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# PROFINET IO PCU|ETR|XXXPNIO

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CE

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# 2 Chapter 1

# **General Specification**

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# **1** General Specification

PROFINET IO protocol is available for the following PSG controllers

## Multi loop controllers PNIO

flexotemp® PCU XXX PNIO systemp® ETR XXX PNIO

#### **Typographical Conventions**

Symbols and conventions are used in this manual for faster orientation for you.

|      | Caution   | With this symbol, references and information are displayed which are decisive for the operation of the device.<br>In case of non-compliance with or inaccurate compliance there can result damage to the device or injuries to persons. |
|------|-----------|---|
| i    | Note      | The symbol refers to additional information and declarations, which serve for improved understanding.   |
|      | Example   | With the symbol, a function is explained by means of an example.  |
|      | Reference | With this symbol, information in another document is referred to.   |
| n.a. |           | Not applicable, not existing  |

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# 2 Introduction

The PNIO controller works as PROFINET IO Device. It supports 1024 (PCU) | 340 (ETR) Byte I/O respectively. The transmission is done by twisted pair wire in full duplex mode with 100 MBit/s. The IP address setting, as usual for PROFINET IO, is done by the configuration of the PROFINET IO Controller (see chapter 8 Integration of a PCUXXXPNIO in a SIMATIC 300 PROFINET Network) and later transferred to the module while start-up of IO Controller.

The available LED's on the module signalize the current PROFINET IO status and possible error messages.

The PROFINET component is based on the PROFINET IO software technology by Siemens. The dual port RAM based hard- and software interface of PROFINET interfaces is standardized (IEC 61158 and IEC 61784).

The PROFINET IO devices have different characteristics per device type and manufacturer. To provide a rather simple configuration for the user, GSD's (General Station Description) are used, including GSDML based descriptions of characteristics of IO Devices for communication parameters, quantity, type, configuration data, parameter and diagnostics information of modules.

All modern configuration tools make it possible to read the GSD's in the configuration and thereby integrate the modules into the PROFINET IO system quickly and easily.

# 3 Principle of Communication / Prerequisites

Integration of the PNIO controller into the control system by means of the GSD file. Content of GSD files see chapter 9.1 GSD File.

The user can define for the PNIO controller, the I/O data areas and their data content that is what channel or system parameters, Direct IO (only PCU) read or written.

This configuration of the PNIO controller is done by the project setup and configuration tool

• flexotempMANAGER (see chapter 7 Configuration and Online Mode with flexotempMANAGER)

The channel and/or system parameters communicated, are named communication objects or abbreviated objects. They are classified in three areas, that are communicated in different ways:

- Static Objects (see chapter 4 Communication by Static Objects)
- Multiplex Objects (see chapter 5 Communication of Multiplex Objects)
- Parameter Channel (see chapter 6 Communication by Parameter Channel)

All objects are presented as words (16 bits) independent of the storage type in the PNIO controller on the control system side.

Writing new values the PNIO controller checks Min /Max limits of the particular parameters.

# 3.1 Activate protocol

The PROFINET IO protocol is available, once the master component with the symbol "PNIO" is selected, designed and configured.

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# Principle of Communication / Prerequisites

# 3.2 Handshake

The last word of the In-/Output buffer respectively is used as **Handshake** and therefore is not available for the communication of objects.

In essence, it serves to ensure **data consistency** on the control system. It is built up as follows:



\*) 1 = Enable =  $\checkmark$ ; <u>NOTE</u>: No processing for bits not set (12...15).

The handshake bits are set by the controller in the output buffer. The PNIO controller reflects the state of the bit after completion of processing in the input buffer of the controller. The handshake bit must always be toggled by the controller only if all of its data contents are written to the output buffer.

The further meaning of the hand shake is in chapters

- 4 Communication by Static Objects
- 5 Communication of Multiplex Objects
- 6 Communication by Parameter Channel

explained.

#) The timeout monitoring on PROFINETIO takes effect when the bus connection is interrupted. To detect a PLC STOP and to switch off heating outputs, bit 11 must betoggled within the timeout time when the timeout montoring (timeout  $\neq$  0) is active. To do this, the PLC program must be adapted to customer requirements. With inactive timeout monitoring (timeout = 0), bit 11 serves as a 1 Hz life signal.

# 4 Communication by Static Objects

Characteristic of Static Objects

- Static objects are linked directly and unambiguously with a parameter on PNIO controller side. Available are system- or channel data / -parameters and Direct IO's (only PCU)
- A static channel data object is directly linked with the zone
- Static Objects have word format

As with Static Objects a unique assignment of a parameter with an in-/output word is always guaranteed, no handshake to ensure data consistency is required.

**Read**: To read Static Objects such as the setpoint value of channel 1, the input buffer has to be configured appropriately with the aid of flexotempMANAGER. The controller can read the appropriate value of there at any time.

**Write**: To write Static Objects, the output buffer has to be configured appropriately with the aid of flexotempMANAGER. Then, the value to be written must be written only on the control side.



In the PNIO controller only changed values are applied. After each writing of a new value, the autosave mechanism of PNIO controller is started. That means, when there is no new writing of Static Objects in the next 10 minutes, after autosave time of 10 minutes elapsed all previously modified values are automatically taken into the EEPROM.

# 5 Communication of Multiplex Objects

In order to communicate with a minimum of in-/output memory requirement in the control a maximum number of channels of the PNIO controller, it is possible to communicate with all of the channel parameters by means of the Multiplex Objects.

Characteristic of Multiplex Objects

- Multiplex Objects are channel parameters of the PNIO controller
- Multiplex Objects are not statically connected with the controller channel
- Multiplex Objects have word format

In the PNIO controllers offsets can be defined, where other MUX channels are accessible. Doing this multiple channels / zones can be processed per communication cycle per channel parameters.

In order to ensure consistent data on the controller side, here's a handshake necessary. The handshake is done via the handshake described in chapter 3.2.

The following norms are valid

• Valid values for MUX channel

PNIO controller: 0<sub>Zone1</sub>...[number of zones-1]

- In order for a treatment of the MUX objects takes place, the handshake bit for writing and for reading the MUX objects must be set to "1" (bit 13 and bit 14 in the handshake).
- The processing of the MUX objects always takes place when the handshake bit 9 (toggle bit MUX channel) changes / toggles. The handshake bit is then reflected in the response (in the input buffer). Thus, the user can recognize that a processing has occurred.



After the change of the handshake bit, the processing of the MUX objects takes place. Therefore, it is essential, first to make all the necessary data entries in the buffer and then to change the handshake bit at last.

# 5.1 Complete communication cycles for MUX Objects

# 5.1.1 Read objects

- 1. Enter the desired channel number in the **MUX Channel** (Bit 0...6) of the handshake word of the output buffer.
- 2. Make sure, that in the handshake word of the output buffer **Handshake Bit 14** (MUX Channel anal edit read objects) is set to 1.
- 3. Toggle Handshake Bit 9 (Toggle bit MUX Channel) in the handshake word of the output buffer.
- 4. Check, that in the handshake word of the input buffer **Handshake Bit 9** (Toggle bit MUX Channel) is reflected. If so, analyze output buffer.

# 5.1.2 Write objects

- 1. Enter **all** parameter data into output buffer.
- 2. Enter the desired channel number in the **MUX Channel** (Bit 0...6) of the handshake word of the output buffer.
- 3. Make sure, that in the handshake word of the output buffer **Handshake Bit 13** (MUX Channel anal edit write objects) is set to 1.
- 4. Toggle **Handshake Bit 9** (Toggle bit MUX Channel) in the handshake word of the output buffer.
- 5. Check, that in the handshake word of the input buffer **Handshake Bit 9** (Toggle bit MUX Channel) is reflected. If so, processing is ready.

## 5.1.3 Read and write objects

- 1. Enter **all** parameter data into output buffer.
- 2. Enter the desired channel number in the **MUX Channel** (Bit 0...6) of the handshake word of the output buffer.
- Make sure, that in the handshake word of the output buffer Handshake Bit 13 (MUX Channel edit write objects) Handshake Bit 14 (MUX Channel edit read objects)

is set to 1.

- 4. Toggle **Handshake Bit 9** (Toggle bit MUX Channel) in the handshake word of the output buffer.
- 5. Check, that in the handshake word of the input buffer **Handshake Bit 9** (Toggle bit MUX Channel) is reflected. If so, analyze input buffer and writing of objects ready.

## 10 Chapter 5

#### **Communication of Multiplex Objects**

# 5.1.4 Check sum calculation MUX data (ONLY with flexotemp® PCU XXX PNIO)

(Available from flexotempMANAGER version 1.3.9; from firmware version PCU XXX PNIO 1517A)

An additional system object was introduced. This contains the checksum for the MUX data of the PCU XXX PNIO. As long as the MUX object for the checksum is not inserted in the PNIO buffer, the PCU XXX PNIO operates as before.

#### Read

If the checksum is inserted into the receive buffer (PLC  $\rightarrow$  PCU output), the PCU XXX PNIO checks the check sum as well as the toggle bit. If this is invalid, the MUX data are not processed.

#### Write

If the checksum is inserted into the send buffer (PCU  $\leftarrow$  PLC input), the PCU XXX PNIO calculates the checksum and enters this into the corresponding word in the buffer. The PLC must then check this accordingly.



The check sum can be calculated as follows:

```
// 1. Step set CheckSum to 0
unsigned int uiCheckSum;
uiCheckSum = 0;
```

// 2. Step add up all MUX objects (X=number of MUX objects)
for(cnt=0;cnt<X;cnt++)
uiCheckSum += "Data word corresponding MUX object"</pre>

// 3. Step add Handshake (only for the MUX relevant bits)
uiCheckSum += (Handshake & 0x62FF);

# 6 Communication by Parameter Channel

The Parameter Channel is used for fast data transfer of large amounts of data. It is suitable for example for backup, for working with recipes or Smart Power Limitation abbreviation SPL Configuration (only PCU). The following are available

| PNIO controller | Parameter Channel n data words | flexotempMANAGER |
|-----------------|--------------------------------|------------------|
|                 |                                |                  |

As for MUX Objects, a handshake is also necessary for Parameter Channels (see chapter 3.2 Handshake) to guarantee the data consistency on controller side.

After all the words of the Parameter Channel has been described with the appropriate values, the handshake bit (bit 8 in the handshake) is toggled. Then the PNIO controller executes the command (handshake bit 12 must be set to "1").

One can only work with one Parameter Channel type.

# 12 Chapter 6

**Communication by Parameter Channel** 

# 6.1 Types of Parameter Channels

Dependent on the commands there are different types (configuration) of Parameter Channels.

