Your Global Automation Partner



# FEN20-... Startup

Getting Started Guide

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## 1 About these instructions

The instructions describe the features and commissioning of the product and help you to operate the product as intended.

Read these instructions carefully before using the product. This is to avoid possible damage to persons, property or the device. Retain the instructions for future use during the service life of the product. If the product is passed on, pass on these instructions as well.

#### 1.1 Target groups

These instructions are aimed at qualified personnel and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

#### 1.2 Explanation of symbols used

The following symbols are used in these instructions



DANGER

DANGER indicates an immediately dangerous situation, with high risk, the death or severe injury, if not avoided.



#### WARNING

WARNING indicates a potentially dangerous situation with medium risk, the death or severe injury, if not avoided.



#### ATTENTION

ATTENTION indicates a situation that may lead to property damage, if it is not avoided.



#### NOTE

In NOTES you find tips, recommendations and important information. The notes facilitate work, provide more information on specific actions and help to avoid overtime by not following the correct procedure.

#### ➤ CALL TO ACTION

This symbol identifies steps that the user has to perform.

#### RESULTS OF ACTION

This symbol identifies relevant results of steps.

#### 1.3 Additional documents

The following additional documents are available online at www.turck.com: Data sheets

#### 1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to **techdoc@turck.com**.



# 2 Notes on the product

#### 2.1 Product identification

The following user manual describes common features and setup of the FEN20 product family:

- IP address setup
- EtherNet/IP configuration example
- PROFINET configuration example
- Modbus TCP configuration example

#### 2.2 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under www.turck.com contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. 41.

# 3 For your safety

The product is designed according to state-of-the-art technology. However, residual risks still exist. Observe the following warnings and safety notices to prevent damage to persons and property. Turck accepts no liability for damage caused by failure to observe these warning and safety notices.

#### 3.1 General safety instructions

- The device must only be mounted, installed, operated and maintained by trained and qualified personnel.
- The device may only be used in accordance with applicable national and international regulations, standards and laws.
- The device meets the EMC requirements for industrial areas. When used in residential areas, take measures to avoid radio interference.

# 4 FEN20 product family

The common features and operating procedures, which are described in this guide, may be applied to every FEN20 device, see the following table and "Definition of terms".

| Article             | IP            | Inp              | ut de          | script     | ion         |                          | Out               | put de      | escripti    | ion                 |                          | Eth            | EtherNet/IP                   |     |    |     | Advanced<br>features |             |
|---------------------|---------------|------------------|----------------|------------|-------------|--------------------------|-------------------|-------------|-------------|---------------------|--------------------------|----------------|-------------------------------|-----|----|-----|----------------------|-------------|
|                     | Address setup | Number of inputs | DIN rail mount | Input type | Signal type | Short circuit protection | Number of outputs | Output type | Signal type | Maximum output load | Short circuit protection | Ethernet ports | <b>Configuration Assembly</b> | DLR | QC | ACD | FLC                  | BEEP        |
| FEN20-4DIP-4DXP     | S             | 8                | -              | DI         | PNP         | 1                        | 8                 | DO          | PNP         | 0.5 A               | -                        | 2              | 1                             | 1   | 1  | 1   | 1                    | 1           |
| FEN20-4DIP-4DXP-DIN | S             | 8                | 1              | DI         | PNP         | -                        | 8                 | DO          | PNP         | 0.5 A               | 1                        | 2              | 1                             | 1   | 1  | 1   | 1                    | 1           |
| FEN20-4DIN-4DXN     | S             | 8                | -              | DI         | NPN         | 1                        | 8                 | DO          | NPN         | 0.5 A               | 1                        | 2              | 1                             | ✓   | 1  | 1   | 1                    | 1           |
| FEN20-4DIN-4DXN-DIN | S             | 8                | 1              | DI         | NPN         | 1                        | 8                 | DO          | NPN         | 0.5 A               | 1                        | 2              | 1                             | 1   | 1  | 1   | 1                    | 1           |
| FEN20-EN1           | S             | 8                | -              | R          | PNP         | -                        | -                 | -           | -           | -                   | 1                        | 2              | 1                             | 1   | 1  | 1   | -                    | -           |
| FEN20-EN1-DIN       | S             | 8                | 1              | R          | PNP         | -                        | -                 | -           | -           | -                   | 1                        | 2              | 1                             | 1   | 1  | 1   | -                    | -           |
| FEN20-16DXP         | SH            | 16               | -              | DI         | PNP         | -                        | 16                | DO          | PNP         | 0.5 A               | 1                        | 2              | 1                             | 1   | 1  | 1   | ✓*                   | <b>√</b> ** |
| FEN20-4IOL          | S             | 4                | 1              | IOL        | PNP         | 1                        | 4                 | IOL         | PNP         | 0.4 A               |                          | 2              | 1                             | 1   | 1  | 1   | 1                    | -           |

\* only BEEP-slave

\*\* up to ARGEE3

#### **Definition of terms**

| Address setup          |   |
|------------------------|---|
| S                      | Software setup  |
| SH                     | Software and hardware setup via rotary switches       |
| l/O type               |   |
| DI                     | Discrete input  |
| DO                     | Discrete output                                       |
| R                      | Router function                                       |
| AI                     | Analog input  |
| AO                     | Analog output   |
| IOL                    | IO-Link Master or DI/DO                               |
| Signal type            |   |
| PNP                    | Sourcing  |
| NPN                    | Sinking   |
| EtherNet/IP            |   |
| Configuration Assembly | Enables passing configuration data during ForwardOpen |
| DLR                    | Device Level Ring                                     |
| QC                     | QuickConnect  |
| ADC                    | Address Conflict Detection                            |



| Extend | led functions  |
|--------|--|
| FLC    | Field Logic Controller<br>FEN20 can be converted into a simple Field Logic Controller (i.e. PLC) that<br>can execute a stand-alone application or become a distributed control<br>component of the EtherNet/IP, Modbus TCP or PROFINET based control<br>system. FLC solutions by Turck are made possible using ARGEE (A Really<br>Great Engineering Environment), a web-based programming environ-<br>ment that allows users to set conditions and actions directly at the field<br>level. By utilizing HTML5, Turck provides a complete engineering envi-<br>ronment for users to write, run, simulate, debug, and monitor code, all<br>without requiring the use of a PLC. |
| BEEP   | Backplane Ethernet Extension Protocol<br>BEEP is a technology feature of many Turck Multiprotocol digital block I/O<br>modules. BEEP allows a network of up to 33 devices (1 master + 32<br>slaves) or 480 bytes of data, to appear to the PLC as a single device<br>on a single connection using a single IP address of the master.   |
|        |  |
| i      | NOTEBEEP is supported by the following FEN20 devices that have firmware revision:V 3.3.4.0FEN20-4DIP-4DXP, FEN20-4DIN-4DXNV 3.8.3.0FEN20-16DXP (BEEP slave only)not supportedFEN20-EN1, FEN20-EN1-DIN, FEN20-4IOLRefer to "ARGEE Reference Manual" for further information on FLC.Refer to "BEEP Reference Manual" for further information on BEEP.  |

# 5 FEN20 IP address setup

All FEN20 devices support software setup of the IP address using either Turck Service Tool or BOOTP/DHCP server. Additionally, FEN20-16DXP has rotary switches capable of setting the IP address. FEN20-4DIP-4DXP and FEN20-4DIN-4DXN stations do not have rotary switches capable of setting the IP address.

#### 5.1 Setting the IP address

Users should set the IP address using either Turck Service Tool or any other IP address server such as BOOTP/DHCP utility, to set, modify or reset the IP address of the device.

The device out of box IP address setup is:

IP address: 192.168.1.254

Netmask: 255.255.255.0

Gateway: 0.0.0.0

#### Mode of operation:

| PGM  | Programmable                               |
|------|--|
| DHCP | <b>Dynamic Host Configuration Protocol</b> |



In the PGM mode the device will reference the previous IP address at power-up, which was assigned to the device prior to shut down.

► Use Turck Service Tool for the IP address management.

