SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.

In this manual, the safety precautions are classified into two levels: "WARNING" and "CAUTION".

![WARNING](https://via.placeholder.com/150)

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

![CAUTION](https://via.placeholder.com/150)

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 safety 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**

- During application of each setting, 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.
CONDITIONS OF USE FOR THE PRODUCT

(1) This software shall be used under the following conditions:
   i) that any failure occurred in this software, if any, shall not lead to any serious accident.
   ii) that the backup and/or fail-safe functions are systematically performed outside the devices in the cases of any failure occurred in this software.

(2) Mitsubishi assumes no responsibility and liability (including but not limited to, default liability, defect liability, quality assurance responsibility, tort liability, product liability) for the quality, performance, and safety of both this software and products using this software.
Thank you for purchasing OPC UA Data Collector.
This manual describes the specifications, procedures before operation, and troubleshooting of this product.
Before using this product, please read this manual and the relevant manuals carefully, and develop familiarity with the functions and performance of this product to handle correctly.
Please make sure that the end users read this manual.
RELEVANT MANUALS

<table>
<thead>
<tr>
<th>Manual name [manual number]</th>
<th>Description</th>
<th>Available form</th>
</tr>
</thead>
</table>

**e-Manual**

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

**TERMS**

Unless otherwise specified, this manual uses the following terms.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address space</td>
<td>Data that contains information of an access target device, a group, and a tag.</td>
</tr>
<tr>
<td>Data model management</td>
<td>A function that abstracts devices, equipment, and lines in the production site and hierarchically manages them.</td>
</tr>
<tr>
<td>Edge application</td>
<td>Software that performs various processing for data utilization in production sites using the functions provided by Edgecross in the edge computing area.</td>
</tr>
<tr>
<td>Edge computing</td>
<td>An information processing method and area, for not only collecting and analyzing data in production sites in real-time, and feedbacking the data, but summarizing the production site data and sharing information with IT systems efficiently with the hardware and software in production sites.</td>
</tr>
<tr>
<td>Edgecross</td>
<td>A software platform that implements specifications and concepts for realizing manufacturing solutions by the FA-IT collaboration centering on the edge computing.</td>
</tr>
<tr>
<td>Edgecross Basic Software</td>
<td>The name of the software product that implements the Edgecross function.</td>
</tr>
<tr>
<td>Industrial PC</td>
<td>A PC specialized for industrial use with features such as high reliability, environmental resistance, and long-term supply.</td>
</tr>
<tr>
<td>Management Shell</td>
<td>The name of the Windows version product that implements the model management function.</td>
</tr>
<tr>
<td>Management Shell Explorer</td>
<td>Software that sets and references data models managed by Management Shell.</td>
</tr>
<tr>
<td>Real-time data processing</td>
<td>A function that realizes the real-time diagnosis and feedback of the production site data.</td>
</tr>
<tr>
<td>Real-time Flow Designer</td>
<td>The name of the software component that performs operation setting of Real-time Flow Manager.</td>
</tr>
<tr>
<td>Real-time Flow Manager</td>
<td>The name of the Windows version software component that implements the real-time data processing.</td>
</tr>
<tr>
<td>Tag</td>
<td>Information to access device data of the CPU module of the own station or a CPU module on a network from an OPC UA client application.</td>
</tr>
</tbody>
</table>
OPC UA Data Collector is a software component that performs the data collection, data reading, and data writing functions to a device connected an OPC UA server.

Data in a device connected to an OPC UA server can be collected and updated by using OPC UA Data Collector in combination with Edgecross Basic Software.

For details on Edgecross Basic Software, refer to the following manual.

## 2 SPECIFICATIONS

This chapter shows the functional specifications, operational specifications, and accessible devices and range of OPC UA Data Collector.

### 2.1 Functional Specifications

This section shows the functional specifications of OPC UA Data Collector.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access target device</td>
<td>Number of connectable devices: 1 server per 1 instance</td>
</tr>
<tr>
<td>Connectable server</td>
<td>OPC UA server with all of the following OPC UA service sets</td>
</tr>
<tr>
<td></td>
<td>• Discovery service set</td>
</tr>
<tr>
<td></td>
<td>• SecureChannel service set</td>
</tr>
<tr>
<td></td>
<td>• Session service set</td>
</tr>
<tr>
<td></td>
<td>• View service set</td>
</tr>
<tr>
<td></td>
<td>• Attribute service set</td>
</tr>
<tr>
<td></td>
<td>• Subscription service set</td>
</tr>
<tr>
<td>Supported type by a data collector</td>
<td>• Data collection function</td>
</tr>
<tr>
<td></td>
<td>• Data reading function/Data writing function</td>
</tr>
<tr>
<td>Data collection function</td>
<td>Maximum number of settings: 12</td>
</tr>
<tr>
<td></td>
<td>Maximum number of collectible tags for one setting (one group): 256</td>
</tr>
<tr>
<td></td>
<td>Maximum number of collectible tags for all settings (all groups): 3072</td>
</tr>
<tr>
<td></td>
<td>Collection interval: • 500 to 900 (ms)</td>
</tr>
<tr>
<td></td>
<td>• 1 to 21600 (s)</td>
</tr>
<tr>
<td>Input data type*1</td>
<td>• BOOL (Bit value)</td>
</tr>
<tr>
<td></td>
<td>• INT (Signed 16-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• UINT (Unsigned 16-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• DINT (Signed 32-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• UDINT (Unsigned 32-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• LINT (Signed 64-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• ULINT (Unsigned 64-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• REAL (32-bit real number value)</td>
</tr>
<tr>
<td></td>
<td>• LREAL (64-bit real number value)</td>
</tr>
<tr>
<td></td>
<td>• WSTRING (Unicode (UTF-16LE)) (16 characters)</td>
</tr>
<tr>
<td>Data reading function/Data writing function</td>
<td>Maximum number of settings: 16</td>
</tr>
<tr>
<td></td>
<td>Maximum number of collectible tags for one setting (one group): 256</td>
</tr>
<tr>
<td></td>
<td>Maximum number of collectible tags for all settings (all groups): 4096</td>
</tr>
<tr>
<td>Input and output data type*1</td>
<td>• BOOL (Bit value)</td>
</tr>
<tr>
<td></td>
<td>• INT (Signed 16-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• UINT (Unsigned 16-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• DINT (Signed 32-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• UDINT (Unsigned 32-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• LINT (Signed 64-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• ULINT (Unsigned 64-bit integer value)</td>
</tr>
<tr>
<td></td>
<td>• REAL (32-bit real number value)</td>
</tr>
<tr>
<td></td>
<td>• LREAL (64-bit real number value)</td>
</tr>
<tr>
<td></td>
<td>• WSTRING (Unicode (UTF-16LE)) (16 characters)</td>
</tr>
</tbody>
</table>

*1 For details on data types, refer to the following manual. 
 Edgecross Basic Software for Windows User’s Manual
### 2.2 Operational Specifications

This section shows the operational specifications of OPC UA Data Collector.

#### Operating status

The status of OPC UA 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.

<table>
<thead>
<tr>
<th>Status of OPC UA Data Collector</th>
<th>Description</th>
<th>Communication status with an access target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data is being read from or written to an access target.</td>
<td>Data Collector and the access target are connected normally. (It will be in this state when the connection processing succeeds.)</td>
<td>Connected</td>
</tr>
<tr>
<td>Data is not read from or written to an access target. (Reconnection is being performed.)</td>
<td>Data Collector and the access target is disconnected. (It will be in this state when the connection processing fails.)</td>
<td>Disconnected</td>
</tr>
</tbody>
</table>

#### Behavior when an error occurs

When OPC UA Data Collector detects an error, it performs the following operations depending on the error type.

<table>
<thead>
<tr>
<th>Error type</th>
<th>Status of OPC UA Data Collector</th>
<th>Behavior of OPC UA Data Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collector operation stop error</td>
<td>• 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. • A error cannot be corrected even by changing the network configuration due to an incorrect parameter setting (device type out of range, for example).</td>
<td>• Discards collected data when this error occurs during data collection. • Stops the data collection, data reading, or data writing function and reports this error to Edgecross Basic Software.</td>
</tr>
<tr>
<td>Data collector operation continuation error</td>
<td>• 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.</td>
<td>• Discards collected data when this error occurs during data collection. • Continues the data collection, data reading, or data writing function even after reporting this error to Edgecross Basic Software.</td>
</tr>
</tbody>
</table>

The type of errors reported to Edgecross Basic Software are as follows:

- Data collector operation stop error: Moderate error
- Data collector operation continuation error: Minor error

#### 2.3 Accessible Devices

This section shows the connection target devices accessible from OPC UA Data Collector.

- Industrial PC in which an OPC UA server is installed
- Devices with the OPC UA server functions equipped

#### Precautions

The connection procedure differs depending on a connection destination device. Check the setting procedure of a connection destination device.
This chapter shows the procedure from start-up to operation of OPC UA Data Collector.

Operating procedure

1. Install OPC UA Data Collector in an industrial PC in which Edgecross Basic Software is installed. For the installation procedure and the operating environment of OPC UA Data Collector, refer to the following document.
   [OPC UA Data Collector Installation Instructions]

2. Set the setting of an OPC UA server and wire and connect it to the industrial PC. For the setting, wiring, and connection methods, refer to the manuals of the OPC UA server and the industrial PC to use.

