CyBro OPC Server User Manual

version 33

applies to CyBro OPC Server v3.0.8 and later

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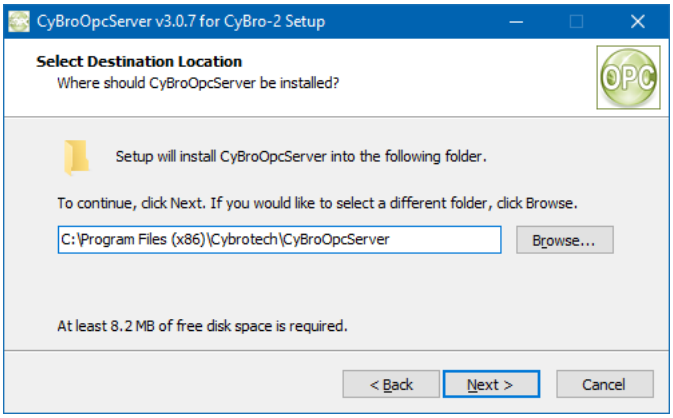
Installation

OPC (OLE for Process Control) is a specification standardized by OPC foundation, which enables clients to access hardware data via OPC servers in a common, well defined way.

CyBro OPC Server enables OPC clients to access Cybro controllers. Clients may read and write whole memory space, including the attached IEX-2 modules.

To install CyBro OPC Server, start the installation and follow instructions. Recommended directory is "C:\Program Files\Cybrotech\CyBroOpcServer".



Installation does the following:

- unpack CyBro OPC files into specified directory
- create start menu group and icons
- register OPC server to be visible for clients
- install redistributable OPC core components

Note: administrator rights are required.

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

To uninstall server, start Control Panel, Add or Remove Programs, select CyBro OPC Server and press Remove button. OPC core components must be uninstalled separetely.

Activation code

To use CyBro OPC Server, valid activation code is required. For activation code contact Cybrotech. Regarding the application size, activation code may be:

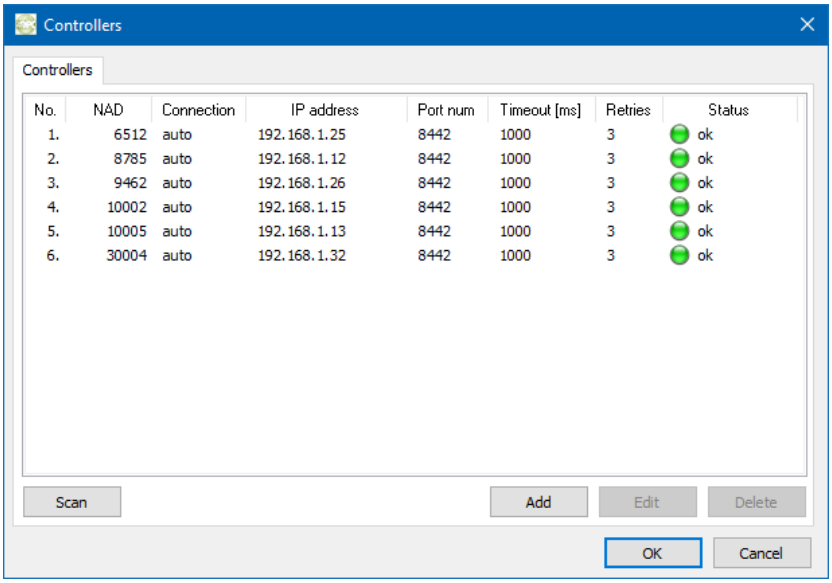
- small up to 100 tags
- medium up to 1000 tags
- large unlimited number of tags

Using the OPC server with 10 or less tags is free, no activation code is needed. There is no limit to number of reads or writes.

Server can be used for development and testing without activation code. After 2 hours, warning message will pop up and server will stop. Server can be restarted manually. Number of restarts is not limited.

