

Integration Objects'

Free OPC UA Explorer Tool

OPC UA Client
Version 1.4 Rev.0

USER GUIDE

OPC Compatibility
OPC Unified Architecture 1.02

Integration Objects' OPC UA Client User's Guide Version 1.4 Rev.0
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PREFACE

ABOUT THIS USER GUIDE


This user guide:

- Describes the main features of the OPC UA Client,
- Lists the system requirements for installing and running the OPC UA Client solution,
- And explains how to run, configure, and use the OPC UA Client application.

TARGET AUDIENCE

This document is intended for any potential users of Integration Objects' OPC UA Client. Basic knowledge of OPC UA (Unified Architecture) specifications is assumed.

DOCUMENT CONVENTIONS

Convention	Description
Monospaced type	Indicates a file reference
Bold	Click/selection action required
	Information to be noted

CUSTOMER SUPPORT SERVICES

Phone	Email
Americas: +1 713 609 9208 Europe-Africa-Middle East +216 71 195 360	Support: customerservice@integrationobjects.com Sales: sales@integrationobjects.com Online: www.integrationobjects.com

GETTING STARTED

1. Overview

Integration Objects' OPC UA Client is a free client tool that supports all the main OPC Unified Architecture (UA) information models: Data Access, Alarms & Conditions, and Historical Access.

This OPC UA Client has the capability to:

- Discover local and remote OPC UA servers,
- Establish secure communication channels,
- Browse the address space of any OPC UA compliant server,
- Monitor real-time data and alarms & conditions,
- Explore and update history data.

As security is the main feature of OPC Unified Architecture standard, our OPC UA Client generates its self-signed Application Instance Certificate to provide application level security and to establish secure connections with OPC UA servers.

2. Pre-Installation Considerations

In order to properly run the OPC UA Client, install these software components on the target system:

- .NET Framework version 4.6 or higher.
- The OPC UA Discovery Server, which lists the OPC UA endpoints available on a given computer.

3. Operating System Compatibility

The OPC UA Client supports the following operating systems:

- Windows 10
- Windows 8
- Windows Seven
- Windows Server 2016
- Windows Server 2012
- Windows Server 2008

4. Installing

To install the OPC UA Client, follow the steps below:

- a. Double-click on the **Integration Objects' OPC UA Client installation package**. The installation welcome dialog box will appear.

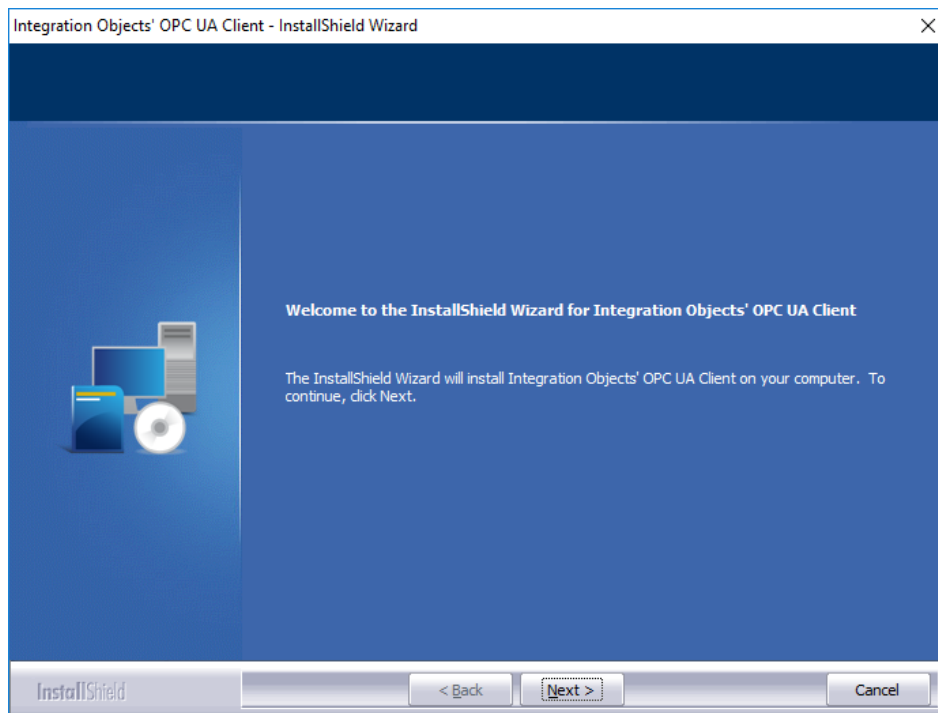


Figure 1: Installation Welcome Dialog Box

- b. Click the **Next** button. The license agreement will be displayed.

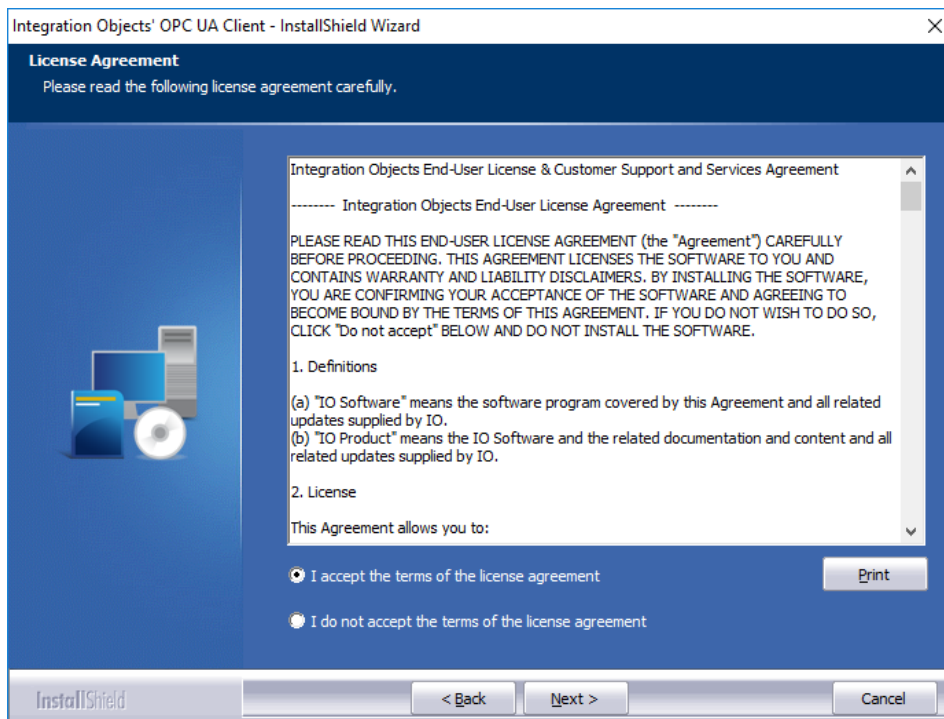


Figure 2: License Agreement Dialog Box

- c. After reading the license agreement and accepting all its terms, click the **Next** button. The customer information dialog box will appear.

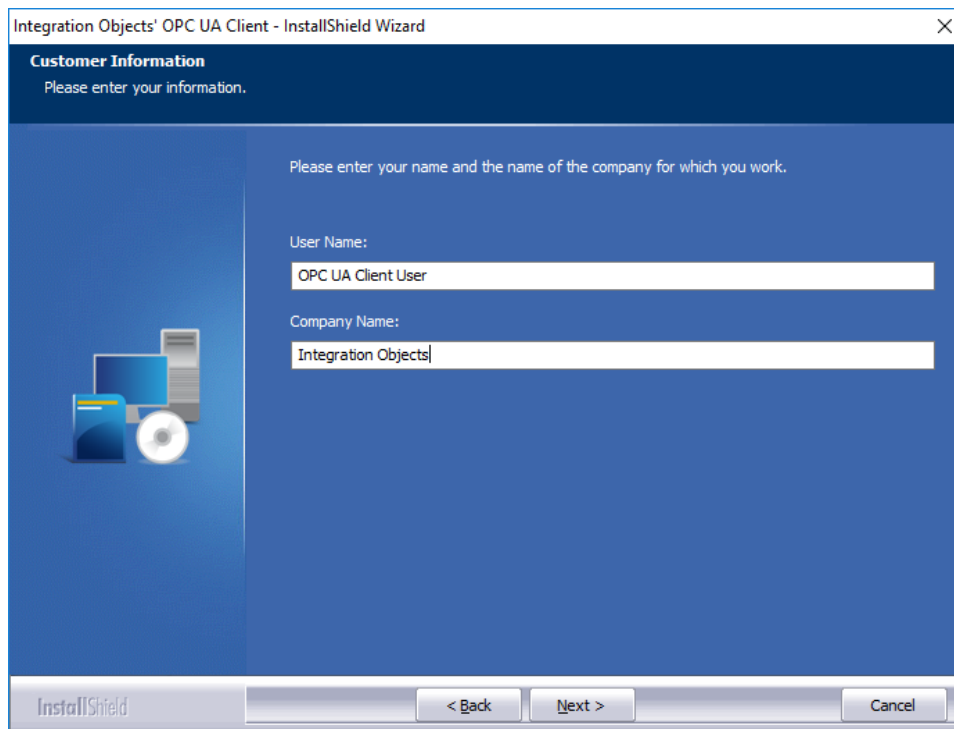


Figure 3: Customer Information Dialog Box

- d. Add the user name and the company name and then click the **Next** button. The dialog box for choosing the destination folder will be displayed.

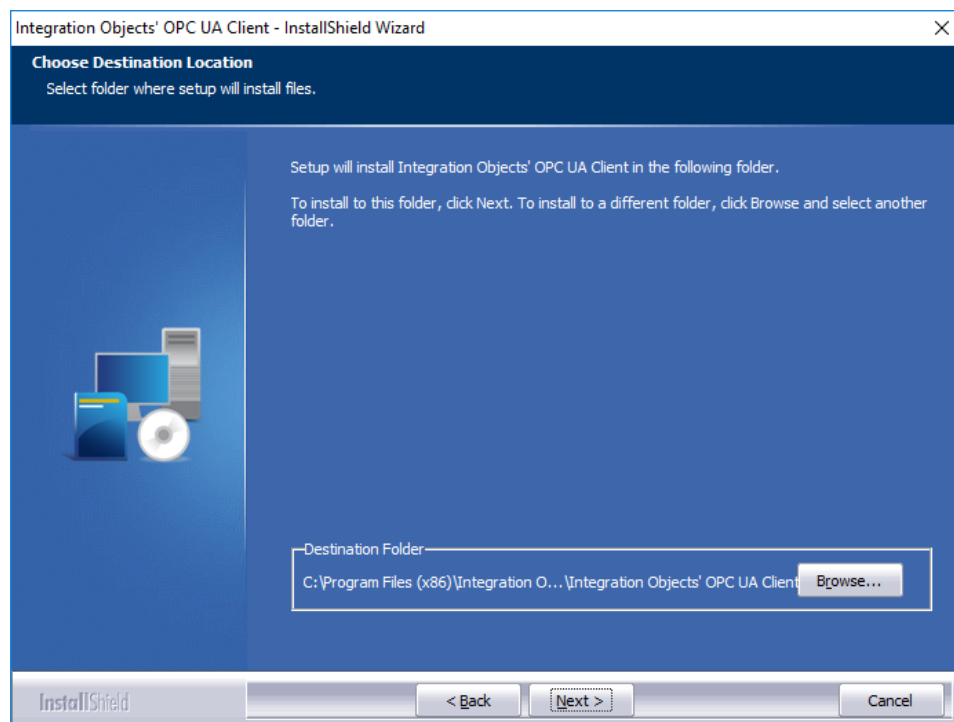


Figure 4: Choose Destination Folder Dialog Box

- e. Click the **Next** button to continue with the chosen installation path, or the **Browse** button to select a different destination folder. The installation dialog box will then appear.

