

OPC UA User Guide

OPC UA Server

This guide walks through the OPC UA usage in EasyBuilder Pro / Weintek HMI.

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1. Overview

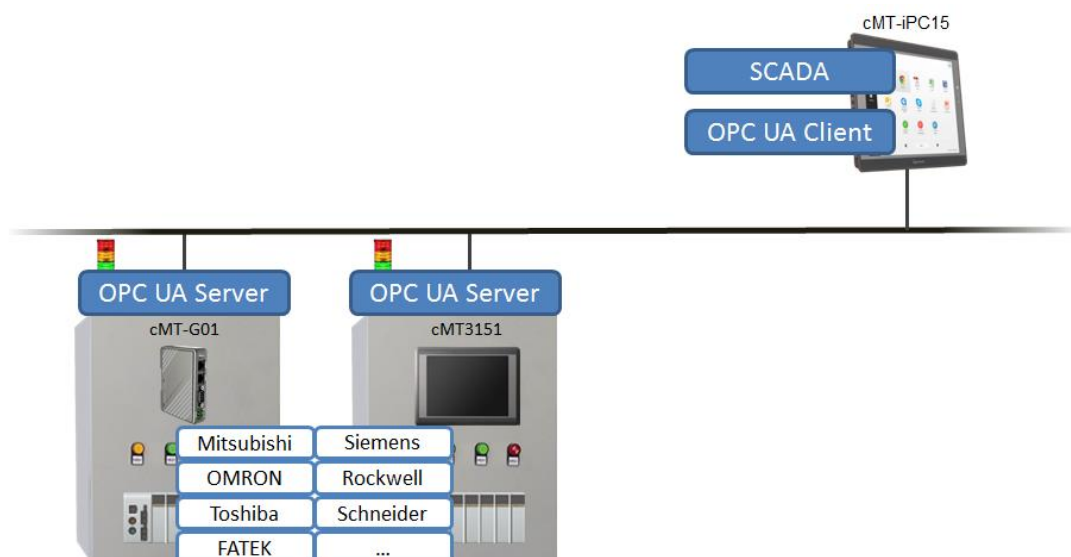
OPC UA (Unified Architecture) is a communication technology often used in industrial automation fields. OPC UA features cross-platform interoperability, unified access, standardized communication, and security. In this architecture, cMT Series HMI models with built-in OPC UA server play a key role as Communication Gateway, and allow OPC UA clients to access HMI or PLC data by subscribing to tags to receive real-time updates. This new architecture can help you achieve vertical integration.

Hardware & Software requirements:

- HMI Model: cMT Gateway Series, cMT Series, cMT X Series Advanced
For cMT-SVR, cMT-HDM, cMT-FHD and cMT-FHDX, license is required and needs to be purchased separately.
- Software: EasyBuilder Pro V5.06.01 or later
- Recommended OPC UA Client: Unified Automation UaExpert

Weintek HMI and OPC UA

The following is an example of OPC Unified Architecture. In this architecture, the user can run SCADA on cMT-iPC15 as an OPC UA client, and use it to access data in OPC UA Server (implemented on cMT Series models), to receive data updates of the PLCs connected to HMI, regardless of which PLC brand is implemented.



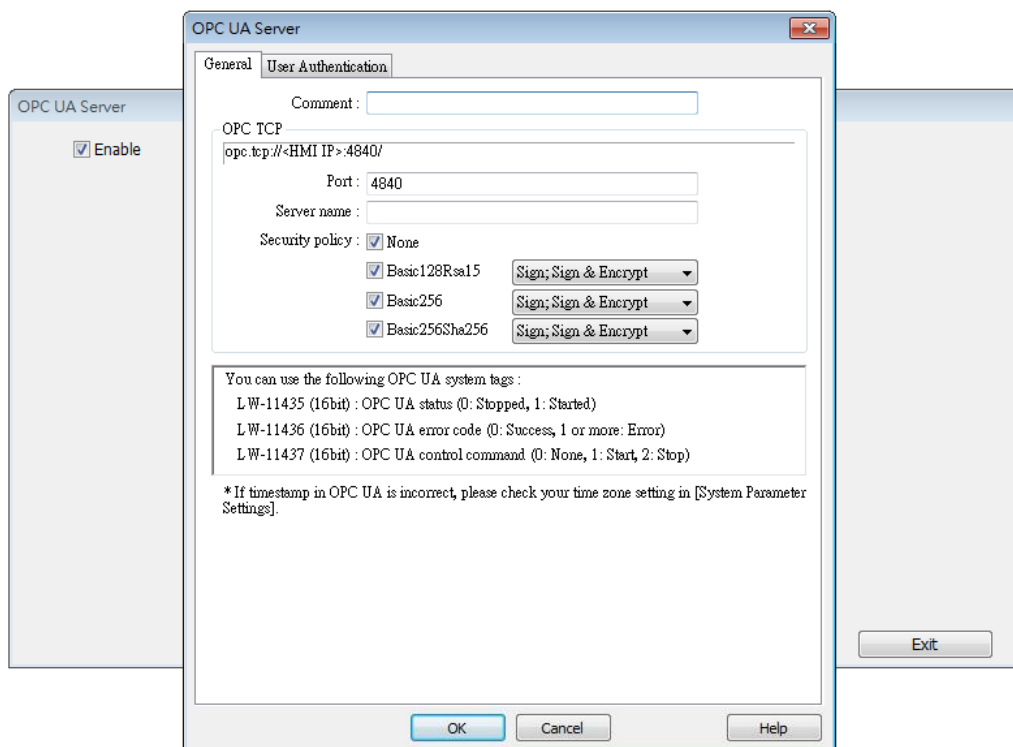
2. EasyBuilder Pro Settings

In EasyBuilder Pro, click [IIoT] » [OPC UA Server] to setup OPC UA Server in the project.

