

# **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



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### 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**

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## 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 64bit version of the OPC Core Components.

If the OPC EasyArchiver deployment version is 32 bit, you need to install the 32bit 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.

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.

The table below lists the prerequisites to communicate with databases:



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.

Integration Objects' OPC EasyArcl	hiver - InstallShield Wizard	$\times$
License Agreement Please read the following license	agreement carefully.	
	Integration Objects End-User License & Customer Support and Services Agreement Integration Objects End-User License Agreement PLEASE READ THIS END-USER LICENSE AGREEMENT (the "Agreement") CAREFULLY BEFORE PROCEEDING. THIS AGREEMENT LICENSES THE SOFTWARE TO YOU AND CONTAINS WARRANTY AND LIABILITY DISCLAIMERS. BY INSTALLING THE SOFTWARE, YOU ARE CONFIRMING YOUR ACCEPTANCE OF THE SOFTWARE AND AGREEING TO BECOME BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT WISH TO DO SO, CLICK "Do not accept" BELOW AND DO NOT INSTALL THE SOFTWARE. 1. Definitions (a) "TO Software" means the software program covered by this Agreement and all related updates supplied by Integration Objects, also referred to as IO. (b) "TO Product" means the IO Software and the related documentation and content and all related updates supplied by IO. 2. License This Agreement allows you to: (c) I accept the terms of the license agreement (c) I do not accept the terms of the license agreement	<
InstallShield	< Back Next > Canc	el

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.



Integration Objects' OPC EasyArchiver - InstallShield Wizard		×
Customer Information Please enter your information.		
	Please enter your name and the name of the company for which you work.	
	User Name: Peter Company Name: Integration Objects	
InstallShield	< <u>B</u> ack <u>N</u> ext > Cance	al 🛛

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.



Integration Objects' OPC EasyArchiver - InstallShield Wizard	×
Setup Type Select the setup type to install.	
Please select a setup type.         Complete         Image: Com	anced
InstαllShield < Back Next > C	ancel

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:



Integration Objects' OPC EasyA	Integration Objects' OPC EasyArchiver - InstallShield Wizard		$\times$
Select Features Select the features setup will i	nstall.		
	Select the Product(s) that you want to install OPC DA OPC EasyArchiver DA for SQL Server OPC EasyArchiver DA for Oracle OPC EasyArchiver DA for MS Access OPC EasyArchiver DA for MySQL OPC EasyArchiver DA for PostgreSQL OPC EasyArchiver DA for ODBC OPC EasyArchiver DA for ODBC OPC EasyArchiver HDA for SQL Server OPC EasyArchiver HDA for SQL Server OPC EasyArchiver HDA for MS Access OPC EasyArchiver HDA for MySQL OPC EasyArchiver HDA for MySQL OPC EasyArchiver HDA for MySQL OPC EasyArchiver HDA for MySQL OPC EasyArchiver HDA for CSV OPC EasyArchiver HDA for CSV Set MB of space required on the C drive 47811.75 MB of space available on the C drive	Description     OPC DA Archiver	
InstallShield	< <u>B</u> ack <u>N</u> ext >	Cancel	

**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.



Integration Objects' OPC EasyAr	chiver - InstallShield Wizard	×
Runtime Mode		
	Please select your OPC EasyArchiver deployment version:	
	64-bit version	
	32-bit version	
InstallShield	< <u>B</u> ack <u>N</u> ext >	Cancel

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.



Integration Objects' OPC EasyArchi	ver - InstallShield Wizard	×
Choose Destination Location Select folder where setup will inst	all files.	
	Setup will install Integration Objects' OPC EasyArchiver in the following folder. To install to this folder, dick Next. To install to a different folder, dick Browse and select anoth folder. Destination Folder C:\Program Files\Integration Obj\Integration Objects' OPC EasyArchiver	er
InstallShield	< Back Next > Cancel	

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.



Integration Objects' OPC EasyArcl	hiver - InstallShield Wizard	$\times$
Ready to Install the Program The wizard is ready to begin inst	allation.	
	Click Install to begin the installation. If you want to review or change any of your installation settings, dick Back. Click Cancel to e the wizard.	kit
InstallShield	< Back Install Cance	e l

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*.



Integration Objects' OPC EasyArchiver - InstallShield Wizard		×
Services Log on		
Select the user account to be use	d to run the services.	
	Please enter the user account to be used to run the Services	
	User Name:	
	Password:	
I <b>nstall</b> Shield	< <u>B</u> ack [ <u>Next</u> >] Canc	el

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.



Integration Objects' OPC EasyArchiver - InstallShield Wizard		
	InstallShield Wizard Complete	
	Integration Objects' OPC EasyArchiver has been successfully installed on your computer.	
	Press Finish button to exit this installation.	
InstallShield	< Back Finish Cancel	

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:

Integration Objects' OPC EasyArchiver - InstallShield Wizard	83
Do you want to completely remove the selected application and all of its features?	
Yes No	

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.

Start page		
Start		
New Config	uration	1
Open Config	guratio	n
Recent		
MyConfig		Open Project
	9	Open Containing Folder
	×	Remove From List

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

File	OPC Se	erver	Archiver	DB	to OPC Trans	fer Hel	p
			4	0	0		
Nev	/ Open	Save	Save As	Exit	Configure	Define	Remove
		Project			Settings	Default C	Configuration

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.



OPC EasyArchiver Settings		x
General Settings Log Settings Archiver Set	tings (AE Sett	tings
Connection	Appearance	]
DA Service Port* 3333	Theme:	Windows7Blue 🗸
HDA Service Port* 3344	Layout:	Reset Views
User authentication	OPC Groups	& Items
Edit Admin Credential	🔲 Use Inde	exes*
Application	Configuration	
Prompt stop services confirmation mes	sage box	
Reconnect to DA server if the connection	is lost every*	30000 🔹 ms
Reconnect to HDA server if the connectio	n is lost every*	30000 🚔 ms
Split Loops per		750 📮 Items
*Restart the application for the changes	to take effect	
Installation	-	OK Cancel

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.



OPC EasyArchiver Settings			x
General Settings Log Settin	ngs Archiver Settings AE	Settings	
Configuration Configuration UI Log DA Service Log UI DA Service Log	Auto Append * Buffer Size File Max Size File Name *	True True To To ArchiverHDAServiceLog	
L Service Log	Maximum Files Save Timeout	0 10	
Restart the application for	or the changes to take effec	t.	
	Installation Folder	- OK Car	ncel

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.



OPC EasyArchiver Settings	x
General Settings Log Settings Archiver Settings AE Settings	
Archiver Service Settings	
Archiving Block Size * 2000	
Max Colmun Size 2000	
Command Timeout * 120 🖶 ms	
Maximum Allowed Memory * 1.5 GB	
Multi Language Database*  Use Alias	
In Format Decimals* Decimal Precision* 3 →	
Data Recovery Settings	
Enabled *	
Automatic when the archiver is running * Period * 3600000	
Maximum backup file size *	
DA 10 MB HDA 10 MB AE 10 MB	
*Restart the application for the changes to take effect.	
Installation Folder OK Cance	:

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.



OPC EasyArchiver Settings		x
General Settings Log Settings Archiver	Settings AE Settings	
Connection	Screen Settings	
AE Service Port* 3355	Rows to Delete* 10	\$ %
Automa	atic Reconnection	
Check AE Server Status every*	30000 ms	
Check Reconnection State		
Reconnect to AE server if no alarm w	vas received during* 30 🚔 mir	nutes
Check Subscription State		
Reconnect to AE Server after*	1 successive failur	res
F	vents Time	
Archive alarms using UTC Time*		
*Restart the application for the change	es to take effect.	
Installat	tion Folder OK	Cancel

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.

餯 Login		x
Login		
Password		
	<u>O</u> k <u>C</u> ancel	

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:

洛 Edit Admin Credential	X
Username	
OEAdmin	
Old password	
•••••	
Password	
•••••	
Re-type password	
•••••	
Enable user authentication	
<u>O</u> K <u>C</u> ancel	

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:





🍥 Connect to OPC Serve	er	_ X
Local Host     OPC DA Servers     OPC HDA Servers     OPC AE Servers		
	Remote Connection	
OPC Server Name		
Host IP Address	127.0.0.1	×
Server Type	<b>v</b>	
	Wait for server startup	
Wait for server startup	1000	🗘 (ms)
(	Reconnect after Server Shutdown	
Reconnect after Serve	r Shutdown	
Connec	Cancel	

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:



🛨 Add Group		x
	General Properties	s
Group Name :	Group0	
Update Rate :		1000 🛖 (ms)
Dead Band :		0.00 🔹 (%)
Time Bias :		0 € (min)
	Read Mode	
Read Mode :	OnDataChange	•
Read Source :	Cache	•
	Write Mode	
Write Mode :	Synchronous	•
Apply		Cancel

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:



💑 OPC Server Address Space	x
Server Properties	_
Server : IntegrationObjects.AdvancedSimulator.1	
Host IP : localhost	
□··· IntegrationObjects.AdvancedSimulator.1	
🖨 Random	
Text	
Date	
Boolean	
Int1	
UInt1	
···· Int2	
UInt2	
···· Int4	
···· UInt4	
···· Real4	
L Real8	
🖻 Writable	
Text	
Date	
Boolean	
Int1	
···· UInt1	
Int2	
UInt2	
Int4	-
OK	

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:

± ™ 🎇 IntegrationObjects.AdvancedSimulatorFullEdition.1 | localhost

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:

Integratio	on Objects' OPC EasyArchiver
?	Are you sure you want to remove all OPC DA servers?
	Yes No

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:



😻 Server Status		x
Property	Value	
Server Name	IntegrationObjects.AdvancedSimulator.1	
Server IP	localhost	
Server Start Time	Thursday, March 31, 2016 10:22:03 AM	
Server Current Time	Thursday, March 31, 2016 10:51:52 AM	
Server Last Update Time	Thursday, March 31, 2016 10:51:49 AM	
Server Current State	RUNNING	
Server Major Version	2	
Server Minor Version	0	
Server Build Number	3	
Server Vendor Info	Integration Objects' OPC Advanced Simulator; http://www.integrationobjects.com	
	ОК	

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**.