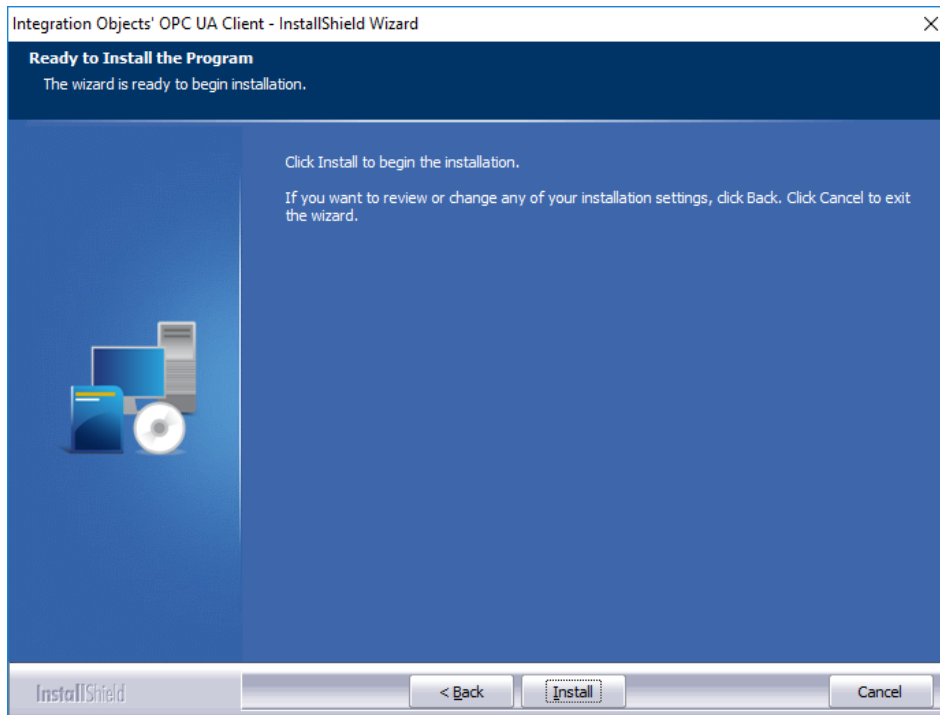


Figure 5: Installation Dialog Box

- f. Click the **Install** button to start installation.

The setup will, then, copy the necessary files to the target folder, create shortcut icon to launch the OPC UA Client from the start menu and the desktop, and make an un-installation entry in the Add/Remove Programs in the Control Panel.

The Installation Complete dialog box will then be displayed.

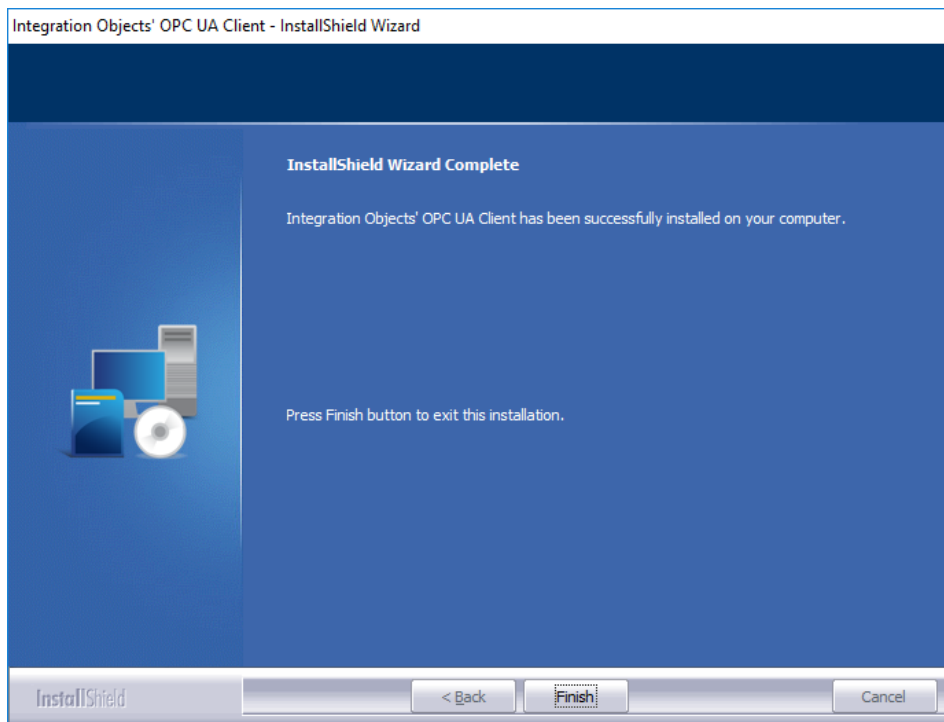


Figure 6: Installation Completed Dialog Box

5. Starting-up

The OPC UA Client can be started manually from the OPC UA Client's shortcut in the start menu. To do so, click on Start → Programs → Integration Objects → OPC UA Client → OPC UA Client

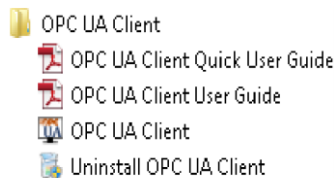


Figure 7: Starting the OPC UA Client

6. Removing the OPC UA Client

To uninstall the OPC UA Client, follow the steps below:

1. Click the **Uninstall** shortcut icon available in the start menu, as illustrated below.

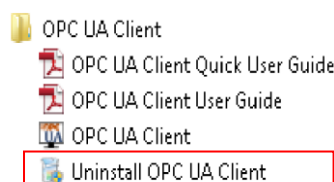


Figure 8: Uninstall Shortcut in the Start Menu

The following dialog box will appear:

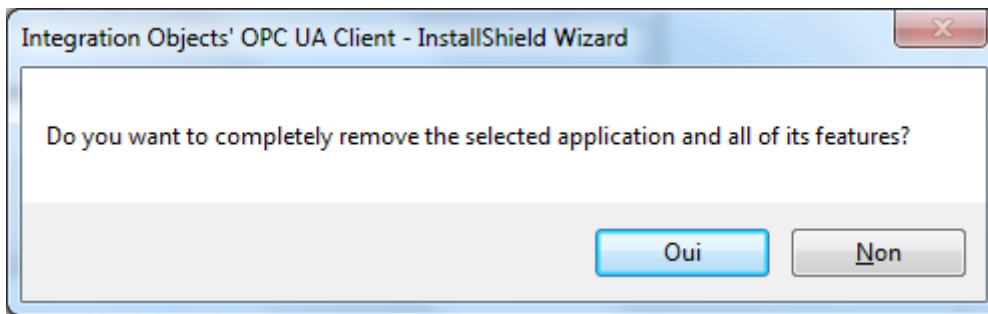


Figure 9: OPC UA Client Uninstall Confirmation

2. Click the **Yes** button to start the uninstallation.
3. The wizard will then take you through the removal steps. At the end, click **Finish** when the un-installation is complete.



If you are using the windows 10, windows server 2012 or windows server 2016 operating system, the uninstaller needs to be run from the start menu as shown below.

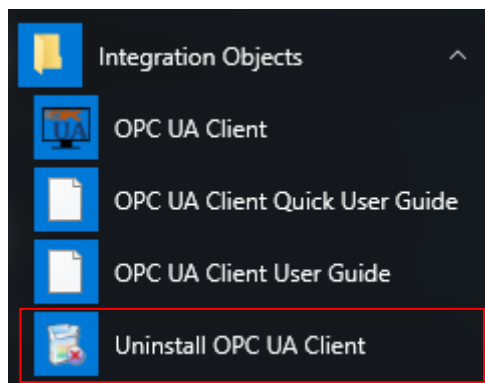


Figure 10: Windows 10 Startup Menu Uninstall Shortcut

The OPC UA Client can also be manually removed as follows:

1. Go to the **Control Panel**.
2. Click **Add/Remove Programs**.
3. In the Add/Remove Programs dialog screen, select **Integration Objects' OPC UA Client**.
4. Click Change/Remove then OK.

USING OPC UA CLIENT

In this section, you will find an overview of the OPC UA Client user interface as well as the required steps to use the application.

1. User Interface Overview

The OPC UA Client user interface allows you to manage multiple sessions, to monitor data, events and alarms, and to explorer historical data.

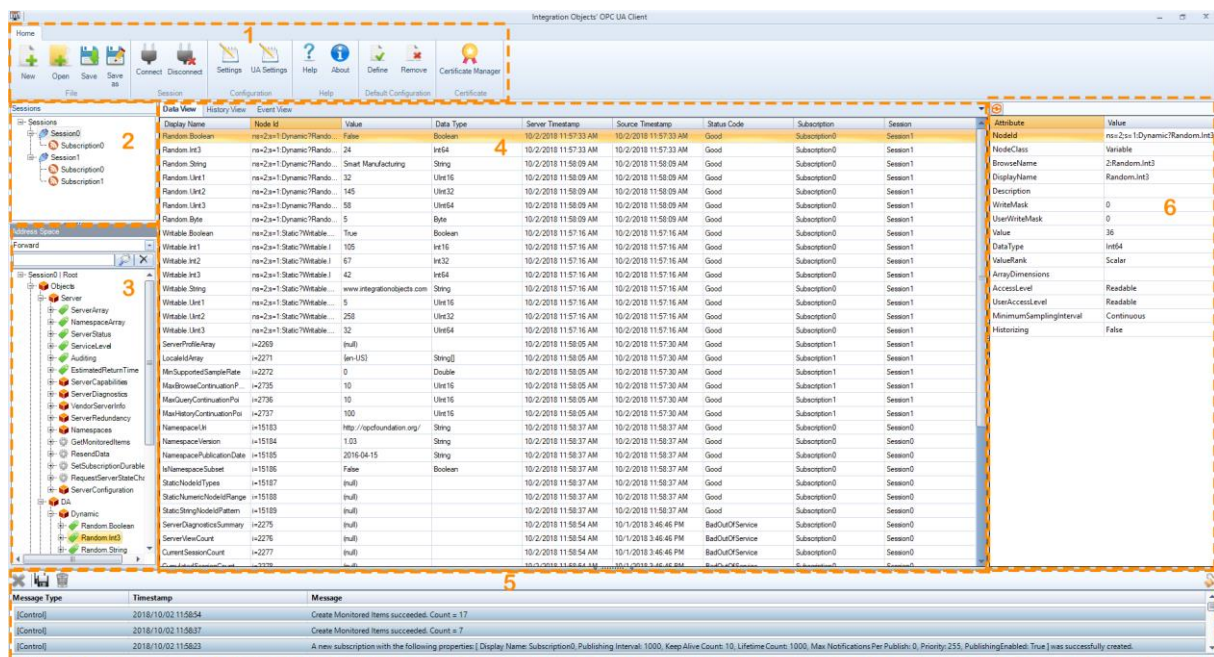


Figure 11: OPC UA Client Main View

There are five parts in the main user interface, as highlighted above:

- Home Menu Bar (1): This part contains the file item bar, the session management, the configuration item bar, the help item bar, the default configuration item bar and the certificate item bar.
- OPC UA Sessions List (2): Tree browser displaying the created sessions within the connected OPC UA servers and its related subscriptions.
- Server Address Space (3): Tree browser displaying the address space of the selected endpoint.
- OPC UA Data Viewer (4): This part contains Data View, History View and Event View.
- Log messages Browser (5): This part displays log messages. The most recent messages are displayed at the top of the messages list.
- Node Details Table (6): shows the attributes of the selected node and their values.