OPC UA Server Settings

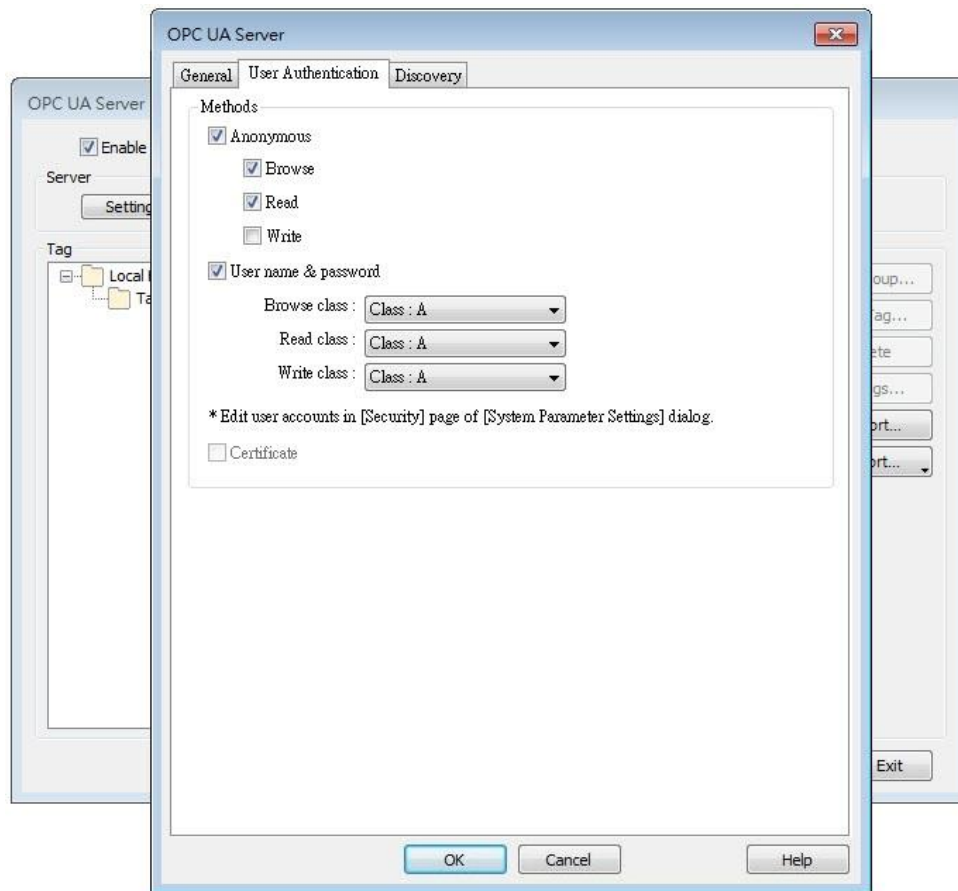
General tab

Firstly and most importantly, OPC UA Server information must be entered. Select [Enable] check box to open OPC UA Server settings dialog box, and enter in Comment and Server Name fields. For the rest, the default settings usually work. Security policy can be configured for the clients to use. EasyBuilder Pro provides system tags related to OPC UA Server, enabling users to monitor the server and give commands.

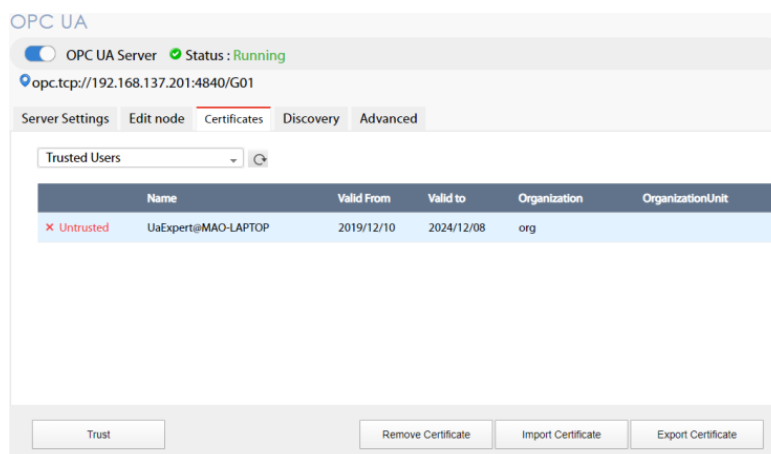


User Authentication tab

This tab is for selecting the authentication method used when the client logs in. Browse, Read, and Write permissions can be granted to anonymous login. The username and password are the same ones as specified in System Parameter Settings » Security tab. When the client logs in using the username and password, the permissions are granted to the security classes specified in System Parameter Settings.