## 5.2 Downloading Turck Service Tool

The Turck Service Tool can be downloaded from the Turck Website using the following link:

Turck Service Tool



# 5.3 Service tool features

The Service tool displays the assigned IP addresses of devices on the network:

| <b>T</b> urck                  | Service Tool, Vers. 3.0 | ).1       |                     |               |                       |               |    |  |  |  |  |  |
|--------------------------------|-------------------------|-----------|---------------------|---------------|-----------------------|---------------|----|--|--|--|--|--|
| Your Global Automation Partner |                         |           |                     |               |                       |               |    |  |  |  |  |  |
| Search                         | (F5) Change (F2)        | Wink (F3) | Actions (F4)        | - Clipboard   | <b>EN</b><br>Language | Expert view C | N  |  |  |  |  |  |
| No.                            | MAC address             | Name      | IP address          | Netmask       | Gateway               | Mode          | De |  |  |  |  |  |
| - 1                            | 00:07:46:25:B2:E9       |           | 192.168.1.44        | 255.255.255.0 | 0.0.0.0               | PGM_DHCP      | FE |  |  |  |  |  |
| - 2                            | 00:07:46:26:17:BF       |           | <u>192.168.1.17</u> | 255.255.255.0 | 0.0.00                | PGM_DHCP, A   | FE |  |  |  |  |  |
|                                |                         |           |                     |               |                       |               |    |  |  |  |  |  |
|                                |                         |           |                     |               |                       |               |    |  |  |  |  |  |

#### Overview of features

| Function           |  |
|--------------------|--|
| Change (F2)        | Change device IP address when device is set to PGM or PGM_DHCP mode, or assign device a PROFINET name  |
| Wink (F3)          | Wink command - flashes BUS LED of the highlighted device   |
| Actions (F4)       | Action button - used to reset the device to the factory default setting<br>Clipboard – copies selected connection<br>Language – Selects between English and German text<br>Expert View - Enables / disables advanced functions |
| Search (F5)        | Network Search function is used to discover Turck devices connected to the same physical network segment   |
| Start DHCP (F6)    | Starts the DHCP server   |
| Configuration (F7) | EtherNet/IP configuration page   |
| ARGEE (F8)         | ARGEE handling   |
| BEEP (F9)          | BEEP composite handling  |

#### 5.3.1 Assigning an IP address using Turck Service Tool

- Click F5 Search network
- > Highlight the device to be assigned/changed an IP address.

| Turck S   | ervice Tool, Vers. 3.0               | ).1          |                      |               |         |              |                    |                     |                 |             |            |  |  |
|-----------|--------------------------------------|--------------|----------------------|---------------|---------|--------------|--------------------|---------------------|-----------------|-------------|------------|--|--|
| Yc        | Your Global Automation Partner TURCK |              |                      |               |         |              |                    |                     |                 |             |            |  |  |
| Search (I | F5) Change (F2)                      | Wink (F3) Ac | tions (F4)           | Doboard Langu | age Ex  | pert view ON | Start DHCP (F6) Co | EIP<br>onfiguration | n (F7) ARGEE (I | F8) - Close | 2          |  |  |
| No.       | MAC address                          | Name         | IP address           | Netmask       | Gateway | Mode         | Device             | Version             | Adapter         | ARGEE       | Protocol   |  |  |
| - 1       | 00:07:46:25:B2:E9                    |              | <u>0.0.0.0</u>       | 0.0.0.0       | 0.0.0.0 | PGM_DHCP     | FEN20-4DIP-4DXP    | 3.3.4.0             | 192.168.1.50    | supported   | DCP, Turck |  |  |
| - 2       | 00:07:46:25:0E:75                    |              | <u>192.168.1.148</u> | 255.255.255.0 | 0.0.0.0 | ROTARY       | FEN20-16DXP        | 3.8.3.0             | 192.168.1.50    | supported   | DCP, Turck |  |  |
|           |                                      |              |                      |               |         |              |                    |                     |                 |             |            |  |  |
| Found 2 D | evices.                              |              |                      |               |         | 1            |                    |                     |                 |             | .:i        |  |  |

- ► Click F2 Change.
- > Enter the IP address, Netmask and Gateway addresses.

| <ul> <li>Change device config</li> </ul> | gurati 🗆 🗉 💌 🗙 |
|--|----------------|
| Device name:                             |                |
|  |                |
| IP configuration                         |                |
| MAC address                              | IP address     |
| 00:07:46:25:B2:E9                        | 192.168.1.44   |
|  |                |
| Netmask                                  | Gateway        |
| 255.255.255.0                            | 0.0.0.0        |
| Set IP configuration                     | a temporarily  |
| Status messages:                         |                |

Complete setup by clicking button

Set in device

The Service tool immediately shows newly assigned IP address. The device Webserver may be initiated by clicking on the IP address hyperlink if the address is on the same subnet as a PC that runs the Service too.

### NOTE

0.0.0.0 at IP address, Netmask and Gateway, indicates that the device came up with the factory default setup and that DHCP client is active, requesting IP address assignment.

| IP address     | Netmask | Gateway |
|----------------|---------|---------|
| <u>0.0.0.0</u> | 0.0.0.0 | 0.0.0.0 |



# 5.4 Assigning an IP address using Rockwell BOOTP/DHCP

➤ Search Rockwell Software directory for BOOTP/DHCP server tool:



Start DHCP tool and click on the MAC address of the device which needs and IP address
 Enter IP address and click OK.

| 5    | BOOTP/DHCP 9      | Server 2 | .3                                     |      |                      |             |        | _ 🗆 X |
|------|-------------------|----------|--|------|----------------------|-------------|--------|-------|
| File | e Tools Help      |          |  |      |                      |             |        |       |
| F    | Request History – | 1        |  |      |                      |             |        |       |
|      | Clear History     | Add to   | o Helation List                        |      |                      |             |        |       |
|      | (hr:min:sec)      | Туре     | Ethernet Address (MAC                  | 3    | IP Address           | Hostname    |        |       |
|      | 9:22:48           | DHCP     | 00:07:46:25:82:E9<br>00:07:46:25:82:E9 |      |                      |             |        |       |
|      | 9:22:44           | DHCP     | 00:50:B6:09:40:08                      | New  | Entry                |             |        | ×     |
|      | 9:22:43           | DHCP     | 00:07:46:25:B2:E9<br>00:1E:37:4E:82:E1 |      |                      |             |        | _     |
|      | 9:22:40           | DHCP     | C8:5B:76:F2:68:41                      | Ethe | ernet Address (MAC): | 00:07:46:25 | :B2:E9 |       |
|      | 9:22:41           | DHCP     | 00:07:46:25:B2:E9                      |      | IP Address:          | 192.168     | 3.1.44 |       |
| F    | Relation List     |          |  |      | Hostname:            |             |        |       |
|      | New Delete        | e Enabl  | e BOOTP Enable DHO                     |      | Description:         |             |        |       |
|      | Ethernet Addre    | ss (MAC) | Type IP Add                            |      |                      | ок          | Cancel | E     |
|      |                   |          |  |      |                      |             |        |       |
|      |                   |          |  |      |                      |             |        |       |

> The device is successfully assigned IP address when it appears in the IP Address column

| 5    | BOOTP/DHCP S       | ierver 2.            | .3               |                        |                |         |           |             | _ 🗆 🗙    |
|------|--------------------|----------------------|------------------|------------------------|----------------|---------|-----------|-------------|----------|
| File | e Tools Help       |                      |                  |                        |                |         |           |             |          |
| F    | lequest History—   |                      |                  |                        |                |         |           |             | <br>     |
|      | Clear History      | Add to               | ) Relat          | tion List              |                |         |           |             |          |
|      | (hr:min:sec)       | Туре                 | Ethe             | rnet Addr              | ess (MAC)      | IP Ad   | ldress    | Hostname    | <b>▲</b> |
|      | 9:24:17            | DHCP                 | 00:0             | 7:46:25:E              | 32:E9          | 192.1   | 68.1.44   |             |          |
|      | 9:24:17<br>9:24:15 | DHCP                 | 00:0             | 7:46:25:E<br>7:46:25:E | 32:E9<br>32:E9 |         |           |             |          |
|      | 9:24:13            | DHCP                 | 00:0             | 7:46:25:E              | 2:E9           |         |           |             |          |
|      | 9:24:11<br>9:24:09 | DHCP                 | - 00:0<br>- 44:8 | 7:46:25:E<br>A:5B:4A:I | 32:E9<br>6F:A7 |         |           |             |          |
|      | 9:24:08            | DHCP                 | 00:0             | 7:46:25:E              | 32:E9          |         |           |             | •        |
|      | ) - l - l' l'- l   |                      |                  |                        |                |         |           |             |          |
|      | relation List      | 1                    |                  | 70   c                 |                |         |           |             |          |
|      | New Delete         | Enabl                | e 800            | IP En                  | able DHCP D    | sable B | UUTP/DHCP |             |          |
|      | Ethernet Addres    | s (MAC)              |                  | Туре                   | IP Address     |         | Hostname  | Description |          |
|      | 00:07:46:25:B2:    | E9                   |                  | DHCP                   | 192.168.1.44   |         |           |             |          |
|      | 00:07:46:25:B2:    | <u>s (MAL)</u><br>E9 |                  | DHCP                   | 192.168.1.44   |         | Hostname  | Description |          |

## 5.5 FEN20-16DXP

 Three rotary switches of the FEN20-16DXP provide various modes of operation, as seen below.



#### 5.5.1 Modes of operation

Based on the position of the switches, the device performs the following operation:

- 000 Restore IP address
- 300 BOOTP mode client
- 400 DHCP mode client
- 500 PGM programmable mode
- 600 PGM-DHCP mode
- 700 PROFINET mode
- 900 Device Recovery Mode (F\_reset)
- 1...254 Static IP address

## NOTE

- The general rule of handling rotary switches when selecting mode of operation is:
- Set the rotary switches to the desired position
- Cycle power to the station.
- Proceed with intended operation as explained hereafter.

