# Contents

1 Welcome to COPA-DATA help .................................................................................................................. 4
2 OPC server........................................................................................................................................... 4
3 Compare OPC Server and OPC UA Server ............................................................................................ 5
4 Technical background............................................................................................................................. 7
   4.1 General OPC Server Information..................................................................................................... 8
   4.2 Item Addressing: ............................................................................................................................. 8
   4.3 Group information............................................................................................................................ 9
   4.4 Supported OPC Specifications: ....................................................................................................... 9
5 Installation and registration of the OPC Server ..................................................................................... 10
6 Licensing the OPC Server ..................................................................................................................... 11
7 Settings in zenon...................................................................................................................................... 11
8 Browsing of the OPC Server .................................................................................................................. 11
9 Starting/stopping the OPC Server ......................................................................................................... 12
10 Logging.................................................................................................................................................. 12
11 Asynchronous read request .................................................................................................................. 12
12 Remote access....................................................................................................................................... 13
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.

PROJECT SUPPORT
You can receive support for any real project you may have from our customer service team, which you can contact via email at 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.

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
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
**Compare OPC Server and OPC UA Server**

**OPC UA SERVER**

*Diagram showing OPC UA Server and OPC Client connections.*

**COMPARISON OF OPC SERVER TO OPC UA SERVER**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>OPC Server</th>
<th>OPC UA Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data model</td>
<td>Limited</td>
<td>for all applications</td>
</tr>
<tr>
<td>Implementation</td>
<td>Manufacturer-dependent</td>
<td>Manufacturer-independent</td>
</tr>
<tr>
<td>Interoperability</td>
<td>--</td>
<td>X</td>
</tr>
<tr>
<td>Configuration</td>
<td>laborious</td>
<td>simple</td>
</tr>
<tr>
<td>Several instances</td>
<td>--</td>
<td>X</td>
</tr>
<tr>
<td>Network use</td>
<td>--</td>
<td>X</td>
</tr>
<tr>
<td>Network technology</td>
<td>--</td>
<td>OPC UA TCP binary Protocol</td>
</tr>
<tr>
<td>Performance</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Platforms</td>
<td>Windows only</td>
<td>independent</td>
</tr>
<tr>
<td>Resource requirements</td>
<td>high</td>
<td>lower</td>
</tr>
<tr>
<td>Service-orientated architecture</td>
<td>--</td>
<td>X</td>
</tr>
<tr>
<td>Security</td>
<td>outdated</td>
<td>In accordance with current standards</td>
</tr>
<tr>
<td>Connection security</td>
<td>--</td>
<td>X</td>
</tr>
</tbody>
</table>
4 Technical background

The concept of OPC is 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.

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>OPC Server</th>
<th>OPC UA Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows CE</td>
<td>--</td>
<td>X</td>
</tr>
</tbody>
</table>

**Key:**
- X: is supported
- --: not supported


**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.Istwert**

**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 in 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:**

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOPCServer</td>
<td>Yes</td>
</tr>
<tr>
<td>IOPCBrowseServerAddressSpace</td>
<td>Yes</td>
</tr>
<tr>
<td>IOPCServerPublicGroups</td>
<td>No</td>
</tr>
<tr>
<td>IPersistFile</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Installation and registration of the OPC Server

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOPCCommon (from 2.0)</td>
<td>Yes</td>
</tr>
<tr>
<td>IOPCSyncIO</td>
<td>No</td>
</tr>
<tr>
<td>IOPCItemProperties (from 2.0)</td>
<td>Yes</td>
</tr>
<tr>
<td>IConnectionPointContainer (from 2.0)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

In order to use the OPC Server it must be licensed. To do this, start the COPA-DATA License Manager using the zenon Startup Tool. In the dialog Info About you can check which license is currently used. Regarding the license the OPC Server is a module of the Process Gateway.

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.
Starting/stopping the OPC Server

- 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_PRODUCTNAME>` 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. Usage in the network is explicitly not recommended!

**Background:** OPC uses DCOM technology for communication over the network, which is considered prone to errors and unstable. Disconnections in particular, such as unplugging a network cable and very long timeout periods are problematic in industrial applications.

Recommended solution:
- Using an OPC_UA Servers

**Note:** zenon supports only local connections. COPA-DATA customer care cannot investigate and correct problems when using Remote DCOM.