



MELSOFT

Engineering Software

MELSOFT GT OPC UA Client Operating Manual



-SW1DNN-GTOUC-MD

SAFETY PRECAUTIONS

Always read the precautions before using this product.

Also read this manual and the relevant manuals mentioned in this manual carefully, and use the product properly while paying full attention to safety.

Note that the precautions in this manual apply only to this product.

The safety precautions are divided into the following levels:  WARNING and  CAUTION.




WARNING

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



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that failure to observe  CAUTION may lead to a serious accident depending on the circumstances.

Make sure to observe both warnings and cautions to ensure personal safety.

Ensure that this manual is easily accessible to all users of this product.

[Test Operation Precautions]



WARNING

- Before testing the operation of a user-created screen (such as turning on or off a bit device, changing the current value of a word device, changing the set value or current value of a timer or counter, and changing the current value of a buffer memory), thoroughly read the manual to fully understand the operating procedure.
During the test operation, never change the data of the devices which are used to perform significant operation for the system.
Doing so may cause an accident due to an incorrect output or malfunction.
-

CONSIDERATIONS FOR USING THIS SOFTWARE

Memory capacity of your personal computer

Windows may terminate running processes on a personal computer with less than 512 MB of memory.

Use MELSOFT GT OPC UA Client on a personal computer with at least 512 MB of memory.

Required amount of virtual memory on the hard disk

MELSOFT GT OPC UA Client requires at least 100 MB of virtual memory on the hard disk while it is running.

If the amount of virtual memory is less than 100 MB while MELSOFT GT OPC UA Client is running, Windows may terminate running processes.

Make sure that there is enough virtual memory on the hard disk to use MELSOFT GT OPC UA Client.

When there is little virtual memory on the hard disk, save your project frequently.

Error message displayed when this software is started or while it is running

MELSOFT GT OPC UA Client checks the amount of available memory space when:

- MELSOFT GT OPC UA Client is started.
- Obtaining tag information.
- Saving tag information.

When the amount of virtual memory is less than 100 MB, the following message appears.

[Operation will be terminated because of insufficient memory. Would you like to stop?]

To stop the operation, click [Yes]. (MELSOFT GT OPC UA Client will not close.)

To continue the operation, click [No].

In this case, exit some running applications or restart Windows to free up memory.

Screen settings in Windows

Do not change the Windows font size from the default. Otherwise, dialogs or other on-screen items may appear improperly.

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RELEVANT MANUALS

The following shows the manuals relevant to this product.
If you need the printed manuals, consult your local sales office.

Manuals

■Screen design software-related manuals

Manual name	Manual number (Model code)	Format
GT Designer3 (GOT2000) Screen Design Manual	SH-081220ENG (1D7ML9)	PDF e-Manual

■GT SoftGOT2000 manuals

Manual name	Manual number	Format
GT SoftGOT2000 Version1 Operating Manual	SH-081201ENG	PDF e-Manual



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

e-Manual has the following features:

- 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 the engineering tool.

ABBREVIATIONS AND GENERIC TERMS

The following shows the abbreviations and generic terms used in this manual.

Software

■Software related to GOT

Abbreviations and generic terms	Description
GT Designer3	Screen design software for GOT2000 series included in GT Works3
GT OPC UA Client	MELSOFT GT OPC UA Client (SW1DNN-GTOUC-MD)
GT SoftGOT2000	GOT2000 compatible HMI software GT SoftGOT2000

Terminology

The following shows the terms in this manual unless otherwise specified.

Term	Description
OPC	Abbreviation of OLE for Process Control. An interoperability standard for the secure and reliable exchange of data in the industrial automation space and in other industries.
OPC UA	Abbreviation of OPC Unified Architecture. A platform independent service-oriented architecture that integrates all the functionality of the individual OPC Classic specifications into one extensible framework.
OPC UA tag	A tag that is used to access the device data of a controller from an OPC UA client.
Tag information	Information that includes the names, configuration, and data types of OPC UA tags.
Endpoint	A server or client that is connected at the end of a network. It can be a personal computer or OPC UA server.
Server certificate	A digital certificate for authenticating a server with SSL authentication. It is used for encrypting data transmitted between GT OPC UA Client and an OPC UA server, and for mutual authentication between them.
Client certificate	A digital certificate for authenticating a client with SSL authentication. It is used for encrypting data transmitted between GT OPC UA Client and an OPC UA server, and for mutual authentication between them.

1 INTRODUCTION

Thank you for downloading MELSOFT GT OPC UA Client.

This manual explains the overview, specifications, installation and uninstallation procedures, and basic usage of MELSOFT GT OPC UA Client (hereafter called "GT OPC UA Client").

Before using the product, read this manual carefully and make sure you understand the functions and performance of GT OPC UA Client for correct use.

To obtain the latest version of GT OPC UA Client, contact your local sales office.

1.1 Features

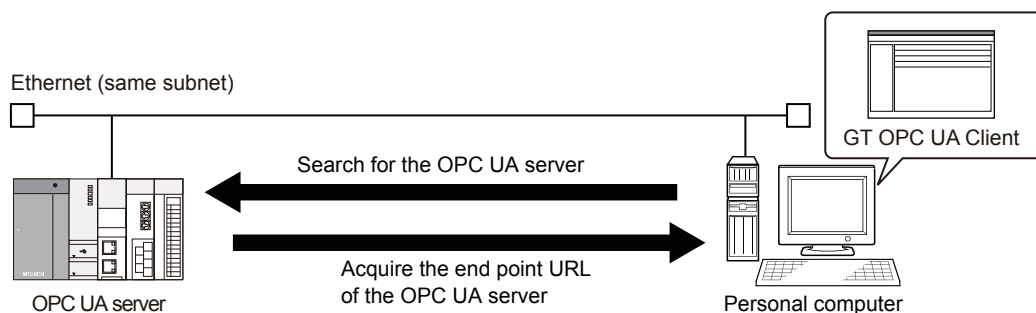
The following shows the features of GT OPC UA Client.

Settings for connecting to an OPC UA server

In GT OPC UA Client, you can configure settings to connect the personal computer and an OPC UA server.

You can search for an OPC UA server and obtain the endpoint URL of the server if the following conditions are satisfied.

