

# Cybro OPC Server User Manual

version 36

applies to Cybro OPC Server v3.1.0 and later



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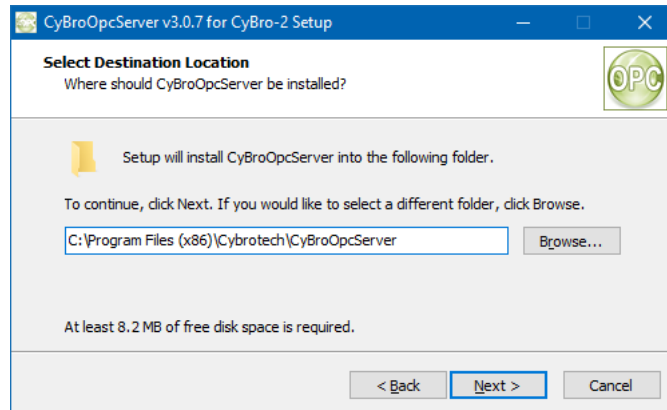
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# Installation

OPC is specification standardized by OPC foundation, which enables clients to access hardware data via servers in a common, well defined way. Cybro OPC Server enables OPC clients to access Cybro controllers. Clients can read and write the entire memory space, including IEX-2 modules.

To install Cybro OPC Server, run installation package **with administrator rights**. Recommended installation directory is C:\Program Files (x86)\Cybrotech\CybroOpcServer.



Installation will unpack Cybro OPC files into specified directory, create start menu icons, register OPC server to be visible for clients, and install redistributable core components.

To upgrade server, install new version into the same directory, without uninstalling the previous one. User settings will be preserved. Before upgrading, close all clients and shut down OPC server.

To uninstall, start Settings, Apps, select Cybro OPC Server and uninstall. OPC core components must be uninstalled separately.

## Activation code

Cybro OPC Server is protected by an activation code. To obtain the code, contact Cybrotech and provide the following:

- company name
- project on which the server will be used
- activation code size

The activation code can be:

- small up to 100 tags
- medium up to 1000 tags
- large unlimited number of tags

The activation code will be in form [COMPANY-PROJECT-12345-67890](#).

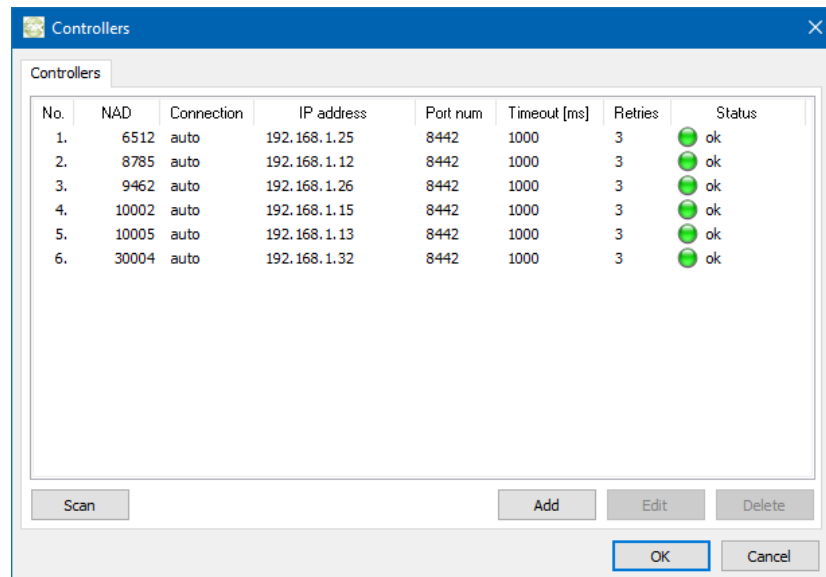
Cybro OPC server is free for up to 10 tags, no activation code is required. There is no limit to the number of reads and writes.

Server can also be used without the activation code for development and testing. After 2 hours, warning message will pop up and server will stop working. The server can be restarted manually.