#### Restore IP address mode (000)

The Restore IP address mode (Network Reset) restores the IP address to the default value. The settings become effective after voltage reset.

When switches are set at 000, the device is capable to:

- Respond to PING command,
- Respond to Turck Service tool
- Run device Webserver
- > The device cannot be connected to a PLC and it does not respond to any connection request.

#### **Default IP Address**

The factory default setup when switches are set to 000 position:

| IP address | 192.168.1.254 |
|------------|---------------|
| Subnet     | 255.255.255.0 |
| Gateway    | 0.0.0         |

| = Gutemay | 0.0.0.0 |
|-----------|---------|
|           |         |
|           |         |



Switch setting "000" is not an operating mode. After resetting the IP address to the default values, it is necessary to set another mode.



## BOOTP/DHCP mode (300/400)

This mode assigns an IP address using the BOOTP/DHCP server respectively.

| 5    | BOOTP/DHCP:          | Server 2 | .3                   |                          |            |       |             |       |           |          |                    |         |
|------|----------------------|----------|----------------------|--------------------------|------------|-------|-------------|-------|-----------|----------|--------------------|---------|
| File | Tools Help           |          |                      |                          |            |       |             |       |           |          |                    |         |
| E B  | equest History-      |          |                      |                          |            |       |             |       |           |          |                    | _       |
|      | Clear History        | Add to   | Relation             | List                     |            |       |             |       |           |          |                    |         |
| [    | (hr:min:sec)         | Туре     | Ethernet             | Address (M               | AC)        | IP A  | \ddress     | Host  | name      |          |                    |         |
|      | 16:00:12<br>16:00:07 | DHCP     | 00:17:08<br>00:07:46 | 8:61:44:10<br>6:FF:20:07 |            | 192   | .168.1.125  |       |           |          |                    |         |
|      | 16:00:07             | DHCP     | 00:07:46             | 6:FF:20:07               |            |       |             |       |           |          |                    |         |
|      |                      |          |                      |                          |            |       |             |       |           |          |                    |         |
|      |                      |          | •                    | ew Entry                 |            |       |             |       |           | ×        |                    |         |
|      |                      |          |                      |                          |            |       |             |       |           | _        |                    | - 11    |
| E B  | elation List         |          |                      | Ethernet A               | ddress (MA | .C):  | 00:07:46:FF | :20:0 | 7         |          |                    |         |
|      | New Delete           | e Enabl  | e BOOTF              |                          | IP Addre   | \$\$: | 192.168     |       | 1.12      | 5        |                    |         |
| l i  | Fil                  |          | [ 7                  |                          | Hostnar    | ne:   |             | _     |           | - 1      |                    | - 11    |
|      | Ethernet Addre       | -07      |                      |                          |            |       | <u> </u>    |       | Enter the | IP addre | ess for the device | e to be |
|      | 00.07.40.FF.20       | .07      |                      |                          | Descripti  | on:   | I           |       |           |          |                    |         |
|      |                      |          |                      |                          |            |       | ок (        |       | Cancel    | 1        |                    |         |
|      |                      |          |                      |                          |            |       |             | _     |           | -        |                    |         |
|      |                      |          | _                    |                          |            |       |             |       |           |          |                    |         |
|      |                      |          |                      |                          |            |       |             |       |           |          |                    | - 11    |
| -S   | tatus                |          |                      |                          |            |       |             |       |           |          | Entries            |         |
| U    | nable to service     | DHCP re  | quest from           | 00:17:08:6               | 1:44:10.   |       |             |       |           |          | 1 of 256           |         |
|      |                      |          |                      |                          |            |       |             |       |           |          |                    |         |

- ➤ After an IP address is assigned, it is temporarily stored in the device. In order to permanently store the IP address, set the rotary switches to either:
- = 001...253 which affects the last octet of the device IP address
- 500 programmable position
- ► Then cycle power to the device.

#### PGM mode (500)

- ► Launch the Turck Service Tool
- ► Select F5 search network
- > Under Mode verify the device reads PGM

| Turck S   | ervice Tool, Vers. 3. | 0.1         |                  |            |             |                      |               |          |              |
|-----------|-----------------------|-------------|------------------|------------|-------------|----------------------|---------------|----------|--------------|
| Yc        | our Global Au         | tomatio     | on Part          | ner        |             | -                    | r U R         | rC       |              |
| Search (I | F5) Change (F2)       | Wink (F3)   | ැටි<br>Actions   | (F4)       | <br>oard Li | <b>EN</b><br>anguage | Expert view C | OFF Clos | e            |
| No.       | MAC address           | N. IP ac    | ldress N         | Vetmask    | Gateway     | Mode                 | Device        | Version  | Adapter      |
| ₹1        | 00:07:46:25:0E:75     | <u>192.</u> | <u>168.1.1</u> 2 | 255.255.25 | 0.0.0.0     | PGM                  | FEN20-16DXP   | 3.8.3.0  | 192.168.1.50 |

- ➤ Select F2 Change and change IP address
- ► Enter desired value.
- ► Click Set in device.

#### PGM-DHCP mode (600)

PGM-DHCP mode is a combination of the DHCP (400) and PGM (500) modes. The device, when initially powered with switches set to 600, acts as DHCP client. It requests assignment of an IP address. After the IP address is assigned, the device disables DHCP and switches to PGM mode. Switches may be left in 600 position.

Upon power cycle, the device retains the last known IP address.

➤ To reset PGM-DHCP mode, set rotary switches to 000 and cycle power

#### PROFINET mode (700)

Allows a PROFINET server to assign a PROFINET name and IP address to the device. The Turck service tool may be used to assign device name and IP address.

#### RECOVERY mode F\_Reset (900)

When the rotary switches are set to the RECOVERY mode (900), the device resets all device resources to factory default values, including configuration parameters and IP address.

- ► Set rotary switches to 900, cycle the power and wait 10 seconds
- ► Set rotary switches to any other position and then cycle power.



#### NOTE

Switch setting "000" is not an operating mode. After resetting the IP address to the default values, it is necessary to set another mode.



# 6 EtherNet/IP configuration (Rockwell)

It is assumed that there is working knowledge of RS Logix Desinger from Rockwell.

The FEN20 module (in this example the FEN20-4DIP-4DXP) is configured on the EtherNet/IP network using either:

Generic device profile or

EDS file

The single generic device profile is available with the Logix5000 controllers. The collection of the generic device profiles of the Turck devices is called a Turck Catalog File.

#### 6.1 Turck catalog files

Turck devices are assigned pre-defined configurations using the generic device profile. The device configuration contains following information, as an example:

| 🗾 Module Proj   | perties Report: TBEN_S (ETHERNET)      | -MODULE 1.1)    |                       |          | ×      |  |  |  |
|---|--|-----------------|-----------------------|----------|--------|--|--|--|
| General Conr  | nection Module Info                    |                 |                       |          |        |  |  |  |
| Туре:   | ETHERNET-MODULE Generic Ethemet Module |                 |                       |          |        |  |  |  |
| Vendor:   | Allen-Bradley                          |                 |                       |          |        |  |  |  |
| Parent:   | TBEN_S                                 | Constanting Dec |                       |          |        |  |  |  |
| Name:   | TBEN_S2_4AI                            | Connection Para | Assembly<br>Instance: | Size:    |        |  |  |  |
| Decemption  | <u>^</u>                               | Input:          | 103                   | 7 🚔 (16  | i-bit) |  |  |  |
|   | <b>T</b>                               | Output:         | 104                   | 1 🚔 (16  | i-bit) |  |  |  |
| Comm Format   | Data - INT 👻                           | Configuration:  | 106                   | 84 🚔 (8+ | oit)   |  |  |  |
| Address / H   | ost Name                               |                 |                       |          | ,      |  |  |  |
| ◎ IP Addre  | SS:                                    | Status Input:   |                       |          |        |  |  |  |
| Host National Control of Contr | me: a150                               | Status Output:  |                       |          |        |  |  |  |
| Status: Offline   | ОК                                     | Cancel          | Apply                 | Help     |        |  |  |  |

- ➤ The collection of the predefined configurations is saved as an L5K file and called the catalog file.
- ► There are several catalog files:
- Turck\_BLOCK\_STATIONS contains all block block IO station configurations
- BL20-E Catalog file, contains all BL20 IO module and BL20-E-GW-EN configrations
- BL67 Catalog file, contains all BL67 IO module and BL67-GW-EN configurations

#### NOTE

Refer to document "How to Configure TBEN-Lx in RSLogix5000 Using Catalog File". It contains detailed description of using the catalog files to configure TBEN-L, TBEN-S, FEN20 and BLCEN.

