CFW-11 configuration in a PROFINET IO network using Siemens Step 7

Application Note

Application Note – PROFINET IO

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CONTENTS

CFW-11 WITH PROFINET IO INTERFACE

The CFW-11 is a high-end general purpose frequency inverter, with excellent performance for speed and torque control, besides integrated PLC functions for positioning. Among its features, several accessories for communication are available, which allow its use in different systems and applications.

The presented document describes how to use CFW-11 frequency inverter with Anybus-CC for PROFINET IO 2-port accessory. The following material has been used to configure and operate CFW-11 in the PROFINET network.

Hardware:
CPU 315-2 DP with 24V power supply and USB to MPI adapter
CP 343-1 Advanced
Hirschmann RS30 Rail Switch
CFW-11 frequency inverter (firmware version 2.0 or above) with Anybus-CC for PROFINET IO 2-port accessory (2 units)

Software:
Simatic Step 7 V5.4 SP5
Anybus IPConfig V1.5.1.1 (supplied in the CFW-11 CD-ROM)

Documents:
Installation, Configuration and Operation Guide for Anybus-CC
CFW-11 Programming Manual
Anybus-CC User's Guide for CFW-11

NOTE!
Several options and procedures for using the necessary software for PLC programming are not described in this document. The user is required to have good knowledge about this software in order to follow the described steps.

STEP 1: INSTALL PROFINET IO INTERFACE AND CONFIGURE CFW-11 PARAMETERS

In order to install PROFINET IO module in CFW-11, follow the procedures described at "Installation, Configuration and Operation Guide for Anybus-CC".

Figure 1: Anybus-CC Installation

Only after the installation, the parameters related to Anybus-CC interface are available via keypad. Some important parameters[1] for Anybus CC communication in CFW-11 are:

- P0723 Anybus Identification: read only parameter to verify if Anybus CC accessory is properly installed and the model of Anybus CC interface detected.
- P0724 Anybus Communication Status: read only parameter to check the communication status between drive and PROFINET controller (master).
- P0727 Anybus I/O Words: parameter to program the number of I/O words for cyclic data exchange with the master.
- P0728 to P0733 Anybus Read Words: parameters to program which data should be available at input area (CFW-11 sends to controller).
- P0734 to P0739 Anybus Write Words: parameters to program which data should be available at output area (controller sends to CFW-11).

NOTE!
If any of these parameters are changed, it is important to power the drive off and on again.

[1] For the detailed description of these parameters, as well some other important parameters for drive communication, refer to Anybus-CC User's Guide for CFW-11.

STEP 2: MAKE ETHERNET CONNECTIONS

The following figure describes the devices connected to PROFINET network. Later, this exactly topology must be programmed as presented.

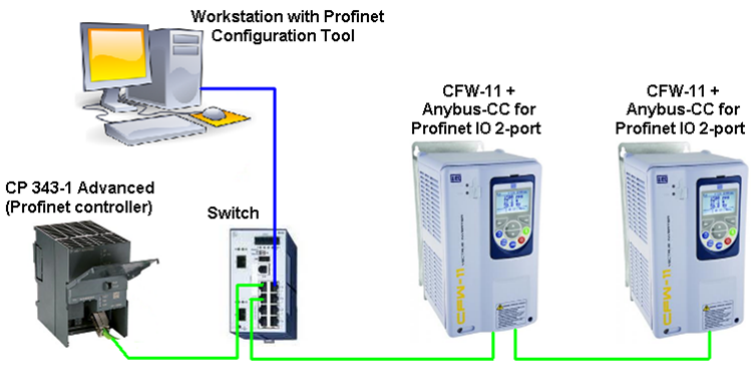

Figure 2: PROFINET Topology

The indicated PROFINET controller has the capability to set the IP address for the devices automatically, but user can configure it manually also, using Anybus IPconfig software. Once the PC is connected to the network, just install and run the software and it will show a list with all detected Anybus-CC modules. Double click the desired module and it will be possible to change the IP address and other properties, like the subnet and DHCP.