# 6.1.1 Type of Parameter Channel for command 1...26

Parameter channel for command 1...26 looks like follows:

| Word | n data words                         |
|------|--------------------------------------|
| 1    | Command                              |
| 2    | Channel/Offset (see chapter 6.2.1)   |
| 3    | Number of channels/Number of objects |
| 4    | Data word 0                          |
| 5    | Data word 1                          |
| 6    | Data word 2                          |
| 7    | Data word 3                          |
| 8    | Data word 4                          |
| 9    | Data word 5                          |
| 10   | Data word 6                          |
|      |                                      |
| n    | Data word n-4                        |

# 6.1.2 Type of Parameter Channel for command 27...28 (only PCU)

Parameter channel for command 27...28 looks like follows:

| Word | n data words                         |
|------|--------------------------------------|
| 1    | Command                              |
| 2    | NodelD (see chapter 6.2.2.1) *)      |
| 3    | SPL Module(s) (see chapter 6.2.2) *) |
| 4    | Current limit 1 NodeID *             |
| 5    | Current limit 2 NodeID *             |
| 6    | Current limit 3 NodeID *             |
| 7    | SPL Status for output 116 Node ID *  |
| 8    | SPL Status for output 1732 Node ID * |
| 9    | Data word 5                          |
| 10   | Data word 6                          |
|      |                                      |
| n    | Data word n-4                        |

\*) only visible, when NodelD  $\neq$  0 and SPL Module  $\neq$  0

# 6.1.3 Type of Parameter Channel for command 29...32 (only PCU)

Parameter channel for command 29...32 looks like follows:

| Word | n data words  |
|------|---|
| 1    | Command   |
| 2    | Start index Direct IO's / Number of Direct IO's (see chapter 6.2.2.1) |
| 3    | <no function=""></no>   |
| 4    | Data word 0   |
| 5    | Data word 1   |
| 6    | Data word 2   |
| 7    | Data word 3   |
| 8    | Data word 4   |
| 9    | Data word 5   |
| 10   | Data word 6   |
|      |   |
| n    | Data word n-4   |

# 6.1.4 Type of Parameter Channel for command 33 (only ETR)

Parameter channel for command 33 looks like follows:

| Word | n data words                  |
|------|-------------------------------|
| 1    | Command                       |
| 2    | Channel (see chapter 6.2.1) x |
| 3    | Number of channels m          |
| 4    | Setpoint x + 0                |
| 5    | Adaptation byte x + 0         |
| 6    | Setpoint x + 1                |
| 7    | Adaptation byte x + 1         |
| 8    | Setpoint x + 2                |
| 9    | Adaptation byte x + 2         |
|      |                               |
| n-1  | Setpoint x + (m-1)            |
| n    | Adaptation byte x + (m-1)     |

#### Allocation adaptation byte

| 0x01 | Zone becomes active           |
|------|-------------------------------|
| 0x02 | Manual Adaptation             |
| 0x04 | Automatic cooling adaptation  |
| 0x08 | Channel wise current transfer |

The setpoint for the specified zone is written and the specified function in the adaptation byte is executed for the zone, e.g. adaptation byte = 0x01 "Zone becomes active".

**Communication by Parameter Channel** 

# 6.2 Parameter Channel Settings

# 6.2.1 Parameter Channel for System- and Channel Data

## Channel/ Offset/ Object number

The available object numbers (display decimal/ hexadecimal) communicated by PROFINET IO are stored in a word and consist of

- Channel (superior byte) and
- Offset (inferior byte)

Specification of object number

| Channel |                      | Offset |                             |
|---------|----------------------|--------|-----------------------------|
| 00      | For system parameter | 00FF   | (Offset System parameter *) |
| 0180    | For Zone 1128 (PCU)  | 00FF   | (Offset zone parameter *)   |
| 0120    | For Zone 132 (ETR)   | 00FF   | (Offset zone parameter *)   |

\*) See object list of PNIO controllers

For channel and offset values a list of values exist in flexotempMANAGER (see chapter 7.2 Online Mode) to choose from. To do this, go into edit mode and select from the 2nd word of the Parameter Channel "Channel / Offset" field buffer of the output buffer with the secondary mouse button.

#### Channel

- 000 System
- 001 <user defined zone name>
- 002 <user defined zone name>
- etc. up to
- n <user defined zone name>

   (n depends on maximal number of zones of configured PNIO controller)

#### Offset

The offsets are different depending on the configured PNIO controllers. The offsets and their sequential order can be read in the document Object list ... PROFINETIO....

# 6.2.2 Parameter Channel for configuration of SPL (only PCU)

Only for flexotemp® PCU XXX PNIO available and valid for the following flexotemp®-components:

- flexotemp® CANCT Current Transducer Interface
- flexotemp® BACI Bus Actuator Interface, Current Input
- flexotemp® DIO16CI Digital In-/Output Interface, Current Input

## 6.2.2.1 NodeID/ Object number

The available object numbers (display decimal/ hexadecimal) communicated by PROFINET IO are stored in a word and consist of

NodelD

#### NodelD

Indicates the first component of the PNIO controller with the appropriate CAN bus node ID, which can be seen from the configuration. If more than one component is addressed, this must be based on the specified CAN bus node ID in consecutive order.

#### 6.2.2.2 Number of SPL Modules/ Object number

The available object numbers (display decimal/ hexadecimal) communicated by PROFINET IO are stored in a word and consist of

• Number of SPL modules

#### Number of SPL modules

Specifies the number of how many modules with SPL functionality should be handled, from NodeID (see 6.2.2.1) continuously.

# 6.2.3 Parameter Channel for configuration of Direct IO's (only PCU)

Only available with flexotemp® PCU XXX PNIO.

#### 6.2.3.1 Start index Direct IO's / Number of Direct IO's

The available object numbers (display decimal/ hexadecimal) communicated by PROFINET IO are stored in a word and consist of

- Start index (superior byte) and
- number of (inferior byte)

#### Start index

Indicates the first Direct IO of the PNIO controller with the appropriate CAN bus node ID, which can be seen from the configuration of Direct IO's. If more than one Direct IO is addressed, this must be based on the specified CAN bus node ID in consecutive order.

#### Number

Specifies the number of how many Direct IO's should be handled, from start index continuously.

## **Communication by Parameter Channel**

# 6.3 Parameter Channel n data words

Upon creation of a Parameter Channel, the operator is asked about the number of data words, the Parameter Channel should consist of. The available buffer size is calculated by the configured in-/output buffers (PLC) (see settings 7.1.1) and the possible number of data words in the list of value to be selected. From a given object reference (see chapter 6.2) starting, the operator can set the number of channels and the number of objects.

The parameters are read/written as far as data words are available.

# 6.3.1 Parameter Channel n data words - Commands

The available commands can be chosen from a list of values in flexotempMANAGER (see chapter 7.2 Online Mode). To do this, go into edit mode and select from the 1st word of the Parameter Channel "Command" field buffer of the output buffer with the secondary mouse button.

#### Command

| 1 | Read 1 object of channel 1   | Read 1, reads object, that is defined by object number.                       |  |
|---|--|---|--|
| 2 | Read 2 objects of 1 channel  | Object number = Channel: 001 Zone 1. Offset: 002 setopint value 🔿             |  |
| 3 | Read 3 objects of 1 channel  | setpoint value of zone 1 is read.   |  |
| 4 | Read 4 objects of 1 channel  |   |  |
| 5 | Read 5 objects of 1 channel  | <b>Read 2</b> and so on, reads the next (2.) object number etc.               |  |
| 6 | Read 6 objects of 1 channel  | based on the defined object number.   |  |
| 7 | Read 7 objects of 1 channel  | Object number = Channel: 001 Zone 1, Offset: 002 setpoint value $\rightarrow$ |  |
| 8 | Read 8 objects of 1 channel  | setpoint value of zone 1 is read, degree of operation of zone 1 is read, e    |  |
| A | Settings of number of channels/number of objects are not considered. |   |  |

| 9 | Read 1 object of 8 channels  | The defined object number and 7 more object numbers are read.<br>Object number ≡ Channel: 001 Zone 1, Offset: 002 setpoint value → setpoint value of zone 1 is read, setpoint value of zone 2 is read, etc. setpoint value of zone 8 is read. |
|---|--|---|
| 6 | Settings of number of channels/number of objects are not considered. |   |

| 16 | Write 1 object to 1 channel  | Write 1, writes object, that is defined by object number.   |  |
|----|--|---|--|
| 17 | Write 2 objects to 1 channel   | Object number = Channel: 001 Zone 1. Offset: 002 setto int value -  |  |
| 18 | Write 3 objects to 1 channel   | setpoint value of zone 1 is written by value in data word 1.  |  |
| 19 | Write 4 objects to 1 channel   |   |  |
| 20 | Write 5 objects to 1 channel   | Write 2 and so on, writes the next (2.) object number etc.  |  |
| 21 | Write 6 objects to 1 channel   | based on the defined object number.   |  |
| 22 | Write 7 objects to 1 channel   | Object number ≡ Channel: 001 Zone 1, Offset: 002 setpoint value →   |  |
| 23 | Write 8 objects to 1 channel   | setpoint value of zone 1 is written by value in data word 1<br>setpoint value of zone 1 is written by value in data word 2, etc.  |  |
| i  | Settings of number of channels/number of objects are not considered. |   |  |
| 24 | Write 1 object to 8 channels   | The defined object number and 7 more object numbers are written.<br>Object number = Channel: 001 Zone 1, Offset: 002 setpoint value → setpoint value of zone 1 is written by value in data word 1 setpoint value of zone 2 is written by value in data word 2, at a set of zone 2 is written by value in data word 2, |  |
|    | Settings of number of channels/n                                     | umber of objects are not considered.  |  |
| U  |  |   |  |

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# Command

| (See number of objects) set.<br>Object number = Channel: 001 Zone 1, Offset: 002 setpoint value ,<br>number of channels 3, number of objects 2 $\rightarrow$<br>setpoint value of zone 1 is read, degree of operation of zone 1 is read,<br>setpoint value of zone 2 is read, degree of operation of zone 2 is read,<br>setpoint value of zone 2 is read, degree of operation of zone 2 is read, |
|--|
|  |

|    |                 | The defined object number is written for the number of channels (see number of channels) and number of objects (see number of objects) set.   |
|----|-----------------|---|
| 26 | Write n objects | Object number = Channel: 001 Zone 1, Offset: 002 setpoint value ,<br>number of channels 3, number of objects $2 \rightarrow$<br>setpoint value of zone 1 is written by data word 1,<br>degree of operation of zone 1 is written by data word 2,<br>setpoint value of zone 2 is written by data word 3,<br>degree of operation of zone 2 is written by data word 4,<br>setpoint value of zone 3 is written by data word 5,<br>degree of operation of zone 3 is written by data word 6. |

| ONLY PCU | 27 | Read current limit and status<br>SPL of y SPL modules from<br>NodeID x             | For the defined NodeID the current limits 13 and the status are read for the specified SPL Modules (see number of SPL Modules).<br>NodeID: 002 NodeID 2, Number of SPL Modules: 002 2 SPL Modules → starting from NodeID 2 the current limit 13 and the status are read into the intended data words for 2 SPL Modules. |
|----------|----|--|---|
| ONLY PCU | 28 | Stipulate current limit and de-<br>/activate SPL of y SPL<br>modules from NodeID x | For the defined NodelD the current limits 13 are set for the specified SPL Modules (see number of SPL Modules) and SPL can be de-/activated.<br>NodelD: 002 NodelD 2, Number of SPL Modules: 002 2 SPL Modules<br>→ starting from NodelD 2 the current limit 13 are written by the data words for 2 SPL Modules.        |
| ≺N       | 6  | Information, how to use the curr   | ent limits, see description of Smart Power Limitation SPL.  |