With the activation code, server can be used on one computer for unlimited time. The number of clients is not limited. To migrate the server, just install on another computer and enter the activation code. Make sure that two computers are not running at the same time for more than 24 hours.

# Controllers

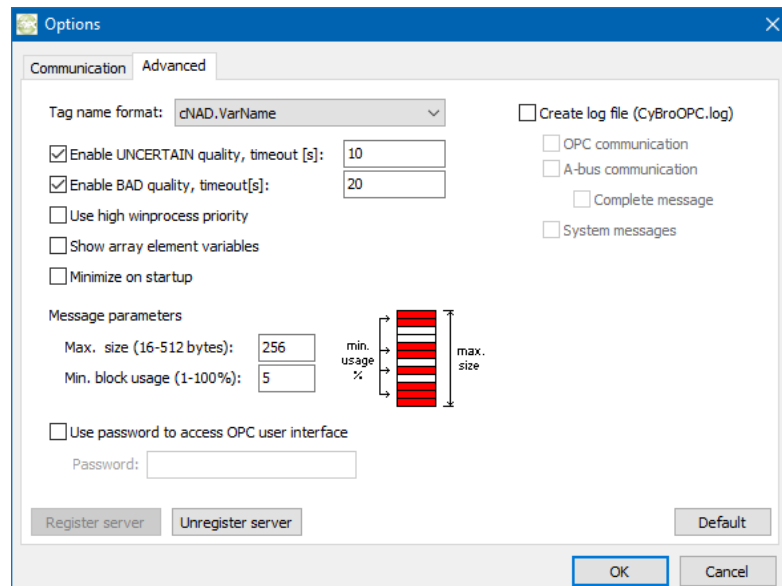
To create a list of controllers use [Scan](#), or add controllers manually.



Status column display the result of the last scan. The order of controllers will be the same in the main window.

# Options

Use Options dialog to set communication options and advanced details.



Default tag format is cNAD.VarName. Other formats are for compatibility with older versions and should not be used for new projects.

High process priority may slightly improve performance when server is handling a large number of controllers. Log file is used for debugging. It may significantly affect server performance. File size is not limited.

## Toolbar



Start/stop (Ctrl-D) Open TCP/IP socket and start communication.



Refresh tag (F9) Refresh selected tags. Refresh is performed by setting read request on selected tags. Tags will be read in next communication cycle.



Refresh all (F10) Read all tags on current controller. Refresh is performed by setting read request on all tags.



Set value (Enter) Write value to selected tags. It is performed by setting write request on selected tags. Value will be written in next communication cycle.



Add to Mon (Ins) Add selected tags to monitor. Monitor is a small OPC client, for both controller and system variables. Unlike background refresh, monitor affects tag status and communication statistics.



Controllers (F5) Open list of available controllers.



Options (F4) Open program settings dialog.

## Status panel

### Server status



Idle, no communication. No controllers configured, or no read/write requests.



Active, communication between server and all controllers are up and running.



Error, socket binding failed or at least one controller is not responding.



Stopped. Press [Start](#) to open TCP/IP socket and restart communication.

Server status is visible in [Sys.Status](#) tag. For more details, use [Sys.OpcStatus](#) tag.

## OPC interface



Active, at least one OPC client is connected.



Idle, no clients connected.

## Network monitor

### Controller status



Active, communication is up and running, no errors detected.



Idle, no active read/write requests.



Communication error.

Controller status is visible in [cXXXX.Sys.Status](#) tag. For more details, use [cXXXX.Sys.PlcStatus](#).

### Animation



Read operation is currently executed.



Write operation is currently executed.



A request from OPC client is pending.

### Tag status



Read request pending, tag will be updated in next communication cycle.