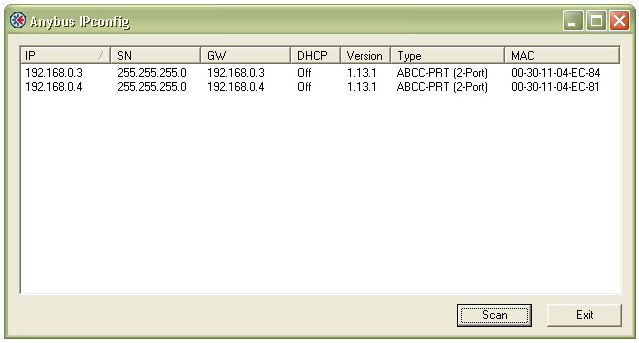

Figure 3: Anybus IPconfig software

With the IP address it is possible, for instance, to use a WEB browser to check I/O data for CFW-11.

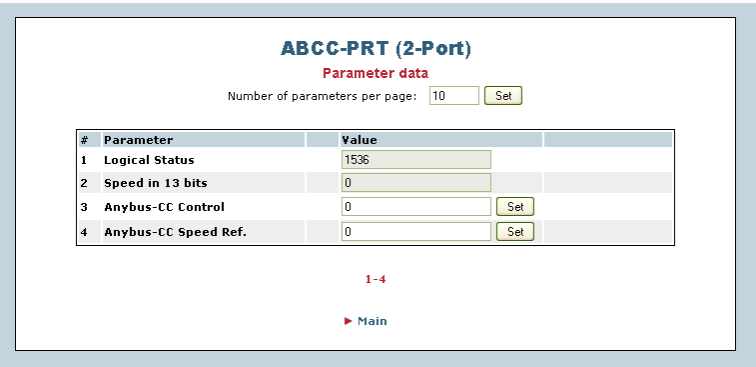

Figure 4: WEB page with I/O data for CFW-11

STEP 3: CONFIGURE DEVICES FOR PROFINET IO COMMUNICATION

In Step 7, create a new project and select the desired CPU – in this case, CPU 315-2DP. Using the hardware configuration tool, first install the configuration files (GSDML) for Anybus-CC, supplied in the CD-ROM with the product.

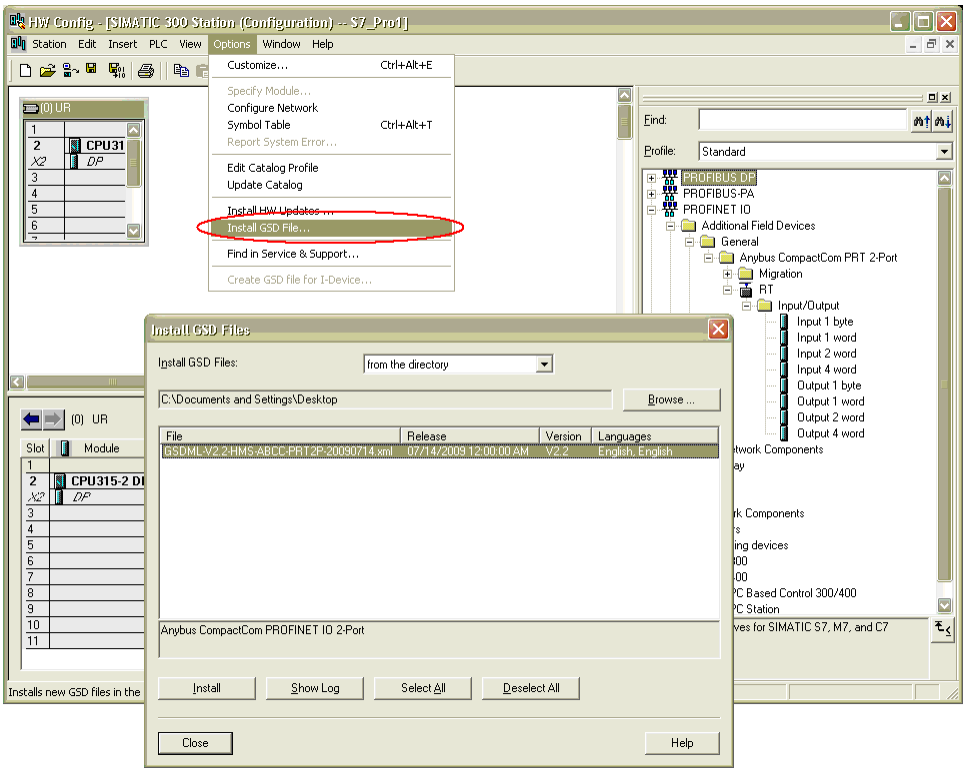

Figure 5: Install GSDML file

> **NOTE!**
> Once the GSDML file is installed, the device will be recognized as “Anybus CompactComm PRT 2-port”, in the “General” category.

