Integration Objects'

OPC Real-Time and Historical Data, Alarms and Events Archiving Software

OPC EasyArchiver
Version 3.0 Rev.2

USER GUIDE

OPC Compatibility

OPC Data Access 1.0a
OPC Data Access 2.00
OPC Data Access 2.05a
OPC Data Access 3.00
OPC Historical Data Access 1.00
OPC Historical Data Access 1.10
OPC Historical Data Access 1.20
OPC Alarms and Events 1.00
OPC Alarms and Events 1.01
OPC Alarms and Events 1.02
OPC Alarms and Events 1.10

OPC EasyArchiver User Guide Version 3.0 Rev.2
Published June 2021

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

PREFACE

ABOUT THIS USER GUIDE

This guide:

- Describes the main features offered by the Integration Objects' OPC EasyArchiver for Microsoft SQL Server, Oracle, Microsoft Access, MySQL, PostgreSQL, OLEDB and ODBC databases and CSV files.
- Lists the system requirements for installing and running OPC EasyArchiver.
- Explains how to configure OPC EasyArchiver.
- And details how to use and run this OPC Client.

TARGET AUDIENCE

This user guide is intended for users who are looking for applications that can collect both real-time data and historical process data and store those data into a database.
Knowledge of the basics of OPC Data Access (OPC DA) and OPC Historical Data Access (OPC HDA) specifications is a prerequisite.
It is also assumed that the user has some prior knowledge of MS SQL Server, Oracle, MS Access, MySQL, PostgreSQL, CSV files, OLEDB and ODBC databases configuration.

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: https://www.integrationobjects.com/

INTRODUCTION

1. Overview

Integration Objects' OPC EasyArchiver allows you to:

- Perform real-time data transfer from one or more OPC Data Access (OPC DA) and OPC Historical Data Access (OPC HDA) servers to any SQL like database accessible through the network or to CSV files.
- Schedule historical data collection from one or more OPC Historical Data Access (OPC HDA) servers and transfer those data to any database accessible through the network.
- Perform real-time alarms and events transfer from one or more OPC Alarm & Events (OPC A&E) servers to any SQL like database accessible through the network or to CSV files.
- Perform real-time data transfer from any SQL like database accessible through the network to any OPC Data Access (OPC DA) server.

The OPC EasyArchiver supports standard databases such as Microsoft SQL Server, Oracle, MySQL, PostgreSQL, Microsoft Access databases, CSV files or other SQL like databases available in your network via OLEDB or ODBC providers.

Using the OPC EasyArchiver, you can have a complete historical record of your process data, collected in real-time or periodically from your historian servers and of your process alarms and events. The archived data can be used for trend analysis, sequence of events, calculations and reporting.

2. Architecture

The following diagram illustrates the OPC EasyArchiver's typical system architecture.
OPC EasyArchiver communicates with the available OPC DA/HDA/AE servers connected to the network in order to collect data and alarms and store those data in MS SQL Server, Oracle, MySQL, MS Access, PostgreSQL, CSV files, or any OLEDB and ODBC compliant databases.

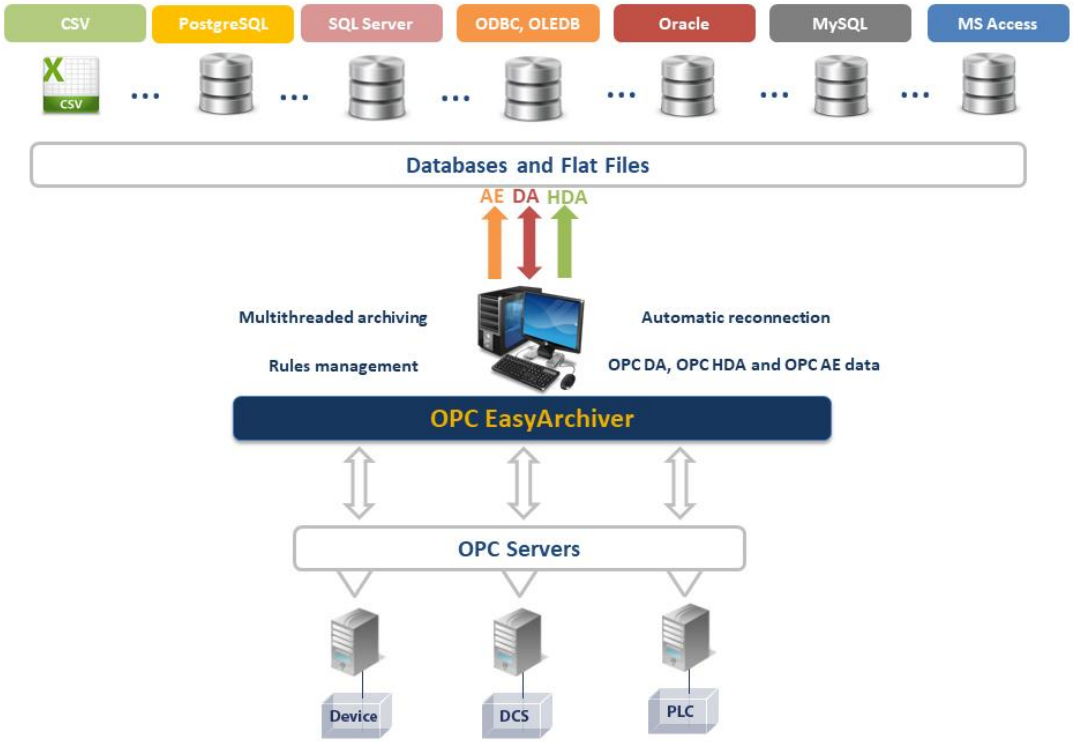


Figure 1: OPC EasyArchiver Architecture

3. Features

The OPC EasyArchiver offers the following features:

- A fully compliant OPC DA Client.
- A fully compliant OPC HDA Client.
- A fully compliant OPC AE Client.
- An intuitive Graphical User Interface allowing users to easily and quickly configure multiple archivers.
- Automatic discovery of OPC servers.
- Managing multiple local and remote connections to OPC Servers.
- Support of the following OPC Data Access functionalities:
  - Items browsing.
  - Managing OPC DA groups (Add, Remove).
  - Monitoring data changes in real-time.
  - Performing synchronous and asynchronous read and write operations of item data values, their timestamps, and their qualities.
- Support of the following OPC Historical Data Access functionalities:

  - Items browsing and management.
  - Synchronous read, update and annotations operations.
  - Asynchronous read, update and annotations operations.
  - Scheduling historical data collection by performing synchronous loop operations for read processed and read raw to automatically and periodically collect historical data.
- Support of the following OPC Alarms & Events functionalities:
  - Browsing of all data sources available in OPC Alarms and Events servers.
  - Filtering of retrieved alarms and events according to several criteria, which are:
    - ✓ Filter by Event Type.
    - ✓ Filter by Severity.
    - ✓ Filter by Category.
    - ✓ Filter by Area.
    - ✓ Filter by Source.
  - Real-time capturing of fired alarms and events.
- Tracing all OPC calls even when they are completed successfully.
- Management of dynamic XML files to save the OPC EasyArchiver's configuration.
- Configuration of a list of critical tags to supervise by setting rules and planning the actions to be undertaken when these rules become valid.

  Example:

  Dispatching alert messages to the plant operators via email, overwriting the current tag value, starting/stopping archivers based on watchdog tags.

- Collecting and archiving real-time and historical process data as well as alarms and events into the following databases:
  - SQL Server databases.
  - Oracle databases.
  - MS Access databases.
  - MySQL databases.
  - PostgreSQL databases.
  - OLEDB databases such as MySQL, IBM DB2, SQL Server, MS Access, Oracle, Microsoft Excel, etc.
  - ODBC databases such as MySQL, SQL Server, MS Access, Oracle, Microsoft Excel and Cassandra etc.
- Collecting and archiving real-time and historical process data as well as alarms and events into CSV files.
- Transfer data from the database to any OPC DA server.
- Automatic reconnection to the database server when the connection is lost.
- Automatic reconnection to the OPC Server when the connection is lost.

- OPC data buffering upon communication loss with the databases and data recovery after successful reconnection. This ensures store and forward capability. Windows Service Archiver: The archiving operations are managed by Windows services running in the background, guaranteeing continuous archiving process and automatic restart when the hosting machine is restarted.

4. Operating Systems Compatibility

OPC EasyArchiver supports the following operating systems:

- Windows XP SP3.
- Windows 7.
- Windows 8.
- Windows 8.1.
- Windows 10.
- Windows Server 2003 SP2.
- Windows Server 2008.
- Windows Server 2008 R2.
- Windows Server 2012.
- Windows Server 2012 R2.
- Windows Server 2016.
- Windows Server 2019.

5. OPC Compatibility

- OPC Data Access 1.0a.
- OPC Data Access 2.00.
- OPC Data Access 2.05a.
- OPC Data Access 3.00.
- OPC Historical Data Access 1.00.
- OPC Historical Data Access 1.10.
- OPC Historical Data Access 1.20.
- OPC Alarms and Events 1.00.
- OPC Alarms and Events 1.01.
- OPC Alarms and Events 1.02.
- OPC Alarms and Events 1.10.

6. Minimum Hardware Requirements

The following are the minimum hardware requirements to run the OPC EasyArchiver:

	Description
Processor	Intel Core i5 (higher recommended).
RAM	4 GB (higher recommended).
Disk Space	500 MB hard disk space for full installation.
Databases	Any compliant MS SQL Server 2005 or later, Oracle version 8i or later, Microsoft Access 2003 or later, MySQL version 5.0 or later, PostgreSQL version 9.x or later, CSV files, MySQL ODBC connector version 5.2 or later or other using OLEDB or ODBC connection providers.

Table 1: Minimum Hardware Requirements

The hardware sizing depends on several factors such as the number of tags, the data update rate and the operating system version.

GETTING STARTED

1. Pre-Installation Considerations

In order to properly run the OPC EasyArchiver, the following software components on the target system need to be installed:

- The OPC Core Components 3.0.0, which consist of all shared OPC modules including the DCOM proxy/stub libraries, the OPC Server Enumerator, .NET wrappers, etc.
  If the OPC EasyArchiver deployment version is 64 bit, you need to install the 64-bit version of the OPC Core Components.
  If the OPC EasyArchiver deployment version is 32 bit, you need to install the 32-bit version of the OPC Core Components.
  You can deploy the OPC core components during the installation by checking the option "Install OPC Core Components" or after installation by using the setup available in the installation folder of the OPC EasyArchiver.

- .NET framework 4.0 or higher.

Also, make sure there is no firewall or antivirus blocking the application.

The table below lists the prerequisites to communicate with databases:

Database	Database Connector Pre-requisite
MS SQL Server	Uses ADO .NET to communicate with the database. No pre-requisites need to be installed.
MS Access	Requires Microsoft Office to be installed.
Oracle	Uses a fully-managed ADO .NET provider to communicate with the database. No additional Oracle Client software is required to be installed to connect to Oracle Database.
MySQL	Uses embedded MySQL connector to communicate with the database. No pre-requisites need to be installed.
ODBC	Requires the ODBC driver to be installed in order to communicate with the corresponding database source type.

OLEDB	Requires the OLEDB driver to be installed in order to communicate with the corresponding database source type.
PostgreSQL	Uses ADO .NET to communicate with the database. No pre-requisites need to be installed.
CSV	No pre-requisites need to be installed.

Table 2: Database Connector Pre-requisites

2. Installing and Running

To install the OPC EasyArchiver:

1. Right click on the downloaded installation package for OPC EasyArchiver and select "**Run as administrator**" from the displayed menu. The installation welcome dialog box will appear.

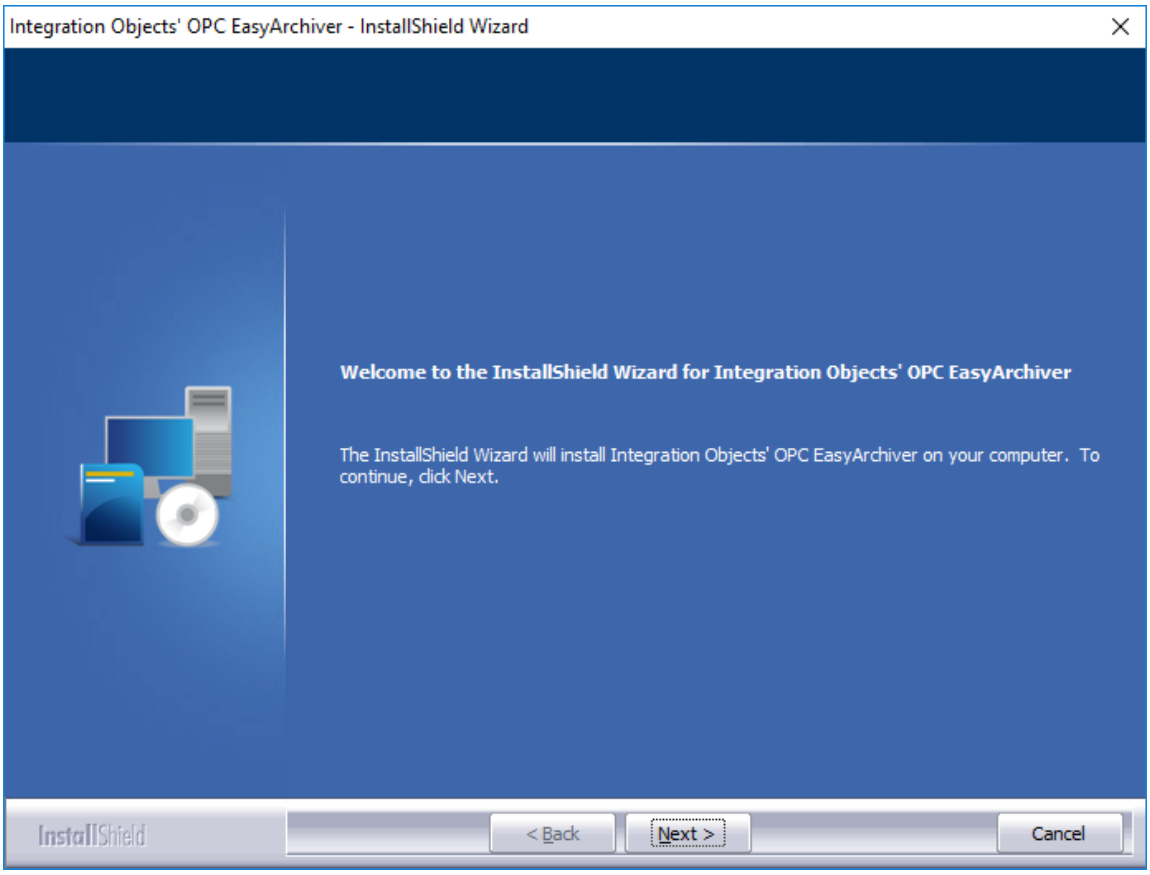


Figure 2: Installation Welcome Dialog

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

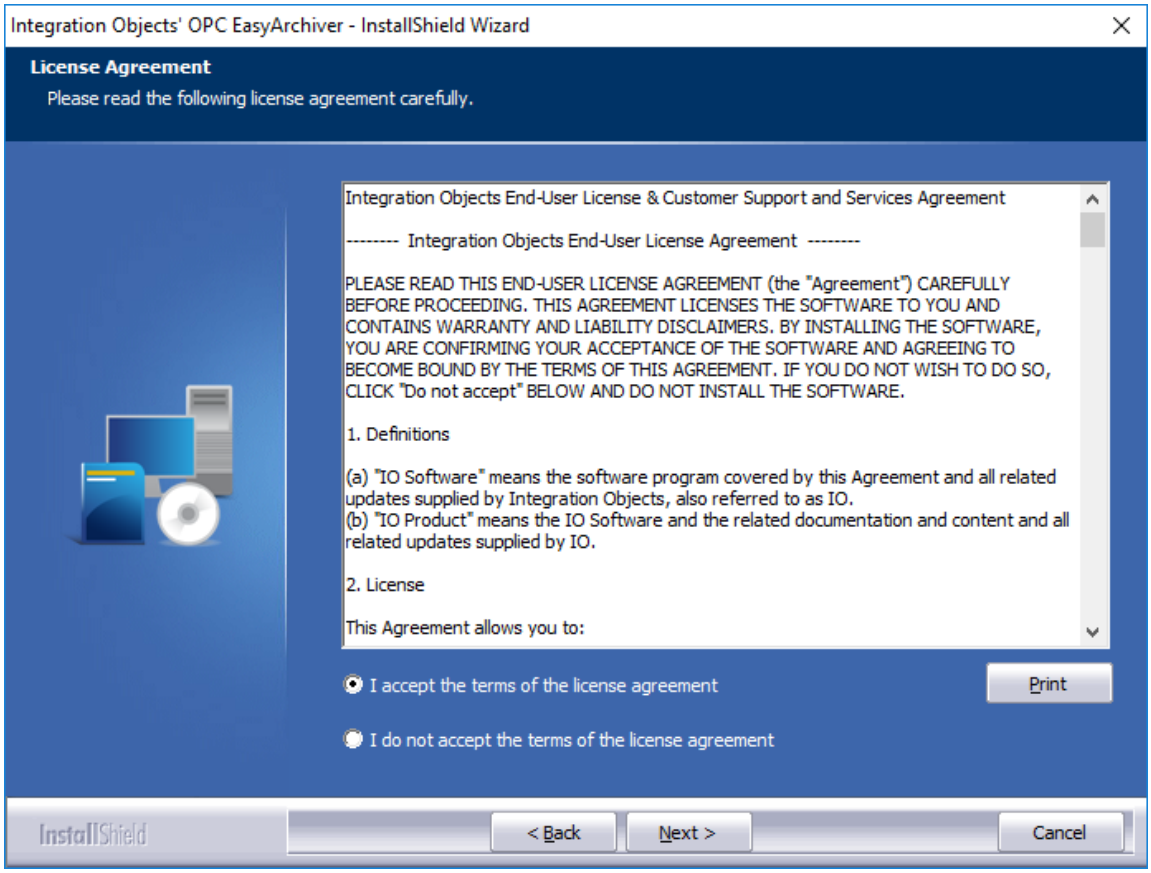


Figure 3: License Agreement Dialog

3. After reading the license agreement, select the first option and click the **Next** button. By proceeding, you are accepting all of the license agreement terms. Otherwise, you can cancel the installation. The customer information dialog box will appear.

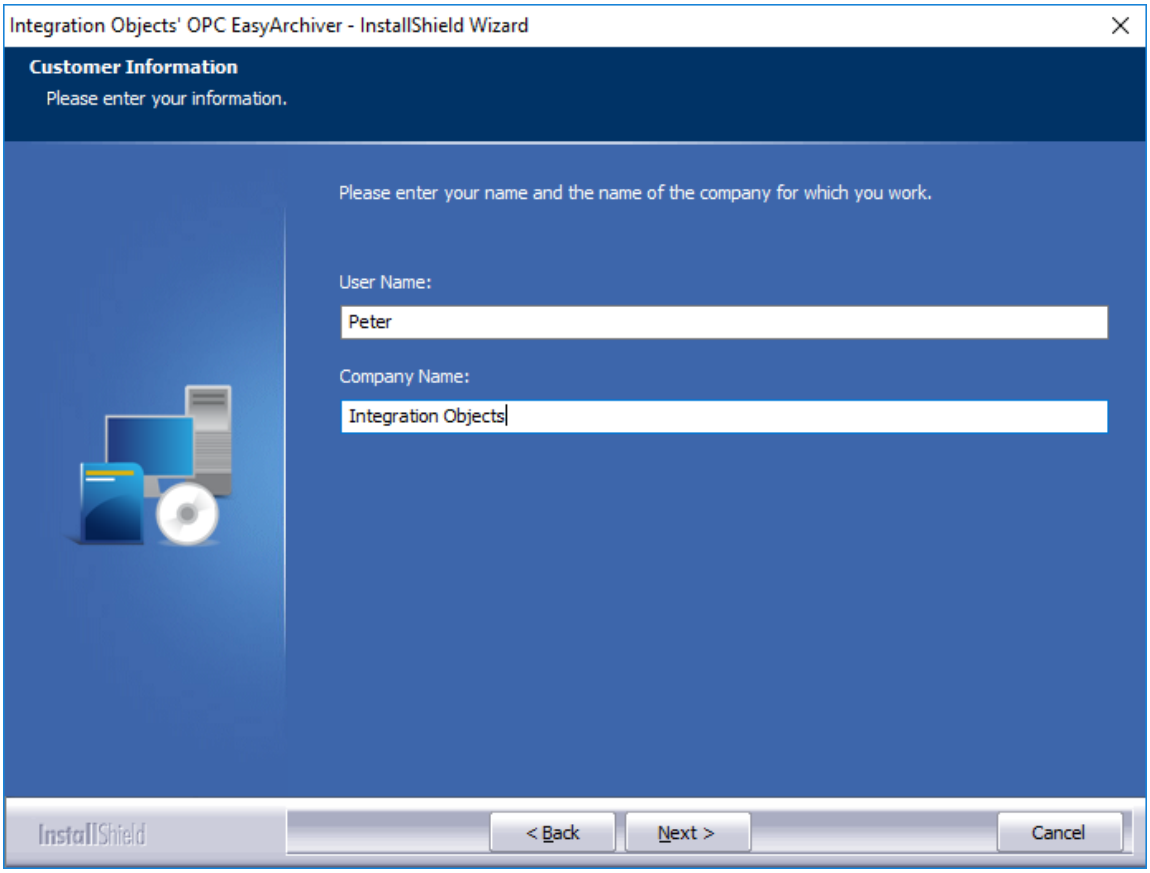


Figure 4: Customer Information Dialog

4. Enter your user name and company name and then click the **Next** button. The dialog box for choosing the setup type will be displayed.

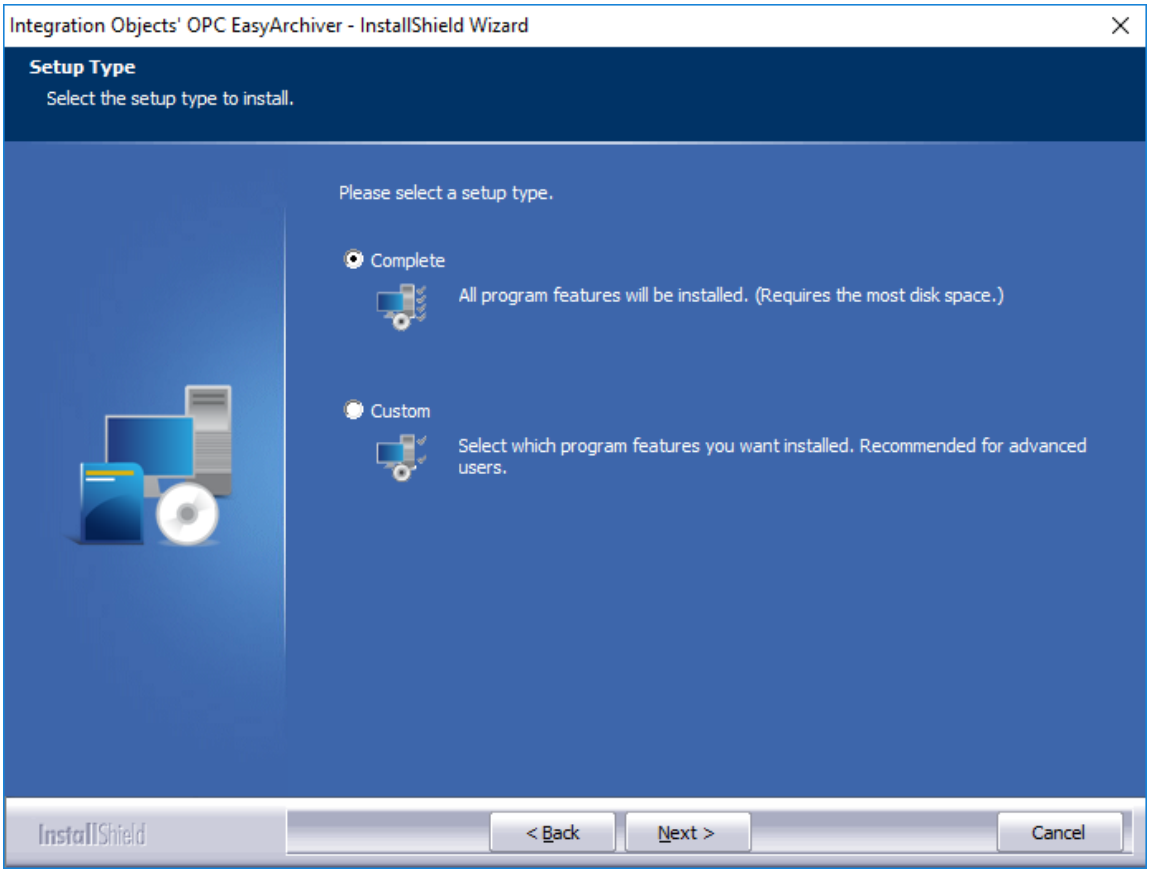


Figure 5: Setup Type Dialog

5. If you choose the **Complete** setup type, all of the product features will be installed. If you choose **Custom** setup type, the following dialog will be displayed and you will need to check the specific features that you want to install:

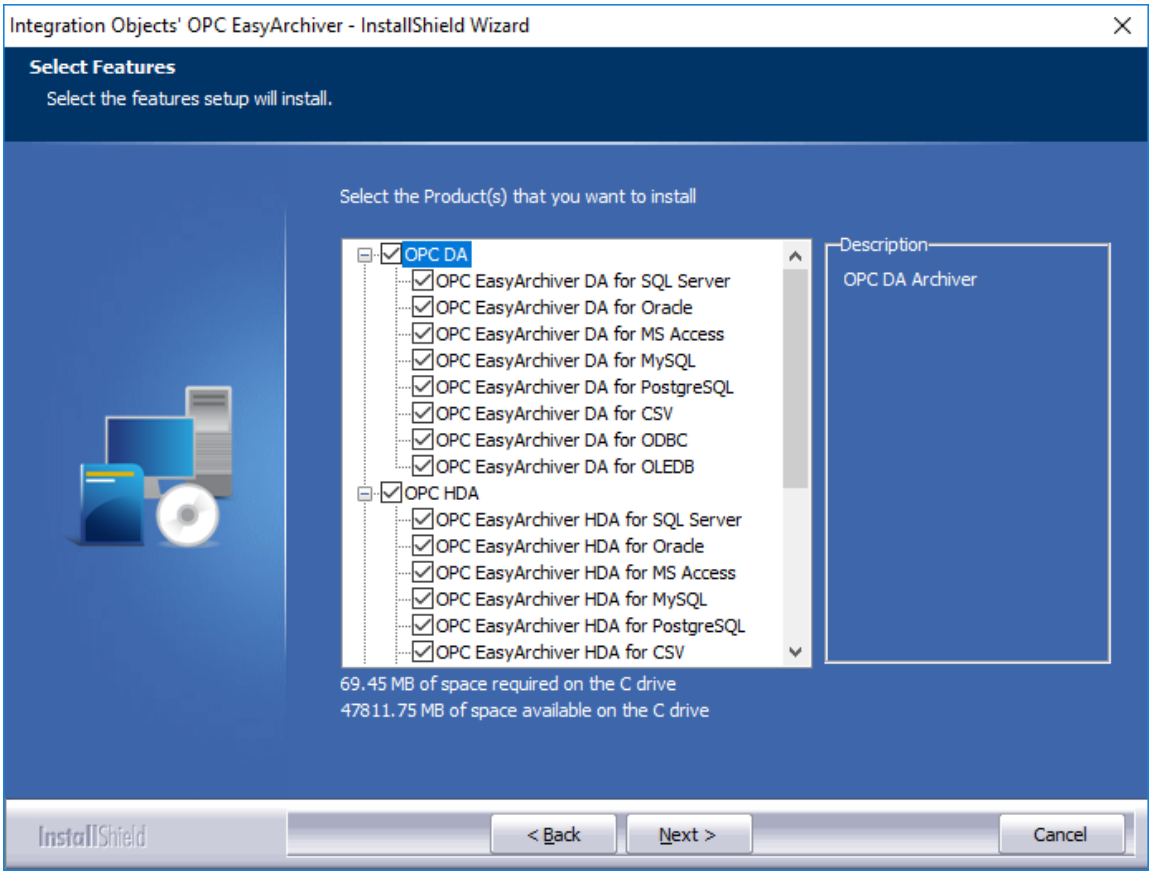


Figure 6: Features Dialog

6. After selecting the features you want to install, click the **Next** button. The dialog box for choosing the OPC EasyArchiver deployment version will be displayed.

The runtime mode dialog box for configuring the deployment version will be displayed only if your operating system is 64-bit version.

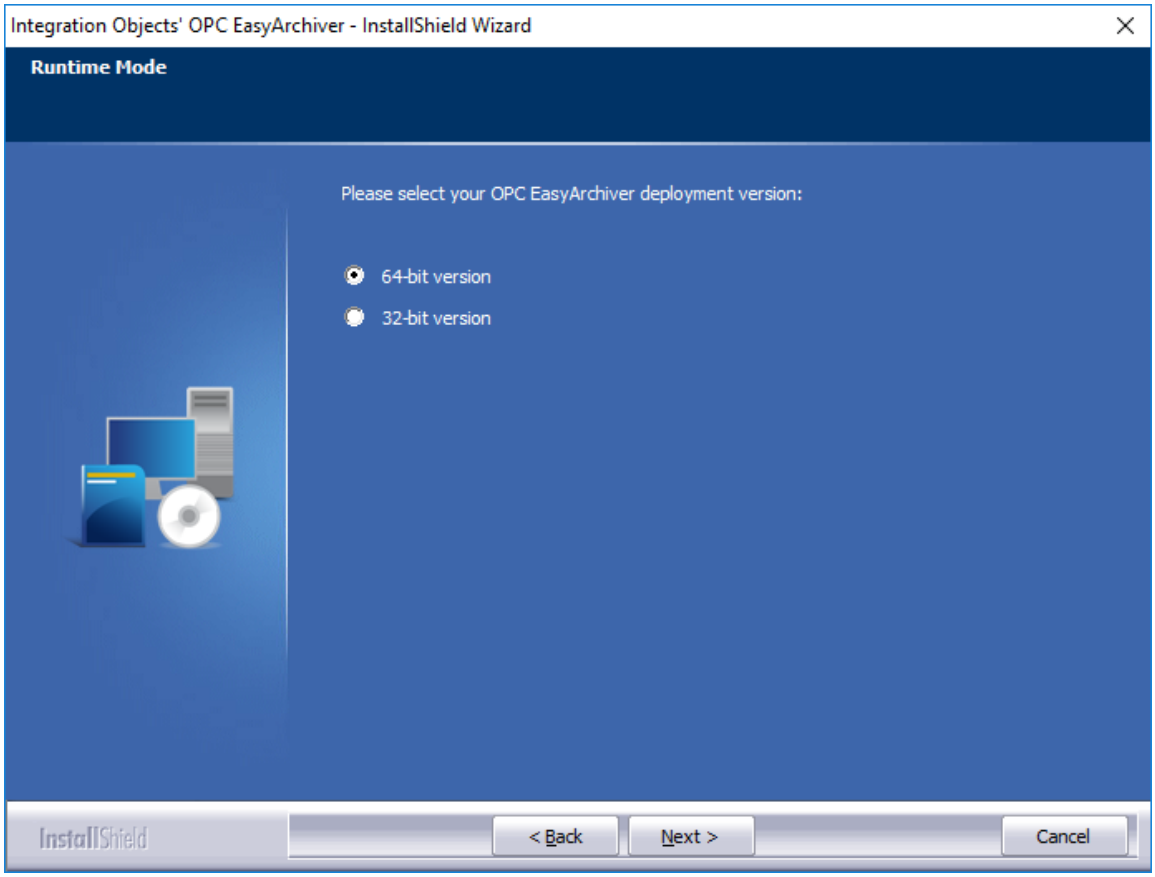


Figure 7: Choose Deployment Version Dialog Box

Some OPC servers that are 32-bit processes work only with 32-bit OPC clients. If this is your case, make sure to select the "32-bit version" option.

7. After selecting the OPC EasyArchiver deployment version, the dialog box for choosing the destination folder will be displayed.

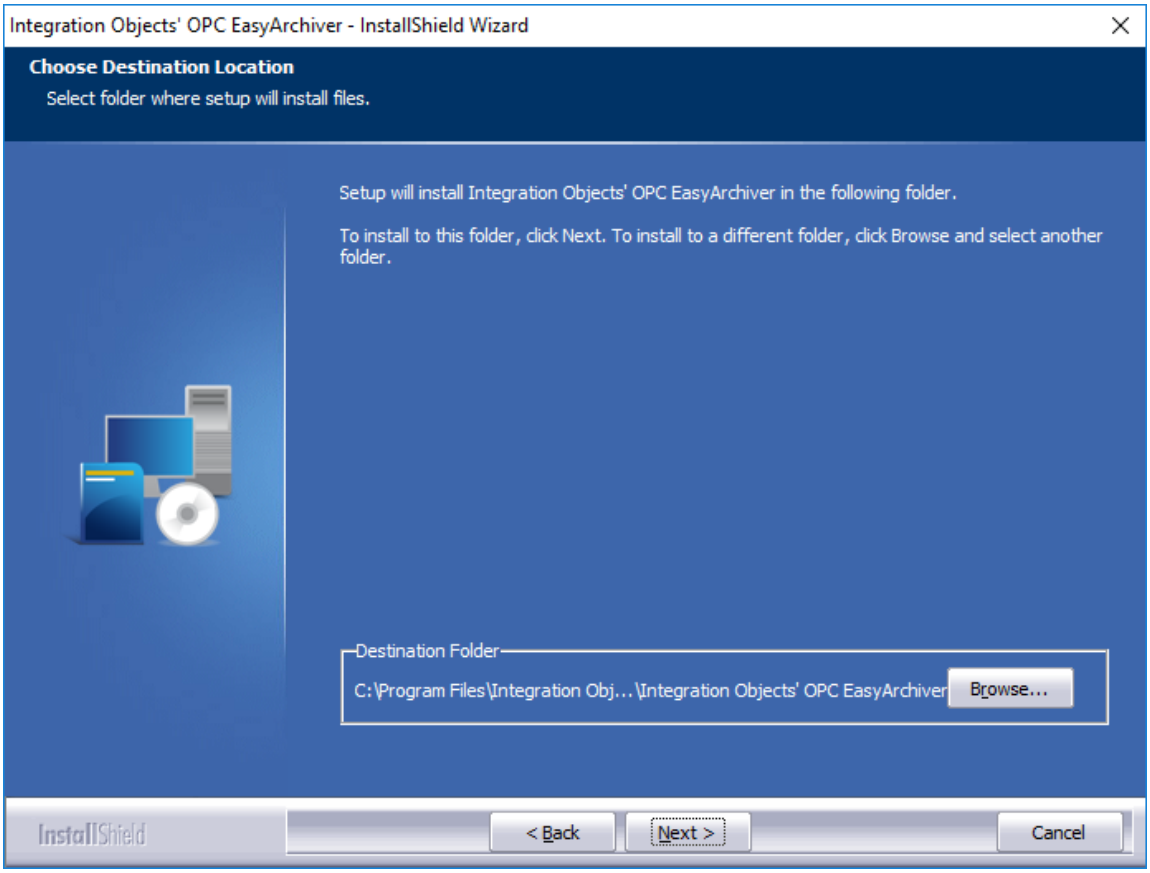


Figure 8: Choose Destination Folder Dialog

8. Click the **Next** button to use the default destination folder and continue the installation, or the **Browse** button to select a different destination folder. The installation dialog box will then appear.

9. Click the **Install** button to start installation.
   The setup will then copy the necessary files to the selected destination folder, create shortcut icons to launch the OPC EasyArchiver and authorization license tool from the start menu and make an un-installation entry in the Programs and Features in the Control Panel.

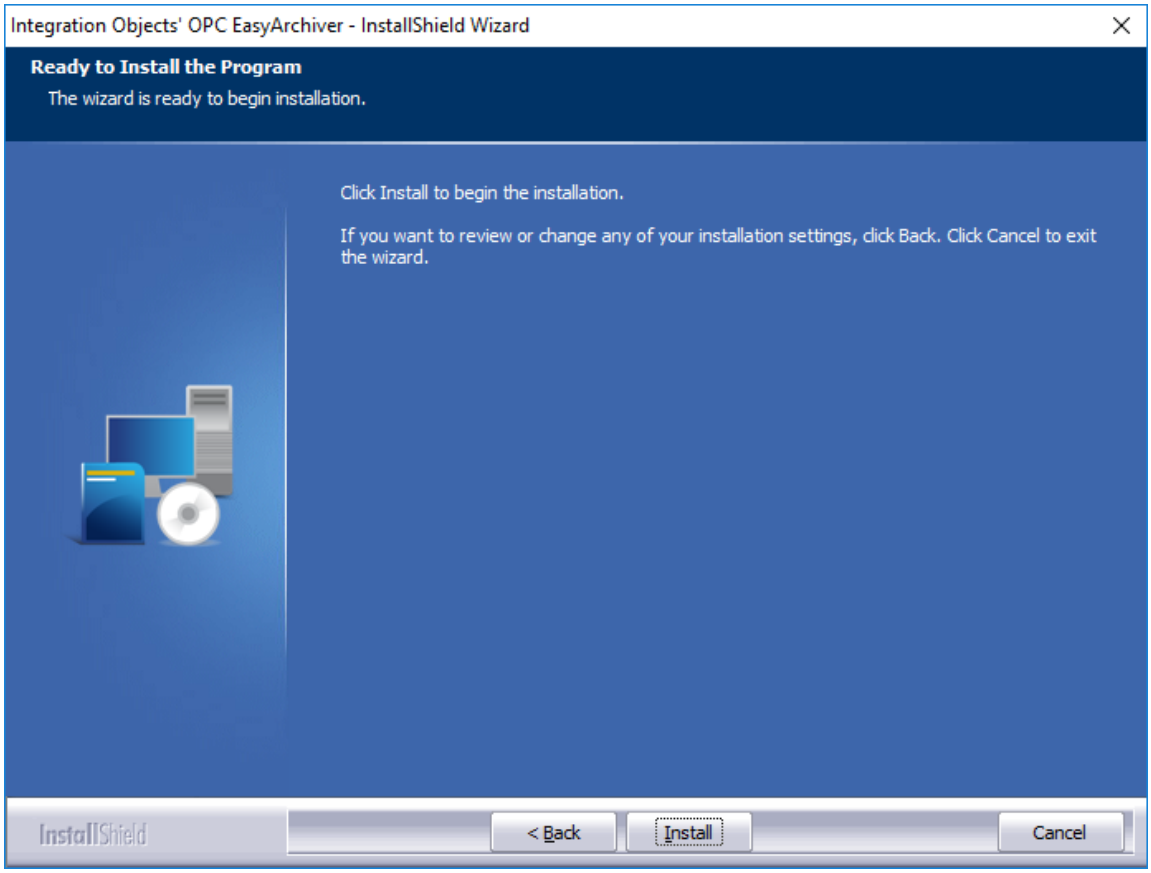


Figure 9: Installation Dialog

10. Before the completion of the installation, the following dialog will be displayed in order to configure the user account that will be used to run the OPC EasyArchiver services. For the user name field, follow the format *Domain name\userlogin.* In case of local account, follow the format **.***userlogin*.

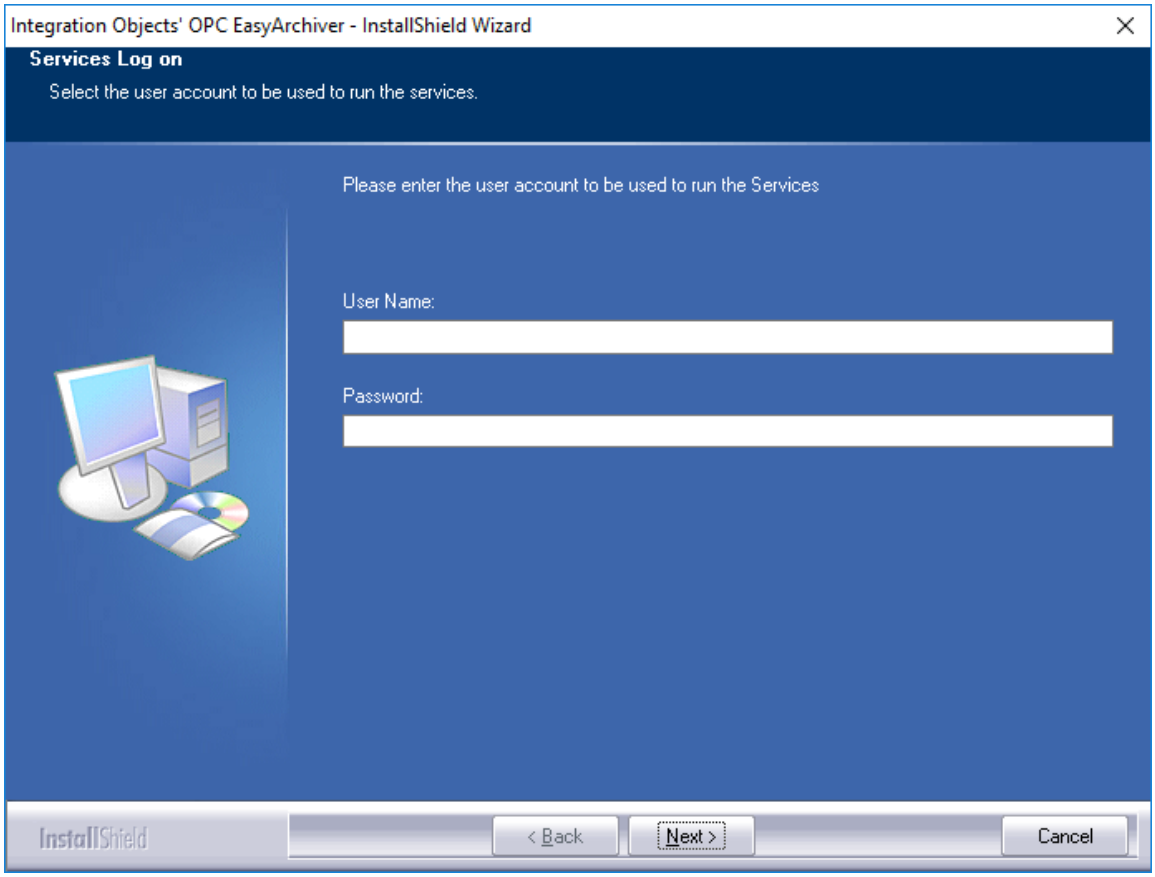


Figure 10: Services Log on

If you do not enter a valid account, the Local System account will be used to run the services. You can still modify this configuration after the installation using the Windows services manager. Make sure that the configured account has the following minimum access rights:

- **Log on as a service**
- **Connect to your OPC Servers and read data**
- **Read/write to the Windows Registry and to selected destination folder**

11. Check the "**Install OPC Core Components**" option and click **Next** if you want to install all shared OPC modules including the DCOM proxy/stub libraries, the OPC Server Enumerator, .NET wrappers, etc.

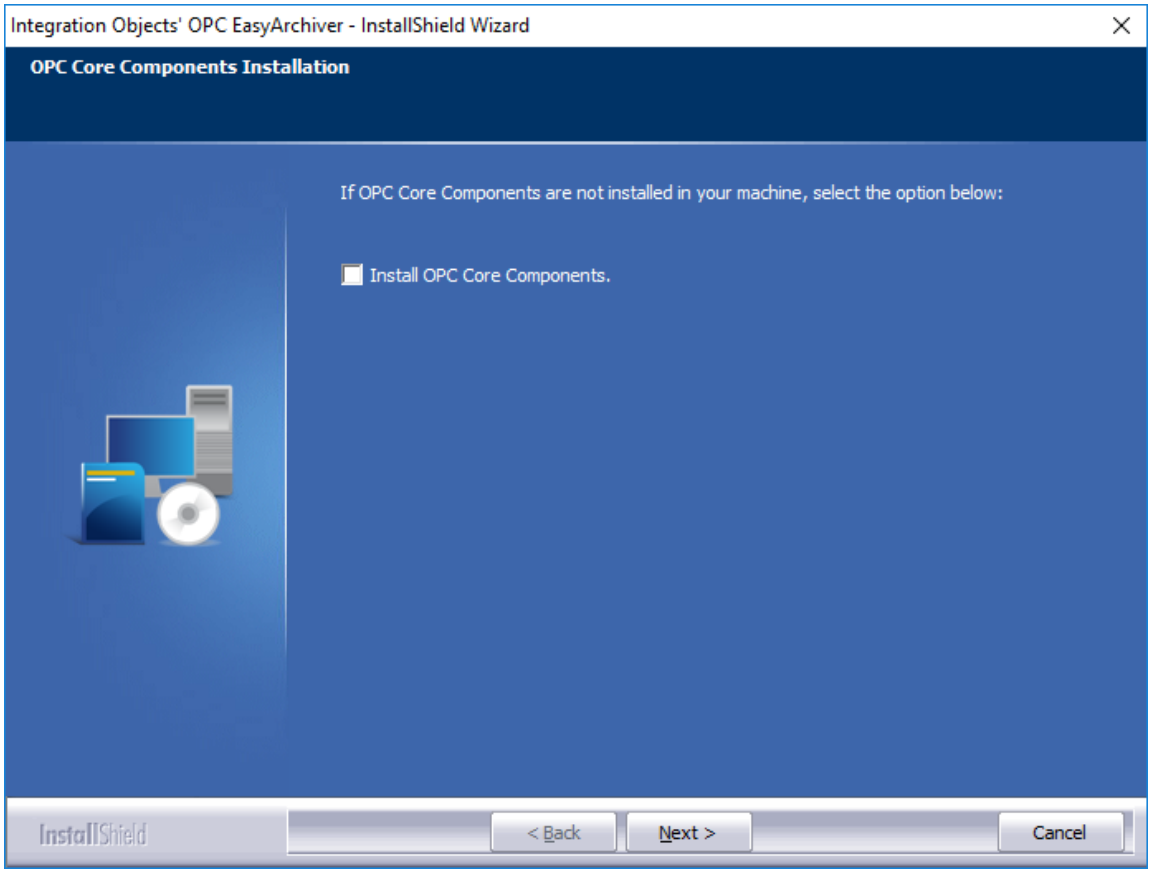


Figure 11: OPC Core Components Installation Dialog

12. Click the **Finish** button to complete the installation.

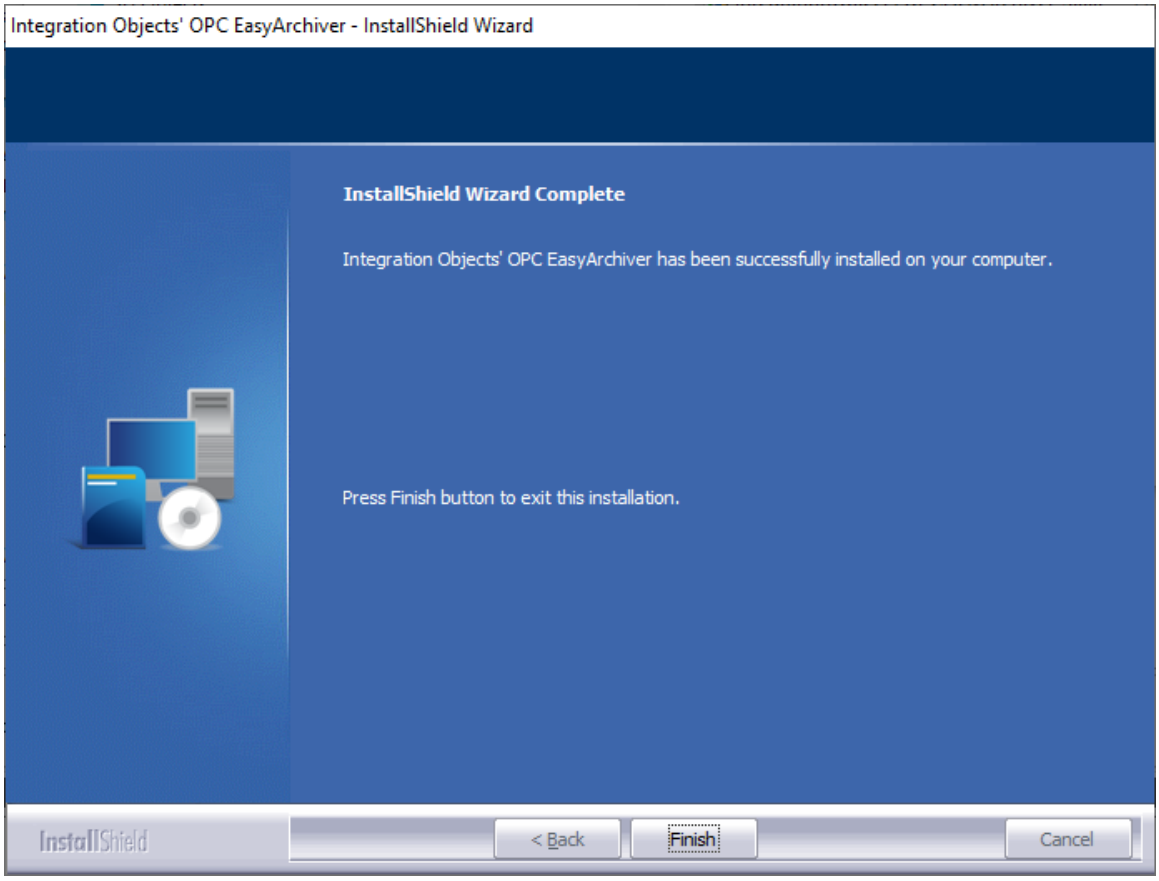


Figure 12: Installation Completed Dialog

3. Starting-up

The OPC EasyArchiver's services are started automatically with the host machine restart. They can be started and stopped manually from the Windows services panel.
The OPC EasyArchiver user interface can be launched from the start menu shortcut. To do so, click on **Start ➔ Programs ➔ Integration Objects ➔ OPC EasyArchiver➔ OPC EasyArchiver:**

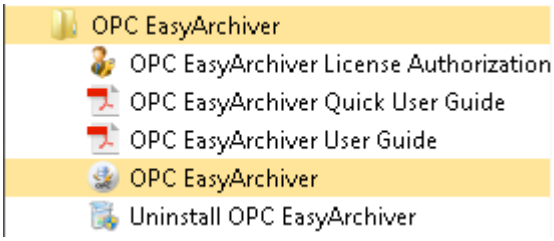


Figure 13: OPC EasyArchiver Start Menu

4. Removing the OPC EasyArchiver

To uninstall the OPC EasyArchiver, follow the steps below:

1. Click the **Uninstall OPC EasyArchiver** shortcut available in the start menu, as shown in the figure below:

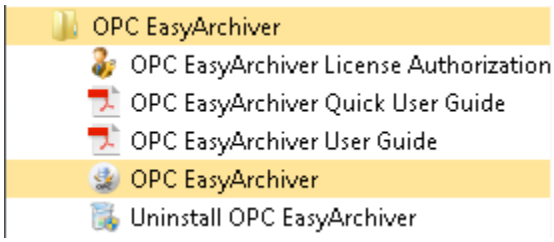


Figure 14: Uninstall Shortcut in the Start Menu

The following dialog box will appear:

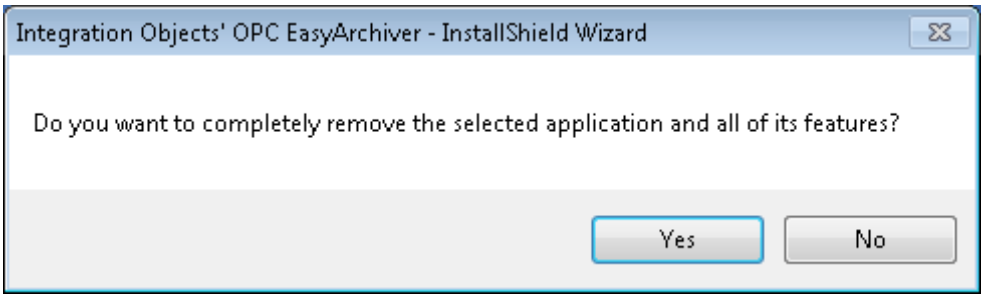


Figure 15: Uninstall the OPC EasyArchiver

2. Click the **Yes** button to start uninstalling.

3. The wizard will then take you through the removal steps. At the end, click **Finish** when the un-installation is complete.

The OPC EasyArchiver can also be manually removed as follows:

1. Go to the **Control Panel**.
2. Click **Programs and Features**.
3. In the **Programs and Features** dialog screen, select **Integration Objects' OPC EasyArchiver**.
4. Click **Uninstall** then **OK**.

USING OPC EASYARCHIVER

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

1. User Interface Overview

The OPC EasyArchiver user interface, illustrated in the figure below, allows you to connect to multiple OPC Servers and configure different archivers.

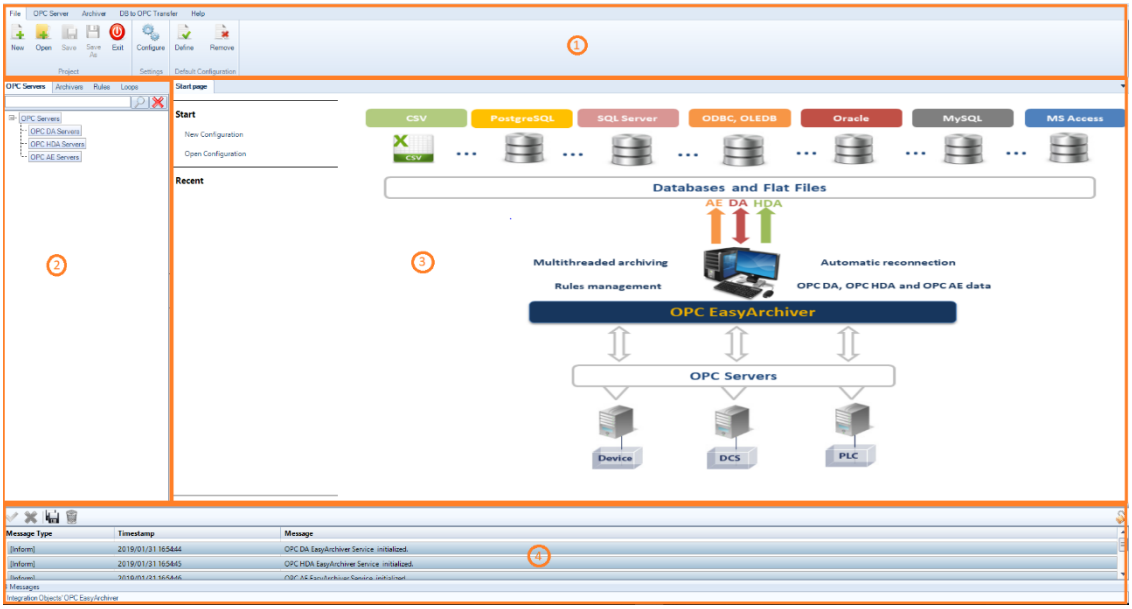


Figure 16: OPC EasyArchiver Main View

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

- Menu bar (1): This part contains the File menu, the OPC Server menu, the Archiver menu, the Transfer DB to OPC menu and the Help menu. These menus provide access to functions that help the user interact with the application.
- Configuration tabs (2): This control contains 5 tabs, which are:
  - OPC Servers: the list of connected OPC DA, HDA and AE servers.
  - Archivers: the list of configured DA, HDA and AE archivers.
  - Rules: the list of rules that the user configured to execute actions such as sending an email, starting or stopping an archiver or writing a value into specific tags.

  - Loops: the list of configured read raw loops, read processed loops, advise raw and advise processed requests.
  - Transfers: the list of configured data transfers from the database to OPC DA servers.
- Start page (3): This is the main welcome page where you can quickly access the recently opened configuration files via the available shortcuts.

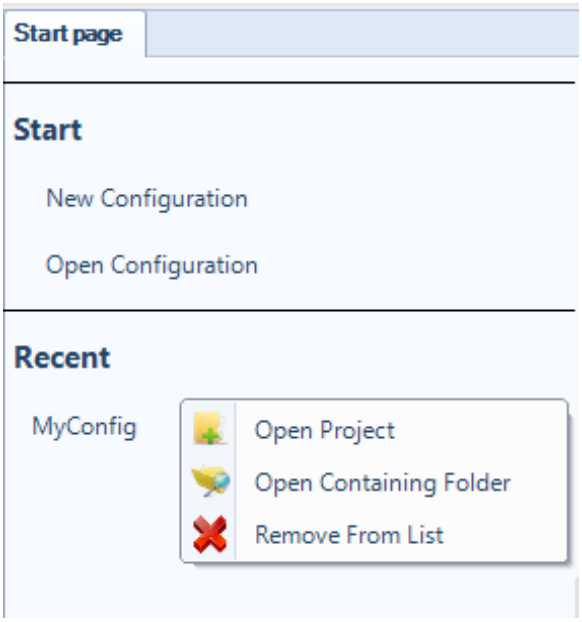


Figure 17: Start Page Menu

From the same view, you also can:

  - Create a new configuration by clicking on **New Configuration** button.
  - Open saved configuration by clicking on **Open Configuration** button.
- Log messages browser (4): This browser displays log messages. The most recent messages are displayed at the top of the messages list.

When launching the OPC EasyArchiver, a new empty configuration will be automatically created**.**

2. File Menu

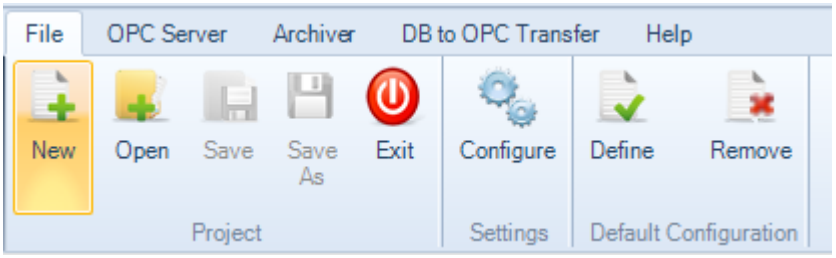


Figure 18: File Menu

2.1. Project

Using the Project section in the File menu, you can**:**

- **New** - Create a new project/configuration by clicking the **New** button.
- **Open** - Open an existing configuration by clicking **Open** and selecting the appropriate ".oda" configuration file.
- **Save** - Save your current configuration by clicking **Save** or **Save As**.
- **Exit** - Close the application by clicking the **Exit** button.

2.2. Settings

Using the Settings section of the File menu, you can configure OPC EasyArchiver settings. Click **Configure** to view and modify these settings. The window below will then be prompted.

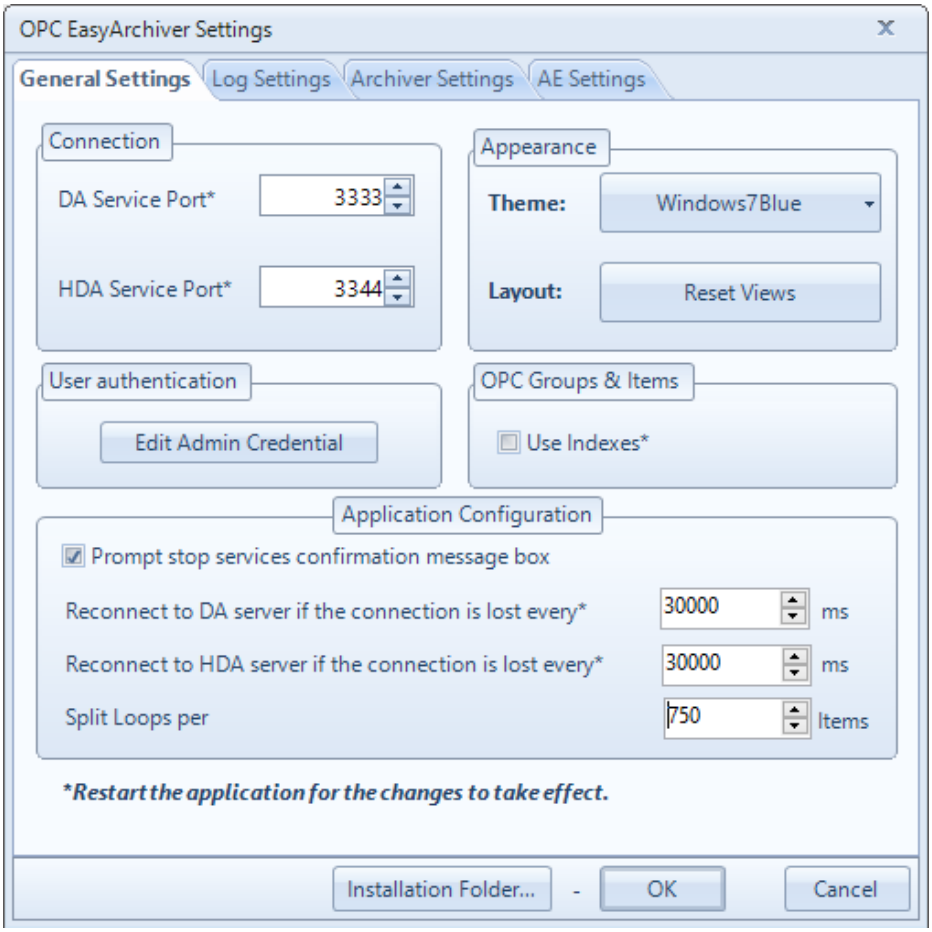


Figure 19: OPC EasyArchiver Settings – General

In the General Settings tab, you can:

- Edit the port numbers used by the OPC EasyArchiver DA and HDA services.
- Change the user interface theme and reset its layout.
- Enable user authentication when opening the interface.
- Enable using the indexes to the OPC groups and items and archive these indexes to the database. The indexes are user-defined identifiers for the OPC groups and items.
  After restarting the OPC EasyArchiver, you will be able to display the group and items indexes when configuring an archiver for an OPC DA Server.
- Choose to display the stop services confirmation message box when closing the user interface.
- Configure the reconnection period to OPC DA Servers when the connection is lost.
- Configure the reconnection period to OPC HDA Servers when the connection is lost.
- Configure the maximum number of items allowed per read raw/processed loop if the split option is checked in the read raw/processed loop configuration.

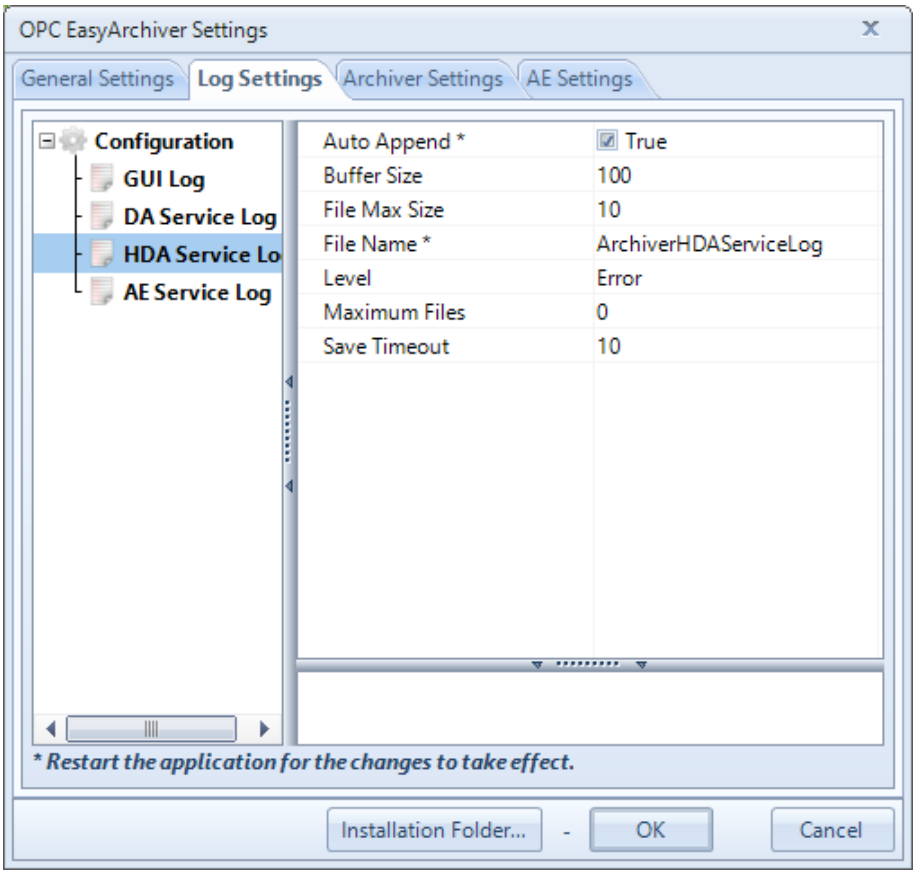


Figure 20: OPC EasyArchiver Settings – Log

In the Log Settings tab, you can configure the log parameters as illustrated in the figure above. For more details about these parameters, refer to the "OPC EASYARCHIVER TRACING CAPABILITIES" section of this user guide.

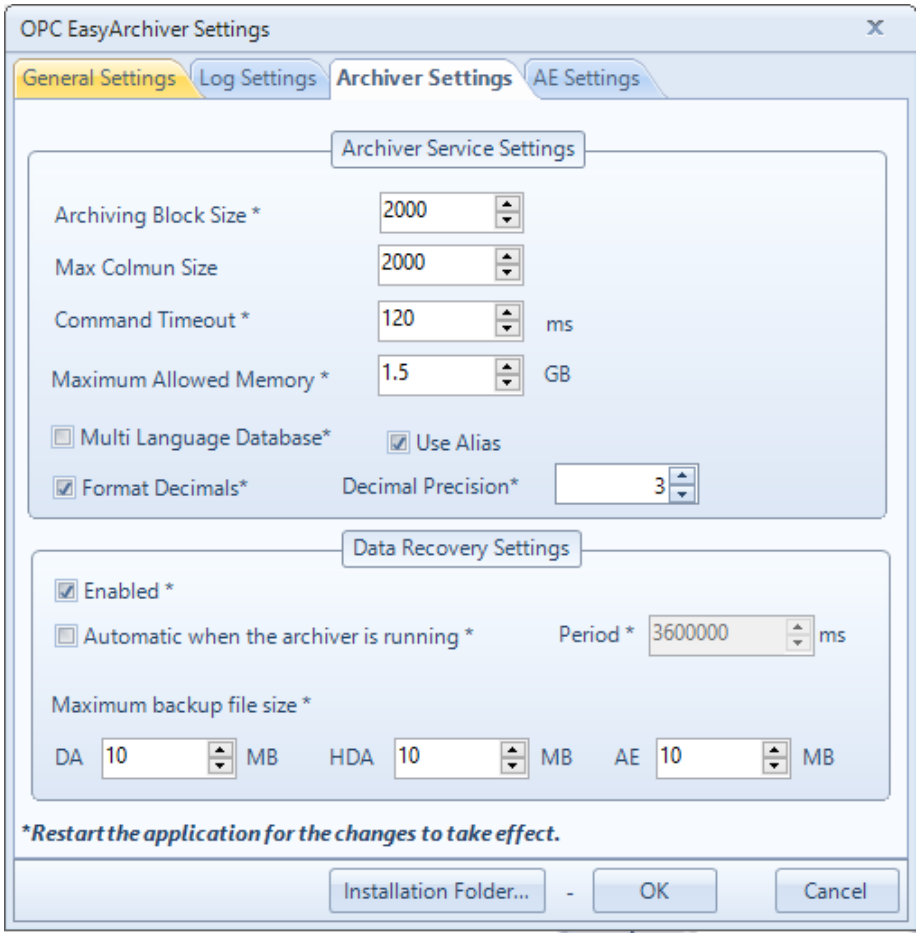


Figure 21: OPC EasyArchiver Settings – Archiver

In the Archiver Settings tab, you can:

- Configure the Archiving Block Size, which represents the maximum number of insert or update queries that can be executed without any waiting period.
- Use the Max Column Size to configure the column size for the *ItemCurrentValue* column in DA and HDA archivers and the column size for the *Message* column in AE archiver. This parameter is used by OPC EasyArchiver when creating new tables in the database.
- Configure the command timeout in milliseconds for the SQL queries execution.
- Configure the maximum allowed memory for the service.
- Enable the multi-language database support for OPC DA and HDA archivers.
- Enable the use of alias instead of the item ID when archiving data. This option is available for HDA Archiver only.
- Enable the formatting of float values and change the number of decimal places. This formatting will be taken into account in the display and the archive of real-time data.

- Configure the data recovery settings:
  - When the "Enabled" option is checked, the queries are saved to local backup files if the connection with the database is down or if the memory of the service reaches the maximum allowed memory size.
  - If the "Automatic when the archiver is running" option is checked, the OPC EasyArchiver will periodically read the SQL queries from the backup files and execute them when the connection to the database is reestablished.
  - The "Period" parameter is the periodicity of data recovery read and execution of the SQL queries from the backup files.
  - The "Maximum backup file size" parameters:
    - "DA": Once the configured size limit in MB is reached and the database connection is still down, a new DA backup file will be automatically generated and saved in the installation folder .
    - "HDA": Once the configured size limit in MB is reached and the database connection is still down, a new HDA backup file will be automatically generated and saved in the installation folder.
    - "AE": Once the configured size limit in MB is reached and the database connection is still down, a new AE backup file will be automatically generated and saved in the installation folder.

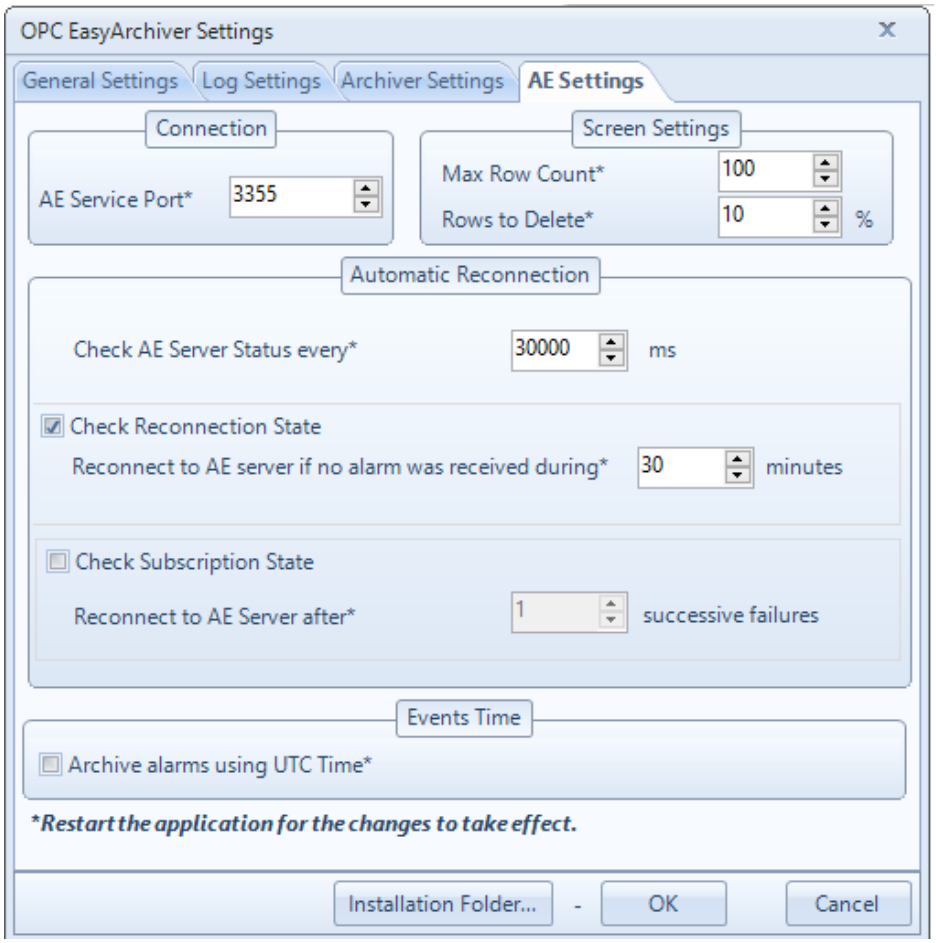


Figure 22: OPC EasyArchiver Settings – AE

In the AE Settings tab, you can:

- Edit the port number used by the OPC EasyArchiver AE service.
- Edit the screen settings by configuring:
  - The maximum number of alarms to be displayed in the screen using the "**Max Row Count**" setting.
  - The percentage of rows to be deleted when the max row count is reached using the "**Rows to be Deleted**" setting.
- Configure the frequency of the checking the servers status using the "**Check AE Server Status every**" parameter. This same parameter indicates the reconnection period to OPC AE Servers when the connection is lost.
- Enable/disable the "**Check Reconnection State**" option that allows to supervise the connection with the OPC AE Servers based on the timestamps of the received alarms. Then, configure the reconnection period to OPC AE Servers when no alarm has been received. If this period is reached and no alarms are received, the OPC EasyArchiver will reconnect to OPC AE Server. If the "**Check Reconnection**

State" is unchecked, the OPC EasyArchiver will not initiate a reconnection based on the alarms timestamps.

- If the "**Check Subscription State**" is checked, the OPC EasyArchiver will monitor the state of your subscriptions and you can configure the number of successive failures when trying to get the subscription state. If this number is reached the OPC EasyArchiver will reconnect to OPC AE server. If the "**Check Subscription State**" is unchecked, the OPC EasyArchiver will not monitor the state of your subscriptions.
- If the "**Archive alarms using UTC time"** is checked, the OPC EasyArchiver will store the alarms into the database with the **active time** and **event time** set in **UTC**.

2.3. Default Configuration

Using the Default Configuration section of the File menu, you can define and remove a default configuration.

The OPC EasyArchiver offers the possibility to set a saved configuration as a startup configuration. It means that the configuration will be loaded automatically at the application start-up. To add a default configuration:

- Save your configuration by clicking the **Save** button available in the File menu. Your configuration will be saved into a folder that contains the following files:
  - A file with the extension ".oda" that contains the names of the DA, HDA and AE configuration files.
  - Files with the extension ".xml" that contain the DA, HDA and AE configuration.

  The user can open and make changes to the ".xml" configuration files using XML or text editors.
- Click the **Define** button in the file menu.

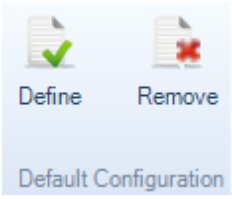


Figure 23: Define/Remove a Default Configuration

The open file dialog screen will be displayed. Select your saved configuration and then click the **OK** button.

When you restart the OPC EasyArchiver or your machine, the default configuration will be loaded automatically.

To remove the default configuration, you only need to click the **Remove** button.

2.4. Managing Administrator Account

2.4.1. Login into OPC EasyArchiver

If you enabled the user authentication feature in the general settings, the OPC EasyArchiver will ask you for your login credentials when starting the application.

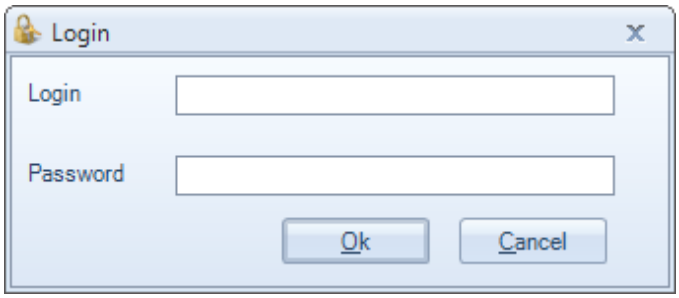


Figure 24: Login Window

The default admin credentials are:

- Login: OEAdmin
- Password: OE@2dmin

2.4.2. Edit Administrator Credentials

To edit your login credentials (user name and password), click on the OPC EasyArchiver **Configure** button available in the File menu, click **Edit Admin Credentials** in the general settings tab and the following window will be displayed:

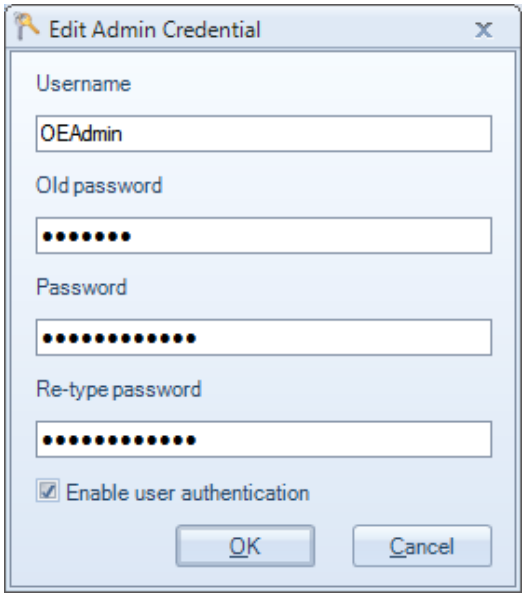


Figure 25: Edit Admin Credentials

It is highly recommended that users change the default password once they enable the user authentication feature.

