ABB

Release Notes OPC-Server V3 Alarm Event for High Availability

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Please read the whole document carefully, as it contains important information!

Installation Instructions:

- The installation of OPC Server AE V3 can be performed using the supplied installer. It installs both the OPC-Server and the CoDeSys Gateway Server.
  If the additional ABB Gateway drivers are needed in a stand-alone environment (without CoDeSys installed on the same computer) please find the installer in CD_AC500\Driver\ABB_AC500_Drivers.

- **If the Pre-Release version of the OPC Server AE V3 as supplied with PS501 V1.3.1 is installed on the computer, it needs to be removed before the new version is installed.**
To do so, please follow the steps described:
  - Shut down any external OPC client
  - Shut down the OPC Tunnel service via service applet (-> Run-> Control Panel -> Administrative tools -> Services, then double click on "ABB OPC Tunnel" -> stop).
  - Shut down the CoDeSys Gateway Server (either via the SysTray Icon ->Exit or using the Taskmanager to shutdown the process Gateway.exe)
  - Open a command prompt (Start -> Run -> cmd) and change to the directory where WinCoDeSysOPC.exe is located. Run "WinCoDeSysOPC /unregserver" to unregister the OPC Server.
  - Uninstall the AE-Configurator using the the "Add or Remove Programs" functionality of Windows in the Control Panel.
  - Restore the Gateway files by copying the files from "CD_AC500\CoDeSys\Gateway" to the Windows-directory "WINNT\SYSTEM32" or "WINDOWS\SYSTEM32", depending on your Windows installation.
    Afterwards, the OPC Server AE V3 can be installed using the supplied installer.

Deinstallation Instructions:

In order to deinstall OPC Server AE V3, all processes and services that access the OPC Server need to be stopped. This includes
  - Shutting down any external OPC client
  - Shutting down the OPC Tunnel service via service applet (-> Run-> Control Panel -> Administrative tools -> Services, then double click on "ABB OPC Tunnel" -> stop).
  - Shutting down the CoDeSys Gateway Server (either via the SysTray Icon ->Exit or using the Taskmanager to shutdown the process Gateway.exe)

Afterwards, the OPC Server AE V3 can be deinstalled using the "Add or Remove Programs" functionality of Windows in the Control Panel.

General recommendations:

To ensure proper communication behaviour the following **dcomcnfg settings** should be installed:

Configure user account for OPC Server

By default the OPC Server (WinCoDeSysOPC.exe) runs in the same user account of the process that launched the OPC Server. Depending on the user account this could lead to unpredictable behaviour. Thus it is required to configure the user account for the OPC server. These instructions apply to Windows XP with at least SP 2 installed and those systems where only OPC clients that are installed on the same machine connect to the OPC server. Remote access via DCOM would require additional configuration that is not described here.

Considerations for choosing the user account:
- The user account does not need administrative rights.
- If possible it is a good practice to use the same user account of the user who is usually logged in and starts CoDeSys (if CoDeSys is running on the same machine).
- If company password policies require an expiration of passwords for interactive user, a user account should be created that does not allow interactive login and has password that never expires.

The procedure to configure the user account has to be repeated every time after:
- The OPC server was reinstalled
- The OPC server was registered using the command "WinCoDeSysOPC.exe /RegServer"
even if the displayed settings are the same.

To configure the user account perform the following procedure as user that is member of the "Administrators" group:

1. Make sure that the OPC server is not already running. Use the task manager to verify that there is no process "WinCoDeSysOPC.exe" when the option "Show processes from all users" is selected.

2. If the OPC Server is already running, the OPC Tunnel application (or any external OPC Client) has started the OPC Server. Shut down the OPC Server by
- Shutting down any external OPC client
- Shutting down the OPC Tunnel service via service applet (-> Run-> Control Panel -> Administrative tools -> Services, then double click on "ABB OPC Tunnel" -> stop). After that check again if "WinCoDeSysOPC.exe" is not running any more (see 1.)