🛨 Add Items							x
			General P	roperties			
Server Progld :	IntegrationObjects.KNetOpc	Simulator.1			Group Num	iber : 0	
Server Address :	localhost				Items Numb	per : 0	
Group Name :	Group0						
Branch Filter :	Leaf Filter :	Type : Native	-	Access : Any	T		
□ IntegrationObject □ Random □ Text □ Date □ Date □ Date □ UInt1 □ Int2 □ UInt2 □ Int4 □ UInt2 □ Int4 □ Real8 ① Writable	cts.KNetOpcSimulator.1	OPC Item Random/Bool Random/Date Random/Int1 Random/Int2 Random/Real Random/Real Random/Real Random/Int Random/Uint Random/Uint Random/Uint	lean 14 18 1 2 4				
To remove an item, dra	ay and drop it to the Grid. , select it by clicking on OPC i	tems list and pr	ess the "De	I" key from the	keyboard.	Apply	Cancel

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:



Add Items	x
Items :	
Item1,Item2	
Delimiter :	
Apply Cancel	

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:

Integration Objects'	OPC EasyArchiver	Untitled.oda										- a x
File OPC Server	Archiver DB to	OPC Transfer	Help									
New Open Save	Save Exit	Configure D Settings D	efine Remove									
OPC Servers Archive	rs Rules Loop	s Transfers	Start page OPC	Data Access								•
		<u> </u>	Select your OPC G	aroup : loca	alhost/IntegrationObje	ects.AdvancedSimul	ator.1 Grou	p0	Remove Grou	p from list		
G- OPC Servers			ItemID	Value	Quality	Time Stamp	Group	Server ProgID	Server Address	Data Type	Access Rights	
G- OPC DA Servers			Random/Boolean	False	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_BOOL	Read_Only	
⊡- ∎ Integration	Objects AdvancedS	Simulator.1   loc	all Random/Date	7/7/201	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_DATE	Read_Only	
⊡- 🦻 Group(			Random/Int1	32	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_11	Read_Only	
/ Rar	dom/Boolean		Random/Int2	210	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_12	Read_Only	
- Bar	oom/Date		Random/Int4	262	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_14	Read_Only	
- / Bar	dom/Int2		Random/Real4	12.09091	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_R4	Read_Only	
- 🖉 Rar	ndom/Int4		Random/Real8	21.5454	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_R8	Read_Only	
- 🌶 Ran	ndom/Real4		Random/Text	10289	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_BSTR	Read_Only	
🧨 Rar	dom/Real8		Random/Ulnt1	83	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_UI1	Read_Only	
- 💉 Rar	ndom/Text		Random/Ulnt2	107	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_UI2	Read_Only	
- 🖋 Ran	ndom/UInt1		Random/Ulnt4	184	Good, Non-Speci	2017/07/07 17:2	Group0	IntegrationObject	localhost	VT_UI4	Read_Only	
Rar     OPC HDA Server	ndom/UInt4		Number of tags: 11									
~ • L' @												0
	Timestame		Marria									
message type	imestamp		message		10 01							- i
[Inform]	2017/07/07 17	120:46	Adding item	s to the grou	p [Group0] succeed	ed.						
[Inform]	2017/07/07 17	2638	Add group G	iroup0 to ser	ver localhost   Integ	rationObjects.Adva	incedSimul	ator.1 succeeded.				
[Inform] 6 Mersson	2017/07/07 17	26-31	Connected t	n cenier Inte	arationObjects.Adu	incedSimulator 1.1	localhort					•
Integration Objects' OPC	EasyArchiver											

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.





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:

+ + () () () () () () () () () () () () ()	Add Items Add Items Manually View Group Data Export Items to CSV File Import Items from CSV File Read Mode	_		
2	Write Mode		Synchronous	
2	Set Group Properties		Asynchronous IO2	Write
Q.	Configure Archiver		Asynchronous IO3	Write VQT
SPC	Configure Transfer			
8	Remove All Items			
×	Remove Group			
Q	View Group Properties			

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:

🔦 Group Properties	x
Group Name :	Group0
Update Rate (ms) :	1000 🚔
Time Bias (min):	0
Dead Band :	0.00
Active State	OK Cancel





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:

View Group Proper	ties	х
Group Name :	Group 0	
Update Rate (ms) :	1000	
Time Bias (min):	0	
Dead Band :	0	
State :	Active	
Archiver :	Not configured	
Read Mode :	onDataChange	
Write Mode :	Synchronous	
Number of items :	0	
	ОК	

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:

🖊 Write Item		x
Item Properties		
Server ProgID :	IntegrationObjects.AdvancedSimulator.1	
Server Address :	localhost	
Group Name :	Group1	
OPC Write Mode :	Synchronous	
Item Name :	Writable/Int2	
Item Current Value :	2	
Item Data Type :	VT_I2	
Enter the New Value :		
Value : 74		
Apply	Cancel	
Арріу	Cancer	

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:

🖊 Write Item		х
Item Properties		
Server ProgID :	IntegrationObjects.KNetOpcSimulator.1	
Server Address :	localhost	
Group Name :	Group0	
OPC Write Mode :	SynchronousIO2 (WriteVQT)	
Item Name :	Stat1	
Item Current Value :	0	
Item Data Type :	VT_R8	
Enter the New Value,	Quality and Timestamp :	
Value :		
Timestamp : 03/16/20	17 10:56:45	
Quality : Bad, Non	-Specific, Not Limited 📃	
Apply	Cancel	

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.

Item Properties		x
General		_
Item ID :	Random/Int1	
Item Current Value :	50	
Item Data Type :	VT_I1	
Item Quality :	Good, Non-Specific	
Item TimeStamp :	1/5/2017 11:57:40 AM	
Item Access Rights :	Read_Only	
Item Description :	0	
Z Active		
Advanced		
Server ProgID :	IntegrationObjects.AdvancedSimulator.1	
Server Host IP :	localhost	
Group Name :	Group0	
	ОК	

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**.

General Properties         Server Progld : IntegrationObjects.AdvancedSimulator.1         Server Address : Iocalhost       Set filter         Items Number : 0       OPC Item         Random/Text       Random/Text         Random/Text       Random/Real8         Random/Meal8       Random/Neal4         Random/Ulnt4       Random/Int4         Random/Ulnt4       Random/Int4         Random/Ulnt2       Random/Int2         Random/Ulnt1       Random/Int2
Server Progld : IntegrationObjects.AdvancedSimulator.1 Server Address : localhost Set filter Items Number : 0
Server Address : localhost Items Number : 0
Items Number : 0   OPC Item Random/Text Random/Text Random/Text Random/Real8 Random/Real4 Random/Ulnt4 Random/Ulnt4 Random/Ulnt4 Random/Ulnt4 Random/Ulnt2 Random/Ulnt2 Random/Ulnt1 Random/Ulnt1 Random/Ulnt1 Random/Ulnt1
Image: Second state sta
Image: IntegrationObjects.AdvancedSimulator.1       Random/Text         Random       Random/Text         Random/Real8       Random/Real4         Random/Ulnt4       Random/Int4         Random/Int4       Random/Int4         Random/Int2       Random/Int2         Random/Int1       Random/Ulnt2
Random     Random/Real8       Random/Text     Random/Real4       Random/Real8     Random/Real4       Random/Real4     Random/Ulnt4       Random/Int4     Random/Int4       Random/Ulnt2     Random/Ulnt2       Random/Int2     Random/Int2       Random/Int1     Random/Int2
Random/Text     Random/Real4       Random/Real8     Random/Ulnt4       Random/Ulnt4     Random/Ulnt4       Random/Ulnt4     Random/Ulnt2       Random/Ulnt2     Random/Ulnt2       Random/Ulnt2     Random/Ulnt2       Random/Ulnt2     Random/Ulnt2       Random/Ulnt2     Random/Ulnt2       Random/Ulnt1     Random/Ulnt1
Image: Random/Real     Random/Ulnt4       Image: Random/Ulnt4     Random/Ulnt4       Image: Random/Ulnt4     Random/Int4       Image: Random/Ulnt2     Random/Ulnt2
Image: Wandom/Ulnt4     Random/Int4       Image: Wandom/Ulnt4     Random/Ulnt2       Image: Wandom/Ulnt2     Random/Ulnt2       Image: Wandom/Ulnt1     Random/Ulnt2
···· Random/Int4     Random/Ulnt2       ··· Random/Ulnt2     Random/Int2       ··· Random/Ulnt1     Random/Ulnt2
Random/Int2 Random/Int2 Random/Unt1 Random/Ulnt1
···· Random/Ulnt1 Random/Ulnt1
Random/Date Random/Boolean
⊞. Writable Random/Date
I o add an item, drag and drop it to the Grid.
To remove an item, select it by clicking on OPC items list and press the "Del" key from the keyboard.

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.



Set Filter	x
🗷 Use filter	
Attribute ID:	OPCHDA_ITEMID (VT_BSTR)
Operator Code:	OPCHDA_EQUAL
Attribute Filter:	Random*
	Apply Cancel

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.

OPC Item	
Random/Text	
Random/Real8	
Random/Real4	
Random/Ulnt4	
Random/Int4	
Random/Ulnt2	(m)
Random/Int2	💥 Remove selected items
Random/Ulnt1	
Random/Int1	
Random/Boolean	
Random/Date	

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:



Add Items	x
Items ·	
Item 1 Item 2	
ican i, ican z	
Delimiter :	
Apply Cancel	

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.



🚜 OPC Server Address Space		x
Server Properties		
Server : IntegrationObjects.AdvancedSimulator.1 Host IP : Iocalhost		
IntegrationObjects.AdvancedSimulator.1 Random Random/Text Random/Real8 Random/Ulnt4 Random/Ulnt4 Random/Ulnt2 Random/Ulnt2 Random/Ulnt1 Random/Int1 Random/Int1 Random/Date Writable		
OK	(	

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:

IntegrationObjects.AdvancedSimulatorFullEdition.1 | localhost

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:

Server Status		x
Property	Value	
Server Name	IntegrationObjects.AdvancedSimulator.1	
Server IP	localhost	
Server Start Time	Thursday, March 31, 2016 10:22:03 AM	
Server Current Time	Thursday, March 31, 2016 11:53:55 AM	
Server Current State	UP	
Server Major Version	2	
Server Minor Version	0	
Server Build Number	3	
Server Max Returned Values	100	
Server Vendor Info	Integration Objects' OPC Advanced Simulator; http://www.integrationobjects.com	
ОК		

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:







# 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:

Read Raw	x
Items	
ItemID	
Simulation/Tag.VT_I1	
Simulation/Tag.VT_UI4	
Simulation/Tag.VT_R8	
Simulation/Tag.VT_R4	-
Parameters	
Absolute time Relative time	•
Start Time 01/18/2017 09:01:07 rms 0	<b>▲</b> ▼
End Time 01/18/2017 09:02:07 🕶 ms 0	÷
Number of values 0 💭 🔲 Bounds	
OK Cancel	

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.



|--|

**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:

Read Processed	= X	
Ite	ms	
ItemID	Aggregate	
Simulation/Tag.VT_I1	OPCHDA_INTERPOLATIVE	
Simulation/Tag.VT_UI4	OPCHDA_TOTAL	
Simulation/Tag.VT_R8	OPCHDA_AVERAGE	
Simulation/Tag.VT_R4	OPCHDA_INTERPOLATIVE	
Simulation/Tag.VT_IUI1 OPCHDA_INTERPOLATIVE		
Simulation/Tag.VT_I2 OPCHDA_INTERPOLATIVE		
Parameters		
Absolute time Relative time	•	
Start Time 01/18/2017 09:02	2:11 💌 ms 🛛 🖨	
End Time 01/18/2017 09:03	3:11 💌 ms 🛛 🖨	
Resample Interval 10 🚔 (sec)		
ОК	Cancel	

Figure 70: Synchronous Read Processed Dialog

Parameter	Description
ltemID	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: Sy	ynchronous	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.

Read At Time		x
	Items	
ItemID		
SQLLink/Random	/Text	
SQLLink/Random/	/Int4	
	Parameters	
-		
TimeStamp	04/01/2016 15:00:00 💌 ms 0 🚍	
TimeStamp	Ddd	
04/15/2016 12:	10:50.000	
04/13/2016 08:	10:50.000 Delete	;
04/01/2016 15:00:00.000		
L		
	OK Cancel	

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.



Read Modified		x
	Items	
ItemID		
SQLLink/Random/In	t2	
SQLLink/Random/In	t4	
[		
	Parameters	
Absolute time Re	elative time	-
Start Time	04/01/2016 08:11:15 💌 ms 0 🚔	
End Time	04/12/2016 08:12:15 💌 ms 0 🛓	
Number of values	0	
	OK Cancel	

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.



Read Attributes	x	
OPC HDA Item		
Parameters		
Start Time 03/31/2016 16:11:55 v ms 0		
End Time 03/31/2016 16:12:55 💌 ms 0 🖨		
Attribute OPCHDA_ITEMID		
Attribute V Add		
OPCHDA_ITEMID	51	
OPCHDA_DATA_TYPE		
OK Cancel		

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.



Insert		X
	Items	
ItemID	Data Type	
Random/Int1	VT_12	
Parameters		
Timestamp	06/20/2017 15:26:45 ms (	¢
Value	25	
Quality	Good	
	OK Cancel	

#### 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.



Delete Raw		x
	Items	_
ltemID		
SQLLink/Randor	m/Text	
SQLLink/Randor	m/Boolean	
	(Barrantara)	
	Parameters	
Absolute time	Relative time	•
Start Time	04/20/2016 16:13:16 🔽 ms 0 🚔	
End Time	04/25/2016 16·14·16 🔽 📖 0 🛋	
	OK Cancel	

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.



