



## Profinet IO Quick Start Guide – SIMATIC Controller Example Project

This quick start guide presents an application example on how to use the CG Drives & Automation VSD (VFX/FDU) device with a SIMATIC controller and with a Profinet 1-port module.

The versions we have used in the example are:

Step 7 Version: 5.4 + SP5

Revision: K5.4.5.0

Simatic S7-300, CPU315-2PN/DP (315-2EH14-0AB0)

Profinet IO 1-Port option, Firmware V.1.12-1

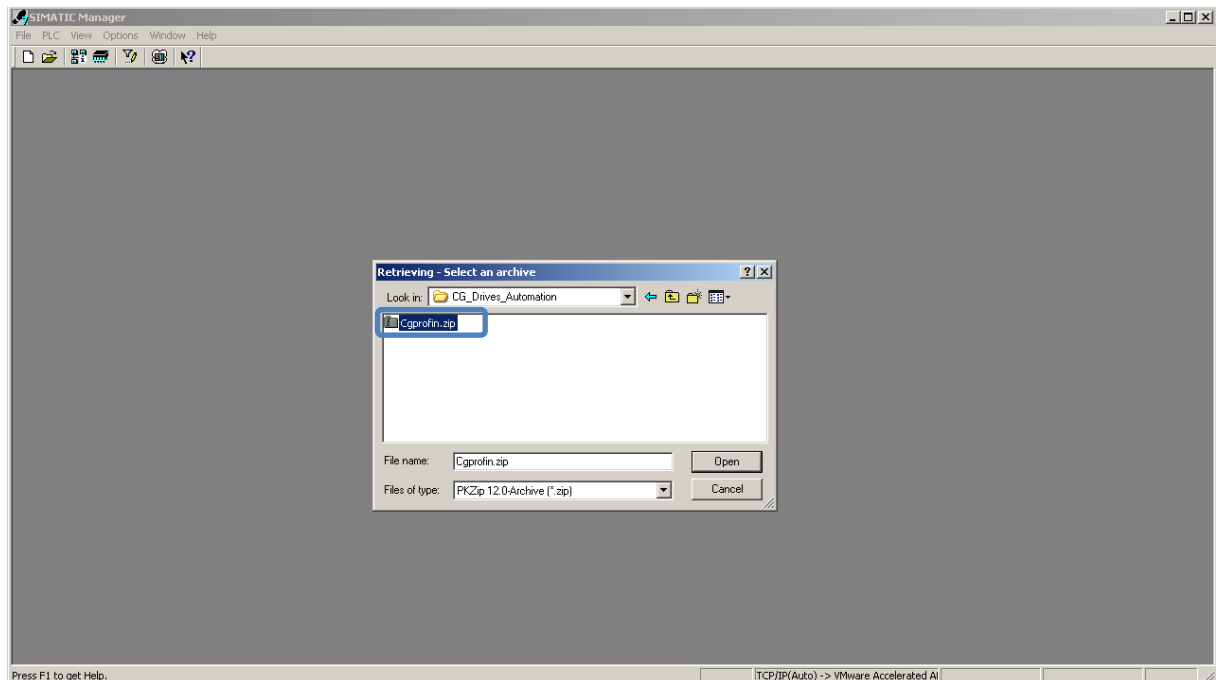
GSDML-V2.2-HMS-ABCC-PRT-20111011.XML (1-port module)

### Open the example project:

Retrieve the example project *Cgprofin.zip*.

Open the **SIMATIC Manager**.

Go to **File → Retrieve**, and select the archived zip file.

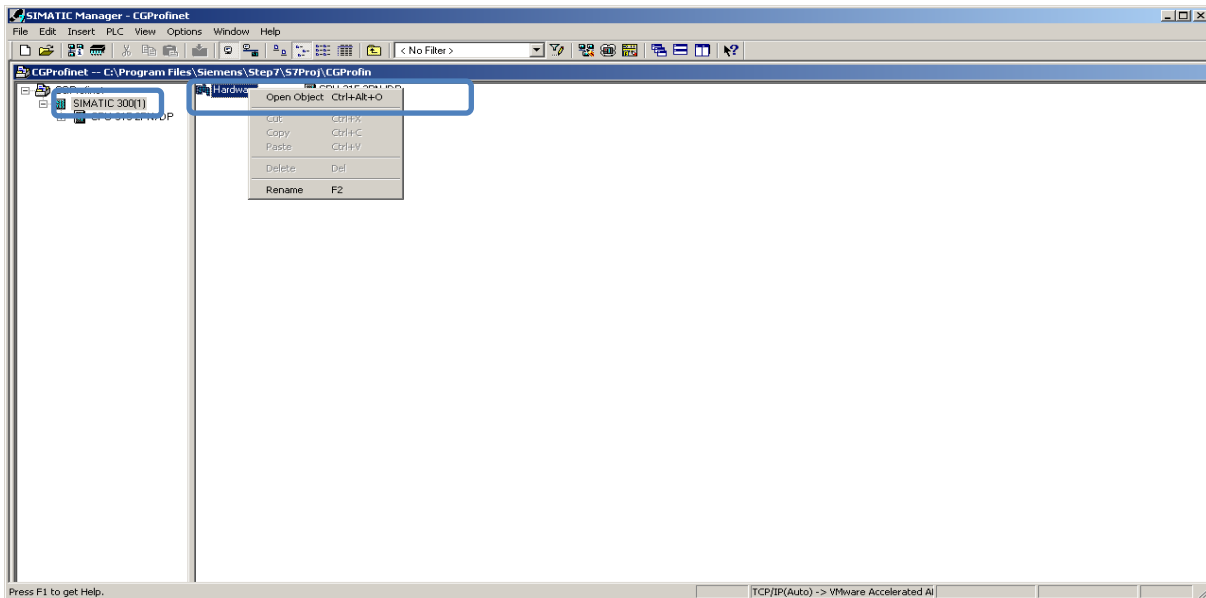


## Install the GSD file

Install the GSD file *GSDML-V2.2-HMS-ABCC-PRT-20111011.XML* for a 1-port device.

