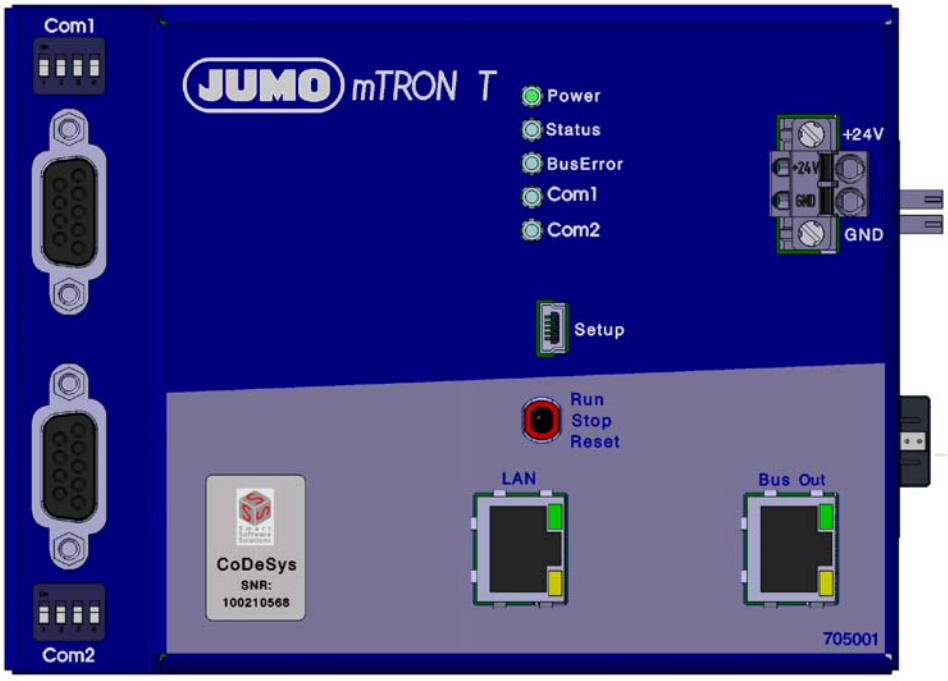
JUMO mTRON T

Measuring, Control, and Automation System
CODESYS OPC Server



B 705001.5.1
Operating Manual

JUMO

2014-10-14/00625938

Contents

Contents

1.1 Available technical documentation

The documents specified below are available for the measuring, control, and automation system.

1.1.1 General information

Product	Type of documentation	No.	Printed	PDF file
Measuring, control, and automation system	Data sheet	T 705000	-	X
	System manual[1]	B 705000.0	X	-
	Setup program manual	B 705000.6	-	X
	System description[2]	B 705000.8	-	X

[1] Accessory subject to charge

[2] Includes an overview of the purpose and content of all documents

1.1.2 Base units

Product	Type of documentation	No.	Printed	PDF file
Central processing unit	Data sheet	T 705001	-	X
	Operating manual	B 705001.0	-	X
	Modbus interface description	B 705001.2.0	-	X
	PROFIBUS-DP interface description	B 705001.2.3	-	X
	Installation instructions	B 705001.4	X	X
	CODESYS OPC server operating manual	B 705001.5.1	-	X

1.1.3 Input/output modules

Product	Type of documentation	No.	Printed	PDF file
Multichannel controller module	Data sheet	T 705010	-	X
	Operating manual	B 705010.0	-	X
	Installation instructions		X	X
Relay module 4-channel	Data sheet	T 705015	-	X
	Operating manual	B 705015.0	-	X
	Installation instructions	B 705015.4	X	X
Analog input module 4-channel	Data sheet	T 705020	-	X
	Operating manual	B 705020.0	-	X
	Installation instructions	B 705020.4	X	X
Analog input module 8-channel	Data sheet	T 705021	-	X
	Operating manual	B 705021.0	-	X
	Installation instructions	B 705021.4	X	X

Product	Type of documentation	No.	Printed	PDF file
Digital input/ output module 12-channel	Data sheet	T 705030	-	X
	Operating manual	B 705030.0	-	X
	Installation instructions	B 705030.4	X	X

1.1.4 Special modules

Product	Type of documentation	No.	Printed	PDF file
Router module	Data sheet	T 705040	-	X
	Installation instructions	B 705040.4	X	X

1.1.5 Operating, visualization, recording

Product	Type of documentation	No.	Printed	PDF file
Multifunction panel 840	Data sheet	T 705060	-	X
	Operating manual	B 705060.0	-	X
	Modbus interface description	B 705060.2.0	-	X
	Installation instructions	B 705060.4	X	X
Operating panels	Data sheet	T 705065	-	X

1.1.6 Power supply units

Product	Type of documentation	No.	Printed	PDF file
24 V power supply units	Data sheet	T 705090	-	X
	Operating instructions QS5.241		X	-
	Operating instructions QS10.241		X	-

1.2 Safety information

1.2.1 Warning symbols

DANGER!
This symbol indicates that **personal injury caused by electrical shock** may occur if the respective precautionary measures are not carried out.

WARNING!
This symbol in connection with the signal word indicates that personal injury may occur if the respective precautionary measures are not carried out.

CAUTION!
This symbol in connection with the signal word indicates that **damage to assets or data loss** will occur if the respective precautionary measures are not taken.

CAUTION!
This symbol indicates that **components could be destroyed** by electrostatic discharge (ESD = Electro Static Discharge) if the respective cautionary measures are not taken.
Only use the ESD packages intended for this purpose to return device inserts, assembly groups, or assembly components.

READ DOCUMENTATION!
This symbol – placed on the device – indicates that the associated **device documentation has to be observed**. This is necessary to recognize the kind of the potential hazards as well as the measures to avoid them.

1.2.2 Note signs

NOTE!
This symbol refers to **important information** about the product, its handling, or additional use.

REFERENCE!
This symbol refers to **further information** in other sections, chapters, or manuals.

FURTHER INFORMATION!
This symbol is used in the tables and refers to **further information** in connection with the table.

DISPOSAL!
This device and the batteries (if installed) must not be disposed in the garbage can after use! Please ensure that they are disposed properly and in an **environmentally friendly manner**.

1.2.3 Intended use

The measuring, control, and automation system is intended for use in an industrial environment, as specified in the technical data of the individual modules of the system. Use for any other purpose is considered contrary to the intended use.