# 18 Chapter 6

# **Communication by Parameter Channel**

#### COMMAND

| ONLY PCU | 29 | Write Direct IO [1255]  | From start index on the number of Direct IOs set is written to Direct IOs. Start index Direct IO's: 001, number of Direct IO's: 1 → starting from start index Direct IO's 1, 1 Direct IO is written by data word 1.           |  |
|----------|----|---|---|--|
| ONLY PCU | 30 | Read Direct IO [1255]   | From start index on the number of Direct IO's set is read from Direct IO's. Start index Direct IO's: 001, number of Direct IO's: 1 → starting from start index Direct IO's 1, 1 Direct IO is read.                            |  |
| ONLY PCU | 31 | Write Direct IO [256300]  | From start index on the number of Direct IO's set is written to Direct IO's.<br>Start index Direct IO's: 256, number of Direct IO's: 1 →<br>starting from start index Direct IO's 256, 1 Direct IO is written by data word 1. |  |
| ONLY PCU | 32 | Read Direct IO [256300]   | From start index on the number of Direct IO's set is read from Direct IO's. Start index Direct IO's: 256, number of Direct IO's: 1 → starting from start index Direct IO's 256, 1 Direct IO is read.                          |  |
| ΥN       | i  | Information on use of Direct IO's are in the operating instructions<br><b>Project Setup - and Configuration Tool flexotempMANAGER Operation</b> . |   |  |
|          |    |   | The extremit and the edentation but are written and/or  |  |

| Y<br>No33Write setpoint value with<br>adaptation controlThe setpoint and the adaptation byte are written an<br>executed from the channel to number of channels specifie<br>$\bigcirc$ Channel: $003 \equiv Zone 3 \equiv x$ , Number of channels: $2 \rightarrow$<br>for Zone 3 the setpoint value of setpoint $x + 0$ is written, Adaptation byte $x$<br>is executed,<br>for Zone 4 the setpoint value of setpoint $x + 1$ is written, Adaptation byte $x$<br>is executed. | d/or<br>d.<br>+ 0<br>+ 1 |
|---|--------------------------|
|---|--------------------------|

Is Parameter Channel n data words not supported for the PNIO controller, an error message occurs in flexotempMANAGER and the writing for the object list is prevented.

# 7 Configuration and Online Mode with flexotempMANAGER

# 7.1 Configuration

Before PROFINET IO is configured for control, PNIO must be configured on controller side.

Therefore change to the project side in flexotempMANAGER and select the menu item <PROFINET IO> beneath the PNIO controller. There are

- Communication settings
- Object list for input-/output buffer (PLC)

specified.

| 🙀 flexotempMANAGER - Unbenannt *  |  |  |  |  |  |
|---|--|--|--|--|--|
| Datei Bearbeiten Kommunikation Ansicht Extras ?   |  |  |  |  |  |
| D 🛎 🔲   X 🖻 💼 🎒 💡 🕏 🛄 🛙   |  |  |  |  |  |
| Kommunikationsserver         Kommentar         Datenblatt         Kommunikation         Zeitserver         Systemparameter         Zonenparameter         Zonenparameter         Objektliste Eingabe-Puffer (SPS)         Objektliste Eingabe-Puffer (SPS)         Objektliste Eingange         Virtuelle digitale Eingänge         Virtuele digita | IP:192 168.000.200 PCU128PNID>PROFINET IO         PROFINET IO         Stationsname         Bytereihenfolge         Timeoul         (a)         Arzahl schneller Direct IOs         Arzahl Inteie Bytes Eingabe-Puffer (SPS)         Arzahl freie Bytes Lingabe-Puffer (SPS)         1024         Steckplatz         Module         Eingabe-Puffer (SPS)         Ausgabe-Puffer (SPS)         Steckplatz         Module         Eingabe-Puffer (SPS)         Ausgabe-Puffer (SPS) |  |  |  |  |
| Start RevotempMANAGER   | , jan 11/23  |  |  |  |  |
|   |  |  |  |  |  |

Example PCU128PNIO

# 7.1.1 Communication settings

## Settings

Station name

To address an I/O device, it must be named.

Station name [1...240 characters] here must match the device name in SIMATIC Manager. Assignment of device name in SIMATIC Manager see chapter 8 Step 7 and/or chapter 8 Step 9.



Be sure to note that the name does NOT contain any capital letters!

byte sequence

Choice between

# 20 Chapter 7 Configuration and Online Mode with flexotempMANAGER

0 – Big Endian (byte with the most significant bit is stored first)

1 – Little Endian (byte with the least significant bit is stored first)

| A                                       | Be sure to note that the configuration of the in-/output buffer (sequence, slots, and type of modules) must later match exactly the configuration of the PNIO controller module in the SIMATIC Manager (see chapter 8). |
|---|---|
| Timeout                                 | All outputs are set to passive upon expiration of the time in seconds set here.<br>If set to 0, the function is deactivated.  |
| Number of fast Direct<br>IOs (only PCU) | The number of the here specified Direct IO's [0 20] will be handled preferentially, i.e. in each processing cycle.  |
| Number of slots                         | The number of slots set here ([0 32] (PCU)   [0 20] (ETR), 0 = no slot occupied) must match with those in the control.  |



If, for example, here 3 is selected, then 3 slots are shown, which can then be assigned to in-/output modules.

| Datai Baahaitan Kamunikatian Anaisht Suban 2   | -  |       |
|--|--|-------|
|  |  |       |
| Detei Bearbeiten Kommunikation Anscht Extras 2<br>Communikationsserver<br>Kommentar<br>Kommentar<br>Categorie Communikation<br>Categorie Communikation<br>Cate | IP:192:188.000.220) PCU128PNI0->PROFINET IO         PROFINET IO         Stationname       Irst         Bytereihendage       0:Big Endan         Timeout       [s]         Anzahl schneller Direct IDs       0         Steckplatz       Modul auswahlen         3       Modul auswahlen | *     |
| Drücken Sie F1, um Hilfe zu erhalten.  | EINZELMODUS OFFLINE TREND OFFLINE  |       |
| 🏂 Start 🗱 flexotempMANAGER   | DE 🤘 🖉   | 11:25 |
|  |  |       |

Example PCU128PNIO

Number of free bytes input buffer (PLC) Number of free bytes output buffer (PLC)

Shows the number of free bytes for the current input buffer.

Shows the number of free bytes for the current output buffer.

Slot If slots are occupied for in-/output modules (double click on <Select module>), words are reserved accordingly in the in-/output buffer (PLC). Input modules 16 Byte, 32 Byte, 64 Byte, 128 Byte, output modules 16 Byte, 32 Byte, 64 Byte, 128 Byte are available.



According to the still free number of bytes in the in-/output buffer only the modules are still available, not exceeding the number of bytes free. I.e. if all bytes of the output buffer are full, only input modules are available for the

I.e. if all bytes of the output buffer are full, only input modules are available for the free slots.





Example PCU128PNIO

If the object lists in-/output buffer are occupied, this will displayed under <Project> <PROFINET IO> as <(used)>.

| flexotempMANAGER - Unbenannt *  | N  | _ 8 × |
|---|--|-------|
| Datei Bearbeiten Kommunikation Ansicht Extras ?   | 4  |       |
| D 🚅 🖬   X 🖻 🖻   🚭   🤋 🕏 🔟 I   |  |       |
| Communicationserver     Communicationserver     Commentar     Commentar     Commentar     Commentar     Conserver     Systemparameter     Conservater     Colpitate Ausgabe-Puffer (SPS)     Objetate Ausgabe | IP-192-183.000.220J PCU123PNI0->PROFINET IO         PROFINET IO         Stationsname       Iest         Byterehenfolge       0 · Big Endan         Timeout       [s]         Anzahl schneller Direct IOs       0         Anzahl Stockplatze       3         Anzahl freie Bytes Eingabe-Puffer (SPS)       992         Steckplatz       Module         Eingabe-Puffer (SPS)       992         Steckplatz       Module         1       32 Byte Eingabemodul         2       22 Byte Eingabemodul       031 [benutzt]         3       Modul auswahlen |       |
| Drücken Sie F1, um Hilfe zu erhalten.   | EINZELMODUS OFFLINE TREND OFFLINE  | 🕺 🗩   |
| 🍂 Start 📓 flexotempMANAGER  | DE 🤘 🕊 🦉   | 11:28 |
|   |  |       |



Example PCU128PNIO



A module can now only be deleted or converted to a module of the same type but different size if the remaining/modified modules provide enough space to

# **22** Chapter 7

# Configuration and Online Mode with flexotempMANAGER

accommodate fully the configured object list.

The position of Static Objects, and MUX objects is maintained, the Parameter Channel migrates to the end of the in-/output buffer before the handshake word.

# 7.1.2 Define object list

By selecting the menu item <Object list input buffer (PLC)> or <Object list output buffer (PLC)> the list type is defined. The procedure is illustrated by the input object list buffer (PLC). The procedure for creating the object list output buffer (PLC) is identical.



Example PCU128PNIO

**Define object list** 

In the left display window for <Object list input\_buffer (PLC)> in a list of values a) all <Object> available for **PROFINET IO Objects** are shown

- Channel data (color see Parameter d): black)
- Multiplexed Data [MUX] (color see Parameter d): blue)
- System parameter [SYS] (color see Parameter d): green)
- Parameter Channel [PAR] (color see Parameter d): red)
- Direct IOs (only PCU) (color see Parameter d): orange)

Select in the display field b) for

- Channel data one Zone/Channel
- Multiplexed Data one MUX Channel

something.

In the display window c) all available parameters for PNIO controller, dependent on selection <Object>, are listed.

By clicking the check box of a parameter in c) the objects are moved to the right display window d).



Create object list in-/output buffer (PLC) for one 32 Byte in-/output module each

Change in flexotempMANAGER to project side

Select menu item <PROFINET IO> beneath of PNIO controller

Selection of menu item <Object list input buffer (PLC)>

| a)   | b)                           | b)                     | c) & d)                            |  |
|--|------------------------------|------------------------|------------------------------------|--|
| <object></object>                          |                              |                        | A Parameter                        |  |
| Channel data                               | <zone></zone>                | <1> Zone 1             | ☑ 002 Setpoint value (P001)        |  |
| Channel data                               | <zone></zone>                | <2> Zone 2             | ☑ 002 Setpoint value (P001)        |  |
| Multiplexed data                           | <mux<br>Channel&gt;</mux<br> | <0> MUX Channel:<br>+0 | ☑ 003 Degree of operation (P002)   |  |
| Multiplexed data                           | <mux<br>Channel&gt;</mux<br> | <3> MUX Channel:<br>+3 | ☑ 003 Degree of operation (P002)   |  |
| System parameters                          |                              |                        | Ø 001 Protocol (CP02)              |  |
| Direct IO's                                |                              |                        | Ø 001 Node ID: 1…                  |  |
| Parameter Channel                          |                              |                        | Parameter Channel n (6) Data words |  |
| Change in flexotemnMANAGER to project side |                              |                        |                                    |  |

Change in flexotempMANAGER to project side

Select menu item <PROFINET IO> beneath of PNIO controller

| Selection of menu item < Object list output buffer (PLC)> |               |            |                             |  |
|---|---------------|------------|-----------------------------|--|
| a)  | b)            | b)         | c) & d)                     |  |
| <object></object>   |               |            | A Parameter                 |  |
| Channel data  | <zone></zone> | <1> Zone 1 | ☑ 002 Setpoint value (P001) |  |

The following object list input buffer (PLC) is created.



