働

設備総合効率 74

時間稼働率 100

性能稼働率 50

良品率 7

非稼働時間

現在の生産情報

品種	1
品名	00_R61P
生産数	100
目標数	14

時間稼働率

アラーム一覧

異常処理 & 点検

戻る

非稼働時間 (非稼働要因2)

20 秒ほど待機すると chart のプロパティに合わせてグラフが表示されていることを確認する。  
 ※本手順では下記が反映されている。  
 ・グラフの上部に「時間稼働率」と表示されていること  
 ・1~100 の値を前後する矩形波のグラフになっていること  
 ※同じデータが出力されている間はグラフが更新されないの  
 で、左記のようなグラフが出現するには 1 分ほどかかる。

## 7 現象別トラブルシューティング

正しく動作しない場合、下記の項目から該当するものを確認してトラブルシューティングを行ってください。

現象	確認事項	処置
コマンドプロンプトで「node-red」を実行しようとする、「node-red」は、内部コマンドまたは外部コマンド、操作可能なプログラムまたはバッチ ファイルとして認識されていません。」と出力され、起動できない	ユーザ環境変数のPathに「C:\Users\【ユーザ名】\AppData\Roaming\npm」が入っているか	入っていない場合、Node.jsを再度インストールする。
ダッシュボードを開いても画面が表示されない。	マネジメントシェルのOPC UA設定でセキュリティポリシーとセキュリティモードが”None”以外になっていないか。	マネジメントシェルのOPC UA設定でセキュリティポリシーとセキュリティモードを”None”に変更する。
ダッシュボードで表示されたグラフで値が動いていない。	読み込むCSVファイルを一度でも開いていないか。	サンプル発生プログラムで「Stop」をクリックし、再度「Generate」をクリックする。
	デプロイをしたか。	Node-REDのエディタ画面で「デプロイ」をクリックする。
	Node-REDのエディタ画面でモニタ開始をしたか。	Node-REDのエディタ画面で「Start Monitor」ノードの横の四角のアイコンをクリックする。
「Browse Model」をクリックしても階層構造が表示されない。	Node-Redを起動中「Browse Model」を複数回実行していないか。	Node-REDを停止させ、再度起動する。
インストーラが解凍できない。	解凍先フォルダのパスが長くないか。	解凍先フォルダを浅い場所に変更する。

# 付録

## 付1 ソフトウェアライセンスについて

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☞ 57 ページ ソフトウェア情報

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## ソフトウェア情報

本製品には下記のソフトウェアが含まれています。

- ① node-red-dashboard (☞ 45 ページ node-red-dashboard)
- ② node-red-contrib-opcua (☞ 45 ページ node-red-contrib-opcua)
- ③ node.js (☞ 46 ページ node.js)
- ④ node-red (☞ 65 ページ pthread)
- ⑤ node-red-contrib-ui-led (☞ 72 ページ node-red-contrib-ui-led)
- ⑥ node-red-contrib-ui-digital-display (☞ 73 ページ node-red-contrib-ui-digital-display)
- ⑦ jquery (☞ 73 ページ jquery)
- ⑧ JSTree (☞ 73 ページ JSTree)

### node-red-dashboard

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since 2016 – Klaus Landsdorf – [klaus.landsdorf@bianco-royal.de](mailto:klaus.landsdorf@bianco-royal.de) – Bianco Royal

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## jnode-red-contrib-ui-digital-display