The Node Details Table is configurable. It can be hidden by unchecking the node details grid parameter in the settings as shown in the figure below:

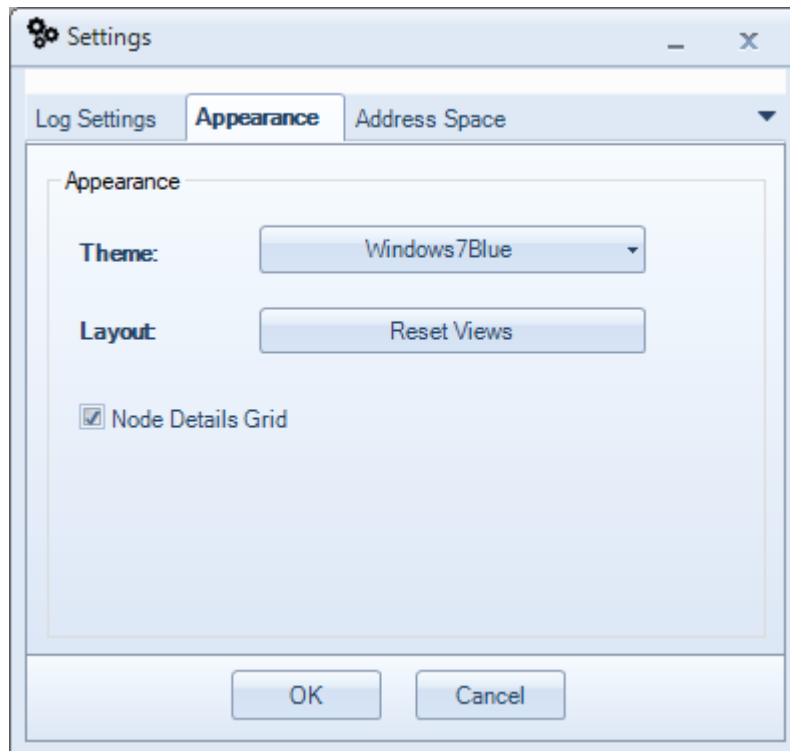


Figure 12: Hide the Node Details Grid

2. Save/Load Configuration



Figure 13: File Item Bar

Using the File item bar, you can:

- **New** - Create a new project by clicking the **New** button.
- **Open** - Open an existing configuration by clicking **Open** and selecting the appropriate “.ouc” configuration file.
- **Save / Save As** - Save your current configuration by clicking **Save / Save As**.

3. Define/Remove Configuration

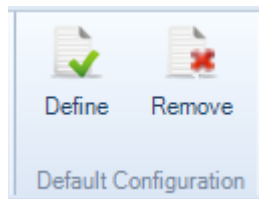


Figure 14: Default Configuration Item Bar

Using the Default Configuration item bar, you can:

- Click the **Define** button to define the default configuration to be loaded automatically at the application start-up. It will prompt a file dialog screen. Select your saved configuration and then click the **OK** button.
- To remove the default configuration, click the **Remove** button.

4. UA Settings

The OPC UA Client comes with default settings for the UA parameters. These settings can be easily edited using the **UA Settings** dialog presented below.

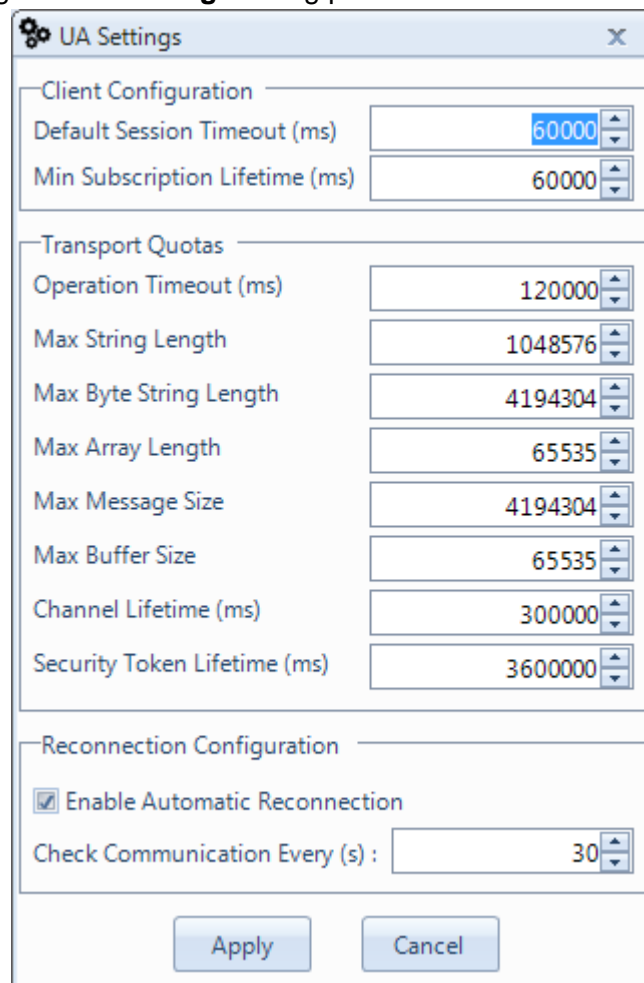


Figure 15: UA Settings Dialog Screen

The default client and transport parameters are listed in the table below:

Setting	Description	Default Value
Default Session Timeout	The default timeout for new sessions (in milliseconds).	60000
Min Subscription Lifetime	The minimum subscription lifetime, that ensures subscriptions are not set to expire too quickly (in milliseconds).	60000
Operation Timeout	The default timeout in milliseconds for operations.	120000
Max String Length	The maximum length for a string value in any message.	1048576
Max Byte String Length	The maximum length for a byte string value in any message.	4194304
Max Array Length	The maximum length for any array in a message. Note that some protocols do not distinguish between bytes and arrays. In these cases the binding will choose the larger of MaxByteStringLength or MaxArrayLength.	65535
Max Message Size	The maximum size of any message.	4194304
Max Buffer Size	The maximum buffer size. This value controls how big a block of memory the transport layer allocates. Setting this value to a large value will reduce performance and use a lot of RAM.	65535
Channel Lifetime	The lifetime of a SecureChannel in milliseconds. This specifies how long the server will keep a broken channel around while waiting for a client to reconnect. Not used by HTTP or .NET TCP bindings.	300000
Security Token Lifetime	The lifetime of a SecurityToken in milliseconds. This specifies how long a security token can be used without renewal.	3600000

Table 1: UA Parameters

For the reconnection configuration, you can check the **Enable Automatic Reconnection** box and configure the period separating two reconnection attempts.

5. Connect to an OPC UA Server

To connect to an OPC UA server, select **Connect** button available in the Home menu bar and the following dialog screen will appear:

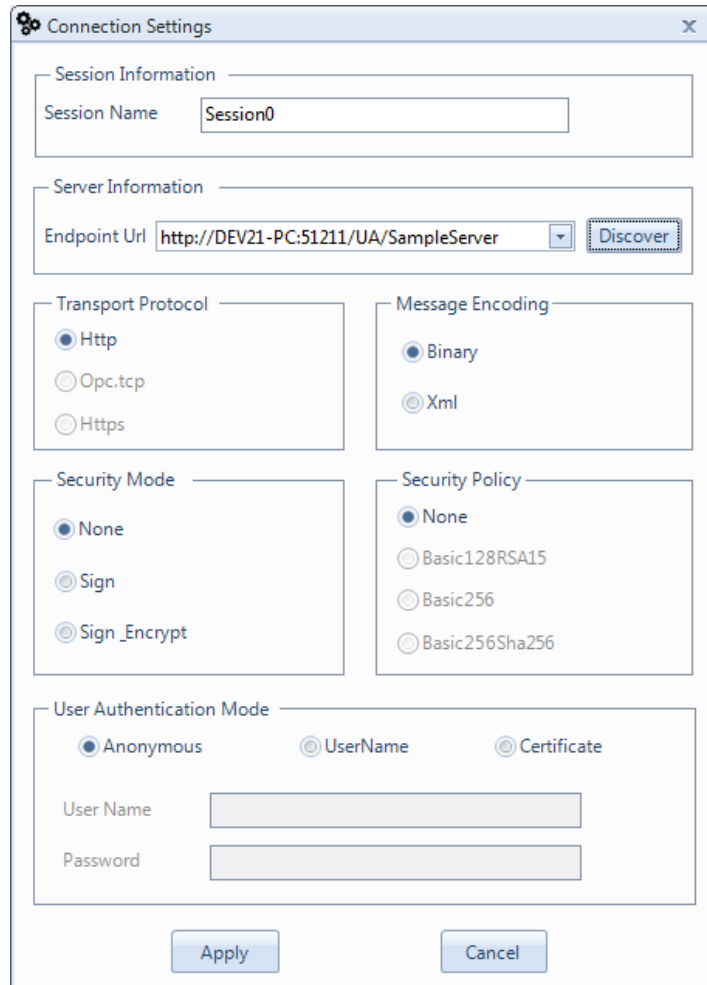


Figure 16: Connection Settings Dialog Screen

All the settings presented in this dialog screen are required to open a channel and to establish a session with the selected OPC UA server.

1. Endpoint settings

The user can either type the server URL or select it from the URL list discovered by the OPC UA Client. Our OPC UA Client supports https and opc.tcp transport protocols and detects which of them to use from the specified endpoint URL.

2. Security settings

The user should also select a Security Mode and Security Policy so that the OPC UA Client opens a secure channel with the selected endpoint. Only security settings supported by the chosen UA server will be enabled.

There are three different Security Modes available:

- None: the channel is not secured.
- Sign: the message is signed with the associated Private Key of the Application Instance Certificate of the OPC UA Client application.
- Sign & Encrypt: the message is also encrypted with the Public Key of the server's Application Instance Certificate.

There are three security policies supported which determine the algorithm for signing and encrypting:

- None: an algorithm suite that does not provide any security settings.
- Basic128RSA15: an algorithm suite that uses RSA15 as the key wrap algorithm and 128-bit Basic as the message encryption algorithm.
- Basic256: an algorithm suite that uses 256-bit Basic as the message encryption algorithm.
- Basic256Sha256: An algorithm suite that uses SHA256 for the signature digest and 256-bit Basic as the message encryption algorithm.

3. Authentication settings

On the session establishment step, it is required to choose the user authentication mode. There are three options available:

- Anonymous: user identity is not set.
- Username and Password: the user is identified by a User Name/Password combination.
- Certificate: the user is identified by an X509 certificate.