3. Start "Component Services" by calling "dcomcnfg" from the command prompt or from "Start → Run". If Component Services are already running restart them after the OPC server was installed and registered.
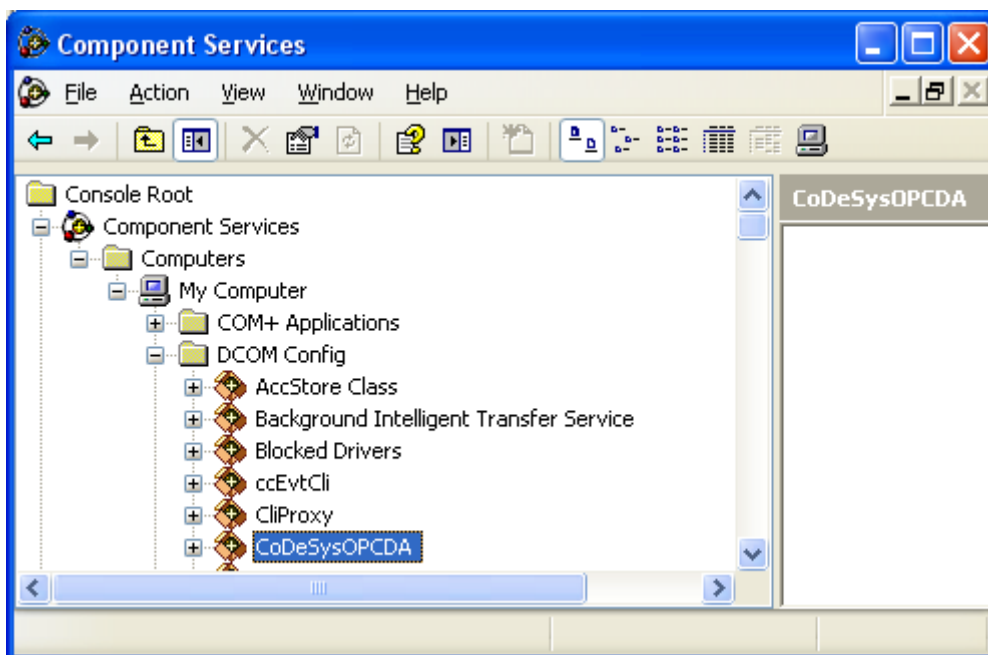
4. Select at first the node "Component Services" below "Console Root" and then expand the nodes "Computers" → "My Computer" → "DCOM Config" by clicking on the "+" sign of each node.
5. Select the node "CoDeSysOPCDA", press the right mouse button and choose "Properties" from the context menu.
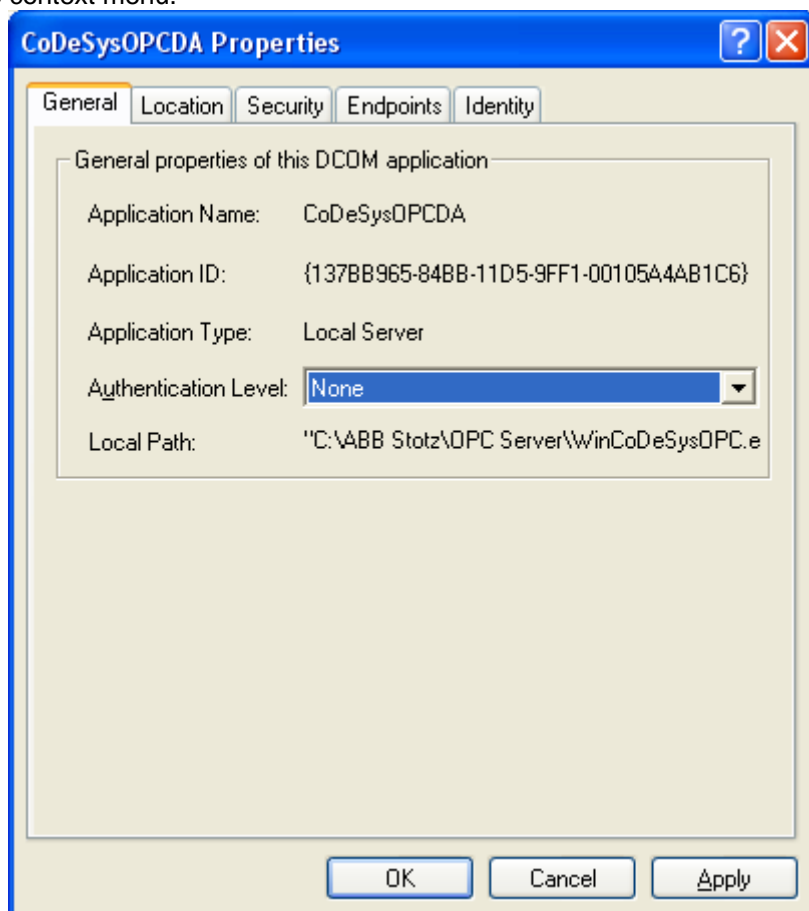
6. Select for "Authentication Level" the value "None" in the tab page "General".
7. Open the tab page "Identity"
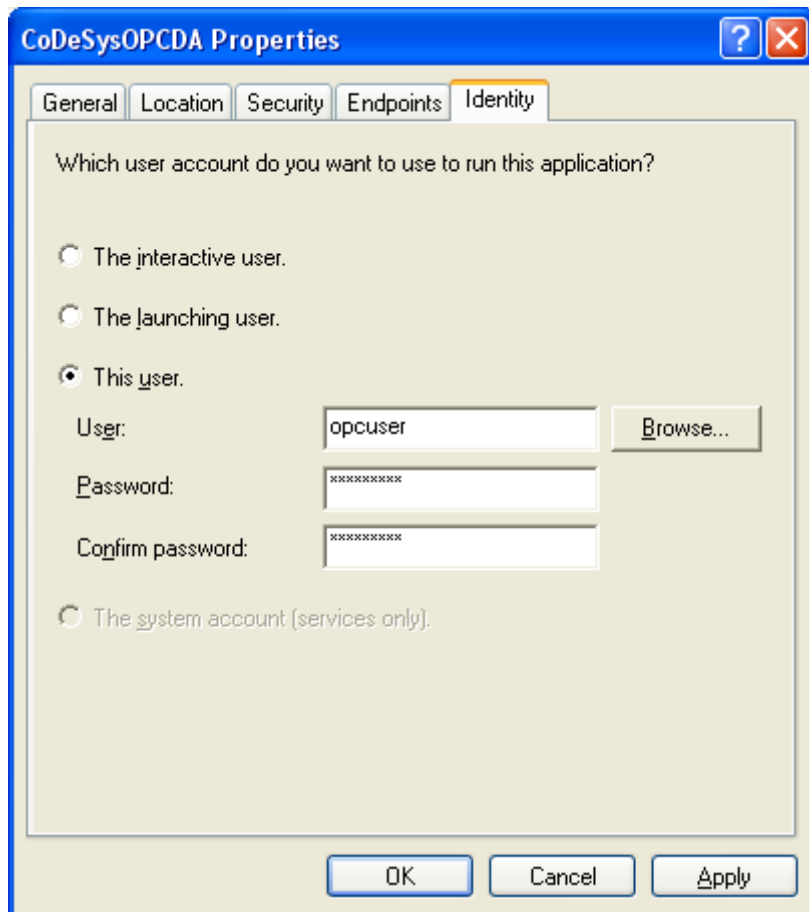
8. Select "This user".
9. Enter the name of the desired user account in the field "User".
10. Enter the password of this user in the fields "Password" and "Confirm password".
11. Press "OK". The dialog checks that the password is valid and displays an error message if the password is wrong.