3. OPC Functionalities

In the menu bar of the OPC EasyArchiver, you can access the different OPC functionalities using the OPC Server menu.

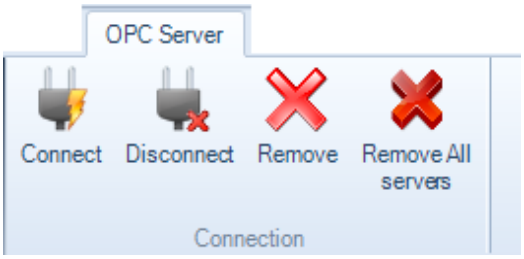


Figure 26: OPC Server Menu Bar

3.1. OPC Servers Management

Click the **Connect** button in the OPC Server menu to connect to local or remote OPC DA/HDA/AE servers. The connection dialog illustrated in the figure below will be prompted:

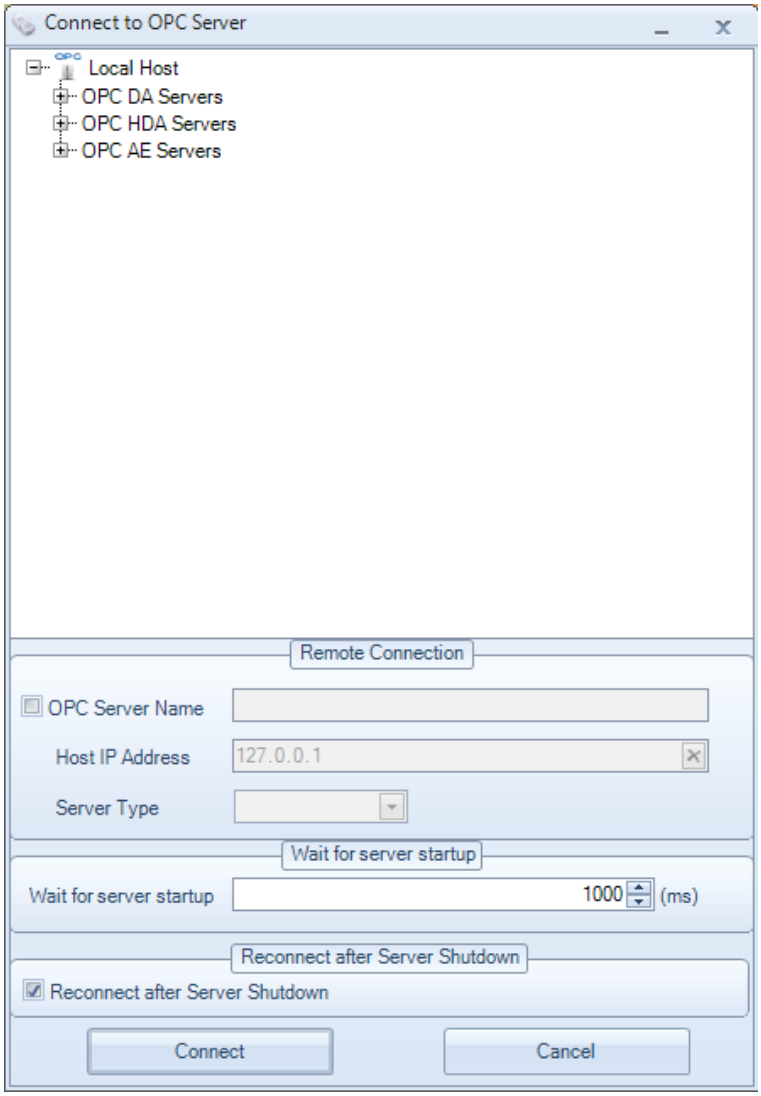


Figure 27: OPC Server Connection Dialog

You can either browse the list of the OPC DA/HDA/AE servers available in your local machine or manually enter:

- The Server name (ProgID) of your OPC DA/HDA/AE server.
- The IP Address of the machine that hosts this OPC Server.
- The server type if it is an OPC DA, HDA or AE server.

You can also refresh the list of available OPC servers by clicking on the **Refresh** action available in the right click menu on the Local Host node.

The **Wait for server startup** defines the time for which the OPC EasyArchiver will wait for the OPC Server to report that it is in RUNNING state before declaring a connection error. By default, this field is set to 1 second (1000 milliseconds).

The **Reconnect after Server Shutdown** defines whether the OPC EasyArchiver will reconnect to the server after it initiates a shutdown request or not.

If the OPC connection operation succeeds, a new node representing the new connection will be added to the OPC Servers tree view in the main user interface.

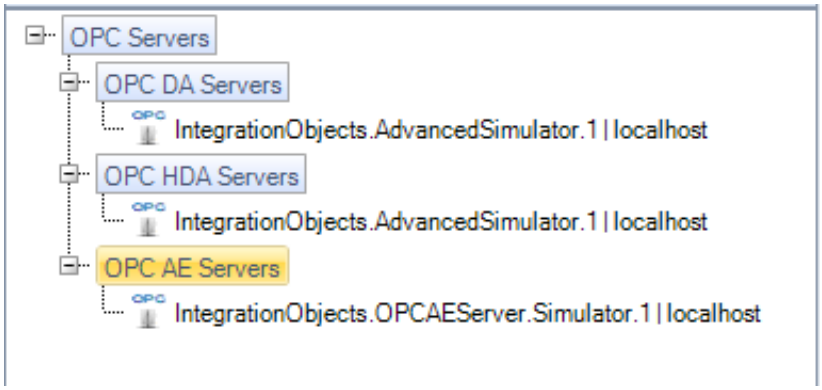


Figure 28: OPC Servers Tree

3.2. OPC Automatic Reconnection

Whenever a communication problem occurs with any connected OPC Server, the OPC EasyArchiver automatically launches the OPC reconnection procedure.
While the connection to the requested OPC Server is lost, the corresponding OPC items will be frozen in their latest status and the server node will be highlighted by a red icon and disabled.

Once the communication is reestablished and reconnection is successful, the OPC Server will be enabled and you can continue using the OPC functionalities of the server.

OPC DA FUNCTIONALITIES

When you successfully connect to an OPC DA server, a node will be created under the OPC DA Servers node in the OPC servers' tree view. This section details the main OPC DA functionalities available in the OPC EasyArchiver.

1. OPC DA Server

Right click on any added OPC DA server node in the OPC DA Servers tree and the following menu will be displayed.

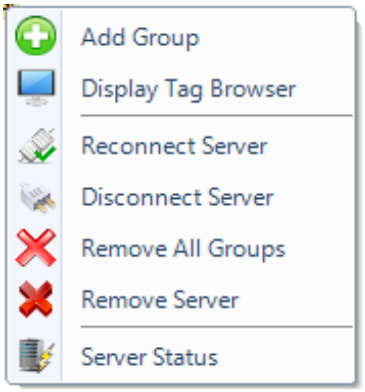


Figure 29: OPC DA Server Context Menu

1.1. Add an OPC Group

To add a new group to a connected OPC server, right click on the server node and select **Add Group** from the displayed menu. The following dialog screen will appear:

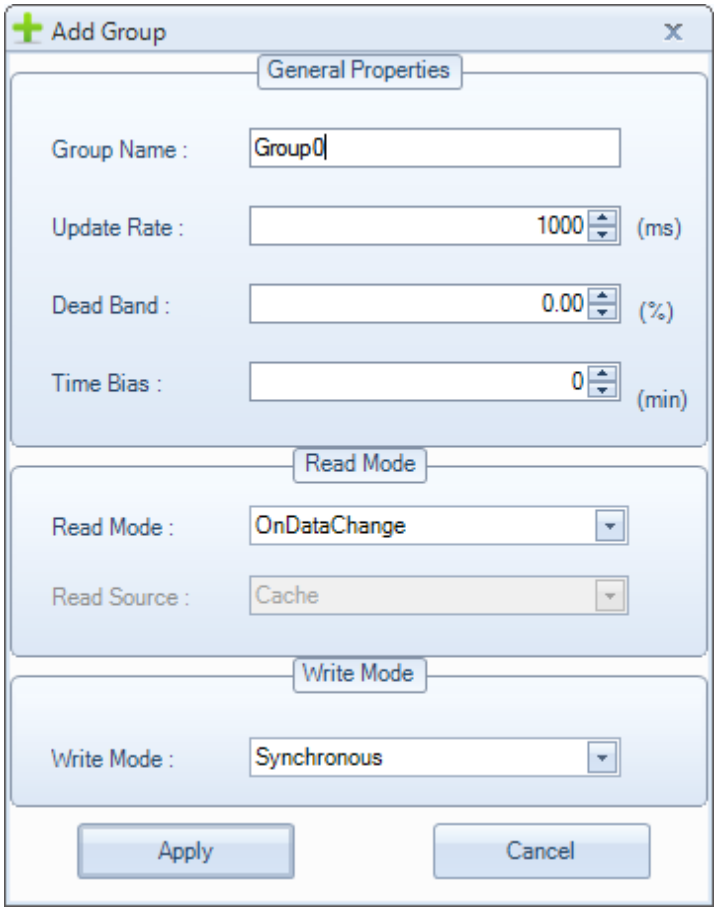


Figure 30: Add Group Dialog

General Properties

- **Group Name**: The name must be unique among the other groups already created in the OPC Server.
- **Update Rate**: specifies the fastest rate at which data changes for this group may be sent by the server. Passing 0 indicates that the server should use its fastest available update rate when using the OnDataChange read mode. The update rate is specified in milliseconds.
- **Dead Band**: is the range through which the input may be varied without initiating a response. It specifies the change percentage in an item value that will cause a notification of this value to the OPC client. A 0.0 value indicates all changes to be received. This parameter is applicable when using the OnDataChange read mode.
- **Time Bias**: indicates the time zone in which the data was collected. Enter 0 to use the default system TimeBias.

Read Mode: indicates the read mode to be used for the group. There are three read modes:

- **OnDataChange** (for OPC DA version 2.05 and higher): the data will be collected asynchronously on report by exception basis.
- **Synchronous:** the data will be collected by performing periodic synchronous read operations to the server. There are two types of read source:
  - DEVICE: Reading data from device.
  - CACHE: Reading data from cache.
- **Asynchronous (I/O 2.0):** the data will be collected by performing periodic asynchronous read operations to an OPC DA version 2.0 or higher compliant server.

Write Mode: indicates the write mode to be used for the group. There are 6 write modes:

- **Synchronous:** allows the OPC EasyArchiver to send synchronous write requests to the OPC server.
- **Asynchronous:** allows the OPC EasyArchiver to send asynchronous write requests to the OPC server (for OPC DA version 2.0 or higher).
- **Synchronous IO2:** allows the OPC EasyArchiver to send synchronous write requests to the OPC server (for OPC DA version 3.0).
- **Asynchronous IO3:** allows the OPC EasyArchiver to send asynchronous write requests to the OPC server (for OPC DA version 3.0).
- **Synchronous IO2 (WriteVQT):** allows the OPC EasyArchiver to send synchronous write VQT (Value, Quality, Timestamp) requests to the OPC server (for OPC DA version 3.0).
- **Asynchronous IO3 (WriteVQT):** allows the OPC EasyArchiver to send asynchronous write VQT (Value, Quality, Timestamp) requests to the OPC server (for OPC DA version 3.0).

1.2. Browse an OPC Server

You can browse the address space including all the branches and items for any OPC DA Server that supports OPC DA browsing. To browse your OPC server, right click on your OPC server node and choose **Display Tag Browser** from the displayed menu. The dialog illustrated in the figure below will be prompted:

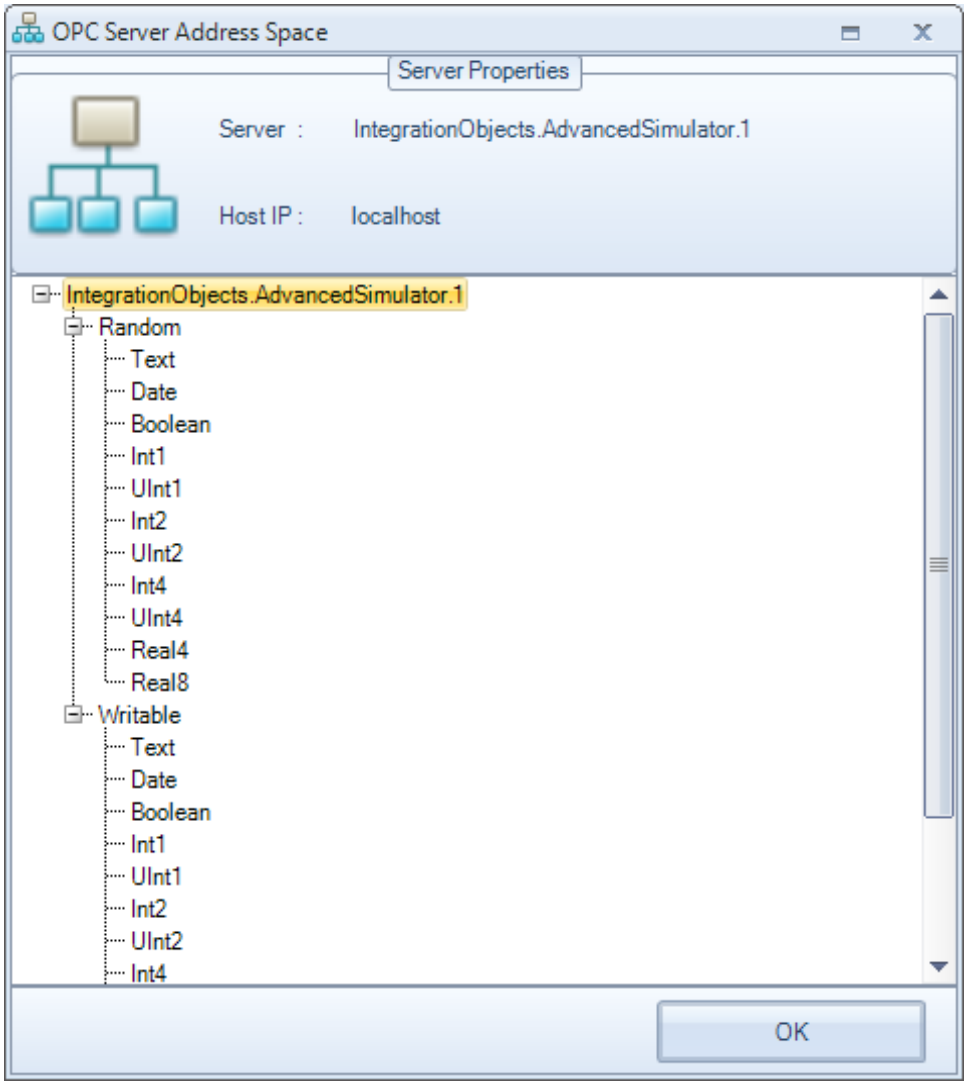


Figure 31: OPC Server Address Space Browser

1.3. Reconnect to OPC Server

To reconnect to your OPC Server, right click on your OPC server node and choose **Reconnect Server**. If the server is already connected, the following message box will be prompted:

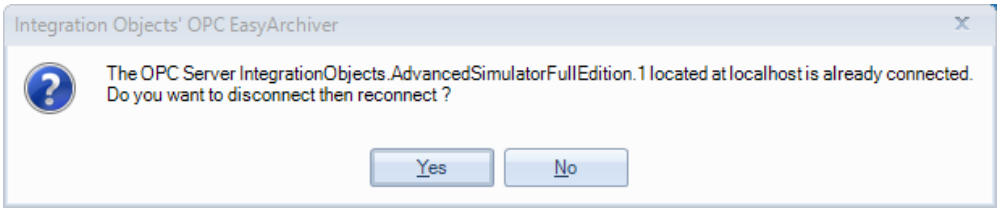


Figure 32: Confirm OPC Server Reconnection

If the reconnection is established successfully, the following notification will be prompted:

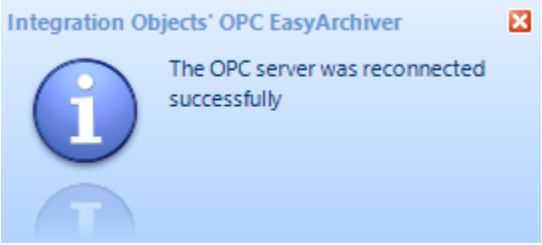


Figure 33: Server Reconnection Succeeded

1.4. Disconnect from OPC Server

To disconnect from your OPC Server, right click on your OPC server node and choose **Disconnect Server**.
If the server is disconnected, the server node icon will be changed as illustrated below:

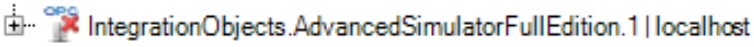


Figure 34: Server Disconnected

1.5. Remove All Groups

To remove all groups from your OPC server, right click on your OPC server node and choose **Remove All Groups**.
The following message box illustrated in the figure below will be prompted:

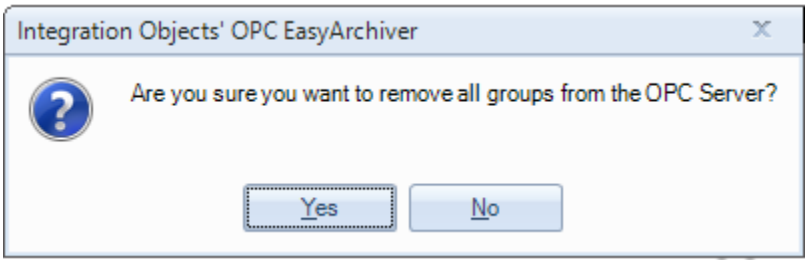


Figure 35: Confirm Remove All Groups

Upon confirmation, all the groups within the selected server node and its children nodes will be consequently removed from the tree view.

1.6. Remove an OPC Server

To remove an OPC Server, click the **Remove Server** button available in the server right click menu. The OPC connection will be then released and the selected server node and its children nodes will be consequently removed from the tree view.

1.7. Remove All OPC Servers

To remove all added OPC servers, click the **Remove All Servers** button available in the OPC Server menu in the menu bar

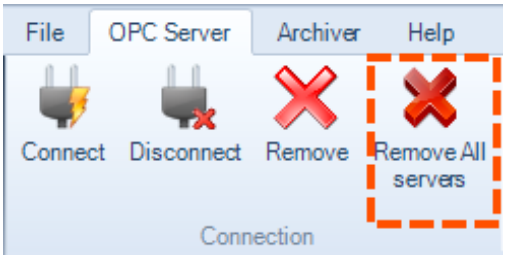


Figure 36: Remove All Servers Button

The following dialog screen will appear in order to confirm the removal:

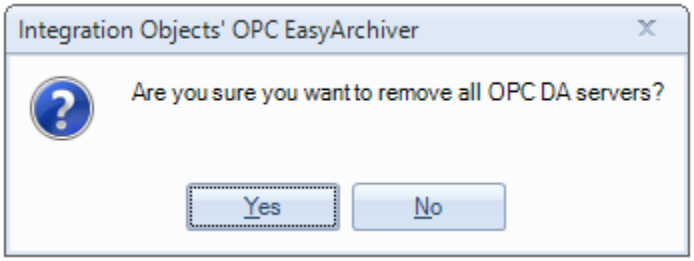


Figure 37: Remove All DA Servers Dialog

Once confirmed, all servers' nodes will be deleted from the tree view and all OPC connections will be released.

1.8. View OPC Server Status

Select your OPC server node and click on the **Server Status** button available in the server right click menu item. The following dialog screen will appear:

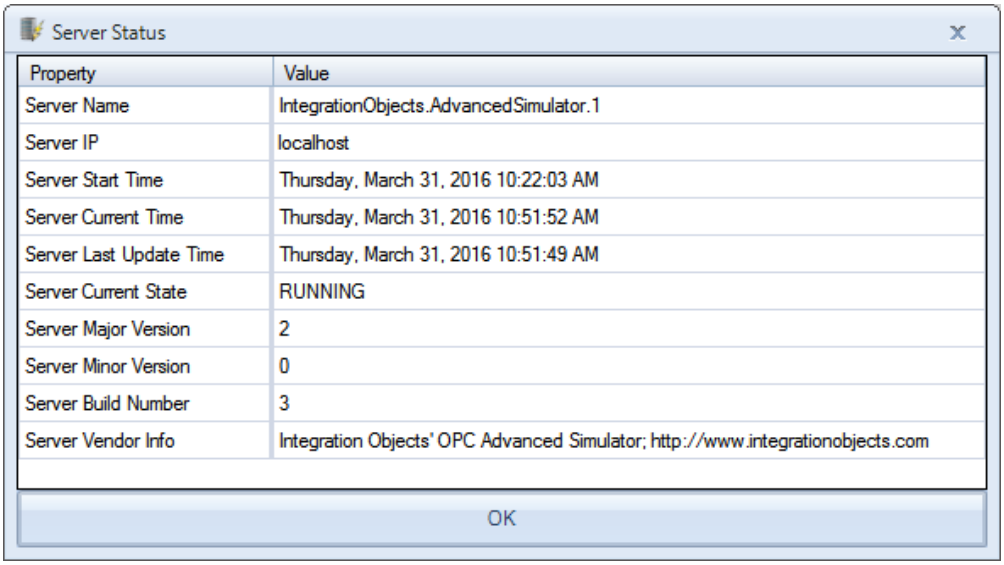


Figure 38: Server Status Dialog Screen

This dialog provides you with the current status and detailed information about the selected OPC server.

2. OPC Group Management

Right click on the selected OPC Group node and the following context menu will be displayed.

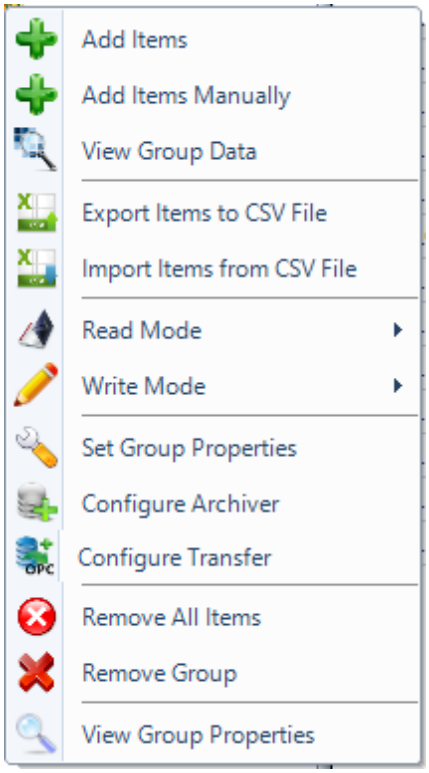


Figure 39: OPC Group Context Menu

2.1. Add OPC Items

To add OPC items, click the **Add Items** from the OPC Group context menu. The Add Items window will be displayed as illustrated in the figure below. Then, drag and drop items from the items tree in the left side to the grid in the right side and click **Apply**.

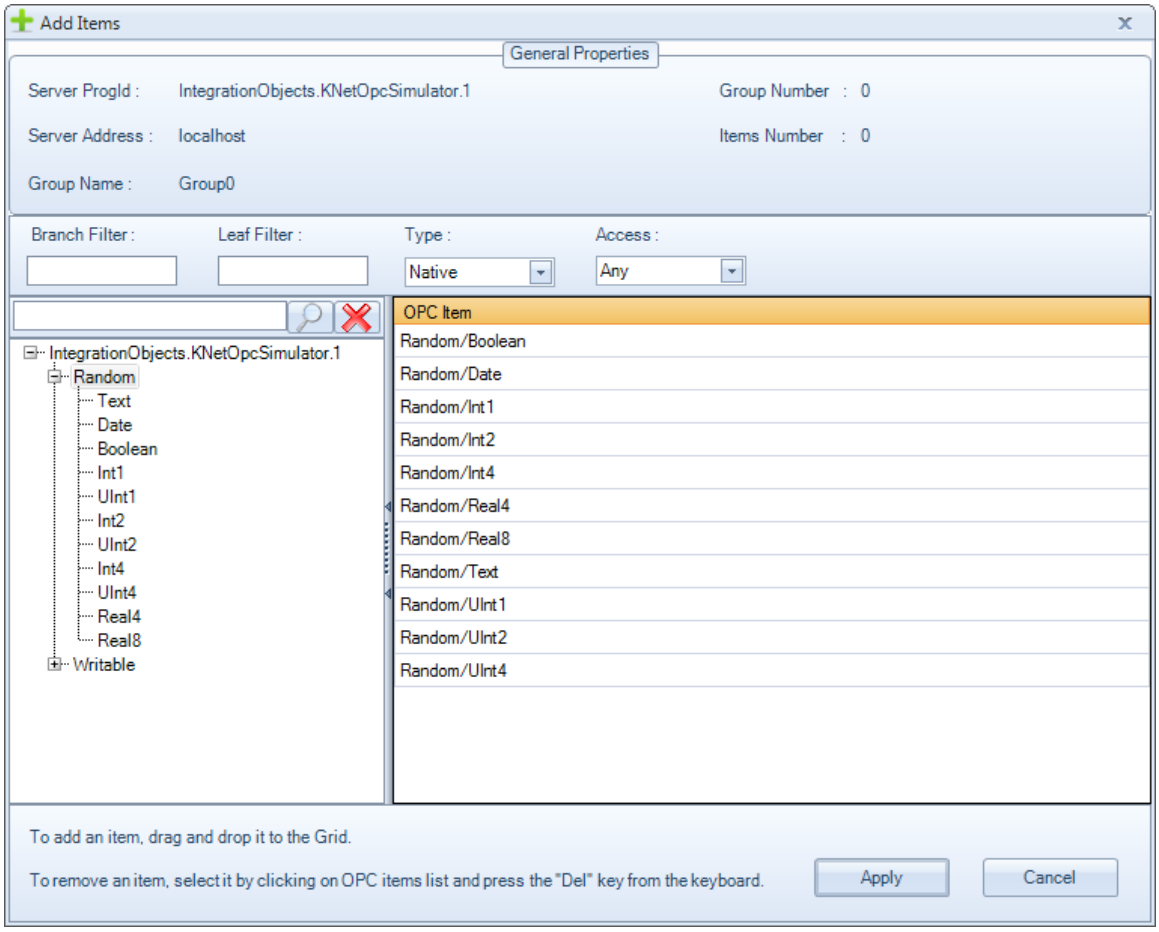


Figure 40: Add Items Dialog

To add all items, you can right click on the root node and press **Add** from the displayed menu, drag-and-drop the root node to the grid view or select multiple tags using the mouse and the Shift key in your keyboard.
To remove items from the selected list, select the items using the shift key in your keyboard and delete them using the **Del** button.

2.2. Add Items Manually

You can add OPC items manually by selecting **Add Items Manually** from the OPC Group context menu. The following window will be displayed:

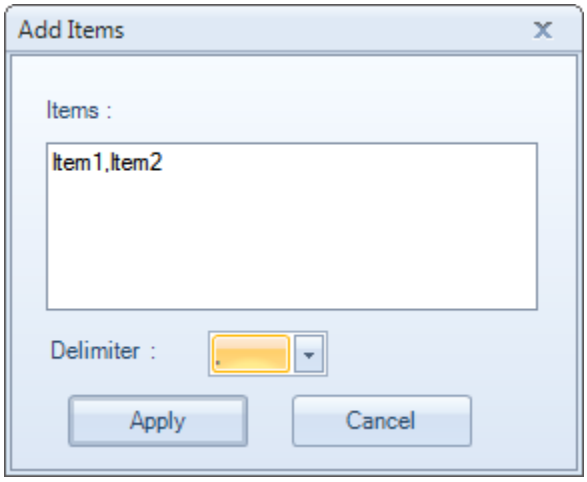


Figure 41: Add Items Manually

In the **Items** section, enter the list of ItemID of the items to be added separated by the delimiter specified in the **Delimiter** drop down list and then click the **Apply** button.

2.3. Monitor OPC Items

You can monitor OPC DA items by selecting **View Group Data** context menu item.

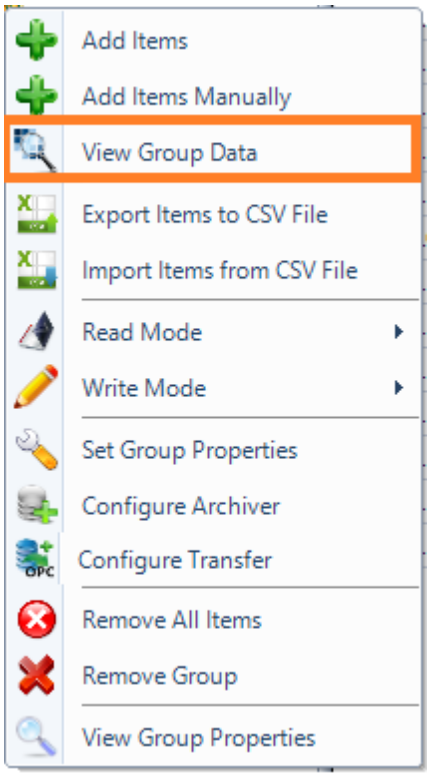


Figure 42: View Group Data

A new tab displaying the data changes grid view will be added to the main user interface, as illustrated in the figure below:

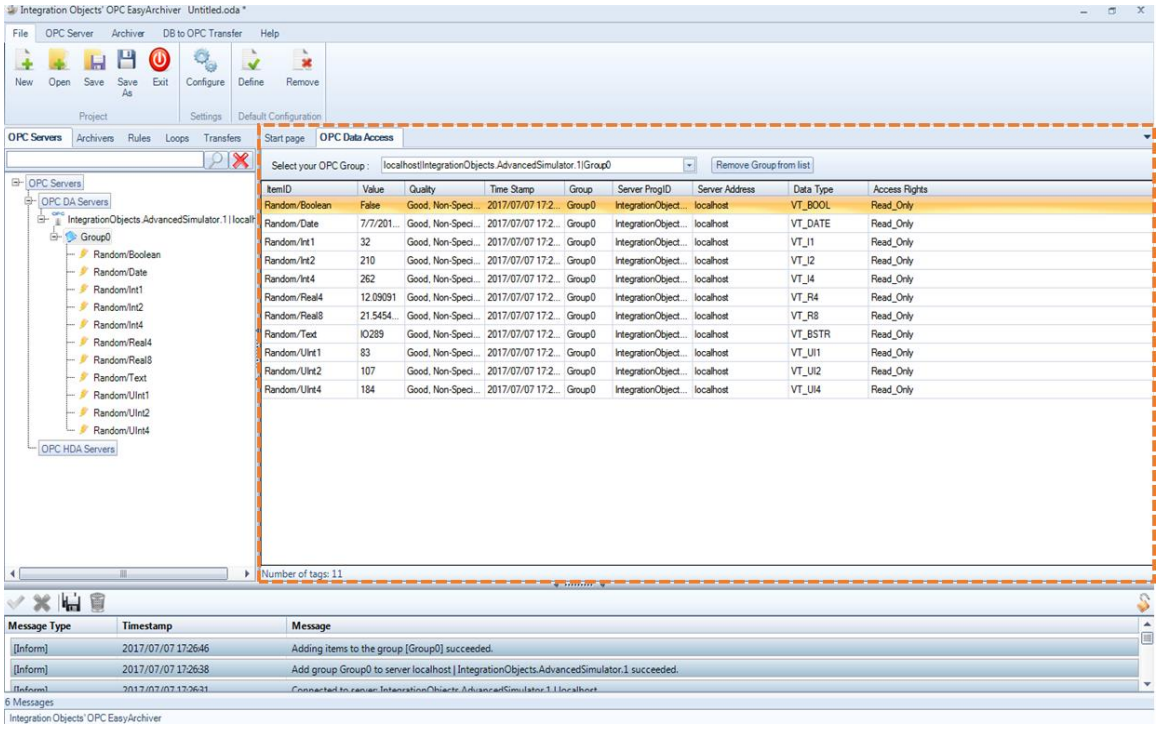


Figure 43: OPC Data Changes Grid View Display

2.4. Export Items to CSV File

You can export added tags into a csv file using the **Export Items to CSV File** option from the OPC Group menu. The file will contain all OPC tags with the following properties: Item ID, State, Data Type and Item User Index.

2.5. Import Items from CSV File

To add items from a CSV file, you can import a tags configuration file using the **Import Items from CSV File** button available in the group right click context menu. The CSV file should have the following format: Item ID, Item State and Item Data Type.

```
Item ID,Item State,Item Data Type, Item Index
Random/Boolean,1,VT_BOOL,0
Random/Date,1,VT_DATE,0
Random/Int1,1,VT_I1,0
Random/Int2,1,VT_I2,0
Random/Int4,1,VT_I4,0
Random/Real4,1,VT_R4,0
Random/Real8,1,VT_R8,0
Random/Text,1,VT_BSTR,0
Random/UInt1,1,VT_UI1,0
Random/UInt2,1,VT_EMPTY,0
Random/UInt4,1,VT_UI4,0
```

Figure 44: CSV File Example

2.6. Change the Read Mode

To change the read mode of the OPC group, click the **Read Mode** option from the OPC Group menu. You will have the list of available read mode as shown in the figure below:

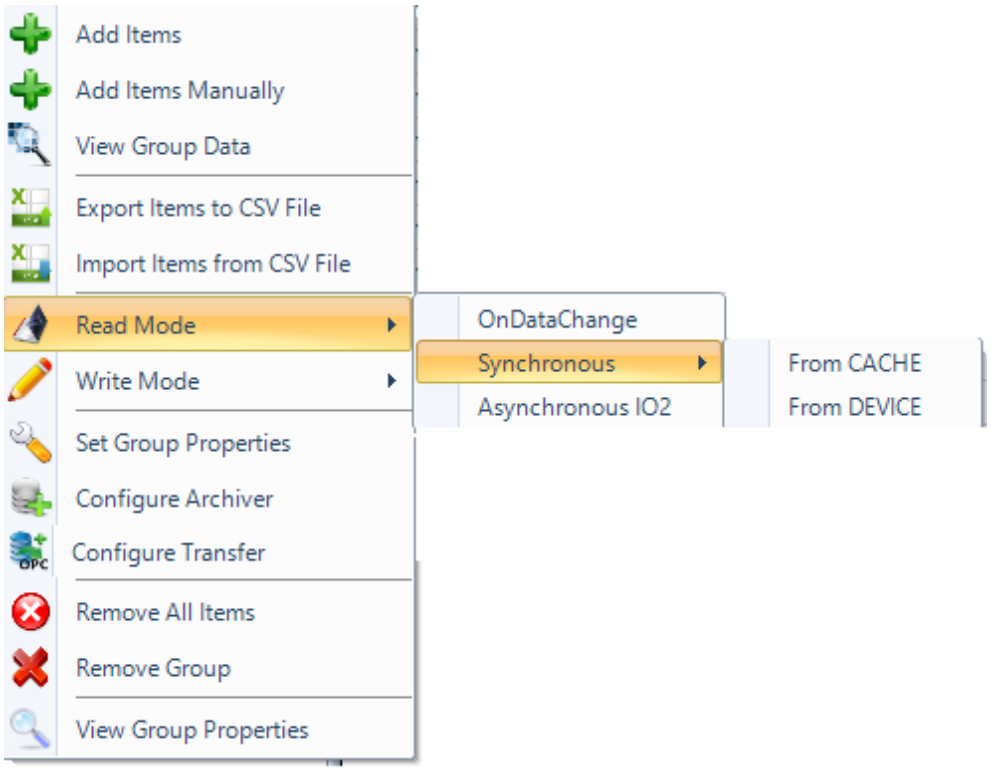


Figure 45: Change the OPC Group Read Mode

2.7. Change the Write Mode

To change the current group write mode, click the **Write Mode** option from the OPC Group menu and select the new mode as shown below:

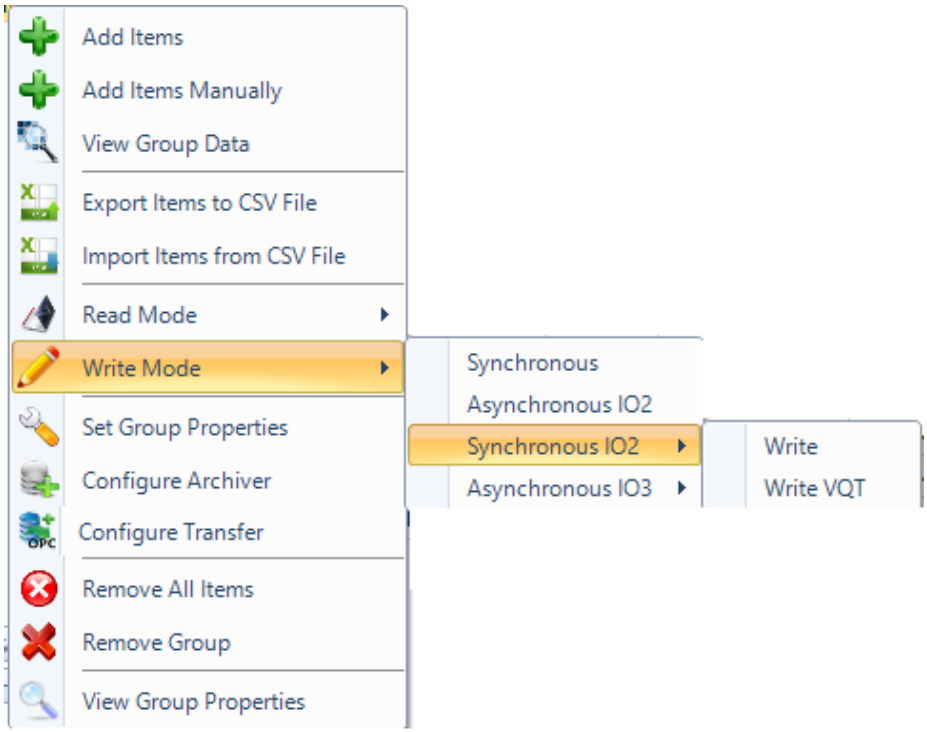


Figure 46: Change the OPC Group Write Mode

2.8. Set Group Properties

To edit the properties of an OPC group, click the **Set Group Properties** option from the OPC Group menu. The following dialog screen will appear:

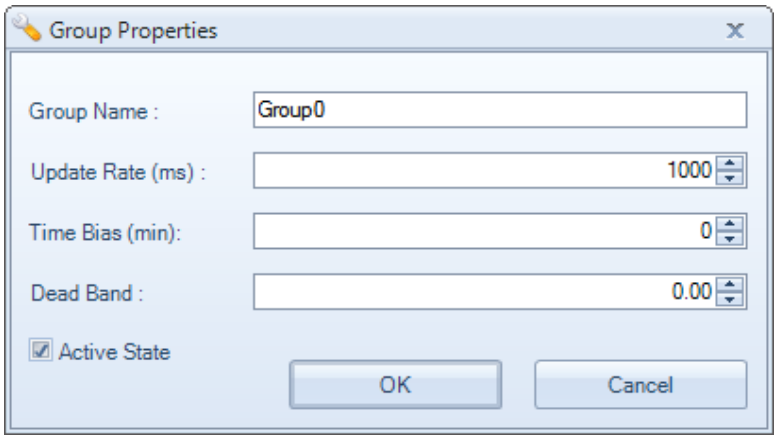


Figure 47: Set Group Properties Dialog

Using this dialog, you can:

- Change the name of the OPC Group. Note that the group name must be unique.
- Update the update rate, the time bias and the dead band parameters of the group.
- Activate/Deactivate the group state by checking/un-checking the **Active State** option.

2.9. Remove All Items

To delete all items of the group, select the related group node, right click on it and select the **Remove All Items** option from the displayed menu. All added items will be removed from the tree view.

2.10. Remove OPC group

You can delete an OPC group by clicking the **Remove Group** option from the OPC Group menu. The group node and its items will be deleted from the tree view.

2.11. View Group Properties

In order to check the OPC DA Group properties, click on **View Group Properties** option from the OPC Group menu. The following dialog screen will appear:

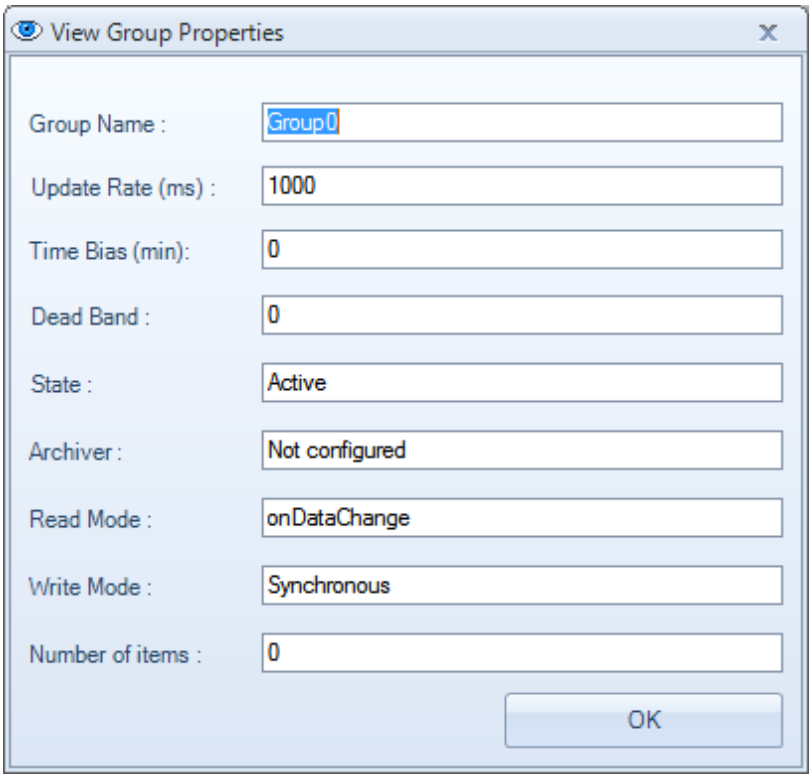


Figure 48: View Group Properties Dialog

3. OPC Item Management

This section describes how to manage OPC items. It is assumed that at least one OPC item is added to an OPC group.
Right click on the OPC item node and the following context menu will be displayed:

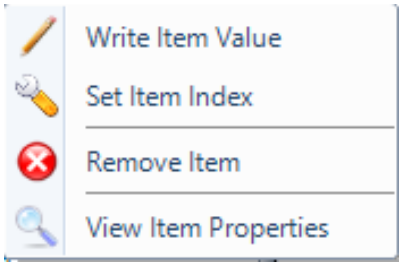


Figure 49: OPC Item Context Menu

3.1. Write Item Value

To write a value to an OPC item, you first need to set the Write mode of the OPC group. Then, right click on the item and select the **Write Item Value** context menu item.

- If the group write mode is **Synchronous** or **Asynchronous**, the following dialog screen will appear:

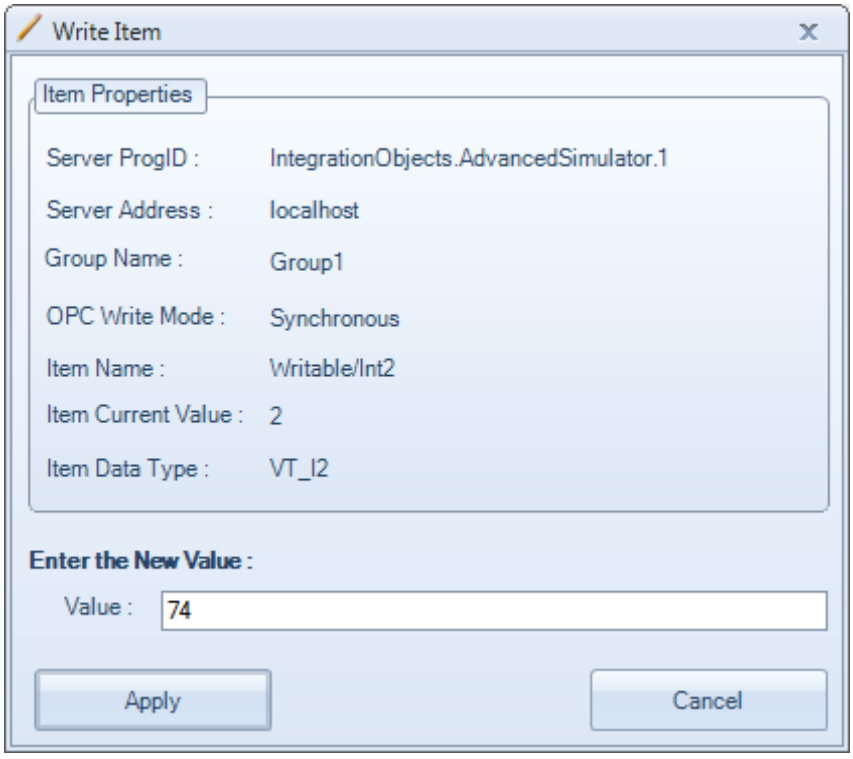


Figure 50: Write Item Dialog (1)

This dialog displays the following information:

- The OPC Server ProgID.
- The OPC Server Address.
- The OPC Group Name.
- The current Write Mode set for the OPC Group.
- The Item ID.
- The Item Current Value.
- The Item Data Type.

To complete the write operation, enter the new value to be written to the item and click the **Apply** button to confirm.

- If the group write mode is **SynchronousIO2 (WriteVQT)** or **Asynchronous IO3 (WriteVQT)**, the following dialog screen will appear:

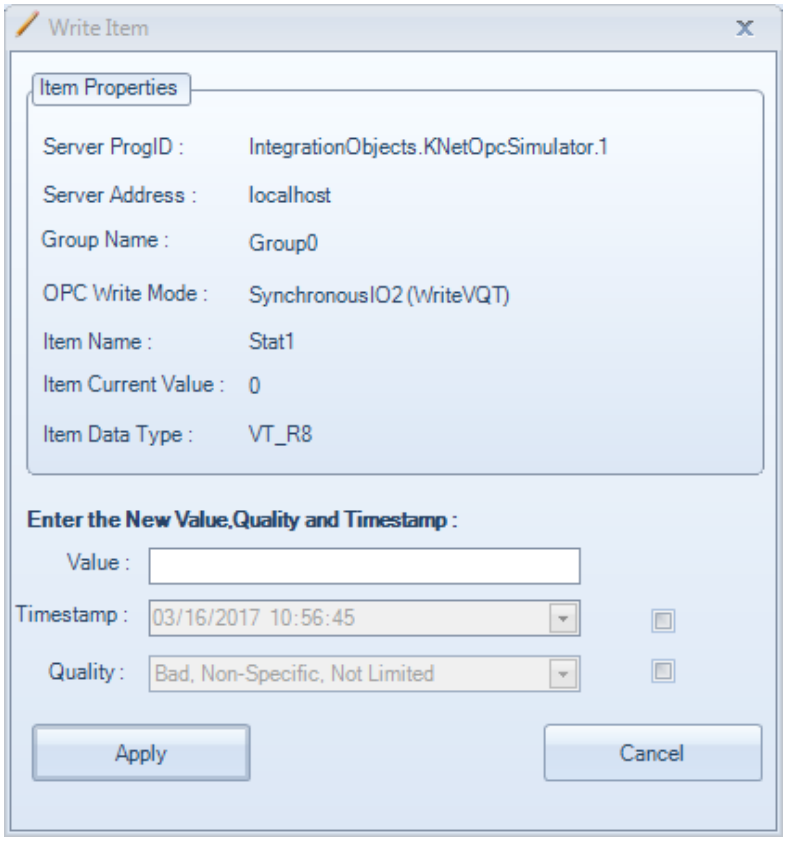


Figure 51: Write Item Dialog (2)

This dialog displays the following information:

- The OPC Server ProgID.
- The OPC Server Address.
- The OPC Group Name.
- The current Write Mode set for the OPC Group.
- The Item ID.
- The Item Current Value.
- The Item Data Type.

To complete the write operation, enter the new value, the new timestamp and quality (if enabled) to be written to the item and click the **Apply** button to confirm.

3.2. Set Item Index

You can set the Item Index by clicking on the **Set Item Index** option from the OPC Item menu. The OPC Item Index will be set in the tree view and during the archiving process.

3.3. Remove an OPC Item

You can remove an OPC Item by clicking on the **Remove Item** option from the OPC Item menu. The OPC Item will be removed from the tree view and from the data changes grid view.

3.4. View Item Properties

You can view the item properties by right click on the OPC Item and selecting **View Item Properties** from the displayed menu.

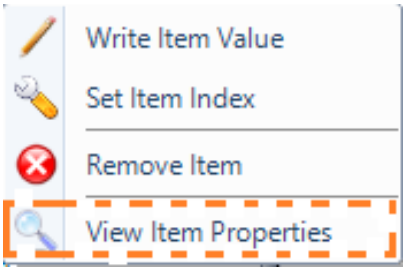


Figure 52: Select View Item Properties

This screen view shows all information related to the item:

- Item ID.

- Item Current Value.
- Item Data Type.
- Item Quality.
- Item Timestamp.
- Item Access Rights.
- Item Description.
- The OPC Server ProgID.
- The OPC Server Host IP.
- The OPC Group Name.
- The Item Active State.

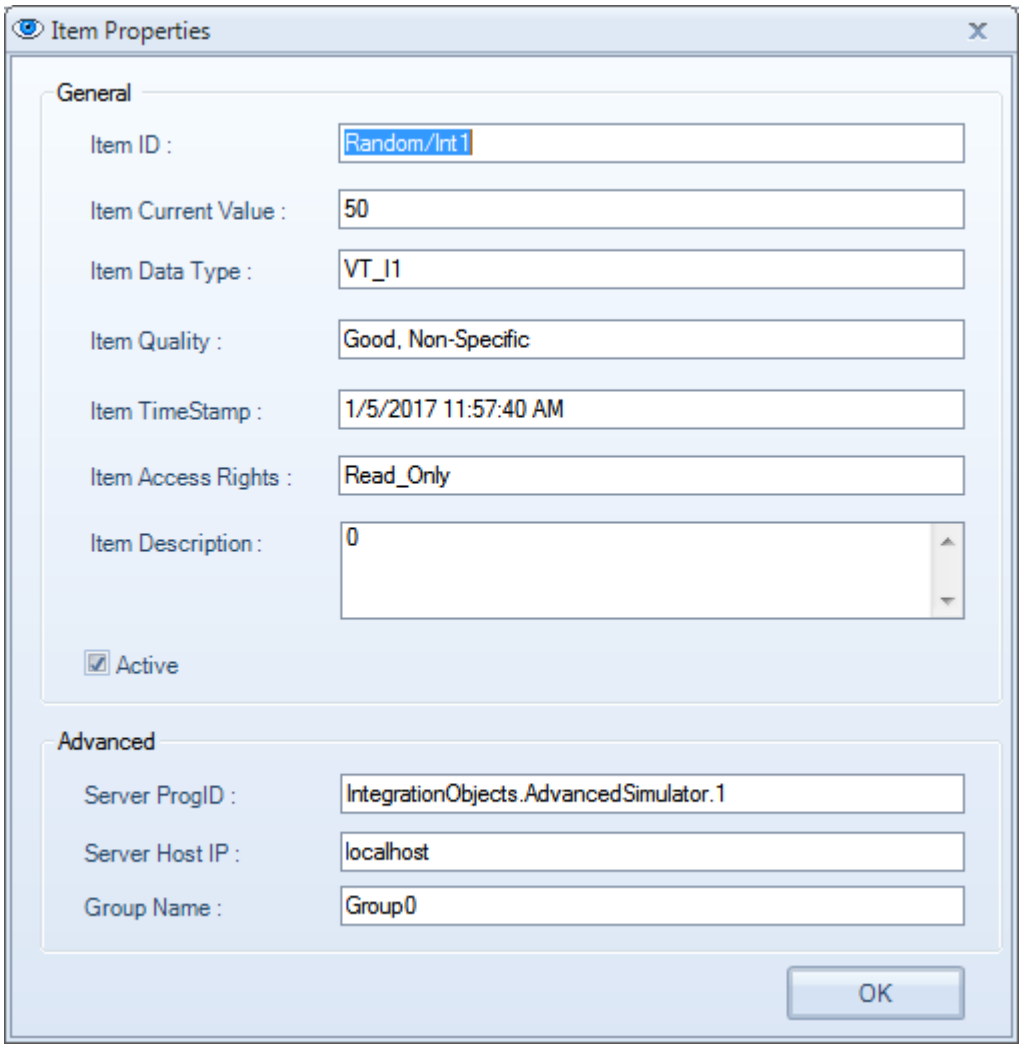


Figure 53: View the OPC Item Properties

You can update the Item Active State by checking or unchecking the **Active** checkbox then clicking the **OK** button.

OPC HDA FUNCTIONALITIES

When you successfully connect to an OPC HDA Server, an OPC HDA Server node will be created under the OPC HDA Servers node in the OPC servers' tree view. This section describes the main OPC HDA functionalities available in the OPC EasyArchiver.

1. OPC HDA Server

Right click on any added OPC HDA Server node in the servers tree view and the following menu will be displayed:

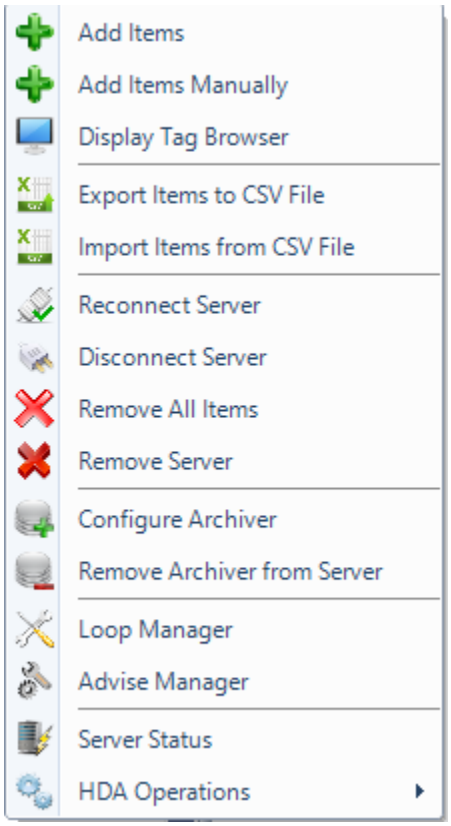


Figure 54: OPC HDA Server Context Menu

1.1. Add OPC HDA Items

To add OPC HDA items, click the **Add Items** option from the OPC HDA Server menu. The Add Items window will be displayed as illustrated in the figure below. Then, drag and drop items from the items tree in the left side to the grid in the right side and click **Apply**.

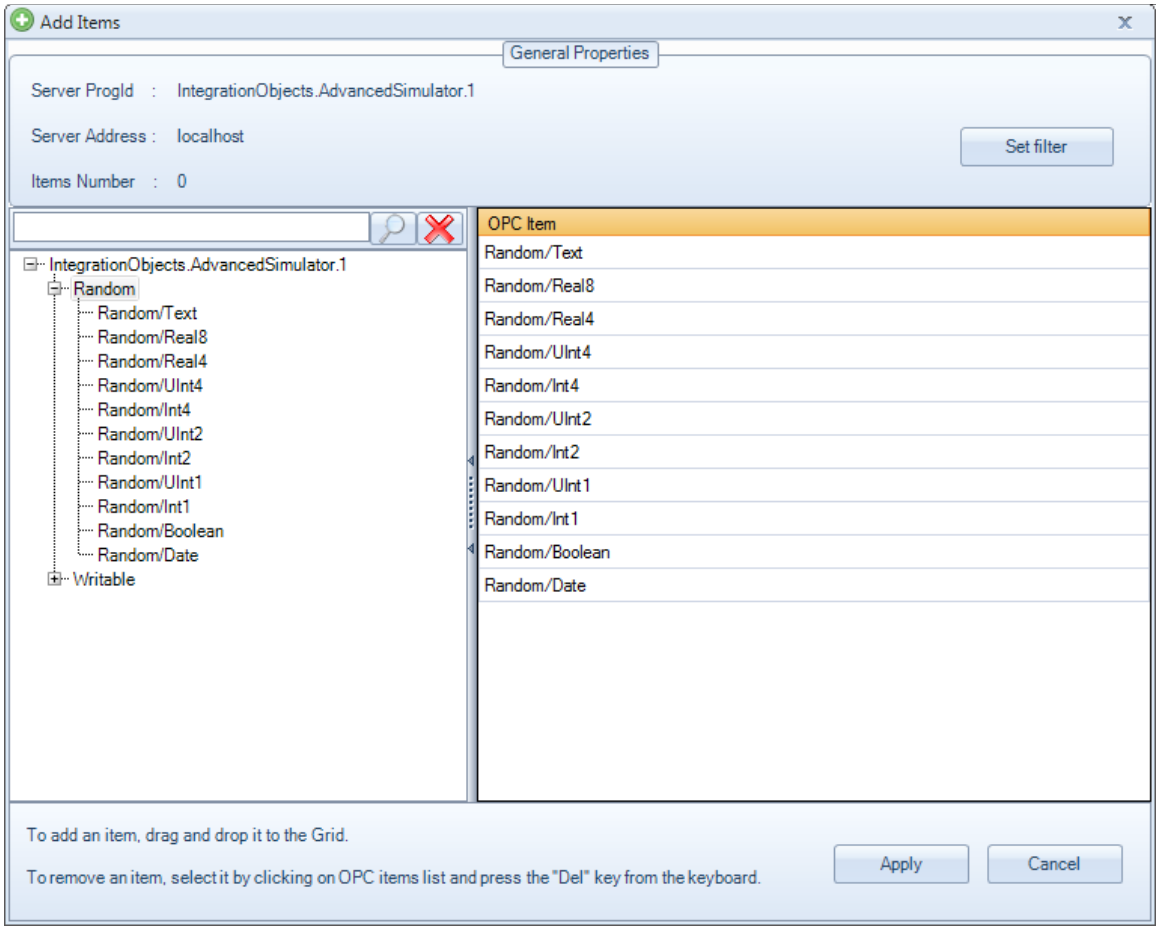


Figure 55: Add OPC HDA Items Dialog

To add all items, you can right click on the root node and press **Add** in the displayed menu, drag-and-drop the root node to the grid view or select multiple tags using the mouse and the Shift key in your keyboard.
In order to browse the OPC HDA Server using a filter, you can click on the **Set filter** button and set the attribute ID you want to execute the filter on.

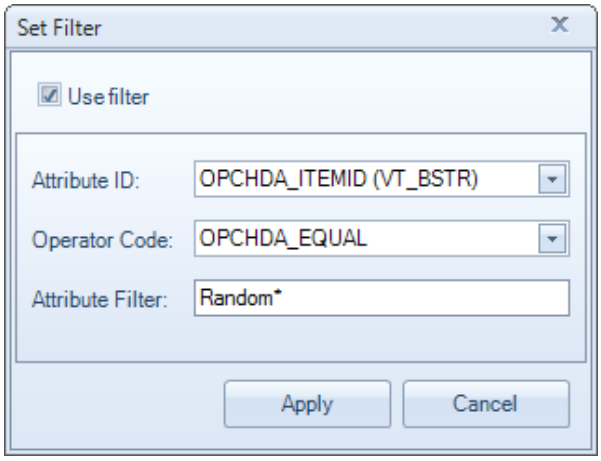


Figure 56: Set Filter for OPC HDA Server

To remove items from the selected list, select the items using the shift key in your keyboard and delete them using the **Del** button or right click on the selected items from the grid and click **Remove selected items** as illustrated below.

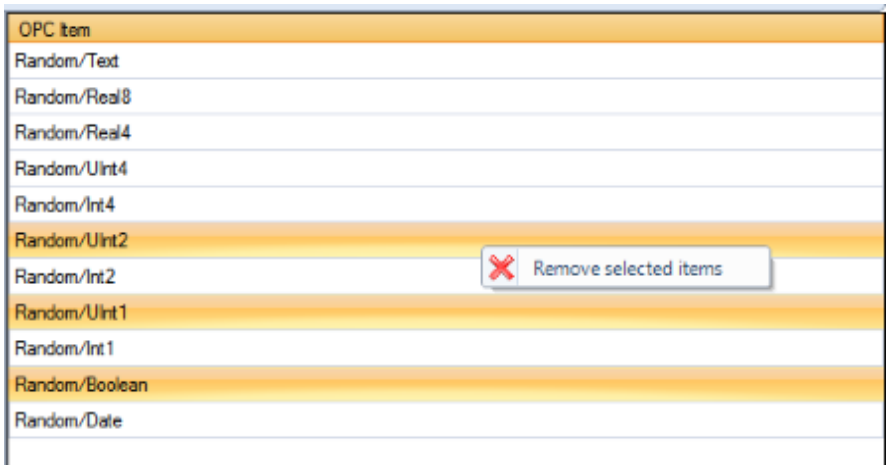


Figure 57: Remove Selected Items

1.2. Add OPC HDA Items Manually

You can add OPC items manually by selecting **Add Items Manually** context menu item. The following window will be displayed:

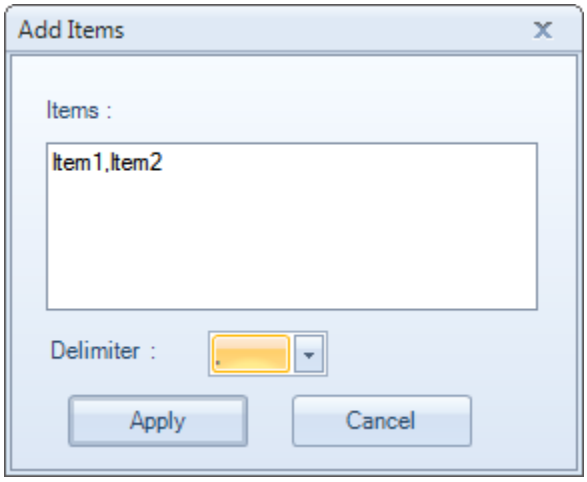


Figure 58: Add Items Manually

In the **Items** section, enter the list of ItemID of the items to be added separated by the delimiter specified in the **Delimiter** drop down list and then click the **Apply** button.

1.3. Browse an OPC HDA Server

You can browse the address space including all the branches and items for any OPC HDA Server that supports OPC HDA Browsing. To browse your OPC HDA server, right click on your OPC server node and choose **Display Tag Browser** from the server right click menu.

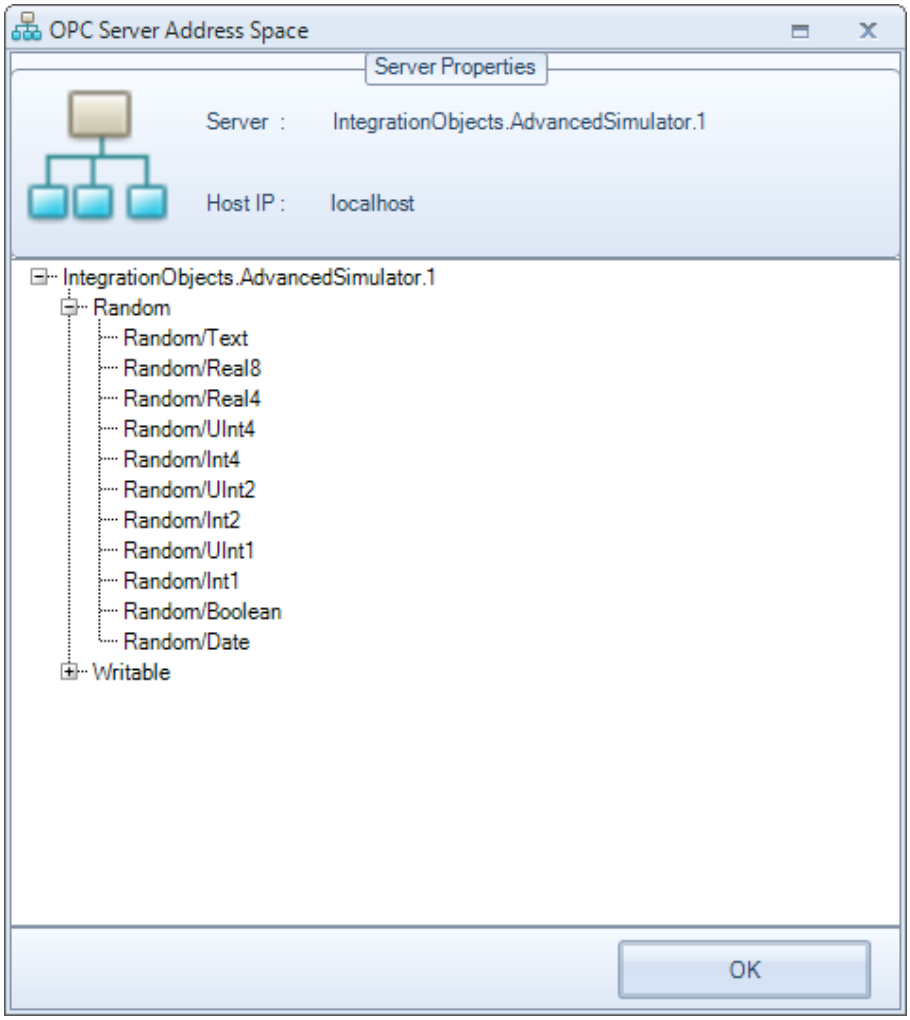


Figure 59: OPC HDA Server Address Space Browser

1.4. Export Items to CSV File

You can export added tags into a csv file using the **Export Items to CSV File** option from the OPC HDA Server menu. The file will contain all OPC tags' Item IDs.

1.5. Import Items from CSV File

To add items from a CSV file, you can import a tags configuration using the **Import Items from CSV File** option available in the OPC HDA Server context menu. The file needs to contain the tags' Items IDs and the alias that corresponds to each tag.

Item ID;Alias;ValueColumnName;TimestampColumnName;QualityColumnName
Random/Text;Alias1;;;
Random/Real8;Alias2;;;
Random/Real4;Alias3;;;
Random/UInt4;Random/UInt4;;;
Random/Int4;Random/Int4;;;
Random/UInt2;Random/UInt2;;;
Random/Int2;Random/Int2;;;
Random/UInt1;Random/UInt1;;;
Random/Int1;Random/Int1;;;
Random/Boolean;Random/Boolean;;;
Random/Date;Random/Date;;;

Figure 60: CSV File Example for OPC HDA Items Import

In order to update the alias related to a tag, use the "Export Items to CSV File" feature, update the alias column in the exported file then import it again.

Note that the ValueColumnName, TimestampColumnName and QualityColumnName are only used by "Aspentech IP21" archiver when the "History Repeat Area" option is used.
You need to enter those fields for the OPC Tags associated to tables having different column names than the ones specified when creating the Archiver.
The new column names will be then considered in the queries construction of the related tag.
If these columns are left empty for a tag, the column names defined in the archiver will be used.

1.6. Reconnect to an OPC HDA Server

To reconnect to your OPC HDA Server, right click on your OPC HDA server node and choose **Reconnect Server**. If the HDA Server is already connected, the following message box will be prompted:

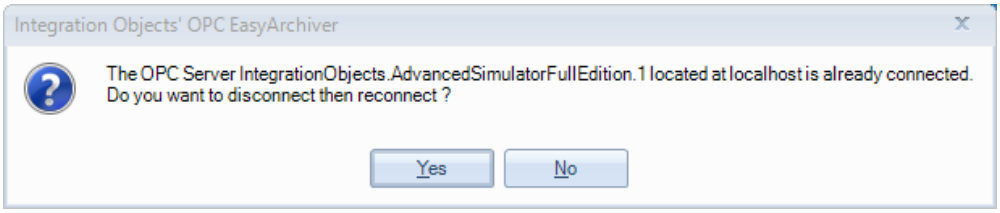


Figure 61: Confirm OPC HDA Server Reconnection

If the reconnection is established successfully, the following notification will be prompted:

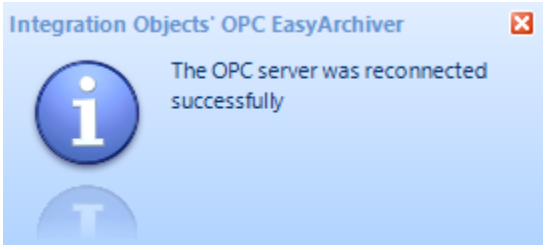


Figure 62: HDA Server Reconnection Succeeded

1.7. Disconnect from OPC HDA Server

To disconnect from your OPC HDA Server, right click on your OPC HDA Server node and choose **Disconnect Server**. If the HDA Server is disconnected, the HDA Server node icon will be changed as illustrated below:

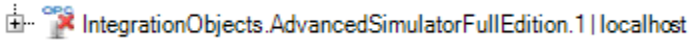


Figure 63: HDA Server Disconnected

1.8. Remove All Items

To delete all items from the server, right click on the related OPC HDA Sever node and click the **Remove All Items** from the displayed menu. All added items will be removed from the tree view.

1.9. Remove an OPC HDA Server

To remove an OPC HDA Server, click the **Remove Server** button available in the server context menu. The OPC HDA connection will be then released and the selected server node and its children nodes will be consequently removed from the tree view.

1.10. Remove All OPC HDA Servers

To remove all added OPC HDA Servers, click the **Remove All Servers** button available in the OPC Server menu in the menu bar.

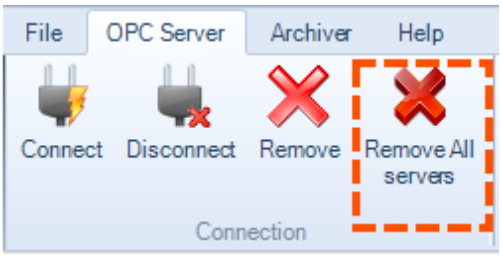


Figure 64: Remove All Connected Servers

The following dialog screen will appear in order to confirm the removal:

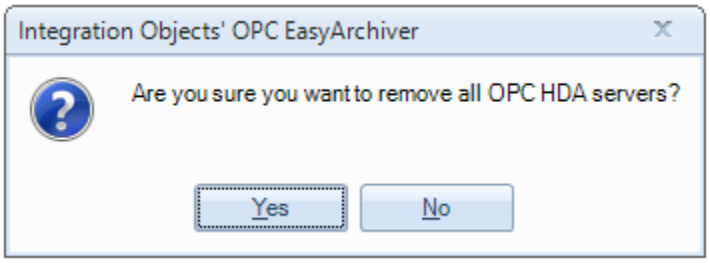


Figure 65: Remove All HDA Servers dialog

Once confirmed, all HDA servers' nodes will be deleted from the tree view and all OPC HDA connections will be released.

1.11. View OPC Server Status

Select your OPC HDA Server node and click on the **Server Status** button available in the server right click menu item. The following dialog screen will appear:

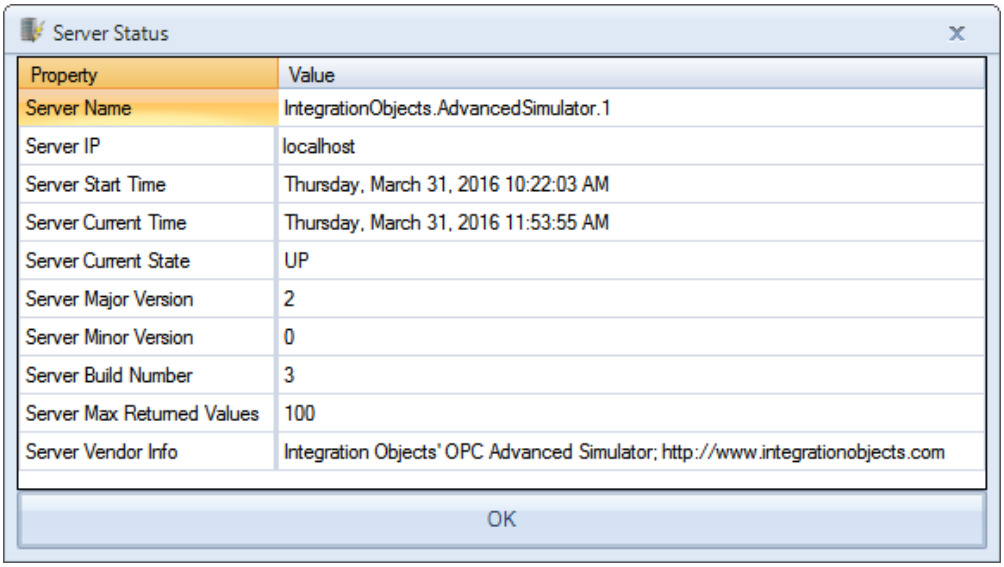


Figure 66: Server Status Dialog Screen

This screen provides you with the current status information about the selected OPC HDA Server.

2. OPC HDA Items and Requests

OPC EasyArchiver supports all functionalities defined by the OPC HDA specifications version 1.20. To send requests to the OPC Server, the user needs to use the OPC HDA

Item context menu or the HDA operations option in the OPC HDA Server menu. Requests are grouped in seven main sub menus:

- **SyncRead**: contains all synchronous read requests.
- **SyncUpdate**: contains all synchronous update requests.
- **SyncAnnotations**: contains all synchronous annotation requests.
- **Sync Loop**: contains loop features for synchronous read raw and read processed requests.
- **ASyncRead**: contains all asynchronous read requests.
- **ASyncUpdate**: contains all asynchronous update requests.
- **ASyncAnnotations**: contains all asynchronous annotation requests.

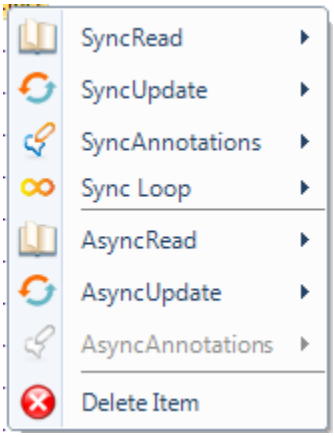


Figure 67: OPC HDA Item Context Menu

2.1. Synchronous Read Menu

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

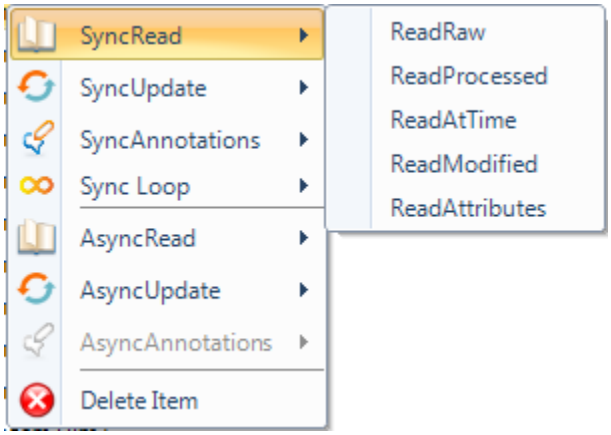


Figure 68: Synchronous Read Menu

2.1.1. Read Raw

This function reads the raw data values, qualities, and timestamps from the OPC HDA Server for one or more items via a synchronous request.
To use this functionality, select one or more items, right-click on them and select the **ReadRaw** menu entry. The following window will appear:

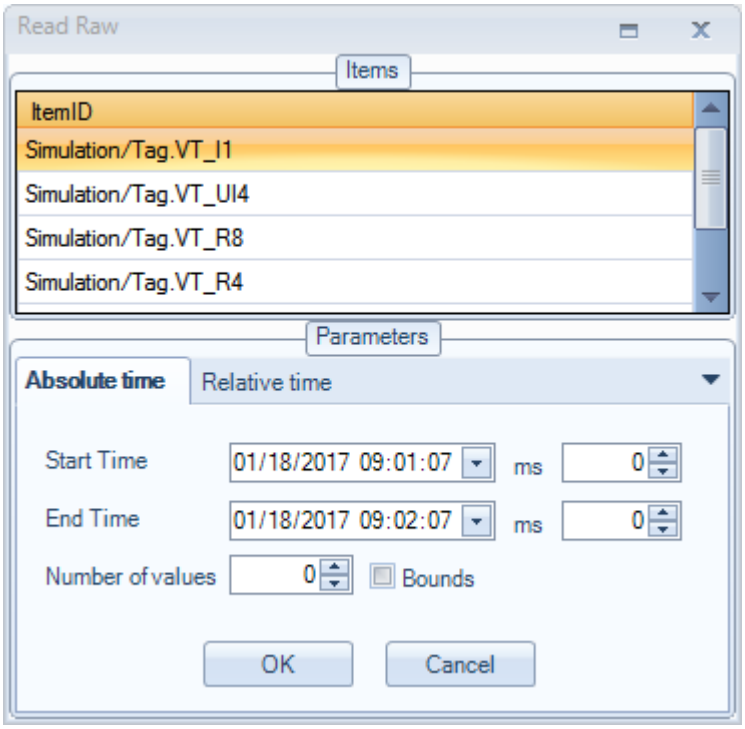


Figure 69: Synchronous Read Raw Dialog

The user can use one of the following date formats to configure his read request:

- **Absolute time: the user provides a complete date.**
- **Relative time: the user provides a string representing a valid relative time. Refer to Appendix A for details on relative time format.**

Parameter	Description
Items	The list of items to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Number of values	The maximum number of values returned for each item over the time range. If it is set to 0, all the values will be returned.