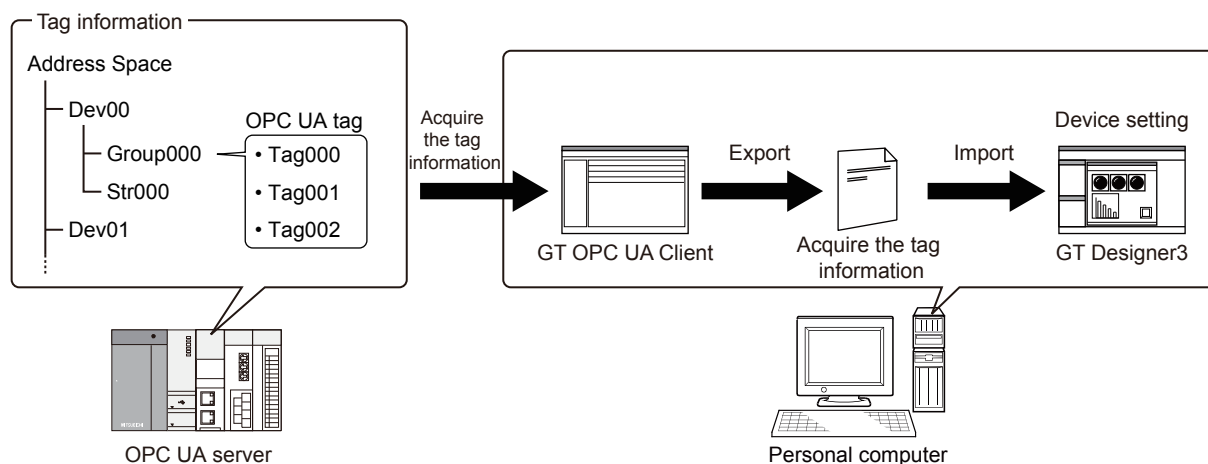
- A personal computer on which GT OPC UA Client is installed and an OPC UA server are on the same subnet.
- GT OPC UA Client and an OPC UA server are installed on the same personal computer.



Collectively reading tag information

GT OPC UA Client collectively obtains tag information from an OPC UA server and exports the information to a tag information file.

By importing the tag information file to GT Designer3, you can specify OPC UA tags as devices monitored by GT SoftGOT2000.

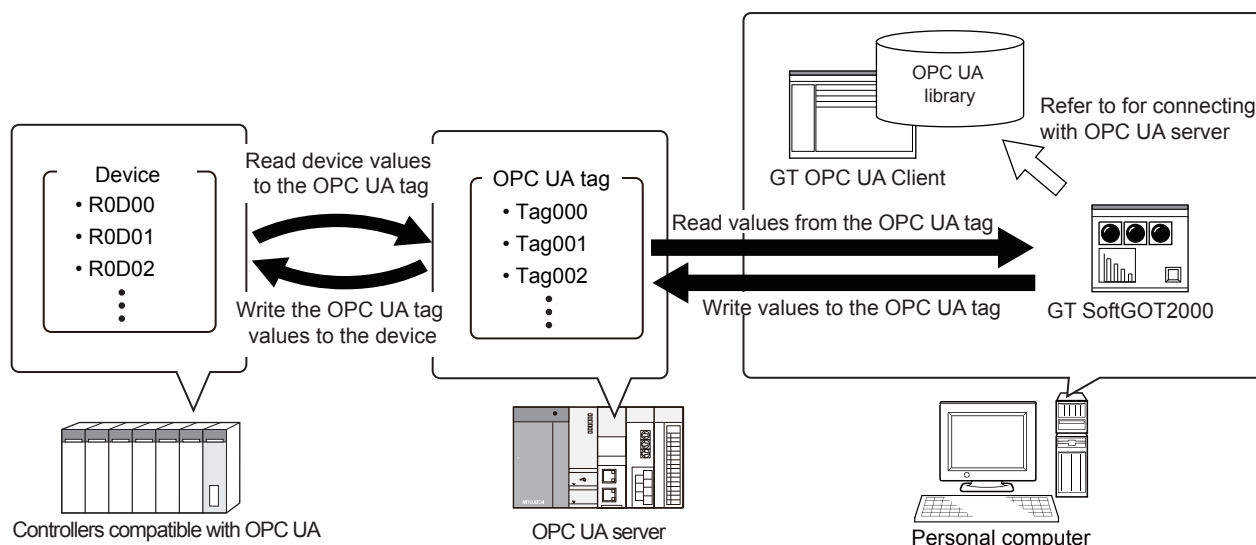


OPC UA library

GT OPC UA Client has an OPC UA library to connect GT SoftGOT2000 and OPC UA servers.

To connect GT SoftGOT2000 to an OPC UA server, install GT OPC UA Client on the personal computer on which GT SoftGOT2000 resides.

Once GT SoftGOT2000 connects to an OPC UA server, GT SoftGOT2000 can read data collected by the server or write data through the server.



2 SPECIFICATIONS

The following shows the specifications of GT OPC UA Client.

2.1 Operating Environment

The following shows the operating environment for GT OPC UA Client.

Item	Description
Model	Windows-compatible personal computer
OS (English version) *1*2*3*4*5*6	<ul style="list-style-type: none">• Microsoft Windows 11 Education (64 bit)• Microsoft Windows 11 Enterprise (64 bit)• Microsoft Windows 11 Pro (64 bit)• Microsoft Windows 11 Home (64 bit)• Microsoft Windows 10 Enterprise (32 bit, 64 bit)• Microsoft Windows 10 Pro (32 bit, 64 bit)• Microsoft Windows 10 Home (32 bit, 64 bit)• Microsoft Windows 10 IoT Enterprise 2016 LTSB (64 bit) (English OPK, or English OPK and a language pack for localization)
CPU	<ul style="list-style-type: none">• Windows 11: 64 bit-compatible processor with dual-core or more or System on a Chip (SoC)• Windows 10: Intel Core 2 Duo Processor 2.0 GHz or more recommended
Memory	<ul style="list-style-type: none">• For Windows 11: 4 GB or more recommended• For 64-bit Windows 10: 2 GB or more recommended• For 32-bit Windows 10: 1 GB or more recommended
Display	Resolution: XGA (1024 × 768 dots) or higher
Hard disk space	<ul style="list-style-type: none">• For installation: 5 GB or more recommended• For execution: 512 MB or more recommended
Display color	High Color (16 bits) or higher
Other software applications	To display PDF manuals, the following software application must be installed. <ul style="list-style-type: none">• Adobe Reader⁷ or later recommended ^{*7}
Other hardware devices	Use the hardware compatible with the above OS. <ul style="list-style-type: none">• For installation: Mouse, keyboard, and DVD drive• For execution: Mouse and keyboard

*1 For installation, administrator privileges are required.

For startup, the standard user or administrator account is required.

To use GT OPC UA Client with another application that runs with administrator privileges, run GT OPC UA Client with administrator privileges.

*2 The following functions are not supported.

Application start in Windows compatibility mode

Fast user switching

Change your desktop themes (fonts)

Remote desktop

Setting the size of text and illustrations on the screen to any size other than [Small-100%]

*3 Operation is not supported in an environment with the text cursor indicator turned on.

*4 A virtual environment such as Hyper-V is not supported.