Read At Time	x
Items	
ItemID	
SQLLink/Random/Date	
Parameters	
TimeStamp 04/30/2016 04:15:07 ms	0 🚖
TimeStamp	Add
04/05/2016 16:15:07.000	
04/30/2016 04:15:07.000 Delete	
OK Cancel	

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.

Read Annotation	ns	x
	Items	
ItemID		
SQLLink/Randor	n/UInt4	
SQLLink/Randor	n/UInt2	
SQLLink/Randor	n/Boolean	
	Parameters	
Absolute time	Relative time	•
Start Time	04/05/2016 16:21:08 💌 ms 0 🚔	
End Time	04/06/2016 16:22:08 💌 ms 0 🚔	
	OK Cancel	

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.

Insert Annotations		x
	Items	
ltemID		
SQLLink/Random/F	Real8	
	Parameters	
Timestamp	04/04/2016 16:26:38 💌 ms	0 🌲
Annotation Time	04/08/2016 16:26:38 💌 ms	0
Value	88	
	OK Cancel	

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:



Read Raw Loop		x
Operation name ReadRawLoop1		
Items		
Random.ArrayOf Reals		
Random.ArrayOfString		_
Random.Boolean		-
Random.Int1		
Random.Int2		
Random.Int4		▼
Parameters		
Absolute time Relative time		•
Start Time 04/07/2021 10:16:19 ms	0 🌲	
Loop Period (sec)		
Waiting Time (sec) 10 🚔		
Number of values 0 💭 🔲 Bounds		
Restart from Last Executed Time		
Split into Multiple Loops		
End Time 04/07/2021 10:16:19 ms	0	
OK Cancel		

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 <b>Bounds</b> option, the bounding values will be returned.				
Restart from Last Executed Time If not: the read raw loop will start from the last exec time. If not: the read raw loop will start from the initially configur- 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:



Read Processed Loop	= x
Operation name ReadProcesse	edLoop1
Ite	ms
ItemID	Aggregate
Random/Int1	OPCHDA_INTERPOLATIVE
Random/Real8	OPCHDA_TOTAL
Random/Real4	OPCHDA_AVERAGE
Random/Int4	OPCHDA_COUNT
Random/Int2	OPCHDA_START
Parar	neters
Absolute time Relative time	•
Start Time 01/03/2018	17:48:10 💌 ms 🛛 📮
End Time 01/03/2018	17:49:10 💌 ms 🛛 0 🚔
Resample Interval (sec)	10 🖨
Waiting Time (sec)	60 🚔
Restart From Last Executed Ti	me
Split into Multiple Loops	
End Time 01/03/2018	18:00:00 🕶 ms 🛛 0 🖨
ОК	Cancel

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:

Loop Manager							x
Operation Type	Operation Name	Start DateTime		Start DateTime Last Executed	Loop Period	Resample Interval	WaitingTime
ReadRaw	ReadRawLoop1	01/26/2017 17:27:47		01/26/2017 17:2	10		5
ReadProcessed	ReadProcessedLoop1	01/26/2017 17:26:53	0	Cancel request	р	10	5
					_		

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:



Start page OPC	Read Raw Loop	OPC Read Processe	d Loop Loop Mar	ager					-
Refresh									
Server ProgID	Host Address	Operation Type	Operation Name	Start Date Time	Start DateTime Last Executed	Loop Period	Resample Interval	Waiting Time	End Date Time
IntegrationObject	localhost	ReadRaw	ReadRawLoop1	12/21/2017 10:1	12/21/2017 10:15:30	10		5	12/21/2017 10:30:00
IntegrationObject	localhost	ReadProcessed	ReadProcessedL	12/21/2017 10:2	12/21/2017 10:29:17	60	10	5	
l l									
ĺ									
ĺ									
ĺ									
Number of value :	0								

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:



Edit Read Raw Lo	оор						x
Operation page	_	ReadRawl	0002				
Operation hame	-	neaunawi	0002				
Select all							
			Items				
ItemID							*
Random/Text	t						
Random/Real	18						
Random/Real	4						Ξ
🔲 Random/UInt/	4						
Random/Int4							
🔲 Random/UInt2	2						
Random/Int2							
🔲 Random/UInt	1						-
Random/Int1							
			 Deserveder				
			-aramete	rs			
Absolute time	Relati	ve time					•
Start Time	01/	03/2018 1	7:52:55	💌 ms		0 ‡	
Loop Period (se	ec)	1	10 🌲				
Waiting Time (s	sec)		5 🌲				
Restart from	n Last B	Executed til	me				
End Time	01/	03/2018 1	8:00:00	• m	s	0 🌲	
		ОК		ancel			

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:

Read Raw		х
Items		
ltemID		
Simulation/Tag.VT_I1		
Simulation/Tag.VT_I2		
Parameters		
Absolute time Relative time		-
Start Time 01/18/2017 09:05:18 rms	0	-
End Time 01/18/2017 09:06:18 me	0	1
	• •	1
Number of values 0 🖶 🔲 Bounds		
OK Cancel		

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 <b>Bounds</b> 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:



Read Processed	= X	
Ite	ms	
ltemID 🛆	Aggregate	
Simulation/Tag.VT_I1	OPCHDA_INTERPOLATIVE	
Simulation/Tag.VT_I2	OPCHDA_AVERAGE	
Parar	neters	
Absolute time Relative time	•	
-		
Start Time 01/18/2017 09:00	5:08 💌 ms 🛛 🖨	
End Time 01/18/2017 09:07	7:08 💌 ms 🛛 🗘	
Resample Interval 10 💭 (sec)		
OK Cancel		

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.





Read At Time	x	
Items		
ItemID		
SQLLink/Random/Text		
SQLLink/Random/Int4		
Parameters		
TimeStamp 04/01/2016 15:00:00 rms	0 🜩	
TimeStamp V	Add	
04/15/2016 12:10:50.000		
04/13/2016 08:10:50.000 Delete		
04/01/2016 15:00:00.000		
OK Cancel		

#### 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.



Read Modified		x
	Items	
ItemID		
SQLLink/Random/Ir	t2	
SQLLink/Random/Ir	tt4	
		]
	Parameters	
Absolute time R	elative time	•
Start Time	04/01/2016 08:11:15 💌 ms 0 🖨	
End Time	04/12/2016 08:12:15 🔽 ms 0 🚔	1
Number of values 0		
OK Cancel		

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.



Read Attributes		x
	OPC HDA Item	
Item name : SQLLink/Random/Boolean		
	Parameters	Π
Start Time	03/31/2016 16:11:55 💌 ms 0	
End Time	03/31/2016 16:12:55 💌 ms 0	
Attribute	OPCHDA_ITEMID	
Attribute	Add V	
OPCHDA_ITEM	1ID Delete	51
OPCHDA_DAT	A_TYPE	
OK Cancel		

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.

Advise Raw		х
Operation name AdviseRaw1		
Items		
ItemID		
Simulation/Tag.VT_I1		
Simulation/Tag.VT_UI4		
Simulation/Tag.VT_R8		
Simulation/Tag.VT_R4		
Simulation/Tag.VT_IUI1		
Simulation/Tag.VT_I2		
Parameters		
Absolute time Relative time		•
Start Time 01/18/2017 09:08:04 💌 ms	0	
Resample Interval (sec) 10		
Waiting Time (sec) 5		
Restart from Last Executed Time		
OK Cancel		

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.



Advise Processed 📼 🗙		
Operation name AdviseProcessed1		
	Agemente	
Simulation/Tag VT 11		
Simulation/Tag VT_UI4		
Simulation/Tag.VT_R8	OPCHDA AVERAGE	
Simulation/Tag.VT R4		
Simulation/Tag.VT_IUI1	OPCHDA_INTERPOLATIVE	
Simulation/Tag.VT_I2 OPCHDA_TOTAL		
Absolute time Relative time		
Start Time         01/18/2017 09:08:27         ms         0 ÷           Resample Interval (sec)         10 ÷		
Number Interval 1		
Restart from Last Executed Time		
OK Cancel		

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:



Advise Manager X					
Operation Type	Operation Name	Start DateTime	Start DateTime Last Executed	Resample Interval	
Advise Read	AdviseRaw1	01/26/2017 17:31:16	01/26/2017 17:3	10	
Advise Read Process	AdviseProcessed1	01/26/2017 2010 Cancel re	quest 7 17:3	10	

#### 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.


Items ItemID SQLLink/Random/Int4 Parameters Timestamp 04/10/2016 16:13:32 • ms Value 152	X			
ItemID         SQLLink/Random/Int4         Parameters         Timestamp       04/10/2016 16:13:32         Value       152				
SQLLink/Random/Int4 Parameters Timestamp 04/10/2016 16:13:32  ms Value 152				
Parameters           Timestamp         04/10/2016 16:13:32           Value         152				
Parameters           Timestamp         04/10/2016 16:13:32           Value         152				
Parameters           Timestamp         04/10/2016 16:13:32           Value         152				
Parameters           Timestamp         04/10/2016 16:13:32           Value         152				
Timestamp         04/10/2016 16:13:32         ms           Value         152	Parameters			
Timestamp         04/10/2016 16:13:32         ms           Value         152				
Value 152	0 ≑			
Cond				
Quality Good 💌				
OK Cancel				

#### 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.



Delete Raw		x
	Items	_
ltemID		
SQLLink/Rando	m/Text	
SQLLink/Rando	m/Boolean	
[		
	Parameters	
Absolute time	Relative time	-
Start Time	04/20/2016 16:13:16 💌 ms 0 🚔	
End Time	04/25/2016 16:14:16 -	ח ו
Lind Time	04/25/2010 10: 14: 10 ms	
	OK Cancel	

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.



Read At Time	x
Items	
ItemID	
SQLLink/Random/Date	
December	
Parameters	
TimeStamp 04/30/2016 04:15:07 ms	0 🖨
TimeStamp	Add
04/05/2016 16:15:07.000	
04/30/2016 04:15:07.000	Delete
OK Cancel	

Figure 103: Asynchronous Delete at Time Dialog

Parameter	Description	
ltems	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.