3. Set the parameters of OPC UA Data Collector. Refer to Page 16 PARAMETER SETTING.

Precautions

When running a data collector on an industrial PC where an antivirus software is installed, an exceeded collection cycle or data missing may occur due to an operation of the antivirus software. Exclude the following folders from the monitoring targets in the antivirus software settings. For the setting methods, refer to the manual for each antivirus software.

- Installation destination folder of a data collector
- Following files and folders of Windows Pagefile.sys
  *.pst
  %systemroot%\System32\Spool
  %systemroot%\SoftwareDistribution\Datastore
  %windir%\Security\Database
  %allusersprofile%\NTUser.pol
  %systemroot%\system32\GroupPolicy\Machine\registry.pol
  %systemroot%\system32\GroupPolicy\User\registry.pol
This chapter shows the functions of OPC UA Data Collector.

### 4.1 Data Collection Function

This function sends a data reading request to an OPC UA server in the interval of the set collection cycle and collects data of data tags when receiving a response from the OPC UA server. Data acquisition starts at the time when the set time has elapsed since the operating status of Edgecross Basic Software was turned to RUN. After that, data is read periodically at specific intervals. However, if data cannot be read at the data acquisition start, data will not be read periodically at specific intervals.

This function works at specific intervals without the effects of the time change of an industrial PC in which OPC UA Data Collector runs.

#### Collection processing time report

When an enable data collection setting is set and the operating status of Edgecross Basic Software is changed from RUN to STOP, this function notifies the software of the collection processing time (maximum and minimum collection processing time)*1 while the software is in the RUN state as events. However, if data collection has never succeeded even once when the 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 in microseconds. When an event is notified, the time unit is converted to milliseconds (three decimal places).

#### When an uncorresponding data type is set

When a data type set in the location parameters is not corresponding to the one in the OPC UA server, a 'collection error (data type mismatch)' (error code: 2015H) is notified.

Check the table below and set the data type corresponding to the one set in the OPC UA server.

<table>
<thead>
<tr>
<th>OPC UA server</th>
<th>Location parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA_BOOLEAN</td>
<td>BOOL</td>
</tr>
<tr>
<td>UA_String</td>
<td>WSTRING</td>
</tr>
<tr>
<td>UA_INT16</td>
<td>INT</td>
</tr>
<tr>
<td>UA_INT32</td>
<td>DINT</td>
</tr>
<tr>
<td>UA_INT64</td>
<td>LINT</td>
</tr>
<tr>
<td>UA_UINT16</td>
<td>UINT</td>
</tr>
<tr>
<td>UA_UINT32</td>
<td>UDINT</td>
</tr>
<tr>
<td>UA_UINT64</td>
<td>ULINT</td>
</tr>
<tr>
<td>UA_FLOAT</td>
<td>REAL</td>
</tr>
<tr>
<td>UA_DOUBLE</td>
<td>LREAL</td>
</tr>
</tbody>
</table>

#### Precautions

- An OPC UA server itself collects data periodically. Therefore, data may not be collected if the collection cycle of OPC UA Data Collector is longer than that of an OPC UA server. It is recommended to set the collection cycle of OPC UA Data Collector shorter than that of an OPC UA server. In addition, the collection cycle depends on the performance of an OPC UA server. For details, refer to the manual of the OPC UA server to be used.
4.1 Data Collection Function

Collection cycle of an OPC UA server
Collection interval of OPC UA Data Collector

- OPC UA Data Collector checks the connection status with an OPC UA server every collection cycle and attempts a re-connection if disconnected. If re-connection fails, it will be disconnected until the connection status check in the next collection timing.
- Character strings including surrogate pair characters cannot be read.
- When the same location is set for some data in one flow, values of the collected data may not match.

To match a data value collected by OPC UA Data Collector with the current value of an access target device, set both the polling cycle of an OPC UA server and collection cycle of OPC UA Data Collector shorter.
4.2 Data Reading Function

This function sends a data reading request to an OPC UA server according to a request from Edgecross Basic Software and reads data of data tags.

When an uncorresponding data type is set

When the data type set in the location parameters is not corresponding to the one in an OPC UA server, a ‘reading error (data type mismatch)’ (error code: 200DH) is notified to Edgecross Basic Software.

Check the table below and set the data type corresponding to the one set in the OPC UA server.

<table>
<thead>
<tr>
<th>OPC UA server</th>
<th>Location parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA_BOOLEAN</td>
<td>BOOL</td>
</tr>
<tr>
<td>UA_String</td>
<td>WSTRING</td>
</tr>
<tr>
<td>UA_INT16</td>
<td>INT</td>
</tr>
<tr>
<td>UA_INT32</td>
<td>DINT</td>
</tr>
<tr>
<td>UA_INT64</td>
<td>LINT</td>
</tr>
<tr>
<td>UA_UINT16</td>
<td>UINT</td>
</tr>
<tr>
<td>UA_UINT32</td>
<td>UDINT</td>
</tr>
<tr>
<td>UA_UINT64</td>
<td>ULINT</td>
</tr>
<tr>
<td>UA_FLOAT</td>
<td>REAL</td>
</tr>
<tr>
<td>UA_DOUBLE</td>
<td>LREAL</td>
</tr>
</tbody>
</table>

4.3 Data Writing Function

This function sends a data writing request to an OPC UA server according to a request from Edgecross Basic Software and writes data to data tags.

Precautions

The operations when writing the WSTRING type data are as follows:

- Character strings composed of only non-surrogate characters: Written as they are.
- Character strings including surrogate pair characters: Written but replaced with an undefined value.
The parameter settings for OPC UA Data Collector can be set in Edgecross Basic Software. For the display of the setting screens for each parameter, refer to Edgecross Basic Software User’s Manual.

Precautions

When the setting file of Edgecross Basic Software storing the access target device settings of OPC UA Data Collector is transferred to another industrial PC, the settings should be set again.
5.1 Communication Parameter

Set the setting on the connection between OPC UA Data Collector and an OPC UA server.

Window

- The "Target Device Setting" screen of Real-time Flow Designer
- The "Target Device Setting" screen of Management Shell Explorer

Displayed items

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client certificate</td>
<td><em>(1) Creation status display</em> The creation status of a client certificate is displayed.</td>
</tr>
<tr>
<td></td>
<td>[Creation] button Click this to display the &quot;Creation of client certificate&quot; screen.</td>
</tr>
<tr>
<td></td>
<td>[Display] button *1 Click this to display the contents of a client certificate. <em>(Page 18 Certificate screen)</em></td>
</tr>
<tr>
<td>Setting of connection end server</td>
<td>End point URL Set the endpoint URL of a connection target server within 0 to 1024 characters.</td>
</tr>
<tr>
<td></td>
<td>Server name The connection target server name is displayed.</td>
</tr>
<tr>
<td></td>
<td>Security policy Select a security policy. The security policy should be the same as that of a connection destination server.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security mode Select a security mode. The security mode should be the same as that of a connection destination server.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[Server authentication] button Click this to connect to the set endpoint URL to update a server name. When clicking this button, communication with an OPC UA server is performed. When a client certificate has not been created yet, the &quot;Creation of client certificate&quot; screen appears. When the certificate of a connected server is not trusted, the &quot;Authentication of server certificate&quot; screen appears so check the contents and trust the certificate.</td>
</tr>
<tr>
<td>User token type</td>
<td>Select a user token type (user recognition method).</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 It cannot be clicked when a client certificate has not been created.

*2 Depending on the connection destination server, it may be possible to connect with multiple security policies and security modes. Check the specifications of the server.
Certificate screen
The following shows the configuration of the "Certificate" screen. By clicking the [Install Certificate] button, a certificate is installed in Windows. *1

*1 It does not affect the operation of Management Shell.
Creating a client certificate

Create a client certificate for connecting an OPC UA server.

The following screen appears if a client certificate has not been created yet when setting the communication parameters of OPC UA Data Collector.

This screen also appears when a client certificate is expired.

**Window**

![Client Certificate Window](image)

**Displayed items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application name</td>
<td>An application name (OPC UA client name) is displayed.</td>
</tr>
<tr>
<td>Organization name</td>
<td>Set an organization name (0 to 256 characters).</td>
</tr>
<tr>
<td>Unit of organization</td>
<td>Set the unit of an organization (0 to 256 characters).</td>
</tr>
<tr>
<td>Region name</td>
<td>Set the name of a region (0 to 128 characters).</td>
</tr>
<tr>
<td>Prefecture/State name</td>
<td>Set a prefecture or state (0 to 128 characters).</td>
</tr>
<tr>
<td>Country</td>
<td>Enter the abbreviation for a country name (0 to 2 characters).</td>
</tr>
<tr>
<td>Domain</td>
<td>Set a domain (0 to 16 characters). Default: The machine name of an industrial PC in which OPC UA Data Collector is installed is displayed.</td>
</tr>
<tr>
<td>Application URI</td>
<td>The application URI is displayed. Format: urn:[host name]:[company name]:[product name]</td>
</tr>
<tr>
<td>Expiration date</td>
<td>Select the expiration date of a client certificate. When using an expired client certificate, the access to an OPC UA server is denied and communication is not established.</td>
</tr>
<tr>
<td>Strength of RSA key</td>
<td>Select the strength of the RSA key. By selecting bigger bit, the communication security will also be higher.</td>
</tr>
<tr>
<td>Signature algorithm</td>
<td>Select a signature algorithm. When selecting &quot;Sha256&quot;, the security of a digital signature will be stronger than when selecting &quot;Sha1&quot;.</td>
</tr>
</tbody>
</table>

**Precautions**

- Depending on the setting of the OPC UA server of a connection target, it is required to trust the created client certificate by the server. For the method for trusting a certificate, refer to the manual of the OPC UA server used.
- Do not re-create a client certificate until the certificate date is expired. If it is necessary to re-create a client certificate, delete the client certificate and the private key file stored in the following locations manually.
  - Client certificate: (Folder in which Edgecross Basic Software is installed)\DataCollector\000002_OPCUA DataCollector_0100\SWnDN-DCOPCUA\PKI\certs\client.der
  - Private key file: (Folder in which Edgecross Basic Software is installed)\DataCollector\000002_OPCUA DataCollector_0100\SWnDN-DCOPCUA\PKI\private\client.pem
- The server certificate (server name[thumb print of server certificate].der) is stored in the following location.
  (Folder in which Edgecross Basic Software is installed)\DataCollector\000002_OPCUA DataCollector_0100\SWnDN-DCOPCUA\PKI\trusted
5.2 Collection Parameter

Set the setting on data collection in OPC UA Data Collector.