Note: If the desired user is already entered select the option "The interactive user", press "Apply" and continue with step 6. Otherwise it could happen that the displayed settings are not really used.

12. If the OPC Tunnel service was previously stopped, start it again.(-> Run-> Control Panel -> Administrative tools -> Services , then double click on "ABB OPC Tunnel" -> start)

Specific information in addition to the OPC server manual:

Registration of OPC server:

In a DigiVis 500 setup context the OPC server **must not** be registered as service. The OPC tunnel itself starts the OPC server within its service.
(Refer to OPC server manual, chapter 3.1).

Offline configuration via Symbol file:

If offline OPC configuration is required (PLC not connected) the project name must be given within the OPCServer.ini file. (Refer to OPC server manual, chapter 5.3.5)
Refer also to the known limitations below (8).

System size:

The OPC server was tested on different system configurations with different sizes, according to the following table:

Nr. Of PLCs	Nr. of I/Os	Nr. of Alarms	Nr. of Trend-signals	Nr. of OPC-Items	Nr. of Clients
1	50	50	5	150	1
2	150	150	10	450	1
2	200	200	30	600	2
4	400	400	50	1200	3

Known limitations:

1. Gateway communication not possible if gateway port is used by other application

It must be ensured that the required Gateway ports (1210 and 1211) are not occupied by different processes. Otherwise the Gateway communication can not be established.
Possible applications that also use port 1210 and/or 1211 are:
- Java update client
- ABB 800xA System

➔
If there are problems to establish Gateway communication check the usage of port 1210 (via any port scanning tool, e.g. SysInternals) and close the application which uses this port.