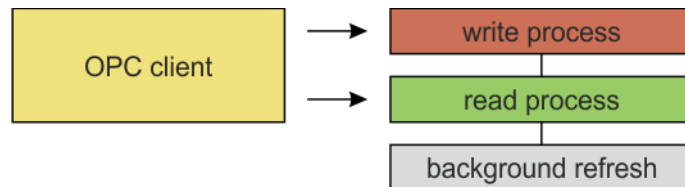
Write request pending, tag will be written in next communication cycle. Tag quality becomes LOCAL\_OVERRIDE until next read is performed.



No requests pending, tag will be refreshed with next background refresh. When communication is fully utilized, background refresh is stopped, idle tags are not updated. Tag quality drops to LAST\_KNOWN.

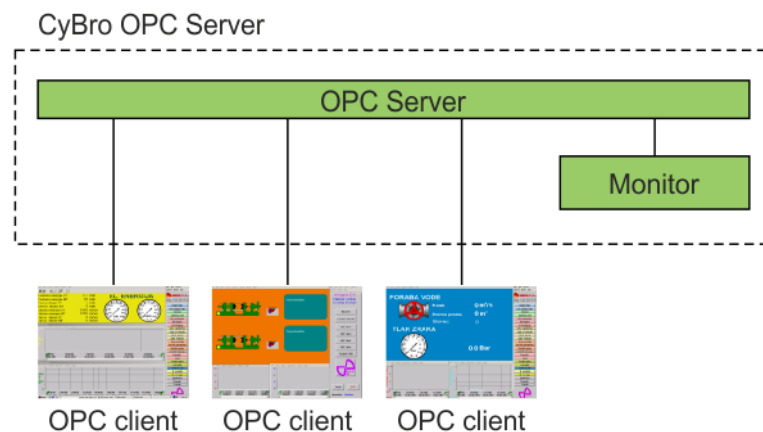
## Process priority

OPC server execute three separate processes: read, write, and background refresh. Write process is top priority, read process is lower, and background refresh is lowest priority.



Read and write process are started by request from OPC client. When no requests are pending, background refresh is processed. Heavy traffic may stop background refresh altogether.

OPC data monitor is a local OPC client. Monitor activity affect system tags.



## Tag quality

According to OPC specification, each tag has [value](#) and [quality](#).

[Value](#) is an actual tag value, quantity. Range of possible values depends on tag type (bit, integer, long, real).

[Quality](#) is a property independent of value, and specifies how reliable the actual value is. Quality depends on how and when the value is obtained. When communication is uninterrupted, quality is always "Good". If communication channel is broken, quality first become "Uncertain", then "Bad".

A range of possible qualities is defined by OPC specification. There are three main categories, "Good", "Uncertain" and "Bad. Each category can contain additional info field, which may give a more detailed explanation about the problem cause.

Cybro OPC server implements the following qualities:

Good..... Value is updated regularly.

Good, local override .....Value is locally overridden using function "Set value". Tag status is red (write pending). After the write command is completed, status becomes green (reading) or gray (idle). When tag value is read next time, quality changes back to "Good".

Uncertain, last usable .....First timeout, last updated value is more than 10 seconds old. Possible reason may be a slower network update time, or communication errors. This is a warning, not error.

Bad .....Value is unusable, no successful read was performed since OPC server started.

Bad, last known .....Second timeout, last updated value is more than 20 seconds old. Communication is broken, value is not reliable any more.

Bad, out of service .....Activation code expired. More tags than allowed by license is used, development timeout (2 hours) expired.