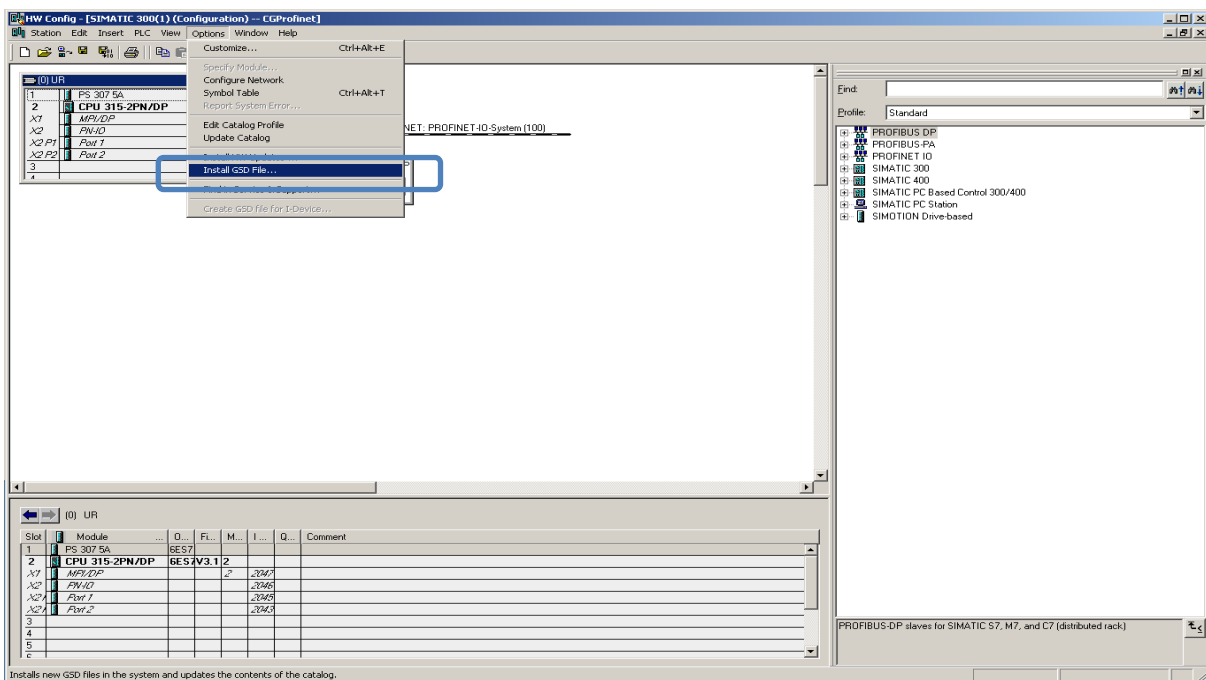
### Open the Hardware Configurator:

Select **SIMATIC 300** in the explorer node tree. Open the hardware configurator by double clicking on the **Hardware** icon or by right clicking on the **Hardware** icon and selecting **Open Object**.