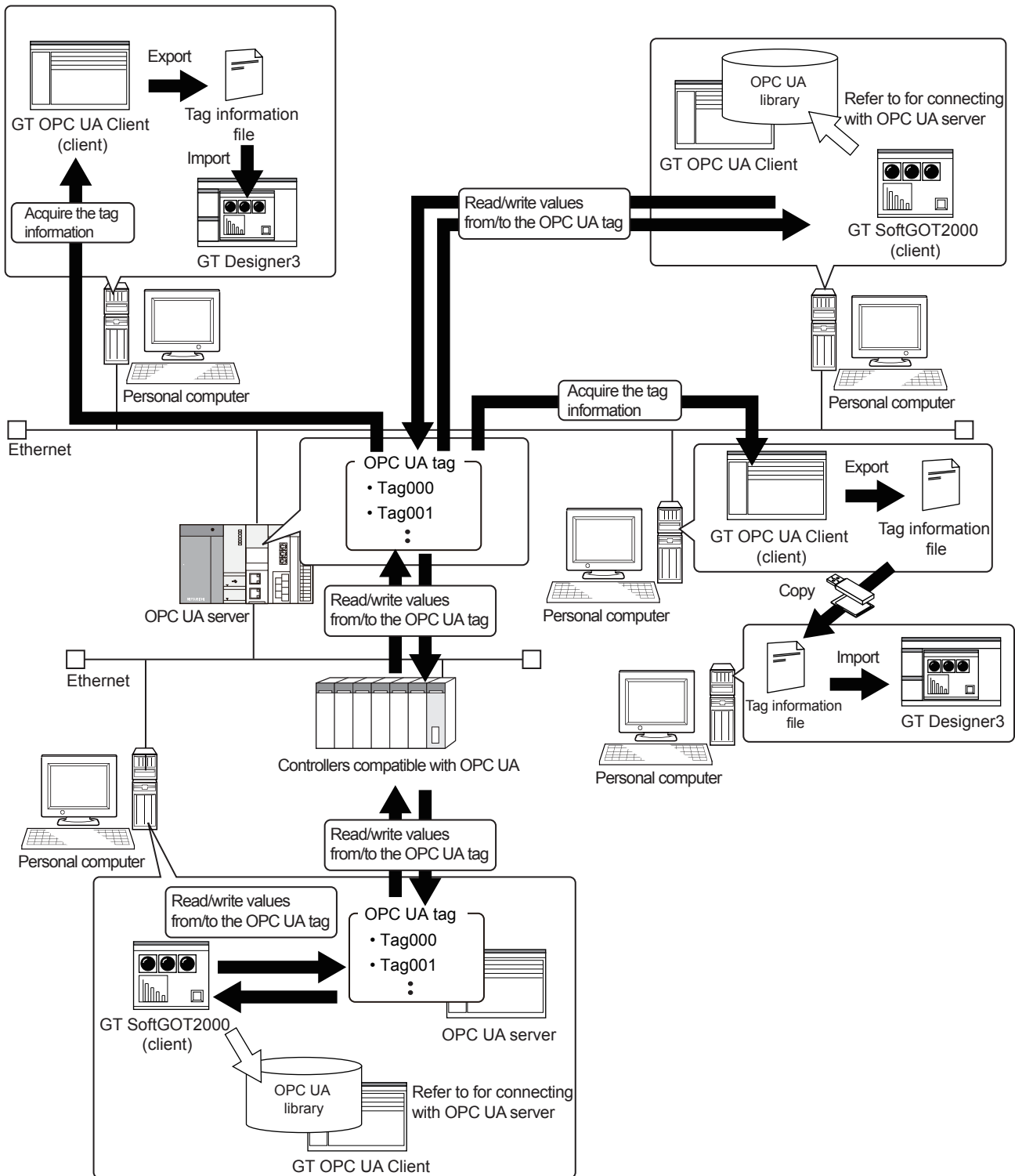
*5 Tablet mode is not supported.

*6 Unified Write Filter is not supported.

*7 Change [Current Default] for [.pdf] from [Reader] to [Adobe Reader] using the Windows Control Panel.

2.2 System Architecture

The following shows the architecture of the system when GT OPC UA Client is used.



2.3 Required Software

The following shows the software required to use GT OPC UA Client.

Software	Version
GT Designer3	Version 1.215Z or later
GT SoftGOT2000	

2.4 OPC UA Servers

The number of connectable clients depends on the specifications of OPC UA servers.

A client can be GT OPC UA Client or GT SoftGOT2000.

The following shows the specifications of OPC UA servers accessible by GT OPC UA Client.

Specifications

Item	Specifications
Version	OPC UA 1.03 or later
Required service set	<p>The following OPC UA service sets are required.</p> <ul style="list-style-type: none"> • Discovery Service Set • SecureChannel Service Set • Session Service Set • View Service Set • Attribute Service Set

Recommended servers

For recommended OPC UA servers, refer to the following Technical Bulletin.

 List of OPC UA Servers Validated to Operate with the GOT2000 Series (GOT-A-0137)

For the Technical Bulletin, refer to the MITSUBISHI ELECTRIC FA Global Website.

www.MitsubishiElectric.com/fa

2.5 Tag Information

The structure of tag information depends on the OPC UA server to be used.

For the details of tag information, refer to the following.

 OPC UA server manual

For tag information files that can be imported to GT Designer3 and the details of OPC UA tags, refer to the following.

 GT Designer3 (GOT2000) Screen Design Manual

3 INSTALLATION AND UNINSTALLATION

The following explains the installation and uninstallation of GT OPC UA Client.

3.1 Installation

Precautions before installation

■User login privileges

Log in to your personal computer with the administrator account.

If you log in with an account other than the administrator account, you cannot install GT OPC UA Client.

■Exiting running software applications

Before installing GT OPC UA Client, exit all running software applications.

If you install GT OPC UA Client while other software applications are running, GT OPC UA Client may not run properly.

■Turning off automatic updating in Windows

Turn off automatic updating in Windows, and then install GT OPC UA Client.

If Windows checks for updates during installation of GT OPC UA Client, the software installer may not operate properly.

■Disabling the compatibility mode

Disable the compatibility mode in Windows.

Otherwise, the installation of GT OPC UA Client will fail.

■Unusable characters and strings

The following characters and strings cannot be used to specify the installation destination folder.

- / * < > | : ;
- Windows reserved words (COM0 to COM9, LPT0 to LPT9, AUX, CON, PRN, NUL, and CLOCK\$)

■Folder that cannot be specified as the installation destination

The [Documents] folder cannot be specified as the install destination.

■Running Windows Update

Run Windows Update in advance to update your personal computer.

Otherwise, the installation may fail.

Procedure

The following shows how to install GT OPC UA Client.

1. Unzip the file downloaded from the MITSUBISHI ELECTRIC FA Global Website, and run setup.exe.
 2. In the setup wizard, follow the on-screen instructions to install the software.
 3. When the installation is complete, click the [Finish] button to exit the installer.
- If Windows needs to be restarted, click the [Finish] button, and then restart Windows.

3.2 Uninstallation

Precautions before uninstallation

■Exiting GT OPC UA Client

While GT SoftGOT2000 or GT OPC UA Client is running, you cannot uninstall GT OPC UA Client.

Exit GT OPC UA Client before uninstallation.

Procedure

The following shows how to uninstall GT OPC UA Client.

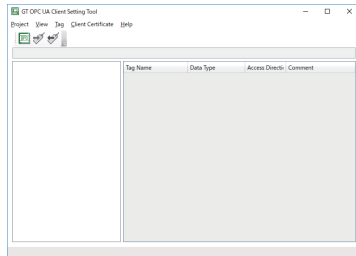
1. Open [Control Panel], select [Programs and Features], select and right-click [GT OPC UA Client Setting Tool], and select [Uninstall].
2. Follow the on-screen instructions to uninstall the software.
3. Click the [Finish] button to complete the uninstallation.

4 OPERATING PROCEDURE

The following outlines how to obtain tag information from an OPC UA server and export the information to a tag information file.