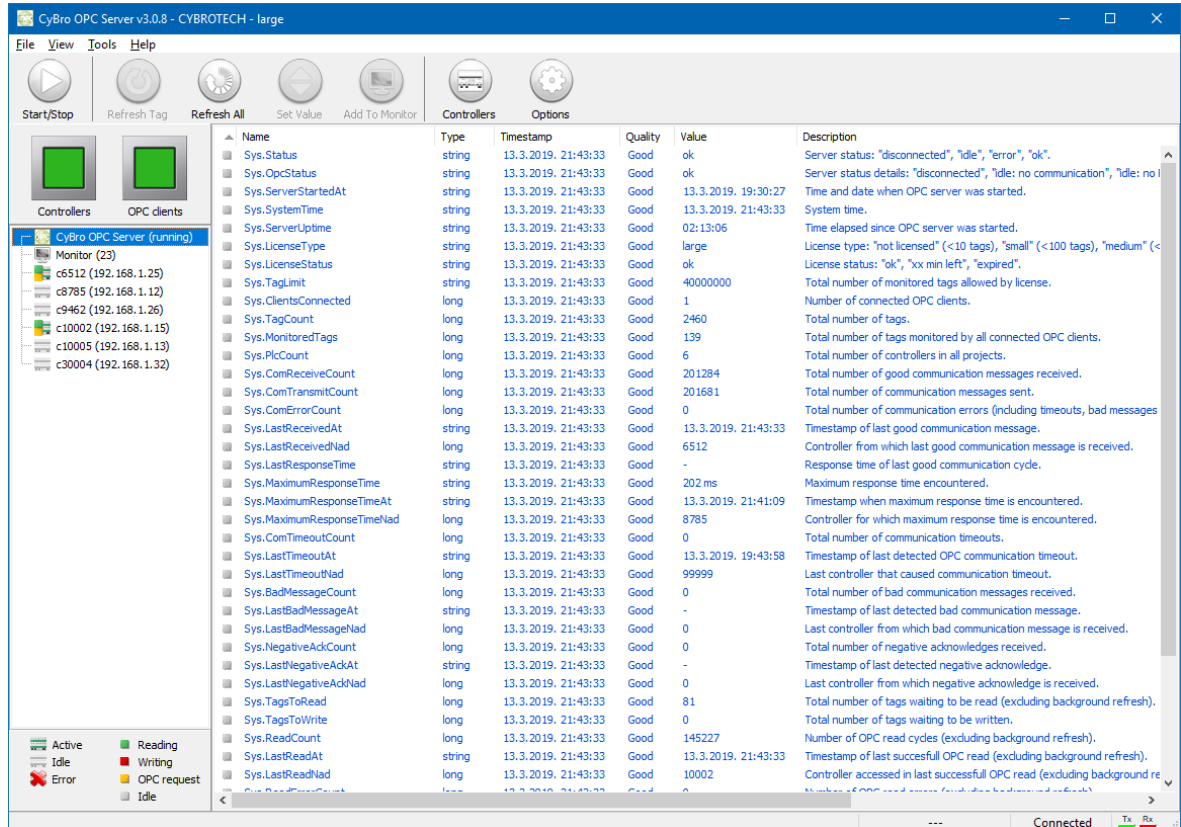
To adjust "Uncertain" and "Bad" timeouts, open [Options/Advanced](#).

## System tags

System tags are virtual tags created by OPC server, used to show information about server and network. Two types are available: those belonging to server, and those belonging to controller.

Some tags are resettable, writing zero (or reset) will clear the tag.

To get more details about system tags, check tag description.



Click column name to sort tags. To restore default tag order, click Status column.



# DCOM setup

OPC 2.0 technology uses Microsoft's COM/DCOM model to exchange data between a client and a server, so DCOM permissions must be set to allow communication between two separate computers. When both client and server are running on the same computer/account, default permissions are suitable.

Latest version of OPC Core Components Redistributables must be installed (included in CybroOpcServer instalation).

## Mutual user accounts

To ensure a successful communication between OPC client and server computers, it is necessary to setup same user accounts on both computers. There are two things to note:

- user account must have a password
- user account must have the same username and password on both computers