When the server URL, the security options, the user authentication mode and the session name are set, the connection to the server can be established by clicking the **Apply** button.

6. Disconnect from an OPC UA Server

To remove an OPC UA Server, you can either select a session from the Sessions tree view and click **Disconnect** button available in the menu bar or right click the session node and select **Remove Session** from the displayed menu. The session will be then terminated, and the selected session node and its related address space will be consequently removed from the Address Space tree view.

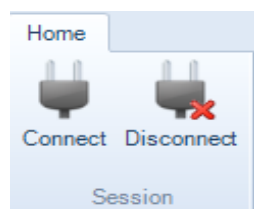


Figure 17: Disconnect Server

7. Manage Certificate

Using the Certificates Management, you can:

- List the certificates: this option displays the list of the trusted, the rejected and the OPC UA Client certificates. Users can trust a rejected certificate by right clicking on it

and selecting Trust as shown in the figure below. They can also reject a trusted certificate.

- Import certificate: this option allows users to select a certificate and add it to the list of the trusted ones.
- Remove certificate: this option allows users to remove the selected certificates from the trusted or rejected list.
- Open certificate folder: this option allows the user to open the folder containing the certificate.

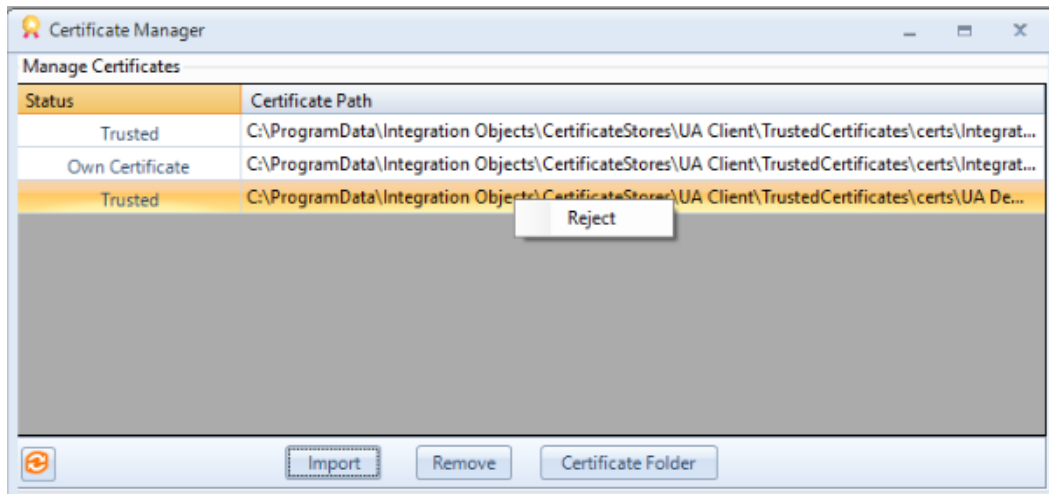


Figure 18: Disconnect Server

8. Manage Sessions

You can connect to different local and remote OPC UA servers by clicking the **Connect** button available in the Home menu bar or by right clicking on the Sessions root node and selecting **Add Session** as shown below.

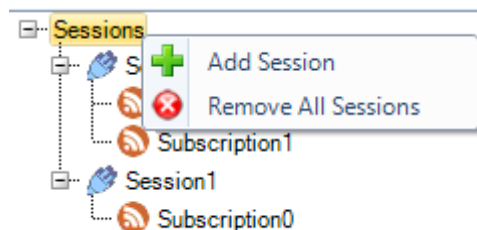


Figure 19: The Sessions Context Menu

You can also remove all the added sessions by selecting **Remove All Sessions** from the Sessions context menu or only remove the selected session by selecting **Remove Session** from the Session context menu as shown in the figure below.

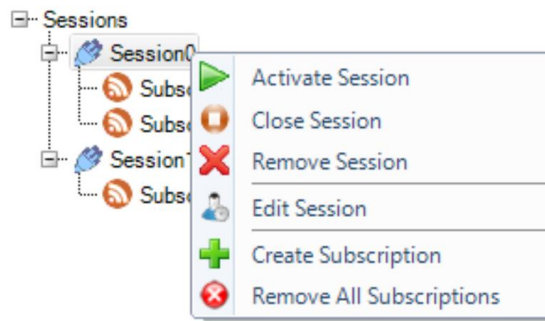
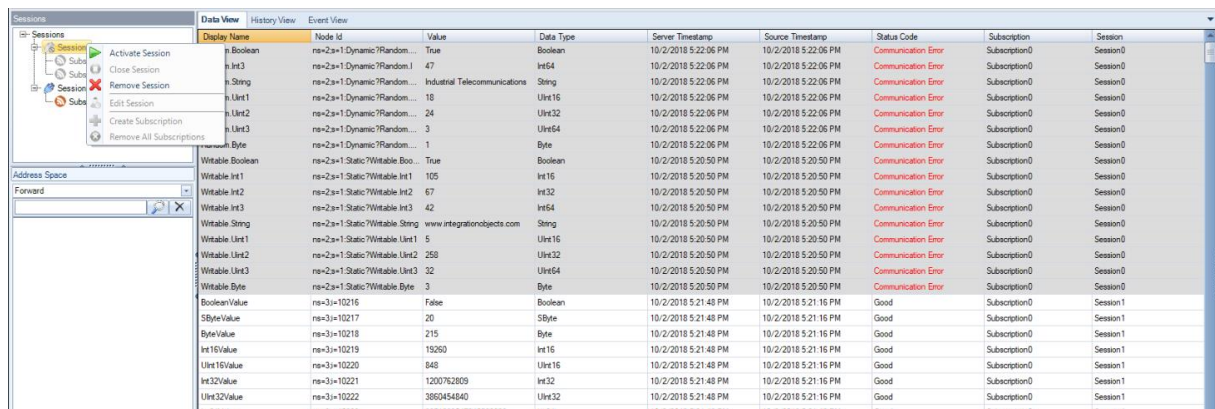


Figure 20: The Session Context Menu

The user can also close and activate the session. When selecting **Close Session**, the session will only be suspended for a period of time as shown in the figure below, thus the user can either activate the session or remove it.

The activation of the session can be invoked even if the session is not closed to republish the subscriptions.



Display Name	Node Id	Value	Data Type	Server Timestamp	Source Timestamp	Status Code	Subscription	Session
Boolean	ns=2+1:Dynamic?Random...	True	Boolean	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Int3	ns=2+1:Dynamic?Random.I	47	Int64	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
String	ns=2+1:Dynamic?Random...	Industrial Telecommunications	String	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Int1	ns=2+1:Dynamic?Random...	18	UInt16	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Int2	ns=2+1:Dynamic?Random...	24	UInt32	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Int3	ns=2+1:Dynamic?Random...	3	UInt64	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Byte	ns=2+1:Dynamic?Random...	1	Byte	10/2/2018 5:22:06 PM	10/2/2018 5:22:06 PM	Communication Error	Subscription0	Session0
Boolean	ns=2+1:Static?Writable.Boo...	True	Boolean	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int1	ns=2+1:Static?Writable.Int1	105	Int16	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int2	ns=2+1:Static?Writable.Int2	67	Int32	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int3	ns=2+1:Static?Writable.Int3	42	Int64	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
String	ns=2+1:Static?Writable.String	www.integrationobjects.com	String	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int1	ns=2+1:Static?Writable.Int1	5	UInt16	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int2	ns=2+1:Static?Writable.Int2	259	UInt32	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Int3	ns=2+1:Static?Writable.Int3	32	UInt64	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
Byte	ns=2+1:Static?Writable.Byte	3	Byte	10/2/2018 5:20:50 PM	10/2/2018 5:20:50 PM	Communication Error	Subscription0	Session0
BooleanValue	ns=3+1:10216	False	Boolean	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
SByteValue	ns=3+1:10217	20	SByte	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
ByteValue	ns=3+1:10218	215	Byte	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
Int16Value	ns=3+1:10219	15260	Int16	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
Int32Value	ns=3+1:10220	848	UInt16	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
Int64Value	ns=3+1:10221	1200762809	Int32	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
UInt32Value	ns=3+1:10222	3863454840	UInt32	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1
UInt64Value	ns=3+1:10223	6651029147048660795	UInt64	10/2/2018 5:21:48 PM	10/2/2018 5:21:16 PM	Good	Subscription0	Session1

Figure 21: Close Session

While the session is activated, the user can change the user identity with which he created the session by selecting **Change User Identity** and the following dialog screen will be prompted:

While the session is activated, the user can edit the session configuration with which he created it by changing the message encoding, the security mode, the security policy and the user authentication mode. The following dialog screen will be prompt when selecting **Edit Session**.

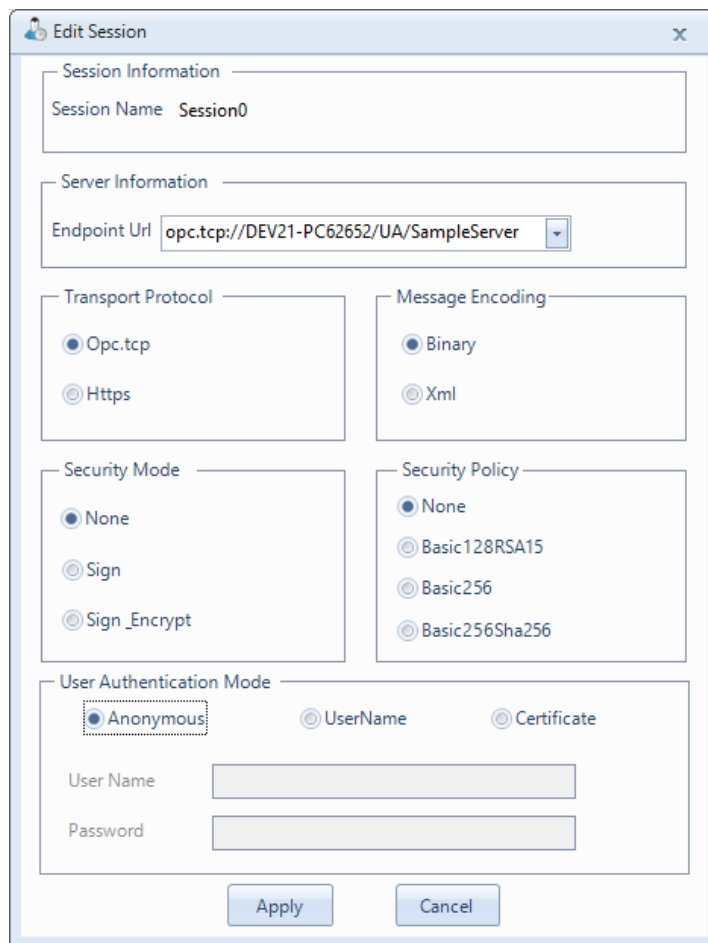


Figure 22: Edit User Authentication Mode

9. Manage Subscriptions

The user can add a new subscription to a specified session either by:

- Right clicking on the session node and selecting **Create Subscription**
- Or after choosing the monitored items to add to (this option will be detailed in section 12 and 14).

The user can also remove all the subscriptions of a selected session or remove only a selected subscription as shown in the figure below.