**Window**

- The [Collection Option] tab in the "Data Collection Setting" screen of Real-time Flow Designer

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection Interval</td>
<td>Set the interval and the unit for collecting data.</td>
</tr>
</tbody>
</table>
5.3 Location Parameter

Select a layer in the tree view, and select a tag to access in the displayed tag list.

Window

- Select the [Collection Data] tab in the "Data Collection Setting" screen of Real-time Flow Designer, and click the [...] button.
- Select the [Instruction Target data] tab in the "Instruction Feedback Setting" screen of Real-time Flow Designer, and click the [...] button.
- Click the [Setting] button in the "Add External Data Tag Resource" or "Edit External Data Tag Resource" screen of Management Shell Explorer.

Displayed items

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Tree view</td>
<td>Address space information and each definition are displayed in a tree.</td>
</tr>
<tr>
<td>(2) Tag list</td>
<td>Tag Name</td>
</tr>
<tr>
<td></td>
<td>Data Type</td>
</tr>
<tr>
<td></td>
<td>Access Direction</td>
</tr>
</tbody>
</table>

*1 The string type defined on an OPC UA server side is converted into 'WSTRING(UTF-16LE)'.

*1
6 TROUBLESHOOTING

This chapter explains the errors which may occur when using OPC UA Data Collector and the troubleshooting.

6.1 Checking Method for Error Descriptions

The following are the methods for checking error descriptions.

<table>
<thead>
<tr>
<th>Checking method</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time Flow Designer</td>
<td>Error codes can be checked in the “Real-time Flow Manager Diagnostics” screen of Real-time Flow Designer. For details, refer to the following manual.</td>
</tr>
<tr>
<td>Management Shell Explorer</td>
<td>Error codes can be checked in the “Error Information List” screen of Management Shell Explorer. For details, refer to the following manual.</td>
</tr>
</tbody>
</table>

**Point**

When an error occurs due to a location parameter setting, the location causing the error can be confirmed in the detailed information for the error code*1.

*1 If the number of characters of 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 type**

There are two types of errors for OPC UA Data Collector; moderate error and minor error.
6.2 Troubleshooting by Symptom

If a function of OPC UA Data Collector does not perform properly, check the applicable items in the following and troubleshoot the error.

Troubleshooting on the OPC UA Data Collector startup

The data collector is not recognized at the Edgecross Basic Software start.

<table>
<thead>
<tr>
<th>Check point</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| Does a signed-in user who started Edgecross Basic Software have the access right to a folder in which OPC UA Data Collector is stored? | • Sign in as a user with the access right to the folder in which OPC UA Data Collector is stored, and start Edgecross Basic Software.  
• Grant the user access to the folder in which OPC UA Data Collector is stored. |

Troubleshooting on data collection

Connection with an OPC UA server is not established.

<table>
<thead>
<tr>
<th>Check point</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the client certificate trusted on the OPC UA server side?</td>
<td>• Trust the client certificate on the OPC UA server side. For the method for trusting a certificate, refer to the manual of the OPC UA server used.</td>
</tr>
<tr>
<td>Is an unauthorized anonymous user trying to connect to a server?</td>
<td>• Allow the anonymous user access on the OPC UA server side.</td>
</tr>
<tr>
<td>Is an user name and password correct?</td>
<td>• Check the user name and password.</td>
</tr>
<tr>
<td>Is the setting file of Edgecross Basic Software transferred to another industrial PC?</td>
<td>• Set the access target device again.</td>
</tr>
</tbody>
</table>

The OPC UA server setting cannot be changed.

<table>
<thead>
<tr>
<th>Check point</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a process using a data collector, and is an OPC UA server connected to?</td>
<td>• Terminate the process using the data collector and disconnect from the OPC UA server.</td>
</tr>
</tbody>
</table>

Troubleshooting on Edgecross Basic Software

An error caused by this product has been detected in Edgecross Basic Software.

<table>
<thead>
<tr>
<th>Check item</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a data collector startup error been detected in Edgecross Basic Software?</td>
<td>Reinstall this product since the file may have been moved or deleted.</td>
</tr>
</tbody>
</table>

Troubleshooting on screens

Contents in the screen may not be displayed properly.

<table>
<thead>
<tr>
<th>Check item</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| 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)\(^*1\), the display of a screen can be enlarged with high DPI scaling by using a Windows 10 function\(^*2\).  
  1 Select “ProcessDesigner.exe”\(^*3\), then select [Properties] on the right-click menu.  
  2 Select the checkbox of “Override high DPI scaling behavior. Scaling performed by:” in the [Compatibility] tab, then select “System” from the pull-down list.  
  3 Click the [OK] button. |

\(^*1\) The Windows version can be checked by the following procedure.  
  ① Press Windows key + `\(^{12}\)`, or select [Windows System] \(→\) [Run] from Windows Start.  
  ② Enter “winver” in the “Run” screen.  
  ③ Check the version in the displayed screen.
*2 The display 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.