With the necessary GSDML files installed, create the network, select the hardware and configure the properties for each device you want to communicate with.

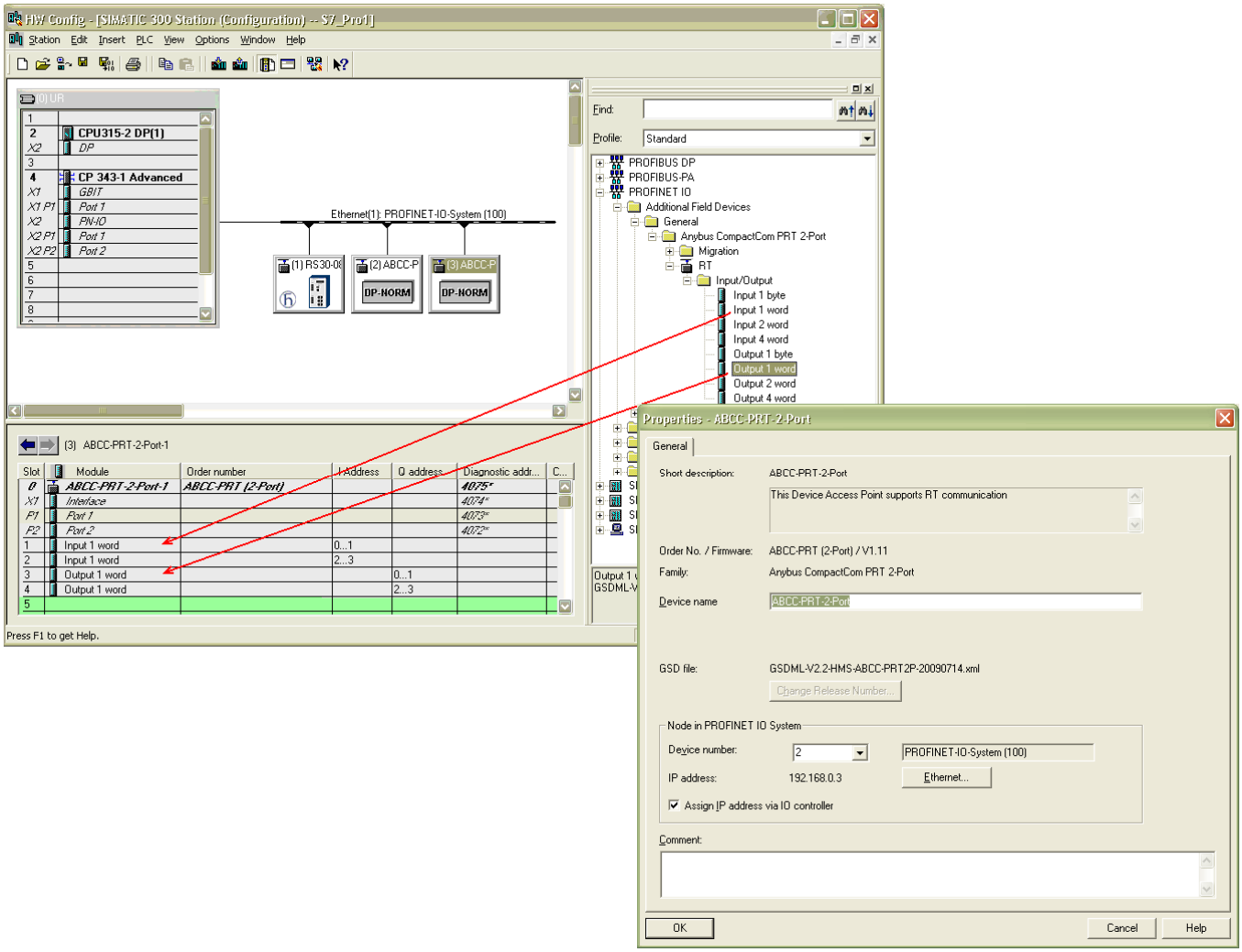

Figure 6: Hardware configuration for PROFINET IO network

> **NOTE!**
> For each CFW-11, it is necessary to select the number of words for input/output, programmed at P0727. It is necessary to select, word by word, all input words and then all output words, in this order.

Once you have selected the correct number of words, pay attention for the “I Address” and “Q Address” columns. These addresses will be used during the PLC program to access the drive data.