Bounds	If the user checks the **Bounds** option, the bounding values will be returned.

Table 3: Synchronous Read Raw Parameters

2.1.2. Read Processed

This function requests from the OPC HDA Server calculated historical values with respect to the aggregate type and the resample interval entered by the user.
To use this functionality, select one or more items, and select the **ReadProcessed** menu entry. The following window will appear:

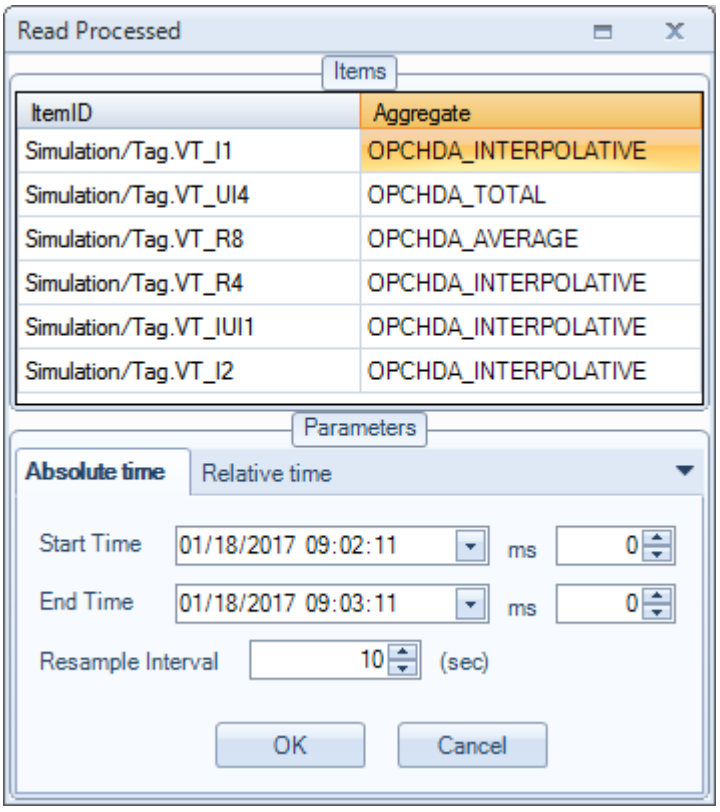


Figure 70: Synchronous Read Processed Dialog

Parameter	Description
ItemID	The list of items to be read.
Aggregate	The calculation to be performed by the OPC Server on the raw data to create the processed values to be returned.
Start Time	The beginning of the history period to be read.

End Time	The end of the history period to be read.
Res int	The resample interval: Interval between returned values.

Table 4: Synchronous Read Processed Parameters

2.1.3. Read at Time

This function reads historical data values for specific timestamps for one or more items. This functionality supports only the absolute time format.
You can add and remove dates using the **Add** and **Delete** buttons.

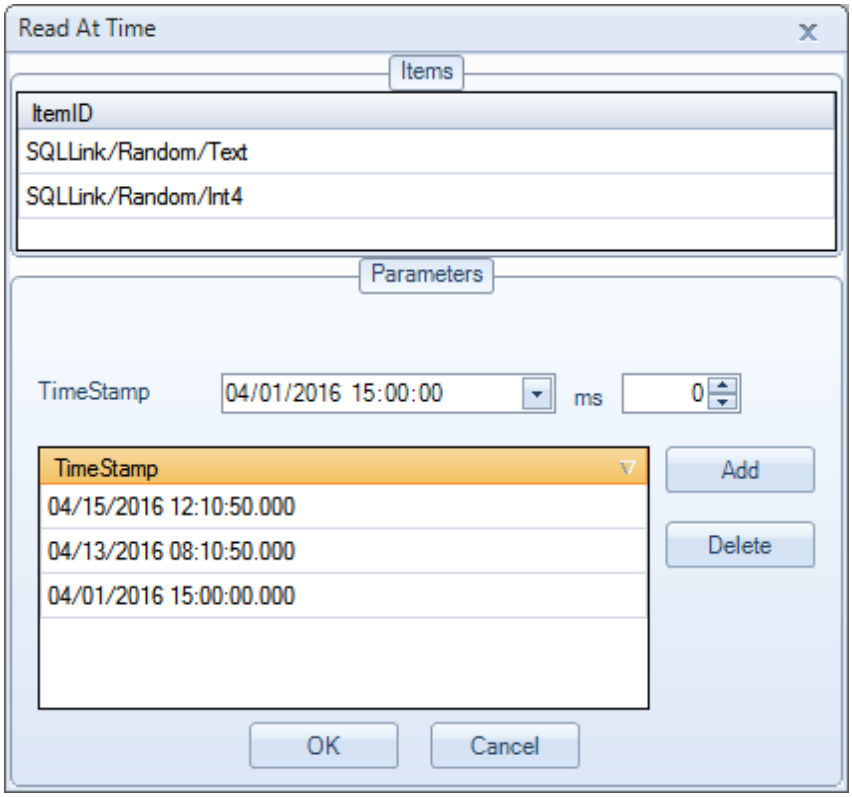


Figure 71: Synchronous Read At Time Dialog

2.1.4. Read Modified

This function reads values of the modification for one or more items from the OPC HDA Server for a specified domain of time.

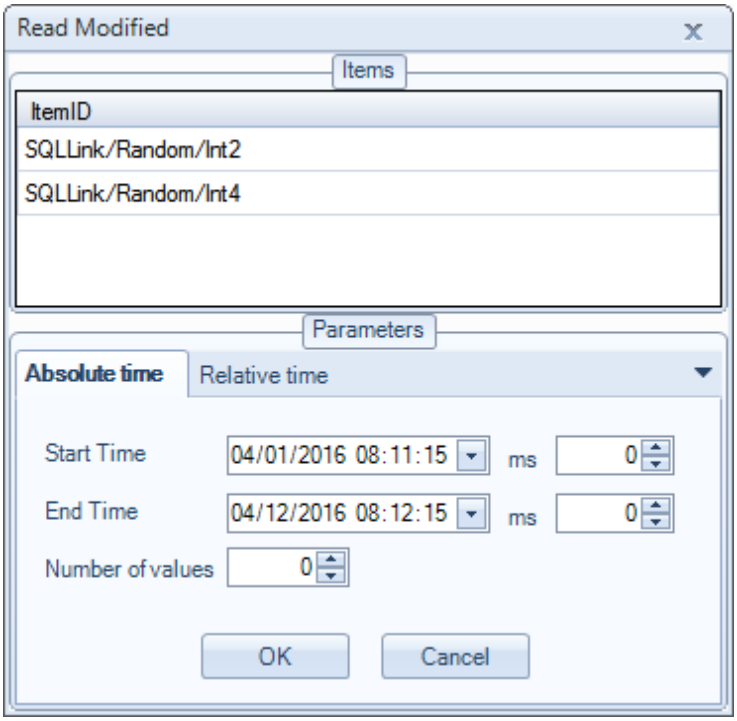


Figure 72: Synchronous Read Modified Dialog

Parameter	Description
Items	The list of items to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Number of values	The maximum number of values returned for each item over the time range. If it is set to 0, all the values will be returned.

Table 5: Synchronous Read Modified Parameters

2.1.5. Read Attributes

This function reads attribute values for a specified domain of time for one OPC HDA item.

The **Add** button will add the selected attributes. If an attribute already exists in the list, it will not be added.

The **Delete** button deletes the selected attribute from the list of attributes.

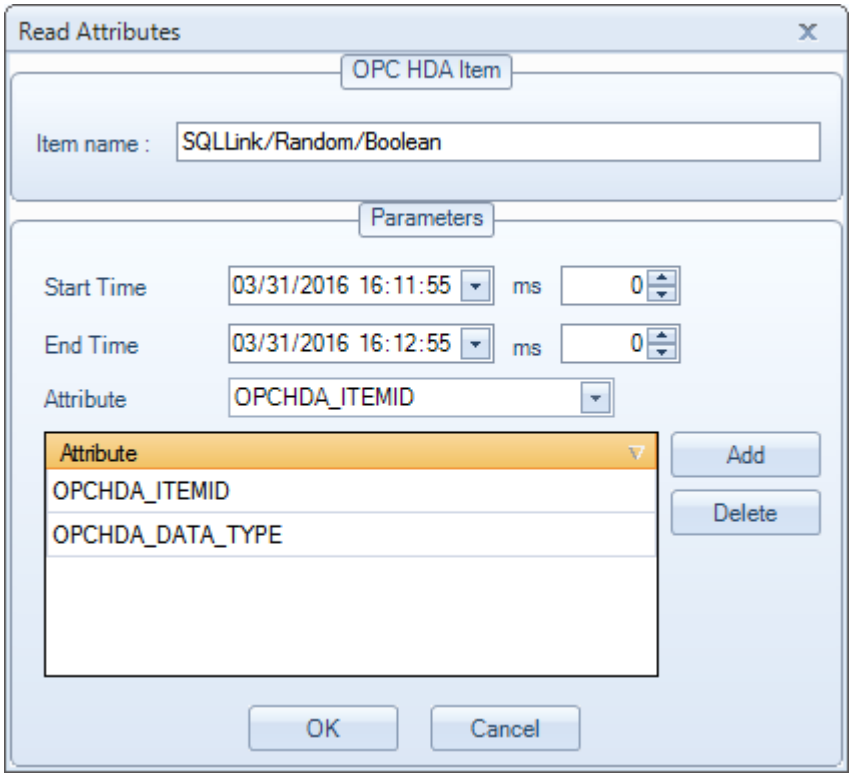


Figure 73: Synchronous Read Attributes Dialog

Parameter	Description
Item name	The item ID to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Attribute	The list of attribute to be read.
Add	Add an attribute ID to the list.
Delete	Remove an attribute from the list.

Table 6: Synchronous Read Attributes Parameters

2.2. Synchronous Update Menu

This menu allows inserting, replacing or deleting data from the OPC HDA Server. It includes five entries:

- Insert.
- Replace.
- InsertReplace.
- Delete Raw.
- Delete Raw At.

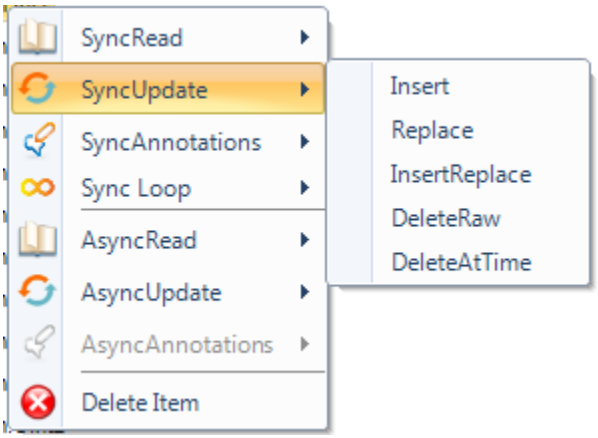


Figure 74: Synchronous Update Menu

2.2.1. Insert, Replace, Insert/Replace

These three update functions are defined as follows:

- **Insert**: this function inserts values and qualities into the OPC HDA Server at the specified timestamps for one or more items. If a value already exists at the specified timestamp, the new value will not be inserted.
- **Replace**: this function replaces the values and qualities in the OPC HDA Server at the specified timestamps for one or more items. If no value exists at the specified timestamp, the new value will not be inserted.
- **InsertReplace**: this function inserts or replaces values and qualities in the OPC HDA Server for the specified timestamps for one or more items. 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 value.

These three functions have similar graphical configuration interface in the OPC EasyArchiver where you must specify information about data values to be sent to the OPC HDA Server. To do so, provide the item Id, timestamp, value, data type and quality.

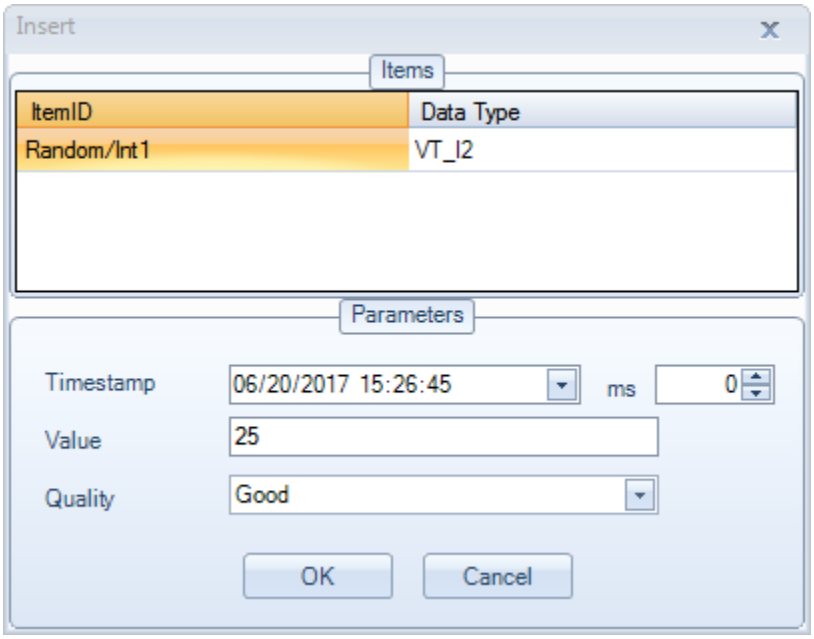


Figure 75: Synchronous Insert, Replace or Insert/Replace Dialog

Parameter	Description
Items	The list of items to be inserted/replaced.
Data Type	The Data Type of the inserted value.
Timestamp	The time stamp for the new value.
Value	The new item value.
Quality	The new item quality.

Table 7: Synchronous Insert, Replace or Insert/Replace Parameters

2.2.2. Delete Raw

This function deletes the values, qualities, and timestamps from the OPC HDA Server for the specified time domain for one or more items.

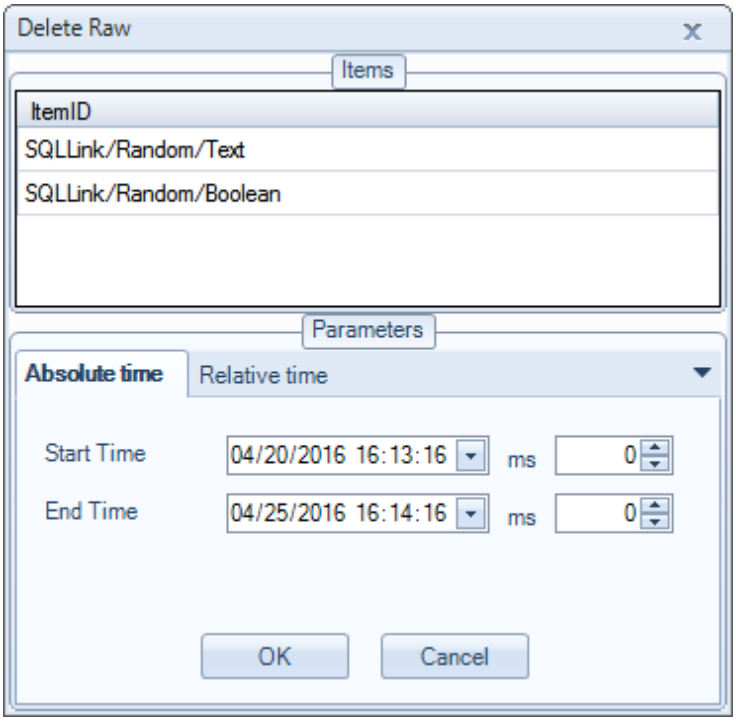


Figure 76: Synchronous Delete Raw Dialog

Parameter	Description
Items	The list of items for which historical data will be deleted.
Start time	The beginning of history period to be deleted.
End time	The end of history period to be deleted.

Table 8: Synchronous Delete Raw Parameters

2.2.3. Delete at Time

This function deletes the values and qualities in the historian for the specified timestamps for one or more items.

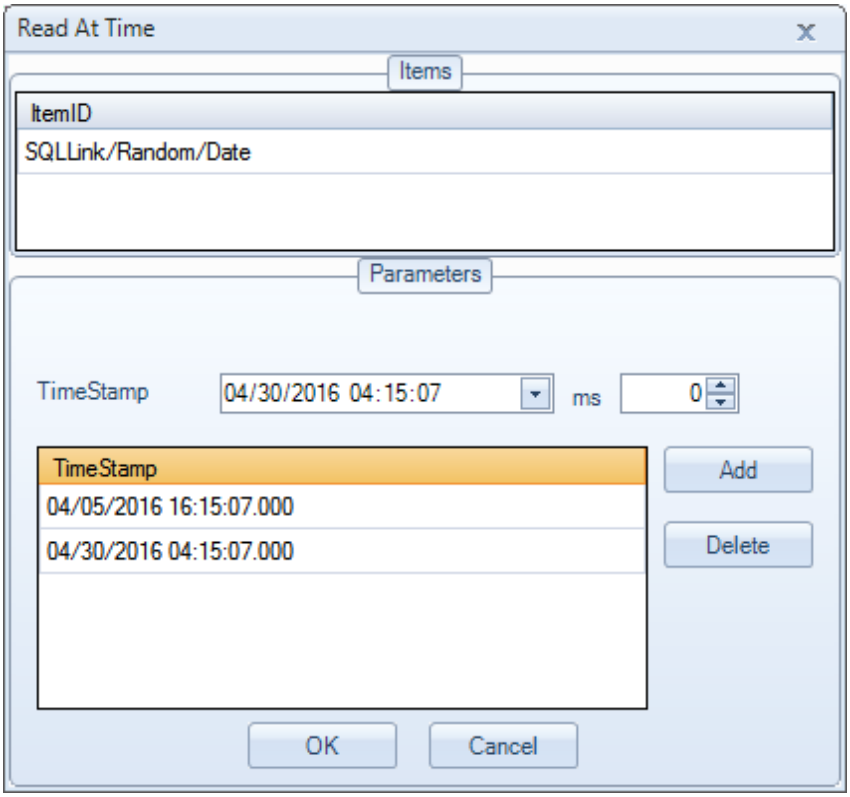


Figure 77: Synchronous Delete at Time Dialog

Parameter	Description
Items	The list of items for which historical data deleted.
Timestamp	The timestamps for the value to be deleted.
Add	Add a new timestamp to the list
Delete	Remove the selected timestamps from the list.

Table 9: Synchronous Delete At Time Parameters

2.3. Synchronous Annotations Menu

This menu offers functionalities to read/insert annotations associated with an Item from/to the OPC HDA Server. For more details about annotations, refer to the OPC HDA specifications. These functionalities are:

- Read annotations.
- Insert annotations.

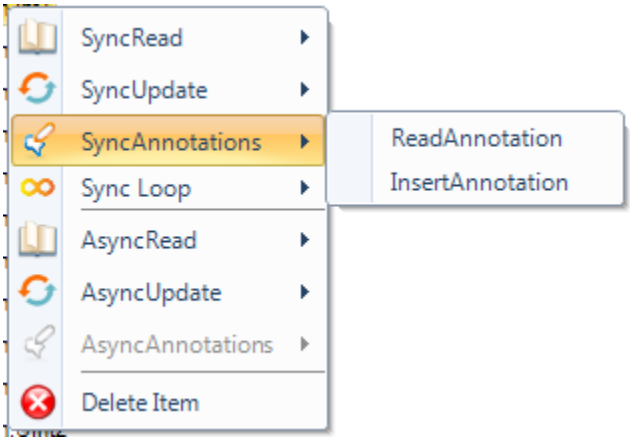


Figure 78: Synchronous Annotations Menu

2.3.1. Read Annotation

This function reads the annotations from the OPC HDA Server for a specified time domain for one or more items.

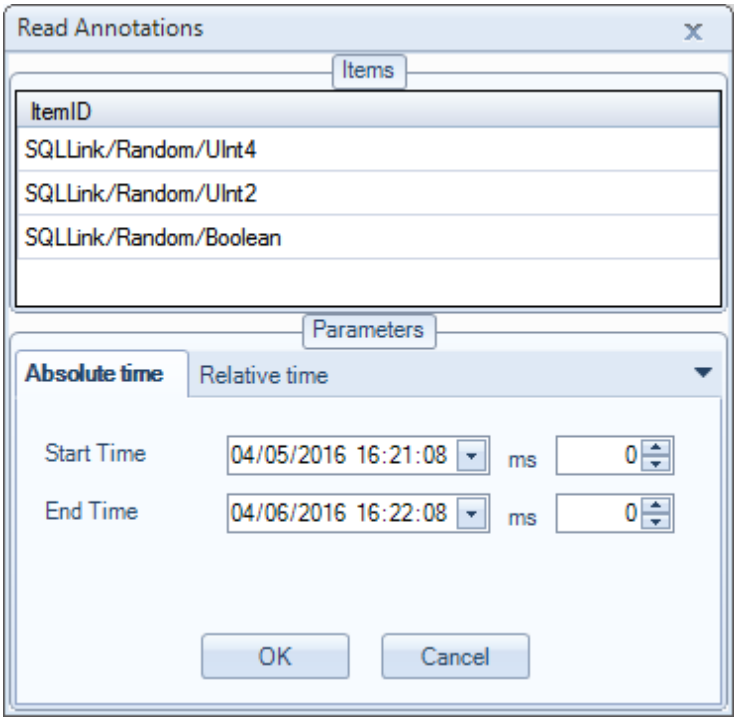


Figure 79: Synchronous Read Annotations Dialog

Parameter	Description
Items	The list of items to read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.

Table 10: Synchronous Read Annotations Parameters

2.3.2. Insert Annotation

This function inserts annotations into the OPC HDA Server. It is intended to insert annotations by users to document observations for a value at a specified timestamp.

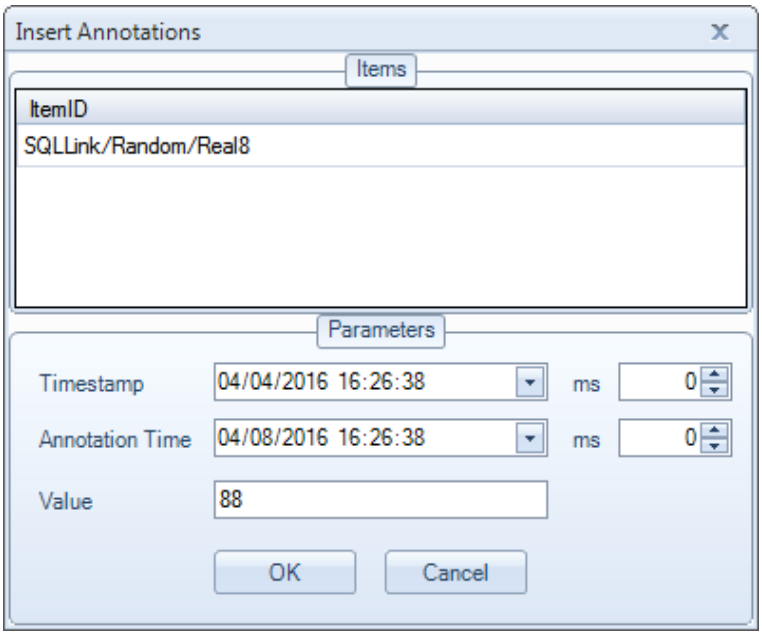


Figure 80: Synchronous Insert Annotations Dialog

Parameter	Description
Items	The list of items to which the annotations is inserted.
Timestamp	The time stamps for the annotations to be inserted.
Annotation time	The annotation time to be inserted.
Value	The annotations values to be inserted.

Table 11: Synchronous Insert Annotations Parameters

2.4. Synchronous Loop Menu

We offer functionalities based on the synchronous interfaces to automate the historical data collection and so simulate the adviseraw and adviseprocessed as the related OPC HDA asynchronous interfaces are optional in the OPC specifications.
OPC EasyArchiver offers two functionalities:

- Read raw loop to simulate adviseraw.
- Read processed loop to simulate adviseprocessed.

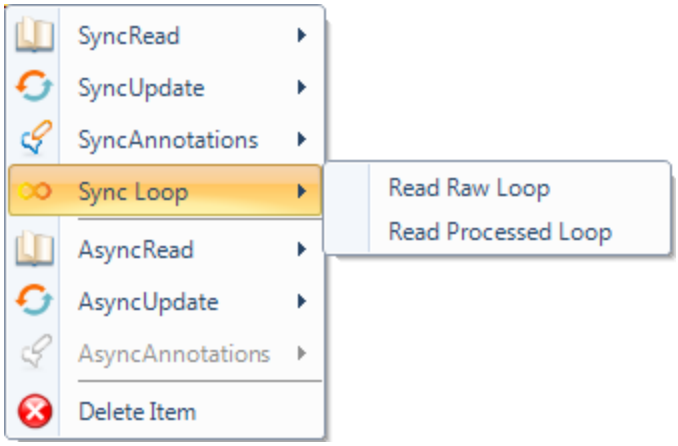


Figure 81: Synchronous Loop Manager

2.4.1. Read Raw Loop

This functionality sends synchronous read raw requests on periodic basis to the OPC HDA Server and per the specified user configuration. The read raw loop configuration dialog is illustrated in the figure below:

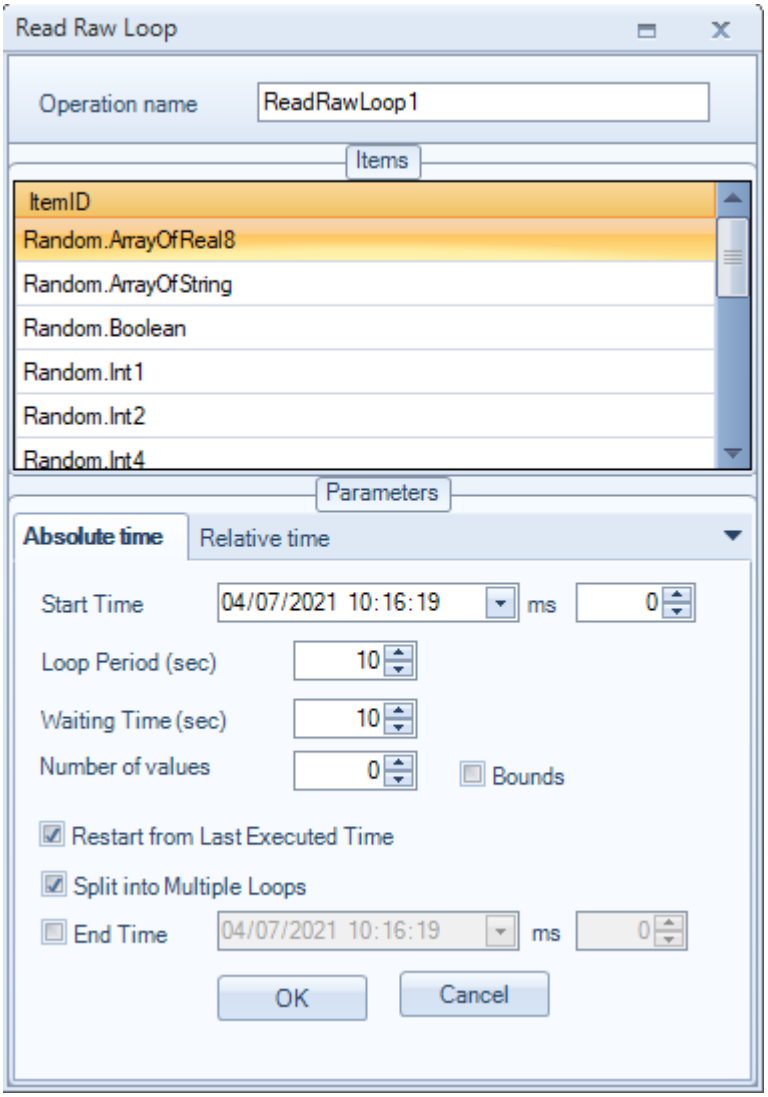


Figure 82: Read Raw Loop Dialog

Parameter	Description
Operation name	The alias name associated with this loop.
Items	The list of items to be read.
Start Time	The beginning of the history period to be read for the first read request within this loop.
Loop Period	The time interval of each read raw.
Waiting Time	The waiting time between 2 read operations.

Number of values	The maximum number of values returned for any item over the time range. If it is set to 0, all the values will be returned.
Bounds	If the user checks the **Bounds** option, the bounding values will be returned.
Restart from Last Executed Time	If checked: The read raw loop will start from the last executed time. If not: the read raw loop will start from the initially configured start time.
Split into multiple loops	If checked, multiple read raw loops will be created automatically per the maximum items size configured in the settings.
End Time	If checked, the read raw loop will be stopped when the specified date time is reached.

Table 12: Read Raw Loop Parameters

2.4.2. Read Processed Loop

This functionality sends synchronous read processed requests on periodic basis to the OPC HDA Server and per the specified user configuration. The read processed loop configuration dialog is illustrated in the figure below:

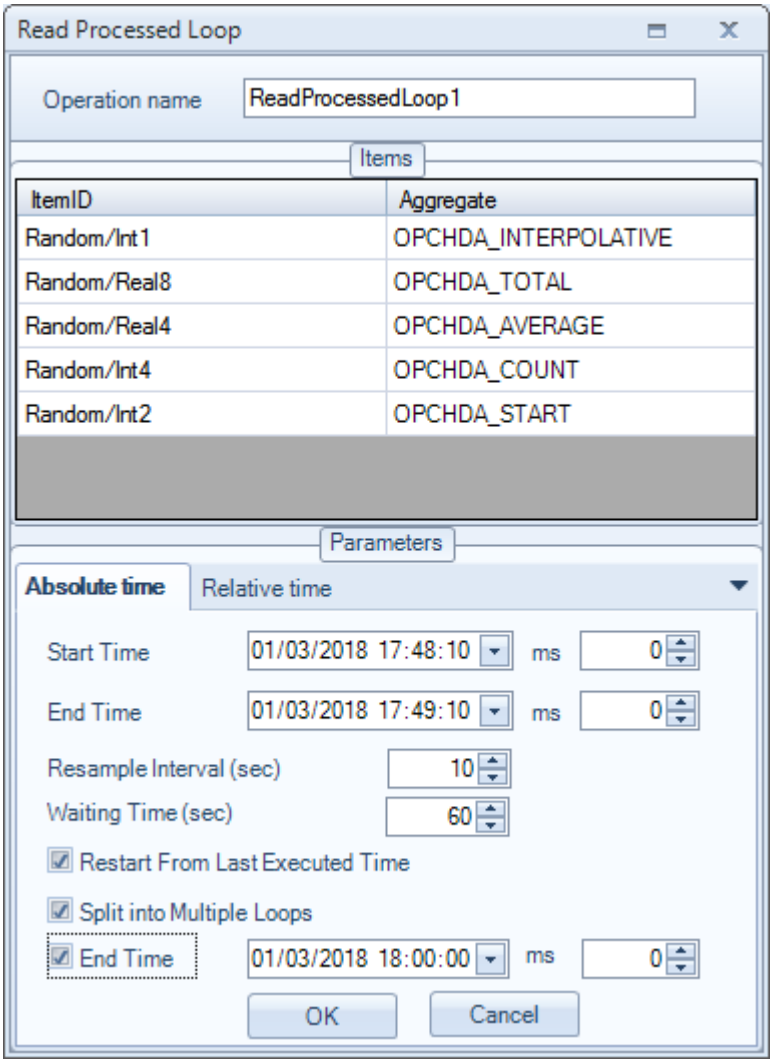


Figure 83: Read Processed Loop

Parameter	Description
Operation name	The alias name associated with this loop.
Item ID	The list of items to be read.
Aggregate	The calculation to be performed by the OPC HDA Server on the raw data to generate the processed values to be returned.
Start Time	The beginning of the history period to be read for the first read request within this loop.
End Time	The end of the history period to be read for the first loop.
Resample Interval	The time interval between returned values.

Waiting Time	The waiting time between 2 read operations.
Restart from Last Executed Time	If checked: The read processed loop will start from the last executed time. If not: the read processed loop will start from the initially configured start time.
Split into multiple loops	If checked, multiple read processed loops will be created automatically per the maximum items size configured in the settings.

Table 13: Read Processed Loop Parameters

2.4.3. Loop Manager

In order to visualize and manage the synchronous loops, you can right click on the OPC HDA Server node and select **Loop Manager**, as illustrated in the figure below:

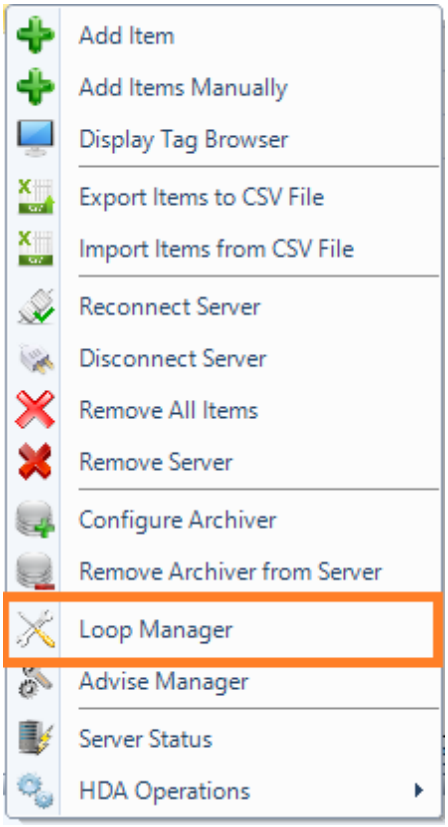


Figure 84: Loop Manager

The loop manager window offers the possibility to monitor active synchronous requests sent to the server and to cancel them. Canceling a request will stop the read operation. The user can cancel requests using the right-click menu as illustrated in the figure below:

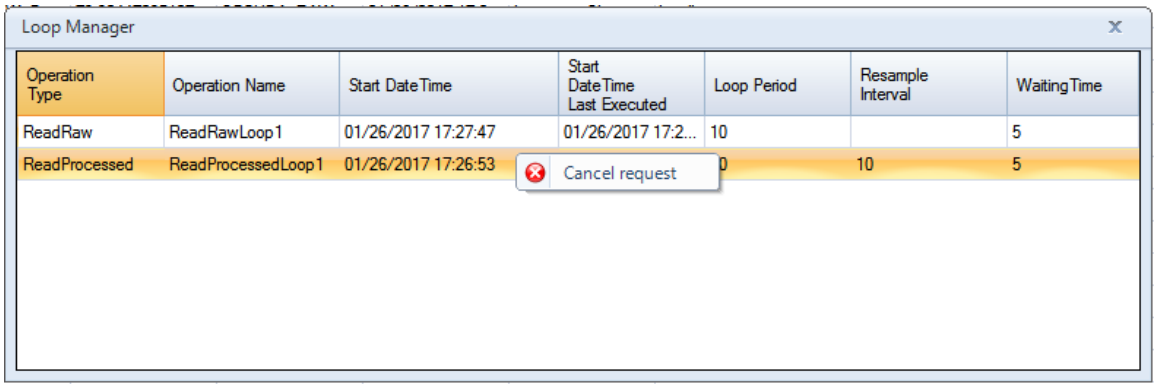


Figure 85: Synchronous Loop Manager

Parameter	Description
Operation Type	The type of the operation: ReadRaw or ReadProcessed.
Operation name	The alias associated with the loop already configured when adding a loop operation.
Start Date Time	The beginning of the history period to be read for the first loop.
Start DateTime Last Executed	The Start Date time of the last executed operation.
Loop Period	The time interval of each read raw request.
Resample Interval	Interval between returned values.
Waiting Time	The waiting time between read operations.

Table 14: Synchronous Loop Manager Parameters

2.4.4. Loops Tab

In order to visualize and manage the synchronous loops, you need to go to the Loops tab. The configured loops are added in the loops tree view.

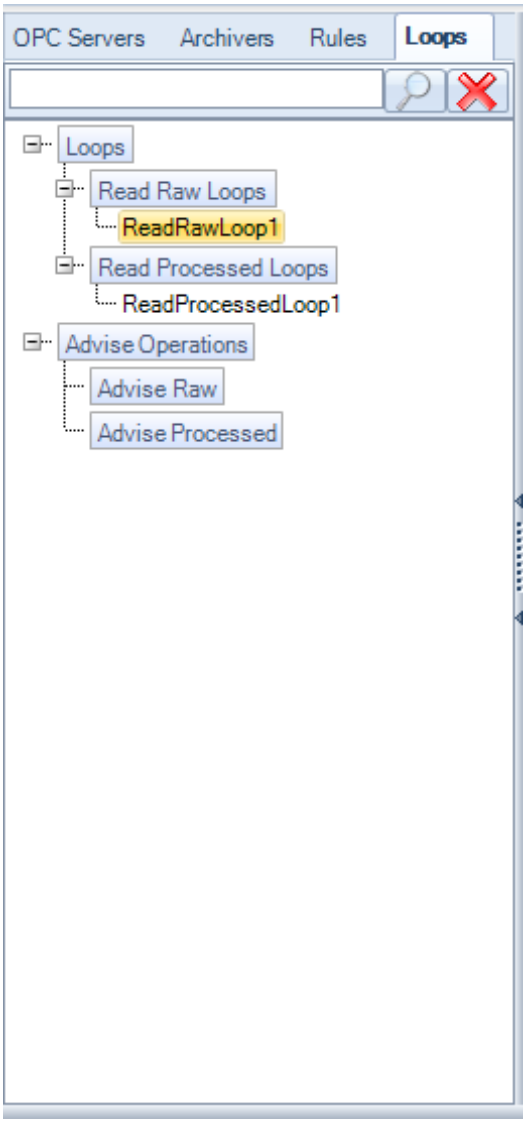


Figure 86: Loops Tree

2.4.4.1. Loop Manager Tab

In order to open the loop manager, click the loops node and a new tab containing the list of Loops will be displayed in the main user interface, as illustrated in the figure below:

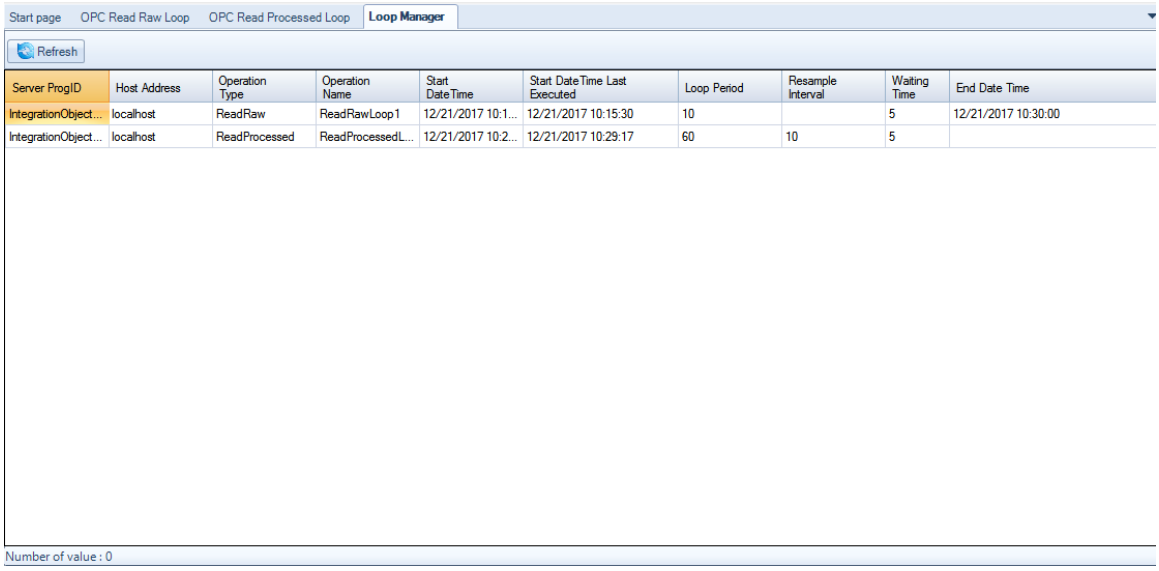


Figure 87: Loop Manager Tab

2.4.4.2. Synchronous Loop Menu

Right click on the loop node on the tree and the following context menu will be displayed:

Figure 88: Loop Context Menu

This menu includes the following actions:

- **View Data**: it opens a new tab that contains the related data in the main user interface.
- **Start**: Starts the synchronous loop.
- **Stop**: Stops the synchronous loop.
- **Cancel**: Cancels the synchronous loop. This action will stop and delete the loop.
- **Edit**: Opens a window in order to edit the loop as follows:

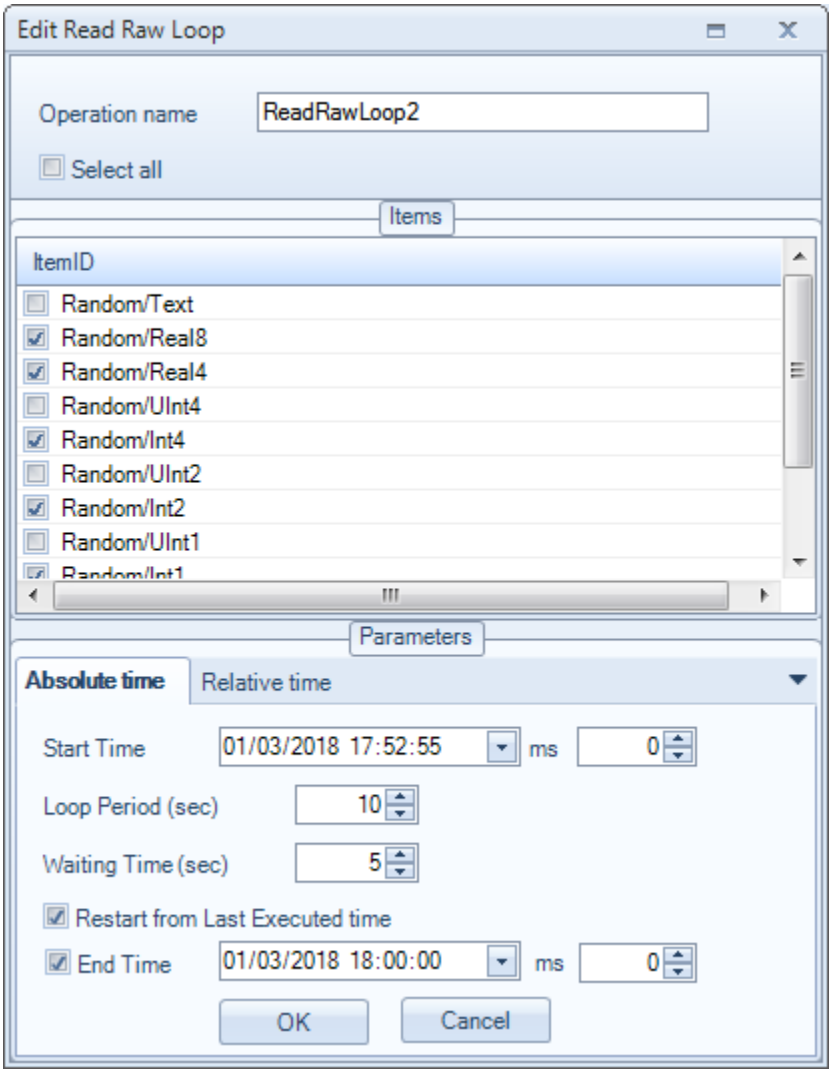


Figure 89: Edit Read Raw Loop Window

2.5. Asynchronous Read Menu

The Async Read menu offers almost the same functionalities offered by the Sync Read menu. The only differences between these two menus are:

- The request sent to the server will be processed asynchronously.
- The Async Read menu offers two extra functionalities, which are the advise raw and advise processed functionalities.

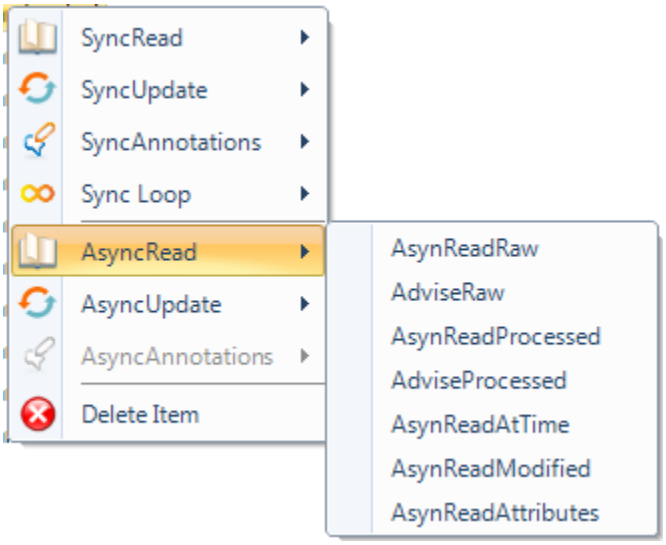


Figure 90: Asynchronous Read Menu

2.5.1. Asynchronous Read Raw

This function reads the values, qualities, and timestamps from the OPC HDA Server for one or more items.

To use this functionality, select one or more items, and click the **ReadRaw** menu entry. The following window will appear:

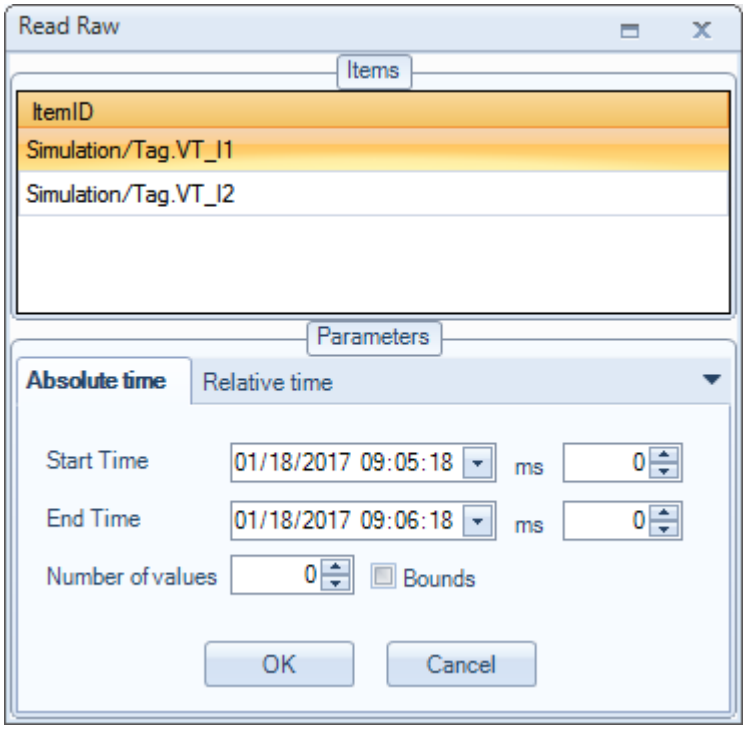


Figure 91: Asynchronous Read Raw Dialog

Parameter	Description
Items	The list of items to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Number of values	The maximum number of values returned for any item over the time range. If it is set to 0, all the values will be returned.
Bounds	If the user checks the **Bounds** option, the bounding values will be returned.

Table 15: Asynchronous Read Raw Parameters

2.5.2. Asynchronous Read Processed

This function requests from the OPC HDA Server calculated values with respect to the aggregate type and the resample interval entered by the user.
To use this functionality, select one or more items, and click the **ReadProcessed** menu entry. The following window will appear:

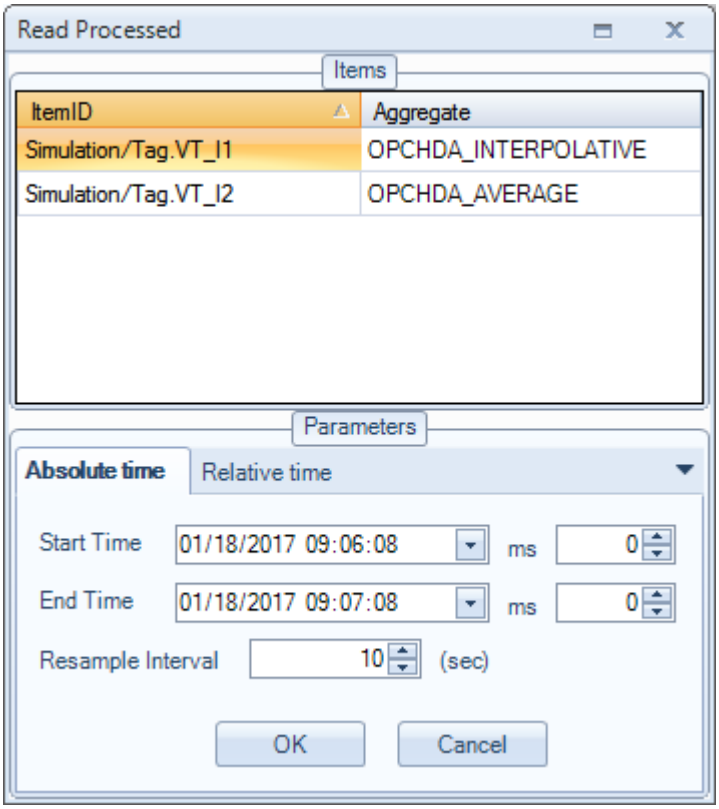


Figure 92: Asynchronous Read Processed Dialog

Parameter	Description
ItemID	The list of items to be read.
Aggregate	The calculation to be performed by the OPC HDA Server on the raw data to generate the values to be returned.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Res int	The resample interval: Interval between returned values.

Table 16: Asynchronous Read Processed Parameters

2.5.3. Asynchronous Read at Time

This function reads historical data values for specific timestamps for one or more items. This functionality supports only the absolute time.
The user can add and remove dates using the **Add** and **Delete** buttons.

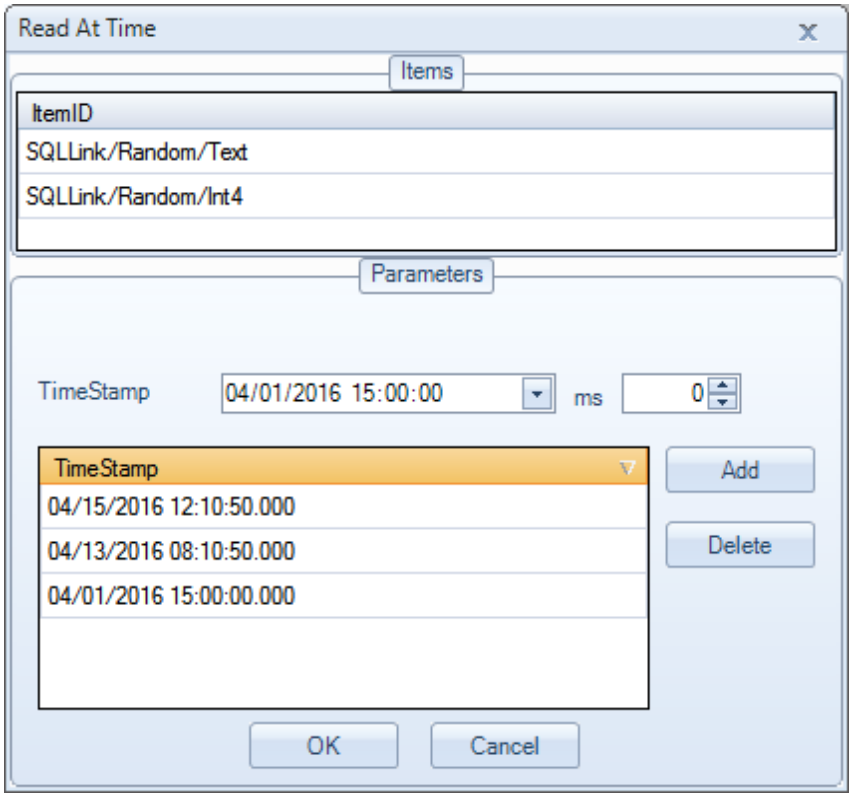


Figure 93: Asynchronous Read at Time Dialog

Parameter	Description
Items	The list of items to be read.
TimeStamp	The timestamps for the requested data.
Add	Add a timestamp to the list.
Delete	Remove the selected timestamps from the list.

Table 17: Asynchronous Read at Time Parameters

2.5.4. Asynchronous Read Modified

This function reads values from history that have been modified/replaced for one or more items from the OPC HDA Server for a specified domain of time.

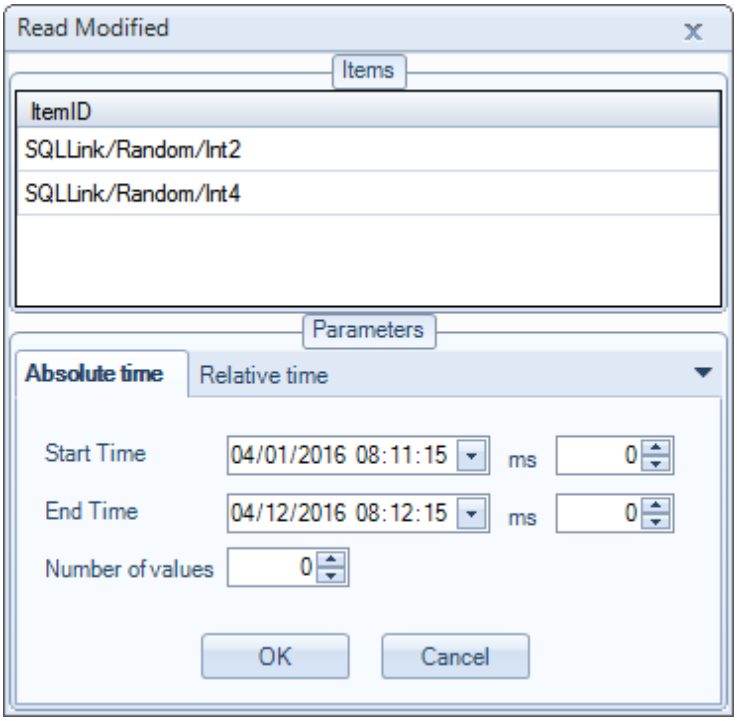


Figure 94: Asynchronous Read Modified Dialog

Parameter	Description
Items	The list of items to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Number of values	The maximum number of values returned for any item over the time range. If it is set to 0, all the values will be returned.

Table 18: Asynchronous Read Modified Parameters

2.5.5. Asynchronous Read Attributes

This function reads attribute values for a specified domain of time for one OPC HDA item.

The **Add** button will add the selected attributes. If an attribute already exists in the list, it will not be added.

The **Delete** button deletes the selected attribute from the list of attributes.

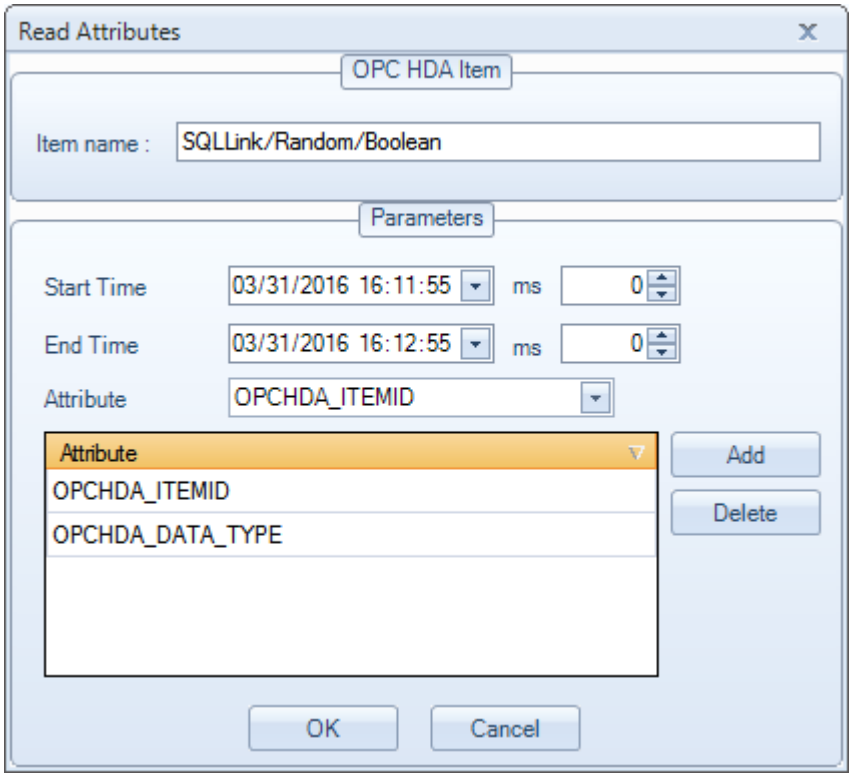


Figure 95: Asynchronous Read Attributes Dialog

Parameter	Description
Item name	The item ID to be read.
Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.
Attribute	The list of attribute to be read.
Add	Add an attribute ID to the list.
Delete	Remove an attribute from the list.

Table 19: Asynchronous Read Attributes Parameters

2.5.6. Advise Raw

This function reads the values, qualities, and timestamps from the OPC HDA Server from the specified start time and at a given update interval for one or more items.

This function is intended to be used to update the OPC HDA client with new data as they become available.

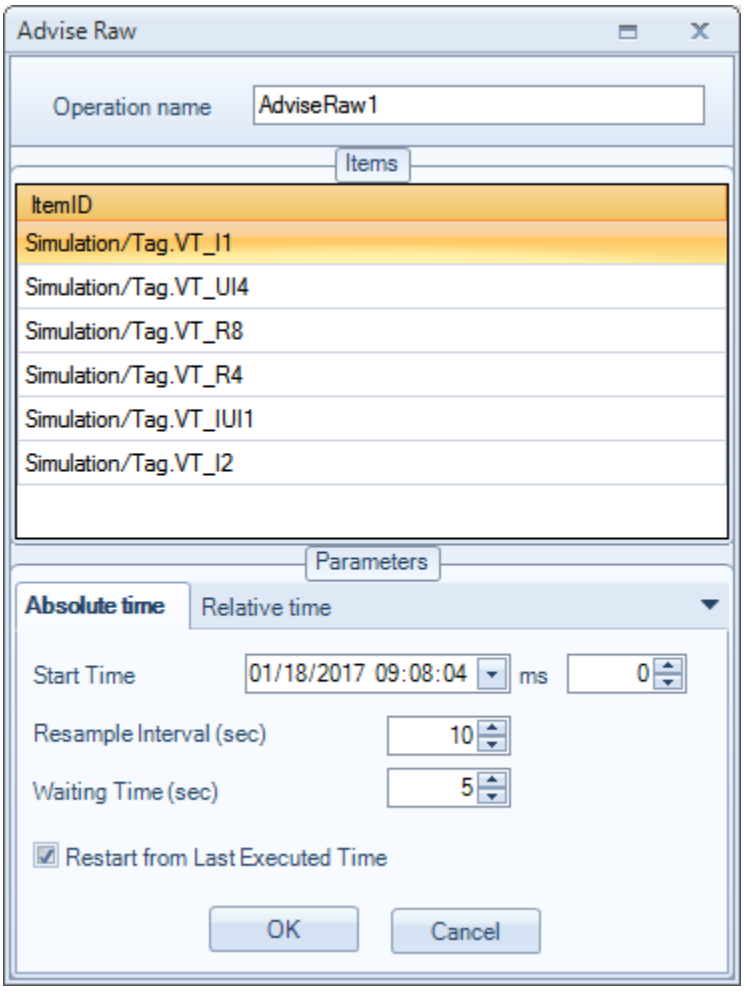


Figure 96: Advise Raw Dialog

Parameter	Description
Operation name	The alias associated with this advise raw request.
Item ID	The list of items to be read.
Start Time	The beginning of the history period to be read.
Resample Interval	The time interval between returned values.
Waiting Time	The waiting time between 2 read operations.

Restart from Last Executed time	If checked, the advise raw request will start from the last executed time. If not, the advise raw request will start from the initially configured start time.

Table 20: Asynchronous Advise Raw Parameters

2.5.7. Advise Processed

This function returns the aggregate values, qualities, and timestamps from the historian from the specified start time and at a given update interval for one or more items.

This function is intended to be used to update the OPC HDA client with new data as they become available.

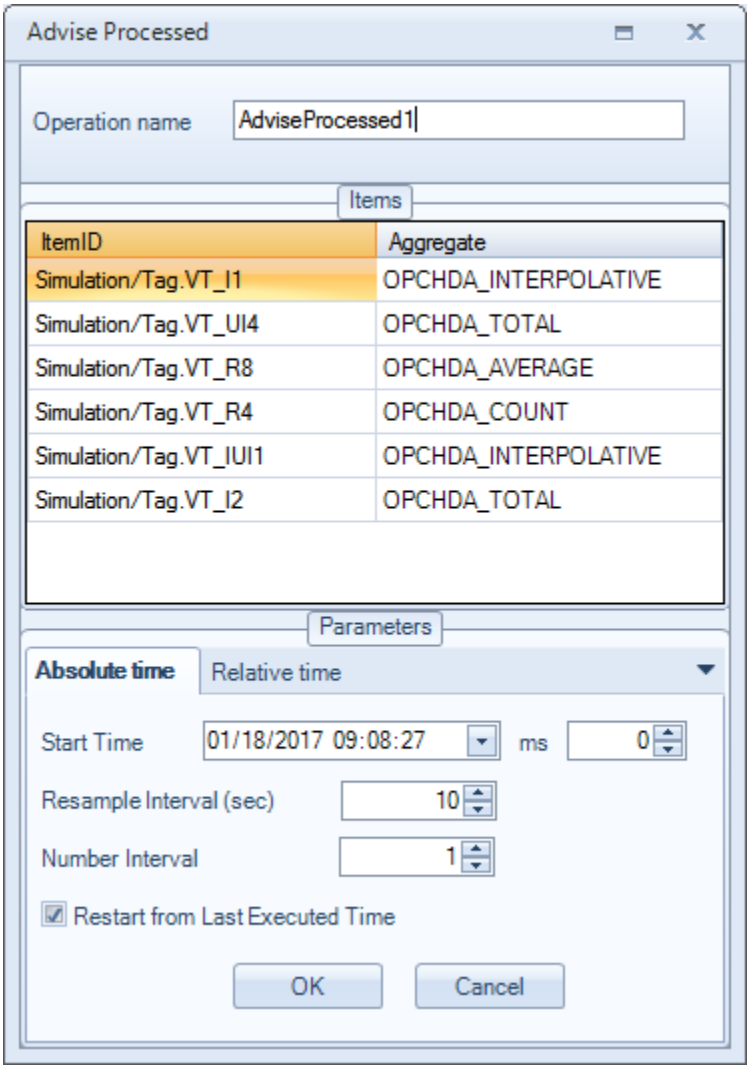


Figure 97: Advise Processed Dialog

Parameter	Description
Operation name	The alias associated with this advise processed request.
Item ID	The list of items to be read.
Aggregate	The calculation to be performed by the OPC HDA Server on the raw data to generate the processed values to be returned.
Start Time	The beginning of the history period to be read.
Resample Interval	The time interval between returned values.
Number Interval	The number of resample intervals between updates.

Restart from Last Executed time	If checked, the advise processed request will start from the last executed time. If not, the advise processed request will start from the initially configured start time.

Table 21: Asynchronous Advise Processed Parameters

2.5.8. Advise Manager

In order to visualize and manage the Advise Raw and Advise Processed requests, right click on the OPC HDA Server and then select **Advise Manager** from the displayed menu:

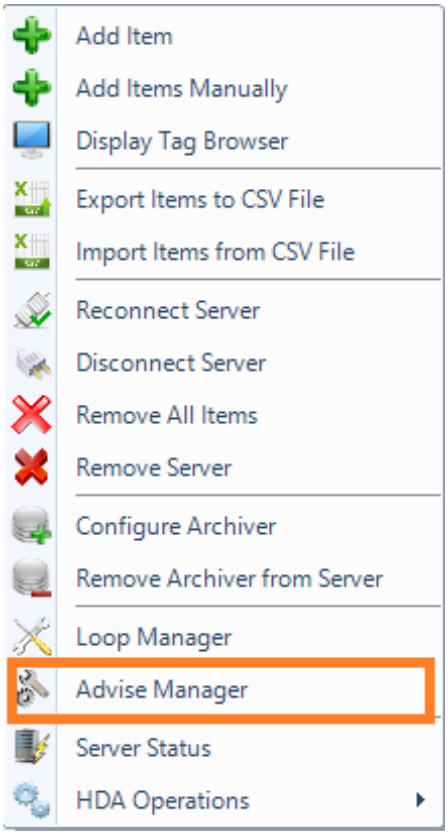


Figure 98: Advise Manager

The Advise Manager window offers the possibility to see active advise requests sent to the server and to cancel them. Canceling a request will stop the operation. You can cancel requests using the right-click menu as illustrated in the figure below:

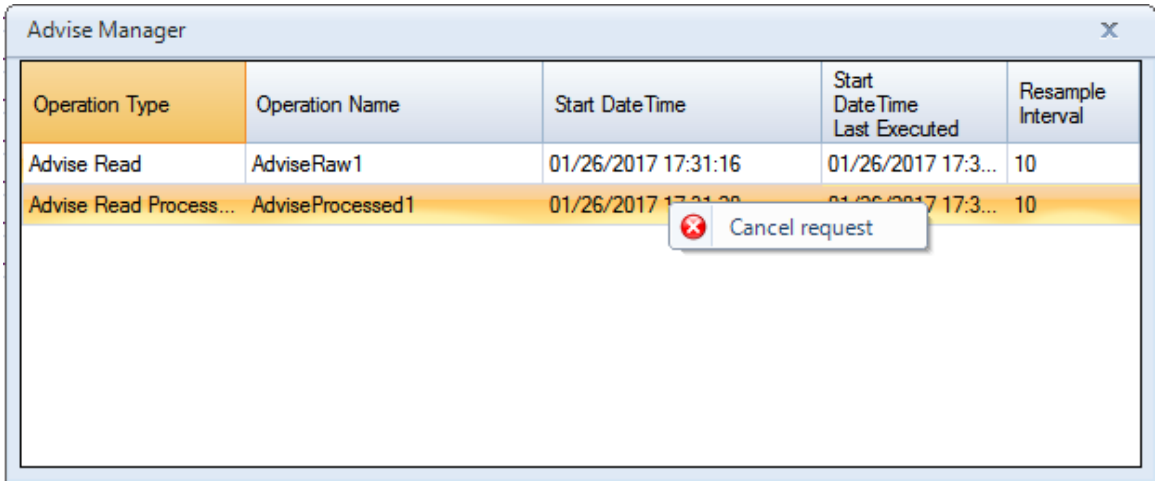


Figure 99: Advise Operations Manager

Parameter	Description
Operation Type	The type of the operation: Advise Read or Advise Read Processed.
Operation name	The alias associated with the advise request already configured when adding a advise operation.
Start Date Time	The beginning of the history period to be read.
Start DateTime Last Executed	The Start Date time of the last executed operation.
Resample Interval	Interval between returned values.

Table 22: Advise Manager Parameters

2.6. Asynchronous Update Menu

This menu offers the same functionalities as the Sync Update menu. The only difference is that the update requests sent to the server will be processed asynchronously.

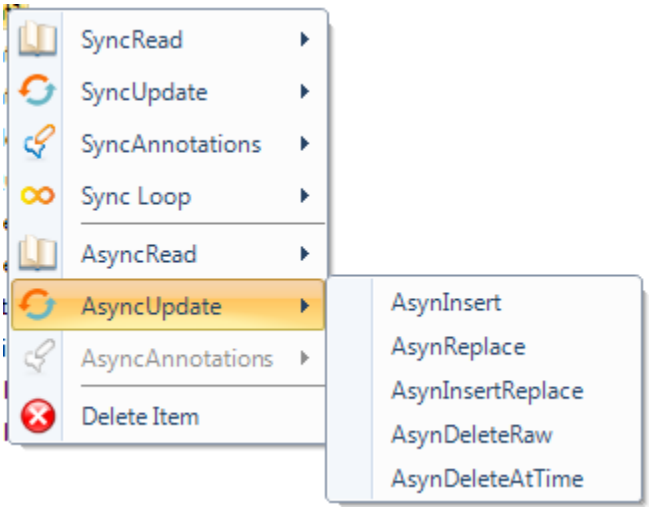


Figure 100: Asynchronous Update Menu

This menu allows inserting, replacing or deleting data asynchronously from the OPC HDA server. It includes five entries:

- Insert.
- Replace.
- InsertReplace.
- Delete Raw.
- Delete Raw At.

2.6.1. Asynchronous Insert, Replace, Insert/Replace

These three update functions are defined as follows:

- **Insert**: this function inserts values and qualities into the OPC HDA Server at the specified timestamps for one or more items. If a value already exists at the specified timestamp, the new value will not be inserted.
- **Replace**: this function replaces the values and qualities in the OPC HDA Server at the specified timestamps for one or more items. If no value exists at the specified timestamp, the new value will not be inserted.
- **InsertReplace**: this function inserts or replaces values and qualities in the OPC HDA Server for the specified timestamps for one or more items. 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 value.

These three functions have similar graphical configuration interface in the OPC EasyArchiver where you must specify information about data values to be sent to the OPC HDA Server. To do so, provide the item Id, timestamp, value, and quality.

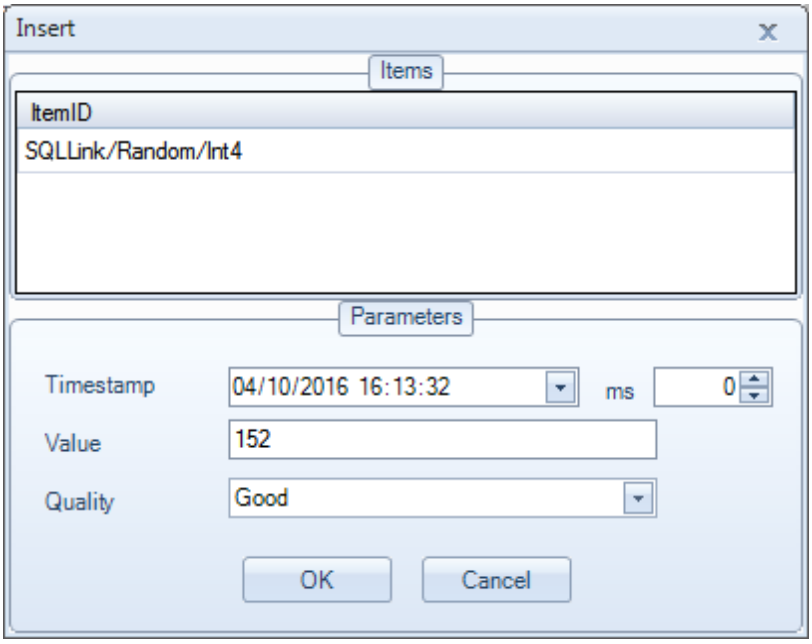


Figure 101: Asynchronous Insert, Replace or Insert/Replace Dialog

Parameter	Description
Items	The list of items to be inserted/replaced.
Timestamp	The time stamp of the new value.
Value	The new item value.
Quality	The new item value quality.

Table 23: Asynchronous Insert Parameters

2.6.2. Asynchronous Delete Raw

This function deletes the values, qualities, and timestamps from the OPC HDA Server for the specified time domain for one or more items.

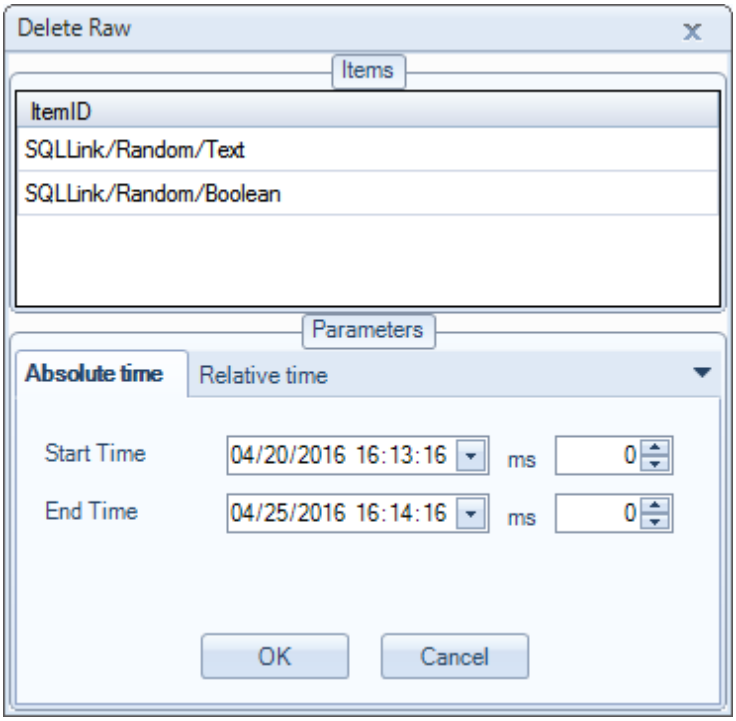


Figure 102: Asynchronous Delete Raw Dialog

Parameter	Description
Items	The list of items for which historical data will be deleted.
Start time	The beginning of history period to be deleted.
End time	The end of history period to be deleted.

Table 24: Asynchronous Delete Raw Parameters

2.6.3. Asynchronous Delete at Time

This function deletes the values and qualities in the historian for the specified timestamps for one or more items.

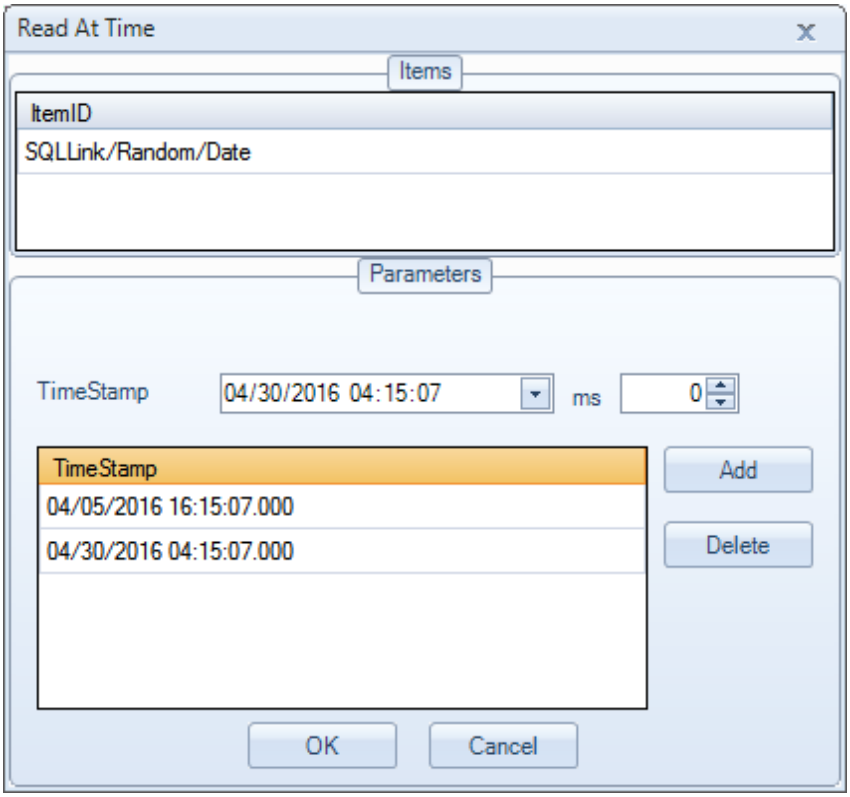


Figure 103: Asynchronous Delete at Time Dialog

Parameter	Description
Items	The list of items for which historical data will be deleted.
Timestamp	The timestamps for the value to be deleted.
Add	Add a new timestamp to the list.
Delete	Remove the selected timestamps from the list.