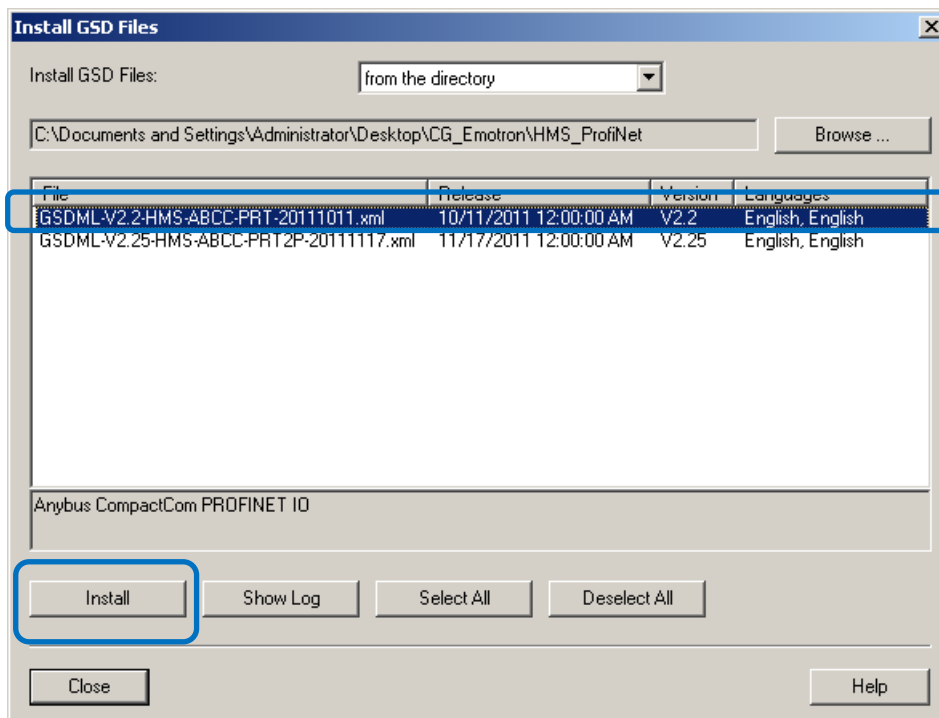


### Install the GSDML file:

In the Options menu, select **Install GSD File...**

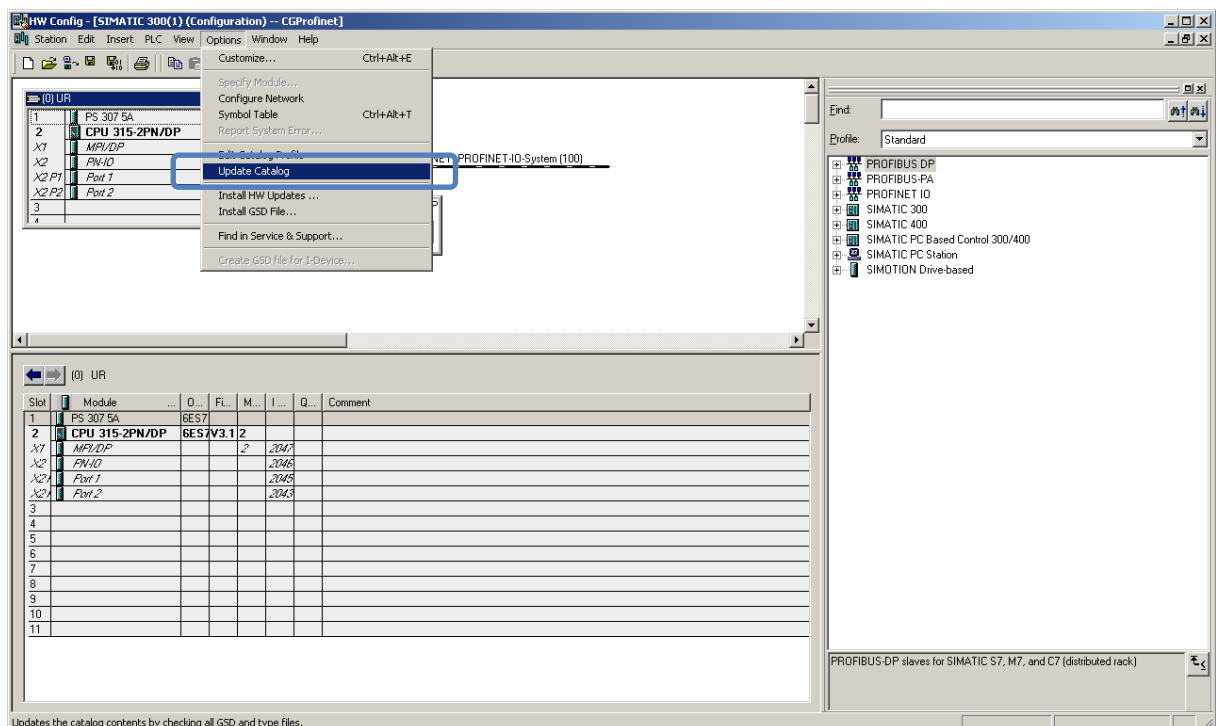


Select the file to install and click on **Install**. In the dialogue box, click Yes. When the installation is completed, close the “Install GSD Files” window and do an update of the catalog, see below.



Update the hardware catalog:

In the Options menu, select Update Catalog.



## Hardware assignment

Configure the hardware setup to apply to your physical hardware.

To assign the IP address and device name to your host and ABCC-PRT device, follow the description in the document *Profinet\_IO\_Setup\_Device*.

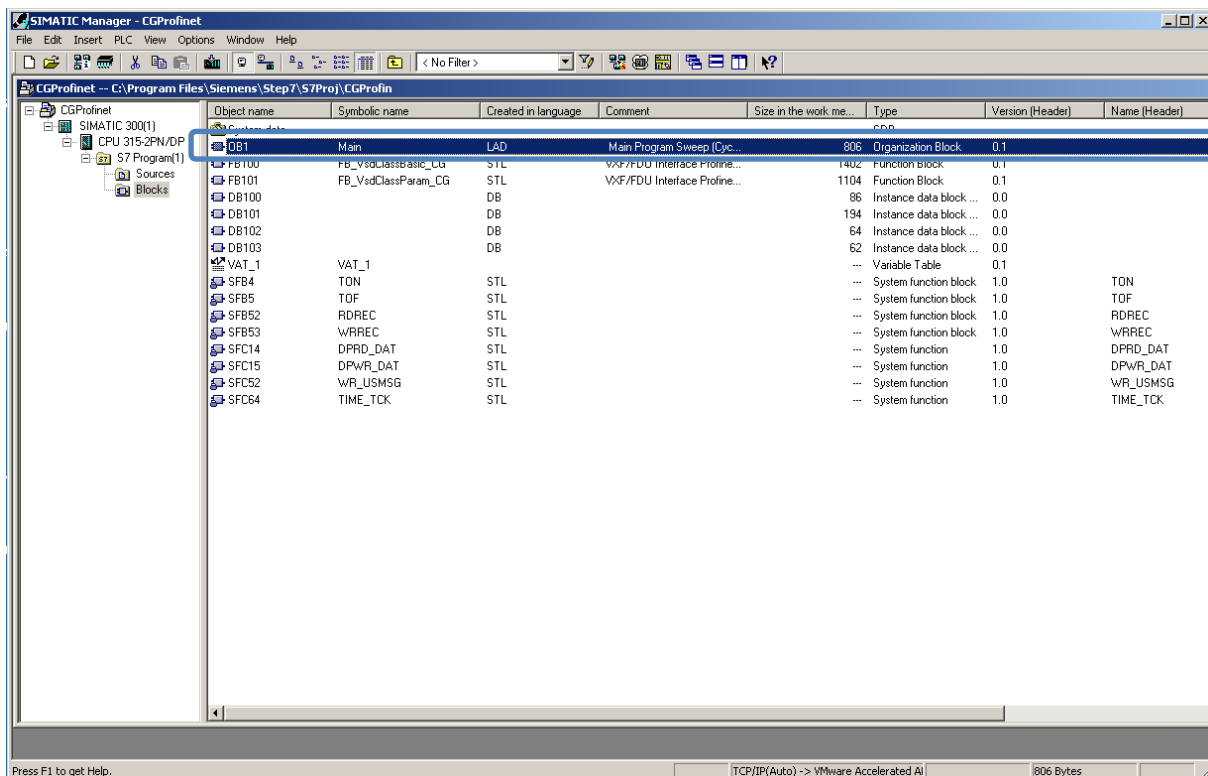
### Setup of the input and output modules for your device:

By default the VSD (VFX/FDU) supports 4 bytes input and 4 bytes output of basic cyclic process data.

In the Profinet IO example project the default address 256-259 is used for the input modules and 256-259 for the output modules (see description in *Profinet\_IO\_Setup\_Device*).