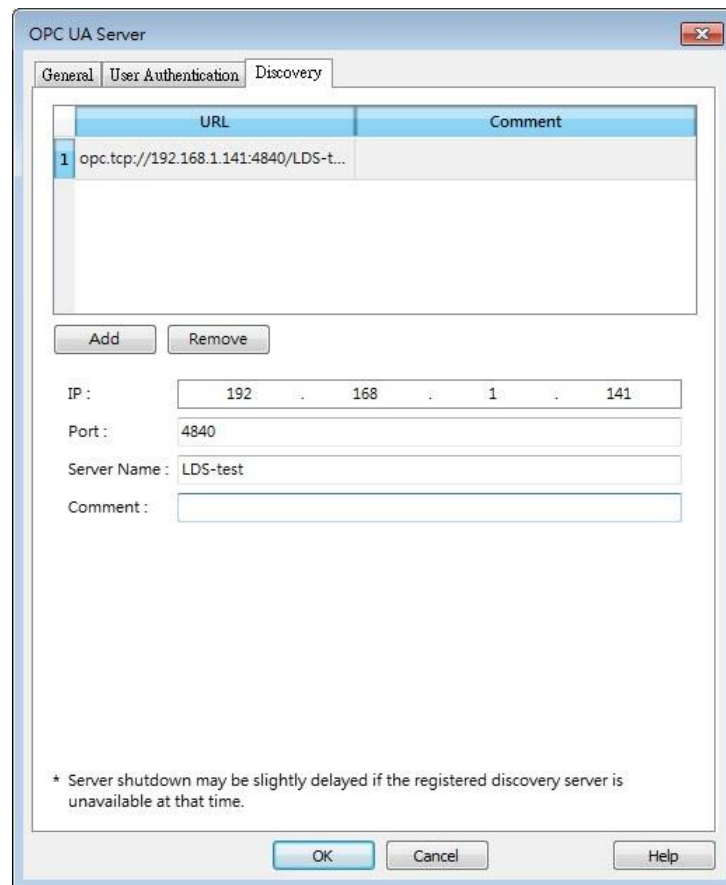
The Certificate option is available only for cMT Gateway series. OPC UA client may use certificates as authentication method instead of username-and-password method to login. Use web interface to configure trusted/untrusted user certificates, as shown below.



Discovery tab

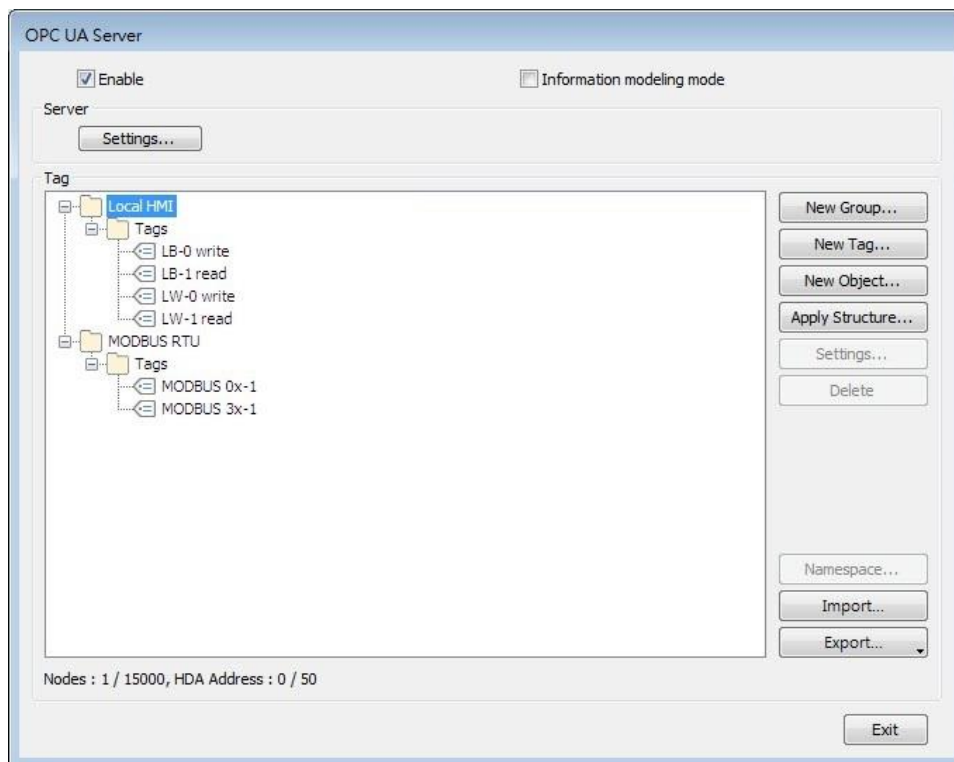
When configured, OPC UA server will register to the Local Discovery Server (LDS). OPC UA Discovery service is used to simplify server location maintenance when there are many OPC UA servers in the network. An OPC UA client can access one LDS

Server and obtain all registered OPC UA server.



Tag

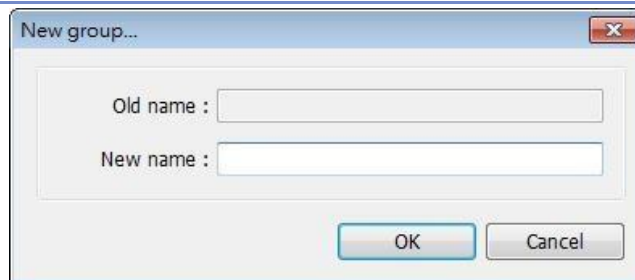
After setting OPC UA Server, go to Tag settings. The client program can use the tags to monitor and control OPC UA Server. As shown in the following screenshot, LB-0 is a readable and writable bit address while LB-1 is a readable bit address. Similarly, LW-0 is a readable and writable word address while LW-1 is a readable word address. The addresses that can be monitored and controlled are not limited to Local HMI addresses; PLC addresses can be added as well.



Setting

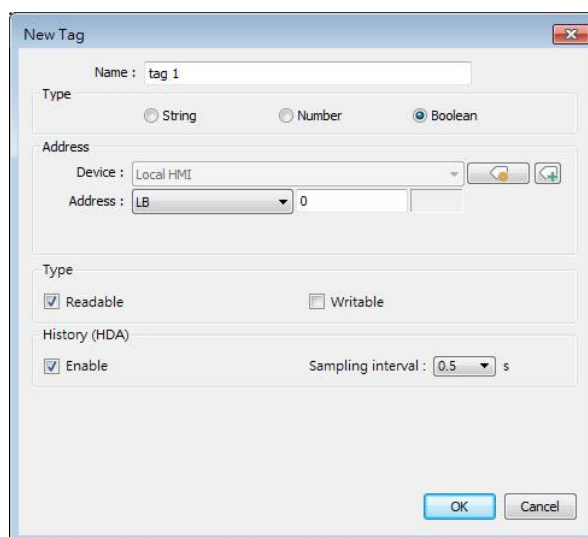
Description

New Group



Add a new group for managing tags.

