zenon manual

OPC Server

v.7.60
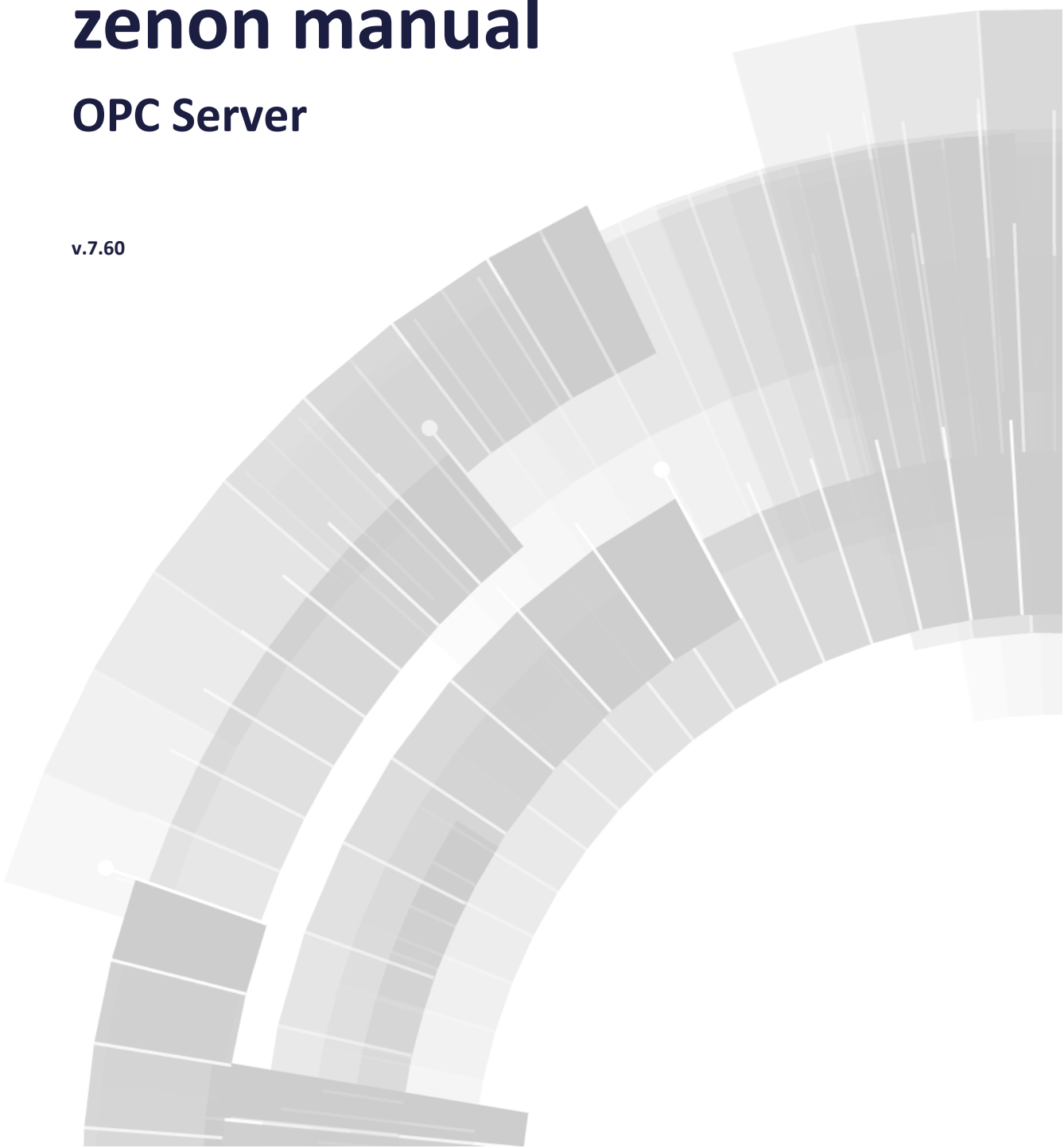
COPADATA
do it your way

Contents

1. Welcome to COPA-DATA help

ZENON VIDEO-TUTORIALS

You can find practical examples for project configuration with zenon in our YouTube channel (https://www.copadata.com/tutorial_menu). The tutorials are grouped according to topics and give an initial insight into working with different zenon modules. All tutorials are available in English.