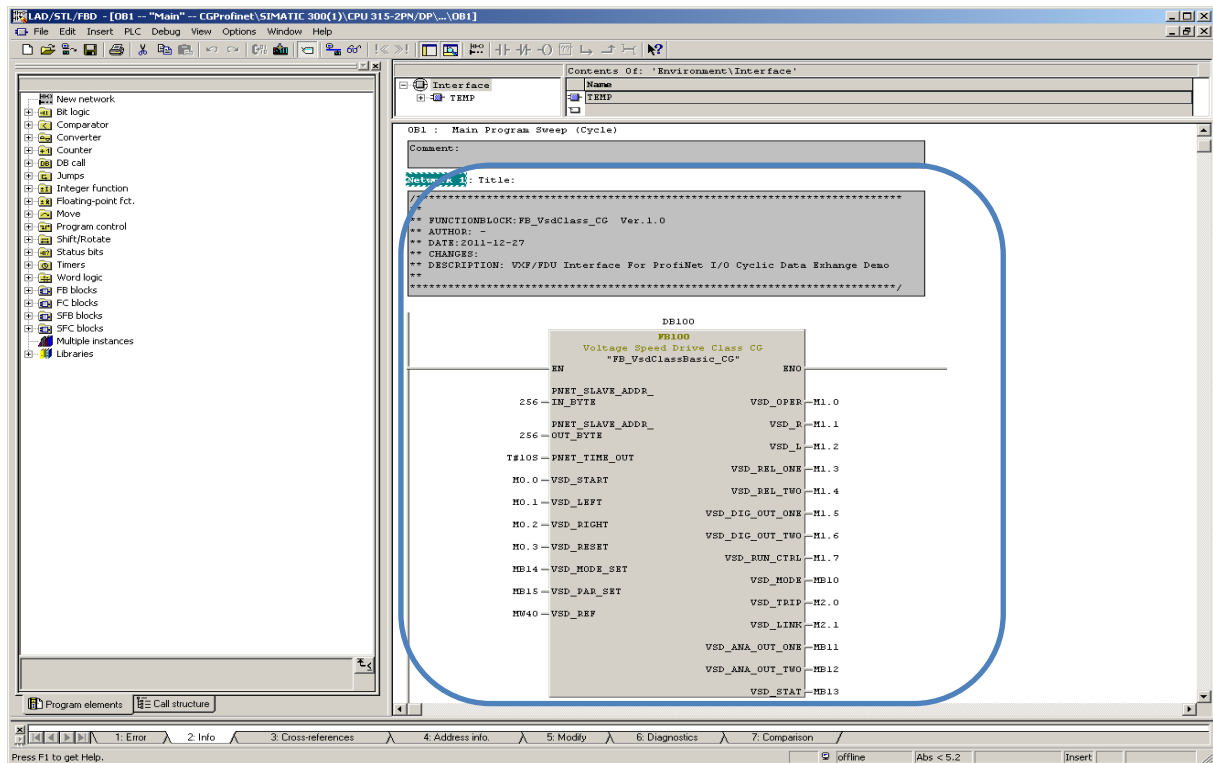
## Profinet IO example project

In SIMATIC Manager, open organization block OB1.



## Function Block in OB1, FB\_VsdClassBasic\_CG (FB100)

The function block “FB\_VsdClassBasic\_CG” is used for basic cyclic process data.

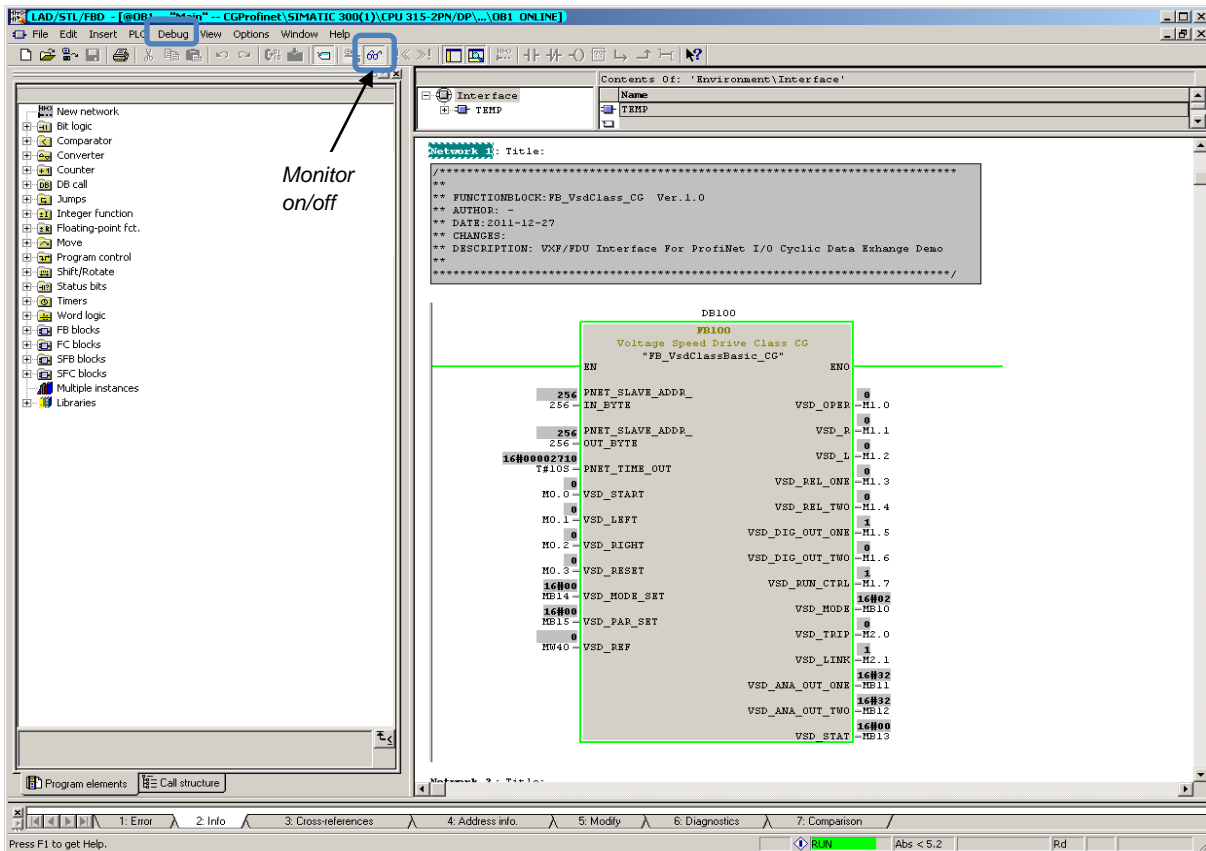


Description of the properties for FB\_VSDClassBasic\_CG (FB100):