Table 25: Asynchronous Delete at Time Parameters

2.7. Asynchronous Annotations Menu

This menu offers the same functionalities offered by the Sync Annotations menu. The only difference is that requests sent to the server will be processed asynchronously.

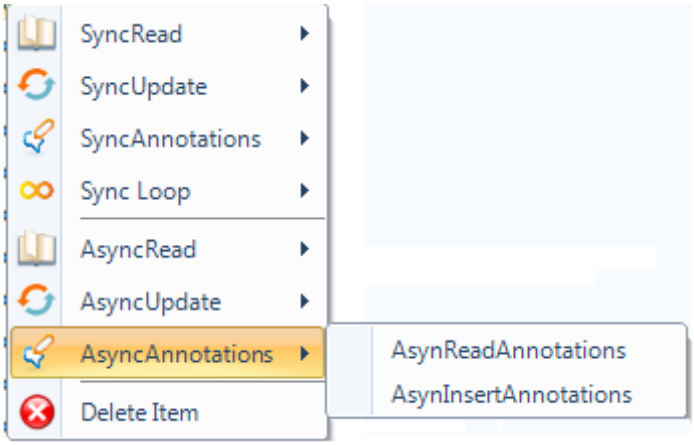


Figure 104: Asynchronous Annotation Menu

2.7.1. Read Annotation

This function reads the annotations from the OPC HDA Server for a specified time domain for one or more items.

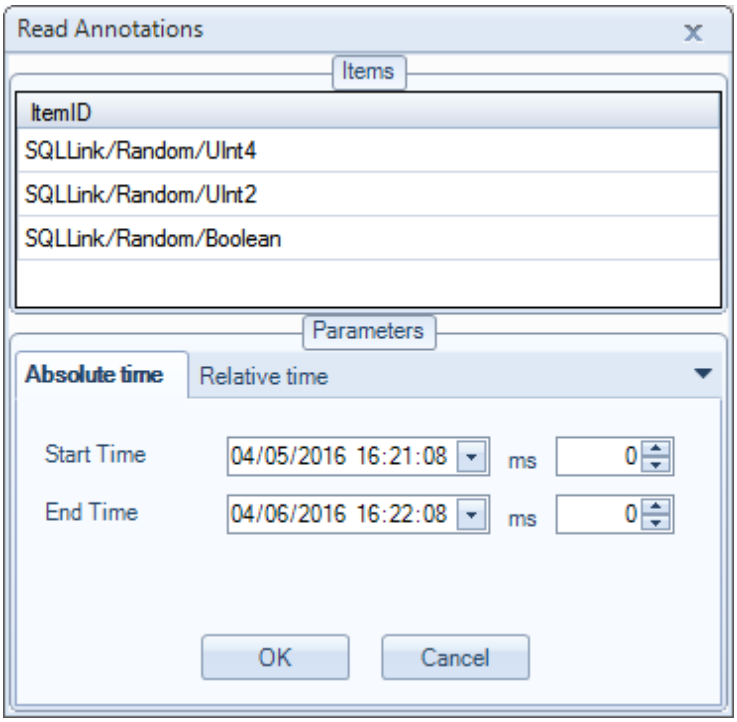


Figure 105: Asynchronous Read Annotations Dialog

Parameter	Description
Items	The list of items to read.

Start Time	The beginning of the history period to be read.
End Time	The end of the history period to be read.

Table 26: Asynchronous Read Annotations Parameters

2.7.2. Insert Annotation

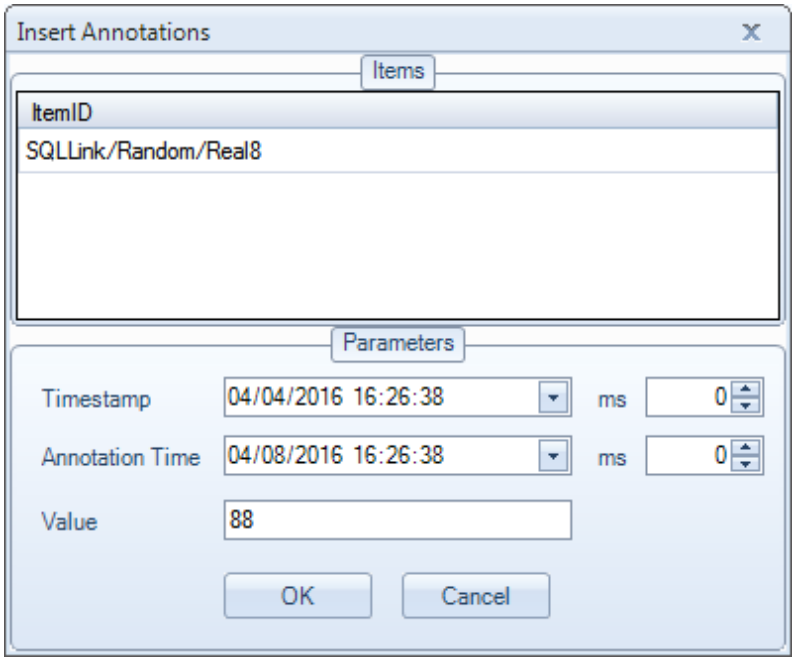


Figure 106: Asynchronous Insert Annotations Dialog

Parameter	Description
Items	The list of items to which the annotations is inserted.
Timestamp	The time stamps for the annotations to be inserted.
Annotation time	The annotation time to be inserted.
Value	The annotations values to be inserted.

Table 27: Asynchronous Insert Annotations Parameters

2.8. Remove an OPC HDA Item

You can remove an OPC HDA Item by clicking on the **Delete Item** context menu item.

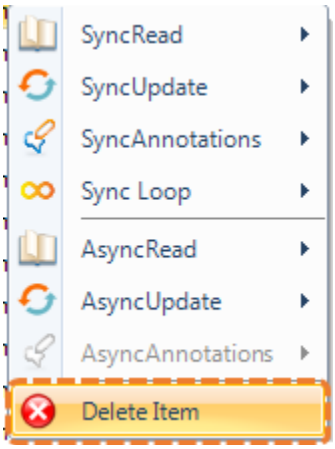


Figure 107: Delete OPC HDA Item

The OPC HDA Item will then be removed.

OPC AE FUNCTIONALITIES

When you successfully connect to an OPC AE server, a node will be created under the OPC AE Servers node in the OPC servers' tree view. This section describes the main OPC AE functionalities available in the OPC EasyArchiver.

1. OPC AE Server

Right click on any added OPC AE Server node in the servers' tree view and the following menu will be displayed:

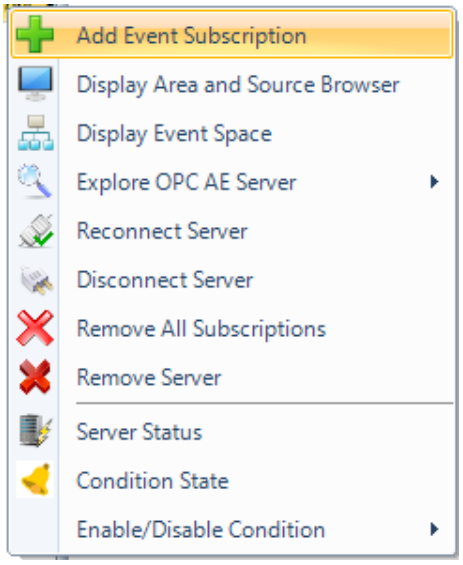


Figure 108: OPC AE Server Context Menu

1.1. Add Event Subscription

To create a new event subscription to a connected OPC AE server, right click on the server node and select the **Add Event Subscription** from the displayed menu. The dialog illustrated in the figure below will be prompted:

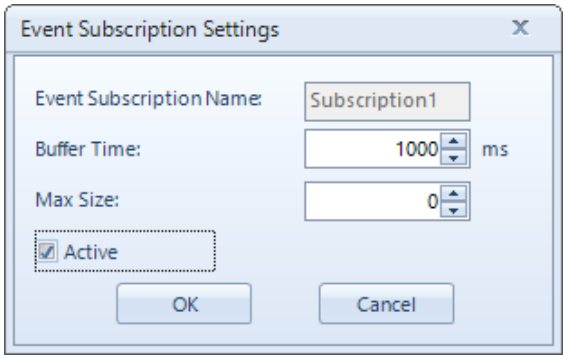


Figure 109: Event Subscription Setting Window

To create a new event subscription, specify the following:

- **Event Subscription Name:** The name to be associated with the event subscription.**Buffer Time**: The requested buffer time milliseconds that indicates to the OPC AE server how often to send event notifications.
- **Max Size:** The requested maximum number of events that will be sent in a single callback. A value of 0 means that there is no limit to the number of events that will be sent within a single callback.
- **Active:**
  - When checked, the event subscription is to be created active.
  - When unchecked, the event subscription is to be created as inactive. If the subscription is inactive, then the OPC AE server will not send event notifications to the client based on the subscription, and has no responsibility to buffer or maintain the event notifications. Thus, event notifications may be lost.

1.2. Display Area and Source Browser

To view the structure of an OPC AE server, right click on the OPC server node and then select the **Display Area and Source Browser** from the displayed menu. The dialog illustrated in the figure below will be prompted:

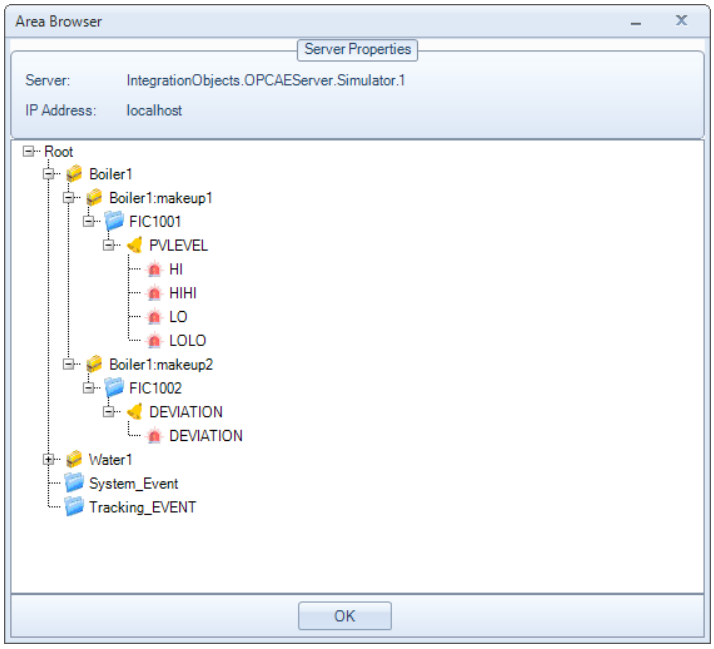


Figure 110: Area Browser

This dialog provides a view of the OPC server structure in a tree view format where you can navigate the structure interactively and discover the existing areas and sources.

1.3. Display Event Space

To display the event space of an OPC AE server, right click on the OPC server node and then select the **Display Event Space** from the displayed menu. The dialog illustrated in the figure below will be prompted:

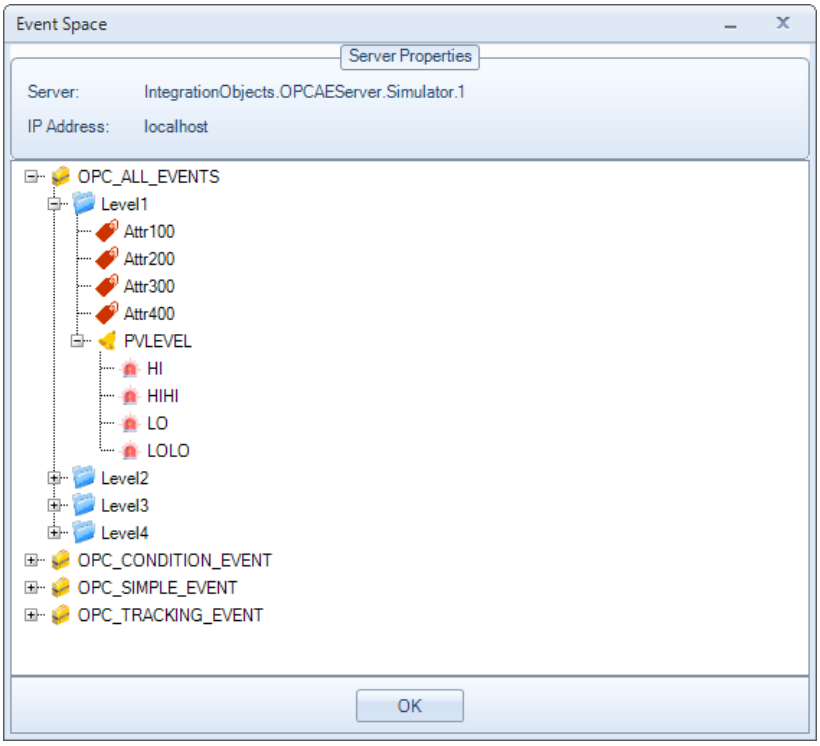


Figure 111: Event Space

This dialog allows you to navigate the event space structure of your OPC AE Server interactively and discover the different categories, conditions and sub-conditions names.

1.4. Explore OPC AE Server

To explore an OPC AE Server, click the **Explore OPC AE Server** button available in the server node right click menu. You can display**:**

- Available Filters.
- Available Categories.
- Available Conditions Names.
- Available Sub-Conditions Names.
- Available Source-Conditions Names.

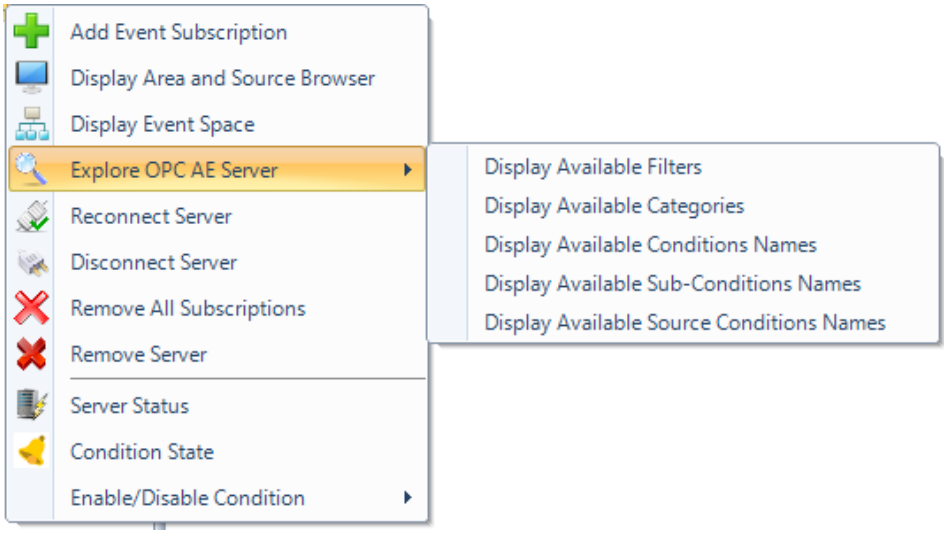


Figure 112: Explore OPC AE Server

1.4.1. Display Available Filters

To view the available filters within an OPC AE server, right click on your OPC AE server node and then select **Explore OPC AE Server → Display Available Filters.**

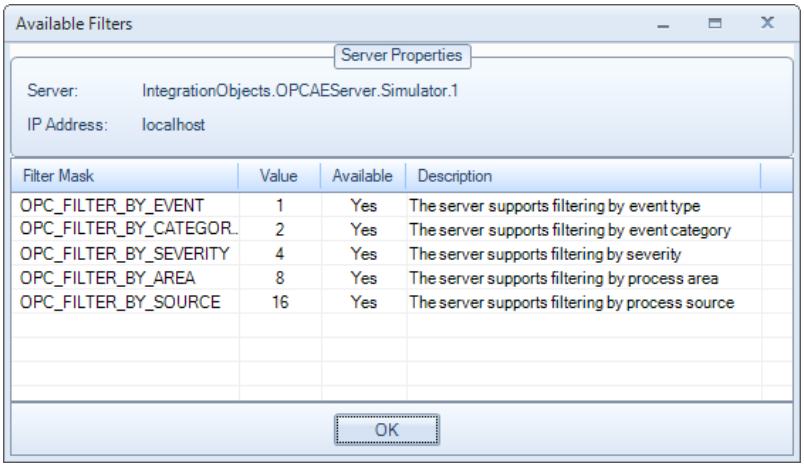


Figure 113: Available Filters

This provides a way to find out the filter criteria that are supported by the OPC AE server.

1.4.2. Display Available Categories

To view the available categories within an OPC AE server, right click on your OPC AE server node and then select **Explore OPC AE Server → Display Available Categories:**

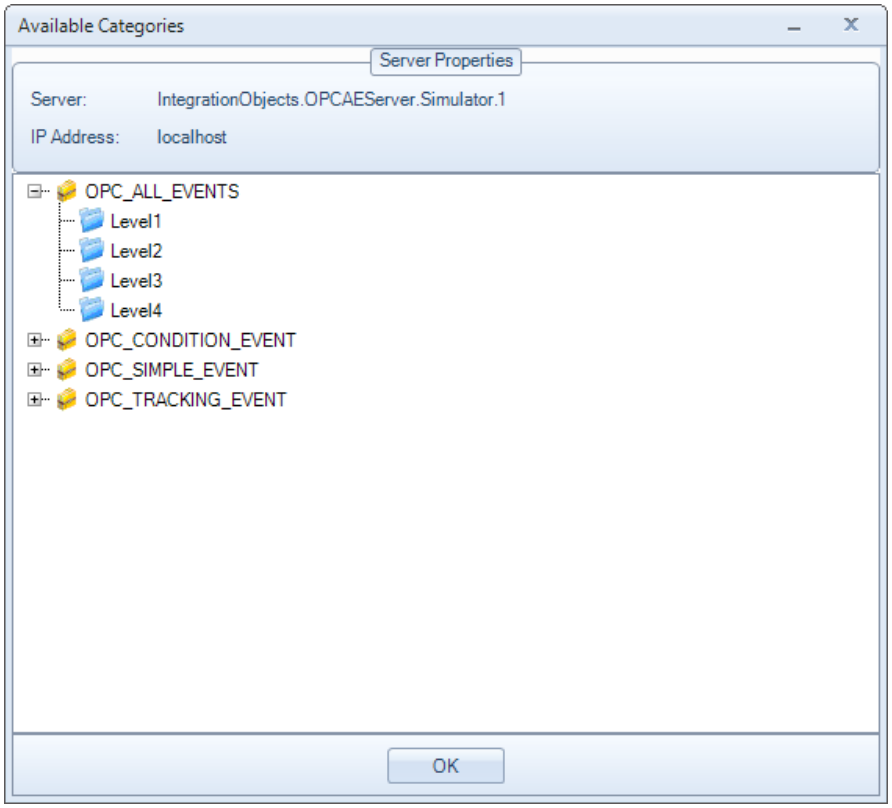


Figure 114: Available Categories

This provides a way to find out the categories of events supported by the OPC AE server.

1.4.3. Display Available Condition Names

To view the available condition names within an OPC AE server, right click on your OPC AE server node and then select **Explore OPC AE Server → Display Available Condition Names:**

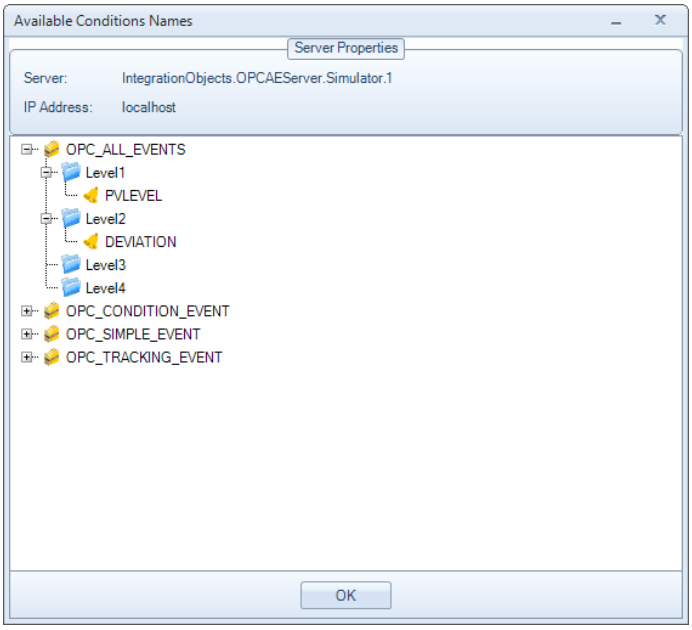


Figure 115: Available Conditions Names

This provides a way to determine the condition names associated with a specific event category within the OPC AE server.

1.4.4. Display Available Sub-Conditions Names

To view the available sub-condition names within an OPC AE server, right click on your OPC AE server node and then select **Explore OPC AE Server → Display Available Sub-Conditions Names:**

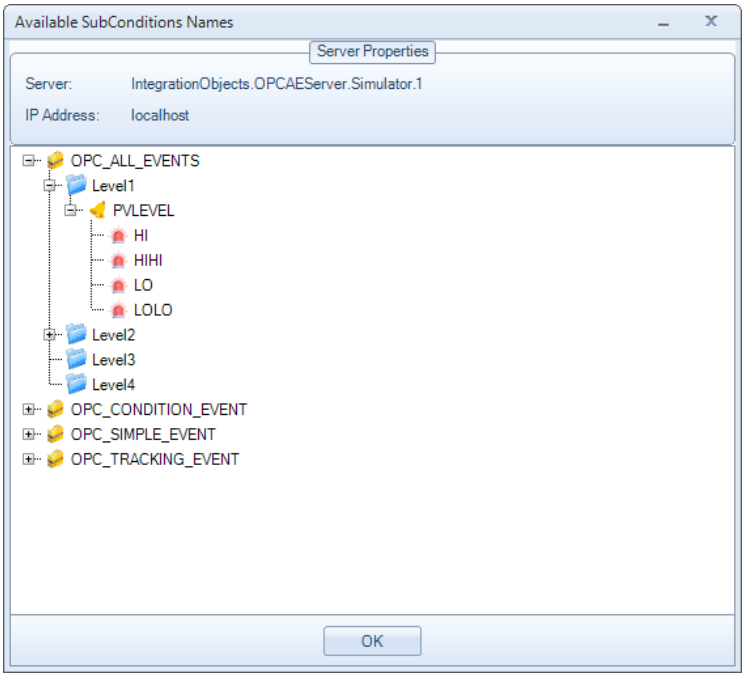


Figure 116: Available Sub-Conditions Names

This provides a way to find out the sub-condition names associated with each condition's name.

1.4.5. Display Available Source-Conditions Names

To view the available Source-Conditions Names of an OPC AE server, right click on your OPC AE server and then select **Explore OPC AE Server --> Display Available Source-Conditions Names:**

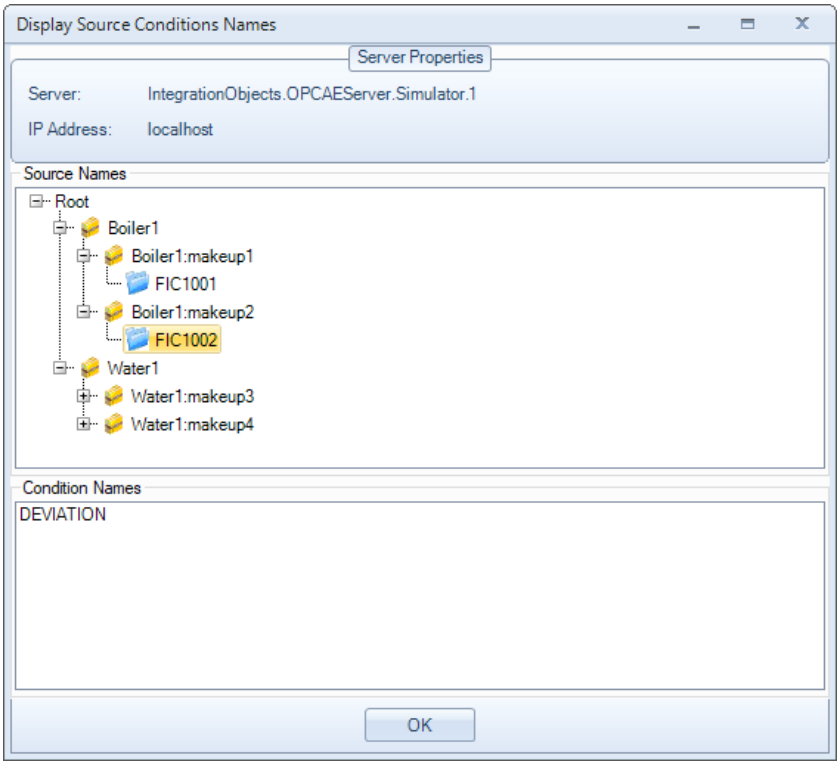


Figure 117: Available Source-Conditions Names

This provides the condition names associated with the specified source.

1.5. Reconnect Server

To reconnect an existing OPC AE server, select the appropriate OPC Server node, right-click on it and then select the **Reconnect Server** menu item. If the server is connected, it will be disconnected then reconnected.

1.6. Disconnect Server

To disconnect an existing OPC AE server, select the appropriate OPC server node, right-click on it and then select the **Disconnect Server** menu item.

1.7. Remove All Subscriptions

To delete all subscriptions of the OPC AE Server, select the related OPC AE Server node and click the **Remove All subscriptions** context menu item. All added subscriptions will be removed from the server and consequently from the tree view.

1.8. Remove Server

To remove an OPC AE Server, click the **Remove Server** button available in the server right click menu. The OPC connection will be then released and the server node and its children nodes will be consequently removed from the tree view.

1.9. Remove All Servers

To remove all added OPC AE servers, click the **Remove All Servers** button available in the OPC Server menu in the menu bar

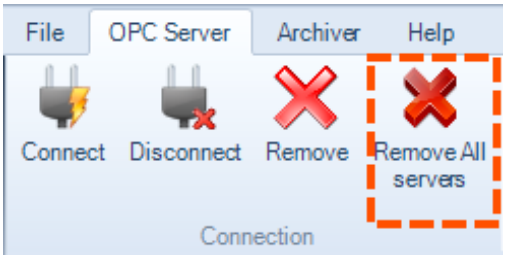


Figure 118: Remove All Servers Button

The following dialog screen will appear in order to confirm the removal:

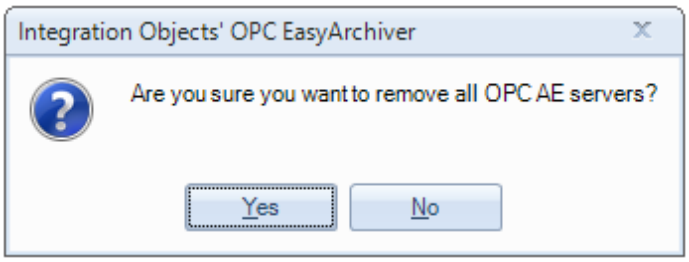


Figure 119: Remove All AE Servers Dialog

Once confirmed, all AE servers' nodes will be deleted from the tree view and all OPC AE connections will be released.

1.10. Server Status

Select your OPC server node and click on the **Server Status** button available in the server right click menu item. The window illustrated in the figure below will then be prompted:

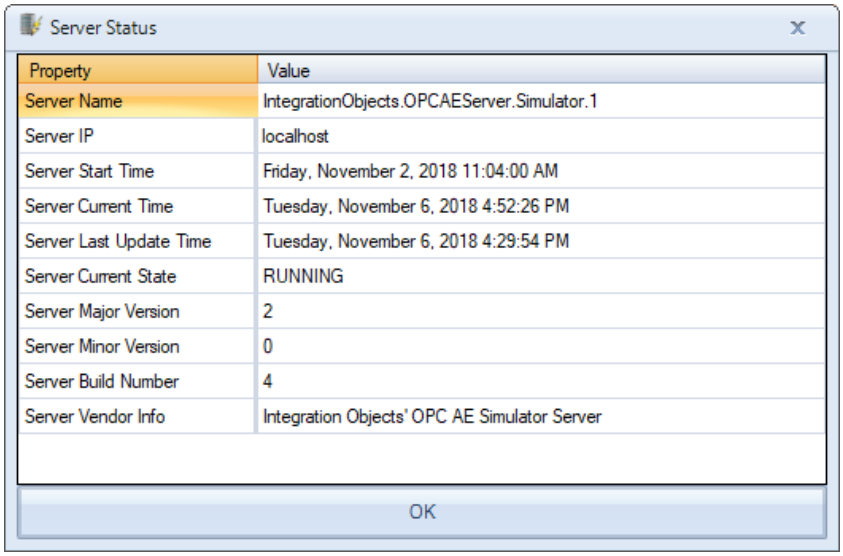


Figure 120: Server Status

This window provides you with the current status and detailed information about the selected OPC AE server.

1.11. Condition State

To view a condition state, right click on the OPC AE server node and then select the **Condition State** menu item. Then, the window illustrated in the figure below will be prompted:

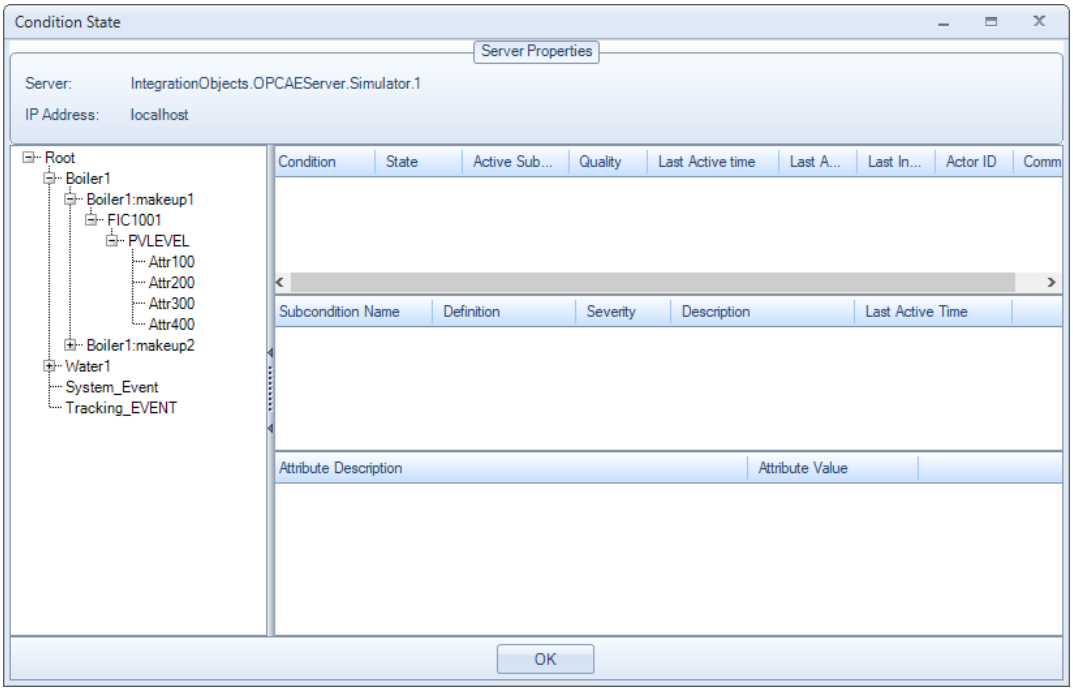


Figure 121: View Condition State

This window displays the current state information of a condition instance for a given source name and condition name. To use this window:

- Drag and drop a condition name from the left side list to the first table in the right side.
- Drag and drop one or many event attributes from the left side list of available event attributes to the last table in the right side.

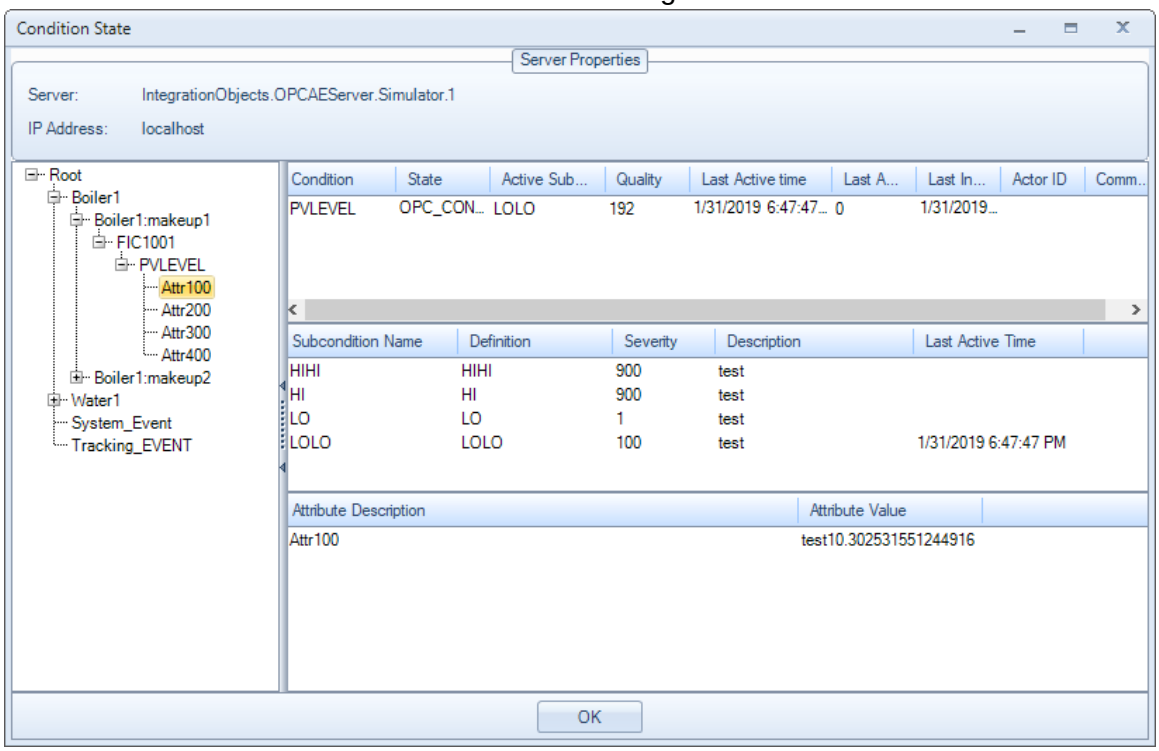


Figure 122: View Condition State

1.12. Enable/Disable Conditions

To enable or disable a condition, right click on your OPC AE server node and then select the Enable/Disable Condition menu item. You can Enable/Disable Condition by:

- Area.
- Source.

The menu illustrated in the figure below will be prompted:

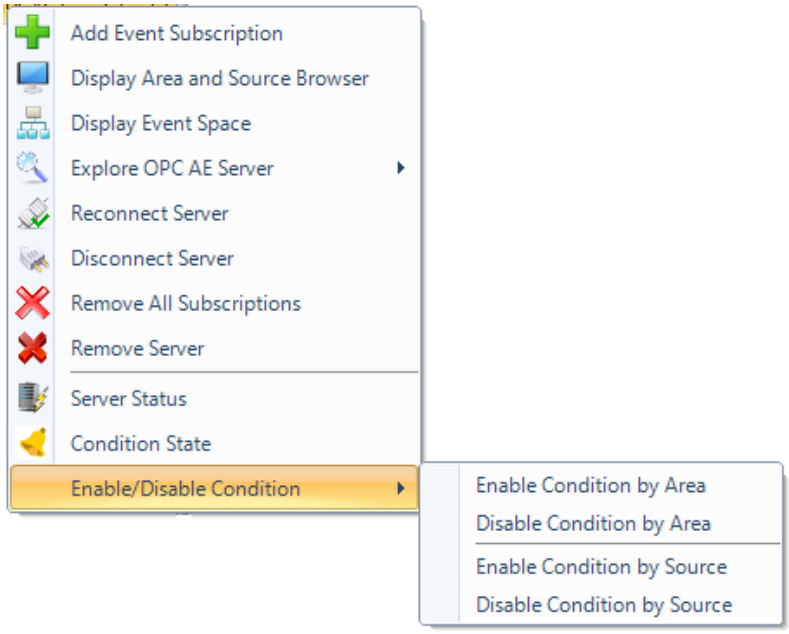


Figure 123: Enable/Disable Condition

1.12.1. Enable Condition by Area

To enable a condition by area, select **Enable Condition by Area** menu item. Then, the window below will be prompted:

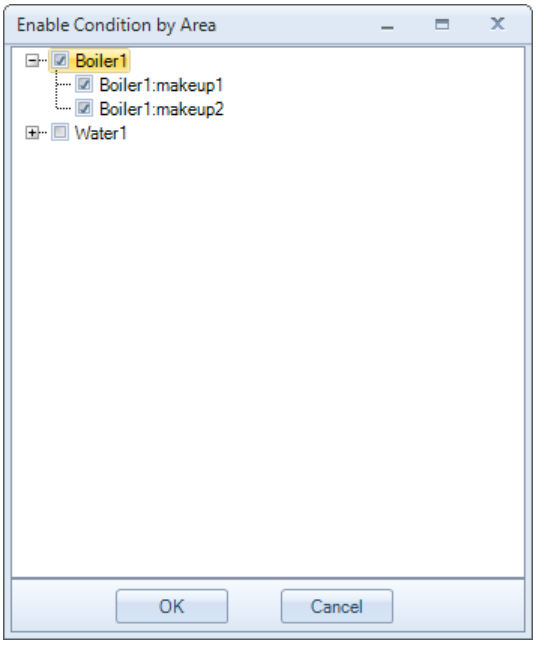


Figure 124: Enable Condition by Area

This allows you to place all conditions for all sources within the specified process areas into the enabled state. Therefore, the server will generate condition-related events for these conditions. To do so:

1. Select the list of areas to enable from the tree structure. You can select a parent item only and the children items will be selected automatically.
2. Click the OK button.

1.12.2. Disable Condition by Area

To disable a condition by area, select **Disable Condition by Area** menu item and the window illustrated below will be prompted:

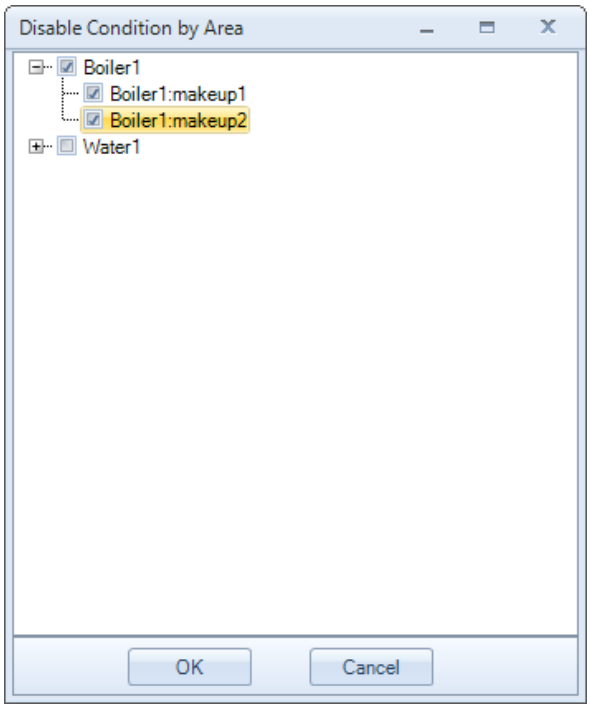


Figure 125: Disable Condition by Area

This allows you to place all conditions for all sources within the specified process areas into the disabled state. Therefore, the server will cease generating condition-related events for these conditions. To do so:

1. Select the list of areas to disable from the tree structure. You can select a parent item only and the children items will be selected automatically.
2. Click the **OK** button.

1.12.3. Enable Condition by Source

To enable a condition by source, select **Enable Condition by Source** menu item and the window below will be prompted:

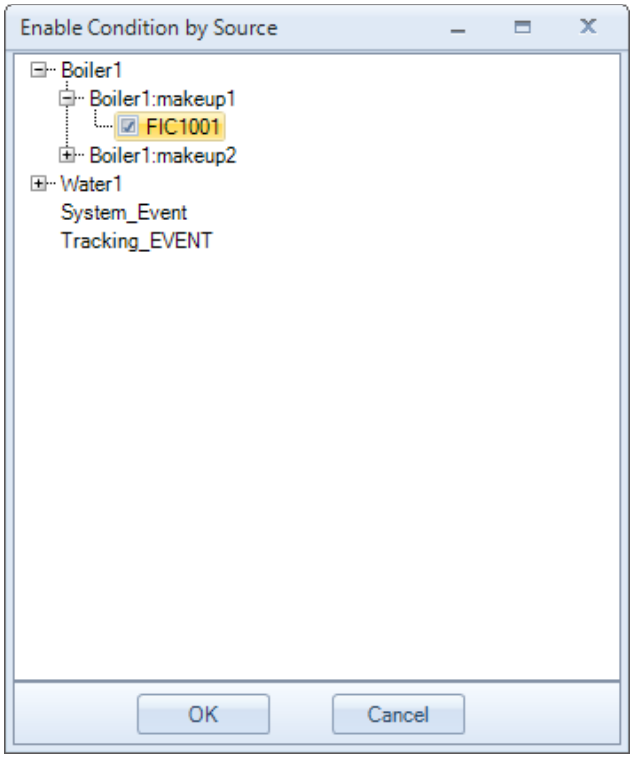


Figure 126: Enable Condition by Source

This allows you to place all conditions for the specified event sources into the enabled state. Therefore, the server will generate condition-related events for these conditions. To do so:

1. Select the list of sources to enable from the tree structure. You can select a parent item only and the children items will be selected automatically.
2. Click the **OK** button.

1.12.4. Disable Condition by Source

To disable a condition by source, select **Disable Condition by Source** menu item and the window illustrated below will be prompted:

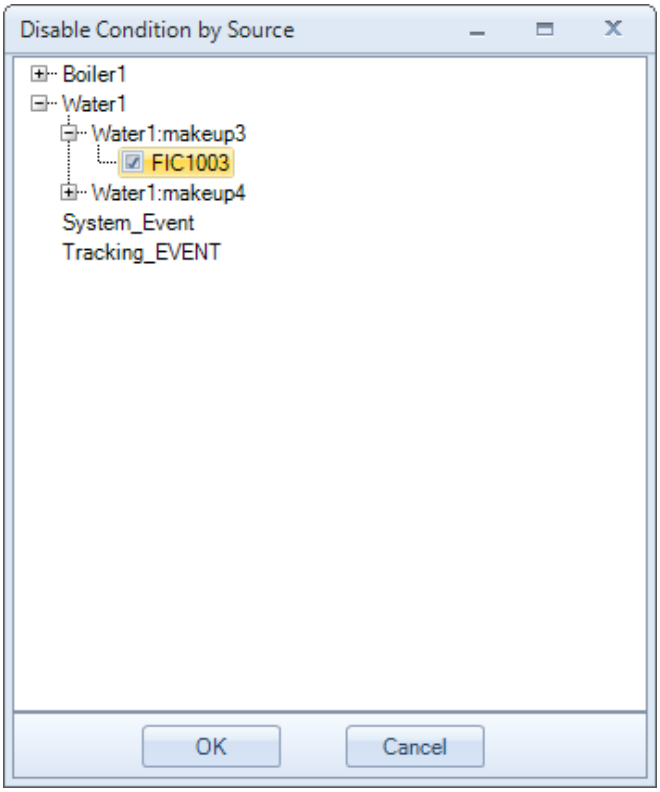


Figure 127: Disable Condition by Source

This allows you to place all conditions for the specified event sources into the disabled state. Therefore, the server will no longer generate condition-related events for these conditions. To do so:

1. Select the list of sources to disable from the tree structure. You can select a parent item only and the children items will be selected automatically.
2. Click the **OK** button.

2. OPC Event Subscription

Right click on the selected OPC Event subscription node and the following context menu will be displayed:

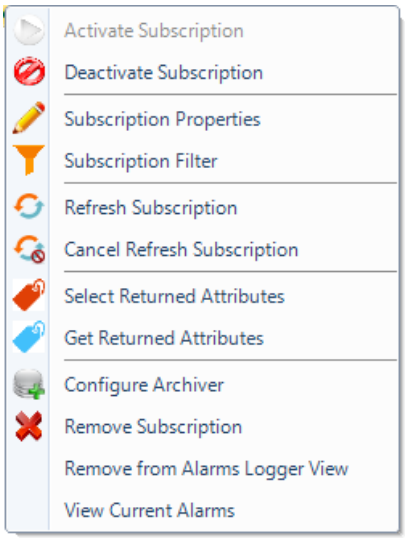


Figure 128: Event Subscription Context Menu

2.1. Activate Event Subscription

To activate an event subscription, right click on the target event subscription node and then select the **Activate Subscription** menu item. Thus, the OPC EasyArchiver will start receiving the event notifications fired by the related OPC AE server for this subscription.

2.2. Deactivate Event Subscription

To deactivate an event subscription, right click on the target event subscription node and then select the **Deactivate Subscription** menu item. Then, the OPC AE server will stop sending the event notifications related to this subscription.

2.3. Subscription Properties

Click on **Subscription Properties** context menu item in order to check the OPC AE event subscription properties. Then, the window illustrated in the figure below will be prompted:

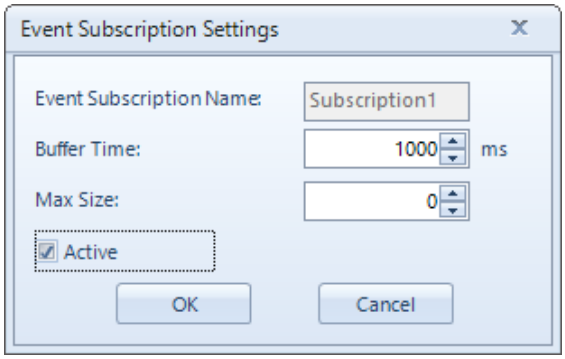


Figure 129: Event Subscription Settings

2.4. Subscription Filter

To setup a filter for an event subscription, right click to the target event subscription node and select **Subscription Filter** menu item. The window illustrated below will be prompted:

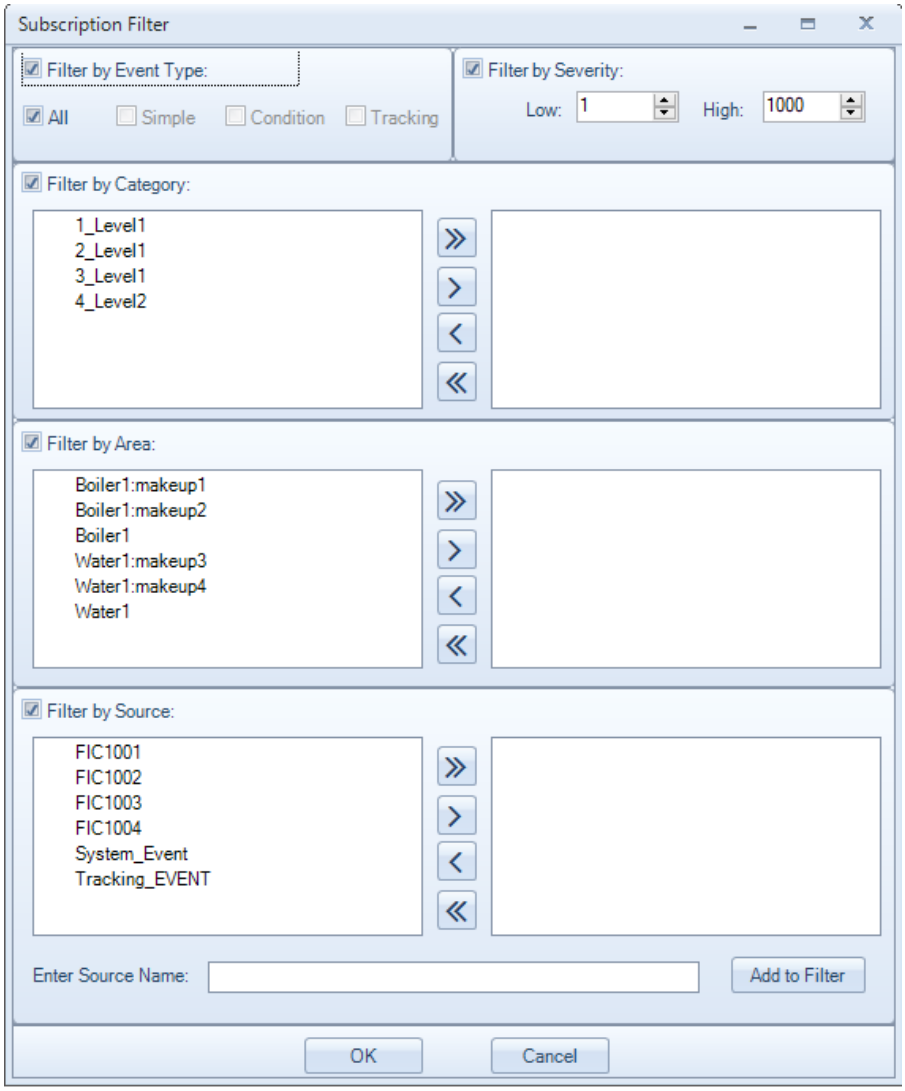


Figure 130: Subscription Filter

This window allows you to set the filtering criteria to be applied on the event subscription based on the following criteria:

- **Event Type:** simple, condition, or tracking.
- **Severity:**
  - Lowest severity, i.e. all events with a severity greater than or equal to the specified severity: type a value for the Low Severity in the Low field.
  - Highest severity, i.e. all events with a severity less than or equal to the specified severity: type a value for the High Severity in the High field.
- **Category:** Using the Add/Remove buttons, you can add/remove event categories to/from the filter. The left side list contains the event categories supported by the OPC AE server. The right side list contains the event categories added to this filter.

- **Area:** Using the Add/Remove buttons, you can add/remove areas to/from the filter. The left side list contains the areas supported by the OPC AE server. The right side list contains the areas added to this filter.
- **Source:** Using the Add/Remove buttons, you can add/remove sources to/from the filter. The left side list contains the sources supported by the OPC AE server. The right side list contains the sources added to this filter.
- **Manual Filtering by Source Name:** Using the Enter Source Name input field, you can manually add sources to the filter. The top right side list contains the sources added to this filter. This option can be helpful in case the OPC AE server fails to return the list of supported sources.

2.5. Refresh Subscription

To refresh an event subscription, right click on the target event subscription node and then select the **Refresh Subscription** menu item. This operation forces the refresh of all active and inactive conditions related to the selected event subscription.

2.6. Cancel Refresh Subscription

To cancel the refresh for an event subscription, right click on the target event subscription node and then select the **Cancel Refresh Subscription** menu item.

2.7. Select Returned Attributes

To retrieve the attributes of an event subscription, right click on the target event subscription node and then select the **Select Returned Attributes** menu item. The window illustrated in the figure below will then be prompted:

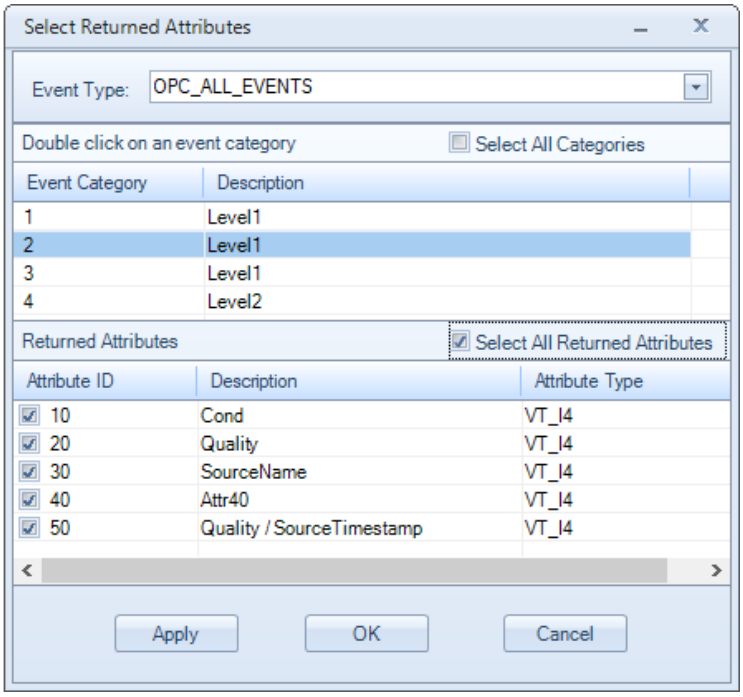


Figure 131: Select All Returned Attributes for the Event Category

- Select an event type from the drop down list. The list of related event categories will be displayed.
- Check the **Select All Categories** checkbox if you want to retrieve the entire event attributes under all the available event categories.
- Check the **Select All Returned Attributes** checkbox if you want to retrieve the entire event attributes under the selected event category.
- If you want to select a specific event category, uncheck **Select All Categories**, then double click on an event category and the list of available event attributes will be displayed.

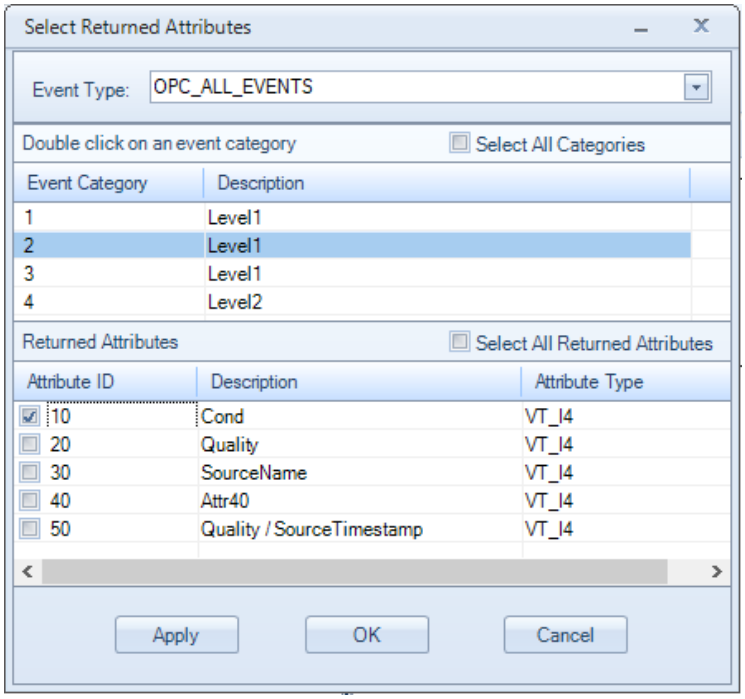


Figure 132: Select Returned Attributes

- If you want to select a specific event attribute, uncheck **Select All Returned Attributes**, check one or more event attributes and then Click **Apply.**
- You can redo the steps above for a different event type or category and at the end click **OK** button.

2.8. Get Returned Attributes

To get the attributes of an existing Event Subscription, right-click on the target OPC event subscription node and then select the **Get Returned Attributes** menu item:

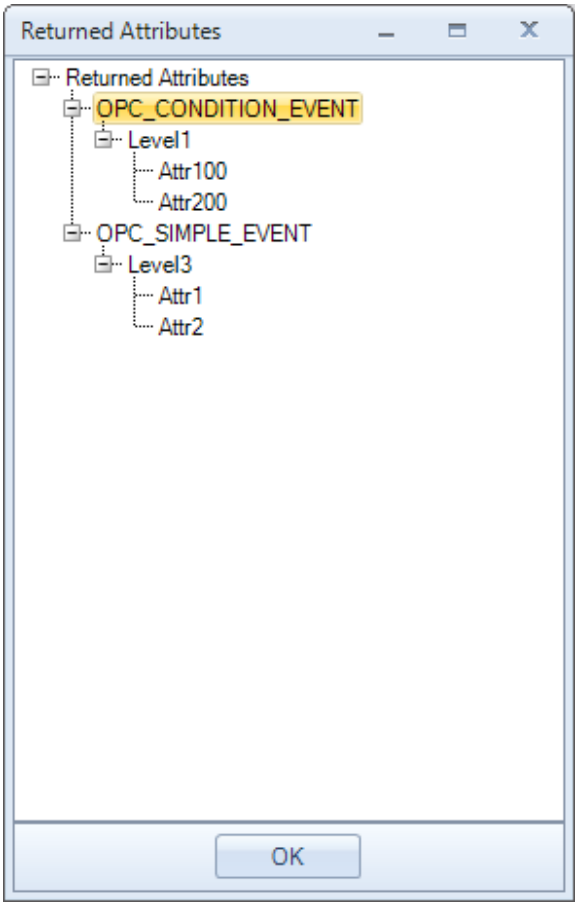


Figure 133: Get Returned Attributes

For each event category, the attributes previously specified in the "Select Returned Attributes" dialog will be retrieved.

2.9. Configure Archiver

The OPC EasyArchiver allows you to configure an archiver for each event subscription. You can also configure the same archiver for multiple event subscriptions.
To configure an archiver for a selected event subscription, right click on the selected event subscription node, and choose the **Configure Archiver** menu item.
If you have already configured archivers, the following window will appear:

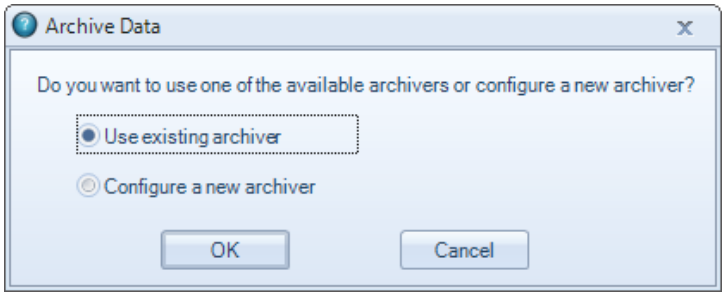


Figure 134: Select AE Archiver Option

You can choose to configure a new archiver and the new archiver will be assigned to the selected event subscription and will then appear in the archivers tree view.
If you choose to use an existing archiver, the following window will appear:

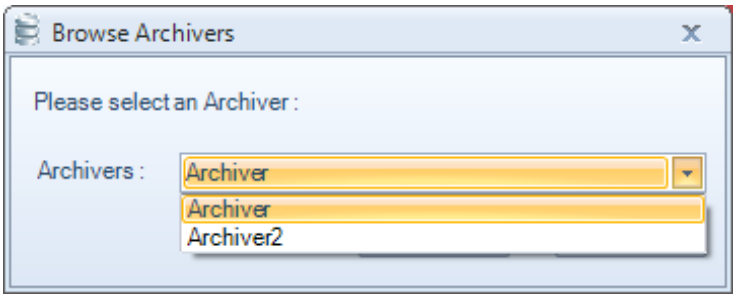


Figure 135: Browse Available Archivers

Select an archiver from the list of available ones and click the **OK** button.

2.10. Remove Subscription

To remove an event subscription, right click on the target event subscription node and then select the **Remove Subscription** menu item.
This operation removes the selected event subscription from the OPC AE Server and from the current configuration of the OPC EasyArchiver.

2.11. View Alarms Logger

You can visualize the list of alarms and events of all OPC AE Servers from the start time till now by selecting **View Alarms Logger** context menu item. This will display the alarms and events received by the OPC EasyArchiver of all OPC AE Servers since the time the related subscriptions were configured.

Note that you can configure the number of alarms to be visualized using the "Max Row Count" setting and the percentage of rows to be deleted when the max row count is reached using the "Rows to be Deleted" setting as illustrated below.

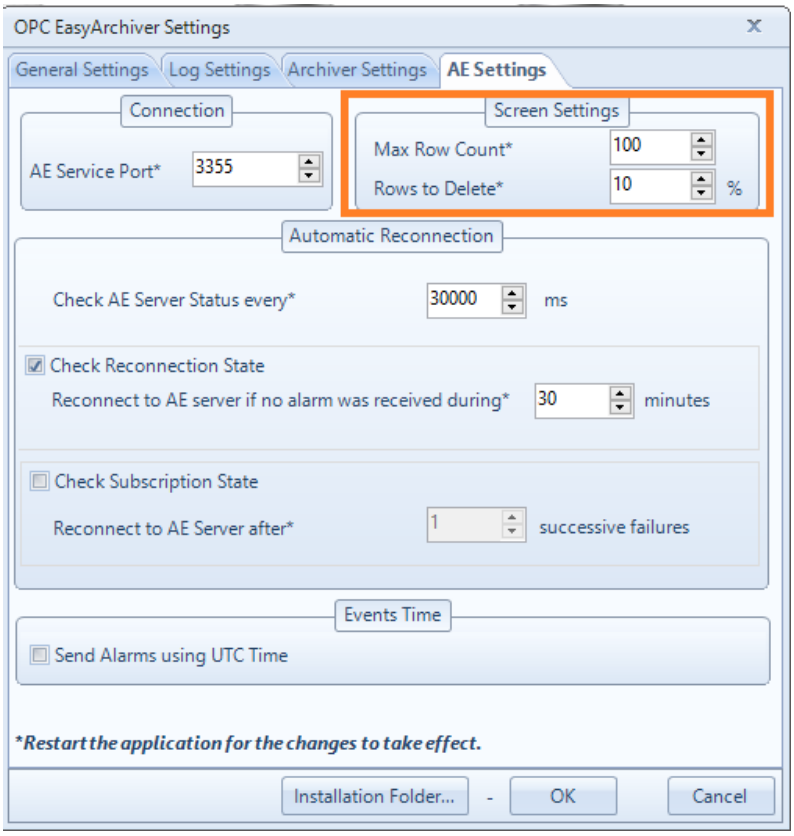


Figure 136: AE Settings

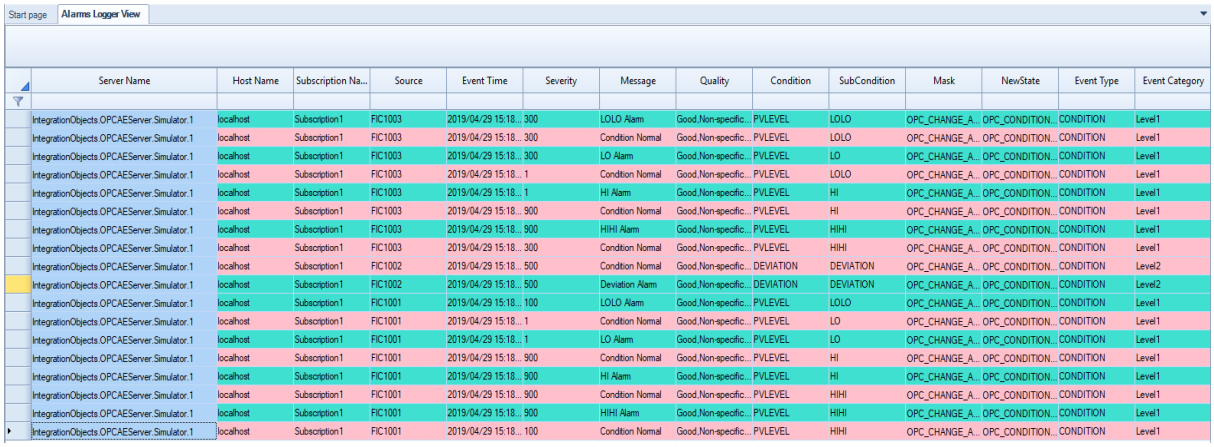


Figure 137: View Alarms Logger

2.12. View Current Alarms

You can monitor the latest updates of the alarms and events received in real-time from all OPC AE Servers by selecting **View Current Alarms** context menu item. A similar dialog screen to the one illustrated below will appear:

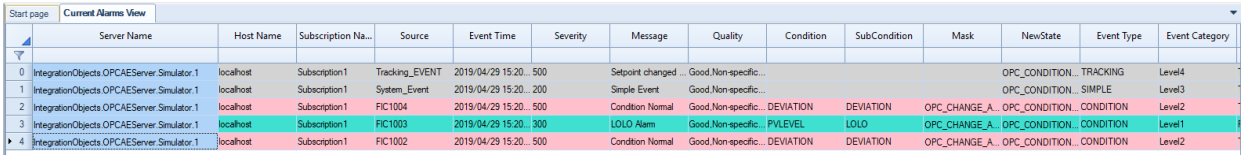


Figure 138: View Current Alarms

The alarms and events fired by all OPC AE Servers are displayed in a screen view in real-time so users can view the latest alarm characteristic changes over time.

2.13. Acknowledge an Event

To acknowledge one or more conditions in the OPC AE Server, OPC clients need to apply the AckCondition method from the OPC AE specification. This AckCondition method specifically acknowledges the conditions becoming active or transitioning into a different sub-condition. The OPC EasyArchiver provides the user with the possibility to automatically acknowledge one or more conditions. To do so, proceed as follows:

- Double-click on the specified source name from the Alarms Logger Viewer.

Figure 139: Event Acknowledgment

- Right click on the specified source name from the screen browser, a menu will appear:

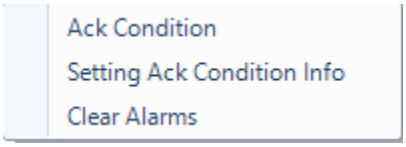


Figure 123: Acknowledgment Menu

- Choose Setting Ack Condition Info, a dialog screen will appear:

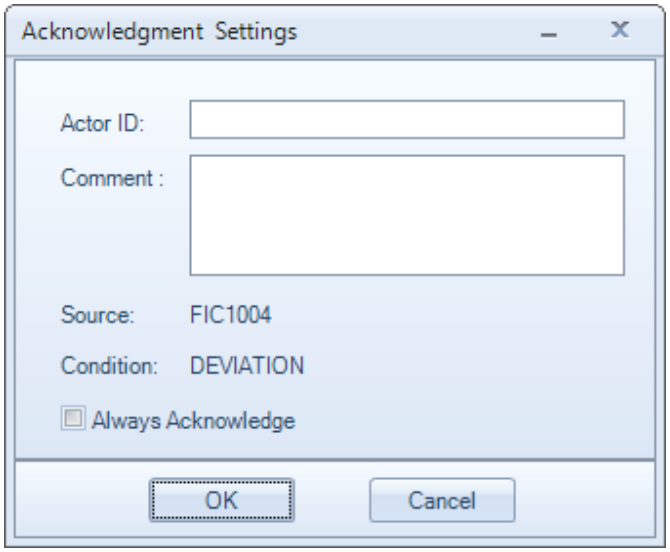


Figure 140: Automatic Condition Acknowledgment Settings

- **Actor ID:** A text identifying who is acknowledging the conditions.
- **Message:** A text message associated with acknowledging the conditions.
- **Source:** Identifies the source of each condition that is being acknowledged.
- **Condition:** Identifies the condition that is being acknowledged.
- **Always acknowledge:** If this option is checked, the OPC EasyArchiver will automatically acknowledge the related condition name when it is prompted.

ARCHIVER FUNCTIONALITIES

The OPC EasyArchiver transfers data collected from any OPC DA,OPC HDA or OPC AE Server to the following types of databases according to the features selected during installation:

- SQL Server databases.
- Oracle databases.
- MS Access databases.
- MySQL databases.
- PostgreSQL databases.
- SQL-like databases using OLEDB connection provider.
- SQL-like databases using ODBC connection provider.

The OPC EasyArchiver can also store the collected data into CSV files.
In this section, we will describe the necessary steps to configure one or more archivers.

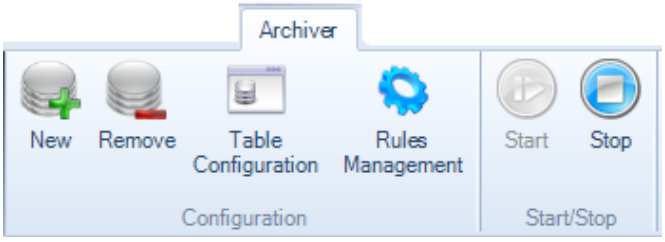


Figure 141: Archiver Menu

1. Add New Archiver

To add a new archiver, click the **New** button located in the archiver menu. The following window will appear:

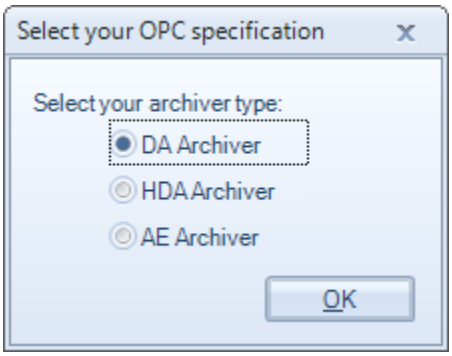


Figure 142: Select Archiver Type Window

Select the archiver type and click **OK**.One of the following dialog screens will appear depending on the selected archiver type:

Figure 143: Add New DA Archiver Wizard

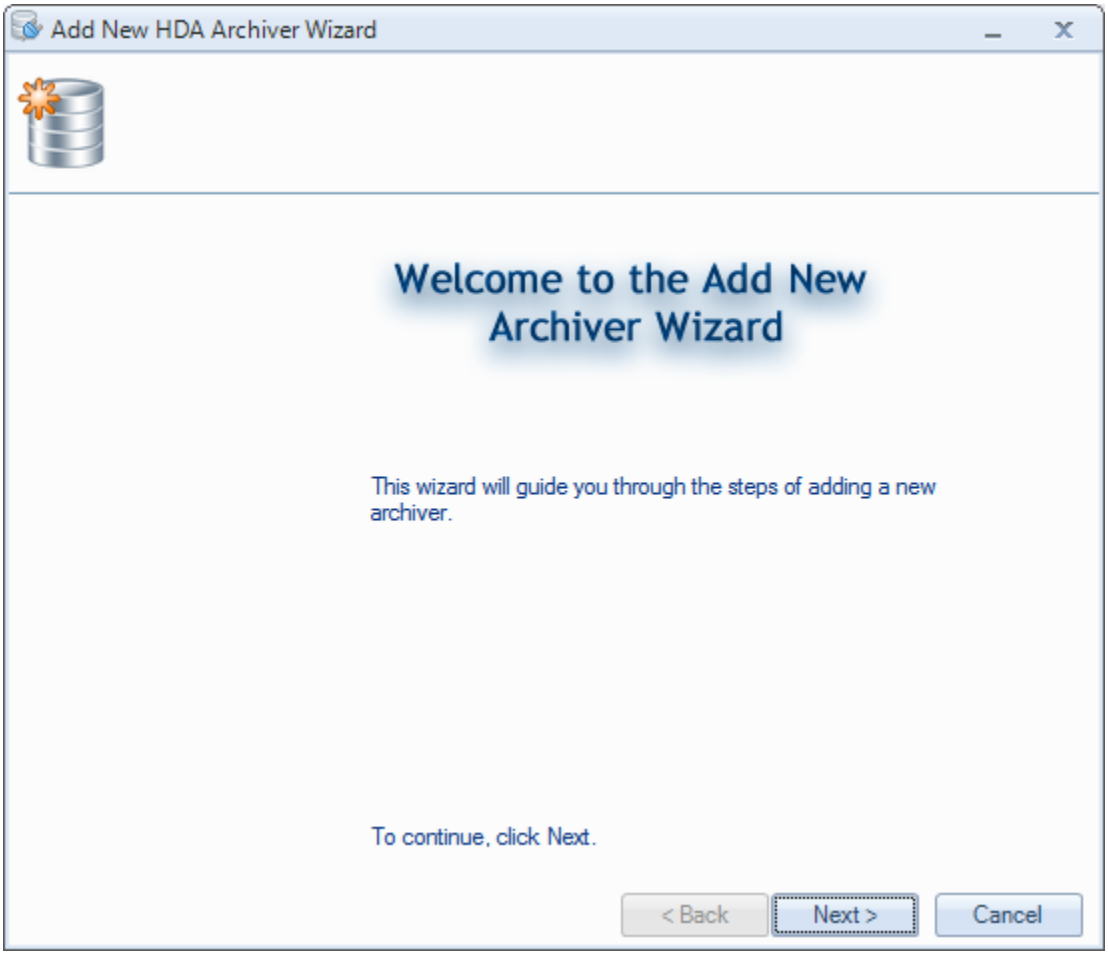


Figure 144: Add New HDA Archiver Wizard

Figure 145: Add New AE Archiver Wizard

Step 1: Click the **Next** button. The following window will be displayed:

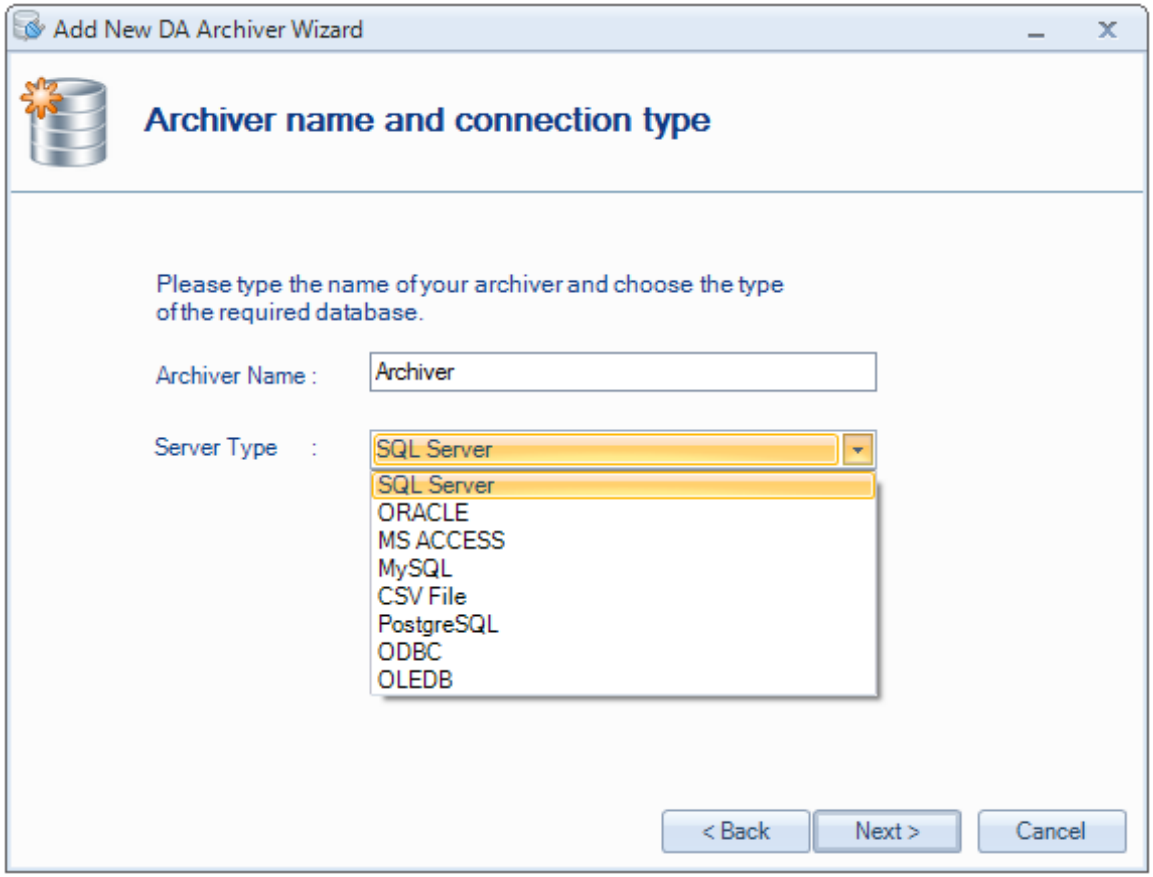


Figure 146: Select Database Type

Depending on the selected features during the installation, you can archive data in the following database / file types:

- SQL Server database.
- Oracle database.
- MS Access database.
- MySQL database.
- CSV file.
- PostgreSQL.
- ODBC compliant database.
- And OLEDB compliant database.