New Tag



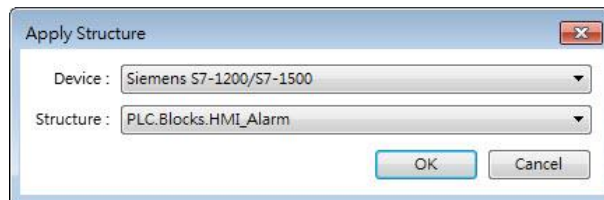
Add a new tag for the client to monitor or control.

The name must be specified, and the address can be Readable or Writeable.

History(HDA)

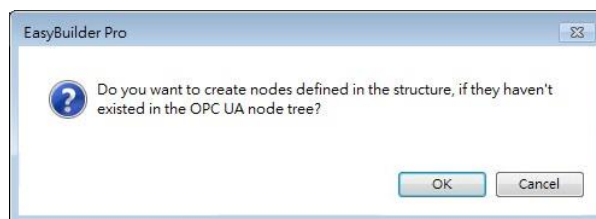
Enable OPC UA HDA.

Apply Structure



Structured node set under a device can be added, only if the device is a symbolic PLC and has structured data type defined.

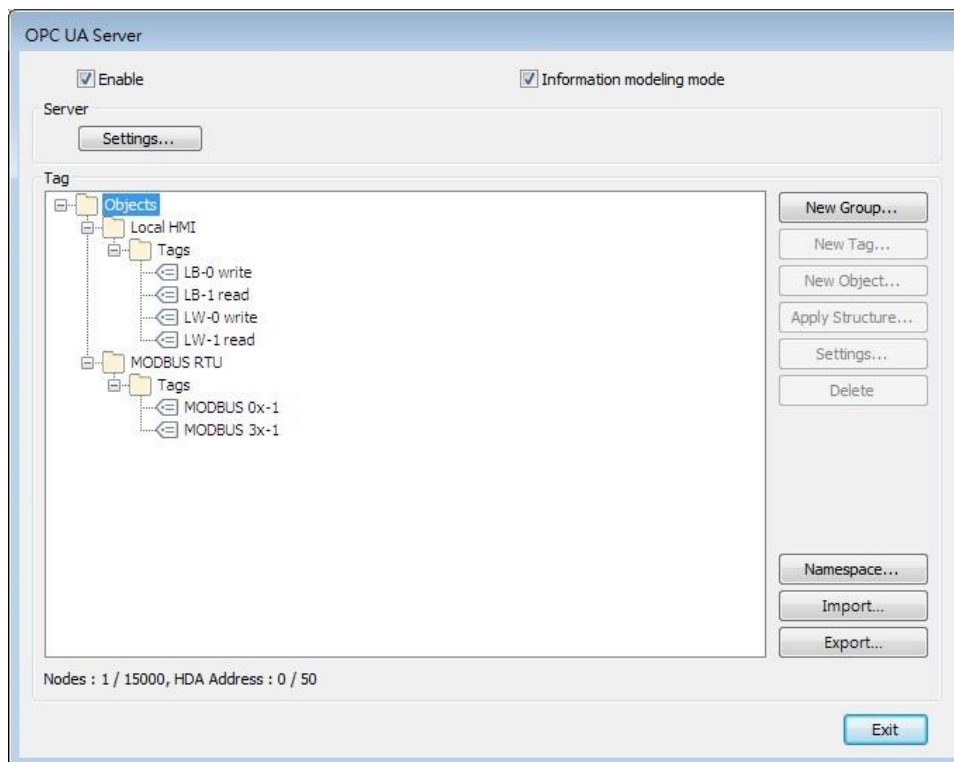
After clicking OK in the Apply Structure window, a prompt window shows asking whether to create nodes that do not exist in the OPC UA node tree.



Settings	Set an existing group or tag.
Delete	Delete an existing group or tag.
Import	Import a tag file. Applicable import formats include: *.xlsx, *.xls, *.csv, *.xml
Export	Export current tags. Applicable export formats include: Excel format or XML format.

Tag – Information Modeling Mode

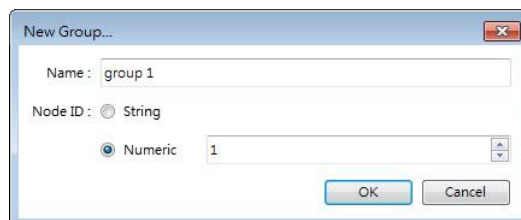
This Mode allows users to create objects by using the defined object types of an imported information model (e.g. EUROMAP 77/83).



Setting

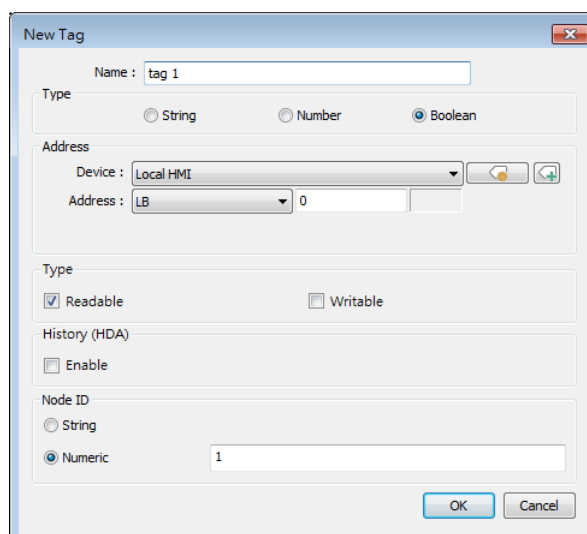
Description

New Group



Add a new group for managing tags. A Node ID can be defined.