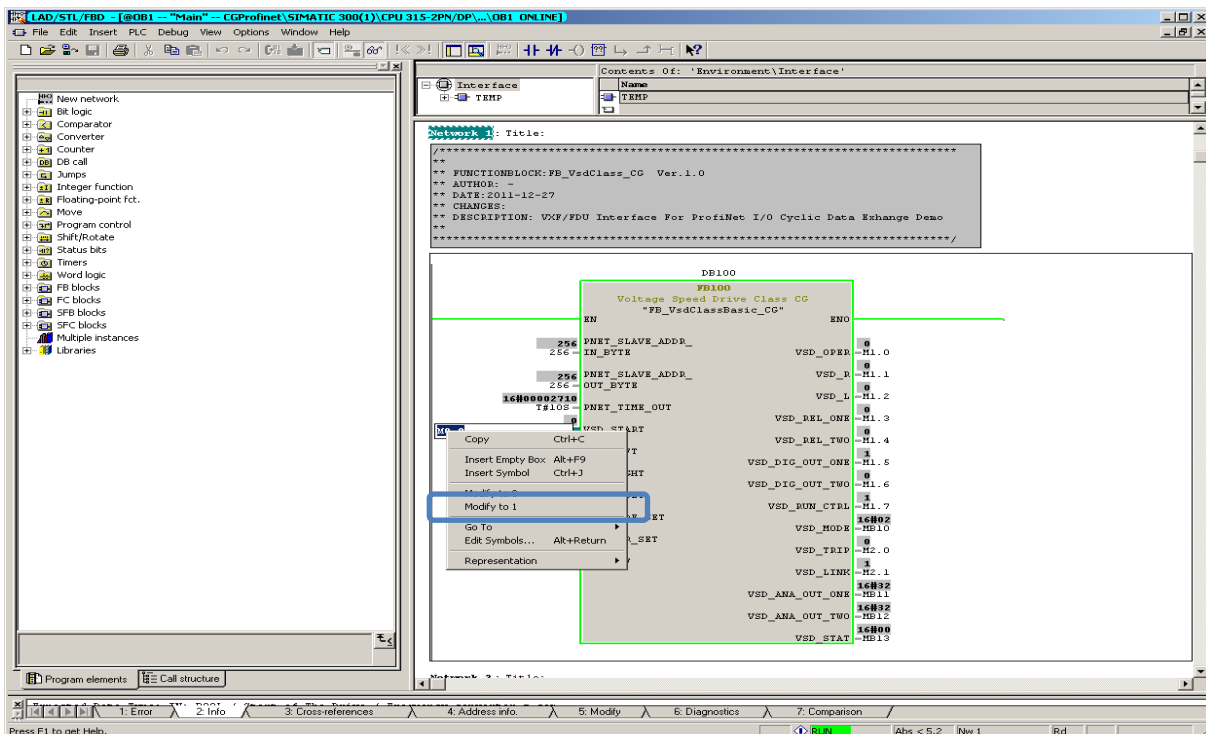
Property	Name	Description
Input	PNET_SLAVE_ADDR_IN_BYTE	ProfiNet DP Slave Slot Address Input Byte:s (start address 4 byte data)
Input	PNET_SLAVE_ADDR_OUT_BYTE	ProfiNet DP Slave Slot Address Output Byte:s (start address 4 byte data)
Input	PNET_TIME_OUT	Communication Time Out (Type Time)
Input	VSD_START	Start of The Drive / Frequency converter when menu [215] =com
Input	VSD_LEFT	Direction "Left" (One direction "Left or Right" must be set =TRUE to start)
Input	VSD_RIGHT	Direction "Right"
Input	VSD_RESET	Reset Error Status Of The Device
Input	VSD_MODE_SET	Drive Mode 0=Speed, 1=Torque, 2=V/Hz, 3=Control Panel
Input	VSD_PAR_SET	Parameter set 0=A, 1=B, 2=C, 3=D
Input	VSD_REF	Speed/Frequency Reference Value (0...1023) Eng.Unit 0-100%
Output	VSD_OPER	VSD Is In Operation (Run=1/Stop=0)
Output	VSD_R	Rotation Right Activated
Output	VSD_L	Rotation Left Activated
Output	VSD_REL_ONE	State Relay 1 (Default Function = Trip)
Output	VSD_REL_TWO	State Relay 2 (Default Function = Run)
Output	VSD_DIG_OUT_ONE	State Dig Out 1 (Default Function = Ready)
Output	VSD_DIG_OUT_TWO	State Dig Out 2 (Default Function = Brake)
Output	VSD_RUN_CTRL	VSD Control Via Bus is Activated 0=run/stp Via Remote/Keyboard/Option 1=run/stp Via Com
Output	VSD_MODE	Drive Mode (00=Speed, 01=Torque, 10=V/Hz, 11=Control Panel)
Output	VSD_TRIP	VSD Trip Bit (see fieldbus manual)
Output	VSD_LINK	VSD Link 1=OK, I/O Device Link established
Output	VSD_ANA_OUT_ONE	VSD Default = Speed Is Selected For Speed Mode, 0-10V =0-255d,4-20mA =50-255d
Output	VSD_ANA_OUT_TWO	VSD Default = Torque Is Selected For Torque Mode, 0-10V =0-255d,4-20mA =50-255d
Output	VSD_STAT	Error And Warnings (see fieldbus manual)

## Monitor FB\_VsdClassBasic\_CG (FB100)

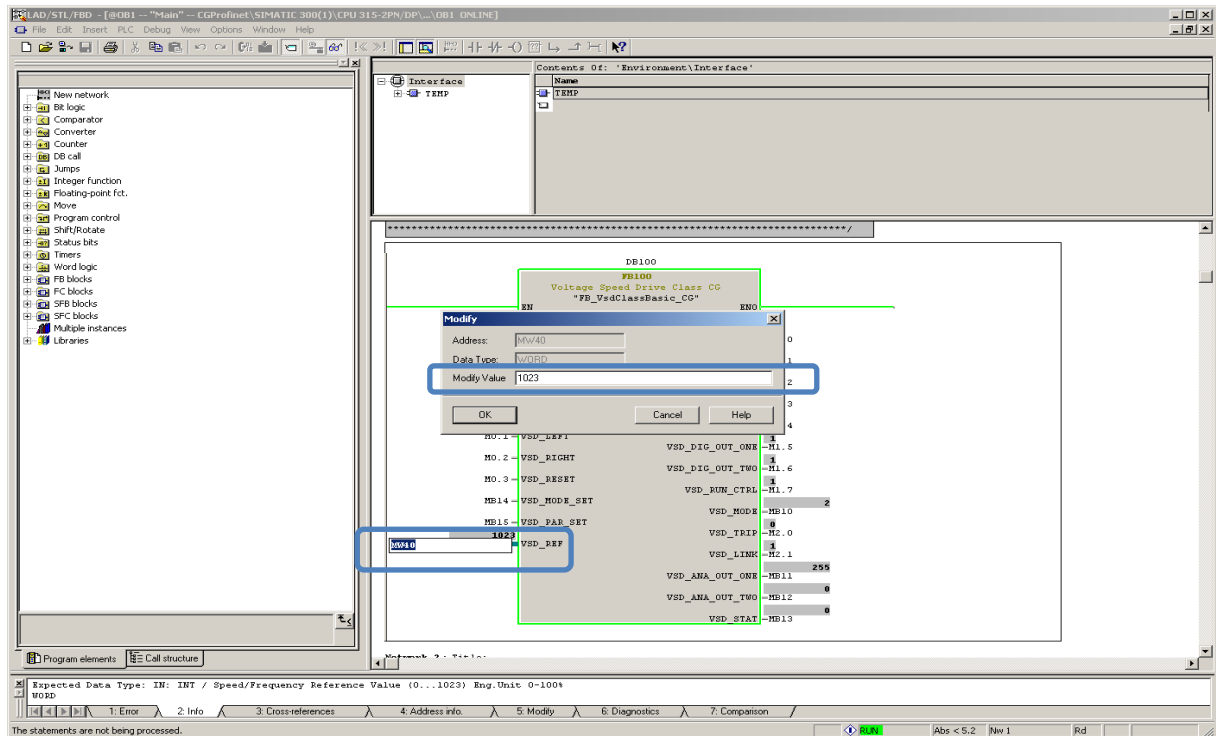
To monitor and simulate the “FB\_VsdClassBasic\_CG (FB100)” function block, go to Monitor mode. Select **Debug → Monitor**, or click on the icon for **Monitor on/off**.