## 6.2 Configuration with catalog file

The FEN20 device configurations are located in the Turck\_BLOCK\_STATIONS catalog file.

#### 6.2.1 FEN20 configuration procedure

- Open both your online project and the Turck\_BLOCK\_STATIONS\_V24\_FULL.ACD catalog file in separate windows.
- > Expand the **1756-EN2T FEN20** bridge in the catalog file.
- Drag the FEN20-4DIP-4DXP configuration and drop it into the Ethernet of the Controller organizer.
- > Drag the FEN20-16DXP configuration and drop it into the Ethernet .
- ► Close the catalog file.

| đ                    | Logix Designer - CLX16v30 in CLX16v30_FEN20_  | DuplexTest.ACD [1769-L16ER-BB1B 30.11]*  |
|----------------------|---|--|
| File                 | e Edit View Search Logic Communicat   | ions Tools Window Help   |
| Ē                    | ) 🛱 🖥 🎂 🕺 🖬 💼 🗠 🖂 🎿   | - <b># 4 % E</b> k V 9 🖱 Q Q .   |
| OffI<br>No I<br>No I | ine  □  □  □  □  □  □  □  □  □  □  □  □  □  | Logix Designer - CLX72_v24 in TURCK_BLOCK_STATIONS_V24_FULLACD [175]   |
|                      | Controller Organizer 🗾 👻 🖡  | File Edit View Search Logic Communications Tools Window Hel  |
| Start                |   | 🗎 🚔 🖶 🚔 陆 🖻 🗠 🖂 📑 🖬 💼 🗠 ా 🖂 📑  |
| age                  | Motion Groups     Add-On Instructions     Data Types     Trends     Motion Groups     Trends     Types     Trends     Types     Trends     Types     Types     Trends     Types     T | Offline       RUN         No Forces       OK         Energy Storage       Path: cnone>         Redundancy       I.0         Image: Controller Organizer       Image: Controller Organizer         Image: Controller Organizer       Image: Controller Organizer<   |
|                      |   | Image: State of the state |



- ► Click on the dropped FEN20 device
- > Insert the Name and IP Address into the following fields:

|        |                                   | _  |                 |                            |            |     |                 |           |       |            | _ |
|--------|-----------------------------------|----|-----------------|----------------------------|------------|-----|-----------------|-----------|-------|------------|---|
| ₿      | Controller Organizer 🚽 🗸 🗸        | E  | Module Prog     | erties Report: Local (ETHE | ERNET-M    |     | OULE 1.001)     |           |       | ×          |   |
| Sta    |                                   |    |                 |                            |            | _   |                 |           |       |            | = |
| Int Pa | 🗄 🗝 Tasks                         |    | General* Con    | nection Module Info        |            |     |                 |           |       |            |   |
| ge     | 🗄 🗀 Motion Groups                 |    | Type:           | ETHERNET-MODULE Gen        | eric Ethen | net | Module          |           |       |            |   |
|        | Add-On Instructions               |    | Vendor:         | Allen-Bradlev              |            |     |                 |           |       |            |   |
|        | 🗄 🗀 Data Types                    |    | Parent:         | local                      |            |     |                 |           |       |            |   |
|        | Trends                            | н  | Name:           |                            |            |     | Connection Para | meters    |       |            |   |
|        | Tr. Logical Model                 |    | None.           | FEN20_4DIP_4DXP            |            |     |                 | Assembly  | _     |            |   |
|        | 🖃 🔄 I/O Configuration             |    | Description:    |                            | *          |     |                 | Instance: | Size: |            |   |
|        | PointIO                           |    |                 |                            |            |     | Input:          | 103       | 4     | 🌲 (16-bit) |   |
|        | ॑──器 Ethernet                     |    |                 |                            | -          |     | Output:         | 104       | 2     | (16-bit)   |   |
|        | 🔁 1769-L16ER-BB1B CLX16v30        |    | Comm Format:    | Data - INT                 |            |     | ouput.          |           |       |            |   |
|        | 🖞 ETHERNET-MODULE FEN20_4DIP_4DXP |    |                 | - N                        |            |     | Configuration:  | 106       | 14    | ≑ (8-bit)  |   |
|        | ETHERNET-MODULE FEN20_16DXP       |    | Address / He    | ost Name                   |            |     |                 |           |       |            |   |
|        | 5 -                               |    | IP Addres       | ss: 192 . 168 . 1          | . 4 4      |     | Status Input:   |           |       |            |   |
|        |                                   |    | Hoet Nar        | ne: >100                   |            |     | Status Output:  |           |       |            |   |
|        |                                   |    | U Host Host     | aroo                       |            |     |                 |           |       |            |   |
|        |                                   |    | l               |                            |            |     |                 |           |       |            |   |
|        |                                   |    | Status: Offline | 6                          | ок         | -   | Cancel          | Apply     |       | Help       |   |
|        |                                   | I. | ototoo. onnine  |                            | 2.11       |     |                 |           |       |            |   |

- ► Under Controller → Controller Tags, expand FEN20\_4DIP\_4DXP:C.Data tag
- > The device configuration tag provides configuration options that may be selected / modified at this point

|       | Controller Organizer 🗢 🕂 🗙    | So | ope: 📴CLX16v30 🗸 Show: All   | Tags    |       |      |           | ✓ Enter Name Filter   |
|-------|-------------------------------|----|------------------------------|---------|-------|------|-----------|---|
| start | □ Controller CLX16v30         |    | Name === [A                  | Value 🔶 | For 🗲 | Styl | Data Typ  | Description   |
| Pa    | Controller Tags               | Н  | FEN20_4DIP_4DXP:C.Data       | {}      | {     | Hex  | SINT[400] |   |
| e     | Controller Fault Handler      |    | + FEN20_4DIP_4DXP:C.Data[0]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Power-Up Handler              |    | + FEN20_4DIP_4DXP:C.Data[1]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Motion Groups                 |    | + FEN20_4DIP_4DXP:C.Data[2]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Add-On Instructions           |    | + FEN20_4DIP_4DXP:C.Data[3]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Data Types                    |    | + FEN20_4DIP_4DXP:C.Data[4]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Trends                        |    | + FEN20_4DIP_4DXP:C.Data[5]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | Logical Model                 |    | + FEN20_4DIP_4DXP:C.Data[6]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       |                               |    | + FEN20_4DIP_4DXP:C.Data[7]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | 🖶 🛲 PointIO                   |    | + FEN20_4DIP_4DXP:C.Data[8]  | 16#00   |       | Hex  | SINT      | Reserved  |
|       | ॑器 Ethernet                   |    | FEN20_4DIP_4DXP:C.Data[9]    | 16#00   |       | Hex  | SINT      | Quick Connect, Eth Custom Setup                             |
|       | 🔁 1769-L16ER-BB1B CLX16v30    |    | FEN20_4DIP_4DXP:C.Data[9].0  | 0       |       | De   | BOOL      | Quick Connect: 0=disable, 1=enable                          |
|       | ETHERNET-MODULE FEN20_4DIP_4D |    | -FEN20_4DIP_4DXP:C.Data[9].1 | 0       |       | De   | BOOL      | Eth 1 Custom Setup: 0=Auto-negotiate, 1=100BT/FD            |
|       | D ETHERNET-MODULE FEN20_16DXP |    | -FEN20_4DIP_4DXP:C.Data[9].2 | 0       |       | De   | BOOL      | Eth 2 Custom Setup: 0=Auto-negotiate, 1=100BT/FD            |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[9].3 | 0       |       | De   | BOOL      | Reserved  |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[9].4 | 0       |       | De   | BOOL      | Reserved  |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[9].5 | 0       |       | De   | BOOL      | Reserved  |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[9].6 | 0       |       | De   | BOOL      | Reserved  |
|       |                               |    | FEN20_4DIP_4DXP:C.Data[9].7  | 0       |       | De   | BOOL      | Reserved  |
|       |                               |    | FEN20_4DIP_4DXP:C.Data[10]   | 16#00   |       | Hex  | SINT      | Invert digital input  |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In/Out 0 - Invert digital input: 0=no, 1=yes        |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In/Out 1 - Invert digital input: 0=no, 1=yes        |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In/Out 2 - Invert digital input: 0=no, 1=yes        |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In/Out 3 - Invert digital input: 0=no, 1=yes        |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In 4 - Invert digital input: 0=no, 1=yes            |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In 5 - Invert digital input: 0=no, 1=yes            |
|       |                               |    | -FEN20_4DIP_4DXP:C.Data[1    | 0       |       | De   | BOOL      | Digital In 6 - Invert digital input: 0=no, 1=yes            |
|       |                               |    | FEN20_4DIP_4DXP:C.Data[1     | 0       |       | De   | BOOL      | Digital In 7 - Invert digital input: 0=no, 1=yes            |
|       |                               |    | FEN20_4DIP_4DXP:C.Data[11]   | 16#00   |       | Hex  | SINT      | Digital In/Out 0 - Manual reset after overcurr., Digital In |
|       |                               |    | + FEN20_4DIP_4DXP:C.Data[12] | 16#0f   |       | Hex  | SINT      | Digital In/Out 0 - Activate output, Digital In/Out 1 - Acti |
|       |                               |    | · ·                          |         |       |      |           |   |

NOTE 

- Turck catalog file advantages are:
- The FEN20 configuration data is saved into the controller and downloaded to the device whenever the connection between the PLC and the device is established.
- The device replacement is seamless as configuration data is downloaded to new device
- The device configuration does not depend on the EDS file.