Controllers

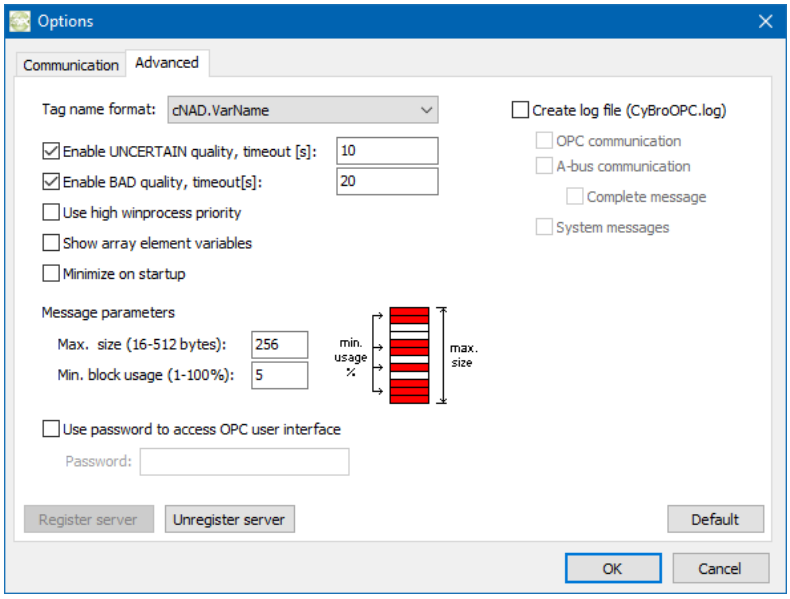
To create list of controllers that will be used with server, use Scan or enter them manually.



Status column display result of last scan. Sort order is retained in 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 large number of controllers. Log file is used for debuging. 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 from curent 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

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

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

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

 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 client 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

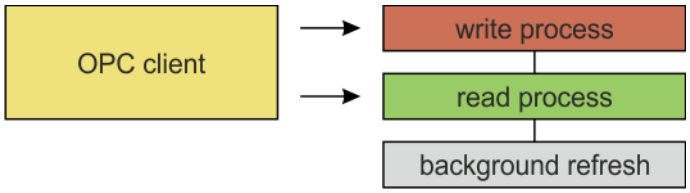
Read request pending, tag will be updated in next communication cycle.

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.

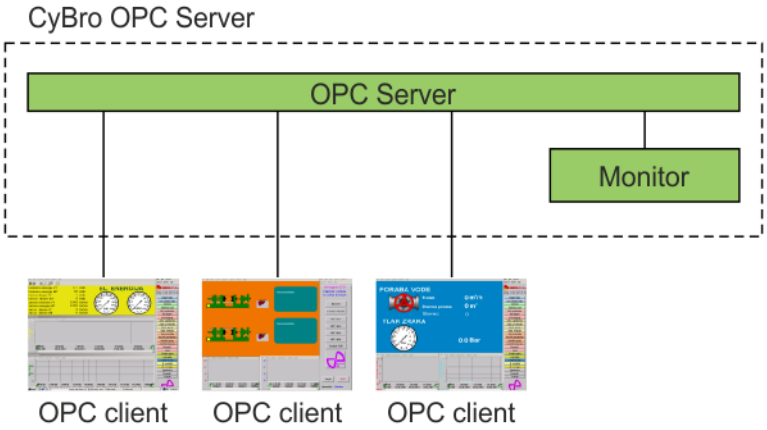
Process priority

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 is started by request from OPC client. When no requests are pending, background refresh is processed. Heavy traffic may temporary stop background refresh.

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 that 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.