The modules have been manufactured in compliance with applicable standards and guidelines as well as the applicable safety regulations. Nevertheless, personal injury or material damage may occur in the event of improper use.

To avoid risks, the modules may only be used:

- for the intended use
- when in good order and condition
- when taking into account the technical documentation provided

Even if a module is used correctly and according to the intended use, it may still pose application-related risks, for example as the result of missing safety devices or incorrect settings.

To avoid incorrect settings, this manual contains relevant safety information and warnings. These must be complied with.

1.2.4 Qualification of personnel

This document contains the information required to ensure that the measuring, control, and automation system described is used as intended.

It is intended for technically qualified personnel who have received special training and have the appropriate knowledge in the field of automation technology (measurement and control technology).

Understanding and technically correct observance of the safety information and warnings contained in the supplied technical documentation are prerequisites for safe startup as well as safety during operation. Only qualified individuals have the required technical knowledge to interpret and put into practice the safety information and warnings used in this document in any given situation.

1.3 System requirements

The CODESYS OPC server is supported by the measuring, control, and automation system from system version 01 onwards.

The system version is determined using the compatibility index of the base unit. Further information on the compatibility index:

⇨ Setup program manual (B 705000.6)

NOTE!
For operation as CODESYS OPC server, on the system side the extra code "PLC according to IEC 61131-3 (CODESYS V3)", code 224 is required.

1.4 Brief description

OPC (OLE for Process Control) is a standardized interface for accessing process data. It is based on the Microsoft® standard COM/DCOM and was developed for the data access requirements in automation technology. In this area it is used predominantly for reading and recording control values.

OPC clients may be visualization tools and programs for operating data logging. OPC servers are typically provided for PLC systems and fieldbus cards.

The CODESYS OPC server is a program part of the CODESYS PLC programming system.

The CODESYS OPC server

- is within the scope of delivery of the CODESYS development environment and is free,
- consists of the server and an OPC configurator,
- requires a symbol configuration in CODESYS and offers all variables which are available in the symbol configuration.

The PLC programming system can be downloaded from the JUMO website www.jumo.de at **SUPPORT/SERVICES > DOWNLOAD > SOFTWARE DOWNLOAD > REMAINING SOFTWARE** (file size approx. 400 MB).

1 Introduction

More detailed information on installing the CODESYS OPC servers V3 is available in the CODESYS OPC server user manual, which is installed alongside the OPC server.

⇨ CODESYS_OPC_Server_V3_User_Guide.pdf, chapter 3

If only the OPC server is required, only the following features should be selected and installed at the time of installation:

- CODESYS Gateway
- CODESYS OPC Server 3

2.1 Automatic installation

The CODESYS OPC server V3 is supplied with the setup program of the measuring, control, and automation system. During installation all files necessary for OPC communication are installed and the OPC server is automatically registered as a COM server.

NOTE!
To use the CODESYS OPC server V3 on a PC with the WINDOWS VISTA operating system[1] it is strongly recommended that you start the OPC client in compatibility mode for WINDOWS XP[1] SP2 and with extended administrator rights. This ensures that the values are continuously updated.

[1] WINDOWS VISTA and WINDOWS XP are registered trademarks of Microsoft Corporation.

Depending on whether the complete development environment or only the CODESYS OPC server is to be installed on the PC, close attention must be paid when selecting features at the time of installation.

2.2 Manual installation, registration, and deinstallation

In addition to automatic installation, it is possible to register the OPC server manually, either as a COM server or as a service. This also applies for deinstallation.

Simultaneous installation and registration

The command ***WinCODESYSOPC /RegServer*** registers the OPC server as a COM server. During this, the current location of the file "WinCODESYSOPC.exe" is always used as the path. Access can therefore only be from a local path.

Registration as a service

The command ***WinCODESYSOPC /Service*** installs the executable file "WinCODESYSOPC.exe" as a Windows system service. Once this has been started, the service remains active until the system is shut down. Communication with the configured PLCs continues. The service is also installed at the current location in this case.

Deinstallation

The command ***WinCODESYSOPC /UnRegServer*** deletes all entries of the OPC server from the Windows registry. The installed files are not deleted.

2 Installation

3.1 Configuring the symbols in the programming system

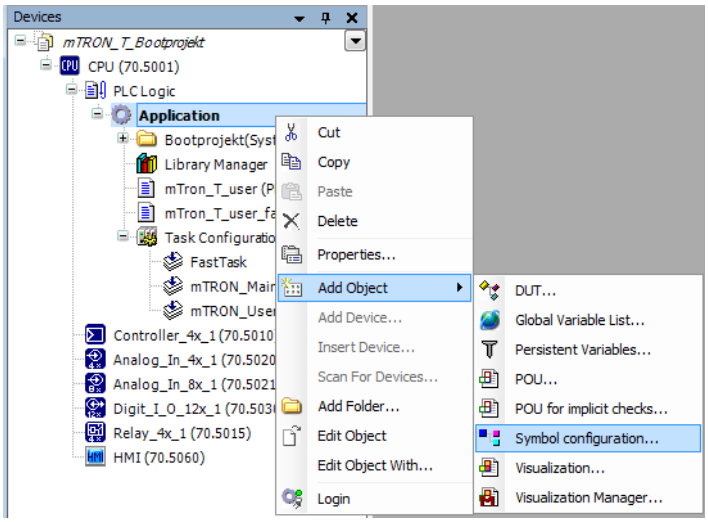
Configuration of the symbols takes place in three steps, which are summarized below. More detailed information is available in the CODESYS OPC server user manual.