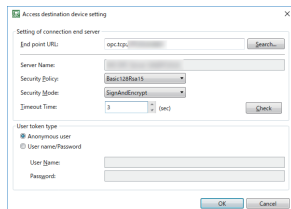
1. Start GT OPC UA Client.

Page 15 Starting GT OPC UA Client



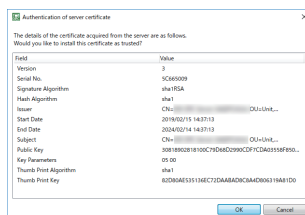
2. Connect GT OPC UA Client to an OPC UA server.

Page 16 Connecting GT OPC UA Client to an OPC UA Server

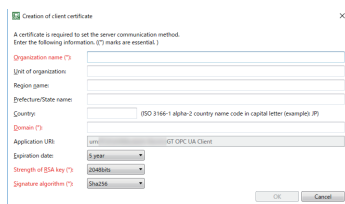


3. Establish a trust relation between GT OPC UA Client and the OPC UA server using their certificates as necessary.

Page 21 Verifying a server certificate in GT OPC UA Client

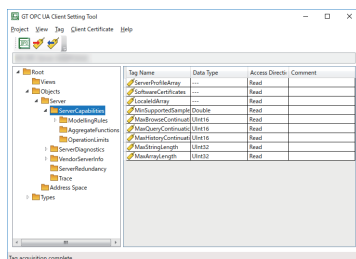


Page 21 Verifying a client certificate on an OPC UA server



4. Obtain tag information from the OPC UA server.

Page 24 Obtaining tag information



5. Export the information to a tag information file.

Page 25 Exporting tag information

6. Import the exported tag information file to GT Designer3.

For details on how to import the file, refer to the following.

 GT Designer3 (GOT2000) Screen Design Manual

To start GT OPC UA Client from GT Designer3 and obtain tag information from an OPC UA server, refer to the following.

 Page 26 STARTING GT OPC UA Client FROM GT Designer3


4.1 Starting and Exiting GT OPC UA Client

The following shows how to start and exit GT OPC UA Client.

Starting GT OPC UA Client

To start GT OPC UA Client, select [Start] → [MELSOFT] → [GT OPC UA Client Setting Tool].

To change the display language, refer to the following.

 Page 30 CHANGING THE DISPLAY LANGUAGE

Exiting GT OPC UA Client

To exit GT OPC UA Client, perform one of the following operations.

- Select [Project] → [Exit] in the main window.
- Click the [×] button on the title bar.

4.2 Connecting GT OPC UA Client to an OPC UA Server

The following explains connecting GT OPC UA Client to an OPC UA server.

Connecting GT OPC UA Client to an OPC UA server

The following shows how to connect GT OPC UA Client to an OPC UA server.

1. In the main window, select [Project] → [Access destination device setting] from the menu to display the [Access destination device setting] dialog.

 Page 17 [Access destination device setting] dialog


2. Set the following items.


- [End point URL]
- [Security Policy]
- [Security Mode]
- [Timeout Time]

3. Click the [Check] button to send a connection request from GT OPC UA Client to the OPC UA server.

If the settings are configured correctly, and a trusted server certificate and client certificate exist, the server name obtained from the OPC UA server appears in [Server Name].

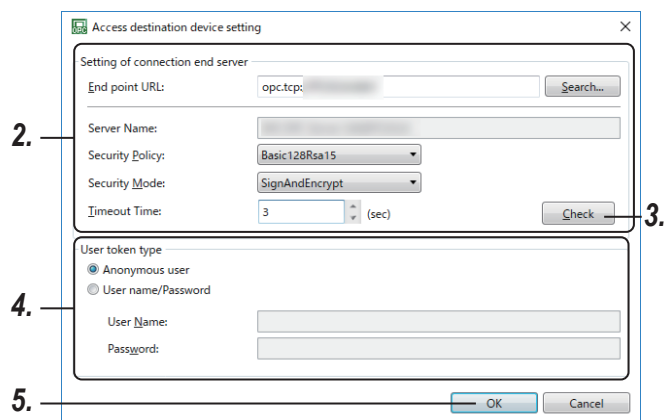
To verify the server certificate or create a client certificate, refer to the following.

 Page 21 Verifying a server certificate in GT OPC UA Client

 Page 21 Verifying a client certificate on an OPC UA server

4. Set [User token type].

5. Click the [OK] button to establish connection between GT OPC UA Client and the OPC UA server.



[Access destination device setting] dialog

The following shows the setting items in the [Access destination device setting] dialog.

Point

You can save the access destination device settings to a setting file (*.gtpm).

The file (*.gtpm) is readable with GT OPC UA Client on other computers.

For information on how to save the settings to a setting file (*.gtpm) and read the file, refer to the following.

☞ Page 19 Saving access destination device settings to a file

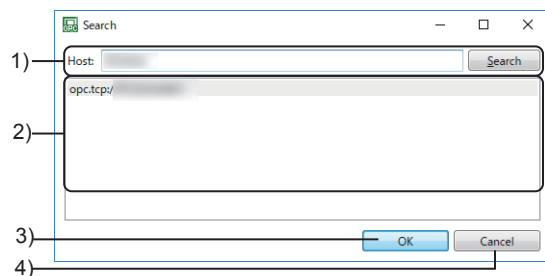
☞ Page 19 Reading access destination device settings from a setting file

No.	Item	Description
1)	[End point URL]	Set the endpoint URL of the OPC UA server. Up to 1024 characters can be entered directly. Click the [Search] button to search for OPC UA servers on the host or subnet on which GT OPC UA Client resides. *1 ☞ Page 18 [Search] dialog
2)	[Server Name]	Displays the OPC UA server name.
3)	[Security Policy]	Select a security policy for communication. Set this item according to the setting of the OPC UA server to be connected. <ul style="list-style-type: none"> • [None] Does not encrypt messages. • [Basic128Rsa15] Uses 128-bit encryption. • [Basic256] Uses 256-bit encryption. • [Basic256Sha256] Uses digital signing and 256-bit encryption.
4)	[Security Mode]	Set whether to digitally sign or encrypt messages. Set this item according to the setting of the OPC UA server to be connected. <ul style="list-style-type: none"> • [None] Does not encrypt messages. • [Sign] Digitally signs messages. • [SignAndEncrypt] Digitally signs and encrypts messages.
5)	[Timeout Time]	Set a time-out period to connect to the server. The setting range is [1] second to [30] seconds.
6)	[Check] button	Checks the settings in [Setting of connection end server] and the presence or absence of a trusted server certificate and client certificate. <ul style="list-style-type: none"> • If the settings are configured correctly, and a trusted server certificate and client certificate exist, the server name obtained from the OPC UA server appears in [Server Name]. • If no trusted server certificate exists, the [Authentication of server certificate] dialog appears. ☞ Page 19 [Authentication of server certificate] dialog After verifying the server certificate, click the [Check] button again to display the server name obtained from the OPC UA server in [Server Name]. • If no client certificate exists, the [Creation of client certificate] dialog appears. ☞ Page 22 [Creation of client certificate] dialog After creating a client certificate, click the [Check] button again to display the server name obtained from the OPC UA server in [Server Name].