Example PCU128PNIO



Creating of

- Parameter Channel
- Multiplexed Data

Note that in each case in the structure of the parameter channel in-/output buffer or handshake is applied. That it is checked prior to the application that in-/output modules are available and it is determined how large the Parameter Channel must be taking into account the size of in-/output buffer.

The following object list output buffer (PLC) is created.



Example PCU128PNIO

# Configuration and Online Mode with flexotempMANAGER

#### 7.1.3 Edit object list

In an already created object list an element of the buffer is selected. Beside the right display window, the keys for processing the object list are activated.



Example PCU128PNIO

Objekt

löschen

#### Further editing of object lists

## By the keys

- <Delete object> (selected object is deleted from the preset object list)
  - <Arrow key up / down>, (selected object is moved up / down in the preset object list)
  - <Copy objects in PROFINET IO list> (ONLY for Channel Data!) To get a list of similar objects quickly, that only differs by channel number, use the key <Copy objects in PROFINET IO list>. The objects are copied in the preset object list.

| Ende der Liste für nachfolgende<br>eingefügte Objekte werden nicht |
|--|
|  |
|  |
| ОК   |
| Abbrechen  |
|  |

<Delete object list>

(all objects are deleted from the displayed list after confirmation of the query <Delete object list really? > with <OK>)

the object lists can be edited.

# 7.1.4 Write / Read object list



Write object list

To activate newly created object lists for in-/output buffers (PLC) in flexotempMANAGER, they must be written into the PNIO controller. For this purpose, the context menu of PNIO controller is selected by the secondary mouse button and <Write PROFINET IO> is chosen. The object list is written directly to the PNIO controller.

#### Example PCU128PNIO

| Komme  | okatioosserver                 |  |
|--------|--------------------------------|--|
| Konne  | dw.                            | Profinet ID  |
|        | (Internet)                     | Chalingan  |
|        | Neue Baugruppe anlegen         |  |
| 9/4 1  | umbenennen                     |  |
|        | löschen                        |  |
| 8- 4 2 | umwandeln in                   |  |
| - 🗣 Zi | December lance                 |  |
| 8-9 Pi | Parameter lesen                |  |
| 1 1 1  | Dotel appropriet               |  |
|        | Projekcierung lesen            | <u> </u>   |
| - • D  | Promet 10 lesen                | the local sectors in the local |
| - • 6  | Parameter + Projekberung + Pr  | trinet 10 lesen  |
| • •    | Parameter schreiben            |  |
|        | Daten exportieren              |  |
|        | Projektierung schreiben        |  |
|        | Profinet 10 schreiben          |  |
| - CNeu | Parameter + Projektierung + Pr | ofinet 10 schreiben  |
|        | Fehlerspeicher anzeigen        |  |
|        | Firmwareupdate                 |  |
|        | Schrittstellentest             |  |
|        | CoDeSys-Variableniste exportie | ren  |
|        | Codenummer                     |  |
|        | Daten->EEPROM                  |  |
|        | Stromübernahme                 |  |
|        | Vorlage erzeugen               |  |

Example PCU128PNIO



#### Read object list

By menu item <Read PROFINET IO> (display context menu of PNIO controller by secondary mouse button) the object lists in the PNIO controller for in-/output buffers (PLC) are read into flexotempMANAGER. The object list is directly read into flexotempMANAGER.

Caution! Previously created lists in flexotempMANAGER that have not yet been written to the PNIO controller will be overwritten by this operation

If you switch between menu items PROFINET IO of the project back and forth and you are ONLINE, a query, whether the respective PROFINET IO information should be read, occurs.



# 7.2 Online Mode

To test the function PROFINET IO without control or to debug the buffer sent by the controller, you can switch to the view <Project> <Status> in flexotempMANAGER. When switching to the menu item <Status PROFINET IO> the current object lists are read from the PNIO controller.

Then, the object lists of the input and the output buffer (PLC) are presented.



# 7.2.1 SIO Mode

Change into SIO mode ON, the in-/output buffers (PLC) can be handled by flexotempMANAGER.

| SIO ON  | Is the SIO mode turned off, the buffers are only read and displayed in online mode.<br>The buffers are described in this mode only by the controller.  |
|---------|--|
|         | The key indicates that the SIO mode can be turned <b>ON</b> in this mode.  |
| SIO OFF | Is the SIO mode switched on, then the read and write buffers that are sent from the controller via PROFINET IO to the PNIO controller, are no longer evaluated. The buffers are now operated via flexotempMANAGER! |
|         | The key indicates that the SIO mode can be turned <b>OFF</b> in this mode.   |



Example PCU128PNIO

#### SIO Mode ON

Anzeige

dezimal

Display

decimal

Anzeige hexadezimal

Display of buffer content hexadecimal



Example PCU128PNIO

# 7.2.2 Edit Mode

The Edit Mode is only available in SIO Mode ON.

Editmode ON In order to test the function of the handshake, it is possible to switch to **Edit mode**. In Edit mode, no more communication takes place. The user can edit the values of the output buffer.

Press key Edit mode ON.





Example PCU128PNIO

For the first setpoint value object channel 1 in the object list output buffer, another value (example: 300) should be specified.

Example PCU128PNIO Select the field buffer behind the object on the right side and activate the entering of values by secondary mouse button. The value 3000 is entered.

Take care of the data format at specification of values of parameters.

| PCU128PNEO                                 | PCU12     | 8PNID->Status Profinet IO Objek | täste |          |           |                            |       |         |             |
|--|-----------|---------------------------------|-------|----------|-----------|----------------------------|-------|---------|-------------|
| Datenblatt                                 | (SPS)+(F  | CU) Eingang                     |       | _        | (SPS)+(F  | <sup>2</sup> CU) Ausgabe   |       |         | (i)         |
| - 💖 Status Kommunikation                   | Bute      | Parameter                       | Kanal | Putter   | Bute      | Parameter                  | Kanal | Putter  | ~           |
| <ul> <li>Status Systemparameter</li> </ul> | 0000/0001 | 002 Solwart (E001)              | 0     | 700      | 0000/0001 | 002 Solhuret (P001)        | 0     | [3000]] | Enveiterte  |
| B- V Status zonenparameter                 | 0002/0003 | 002 Solwert (P001)              | 1     | 1000     | 0002/0003 | our commence cort          |       | 0       | Eingabe übe |
| in Status                                  | 0004/0005 | 003 Stelared (P002)             | MU.   | 0        | 0004/0005 |                            |       | Ô.      | sekundare   |
| - Status Regeiparameter                    | 0006/0007 | 003 Stelgrad (P002)             | MU    | 0        | 0006/0007 |                            |       | 0       | Maustaste   |
| Status Regelung                            | 0008/0009 | 001 Protokoll (CP02)            | SYS   | 0        | 0008/0009 |                            |       | 0       |             |
| Status Kanalflag / Timer                   | 0010/0011 | 001 nicht zugeordnet            |       | 21449    | 0010/0011 |                            |       | 0       |             |
|  | 0012/0013 | Betehi / kein Betehi aktiv      | PABn  | 0        | 0012/0013 | Befehl / kein Befehl aktiv | PABn  | 0       |             |
| E Ratus Profinet 10                        | 0014/0015 | Kanal SYS / Offset 0            | PABn  | 0        | 0014/0015 | Kanal SYS / Offset 0       | PABn  | 0       |             |
| - Status Objektliste Eingabe-/Ausg         | 0016/0012 | keine Funktion                  | PARn  | 0        | 0016/0017 | keine Funktion             | PARn  | 0       | Anzeige     |
| Status Direct IOs                          | 0018/0019 | Daterwart 0                     | PMRn  | 0        | 0018/0019 | Datenwort 0                | PMRn  | 0       | hexadezimi  |
| Status virtuelle digitale Eingänge         | 0020/0021 | Daterwort 1                     | PARn  | 0        | 0020/0021 | Datenwort 1                | PARn  | 0       |             |
| Status virtuelle dicitale Ausoance         | 0022/0023 | Daterwort 2                     | PARn  | <u>v</u> | 0022/0023 | Daterwort 2                | Palin |         | Educate     |
| Datus 10-Differ CAN/Componenten            | 0024/0025 | Daterwart 3                     | Pagen | 0        | 0024/0025 | Daterwort 3                | Pagen |         | Comode      |
| D thread Dates                             | 0026/0027 | Daterwort 4                     | PAPIN | 0        | 0026/0027 | Diatenwort 4               | Papin | 0       | urr         |
| E orezentoaran                             | 0020/0023 | Carer and a solo solo and       | renn  | 2040     | 0028/0029 | Marchite 2000 0000 00      | renn  | 8       |             |
|  |           |                                 |       |          |           |                            |       |         |             |
| Philip N. Status                           | ×         |                                 |       | 1        |           |                            |       | ×       |             |

Example PCU128PNIO

<RETURN> confirms the entered value.

Handshake

The bits in the handshake (see chapter 3.2) should be set accordingly before writing the object list.

The object "handshake" (right window) must be select and the secondary mouse button must be pressed. A dialogue box appears.

In the dialog box

• Set <Edit static objects> (✓)

| it | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 3     | 2 1  | 0              |      |       |       |       |        |       |          |             |             |             |            |       |      |   |
|----|----|----|----|----|----|----|---|---|---|---|---|---------|------|----------------|------|-------|-------|-------|--------|-------|----------|-------------|-------------|-------------|------------|-------|------|---|
|    | 0  | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0 | 0 | 0 0     | 0 0  | 0              | 0000 |       |       |       |        |       |          |             |             |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   | 1 |   | MU<br>0 | X-Ka | nal:<br>jültig | je M | MU    | ĸк    | anä   | ile O· | 127   | ŋ (<br>1 | l=<1<br>27: | > Z<br>=<13 | Cone<br>28> | e 1<br>Zor | ne 13 | 28   |   |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | To   | oggle          | ebi  | it Pa | aram  | nete  | erkan  | nal   |          |             |             |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | T    | oggle          | ebi  | it M  | IUX-I | Kar   | nal    |       |          |             |             |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | To   | oggle          | ebi  | it st | atisc | che   | Obje   | ekte  | •        |             |             |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | Ti   | meo            | ut   | Trig  | gger  | ina   | ıktiv, | da    | PR       | OF          | INE         | тю          | ) Ti       | meo   | ut=0 | s |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | Pa   | aram           | nete | erka  | anal  | bea   | arbei  | iten  |          |             |             |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   |   | Г       | м    | UX-K           | Kar  | nal   | Sch   | nreit | oobje  | ekte  | be       | arb         | eite        | n           |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   |   | I       | м    | UX-K           | Kar  | nal   | Les   | eob   | ojekte | e be  | earb     | eite        | en          |             |            |       |      |   |
|    |    |    |    |    |    |    |   |   |   |   | - | F       | ₹ St | atisc          | che  | e Ol  | bjek  | te b  | bearb  | peite | en       |             |             |             |            |       |      |   |

# Example PCU128PNIO

Exit dialog box by <OK>.

According to the settings you will see a value other than 0 in the buffer for handshake.

Editmode OFF When you exit the **Edit mode**, the specified are written to the PNIO controller and trigger the appropriate actions.