2. Restrictions on alarm calculation precision for LONG data types

CoDeSys supports the usage of LONG (64Bit) data type variables. If those variables are used for alarm calculation the full resolution of 20 digits is not available since the OPC server is only able to deal properly with 15 digits resolution (double real format).

➔
The configured alarm limits shall not extend 15 digit significance.

3. WinCoDeSysOPC.exe consumes memory during Browse/Synchronize operation from DigiVis500 GraphicsBuilder

An OPC-Browse-or-Synchronize operation performed with the DigiVis500 Graphicsbuilder may consume up to 600 Kbytes which will not be released until the OPC server process has been restarted.

4. Communication of OPC server only possible after "clean" download

The OPC server can communicate to the PLCs only when the following rules are followed:

➔
- The download of the program from CoDeSys to the PLC must be done via the gateway that is used for the OPC server, not from different PC
- The gateway.exe must always run in the same user account since data is stored in the registry below HKEY_CURRENT_USER. (The gateway.exe may run in different accounts when started by the ABB OPC Tunnel service or by CoDeSys)
- The same driver must be used in the communication parameters in CoDeSys and in OPCConfig, either "3S TCP/IP" or "ABB TCP/IP Level 2 AC"

5. OPC configuration parameter "Update Rate" must not be "0ms"

For the specific value "0ms" for the OPC server update rate the data communication is not working.

➔
Select any appropriate value except "0ms".

6. Access violation on multiple connect/disconnect of DA client with connected AE

A crash of OPC server may happen if multiple connect/disconnect actions of an OPC DA client are performed if in parallel an OPC AE client is connected.

➔
This will not happen if only DigiVis500 is used as OPC client since the used OPC tunnel permanently establishes a DA and an AE connection.

7. OPC Config file open path limited to 100 characters

The maximum path length for the nested OPCServer.ini file may only be 100 characters. If the path length extends this limit the OPCServer.ini file can not be opened from the OPC Configurator tool.

➔
Select an installation path for the OPC server which does not extend 100 characters.

8. Offline configuration only possible for one PLC

The possibility to configure the OPC Server without connected PLCs only via the symbol file is restricted to only 1 PLC offline at the same time.
If the OPCServer.ini file contains more than 1 PLCs that are not connected, the OPC server may crash.

9. OPC server may crash with invalid configurations

The OPCConfig Tool does not generally prevent invalid configurations that may lead to crashes of the OPC server.
Known examples that must be avoided are:
- No connection configured for interface "GATEWAY"

10. OPC server may crash during frequent Power Off/On of PLCs

Under rare conditions it could happen that the CoDeSys OPCServer issues an access violation. Observed problem condition were the frequent Power Off/On of PLCs over a longer period and also frequent TCP/IP network interrupts over a long period.

On a freshly installed PC a notification message box would then appear with a message like
"Application Error – the instruction at "0x*" referenced memory at "0x****""**
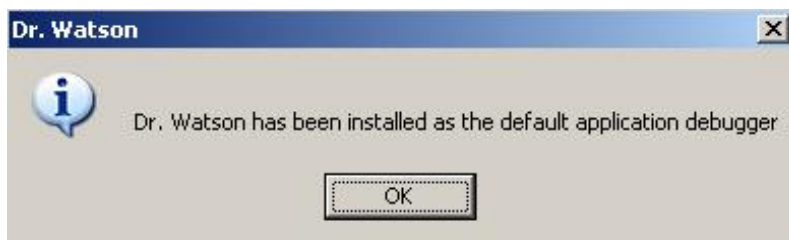During the time this message box is displayed the OPCServer is blocked and could not restart.

➔
To get around this problem, Microsoft delivers also an alternative exception handler called DrWtSn32.exe (Doctor Watson Application)