New Tag



Add a new tag for the client to monitor or control.

Two types of tags can be added: Data Variable and Property.

Data Variable: The data collected by the device. New tags, either data variable or property, can be added under a data variable.

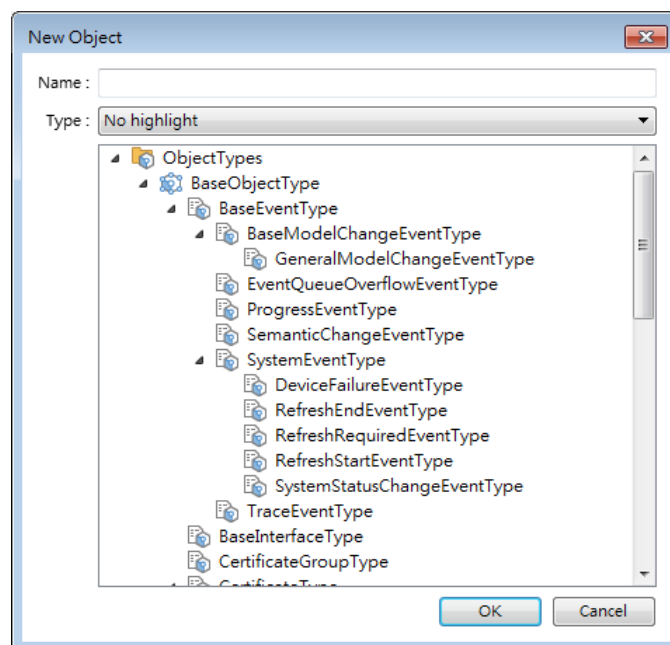
Property: The parameters of the device. No new tags can be added under a property.

The name must be specified, the address can be Readable or Writeable, and a Node ID can be defined.

History(HDA)

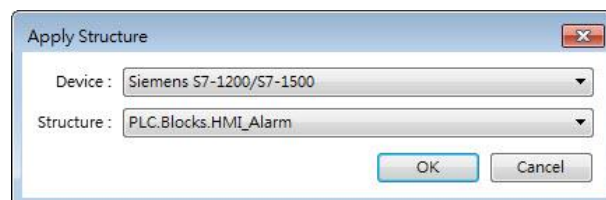
Enable OPC UA HDA.

New Object



Add an object in the Object Types list. The name must be specified.

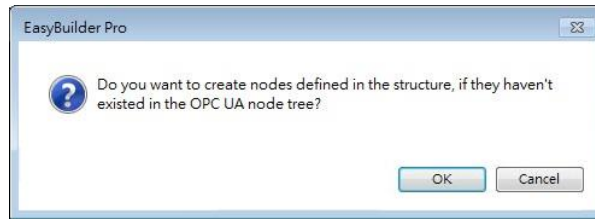
Apply Structure



Structured node set under a device can be added, only if the device is a symbolic PLC and has structured data type defined.

After clicking OK in the Apply Structure window, a

prompt window shows asking whether to create nodes that do not exist in the OPC UA node tree.



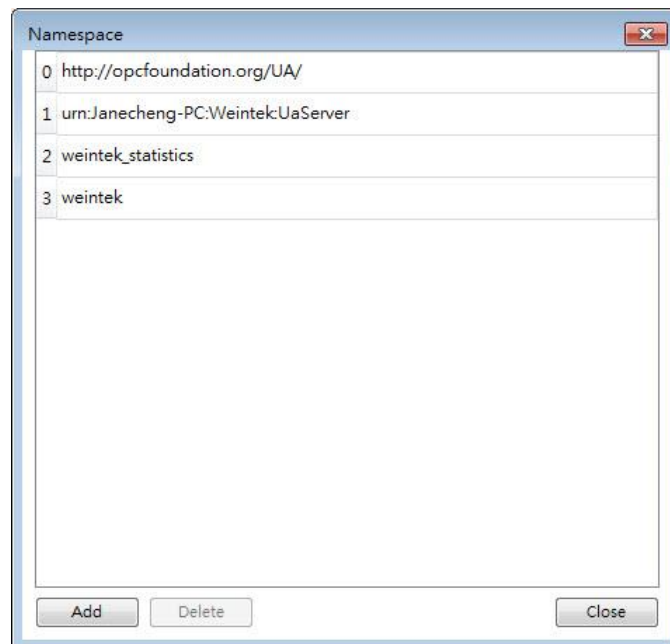
Settings

Set an existing group or tag.

Delete

Delete an existing group or tag.

Namespace



Object types of a device can be added to or deleted from this list.

Import

Import a tag file. Applicable import formats include: *.xlsx, *.xls, *.csv, *.xml

Export

Export current tags. Applicable export formats include: Excel format or XML format.

Note

- When downloading the project file to HMI, please make sure that the HMI time and time-zone settings are correct. Otherwise, the client program may not be able to authenticate, and the communication may fail due to authentication error caused by incorrect certificate valid time.
- Changing from Information Modeling Mode back to general mode is possible but please note that the node definition will be lost by doing so.