## 6.3 Configuration with EDS file

- The following example shows configuration an FEN20 device with a Rockwell PLC utilizing the EDS file.
- ➤ Install EDS file using the Logix Designer menu.



► Select New Module in the Controller Organizer.



> Highlight device to add to the network and click Create.

| FEN         | 20  |             | Cle   | ar Filte    | ers  | Hide Filters | * |
|-------------|---|-------------|-------|-------------|--|--------------|---|
| V           | Module Type Catego                              | ory Filters |       | <u>~</u>    | Module Type Vendor Filters                                   |              | * |
| ✓<br>✓<br>✓ | Analog<br>CIP Motion Converter<br>Communication | r           |       | ▼<br>▼<br>▼ | Allen-Bradley<br>Advanced Energy Industries, Inc.<br>BALLUFF |              |   |
| V           | Communications Ada                              | pter        |       | -           | Cognex Corporation   |              | - |
| •           |   | III         | •     | •           |  | •            |   |
| •           | Catalog Number                                  | Description | Vendo | r           | Category   |              |   |
|             | 6931090   | FEN20-16DXP | TURC  | K K         | Communications Adapter                                       |              |   |
|             |   |             |       |             |  |              |   |
|             |   |             |       |             |  |              |   |



| New Module  |  |                                   |   | X |
|---|--|-----------------------------------|---|---|
| General* <u>Conne</u><br>Type:<br>Vendor:<br>Parent:<br>Name:<br>Description: | sction Module Info Inte<br>6931090 FEN20-4DIP-4E<br>TURCK<br>Local<br>FEN20<br>FEN20-4DIP-4DXP | net Protocol   Port Configu<br>XP | Ethernet Address   Private Network: 192.168.1. 44   IP Address:  Host Name: |   |
| Module Defini<br>Revision:<br>Electronic Ke<br>Connections:                   | tion<br>2.005<br>ying: Compatible Module<br>Exclusive Owner                                    | •<br>Change                       |   |   |
| Status: Creating  |  |                                   | OK Cancel Hel   | p |

► Enter device Name and Ethernet Address fields.

- Click Change to open the Module Definition.
  Select INT data format, click OK.

| Conn         |                          | ngura | lion                                  |                |       |                     |
|--------------|--------------------------|-------|---------------------------------------|----------------|-------|---------------------|
| Type:        | 6931090 FEN20-4DIP-4DXP  |       |                                       |                |       |                     |
| Vendor:      | TURCK                    |       |                                       |                |       |                     |
| Parent:      | Local                    |       |                                       |                |       |                     |
| Name:        | FEN20                    | 1     | Module Definition                     |                | _     | ×                   |
| Description: | FEN20-4DIP-4DXP          | ^     | Revision: 2<br>Electronic Keying: Cor | ▼ mpatible Mod | 005 📑 | -                   |
|              |                          | -     | Connections:                          |                |       |                     |
| Module Defir | nition                   |       | Name                                  |                | Size  | 0.17                |
| Revision:    | 2.005                    |       | Exclusive Owner                       | Input:         | 8     |                     |
| Electronic K | eying: Compatible Module |       |                                       | Output.        | -     | SINT                |
| Connections  | Exclusive Owner          |       |                                       |                |       | INT<br>DINT<br>REAL |
|              | Change                   |       | ОК                                    | Can            | cel   | Help                |

| ■ Module Definition*   | ion  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| Revision: 2  005  Bectronic Keying: Compatible Module  |  |  |  |  |  |  |  |
| Connections:       Name     Size       Exclusive Owner     Input: 4       Output: 2     INT  | Ethernet Address  Private Network: 192.168.1. 44 |  |  |  |  |  |  |
|  | )  |  |  |  |  |  |  |
| ix Designer These changes will cause module data types and properties to change. Data will be set to default values unless it can be recovered from the existing module properties. Verify module properties before Applying changes. Change module definition? Yes No |  |  |  |  |  |  |  |

► Confirm and follow dialog to end configuration.

> The FEN20 data is represented in the INT data format:

| ⇔     | Controller Organizer 🗸 🕂 🗙 | S | cope: 📴CLX16v30 🗸          | Sh   | now: All Tag | js                  |         |           |             |
|-------|----------------------------|---|----------------------------|------|--------------|---------------------|---------|-----------|-------------|
| Start | Controller CLX16v30        |   | Name == △                  | ۵  ۱ | Value 🗲      | For <del>&lt;</del> | Style   | Data Type | Description |
| Pag   | Hasks     Define Converse  |   | +-FEN20:C                  |      | {}           | {                   |         | _0030:69  |             |
|       | Add-On Instructions        |   | FEN20:I                    | 1    | {}           | {                   |         | _0030:69  |             |
|       |                            |   | -FEN20:I.ConnectionFaulted | d    | 0            |                     | Decimal | BOOL      |             |
|       | Trends                     |   | – FEN20:I.Data             |      | {}           | { <b>.</b> .        | Decimal | INT[4]    |             |
|       | Logical Model              |   | +-FEN20:I.Data[0]          |      | 0            |                     | Decimal | INT       |             |
|       | i⊒                         |   | +-FEN20:I.Data[1]          |      | 0            |                     | Decimal | INT       |             |
|       | PointIO                    |   | + FEN20:1.Data[2]          |      | 0            |                     | Decimal | INT       |             |
|       |                            |   | + FEN20:1.Data[3]          |      | 0            |                     | Decimal | INT       |             |
|       | 🔁 1769-L16ER-BB1B CLX16v30 |   | - FEN20:0                  |      | { <b></b> }  | { <b>.</b> .        |         | _0030:69  |             |
|       | 6931090 FEN20              |   | - FEN20:0.Data             |      | { <b></b> }  | { <b>.</b> .        | Decimal | INT[2]    |             |
|       |                            |   | + FEN20:0.Data[0]          |      | 0            |                     | Decimal | INT       |             |
|       |                            |   | + FEN20:0.Data[1]          |      | 0            |                     | Decimal | INT       |             |
|       |                            |   |                            |      |              |                     |         |           |             |

#### NOTE

Ĩ

- Disadvantages of using EDS file for device configuration:
- Tag description is missing
- Minor changes to the EDS file requires the file to be updated. When done, a project that had used previous release of the EDS file, cannot display device properties. This is usually causing issues for a system integrator.



# 7 PROFINET configuration

# 7.1 GE Proficy machine edition setup

It is assumed that there is working knowledge of GE Proficy Machine Edition.

#### 7.1.1 Create new GE project

- ➤ Create a New project in Proficy using New Project Wizard or Open Project.
- ► Select File  $\rightarrow$  New Project.

| 7 Т  | est - Proficy Machine Edition    |      |    |               |                |         |       |       |       |     |      |
|------|----------------------------------|------|----|---------------|----------------|---------|-------|-------|-------|-----|------|
| Eile | Edit Search Project Target Varia | bles |    | <u>T</u> ools | W              | indov   | v H   | lelp  |       |     |      |
| 20   | New Project                      |      | b  | ß             | $\Sigma$       | <u></u> | ×     | 1     | 1     | 6   | 4    |
| Ê    | Open Project                     |      | R. | -11-          | <del>/</del> / | -0-     | -(/)- | -(†)- | -(4)- | (S) | - () |
|      | Restore Project                  |      |    |               |                | д       | ×     |       |       |     |      |
|      | Cours And Dealers Dealers        |      |    |               |                |         |       |       |       |     |      |

For a new project, insert the Project Name, Project Template, and Project location.
When done click OK.

| New Project       |  |   |   | ×  |
|-------------------|--|---|---|--|
|                   |  |   |   |  |
| Project Name:     | PLC1   |   |   |  |
| Project Template: | GE Intelligent Platforms PACSy   | istems RX3i   | -   | Set as default   |
| Project Location: | GE Intelligent Platforms PACSy<br>GE Intelligent Platforms PACSy<br>GE Intelligent Platforms Remoti<br>GE Intelligent Platforms Remoti<br>GE Intelligent Platforms Remoti<br>GE Intelligent Platforms Remoti<br>GE Intelligent Platforms Series<br>GE Intelligent Platforms Series<br>GE Intelligent Platforms Series<br>GE Intelligent Platforms Series<br>GE Intelligent Platforms Versalw<br>GE Intelligent Platforms Versalw<br>GE Intelligent Platforms Versalw | stems RX3i<br>stems RX7i<br>e I/O - PACSystems RX3i<br>e I/O - Series 90-30 Ether<br>e I/O - Series 90-70 Geniu<br>e I/O - VersaMax Ethernet<br>e I/O - VersaMax Ethernet<br>e I/O - VersaMax Ethernet<br>go Micro PLC<br>90-30 PLC<br>1ax Nano/Micro PLC<br>1ax PLC<br>t | Etherne<br>net<br>t   | i target   |
|                   | e<br>arget 1<br>Data Watch Lists<br>Hardware Configuration<br>Logic<br>  | Target1:<br>Data Watch Lists:<br>Hardware<br>Configuration:<br>Logic Program<br>Blocks:<br>Reference View<br>Tables:<br>Supplemental<br>Files:  | PACSyste<br>Empty<br>Default P<br>RX3i<br>Contains<br>_MAIN LD<br>Contains<br>RVTs<br>Contains<br>folders | ms RX3i<br>ACSystems<br>empty<br>Block<br>Default<br>empty |
|                   | OK   | Cancel  |   |  |

Once the project is in Proficy, Right click on the Processor and select the CPU.
 Click OK.