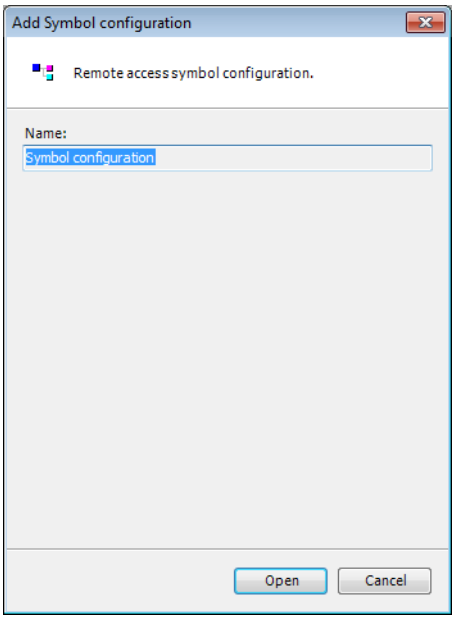
⇨ CODESYS_OPC_Server_V3_User_Guide.pdf, chapter 5.1 ("V3 interface")

Step 1: Adding symbol configuration

Select the CPU application object in the device tree (right mouse click) and add symbol configuration:

CPU (70.5001) > PLC LOGIC > APPLICATION > ADD OBJECT > SYMBOL CONFIGURATION



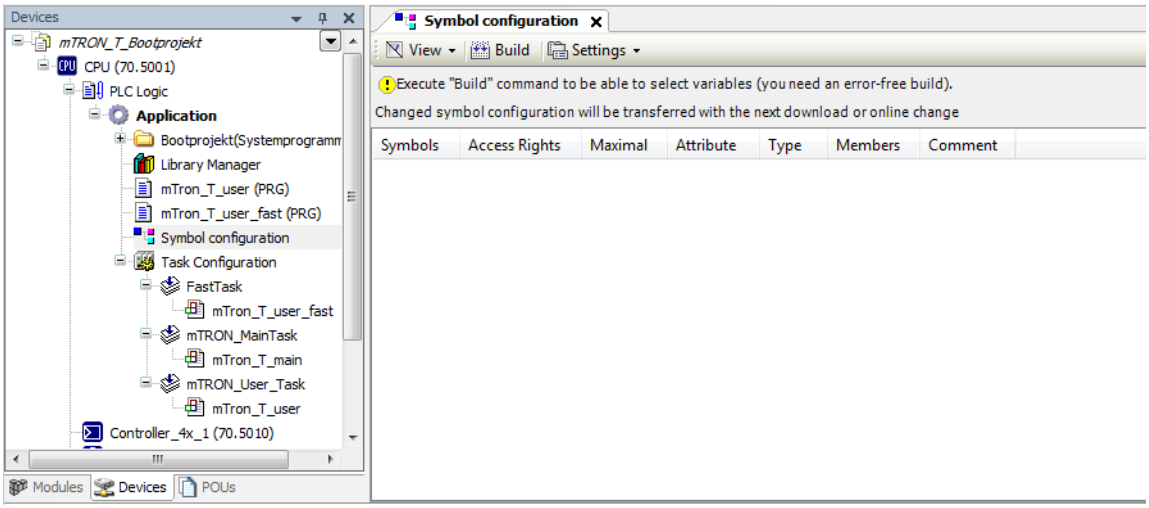


If necessary, change the description and add the symbol configuration by clicking the "Open" button.

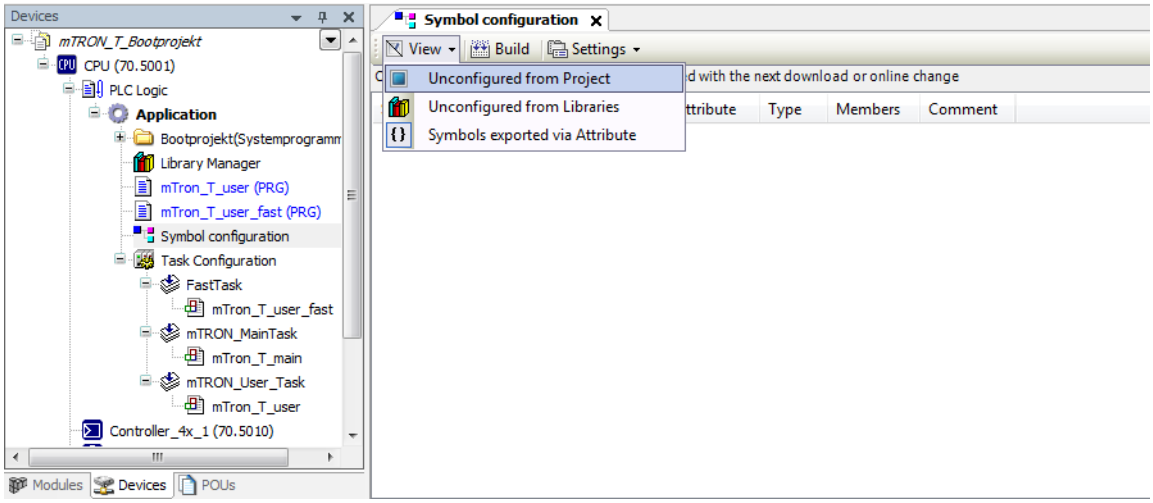
Step 2: Configuring symbols

Double-clicking **SYMBOL CONFIGURATION** opens the following dialog.

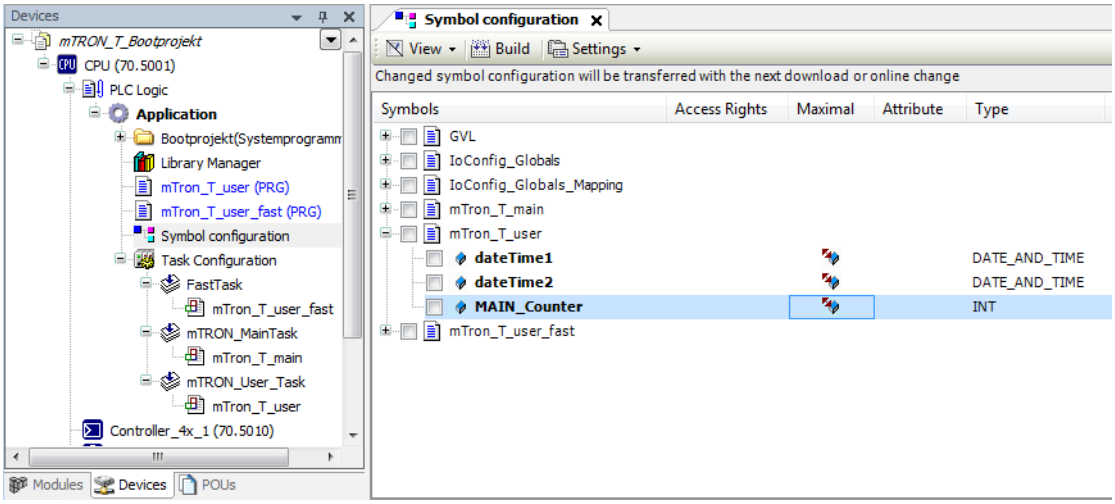
Execute the "Build" command to allow variables to be selected:



Select the entry "Unconfigured from Project" in the "View" menu:



Select the required variables:



In the symbol configuration the access rights for each selected variable can be changed. To do this, in the "Access Rights" column click on the symbol next to the variables in question. The access rights change each time the mouse is clicked:

Symbol	Access right
	read+write
	write-only
	read-only

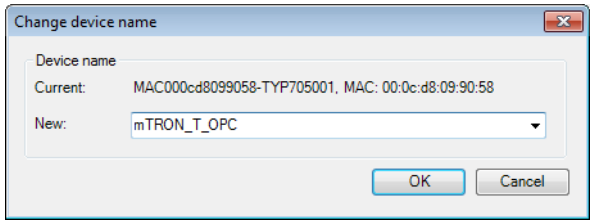
Step 3: Logging in

When logging into the PLC the application is compiled and loaded.