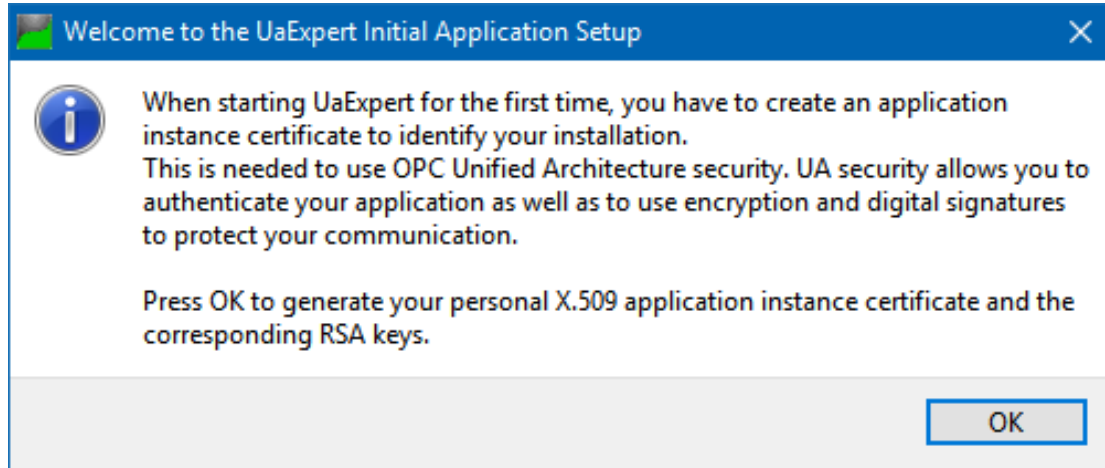
3. OPC UA Client

Unified Automation UaExpert

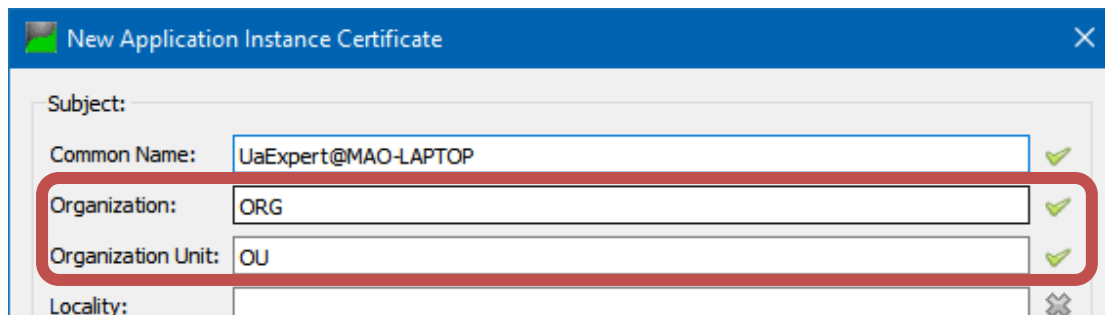
[Download Link](#)

At the first time using this client software, please follow these settings steps:

1. Click OK to create an application instance certificate to identify your installation.

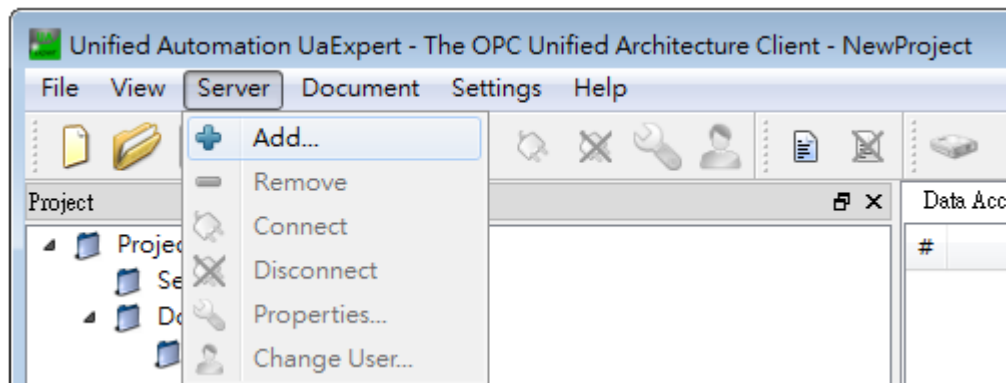


2. Fill in Organization and Organization Unit.

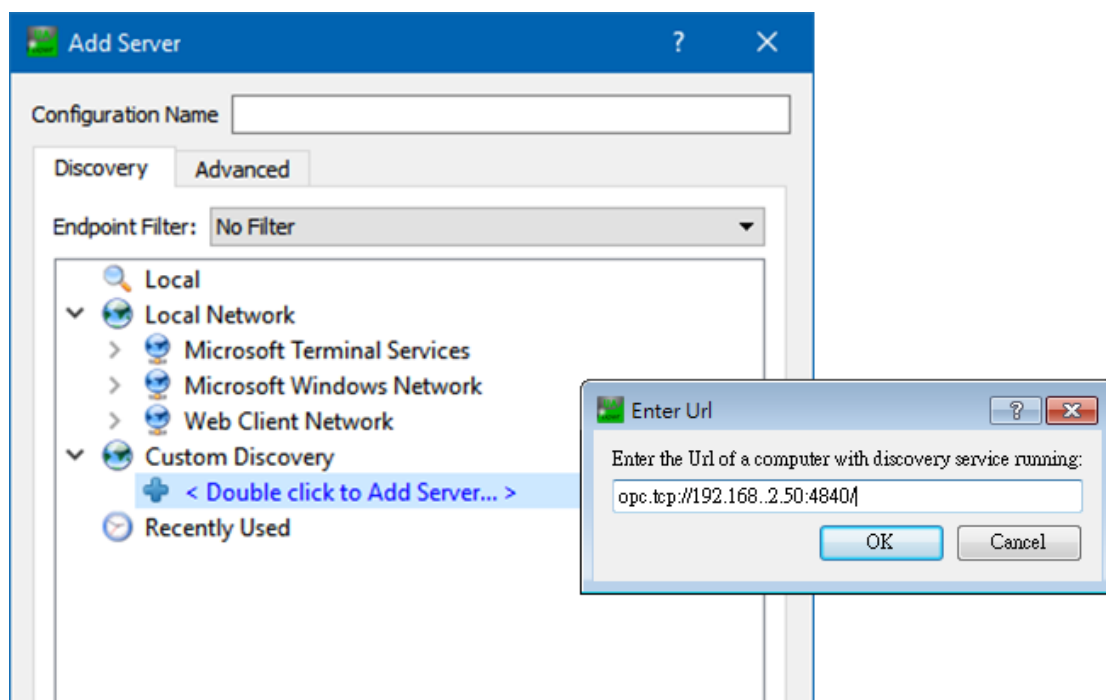


And then, connect to OPC UA Server.