The appearing box <Write object list output buffer?> has to be acknowledge accordingly.

After an error-free processing the content is copied into the input buffer.

# Configuration and Online Mode with flexotempMANAGER



Select the field buffer behind the object on the right side and activate the entering of values by secondary mouse button. The value 3500 is entered and confirmed by <RETURN>.



Take care of the data format at specification of values of parameters.



After an error-free processing the content is copied into the input buffer.

OFF

# 8 Integration of a PCUXXXPNIO in a SIMATIC 300 PROFINET Network

To integrate a temperature PNIO controller in a SIMATIC 300 PROFINET network, the following steps have to be executed.



The example describes the procedure using the SIMATIC Manager of Siemens.

Create empty and/or new project.

In this example the project has the name **"flexotempPNIO**" and is stored in the folder **"D:\Daten\flexotempPNIO**".

| itei Ziel:<br>1 🚘 | system Ansicht Extras Fer         | ister Hilfe       |                    |
|-------------------|-----------------------------------|-------------------|--------------------|
|                   |                                   | _                 |                    |
| Ne                | ues Projekt                       |                   | ×                  |
|                   | Anwenderprojekte Bibliothek       | en Multiprojekte  |                    |
|                   | Name                              | Ablagepfad        |                    |
|                   |                                   | D:\Daten\S7\Alarm | Logger\AlarmeZe    |
|                   | AlarmeZeitstempel                 | D:\Daten\S7\Alarm | Logger neu\Alarme  |
|                   | AlarmeZeitstempel                 | D:\Daten\S7\Alarm | neZe               |
|                   | AlarmeZeitstempel                 | D:\Daten\S7\Alarm | ZeitStempel        |
|                   | AlarmeZeitstempel                 | D:\Daten\S7\C_SF  | PS_101007\Alarmez  |
|                   | alarmeZeitstempel071010           | C:\Programme\Sier | nens\Step7\s7proj\ |
|                   | AnbindunaMCII<br>◀                | C-\Programme\Sier | ens\Sten7\s7nmi\   |
|                   | <u></u>                           |                   |                    |
| I                 | 🔲 In aktuelles Multiprojekt einfi | igen              |                    |
| 1                 | Name:                             |                   | Lyp:               |
|                   | flexotempPNIO                     |                   | Projekt 💌          |
| · · · · ·         |                                   |                   | E seas a s         |
|                   | Ablageort (Pfad) :                |                   | E-BIDIOMEK         |
|                   | D:\Daten\flevotempPNI0            |                   | Durchaushan        |
|                   | o. lo don nonocompi nito          |                   |                    |
|                   |                                   |                   |                    |
|                   | OK                                | Abbred            | hen Hilfe          |
|                   |                                   |                   |                    |

#### SIMATIC Manager step 1

Before the PROFINET IO connection is established, the hardware of the PLC Controllers must be configured first.

In this example a S7315-2 CPU is used.

Select in the dialog <**Neues Objekt einfügen>** of SIMATIC Managers <**SIMATC 300-Station>**.



## SIMATIC Manager step 2

## Create hardware configuration

Click on <Hardware> to reach the hardware Manager.

| SIMATIC Manager - [flexoten   | npPNIO D:\Daten\fl    |
|-------------------------------|-----------------------|
| 🎒 Datei Bearbeiten Einfügen Z | ielsystem Ansicht Ext |
| 🗅 🛩 🔡 🛲 🕺 🖻 🖻                 |                       |
| E B flexotempPNIO             | Hardware              |
| SIMATIC 300(1)                | 13                    |
|                               |                       |
|                               |                       |
|                               |                       |

Create module rack for hardware.

| HW Konfig = [51MATIC 300(1) (Konfiguration) flexotempPNIO] | 1.07-                 |                   |          |                                      |
|--|-----------------------|-------------------|----------|--------------------------------------|
| D of the second bridger Langester Andre Cortes Person      | Pare                  |                   |          |                                      |
|  |                       |                   |          | l inter                              |
| = (0) UR   |                       |                   | 3        | Suten                                |
| 1  |                       |                   |          |                                      |
| 3  |                       |                   |          | grone Standard                       |
|  |                       |                   |          | PROFIBUS-OP                          |
| 6  |                       |                   |          | B PROFINET 10                        |
| 1 <del>/ 1</del>   |                       |                   | -        | B-M SMATIC 300                       |
| •  |                       |                   | 1        | ÷ 🛄 CP-300                           |
| ale la un  |                       |                   |          | E-CPU-300                            |
|  | Learning Lawrence     | Leason Lasson     | free E   | 18-00 IM-300                         |
| Steptplatz Daugruppe Destemuniner                          | Filliware Mr1-Adlesse | E-Adeste A-Adeste | Nonmerka | M7-EXTENSION                         |
| 2  |                       |                   |          | 18 🔄 PS-300                          |
| 3  |                       |                   |          | E- RACK-300                          |
| 6  |                       |                   |          | @ 🛄 SM-300                           |
| 6  |                       |                   |          | E SIMATIC 400                        |
| 8  |                       |                   |          | B G SIMATIC PC Sated Control 300/401 |
| 9  |                       |                   | §        |                                      |
| 10   |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          |                                      |
|  |                       |                   |          | 1                                    |
|  |                       |                   |          | RES7 39017770-0440                   |
|  |                       |                   |          | In verschiedenen Längen lieferbar    |
| 1  |                       |                   |          |                                      |
| änfügen nöglich  |                       |                   |          | And                                  |
| 🏨 Start 🔄 🏉 🗊 🦨 SDNATIC Manager - (Flex 🔡 Total Con        | mander 6.01 - 1       | nig - [SIMATIC    |          | 4 07.23 CK 07.23                     |

# SIMATIC Manager step 3

Equip slots of the module rack (rail) with the required components.

The are available in the hardware catalog of SIMATIC Manager.

In this example CPU 315-2 PN/DP is selected.

This CPU has a Profibus DP and a PROFINET Controller.