3.2 Changing device names

In the measuring, control, and automation system the device name is assigned automatically. It is composed of the MAC address and the description of the device family. This name is not suitable for use with the CODESYS OPC server and must be changed.

The change is carried out in CODESYS in the configuration of the CPU:
Communication settings > Open context menu for the relevant CPU in the network path (right mouse click) > Change device name

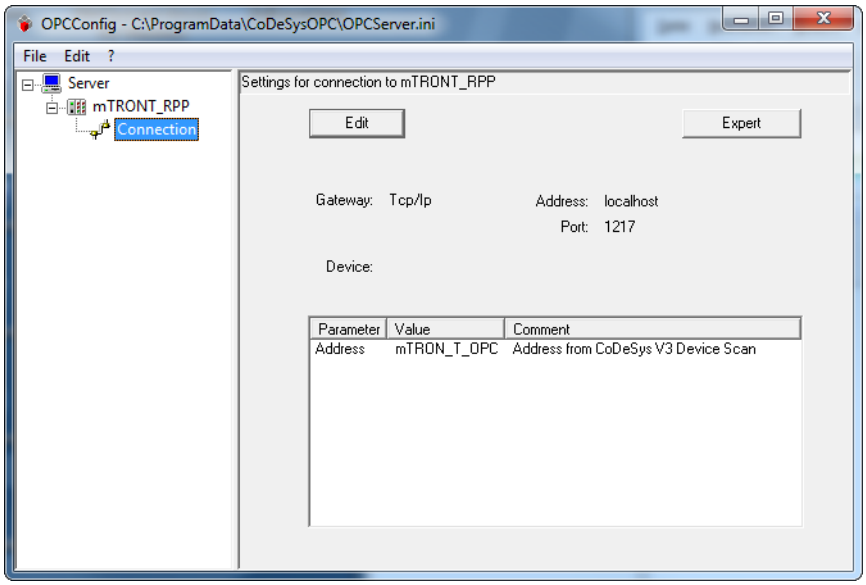


3.3 Configuring the OPC server

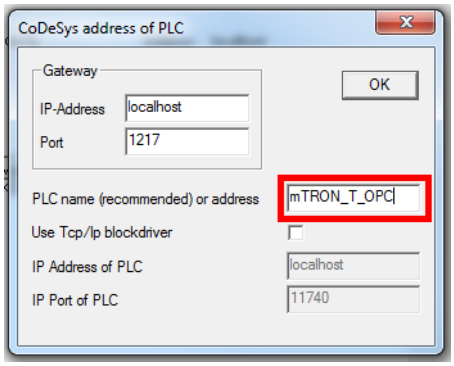
Configure the OPC server according to the CODESYS OPC server user manual.

⇨ CODESYS_OPC_Server_V3_User_Guide.pdf, chapter 6

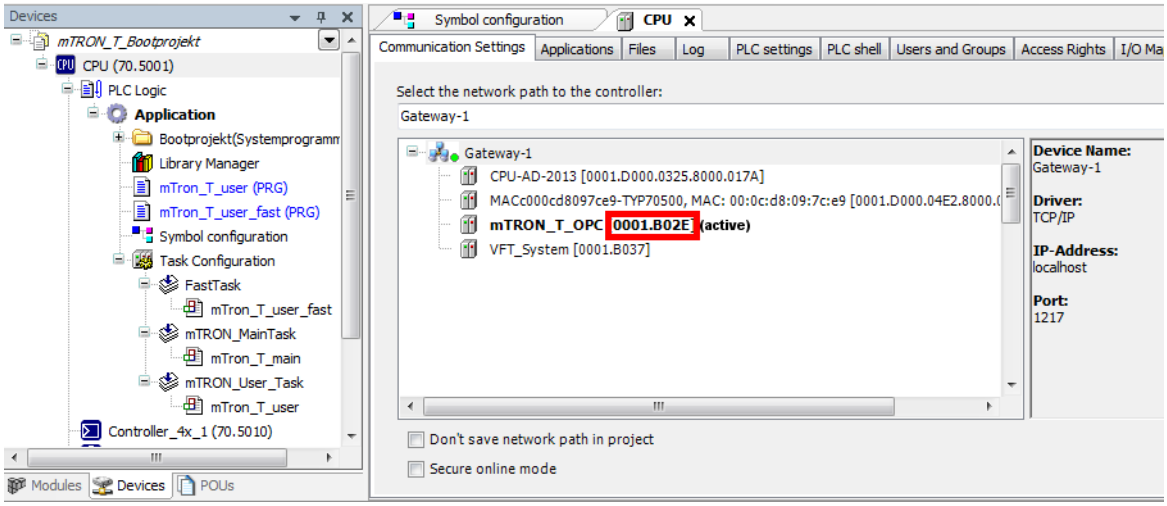
During configuration, the PLC name must be entered in the "CoDeSys address of PLC" dialog. Click the "Edit" button to open the dialog:



Enter the name of the system‘s CPU (here: "mTRON_T_OPC"):



Alternatively the address from the communication settings can be used (here: "001.B02E"):