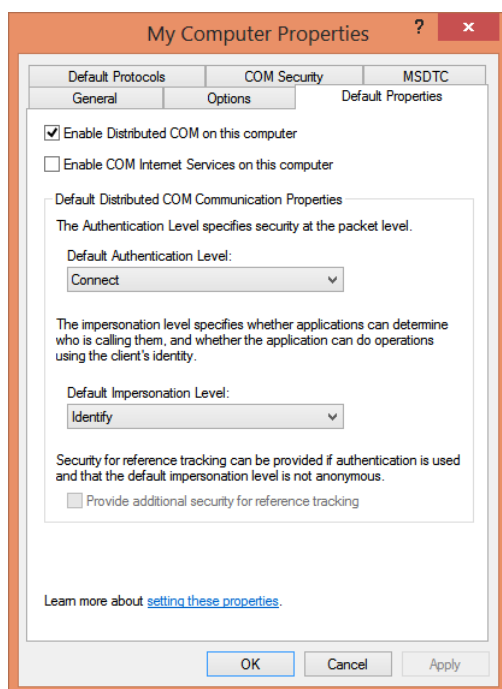
Windows 10 and later also requires local security policies. Go to Control Panel / Administrative Tools / Local Security Policy, or open "[secpol.msc](#)". Next, navigate to Security Settings / Local Policies / Security Options and find the "Network access: Sharing and security model for local accounts" option and set to "Classic - local users authenticate as themselves".

## System-wide DCOM settings

Open "[dcomcnfg.exe](#)", navigate to Component Services / Computers, right-click on My Computer and select Properties.

On the Default Properties tab:

1. Set "Enable Distributed COM on this computer"
2. Set "Default Authentication Level" to "Connect"
3. Set "Default Impersonation Level" to "Identify"



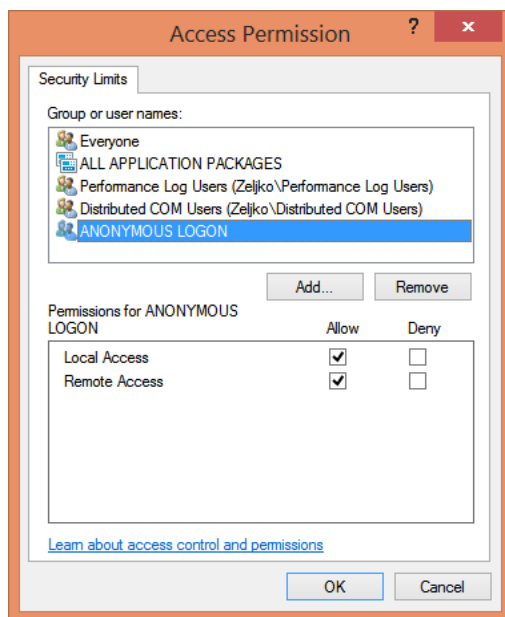
On the COM Security tab:

1. Under Access Permissions, click Edit Default and add the following Group or user names:

Anonymous Logon

Everyone  
Interactive  
Network  
System

2. Ensure that both Local and Remote Access are allowed for all groups/users above.
3. Do the same for Edit Limits option (if the button is not disabled).
4. Repeat the above three steps for Launch and Activation Permissions.



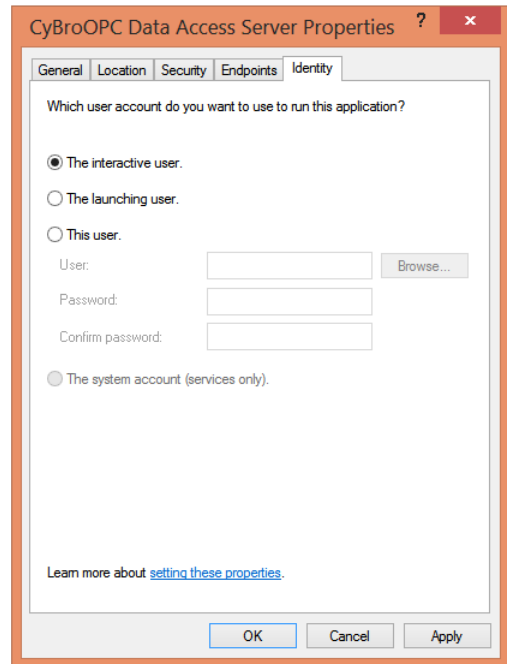
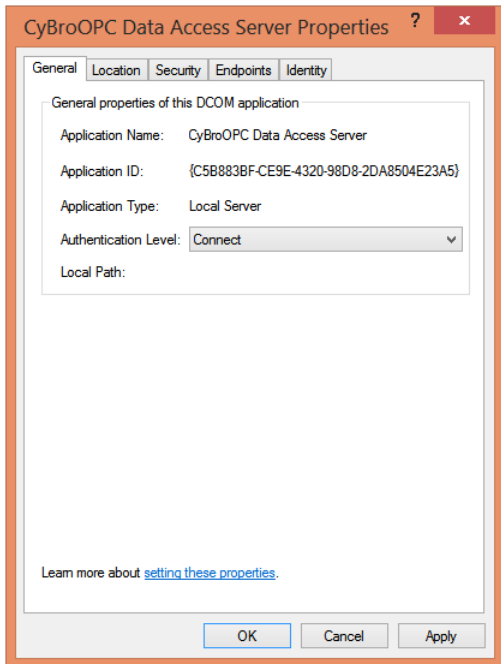
## Specific DCOM settings