Read Annotation	15	x
	Items	
ItemID		
SQLLink/Randor	n/UInt4	
SQLLink/Randor	n/UInt2	
SQLLink/Randor	n/Boolean	
	Parameters	
Abaaluta tima	Pelative free	-
Absolute ume	Relative time	•
Start Time	04/05/2016 16:21:08 💌 ms 0 🖨	
End Time	04/06/2016 16:22:08 🔽 ms 0 🚔	
	OK Cancel	

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

Insert Annotations			X
	Items		
ltemID			
SQLLink/Random/F	Real8		
	Parameters		
Timestamp	04/04/2016 16:26:38	ms	0 🌲
Annotation Time	04/08/2016 16:26:38	ms	0 🌲
Value	88		
	OK Cancel		

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:



Event Subscription Settings		x
Event Subscription Name:	Subscription1	ms
Max Size:	0	
Active     OK	Cancel	

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:



Event Space	-	x
Server Properties		
Server: IntegrationObjects.OPCAEServer.Simulator.1		
IP Address: localhost		
Image: Constraint of the second se		
ОК		

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**  $\rightarrow$  **Display Available Filters.** 

Available Filters			– = ×						
Server Properties									
Server: IntegrationOt	jects.OPCA	EServer.Sin	nulator.1						
IP Address: localhost									
Filter Mask	Value	Available	Description						
OPC_FILTER_BY_EVENT	1	Yes	The server supports filtering by event type						
OPC_FILTER_BY_CATEGOR	. 2	Yes	The server supports filtering by event category						
OPC_FILTER_BY_SEVERITY	4	Yes	The server supports filtering by severity						
OPC_FILTER_BY_AREA	8	Yes	The server supports filtering by process area						
OPC_FILTER_BY_SOURCE	16	Yes	The server supports filtering by process source						
		OK							

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**  $\rightarrow$  **Display Available Categories:** 

Available Categories _ X
Server Properties Server: IntegrationObjects.OPCAEServer.Simulator.1 IP Address: Iocalhost
ОК

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**  $\rightarrow$  **Display Available Condition Names:** 



Available Conditions Names		-	x
	Server Properties		
Server: IntegrationObjects.OPC	AEServer.Simulator.1		
IP Address: localhost			
Br OPC_ALL_EVENTS			
📁 Level3			
Level4			
	ок		

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**  $\rightarrow$  **Display Available Sub-Conditions Names:** 



Available SubConditions Names	-	х
Server Properties		
Server: IntegrationObjects.OPCAEServer.Simulator.1		
IP Address: localhost		
Image: Constraint of the second state of the second st		
ОК		

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:** 



Display Source Conditions Names	-	x
Server Properties		
Server: IntegrationObjects.OPCAEServer.Simulator.1		
IP Address: localhost		
Source Names		
□··· Root         □··· ℘       Boiler1         □··· ℘       Boiler1:makeup1         □··· ℘       Boiler1:makeup2         □··· ℘       Water1         □··· ℘       Water1:makeup3         □··· ℘       Water1:makeup4		
Condition Names		
DEVIATION		
ОК		

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:





😻 Server Status		x				
Property	Value					
Server Name	IntegrationObjects.OPCAEServer.Simulator.1					
Server IP	localhost					
Server Start Time	Friday, November 2, 2018 11:04:00 AM					
Server Current Time Tuesday, November 6, 2018 4:52:26 PM						
Server Last Update Time	ver Last Update Time Tuesday, November 6, 2018 4:29:54 PM					
Server Current State	ate RUNNING					
Server Major Version	2					
Server Minor Version	0					
Server Build Number	4					
Server Vendor Info	Integration Objects' OPC AE Simulator Server					
ок						

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:

Condition State								- =	X
			Server Prope	rties					
Server: IntegrationObjects.OI IP Address: Iocalhost	PCAEServer.Simu	ulator.1							
⊡ Root	Condition	State	Active Sub	Quality	Last Active time	e Last A	Last In	Actor ID	Comm
⊡ • Boiler1									
B⊡-FIC1001 B-FVEL									
Attr100	<								>
Attr300	Subcondition Na	ame De	efinition	Severity	Description		Last Activ	e Time	_
B Boiler1:makeup2 Water1 System_Event Tracking_EVENT	•								
	Attribute Descrip	tion				Attribute Value			
			ОК						



#### 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.

Condition State								- =	x
			Server Prop	erties					
Server: IntegrationObjects.0	)PCAEServer.Si	mulator.1							
IP Address: localhost									
⊡ Root	Condition	State	Active Sub	Quality	Last Active time	Last A I	Last In	Actor ID	Comm
Boiler1:makeup1     Boiler1:makeup1     FIC1001     PVLEVEL     Attr100	PVLEVEL	OPC_CON	LOLO	192	1/31/2019 6:47:47	0 1/	/31/2019		·
Attr200	<								>
Attr300	Subcondition N	ame De	efinition	Severity	Description	L	Last Active 1	Time	
Boiler1:makeup2 ⊕ Water1	HIHI HI	HIF HI	11	900 900	test test				
System_Event		LO	LO	100	test	1/.	31/2019 6:4	17:47 PM	
	Attribute Descri	ption			Att	ribute Value			
	Attr100				test	10.3025315512	244916		
			ОК						

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:



-				
÷	Add Event Subscription			
	Display Area and Source Browser			
<b>.</b>	Display Event Space			
Q	Explore OPC AE Server	×		
ÿ	Reconnect Server			
<b>\$</b>	Disconnect Server			
≍	Remove All Subscriptions			
×	Remove Server			
¥	Server Status			
∢	Condition State			
	Enable/Disable Condition	•	E	nable Condition by Area
_		_	C	isable Condition by Area
			E	nable Condition by Source
				Disable Condition by Source

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:

Disable Condition by Area	-	x
Disable Condition by Area	-	x
OK Cancel		

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:

Enable Condition by Source	-	. 🗆	x
Boiler1     Boiler1:makeup1     Boiler1:makeup2     Water1     System_Event     Tracking_EVENT			
OK Cancel		]	

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:





Disable Condition by Source	-	x
<ul> <li>➡ Boiler1</li> <li>➡ Water1</li> <li>➡ Water1:makeup3</li> <li>➡ Water1:makeup4</li> <li>System_Event</li> <li>Tracking_EVENT</li> </ul>		
OK Cancel		

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:



Event Subscription Settings	x
Event Subscription Name:	Subscription1
Buffer Time:	1000 🚔 ms
Max Size:	0
Active	
ОК	Cancel

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:



Subscription Filter	_ = X
Filter by Event Type: All Simple Condition Tracking	Filter by Severity: Low: 1 + High: 1000
Filter by Category:	
1_Level1 2_Level1 3_Level1 4_Level2	» > < «
Filter by Area:	
Boiler1:makeup1 Boiler1:makeup2 Boiler1 Water1:makeup3 Water1:makeup4 Water1	» > <
Filter by Source:	
FIC1001 FIC1002 FIC1003 FIC1004 System_Event Tracking_EVENT	» > <
Enter Source Name:	Add to Filter
ОК	Cancel

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:



Select Returned Att	ributes	_ >	C
Event Type: OPC	ALL_EVENTS		
Double click on an ev	ent category	Select All Categories	
Event Category	Description		
1	Level1		
2	Level1		
3	Level1		
4	Level2		
Returned Attributes		Select All Returned Attribute	s
Attribute ID	Description	Attribute Type	
10	Cond	VT_14	
20	Quality	VT_14	
🜌 30	SourceName	VT_14	
<b>⊌</b> 40	Attr40	VT_I4	
50	Quality / SourceTimestamp	VT_14	
<			>
Apply	ОК	Cancel	

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.



Select Returned Attributes _ X						
Event Type: OPC	C_ALL_EVENTS	•				
Double click on an e	vent category	Select All Categories				
Event Category	Description					
1	Level1					
2	Level1					
3	Level1					
4	Level2					
Returned Attributes		Select All Returned Attributes				
Attribute ID	Description	Attribute Type				
10	Cond	VT_14				
20	Quality	VT_14				
30	SourceName	VT_I4				
40	Attr40	VT_14				
50	Quality / SourceTimestamp	VT_14				
<		>				
Арр	ly OK	Cancel				

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:

🖹 Browse Are	chivers	×
Please selec	tan Archiver:	
Archivers :	Archiver	•
	Archiver	
	Archiver2	

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.



OPC EasyArchiver Settings	:					
General Settings Log Settings Archiver Settings AE Settings						
Connection     Screen Settings       AE Service Port*     3355       Image: Service Port*     3355       Image: Service Port*     10       Image: Service Port*     10       Image: Service Port*     10						
Automatic Reconnection	ור					
Check AE Server Status every* 30000 ms						
Check Reconnection State						
Reconnect to AE server if no alarm was received during* 30 💭 minutes						
Check Subscription State						
Reconnect to AE Server after*						
	2					
Events Time						
*Restart the application for the changes to take effect.						
Installation Folder OK Cancel						

Figure 136: AE Settings

Start	page Alarms Logger View													<b>~</b>
	Server Name	Host Name	Subscription Na	Source	Event Time	Severity	Message	Quality	Condition	SubCondition	Mask	NewState	Event Type	Event Category
7														
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	300	LOLO Alam	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	. 300	Condition Normal	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	300	LO Alarm	Good,Non-specific	PVLEVEL	LO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	.1	Condition Normal	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	1	HI Alarm	Good,Non-specific	PVLEVEL	н	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	900	Condition Normal	Good,Non-specific	PVLEVEL	н	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	900	HIHI Alarm	Good,Non-specific	PVLEVEL	нн	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:18	300	Condition Normal	Good,Non-specific	PVLEVEL	ніні	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1002	2019/04/29 15:18	500	Condition Normal	Good,Non-specific	DEVIATION	DEVIATION	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level2
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1002	2019/04/29 15:18	500	Deviation Alarm	Good,Non-specific	DEVIATION	DEVIATION	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level2
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	100	LOLO Alam	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	1	Condition Normal	Good,Non-specific	PVLEVEL	LO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	1	LO Alarm	Good,Non-specific	PVLEVEL	LO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	900	Condition Normal	Good,Non-specific	PVLEVEL	н	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	900	HI Alarm	Good,Non-specific	PVLEVEL	н	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	900	Condition Normal	Good,Non-specific	PVLEVEL	ніні	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	900	HIHI Alarm	Good,Non-specific	PVLEVEL	нн	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
Þ	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1001	2019/04/29 15:18	100	Condition Normal	Good,Non-specific	PVLEVEL	ніні	OPC CHANGE A	OPC CONDITION.	CONDITION	Level1

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:

ľ	Start p	page Current Alarms View													-	•
	4	Server Name	Host Name	Subscription Na	Source	Event Time	Severity	Message	Quality	Condition	SubCondition	Mask	NewState	Event Type	Event Category	
I	7															Π
	0	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	Tracking_EVENT	2019/04/29 15:20	500	Setpoint changed	Good.Non-specific				OPC_CONDITION	TRACKING	Level4	ľ
I	1	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	System_Event	2019/04/29 15:20	200	Simple Event	Good,Non-specific				OPC_CONDITION	SIMPLE	Level3	i.
I	2	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1004	2019/04/29 15:20	500	Condition Normal	Good,Non-specific	DEVIATION	DEVIATION	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level2	ł
I	3	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1003	2019/04/29 15:20	300	LOLO Alarm	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1	i.
I	• 4	IntegrationObjects.OPCAEServer.Simulator.1	localhost	Subscription 1	FIC1002	2019/04/29 15:20	500	Condition Normal	Good,Non-specific	DEVIATION	DEVIATION	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level2	H

Figure 138: View Current Alarms

The alarms and events fired by all OPC AE Servers are displayed in a screen view in realtime 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.

IntegrationObjects	localhost	Subscription 1	FIC1001	2018/11/08 09:43:00.500	100	LOLO Alarm	Good,Non-specific	PVLEVEL	LOLO	OPC_CHANGE_A	OPC_CONDITION	CONDITION	Level1
IntegrationObjects	localhost	Subscription 1	Tracking_EVENT	2018/11/08 10:42:42.312	500	Setpoint changed	Non-specific.					TRACKING	Level4
IntegrationObjects	localhost	Subscription 1	System_Event	2018/11/08 11:42:40.289	200	Simple Event	Non-specific.					SIMPLE	Level3

#### Figure 139: Event Acknowledgment

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

Ack Condition
Setting Ack Condition Info
Clear Alarms

Figure 123: Acknowledgment Menu

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



Acknowledgment Settings –		x		
Actor ID:				
Comment :				
Source:	FIC1004			
Condition:	DEVIATION			
🔲 Always A	Acknowledge			
	ОК	Cancel	]	

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:

🐼 Add New DA Archiver Wizard		-	х
	Welcome to the Add New Archiver Wizard		
	This wizard will guide you through the steps of adding a new archiver.		
	To continue, click Next.	Cance	al

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:



😼 Add Ne	🐼 Add New DA Archiver Wizard 🛛 🗕 🗙			
	Archiver nam	e and connection type		
	Please type the na of the required dat	ime of your archiver and choose the type abase.		
	Archiver Name :	Archiver		
	Server Type :	SQL Server         SQL Server         ORACLE         MS ACCESS         MySQL         CSV File         PostgreSQL         ODBC         OLEDB		
		< Back Next > Canc	el	

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.