No.	Item	Description
7)	[User token type]	Select a user authentication method. <ul style="list-style-type: none"> • [Anonymous user] Performs an anonymous login. • [User name/Password] Authenticates users with a user name and password. Select this item, and set [User Name] and [Password].
8)	[OK] button	Connects GT OPC UA Client to the OPC UA server, and closes the [Access destination device setting] dialog.
9)	[Cancel] button	Cancels the settings, and closes the [Access destination device setting] dialog.

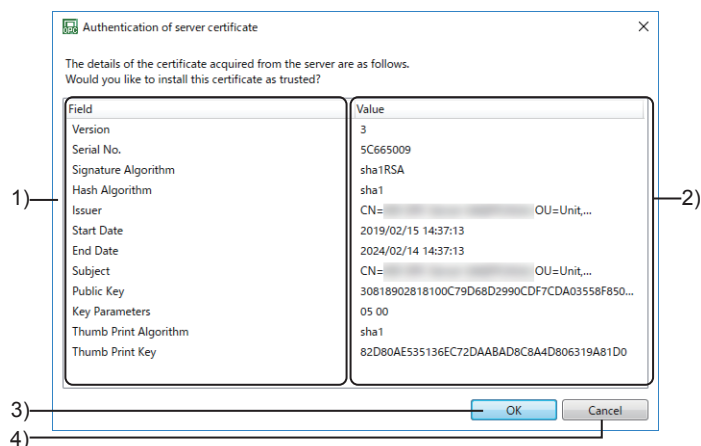
*1 Some OPC UA servers cannot be searched for in the [Search] dialog depending on their types.

■[Search] dialog



No.	Item	Description
1)	[Host]	Enter all or part of a host name and click the [Search] button to display the search results in the endpoint URL list.
2)	Endpoint URL list	Lists the endpoint URLs of the OPC UA servers found. Select the endpoint URL of the OPC UA server to be connected.
3)	[OK] button	Reflects the selected endpoint URL to the [Access destination device setting] dialog, and closes the [Search] dialog.
4)	[Cancel] button	Closes the [Search] dialog.

■[Authentication of server certificate] dialog



No.	Item	Description
1)	[Field]	Displays the fields in the server certificate.
2)	[Value]	Displays the values obtained from the server certificate.
3)	[OK] button	Installs the server certificate as trusted, and closes the [Authentication of server certificate] dialog.
4)	[Cancel] button	Does not install the server certificate, and closes the [Authentication of server certificate] dialog.

Saving access destination device settings to a file

You can save access destination device settings to a setting file (*.gtpm).

The file (*.gtpm) is readable with GT OPC UA Client on other computers.

The following shows how to save the access destination device settings to a setting file (*.gtpm).

1. In the main window, select [Project] → [Save as Access destination device setting] from the menu to display the [Save as Access destination device setting] dialog.
2. Specify where to save a setting file, a file type and a file name, and click the [Save] button to save the settings to the setting file (*.gtpm).

Reading access destination device settings from a setting file

You can read access destination device settings from a setting file (*.gtpm).

The following shows how to read access destination device settings from a setting file (*.gtpm).

1. In the main window, select [Project] → [Open Access destination device setting] from the menu to display the [Open Access destination device setting] dialog.
2. Specify the location of a setting file, file type and file name, and click the [Open] button to open the file.
3. Connect GT OPC UA Client to an OPC UA server in the [Access destination device setting] dialog.

☞ Page 17 [Access destination device setting] dialog

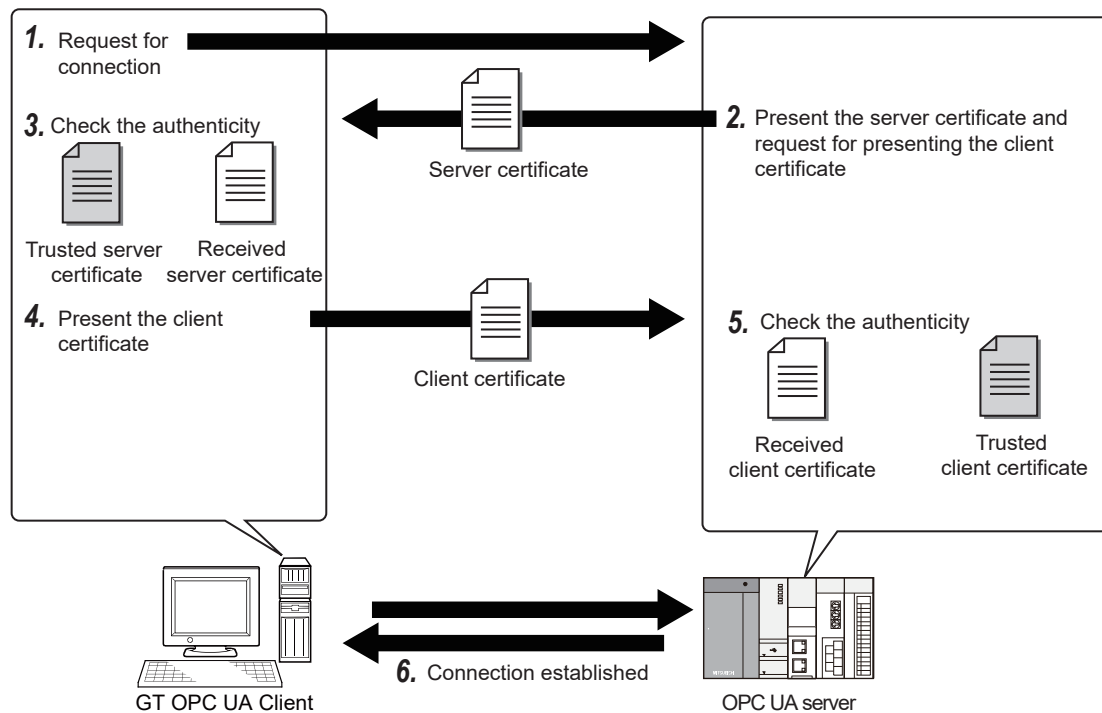
4.3 Mutually Authenticating a Client and Server Using Their Certificates

The following explains how to mutually authenticate GT OPC UA Client and an OPC UA server using their certificates.

Overview of client certificates and server certificates

A client certificate and a server certificate are digital certificates that are used to mutually authenticate GT OPC UA Client and an OPC UA server and to encrypt data.

To connect GT OPC UA Client to an OPC UA server, they need to trust their certificates each other.



1. In the [Access destination device setting] dialog in GT OPC UA Client, click the [Check] button to send a connection request to an OPC UA server.

 Page 17 [Access destination device setting] dialog

2. The OPC UA server sends its certificate to GT OPC UA Client and requests a client certificate.
3. GT OPC UA Client compares the received server certificate and the certificate stored in advance for verification.
4. GT OPC UA Client sends its certificate to the OPC UA server.
5. The OPC UA server compares the received client certificate and the certificate stored in advance for verification.
6. GT OPC UA Client and the OPC UA server are connected.


Verifying a server certificate in GT OPC UA Client

You can obtain a server certificate and verify the certificate in the [Access destination device setting] dialog when configuring access destination device settings.

 Page 17 [Access destination device setting] dialog

If GT OPC UA Client does not have a trusted server certificate, verify a server certificate in the following procedure.