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
## 6.3 Error Code List

This section shows the codes for errors that occur in OPC UA Data Collector.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Name</th>
<th>Error Description</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001H</td>
<td>Data Collection Setting Error</td>
<td>The Data Collection setting is incorrect.</td>
<td>Please review and correct the Data Collection setting.</td>
</tr>
</tbody>
</table>
| 2002H      | OPC UA server connection error (Connection failure) | Failed to connect to the OPC UA server. | • Please check that the OPC UA server has started.  
• Please review and correct the path to the device on which the OPC UA server operates.  
• Please check if the end point URL of the OPC UA server is correct.  
• If the load on the network is high, please reduce the load.  
• Reduction of access frequency to the OPC UA server, amount of communication data.  
• Separation of communication path of this product and communication path of other software.  
• Reduction of communication to be simultaneously executed for one Target Device.  
• If the load on the OPC UA server is high, please reduce the load.  
• Reduction of the number of clients to be connected to the OPC UA server.  
• Closing applications running on the OPC UA server. |
| 2003H      | OPC UA server connection error (Session establishment failure) | Failed to establish the session. | • Please check that the security policy and security mode are matched with those of the server.  
• Please check that the user name and password are correctly set.  
• For an anonymous user, please check that the access from an anonymous user is allowed on the server.  
• Please check that the client certificate is trusted by the server.  
• Please check that the number of available simultaneous connected clients is not exceeded. If the number of available simultaneous connected clients is exceeded, please reduce the number of clients.  
• If the load on the OPC UA server is high, please reduce the load.  
• Closing applications running on the OPC UA server. |
| 2004H      | Certificate reading error | Failed to read a certificate. | • Please check if a client certificate exists.  
• Please check that the client certificate is not expired.  
• Please check that the time of the industrial PC running this product does not exceed the validity period of the client certificate. |
| 2005H      | Reading error (OPC UA server connection failure) | Failed to read the data because the connection with the OPC UA server was lost. | • Please check that the OPC UA server has started.  
• Please review and correct the path to the device on which the OPC UA server operates.  
• If the load on the network is high, please reduce the load.  
• Reduction of access frequency to the OPC UA server, amount of communication data.  
• Separation of communication path of this product and communication path of other software.  
• Reduction of communication to be simultaneously executed for one Target Device.  
• If the load on the OPC UA server is high, please reduce the load.  
• Reduction of the number of clients to be connected to the OPC UA server.  
• Closing applications running on the OPC UA server. |
<table>
<thead>
<tr>
<th>Error code</th>
<th>Error name</th>
<th>Error description</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| 2006H      | Writing error (OPC UA server connection failure) | Failed to write the data because the connection with the OPC UA server was lost. | • Please check that the OPC UA server has started.  
• Please review and correct the path to the device on which the OPC UA server operates.  
• If the load on the network is high, please reduce the load.  
• Reduction of access frequency to the OPC UA server, amount of communication data.  
• Separation of communication path of this product and communication path of other software.  
• Reduction of communication to be simultaneously executed for one Target Device.  
• If the load on the OPC UA server is high, please reduce the load.  
• Reduction of the number of clients to be connected to the OPC UA server.  
• Closing applications running on the OPC UA server. |
| 2007H      | Data Collector internal error | An unexpected error occurred inside this product. | • If Real-time Flow Manager is used, please write the Real-time Flow Manager parameter again.  
• Please check that no other error occurs.  
• Please restart the Industrial PC running this product.  
• Please reinstall this product.  
• If the same error occurs, please consult your local Mitsubishi representative. |
| 2008H      | Target Device setting error | The Target Device setting information does not exist. | Please set the Target Device setting of the basic software again. |
| 2009H      | Reading error (Access to a non-existent tag) | Failed to read the data because reading was performed on a tag which did not exist in the OPC UA server. | Please review the location setting or OPC UA server setting so that the tag of the location setting exists in the OPC UA server. |
| 200AH      | Writing error (Access to a non-existent tag) | Failed to write the data because writing was performed on a tag which did not exist in the OPC UA server. | Please review the location setting or OPC UA server setting so that the tag of the location setting exists in the OPC UA server. |
| 200BH      | Reading error (Incorrect access direction) | Failed to read the data because reading was performed on a tag which was set to unreadable in the OPC UA server. | Please review the location setting or OPC UA server setting so that the access direction of the tag of the location setting becomes read or read/write. |
| 200CH      | Writing error (Incorrect access direction) | Failed to write the data because writing was performed on a tag which was set to unwritable in the OPC UA server. | Please review the location setting or OPC UA server setting so that the access direction of the tag of the location setting becomes write or read/write. |
| 200DH      | Reading error (Data type mismatch) | The settings for the data types of the tag of the location setting and OPC UA server are different. | Please review the location setting or OPC UA server setting so that the data types of the tag of the location setting and OPC UA server match. |
| 200EH      | Writing error (Data type mismatch) | The settings for the data types of the tag of the location setting and OPC UA server are different. | Please review the location setting or OPC UA server setting so that the data types of the tag of the location setting and OPC UA server match. |
| 200FH      | Reading error (Error detected in the OPC UA server) | Failed to read the data because an error was detected in the OPC UA server. | • Please check the measures with the error code displayed on the status code in the user's manual of the OPC UA server and perform them.  
• If the above actions do not solve the problem, please contact the manufacturer of the OPC UA server. |
| 2010H      | Writing error (Error detected in the OPC UA server) | Failed to write the data because an error was detected in the OPC UA server. | • Please check the measures with the error code displayed on the status code in the user's manual of the OPC UA server and perform them.  
• If the above actions do not solve the problem, please contact the manufacturer of the OPC UA server. |
<table>
<thead>
<tr>
<th>Error code</th>
<th>Error name</th>
<th>Error description</th>
<th>Corrective action</th>
</tr>
</thead>
</table>
| 2011H      | Target OPC UA server communication timeout error        | The communication with the target OPC UA server has timed out.                     | • Please check that the OPC UA server has started.  
  • Please review and correct the path to the device on which the OPC UA server operates.  
  • If the load on the network is high, please reduce the load.  
  • Reduction of access frequency to the OPC UA server, amount of communication data.  
  • Separation of communication path of this product and communication path of other software.  
  • Reduction of communication to be simultaneously executed for one Target Device.  
  • If the load on the OPC UA server is high, please reduce the load.  
  • Reduction of the number of clients to be connected to the OPC UA server.  
  • Closing applications running on the OPC UA server.  
  • In the case using Real-time Flow Manager  
  • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again. |
| 2012H      | Collection error (OPC UA server connection failure)     | Failed to collect the data because the connection with the OPC UA server was lost.  | • Please check that the OPC UA server has started.  
  • Please review and correct the path to the device on which the OPC UA server operates.  
  • If the load on the network is high, please reduce the load.  
  • Reduction of access frequency to the OPC UA server, amount of communication data.  
  • Separation of communication path of this product and communication path of other software.  
  • Reduction of communication to be simultaneously executed for one Target Device.  
  • If the load on the OPC UA server is high, please reduce the load.  
  • Reduction of the number of clients to be connected to the OPC UA server.  
  • Closing applications running on the OPC UA server.  
  • In the case using Real-time Flow Manager  
  • 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 the OPC UA server.  | • Please review the location setting or OPC UA server setting so that the tag of the location setting exists in the OPC UA server.  
  • In the case using Real-time Flow Manager  
  • 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 the OPC UA server.  | • Please review the location setting or OPC UA server setting so that the access direction of the tag of the location setting becomes read or read/write.  
  • In the case using Real-time Flow Manager  
  • 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 OPC UA server are different.  | • Please review the location setting or OPC UA server setting so that the data types of the tag of the location setting and OPC UA server match.  
  • In the case using Real-time Flow Manager  
  • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again. |
| 2016H      | Collection error (Error detected in the OPC UA server)  | Failed to collect the data because an error was detected in the OPC UA server.     | • Please check the measures with the error code displayed on the status code in the user's manual of the OPC UA server and perform them.  
  • If the above actions do not solve the problem, please contact the manufacturer of the OPC UA server.  
  • In the case using Real-time Flow Manager  
  • Please execute STOP operation with Real-time Flow Designer, then execute RUN operation again. |
This section shows the codes for events that occur in OPC UA Data Collector.

<table>
<thead>
<tr>
<th>Event code</th>
<th>Event status</th>
<th>Event name</th>
<th>Event description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9000H</td>
<td>Information</td>
<td>Collection processing time</td>
<td>Measurement of collection processing time has been completed.</td>
</tr>
</tbody>
</table>
## Appendix 1  Processing Performance and Processing Time

This section shows the processing performance and processing time of OPC UA Data Collector.

### Measurement conditions 1

#### Industrial PC

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel® Atom™ E3845 1.91 GHz 64-bit architecture</td>
</tr>
<tr>
<td>RAM</td>
<td>8 GB</td>
</tr>
<tr>
<td>OS (64-bit version)</td>
<td>Windows® 10 Pro</td>
</tr>
<tr>
<td>Ethernet network I/F Interface</td>
<td>100BASE-TX</td>
</tr>
<tr>
<td>Communication method</td>
<td>Half duplex</td>
</tr>
<tr>
<td>Communication speed</td>
<td>100BASE-TX: 100 Mbps</td>
</tr>
<tr>
<td>Number of cascaded stages</td>
<td>100 Mbps: 1</td>
</tr>
</tbody>
</table>

#### Parameters of a data collector

<table>
<thead>
<tr>
<th>Parameter type</th>
<th>Setting item</th>
<th>Setting content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection parameter</td>
<td>Collection interval</td>
<td>500 (ms)</td>
</tr>
</tbody>
</table>

#### Parameters of an OPC UA server

<table>
<thead>
<tr>
<th>Item</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection cycle</td>
<td>500 (ms)</td>
</tr>
<tr>
<td>Number of collectable tags</td>
<td>512</td>
</tr>
</tbody>
</table>

#### Access target server

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the same industrial PC</td>
<td>OPC UA server</td>
</tr>
<tr>
<td>Outside</td>
<td>MELSEC iQ-R OPC UA server module</td>
</tr>
</tbody>
</table>
# Measurement conditions 2

## Industrial PC

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel® Atom™ E3826 1.46GHz (Dual Core)</td>
</tr>
<tr>
<td>RAM</td>
<td>4 GB</td>
</tr>
<tr>
<td>OS (64-bit version)</td>
<td>Windows® 10 Pro (64bit)</td>
</tr>
<tr>
<td>Ethernet network I/F</td>
<td>Interface 100BASE-TX</td>
</tr>
<tr>
<td></td>
<td>Communication method Full-duplex</td>
</tr>
<tr>
<td></td>
<td>Communication speed 100Mbps(100BASE-TX)</td>
</tr>
<tr>
<td></td>
<td>Number of cascaded stages 100 Mbps: 1</td>
</tr>
</tbody>
</table>

## Parameters of a data collector

<table>
<thead>
<tr>
<th>Parameter type</th>
<th>Setting item</th>
<th>Setting content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection parameter</td>
<td>Collection interval</td>
<td>500 (ms)</td>
</tr>
</tbody>
</table>

## Parameters of an OPC UA server

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection cycle</td>
<td>500 (ms)</td>
</tr>
<tr>
<td>Number of collectable tags</td>
<td>512</td>
</tr>
</tbody>
</table>

## Access target server

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the same industrial PC</td>
<td>OPC UA server</td>
</tr>
<tr>
<td>Outside</td>
<td>MELSEC iQ-R OPC UA server module</td>
</tr>
</tbody>
</table>
## Processing performance

The following table shows the processing performance capable of collecting all data in a specified cycle per collection processing time (single collection cycle).