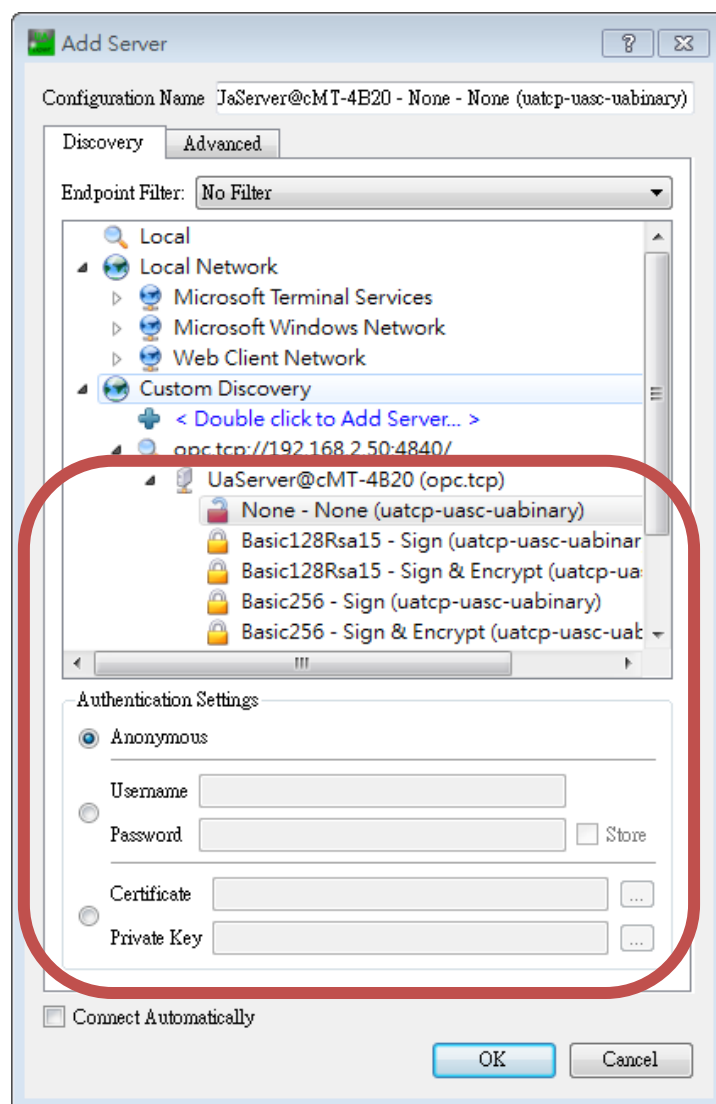
1. Click [Server] » [Add] to add the server.



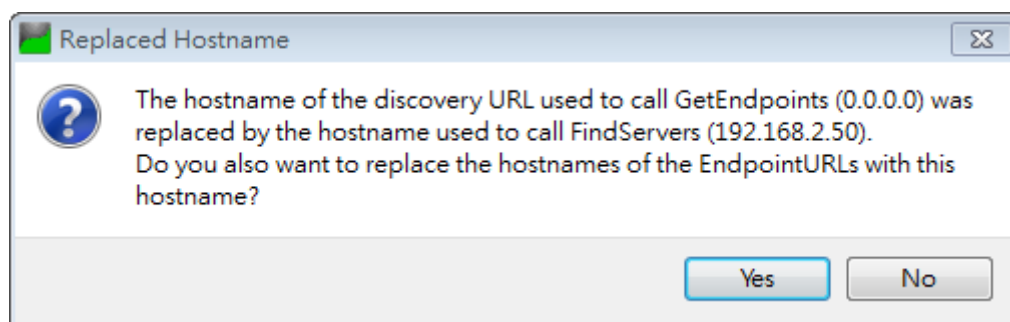
2. Double click on [Double click to Add Server], and enter the OPC UA Server URL.
The IP address is the HMI IP address.



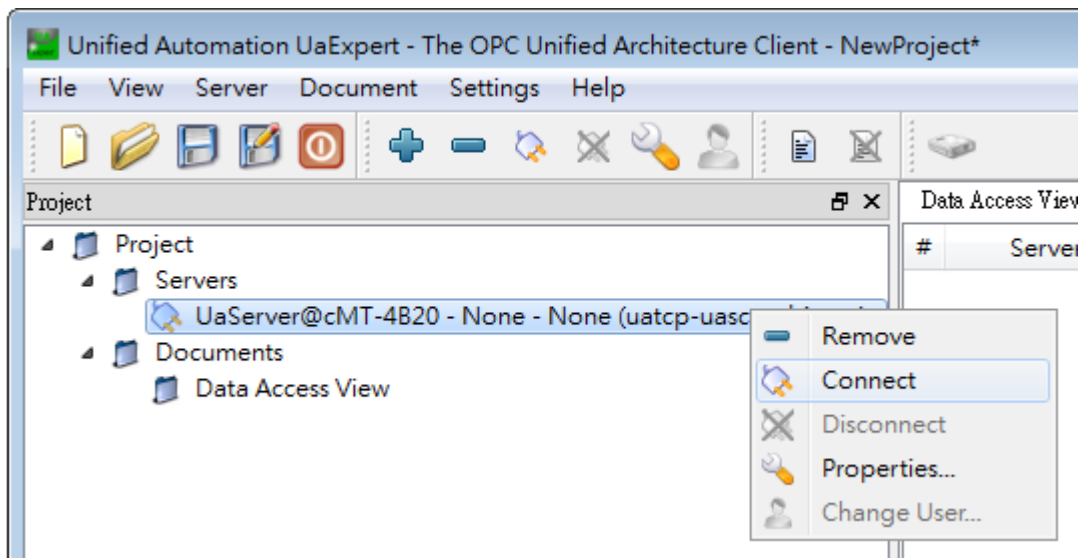
3. OPC UA Server information shows, in this tab, authentication methods can be specified.