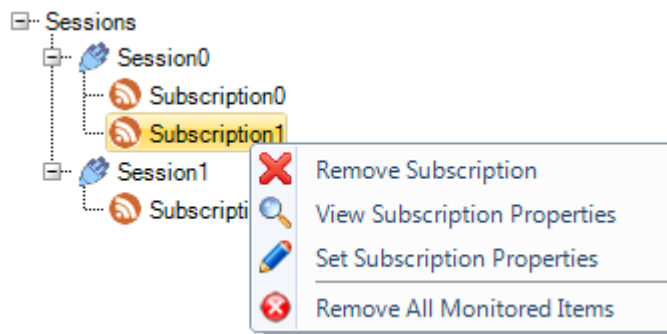


Figure 23: The Subscription Context Menu

The default subscription parameters are listed in the table below:

Setting	Description	Default Value
Publishing Interval	This interval defines the cyclic rate that the subscription is being requested to return notifications to the client. This interval is expressed in milliseconds.	1000 ms
Keep Alive Count	This setting defines the number of consecutive publishing cycles in which there have been no notifications to report to the client. When the maximum keep-alive count is reached, a Publish request is de-queued and used to return a keep alive message. This keep-alive message informs the client that the subscription is still active.	10
Lifetime Count	When the publishing timer has expired this number of times without a publish request being available to send a notification message, then the subscription shall be deleted by the server.	1000
Max Notifications per Publish	The maximum number of notifications that the client wishes to receive in a single Publish response. A value of zero indicates that there is no limit.	0
Priority	This setting indicates the relative priority of the subscription. When more than one Subscription needs to send notifications, the server should de-queue a publish request to the subscription with the highest priority number. For subscriptions with equal priority the server should de-queue Publish requests in a round-robin fashion.	255
Publishing Enabled	A Boolean parameter with the following values: -TRUE: publishing is enabled for the subscription. -FALSE: publishing is disabled for the subscription.	True

Table 2: Subscription Parameters

These parameters can be edited if required by selecting **Set Subscription Properties** from

the subscription context menu and the following dialog screen will be displayed:

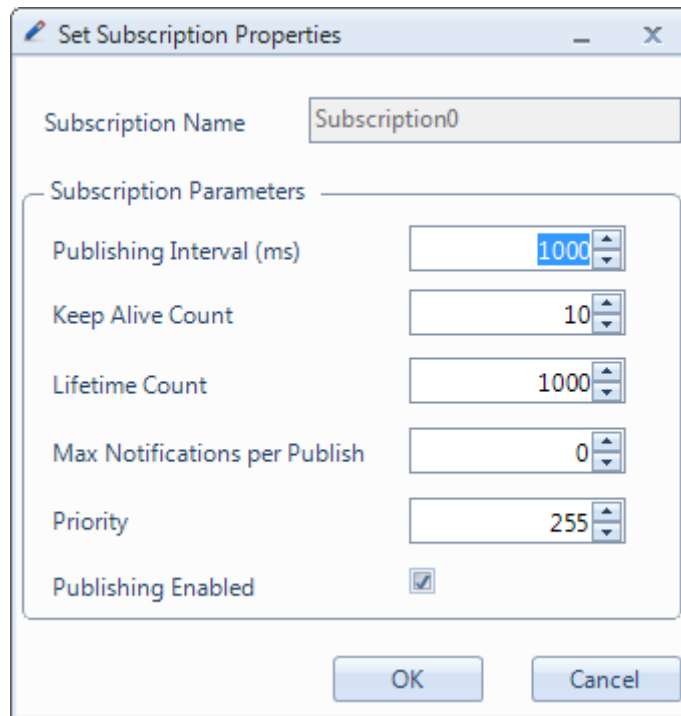


Figure 24: Set Subscription Properties

10. Browse OPC UA Server Address Space

To browse the address space of a server, select its related session from the Sessions tree view and a set of objects and related information that the selected server makes available to the client will be displayed in the AddressSpace tree view.

The model for these Objects is defined by the OPC UA Object Model and the elements of this model are represented in the address space as nodes. Each node is assigned to a node class.

OPC UA defines eight node classes as illustrated in the figure below:









Object 	Variable 	Method 	View 
ObjectType 	VariableType 	ReferenceType 	DataType 

Figure 25: OPC UA Node Classes

Objects and their components are represented in the AddressSpace as a set of Nodes described by Attributes and interconnected by References.

The user can choose the reference type to browse the address space of the OPC UA server by right clicking the session root node and selecting **Browse Options** as shown in the figure below:

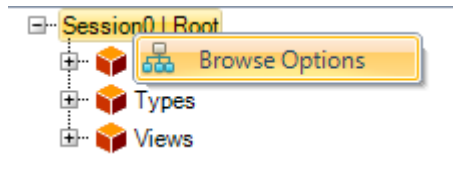


Figure 26: The Root Context Menu

The following dialog screen will be displayed:

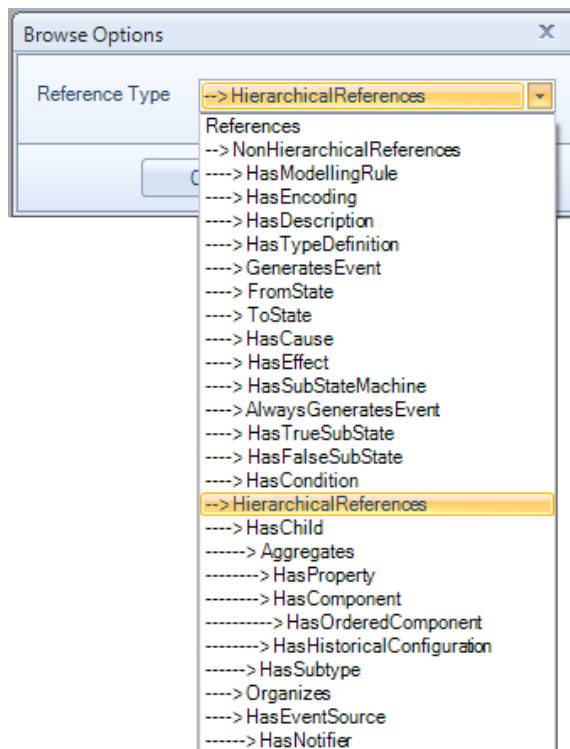


Figure 27 : Browse Options Dialog Screen

By default, the reference type is set to HierarchicalReferences.

In some cases, the OPC UA Server address space may contain duplicated nodes. To avoid displaying a duplicated address space, the user can set the **Suppress Duplicated References** parameter to true as shown in the figure below:

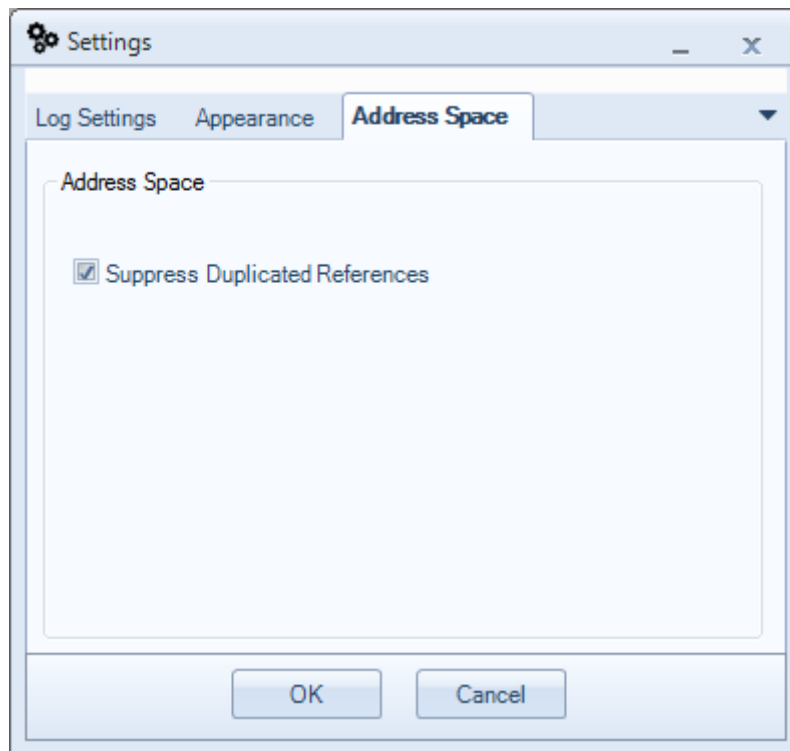


Figure 28: Suppress Duplicated References

11. Show References and Attributes

To view the references and the attributes of a node in the address space of the OPC UA server, click on the **References and Attributes** context menu item as illustrated in the figure below:

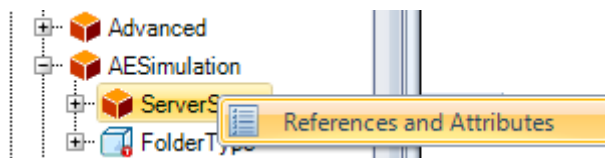
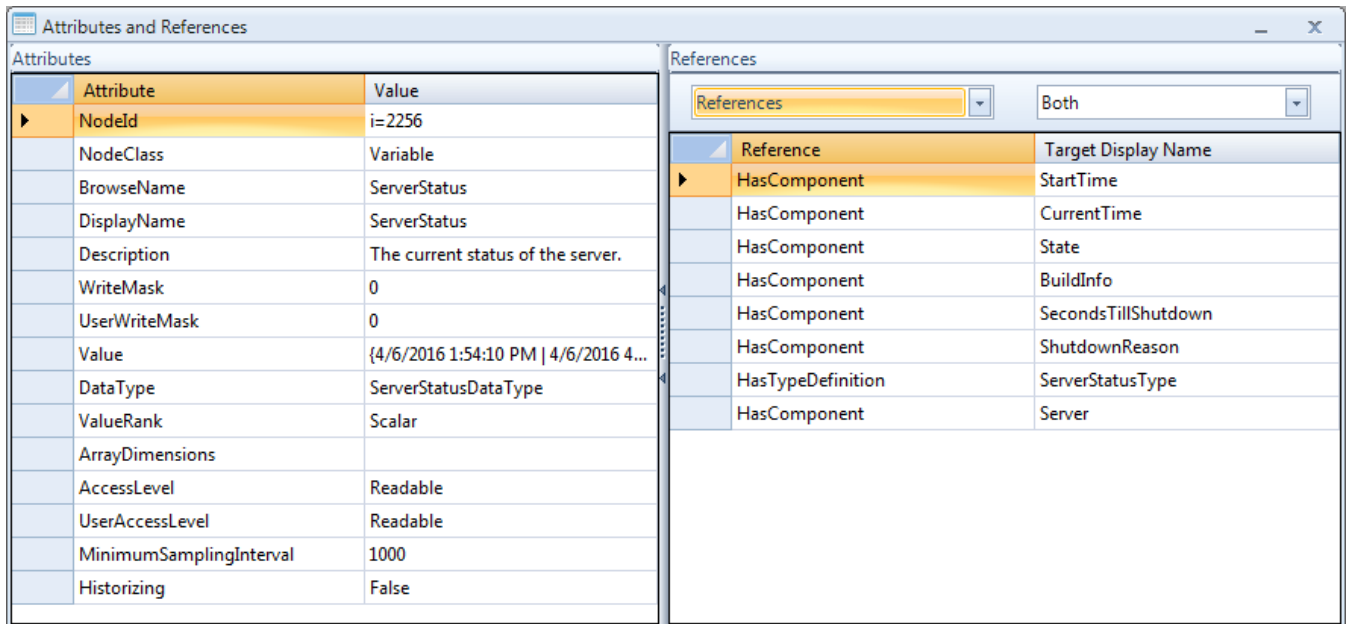