### Measurement conditions 1

<table>
<thead>
<tr>
<th>Number of collection node points</th>
<th>Performance value (ms)</th>
<th>CPU usage rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPC UA server in the same industrial PC</td>
<td>Outside of OPC UA server</td>
</tr>
<tr>
<td>256</td>
<td>2.8</td>
<td>2.9</td>
</tr>
<tr>
<td>512</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>1024</td>
<td>4.0</td>
<td>4.4</td>
</tr>
<tr>
<td>2048</td>
<td>6.0</td>
<td>4.6</td>
</tr>
</tbody>
</table>

### Measurement conditions 2

<table>
<thead>
<tr>
<th>Number of collection node points</th>
<th>Performance value (ms)</th>
<th>CPU usage rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPC UA server in the same industrial PC</td>
<td>Outside of OPC UA server</td>
</tr>
<tr>
<td>256</td>
<td>2.51</td>
<td>6.89</td>
</tr>
<tr>
<td>512</td>
<td>6.2</td>
<td>4.92</td>
</tr>
<tr>
<td>1024</td>
<td>6.36</td>
<td>8.98</td>
</tr>
<tr>
<td>2048</td>
<td>6.81</td>
<td>5.59</td>
</tr>
</tbody>
</table>
Appendix 2  Software Licenses

This software consists of multiple software components. Each of them is copyrighted by Mitsubishi and/or third parties. The following types of software are contained:

- Software copyrighted by third parties and distributed as free software
- Source codes are not distributed for the software that Mitsubishi and/or third parties have copyrights to.

Please refrain from inquiring about the source codes of this open source.

Software information

This product contains the following software:

1. RapidJSON (Page 32 RapidJSON)
2. BouncyCastle (Page 33 BouncyCastle)
3. msinttypes (Page 34 msinttypes)
4. OpenSSL toolkit (Page 35 OpenSSL toolkit)
5. Libxml2 (Page 38 Libxml2)
6. UA-.NETStandard (Page 39 UA-.NETStandard)
7. C++ based OPC UA Client Server SDK Bundle (Page 47 C++ based OPC UA Client Server SDK Bundle)

RapidJSON

This product uses RapidJSON licensed under the MIT License.

The copyright and permission notices of RapidJSON are described below.

Tencent is pleased to support the open source community by making RapidJSON available.

Copyright (C) 2015 THL A29 Limited, a Tencent company, and Milo Yip. All rights reserved.

If you have downloaded a copy of the RapidJSON binary from Tencent, please note that the RapidJSON binary is licensed under the MIT License.

If you have downloaded a copy of the RapidJSON source code from Tencent, please note that RapidJSON source code is licensed under the MIT License, except for the third-party components listed below which are subject to different license terms. Your integration of RapidJSON into your own projects may require compliance with the MIT License, as well as the other licenses applicable to the third-party components included within RapidJSON. To avoid the problematic JSON license in your own projects, it's sufficient to exclude the bin/jsonchecker/ directory, as it's the only code under the JSON license.

A copy of the MIT License is included in this file.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
BouncyCastle
This product uses BouncyCastle licensed under the MIT License.
The copyright and permission notices of BouncyCastle are described below.
Copyright (c) 2000 - 2017 The Legion of the Bouncy Castle Inc. (http://www.bouncycastle.org)

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
This product uses msinttypes licensed under the BSD License.
The copyright and permission notices of msinttypes are described below.

The msinttypes r29
Copyright (c) 2006-2013 Alexander Chemeris
All rights reserved.

Redistribution and use in source and binary forms, with or without
modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
* Neither the name of copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS AND CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
OpenSSL toolkit

This product uses OpenSSL toolkit licensed under the OpenSSL License and the Original SSLeay License. The permission notice of the OpenSSL License and Original SSLeay License is described below.

LICENSE ISSUES

The OpenSSL toolkit stays under a double license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts.

OpenSSL License

/* ====================================================================
 * Copyright (c) 1998-2018 The OpenSSL Project. All rights reserved.
 * 
 * Redistribution and use in source and binary forms, with or without
 * modification, are permitted provided that the following conditions
 * are met:
 * 
 * 1. Redistributions of source code must retain the above copyright
 *    notice, this list of conditions and the following disclaimer.
 * 
 * 2. Redistributions in binary form must reproduce the above copyright
 *    notice, this list of conditions and the following disclaimer in
 *    the documentation and/or other materials provided with the
 *    distribution.
 * 
 * 3. All advertising materials mentioning features or use of this
 *    software must display the following acknowledgment:
 *    "This product includes software developed by the OpenSSL Project
 *    for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
 * 
 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
 *    endorse or promote products derived from this software without
 *    prior written permission. For written permission, please contact
 *    openssl-core@openssl.org.
 * 
 * 5. Products derived from this software may not be called "OpenSSL"
 *    nor may "OpenSSL" appear in their names without prior written
 *    permission of the OpenSSL Project.
 * 
 * 6. Redistributions of any form whatsoever must retain the following
 *    acknowledgment:
 *    "This product includes software developed by the OpenSSL Project
 *    for use in the OpenSSL Toolkit (http://www.openssl.org/)"
 * 
 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT AS IS AND ANY
 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
 * OF THE POSSIBILITY OF SUCH DAMAGE.
 * 
 * ====================================================================
 *
 * This product includes cryptographic software written by Eric Young
Original SSLeay License
-----------------------
/* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
 * All rights reserved.
 *
 * This package is an SSL implementation written
 * by Eric Young (eay@cryptsoft.com).
 * The implementation was written so as to conform with Netscapes SSL.
 *
 * This library is free for commercial and non-commercial use as long as
 * the following conditions are aheared to. The following conditions
 * apply to all code found in this distribution, be it the RC4, RSA,
 * SHA1, DES, etc., code; not just the SSL code. The SSL documentation
 * included with this distribution is covered by the same copyright terms
 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
 *
 * Copyright remains Eric Young's, and as such any Copyright notices in
 * the code are not to be removed.
 * If this package is used in a product, Eric Young should be given attribution
 * as the author of the parts of the library used.
 * This can be in the form of a textual message at program startup or
 * in documentation (online or textual) provided with the package.
 *
 * Redistribution and use in source and binary forms, with or without
 * modification, are permitted provided that the following conditions
 * are met:
 * 1. Redistributions of source code must retain the copyright
 *    notice, this list of conditions and the following disclaimer.
 * 2. Redistributions in binary form must reproduce the above copyright
 *    notice, this list of conditions and the following disclaimer in the
 *    documentation and/or other materials provided with the distribution.
 * 3. All advertising materials mentioning features or use of this software
 *    must display the following acknowledgement:
 *    "This product includes cryptographic software written by
 *     Eric Young (eay@cryptsoft.com)"
 *    The word `cryptographic' can be left out if the rouines from the library
 *    being used are not cryptographic related :-).
 * 4. If you include any Windows specific code (or a derivative thereof) from
 *    the apps directory (application code) you must include an acknowledgement:
 *    "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
 *
 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
 * SUCH DAMAGE.
 *
 * The licence and distribution terms for any publically available version or
 * derivative of this code cannot be changed. i.e. this code cannot simply be
 * copied and put under another distribution licence
 * [including the GNU Public Licence.]
Libxml2

This product uses Libxml2 licensed under the MIT License.
The copyright and permission notices of Libxml2 are described below.

Except where otherwise noted in the source code (e.g. the files hash.c, list.c and the trio files, which are covered by a similar licence but with different Copyright notices) all the files are:

Copyright (C) 1998-2012 Daniel Veillard. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
This product uses UA-.NETStandard of OPCFoundation.

The permission notice of UA-.NETStandard is described below.

This repository includes the UA .NET Stack sample libraries and sample applications, all based on the .NET Standard Library. The UA .NET Standard Library Stack follows a dual-license:

- OPC Foundation Corporate Members: RCL
- Everybody else: GPL 2.0

RCL enables OPC Foundation members to deploy their applications using the software without being required to disclose the application code. Non-members licensed under GPL 2.0 must disclose their application code when using the software.

If OPC Foundation Corporate Membership is terminated, the license reverts to GPL 2.0 whenever any fixes or updates published on GitHub are applied to the former member's application. This includes updates acquired by fetching any Git commit made after membership termination or the use of binaries distributed in OPC NuGet packages that were posted after the membership termination date.

Note: Dual license applies to this repository only; GPL 2.0 applies to all other repositories.

All samples, the platform layers, and files generated with the ModelCompiler by means of the OPC UA NodeSet are provided under the MIT license.

[RCL License]

Reciprocal Community License 1.00 (RCL1.00)
Version 1.00, June 24, 2009
Copyright (C) 2008, 2009 OPC Foundation, Inc., All Rights Reserved.

PREAMBLE

The Reciprocal Community License (RCL) is based on the concept of reciprocity or, if you prefer, fairness.

The RCL is adapted from the Open Source Reciprocal Public License (RPL) where the "Public" in the Open Source RPL license is replaced by the "Community" in the RCL License. In short, the RPL license grew out of a desire to close loopholes in previous open source licenses, loopholes that allowed parties to acquire open source software and derive financial benefit from it without having to release their improvements or derivatives to the community which enabled them. This occurred any time an entity did not release their application to a "third party". While there is a certain freedom in this model of licensing, it struck the authors of the RPL as being unfair to the open source community at large and to the original authors of the works in particular. After all, bug fixes, extensions, and meaningful and valuable derivatives were not consistently faster, growth and expansion of the overall open source software base.

While you should clearly read and understand the entire license, the essence of the RCL is found in two definitions: "Deploy" and "Required Components".

Regarding deployment, under the RCL your changes, bug fixes, extensions, etc. must be made available to the community when you Deploy in any form -- either internally or to an outside party.