1. In the [Access destination device setting] dialog, click the [Check] button to display the [Authentication of server certificate] dialog.

 Page 19 [Authentication of server certificate] dialog

2. Click the [OK] button to verify the server certificate.

Verifying a client certificate on an OPC UA server

The authentication method differs depending on the OPC UA server.

Connecting to an OPC UA server that supports automatic verification of client certificates

When you send a connection request to a server in the [Access destination device setting] dialog, the client certificate is verified.

 Page 17 [Access destination device setting] dialog


■When a valid client certificate exists in GT OPC UA Client

Click the [Check] button in the [Access destination device setting] dialog to verify the client certificate on the OPC UA server.

■When a valid client certificate does not exist in GT OPC UA Client

1. Click the [Check] button in the [Access destination device setting] dialog to display the [Creation of client certificate] dialog.

Refer to the following, and create a client certificate.

 Page 22 [Creation of client certificate] dialog

2. Click the [Check] button again in the [Access destination device setting] dialog to verify the client certificate on the OPC UA server.

Connecting to an OPC UA server that does not support automatic verification of client certificates

Copy the client certificate to an OPC UA server, and verify the certificate on the server.

The following shows how to verify a client certificate on the OPC UA server.

1. Create a client certificate in GT OPC UA Client.

 Page 22 Creating a client certificate


2. Export the client certificate.

 Page 23 Exporting a client certificate

3. Copy the client certificate to the OPC UA server, and verify the certificate.

The method of manually verifying a client certificate differs depending on the OPC UA server.

For the details of the verification method, refer to the following.

 OPC UA server manual

Creating a client certificate

Create a client certificate if a valid client certificate does not exist in GT OPC UA Client.
You do not need to create a client certificate every time GT OPC UA Client connects to an OPC UA server.
The following shows how to create a client certificate.

1. In the main window, select [Client Certificate] → [Create] from the menu to display the [Creation of client certificate] dialog.
2. Enter the information of a client certificate.
Setting [Organization name], [Domain], [Strength of RSA key], and [Signature algorithm] is mandatory.
If these fields are not set, a client certificate cannot be created.
3. Click the [OK] button to create a client certificate and security key in the following folders.
Client certificate: C:\Users\ (User name) \AppData\Roaming\MELSOFT GT OPC UA Client Setting Tool\PKI\certs
Security key: C:\Users\ (User name) \AppData\Roaming\MELSOFT GT OPC UA Client Setting Tool\PKI\private

[Creation of client certificate] dialog

Creation of client certificate

A certificate is required to set the server communication method.
Enter the following information. (*) marks are essential.)

1) Organization name (*):

2) Unit of organization:

3) Region name:

4) Prefecture/State name:

5) Country: (ISO 3166-1 alpha-2 country name code in capital letter (example): JP)

6) Domain (*):

7) Application URI:

8) Expiration date:

9) Strength of RSA key (*):

10) Signature algorithm (*):

11) 12)

No.	Item	Description
1)	[Organization name]	Specify an organization name within 256 characters. This setting is mandatory.
2)	[Unit of organization]	Specify an organization unit within 256 characters.
3)	[Region name]	Specify a region name within 256 characters.
4)	[Prefecture/State name]	Specify a prefecture or state name within 256 characters.
5)	[Country]	Specify a country with its ISO 3166-1 alpha-2 code. Up to two one-byte alphanumeric characters can be entered. Example) Japan: JP
6)	[Domain]	Specify a domain within 16 characters. This setting is mandatory.
7)	[Application URI]	Displays the application URI. *1
8)	[Expiration date]	Set the expiration date of the client certificate. <ul style="list-style-type: none">• [1 hour]• [1 day]• [1 week]• [1 month]• [1 year]• [2 year]• [3 year]• [4 year]• [5 year]• [10 year]• [20 year]
9)	[Strength of RSA key]	Set the strength of the RSA key.*2 Set this item according to the setting of the OPC UA server to be connected. This setting is mandatory. <ul style="list-style-type: none">• [1024bits]• [2048bits]• [3072bits]• [4096bits]

No.	Item	Description
10)	[Signature algorithm]	Set a signature algorithm. Set this item according to the setting of the OPC UA server to be connected. This setting is mandatory. • [Sha1] [Sha256]
11)	[OK] button	Creates a client certificate and security key, and closes the dialog.
12)	[Cancel] button	Cancels the settings and closes the dialog.

*1 The application URI identifies its OPC UA client.

*2 The RSA key is a pair of a public key and a private key used in public-key cryptosystems.

Exporting a client certificate

The following shows how to export a client certificate.

1. In the main window, select [Client Certificate] → [Copy] from the menu to display the [Export Client Certificate] dialog.
2. Specify where to save a client certificate, a file type and a file name, and click the [Save] button to export the certificate to a file (*.der).

4.4 Obtaining Tag Information and Exporting the Information

Obtain tag information from an OPC UA server and export the information to a tag information file (*.gtuc).

If you import the tag information file (*.gtuc) to GT Designer3, you can specify OPC UA tags as devices.

The following shows how to export tag information to a file (*.gtuc).

1. Obtain tag information from an OPC UA server.

☞ Page 24 Obtaining tag information

2. Export the information to a tag information file (*.gtuc).

☞ Page 25 Exporting tag information

Obtaining tag information

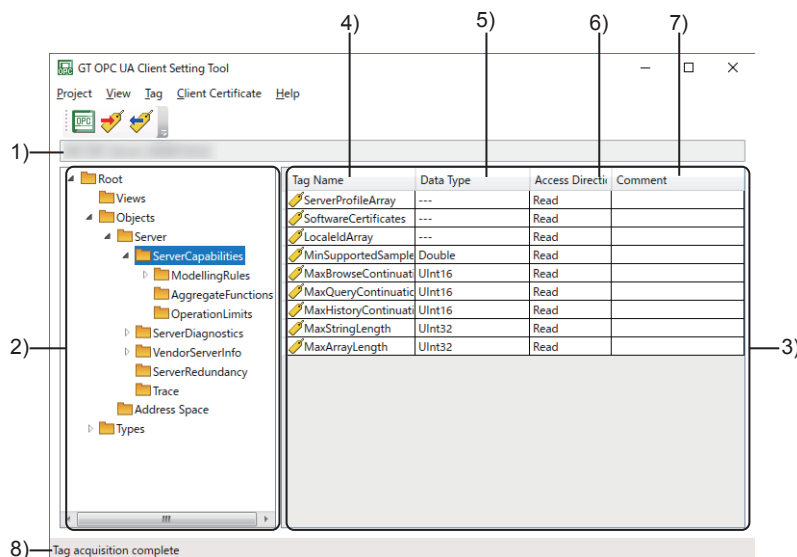
The following shows how to obtain tag information with GT OPC UA Client.

1. Connect GT OPC UA Client to an OPC UA server in the [Access destination device setting] dialog.


☞ Page 16 Connecting GT OPC UA Client to an OPC UA Server

2. In the main window, select [Tag] → [Import Tags] from the menu to obtain tag information from the OPC UA server.

Main window



No.	Item	Description
1)	Server name	Displays the OPC UA server name.
2)	Tag information tree	Displays the tag information obtained from the OPC UA server in the tree structure. Select a folder to list the OPC UA tags in the folder in the tag list.
3)	Tag list	Displays the OPC UA tags in a list.
4)	[Tag Name]	Displays the OPC UA tag names.