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## jquery

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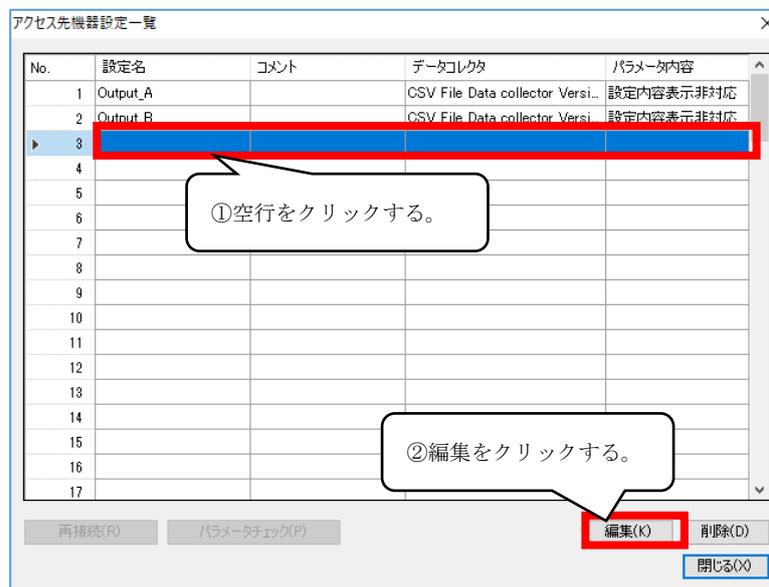
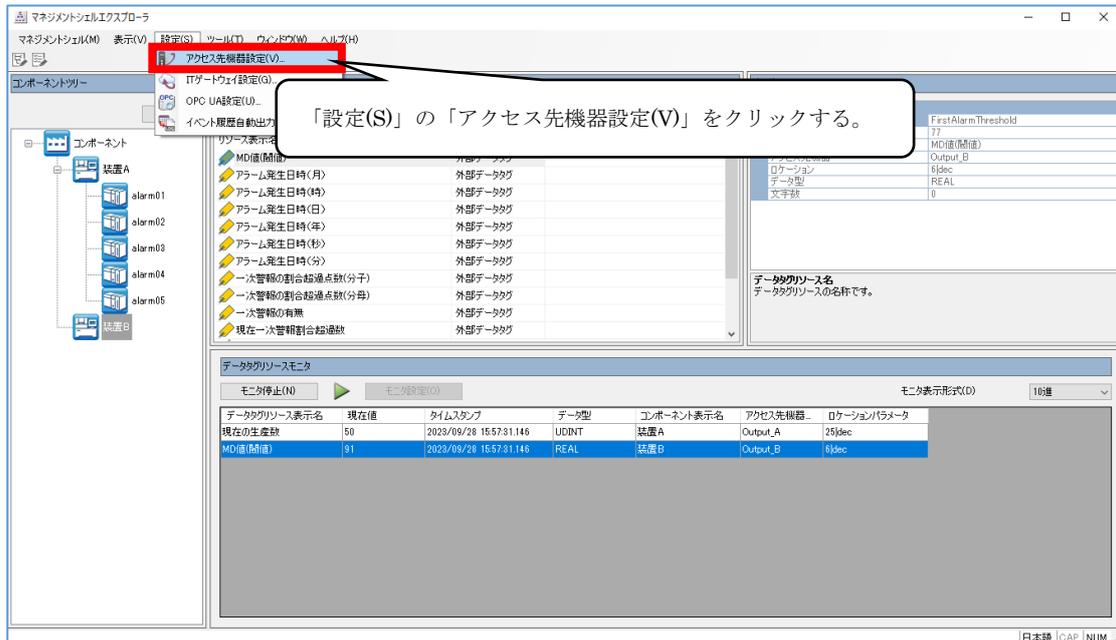
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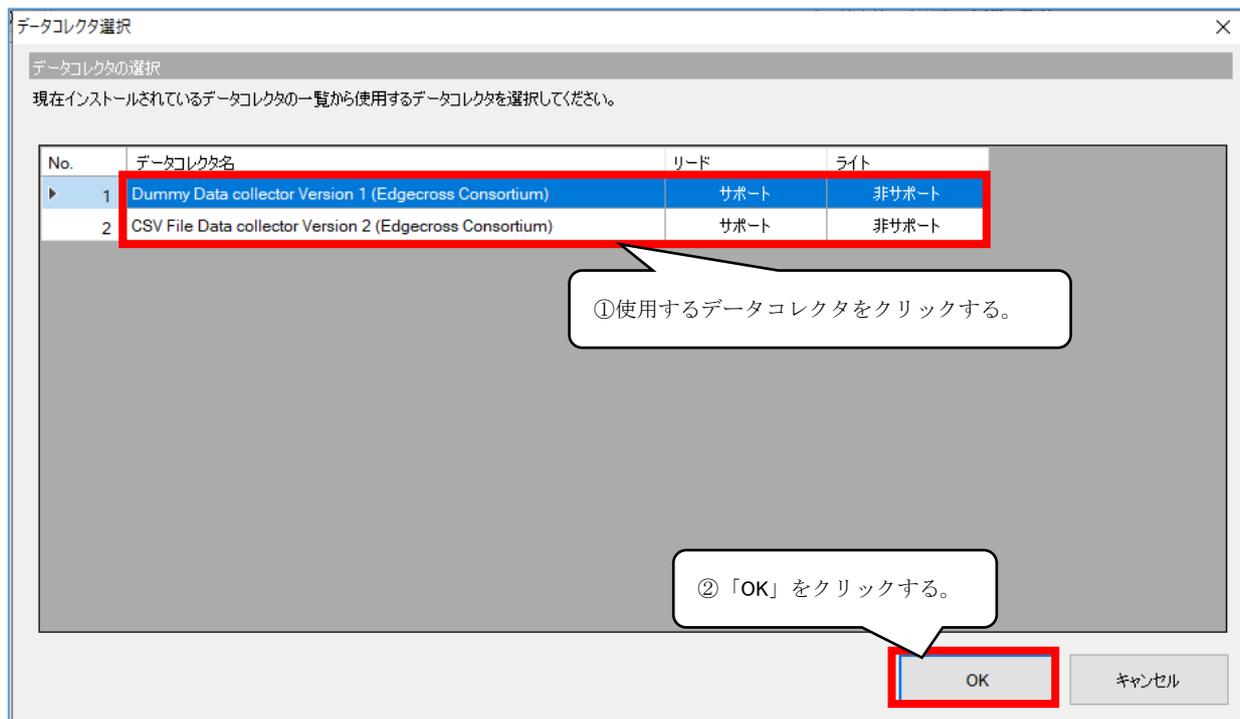
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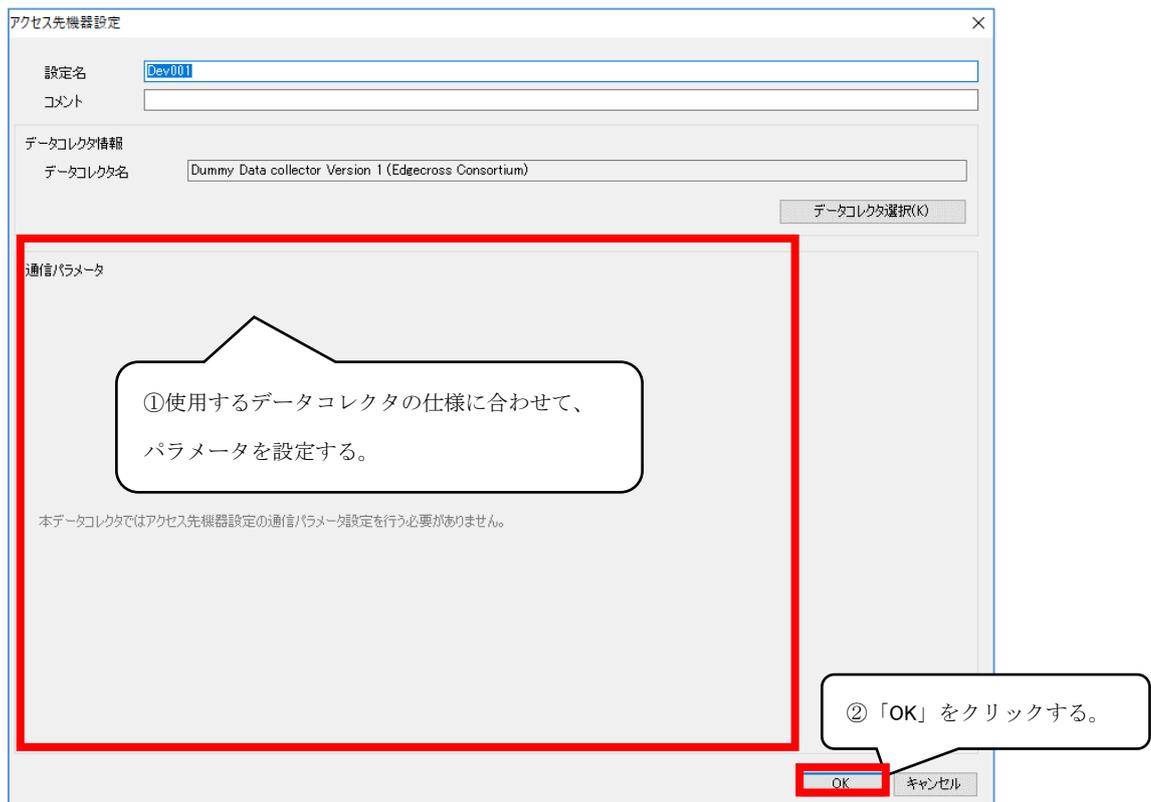
## 付2 アクセス先機器設定の変更方法