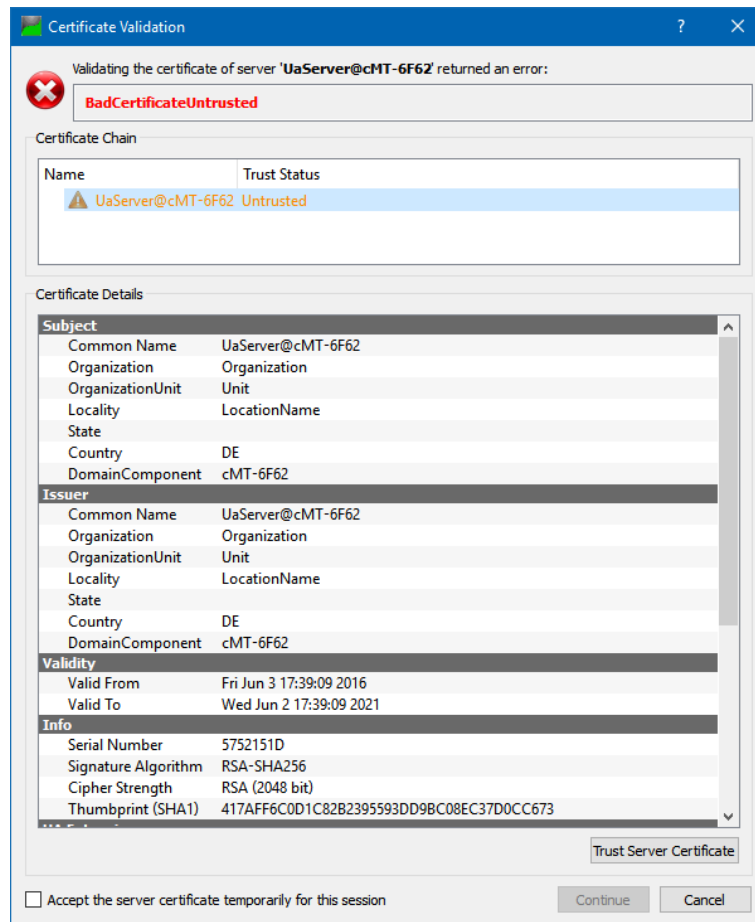
4. When the following message window shows, click [Yes].



5. Click the right mouse button and then click [Connect] to connect with OPC UA Server.



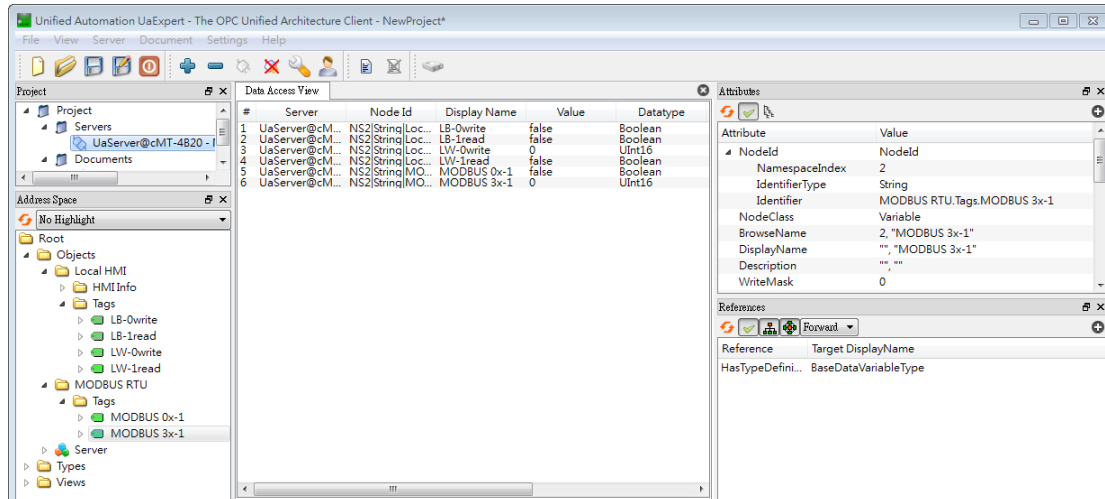
6. Select “Trust Server Certificate” and click [Continue], and finish the settings.



4. Accessing OPC UA Server Data

When the connection settings are completed, address information can be found in Address Space field. HMI parameters are in HMI Info folder, and user-defined tags

are in Tags folder. By dragging a tag to the Data Access View filed, the details on the tag can be viewed, and its value can be changed, as long as it's a writeable address, such as LB-0 and LW-0 mentioned earlier. The value of addresses that are only readable, such as LB-1 and LW-1, cannot be changed.



5. References

OPC UA Security-How It Works:

https://opcfoundation.org/wp-content/uploads/2014/08/11_OPC_UA_Security_How_It_Works.pdf

OPC Support General Information:

<https://wikis.web.cern.ch/wikis/display/EN/General+Information>