GENERAL HELP

If you cannot find any information you require in this help chapter or can think of anything that you would like added, please send an email to documentation@copadata.com (mailto:documentation@copadata.com).

PROJECT SUPPORT

You can receive support for any real project you may have from our Support Team, who you can contact via email at support@copadata.com (mailto:support@copadata.com).

LICENSES AND MODULES

If you find that you need other modules or licenses, our staff will be happy to help you. Email sales@copadata.com (mailto:sales@copadata.com).

2. OPC server

The OPC server makes the variables of the project available for standard OPC client tools.

The use of the OPC UA Server is recommended for several operations. It is part of the COPA-DATA Process Gateway

> **License information**
>
> *Must be licensed in Editor and Runtime.*
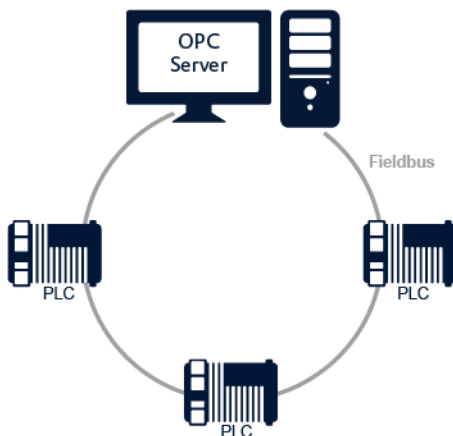
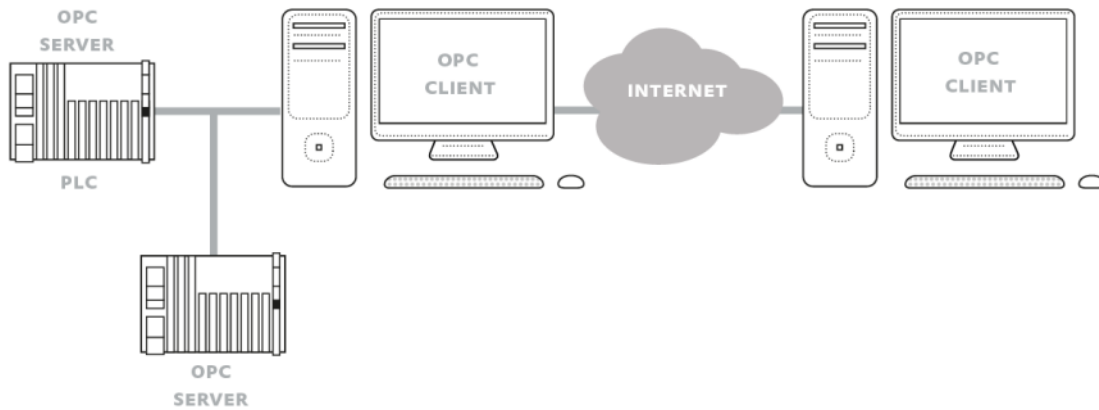# 3. Compare OPC Server and OPC UA Server

The OPC UA server system has superseded the OPC server. Use of an OPC UA server is recommended for most applications.

OPC SERVER

- ▶ OPC Task Force since 1995
- ▶ Uniform interface for automation systems
- ▶ Based on Microsoft's COM/DCOM technology
- ▶ OPC foundation since 1996
- ▶ several specifications for different applications

OPC UA SERVER

COMPARISON OF OPC SERVER TO OPC UA SERVER

| Parameters	OPC Server	OPC UA Server
Data model	Limited	for all applications
Implementation	Manufacturer-dependent	Manufacturer-independent
Interoperability	--	**X**
Configuration	laborious	simple
Several instances	--	**X**
Network use	--	**X**
Network technology	--	OPC UA TCP binary protocol
Performance	low	high
Platforms	Windows only	independent
Resource requirements	high	lower
Service-orientated architecture	--	**X**
Security	outdated	In accordance with current standards
Connection security	--	**X**
Windows CE	--	**X**

Key:

▶ **X**: is supported

▶   **--**: not supported

4.   Technical background

The concept of OPC ist conceived for the application in the cell and management level. Here the OPC server offers data from the control level