It is also necessary to define the network topology. Step 7 has the Topology Editor, which allows connecting graphically the PROFINET interfaces according to your network topology.

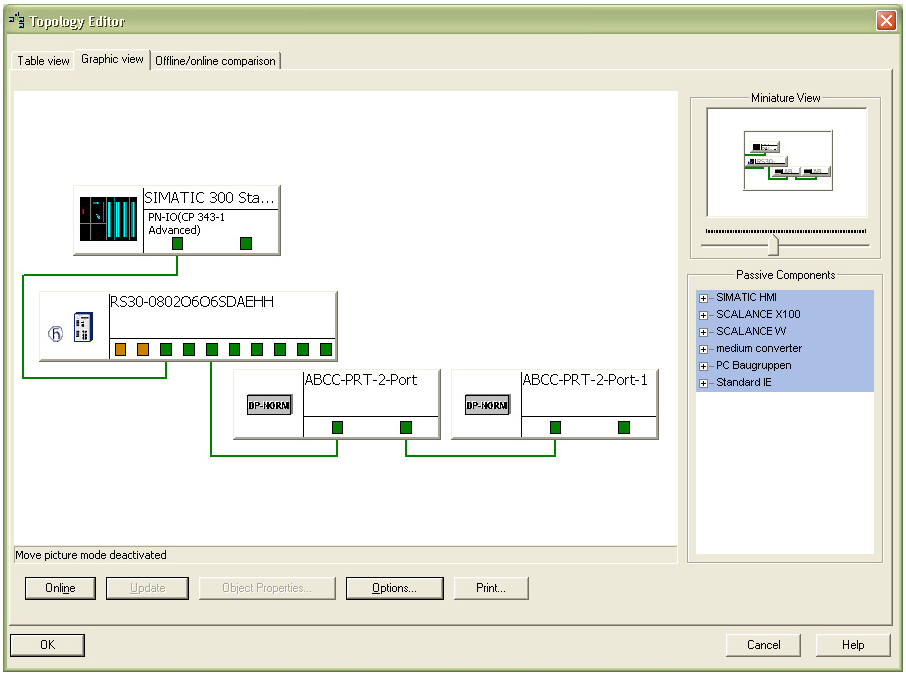

Figure 7: Topology Editor

After this, it is possible to download the hardware configurations. With the hardware configuration loaded into the PLC, the Topology Editor offers the online Graphic view, to check if all connections are correct. The "HW Config" software must be connected to the CP via PROFINET interface in order to check the topology.

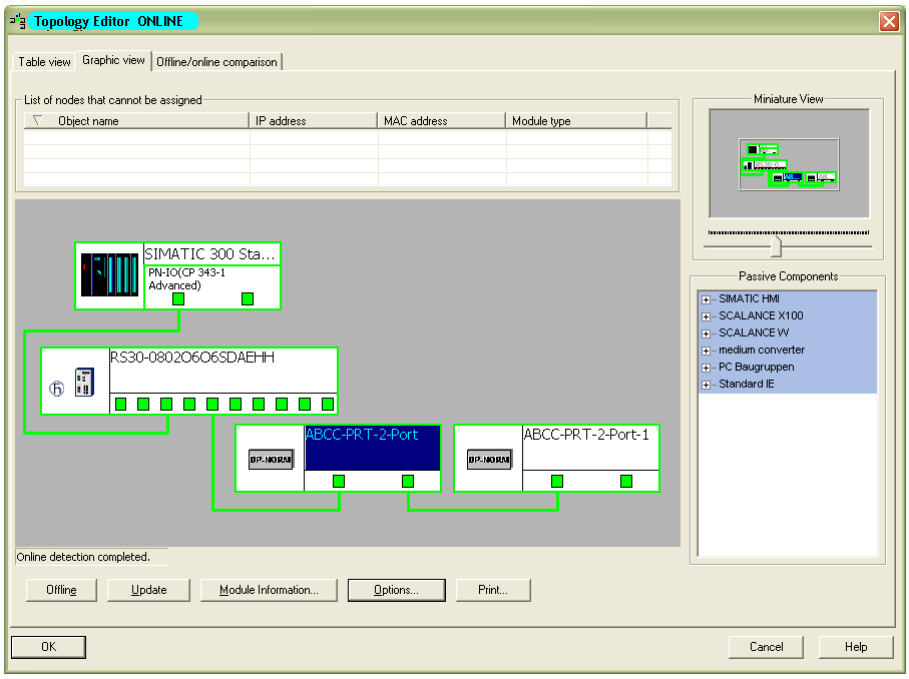

Figure 8: Topology Editor – online view

STEP 4: ACCESS I/O DATA FOR DEVICE MONITORING AND CONTROLLING

The used CP 343-1 Advanced requires special blocks for data transfer[2] between CP and CPU. In order to access the mapped data for CFW-11, it is necessary to call some data transfer functions to transfer the I/O data between CP and CPU.