| 170.1170                                       |   | 1                                     |                    |                       |                                     |            |            |                 |   | 의:                      |
|--|---|---------------------------------------|--------------------|-----------------------|-------------------------------------|------------|------------|-----------------|---|-------------------------|
| UTUH   |   |                                       |                    |                       |                                     |            |            |                 | Sychen  | nta                     |
| 0  | PU 315-2 PN/DP  |                                       |                    |                       |                                     |            |            |                 | Erofit Standard   | 1                       |
| A  | V-10  |                                       |                    |                       |                                     |            |            |                 | 10 🛄 C7   | 7                       |
| P1 R   | 5A 7  |                                       |                    |                       |                                     |            |            |                 | E) (P-300<br>(CP-300)   |                         |
|  |   |                                       |                    |                       |                                     |            |            |                 | 8 CPU 312   |                         |
|  |   |                                       |                    |                       |                                     |            |            |                 | E CPU 312 IFM   |                         |
|  |   |                                       |                    |                       |                                     |            |            |                 | CPU 312C  |                         |
|  |   |                                       |                    |                       |                                     |            |            |                 | IE CPU 313C   |                         |
| 1  |   |                                       |                    |                       |                                     |            |            |                 | R CPU 313C-2 DP   |                         |
|  |   |                                       |                    |                       |                                     |            |            |                 |   |                         |
|  |   |                                       |                    |                       |                                     |            |            | D.              | 🗷 🦲 CPU 313C-2 PIP  |                         |
|  |   |                                       |                    |                       |                                     |            |            | A               | B CPU 313C-2 PP<br>B CPU 313C-2 PP<br>B CPU 314   |                         |
|  |   |                                       |                    |                       |                                     |            |            | 1               | <ul> <li>CPU 313C-2 PP</li> <li>CPU 314</li> <li>CPU 314</li> <li>CPU 314 FM</li> <li>CPU 314/FM</li> <li>CPU 314C-2 DP</li> </ul>  |                         |
|  | 10  |                                       | _                  | _                     | _                                   |            |            | 1               | CPU 313C-2PP     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314C-2DP     CPU 314C-2PP  |                         |
| (0)  | JR  |                                       |                    |                       |                                     |            |            | 1               | CPU 313C-2PP     CPU 313C-2PP     CPU 314     CPU 314 IFM     CPU 314 IFM     CPU 314C-2PP     CPU 314C-2PP     CPU 315   |                         |
| (0) 1<br>scikpiatz                             | JR<br>Bauguppe  | Bestelinummer                         | Ferroware          | MPI-Advesse           | E-Adesse                            | AAdresse   | Kommentar  | 1               | CPU 313C2PP     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314     CPU 31422PP     CPU 314C2PP     CPU 3152PP     CPU 315     CPU 31522P   |                         |
| ockpiałz                                       | JR<br>1 Bauguppe  | Destelinumer                          | Ferrovate          | MPI-Adresse           | E-Adesse                            | AAdresse   | Kommentar  |                 | CPU 313C-2PP     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314C-2DP     CPU 314C-2DP     CPU 3152DP     CPU 3152DP     CPU 3152PN/DP     SC7 3152EN/DP  | 0.0480                  |
| ocktiatz                                       | IR<br>Bauguppe<br>CPU 315-2 PN/DP   | Bestelkurmer<br>6ES7 315-2EH13-0A80   | Ferriviare<br>V2.6 | MPI-Advasce           | E-Adesse                            | A-Adresse  | Kommenitar | A9              | CPU 315/2 PP     CPU 316/2 PP     CPU 314/FM     CPU 314/FM     CPU 314/FM     CPU 314/FM     CPU 315/2 PP     CPU 315/2 | 0 0480                  |
| (0) 1<br>sckpistz                              | IR<br>Bauguope<br>11 CPU 315-2 PN/DP<br>AMR-20P<br>/RM/7  | Destelnumeer<br>6ES7 315-2EH13-0A80   | Ferrovate<br>V2.6  | MPI-Admite            | E-Adesse                            | A Adresse  | Kommentar  | <br>₹           | CPU 313C2 PP     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314C2 PP     CPU 314C2 PP     CPU 3152 PPU     CPU  | 0 0480<br>3 0480        |
| ckpistz  | IR<br>Baugnope<br>CPU 315-2 PN/DP<br>ARE/DP<br>ARE/DP<br>ARE/   | Destelnumer<br>6ES7 315-2EH13-0A80    | Firmware<br>V2.6   | MPI-Adieste<br>2<br>2 | E-Admise<br>2047-<br>2046-<br>2045- | A-Adresse  | Kommentar  | ARIA            | CPU 33522PP     CPU 33422PP     CPU 344 FM     CPU 344 FM     CPU 344 FM     CPU 344 FM     CPU 34520P     CPU 352 FW0P     CPU 3552  | 0 QABO<br>3 QABO _      |
| ckpistz  | R<br>Bauguspe<br>SCPU 315-2 PN/DP<br>MP/CP<br>/W/O<br>Asr 7   | Destelex.meer<br>6ES7 315-2EH13-0A80  | Ferrovase<br>V2.6  | MPI-Advasse<br>2<br>2 | E-Admise<br>2047*<br>2045*          | A-Adresse  | Konmentar  | AR              |   | 00480<br>30480 _        |
| ckpistz  | IR<br>Bauguppe<br>CPU 315-2 PN/DP<br>MR-CP<br>MR-CP<br>ANAD<br>Aber 1   | Bastelsumer<br>6ES7 315-2EH13-0AB0    | Ferrovase<br>V2.6  | MP-Adiasse<br>2.<br>2 | E-Admise<br>2047*<br>2045*          | A-Adresse  | Konmentar  |                 | CPU 313:22PP     CPU 313:22PP     CPU 314:22PP     CPU 314:22PP     CPU 314:22PP     CPU 315:22PP     CPU 315:22PP     CPU 315:22PP     CPU 315:2PP       | 00480<br>30480 ,        |
| (0) 1<br>ckpistz                               | IR<br>Bisignope<br>I CPU 315-2 PN/DP<br>APR/D<br>APR/D<br>APR/D<br>APR/T                                      | Batelsurver<br>6E57 315-2EH13-0A80    | Firmwate<br>V2.6   | MPI-Advesse<br>2<br>2 | E-Admise<br>2047-<br>2046-<br>2045- | A Adresse  | Kommenitat |                 | CPU 313:22PP     CPU 313:22PP     CPU 314     CPU 314     CPU 314     CPU 314     CPU 314:PH     CPU 315      | 00480<br>30480 ,        |
| 10) 1<br>sckplatz                              | IR<br>Bauguspe<br>ICPU 315-2 PN/DP<br>ARDP<br>/MAD<br>/Ref /  | Destelvance<br>6F57 315-2EH13-0A80    | Firmwate<br>V2.6   | MP-Adesse<br>2<br>2   | E-Adesse<br>2047*<br>2046*<br>2045* | AAdrosse   | Kommenitat | <sup>23</sup> 키 | CP 33522PP     CP 33522P     CP 3352PP     CP 3341Pi     CP 3341Pi     CP 3341Pi     CP 33422P     CP 3352     CP 335   | 00480<br>3-0480 _       |
| 10) 1<br>sckistz<br>7<br>2<br>2<br>2<br>7<br>1 | IR<br>Beagacpe<br>CPU 315-2 PN/DP<br>ARCO<br>ARCO<br>ARCO<br>ARCO   | Destelsurreer<br>6ES7 315-2EH13-0A80  | Ferrovate<br>V2.6  | MP-Adasse<br>2<br>2   | E-Admise<br>2047*<br>2046*<br>2045* | A-Adresse  | Kommeritat | ARIA            | CPU 33522PP     CPU 33522PF     CPU 3362PF     CPU 334PA     CPU 334PA     CPU 334PA     CPU 33422PP     CPU 3352     CPU 3355     CPU 335     CPU 3355     CPU 335     CPU 345    | 00480<br>3-0480 _       |
| 00 1<br>ockristz<br>7<br>22<br>277             | IR<br>Bauguope<br>I CPU 315-2 PN/DP<br>MP4:0P<br>AV40<br>AV40<br>AV40<br>AV40<br>AV40<br>AV40<br>AV40<br>AV40 | Destelsurese<br>6E57 315-2EH13-0A80   | Ferriouste<br>V2.6 | MPL-Advesse<br>2<br>2 | E-Admite<br>2047*<br>2045*<br>2045* | Avlickeose | Kommenitat |                 | CP 33522PP     CP 33522P     CP 3352PP     CP 3341Pi     CP 3341Pi     CP 3341Pi     CP 3341Pi     CP 3352P     CP 3352P     CP 3352P     CP 3352PP     | 00480<br>3-0480 _       |
| 1 10 10 1<br>nocksistz                         | JR<br>Besgruppe<br>CPU 315-2 PN/DP<br>AR2 CP<br>AR2 CP<br>AR40<br>Arbor<br>Arbor<br>Arbor<br>Arbor<br>Arbor   | Destaburrear<br>6ES7 315-2EH13-0A80   | Ferrocate<br>V2.6  | MPI-Advasce<br>2<br>2 | E Admite<br>2047-<br>2045-          | A-Adresse  | Konmentar  |                 | C CV 3352 2PP     C CV 3352 2P     C CV 3352 2P     C CV 334     CV 334     CV 334     CV 334     CV 3342 2P     CV 3452 2P     CV 3452 2P     CV 3452 2P     CV 3552 2V     CV 3552 2V     CV 3552 2V     CV 355     CV 357     CV 35     CV 357     CV     CV 357     CV     | 0 Q480<br>3 Q480 _      |
| (0) 1<br>recksistz                             | IR<br>Вацисее<br>СРИ 315-2 РИЛОР<br>МР.40<br>Рос 7<br>Рос 7   | Destelsummer<br>6E 57 315-2E H13 0A80 | Ferrovane<br>V2.6  | MR Adasse<br>2<br>2   | E-Adesse<br>2047*-<br>2045*         | A-Adeose   | Kanmerka   |                 | CPU 33522PP     CPU 33522PP     CPU 3352PP     CPU 341F4     CPU 341F4     CPU 341F4     CPU 34522PP     CPU 3352     CPU 3352PP     CP  | 0 Q480<br>3 Q480 _      |
| 100 1<br>reckplatz                             | /Я<br>Видисоре<br>1020 3152 РИОР<br>ИВС/Р<br>7960<br>7967<br>7967   | Destabuence<br>6E 57 315-7EH13-0A80   | Ferrocase<br>V2.6  | MPI Adesse<br>2<br>2  | E-6dasse<br>2047*<br>2046*<br>2045* | A Adresse  | Kanmentai  |                 | CPU 37522PP     CPU 37522PP     CPU 3752PP     CPU 375     CPU 375     CPU 375     CPU 375     CPU 3752PP     CPU 3752PP  | 00400<br>30480 _        |
| 00 1<br>nockplatz                              | )R<br>Видисора<br>СРШ 1952 РНОР<br>ЛУЧО<br>ЛУЧО<br>РучО<br>РучО<br>РучО<br>РучО                               | Darbehumer<br>RES7 315-20113-0480     | Ferrovaee          | MPLAdasse<br>2<br>2   | E-Admite<br>2047<br>2046"<br>2045"  | A-Adresse  | Kanmenta   |                 | COUST 24     COUST 25      | 00460<br>30460<br>08406 |
| 10 1<br>sckpistz                               | R<br>Bagacee<br>CPU 3752 PMOP<br>MPLO<br>PMO<br>Far 1   | Brindrumow<br>8157/315-22H13-0A00     | Ferrocate<br>V2.6  | MPLAdesse<br>2<br>2   | E Adesse<br>2047-<br>2045'          | Avideose   | Konmenta   |                 | B C (2) 332,2 PP (3) 32,2 PP (3) 32,2 PP (3) 32,2 PP (3) 24,2 | 00480<br>30480<br>      |

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Integration of a PCUXXXPNIO in a SIMATIC 300 PROFINET Network

One <PROFINET IO-System einfügen>

| HW Konfig - [SIMATIC 300(1) (Konf      | iguration) flexotempPNIO]  |                               |
|--|--|-------------------------------|
| III Station Bearbeiten Einfügen Zielsy | rstem Ansicht Extras Fenster H   | ilfe                          |
| D 😂 🐎 🖩 🕵 🎒 🖪 🖻                        | 🔬 🎪 🚯 🗖 💥 😽  |                               |
|  |  |                               |
| X2 P1 Port 1                           | Kopieren   | Ctrl+C                        |
| 4<br>5<br>6<br>7<br>0                  | Objekt tauschen<br>Mastersystem einfügen<br>Mastersystem tinnenen<br>PROFINET I OSystem einfügen<br>PROFINET I OSystem tinnen<br>PROFINET I O Topplogie<br>Taktsynchronisation |                               |
| -                                      | Baugruppe spezifizieren  |                               |
| (0) UR                                 | Löschen  | Del                           |
| Steckplatz Baugrupp B                  | <b>Gehe zu</b><br>Zugeordnete Baugruppen filtern   | •                             |
| X1 MFI/DF                              | Beobachten/Steuern   |                               |
| X2 PN/II<br>X2 F1 Port 1<br>3<br>4     | Symbole bearbeiten<br>Objekteigenschaften<br>Objekt: öffnen mit  | Alt+Return<br>Ctrl+tAlt+O     |
| 5 6<br>6 7<br>8                        | Produktsupport-Informationen<br>FAQs<br>Handbuch-Suche   | Ctrl+F2<br>Ctrl+F7<br>Ctrl+F6 |
| 9<br>10                                | Device Tool starten  |                               |

Give the PROFINET IO System a name and set a check for <Namen im IO-Device / Controller verwenden>.

In this example the PROFINET IO system is named "pn-netzwerk".

| igenschaften PROFIN   | €T IO-System                                | ×               |
|-----------------------|---|-----------------|
| Aligemein Aktualisien | ingszek                                     |                 |
| Kurzbezeichnung:      | PROFINET IO-System                          |                 |
| Name:                 |   |                 |
| IO-System-Nr.         | 100 Vame m IU-Device / Controller Verwenden |                 |
| Subnetz:              | Ethemet(1)<br>Eigenschaften                 |                 |
| Kommentar.            |   |                 |
|                       | ×<br>2                                      |                 |
|                       |   |                 |
| OK                    |   | Abbrechen Hille |

Click on the PROFINET IO Controller Module, to reach the property dialog of the PROFINET IO Controller.

Configure the PROFINET IO network.

Click on **<Eigenschaften>**, to define the properties of the interface.

| <u>G</u> erätename: | PNHO            |                | . pn-netzwerk |         |
|---------------------|-----------------|----------------|---------------|---------|
|                     |                 |                |               |         |
| - Schnittstelle     | Ethernet        |                |               |         |
| Gerätenummer:       | 0               |                |               |         |
| Adresse:            | - 192.168.0.240 |                |               |         |
| Vernetzt:           | ja              | Eigenschaften. | .] 🛑          |         |
| Kommentar:          |                 | 0.             |               |         |
|                     |                 |                |               | <u></u> |
|                     |                 |                |               | -       |

# Meusburger Deutschland GmbH 37 PROFINET IO

In the dialog **<Eigenschaften–Ethernet Schnittstelle>** IP address and subnet mask of PROFINET IO Controller are defined.

Select the appropriate subnet by selection menu for <**Subnetz**>.

Select desired settings and confirm by <OK>.

The network settings for PROFINET IO Controllers are completed.

| Allgemein Parameter  |   |
|--|---|
| JP-Adresse: <b>192168 0.24</b><br>Subnetz <u>m</u> aske: 255.255.255.1 | Netzübergang           © Keinen Router verwenden           © Router verwenden           Adgresse:         192.168.0.240 |
| Subnetz:<br>nicht vernetzt   | <u>N</u> eu   |
| Ethernet[1]  | Eigenschaften   |
|  |   |

#### **SIMATIC Manager step 4**

After completion of the Control Setup the following steps are explained, that are necessary for the Setup of the PROFINET IO component **PCU128PNIO**.

The characteristic features of the communication module **PCU128PNIO** are defined in the form of a electronic data sheet, the GSDML file. If the file does not exist, it must be installed in the SIMATIC Manager.

Select <Extras> <GSD-Dateien installieren>.