Once you start running the software you have to start sharing the software. Further, under the RCL all derivative work components you author including schemas, scripts, source code, documentation, etc. -- must be shared. You have to share the whole pie, not an isolated slice of it. The authored components you must share are confined to the original module licensed (e.g. SDK, stack, wrapper, proxy, utility, etc.). You do not need to share any additional authored components that you create that utilize the licensed component. This license is meant to be friendly to commercial software vendors that must protect the IP in their code. You are not expected to share your proprietary source code that makes use of the module(s) licensed under this agreement.

The specific terms and conditions of the license are defined in the remainder of this document.

1 LICENSE TERMS
1.1 General; Applicability & Definitions. This Reciprocal Community License Version 1.00 ("License") applies to any programs or other works as well as any and all updates or maintenance releases of said programs or works ("Software") not already covered by this License which the Software copyright holder ("Licensor") makes available containing a License Notice (hereinafter defined) from the Licensor specifying or allowing use or distribution under the terms of this License. As used in this License:

1.2 "Contributor" means any person or entity who created or contributed to the creation of an Extension.

1.3 "Deploy" means to use, Serve, sublicense or distribute Licensed Software other than for Your internal Research and/or Personal Use, and includes without limitation, any and all internal use or distribution of Licensed Software within Your business or organization other than for Research and/or Personal Use, as well as direct or indirect sublicensing or distribution of Licensed Software by You to any third party.

1.4 "Derivative Works" as used in this License is defined under U.S. copyright law.

1.5 "Extensions" means any Modifications, Derivative Works, or Required Components as those terms are defined in this License.

1.6 "License" means this Reciprocal Community License.

1.7 "License Notice" means any notice contained in EXHIBIT A.

1.8 "Licensed Software" means any Software licensed pursuant to this License. Licensed Software also includes all previous Extensions from any Contributor that You receive.

1.9 "Licensor" means the copyright holder of any Software previously not covered by this License who releases the Software under the terms of this License.
1.10 "Modifications" means any additions to or deletions from the substance or structure of (i) a file containing Licensed Software, or (ii) any new file that contains any part of Licensed Software.

1.11 "Original Licensor" means the Licensor that is the copyright holder of the original work. For this license the Original Licensor is always the OPC Foundation.

1.12 "Personal Use" means use of Licensed Software by an individual solely for his or her personal, private and non-commercial purposes. An individual's use of Licensed Software in his or her capacity as an officer, employee, member, independent contractor or agent of a corporation, business or organization (commercial or non-commercial) does not qualify as Personal Use.

1.13 "Required Component(s)" means any text, programs, scripts, schema, interface definitions, control files, or other works created by You which are required by a third party of average skill to successfully install and run Licensed Software containing Your Modifications, or to install and run Your Derivative Works. Required Components by this definition are the supporting works that are necessary to utilize your Modifications and Derivative Works. This does not include your applications and supporting works that utilize the Licensed Software.

1.14 "Research" means investigation or experimentation for the purpose of understanding the nature and limits of the Licensed Software and its potential uses.

1.15 "Serve" means to deliver Licensed Software and/or Your Extensions by means of a computer network to one or more computers for purposes of execution of Licensed Software and/or Your Extensions.

1.16 "Software" means any computer programs or other works as well as any updates or maintenance releases of those programs or works which are distributed publicly by Licensor.

1.17 "Source Code" means the preferred form for making modifications to the Licensed Software and/or Your Extensions, including all modules contained therein, plus any associated text, interface definition files, scripts used to control compilation and installation of an executable program or other components required by a third party of average skill to build a running version of the Licensed Software or Your Extensions.

1.18 "User-Visible Attribution Notice" means any notice contained in EXHIBIT B.

1.19 "You" or "Your" means an individual or a legal entity exercising rights under this License. For legal entities, "You" or "Your" includes any entity which controls, is controlled by, or is under common control with, You, where "control" means (a) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (b) ownership of fifty percent (50%) or more of the outstanding shares or beneficial ownership of such entity.

2.0 Acceptance Of License. You are not required to accept this License since you have not signed it, however nothing else grants you permission to use, copy, distribute, modify, or create derivatives of either the Software or any Extensions created by a Contributor. These actions are prohibited by law if you do not accept this License. Therefore, by performing any of these actions You indicate Your acceptance of this License and Your agreement to be bound by all its terms and conditions. IF YOU DO NOT AGREE WITH ALL THE TERMS AND CONDITIONS OF THIS LICENSE DO NOT USE, MODIFY, CREATE DERIVATIVES, OR DISTRIBUTE THE SOFTWARE. IF IT ISIMPOSSIBLE FOR YOU TO COMPLY WITH ALL THE TERMS AND CONDITIONS OF THIS LICENSE THEN YOU CAN NOT USE, MODIFY, CREATE DERIVATIVES, OR DISTRIBUTE THE SOFTWARE.

3.0 Grant of License From Licensor. Subject to the terms and conditions of this License, Licensor hereby grants You a world-wide, royalty-free, non-exclusive license, subject to Licensor's intellectual property rights, and any third party intellectual property claims derived from the Licensed Software under this License, to do the following:

3.1 Use, reproduce, modify, display, and perform Licensed Software and Your Extensions in both Source Code form or as an executable program. You may also sublicense and distribute Licensed Software and Your Extensions as an executable program. OPC Foundation Corporate Members may also sublicense and distribute Licensed Software and Your Extensions in Source Code form.

3.2 Create Derivative Works (as that term is defined under U.S. copyright law) of Licensed Software.

3.3 Under claims of patents now or hereafter owned or controlled by Licensor, to make, use, have made, and/or otherwise dispose of Licensed Software or portions thereof, but solely to the extent that any such claim is necessary to enable You to make, use, have made, and/or otherwise dispose of Licensed Software or portions thereof.

3.4 Licensor reserves the right to release new versions of the Software with different features, specifications, capabilities, functions, licensing terms, general availability or other characteristics. Title, ownership rights, and intellectual property rights in and to the Licensed Software shall remain in Licensor and/or its Contributors.

4.0 Grant of License From Contributor. By application of the provisions in Section 6 below, each Contributor hereby grants You a world-wide, royalty-free, non-exclusive license, subject to said Contributor's intellectual property rights, and any third party intellectual property claims derived from the Licensed Software under this License, to do the following:

4.1 Use, reproduce, modify, display and perform any Extensions Deployed by such Contributor or portions thereof, in both Source Code form or as an executable program, either on an unmodified basis or as part of Derivative Works. You may also sublicense and distribute Extensions Deployed by such Contributor or portions thereof, as an executable program. OPC Foundation Corporate Members may also sublicense and distribute Extensions Deployed by such Contributor or portions thereof, in Source Code form.

4.2 Under claims of patents now or hereafter owned or controlled by Contributor, to make, use, have made, and/or otherwise dispose of Extensions or portions thereof, but solely to the extent that any such claim is necessary to enable You to make, use, have made, and/or otherwise dispose of Licensed Software or portions thereof.

5.0 Exclusions From License Grant. Nothing in this License shall be deemed to grant any rights to trademarks, copyrights, patents, trade secrets or any other intellectual property of Licensor or any Contributor except as expressly stated herein. Except as expressly stated in Sections 3 and 4, no other patent rights, express or implied, are granted herein. Your Extensions may require additional patent licenses from Licensor or Contributors which each may grant in its sole discretion. No right is granted to the trademarks of Licensor or any Contributor even if such marks are included in the Licensed Software. Nothing in this License shall be interpreted to prohibit Licensor from licensing under different terms from this License any code that Licensor otherwise would have a right to license.
5.1 You expressly acknowledge and agree that although Licensor and each Contributor grants the licenses to their respective portions of the Licensed Software set forth herein, no assurances are provided by Licensor or any Contributor that the Licensed Software does not infringe the patent or other intellectual property rights of any other entity. Licensor and each Contributor disclaim any liability to You for claims brought by any other entity based on infringement of intellectual property rights or otherwise. As a condition to exercising the rights and licenses granted hereunder, You hereby assume sole responsibility to secure any other intellectual property rights needed, if any. For example, if a third party patent license is required to allow You to distribute the Licensed Software, it is Your responsibility to acquire that license before distributing the Licensed Software.

6.0 Your Obligations And Grants. In consideration of, and as an express condition to, the licenses granted to You under this License You hereby agree that any Modifications, Derivative Works, or Required Components (collectively Extensions) that You create or to which You contribute are governed by the terms of this License including, without limitation, Section 4. Any Extensions that You create or to which You contribute must be Deployed under the terms of this License or a future version of this License released under Section 7. You hereby grant to Licensor and all third parties a world-wide, non-exclusive, royalty-free license under those intellectual property rights You own or control to use, reproduce, display, perform, modify, create derivatives, sublicense, and distribute Licensed Software, in any form.

Any Extensions You make and Deploy must have a distinct title so as to readily tell any subsequent user or Contributor that the Extensions are by You. You must include a copy of this License or directions on how to obtain a copy with every copy of the Extensions You distribute. You agree not to offer or impose any terms on any Source Code or executable version of the Licensed Software, or its Extensions that alter or restrict the applicable version of this License or the recipients' rights hereunder. Additionally, you hereby grant to the Original Licensor the right to use, reproduce, display, perform, modify, create derivatives, sublicense, and distribute Licensed Software, in any form, under the terms of this license and/or any other license terms it sees fit.