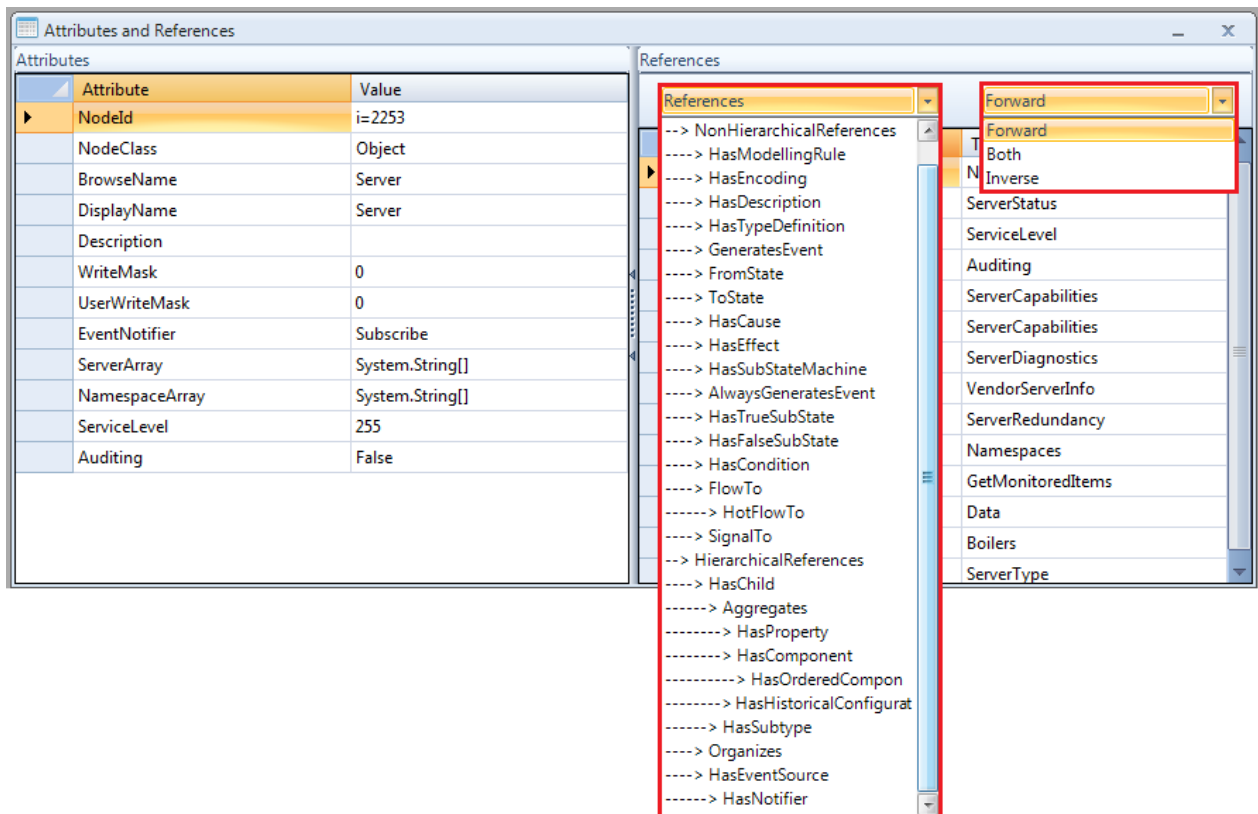
Figure 29: Show References and Attributes

The following dialog screen will be prompted:


Figure 30: References and Attributes Dialog Screen

The attributes table shows the attributes of the selected node and their respective values and the references table shows the type of reference and the display name of the node that the reference points to.

On top of the references table, there are two dropdown lists allowing the user to choose the references options as shown in the figure below:


Figure 31: References Options

12. Read

To read the value of a node of Variable type, click on the **Read** context menu item as shown below:

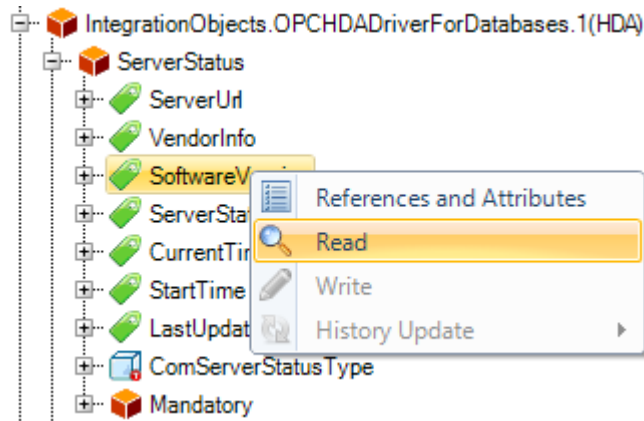


Figure 32: Read Variable

The dialog box below will appear displaying the following information:

- The OPC UA server timestamp
- The source timestamp
- The status code
- The current value of the variable
- The value type

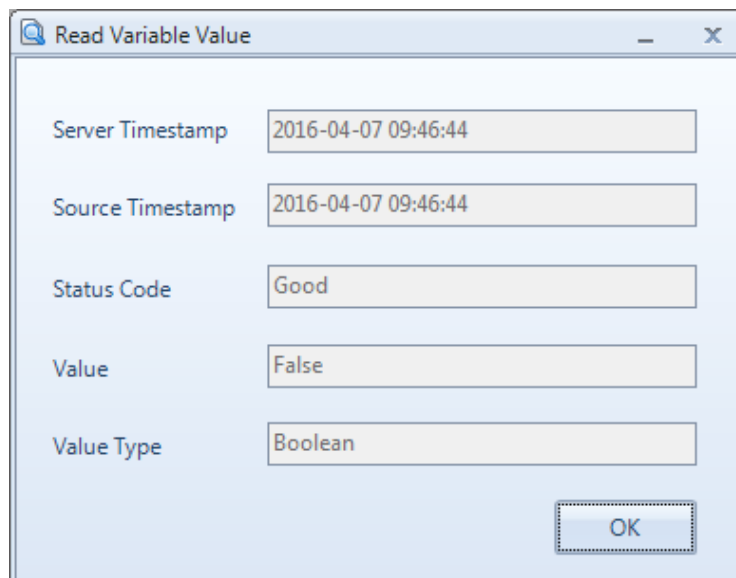


Figure 33: Read Variable Dialog Box

13. Write

To write a value to a variable node, first, you need to right click on the node and then select the **Write** context menu item as illustrated in the figure below.

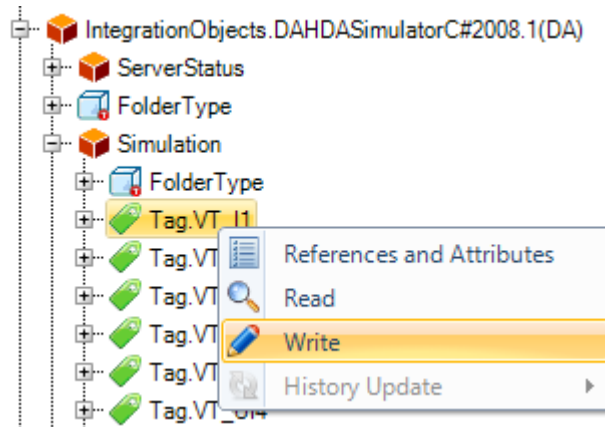


Figure 34: Write Variable Value

To complete the write operation, enter the new value to be written to the node and click the **OK** button to confirm as shown below:

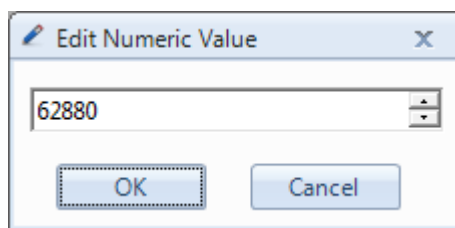


Figure 35: Edit Value

14. Call Method

To call a method, you need to right click on a method node from the server address space and select **Call Method** from the displayed menu as illustrated in the figure below.

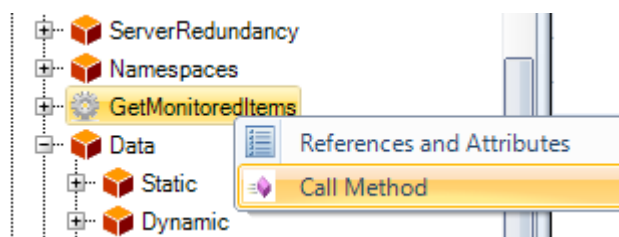


Figure 36: Call Method

A dialog box similar to the one below will be prompted.

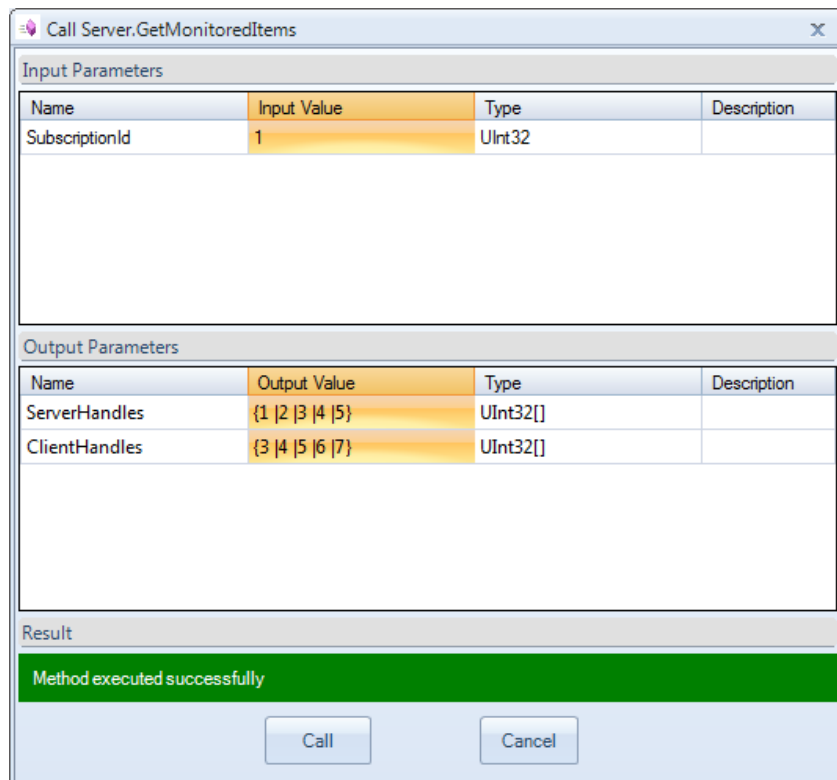


Figure 37: Call GetMonitoredItems Method

In this dialog, you can set the input values and then click **Call**. The output values appear in the Output Value column and the Result text field shows whether the call succeeded or not.

The figure above illustrates the call of “GetMonitoredItems” method. This method is used to get information about the monitored items of a subscription.

Input parameter:

- SubscriptionId - identifier of the subscription.