Step 2: Type the name of your archiver and select the database / file type. Click the **Next** button. You will then be prompted to configure your connection string depending in the selected database / file type:

- **SQL Server Type:** if you selected SQL server database, the following window will be displayed:

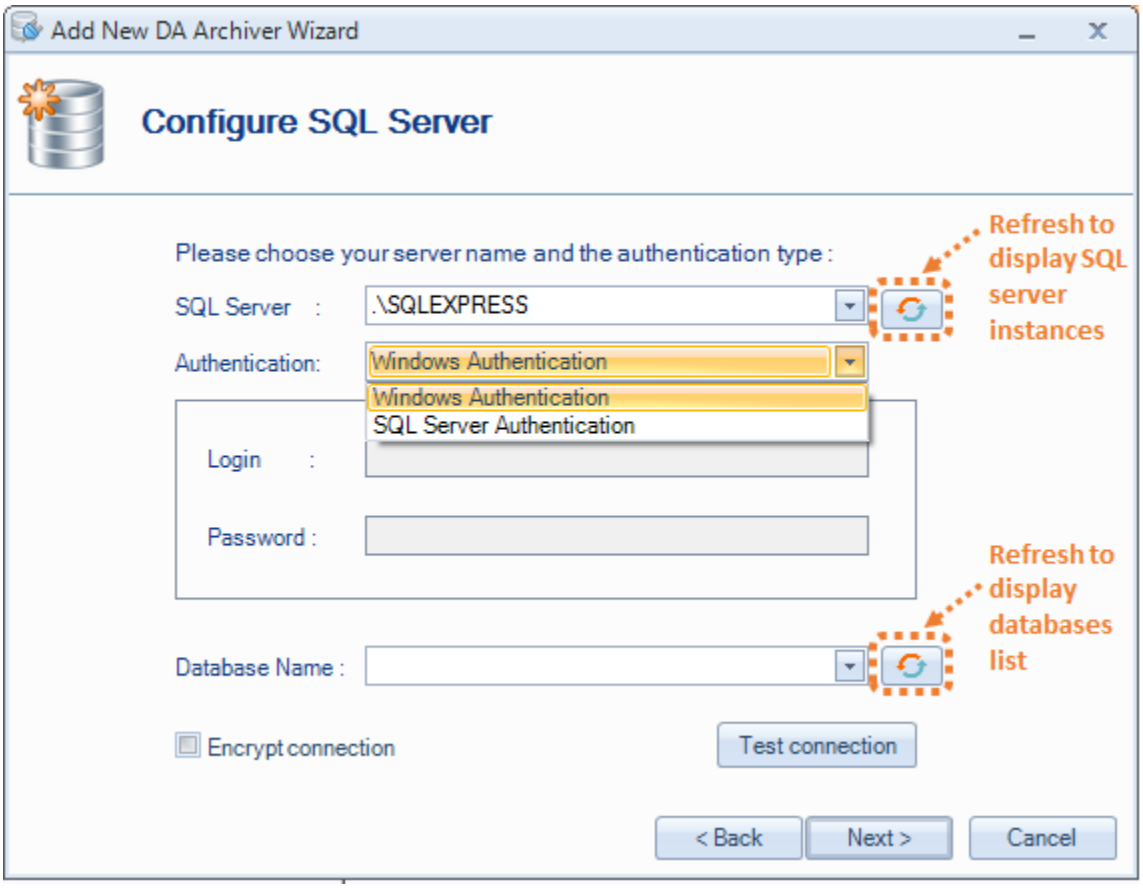


Figure 147: Configure SQL Server Connection

Parameter	Description
SQL Server	The name of the SQL Server available in your network.
Authentication	To connect, you can choose one of the two following authentication modes: • Windows Authentication. • SQL Server Authentication: In this case, you have to specify the login and password used by the SQL Server driver when connecting to SQL Server.
Database Name	Enter the database name in the Database Name field or select one of the available names after clicking on the refresh button.

Encrypt connection	If checked, the connection between the OPC EasyArchiver and the SQL Server Database will be encrypted.
Test connection	Test if the connection to the SQL database using the entered credentials succeed.

Table 28: MS SQL Server Archiver Configuration Parameters

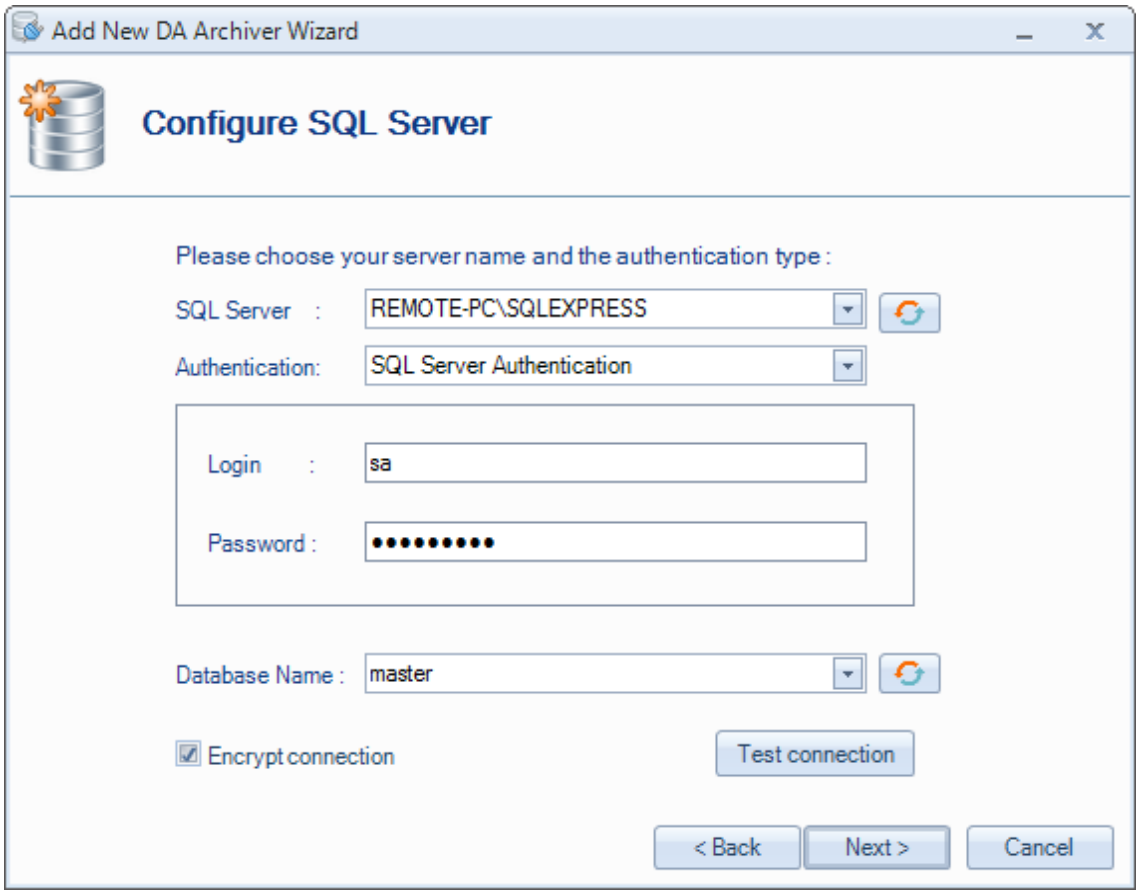


Figure 148: SQL Server Authentication Mode

- **Oracle Type:** if you selected Oracle database, the following window will be displayed:

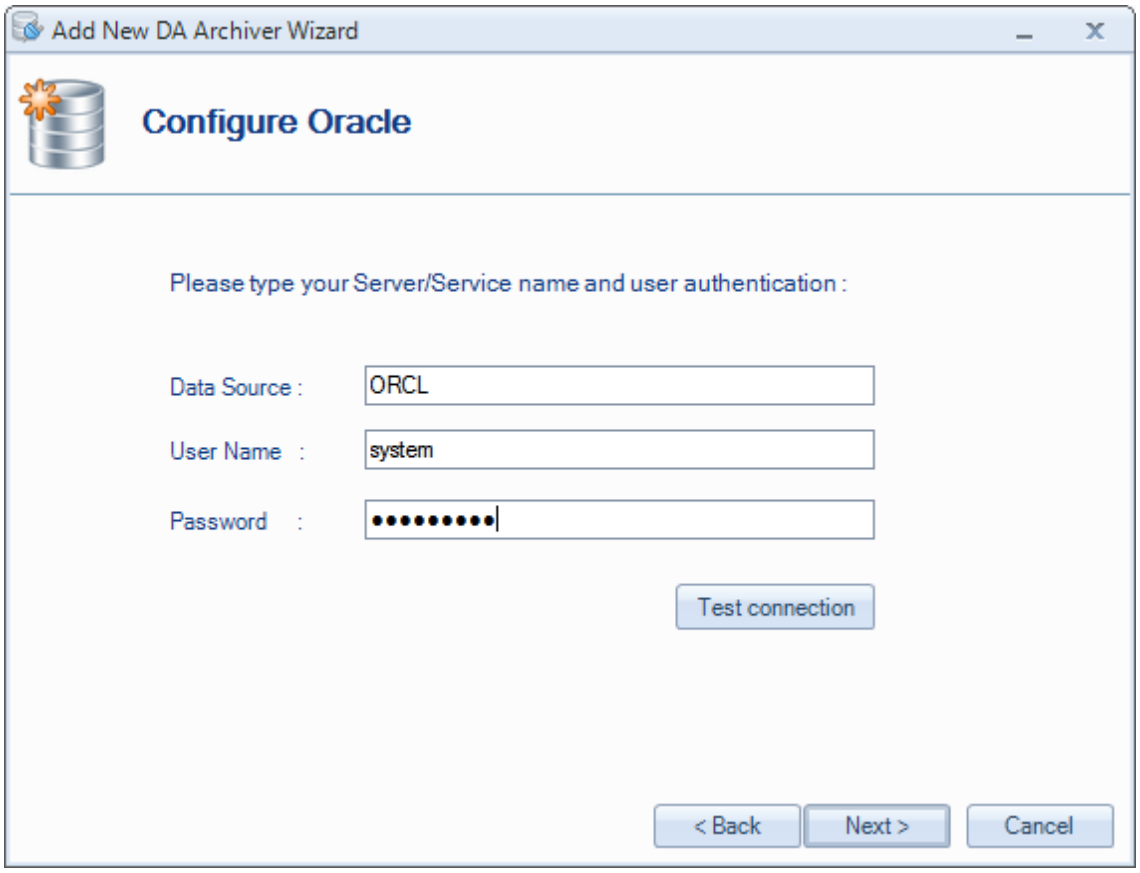


Figure 149: Oracle Connection Dialog

Parameter	Description
Data Source	The Oracle data source name.
User Name	The user account login.
Password	The user account password.
Test Connection	Test if the connection to the Oracle database using the entered credentials succeed.

Table 29: Oracle Archiver Configuration Parameters

- **MS Access Type:** if you select MS Access database, the following window will be displayed:

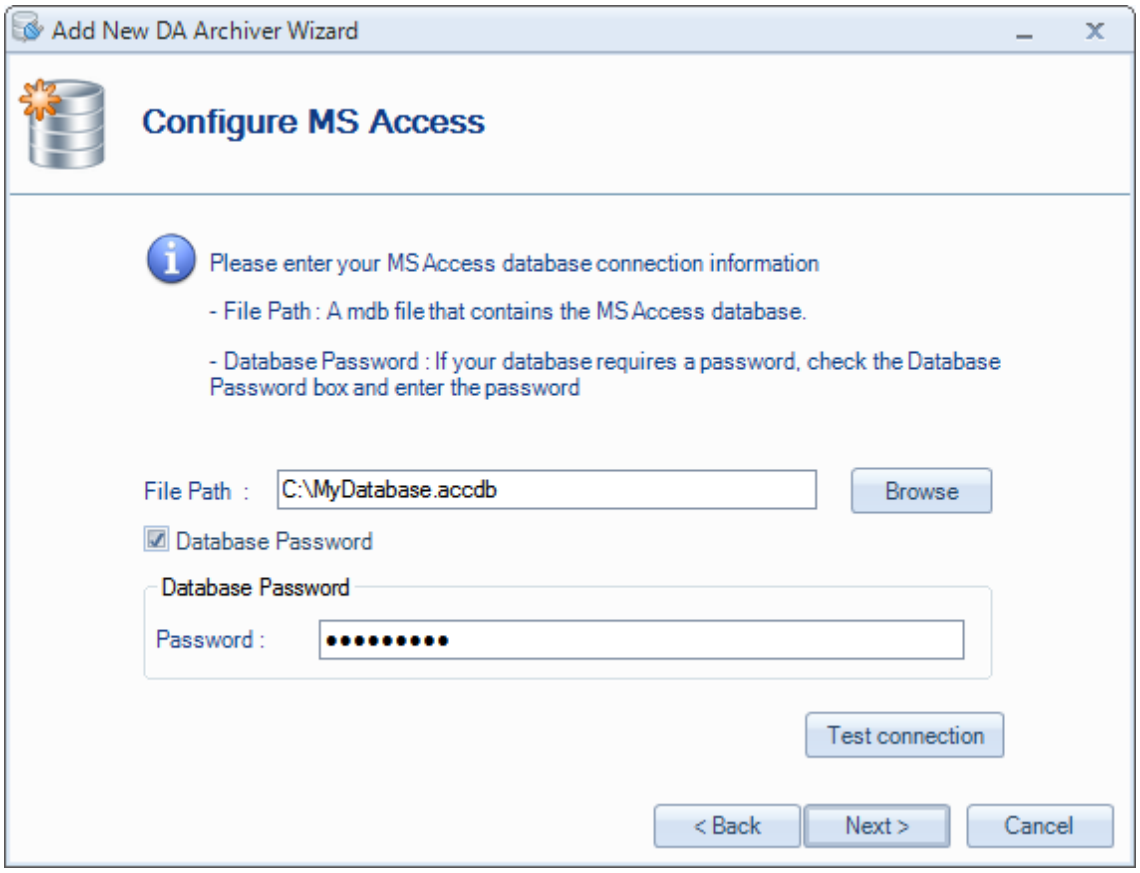


Figure 150: MS Access Connection Dialog

Parameter	Description
File Path	You can browse the path to the MS Access file or manually type the path in the **File Path** text box.
Password	If your MS Access database requires a password, check the **Database Password** box and enter the password in the **Password** text box.
Test Connection	Test if the connection to the MS Access database using the entered credentials succeed.

Table 30: MS Access Archiver Configuration Parameters

This type of configuration could only be used for local connections. In order to connect remotely to any MS access database, you should select the ODBC connection type.

- **MySQL Type:** if you select a MySQL database type, the following window will be displayed:

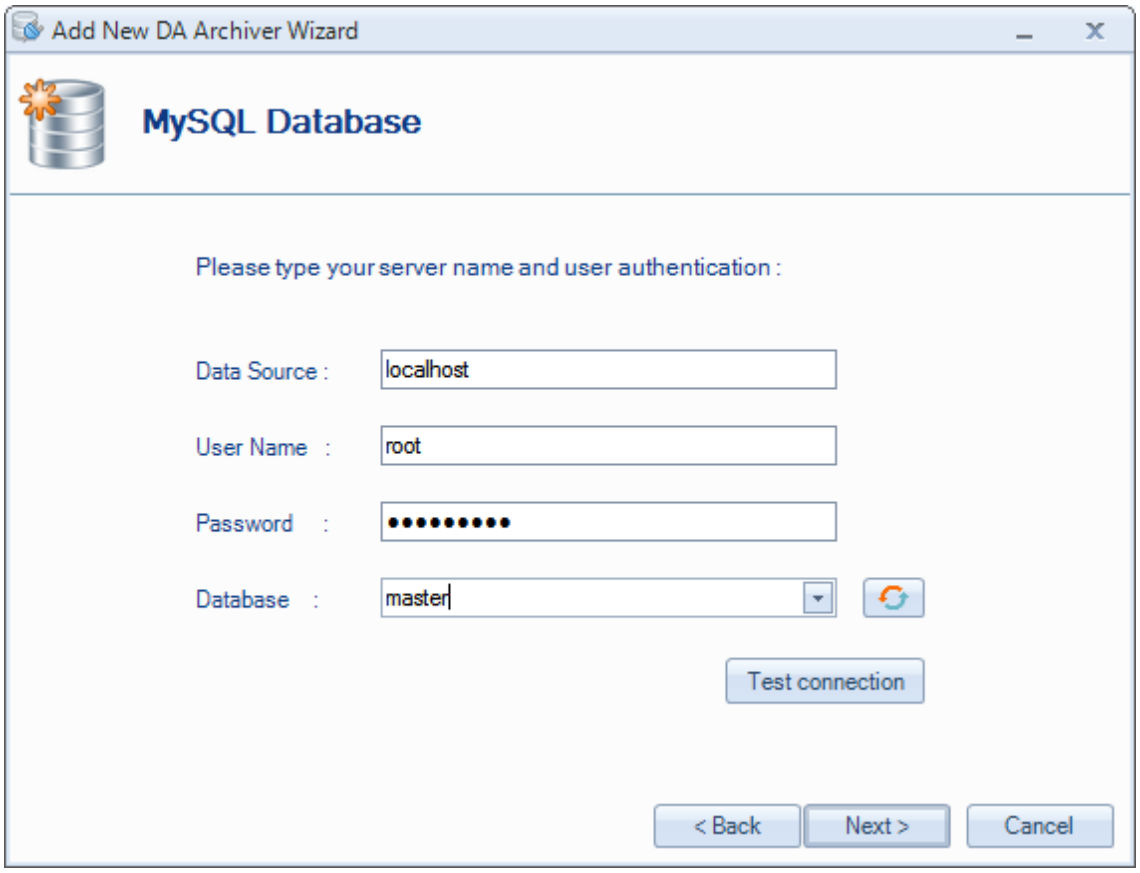


Figure 151: MySQL Connection Dialog

Parameter	Description
Data Source	The MySQL data source name.
User Name	The user account login.
Password	The user account password.
Database	The name of the database. The user can click on the refresh button in order to test the connection and retrieve the databases available.
Test Connection	Test if the connection to the MySQL database using the entered credentials succeed.

Table 31: MySQL Archiver Configuration Parameters

- **CSV File Type:** if you select a CSV File type, the following window will be displayed:

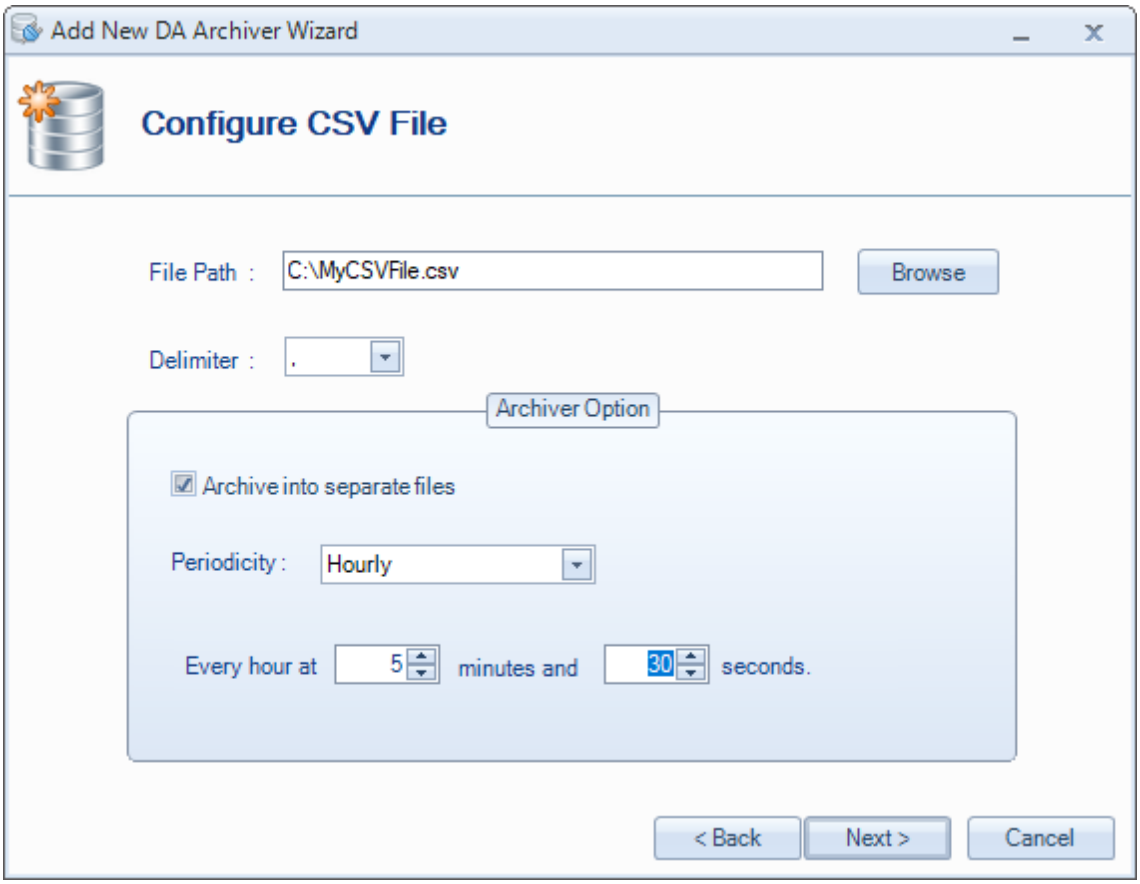


Figure 152: CSV File Connection Dialog

Parameter	Description
File Path	The CSV file full path.
Delimiter	The delimiter used between the CSV file columns. You can select from the available delimiters or choose your own delimiter if it is supported by the CSV format. By default, the delimiter is a comma (,).
Archive in separate files	Checked: Archive OPC data in separate CSV files according to the defined periodicity. Unchecked: OPC data are stored in the specified CSV file.

Periodicity	The CSV file will be copied after the specified periodicity. The periodicity can be: • Weekly: A new CSV file is created for each defined week period. You must select the day and time of the week when the new CSV file will be created. • Daily: A new CSV file is created for each defined day period. You must select the exact time of a day when the new CSV file will be created. • Hourly: A new CSV file is created for each defined hour period. You must select the exact minute and second of an hour when the new CSV file will be created. • Every minute: A new CSV file is created for each defined minute period. You must select the exact second when the new CSV file will be created. • Custom: A new CSV file is created for each defined second period. You must select the exact time in seconds when the new CSV file will be created.

Table 32: CSV Archiver Configuration Parameters

- **PostgreSQL Type:** if you select PostgreSQL database, the following window will be displayed:

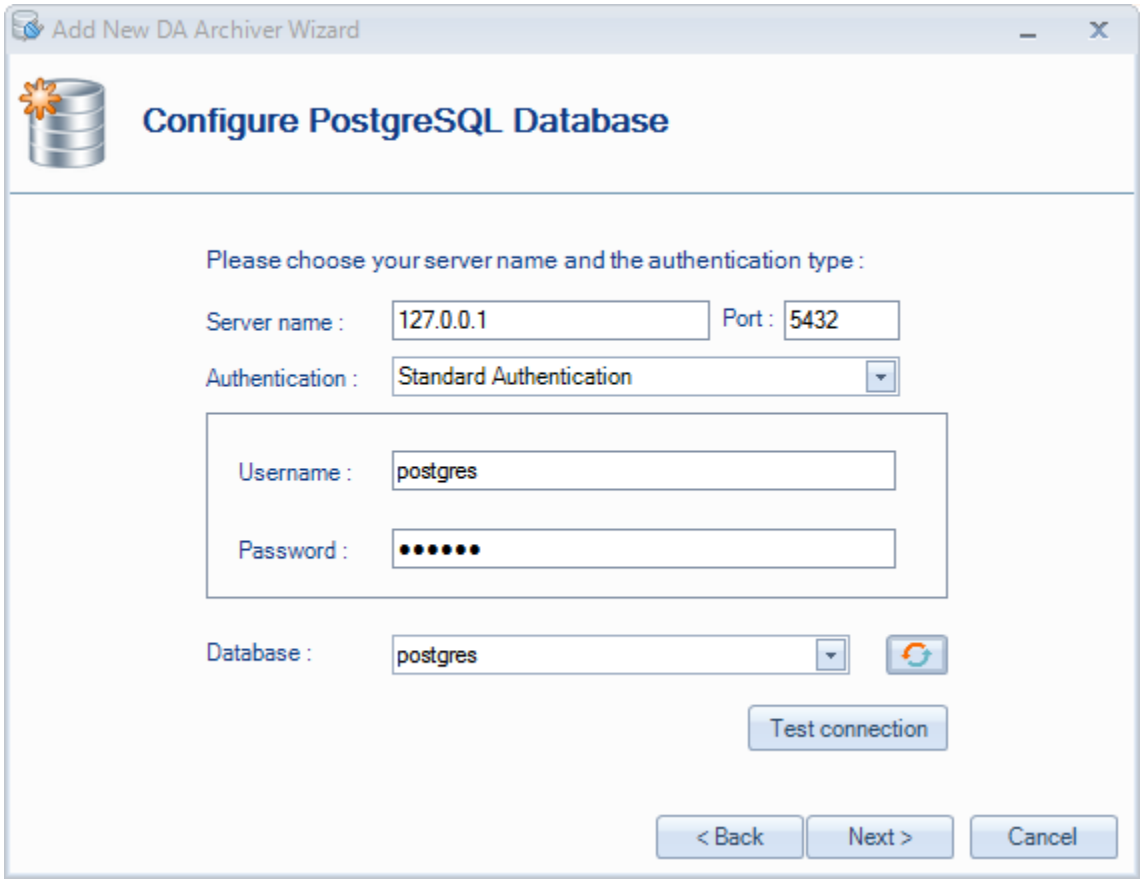


Figure 153: PostgreSQL Connection Dialog

Parameter	Description
Server name	Name of the PostgreSQL database available in your network.
Port	The port of the PostgreSQL database server.
Authentication	You can choose one of the two following authentication modes: • Windows Authentication. • Standard Authentication: In this case, you have to specify the username and password used by the PostgreSQL database.
Database	Enter the database name in the Database field or just select one of the available names after clicking on the refresh button.

Test connection	Test if the connection to the PostgreSQL database using the entered credentials succeed.

Table 33: PostgreSQL Archiver Configuration Parameters

- **ODBC Type:** if you select an ODBC database type, one of the following windows will be displayed depending on the archiver type:

DA Archiver:

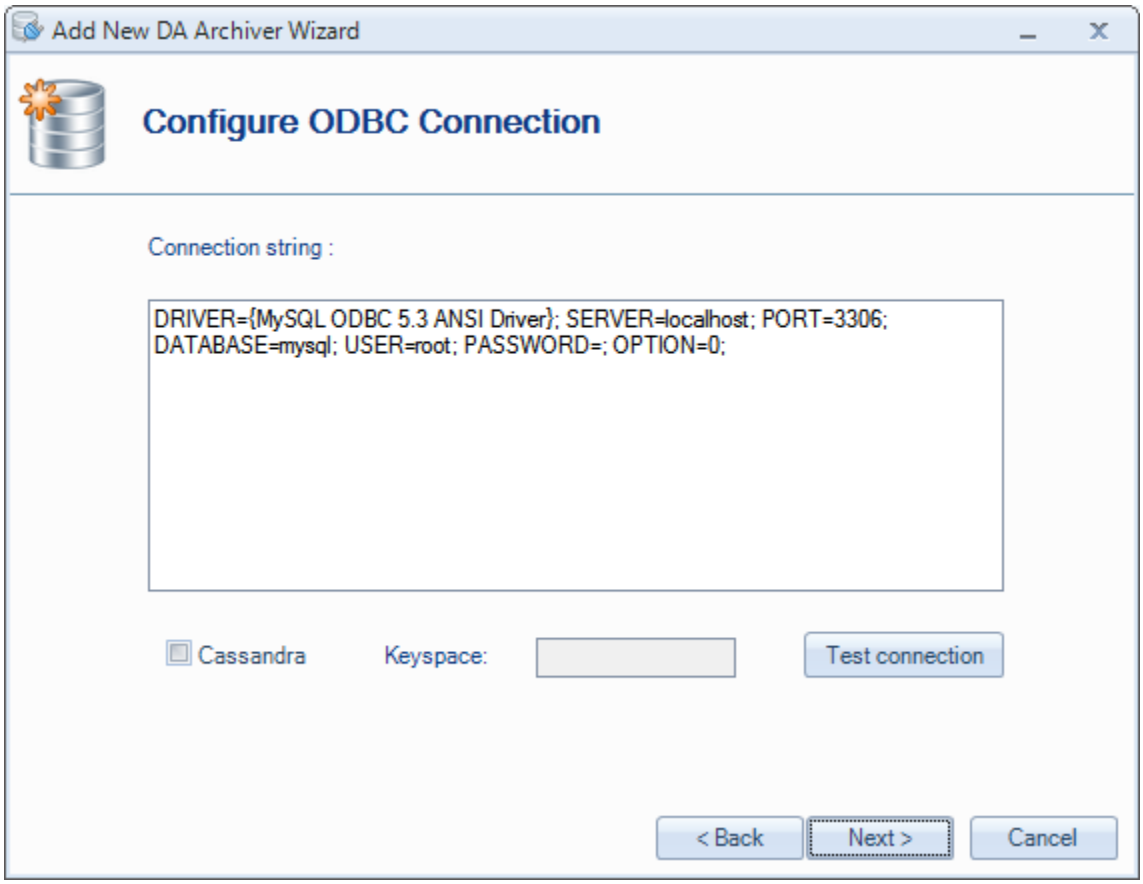


Figure 154: DA Archiver: ODBC Connection String Dialog

In this dialog, you need to enter the connection string of your database. The example in the above figure shows a connection string for MySQL driver version 5.3.

For the NoSQL Database "Cassandra", you need to check the "Cassandra" option and enter the name of the keyspace.

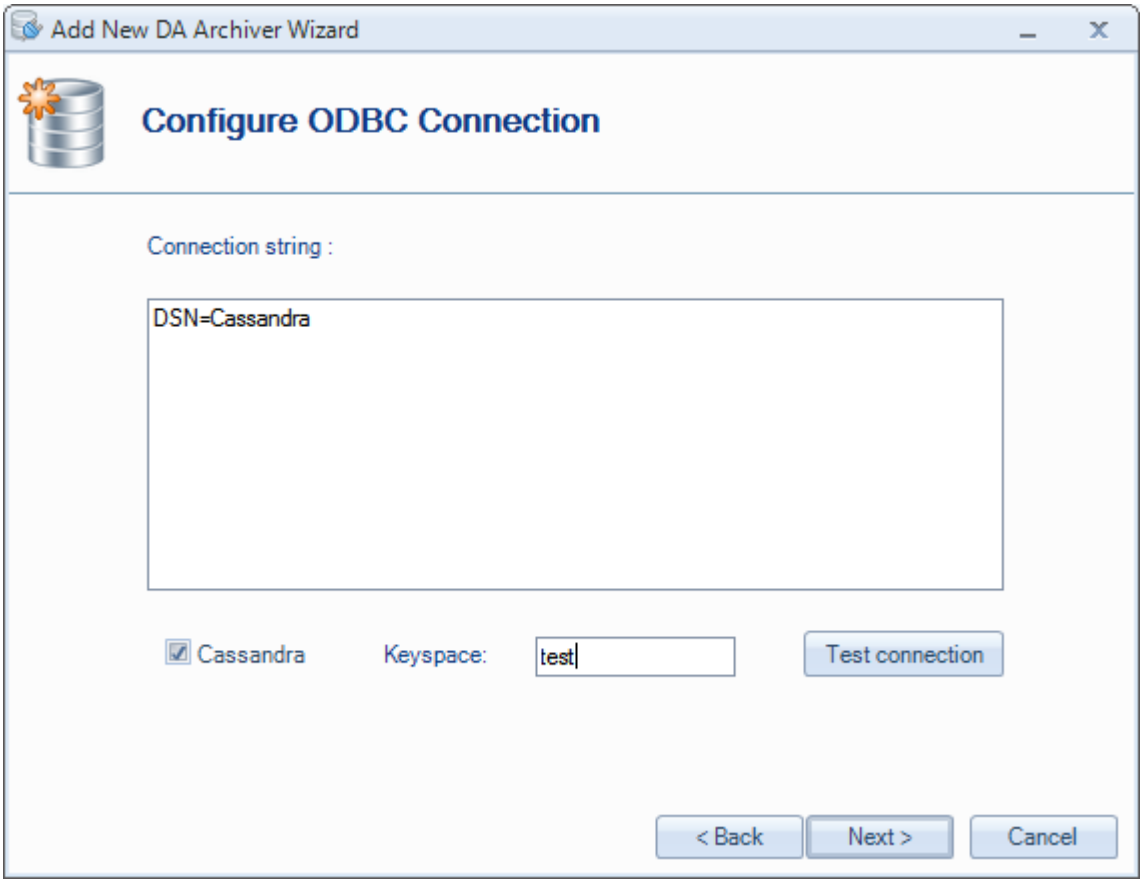


Figure 155: ODBC Connection String Dialog (Cassandra)

Note that the Cassandra database is supported in the DA archiver only.

HDA Archiver:

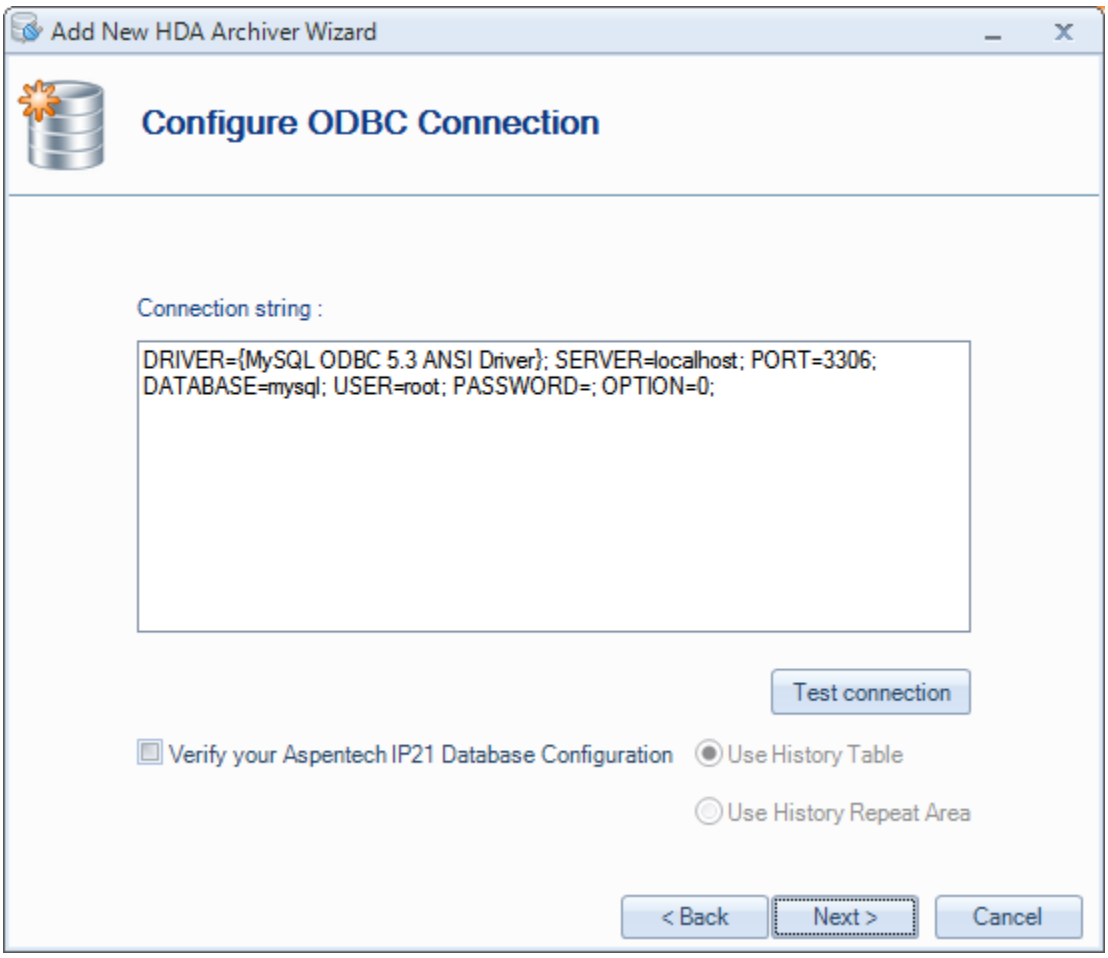


Figure 156: HDA Archiver: ODBC Connection String Dialog

In this dialog, you need to enter the connection string of your database. The example in the above figure shows a connection string for MySQL driver version 5.3.

For Aspentech IP21 database, you need to check the "**Verify your Aspentech IP21 Database Configuration**" option.
If you select "Use History Repeat Area" and click **Next**, the following window will be displayed:

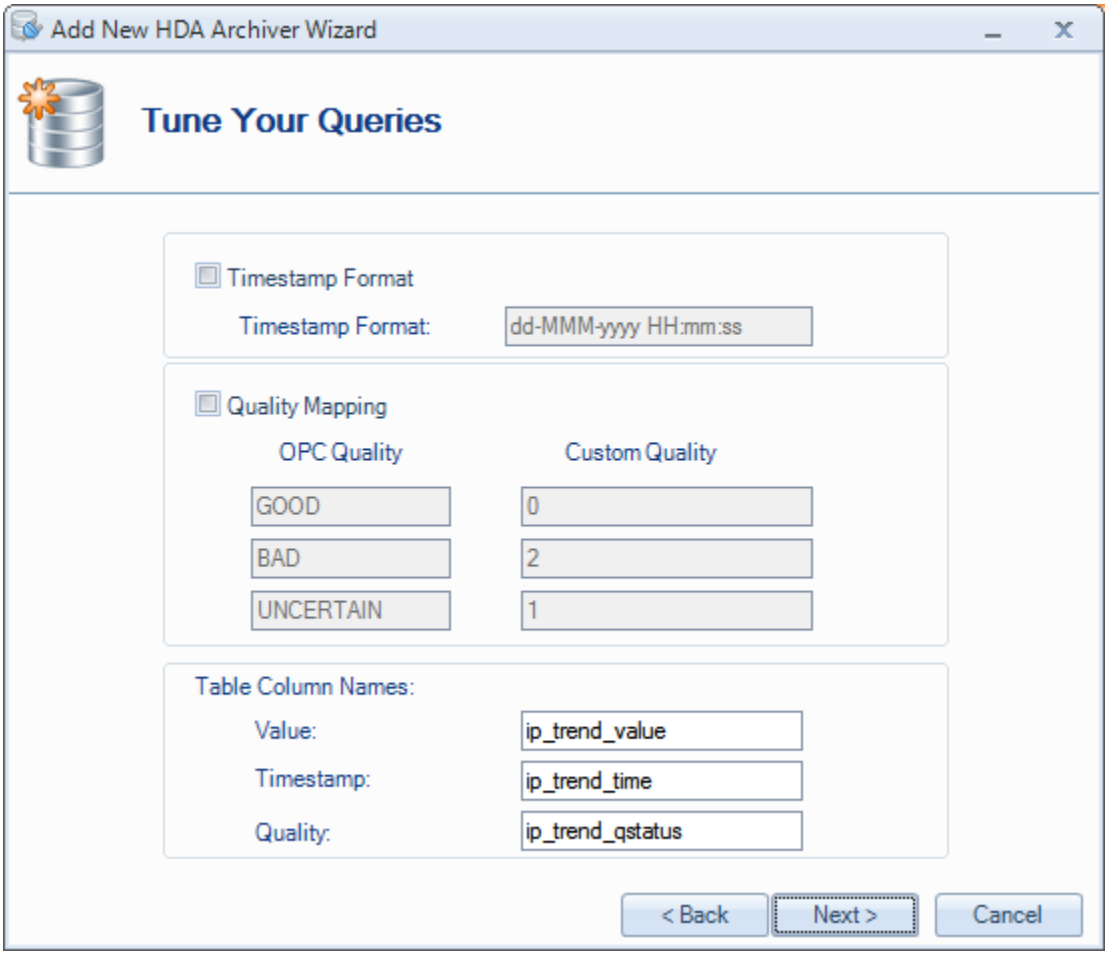


Figure 157: Tune Your Queries Dialog

In this dialog, you can:

1. Change the timestamp format.
2. Configure your own quality values.
3. Enter the column names of your tables.

To support Chinese characters for MySQL, you need to add "Charset=utf8" to the connection string and set the "MultiLanguageFlag" parameter to true in the "EasyArchiverServiceConfig.ini" configuration file. Here is an example of the connection string: "DRIVER={MySQL ODBC 5.3 ANSI Driver}; SERVER=127.0.0.1; PORT=3306; DATABASE=mysql; USER=root; PASSWORD=io;Charset=utf8; OPTION=0;"

- **OLEDB Type:** if you select an OLEDB database type, the following window will be displayed:

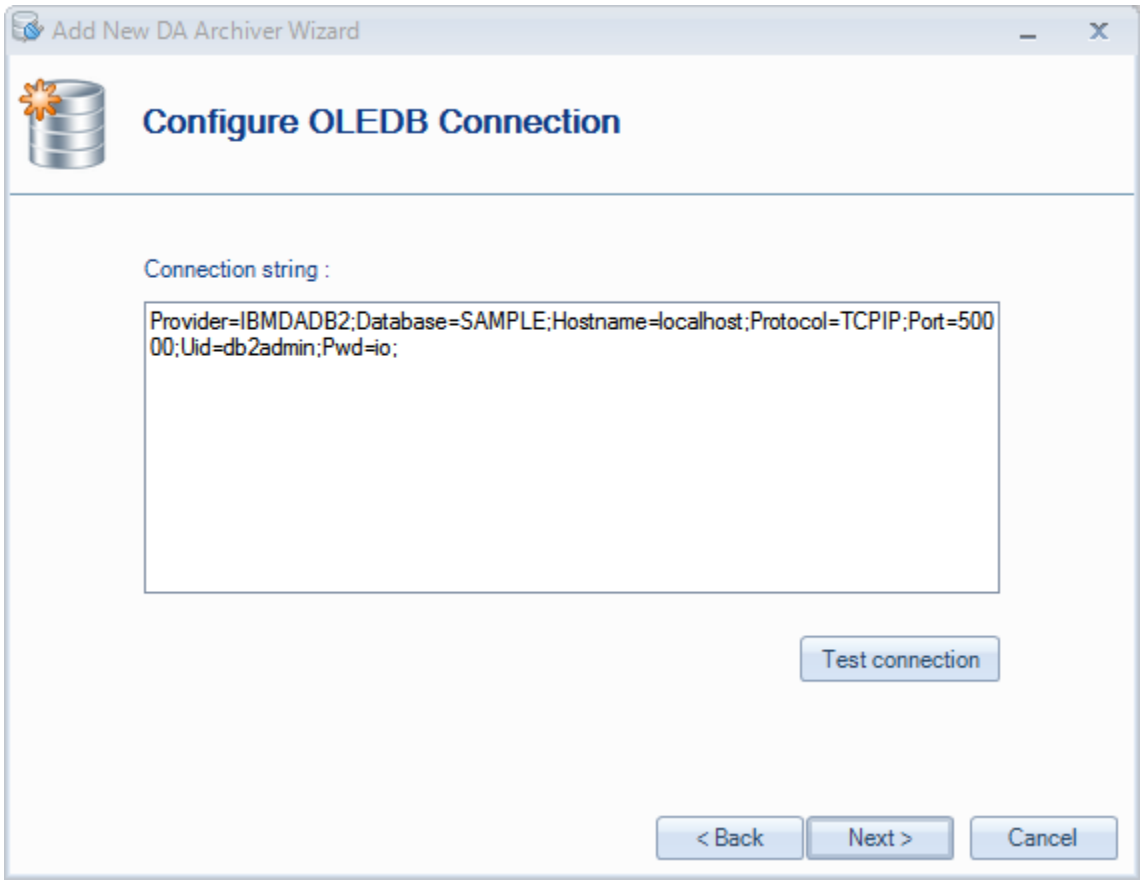


Figure 158: OLEDB Connection String Dialog

In this dialog, you need to enter the connection string of your OLEDB database. The example in the above figure shows a connection string for IBM DB2 database.

If you are using the 64-bit version of the OPC EasyArchiver and you want to connect to Excel, make sure to install the 64-bit version of Microsoft Office as well as the 64-bit version of the OLEDB driver.

Step 3: Once the database connection parameters are configured, click the **Next** button and the next window will allow you to configure your data tables. This configuration depends on the type of the archiver (DA, HDA or AE):

1.1. Configuring DA Archiver

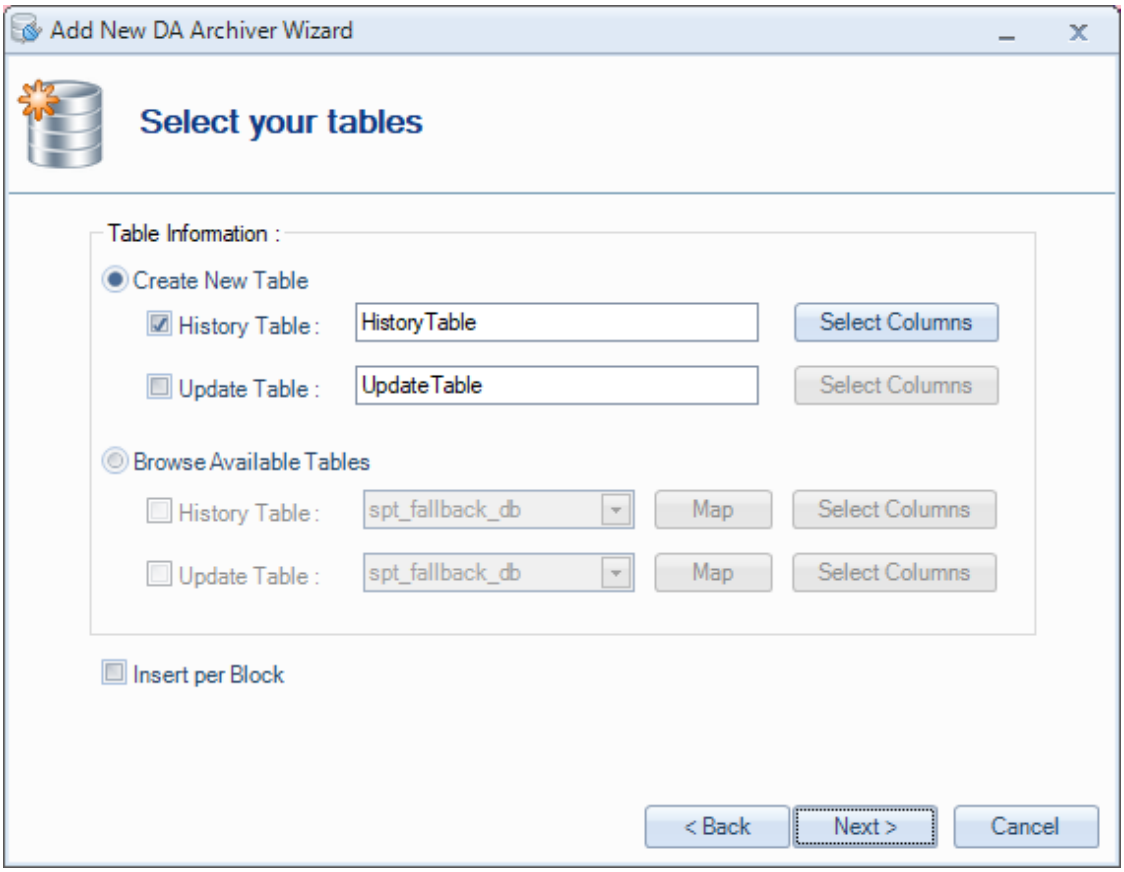


Figure 159: Configure OPC DA Tables Dialog

The OPC EasyArchiver offers the possibility to archive the data into pre-existing tables or create new ones.

When checking the **Insert per Block** option, you can take advantage of the versions of databases that support the functionality of inserting multiple data in a single operation.

Note that the "Insert per Block" functionality applies only for SQL Server and MS Access archivers.

- **Create New Table**: If you choose this option, OPC EasyArchiver will create two new tables into your database depending on your selection:

History Table: The history table is used to store all received data. By default, the created table has the following columns:

- ItemID: The OPC item name.
- ItemCurrentValue: The OPC item current value.
- ItemTimeStamp: The time stamp returned by the OPC Server.

For Cassandra database, the history table will contain also a column with the type "uuid" that represents the primary key of the table.

Update Table: The update table stores only the last received values of the OPC tags. By default, the created columns are the same as previously listed for the history table.

To add more columns to the tables, click on the corresponding **Select Columns** button and check the columns to be added. You can add the following properties:

- ServerProgID:The OPC server progID.
- ItemQuality: The quality of the data value.
- ServerAddress: The OPC server host IP address.
- GroupName: The name of the OPC group.
- ReadMode: The OPC group read mode.
- ItemAccessRights:The OPC item access rights. It may be Read, Read/Write or Write.
- ItemDataType: The type of the OPC item data.

Note that the default maximum column size for the ItemCurrentValue is 2000. This parameter is used by OPC EasyArchiver when creating new tables in the database. You can edit this parameter from the "EasyArchiverServiceConfig.ini" file available in the OPC EasyArchiver installation folder. You only need to modify MaxValueColumnSize value and save the changes made to the ini file.

- **Browse Available Tables**: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as shown in the figure below:

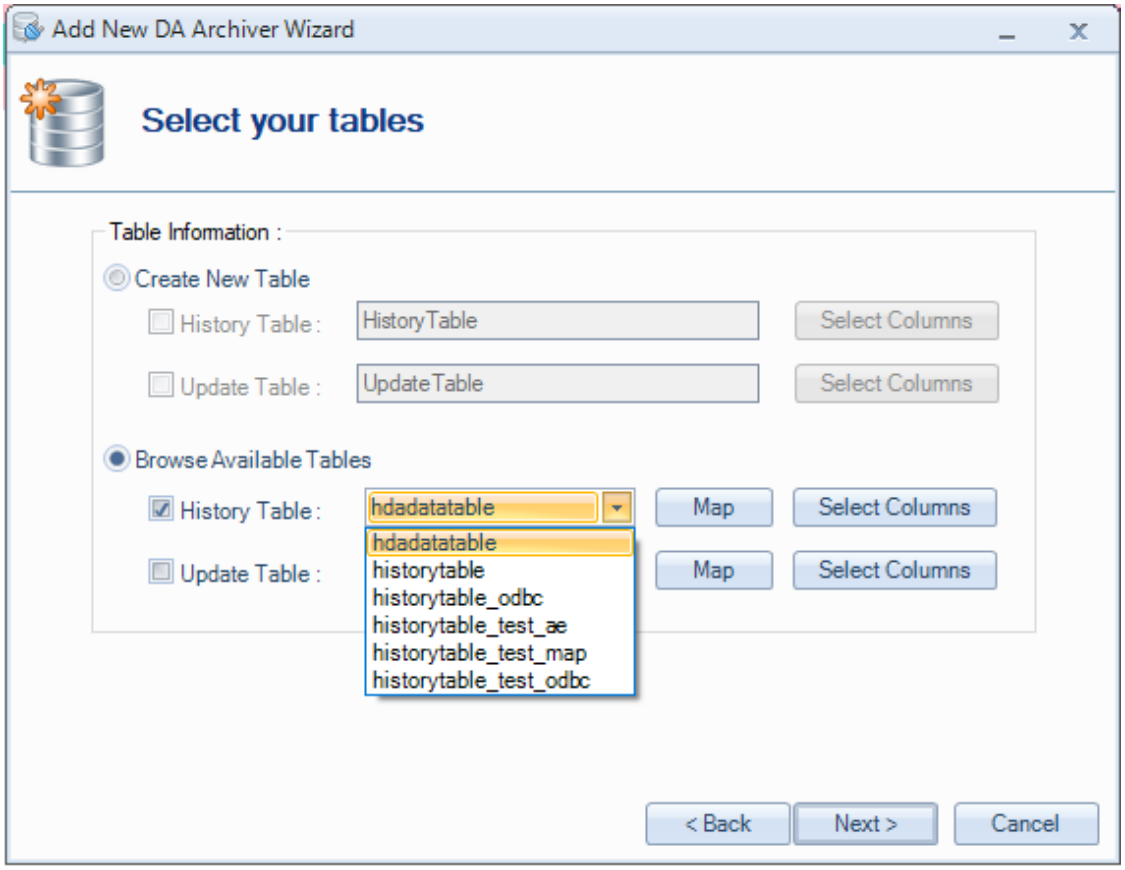


Figure 160: Browse Available Tables

After selecting an existing table, you will need to map fields of the tables. Click the **Map** button to proceed:

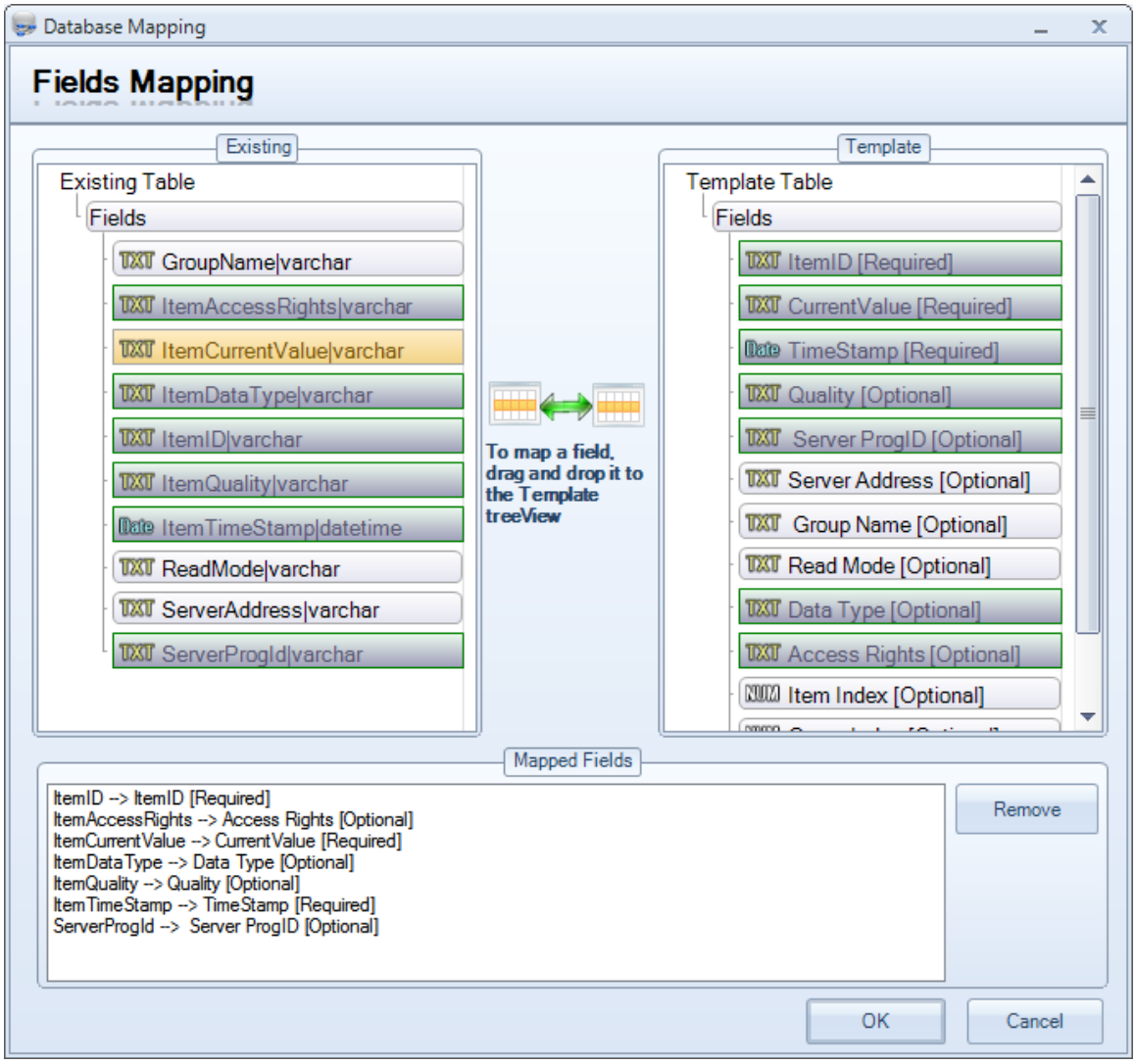


Figure 161: Fields Mapping

In this dialog, you have to define the association between the data and the columns of the selected table. The Template Table is the default table of the archiver. The existing table is the table previously selected. To complete the mapping, drag and drop the field from the existing table to the corresponding one in the template table.

Mapped fields will appear in the text zone at the bottom of the dialog screen. You can select a mapped item and click the **Remove** button in order to cancel the mapping operation.
Once done, click the **OK** button and a dialog box indicating that you should select one or more groups to assign to the archiver will be displayed:

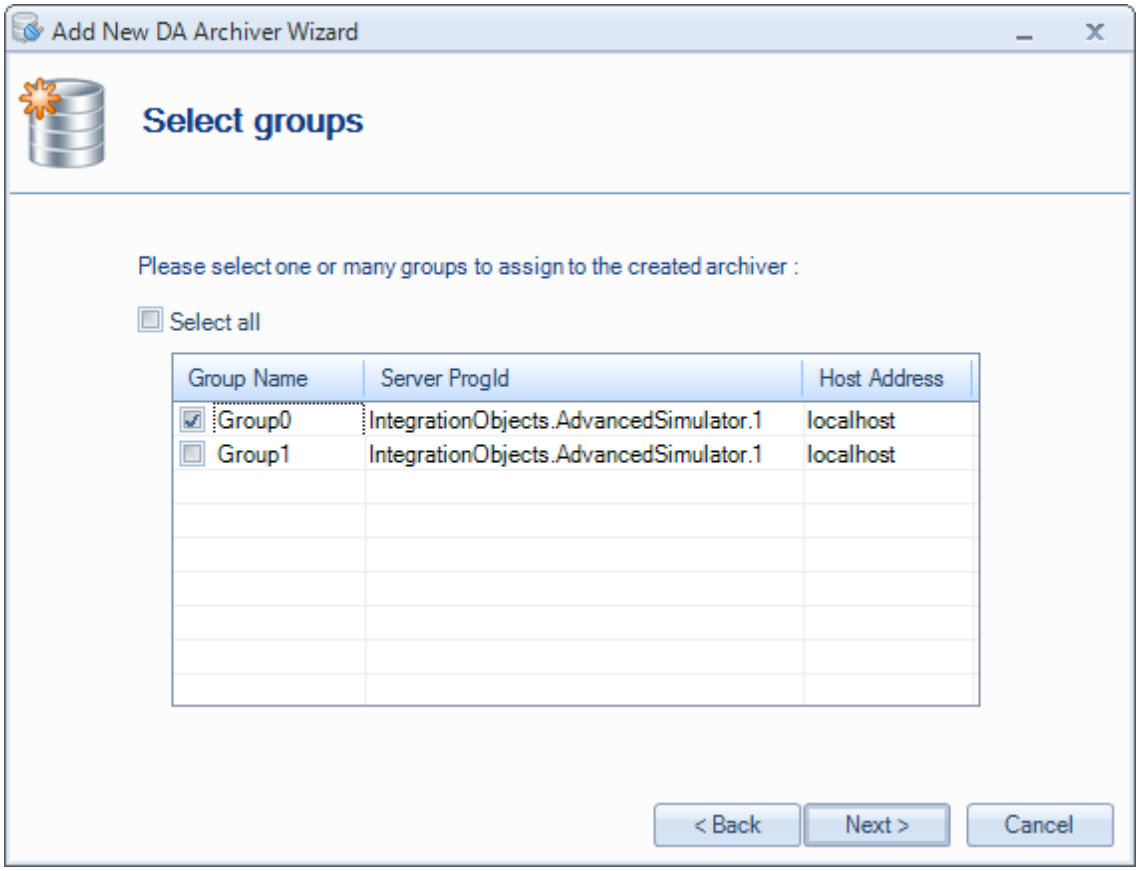


Figure 162: Assign Groups to the DA Archiver

1.2. Configuring HDA Archiver

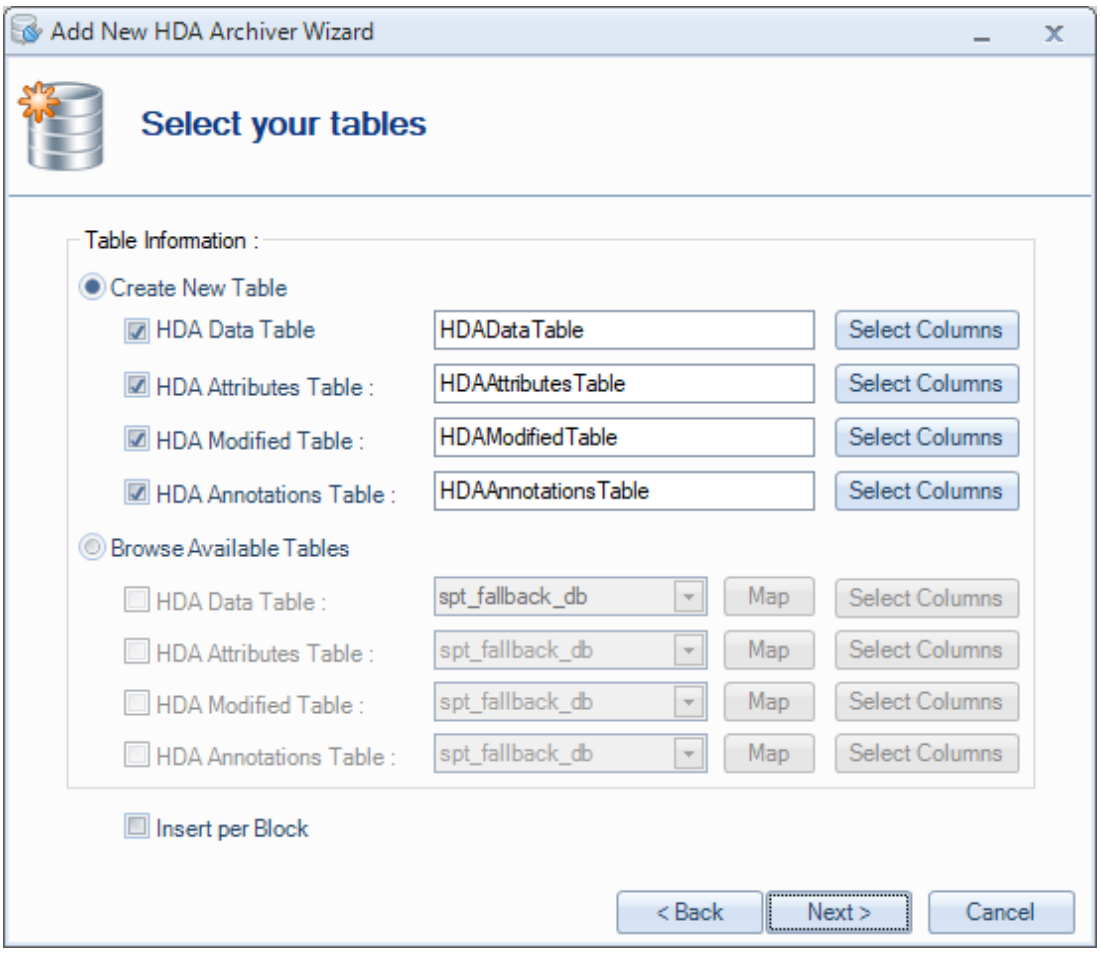


Figure 163: Configure OPC HDA Tables Dialog

The OPC EasyArchiver offers the possibility to archive the data into pre-existing tables or create new ones.
When checking the **Insert per Block** option, you can take advantage of the versions of databases that support the functionality of inserting multiple data in a single operation.

Note that the "Insert per Block" functionality applies only for SQL Server and MS Access archivers.

- **Create new Table**: If you choose this option, the OPC EasyArchiver will create four new tables into your database depending on your selection:

  HDA Data Table: This table is used to save the historical data received as results of Sync and Async ReadRaw, Sync and Async ReadProcessed, Loop ReadRaw, Loop ReadProcessed requests. By default, the created table has the following columns:
  - ItemID: The OPC HDA item name.

- ItemCurrentValue: The OPC HDA item current value.
- ItemTimeStamp: The time stamp returned of the OPC HDA item.

HDA Attributes Table: This table will contain the data returned from a synchronous or asynchronous read attributes request.

HDA Modified Table: This table will contain the data returned from a synchronous or asynchronous read modified request. By default, created columns are the same as previously listed for the HDA data table.

HDA Annotations Table: This table will contain the data returned from a synchronous or asynchronous read annotations request.

To add more columns to the tables, click on the corresponding **Select Columns** button and check the columns to be added.

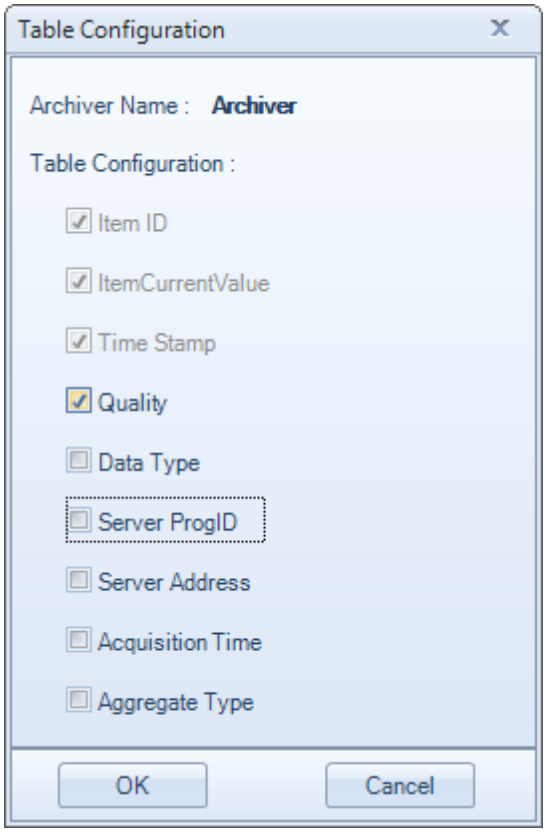


Figure 164: Table Configuration

- **Browse Available Tables**: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as shown in the figure below:

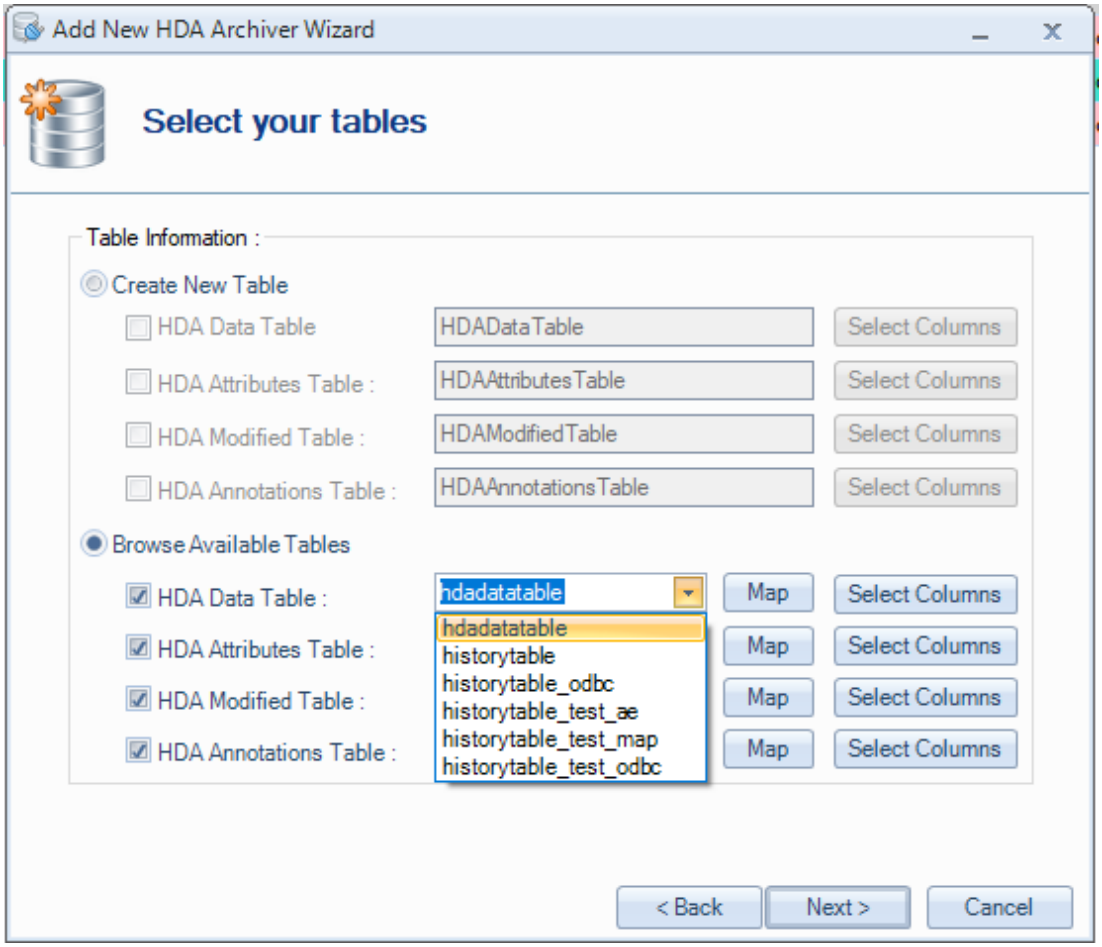


Figure 165: Browse Available Tables

After selecting an existing table, you will need to map fields of the tables. Click the **Map** button to proceed:

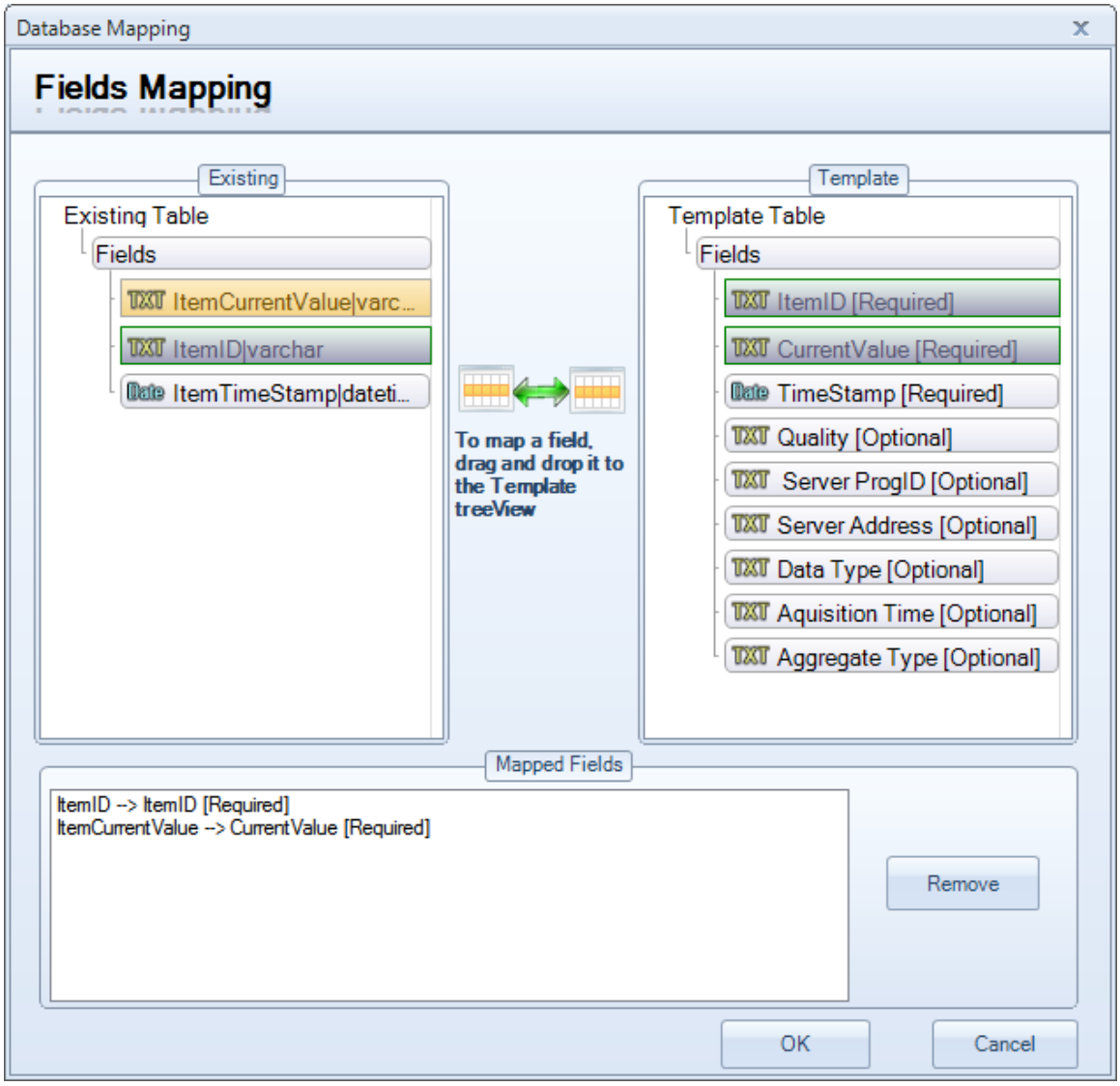


Figure 166: Fields Mapping

In this dialog, you have to define the association between the data and the columns of the selected table. The Template Table is the default table of the archiver. The existing table is the table previously selected. To complete the mapping, drag and drop the field from the existing table to the corresponding one in the template table.

Mapped fields will appear in the text zone at the bottom of the dialog screen. You can select a mapped item and click the **Remove** button in order to cancel the mapping operation.
Once done, click the **OK** button and a dialog box indicating that you should select one or more servers to assign to the archiver will be displayed:

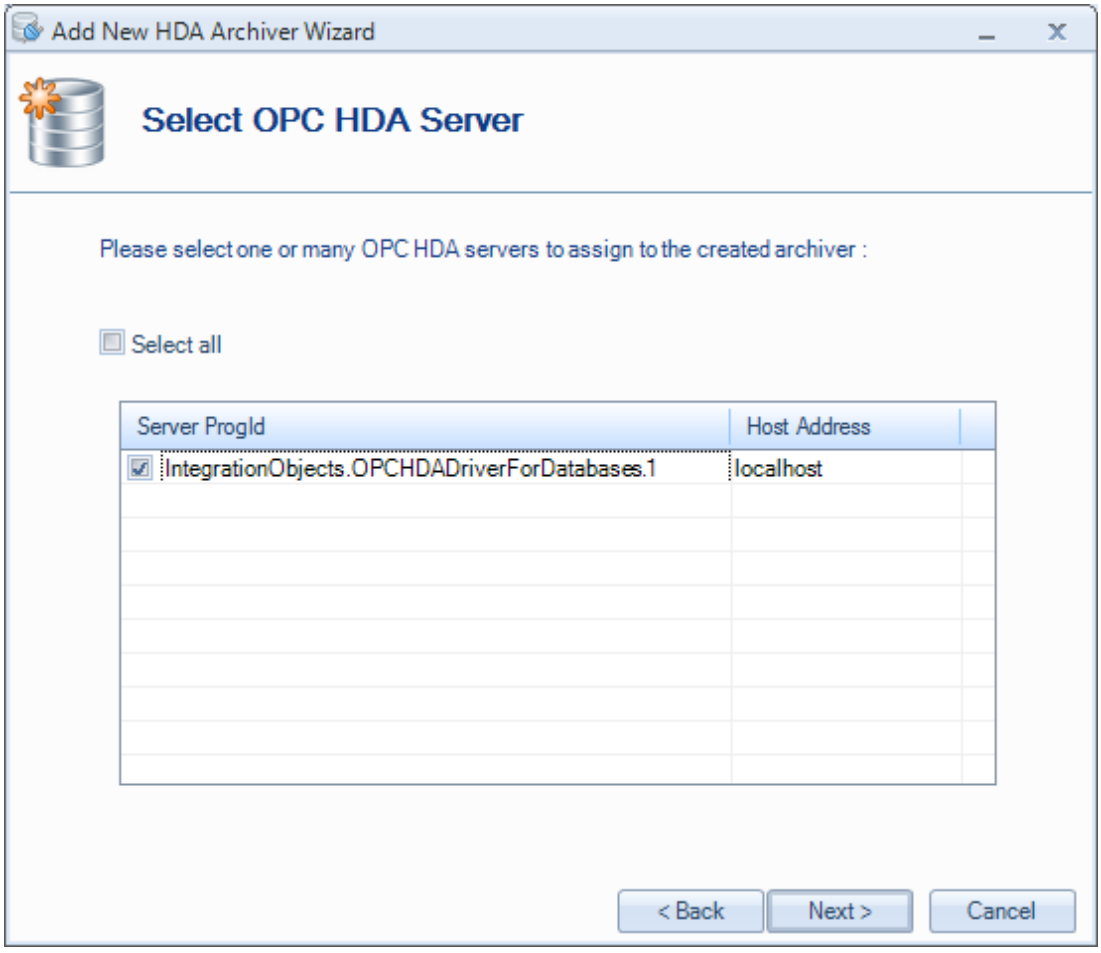


Figure 167: Assign OPC HDA Server to the Archiver

1.3. Configuring AE Archiver

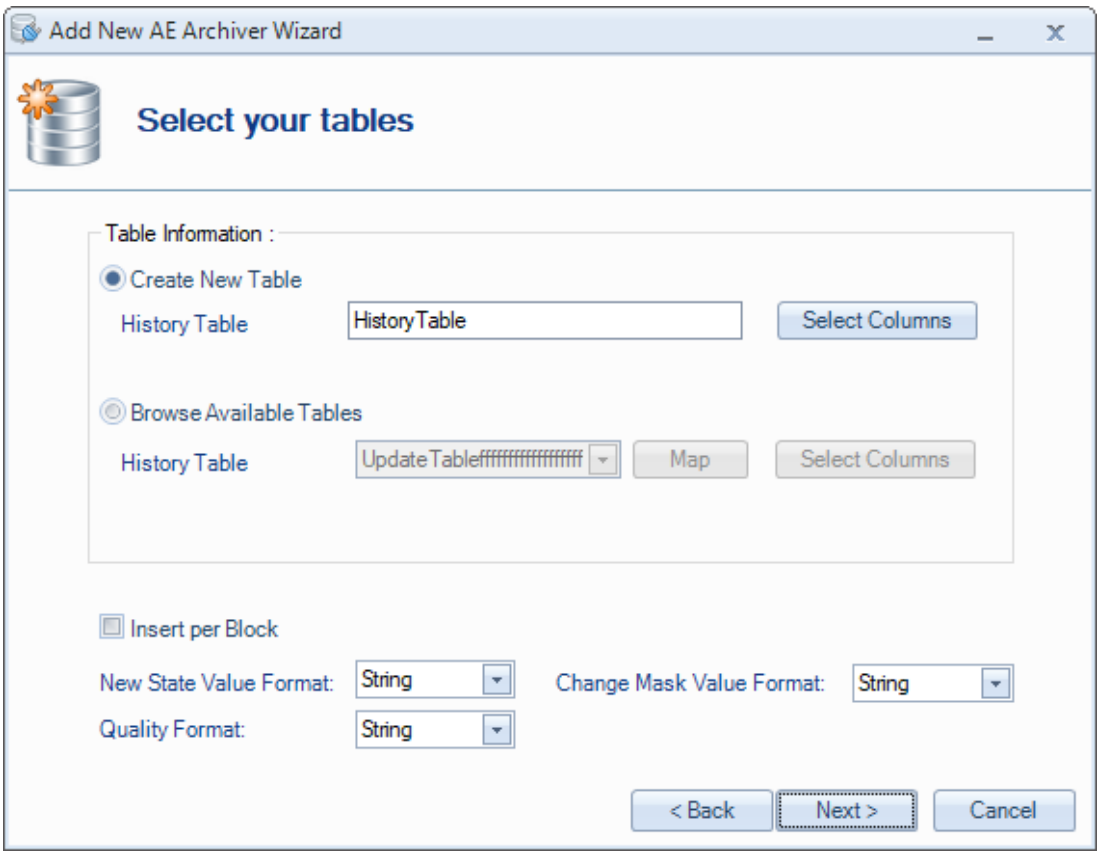


Figure 168: Configure OPC AE Tables Dialog

The OPC EasyArchiver offers the possibility to archive the alarms and events into pre-existing tables or create new ones.
When checking the **Insert per Block** option, you can take advantage of the versions of databases that support the functionality of inserting multiple data in a single operation.