To modify the input property of the function block, mark and right click on the input variable, e.g. M0.0 (VSD\_START), and select **Modify to 1** (1=TRUE, 0=FALSE). In the same way, change M0.2 (VSD\_RIGHT) to TRUE (1).

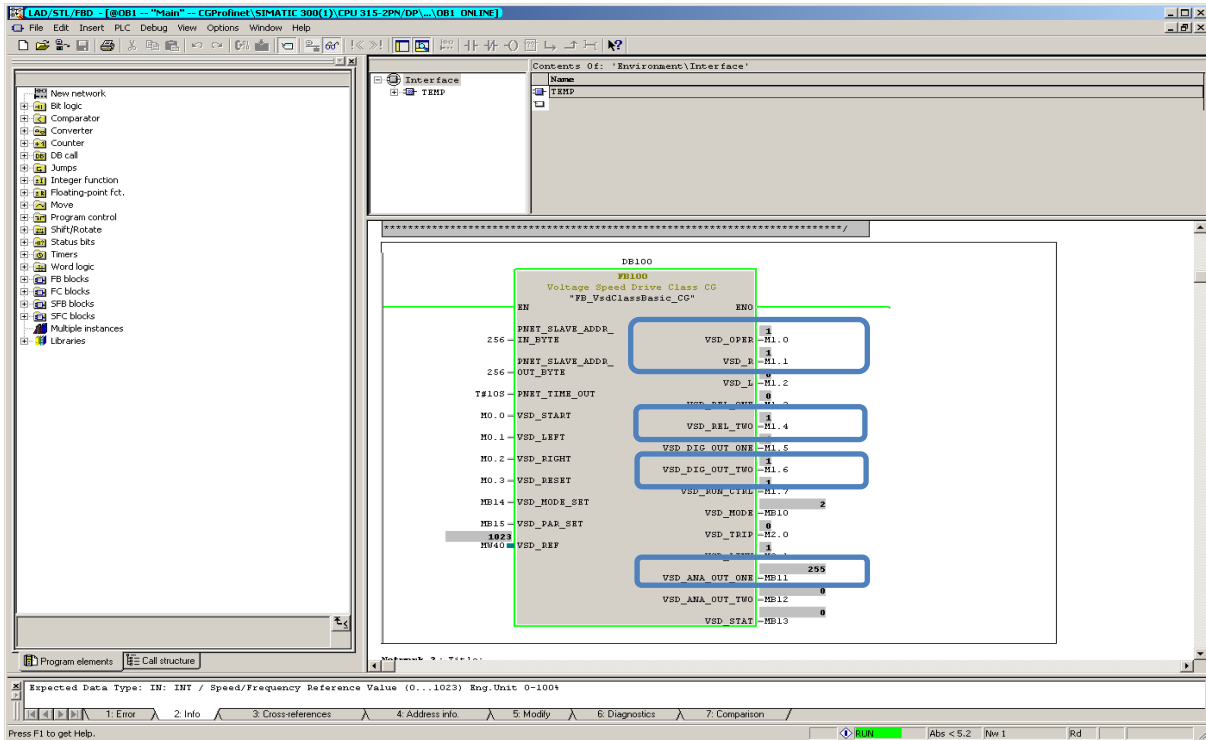


To change the VSD reference value, modify the MW40 (VSD\_REF). Enter the reference value, e.g. 1023 (decimal value), and click OK. The reference value 1023 represents 100% of the actual reference, speed in this example.



When the modified values for the VSD block have been entered, the outputs can, for instance, indicate the following:

- Operation status (VSD\_OPER): TRUE (1)
- Run direction right (VSD\_R): TRUE (1)
- Relay 2 function (VSD\_REL\_TWO): TRUE (1) (default setting “Run” in VSD menu [552]).
- Digital output 2 (VSD\_DIG\_OUT\_TWO): TRUE (1) (default setting “Brake” in VSD menu [542], 0=brake active / 1=brake released)
- Analog output 1 (VSD\_ANA\_OUT\_ONE): 255d (default setting “Speed” in VSD menu [530]) The value 255d in this example is equal to max speed.