3 Configuration and testing

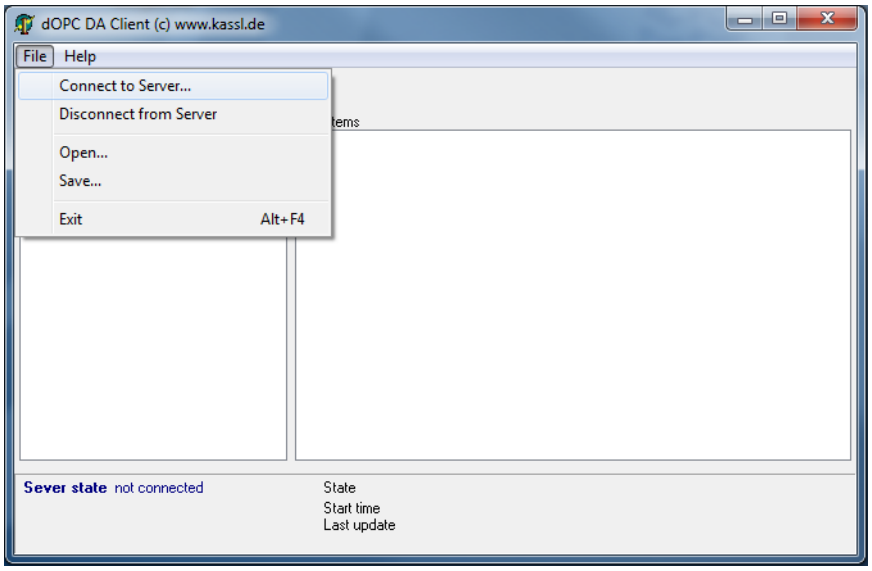
3.4 Testing the OPC server

The OPC server should be tested using an OPC client.

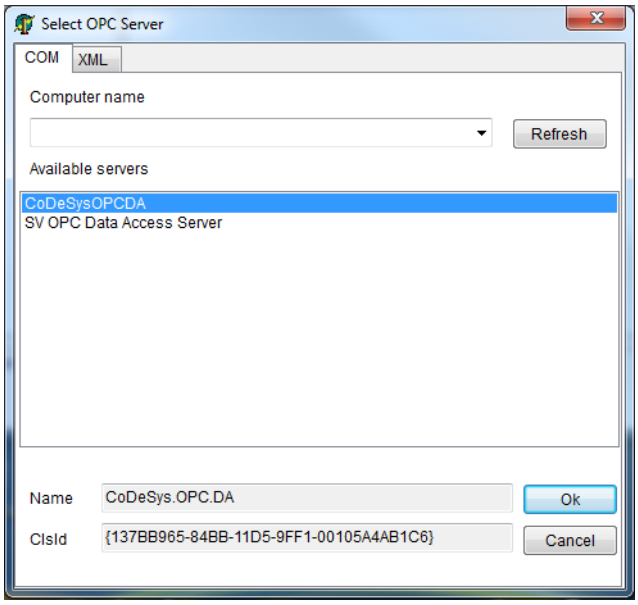
In the following description the free OPC DA Data Access Client from Kassl GmbH is used (www.kassl.de/opc/download.shtml).

Establishing a connection to the OPC server

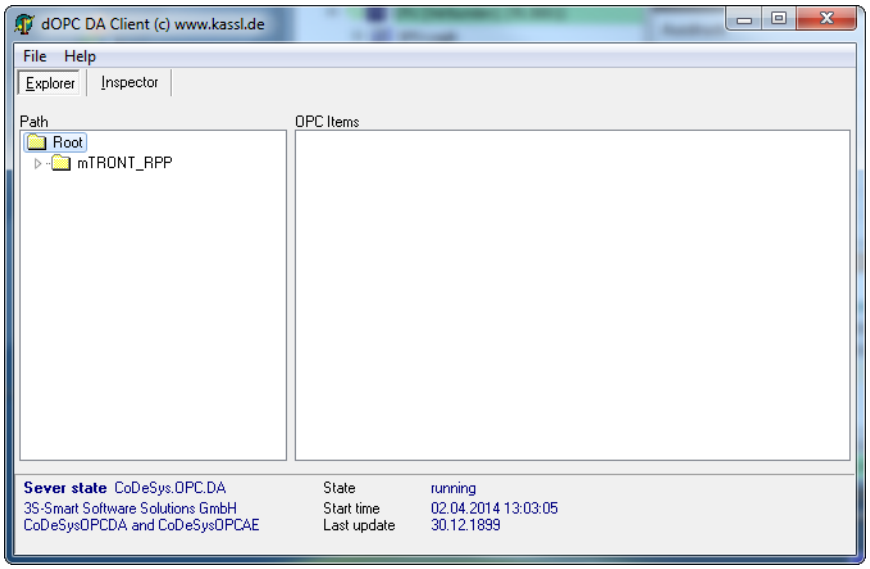
After the OPC client has been started the connection to the OPC server must be established: **FILE > CONNECT TO SERVER...**



To do this, select "CoDeSysOPCDA-Server" from the list of available OPC servers:

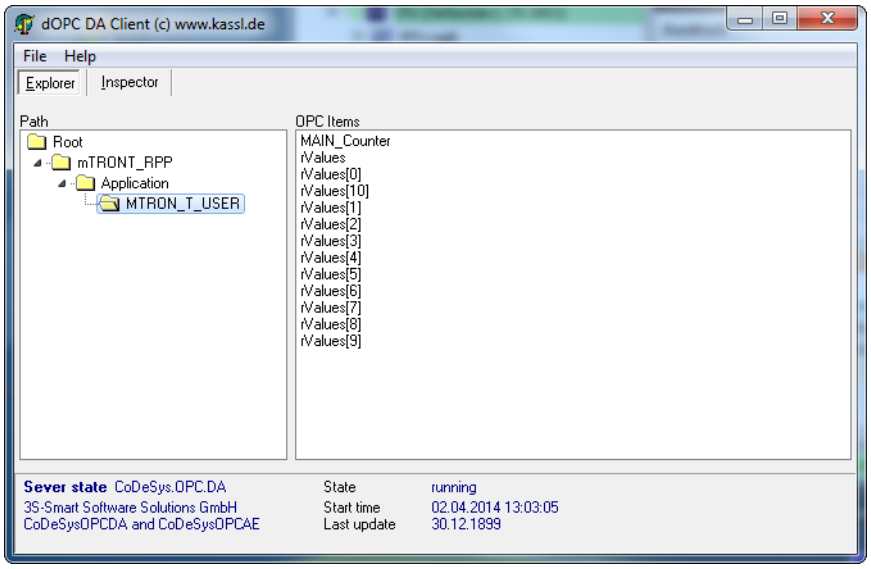


Shortly afterwards the OPC client is connected to the OPC server. The server state changes from "not connected" to "running", and the connected PLC is displayed in the path window:

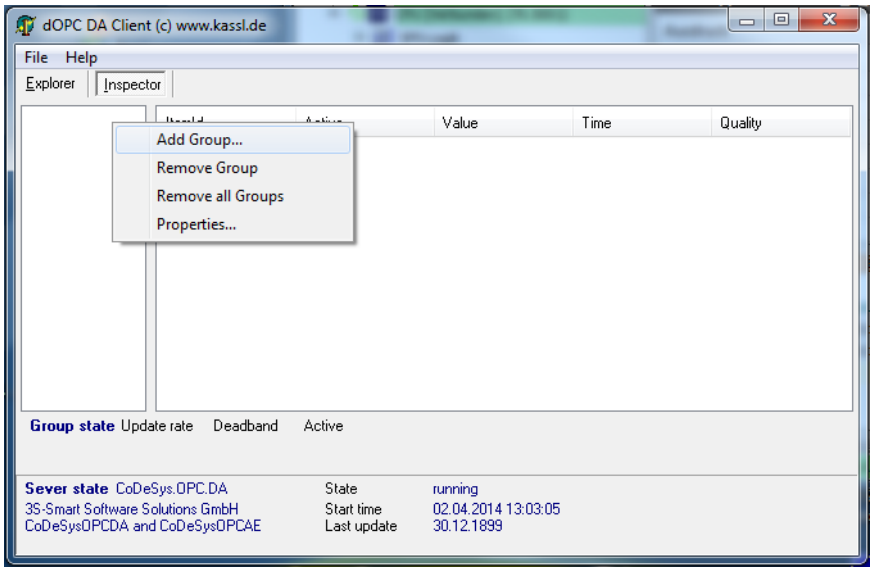


Selecting and displaying variables

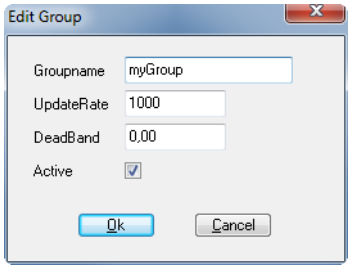
Open the path using the mouse until the variables required for the tests (OPC items) appear:



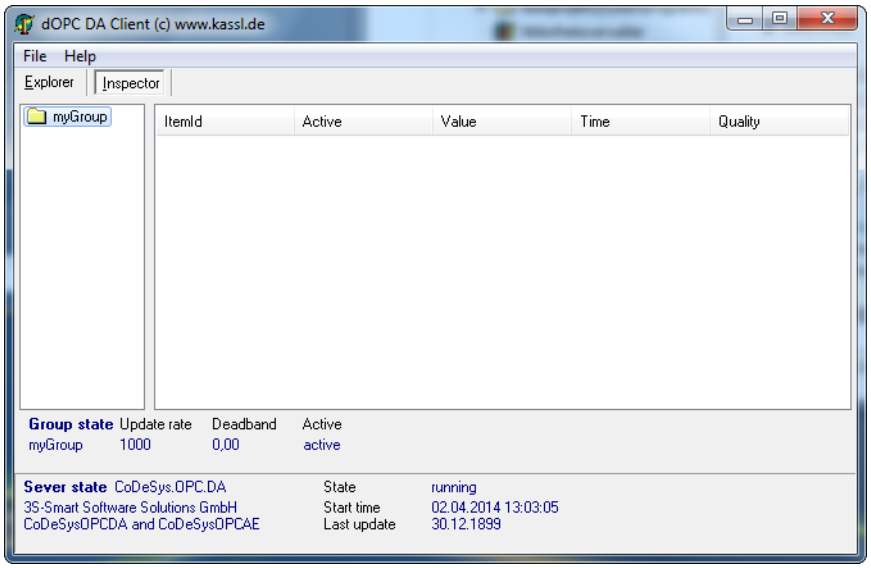
Click on the "Inspector" tab and add a group to display individual variables and to edit if necessary:



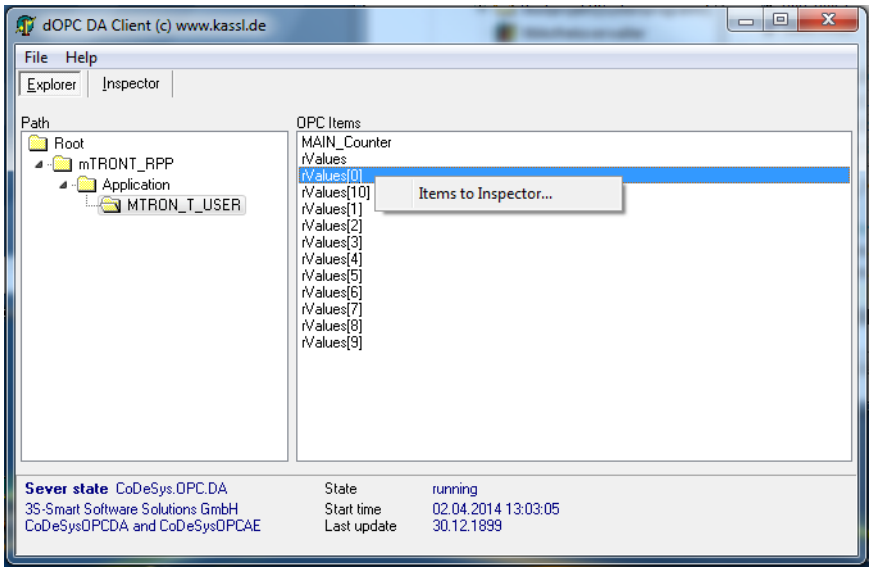
Enter Groupname and UpdateRate and confirm by clicking "Ok":



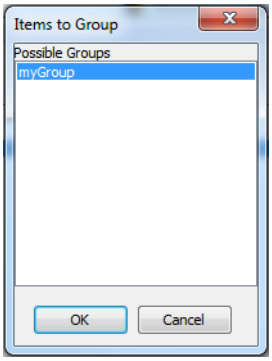
The new group appears in the left part of the window:



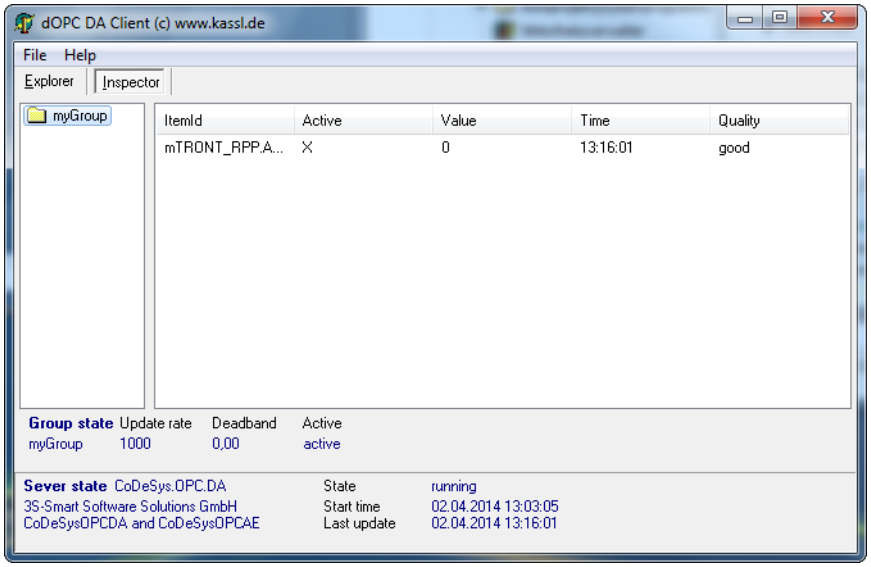
Click on the "Explorer" tab and select the variable (OPC item) which should be assigned to the Inspector (Items to Inspector...):



Select the group to which the variable will be assigned in the Inspector:



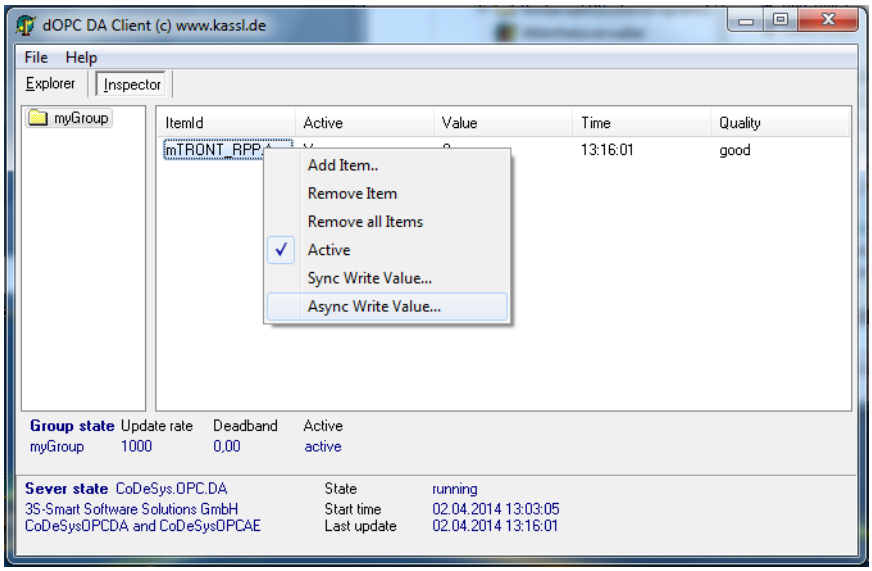
Click on the "Inspector" tab to display the value and status of the variables:



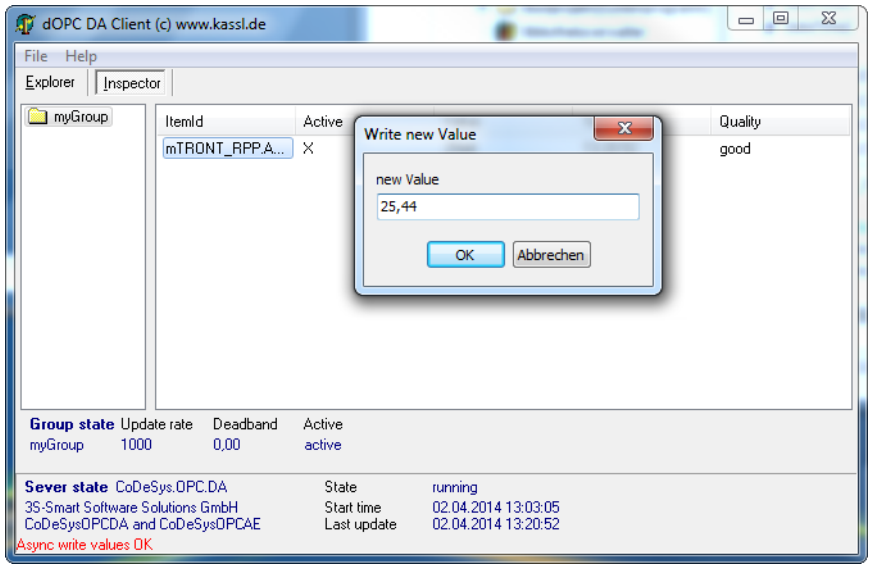
3 Configuration and testing

Changing the value of the variables

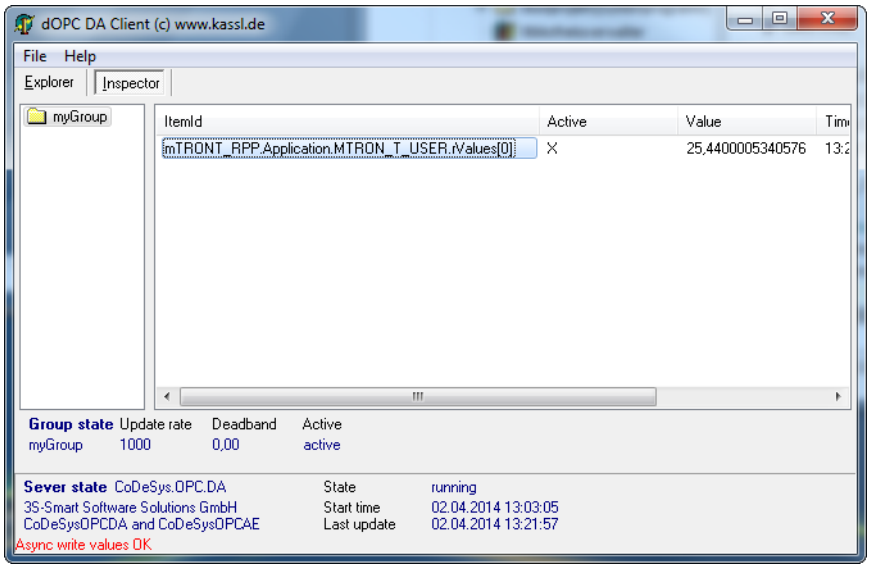
Select the variable, open the context menu (right mouse click) and select the menu option "Async Write Value...":