<u>Step 2:</u> 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:

😼 Add Ne	🐼 Add New DA Archiver Wizard 🛛 🔍 🔺 🗙				
	Configure SQ	L Server			
	Please choose ye	our server name and the authentication type :	Refresh to display SQL		
	SQL Server :	.\sqlexpress	server		
	Authentication:	Windows Authentication	Instances		
	Login :	SQL Server Authentication			
	Password :		Refresh to display		
	Database Name :		databases list		
	Encrypt connec	tion Test connection			
		< Back Next >	Cancel		

#### Figure 147: Configure SQL Server Connection

Parameter	Description		
SQL Server	The name of the SQL Server available in your network.		
Authentication	<ul> <li>To connect, you can choose one of the two followin authentication modes:</li> <li>Windows Authentication.</li> <li>SQL Server Authentication: In this case, you have t specify the login and password used by the SQL Server driver when connecting to SQL Server.</li> </ul>		
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 SQ	_ Server	Archiver	Configuration	Parameters
-----------------	----------	----------	---------------	------------

🚳 Add Ne	🐼 Add New DA Archiver Wizard 🛛 💶 🗴			x
	Configure SQ	L Server		
	Please choose y	our server name and the authentication type :		
	SQL Server :	REMOTE-PC\SQLEXPRESS		
	Authentication:	SQL Server Authentication		
	Login :	sa		
	Password :	•••••		
	Database Name :	master 💽 🕤		
	Encrypt connect	ction Test connection		
		< Back Next >	Cance	ł

Figure 148: SQL Server Authentication Mode



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

🐼 Add New DA Archiver Wizard 🛛 💶 🗙				
	Configure Ora	acle		
	Please type your	Server/Service name and user authentication :		
	Data Source :	ORCL		
	User Name :	system		
	Password :	••••••		
		Test connection		
		< Back Next > Can	cel	

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:

🚳 Add Ne	🐼 Add New DA Archiver Wizard 🗕 🛛			
	Configure MS Access			
	<ul> <li>Please enter your MS Access database connection information</li> <li>File Path : A mdb file that contains the MS Access database.</li> </ul>			
	<ul> <li>Database Password : If your database requires a password, check the Database Password box and enter the password</li> </ul>			
	File Path : C:\MyDatabase.accdb Browse			
	Database Password			
	Database Password			
	Password :			
	Test connection			
	< Back Next > Can	cel		

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 <b>File Path</b> text box.
Password	If your MS Access database requires a password, check the <b>Database Password</b> box and enter the password in the <b>Password</b> 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:

😼 Add Ne	ew DA Archiver Wizard		-	x
	MySQL Databa	ase		
	Please type your	server name and user authentication :		
	Data Source :	localhost		
	User Name :	root		
	Password :	•••••		
	Database :	master 🕤 🗲		
		Test connection		
		< Back Next >	Cance	#

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:

😼 Add Ne	ew DA Archiver Wizard	-	x
	Configure CSV File		
	File Path : C:\MyCSVFile.csv Browse	]	
	Delimiter :  Archiver Option		
	Archive into separate files		
	Periodicity : Hourly		
	Every hour at 5 💭 minutes and 💷 💭 seconds.		
	< Back Next >	Cance	el

#### 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.



	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.
	<ul> <li>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.</li> </ul>
Periodicity	<ul> <li>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.</li> </ul>
	• 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.
	<ul> <li>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.</li> </ul>

 Table 32: CSV Archiver Configuration Parameters



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

😼 Add Ne	ew DA Archiver Wizard	-	x				
Configure PostgreSQL Database							
	Please choose y	our server name and the authentication type :					
	Server name :	127.0.0.1 Port : 5432					
	Authentication :	Standard Authentication					
	Username :	postgres					
	Password :	•••••					
	Database :	postgres  Test connection					
		< Back Next > Cano	el				

#### 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	<ul> <li>You can choose one of the two following authentication modes:</li> <li>Windows Authentication.</li> <li>Standard Authentication: In this case, you have to specify the username and password used by the PostgreSQL database.</li> </ul>
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.
Test connection	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:

🐼 Add Ne	ew DA Archiver Wizard	-	x
	Configure ODBC Connection		
	Connection string :		
	DRIVER={MySQL ODBC 5.3 ANSI Driver}; SERVER=localhost; PORT=3306; DATABASE=mysql; USER=root; PASSWORD=; OPTION=0;		
	Cassandra Keyspace: Test connection		
	< Back Next >	Cance	ł

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.



🐼 Add New DA Archiver Wizard					-	X	
	Configure OD	BC Conne	ection				
	Connection string :						
	DSN=Cassandra						
	🗹 Cassandra	Keyspace:	test		Test connection		
				< Back	Next >	Cance	<u>ا</u> ا

Figure 155: ODBC Connection String Dialog (Cassandra)

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



#### HDA Archiver:

🐼 Add New HDA Archiver Wizard	-	x
Configure ODBC Connection		
Connection string : DRIVER={MySQL ODBC 5.3 ANSI Driver}; SERVER=localhost; PORT=3306; DATABASE=mysql; USER=root; PASSWORD=; OPTION=0;		
Test connectio Use History Table Use History Repeat A	n rea Canc	el

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:



🐼 Add New HDA Archiver Wizard					
	Tune Your Queries				
	Timestamp Format	dd-MMM-yyyy HH:mm:ss			
	Quality Mapping	Custom Quality			
	GOOD	0			
	UNCERTAIN	1			
	Table Column Names:				
	Value:	ip_trend_value			
	Timestamp:	ip_trend_time			
	Quality:	ip_trend_qstatus			
		< Back Next >	Cance	el	

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:

🐼 Add No	ew DA Archiver Wizard	-	x
	Configure OLEDB Connection		
	Connection string :		
	Provider=IBMDADB2;Database=SAMPLE;Hostname=localhost;Protocol=TCPIP;Port=500 00;Uid=db2admin;Pwd=io;		
	Test connection		
	< Back Next >	Cancel	

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.



<u>Step 3:</u> 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

🐼 Add New DA Archiver Wizar	d	-	X
Select your t	ables		
Table Information :			
Create New Table			
History Table :	HistoryTable Select Columns		
Update Table :	UpdateTable Select Columns		
Browse Available Tab	les		
History Table :	spt_fallback_db		
Update Table :	spt_fallback_db 🔹 Map Select Columns		
Insert per Block			
	< Back Next >	Cance	el

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.

 <u>Create New Table</u>: If you choose this option, OPC EasyArchiver will create two new tables into your database depending on your selection:



<u>History Table:</u> 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.

<u>Update Table:</u> 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.

 <u>Browse Available Tables</u>: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as shown in the figure below:



🐼 Add New DA Archiver Wizar	d			-	×
Select your t	ables				
Table Information :					
Create New Table					
History Table :	HistoryTable		Select Columns		
Update Table :	UpdateTable		Select Columns		
Browse Available Tab	les				
History Table :	hdadatatable 🔹	Мар	Select Columns		
🔲 Update Table :	historytable historytable_odbc historytable_test_ae	Мар	Select Columns		
	historytable_test_map historytable_test_odbc				
		< Back	Next >	Cano	el

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:



🐼 Add Ne	ew D	A Archiver Wizard			-	x
	S	elect groups	;			
	Ple	ase selectone or m Select all	any groups to assign to the created archiver	:		
		Group Name	Server Progld	Host Address		
		Group0	IntegrationObjects.AdvancedSimulator.1	localhost		
		Group1	IntegrationObjects.AdvancedSimulator.1	localhost		
			< Back	Next >	Cance	el 🚽

Figure 162: Assign Groups to the DA Archiver



## 1.2. Configuring HDA Archiver

🐼 Add New HDA Archiver Wizard		_ ×
Select your tables	;	
Table Information :		
Create New Table		
📝 HDA Data Table	HDAData Table	Select Columns
HDA Attributes Table :	HDAAttributesTable	Select Columns
HDA Modified Table :	HDAModified Table	Select Columns
HDA Annotations Table :	HDAAnnotationsTable	Select Columns
Browse Available Tables		
HDA Data Table :	spt_fallback_db 🚽 Map	Select Columns
HDA Attributes Table :	spt_fallback_db 💌 Map	Select Columns
HDA Modified Table :	spt_fallback_db 🚽 Map	Select Columns
HDA Annotations Table :	spt_fallback_db 💌 Map	Select Columns
Insert per Block		
	< Back	lext > Cancel

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.

 <u>Create new Table</u>: If you choose this option, the OPC EasyArchiver will create four new tables into your database depending on your selection:

<u>HDA Data Table:</u> 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.

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

<u>HDA Modified Table:</u> 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.

<u>HDA Annotations Table</u>: 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.

Table Configuration 🗶
Archiver Name : Archiver
Table Configuration :
🗷 Item ID
☑ ItemCurrentValue
☑ Time Stamp
🗹 Quality
🔲 Data Type
Server ProgID
Server Address
Acquisition Time
Aggregate Type
OK Cancel

Figure 164: Table Configuration

 <u>Browse Available Tables</u>: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as shown in the figure below:



🐼 Add New HDA Archiver Wizard			-	x
Select your tables	5			
Table Information :				
Create New Table				
HDA Data Table	HDAData Table		Select Columns	
HDA Attributes Table :	HDAAttributesTable		Select Columns	
HDA Modified Table :	HDAModifiedTable		Select Columns	
HDA Annotations Table :	HDAAnnotationsTable		Select Columns	
Browse Available Tables				
🗷 HDA Data Table :	hdadatatable	Мар	Select Columns	
HDA Attributes Table :	hdadatatable historytable	Мар	Select Columns	
HDA Modified Table :	historytable_odbc historytable test æ	Мар	Select Columns	
HDA Annotations Table :	historytable_test_map historytable_test_odbc	Мар	Select Columns	
				-
	< Back	c Ne	ext > Cance	1

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:



Database Mapping	x
Database Mapping  Fields Mapping  Existing  Existing Table  Fields  TXXT ItemCurrentValue[varc  TXXT ItemID[varchar  TXXT ItemID[varchar  TXXT ItemTimeStamp]dateti	Template Table Fields Twill temID [Required] Twill CurrentValue [Required]
To map a field, drag and drop it to the Template treeView	TXXT Quality [Optional]         TXXT Server ProgID [Optional]         TXXT Server Address [Optional]         TXXT Data Type [Optional]         TXXT Aquisition Time [Optional]         TXXT Aggregate Type [Optional]
Mapped Fields	
ItemID> ItemID [Required] ItemCurrentValue> CurrentValue [Required]	Remove
	OK Cancel

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:



🚳 Add N	ew HDA Archiver Wizard		-	X	
	Select OPC HDA Server				
PI	ease select one or many OPC HDA servers to assign to the cre	ated archiver :			
	Select all				
	Server Progld	Host Address			
	IntegrationObjects.OPCHDADriverForDatabases.1	localhost			
	< Back Next > Cancel				

Figure 167: Assign OPC HDA Server to the Archiver



## 1.3. Configuring AE Archiver

🐼 Add New AE Archiver Wizard		-	X
Select your ta	ables		
Table Information :			
Create New Table			
History Table	HistoryTable Select Columns		
Browse Available Table     History Table	es UpdateTableffffffffffffffffffffffffffffffffffff		
Insert per Block New State Value Format: Quality Format:	String     Change Mask Value Format:     String       String     •	•	
	< Back Next >	Cance	el

Figure 168: Configure OPC AE Tables Dialog

The OPC EasyArchiver offers the possibility to archive the alarms and events into preexisting 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. <u>String:</u> The new state will be stored in its string representation.
  - 2. <u>Integer</u>: 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	Empty	0
Enabled, not Active and		
not Acknowledged		
The condition is Enabled	OPC_CONDITION_ENABLED;	1
The condition is Active	OPC_CONDITION_ACTIVE;	2
The condition is Enabled	OPC_CONDITION_ACTIVE;	3
and Active	OPC_CONDITION_ENABLED;	
The condition is	OPC_CONDITION_ACKED;	4
Acknowledged		
The condition is Enabled	OPC_CONDITION_ACKED;	5
and Acknowledged	OPC_CONDITION_ENABLED;	
The condition is Active	OPC_CONDITION_ACTIVE;	6
and Acknowledged	OPC_CONDITION_ACKED;	
The condition is Enabled,	OPC_CONDITION_ACTIVE;	7
Active and Acknowledged	OPC_CONDITION_ACKED;	
	OPC_CONDITION_ENABLED;	

Table 34: String and Integer Format of New State

 <u>Custom</u>: 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:

stom New State	-	X
The condition is not Enable, not Active and not Acknowledged	0 🌩	
The condition is Enabled	1÷	
The condition is Active	2	
The condition is Enabled and Active	3	
The condition is Acknowledged	4 🛓	
The condition is Enabled and Acknowledged	5 🜩	
The condition is Active and Acknowledged	6 🚔	
The condition is Enabled, Active and Acknowledged	7 🜲	
OK Cancel		

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. <u>String:</u> The mask value will be stored in its string representation.
  - 2. <u>Integer</u>: The mask value will be stored in its numerical representation.
- Quality Format: You can set the quality format to:
  - 1. <u>String:</u> The quality format will be stored in its string representation.
  - 2. <u>Integer</u>: The quality format will be stored in its numerical representation.
- **<u>Create new Table:</u>** If you choose this option, the OPC EasyArchiver will create the following new table into your database:

<u>History Table:</u> 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.