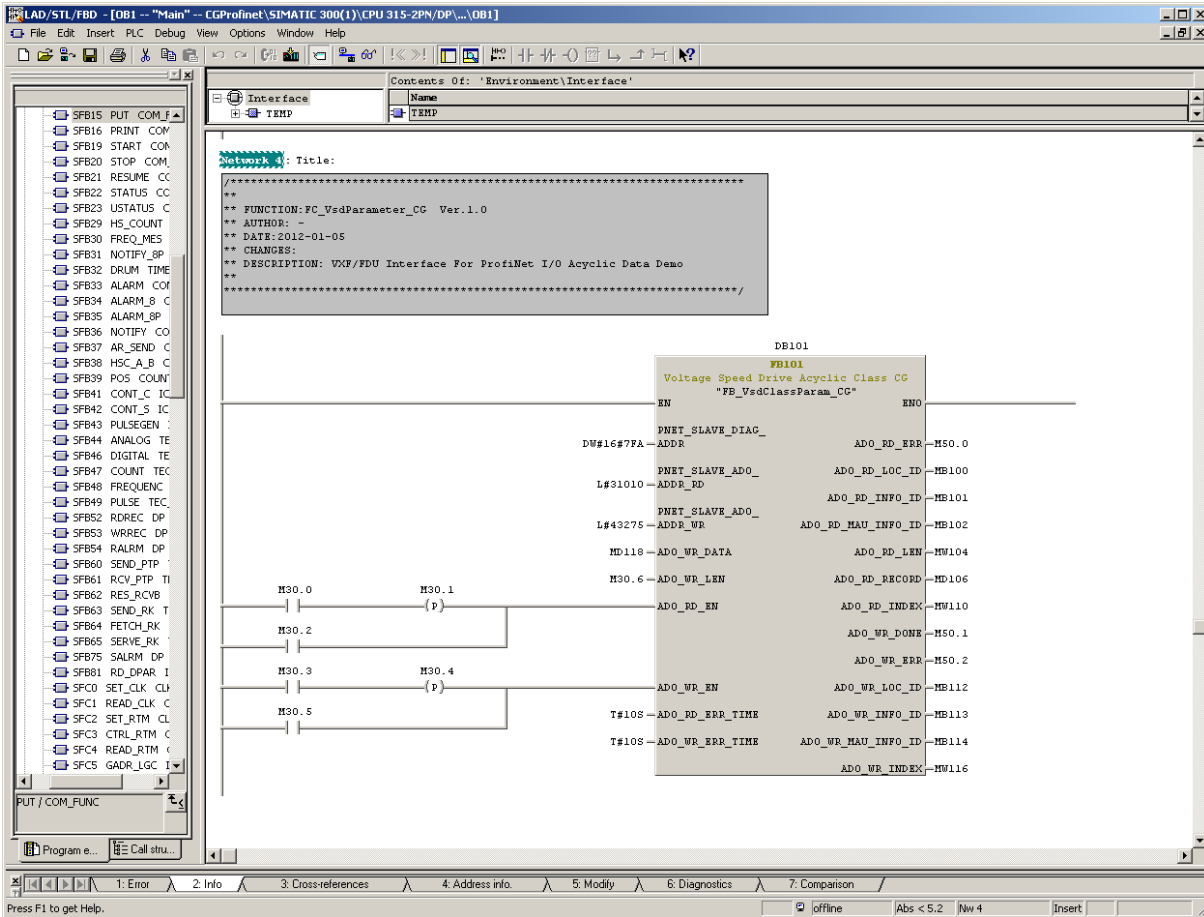




## Function block in OB1, FB\_VsdClassParam\_CG (FB100)

The function block "FB\_VsdClassParam\_CG" is used to read and write acyclic data.

The variable M30.0 enables the ADO\_RD\_EN property to read acyclic data, and M30.3 enables the ADO\_WR\_EN property to write acyclic data. M30.2 and M30.5 are used for debugging purposes only (continuous read/write).



## Description of the properties for FB\_VsdClassParam\_CG (FB101)

Property	Name	Description
Input	PNET_SLAVE_DIAG_ADDR	ProfiNet Slave Diagnostic Address
Input	PNET_SLAVE_ADO_ADDR_RD	ProfiNet Slave Application Data Object Index Read Data (Modbus number**)
Input	PNET_SLAVE_ADO_ADDR_WR	ProfiNet Slave Application Data Object Index Write Data (Modbus number**)
Input	ADO_WR_DATA	ADO Write Data Input
Input	ADO_WR_LEN	ADO Write Data Length FALSE (0) =2 bytes, TRUE (1) =4 Bytes
Input	ADO_RD_EN	ADO Read Enable
Input	ADO_WR_EN	ADO Write Enable
Input	ADO_RD_ERR_TIME	ADO Reset Com. Fault, Read Time (Data Type Time)
Input	ADO_WR_ERR_TIME	ADO Reset Com. Fault, Write Time (Data Type Time)
Output	ADO_RD_ERR	Read Acyclic Data Error Bit
Output	ADO_RD_LOC_ID	Read Acyclic Data Location (Error) ID*
Output	ADO_RD_INFO_ID	Read Acyclic Data Information (Error) ID*
Output	ADO_RD_MAU_INFO_ID	Read Acyclic Data Manufacturing Specific Info (Error) ID*
Output	ADO_RD_LEN	Read Acyclic Data Payload Data Length
Output	ADO_RD_RECORD	Read Acyclic Data Payload Data In From Datagram
Output	ADO_RD_INDEX	Read Acyclic Data Index Address (Profinet Index)
Output	ADO_WR_DONE	Write Acyclic Data Write Data Done
Output	ADO_WR_ERR	Write Acyclic Data Write Data Error
Output	ADO_WR_LOC_ID	Write Acyclic Data Location (Error) ID*
Output	ADO_WR_INFO_ID	Write Acyclic Data Information (Error) ID*
Output	ADO_WR_MAU_INFO_ID	Write Acyclic Data Manufacturing Specific Info (Error) ID*
Output	ADO_WR_INDEX	Write Acyclic Data Index Address (Profinet Index)