Open "dcomcnfg.exe", navigate to Component Services / Computers / My Computer / DCOM Config. Find OPCEnum or OPC server in the list, right-click and select Properties.

1. On the General tab, set Authentication Level to "Connect".
2. On the Security tab, under "Launch and Activation Permissions", select Customize, Edit. Add the following users and ensure that all permissions are allowed for them:

Everyone  
Interactive  
Network  
System

3. Repeat the procedure for "Access Permissions".
4. On the Identity tab, select the user under which your OPC server will run (in case of OPCEnum, set to "The system account"). Since CybroOPCServer wasn't intended to run as a service, it should be set to "Interactive user" or "This user". If "Interactive user" is selected, it is necessary to remain logged on at the computer in order for the OPC server to run.



## Firewall exception rules

To enable successful communication with the OPCenum and OPC Server from the remote computer, they should be added to the firewall exception list. This task is specific to the firewall used, so it is not covered here.

## Troubleshooting

If you does not succeed in connecting to the remote OPC server, even after DCOM permissions are configured, there is a troubleshooting guide available at OPC Training Institute. Also you can find a small utility, OPC Rescue, which will help to identify error cause.

# Troubleshooting

## Hardware

- check cybro power supply (PWR led)
- check cybro status (RUN led)
- check ethernet cable (LNK/ACT led)

## TCP/IP connection

- use command line to ping cybro by ip address
- use CyPro to check connection with cybro

## PLC program

- use CyPro to check that alc file is sent to plc (PLC info)

## OPC server

- try local monitor
- reset settings to default
- select Ethernet adapter
- start/stop server
- open controllers, re-scan, accept
- shutdown server

## OPC client

- use independent client (Matrikon OPC Explorer, OPC Rescue)

## Windows

- run diagnostic tools (Resource Monitor, Reliability Monitor)

## Miscellaneous

- install OPC server on another PC
- file a bug report

# Keyboard shortcuts

Ctrl-A .....Select all tags

Insert.....Add selected tags to monitor (controller only)

Delete .....Remove selected tags from monitor (monitor only)

Enter .....Set tag value

Space .....Toggle tag value (bit only)

Ctrl-Up/Down .....Move selected tags up/down (monitor only)

F4 .....Options dialog

F5 .....Controllers dialog

F9 .....Refresh selected tags

F10 .....Refresh all PLC tags / all monitor tags

Alt-F4 .....Close OPC window

Ctrl-Alt-F4 .....Shutdown OPC server

# Technical specifications

Server ID .....CyProOPC.DA2  
OPC version ..... 1.0, 1.0a and 2.0  
OPC interface .....synchronous and asynchronous  
Supported OS.....Win10 and later  
Supported controllers .....Cybro-2 and Cybro-3  
Communication media.....Ethernet/LAN  
Communication protocol.....A-bus symbolic (variables read directly from PLC)