Table Configuration		- = X
Use Separate Columns for A	ributes Configure Attri	butes Mapping
ServerProgID ServerAddress SubscriptionName SourceName Condition SubCondition Quality Severity EventTime EventTime_MS EventType Mask NewState AckReq Activetime		
	ОК	Cancel

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**".



Table Configuration			- = X
Table Configuration         Image: Use Separate Columns for Columns         Image: ServerProgID         Image: ServerAddress         Image: ServerAddrese         Image: ServerAddre	r Attri	ibutes Configure Configuration Item Column Is Primary Key	Attributes Mapping
<ul><li>AckReq</li><li>Activetime</li></ul>	-		
		ОК	Cancel

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.



Config	ure Attributes Map	oping		_		X	:
Config	gure the attributes a	and column names m	Automatic mapping for attributes with the	same n	ame		
	Category ID	Category Name	Attribute Name	Existing Table Columns			
Þ	1	Level1	Cond	CondUUUU		$\sim$	
	1	Level1	Quality	CondUUUU			
	1	Level1	SourceName	Quality_1			
	1	Level1	EventType	SourceName_1 EventType_1			
	1	Level1	Quality/SourceTi	Quality / Source Timestamp			
	2	Level1	Cond	Att 400			
	2	Level1	Quality	Attr4000 Quality_1		V	
	2	Level1	SourceName	SourceName_1		$\sim$	
	2	Level1	Attr40	Attr40		$\sim$	
	2	Level1	Quality/SourceTi	. Quality / SourceTimestamp		$\sim$	
	3	Level1	Cond	CondUUUU		$\sim$	
	3	Level1	Quality	Quality_1		$\sim$	
	3	Level1	SourceName	SourceName_1		$\sim$	
	3	Level1	Attr400	Attr400		~	-
				ОК	Cance	:	]

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.

Category ID	Category Name	Attribute Name	Existing Table Columns	
1	Level1	Cond	ABCD <	~
1	Level1	Quality	Quality_1	~
1	Level1	SourceName	SourceName_1	~
1	Level1	EventType	EventType_1	~
1	Level1	Quality/SourceTi	Quality / SourceTimestamp	~
2	Level1	Cond	Cond	~

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.

Config	ure Attributes Ma	oping		_ = ×
Confi	gure the attributes a	and column names m	I Automatic mapping for attributes with the same name	
	Category ID	Category Name	Attribute Name	Existing Table Columns
	1	Level1	Cond	Cond
•	1	Level1	Quality	Quality_1
	1	Level1	SourceName	SourceName_1
	1	Level1	EventType	EventType_1
	1	Level1	Quality/SourceTi	. Quality / SourceTimestamp 🗸 🚽
	2	Level1	Cond	Cond
	2	Level1	Quality	Quality_1
	2	Level1	SourceName	SourceName_1
	2	Level1	Attr40	Attr40 🗸
	2	Level1	Quality/SourceTi	. Quality / SourceTimestamp 🗸 🗸 🗸
	3	Level1	Cond	Cond
	3	Level1	Quality	Quality_1
	3	Level1	SourceName	SourceName_1
	3	Level1	Attr400	Attr400 🗸 🗸
				OK Cancel

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:

Integratio	on Objects' OPC EasyArchiver Service	
<u>^</u>	The configured attribute columns are not available in the selected existing table. Click Yes to add the missing columns to your existing table or No to go back and change your configuration.	
	<u>Y</u> es <u>N</u> o	

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

 <u>Browse Available Tables</u>: In this option, the OPC EasyArchiver browses the list of available tables in the selected database as illustrated in the figure below:

🐼 Add New AE Archiver Wizard		-	x
Select your ta	ables		
Table Information :			
Create New Table			
History Table	HistoryTable Select Columns		
Browse Available Tabl	es		
History Table	HistoryTable Map Select Columns		
Insert per Block			
New State Value Format:	String Change Mask Value Format: String	-	
Quality Format:	String		
	< Back Next >	Cance	el

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:

🗟 Add Ne	ew A	E Archiver Wizard			-	x
	S	elect Subscrip				
	Ple	ase select one or many Select all	subscriptions to assign to the created a	archiver :		
		Subscription Name	Server Progld	Host Address		
		Subscription1	IntegrationObjects.OPCAEServer.Si	localhost		
			< Back	Next >	Cance	el

Figure 179: Assign Event Subscriptions to the AE Archiver

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



🐼 Add New DA Archiver Wizard					
Add New DA A	Archiver Wizard Archiver Name : Archiver Server Type : SQL Server Server Name : DEV70-PC\SQLEXPRESS Database Name : master History Table Name : HistoryTableTest	-	x		
	Authentication Mode : Windows	Cance			

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:

🔦 Table Configuration	x
Archiver Name : Archiver	
Table Configuration :	
🔽 Item ID	
☑ ItemCurrentValue	
🔽 Time Stamp	
Access Rights	
Quality	
🔲 Data Type	
Read Mode	
Server ProgID	
Server Address	
Group Name	
Item Index	
Group Index	
OK Cancel	

Figure 188: DA Archiver Settings Dialog



Table Configuration X
Archiver Name : Archiver
Table Configuration :
✓ Item ID
☑ ItemCurrentValue
✓ Time Stamp
Quality
Data Type
Server ProgID
Server Address
Acquisition Time
Aggregate Type
OK Cancel

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:

💼 Archiver Properties		х
Property	Value	
Archiver Name	Archiver	
Database Type	SQL Server	
Server Name	DEV70-PC\SQLEXPRESS	
Database Name	master	
Update Table Name	No Update table was defined for this archiver.	
History Table Name	HistoryTable	
Connection String	Data Source = DEV70-PC\SQLEXPRESS;Initial Catalog = master; Trusted_Connection=yes;	
Groups Assigned to Archiver	IntegrationObjects.AdvancedSimulator.1   Group0 IntegrationObjects.AdvancedSimulator.1   Group3	
	ОК	

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:



		-				
ServerProgID	Host Address	Category ID	Category Name	Attribute Name	Column Name	Subscriptions
IntegrationObject	localhost	1	Level1	Attr100	Attr100	Subscription1
IntegrationObject	localhost	1	Level1	Attr200	Attr200	Subscription1
IntegrationObject	localhost	1	Level1	Attr300	Attr300	Subscription1
IntegrationObject	localhost	1	Level1	Attr400	Attr400	Subscription1
IntegrationObject	localhost	2	Level2	Attr1000	Attr1000	Subscription 1
IntegrationObject	localhost	2	Level2	Attr2000	Attr2000	Subscription1
IntegrationObject	localhost	2	Level2	Attr3000	Attr3000	Subscription1
IntegrationObject	localhost	2	Level2	Attr4000	Attr4000	Subscription 1
IntegrationObject	localhost	3	Level3	Attr1	Attr1	
IntegrationObject	localhost	3	Level3	Attr2	Attr2	
IntegrationObject	localhost	3	Level3	Attr3	Attr3	
IntegrationObject	localhost	3	Level3	Attr4	Attr4	
IntegrationObject	localhost	4	Level4	Attr10	Attr10	

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.



Table Configuration	_ = X	
Table Configuration Use Separate Columns for Al Columns ServerProgID ServerAddress SubscriptionName SourceName	tributes Configure Attributes Mapping	
Sourceivame Condition SubCondition Quality Severity EventTime EventTime_MS EventCategory		
EventType     Mask     NewState     AckReq     Activetime		
	OK	]

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**".



Table Configuration _ 🗖 🗙				
Table Configuration          Image: Columns         Image: Columns         Image: Columns         Image: Columns         Image: Columns         Image: Columns         Image: Condition         Image: Condition </td <td>r Attri</td> <td>ibutes Configure Configuration Item Column Is Primary Key</td> <td>Attributes Mapping          Attributes Mapping         ServerProgID         ServerProgID         False</td> <td></td>	r Attri	ibutes Configure Configuration Item Column Is Primary Key	Attributes Mapping          Attributes Mapping         ServerProgID         ServerProgID         False	
Quality Quality EventTime EventTime_MS EventCategory EventType Mask NewState AckReq Activetime				
		ОК	Cancel	

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.



Config	ure Attributes Map	oping		_		x
Config	gure the attributes a	and column names m	Automatic mapping for attributes with the s	ame nar	ne	
	Category ID	Category Name	Attribute Name	Existing Table Columns		
Þ	1	Level1	Cond	CondUUUU	~	~
	1	Level1	Quality	CondUUUU		
	1	Level1	SourceName	Quality_1		
	1	Level1	EventType	SourceName_1 EventType_1		
	1	Level1	Quality/SourceTi	Quality / Source Timestamp		
	2	Level1	Cond	Att 400 Att 400		
	2	Level1	Quality	Attr4000 Quality_1	~	
	2	Level1	SourceName	SourceName_1	~	
	2	Level1	Attr40	Attr40	~	
	2	Level1	Quality/SourceTi	. Quality / SourceTimestamp	~	-
	3	Level1	Cond	CondUUUU	~	-
	3	Level1	Quality	Quality_1	~	
	3	Level1	SourceName	SourceName_1	~	·
	3	Level1	Attr400	Attr400	~	< -
				ОК	Cancel	

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.

Category ID	Category Name	Attribute Name	Existing Table Columns	
1	Level1	Cond	ABCD <	~
1	Level1	Quality	Quality_1	~
1	Level1	SourceName	SourceName_1	~
1	Level1	EventType	EventType_1	~
1	Level1	Quality/SourceTi	Quality / SourceTimestamp	~
2	Level1	Cond	Cond	~

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.