Select XML file

Note: Please download the latest version of the Meusburger homepage (at least 09/2011)

| HW Kon   | nfiq - [S                                   | IMAI                          | IC 30 <u>0(</u> | 1) (Kon    | figural                | tion)                                 | flexotem                       | pPNI01  |                                     |                 |                   |
|--|---|-------------------------------|-----------------|------------|------------------------|---------------------------------------|--------------------------------|---|-------------------------------------|-----------------|-------------------|
| Station  | Bearb                                       | eiten                         | Einfüge         | n Ziels    | ystem                  | Ansicht                               | Extras                         | Fenster   | Hilfe                               |                 |                   |
| -<br>D 🚅 🕯   | - <b>B</b>                                  | <b>B</b> 01                   | -<br>           | <b>b</b> R | . 📩                    | ŵ   [:                                | Einst                          | ellungen  | •                                   |                 | Ctrl+A            |
| = (0) UF   | R   | U 315                         | i-2 PN/         | DP         |                        |                                       | Baug<br>Netz<br>Symb           | ruppe spe<br>konfigurie<br>ooltabelle<br>emfehler r | zifizieren<br><b>:ren</b><br>nelden |                 | Ctrl+A            |
| X1<br>X2<br>X2 P1  | PN-   | VDP<br>10.pn-<br>11           | netzwerk        |            |                        |                                       | Katal<br>Katal                 | ogprofile<br>og aktuali                             | bearbeiten<br>sieren                | 1               |                   |
| 3<br>4<br>5  |   |                               |                 |            |                        |                                       | HW-U<br>GSD-                   | Jpdates in<br>Dateien in                            | stallieren<br>stallieren            | •               |                   |
| 6  |   |                               |                 |            |                        | - 1                                   | Such                           | e in Servio   | e & Suppoi                          | rt              |                   |
| 10   |   |                               |                 |            |                        |                                       | GSD-                           | Datei für   | I-Device er                         | stellen         |                   |
| 5D-Dateio<br>GSD-Datei   | en insta<br>ien insta                       | alliere<br>llieren:           | n               |            | aus der                | m Verzeio                             | chnis                          |   | -                                   |                 |                   |
| 5D-Dateio<br>GSD-Datei<br>D:\Daten   | en insta                                    | alliere<br>llieren:           | :n              | 1          | aus der                | m Verzeio                             | chnis                          |   | <b>.</b>                            |                 | Durchsuc          |
| 5D-Datei<br>GSD-Datei<br>D:\Daten<br>Datei<br>GSDML\                         | en insta<br>ien insta<br>/2.1-PSI           | allieren:<br>lieren:<br>3-PCU | n<br>xxxPNIO-   | 2009110    | aus der<br>(<br>4. xml | m Verzeic<br>Ausgabe<br>04.11.20      | chnis<br>estand<br>109 00:00:0 | Versi<br>0 V2.1                                     | on Sprac<br>Englis                  | chen<br>sch, De | <u>D</u> urchsuc  |
| 5D-Dateic<br>GSD-Datei<br>D:\Daten<br>Datei<br>ISSDML\                       | en insta<br>ien insta<br>/2.1-PSi           | allieren:<br>lieren:          | m<br>xxxxPNIO-  | 2009110-   | aus der<br>4.xml       | m Verzeie<br>Ausgabe<br>04.11.20      | estand<br>109 00:00 0          | Versi<br>0 V2.1                                     | on Sprac                            | chen<br>sch, De | <u>D</u> urchsucl |
| 5D-Dateir<br>GSD-Datei<br>D:\Datei<br>GSDML-                                 | en insta<br>ien insta<br>/2.1.PSi           | allieren:<br>lieren:<br>3-PCU | xxPNIO          | 2005110-   | aus der<br>4. xml      | m Verzeik<br>Ausgabe<br>04 11 20      | stand<br>109 00:00 0           | Versi<br>0 V2.1                                     | on Sprac<br>Englis                  | then<br>ch, De  | <u>D</u> urchsuch |
| 5D-Dateir<br>GSD-Datei<br>D:\Datei<br>IGSDML\<br>PROFINE                     | en insta<br>ien insta<br>/2.1.PSI           | allieren:<br>3-PCU            | ****PNIO        | 20031104   | aus der                | m Verzeir<br>Ausgabe<br>04 11 20      | stand<br>109 00:00 0           | Versi<br>0 V2.1                                     | on Sprac                            | ch De           | Durchsuch         |
| SD-Dateit<br>GSD-Datei<br>D:\Daten<br>Datei<br>ISSDMLA<br>PROFINE<br>Install | en insta<br>ien insta<br>/21-PS(<br>T 10-De | ilieren:                      | n<br>xxxxPNIO   | 2009110    | aus der<br>4.xml       | m Verzeir<br>Ausgabe<br>04.11.20<br>L | stand<br>ostootooto            | Versi<br>0 V2.1                                     | on Sprac<br>Englis                  | shen<br>sch. De | Durchsuch         |

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Integration of a PCUXXXPNIO in a SIMATIC 300 PROFINET Network

#### **SIMATIC Manager step 5**

After installing the GSD file the PROFINET IO module PCU128PNIO is in the catalog of the SIMATIC Manager available. The module can be connected to the network section of the PROFINET IO network.

Drag the element "**PSG PCUxxxPNIO**" with the mouse button to the network section and keep the primary mouse button pressed.



#### SIMATIC Manager step 6

The PROFINET IO Slave participant is now connected with the PROFINET IO bus section.

| (0) UR    |                    |          | 1 | Eth | emet(1): on netz  | werk (100)  |
|-----------|--------------------|----------|---|-----|-------------------|-------------|
| CPU       | 315-2 PN/DP        | <u> </u> |   |     | emet(1): prinetzi | Melik (100) |
|           | DP<br>Dog gotzundt |          |   |     | 🚡 (1) COMXR       | EPI         |
| 2 P1 Port | 1                  |          |   |     | <b>IPS</b>        | 3           |
|           |                    |          |   |     | flexiotem         | 0           |
| _         |                    |          |   |     |                   |             |
|           |                    |          |   |     |                   |             |
|           |                    |          |   |     |                   |             |
|           |                    |          | 1 |     |                   |             |

In the next step, the process image of the I/O data can be specified. All relevant data types of the **PCUxxxPNIO** are defined in the GSD file. The appropriate modules can now easily be drawn with the help of the mouse pointer on the appropriate slots. Here, keep the primary mouse button pressed.

| PU 315-2 PN/DP<br>BVDP<br>R4Dp onachedk<br>Bar I     |  | Ethemet(); pn netz   | week (100)  |  |                      | Droft   | Standard<br>PROFIBUS OP<br>PROFIBUS PA<br>PROFINET IO   | 10  |
|--|--|--|---|--|----------------------|---|---|---|
| PD 315-2 PHOP<br>PPDP<br>74/02 po naciwerk<br>lant 1 |  | flexiotem  | <b>5</b><br>0°  |  |                      | Polit   | Standard<br>PROFIBUS OP<br>PROFIBUS PA<br>PROFINET IO   |   |
| 74-IO ponaciwerk<br>Tert 1                           |  | flexiotem  | <b>5</b><br>0°  |  |                      |   | PROFIBUS-OP<br>PROFIBUS-PA<br>PROFINET IO   |   |
|  |  |  |   |  | 1                    |   | G datway<br>I/O<br>Netwak Components<br>Sensors<br>Watere FELDGERATE<br>■ I/O<br>■ J/O<br>■  | odul<br>odul  |
| COMPREPAS pronetzwerk                                | Restellautorer   | Eddesse  | - ådesse  | Diamoseate   | LK L                 |   | Eingsbemodule   | lubo  |
| CONTREPNS privation                                  | 150x10x  |  |   | .394.2*  |                      |   | Ot 6 Byte Eingabern   | dul   |
| 128 Byte Ausgaberrodul                               |  |  | 256383  |  |                      |   | 002 Byte Eingabern  | 1000  |
| 128 Byte Ausgaberrodul                               |  |  | 384511  |  |                      |   | 120 Byte Elizabeth  | ndul.   |
| 128 Byte Eingeberrodul                               |  | 256383   |   |  |                      | 1.00  | SIMATIC 300   | 1000  |
| 128 Byte Eingsbernodul                               |  | 384511   |   |  |                      | i i i i i i i i i i i i i i i i i i i   | SIMATIC 400   |   |
| B 1000 - 5 - 1 - 11                                  |  | F10.000  | -   |  | + 1                  |   | SIMATIC PC Based Control 300/400  |   |
| 120 Byte Eingeberricdu                               |  | 512639   |   |  | + 1                  | ÷ .   | SIMATIC PC Station  |   |
|  |  |  |   |  | + 1                  |   |   |   |
|  |  |  | -   |  |                      |   |   |   |
|  |  |  |   |  | -                    |   |   |   |
|  |  |  |   |  |                      |   |   |   |
|  |  |  |   |  |                      |   |   |   |
|  |  |  |   |  |                      | <u> </u>  |   |   |
|  |  |  |   |  | -                    | 128 Byte  | le Eingaberrodul  | . t   |
|  |  |  |   |  | H                    | DODML   | 242 1450 4C0 xxxr10 20091104 xm   | 1 -   |
|  |  |  |   |  | Ē                    | 129 Bye<br>GSDML  | te Eingabernodul<br>"V2.1.PSG-PCUxxxPNID-20091104.xml   | I   |
|  | 2006/REPHS prvetawni.<br>Bacyuson<br>2006/REPHS prvetawni.<br>2006/REPHS prvetawni.<br>2018 byte Englemental<br>128 byte Englemental<br>128 byte Englemental<br>128 byte Englemental | 2049RPM pretown between the standard st | 2049RPM pretowa<br>based of the second | 204/2019 greetswit<br>Bagges Berkhanne Eddense Addesse<br>Dolly Fragmend (SJ 10 2000)<br>103 brit hospitendd SS 100 2000<br>103 brit fragmendd SS 100 2000<br>103 brit f | 2005/EPIG proteises. | Bangan         Benhamm         Edgens         Address         Edgensel         K.           Ob/OD/780 proteom         553 /b         266 /b         2 | 2004/RMG prestowit         Extension         Address         Dagmentation           Imagenesis         Extension         Address         Dagmentation         Imagenesis         Imagenesis </td <td>2006/EPIC proteomic         6 datase         6 datase<!--</td--></td> | 2006/EPIC proteomic         6 datase         6 datase </td |

Be sure to note that the configuration of the I/O data (sequence, slots, and type of modules) must later match exactly the configuration of the PCUxxxPNIO component in the flexotempMANAGER.

Subject to technical changes Rev. 1.00.05

#### SIMATIC Manager step 7

Open the properties dialog by clicking on the PROFINET IO slave on the bus section.

Unambiguous device name see chapter 8 Step 9.