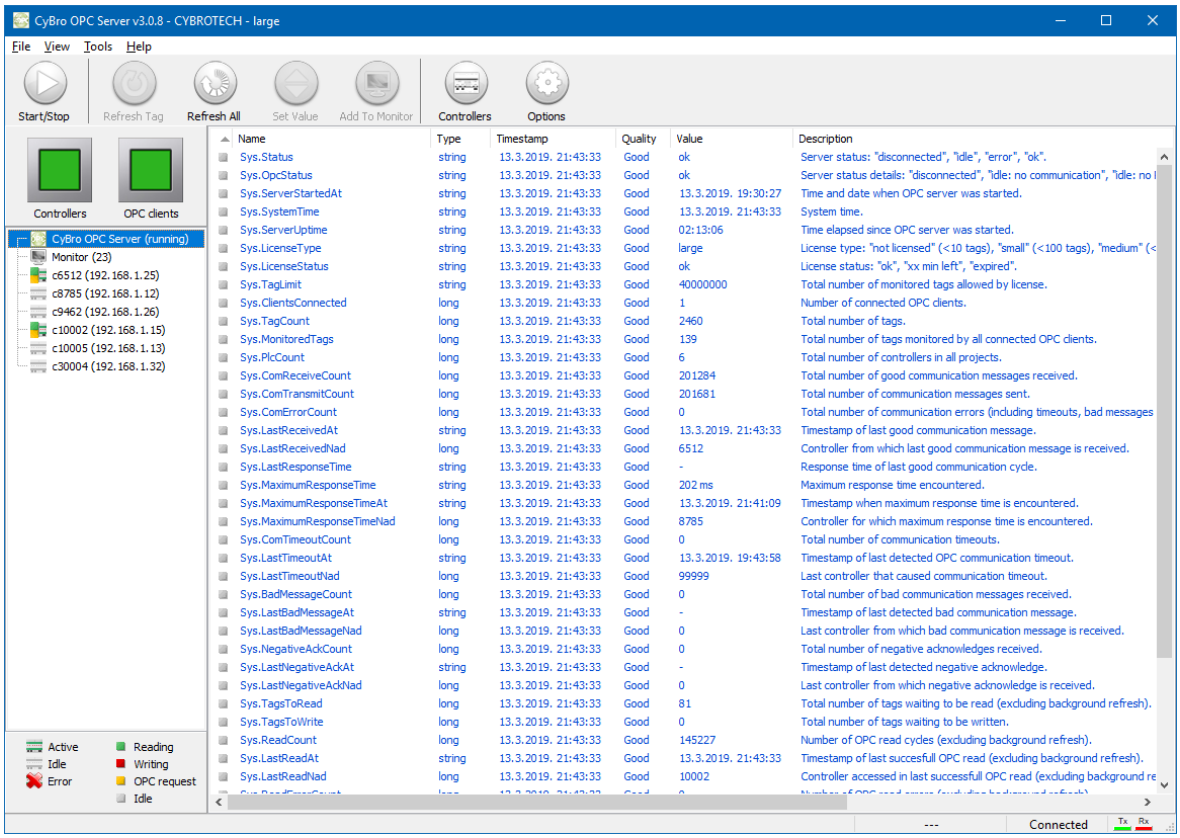
To adjust "Uncertain" and "Bad" timeouts, open Options/Advanced.

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 objects on different computers.

As a prerequisite, 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/password on both computers

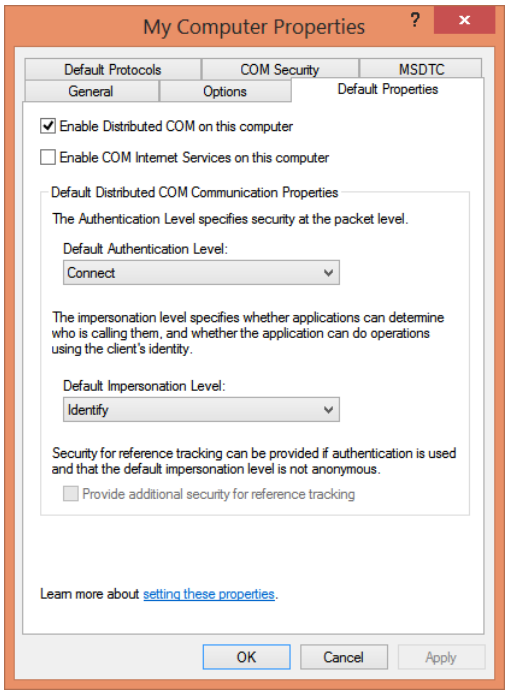
On Windows 7 and later it is also necessary to set the local security policies. Go to Control Panel / Administrative Tools / Local Security Policy, or open "secpol.msc". Next, navigate to Security Settings / Local Policies / Security Options and find the "Network access: Sharing and security model for 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:

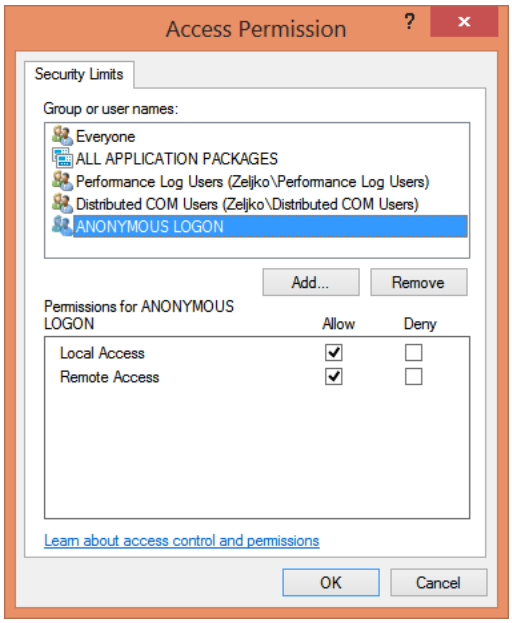
Anonymous Logon

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.

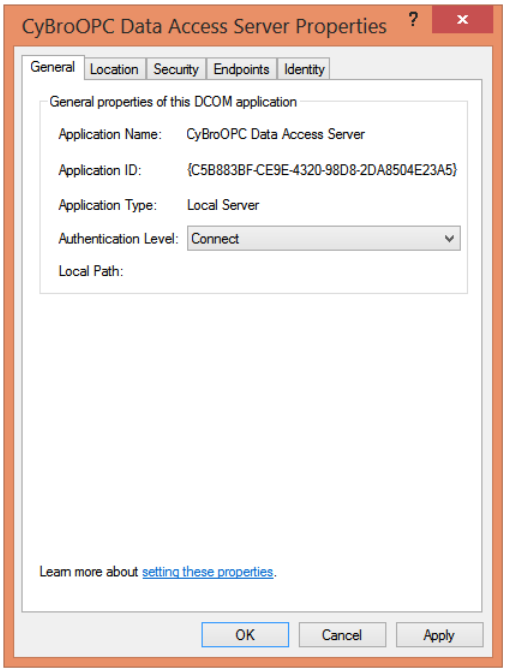
1. On the General tab, set Authentication Level to "Connect".

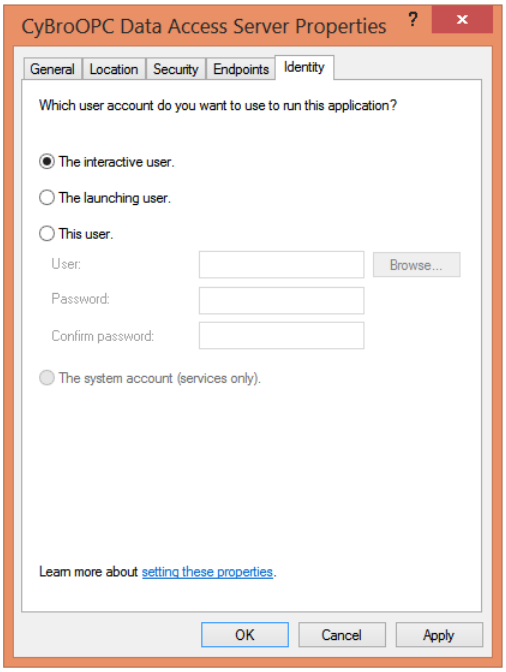
2. On the Security tab, under "Launch and Activation Permissions", select Customize, Edit. Add the following users and ensure that all permissions are allowed for them:

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 it to "The system account"). Since CyBroOPCServer wasn't developed 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.

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	Win7, Win10
Supported controllers	Cybro-2 and Cybro-3
Communication media	Ethernet/LAN
Communication protocol	A-bus symbolic (variables read directly from PLC)