Config	ure Attributes Ma	oping		_ = ×
Confi	gure the attributes a	and column names m	I Automatic mapping for attributes with the same name	
	Category ID	Category Name	Attribute Name	Existing Table Columns
	1	Level1	Cond	Cond
•	1	Level1	Quality	Quality_1
	1	Level1	SourceName	SourceName_1
	1	Level1	EventType	EventType_1
	1	Level1	Quality/SourceTi	. Quality / SourceTimestamp 🗸 🚽
	2	Level1	Cond	Cond
	2	Level1	Quality	Quality_1
	2	Level1	SourceName	SourceName_1
	2	Level1	Attr40	Attr40 🗸
	2	Level1	Quality/SourceTi	. Quality / SourceTimestamp
	3	Level1	Cond	Cond
	3	Level1	Quality	Quality_1
	3	Level1	SourceName	SourceName_1
	3	Level1	Attr400	Attr400 🗸 🗸
				OK Cancel

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:

Integratio	on Objects' OPC EasyArchiver Service	
<u>^</u>	The configured attribute columns are not available in the selected existing table. Click Yes to add the missing columns to your existing table or No to go back and change your configuration.	
	<u>Y</u> es <u>N</u> o	

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:

🖹 Browse Are	hivers	х
Please selec	tan Archiver:	
	[a	
Archivers :	Archiver	
	Archiver2	

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:



🖹 Browse Are	hivers	х
Please selec	tan Archiver:	
	[	
Archivers :	Archiver	×
	Archiver	
	Archiver2	

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:



Archive Data	x
Do you want to use one of the available archivers or confi	igure a new archiver?
Use existing archiver	
© Configure a new archiver	
OK	

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:

🖹 Browse Are	chivers	x
Please selec	tan Archiver:	
Archivers :	Archiver	-
	Archiver Archiver2	

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:



Add New DB to OPC Transfer Wizard	-	x
Welcome to the Add New Transfer Wizard		
This wizard will guide you through the steps of adding a new DB to OPC Transfer.		
To continue, click Next. < Back Next >	Cance	ł

Figure 211: Add New DB to OPC Transfer Wizard

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



😼 Add Ne	ew DB to OPC Transfer	r Wizard	-	x
	Transfer name and connection type			
	Please type the na of the required data	me of your transfer and choose the type abase.		
	Name :	Transfer		
	Server Type :	SQL Server SQL Server ORACLE MS ACCESS MySQL PostgreSQL ODBC OLEDB		
		< Back Next >	Cance	1

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.

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

#### <u>Step 3:</u>

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:

🐼 Add Ne	ew DB to OPC Transfer	Wizard	-	X
	Configure Ora	acle		
	Please type your	Server/Service name and user authentication :		
	Data Source :			
	User Name :			
	Password :			
		Test connection		
		< Back Next >	Cance	ł

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

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



🐼 Add New DB to OPC Transfer W	izard	_ x
Select your tab	les	
Table Information :		
Create New Table	WriteTable	Select Columns
Browse Available Tables	HistoryTable20160728 💌 Map	Select Columns
DB Read Frequency		
DB Nedu Frequency (ms).		
	< Back	Next > Cancel

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.

 <u>Create New Table</u>: If you choose this option, OPC EasyArchiver will create a new write table into the selected database:

<u>Write Table:</u> 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.

🔦 Table Configuration	x
Transfer Name : <b>Transfer</b>	
Table Configuration :	
🗹 Item ID	
✓ ItemValue	
✓ Started	
Time Stamp	
Quality	
🔲 Data Type	
Server ProgID	
Server Address	
OK Cancel	

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:



🐼 Add New DB to OPC	Transfer Wizard	ł		_	x
Select y	our tables	:			
Table Information	ı:				
Create New	Table Wri	teTable		Select Columns	
Browse Avail	able Tables Wri Wr Wr	iteTable1 iteTable1 iteTable2	Мар	Select Columns	
DB Read Freque	ency				
DB Read Freq	uency (ms):	1000 🜲			
			< Back	Next > Cance	el

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:



😼 Add Ne	ew D	B to OPC Transfer W	izard		-	x
	S	elect groups				
	Ple	ase select one or man Select all	y groups to assign to the created transfer			
		Group Name	Server Progld	Host Address		
		Group0	IntegrationObjects.KNetOpcSimulato	localhost		
			< Back	Next >	Cance	el 🚽

Figure 218: Assign Groups for the Transfer

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



😼 Add New DB t	o OPC Transfer Wizard	-	x
	Transfer Name : Transfer3 Server Type : SQL Server Server Name : .\sqlexpress2014 Database Name : master Write Table Name : WriteTableTest Authentication Mode : Windows	_	
	DB Read Frequency : 1000	Cance	2

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:



OPC Servers	Archivers	Rules	Loops	Transfers
				$\mathbb{P}$
□ Transfers	]			
B- B SQ	L Server			
· 💓	Transfer			
				E

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:

able Configuration	x
Transfer Name : Transfer	
Table Configuration :	
📝 Item ID	
☑ ItemValue	
✓ Started	
🔲 Time Stamp	
Quality	
🔲 Data Type	
Server ProgID	
Server Address	
OK Cancel	

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:

💼 Transfer Properties		x
Property	Value	
Transfer Name	Transfer	
Database Type	SQL Server	
Server Name	.\sqlexpress2014	
Database Name	master	
Write Table Name	WriteTableTest	
Connection String	Data Source = .\sqlexpress2014;Initial Catalog = master; Trusted_Connection=yes;	
Groups Assigned to Transfer	IntegrationObjects.KNetOpcSimulator.1   Group0	
DB Read Frequency(ms)	1000	
	ОК	

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:

🖹 Browse Tra	ansfers		x
Please selec	t a transfer:		
Transfers:	Transfer		•
		ОК	Cancel

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:



Configure Quality Map	ping	x
OPC Quality: Custom Quality:	Bad, Sensor Failure	Add
	Mapped Qualities	
OPC Quality Bad, Non-Specific Good, Non-Specific	Custom Quality Bad Good	Delete
Sav	e Cancel	

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:



😒 Define Rules	_	x
	Welcome to the New Rule Wizard	
	This wizard will guide you to define a new rule for the archiver.	
	To continue click Next	

Figure 233: Add New Rule Wizard

Managing rules consists in managing conditions and actions.

#### **1.1. Condition Management**

• <u>Step 1</u>: Click the **Next** button, the following window will appear:


😒 Define I	Rules			-	x
	Define Conditions				
	Select the conditions of the rule:		Select All		
	Conditions		1		
	Where the Item Current Value <= Value				
	Where the Item Current Value < Value				
	Where the Item Current Value >= Value				
	Where the Item Current Value > Value				
	Where the Item Current Quality != Quality				
	Where the Item Current Quality == Quality				
	If IPAddress is reachable				
	If IPAddress is not reachable				
	If port PortNumber of IPAddress is open				
	If port PortNumber of IPAddress is closed				
	If connection with OPC DA Server is down				
	<		>		
		< Back	Next >	Canc	el

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
	==
V 1_12	<=
	>=
	<
	>
	!=
VT_ARRAY   VT_I2	==
	!=
	==
V1_14	<=
	>=
	<
	>
	!=
VT_ARRAY   VT_I4	==



	!=
VT_R4	==
	<= >=
	<
	> !=
VT_ARRAY   VT_R4	==
	!=
VT_R8	== <=
	>=
	<
	!=
VT_ARRAY   VT_R8	==
	!=
VT_BSTR	==
	!=
VT_ARRAY   VT_BSTR	==
	!=
VT 11	==
	<= >=
	<
	> !=
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.
- <u>Step 2</u>: Select the conditions of your rule and then Click the **Next** button. The following window will appear:



S Define Rules	-	x
Define Values		
Please click on the hyper link to define values for the conditions :		
Where the <u>Random/Int1</u> Current Value != <u>0</u>	*	
AND		
Where the <u>Item</u> Current Value == <u>Value</u>	-	
AND	=	
Where the <u>Item</u> Current Value < <u>Value</u>		
AND		
Where the <u>Item</u> Current Value > <u>Value</u>		
AND		
If <u>10.120.50.117</u> is reachable	-	
< III	•	
< Back Next >	Canc	el

Figure 235: Define Values Dialog

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



Items List	_	x
Address :	localhost	
ProgID :	IntegrationObjects.AdvancedSimulator.1	
Item ID :	Random/Real4	
OPC Serve	ers	
🖻 🃁 🃁 Inte	grationObjects.AdvancedSimulator.1 localhost	
📬 (	Group0	
📔 🛛 🚔 (	Group1	
	Random/Boolean	
	Random/Date	
	Random/Int1	
	Random/Int2	
	Random/Int4	
	Random/Real4	
	Random/Real8	
	Random/Text	
I	Random/UInt1	
	Random/UInt2	
· · · ·	Random/UInt4	
····· 📬 (	Group2	
L		
ОК	Cancel	

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:



Set a value		х
Enter the value :	152 OK Cancel	

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.

Configure IP Address	x
Enter the IP Address	9.10.0.49
	<u>O</u> K

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.



Servers List	-	x
OPC Servers     IntegrationObjects.AdvancedSimulatorFullEdit     OPC HDA Servers     OPC AE Servers	ion.1 localho	st
ОК	Cancel	

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:

Select And / Or	-	x
Apply the rule if :		
the rule matches all the sub-condition	tions(And)	
$\textcircled{\sc opt}$ the rule matches at least one of the sub-conditions ( Or)		
ОК	Cancel	

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.

Define Rules		-	x
Define	Actions		
Select the	action(s) for your rule :		
Send	d an Email Message to Operator.		
Star	tArchiver		
Stop	Archiver		
🔲 Writ	e New Value		
Actio	n Values:		
Ite	m ID : Browse		
Ne	w Value :		
	< Back Next >	Cance	4

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.



😜 Define f	Rules			-	х
	Define Actions				
	Select the action(s) for your rule :				
	<ul> <li>Send an Email Message to Operator.</li> <li>Start Archiver</li> <li>Stop Archiver</li> </ul>				
	<	Back	Next >	Cance	el

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.



S Define Rules		-	x
Configure Emails			
Sender Address : sende	erAddress@gmail.com		
Receiver Address : reciev	verAddress@gmail.com		
SMTP Server : secur	e.emailsrvr.com		
Subject : Alert	Message		
Message : This is	s an alert message		
	v -		
Configure SMTP Serve	r Test Account Settings		
	< Back Next >	Cance	el

Figure 243: Configure Emails Dialog

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



SMTP Server Configuration
SMTP Server     secure.emailsrvr.com       SMTP Port Number     25 🖨
Require Authentication Use Default Credentials
Authentication
User Name senderAddress@gmail.com
Password
OK Cancel

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.

Integratio	on Objects' OPC EasyArchiver	x
1	The test was successful!	
	<u>O</u> K	

Figure 245: The Test Email is Successfully Sent



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

🔓 Reply 😰 Reply All	्र Forward 着 IM	
Test	.com 🔳	.com
This is a test		

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:



Address : localhost ProgID : IntegrationObjects.AdvancedSimulator.1 Item ID : Writable/Real4 	Items List		-	x
Address : localhost ProgID : IntegrationObjects.AdvancedSimulator.1 Item ID : Writable/Real4 				
ProgID : IntegrationObjects.AdvancedSimulator.1 Item ID : Writable/Real4 ProPC Servers ProPC Servers	Address :	localhost		
Item ID : Writable/Real4	ProgID :	IntegrationObjects.AdvancedSimulator.1		
Writable/Neal4      Writable/Boolean     Writable/Date     Writable/Int1     Writable/Int2     Writable/Int4     Writable/Real8     Writable/Catt     Writable/Int4     Writable/Int4     Writable/Int4     Writable/Unt1     Writable/Unt1     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt1     Writable/Ulnt1     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt4	Item ID ·	Writshle /Real/		_
OPC Servers     IntegrationObjects.AdvancedSimulator.1 localhost     Group0     Writable/Boolean     Writable/Date     Writable/Int1     Writable/Int2     Writable/Int4     Writable/Real4     Writable/Real8     Writable/Crext     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt1     Writable/Ulnt1     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt2     Writable/Ulnt2     Random/Boolean     Random/Boolean     Random/Date     Random/Int1	non ib .	Witable Hoart		
IntegrationObjects.AdvancedSimulator.1 localhost          Group0         Writable/Boolean         Writable/Date         Writable/Int1         Writable/Int2         Writable/Real4         Writable/Real8         Writable/Ulnt1         Writable/Int2         Writable/Real8         Writable/Ulnt1         Writable/Int2         Writable/Real8         Writable/Ulnt1         Writable/Ulnt2         Writable/Ulnt4         Random/Boolean         Random/Date         Random/Date         Random/Int1	El OPC Serve			
Group0 Writable/Boolean Writable/Date Writable/Int1 Writable/Int2 Writable/Int4 Writable/Real8 Writable/Real8 Writable/Text Writable/UInt1 Writable/UInt1 Writable/UInt2 Writable/UInt2 Writable/UInt2 Writable/UInt4 Random/Boolean Random/Date Random/Date Random/Int1	⊡- GFC Serve	arationObjects.AdvancedSimulator.1 localhost		
Writable/Boolean Writable/Date Writable/Int1 Writable/Int2 Writable/Real4 Writable/Real8 Writable/Cext Writable/Ulnt1 Writable/Ulnt2 Writable/Ulnt2 Writable/Ulnt2 Writable/Ulnt4 Random/Boolean Random/Date Random/Date Random/Int1		GroupO		
<ul> <li>Writable/Date</li> <li>Writable/Int1</li> <li>Writable/Int2</li> <li>Writable/Int4</li> <li>Writable/Real4</li> <li>Writable/Real8</li> <li>Writable/Text</li> <li>Writable/Ulnt1</li> <li>Writable/Ulnt2</li> <li>Writable/Ulnt2</li> <li>Writable/Ulnt4</li> <li>Random/Boolean</li> <li>Random/Date</li> <li>Random/Date</li> <li>Random/Int1</li> </ul>		Writable/Boolean		
<ul> <li>Writable/Int1</li> <li>Writable/Int2</li> <li>Writable/Real4</li> <li>Writable/Real8</li> <li>Writable/Cext</li> <li>Writable/UInt1</li> <li>Writable/UInt2</li> <li>Writable/UInt2</li> <li>Writable/UInt4</li> <li>Group1</li> <li>Random/Boolean</li> <li>Random/Date</li> <li>Random/Int1</li> </ul>		Writable/Date		
<ul> <li>Writable/Int2</li> <li>Writable/Real4</li> <li>Writable/Real8</li> <li>Writable/Text</li> <li>Writable/UInt1</li> <li>Writable/UInt2</li> <li>Writable/UInt4</li> <li>Group1</li> <li>Random/Boolean</li> <li>Random/Date</li> <li>Random/Int1</li> </ul>		Writable/Int1		
Writable/Real4 Writable/Real8 Writable/Text Writable/Ulnt1 Writable/Ulnt2 Writable/Ulnt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/Int2		
Writable/Real4 Writable/Real8 Writable/Text Writable/UInt1 Writable/UInt2 Writable/UInt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/Int4		
Writable/Real8 Writable/Text Writable/UInt1 Writable/UInt2 Writable/UInt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/Real4		
Writable/Text Writable/UInt1 Writable/UInt2 Writable/UInt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/Real8		
Writable/UInt1 Writable/UInt2 Writable/UInt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/Text		Щ
Writable/UInt2 Writable/UInt4 Group1 Random/Boolean Random/Date Random/Int1		Writable/UInt1		
Writable/Ulnt4		Writable/UInt2		
Group1		Writable/UInt4		
Random/Boolean Random/Date Random/Int1		aroup1		
Random/Date	· · · · ·	Random/Boolean		
		Random/Date		
OK Cancel	ОК	Car	ncel	

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:



♀ Define R	🛇 Define Rules 🛛 💶 🗙					
	Define Actions	5				
	Select the action(s) f	or your rule :				
	Send an Email N	Message to Operator.				
	Start Archiver					
	Stop Archiver					
	Write New Value	e				
	Action Values:					
	Item ID :	Writable/Real4	Browse			
	New Value :	100	]			
			)			
		< Back	K Next >	Cance	el	

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:



😫 Browse Archivers	x				
Please select an Archiver :					
Archivers :	Archiver				
HDA Archivers :	<b></b>				
AE Archivers :	•				
	OK Cancel				

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:

🖹 Browse Archivers		x
Please select an Arc	hiver :	
Archivers :	Archiver	-
HDA Archivers :		<b>T</b>
AE Archivers :		Ŧ
	OK Cancel	

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:



💊 Define Rule	5 –	x
	Provide a name for your rule :	
	Rule Name : Rule	
	Execute only when first verified.	
	Log rule execution into event log view.	
	Rule Parameters :	
	Sub-conditions :	
	Where the Random/Int1 Current Value != 0	
	Actions :	
	- Write this value : 100 into the OPC Item : Writable/Real4	
	- Start the Archiver : Archiver	
	< Back Finish Cance	

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.

	Enable Rule
Ø	Disable Rule
2	Edit Rule
0	Remove Rule
9	Rule Properties

Figure 256: View Rule Properties

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

💊 Rule Properti	es	X		
- Rule Name :	Rule1			
- Actions :	Send an email			
	✓ Write item value			
	Start archiver			
	✓ Stop archiver			
Details :				
Sub-conditions	S :			
Where the Ra	ndom/Boolean Current Value == 1			
AND	AND			
Where the Ra	indom/Real4 Current Value > 96			
Actions :				
-Write this va	alue : Stop into the OPC Item : Writable/Text			
- Stop the Arc	hiver : Archiver			
	ОК			

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.inifile):

- 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
	There are five log levels:	Control
	<ol> <li>Control: Logs only control messages generated by Archiver Service.</li> </ol>	
	2. Error: Logs error and control messages generated by the Archiver Service.	
	<ol> <li>Warning: Logs warning, error and control messages generated by Archiver Service.</li> </ol>	
Level	<ol> <li>Inform: Logs information, warning, error and control messages generated by the Archiver Service.</li> </ol>	
	<ol><li>Debug: Logs all messages generated by the Archiver Service.</li></ol>	
	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.	
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.seAcquisitionTimeFlagNote 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	
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           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.	
	True: The OPC AE Archiver will store	False
SetToUTCTime	False: The OPC AE Archiver store alarms	
	with timestamp using local time.	

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.

&	Integration Objects' License Authorization Tool		Х		
Pi	Product name:         Integration Objects' OPC EasyArchiver         Product version:         2.3.0           User name:         Windows User         Contegration         Contegration				
с	ompany name: Integration Objects				
ď	Step1: Generate your user code				
	Select the features you want to activate and click on the Gene	erate button in order to generate your user	rid		
	Installed Features:				
	Feature	License Status	Activate		
	Integration Objects' OPC DA EasyArchiver for SQL Server	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for Oracle	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for MS Access	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for MySQL	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for PostgreSQL	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for CSV	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for ODBC	The Demo has expired			
	Integration Objects' OPC DA EasyArchiver for OLEDB	The Demo has expired			
	User ID		<u>G</u> enerate		
ď	Step2: Enter your activation code				
	Send a request for activation by e-mail to our customer servic Enter the received activation code and click on the Register b	e including the generated User ID above. outton.			
	Activation code		<u>R</u> egister		
S	upport: customerservice@integrationobjects.com		Close		

Figure 260: Demo License Expired

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



&	Integration Objects' License Authorization Tool		x			
P	Product name: Integration Objects' OPC EasyArchiver Product version: 2.3.0					
	and a second sec					
ſ	Step1: Generate your user code					
	Select the features you want to activate and click on the Gene	erate button in order to generate your user	id			
	Installed Features:					
	Feature	License Status	Activate 🔺			
	Integration Objects' OPC DA EasyArchiver for SQL Server	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for Oracle	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for MS Access	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for MySQL	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for PostgreSQL	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for CSV	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for ODBC	The Demo has expired				
	Integration Objects' OPC DA EasyArchiver for OLEDB	The Demo has expired	<b>•</b>			
	User ID		<u>G</u> enerate			
ſ	Step2: Enter your activation code					
ſ			Copy button			
Send a request for activation by e-mail to our customer service including the generated User ID above. Enter the received activation code and click on the Register button.						
	Activation code	•	<u>R</u> egister			
s	upport: <u>customerservice@integrationobjects.com</u>	Enter activation cod	le here			

Figure 261: Activate License

e. Click the **Register** button.

nteoration

#### 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:

Integration Objects OPC	EasyArchiver DA Service F	Properties (Loca 🗙	
General Log On Reco	very Dependencies		
Log on as:			
C Local System accour	<b>nt</b> nteract with desktop		
<ul> <li>This account:</li> </ul>	.VAdministrator	Browse	
Password:	•••••		
Confirm password:	•••••		
Help me configure user account log on options.			
You can enable or disable this service for the hardware profiles listed below:			
Hardware Profile		Service	
Undocked Profile		Enabled	
Troubleshooting using ha	ardware profiles. Enable	Disable	
	OK Cano	el Apply	

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.



🚡 Local Security Policy				
File Action View Help				
🗢 🔿 🙍 📰 💥 🗒 😖 👔 🖬				
🚡 Security Settings	Policy	Security Setting	-	
A Count Policies	Deny log on as a service		_	
Password Policy	B Deny log on locally	ASPNET,SQLDebugger,		
Account Lockout Policy	B Deny log on through Remote Desktop Services	ASPNET		
Local Policies	Enable computer and user accounts to be trusted for delega	Administrators		
User Rights Assignment	Force shutdown from a remote system	Administrators,*S-1-5-3		
Security Options	🚰 Generate security audits	LOCAL SERVICE, NETWO		
Windows Firewall with Advanced Security	B Impersonate a client after authentication	LOCAL SERVICE, NETWO		
Network List Manager Policies	🔯 Increase a process working set	Users		
Public Key Policies	Increase scheduling priority	Administrators	Ξ	
Software Restriction Policies	Load and unload device drivers	Administrators,*S-1-5-3		
Application Control Policies	Lock pages in memory			
IP Security Policies on Local Compute	Log on as a batch job	IODOMAIN\fida,IODOM		
Advanced Audit Policy Configuration	Log on as a service	NETWORK SERVICE, IOD		
	Manage auditing and security log	Administrators		
4 III •	🕅 Modify an object label		-	

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.

#### 

- 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:

OPC EasyArchiver Settings			
General Settings Log Settings Archiver Settings AE Settings			
Connection	Appearance		
DA Service Port* 3333	Theme: Windows7Blu	e 🔻	
HDA Service Port* 3344	Layout: Reset Views	;	
User authentication	OPC Groups & Items		
Edit Admin Credential			
Application Configuration			
Prompt stop services confirmation message box			
Reconnect to DA server if the connectio	on is lost every 30000	ms	
Reconnect to HDA server if the connect	ion is lost every 30000	🗘 ms	
Split Loops per 750 F Items			
*Restart the application for the changes to take effect.			
Installation Folder OK Cancel			

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.


OPC Quality:	Bad, Sensor Failure	
Custom Quality:	Bad	Add
	Mapped Qualities	
OPC Quality	Custom Quality	Delete
Bad, Non-Specific	Bad	
Good, Non-Specific	Good	

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 <u>here</u> 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:

Select Returned Attr	ibutes	-	x
Event Type: OPC	ALL_EVENTS	[	•
Double click on an ev	ent category	Select All Categories	
Event Category	Description		
1	Level1		
2	Level1		
3	Level1		
4	Level2		
Returned Attributes		Select All Returned Attribut	tes
Attribute ID	Description	Attribute Type	
10	Cond	VT_14	
20	Quality	VT_14	
30	SourceName	VT_I4	
40	Attr40	VT_14	
50	Quality / SourceTimestamp	VT_14	
<			>
Apply	ОК	Cancel	

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:



OPC EasyArchiver Settings		х
General Settings Log Settings Archiver	Settings AE Settings	
Connection	Screen Settings	
AE Service Port* 3355	Rows to Delete* 10	• %
Automa	tic Reconnection	
Check AE Server Status every*	30000 💼 ms	
Check Reconnection State		
Reconnect to AE server if no alarm wa	as received during* 30 🚔 minu	tes
Check Subscription State		
Reconnect to AE Server after*	successive failures	5
E	vents Time	
Send Alarms using UTC Time		
*Restart the application for the changes	to take effect.	
Installat	tion Folder OK	Cancel

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:

Read Raw	x
Items	
itemID	
Random/Real4	
Parameters	
Absolute time Relative time	
	-
Start Time Now-1d	
End Time Now	
Number of values 100 😴 🔲 Bounds	
OK Cancel	

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.
Sunday	

#### 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.
у	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:

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