Note that the "Insert per Block" functionality applies only for SQL Server and MS Access archivers.

You can also fine-tune your data archiving using the following parameters:

- **New State Value Format**: You can set the new state format to:
    1. String: The new state will be stored in its string representation.
    2. Integer: The new state will be stored in its numerical representation.
    The table below lists the string and integer values for the new state:

New State	String Format	Integer Format
The condition is not Enabled, not Active and not Acknowledged	Empty	0
The condition is Enabled	OPC_CONDITION_ENABLED;	1
The condition is Active	OPC_CONDITION_ACTIVE;	2
The condition is Enabled and Active	OPC_CONDITION_ACTIVE; OPC_CONDITION_ENABLED;	3
The condition is Acknowledged	OPC_CONDITION_ACKED;	4
The condition is Enabled and Acknowledged	OPC_CONDITION_ACKED; OPC_CONDITION_ENABLED;	5
The condition is Active and Acknowledged	OPC_CONDITION_ACTIVE; OPC_CONDITION_ACKED;	6
The condition is Enabled, Active and Acknowledged	OPC_CONDITION_ACTIVE; OPC_CONDITION_ACKED; OPC_CONDITION_ENABLED;	7

Table 34: String and Integer Format of New State

3. Custom: the new state will be stored in a numerical format as defined by the user. When you select the **Custom** option, the **Custom New State** button will be enabled. To change the numerical values of the new state, click the **Custom New State** button and the following dialog will be prompted:

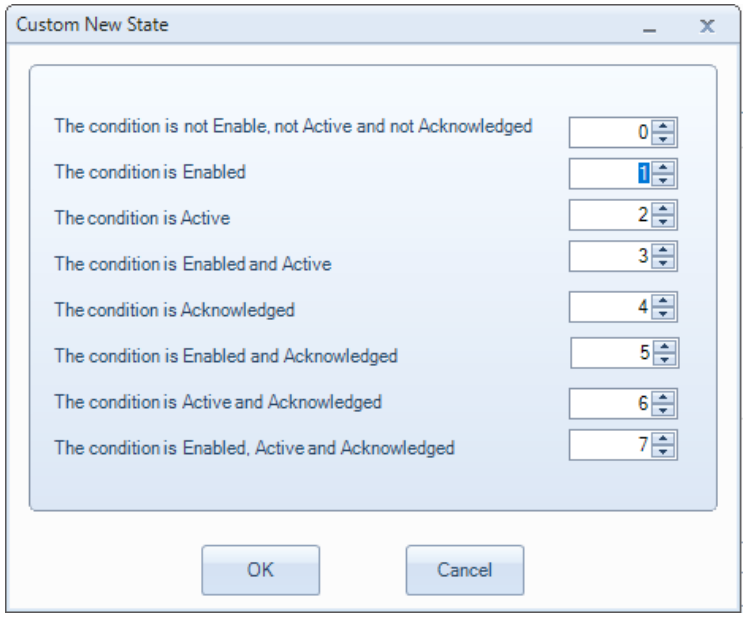


Figure 169: Custom New State Form

Set the values that you need and click **OK** to validate the custom new state values.

- **Change Mask Value Format**: You can set the mask value format to:
  1. String: The mask value will be stored in its string representation.
  2. Integer: The mask value will be stored in its numerical representation.
- **Quality Format**: You can set the quality format to:
  1. String: The quality format will be stored in its string representation.
  2. Integer: The quality format will be stored in its numerical representation.

- **Create new Table:** If you choose this option, the OPC EasyArchiver will create the following new table into your database:

  History Table: The history table is used to store all received alarms. By default, the created table has the following columns:
  - ServerProgID: The server progID.
  - SourceName: The source name.
  - SubCondition: The sub-condition name.
  - SubscriptionName: The event subscription name.
  - EventType: The event type.
  - Mask: The event mask.
  - EventCategory: The event category.
  - Condition: The condition name.
  - SubCondition:The sub-condition name.
  - ActiveTime: The active time.
  - ActiveTime_MS: The active time in milliseconds.
  - EventTime: The event time.
  - EventTime_MS: The event time in milliseconds.
  - Cookie: The cookie.
  - Message: The message.
  - ActorID: The actorID.

Click on the **Select Columns** button to add more columns, update column names or set a primary key to the table. The window below will be prompted where you can check the wanted columns to be added.

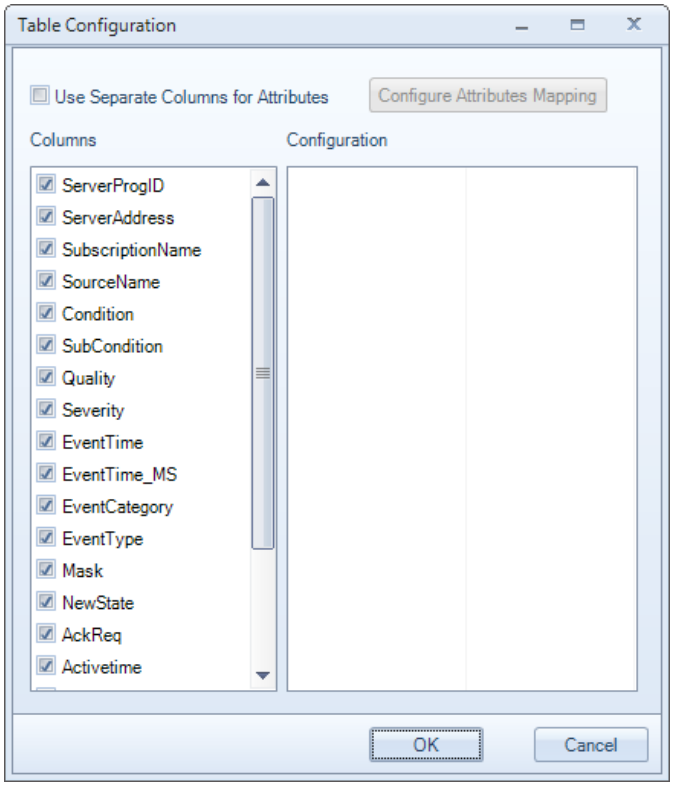


Figure 170: Table Configuration

To edit the column name in the Table Configuration window:

- Double click on the text in **Column** field available on the right side section.
- Enter the new name.
- Hit the Enter key.
- Click the **OK** button to save your configuration.

To update the primary key, check the **Is Primary Key** option available on the right side section.

To receive the list of OPC AE Attributes in separate columns with the Column Name of the database table that are mapped to, check "**Use Separate Columns for Attributes**". Otherwise the list of AE attributes is concatenated and saved in the column "**Attributes**".

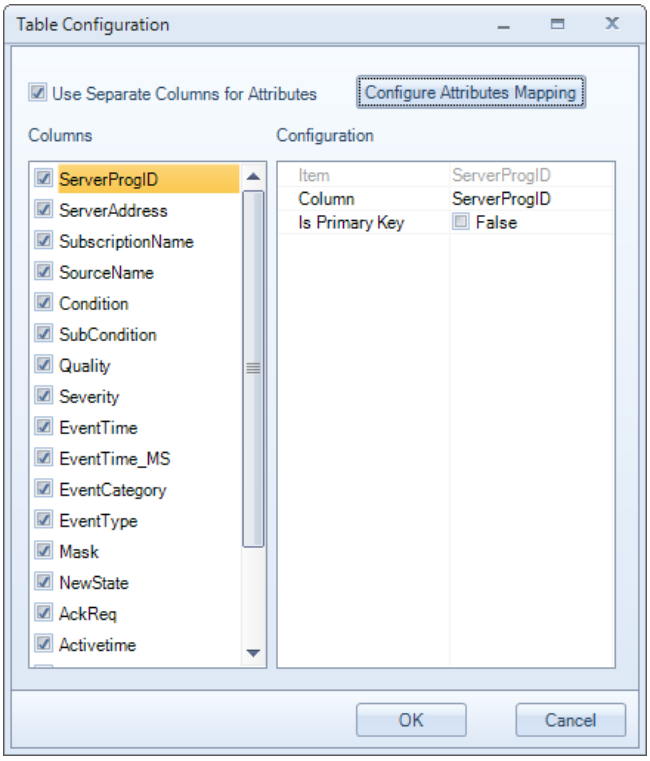


Figure 171: Use Separate Columns for Attributes

The list of fields to be used as the primary key must define a unique row for each alarm. Example: If the user uses the Source Name as a Primary Key only, this configuration will generate a database error that mentions that a duplicate value in Primary Key is detected.

In case of using MySQL database for the archiver, the length of list of fields to be used as the primary key should be limited. Otherwise, a database error may occur.

Click **Configure Attributes Mapping** button to map the table columns to the attributes and the window illustrated below will be prompted.

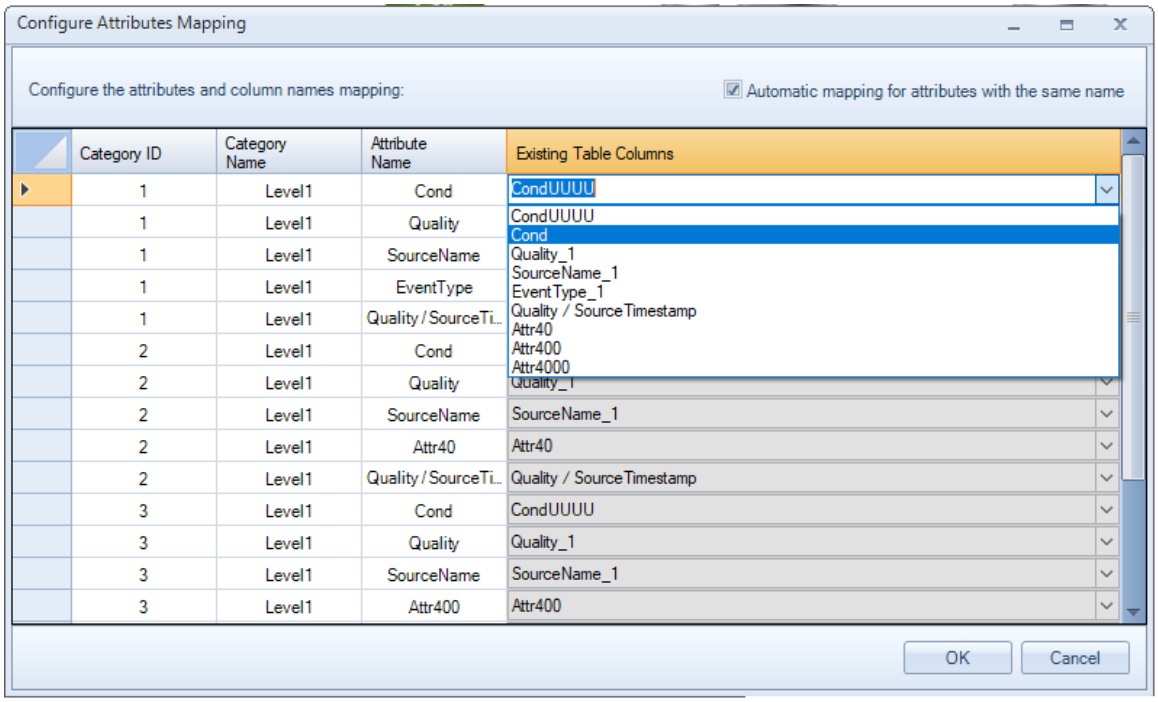


Figure 172: Select a Pre-Existing Column

The mapping is preconfigured in this window as follows:

- By default, the attributes are mapped with columns with the same names. If you confirm this default mapping and columns with same attribute names do not exist in the selected table, the missing columns will be added to the table.
- To modify a mapping, you need to select the column from the drop down list. This list includes the pre-existing table columns of the existing table as illustrated above. You can also add a new column by typing its name and selecting it.

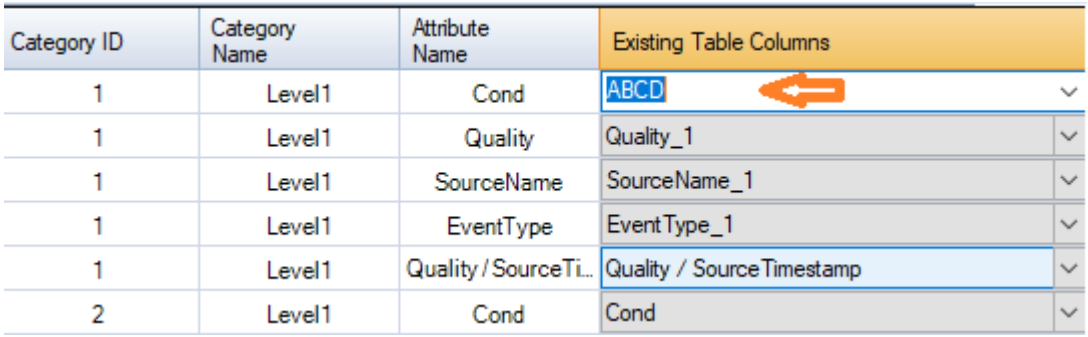


Figure 173: Enter a New Column Name

- The option "**Automatic mapping for attributes with the same name**" is checked by default. This option allows to automatically select the same column to attributes with the same name.

The **Automatic mapping for attributes with the same name** is useful in case you have the attributes with same name under different categories.

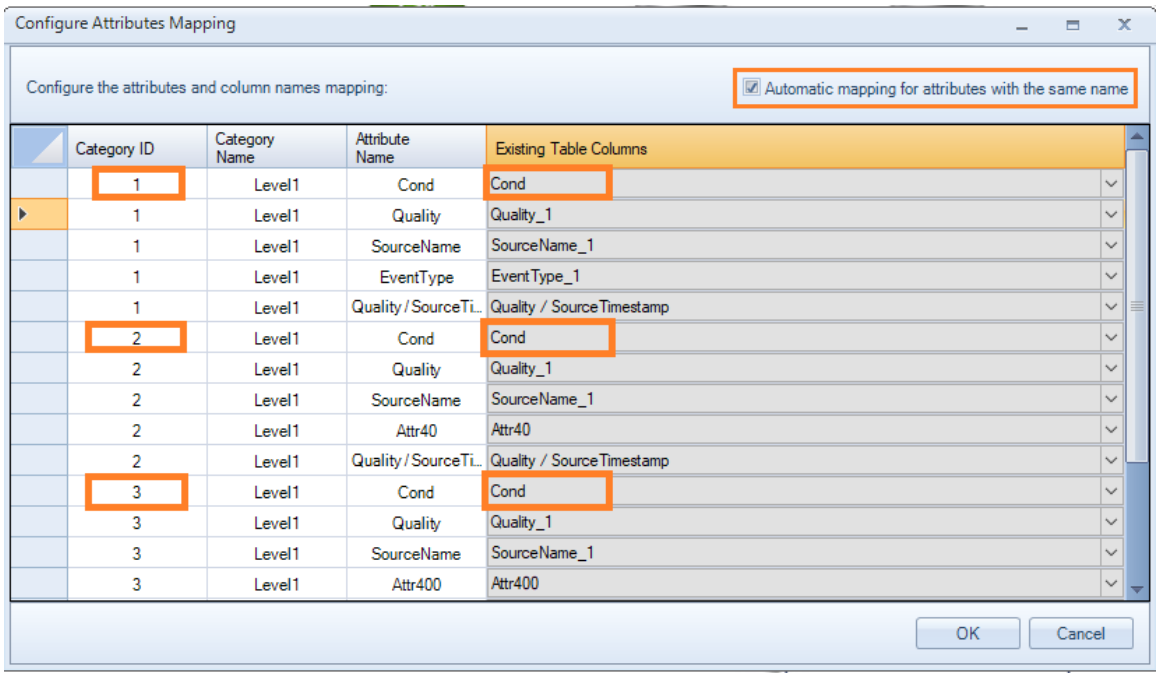


Figure 174: Automatic Mapping for Attributes with the Same Name

- Uncheck the **Automatic mapping for attributes with the same name** option if you need to modify the mapping of each attribute independently.

  In case of an existing table, when you click **OK**, if any of the attributes columns are not available in the existing table, the following message box is displayed:

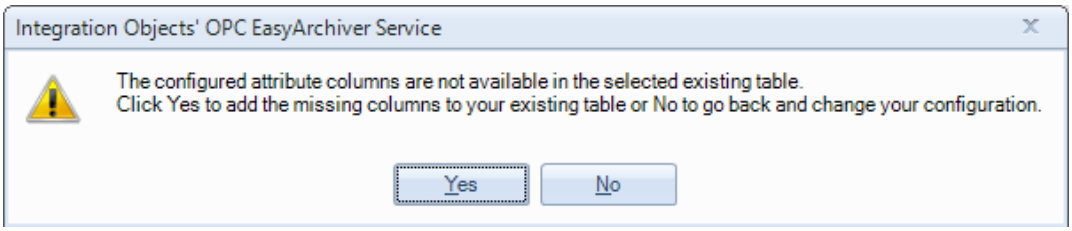


Figure 175: Add Missing Columns to the Existing Table

The OPC Easy Archiver will not make any changes unless you approve of the configuration changes.

When you click **OK**, if any of the server attributes are going to be changed, the following message box is displayed:

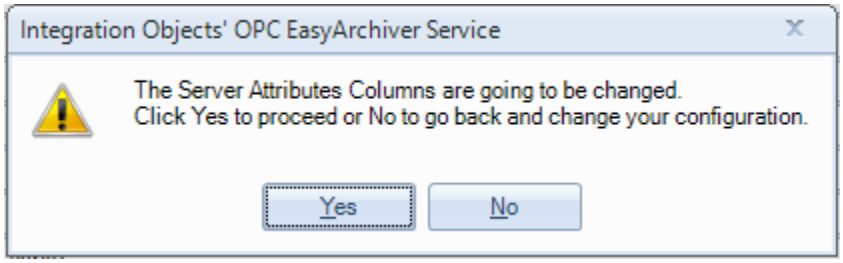


Figure 176: Change Server Attributes Columns

The OPC Easy Archiver will not make any further changes unless you approve of the configuration changes.

OPC Easy Archiver supports Multilanguage characters for AE archiving

- **Browse Available Tables**: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as illustrated in the figure below:

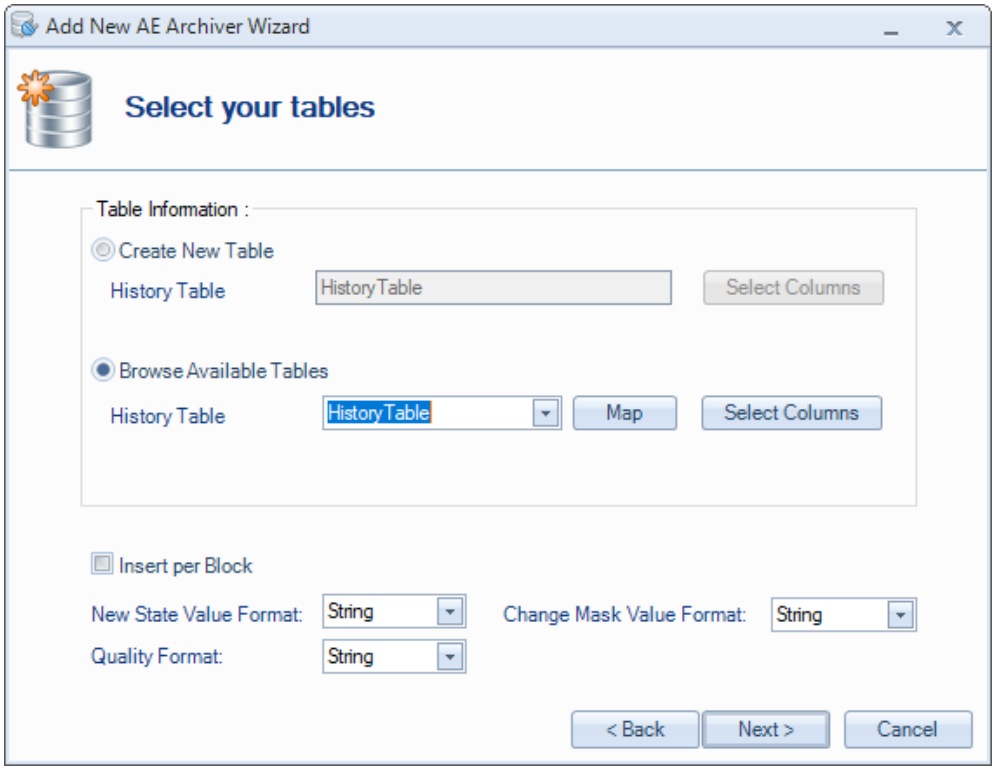


Figure 177: Browse Available Tables

After selecting a pre-existing table, you will need to map the data to the table columns. Click the **Map** button to proceed:

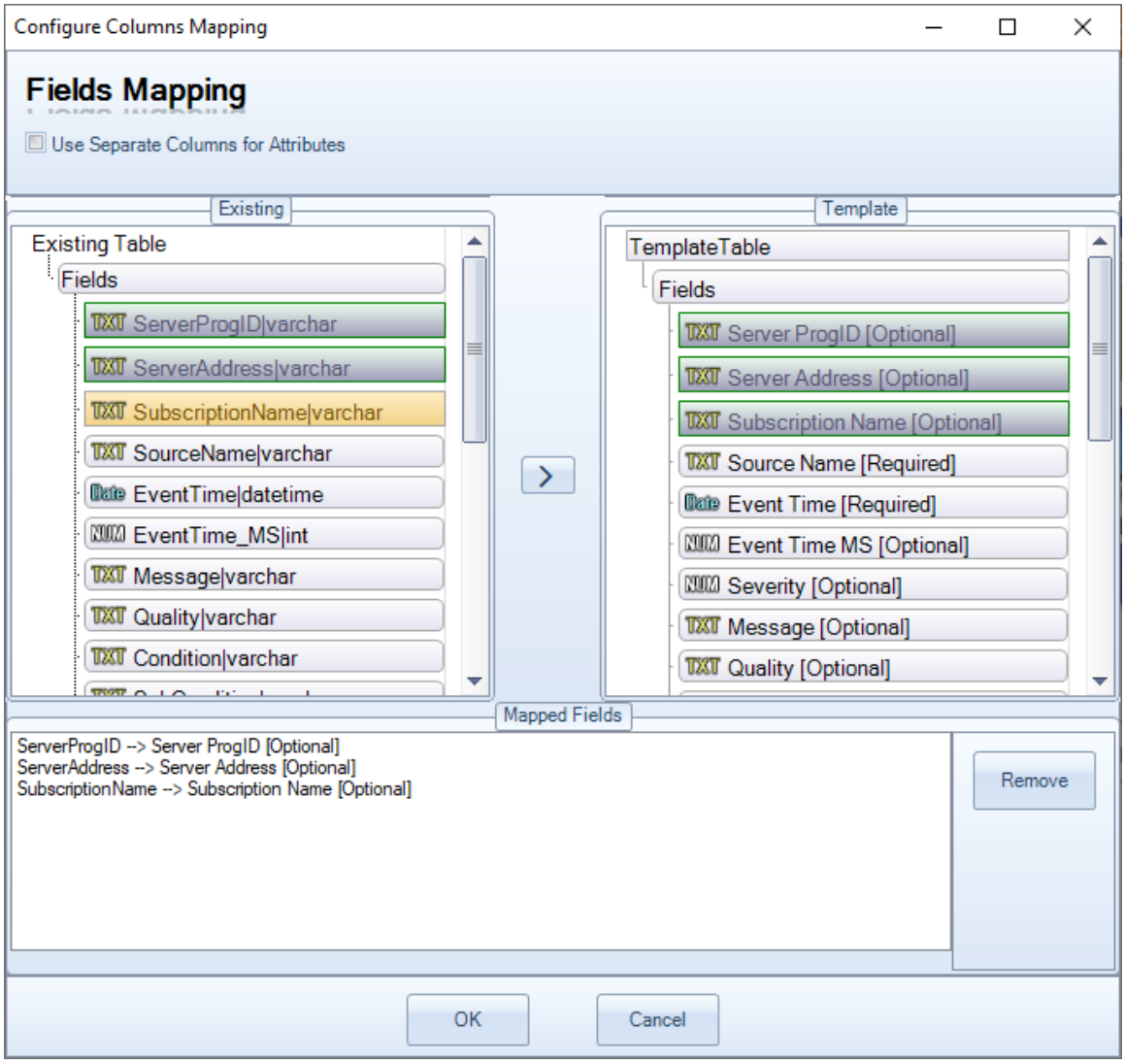


Figure 178: Fields Mapping

In this dialog, you have to define the association between the data and the columns of the selected table. The Template Table is the default table of the AE archiver. The existing table is the table previously selected. To complete the mapping, drag and drop the field from the existing table to the corresponding one in the template table.

If you want to map the list of different OPC AE attributes with fields from existing table, you have to check the "**Use Separate Columns for attributes**" option and you will see the list of OPC AE Attributes in the Template Table.

Mapped fields will appear in the text zone at the bottom of the dialog screen. You can select a mapped item and click the **Remove** button in order to cancel the mapping operation.

Once done, click the **OK** button and a dialog box indicating that you should select one or more Event Subscriptions to assign to the archiver will be displayed:

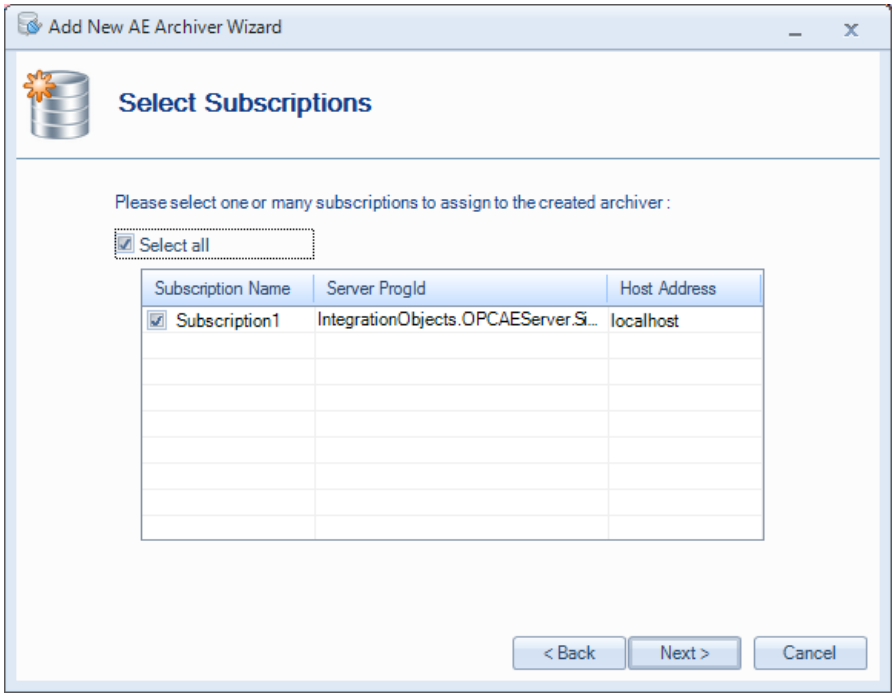


Figure 179: Assign Event Subscriptions to the AE Archiver

Step 5: Click the **Next** button to proceed and the following window will appear. This window contains a summary of the archiver configuration.

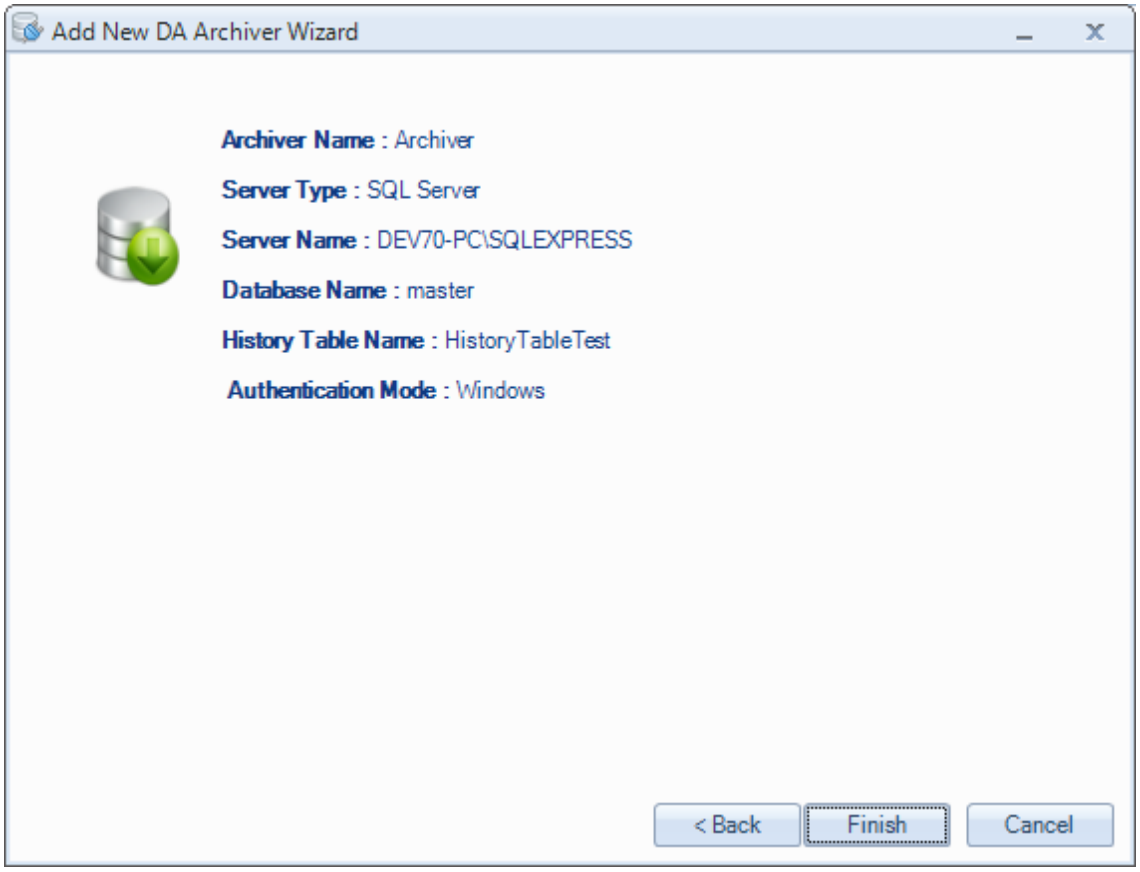


Figure 180: Summary Wizard Page

Click the **Finish** button, the new archiver will be added to the tree view of archivers as shown below:

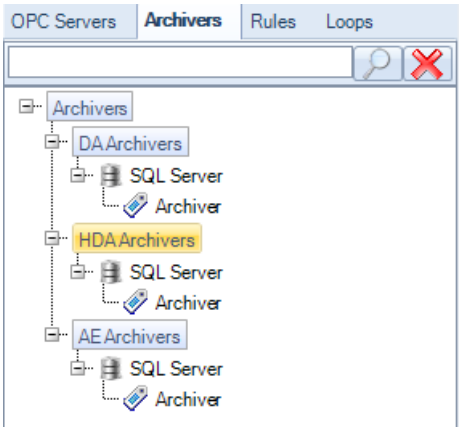


Figure 181: Archivers Tree View

When you right click on an archiver, you will get one of the following menus depending on the type of archiver (DA, HDA, or AE):

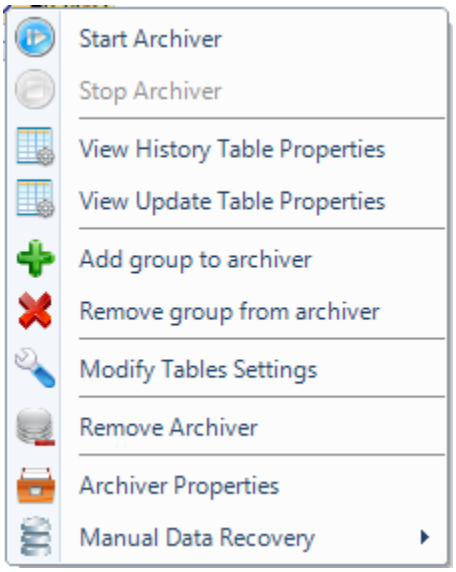


Figure 182: DA Archiver Menu

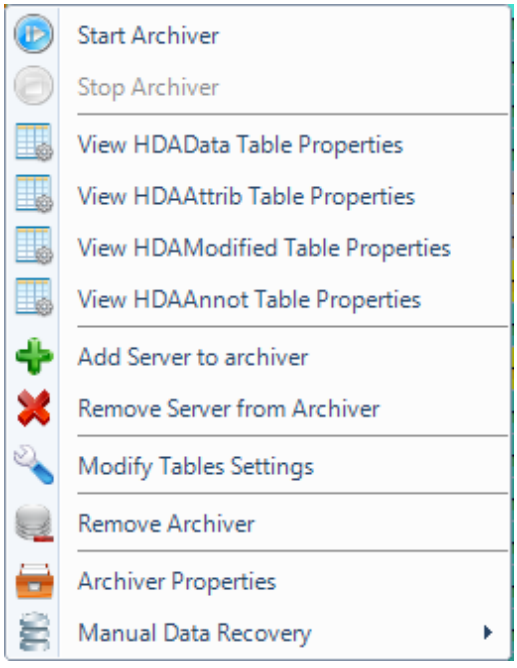


Figure 183: HDA Archiver Menu

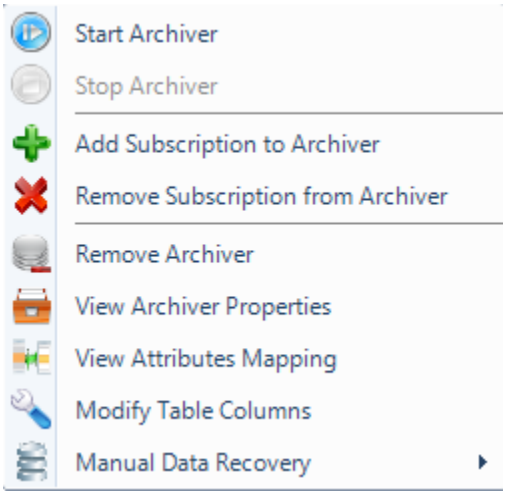


Figure 184: AE Archiver Menu

2. Start Archiver

To start an archiver, select archiver in the archivers list and click the **Start** button from the archiver menu bar or right click on the archiver and select **Start Archiver** from the displayed menu.

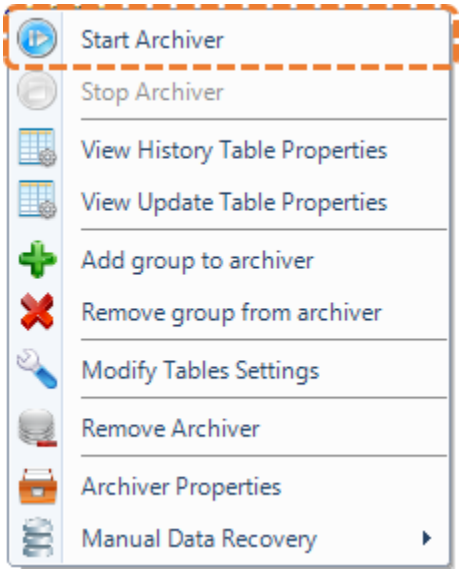


Figure 185: Start Archiver

3. Stop Archiver

To stop the Archiver, click the **Stop** button in the archiver menu bar or right click on the archiver and select **Stop Archiver** from the displayed menu.

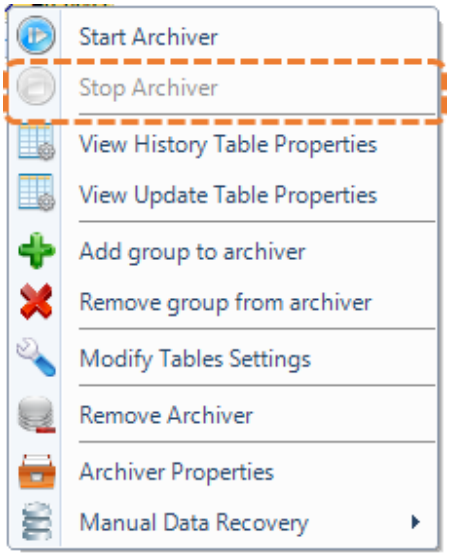


Figure 186: Stop Archiver

4. Remove Archiver

To remove an archiver, select the archiver node from the tree view of archivers and click the **Remove** button in the ribbon bar.
You can also use the **Remove Archiver** context menu item as shown in the figure below:

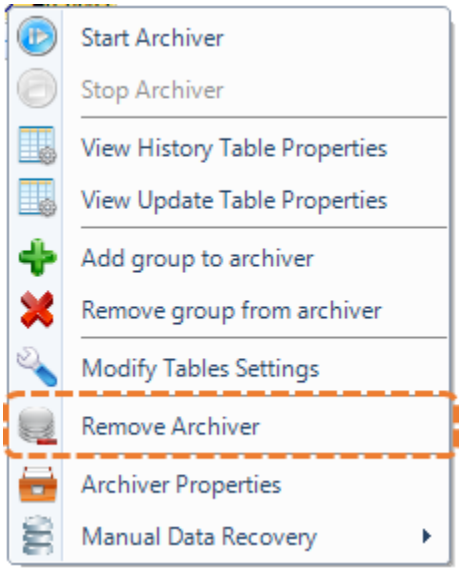


Figure 187: Remove Archiver

5. Modify Tables Settings

For DA and HDA archivers, click the **Modify Table Settings** context menu item, a screen dialog similar to the following will then be opened:

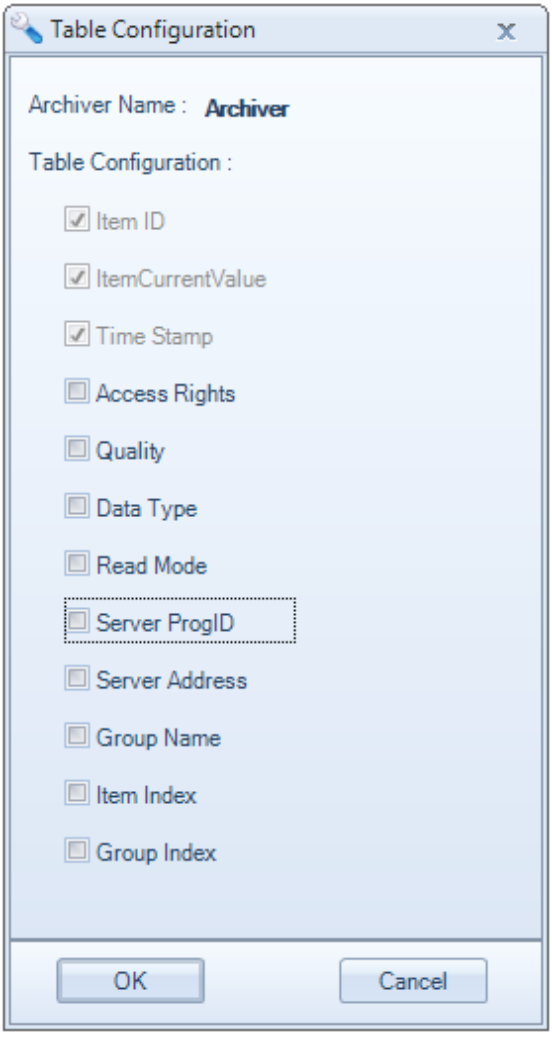


Figure 188: DA Archiver Settings Dialog

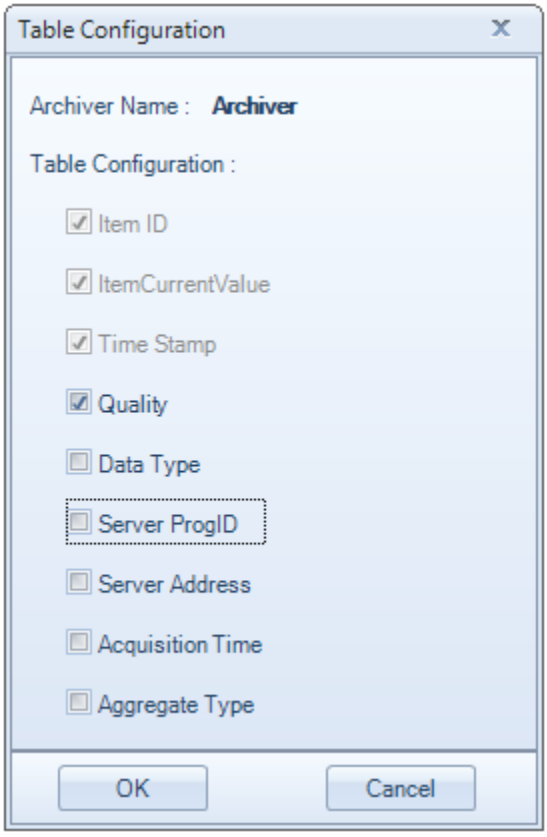


Figure 189: HDA Archiver Settings Dialog

Note that when you choose to create new history and update tables, only ItemID, ItemCurrentValue and ItemTimeStamp columns are enabled by default.
For Cassandra database, the ItemID, ItemCurrentValue, ItemTimeStamp and UUID columns are enabled by default.
For the HDA Archivers, when you choose to create a new HDA Data Table, the ItemID, ItemCurrentValue, Timestamp and Quality will be enabled by default.

Note that the Item index and Group index are visible only if you previously selected the Use Indexes option on the OPC EasyArchiver settings window.

You can check in the above dialog the items' properties you want to store when the archiver starts such as the Item's Access Rights, the Server ProgID or the Item's Data Type. Then, click the **OK** button to confirm.
Another way to access the above dialog is to select the requested archiver and click the **Table Configuration** button available in the archiver menu:

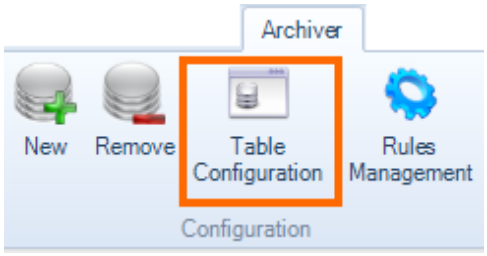


Figure 190: Table Configuration Menu

6. View Archiver Properties

To view the archiver properties, click the **Archiver Properties** context menu item and the following window will appear as illustrated in the figure below:

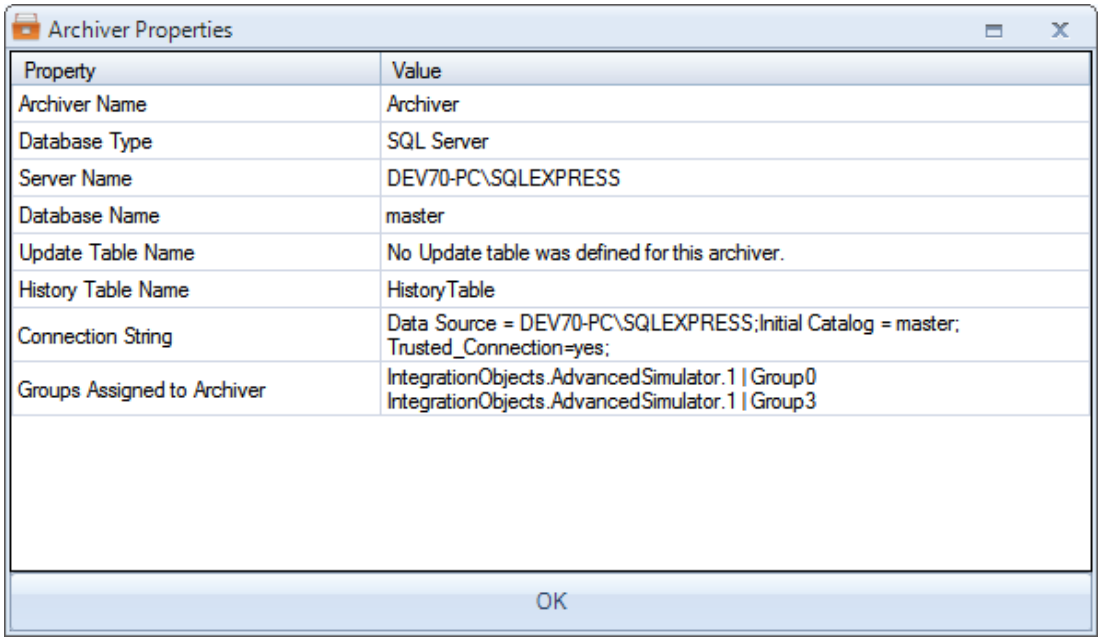


Figure 191: Archiver Properties Dialog

7. View Attributes Mapping

To view the attributes and columns mapping for the AE archiver, click **the View Attributes Mapping** context menu item and the following window will appear as illustrated in the figure below:

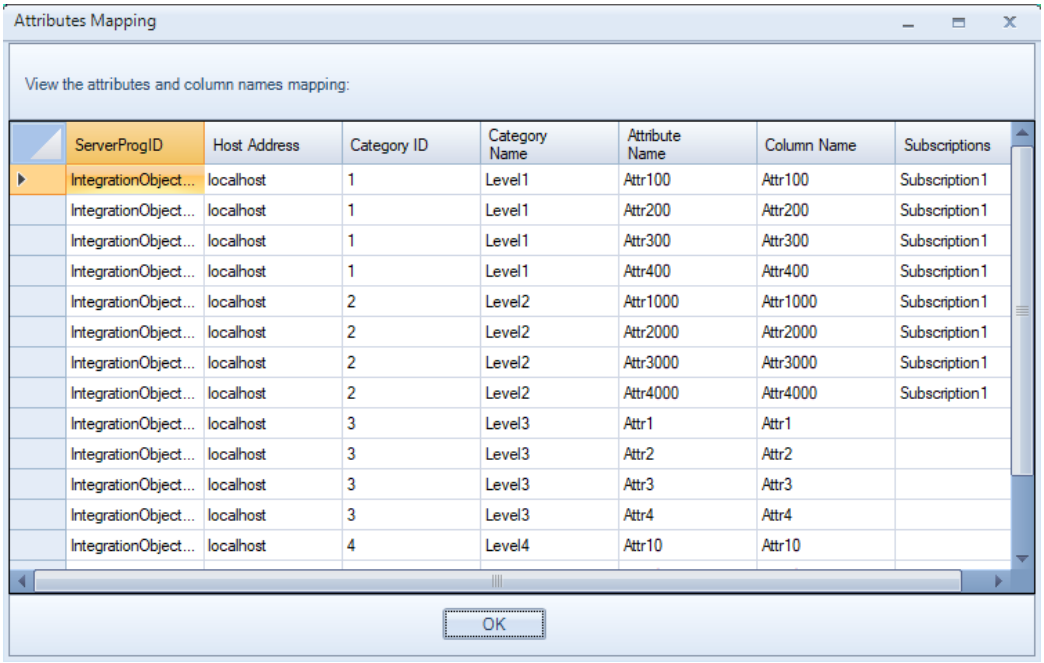


Figure 192: Attributes Mapping Dialog

The Subscriptions column indicates the names of the subscriptions where the attribute belongs in case it is selected from **Select Returned Attributes** in **AE Subscription Menu.**

8. Modify Table Columns

For AE Archivers, to add more columns, update column names or set a primary key to the table. Click the **Modify Table Columns** context menu item The window below will be prompted where you can check the wanted columns to be added.

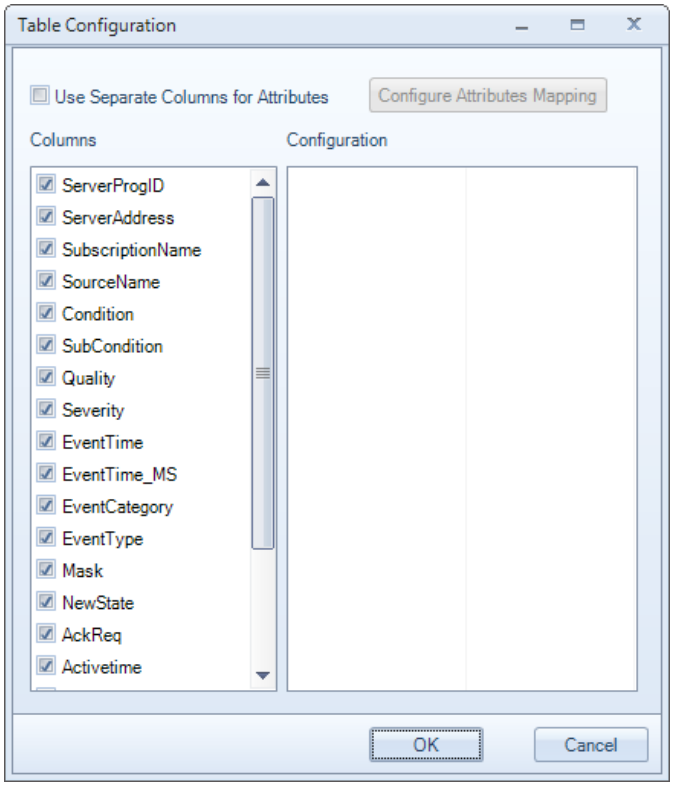


Figure 193: Table Configuration

To edit the column name in the Table Configuration window:

- Double click on the text in **Column** field available on the right side section.
- Enter the new name.
- Hit the Enter key.
- Click the **OK** button to save your configuration.

To update the primary key, check the **Is Primary Key** option available on the right side section.

To receive the list of OPC AE Attributes in separate columns with the Column Name of the database table that are mapped to, check "**Use Separate Columns for Attributes**". Otherwise the list of AE attributes is concatenated and saved in the column "**Attributes**".

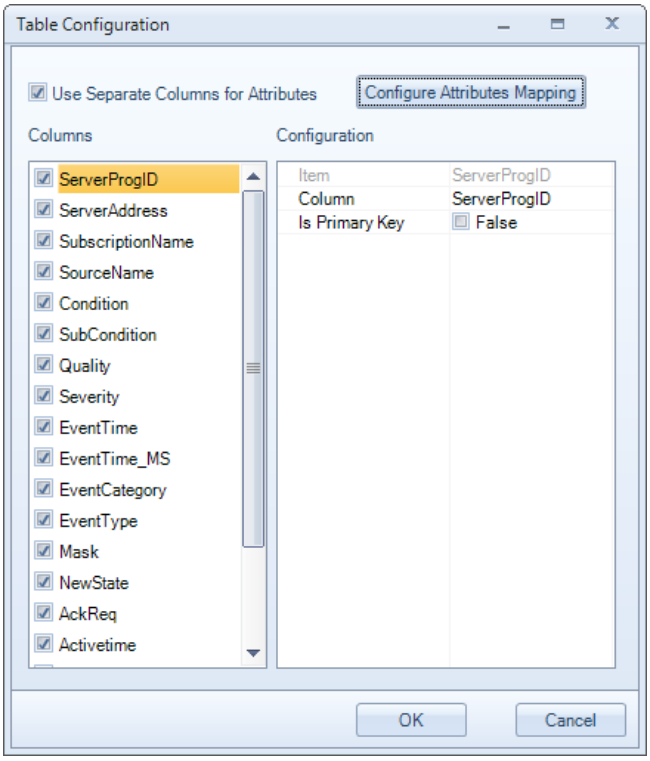


Figure 194: Use Separate Columns for Attributes

The list of fields to be used as the primary key must define a unique row for each alarm. Example: If the user uses the Source Name as a Primary Key only, this configuration will generate a database error that mentions that a duplicate value in Primary Key is detected.

In case of using MySQL database for the archiver, the length of list of fields to be used as the primary key should be limited. Otherwise, a database error may occur.

Click **Configure Attributes Mapping** button to map the table columns to the attributes and the window illustrated below will be prompted.

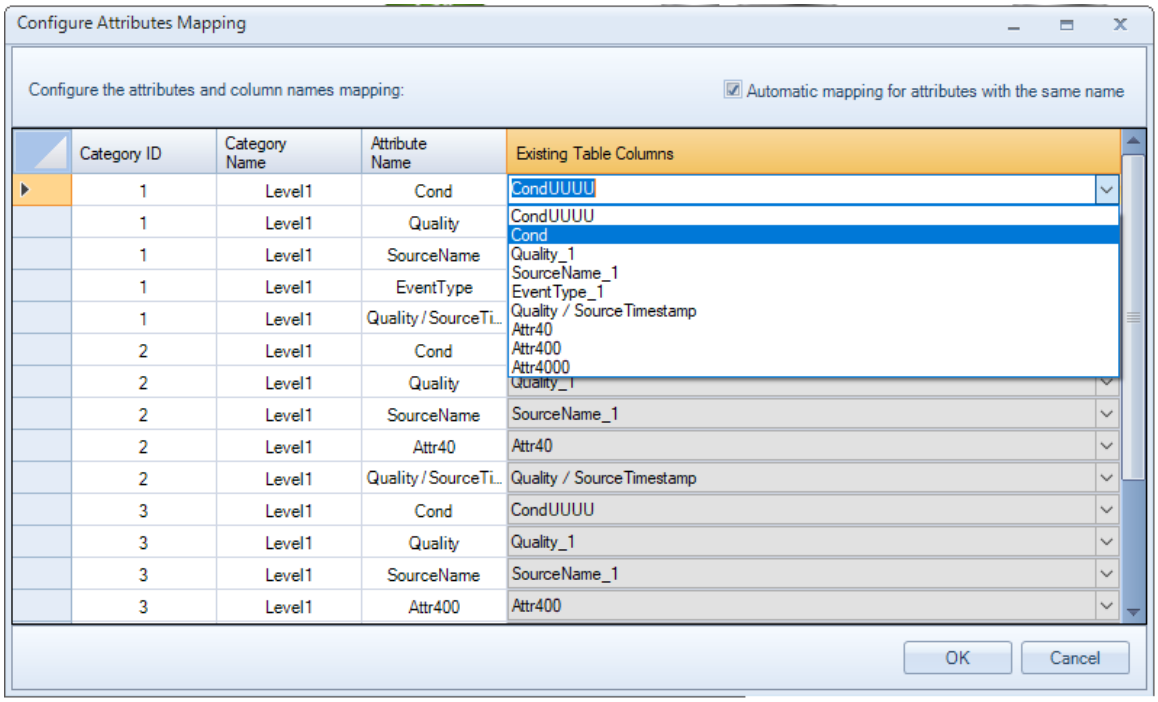


Figure 195: Select a Pre-Existing Column

The mapping is preconfigured in this window as follows:

- By default, the attributes are mapped with columns with the same names. If you confirm this default mapping and columns with same attribute names do not exist in the selected table, the missing columns will be added to the table.
- To modify a mapping, you need to select the column from the drop down list. This list includes the pre-existing table columns of the existing table as illustrated above. You can also add a new column by typing its name and selecting it.

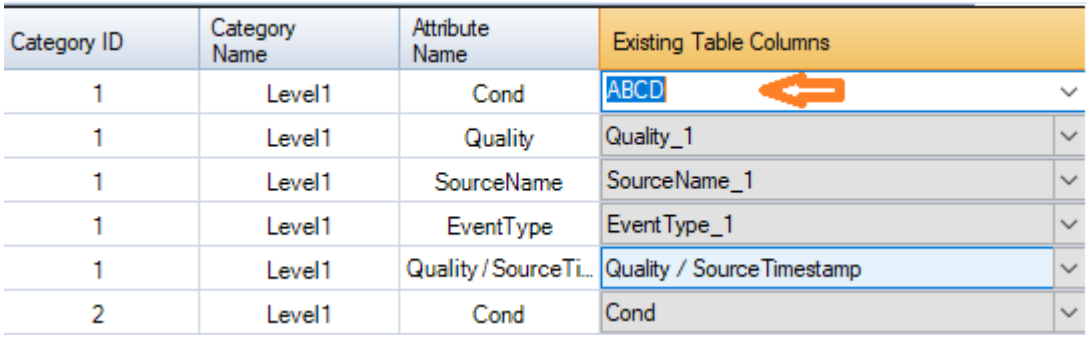


Figure 196: Enter a New Column Name

- The option "**Automatic mapping for attributes with the same name**" is checked by default. This option allows to automatically select the same column to attributes with the same name.

The **Automatic mapping for attributes with the same name** is useful in case you have the attributes with same name under different categories.

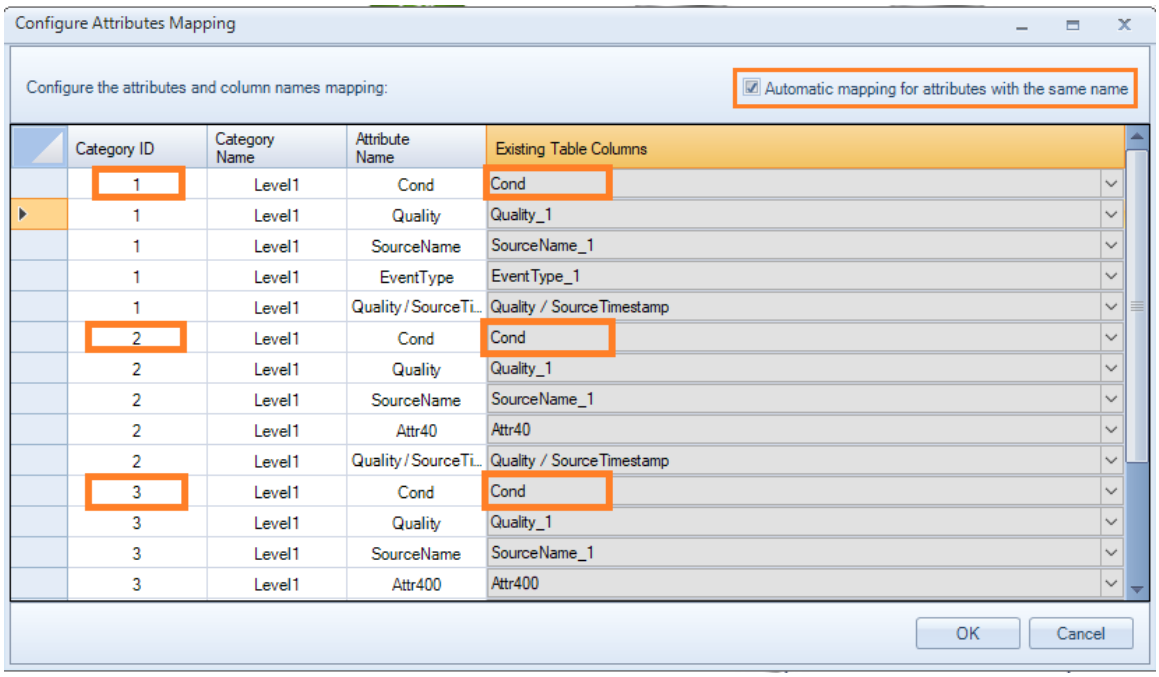


Figure 197: Automatic Mapping for Attributes with the Same Name

- Uncheck the **Automatic mapping for attributes with the same name** option if you need to modify the mapping of each attribute independently.

In case of an existing table, when you click **OK**, if any of the attributes columns are not available in the existing table, the following message box is displayed:

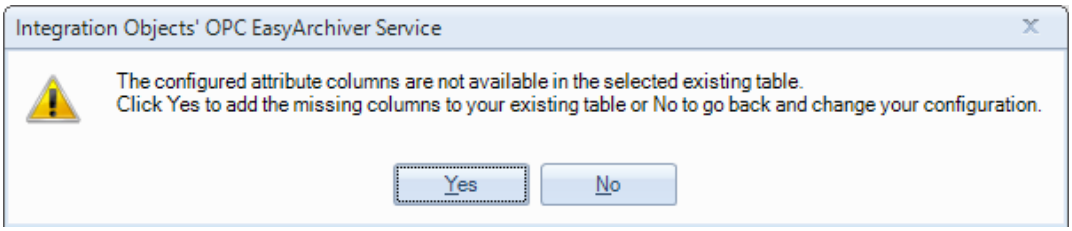


Figure 198: Add Missing Columns to the Existing Table

The OPC Easy Archiver will not make any changes unless you approve of the configuration changes.

When you click **OK**, if any of the server attributes are going to be changed, the following message box is displayed:

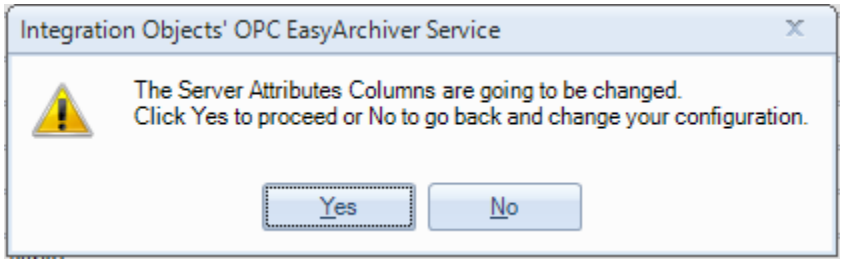


Figure 199: Change Server Attributes Columns

The OPC Easy Archiver will not make any further changes unless you approve of the configuration changes.

9. Manual Data Recovery

The OPC EasyArchiver allows you to manually execute a set of SQL queries from a backup file.

To choose the backup file and start the data recovery manually, go to **Manual Data Recovery** menu item and click **Start**.

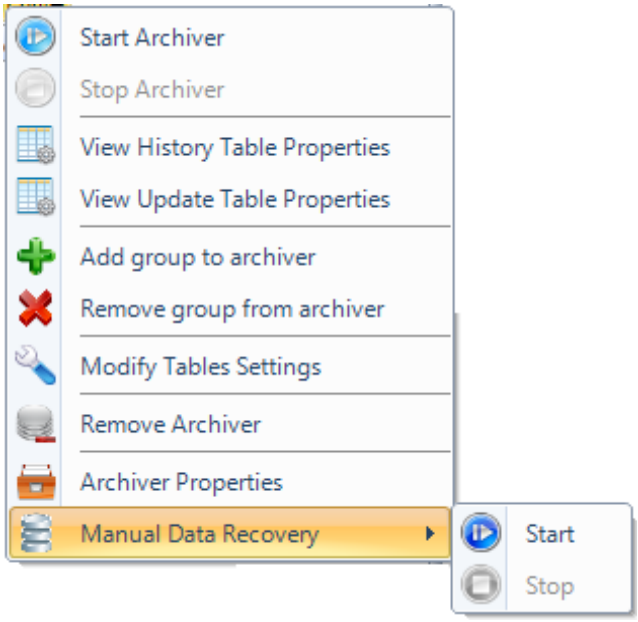


Figure 200: Manual Data Recovery

The Data Recovery will be automatically stopped once all the queries in the backup file are executed. You can also stop it manually using the **Stop** menu item.

10. Configure Archiver for an OPC Group

The OPC EasyArchiver allows you to configure a DA archiver for each OPC Group. You can also choose the same archiver for many groups.

To configure an archiver for a selected OPC group, right click on the selected group node, and choose the **Configure Archiver** context menu item.

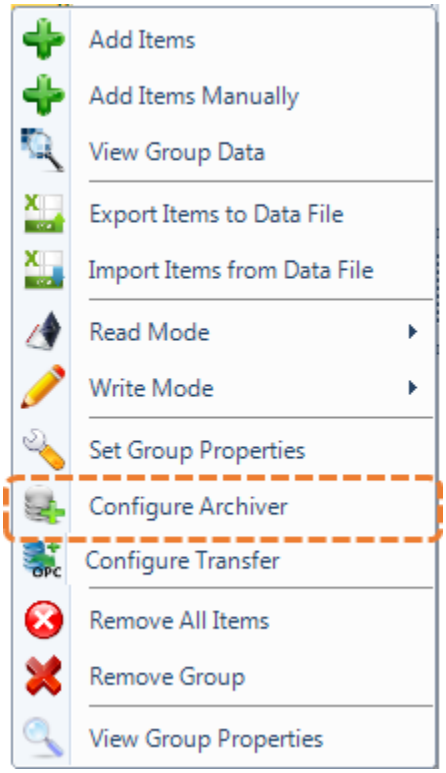


Figure 201: Configure Archiver for an OPC DA Group

If you have already configured archivers, the following window will appear:

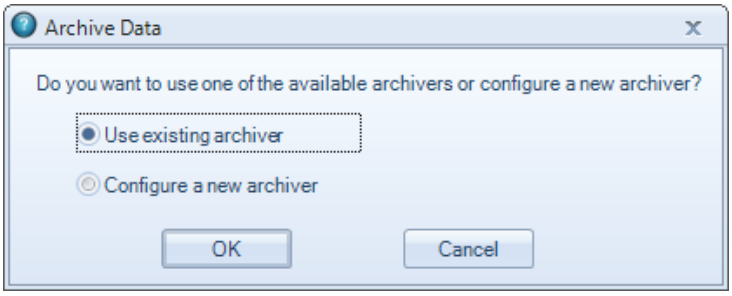


Figure 202: Select DA Archiver Option

You can choose to configure a new archiver and the new archiver will be added to the OPC group and will then appear in the archivers tree view.

If you choose to use an existing archiver, the following window will appear:

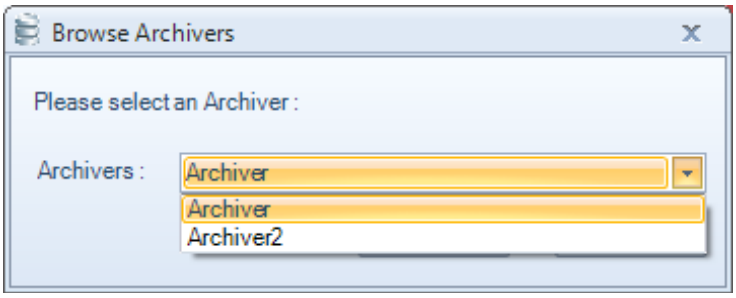


Figure 203: Browse Available Archivers

Select an archiver from the list of available ones and click the **OK** button.

11. Configure Archiver for an OPC HDA Server

The OPC EasyArchiver allows you to configure a HDA archiver for each OPC HDA Server. You can also choose the same archiver for multiple servers.

To configure an archiver for a selected OPC HDA Server, right click on the selected server node, and choose the **Configure Archiver** context menu item.

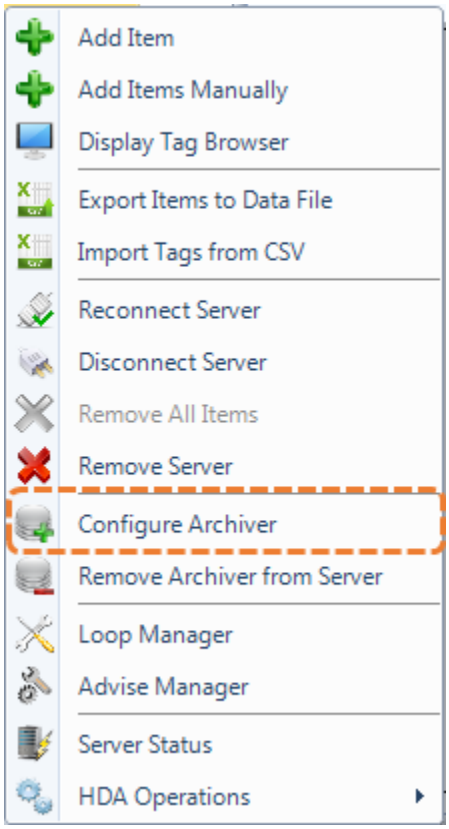


Figure 204: Configure Archiver for an OPC HDA Server

If you have already configured archivers, the following window will appear:

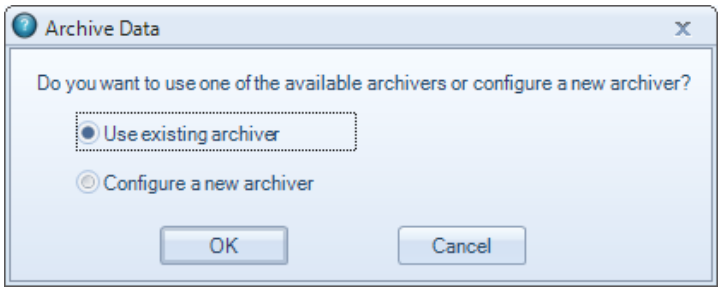


Figure 205: Select HDA Archiver Option

If you choose to use an existing archiver, the following window will appear:

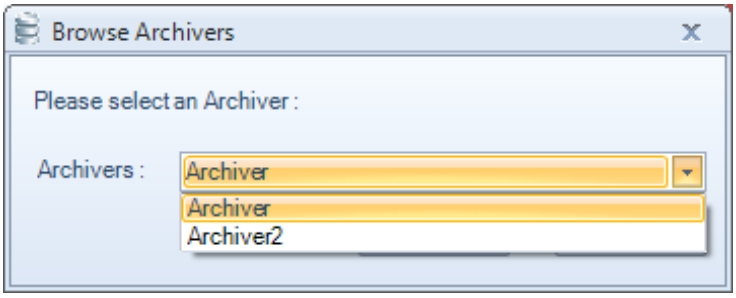


Figure 206: Browse Available HDA Archivers

Select an archiver from the list of available ones and click the **OK** button.

12. Configure Archiver for an OPC Event subscription

The OPC EasyArchiver allows you to configure an AE archiver for each event subscription. You can also choose the same archiver for more than one event subscription.

To configure an archiver for a selected OPC Event subscription, right click on the selected Event subscription node, and choose the **Configure Archiver** context menu item.

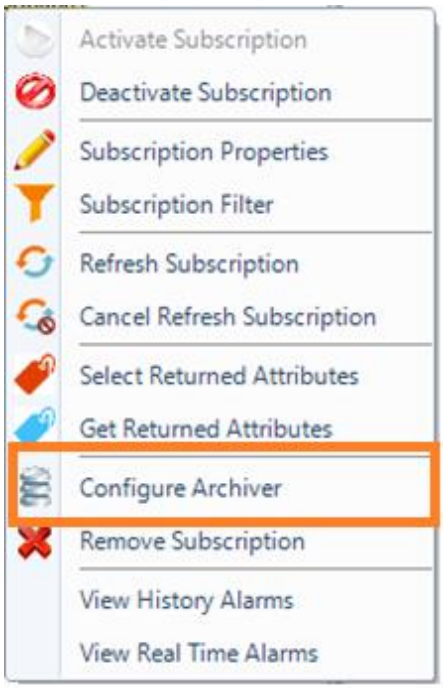


Figure 207: Configure Archiver for an OPC AE Event Subscription

If you have already configured archivers, the following window will appear:

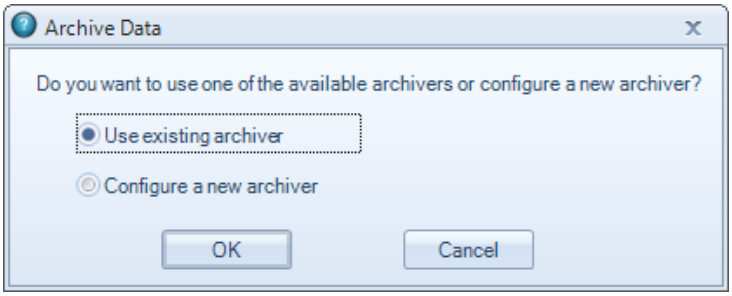


Figure 208: Select AE Archiver Option

You can choose to configure a new archiver and the new archiver will be assigned to the event subscription and will then appear in the archivers tree view.

If you choose to use an existing archiver, the following window will appear:

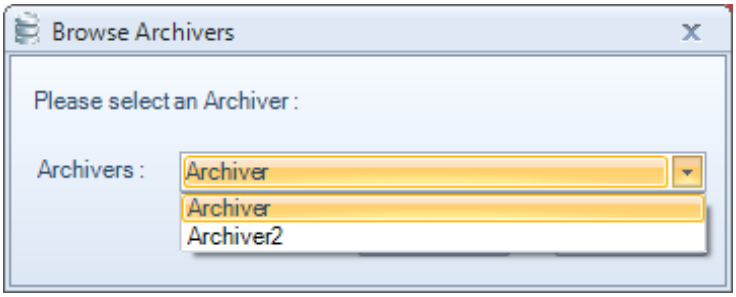


Figure 209: Browse Available Archivers

Select an archiver from the list of available ones and click the **OK** button.

DATABASE TO OPC TRANSFER FUNCTIONALITIES

The OPC EasyArchiver provides the ability to transfer data from following types of database to any connected OPC DA server:

- SQL Server databases.
- Oracle databases.
- MS Access databases.
- MySQL databases.
- PostgreSQL databases.
- SQL-like Databases using OLEDB connection provider.
- SQL-like Databases using ODBC connection provider.

This transfer consists in periodically reading new data values from the database tables and performing OPC write operations to the connected OPC Servers.
In this section, we will describe the necessary steps to configure one or more transfers.