Enter the new value in the "Write new Value" window and click "Ok" to assign this value to the OPC server:



The new value assigned to the OPC server is now displayed in the Inspector:



3 Configuration and testing

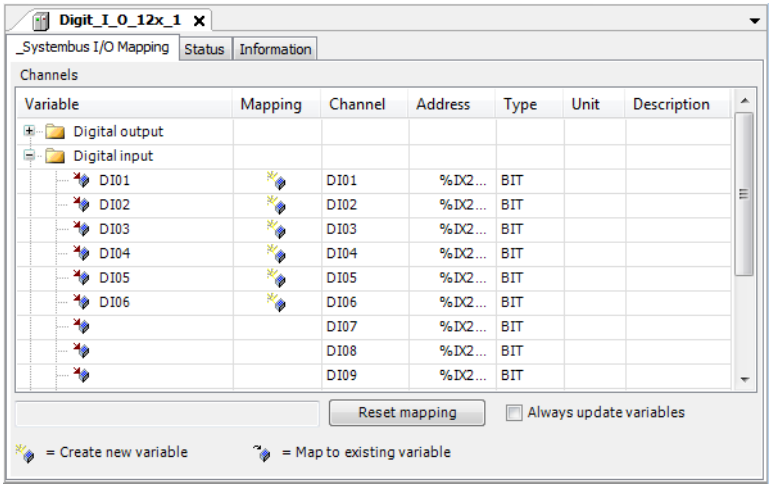
3.5 Visualization of other objects

The OPC server can also access objects (inputs, outputs) from the measuring, control, and automation system which are not used within a CODESYS project. The followings steps are necessary for this:

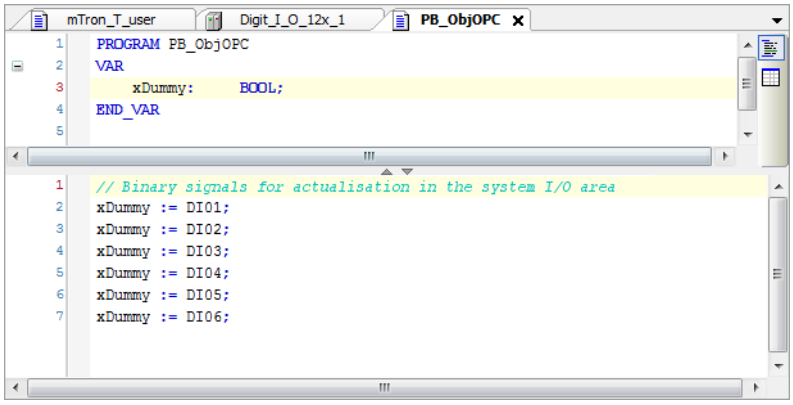
Digital inputs

Digital inputs in CODESYS are declared directly in the system I/O area of the corresponding modules and used in a program so that they are updated cyclically.

Declaration in the system I/O area:



Use in the program (only for cyclical updating):



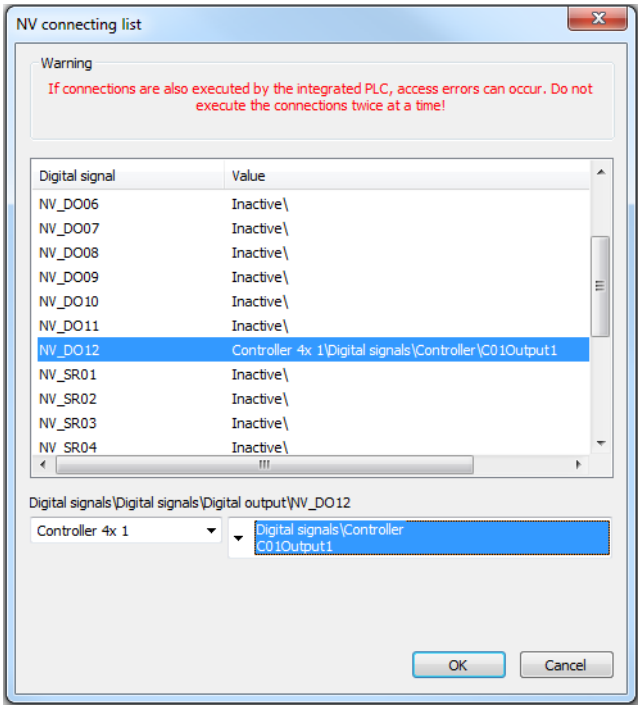
Analog inputs

Analog inputs require the same procedure as digital inputs.

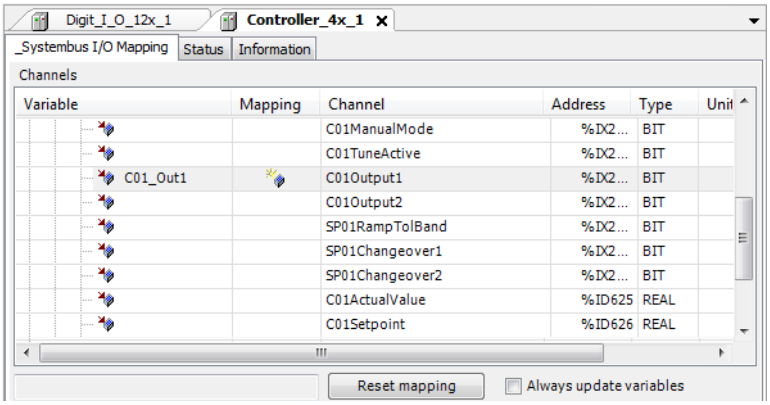
Digital outputs

Digital outputs cannot be included directly in the symbol configuration for the OPC access. Instead, the signal source, which is linked in the system configuration (NV connecting list) with the respective digital output, must be processed in read-only mode in CODESYS.

Example:
Switching output 1 of the first controller (C01Output1) is selected in the NV connecting list as the signal source for digital output 12 (NV_DO12):



In CODESYS the signal source (C01Output1) is now evaluated:



This signal is processed in the same way as an unused digital input.

Analog outputs

Analog outputs require the same procedure as digital outputs.

3 Configuration and testing

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