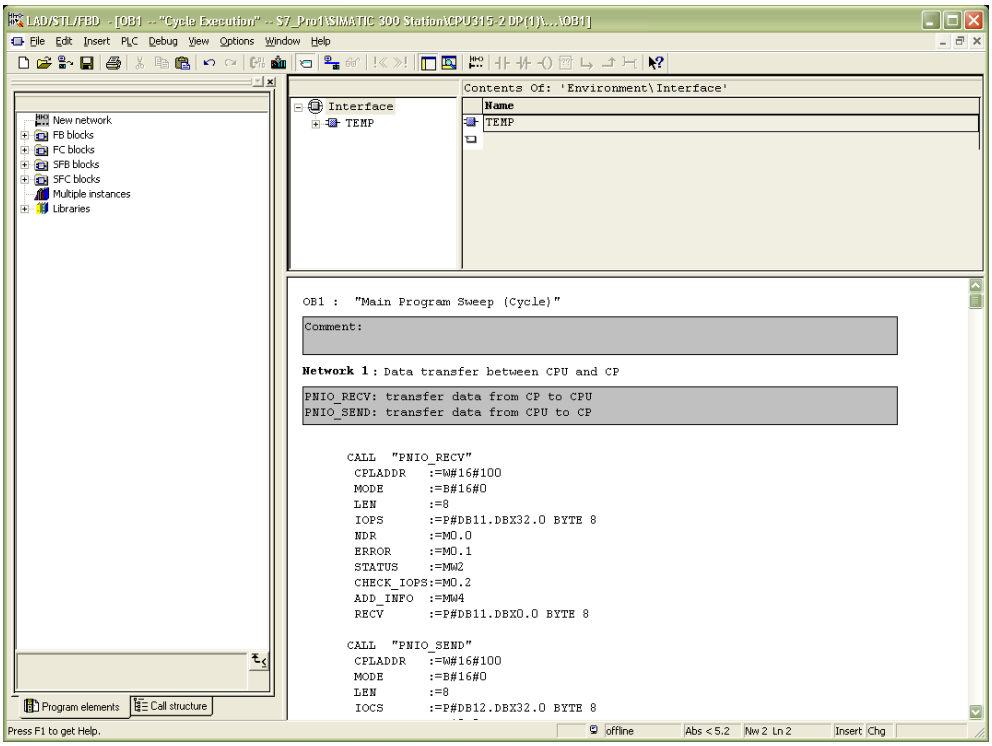

Figure 9: CPU blocks for data transfer

With the data available in CPU, it is possible to access the input data to monitor the status and variables transmitted by the drive, and to access the output data to control the drive. Refer to Anybus-CC User's Guide for CFW-11 in order to check the content of each I/O word.

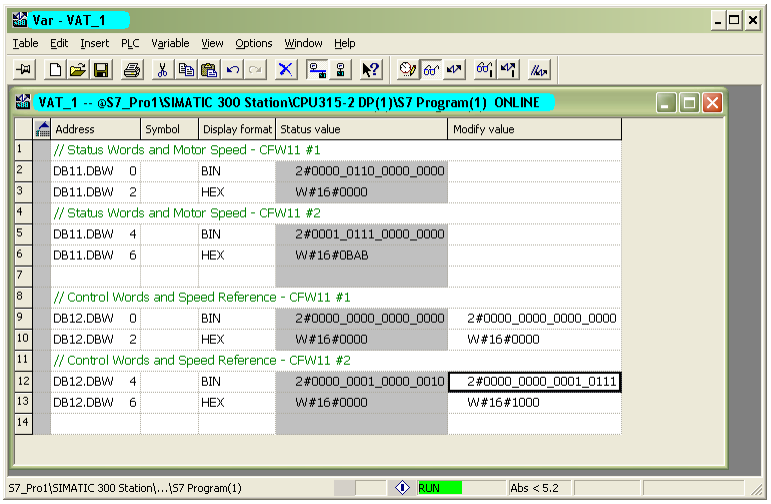

Figure 10: I/O data communicated with the drive

[2] Some CPUs with integrated PROFINET interface do not require specific blocks for data transfer, and the I/O data can be accessed directly via CPU memory addressing.