No.	Item	Description
5)	[Data Type]	<p>Displays the data types of the OPC UA tags.</p> <ul style="list-style-type: none"> • [Boolean]: Bit • [SByte]: Signed 8-bit integer • [Byte]: Unsigned 8-bit integer • [Int16]: Signed 16-bit integer • [UInt16]: Unsigned 16-bit integer • [Int32]: Signed 32-bit integer • [UInt32]: Unsigned 32-bit integer • [Int64]: Signed 64-bit integer • [UInt64]: Unsigned 64-bit integer • [Float]: Single-precision real number • [Double]: Double-precision real number • [String]: Character string • [---]: Data type that is not supported by GT Designer3 <p>Some OPC UA tags listed cannot be used in GT Designer3. For the OPC UA tags usable in GT Designer3, refer to the following.  GT Designer3 (GOT2000) Screen Design Manual</p>
6)	[Access Direction]	<p>Displays the access permissions of the OPC UA tags.</p> <ul style="list-style-type: none"> • [Read]: Reading permitted only • [Write]: Writing permitted only • [Read, Write]: Reading and writing permitted
7)	[Comment]	Displays the comments for the OPC UA tags.
8)	Status bar	Displays the current status.

Exporting tag information

The following shows how to export tag information.

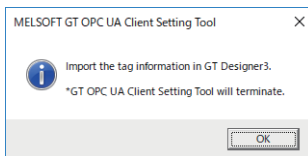
1. In the main window, select [Tag] → [Export Tags] from the menu to display the [Export Tags] dialog.
2. Specify where to save tag information, a file type and a file name, and click the [Save] button to save the tag information to a tag information file (*.gtuc).

5 STARTING GT OPC UA Client FROM GT Designer3

If GT Designer3 and GT OPC UA Client are installed on the same personal computer, you can start GT OPC UA Client from GT Designer3 to import tag information.

In such a case, export tag information to a file (*.gtuc) with GT OPC UA Client, and import the file to GT Designer3 in the following procedure.

- 1.** Obtain the name of the target OPC UA server in the [Access destination device setting] dialog.
☞ Page 16 Connecting GT OPC UA Client to an OPC UA Server
- 2.** Establish a trust relation between GT OPC UA Client and the OPC UA server using their certificates as necessary.
☞ Page 21 Verifying a server certificate in GT OPC UA Client
☞ Page 21 Verifying a client certificate on an OPC UA server
- 3.** In the main window, obtain tag information from the OPC UA server.
☞ Page 24 Obtaining tag information
- 4.** Export the information to a tag information file (*.gtuc).
☞ Page 25 Exporting tag information
- 5.** When the export is complete, the following dialog appears.
Click the [OK] button to send the path to the tag information file to GT Designer3 and exit GT OPC UA Client.



- 6.** Import the tag information file to GT Designer3.
For details on how to import the file, refer to the following.
☞ GT Designer3 (GOT2000) Screen Design Manual

6 EXPORTING A CLIENT CERTIFICATE FOR GT SoftGOT2000

A client certificate is required to connect GT SoftGOT2000 with an OPC UA server.

A client certificate created by GT OPC UA Client is usable for GT SoftGOT2000 to connect to an OPC UA server.

The following shows how to export a client certificate for GT SoftGOT2000.

1. In the main window, select [Client Certificate] → [Export for GT SoftGOT] from the menu to display the [Export Client Certificate for GT SoftGOT2000] dialog.
2. Specify where to save a client certificate, a file type, and a file name, and click the [Save] button to export the certificate for GT SoftGOT2000 to a file (*.gtcl).
3. Import the client certificate (*.gtcl) in the [Communication Setup] dialog of GT SoftGOT2000.

For the details of the [Communication Setup] dialog in GT SoftGOT2000, refer to the following.

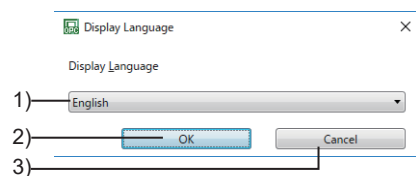
 GT SoftGOT2000 Version1 Operating Manual

7 CHANGING THE DISPLAY LANGUAGE

You can change the display language of GT OPC UA Client.
Japanese, English, and Simplified Chinese are supported.

1. In the main window, select [View] → [Switch Display Language] from the menu to display the [Switch Display Language] dialog.
2. Select a language and click the [OK] button to change the display language.

7.1 [Display Language] Dialog



No.	Item	Description
1)	[Display Language]	Select a display language.
2)	[OK] button	Changes the display language and closes the dialog.
3)	[Cancel] button	Cancels the settings and closes the dialog.

8 PRECAUTIONS


Updating the tag information

GT OPC UA Client does not collect tag information periodically.

If tag information is updated, added, or deleted on an OPC UA server, obtain the tag information with GT OPC UA Client again and update the tag information of GT Designer3.

Precautions for drawing

For the precautions for using OPC UA tags in GT Designer3, refer to the following.

 GT Designer3 (GOT2000) Screen Design Manual



9 TROUBLESHOOTING

9.1 Troubleshooting

If GT OPC UA Client does not operate properly, check the following and troubleshoot problems.

Troubleshooting problems with data collection

GT OPC UA Client cannot connect to an OPC UA server.

Check if:	Corrective action
The client certificate is trusted by the OPC UA server.	Trust the client certificate on the OPC UA server. For the details, refer to the following.  Page 21 Verifying a client certificate on an OPC UA server
A same-name client certificate is stored.	Delete the expired client certificate, and create a client certificate.
The client certificate has expired.	The client certificate is stored under the following folder path: C:\Users\<User name>\AppData\Roaming\MELSOFT GT OPC UA Client Setting Tool\PKI\certs File name: GTOPCUA.der For the details, refer to the following.  Page 22 Creating a client certificate
The host name for the endpoint URL is the same as the host name set on the server.	Check the host name in the server certificate. The server certificate is stored under the following folder path: C:\Users\<User name>\AppData\Roaming\MELSOFT GT OPC UA Client Setting Tool\PKI\trusted
The OPC UA server is on the host or subnet on which GT OPC UA Client resides.	Check the system configuration.
The firewall settings are configured correctly.	Check the firewall settings on your personal computer.

Troubleshooting problems with screen display

On-screen items appear improperly.

Check if:	Corrective action
[Change the size of text, apps, and other items] is set to 100% in Windows.	<ul style="list-style-type: none">Set [Change the size of text, apps, and other items] to 100%.In Windows 10 (version 1703 or later), the on-screen items can be rescaled to the specified percentage of normal size. ^{*1}*2 <p>(1) Select GtOpcUaClientTool.exe, and then select [Properties] from the right-click context menu. ^{*3}</p> <p>(2) On the [Compatibility] tab, select [Override high DPI scaling behavior. Scaling performed by:], and select [System] from the pull-down menu.</p> <p>(3) Click the [OK] button.</p>

*1 Check the version of Windows in the following procedure.