Output parameters:

- ServerHandles (UInt32[]) - array of ServerHandles for all MonitoredItems of the subscription identified by SubscriptionId.
- ClientHandles (UInt32[]) - array of ClientHandles for all MonitoredItems of the subscription identified by SubscriptionId.

15. Monitor Real-Time Data

To monitor real-time data, the user needs to drag and drop the variable node or the list of variable nodes from the address space browser to the **Data View** grid view, and the following dialog screen will be prompted:

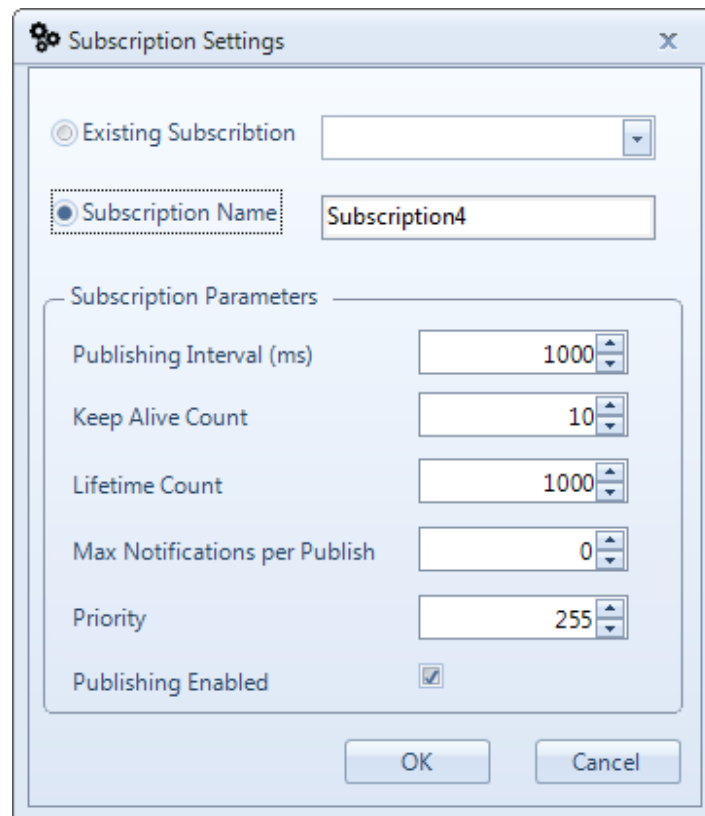


Figure 38: Subscription Settings

Using this dialog box, you can choose either an existing subscription if available or create a new subscription to receive data changes.

After clicking the **OK** button, a new line in the grid view will be added displaying the following information as illustrated in the figure below:

- Display Name
- Node ID
- Value
- Data Type
- Server Timestamp
- Source Timestamp
- Status Code
- Subscription
- Session

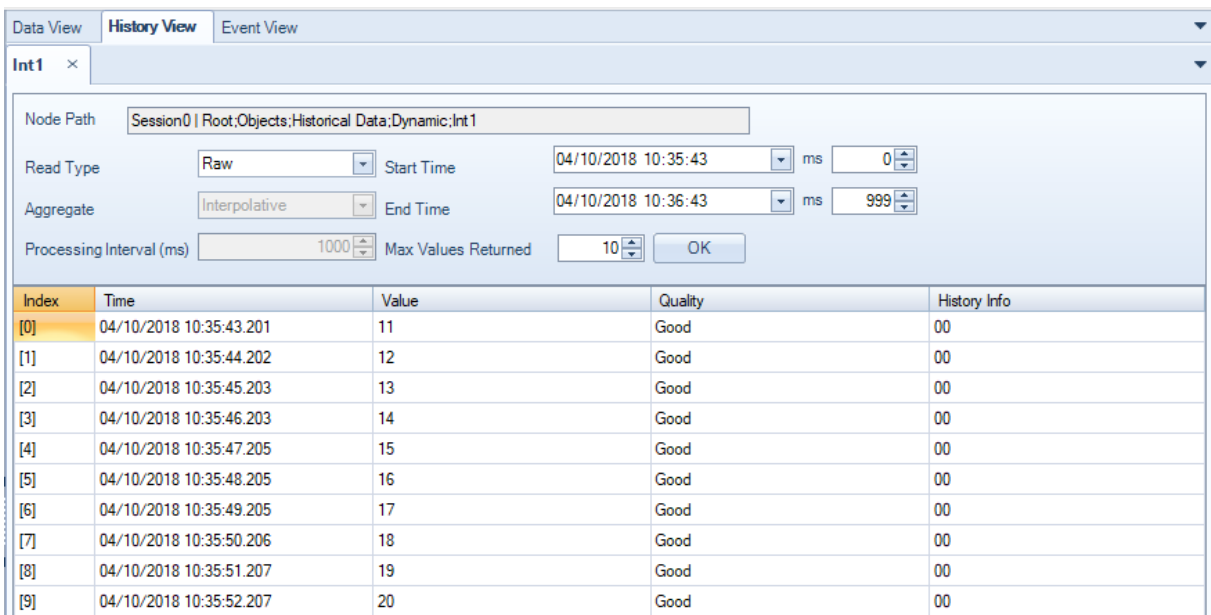
Display Name	Node Id	Value	Data Type	Server Timestamp	Source Timestamp	Status Code	Subscription	Session
Int1	ns=2;s=Dynamic/Int1	17	Int32	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription0	Session0
Int2	ns=2;s=Dynamic/Int2	65	Int64	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription0	Session0
Int3	ns=2;s=Dynamic/Int3	36	String	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription0	Session0
UInt1	ns=2;s=Dynamic/UInt1	44512	UInt16	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription0	Session0
UInt2	ns=2;s=Dynamic/UInt2	2810188310	UInt32	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription0	Session0
UInt3	ns=2;s=Dynamic/UInt3	10967740682877486908	UInt64	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription1	Session0
String1	ns=2;s=Dynamic/String1	System Integration	String	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription1	Session0
Byte1	ns=2;s=Dynamic/Byte1	27	Byte	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription1	Session0
Boolean	ns=2;s=Dynamic/Boolean	True	Boolean	03/10/2018 15:26:50.625	03/10/2018 15:26:50.625	Good	Subscription1	Session0
Int1	ns=2;s=Static/Int1	-16406	Int16	03/10/2018 14:39:42.874	03/10/2018 14:39:42.874	Good	Subscription0	Session1
Int2	ns=2;s=Static/Int2	1866990214	Int32	03/10/2018 14:39:42.876	03/10/2018 14:39:42.876	Good	Subscription0	Session1
Int3	ns=2;s=Static/Int3	6819221709950500880	Int64	03/10/2018 14:39:42.876	03/10/2018 14:39:42.876	Good	Subscription0	Session1
UInt1	ns=2;s=Static/UInt1	39711	UInt16	03/10/2018 14:39:42.876	03/10/2018 14:39:42.876	Good	Subscription0	Session1
UInt2	ns=2;s=Static/UInt2	400632959	UInt32	03/10/2018 14:39:42.877	03/10/2018 14:39:42.877	Good	Subscription0	Session1
UInt3	ns=2;s=Static/UInt3	1408172898387341416	UInt64	03/10/2018 14:39:42.877	03/10/2018 14:39:42.877	Good	Subscription0	Session1
String1	ns=2;s=Static/String1	www.integrationobjects.com	String	03/10/2018 14:39:42.877	03/10/2018 14:39:42.877	Good	Subscription0	Session1

Figure 39: Data View

16. Explore History Data

To explore history data, variable nodes that have history data need to be dragged and dropped to the **History View** so that a new tab with the node display name will be created.

The user can choose between Read Raw, Read Processed, Read Modified and Read at Time. The figure below illustrates the read raw action:



Index	Time	Value	Quality	History Info
[0]	04/10/2018 10:35:43.201	11	Good	00
[1]	04/10/2018 10:35:44.202	12	Good	00
[2]	04/10/2018 10:35:45.203	13	Good	00
[3]	04/10/2018 10:35:46.203	14	Good	00
[4]	04/10/2018 10:35:47.205	15	Good	00
[5]	04/10/2018 10:35:48.205	16	Good	00
[6]	04/10/2018 10:35:49.205	17	Good	00
[7]	04/10/2018 10:35:50.206	18	Good	00
[8]	04/10/2018 10:35:51.207	19	Good	00
[9]	04/10/2018 10:35:52.207	20	Good	00

Figure 40: Read Raw

The Processing Interval, the Start Time, the End Time and the Max Values Returned parameters are configurable using the fields available at the top of the grid view. The figure below is an example of read processed data (read the average value):

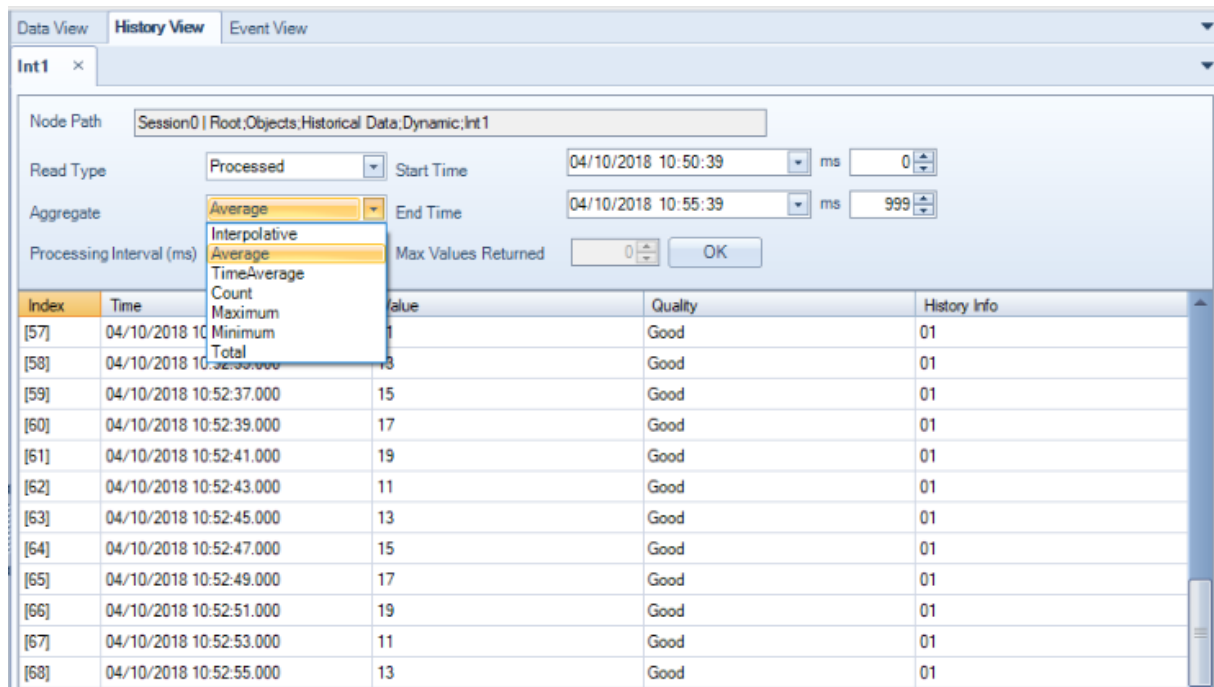


Figure 41: Read Processed

17. Update History Data

To update history data, you need to right click on a variable node that has a history write access and select **History Update**.