STEP 5: ACYCLIC REQUESTS

Besides the I/O data exchange with CFW-11, it is possible to send acyclic requests to access other drive parameters via PROFINET.

To access the drive parameters, it is necessary to indicate the hardware address, using the CP module address and the PROFINET IO component address (ID), according to programmed at “HW Config”. Other necessary fields to define are:

- Write_rec: indicates if it is a write request (TRUE in this case).
- Index: represents the parameter number.
- Len: the data size (length) of the parameter. For any drive parameter, the length is always 1 word (2 bytes).

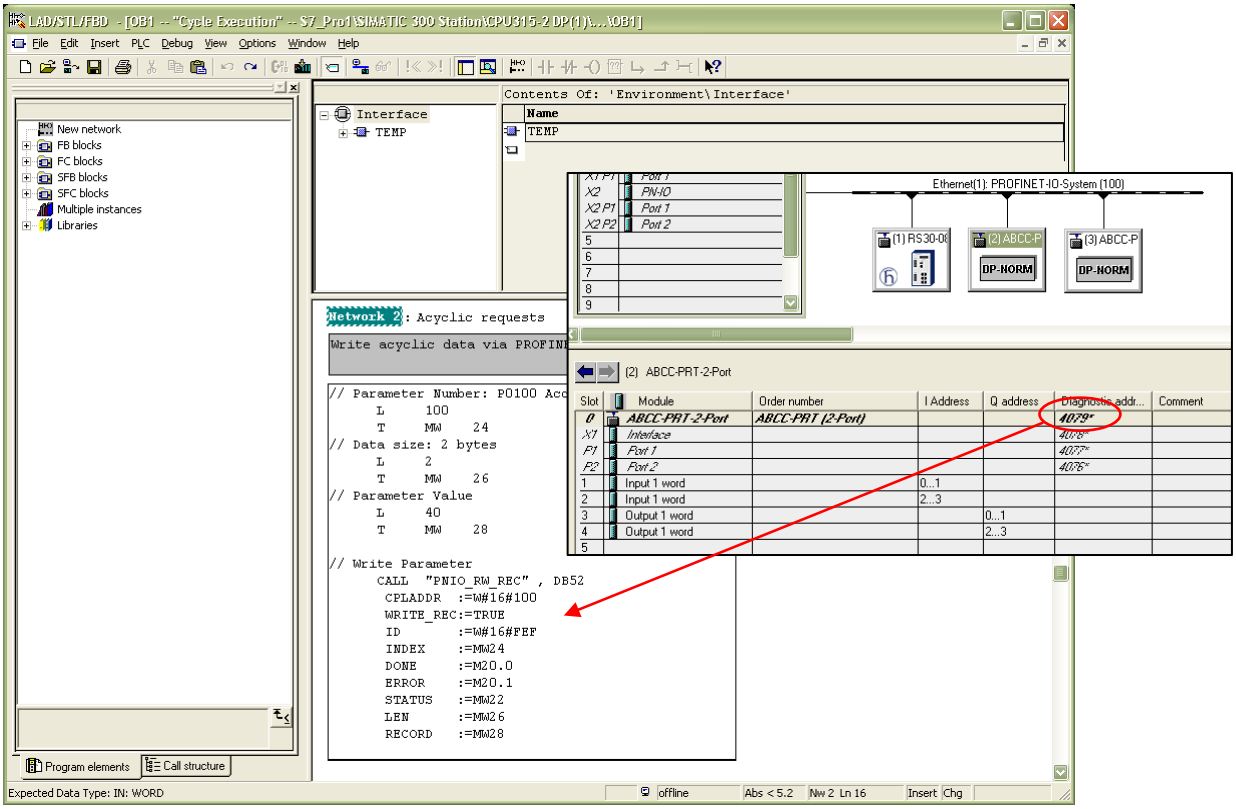

Figure 11: Acyclic write request

> **NOTE!**
> For read requests, it is necessary that the “Len” field is applied to the PROFINET read request also, what is not always valid for Siemens platform.

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