To add the PROFINET Controller, right click on the slot the PROFINET card is in the chassis and in the pop up window click Add Module.

| Navigator           |                   |           | <b>₽</b> × |
|---------------------|-------------------|-----------|------------|
|                     |                   |           |            |
| 🚊 🎬 Hardware Confi  | iguration         |           | <b>A</b>   |
| 🖃 🎆 Rack 0 (IC6     |                   |           |            |
| 📲 Slot 0 (1         | (C695PSA040)      |           |            |
| 🖁 Slot 1 (l         | Used With Slot 0) |           |            |
| 庄 🖷 🗐 Slot 2 (1     | IC695CPE305)      |           |            |
| 🖬 Slot 3-4          | N                 |           |            |
| Slot 4              | Configure         | Enter     |            |
| 🛛 Slot 🗉            | Cut               | Chrl+X    |            |
| 🛛 Slot (            | Conv              | Ctrl+C    |            |
| 🛛 Slot :            | Docto             | Chilly    |            |
| 🛛 Slot 8            | rasue             | CUITY     |            |
| 🛛 Slot 🤄            | Add Module        | Ins       |            |
| 🛛 Slot :            | Replace Module    |           |            |
| 🛛 Slot :            | Delete Module     | Del       |            |
| 🛛 Slot :            |                   |           |            |
|                     | Properties        | Alt+Enter | <b>•</b>   |
|                     |                   |           |            |
| 🛛 💏 Opt 📝 Utili 🛛 😹 | Ma 📴 Pro          | 🔋 Vari    | 💡 Info     |



- ➤ In the Catalog Window, click on the **Bus Controller** Tab and select communication master. In our example, the RX3i Profibus Master and RX3i PROFINET Controller are used.
- ► Click OK.

| Cat         | alog                 |                 |            |  | ×      |
|-------------|----------------------|-----------------|------------|--|--------|
| Ce          | entral Process       | ing Uni         | t]         |  |        |
| Di          | iscrete Input        | Discre          | te Output  | Discrete Mixed Analog Input Analog Output            |        |
| Ar          | nalog Mixed 📗        | Commu           | unications | Bus Controller   Motion   3rd Party   Power Supplies |        |
| Ca          | atalog Number        | r               | Descriptio | n  | Cancel |
| <b>F</b> IC | 693BEM321            |                 | 90-30 Fan  | uc I/O Link Module (Master)                          |        |
| 10          | 693BEM331            |                 | 90-30 Ger  | nius Bus Controller (GBC)                            |        |
| 10          | 693BEM341            |                 | 90-30 2.5  | MHz FIP Bus Controller                               |        |
| 10          | 693DNM200            |                 | 90-30 Dev  | viceNet Master                                       |        |
| IC          | 694BEM321            |                 | 90-30 Fan  | uc I/O Link Module (Master)                          |        |
| 10          | IC694BEM331 RX3i Ger |                 | RX3i Gen   | ius Bus Controller (GBC)                             |        |
| 10          | 694DNM200            | 4DNM200 RX3i De |            | iceNet Master  |        |
| 10          | 695PBM300            |                 | RX3i Profi | bus Master   |        |
| IC          | :695PNC001           |                 | RX3i PRO   | IFINET Controller (2 SFP)                            |        |
| L .         |                      |                 |            |  |        |
|             |                      |                 |            |  |        |
| L .         |                      |                 |            |  |        |
|             |                      |                 |            |  |        |
|             |                      |                 |            |  |        |
|             |                      |                 |            |  |        |
|             |                      |                 |            |  |        |
|             |                      |                 |            |  |        |

#### 7.1.2 Add the FEN20 device

➤ Right click on the PROFINET Controller in the Navigator Window. Select Launch Discovery Tool in the Pop up Window.



- > Click on **Refresh Device** List to bring list of devices on the network.
- > Select device to be modified and click edit device.

| ſ | - Connection    | Settings       |                            |                |                     |       |                          |                              |           |             |       |
|---|-----------------|----------------|----------------------------|----------------|---------------------|-------|--------------------------|------------------------------|-----------|-------------|-------|
|   | Connection      | : Local Area C | Connection 2               |                |                     |       |                          |                              |           |             | •     |
|   | LAN:            | LAN01          |                            |                |                     |       |                          |                              |           |             | •     |
|   | Status:         | No Errors      |                            |                |                     |       |                          |                              |           |             |       |
|   | Status          | Device Name    |                            | IP             | <sup>o</sup> Addres | s     |                          | Vendor                       |           |             | Devic |
| I | 2               |                |                            | <b>()</b> 19:  | 2.168.              | 1. 2  |                          | Hans Turck                   | GmbH + Co | o. KG       | FEN20 |
|   | <b>Q</b>        | fgen           |                            | 19             | 2.168.              | 1.111 |                          | Hans Turck                   | GmbH + Co | o. KG       | FGEN  |
| Γ | Filters (3/3) — |                | Selection Prope            | erties —       |                     |       |                          |                              |           |             |       |
|   | 🗹 🕜 Assigned    |                | MAC Address:               | 00-07-46       | 6-FF-40-CI          | F     | IP Address:              | 192.168.1.2                  |           | Identify De | evice |
|   | 🗹 😥 Assigned    | with errors    | Device Role:<br>Vendor ID: | Device<br>013D |                     |       | Subnet Mask:<br>Gateway: | 255.255.255.0<br>192.168.1.1 |           | Edit Dev    | ice   |
|   | 🗹 🥐 Not assign  | ned            | Device ID:                 | 9001           |                     |       |                          |                              |           |             |       |

#### 7.1.3 Assign FEN20 name and IP address

➤ In the properties window, the Device Name and IP address can be changed. You can also reset the device to factory defaults and identify the device on the network. When identifying the device, the LEDs on the gateway will flash. When Done click on the exit button.

| FEN20-16DXP Properties   |   | ×                  |
|--|---|--------------------|
| Vendor Name: Hans Turck GmbH + Co. KG<br>MAC Address: 00-07-46-FF-40-CF<br>Device Type: FEN20-16DXP                | Vendor ID: 013D<br>Device ID: 9001<br>Device Role: Device | Identify Device    |
| Device Name  |   | Set Device Name    |
| IP Address         192.168.1.2           Subnet Mask:         255.255.255.0           Gateway:         192.168.1.1 |   | Set IP Information |
| Reset device to factory settings   |   | Reset Device       |
|  |   | ×                  |
|  | Exit  |                    |



#### 7.1.4 Installing GSD or GSDML files in the hardware configuration

➤ In the Toolchest window click on the dropdown arrow and select a Profibus or PROFINET Device.

| Toolchest                                | × |
|--|---|
| Profibus Devices                         | - |
| - Ser. All Drawers                       |   |
|  |   |
| - 📴 PLC1                                 |   |
|  |   |
| - 🍋 9030 Ethernet NIU                    |   |
| - 🍋 Basic Data Types                     |   |
| - 🖰 Basic Enum Types                     |   |
| - 🖰 DeviceNet Devices                    |   |
| - 🍋 FBD Instructions                     |   |
| │ — @ Guided Tour                        |   |
| HART Utilities                           |   |
| – 👰 LD Instructions                      |   |
| Contraction Developer                    |   |
| - Carlos Developer Flowchart             |   |
| - CSystems ENIU High Availabily Enablers |   |
| PC FBD Instructions                      |   |
| PC Ladder Instructions                   |   |
| C SPC Instructions                       |   |
|  |   |
|  |   |

► Right mouse click the Toolchest window.