Figure 210: DB to OPC Transfer Menu

1. Add New Transfer

To add a new transfer, click the **New** button located in the DB to OPC Transfer menu and the following wizard will appear:

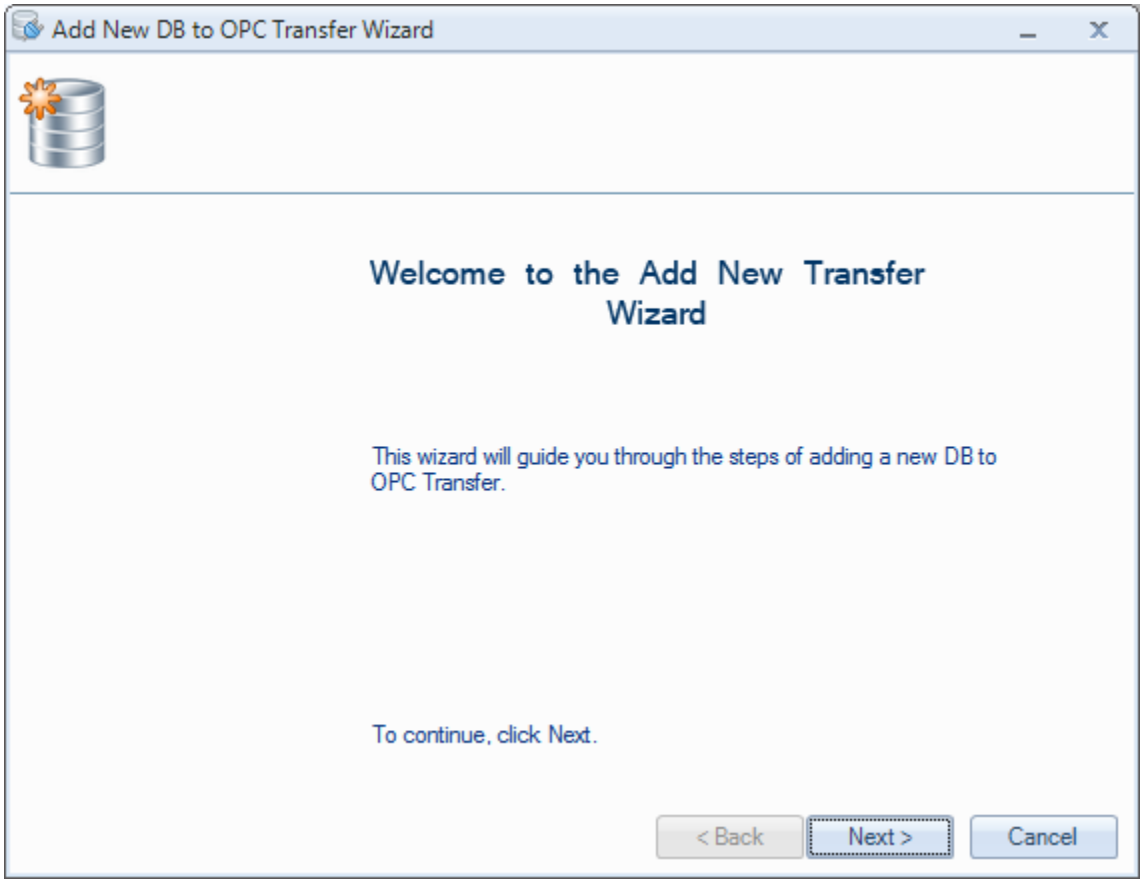


Figure 211: Add New DB to OPC Transfer Wizard

Step 1: Click the **Next** button. The following window will be displayed:

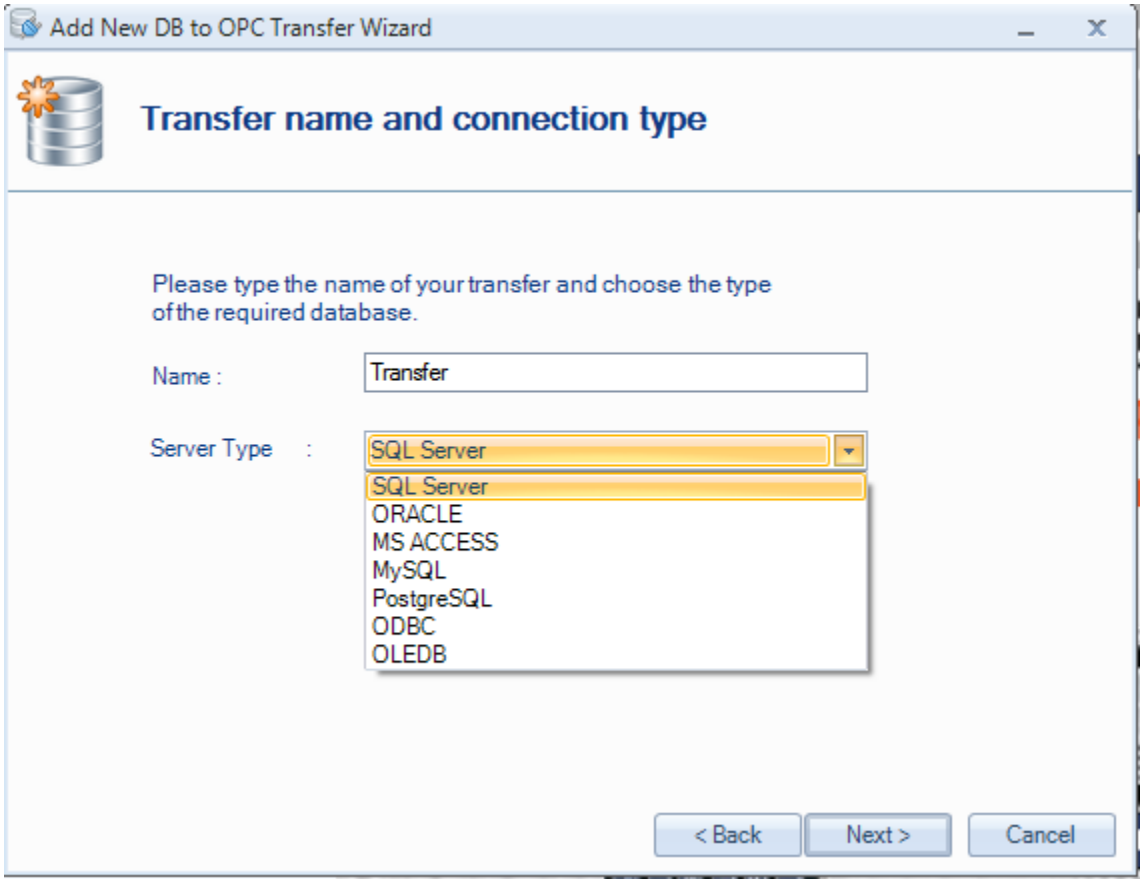


Figure 212: Select Database Type

Depending on the selected features during the installation, you can read data from the following database types:

- SQL Server database.
- Oracle database.
- MS Access database.
- MySQL database.
- PostgreSQL.
- ODBC compliant database.
- And OLEDB compliant database.

Step 2: Type a name to identify your transfer and select the database type. Click the **Next** button.

Step 3:
You will then be prompted to configure your connection string depending in the selected database type. You can refer to the archiver functionalities section for more details about this step as the configuration parameters are the same.

For example, the following window will be displayed for Oracle database type:

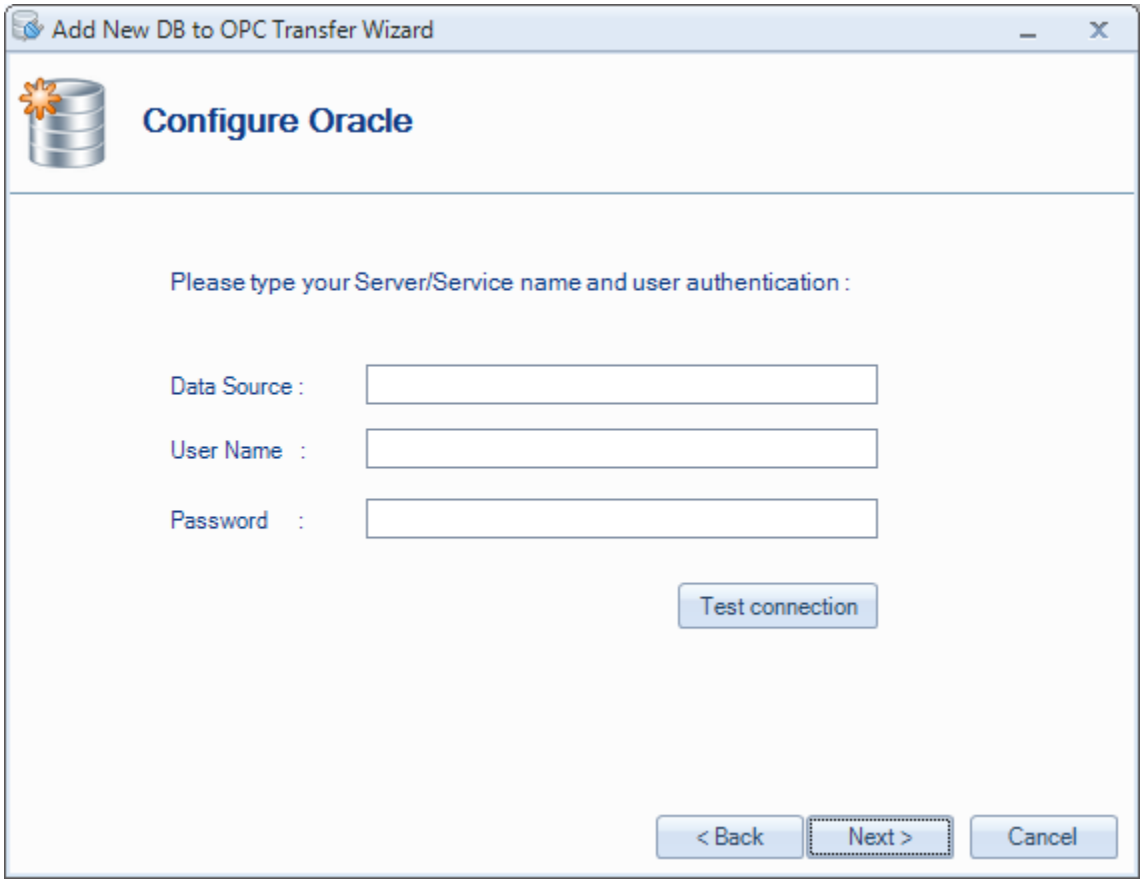


Figure 213: Oracle Connection Dialog

Parameter	Description
Data Source	The Oracle data source name.
User Name	The user account login.
Password	The user account password.
Test Connection	Test if the connection to the Oracle database using the entered credentials succeed.

Table 35: Oracle Configuration Parameters

Step 4: Once the database connection parameters are configured, click the **Next** button and the following window will be displayed:

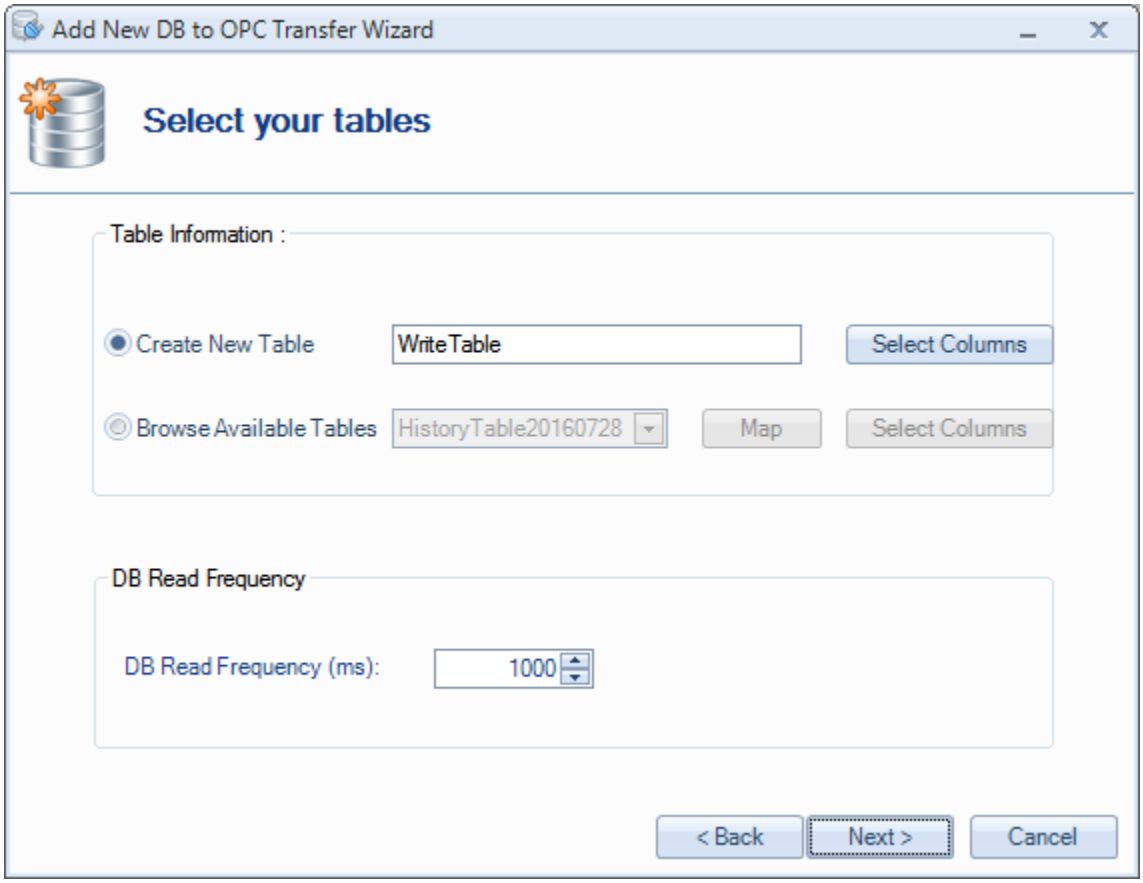


Figure 214: Browse OPC DA Tables Dialog

The OPC EasyArchiver offers the possibility to read the data from an existing table or to create new one.

- **Create New Table**: If you choose this option, OPC EasyArchiver will create a new write table into the selected database:

  Write Table: The write table is used to store the data to be transferred to the OPC Server. By default, the created table has the following columns:
  - ItemID: The OPC item name.
  - ItemValue: The OPC item value.
  - Started: The status of the transfer. Initially, this flag should be set to 0 to indicate to the OPC EasyArchiver that the row is not processed yet.

  For Cassandra database, the write table will contain also a column with the type "uuid" that represents the primary key of the table.

  To add more columns to the table, click on **Select Columns** and check the columns to be added. You can add the following properties:

- ItemTimestamp: The timestamp of the new data.
- ServerProgID:The OPC server progID.
- ItemQuality: The quality of the data value.
- ServerAddress: The OPC server host IP address.
- ItemDataType: The type of the OPC item data.

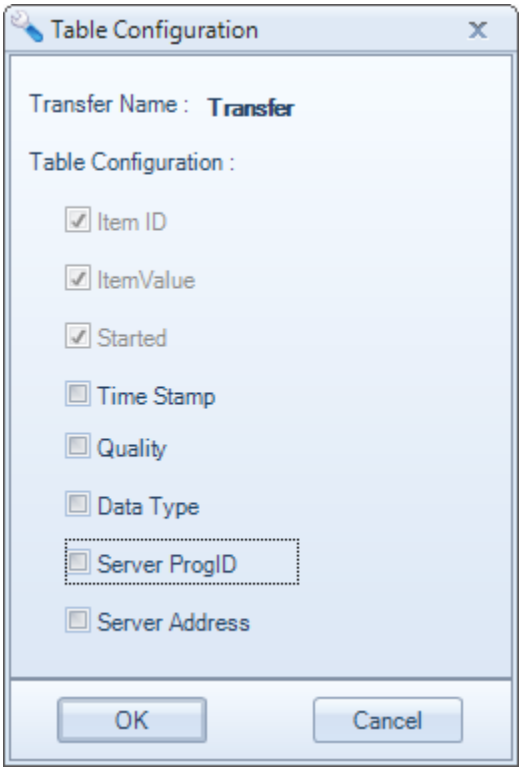


Figure 215: Table Configuration Window

Note that the values of the "Started" column need be initially set to 0. During the database scan, the OPC EasyArchiver reads the "Started" flag. In case it is set to "0", it writes the related data value to the related OPC server and sets the flag to the result of the item OPC write operation such as "Write Item Value Succeeded", "Write Item Value Failed". Then, this data will be ignored in the next scan loop.

Note that the Write Mode used by the transfer is the write mode defined in the related group.

- **Browse Available Tables**: In this option, the OPC EasyArchiver browses the list of available tables under the selected database as shown in the figure below:

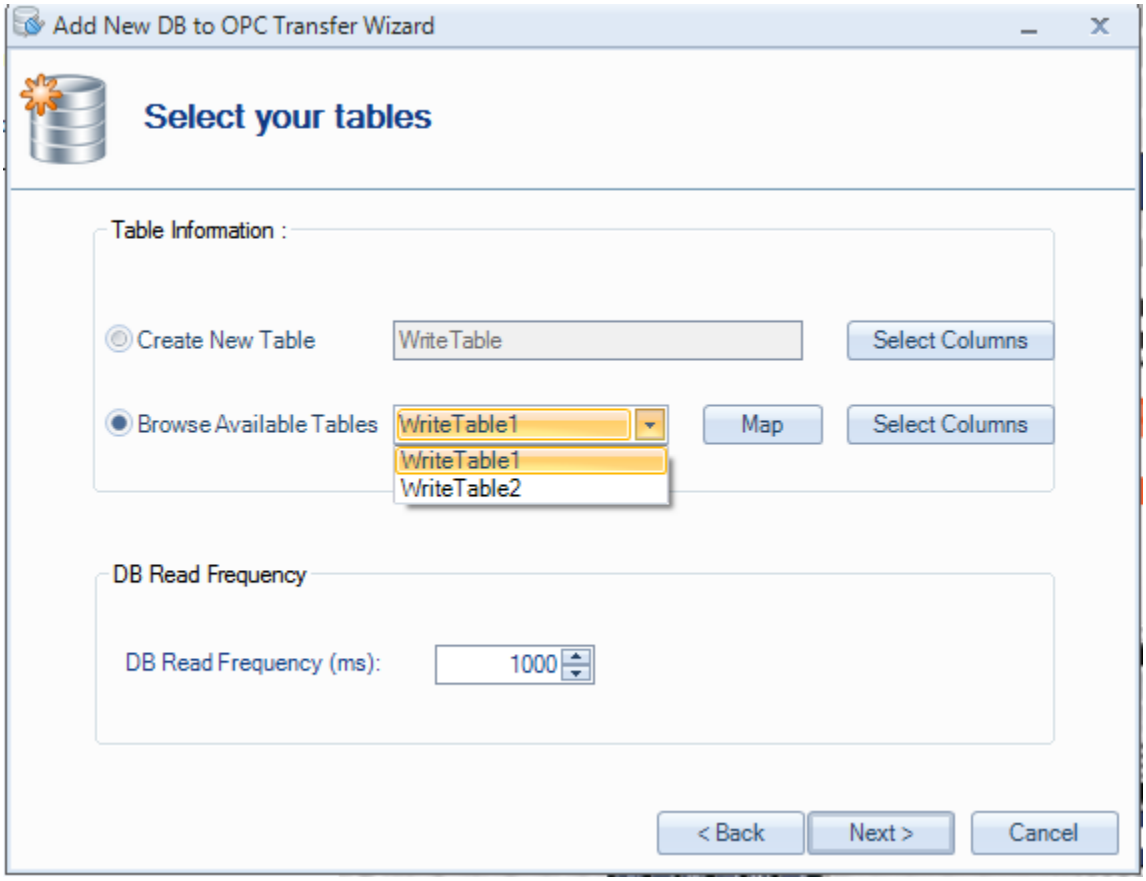


Figure 216: Browse Available Tables

The **DB Read Frequency** parameter is the time frequency in milliseconds to be used to check for new data in the database.

After selecting an existing table, you will need to map fields of the tables. Click the **Map** button to proceed:

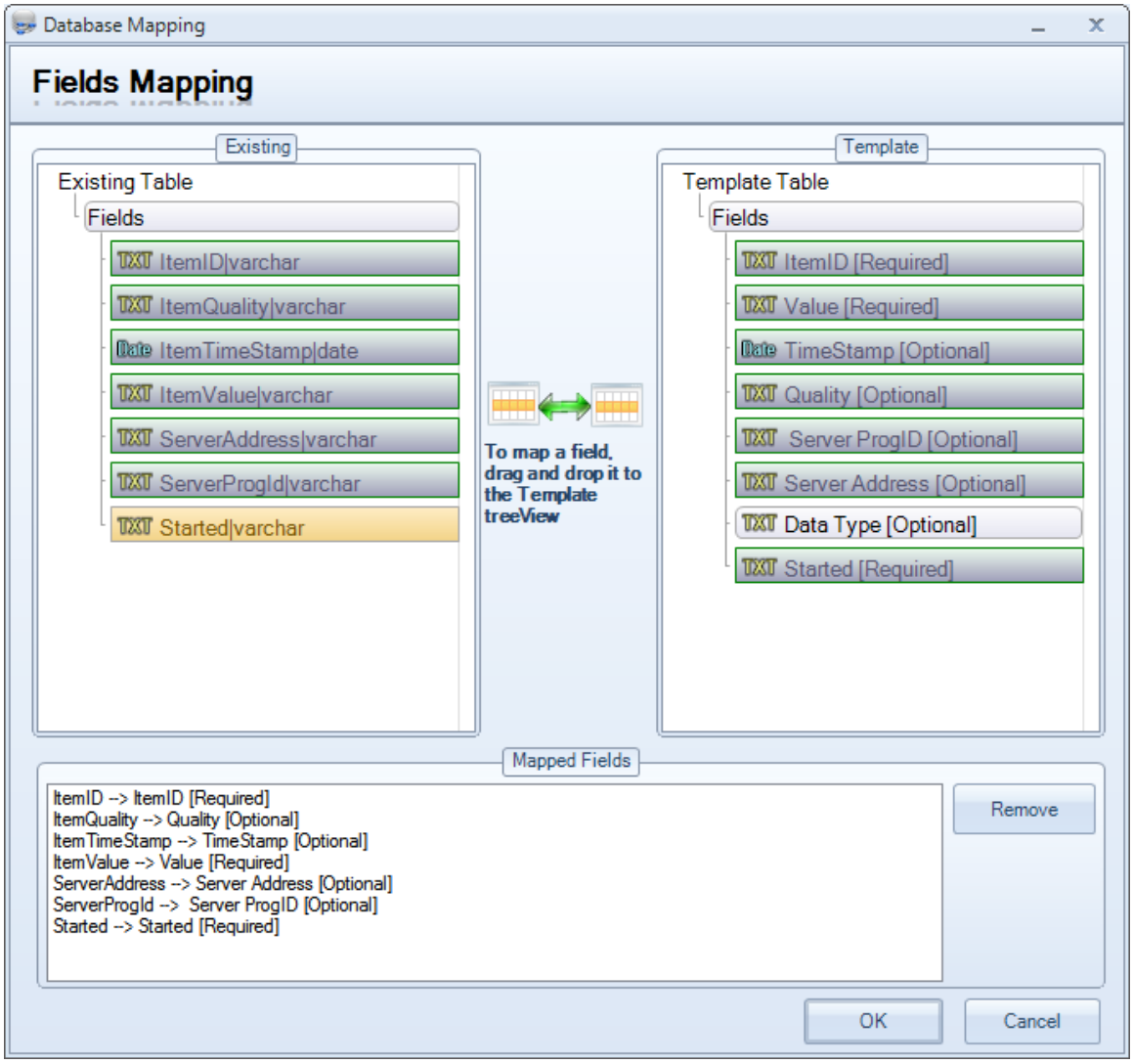


Figure 217: Fields Mapping

In this dialog, you have to defined the association between the data and the columns of the selected table. The Template Table is the default table of the transfer in the OPC EasyArchiver. The existing table is the table previously selected. To complete the mapping, drag and drop the field from the existing table to the corresponding one in the template table.

Mapped fields will appear in the text zone at the bottom of the dialog screen. You can select a mapped item and click the **Remove** button in order to cancel the mapping operation.

Once done, click the **OK** button. The next step is to select one or more groups to assign to the transfer:

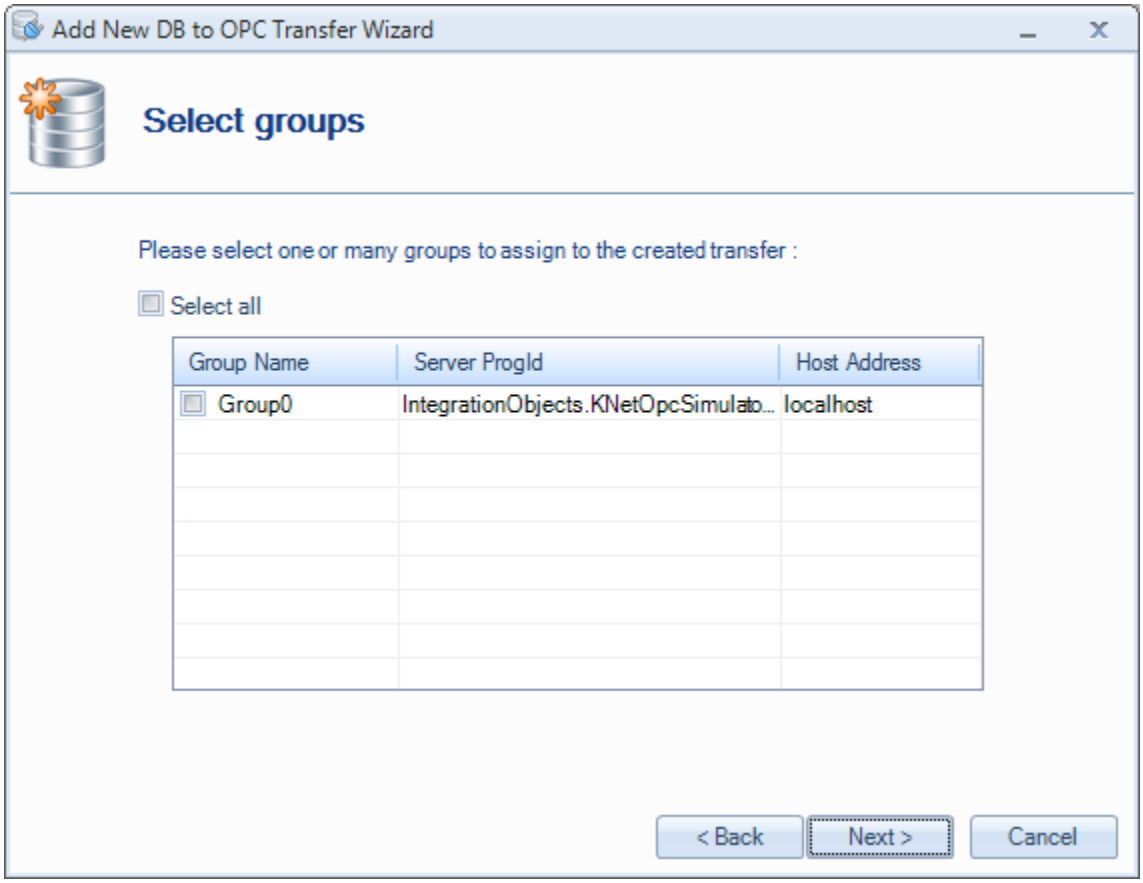


Figure 218: Assign Groups for the Transfer

Step 5: Click the **Next** button to proceed and the following window will appear. This window contains a summary of the transfer configuration:

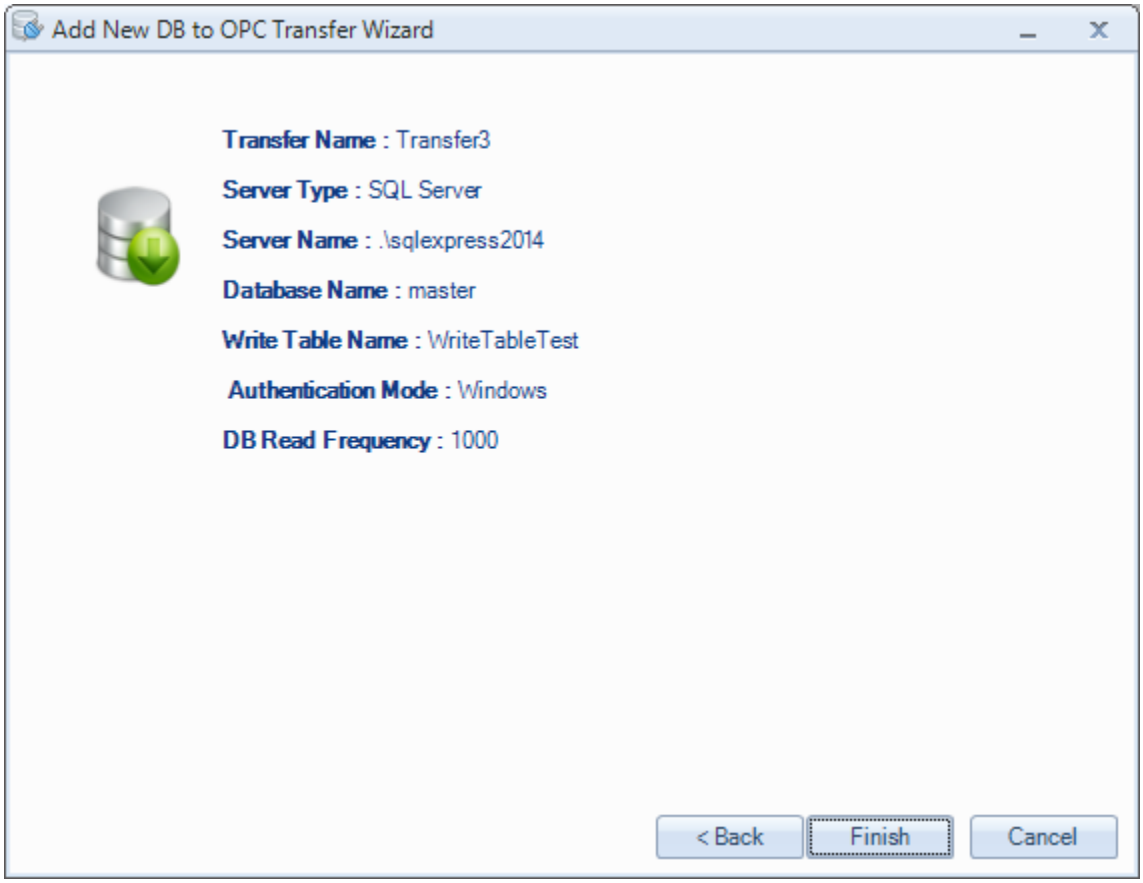


Figure 219: Summary Wizard Page

Click the **Finish** button. The new transfer will be added to the tree view of the **Transfers** tab as shown below:

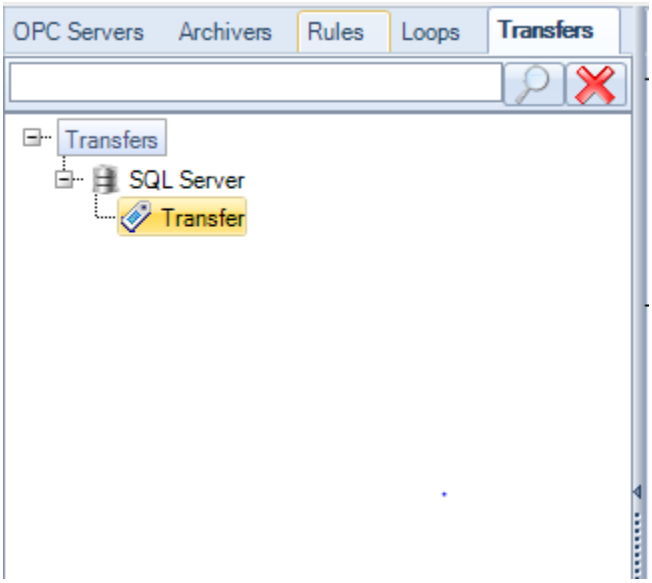


Figure 220: Transfers Tree View

When you right click on a transfer node, you will get the following menu:

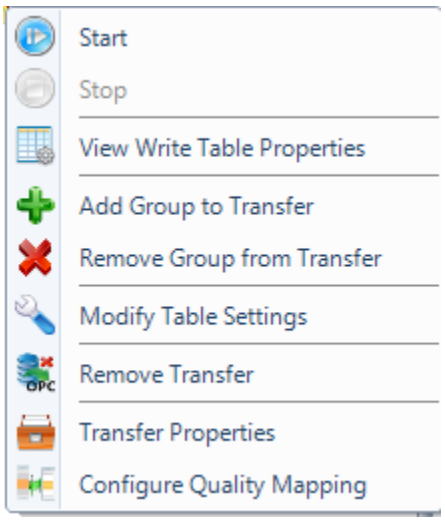


Figure 221: Transfer Menu

2. Start Transfer

To start a transfer, select a transfer in the transfers list and click the **Start** button from the transfer menu bar or right click on the transfer node and select **Start Transfer** from the displayed menu.

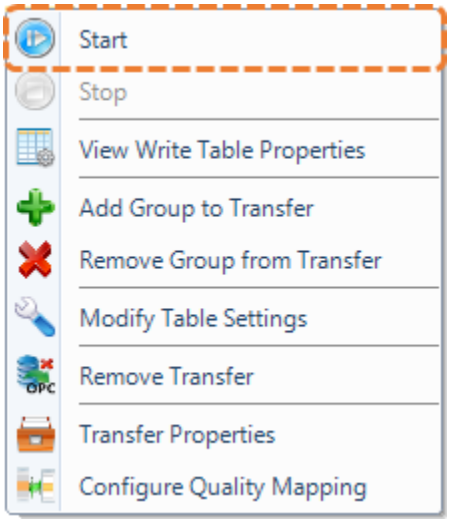


Figure 222: Start Transfer

3. Stop Transfer

To stop the Transfer, click the **Stop** button in the transfer menu bar or right click on the transfer node and select **Stop Transfer** from the displayed menu.

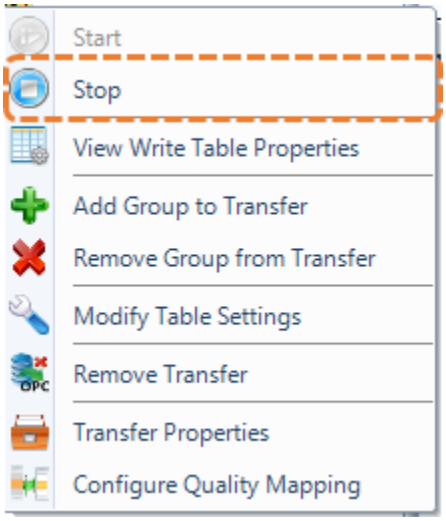


Figure 223: Stop Transfer

4. Remove Transfer

To remove a transfer, select the transfer node from the tree view of transfers and click the **Remove** button in the ribbon bar.

You can also use the **Remove Transfer** context menu item as illustrated in the figure below:

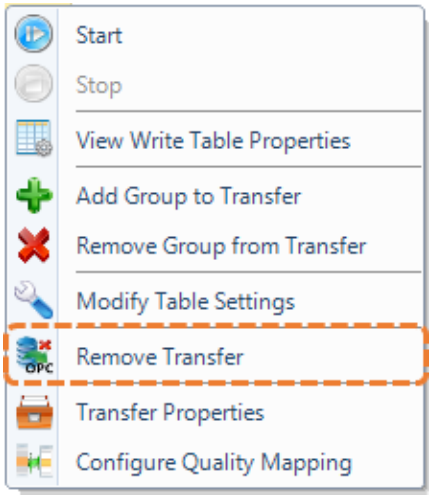


Figure 224: Remove Transfer

5. Modify Tables Settings

Click the **Modify Table Settings** context menu item, a screen dialog similar to the following will then be opened:

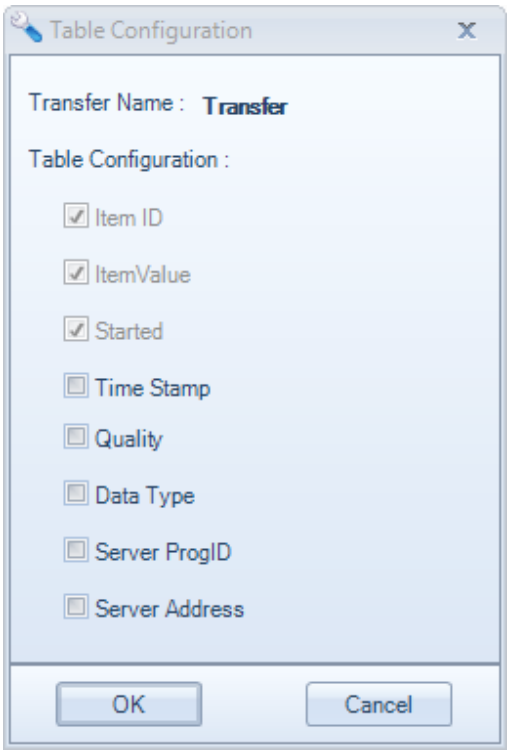


Figure 225: Table Configuration Dialog

Note that when you choose to create new write table, only ItemID, ItemValue and Started columns are enabled by default.

You can check in the above dialog the items' properties you want to read when the transfer starts such as the Server ProgID or the Item's Data Type.
Then, click the **OK** button to confirm.

Another way to open the above dialog is to select the requested transfer and click the **Table Configuration** button available in the transfer menu.

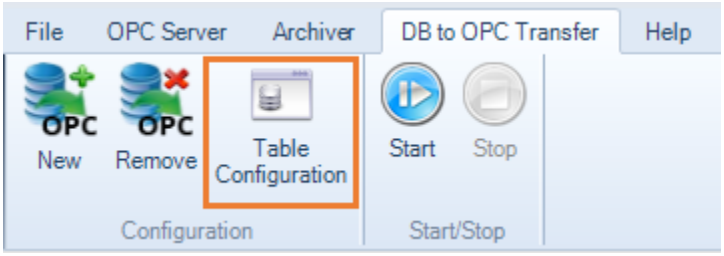


Figure 226: Table Configuration Menu

6. View Transfer Properties

To view the transfer properties, click the **Transfer Properties** context menu item and the following window will appear:

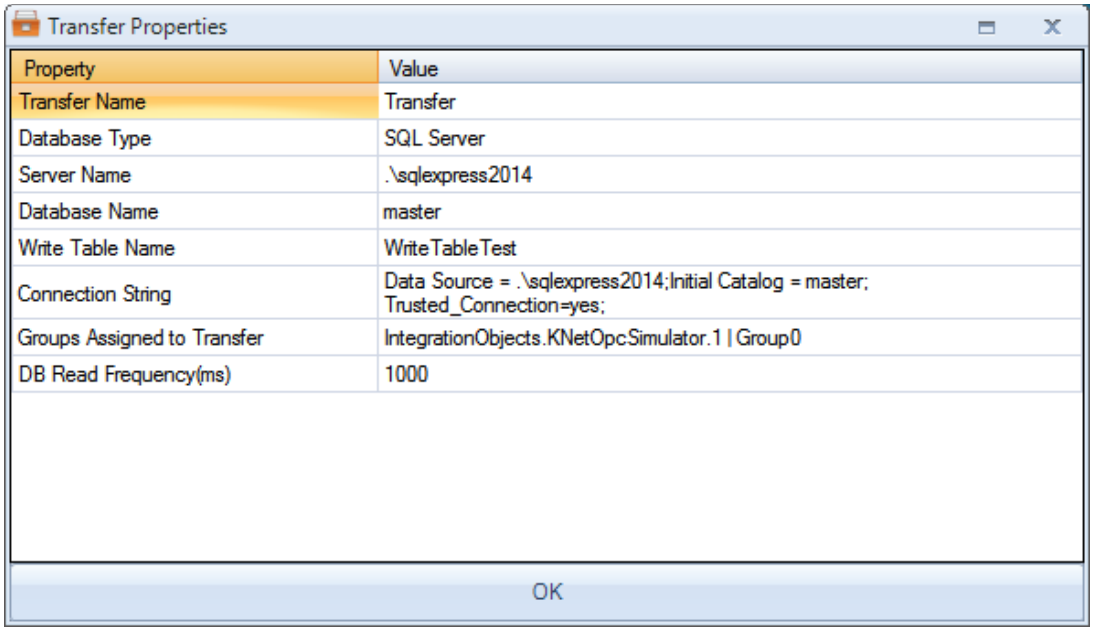


Figure 227: Transfer Properties Dialog

7. Configure Transfer for an OPC Group

The OPC EasyArchiver allows you to configure a transfer for each OPC Group. You can choose the same transfer for many groups.

To configure a transfer for a selected OPC group, right click on the selected group node, and choose the **Configure Transfer** context menu item:

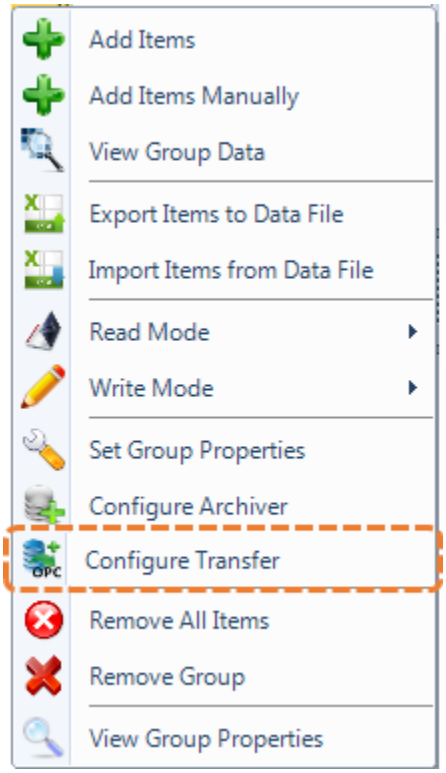


Figure 228: Configure Transfer for an OPC DA Group

If you have already configured transfers, the following window will appear:

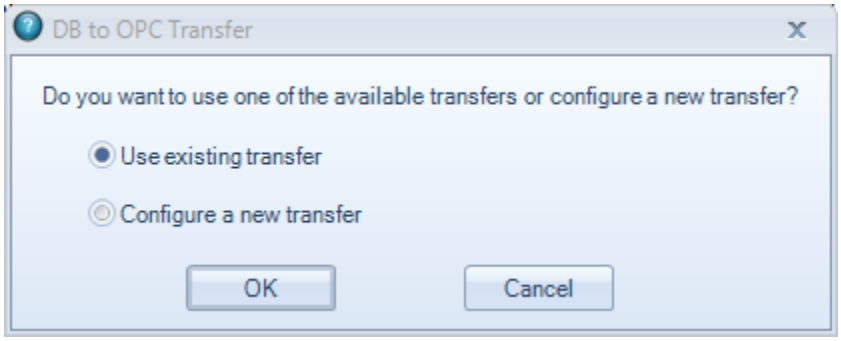


Figure 229: Select Transfer Option

You can choose to configure a new transfer and the new transfer will be added to the OPC group and to the transfers tree view.
If you choose to use an existing transfer, the following window will appear:

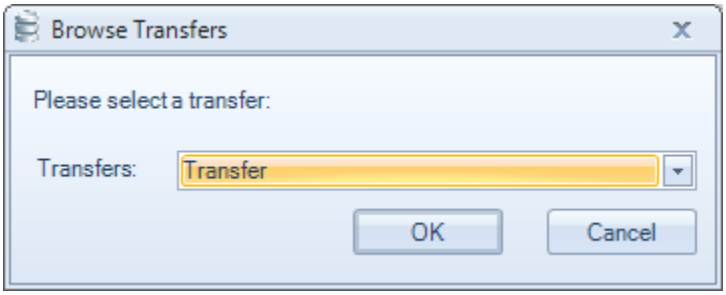


Figure 230: Browse Available Transfers

Select a transfer from the list of available ones and click the **OK** button.

8. Configure Quality Mapping

If your write table does not use the default OPC Qualities, you can map your custom qualities to the standard OPC ones.
To configure your own qualities values, click the **Configure Quality Mapping** context menu item:

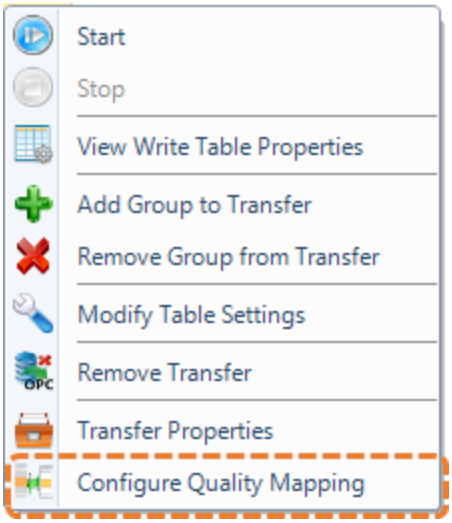


Figure 231: Configure Quality Mapping

The following configuration window will be prompted:

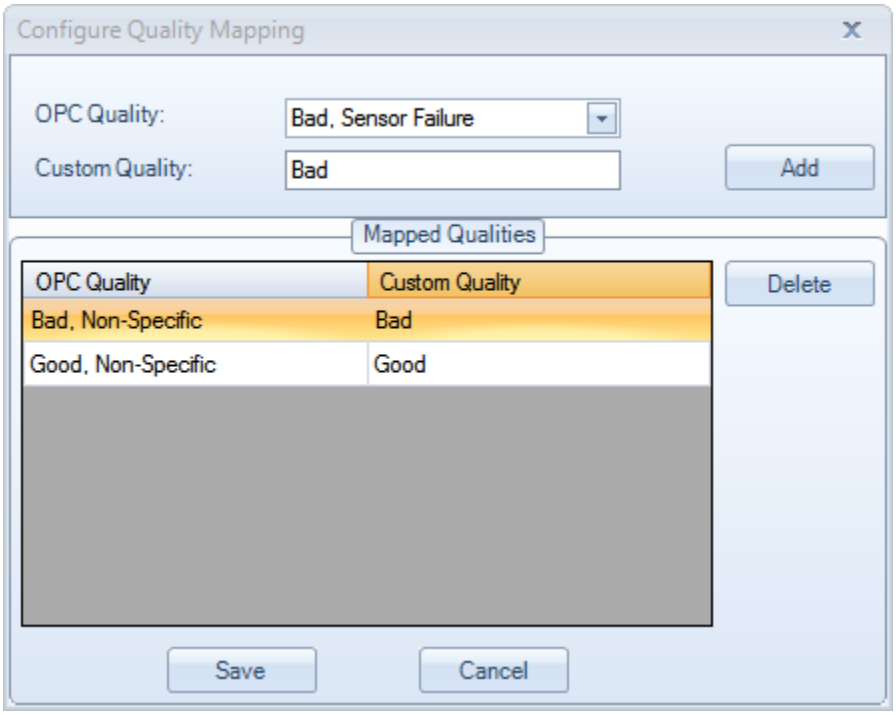


Figure 232: Configure Quality Mapping Window

Enter your custom quality in the Custom Quality field, map it to the standard OPC quality using the OPC Quality drop down list and then click the **Add** button.
The configured mapping will be displayed in the list at the bottom of the window. You can use the **Delete** button to remove any misconfiguration and the **Save** button to confirm your configuration when you are done.

RULES CONFIGURATION MANAGEMENT

Using the OPC EasyArchiver, you can configure the list of critical OPC DA items to supervise by setting rules and planning the actions to be undertaken when these rules become valid.

The rules configuration manager module helps you to supervise your critical devices. If you want to control one or a combination of tag values, you can set rules related to these tags. The OPC EasyArchiver will evaluate the existing rules with the tag values updated in real-time and take the configured action when necessary.

1. Add New Rule

To add new rule, click the **Rules Management** button available in the archiver menu. The following wizard will be prompted:

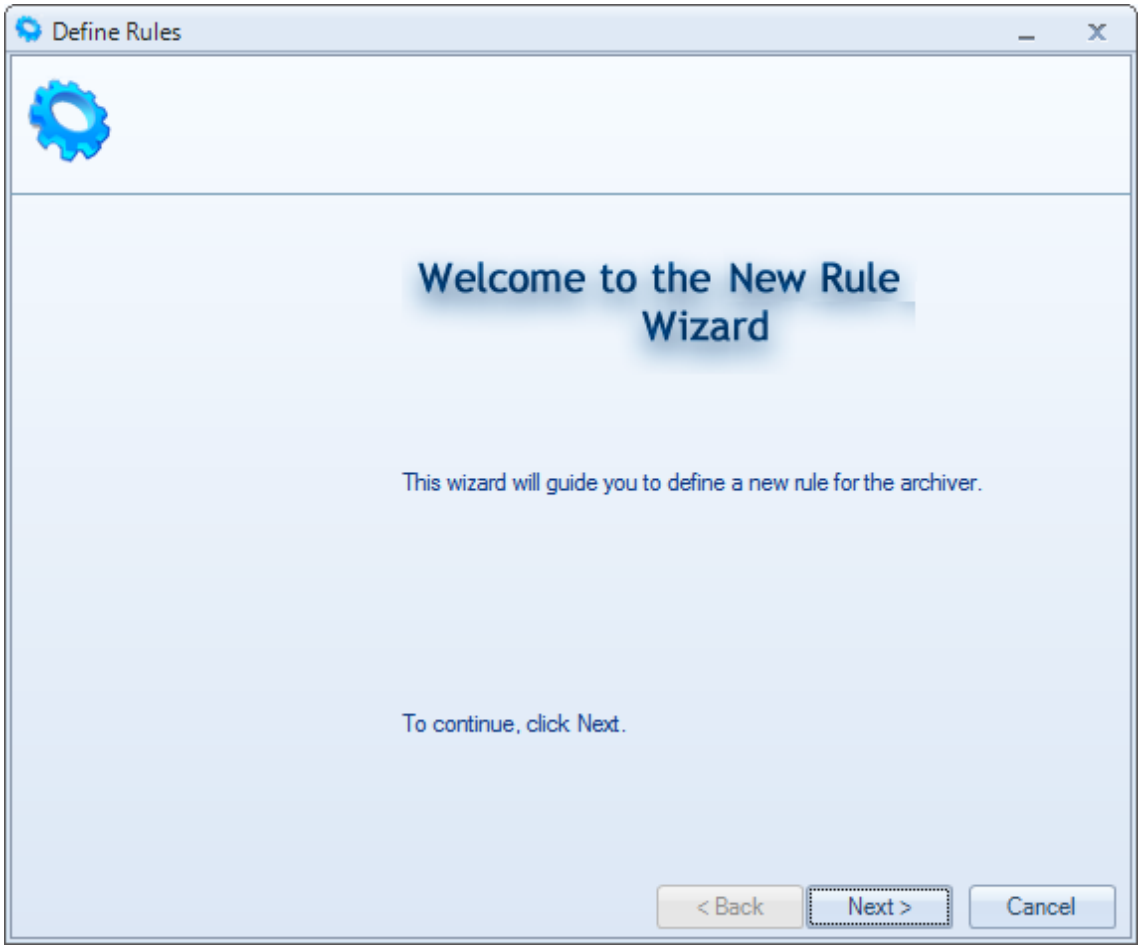


Figure 233: Add New Rule Wizard

Managing rules consists in managing conditions and actions.

1.1. Condition Management

- Step 1: Click the **Next** button, the following window will appear:

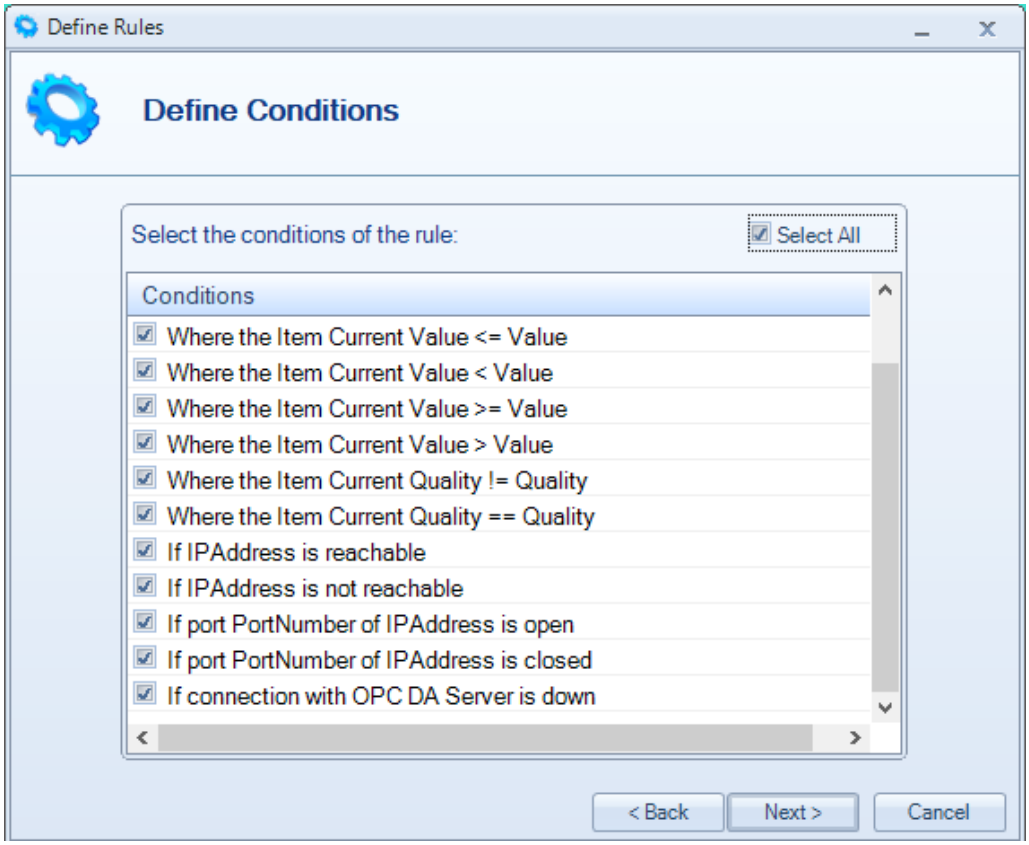


Figure 234: Conditions List Dialog

As you can see in the figure above, you can monitor:

- The current value of the OPC DA item:

Data Type	Operator
VT_I2	== <= >= < > !=
VT_ARRAY | VT_I2	== !=
VT_I4	== <= >= < > !=
VT_ARRAY | VT_I4	==

	!=
VT_R4	== <= >= < > !=
VT_ARRAY | VT_R4	== !=
VT_R8	== <= >= < > !=
VT_ARRAY | VT_R8	== !=
VT_BSTR	== !=
VT_ARRAY | VT_BSTR	== !=
VT_I1	== <= >= < > !=
VT_ARRAY | VT_I1	== !=
VT_UI1	== <= >= < > !=
VT_ARRAY | VT_UI1	== !=
VT_DATE	== <= >= < > !=

VT_ARRAY | VT_DATE	== !=
VT_UI2	== <= >= < > !=
VT_ARRAY | VT_UI2	== !=
VT_UI4	== <= >= < > !=
VT_ARRAY | VT_UI4	== !=
VT_INT	== <= >= < > !=
VT_ARRAY | VT_INT	== !=
VT_UINT	== <= >= < > !=
VT_ARRAY | VT_UINT	== !=
VT_BOOL	== !=
VT_ARRAY | VT_BOOL	== !=
VT_CY	== <= >= < >

	!=
VT_ARRAY|VT_CY	**==** **!=**

Table 36: Data Types & Available Conditions

- The current quality of the OPC DA item:
  For the quality, the user can use two operator types: == or ! =.
  The following is the list of available quality descriptions:
    - Bad; Non-Specific; Non-Specific.
    - Bad; Non-Specific; Non-Limited.
    - Bad; Non-Connected; Non-Specific.
    - Bad; Non-Connected; Non-Limited.
    - Good; Non-Specific; Non-Specific.
    - Good; Non-Specific; Non-Limited.
    - Good; Non-Connected; Non-Specific.
    - Good; Non-Connected; Non-Limited.

- The availability of a remote machine or a communication link using an IP address and a port number.
- The availability of communications with an OPC DA Server.

- Step 2: Select the conditions of your rule and then Click the **Next** button. The following window will appear:

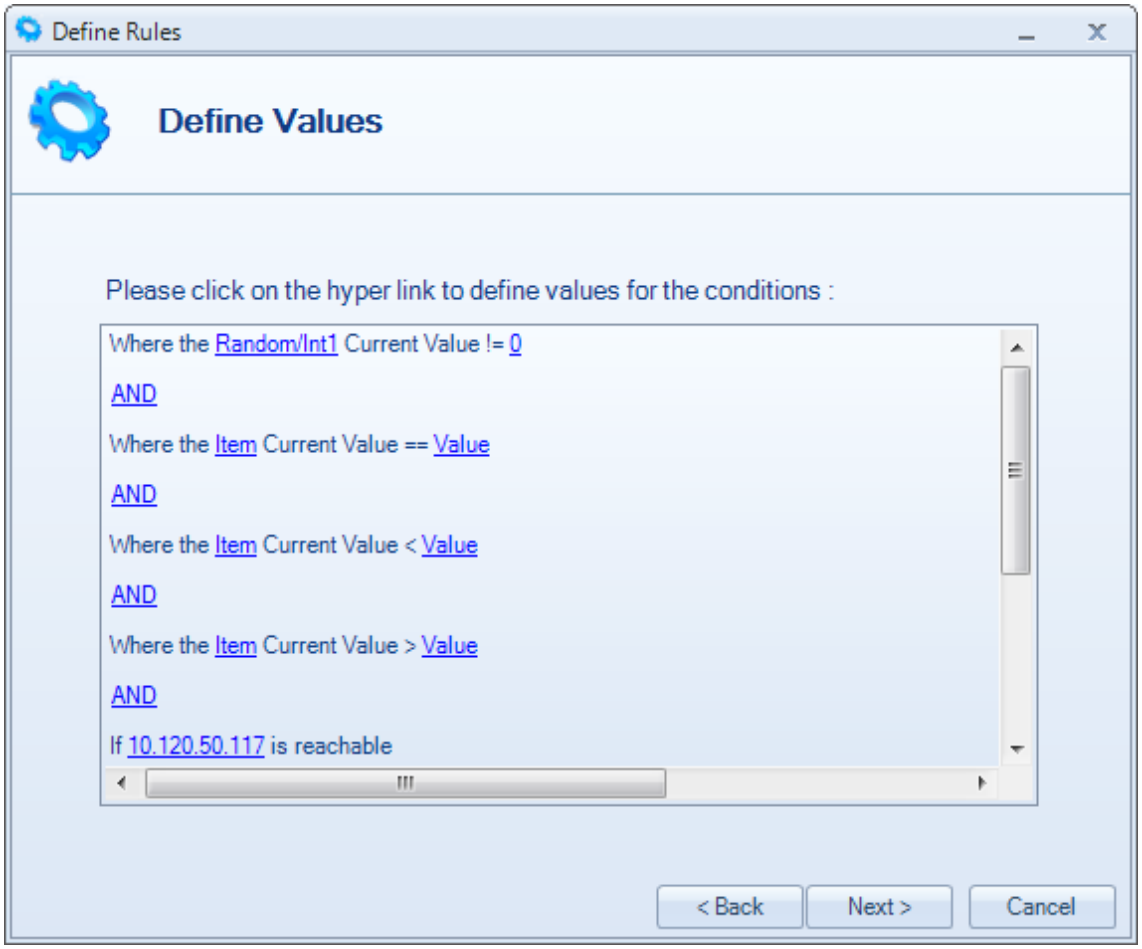


Figure 235: Define Values Dialog

To select an item, click on the **Item** hyperlink, the following window will appear:

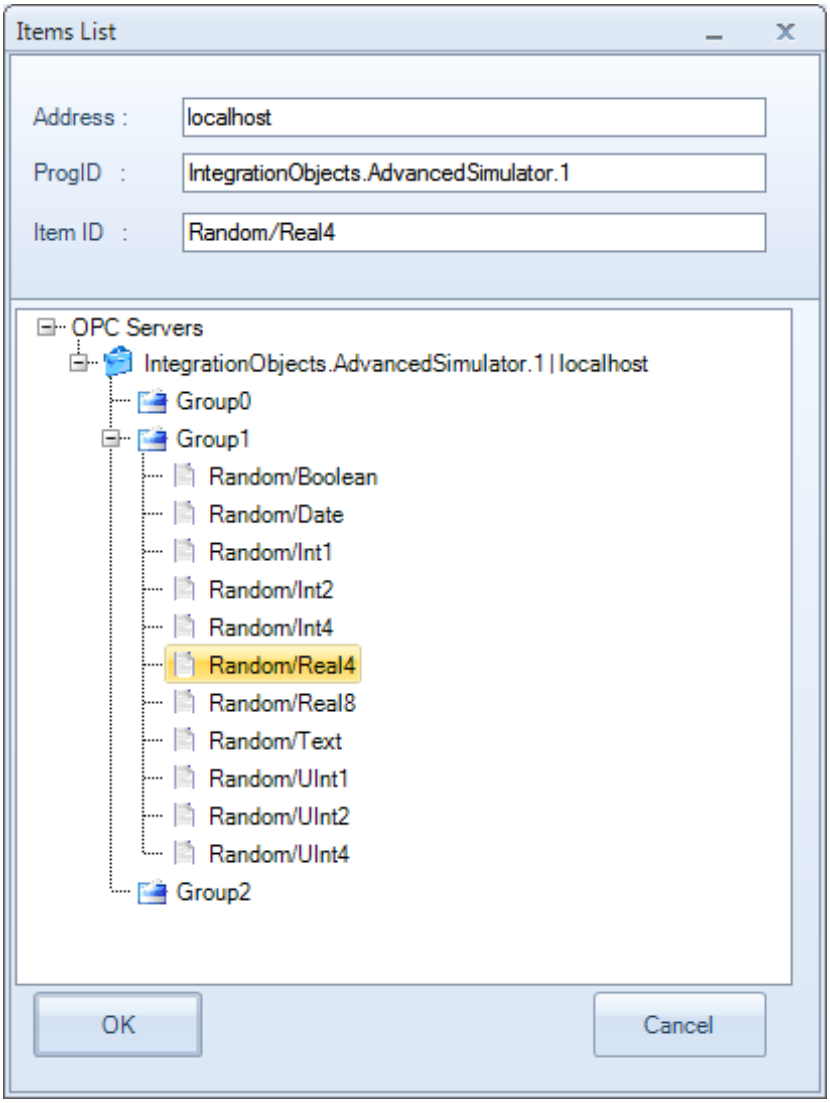


Figure 236: OPC DA Items List Dialog

Select the OPC item that you want to supervise and click the **OK** button, or click **Cancel** to go back to the previous window.

Then, click on the **Value** hyperlink to enter your critical value. The screen dialog below will appear:

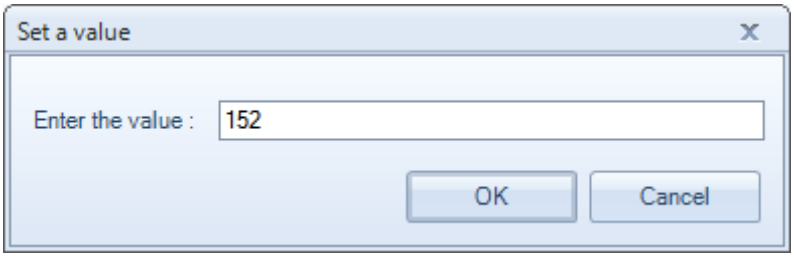


Figure 237: Set Value Dialog

In order to check the communication between your machine and a remote server, you can click on **IPAddress** hyperlink and enter the remote server's IP Address.

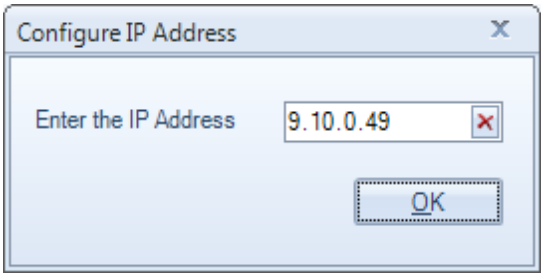


Figure 238: Configure IP Address Dialog

In order to check the availability of communication with an OPC server, you can click on the **OPC Server** hyperlink and select the server.

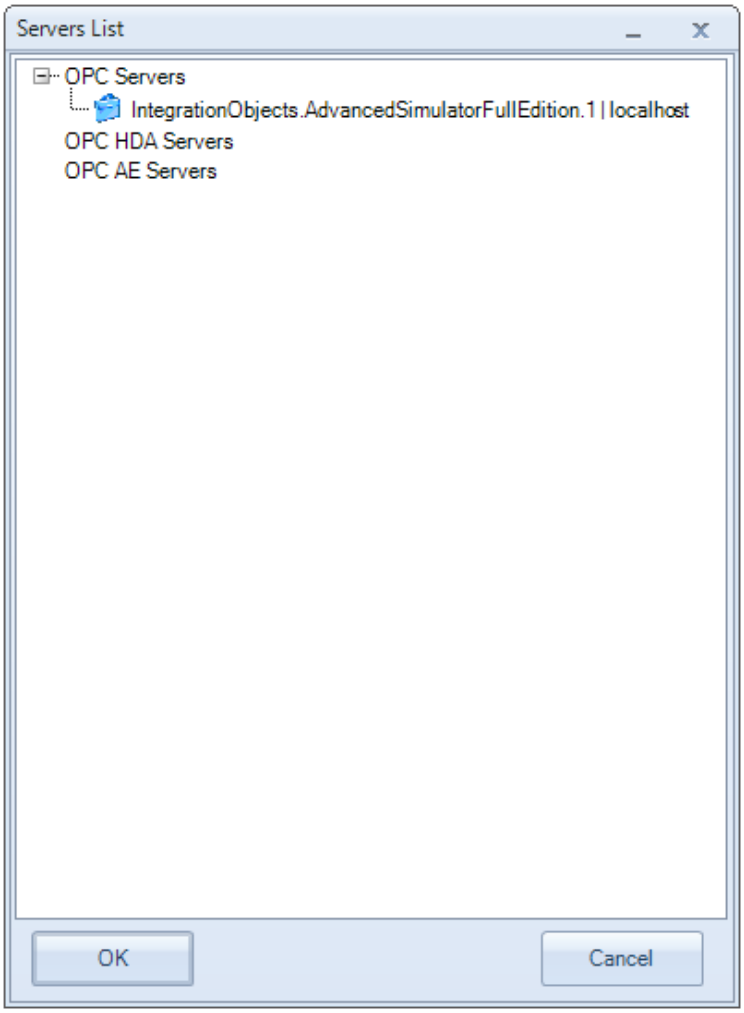


Figure 239: Select OPC Server Dialog

You can also change the logical operator (AND/OR) between the conditions, click on the **AND** hyperlink, you will see a window similar to the following one:

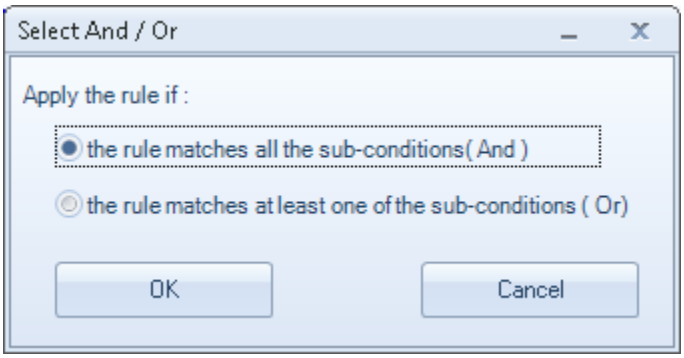


Figure 240: Select Logical Operator Dialog

1.2. Action Management

The OPC EasyArchiver supports four types of actions for DA rules as illustrated in the figure below:

1. Sending email to the specified operator/end user to inform him of the confirmed condition state.
2. Executing a write operation.
3. Starting a pre-configured archiver.
4. Stopping a running archiver.

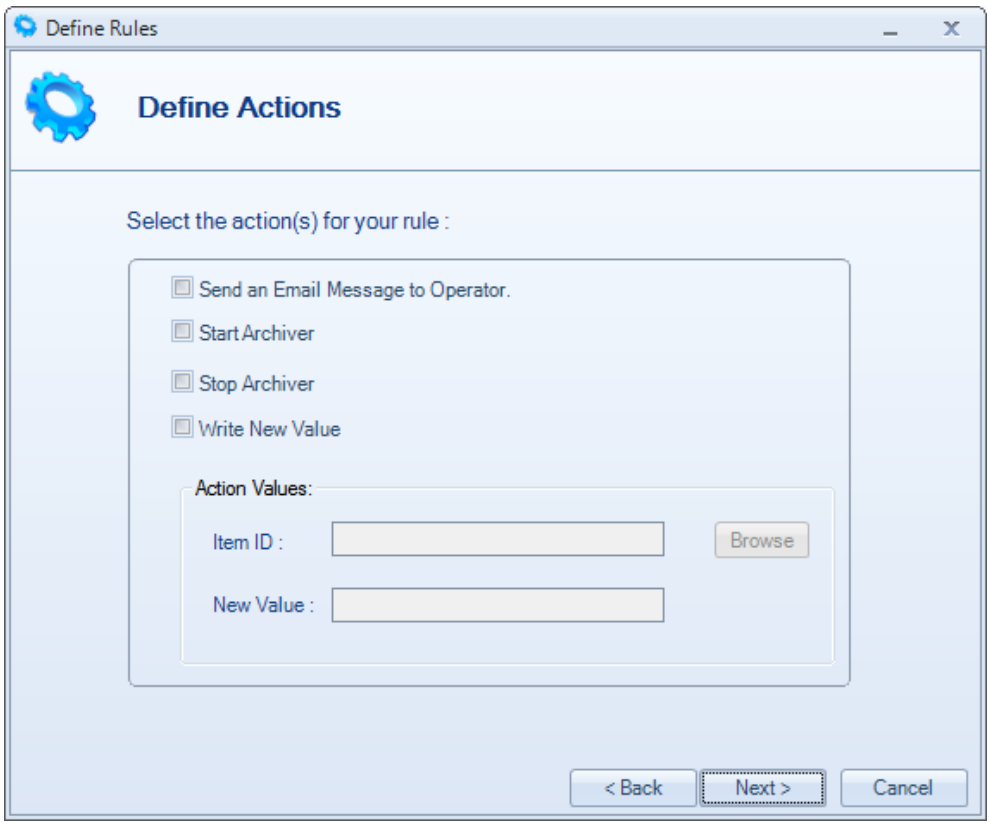


Figure 241: Rules Action Dialog for DA Rules

The OPC EasyArchiver supports three types of actions for HDA and AE rules as illustrated in the figure below:

1. Sending email to the specified operator/end user to inform him of the confirmed condition state.
2. Starting a pre-configured archiver.
3. Stopping a running archiver.

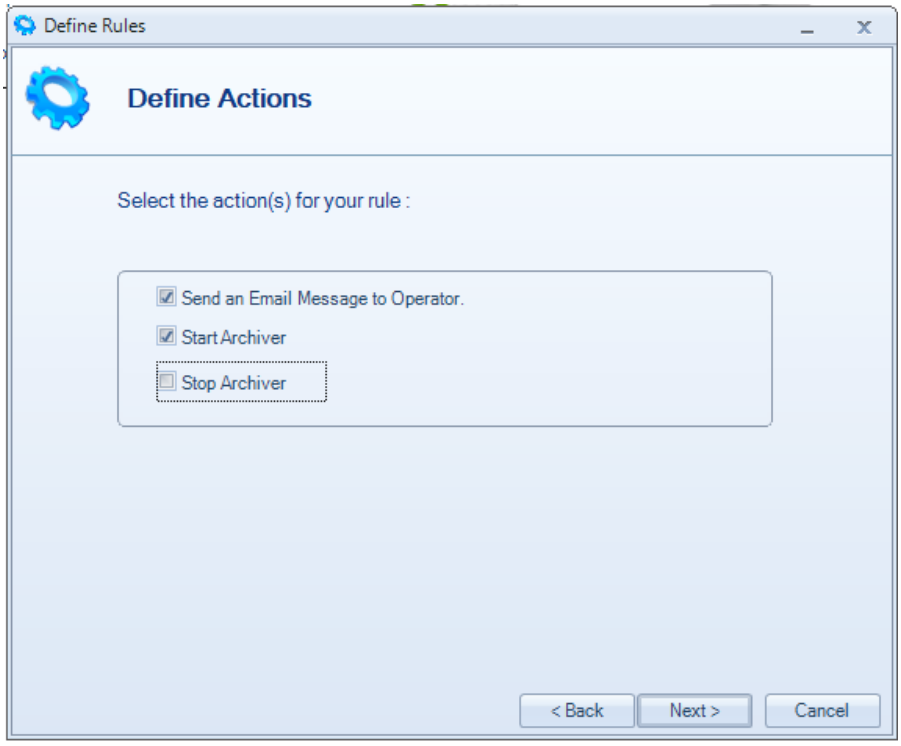


Figure 242: Rules Action Dialog for HDA/AE Rules

1.2.1. Send an E-Mail

When using the "Send an Email" action, you have to enter the following necessary information in the screen dialog below:

- The sender e-mail address.
- The receiver e-mail address.
- The SMTP server address.
- The subject.
- And the message of the notification email.

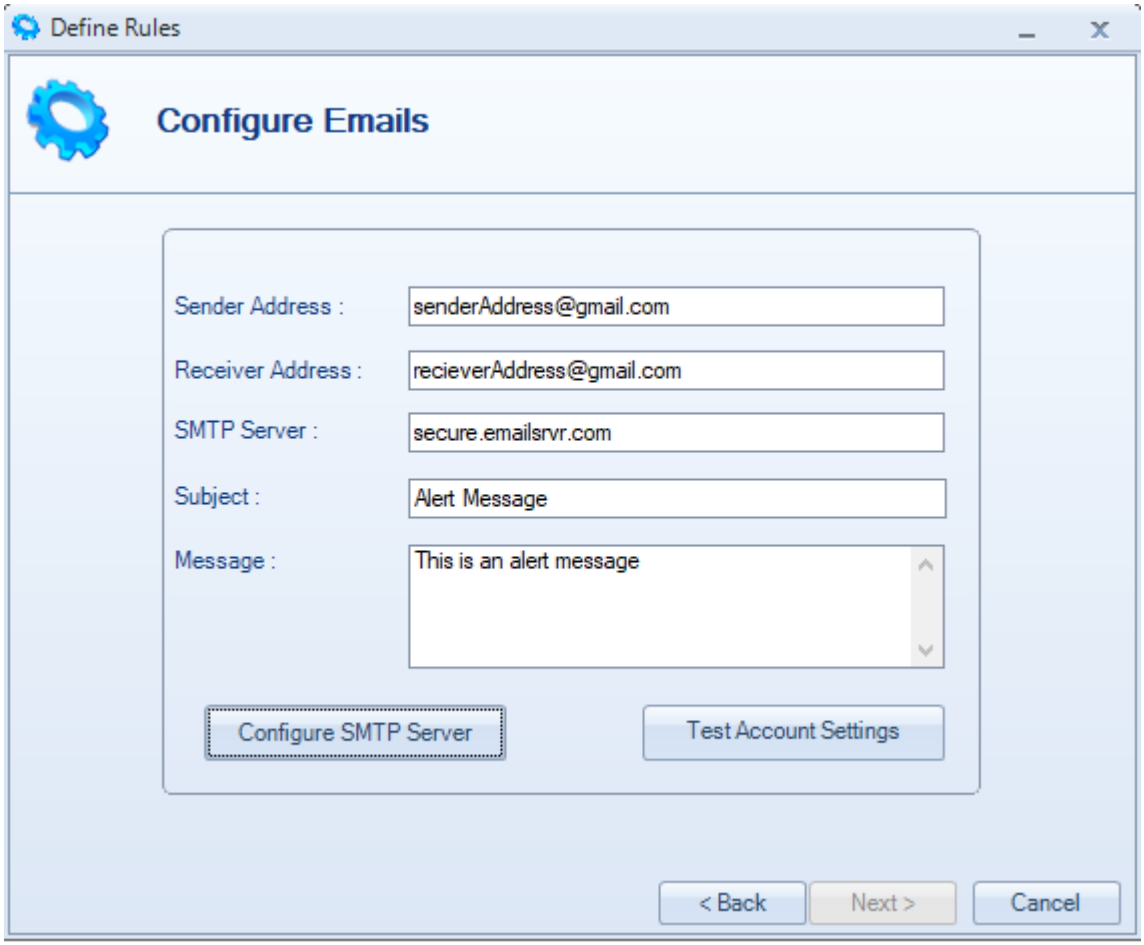


Figure 243: Configure Emails Dialog

To enter the SMTP Server settings, click the **Configure SMTP Server** button and the following dialog will be prompted.