6.1 Availability of Source Code. You must make available, under the terms of this License, the Source Code of any Extensions that You Deploy, by uploading the Source Code directly to the website of the Original Licensor. The Source Code for any version that You Deploy must be made available within one (1) month of when you Deploy. You may not charge a fee for any copy of the Source Code distributed under this Section. At the sole discretion of the Original Licensor, some or all of Your contributed Source Code may be included in a future baseline version released by the Original Licensor.

6.2 Description of Modifications. You must cause any Modifications that You create or to which You contribute to be documented in the Source Code, clearly describing the additions, changes or deletions You made. You must include a prominent statement that the Modifications are derived, directly or indirectly, from the Licensed Software and include the names of the Licensor and any Contributor to the Licensed Software in (i) the Source Code and (ii) in any notice displayed by the Licensed Software You distribute or in related documentation in which You describe the origin or ownership of the Licensed Software. You may not modify or delete any pre-existing copyright notices, change notices or License text in the Licensed Software without written permission of the respective Licensor or Contributor.

6.3 Intellectual Property Matters.

a. Third Party Claims. If You have knowledge that a license to a third party's intellectual property right is required to exercise the rights granted by this License, You must include a human-readable file with Your distribution that describes the claim and the party making the claim in sufficient detail that a recipient will know whom to contact.

b. Contributor APIs. If Your Extensions include an application programming interface ("API") and You have knowledge of patent licenses that are reasonably necessary to implement that API, You must also include this information in a human-readable file supplied with Your distribution.

c. Representations. You represent that, except as disclosed pursuant to 6.3(a) above, You believe that any Extensions You distribute are Your original creations and that You have sufficient rights to grant the rights conveyed by this License.

6.4 Required Notices.

a. License Text. You must duplicate this License or instructions on how to acquire a copy in any documentation You provide along with the Source Code of any Extensions You create or to which You contribute, wherever You describe recipients' rights relating to Licensed Software.

b. License Notice. You must duplicate any notice contained in EXHIBIT A (the "License Notice") in each file of the Source Code of any copy You distribute of the Licensed Software and Your Extensions. If You create an Extension, You may add Your name as a Contributor to the Source Code and accompanying documentation along with a description of the contribution. If it is not possible to put the License Notice in a particular Source Code file due to its structure, then You must include such License Notice in a location where a user would be likely to look for such a notice.

c. User-Visible Attribution. You must duplicate any notice contained in EXHIBIT B (the "User-Visible Attribution Notice") in each user-visible display of the Licensed Software and Your Extensions which delineates copyright, ownership, or similar attribution information. If You create an Extension, You may add Your name as a Contributor, and add Your attribution notice, as an equally visible and functional element of any User-Visible Attribution Notice content. To ensure proper attribution, You must also include such User-Visible Attribution Notice in at least one location in the Software documentation where a user would be likely to look for such notice.

6.5 Additional Terms. You may choose to offer, and charge a fee for, warranty, support, indemnity or liability obligations to one or more recipients of Licensed Software. However, You may do so only on Your own behalf, and not on behalf of the Licensor or any Contributor except as permitted under other agreements between you and Licensor or Contributor. You must make it clear that any such warranty, support, indemnity or liability obligation is offered by You alone, and You hereby agree to indemnify the Licensor and every Contributor for any liability plus attorney fees, costs, and related expenses due to any such action or claim incurred by the Licensor or such Contributor as a result of warranty, support, indemnity or liability terms You offer.

6.6 Conflicts With Other Licenses. Where any portion of Your Extensions, by virtue of being Derivative Works of another product or similar circumstance, fall under the terms of another license, the terms of that license should be honored however You must also make Your Extensions available under this License. If the terms of this License continue to conflict with the terms of the other license you may write the Licensor for permission to resolve the conflict in a fashion that remains consistent with the intent of this License. Such permission will be granted at the sole discretion of the Licensor.
7.0 Versions of This License. Licensor may publish from time to time revised versions of the License. Once Licensed Software has been published under a particular version of the License, You may always continue to use it under the terms of that version. You may also choose to use such Licensed Software under the terms of any subsequent version of the License published by Licensor. No one other than Licensor has the right to modify the terms applicable to Licensed Software created under this License.

7.1 If You create or use a modified version of this License, which You may do only in order to apply it to software that is not already Licensed Software under this License, You must rename Your license so that it is not confusingly similar to this License, and must make it clear that Your license contains terms that differ from this License. In so naming Your license, You may not use any trademark of Licensor or of any Contributor. Should Your modifications to this License be limited to alteration of a) Section 13.8 solely to modify the legal Jurisdiction or Venue for disputes, b) EXHIBIT A solely to define License Notice text, or c) to EXHIBIT B solely to define a User-Visible Attribution Notice, You may continue to refer to Your License as the Reciprocal Community License or simply the RCL.

8.0 Disclaimer of Warranty. LICENSED SOFTWARE IS PROVIDED UNDER THIS LICENSE ON AN "AS IS" BASIS, WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES THAT THE LICENSED SOFTWARE IS FREE OF DEFECTS, MERCHANTABLE, FIT FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT. FURTHER THERE IS NO WARRANTY MADE AND ALL IMPLIED WARRANTIES ARE DISCLAIMED THAT THE LICENSED SOFTWARE MEETS OR COMPLIES WITH ANY DESCRIPTION OF PERFORMANCE OR OPERATION, SAID COMPATIBILITY AND SUITABILITY BEING YOUR RESPONSIBILITY. LICENSOR DISCLAIMS ANY WARRANTY, IMPLIED OR EXPRESSED, THAT ANY CONTRIBUTOR'S EXTENSIONS MEET ANY STANDARD OF COMPATIBILITY OR DESCRIPTION OF PERFORMANCE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LICENSED SOFTWARE IS WITH YOU. SHOULD LICENSED SOFTWARE PROVE DEFECTIVE IN ANY RESPECT, YOU (AND NOT THE LICENSOR OR ANY OTHER CONTRIBUTOR) ASSUME THE COST OF ANY NECESSARY SERVICING, REPAIR OR CORRECTION. UNDER THE TERMS OF THIS LICENSOR WILL NOT SUPPORT THIS SOFTWARE AND IS UNDER NO OBLIGATION TO ISSUE UPDATES TO THIS SOFTWARE. LICENSOR HAS NO KNOWLEDGE OF ERRANT CODE OR VIRUS IN THIS SOFTWARE, BUT DOES NOT WARRANT THAT THE SOFTWARE IS FREE FROM SUCH ERRORS OR VIRUSES. THIS DISCLAIMER OF WARRANTY CONSTITUTES AN ESSENTIAL PART OF THIS LICENSE. NO USE OF LICENSED SOFTWARE IS AUTHORIZED HEREUNDER EXCEPT UNDER THIS DISCLAIMER.

9.0 Limitation of Liability. UNDER NO CIRCUMSTANCES AND UNDER NO LEGAL THEORY, WHETHER TORT (INCLUDING NEGLIGENCE), CONTRACT, OR OTHERWISE, SHALL THE LICENSOR, ANY CONTRIBUTOR, OR ANY DISTRIBUTOR OF LICENSED SOFTWARE, OR ANY SUPPLIER OF ANY OF SUCH PARTIES, BE LIABLE TO ANY PERSON FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY CHARACTER INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF GOODWILL, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, OR ANY AND ALL OTHER COMMERCIAL DAMAGES OR LOSSES, EVEN IF SUCH PARTY SHALL HAVE BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION OF LIABILITY SHALL NOT APPLY TO LIABILITY FOR DEATH OR PERSONAL INJURY RESULTING FROM SUCH PARTY'S NEGLIGENCE TO THE EXTENT APPLICABLE LAW PROHIBITS SUCH LIMITATION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THIS EXCLUSION AND LIMITATION MAY NOT APPLY TO YOU.

10.0 Restricted Rights Legend. This Specification is provided with Restricted Rights. Use, duplication or disclosure by the U.S. government is subject to restrictions as set forth in (a) this Agreement pursuant to DFARs 227.7202-3(a); (b) subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARs 227.7202-3(a); or (c) the Commercial Computer Software Restricted Rights clause at FAR 52.227-19 subdivision (c)(1) and (2), as applicable. Contractor / manufacturer are the OCP Foundation, 16101 N. 82nd Street, Suite 3B, Scottsdale, AZ, 85260-1830. Responsibility for Claims. As between Licensor and Contributors, each party is responsible for claims and damages arising, directly or indirectly, out of its utilization of rights under this License which specifically disclaims warranties and limits any liability of the Licensor. This paragraph is to be used in conjunction with and controlled by the Disclaimer Of Warranties of Section 8, the Limitation Of Damages in Section 9, and the disclaimer against use for High Risk Activities in Section 10. The Licensor has thereby disclaimed all warranties and limited any damages that it or may be liable for. You agree to work with Licensor and Contributors to distribute such responsibility on an equitable basis consistent with the terms of this License including Sections 8, 9, and 10. Nothing herein is intended or shall be deemed to constitute any admission of liability.

12.0 Termination. This License and all rights granted hereunder will terminate immediately in the event the circumstances described in Section 13 or if applicable law prohibits or restricts You from fully and or specifically complying with Sections 3, 4 and/or 6, or prevents the enforceability of any of those Sections, and You must immediately discontinue any use of Licensed Software.