 $\blacktriangleright$  Click Assistants  $\rightarrow$  Add GSD File....

| UICHESC  |             |                               |  |  | Ą |
|--|-------------|-------------------------------|--|--|---|
| 🍋 Profibus Devic   | es          |                               |  |  |   |
| GE INTELLIGEN  | FPLATFORMS  | в                             |  |  |   |
| HORNER ELECT   | RIC         |                               |  |  |   |
|  | JE PRODUCTS |                               |  |  |   |
| WHEDCO, INC_   |             |                               |  |  |   |
|  |             |                               |  |  |   |
|  |             |                               |  |  |   |
|  |             |                               |  |  |   |
| Collapse All   |             |                               |  |  |   |
| New Drawer   |             |                               |  |  |   |
| Rename Drawer  |             |                               |  |  |   |
| Delete Drawer  | Del         |                               |  |  |   |
| Export Drawer  | Del         |                               |  |  |   |
| Export Drawer  | Del         |                               |  |  |   |
| Export Drawer<br>Import Drawer<br>Import Drawer  | Del         |                               |  |  |   |
| Export Drawer<br>Import Drawer<br>Import Drawer as Co<br>Scan for new objects  | Del<br>py   |                               |  |  |   |
| Delete Drawer<br>Export Drawer<br>Import Drawer<br>Import Drawer as Co<br>Scan for new objects<br>New Folder               | Del         |                               |  |  |   |
| Delete Drawer<br>Export Drawer<br>Import Drawer<br>Import Drawer as Co<br>Scan for new objects<br>New Folder<br>Assistants | Del         | d G5D File                    |  |  |   |
| Delete Drawer<br>Export Drawer<br>Import Drawer<br>Import Drawer as Co<br>Scan for new objects<br>New Folder<br>Assistants | Del         | d GSD File<br>ite To GSD File |  |  |   |



•

# NOTE

All files with .GSD are the default GSD files in the English language. Other versions may include GSE (English), GSF (French), and GSG (German) languages. All PROFINET files are xml files.

- > Browse to the folder where the GSD file is located.
- ► Select file(s). Click **Open**.



- 7.1.5 Adding a PROFINET device onto the network.
  - > Click on the PROFINET Devices drop down in the Toolchest.





- ► Click on the folder to open the folder
- ► Click on the GSDML file and drag it to the **PROFINET** card.



 Once it is under the PROFINET, click on the gateway and the device name and IP Address will be in the Inspector. This must match the configuration downloaded to the gateway when using the network discovery tool.

| Navigator                              | 4 ×                                |  |  |  |  |  |  |
|--|------------------------------------|--|--|--|--|--|--|
|  |                                    |  |  |  |  |  |  |
| 📲 Slot 0                               | (IC695P5A040)                      |  |  |  |  |  |  |
| 📔 Slot 1                               | (Used With Slot 0)                 |  |  |  |  |  |  |
| 🕀 📲 Slot 2                             | (IC695CPE305)                      |  |  |  |  |  |  |
| 🖃 📲 Slot 3                             | (IC695PNC001) *                    |  |  |  |  |  |  |
| i⊞… 🛽 bl                               | 67 (#1) [BL67-GW-EN-PN] *          |  |  |  |  |  |  |
| 🖃 🔋 turck-fen20-16dxp (#5) [FEN20-16DX |                                    |  |  |  |  |  |  |
| □ 📳 Slot 0 (FEN20-16DXP) *             |                                    |  |  |  |  |  |  |
|  | Interrace I (PN-IO)*               |  |  |  |  |  |  |
|  | Port 2 (Port 2)*                   |  |  |  |  |  |  |
|  | Slot 1 (16DXP) *                   |  |  |  |  |  |  |
|  | urck-fgen (#4) [FGEN-XSG16-5001] * |  |  |  |  |  |  |
| 🗐 🗐 Slot 4                             | (IC695PBM300) *                    |  |  |  |  |  |  |
| Ē- 🗊 [1                                | ] BLCDP *                          |  |  |  |  |  |  |
| -1                                     | [0] 4AI-VI *                       |  |  |  |  |  |  |
| I I                                    | [[1]4AT-VI(1)*                     |  |  |  |  |  |  |
|  |                                    |  |  |  |  |  |  |
| [ 🚾 🛛 🖉 🖉 🖉                            | M 😰 Pr 🔯 Va 🧣 Inf                  |  |  |  |  |  |  |
| Inspector                              | <b>#</b> ×                         |  |  |  |  |  |  |
| IO-Device                              |                                    |  |  |  |  |  |  |
| Device Number                          | 5                                  |  |  |  |  |  |  |
| Update Rate (ms)                       | 128                                |  |  |  |  |  |  |
| Reference Variable                     | <none></none>                      |  |  |  |  |  |  |
| ⊡Network Identification                |                                    |  |  |  |  |  |  |
| IO LAN                                 | LAN01                              |  |  |  |  |  |  |
| Device Name                            | lurck-renzu-rooxp                  |  |  |  |  |  |  |
| Device Description                     |                                    |  |  |  |  |  |  |
| IP Address                             | 192.168.1.2                        |  |  |  |  |  |  |
| Elueneral                              |                                    |  |  |  |  |  |  |
| GSDML                                  | GSDML-V2.2-TURCK-FEN20-20130704    |  |  |  |  |  |  |
| L Douroo Luno                          | FEN20-16DXP                        |  |  |  |  |  |  |
| Device Type                            |                                    |  |  |  |  |  |  |
| Device Access Point IE                 | DAP 2                              |  |  |  |  |  |  |
| Device Access Point IE                 | DAP 2                              |  |  |  |  |  |  |

Double click on turck-fen20-16dxp to bring up the properties and station parameters of the gateway. Double click on slot 1 to bring parameters for the 16 DXP points.



→ This will bring up the GW parameters for PROFINET.

| 2 | PROFINET DCP - Direct Connection (0      | .3.5.1) 16DXP (0.3.5.0) FEN20-16DXP                  | ₹× |
|---|--|--|----|
| Γ | 10-Device Access Point   Media Redundanc | y Station parameter Protocol selection GSDML Details |    |
| l | Output behaviour at communication loss:  | Set to zero  | •  |
| l | Disable all diagnosis:                   |  |    |
|   | Disable output power diagnosis:          |  |    |
| l | 1/O Assistant Force Mode disabled:       |  |    |
| l |  |  |    |

> After changing the parameters click the x to close the window.

| PROFINET DCP - Direct Con  | nection (0.3.5.1) 16DXP (0.3.5.0) FEN20-16DXP |   | ₹× |
|----------------------------|---|---|----|
| Settings Inputs/outputs GS | SDML Details                                  |   |    |
| Digital input 1::          | Normal  | • | -  |
| Digital input 2::          | Normal  | • |    |
| Digital input 3::          | Normal  | • |    |
| Digital input 4::          | Normal  | • |    |
| Digital input 5::          | Normal  | • |    |
| Digital input 6::          | Normal  | • |    |
| Digital input 7::          | Normal  | • |    |
| Digital input 8::          | Normal  | • |    |
| Digital input 9::          | Normal  | • |    |
| Digital input 10::         | Normal .                                      | • |    |
| Digital input 11::         | Normal  | • |    |
| Digital input 12::         | Normal  | • |    |
| Digital input 13::         | Normal  | • |    |
| Digital input 14::         | Normal  | • |    |
| Digital input 15::         | Normal  | • |    |
| Digital input 16::         | Normal  | • |    |
| Output 1::                 | Activate                                      | • |    |
| Output 2::                 | Activate                                      | • |    |
| Output 3::                 | Activate                                      | • |    |



# 8 Modbus TCP configuration

The Modbus TCP project and configuration of the FEN20 (in this example the FEN20-4DIP-4DXP) is shown utilizing Turck's TX500 HMI/PLC platform, which supports:

- IEC 61131 multitasking PLC runtime utilizing CODESYS v3.5.8.1 PLC
- 20 MB program/data memory
- 32 kB non-volatile memory
- PROFINET Controller (master)
- EtherNet/IP Scanner (master)
- Modbus TCP Client (master)
- Modbus RTU Client (master)
- CANopen Master (optional via plug-in module)
- Modbus TCP Server (slave)
- Modbus RTU Server (slave)
- OPC UA Server
- Standard Ethernet TCP/IP und UDP/IP communication
- Serial RS232, RS485 and RS422 communication

Network topology used in the project:



- 192.168.1.44 FEN20-4DIP-4DXP Modbus TCP slave
- 192.168.1.54 FEN20-16DXP-Modbus TCP slave

## 8.1 Create TX500 Modbus TCP master project

It is assumed that user has a basic knowledge of the CODESYS project and programming environment.

> Open an existing project or start a new CDS3 project:



► At Tools menu, open Package Manager.