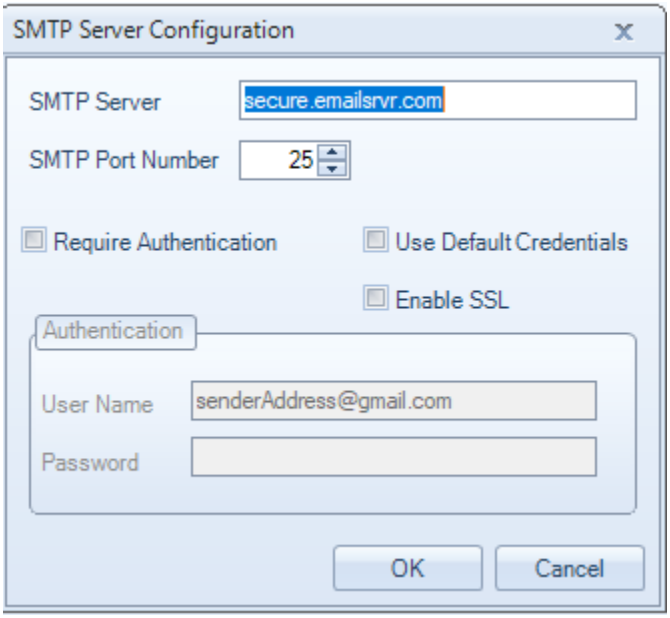


Figure 244: Configure SMTP Server

In the dialog illustrated above, you have to:

- Enter the SMTP Server address.
- Edit the SMTP Server port number if it is not set to 25 by default.
- Enable the "**Require Authentication**" option if your SMTP Server requires authentication and specify the user name and password to be used by the OPC EasyArchiver when sending email notifications.
- When the **"Require Authentication"** is disabled, you can choose to **"Use Default Credentials"** and/or **"Enable SSL"** options when sending email notifications. Both options are optional.

The **Next** button in the Define Actions Wizard will be enabled once a "Test" email is successfully send to the destination. In order to test your Email configuration, click the **"Test Account Settings"** button. If the **"**Test**"** Email is successfully sent to the receiver address, the following message box is prompted.

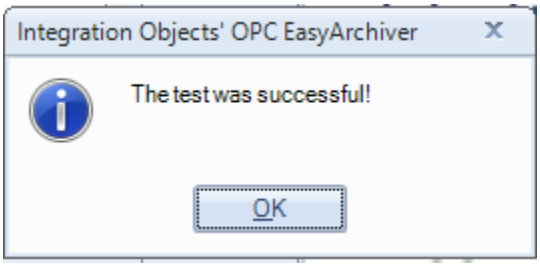


Figure 245: The Test Email is Successfully Sent

You should find the following "Test" email in your destination inbox when the test is successful.

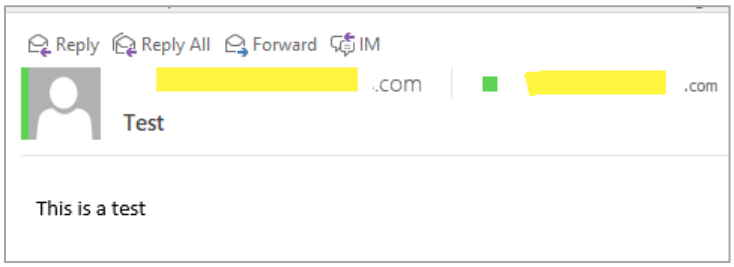


Figure 246: The Test Email

1.2.2. Set a Write Operation for DA Rules

When the action is to set to a write operation, you need to select the **Write New Value** check box. Then, click the **Browse** button and select the tag to be written as follows:

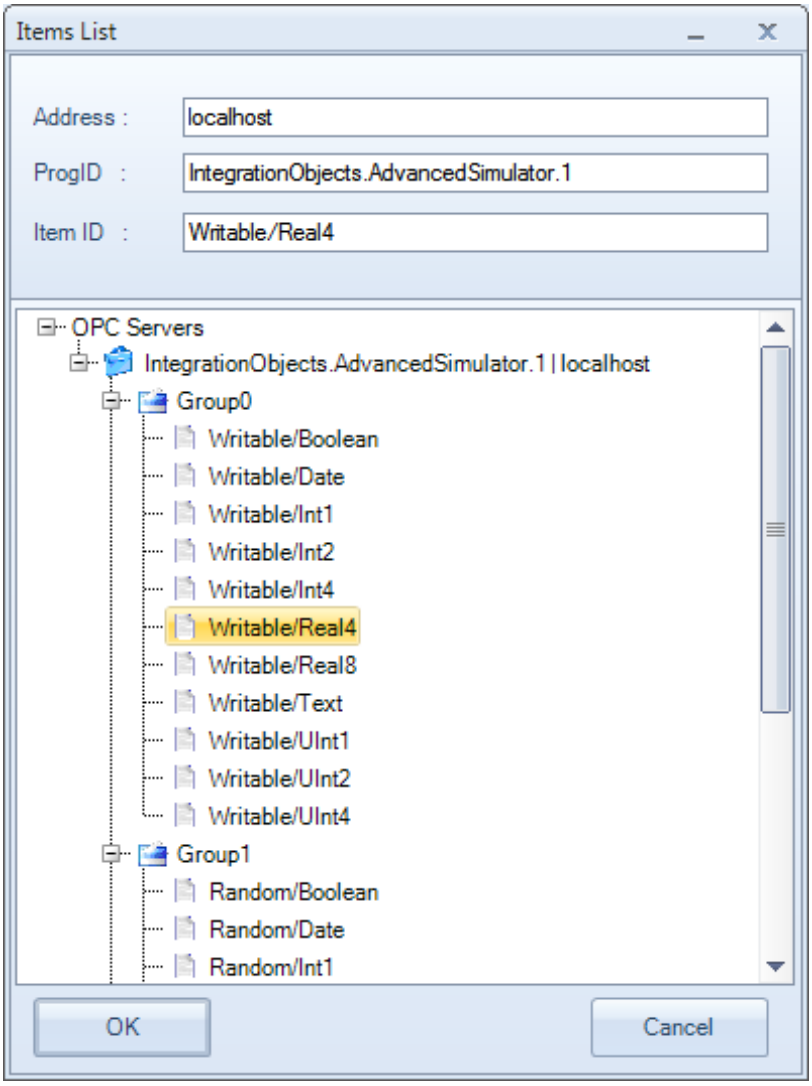


Figure 247: Select OPC DA Item Dialog

If the OPC Item that you have selected is not writable, a notification message will be displayed.
Now, you have to configure the value to be written as illustrated in the figure below:

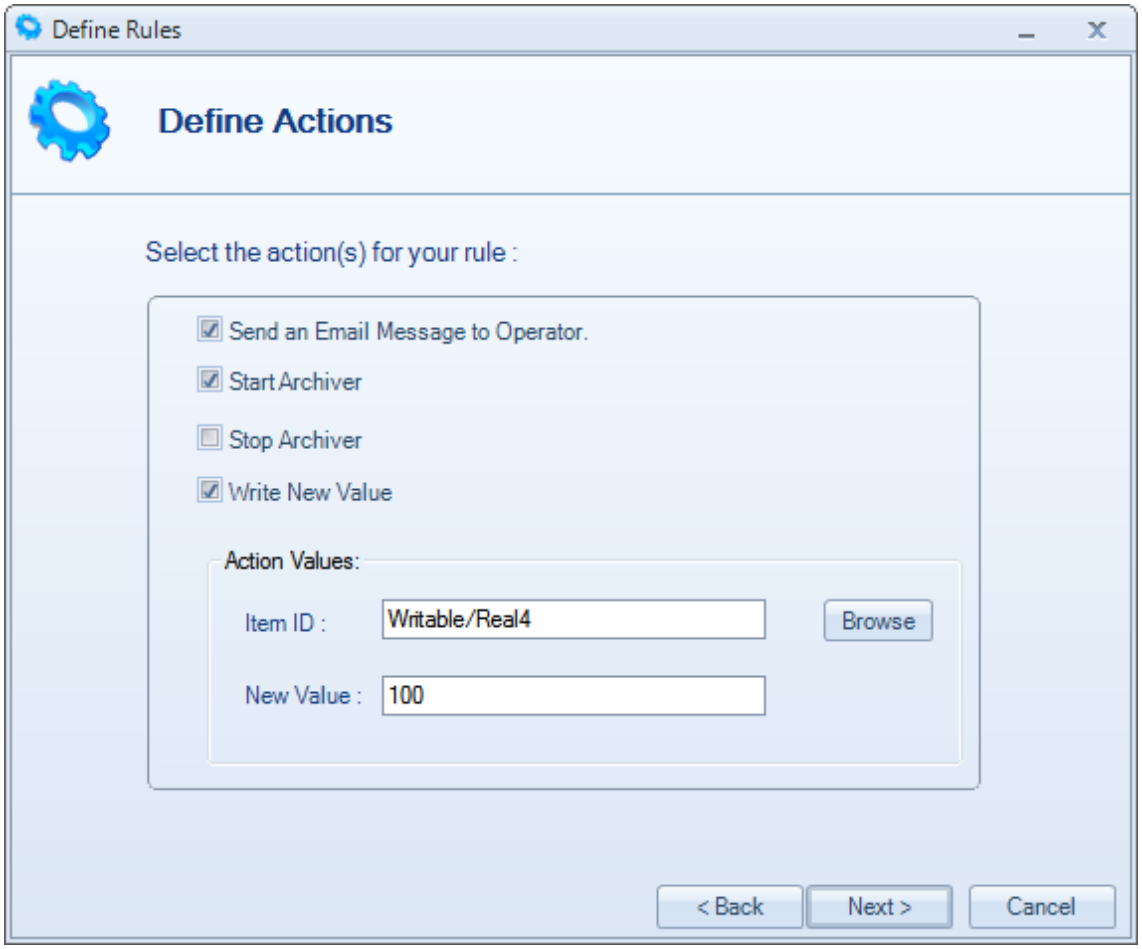


Figure 248: Set up the Value to the OPC Item for DA Rules

1.2.3. Start Archiver Action

When the action is set to start an archiver, check the **Start Archiver** option. The list of configured archivers will be then displayed as shown below:

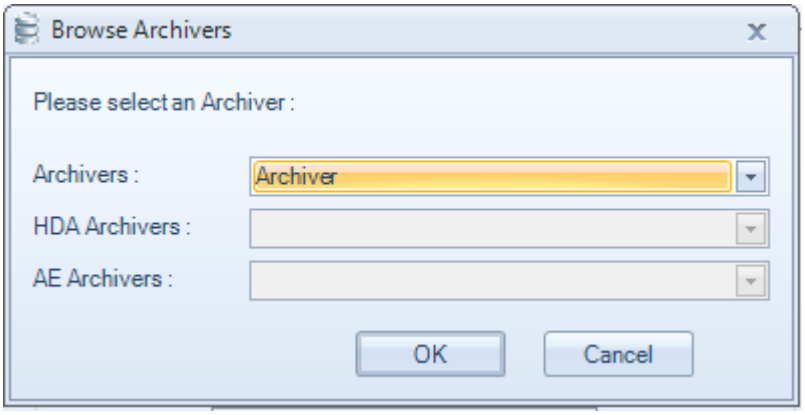


Figure 249: Browse Available Archivers

It is recommended to create another rule to stop the same archiver. The same rule cannot stop and start the same archiver when the same conditions are true.

1.2.4. Stop Archiver Action

When the action is set to stop an archiver, you will need to check the **Stop Archiver** option and choose the archiver to stop from the displayed list:

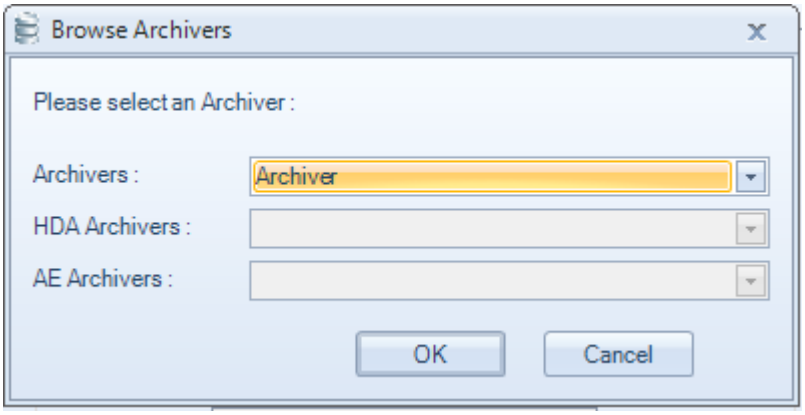


Figure 250: Browse the Archiver to be Stopped

Once you finish entering the needed information, click the **Next** button and the following dialog will be displayed:

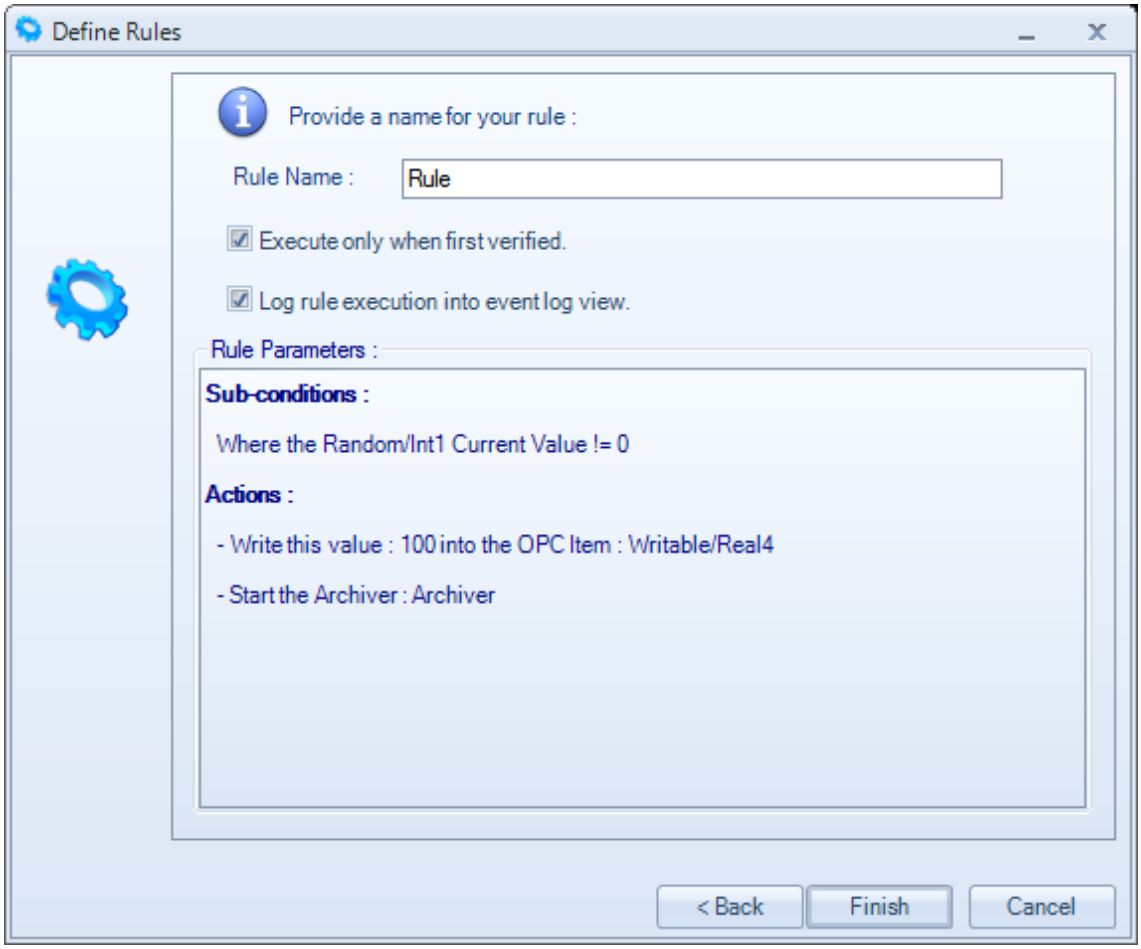


Figure 251: Rules Wizard Finish Page

As a final step, you need to specify a name for your rule. You can also choose to execute the rule only one time by checking the **Execute only when first verified** option and to log the rule status into the log messages view by checking the **Log rule execution to event log view** option.
After verification, click the **Finish** button. Your rule will be added to the tree view of rules as shown in the figure below:

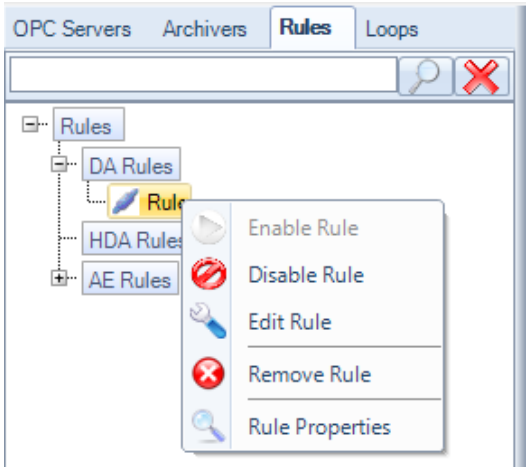


Figure 252: Rules Tree View

Using the rule context menu, you can:

- Enable/Disable a rule by using the **Enable Rule** and **Disable Rule** buttons.
- Edit the rule configuration by clicking the **Edit Rule** button.
- Remove a rule by clicking the **Remove Rule** button.
- Display the rule properties by clicking the **Rule Properties** button.

2. Remove a Rule

To remove a rule, right click on the rule node in the Rules' tree view and select the **Remove Rule** button from the displayed menu.

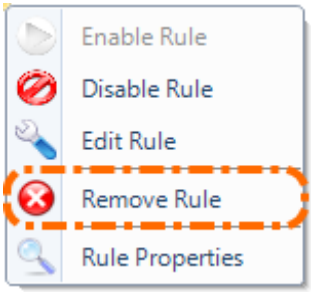


Figure 253: Remove Rule

3. Edit a Rule

To edit a rule, right click on the rule node in the Rules' tree view and select the **Edit Rule** button from the displayed menu.

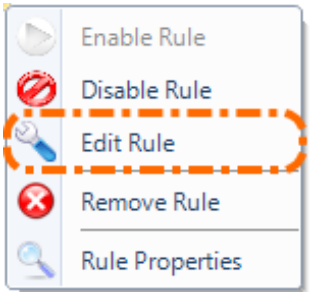


Figure 254: Edit Rule

When you confirm you want to edit the rule, the following wizard will be prompted:

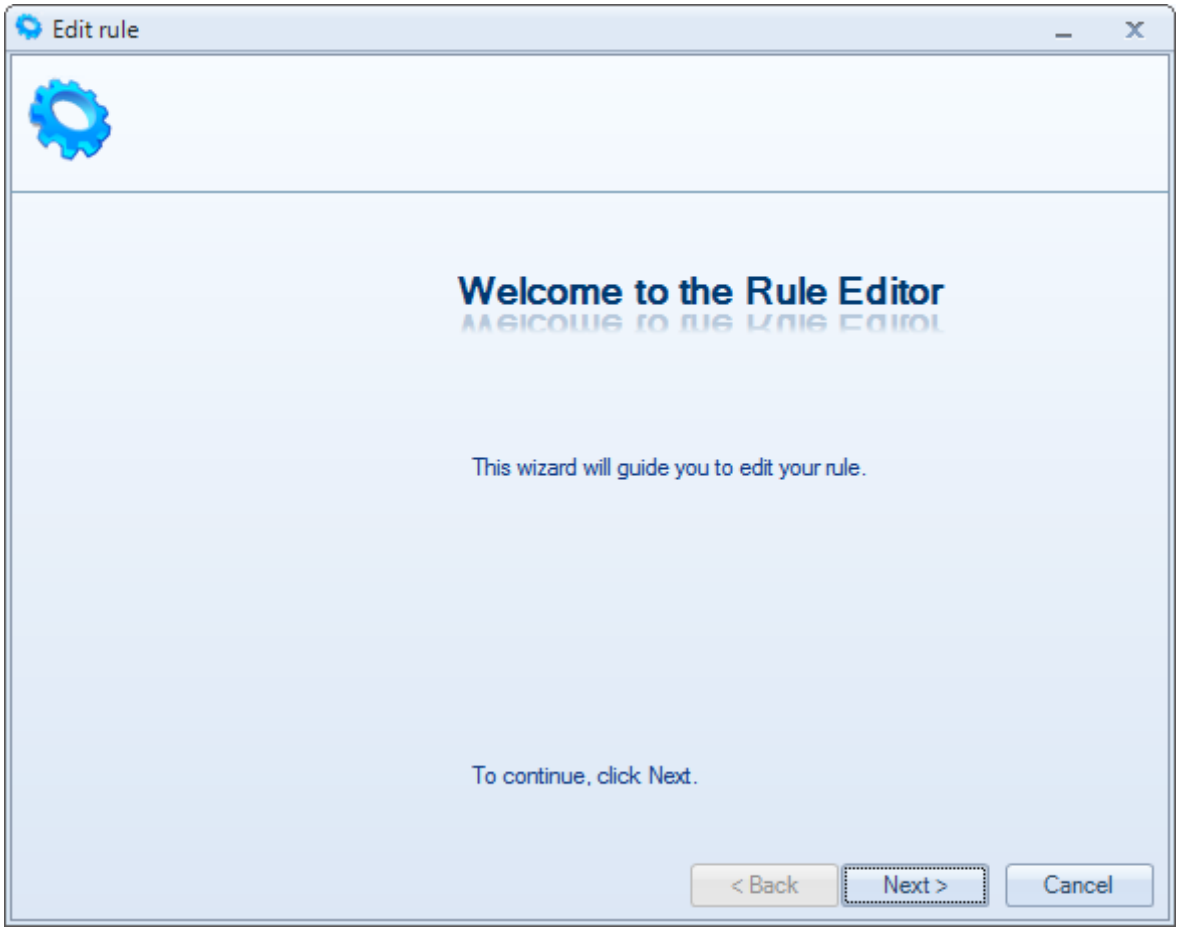


Figure 255: Rule Editor Wizard

The Rule Editor wizard will take you through the same steps of creating a new rule.

4. View Rule Properties

To view a rule's properties, right click on the rule node in the Rules' tree view and select the **Rule Properties** button from the displayed menu.

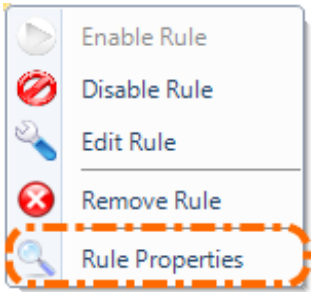


Figure 256: View Rule Properties

The following dialog will be displayed containing the configuration of your rule.

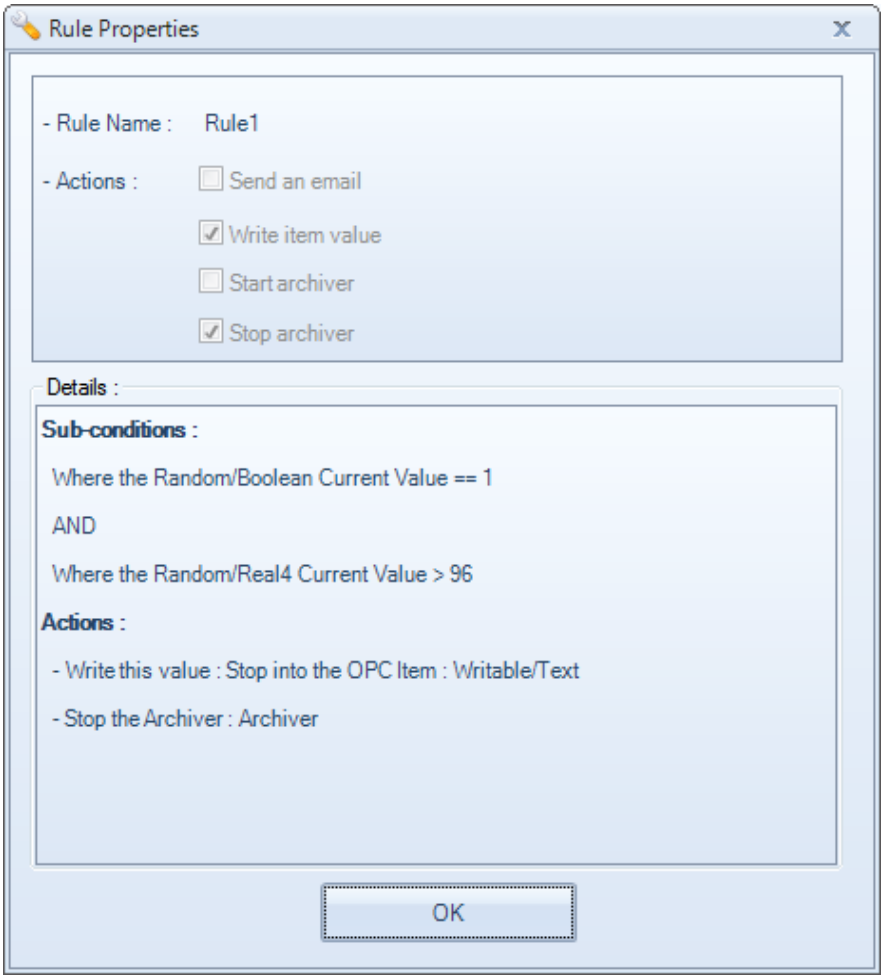


Figure 257: Rule Properties

OPC EASYARCHIVER TRACING CAPABILITIES

The OPC EasyArchiver provides tracing capabilities. It produces 3 log files named as below:

- The `LogEvent.log` that records errors and debugging information in relation of the user interface.
- The `ArchiverServiceLog.log` that records errors and debugging information of the DA archiver service.
- The `ArchiverHDAServiceLog.log` that records errors and debugging information of the HDA archiver service.
- And the `ArchiverAEServiceLog.log` that records errors and debugging information of the AE archiver service

These log files are generated at start-up under the installation folder. If difficulties occur with the OPC EasyArchiver, these log files can be extremely valuable for troubleshooting. Under normal operation, the client logs contain very little information.

The OPC EasyArchiver incorporates 2 configuration files: `OPCEasyArchiverConfig.ini` and `EasyArchiverServiceConfig.ini`. These files include several logging parameters. All these parameters have default settings and can be changed by editing the configuration file.

To change one of the configuration files (in this example we use the `EasyArchiverServiceConfig.ini` file):

1. Open `EasyArchiverServiceConfig.ini` in a text editor.
2. Edit any of the parameters listed in the following tables:

Log Setting	Description	Default Value
AutoAppend	Set to true to continue writing log messages in the existed log file or to false to create a new file.	True
BufferSize	The maximum number of messages to be stored in the runtime memory before launching a write action in the hard disk. The specified value must be greater than 100.	100
FileName	The OPC Archiver Service log file name.	ArchiverServiceLog (for the DA Archiver Service)

MaximumFiles	Set to 0 means that log files will be created in an unlimited way.	0
Level	There are five log levels: 1. Control: Logs only control messages generated by Archiver Service. 2. Error: Logs error and control messages generated by the Archiver Service. 3. Warning: Logs warning, error and control messages generated by Archiver Service. 4. Inform: Logs information, warning, error and control messages generated by the Archiver Service. 5. Debug: Logs all messages generated by the Archiver Service. The higher the log level, the more information is recorded. We recommend using level "Control" for a better performance of the service. The other levels are dedicated for troubleshooting purposes.	Control
AutoSaveTimeOut	The time to wait to read all messages from the buffer and write it on hard disk, the minimum value is 10s.	10

Table 37: Log Settings

3. Save the file for the log settings and restart your application (GUI and services) for the changes to take effect.

Sample of the `EasyArchiverServiceConfig.ini` Configuration File:

```
[FileLogConfiguration]
AutoAppend=True
BufferSize=100
FileName=ArchiverServiceLog
MaximumFiles=0
Level=Error
AutoSaveTimeOut=10

[HDAFileLogConfiguration]
AutoAppend=True
```

```
BufferSize=100
FileName=ArchiverHDAServiceLog
MaximumFiles=0
Level=Error
AutoSaveTimeOut=10
```

OPC EASYARCHIVER CONFIG INI FILE

The OPC EasyArchiver incorporates 2 configuration files: `OPCEasyArchiverConfig.ini` and `EasyArchiverServiceConfig.ini`. These files include several configuration and logging parameters. All these parameters have default settings and can be changed by editing the configuration file.

To change one of the configuration files, open the ini file in a text editor, edit any of the parameters listed in the following table and save your changes.
For the logging parameters, refer to the "OPC EASYARCHIVER TRACING CAPABILITIES" section.

Setting	Description	Default Value
`OPCEasyArchiverConfig.ini`		
PromptStopServicesOnClose	True: When closing the OPC EasyArchiver, messages are displayed to ask the user if he wants to stop OPC EasyArchiver services. False: No message is displayed when closing the OPC EasyArchiver.	True
GetMaxHistoryAlarmsRowCount	It indicates the number of alarms to be visualized for the Alarms Logger feature.	0
PercentDeletedRows	It indicates the percentage of rows of alarms and events to be deleted if the max row count is reached when you using the Alarms Logger feature.	0%
Style	It indicates the user interface theme.	Windows7Blue
Color	It indicates the user interface Color.	
`EasyArchiverServiceConfig.ini`		
DAPortNumber	It defines the port number used by the OPC EasyArchiver DA service.	3333
HDAPortNumber	It defines the port number used by the OPC EasyArchiver HDA service.	3344
AEPortNumber	It defines the port number used by the OPC EasyArchiver AE service.	3355

defaultConfigPath	It defines the full path of default configuration file.	
UseAcquisitionTimeFlag	True: Replace the data value timestamp by the acquisition time when using the DA archivers. Note that this option is only available for the groups with asynchronous read mode False: The data value timestamp will be archived as received from the OPC Servers.	False
UseIndexation	True: Enable using the indexes to the OPC groups and items and archives. False :disable using the indexes to the OPC groups and items and archives.	False
MaxValueColumnSize	It defines the size for the ItemCurrentValue column in DA and HDA archivers and the size for the message column in AE archiver. It is used by OPC EasyArchiver when creating new tables in the database.	2000
WaitBeforeServerStartup	It defines the time for which the OPC EasyArchiver will wait for the OPC Server to report that it is in RUNNING state before declaring a connection error.	1000 ms
CommandTimeout	It defines the command timeout of the SQL queries execution.	120 ms
MultiLanguageFlag	True: Enable the multi-language database support. False: Disable the multi-language database support.	False
DecimalPrecision	It defines the decimal precision. This formatting will be taken into account in the display and the archive of real time data (OPC DA). When set to 0, the data value will be displayed and archived as received from the OPC DA Server.	3
MaxAllowedMemory	It defines the maximum allowed memory for services.	1.5 GB

ReconnectionPeriodToDAServers	It defines the reconnection period for OPC DA servers when the connection is lost.	30000 ms
ReconnectionPeriodToHDAServers	It defines the reconnection period for OPC HDA servers when the connection is lost.	30000 ms
LoopMaxItemsCount	It defines the maximum number of items allowed per read raw/processed loop if the split option is checked in the read raw/processed loop configuration.	750 items
UseAlias	True: Enable the use of alias instead of the item ID when archiving data. This option is available for HDA Archiver only. False: Disable the use of the alias feature.	False
SyncCallMaxPeriod	It defines the maximum period to wait for the response of the GetHistorian call.	900000 ms
SyncCallCheckPeriod	It defines the maximum timeout period to get a response to the GetHistorian call	300000 ms
SyncHDACallMaxPeriod	It defines the maximum period for wait that will take the GetHistorian call to return a response.	900000ms
SyncHDACallCheckPeriod	It defines the maximum timeout period to get a response to the GetHistorian call.	300000 ms
DataRecoveryEnabled	True: the queries are saved to a backup file if the database connection is broken or if the memory of the service reaches the maximum allowed memory size. False: the data recovery feature is disabled.	True
AutomaticDataRecovery	True: Enable the automatic data recovery after connection with the database is reestablished. False: Disable the automatic data recovery. The user in this case will have to recover the data available in the backup file manually.	False
RecoveryInterval	It defines the periodicity of data recovery to read and execute the SQL queries from backup file.	1000ms
RefreshSubscriptionOnStartup	When set to true, the OPC EasyArchiver will send a refresh call to the	False

	subscriptions after creating the subscriptions and filters and when loading the configuration at start-up.	
DisableSubscriptionOnStartup	True: when loading the configuration at start-up, the OPC EasyArchiver creates the subscriptions as deactivated. After adding the filters, the subscriptions are activated. False: the subscriptions are created as activated subscriptions.	False
ReconnectionPeriodToAEServers	It defines the reconnection period for OPC AE servers when the connection is lost.	30000 ms
ReconnectionTimeout	It indicates the time period for which the OPC EasyArchiver will wait to receive new alarms before launching the reconnection with the OPC AE server.	30 minutes
MaxSubscriptionStateFailure	It indicates the number of successive failures for getting subscription status that the OPC EasyArchiver will tolerate before launching the reconnection with the OPC AE server.	1
CheckSubscriptionState	True: The OPC EasyArchiver will periodically check the subscription state. False: The OPC EasyArchiver will not monitor the subscription state.	False
BackUpDAFileMaximumSize	It sets the maximum size limit in MB for a DA data backup file. When this limit is reached, the OPC EasyArchiver will generates a new backup file.	10 MB
BackUpHDAFileMaximumSize	It sets the maximum size limit in MB for a HDA data backup file. When this limit is reached, the OPC EasyArchiver will generates a new backup file.	10 MB
BackUpAEFileMaximumSize	It sets the maximum size limit in MB for a AE data backup file. When this limit is reached, the OPC EasyArchiver will generates a new backup file.	10 MB
CheckReconnectionState	True: The OPC EasyArchiver will periodically reconnect to the AE server if no alarms was received during the set ReconnectionTimeout.	True

	False: The OPC EasyArchiver will not monitor the reconnection process.	
SetToUTCTime	True: The OPC AE Archiver will store alarms with timestamp using UTC time. False: The OPC AE Archiver store alarms with timestamp using local time.	False

Table 38: Config ini Parameters

TROUBLESHOOTING

Case 1: Cannot launch the OPC EasyArchiver

If you are using an evaluation license, you should first check the license validity by launching the License Authorization tool. You can start it directly from the startup menu:

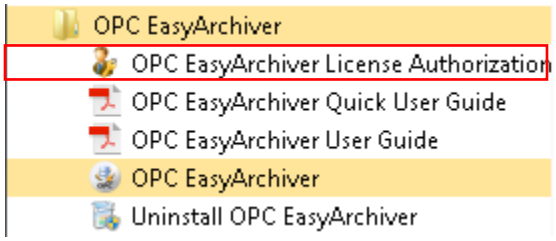


Figure 258: Open License Authorization Tool

1. Right click on the License Authorization tool shortcut available in the start menu and select "**Run as administrator**".
2. If your demo license is still valid but you still cannot access the OPC EasyArchiver user interface, verify that you have run the installation program of the OPC Easy Archiver with an administrator account that has read and write access privileges to the Windows registry. If yes, specifically use the "**Run as administrator**" option as illustrated below to open the user interface of the OPC Easy Archiver.

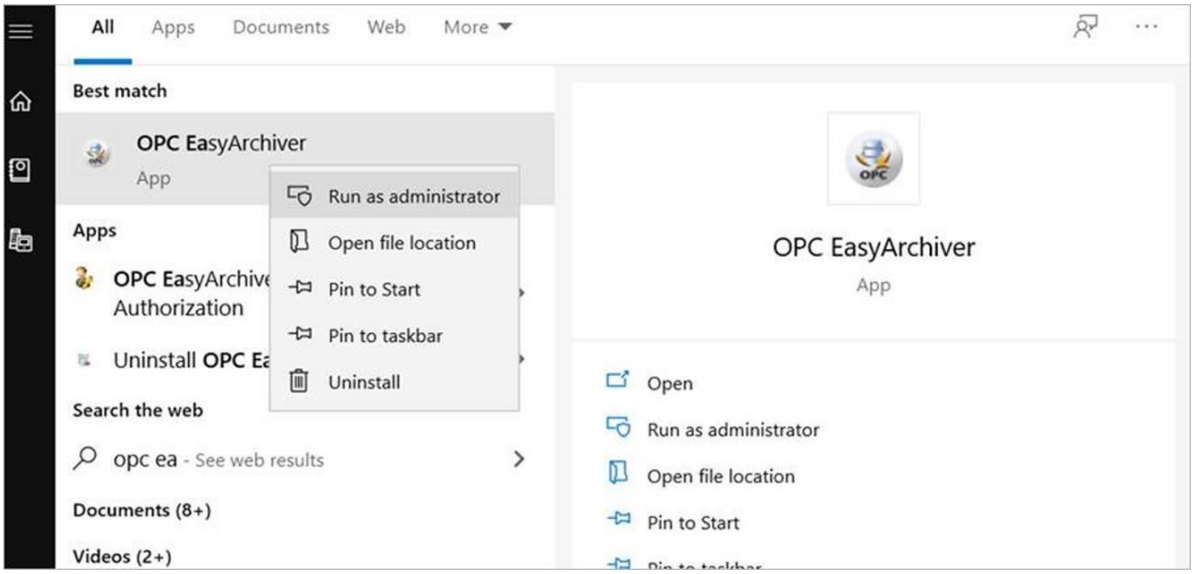


Figure 259: Run as Administrator

3. If the License Authorization tool shows that the demo has expired and you want to activate it using your full and purchased license, follow the steps below:

    a. Choose the features you want to activate and that match your purchase order.

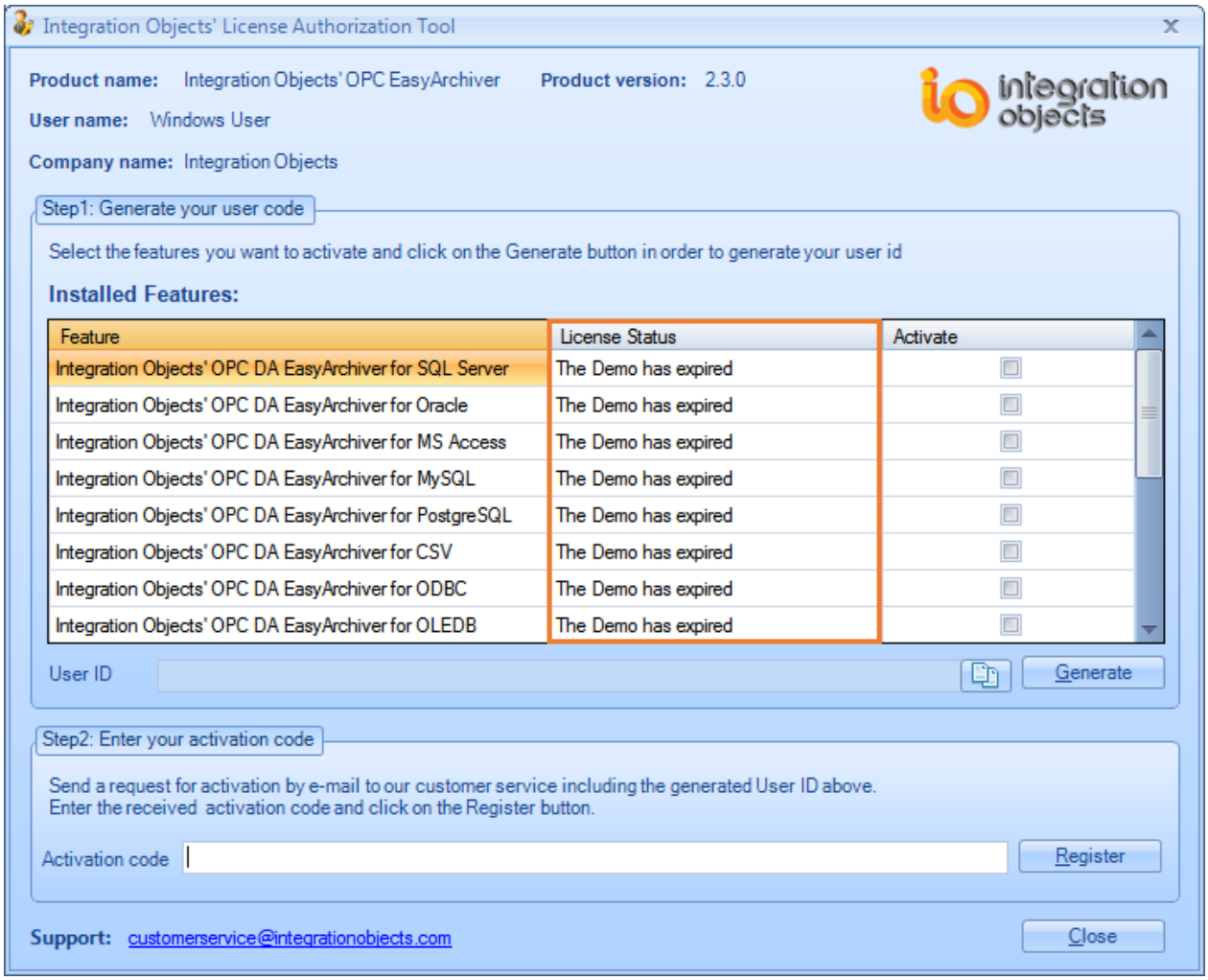


Figure 260: Demo License Expired

    b. Click the **Generate** button.
    c. Copy and send the User ID to the sales team {sales@integrationobjects.com} so they can generate the dedicated activation code.
    d. Enter the given **Activation code.**

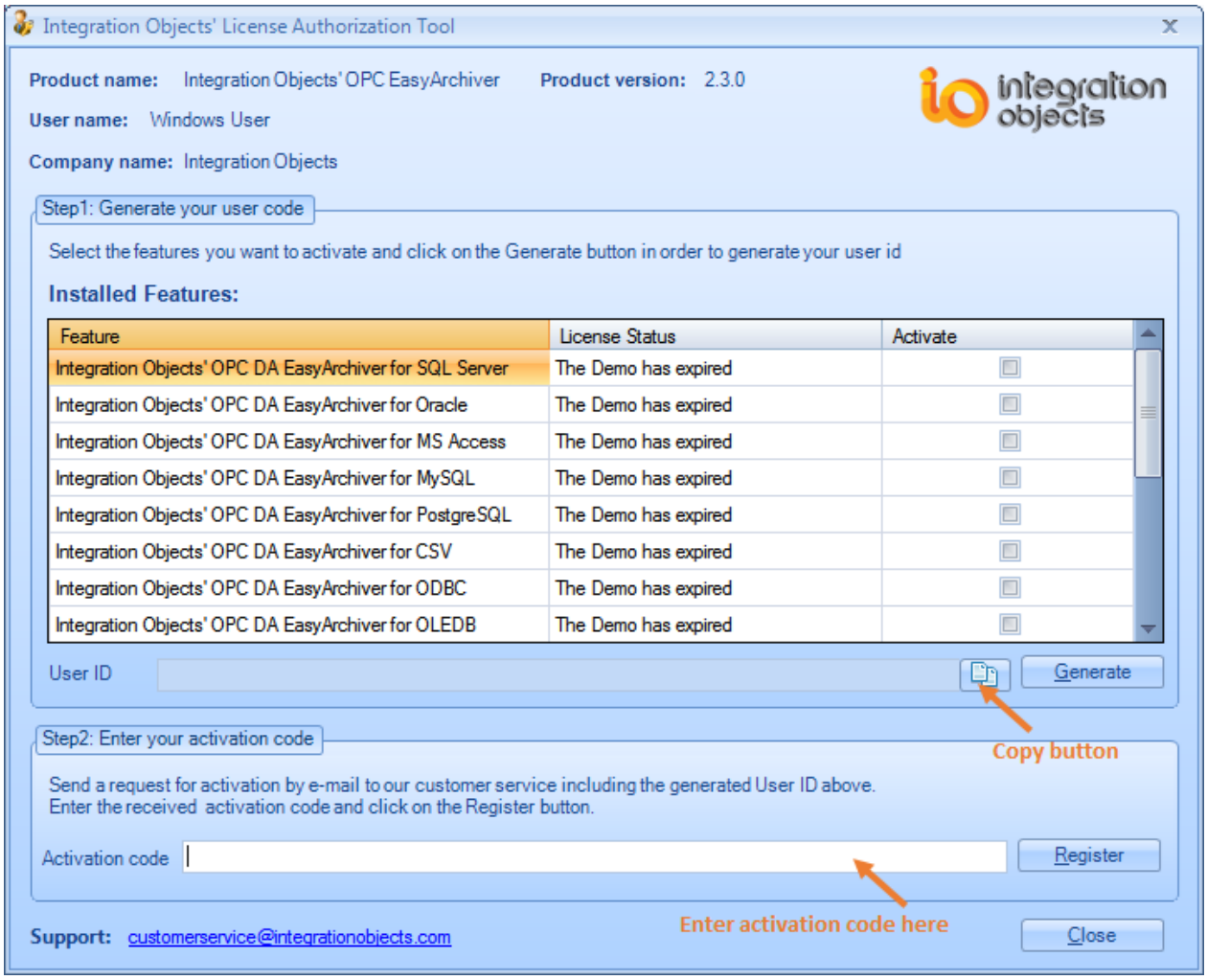


Figure 261: Activate License

e. Click the **Register** button.

Case 2: Cannot start the OPC EasyArchiver services

In case the OPC EasyArchiver DA, HDA or AE services could not be started:

1. Check if the license is still valid (see the first case above).
2. The user account configured for the archiver services has the privileges to run the service.

In order to check and change the user account running the OPC EasyArchiver services, proceed as follows:

1. Open the Windows Services panel
2. Right click on **Integration Objects' OPC EasyArchiver DA Service** for the DA archiver service, **Integration Objects' OPC EasyArchiver HDA Service** for the HDA archiver service or **Integration Objects' OPC EasyArchiver AE Service** for the AE archiver service and select **Properties.**

3. Go to the **Log on** tab.
4. Check **This account** and enter the user credentials for the service as illustrated in the figure below:

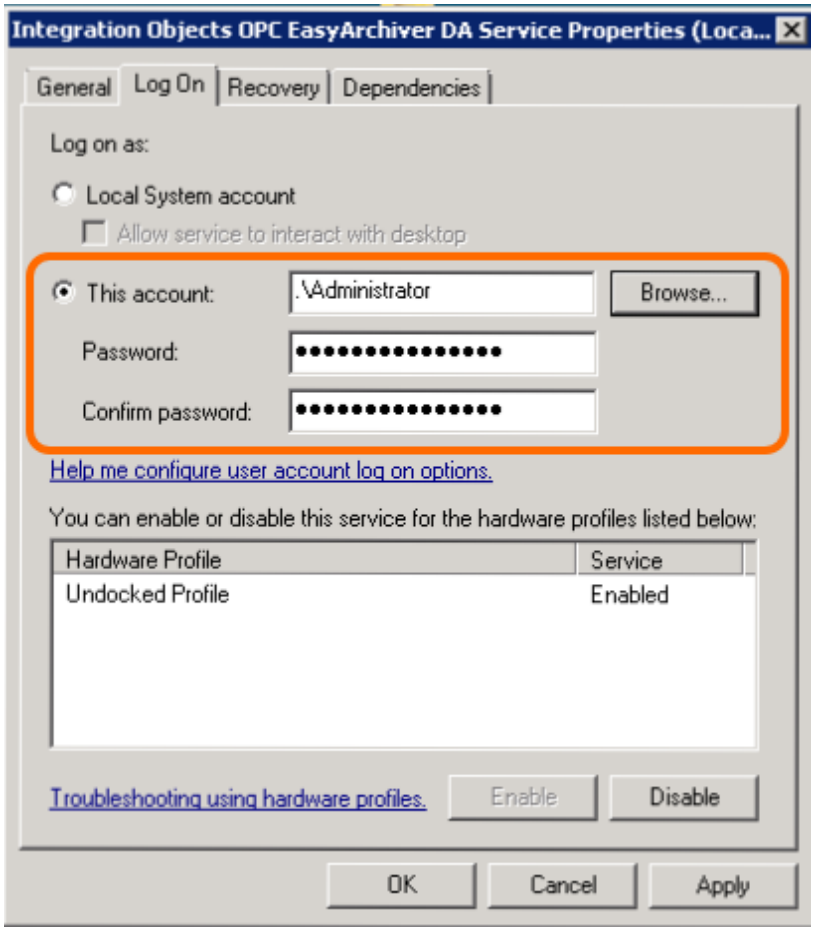


Figure 262: OPC EasyArchiver DA Service Log on

5. Click the **OK** button.

The specified user account needs to have read/write access to the Windows registry and to the OPC EasyArchiver installation folder as well as access rights to connect to your OPC Server and read data.

To add the "Log on as a service" right to a user account on your local computer:

- Open the Local Security Policy.
- In the console tree, double-click **Local Policies**, and then click **User Rights Assignment.**
- In the details panel, double-click **Log on as a service**.

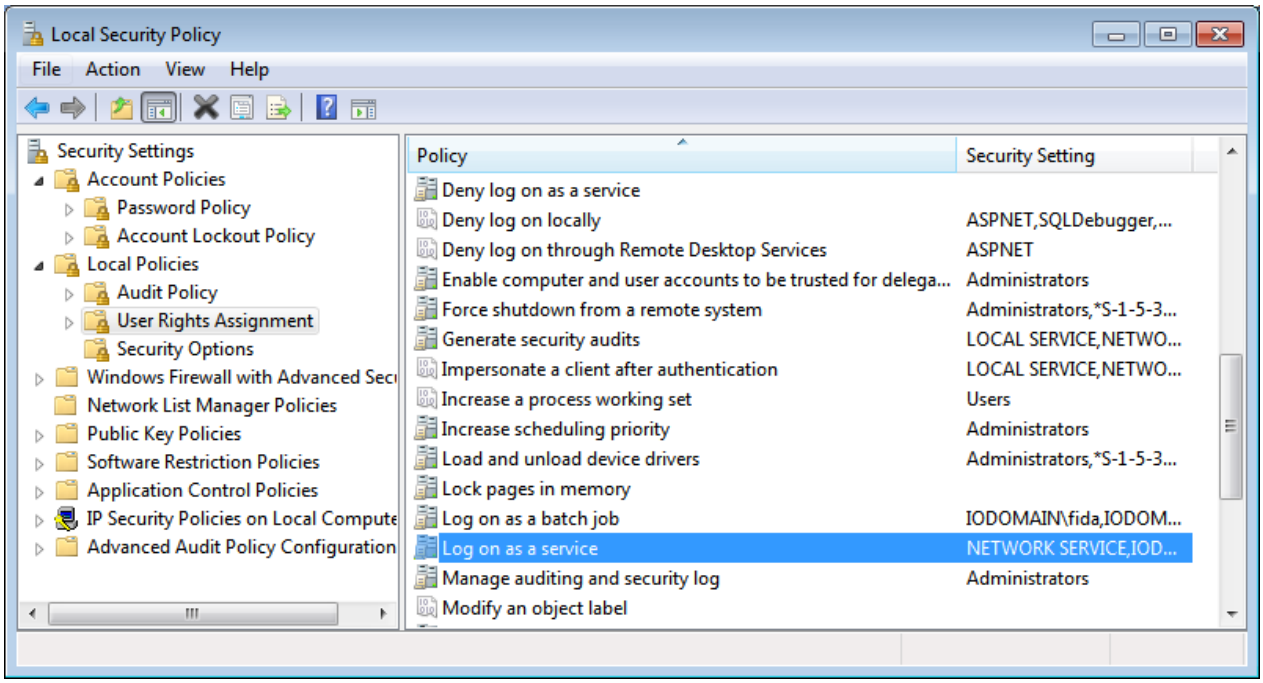


Table 39: Log on as a Service Policy

- Click **Add User or Group**, and then add your user account to the list of accounts that have the Log on as a service right.

Case 3: Cannot connect to a local OPC Server

You should check whether the OPC Core Components are installed in your machine.
The OPC Core components to be installed depend on the deployment version of the OPC EasyArchiver. The installation program is located in the installation folder under:
.\Integration Objects\Integration Objects' OPC EasyArchiver\Components

If OPC Core components are already installed, you should use the regsvr32 command as shown below to register them again:

1. Example (Windows 7, 64 bit, System Drive "C:"):

    regsvr32 “C:\Windows\SysWOW64\opcproxy.dll”.
    regsvr32 “C:\Windows\ SysWOW64\opccomn_ps.dll”.

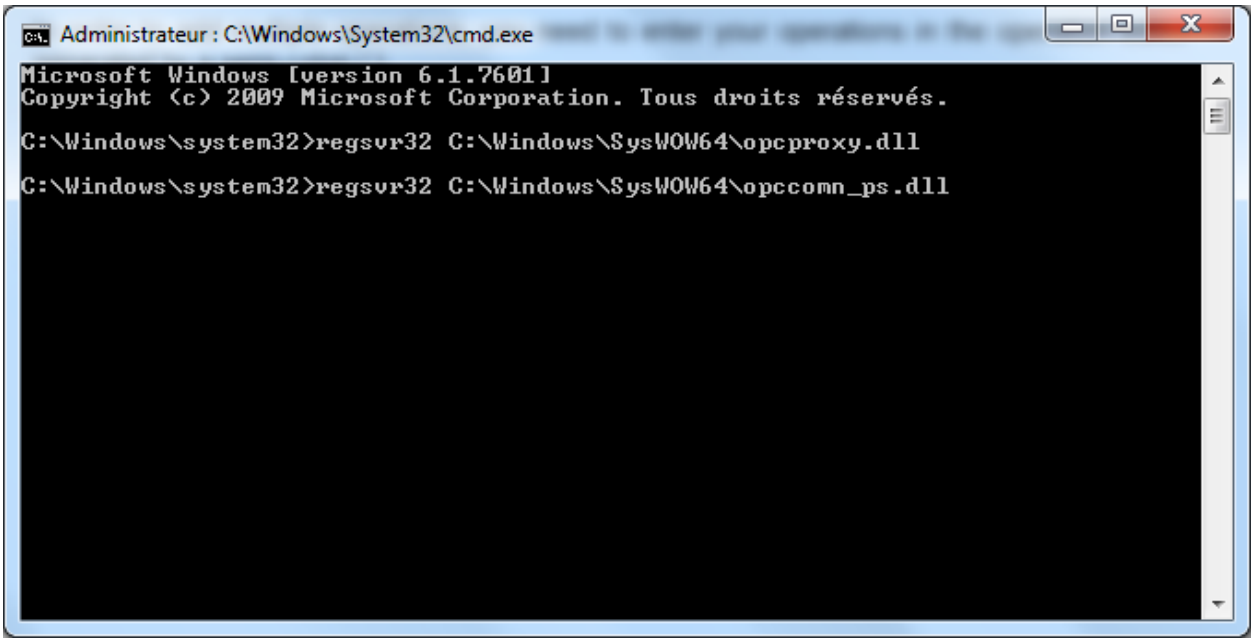


Figure 263: Register OPC Core Components on Windows 7 64 bit

2. Example (Windows 7, 32 bit, System Drive "C:"):

regsvr32 "C:\WINDOWS\system32\opcproxy.dll".
regsvr32 "C:\WINDOWS\system32\opccomn_ps.dll".

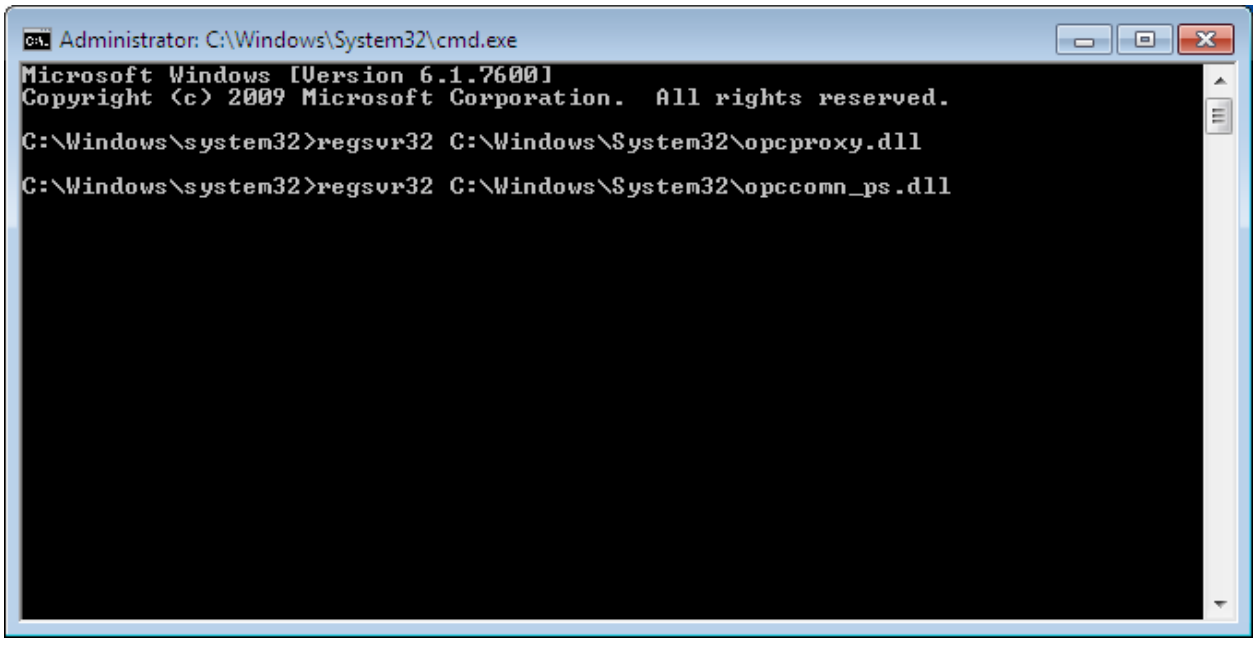


Figure 264: Register OPC Core Components on Windows 7 32 bit

You can also repair the installation OPC Core Components using the installation wizard.

In case the problem persists, you need to change the user account configured to run the archiver service. Check **Case 2** for more details.

Case 4: I need to access the OPC EasyArchiver files. Where can I find the installation folder for OPC EasyArchiver?

Follow these steps:

1. Select the OPC EasyArchiver shortcut (from your Desktop or the Start Menu).
2. Right click on it and choose properties.
3. A properties window appears containing the shortcut information.
4. Click the **Find Target …** button.

OR

1. Open the OPC EasyArchiver.
2. Go to the File menu bar and click on **Configure** button.
3. Click the **Installation Folder** button as illustrated in the figure below:

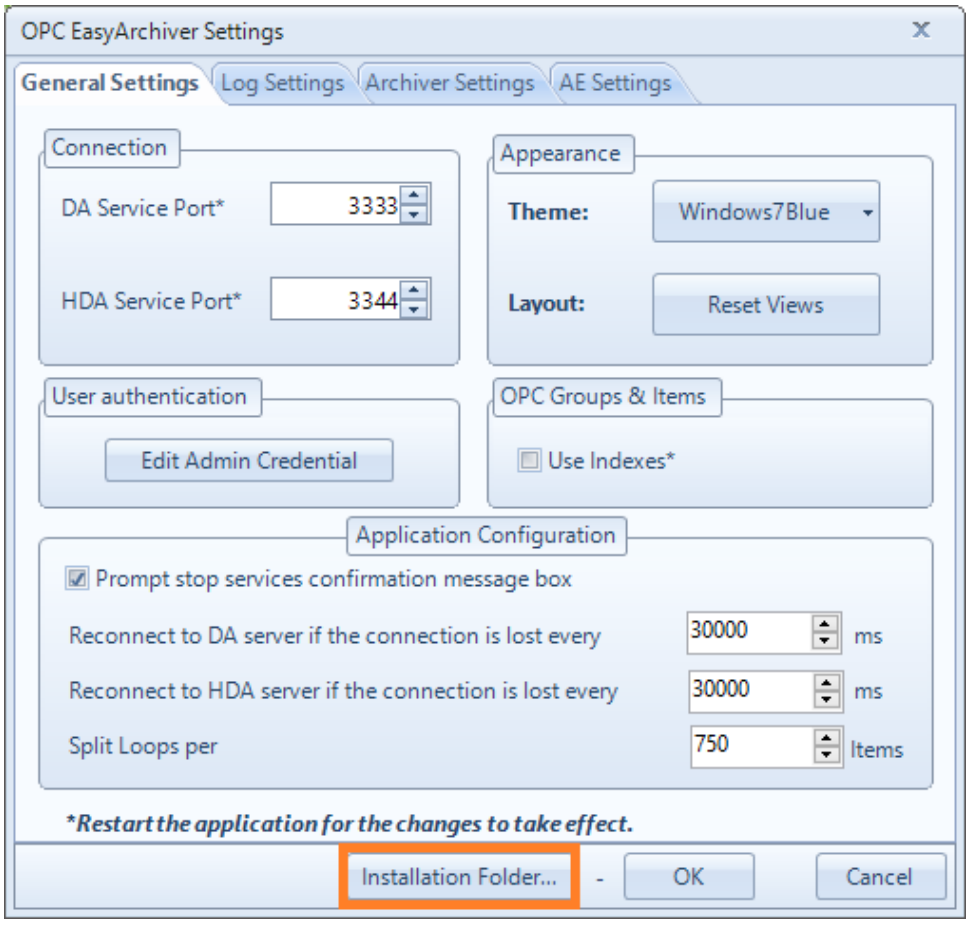


Figure 265: Open Installation Folder

Case 5: Cannot create a table in your database

When creating an archiver, you may encounter an issue when connecting to a database or creating a table due to a lack of privileges.

In this case, you need to either grant the right permissions to the user account of the OPC EasyArchiver service or run the service with a user account having the required database privileges. Check **Case 2** on how to configure the user account for the archiver service.

Case 6: DB to OPC Transfer does not work

If you configure a DB to OPC Transfer and it does not work, verify the following items:

- The values of the "Started' column in the write table need be set to 0 for the data values to be sent to your OPC Server.
- The related OPC items need to be writable.
- If your write table contains the ProgID and server address columns, verify that they are filled correctly.

Case 7: The Quality and Timestamp are not transferred from DB to OPC

If you encounter this case, check the following:

- The write mode of the group assigned to the transfer need be set to "Synchronous IO2 (WriteVQT)" or "Asynchronous IO3 (WriteVQT)".
- If you used an existing table when creating the DB to OPC Transfer, make sure that you mapped the quality and timestamp fields.
- If your OPC qualities are different from the standard OPC ones, you need to configure the quality mapping. To do so:
    a. Right click on the transfer node.
    b. Select **Configure Quality Mapping** from the displayed menu:

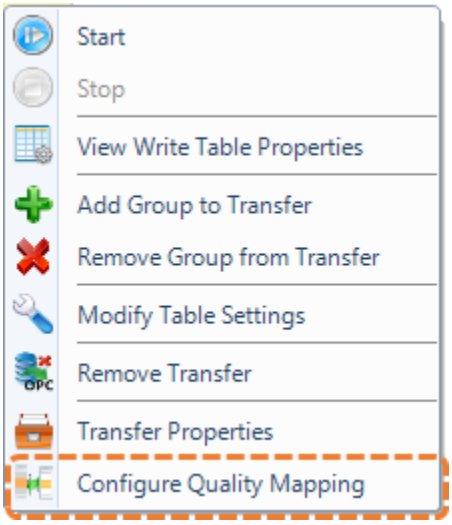
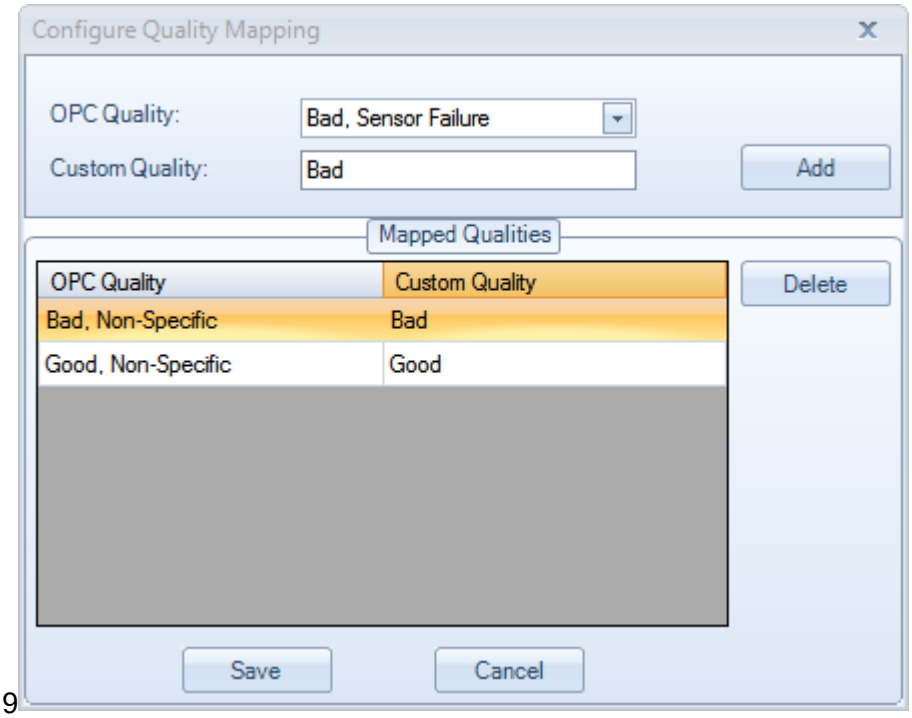


Figure 266: Configure Quality Mapping

c. Map the qualities in the prompted window and click the **Save** button.



9

Figure 267: Configure Quality Mapping Window

Case 8: Cannot connect to a remote OPC Server

To enable the OPC remote communications, you need to configure DCOM between the OPC client and server machines. The connection problem can be caused by DCOM misconfiguration. Click here for more details and guidelines about DCOM configuration.

Case 9: I can connect to my OPC Server using OPC DA Explorer but the connection fails with the OPC EasyArchiver

You need to first make sure that the OPC EasyArchiver service is running with the same user account used to run the OPC DA Explorer. Refer to **Case 2** to configure the Log on parameter for the OPC EasyArchiver services.

If the above does not resolve the connection failure, some OPC Servers that are 32-bit work only with 32 bit OPC clients. If you are using OPC EasyArchiver 64-bit version, try the following:

1. Uninstall the OPC EasyArchiver.
2. Restart the machine.
3. Reinstall the OPC EasyArchiver using an administrator account.
4. The installation wizard will take you through the different steps. **When reaching the Runtime Mode dialog, select the "32-bit version" option.**
5. Configure the OPC EasyArchiver service logon with the user account that is launching the OPC DA Explorer.
6. Redo your connection test.

Case 10: Cannot get the selected returned attributes from OPC AE Server

You need to check the attributes for each event category, then click apply before moving to a different event category and repeat the same for each event category. At the end, you need to click the **OK** button. Refer to the Select Returned Attributes window illustrated below:

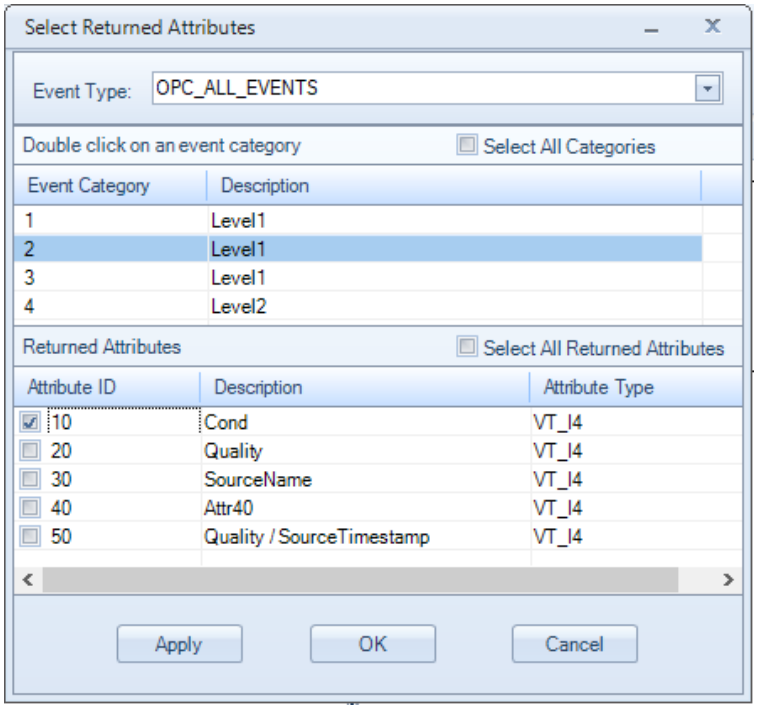


Figure 268: Select Returned Attributes

Or use the "**Select All Categories**" and "**Select All Returned Attributes**" options as described in the "2.7. Select Returned Attributes" section.

Case 11: Reconnection to OPC AE server while the status of the server is running

If you notice that the OPC EasyArchiver reconnects to OPC AE server while you do not have any communication issue, this is because the OPC EasyArchiver also monitors the received alarms and events and initiates au automatic reconnection when no alarm has been received after a configurable period. Refer to the AE settings illustrated below:

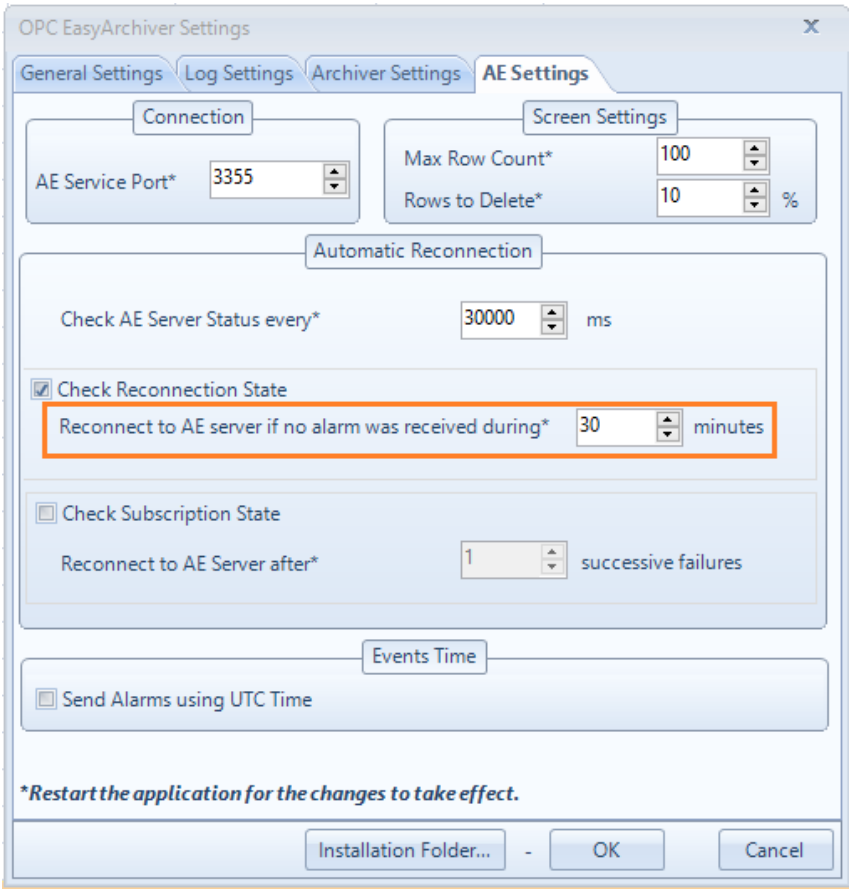


Figure 269: AE Settings

Case 12: I am not able to find alarms when using OPC EasyArchiver AE feature

You need to verify the list of fields configured as primary keys as some rows would not be inserted in your table because the primary key cannot be duplicated.

Case 13: OPC EasyArchiver can connect to OPC server, but there are no items found when browsing the OPC server or added after loading the default configuration

This case may happen when the OPC Server start up is slow and the OPC EasyArchiver connected to it, and tried to add the items while the OPC Server was still loading its address space.

To avoid such situation, you need to fine tune the "WaitForServerStartup" parameter. The value depends on the time that your OPC Server takes to load its address space. Follow the steps below to edit this parameter in your default configuration:

1. Stop the OPC EasyArchiver GUI and Services.
2. Open your oda XML configuration files.
3. Locate the "WaitForServerStartup" parameter and update each instance to 300000. The value is in milliseconds.

4. Start the OPC EasyArchiver, load your configuration and redo your tests.

Or refer to the "3.1. OPC Servers Management" section on how to configure this parameter when first connecting to your OPC Server.

Case 14: OPC EasyArchiver can connect to ORACLE Database but the Create Table fails for this reason: ORA-00972: identifier is too long

This case may happen when one of the created columns has a name with more than 30 characters long. There are two options to resolve this issue:

- Use Oracle version 12.2 or higher as column names was limited to up to 31 characters long in the older Oracle database versions.
- If you are using AE Archiver, do not enable the "Use Separate Columns for Attributes" option. This will instruct the AE archiver to archive all the attributes into a single column named "Attributes".

APPENDIX A: RELATIVE TIME FORMAT

When reading OPC HDA items values, you can use relative time as illustrated in the figure below:

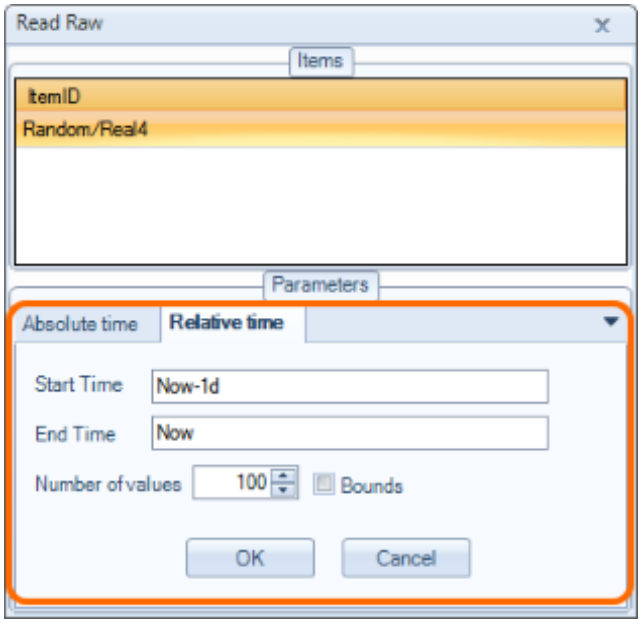


Figure 270: Relative Time

The format used for the relative time is:

keyword+/-offset+/-offset…

where keyword and offset are as specified in the table below.

Keyword	Description
Now	The current UTC time as calculated on the server.
Today	00:00:00 on the current day.
Yesterday	00:00:00 on the previous day.

Monday Tuesday Wednesday Thursday Friday Saturday Sunday	00:00:00 on the most recent of that day of the week.

Table 40: Relative Time List Keywords

Offset	Description
ms	Offset from time in milliseconds.
s	Offset from time in seconds.
m	Offset from time in minutes.
h	Offset from time in hours.
d	Offset from time in days.
w	Offset from time in weeks.
mm	Offset from time in months.
y	Offset from time in years.

Table 41: Relative Time List Offsets

The time format must respect the following instructions:

- Whitespace is ignored.
- The time string must begin with a keyword.
- Each offset must be preceded by a signed integer that specifies the number and direction of the offset. If the integer preceding the offset is unsigned, the value of the preceding sign is assumed (beginning default sign is positive).
- The keyword refers to the beginning of the specified time period. Today means the timestamp at the beginning of the current day (00:00 hours, midnight), Yesterday means the timestamp at the beginning of the day before, etc.

Examples:

- **Today-1d+7h+30m** could represent the start time for data request for a daily report beginning at 7:30 in the morning of the current day (Today: the first timestamp for today, -1D would make it the first timestamp for yesterday, +7H would take it to 7 a.m. yesterday, +30m would make it 7:30 a.m. yesterday.
- **Monday-1d+5h** would be 5 a.m. on the last Sunday.
- **Now-1h-15m** would be an hour and fifteen minutes ago.

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

Offices
- Americas: +1 713 609 9208
- Europe-Africa-Middle East: +216 71 195 360

Email
- Support Services: customerservice@integrationobjects.com
- Sales: sales@integrationobjects.com

To find out how you can benefit from other Integration Objects products and custom-designed solutions, visit our website https://www.integrationobjects.com/.