12.1 Automatic Termination Upon Breach. This License and the rights granted hereunder will terminate automatically if You fail to comply with the terms herein and fail to cure such breach within thirty (30) days of becoming aware of the breach. All sublicenses to the Licensed Software that are properly granted shall survive any termination of this License. Provisions that, by their nature, must remain in effect beyond the termination of this License, shall survive.

12.2 Termination Upon Assertion of Patent Infringement. If You initiate litigation by asserting a patent infringement claim (excluding declaratory judgment actions) against Licensor or a Contributor (Licensor or Contributor against whom You file such an action is referred to herein as "Respndent") alleging that Licensed Software directly or indirectly infringes any patent, then any and all rights granted by such Respondent to You under Sections 3 or 4 of this License shall terminate prospectively upon sixty (60) days notice from Respondent (the "Notice Period") unless within that Notice Period You either agree in writing (i) to pay Respondent a mutually agreeable reasonably royalty for Your past or future use of Licensed Software made by such Respondent, or (ii) withdraw Your litigation claim with respect to Licensed Software against such Respondent.

12.3 Reasonable Value of This License. If You assert a patent infringement claim against Respondent alleging that Licensed Software directly or indirectly infringes any patent where such claim is resolved (such as by license or settlement) prior to the initiation of patent infringement litigation, then the reasonable value of the licenses granted by said Respondent under Sections 3 and 4 shall be taken into account in determining the amount or value of any payment or license.

12.4 No Retroactive Effect of Termination. In the event of termination under this Section all end user license agreements (excluding licenses to distributors and resellers) that have been validly granted by You or any distributor hereunder prior to termination shall survive termination.

APPX Appendix 2 Software Licenses
13.0 Miscellaneous.


13.2 Relationship of Parties. This License will not be construed as creating an agency, partnership, joint venture, or any other form of legal association between or among You, Licensor, or any Contributor, and You will not represent to the contrary, whether expressly, by implication, appearance, or otherwise.

13.3 Independent Development. Nothing in this License will impair Licensor’s right to acquire, license, develop, subcontract, market, or distribute technology or products that perform the same or similar functions as, or otherwise compete with, Extensions that You may develop, produce, market, or distribute.

13.4 Consent To Breach Not Waiver. Failure by Licensor or Contributor to enforce any provision of this License will not be deemed a waiver of future enforcement of that or any other provision.

13.5 Severability. This License represents the complete agreement concerning the subject matter hereof. If any provision of this License is held to be unenforceable, such provision shall be reformed only to the extent necessary to make it enforceable.

13.6 Inability to Comply Due to Statute or Regulation. If it is impossible for You to comply with any of the terms of this License with respect to some or all of the Licensed Software due to statute, judicial order, or regulation, then You cannot use, modify, or distribute the software.

13.7 Export Restrictions. You may be restricted with respect to downloading or otherwise acquiring, exporting, or reexporting the Licensed Software or any underlying information or technology by United States and other applicable laws and regulations. By downloading or by otherwise obtaining the Licensed Software, You are agreeing to be responsible for compliance with all applicable laws and regulations.

13.8 Arbitration, Jurisdiction & Venue. This License shall be governed by Minnesota law provisions (except to the extent applicable law, if any, provides otherwise), excluding its conflict-of-law provisions. You expressly agree that any dispute relating to this License shall be submitted to binding arbitration under the rules then prevailing of the American Arbitration Association. You further agree that Minnesota USA is proper venue and grant such arbitration proceeding jurisdiction as may be appropriate for purposes of resolving any dispute under this License. Judgment upon any award made in arbitration may be entered and enforced in any court of competent jurisdiction. The arbitrator shall award attorney's fees and costs of arbitration to the prevailing party.

13.9 Entire Agreement. This License constitutes the entire agreement between the parties with respect to the subject matter hereof.

EXHIBIT A

The License Notice below must appear in each file of the Source Code of any copy You distribute of the Licensed Software or any Extensions thereto:

Unless explicitly acquired and licensed from Licensor under another license, the contents of this file are subject to the Reciprocal Community License (“RCL”) Version 0.9, or subsequent versions as allowed by the RCL, and You may not copy or use this file in either source code or executable form, except in compliance with the terms and conditions of the RCL.

All software distributed under the RCL is provided strictly on an "AS IS" basis, WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, AND LICENSOR HEREBY DISCLAIMS ALL SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, OR NON-INFRINGEMENT. See the RCL for specific language governing rights and limitations under the RCL.

EXHIBIT B

The User-Visible Attribution Notice below, when provided, must appear in each user-visible display as defined in Section 6.4 (c): "Portions copyright © by OPC Foundation, Inc. and licensed under the Reciprocal Community License (RCL)

[GPLv2 License]

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991
Copyright © 1989, 1991 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software— to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification"). Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of this license document, but changing it is not allowed.

0. You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.
Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License.

If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.
10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS
C++ based OPC UA Client Server SDK Bundle

This product uses C++ based OPC UA Client Server SDK Bundle.
The copyright notice of C++ based OPC UA Client Server SDK Bundle is described below.
Copyright (c) 2006-2016 Unified Automation GmbH. All rights reserved.
Appendix 3  Supported Edgecross Basic Software Version

The following table shows the version of Edgecross Basic Software supported by OPC UA Data Collector.

<table>
<thead>
<tr>
<th>OPC UA Data Collector version*1</th>
<th>Data collector version*2</th>
<th>Data collector specifications version*2</th>
<th>Edgecross Basic Software version*2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00A</td>
<td>1</td>
<td>1.00</td>
<td>1.00 or later</td>
</tr>
<tr>
<td>1.01B</td>
<td>2</td>
<td></td>
<td>1.10 or later</td>
</tr>
<tr>
<td>1.02C</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.03D or later</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 It can be checked in the screen displayed by selecting [Windows System] ⇒ [Control Panel] ⇒ [Programs] ⇒ [Programs and Features] from Windows Start.
*2 For the checking method, refer to the following:

Restrictions when using in Management Shell

The following shows restrictions for using OPC UA Data Collector in Management Shell.

Import and export

Each version has restrictions as shown below for importing or exporting a setting file.
○: Without restrictions, △: With restrictions, ×: Not available

<table>
<thead>
<tr>
<th>OPC UA Data Collector version</th>
<th>Importing a setting file in the same industrial PC as the one which exported the file</th>
<th>Importing a setting file in a different industrial PC from the one which exported the file</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00A</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>1.01B or later</td>
<td>○</td>
<td>△*1</td>
</tr>
</tbody>
</table>

*1 An error occurs in starting Management Shell since a target device setting where OPC UA 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.

Data model import and data model export

Each version has restrictions as shown below for importing and exporting a data model.
○: Without restrictions, △: With restrictions, ×: Not available

<table>
<thead>
<tr>
<th>OPC UA Data Collector version</th>
<th>Importing a data model in the same industrial PC as the one which exported the model</th>
<th>Importing a data model in a different industrial PC from the one which exported the model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.02C or earlier</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>1.03D or later</td>
<td>○</td>
<td>△*1</td>
</tr>
</tbody>
</table>

*1 An error occurs in starting Management Shell since a target device setting where OPC UA 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.
Appendix 4  Added and Changed Functions

This section shows the added and changed function of OPC UA Data Collector.

<table>
<thead>
<tr>
<th>Added/changed contents</th>
<th>Version</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Shell added in Edgecross Basic Software Ver.1.10 is supported.</td>
<td>1.01B</td>
<td>—</td>
</tr>
</tbody>
</table>
INDEX

A
Accessible Device .......................... 10

C
Client certificate .......................... 19
Collection parameter ...................... 20
Communication parameter ............... 17

D
Data collection function .................. 13
Data reading function .................... 15
Data writing function .................... 15

E
Error code list ............................. 25

F
Functional Specifications ................ 9

L
Location parameter ....................... 21

O
Operational Specifications ............... 10

T
Troubleshooting by symptom ............. 23
### REVISIONS

*The manual number is given on the bottom left of the back cover.*

<table>
<thead>
<tr>
<th>Revision date</th>
<th><em>Manual number</em></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2018</td>
<td>SH(NA)-081921ENG-A</td>
<td>First edition</td>
</tr>
<tr>
<td>May 2018</td>
<td>SH(NA)-081921ENG-B</td>
<td>Partial correction</td>
</tr>
<tr>
<td>September 2018</td>
<td>SH(NA)-081921ENG-C</td>
<td>Added or modified parts Section 6.4</td>
</tr>
<tr>
<td>March 2019</td>
<td>SH(NA)-081921ENG-D</td>
<td>Added or modified parts Chapter 3, Section 4.1, Section 4.3, Section 5.1, Section 5.2, Section 5.3, Section 6.3, Appendix 3, Appendix 4</td>
</tr>
<tr>
<td>June 2019</td>
<td>SH(NA)-081921ENG-E</td>
<td>Partial correction</td>
</tr>
<tr>
<td>December 2019</td>
<td>SH(NA)-081921ENG-F</td>
<td>Added or modified parts Section 4.1, Section 4.2, Section 6.1, Appendix 3</td>
</tr>
</tbody>
</table>

Japanese manual number: SH-081920-G

This manual confers no industrial property rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

© 2018 MITSUBISHI ELECTRIC CORPORATION
TRADEMARKS

Intel is either registered trademarks or trademarks of Intel Corporation in the United States and/or other countries.
Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies.
In some cases, trademark symbols such as "™" or "®" are not specified in this manual.
When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.