The device name must match the station name of **PCUxxxPNIO**, that is used in flexotempMANAGER (see chapter 7.1.1)

| genschaften - COMXI | REPNS  |               |             |           | >        |
|---------------------|--|---------------|-------------|-----------|----------|
| Allgemein 10-Zyklus |  |               |             |           |          |
| Kurzbezeichnung:    | COMXREPNS                                    |               |             |           |          |
|                     | PROFINET IO-Device                           |               |             |           | ×        |
| Bestell-Nr:         | 153x.10x                                     |               |             |           |          |
| Familie:            | PSG-Plastic Service GmbH                     |               |             |           |          |
| Gerätename:         | pcu128pnio                                   |               | , pn-netzwe | ık        |          |
| GSD-Datei:          | GSDML-V2.1-PSG-PCUxxx<br>Ausgabestand ändern | (PNIO-2009110 | )4. xml     |           |          |
| Gerätenummer:       | 1 -  | pn-netzwe     | rk (100)    |           | -        |
| IP-Adresse:         | 192.168.0.241                                | Etherr        | net         |           |          |
| IP-Adresse durch    | 10-Controller zuweisen                       |               |             |           |          |
| Kommentar:          |  |               |             |           |          |
|                     |  |               |             |           | <u>_</u> |
|                     |  |               |             |           | <b>v</b> |
| ОК                  |  |               |             | Abbrechen | Hilfe    |



Before an I/O device can be addressed by an I/O controller, you must have a device name. In PROFINET IO, this approach has been chosen because names are easier to handle than complex IP addresses. Assigning a device name for a specific I/ O device can be compared with the setting of the PROFIBUS address for a DP slave.

#### **SIMATIC Manager step 8**

Exit hardware configuration and change to main window of SIMATIC Manager.

Select item <**Ethernet-Teilnehmer bearbeiten**> in menu <**Zielsystem**>.

The following dialog contains the button <**Durchsuchen**>.

After selection of the button, all online reachable participants are shown.





This function is only available, when as PG/PC interface an Ethernet interface was chosen in SIMATIC Manager.

#### 40 Chapter 8

#### Integration of a PCUXXXPNIO in a SIMATIC 300 PROFINET Network

From the list of participants reached select the corresponding slave module and select it (a connection to the PROFINET network must exist).

Confirm with the button **<OK>**.

| By Cotel Boarbeiten Einfügen 2    | Belayistem Ansie | he Extras              | Fenster<br>1: mm | Hite<br>Carl Correct                                       | Ellers   | चा 🕫 । अस                                      | -  |
|-----------------------------------|------------------|------------------------|------------------|--|--|--|--|
| BrevotempPNIO     BitMATIC 300(1) | BA Hardware      | Ethernet T<br>MAC Adre | eihehn<br>sin    | er bearbeiten<br>er  | 0  | Inline erreichbar<br>Durchsuchen.              | e Teilnehmer   |
|                                   |                  | © IP-Pa                | ameter           | rerwenden  |  | Netzibergang                                   |  |
|                                   | <br>             | Staten<br>wheten       |                  | IP Adresse<br>192168 0 247<br>192168 0 240<br>192168 0 240 | MAC Adresse<br>0002x8220180.04<br>0006 49:2847-48<br>00-06 49:481-48 | Gerätetyp<br>PSG-Flantic<br>\$7:300<br>ET 200M | Gerätename<br>convergens pri<br>priv op netav<br>m153-4pn pri- |
|                                   |                  | Binken                 | MAC              | Adresser ji  | 00-02 A2-20 80-D4  |  | ы  |
|                                   |                  | ок                     |                  |  |  | Abbrechen                                      | Hille  |
|                                   |                  | Schließer              |                  |  |  |  | н  |

#### SIMATIC Manager step 9

The dialog **<Ethernet-Teilnehmer bearbeiten>** contains in the window MAC address the MAC address of the **PCUxxxPNIO** component.

The device name can be changed here or extended by the network name. In this case consider the following syntax:

[device name].[network name]

Change of name assigned by pressing the **<Name zuweisen**> button. If the name is successfully assigned, this is confirmed by a corresponding dialog. Only now the participant is addressable by the PROFINET controller.

The device name SIMATIC Manager is also valid as station name flexotempMANAGER (see chapter 7.1.1).

|   |   | Online erreichbare Teilnehmer |
|---|---|-------------------------------|
| IAC-Adresse:  | 00-02-A2-20-B0-D4   | Durchsuchen                   |
| P-Konfiguration eins  | tellen  |                               |
| IP-Parameter ve   | wenden  |                               |
|   |   | Netzübergang                  |
| IP-Adresse:   | ļ.  | Keinen Router verwenden       |
| Subnetmaske:  |   | C Router verwenden            |
|   |   | Adresse:                      |
| IP-Adresse von<br>identifiziert über —<br>Client-ID   | sinem DHCP-Server beziehen  | C Gerätename                  |
| P-Adresse von<br>identifiziert über Client-ID Client-ID:  | einem DHCP-Server beziehen  | C Gerätename                  |
| IP-Adresse von i<br>identifiziert über<br>Client-ID<br>Client-ID:<br>IP-Konfiguration :<br>erätename vergebo                                      | einem DHCP-Server beziehen C MAC Adresse uweisen en   | C Gerätename                  |
| IP-Adresse von in<br>identifiziert über<br>Client-ID<br>Client-ID<br>IP-Konfiguration =<br>IP-Konfiguration =<br>erätename vergebr<br>Gerätename: | einem DHCP-Server beziehen C MAC Adresse uweisen en pcu128pnio.pn-netzwerk                  | C Gerätename                  |
| PP-Adresse von in<br>identifiziert über<br>Client-ID<br>Dient-ID:<br>IP-Konfiguration s<br>erätename vergebe<br>Gerätename:                       | einem DHCP-Server beziehen  MAC Adresse  uweisen  pcu128pnio.pn-netzwerk  d. sin tall.m.exe | C Gerötename                  |
| PP-Adresse von in<br>identifiziert über<br>Client-ID<br>Dient-ID<br>IP-Konfiguration a<br>erätename vergebe<br>Gerätename:<br>Ücksetzen auf We    | einem DHCP-Server beziehen  MAC Adresse  uweisen  pcu128pnio.pn-netzwerk kseinstellungen    | C Gerätename                  |

Be sure to note that the name does NOT contain any capital letters!

#### SIMATIC Manager step 10

Upon successful transfer

- of project into S7
- of configuration with the aid of flexotempMANAGER into PCU128PNIO

the component status can be checked in the hardware configuration in the SIMATIC Manager.

Select the appropriate component by mouse and then menu item **<Zielsystem> <Baugruppenzustand>**.

| Station Bearbeiten Einrugen                         | Zielsystem Ansicht Extras Fenster Hilfe<br>Laden in Baugruppe Ctrl+L<br>Laden in PG                       |               |
|---|---|---------------|
| ⊇(0) UR   | Baugruppen-Identifikation laden<br>Baugruppen-Identifikation laden in PG                                  | wer           |
| 2 CPU 315-2 PN/DP                                   | Gestörte Baugruppen   | -             |
| X2 PN-IO.pn-netzwerk<br>X2 P1 Port 1<br>3<br>4<br>5 | Baugruppenzustand Ctrl+D<br>Betriebszustand Ctrl+T<br>Urlöschen<br>Uhrzeit stellen,<br>Beobachten/Steuern | <b>7</b><br>° |
| 7   | Firmware aktualisieren  |               |
| o I   | Gerätenamen auf Memory Card speichern   |               |
|   | Ethernet  | •             |
|   | PROFIBUS  | •             |
|   | Servicedaten speichern  |               |

If everything works properly,

- the specified name
- the status "Baugruppe vorhanden und o.k." are shown.

| Baugruppenzus   | tand - COMXREPNS  |                                    |                               |
|---|---|------------------------------------|-------------------------------|
| Efad: flexotempPN<br>Status: OK<br>Allgemein 10-Devic | IO\SIMATIC 300(1)\CPU 315-2<br>ce Diagnose   Identifikation | 2 PN/[ Betriebszustand der         | CPU: 🚸 RUN                    |
| Bezeichnung:<br>Name:                                 | COMXREPNS<br>pcu128pnio.pn-netzwerk                         | Systemkennung:                     | PROFINET IO                   |
| ⊻ersion:  | Bestell-Nr. / Bezeichn.<br>153x.10x                         | Komponente<br>Hardware<br>Firmware | Ausgabestand<br>6<br>V 2.1.40 |
| IO-System:<br>Gerätenummer:                           | 100<br>1  | Adresse: E 204                     | 3                             |
| <u>S</u> tatus:                                       | Baugruppe vorhanden und                                     | Jak.                               | ×                             |
| Schließen <u>4</u>                                    | uktualisieren <u>D</u> rucken                               |                                    | Hilfe                         |

If the status message **"Baugruppe projektiert, aber nicht vorhanden...**" is displayed, please check the module configuration in the S7 and the flexotempMANAGER to match. Also check the station name see flexotempMANAGER and the device name in the S7.

The current status of PROFINET IO can also be seen on the status side PROFINET IO in flexotempMANAGER:

- Version: Firmware version PCUXXXPNIO
- Firmware: Firmware type on PCUXXXPNIO
- Status: Status of data exchange
- Communication status
- Active station name
- Active IP address
- ...
- Active module configuration

| 📽 🖬 🖇 🛍 🚳 💲 🕏 😫 💵   | 10 18 19 18 18 🖬 🏂 6  |   |
|---|---|---|
| Policitation     P | POLICE IN A CONTRACT OF THE ADDRESS OF THE ADD | 2.1.40.0 (build 41):55.2009<br>PROFINET ID Device<br>1 Determinational Math<br>SUCCESS, STATUS GKAY<br>20.1.1290 prior 429-445<br>1.152168 0.247<br>2.25259 0.0<br>1.132168 0.247<br>D Big Enden<br>F<br>640<br>769 |
|   | Steckplatz Module E   | ingabe-Putler (SPS) Ausgabe-Putler (SPS)  |
|   | 1 128 Byte Ausgabemodul   | 0 127 [benutzt]   |
|   | 2 120 Byte Einsaberocki 0   | - 127 [benutzt]   |
|   | 4 128 Bute Einpabemodul 12  | 28  |
|   | 5   |   |
|   | 6 120 Bute Eingebenock/ 2   | 56 383 [benutzt]  |

# 9 Appendix

# 9.1 GSD File

See <u>www.meusburger.com</u> under Downloads the relevant PNIO controller.

# 9.2 PROFINET PLC Data types

| Data type     | Description                          | Range                        | PLC   |
|---------------|--------------------------------------|------------------------------|-------|
| Boolean       | 8-bit Boolean                        | False (0x00) and True (0x01) | byte  |
| Integer8      | 8-bit signed integer                 | -128127                      | byte  |
| Integer16     | 16-bit signed integer                | -32,76832767                 | word  |
| Integer32     | 32-bit signed integer                | -21474386482147438647        | dword |
| Unsigned8     | 8-bit unsigned integer               | 0255                         | byte  |
| Unsigned16    | 16-bit unsigned integer              | 065,535                      | word  |
| Unsigned32    | 32-bit unsigned integer              | 04294967295                  | dword |
| FloatingPoint | 32-bit IEEE-754 floating point value | 1.19209290e-383.4028235e+38  | dword |

# 9.3 Version History

| Version | Date      | Changes  |
|---------|-----------|--|
| 1.00.05 | 9/13/2017 | flexotempMANAGER Station name = SIMATIC Manager device name; |
| 1.00.04 | 7/18/2017 | Chapter Check sum calculation MUX data added; Timeout        |
| 1.00.03 | 7/3/2014  | Parameter Channel for command 33 added (only ETR)            |
| 1.00.02 | 12/5/2013 | SIMATC step 4 specified; ETR132PNIO added                    |
| 1.00.01 | 3/24/2010 | Project PROFINET IO Parameter Timeout amended                |
| 1.00.00 | 1/25/2010 | First edition  |
| 0.00.01 | 1/18/2010 | Preliminary version  |