OPC CLIENTS AND OPC SERVER

OPC SERVER
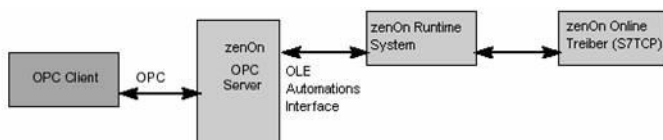
OPC defines objects that are described by object interfaces. In the OPC server there are two kinds of object interfaces, which can be addressed by an OPC client:

▶   The COM custom interface

▶   The OLE automation interface

OBJECT INTERFACE OF THE OPC SERVER
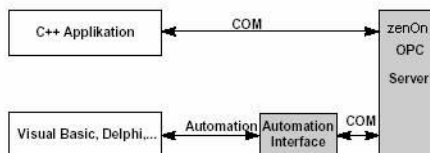
The COM interface is used by function-pointer-orientated languages, such as C++. It is possible to communicate with script languages, such as Visual Basic, using the Automation Interface.

OPC OBJECT HIERARCHY

An OPC server consists of three hierarchically-stepped objects:

▶   The server

▶   Groups and

▶   Items

An OPC server projects the real objects to items (variables). These items are unique within the OPC server. The client organizes the items in one or more OPC groups.

4.1   General OPC Server Information

The OPC server:

▶   is an Out of Prozess server

▶   runs in a Single Thread Apartment (STA)
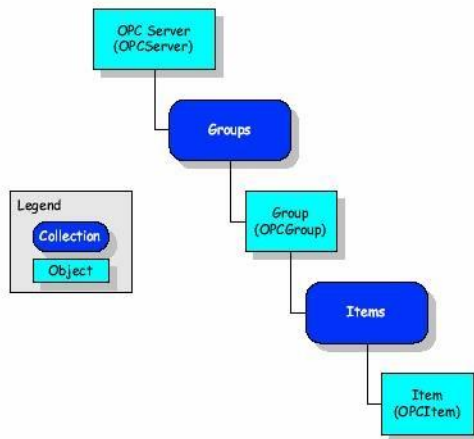
▶   Is registered as a MULTIPLEUSE COM server
    That means: The server runs only once as a process instance. Several OPC clients sign into the same server.

▶   only works locally

4.2   Item Addressing:

The OPC server has to be able to distinguish, from which projects the variables come, because several projects can be started in the Runtime.
So the server uses the following nomenclature for the process variables:
Projectname.Variablename

Example:

Projekt1.ActualValue

Project1 = name of the project currently running in the Runtime

. (Point) = Separator

ActualValue = Existing name of variable

> ⚠ **Attention**
>
> *Ensure that the OPC Data Access Client for each project accesses the variables in its own respective group. Access to variables from different zenon Runtime projects in one single group can cause error messages.*

4.3   Group information

A group name can be freely defined. For example: **Test group 1**.

The update cycle in the group is not considered by the OPC Server as the OPC Server has an on-change data connection to the Runtime. Therefore every modification of value will be transmitted to the OPC Server without cyclically requesting the value.

> 💡 **Information**
>
> *OPC clients must create an own group for each zenon project.*

4.4   Supported OPC Specifications:

OPC Data Access Servers Version 1.0

OPC Data Access Servers Version 2.0

SUPPORTED OPC INTERFACES:

Interfaces	supported
`IOPCServer`	Yes
`IOPCBrowseServerAddressSpace`	Yes
`IOPCServerPublicGroups`	No
`IPersistFile`	Yes
`IOPCCommon (from 2.0)`	Yes
`IOPCSyncIO`	No
`IOPCItemProperties (from 2.0)`	Yes
`IConnectionPointContainer (from 2.0)`	Yes

5. Installation and registration of the OPC Server

The OPC core components from the OPC Foundation must be installed for use of the OPC server. On computers with a 64-bit operating system, it is necessary to install both the 32-bit version and the 64-bit version. You can find the setups on the installation medium with the additional programs. The computer may need to be restarted after installation.

The OPC server is not registered by default for security reasons. After installation, the OPC server can therefore not be discovered by an OPC client. The OPC Server has to be explicitly registered

Registering the OPC Server

1. Install the **OPC-DA Core Components** from the OPC Foundation.
   The setup is on the installation medium in the **AdditionalSoftware** folder.