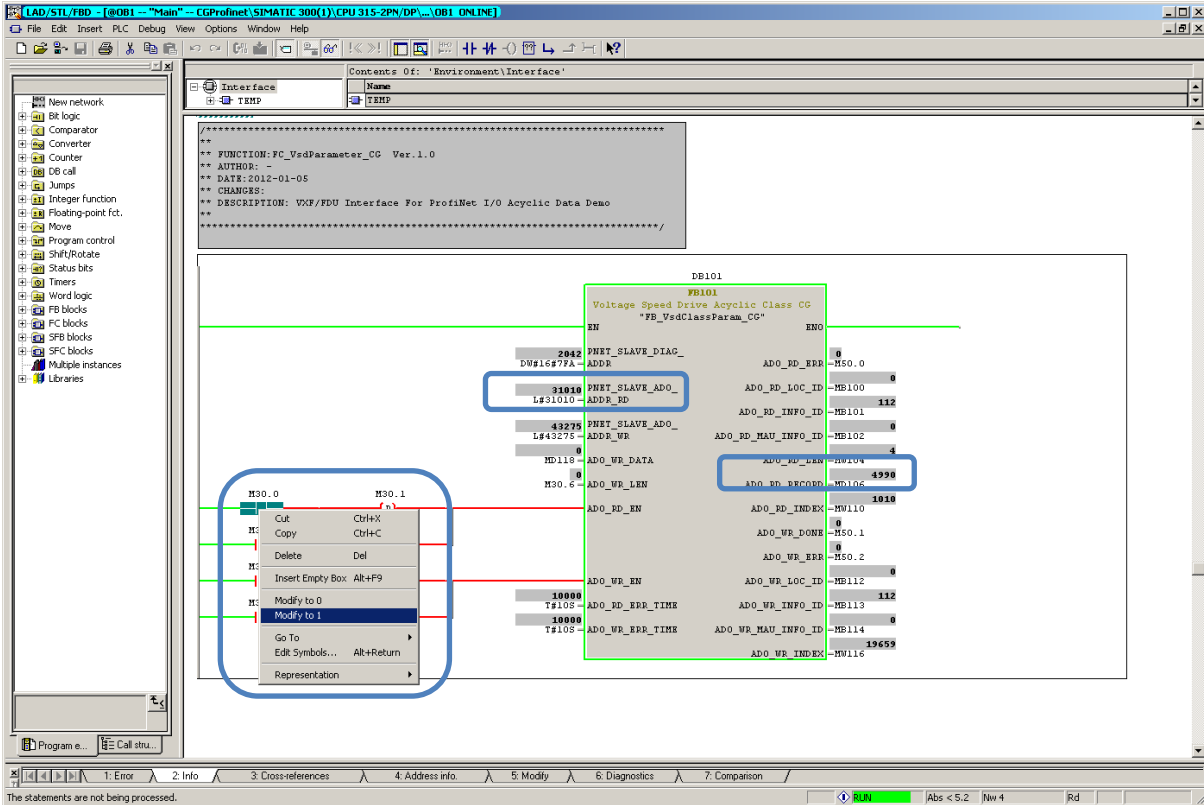
\* For more information about the error codes, read Step 7 help file for SFB52 and SFB53 in the SIMATIC Manager tool.

\*\* Note: FB101 uses Modbus numbers for acyclic parameter access.

## Monitor FB\_VsdClassParam\_CG (FB101)

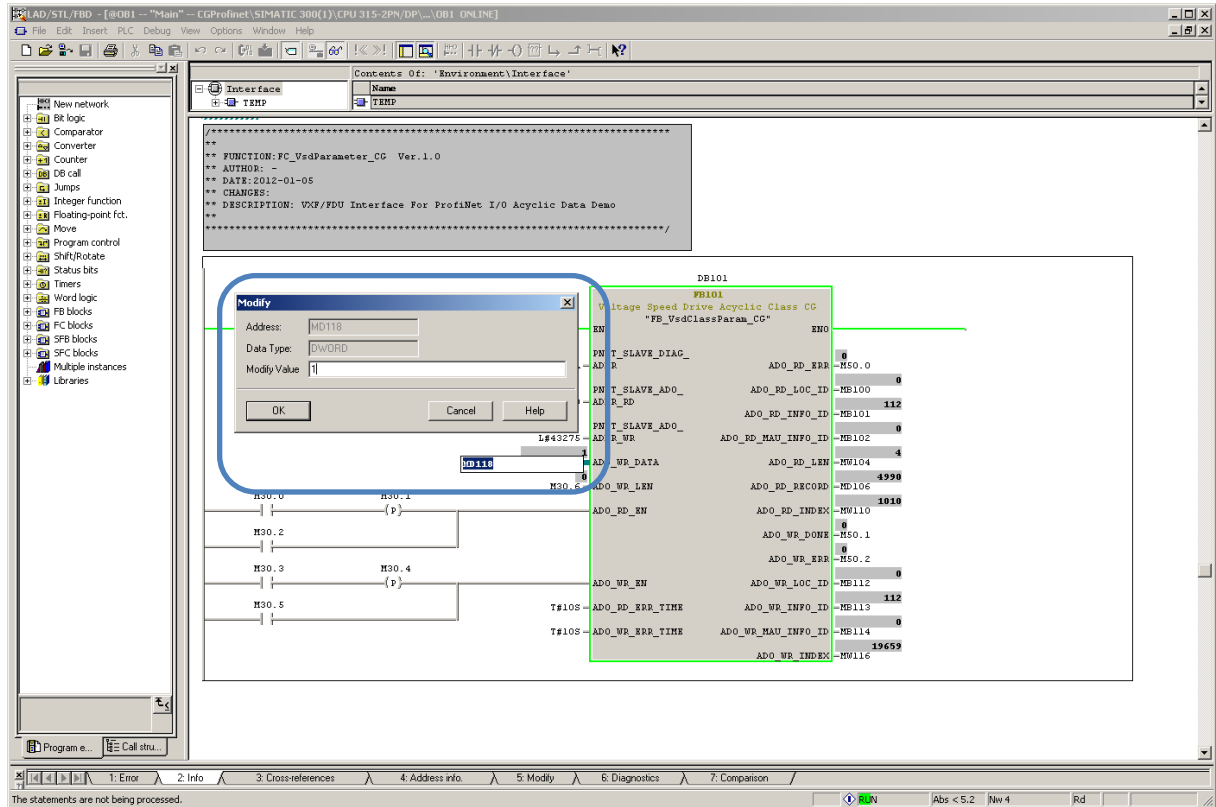
To read acyclic data, setup the input property of the function block. Mark and right click on the input variable, e.g. M30.0 for ADO Read Enable (ADO\_RD\_EN), and select **Modify to 1** (TRUE). In the example the slave read address (PNET\_SLAVE\_ADO\_ADDR\_RD) property is set to Modbus number *31010* to read the parameter [719] DC-voltage of the drive.

The value of the voltage is displayed in property ADO\_RD\_RECORD (read record) MD106. In this case the value is *4990* (*499 VDC*). The diagnostic address "7FAh (2042d) DAP" (Device Access Point) is the address for the mandatory module in slot 0 of the device (see hardware manager window).



To write acyclic data, modify the value for the input property ADO\_WR\_DATA as desired. In this example the slave read address property (PNET\_SLAVE\_ADDR\_WR) is set to modbus number 43275 to write to function [553] Relay 3.

The input property ADO\_WR\_LEN, variable M30.6, needs to be set to FALSE (0) when writing 16 bit data, and to TRUE (1) when writing 32 bit data (equal to 2 and 4 byte write length respectively).



To trigger transfer of the acyclic data, change the input property ADO\_WR\_EN by setting the variable M30.3 to TRUE (1).