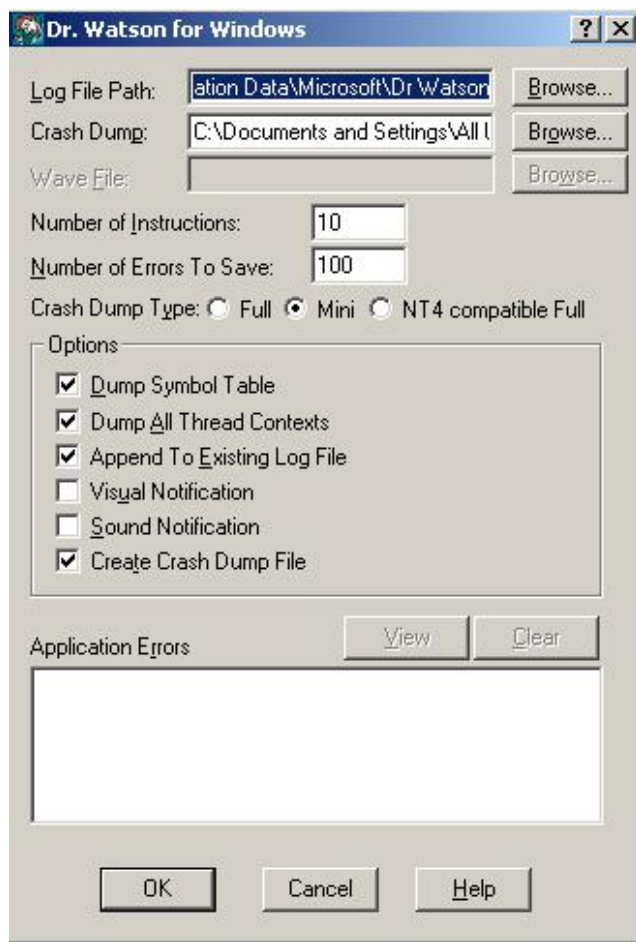To install this exception handler type in -> Start -> Run -> drwtsn32.exe –i
The following message will be displayed on success:

Afterwards issue the same operations as above **without** an argument

    Start -> Run -> drwtsn32.exe

The Doctor Watson options and parameter will be displayed like this:

Dr. Watson for Windows

Log File Path: ation Data\Microsoft\Dr Watson   Browse...
Crash Dump: C:\Documents and Settings\All U   Browse...
Wave File: Browse...

Number of Instructions: 10
Number of Errors To Save: 100
Crash Dump Type: ○ Full ● Mini ○ NT4 compatible Full

Options
☑ Dump Symbol Table
☑ Dump All Thread Contexts
☑ Append To Existing Log File
☐ Visual Notification
☐ Sound Notification
☑ Create Crash Dump File

Application Errors   View   Clear

OK   Cancel   Help

Be sure to unselect the checkbox "Visual Notification"

Now, if the OPCServer crashes, it will be restarted and will continue to work

11. Download to PLC with running OPC-Clients could crash OPCServer

Under rare conditions the download of a program to the PLC can crash the OPCServer. This was observed while several different OPC clients were accessing the PLC after a high number of download attempts.

➔
After the crash the OPCServer may restart properly again if the preparations for recovering with Dr.Watson are executed as for **10.**

12. After PLC PowerON/Off Test the OPC server may get no channel from gateway

Observed within a test scenario where different PLCs were frequently powered On/OFF over a long time. Occasionally the OPC server may stop to deliver values to the Clients.

➔
Restarting of gateway process (within task manager) and OPC server (via OPC tunnel if DigiVis500 is installed) may solve the problem

13. Short wait times may result in update problems

To avoid update problems at it is currently important to set a wait time that is long enough.
Recommendation is to take 30 seconds but not less than 15 seconds.
For larger systems even larger wait times could be required. On normal start-up (all PLCs are running and connected to the network) the log file of the OPC server could be used to determine a sufficient wait time.

14. Inconsistencies between AE configuration and DA namespace are difficult to detect

No error or warning is logged when Data Access items are missing that are used as event source for alarming. The OPC server does also not generate a bad quality notification in this case.
When Data Access items that are used as event source are removed from the namespace, there is no chance to reconnect them to the events while the OPC server is running.

Usually the AE configuration is created with the AEConfig tool by using the browsed address space information and should be consistent at the time of creation. Problems could occur when the PLC programs are changed later or the symbol configuration is changed.

➔
PLC program changes should be reflected according to the OPC Alarm configuration.

15. OPC server leaks memory during operation

In a medium System Test Setup the OPC server leaks memory under frequent operation conditions.
Observed was a memory consumption of about 10MB within 15 days.

16. Program changes of a redundant PLC pair may lead to "bad quality" of OPC items

As long as the program changes are not consistently loaded to both HA PLCs the not yet loaded PLC will show bad quality for newly added items unless the second PLC is also loaded with the program changes.

➔
After PLC program changes with changed symbol information for OPC access both PLCs must be loaded and the OPC server needs to be restarted.