2. Open the command line with administrator rights (Elevated Command Prompt).

3. Enter the registry command with the desired parameters.
   Possible entries:

   - **zenopcsrv.exe /RegSrv**:
     Registers the OPC server. A message is given if this is not successful.

   - **zenopcsrv.exe /RegSrvD**:
     Registers the OPC server and also gives a message if this is successful.

   - **zenopcsrv.exe /UnregSrv**:
     Deregisters the OPC server. A message is given if this is not successful

   - **zenopcsrv.exe /UnregSrvD**:
     Deregisters the OPC server and also gives a message if this is successful

In the event of errors, check that you have sufficient authorizations.

Note: Changes made via the zenon **Startup Tool** or the installation of a new zenon version do not lead to any change to the registration of the OPC server.

6. Licensing the OPC Server

The OPC Server only runs, if it is correctly licenced. Otherwise you get the following error message:

Licencing is done with the standard licencing procedure. On ordering the OPC Server you have to state, on which computer the OPC Server should be installed, and the Runtime serial number you use there. From the licencing office you then get a new serial number and a new activation number for that computer. With these the OPC Server is licensed. These numbers have to be entered in the `zenon6.ini` with the tool licence order (Start – Programs – COPA-DATA – Licence order).

7. Settings in zenon

VBA has to be activated, so that the control system OPC Server can get data from the Runtime. Please check, if the following entries in the `zenon6.ini` are set correctly:

`[VBA]`

EVENT=1 (Switches on or off the event mechanism for the VBA – COM interface)

Default =0

This setting must be set to **EVENT=**1.

> ⚠ Attention
>
> *If the event mechanism in the Runtime is deactivated, the OPC Server can access the variables for writing, but the reading access does not work!*
> *The OPC Server then gets no change events from the Runtime. For the connection quality all OPC Clients will display "disturbed".*

No further settings in zenon are necessary.

The OPC Server reads out the running Runtime and offers all variables of all running projects for the connection.

> **Information**
>
> *As soon as the Runtime is started, you can read out all variables from all projects that are available in the Runtime. This is independent from the fact, if the included projects are standalone, client or server projects.*

8. Browsing of the OPC Server

OPC Clients use two different methods to find and to browse the variable information of the OPC Server. Finding the OPC Servers installed on the PC can be done in two ways.

- ▶ Reading out the Registry
- ▶ Browsing with the additional program `OPCEnum.exe`

The additional program **OPCEnum** is not distributed. So it can happen that an OPC Client cannot find the control system OPC Server, because it uses this browsing method. Read the documentation of the OPC Client to find out whether the browsing method can be changed to reading out the registry. (For the Matrikon OPC Explorer you find that under Options.) If this is not the case, you must install the program **OPCEnum**.

Hint: If you install the freely available Matrikon OPC Simulator Server, OPCEnum is also installed.

> **Information**
>
> *When browsing the control system OPC Server offers all variables that exist in the running control system Runtime. So you have to make sure, that the control system Runtime is running, before you start browsing the variables.*

9. Starting/stopping the OPC Server

The OPC Server is automatically started by the first client that connects to it and it is stopped by the last client that disconnects.

10. Logging

For monitoring and evaluating the activities of the <CD_PRODUCTNAM> OPC Server the Diagnosis Viewer is used.

11. Asynchronous read request

The OPC interface IAsyncIO and the OPC interface IAsyncIO2 support multiple asynchronous read requests.

12. Remote access

Remote access by means of DCOM technology is not supported. zenon only supports access to locally-installed OPC DA servers.

> ⚠ **Attention**
>
> *The OPC server is optimized for local use; use in a network is expressly not recommended!*
> *Background: OPC uses DCOM technology for communication over the network, which is considered prone to errors and unstable. Particular disconnections, such as unplugging a network cable and very long timeout periods are problematic in industrial applications.*
>
> **Recommended solutions:**
>
> ▸ Using an OPC_UA Servers
>   or
>
> ▸ Local installation:
>   zenon Runtime is installed and works as a client for the desired projects on the same computer on which the OPC client is running. zenon OPC Server is started for this client. In this way, zenon OPC Server can be connected to the OPC client.