The History Update menu includes five entries, as illustrated in the figure below:

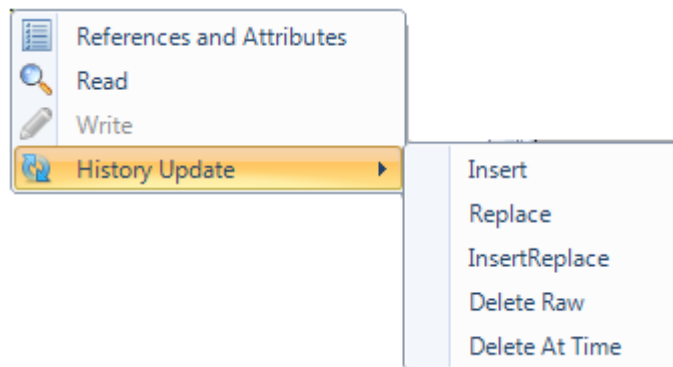


Figure 42: Update History Data

a. Insert, Replace, Insert/Replace

These three update functions are defined as follows:

- **Insert:** this function inserts values and qualities at the specified timestamps. If a value exists at the specified timestamp, the new value will not be inserted.
- **Replace:** this function replaces the values and qualities at the specified timestamps. If no value exists at the specified timestamp, the new value will not be inserted.
- **Insert/Replace:** this function inserts or replaces values and qualities for the specified timestamps. If the item has a value at the specified timestamp, the new value and

quality will replace the old one. If there is no value at that timestamp, the function will insert the new data.

These three functions have similar graphical configuration interface where the user must provide the value, value type, timestamp, and quality.

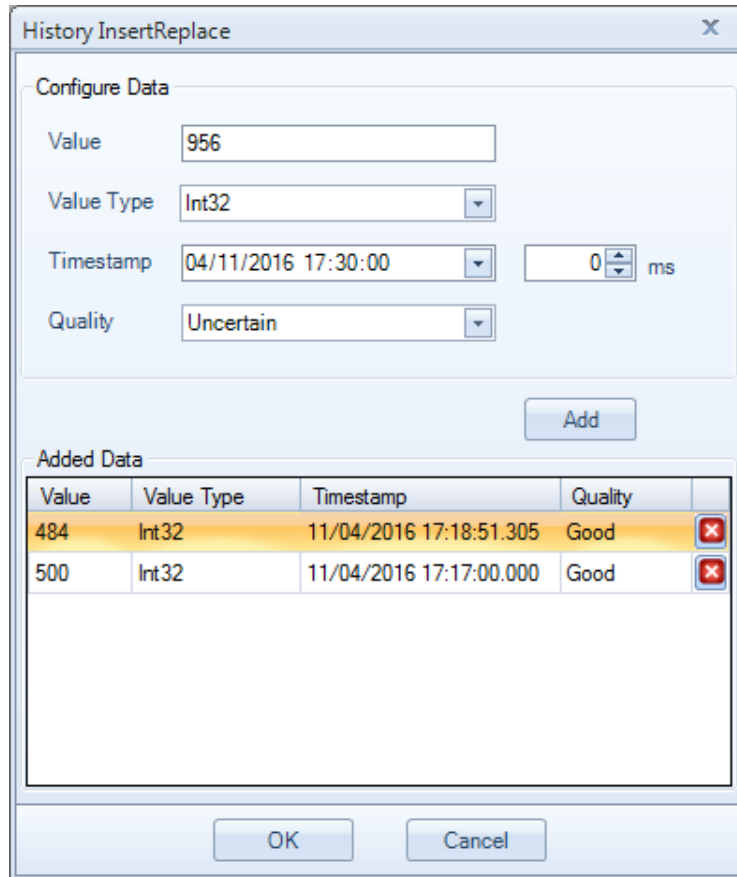


Figure 43: History InsertReplace Dialog

b. Delete Raw

This function deletes the values, qualities, and timestamps for the specified time.

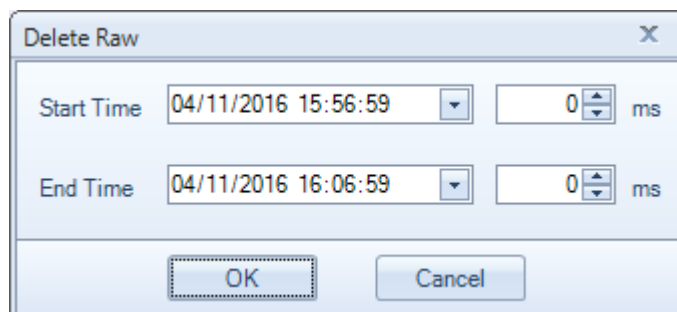


Figure 44: Delete Raw Dialog

c. Delete At Time

This function deletes the values and qualities in the historian for the specified timestamps.

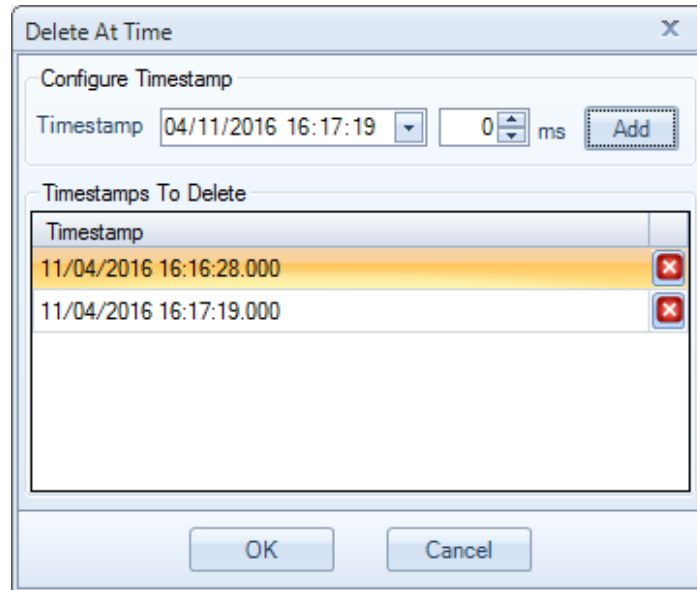


Figure 45: Delete At Time Dialog

18. Monitor Alarms and Conditions

To monitor alarms and events, the object node that should be an Event Notifier need to be dragged and dropped from the address space browser to the **Event View** grid view. Same as monitoring real-time data, a subscription should be created to receive Alarm and Condition notifications from the server.

After choosing the subscription, the event and alarm notifications will be added to the grid view displaying the following information as illustrated in the figure below:

- Node Display Name
- Event Type
- Source Name
- Time
- Message
- Severity
- Subscription Name
- Session Name

Data View History View Event View									
AckReq	Node Display Name	Event Type	Source Name	Time	Message	Severity	Condition	Subscription Name	Session Name
Req	Server	Level	EventSources.Area2.Condition	3/2/2017 1:50:58 PM	Condition Active	100	SPLEVEL	Subscription0	Session2
	Server	Signal Change	EventSources.Area1.Simple2	3/2/2017 1:50:54 PM	False	800		Subscription0	Session2
	Server	Advanced Control	EventSources.Area1.Tracking	3/2/2017 1:50:59 PM	3489	600		Subscription0	Session2
	Server	Device Failure	EventSources.Area1.Simple	3/2/2017 1:50:59 PM	True	400		Subscription0	Session2
	Simulation	Program Transition...	Simulation	3/2/2017 1:49:56 PM	The "":"Start" m...	500		Subscription0	Session3
	Server	Injection Test Repor...	HistoryEvents/Titan	3/2/2017 1:50:54 PM	An injection test ...	500		Subscription0	Session3
	Server	FluidLevel Test Rep...	HistoryEvents/Jupiter	3/2/2017 1:50:54 PM	A fluid level test r...	500		Subscription0	Session3

Figure 46: Event View

The Vendor Specific Event Attributes can also be displayed, in the event grid view, with the same order defined by the server as shown in the figure below:

Data View History View Event View										
Message	Severity	Condition	Subscription Name	Session Name	Attr #0	Attr #1	Attr #2	Attr #3	Attr #4	Attr #5
4 Deviation Alarm	500	DEVIATION	Subscription0	Session0	(null)	(null)	(null)	(null)	(null)	(null)
4 LOLO Alarm	300	PVLEVEL	Subscription0	Session0	357	358	359	360	361	362
4 Condition Normal	500	DEVIATION	Subscription0	Session0	(null)	(null)	(null)	(null)	(null)	(null)
4 Simple Event	1		Subscription0	Session0	(null)	(null)	(null)	(null)	(null)	(null)
4 Setpoint changed Tracking Event	1		Subscription0	Session0	(null)	(null)	(null)	(null)	(null)	(null)
4 LOLO Alarm	100	PVLEVEL	Subscription0	Session0	451	452	453	454	455	456

Figure 47: Event Attributes

The displayed attributes columns number can be modified using the config ini located in the installation folder. The related tag is called **ColumnCount** and is set to 20 by default as shown below.

```

[FileLogConfiguration]
AutoAppend=true
BufferSize=100
LogFileMaxSize=10
MaximumFiles=0
Level=Error
AutoSaveTimeOut=10
[Display]
Style=Windows7Blue
ColorStyle=Empty
[ConfigSetting]
DefaultConfigPath=
[AddressSpaceConfiguration]
SuppressDuplicateReferences=false
[EventAttributes]
ColumnCount=20
  
```

Figure 48: Event Attributes Number Configuration

19. Acknowledge Alarms

To acknowledge the alarms, select one or many rows from the Event gridview then right click and select **Acknowledge Selected** as illustrated in the figure below.


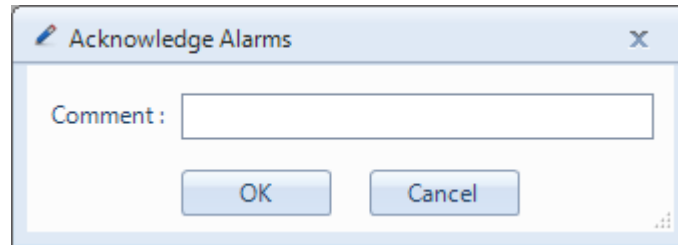
Data View History View Event View									
AckReq	Node Display Name	Event Type	Source Name	Time	Message	Severity	Condition	Subscription Name	Session Name
Req	Server	Level	EventSources.Area2.Condition	3/2/2017 1:44:59 PM	Condition Active	100	SPLEVEL	Subscription0	Session2
			EventSources.Area1.Simple2	3/2/2017 1:44:55 PM	False	800		Subscription0	Session2
	Server	Advanced Control	EventSources.Area1.Tracking	3/2/2017 1:44:55 PM	3416	600		Subscription0	Session2
	Server	Device Failure	EventSources.Area1.Simple	3/2/2017 1:44:55 PM	False	400		Subscription0	Session2

Figure 49: Acknowledge Selected Alarms

If the acknowledge is required the **Acknowledge Alarms** dialog will be prompted so that the user enters his comment.



The dialog box is titled "Acknowledge Alarms" and contains a text input field labeled "Comment:" and two buttons: "OK" and "Cancel".

Figure 50: Acknowledge Alarms Dialog

For additional information on this guide, questions or problems to report, please contact:

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