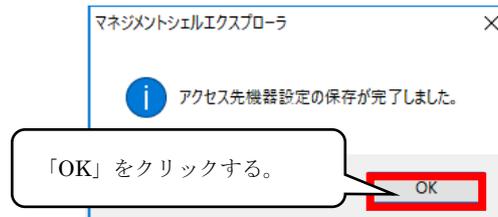
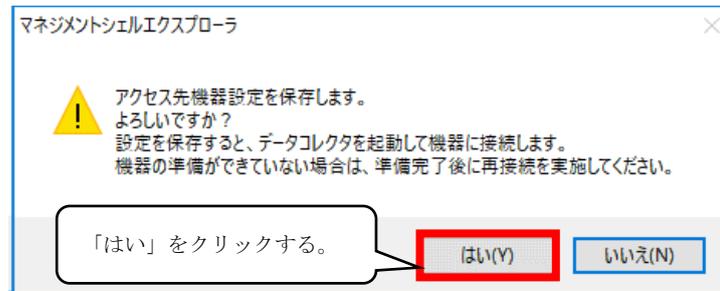
ダッシュボードサンプル for Edgecross では CSV ファイルデータコレクタを使用してデータを取得していますが、他のデータコレクタを使用する場合の手順を記載します。





データコレクタのパラメータ設定方法については、使用するデータコレクタのマニュアルを参照してください。





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# MEMO

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## 改訂履歴

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2023 年 10 月作成

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