- (1) Hold down the Windows key and press the [R] key, or select [Windows System] → [Run] from the Windows start menu.
- (2) Enter "winver" on the [Run] screen.
- (3) Check the version on the displayed screen.

*2 Some on-screen items may appear blurry due to rescaling.

The following shows the settable values for [Change the size of text, apps, and other items] in Windows 10 and the recommended display resolution for each value.

- Value: 100%, display resolution: 1024 × 768 dots or higher
Value: 125%, display resolution: 1900 × 1200 dots or higher
Value: 150%, display resolution: 1900 × 1200 dots or higher
Value: 175%, display resolution: 2880 × 1620 dots or higher
Value: 200%, display resolution: 2880 × 1620 dots or higher
Value: 225%, display resolution: 3840 × 2160 dots or higher
Value: 250%, display resolution: 3840 × 2160 dots or higher






*3 GtOpcUaClientTool.exe is stored in the folder where GT OPC UA Client Setting Tool is installed.







The following shows an example of the location of the file.

Example) When the install destination folder is set as default
C:\Program Files\MELSOFT\GTOPCUAClient

9.2 Error Messages

The following shows the error messages that may appear when GT OPC UA Client is used.

Error message	Cause	Corrective action
Failed to acquire a server certificate. The security policy and the security mode may not be matched with those of the server.	The security policy and security mode do not match with those of the server.	Set the security policy and security mode of the OPC UA server. Multiple security policies and security modes can be set depending on the OPC UA server. Check the specifications of the server.  Page 17 [Access destination device setting] dialog
Access is denied from the server. Please check user name and password. If it is an anonymous user, please make sure that it is set to be accessible by anonymous user on the server side.	<ul style="list-style-type: none"> The user name or password is not correct. An anonymous user is selected to access the server that does not allow access from anonymous users. 	Check the user name and password.  Page 17 [Access destination device setting] dialog
Access is denied from the server. The client certificate may not be trusted by the server.	The client certificate is not trusted by the server.	Trust the client certificate on the OPC UA server.
Failed to connect to the server. Please check the following settings. <ul style="list-style-type: none"> Host Name of End point URL Server settings Communication environment 	The connection to the server has failed.	<ul style="list-style-type: none"> Check the settings of the OPC UA server. Check the following troubleshooting.  Page 34 GT OPC UA Client cannot connect to an OPC UA server. Uninstall GT OPC UA Client, and install it again. If the error recurs, contact your local sales office.
The server has reached its maximum number of sessions. Please check the number of sessions connected to the server.	The number of sessions on the server exceeds the maximum value.	Check the number of concurrent sessions on the server.
Failed to connect to the server. Please wait a while and try access again.	The server is busy.	Wait a while and try again.
[Save destination path] The client certificate cannot be created in this folder. Please check an access permission.	You do not have permission to access the folder where the client certificate is stored.	Contact the administrator and obtain the access permission.
[Save destination path] The server certificate cannot be saved in this folder. Please check an access permission.	You do not have permission to access the folder where the server certificate is stored.	Contact the administrator and obtain the access permission.
[File name] cannot be saved in the specified path. Possible causes are shown below. <ul style="list-style-type: none"> The folder path does not exist. The route drive is specified. The destination is read only. Other user is editing the destination. Memory required for save is insufficient. Medium of the specified drive is broken. The specified file name is too long. Other errors occurred during the saving process. Save the project in another drive once.	The access destination device setting cannot be saved due to disconnection of the network or other causes.	Take the following actions according to the cause. <ul style="list-style-type: none"> Check the network environment. Check the path to the save destination. Specify a folder as the save destination. Check that any data in the save destination is not being edited. Free up disk space to store the file. Check that the physical drive where the file will be saved is not broken. Change the file name.
Failed to retrieve the file. Possible causes are shown below. <ul style="list-style-type: none"> Free space of the media where the access destination device setting being saved is insufficient. File data is broken. The access destination device setting file does not exist in the specified path. 	<ul style="list-style-type: none"> The medium where the setting file (*.gtpm) is saved has insufficient free space. The setting file (*.gtpm) is corrupt. The specified path to the setting file (*.gtpm) is incorrect. 	<ul style="list-style-type: none"> Free up space on the medium where the access destination device setting file is saved. Create a setting file (*.gtpm) again.  Page 19 Saving access destination device settings to a file Specify the path where the file to be read is stored.
There is a possibility that the environment of the application is broken. Please install it again.	The registry is in one of the following states. <ul style="list-style-type: none"> The registry is nonexistent. The registry is in a state in which it cannot be read. An invalid value is set in the registry. 	Uninstall GT OPC UA Client, and install it again.  Page 12 INSTALLATION AND UNINSTALLATION

Error message	Cause	Corrective action
Failed to start tool with the display language specified at the time of previous termination. Tool will be started with the default language.	<ul style="list-style-type: none"> GT OPC UA Client has failed to start with the language specified at the time of the previous termination. GT OPC UA Client has failed to read a file when displaying the [Switch Display Language] dialog. 	<ul style="list-style-type: none"> Configure the settings in the [Switch Display Language] dialog again. Uninstall GT OPC UA Client, and install it again.
The help file cannot be found. Please install GT OPC UA Client.	The help file (PDF) does not exist.	Install GT OPC UA Client again, and try to view the help.  Page 12 INSTALLATION AND UNINSTALLATION
Failed to load client certificate. Please create the client certificate again.	Reading a client certificate has failed.	Create a client certificate again.  Page 22 Creating a client certificate
Access is denied from the server. The client certificate is expired. Please create the client certificate again.	The client certificate has expired.	Create a client certificate again.  Page 22 Creating a client certificate
Failed to get tag information. Please check the server setting.	The obtained tag information (NodeID, DisplayName, DataType, or AccessLevel) is invalid.	Check the settings of the OPC UA server.
Failed to export tag information. Please export it again.	Exporting tag information has failed.	Export tag information again.  Page 24 Obtaining Tag Information and Exporting the Information
Failed to acquire a server certificate. Please install the certificate on the server.	<ul style="list-style-type: none"> A server certificate is not installed on the connected server. The server certificate has expired. 	Install a valid server certificate on the connected server. Verify the server certificate in GT OPC UA Client afterward.  Page 21 Verifying a server certificate in GT OPC UA Client
An unexpected error occurred.	An unexpected error has occurred.	<ul style="list-style-type: none"> Check the settings of the OPC UA server. Check the following troubleshooting.  Page 34 GT OPC UA Client cannot connect to an OPC UA server. Uninstall GT OPC UA Client, and install it again. If the error recurs, contact your local sales office.

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📖 Page 37 RapidJSON

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

Print date	* Manual No.	Revisions
April 2019	SH(NA)-082174ENG-A	First edition
October 2019	SH(NA)-082174ENG-B	Partial corrections
April 2022	SH(NA)-082174ENG-C	Compatible with Windows 11
April 2023	SH(NA)-082174ENG-D	Ended: Support for Windows 8.1, Windows 8, and Windows 7
October 2024	SH(NA)-082174ENG-E	Partial corrections

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.NET based OPC UA Client SDK(binary)

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SH(NA)-082174ENG-E(2410)MEE

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