17. No recovery for items with quality BAD (Config error)

If Items have quality BAD caused by configuration error there is no automatic recovery from that error once the symbols are corrected and loaded to the PLC (OPC Server/Gateway).
The items with quality BAD (Config error) must be removed and re-added to the OPC group (restart DigiVis for trend, reopen other displays).

18. Archiving of OPCServer logfile does not work if a '.' is in the path

The automatic OPC logfile extension to new logfiles does not work if a '.' is contained within the OPC installation path (where the logfile is located).

➔
Avoid '.' Characters within the OPC installation path.

19. Misleading "HA Master changed" print outs in opcsrv.log

There might be information provided that the HA master role has changed within the OPC logfile that is not based on a real HA PLC switch over but only on internal OPC server communication monitoring. Usually these logs are provided pair wise with two switch-overs within a very short time frame (100ms-200ms).
Those log file entries can be ignored.

20. Active alarms with bad quality remain till restart of OPC server

If a PLC produces active alarms and will then be disconnected (and potentially removed) the alarm quality status for those alarms goes to BAD which is not visualized within DigiVis500.
The alarms can not be notified and deleted from the message page.
The alarms will remain unless the PLC is reconnected or the OPC server is restarted.

21. Space is accepted as Alarm Message in AE Config tool

A space character as message text only will not be complained by the check function.

22. OPC Config Tool: Missing information if ini-file isn't available

An OPCServer.ini file that can not be reached at its expected location from pick list (because it has been moved) will not be opened and the user will not be informed about the fail reason.

23. OPC Config and AE Config ini file types could be opened and maybe emptied

OPC Config and AE Config ini file types could be opened and maybe destroyed with both tools.
This may happen if the "wrong" ini file is saved after opening. The presentation was empty before.

➔
User must take care to open the correct .ini file with OPCConfig and OPCAEConfig tools.

24. OPCServer crashes if there is no ini-File

There must be a valid OPCServer.ini file available at the OPC installation directory before the OPC server starts.
Otherwise the OPC server will not be able to start successfully.

25. Low Update rate of OPC server may lead to high CPU load

The Update rate parameter within the OPCServer.ini file is not limited to a minimal value.
If the User enters unintentionally a low number (f.e.1), the OPC-Server takes this number and tries to update every millisecond.
Because it is a TCP-communication, the PLC must answer to each packet and will be heavily disturbed from working on the process, which could even lead to overrun and failures.
This results in a burst on each PLC, with rises CPU load up to 75% or higher depending on the number of communicated items.

➔
Recommendation is to choose an Update rate not lower than 200ms-500ms depending on the system extension.
Together with DigiVis500 an Update rate of 500ms is a reasonable value.

26. OPC write from Graphics Builder fails

OPC write access to PLC variables from the Graphics Builder value window is producing an error message.

➔
Use CoDeSys for write access to PLC variables.

27. AE Configuration Tool: Empty edit controls are not checked

Empty edit controls within the AE Configuration tool for severity and limit values will not be checked.
They are stored as zero within the OPCServer.ini file.
For "Severity" this means that no alarm will be produced for this limit.
Limit values will be checked against zero.

28. Asynchronous write to OPC DA2.0 interface may lead to deadlock of OPC server

If the <IOPCAsyncIO2::Write()> interface of the OPC server is accessed with a high number of items within a short period (several thousand items changed within one second) the OPC server might get trapped in a deadlock. In this case the OPC server needs to be closed manually.

This is not relevant for use of the OPC server in combination with DigiVis 500 since here the DA3.0 interface is used which does not have the problems.

29. Reading of large OPCServer.ini files may take several minutes

The start or restart of the OPC server may take several minutes if the configuration file is very large (e.g. 30 PLC's).

30. AE Configurator: New languages get active only after closing config tool

Within the AE Configurator tool new language settings can be activated for the message texts if the "[addlangbutton]" key is activated within the <settings.ini> file.
Newly added language settings will currently work only if the AE Configurator is closed and reopened after the language addition. Otherwise added message texts for the new language will not be saved.

31. OPC Server setup: Configuration file is overwritten during new installation

The OPC server setup overwrites an existing <OPCServer.ini> file with a default file, so the user configuration might get lost if no backup is available.

=> provide a backup of the <OPCServer.ini> under a different name before (re)installation of the OPC server. After installation the saved file can be copied back to the <OPCServer.ini>.