> Verify that TX500 DTM package is installed; if not, follow dialog to install package.

| 🍅 D          | X500_M                        | IOD_M        | aster_r1.p      | roject*       | - CODE         | SYS           |               |               |              |     |       |        |        |       |               |
|--------------|-------------------------------|--------------|-----------------|---------------|----------------|---------------|---------------|---------------|--------------|-----|-------|--------|--------|-------|---------------|
| <u>F</u> ile | <u>E</u> dit                  | <u>V</u> iew | <u>P</u> roject | <u>B</u> uild | <u>O</u> nline | <u>D</u> ebug | <u>T</u> ools | <u>W</u> indo | w <u>H</u> e | lp  |       |        |        |       |               |
| 管            | 🛩 🖬                           | 16           | 600             | χĘ            | • CL '         | × 1 #         |               |               | • Dî         |     | 05    | 0ğ     | ÷      | 1     | <b>%</b> I () |
|              | 🗊 Pac                         | kage N       | Manager         |               |                | _             | _             |               |              |     |       |        | _      |       |               |
| Dev<br>E     | Currently installed packages: |              |                 |               |                |               |               |               |              |     |       |        |        |       |               |
|              | Refresh Sort by: Name         |              |                 |               |                |               |               |               |              |     | Name  |        |        |       |               |
|              | N                             | ame          |                 | Ve            | ersion         | Install       | ation dat     | e U           | lpdate i     | nfo | Lice  | ense i | info   |       |               |
|              | =                             | BLxx-        | PG-EN-V3        | 1.            | 0.5.0          | 6/23/2        | 017           |               |              |     | No li | cense  | e requ | uired |               |
|              | -                             | TBEN-        | Lx-PLC-1x       | : 1.0         | 0.3.0          | 6/23/2        | 017           |               |              |     | No li | cense  | e requ | uired |               |
|              | -                             | TX500        | )               | 1.            | 0.4.0          | 6/23/2        | 017           |               |              |     | No li | cense  | e requ | uired |               |
|              |                               |              |                 |               |                |               |               |               |              |     |       |        |        |       |               |



#### 8.1.1 Add Ethernet adapter

- ► Highlight **Device** in the **Device** organizer.
- ► Right-click to Add Device.



> Expand Fieldbuses in the Add device page.

> Expand Ethernet adapter and select Ethernet by Turck.



#### ► Click Add Device.

| Add Device  |   |           |            |               |                  |   |  |  |  |  |
|---|---|-----------|------------|---------------|------------------|---|--|--|--|--|
| Name: Et<br>Action:   | hernet  | ica 🔿 Plu | a davira . | Lindata davis |                  | ] |  |  |  |  |
| Device:<br>Vendor: <all vendors=""></all>   |   |           |            |               |                  |   |  |  |  |  |
| Name  | <u></u>   | Vendor    | Version    |               |                  | Ĩ |  |  |  |  |
| Group<br>Displa   | Group by category     Display all versions (for experts only)     Display outdated versions |           |            |               |                  |   |  |  |  |  |
| Information   |   |           |            |               |                  |   |  |  |  |  |
| Name: Ethernet<br>Vendor: Turck<br>Categories: Ethernet Adapter, Ethernet Adapter, Ethernet Adapter<br>Version: 3.5.7.20<br>Order Number: -       |   |           |            |               |                  |   |  |  |  |  |
| Append selected device as last child of         Device         ① (You can select another target node in the navigator while this window is open.) |   |           |            |               |                  |   |  |  |  |  |
|   |   |           |            | C             | Add Device Close |   |  |  |  |  |

> At Ethernet Adapter , assign an IP address to the adapter (it is actual IP address of the TX500).







> Other option is to highlight Device, open Project menu, select Edit Object.

► Scan network on the **Scan network...** page.

| Device X               |                                 |
|------------------------|---------------------------------|
| Communication Settings | Scan network Gateway • Device • |
| Applications           |                                 |
| Files                  |                                 |
| Log                    |                                 |

➤ Confirm selection when right side is populated as follows:

| Select Device                              | ×                                  |
|--|------------------------------------|
| Select the network path to the controller: |                                    |
| Gateway-1 (scanning)                       | Device Name:<br>TX507-P3CV01       |
|  | Device Address: Wink Wink          |
|  | Target Version:<br>1.0.4.0         |
|  | Target Vendor:<br>Turck            |
|  | Target ID:<br>10CD 0203            |
|  | Target Name:<br>Turck/ARM/WinCE TV |
|  | Target Type:<br>4096               |
|  |                                    |
|  |                                    |
|  | OK Cancel                          |

#### 8.1.2 Add Modbus master

> At Ethernet in the device organizer, right-click and select Add Device....

| Template TX500.project* - CODESYS                       |   |   |  |  |  |  |  |  |  |  |  |
|---|---|---|--|--|--|--|--|--|--|--|--|
| <u>File E</u> dit <u>V</u> iew <u>P</u> roject <u>B</u> | uild <u>O</u> nline <u>D</u> ebug <u>T</u> ool                              | ls <u>W</u> indow <u>H</u> elp                        |  |  |  |  |  |  |  |  |  |
| 🎦 🚔 🔚 🕘 🗠 🖓   | 🖹 🖆 📕   舎   い つ 以 貼 略 ×   構 端   晶   油・ピ   幽   端 ◎ → 📲 ×   ほ 短 性 地 お   ♪   ╤ |   |  |  |  |  |  |  |  |  |  |
|   |   |   |  |  |  |  |  |  |  |  |  |
| Devices   | - + ×   | Add Device  |  |  |  |  |  |  |  |  |  |
| Template TX500  |   |   |  |  |  |  |  |  |  |  |  |
| Bevice (1x507#3CV0                                      | 1)  | Name:   |  |  |  |  |  |  |  |  |  |
| 🖹 🔘 Application   |   | Action:   |  |  |  |  |  |  |  |  |  |
| 👘 Library M   | anager  | Append device Insert device Plug device Update device |  |  |  |  |  |  |  |  |  |
| PLC_PRG   | (PRG)   | Device:   |  |  |  |  |  |  |  |  |  |
| i⊒-∰ Main   | Task  | Vendor: <a>All vendors&gt;</a>                        |  |  |  |  |  |  |  |  |  |
| <u>с</u> В ь  | PLC_PRG   | Name Vendor Version                                   |  |  |  |  |  |  |  |  |  |
| 🚹 Ethernet (Et  | Properties  |   |  |  |  |  |  |  |  |  |  |
| 100   | Add Object  |   |  |  |  |  |  |  |  |  |  |
| <b>`</b>  | Add Folder  | 🗷 🛲 Profinet IO                                       |  |  |  |  |  |  |  |  |  |
|   | Add Device  |   |  |  |  |  |  |  |  |  |  |
|   | Insert Device   |   |  |  |  |  |  |  |  |  |  |
|   | Disable Device  |   |  |  |  |  |  |  |  |  |  |
|   | Update Device   |   |  |  |  |  |  |  |  |  |  |
| Ľ   | Edit Object   |   |  |  |  |  |  |  |  |  |  |
|   | Edit Object With  | Group by category                                     |  |  |  |  |  |  |  |  |  |

- ► At Add device page, expand Modbus.
- ► Highlight Modbus TCP Master.
- > Enter name TX500\_Modbus\_TCP\_Master in the name field.
- ► Click Add Device at lower corner.







> At TX500\_Modbus\_TCP\_Master property page, check the check-box Auto-connect.

#### 8.1.3 Add Modbus TCP slave

The next part shows how to configure FEN20-4DIP-4DXP as the Modbus TCP slave. The same procedure is used for any other Modbus TCP slave device.

- > At TX500\_Modbus\_TCP\_Master, right-click and select Add Device....
- ► Select Modbus TCP Slave by 3S.
- ► Enter FEN20\_4DIP\_4DXP into Name field.
- ► Click Add Device and exit.



► At FEN20 in the device organizer, double-click to open the device property page.



At General tab, enter the IP address of the FEN20-4DIP-4DXP into Slave IP address.
Assign 1 to Unit-ID (each device has unique Unit-ID number).

| Device 🔐 Ethernet          | TX500_Modbus_TCP_Master | FEN20_4DIP_4DXP X  |  |  |  |  |  |
|----------------------------|-------------------------|--------------------|--|--|--|--|--|
| General                    | Modbus-TCP              |                    |  |  |  |  |  |
| Modbus Slave Channel       | Slave IP Address:       | 192 . 168 . 1 . 44 |  |  |  |  |  |
| Modbus Slave Init          | Unit-ID [1247]          | 1                  |  |  |  |  |  |
| MadhuaTCDSIava Daramatara  | Response Timeout (ms)   | 1000               |  |  |  |  |  |
|                            | Port                    | 502                |  |  |  |  |  |
| ModbusTCPSlave I/O Mapping |                         |                    |  |  |  |  |  |
| Status                     |                         |                    |  |  |  |  |  |
| Information                |                         |                    |  |  |  |  |  |

#### 8.1.4 Configure FEN20 IO data map

The FEN20-4DIP-4DXP data sheet contains the IO data map of the device which is used to configure IO channels in the project:

| Process Data I | vrocess Data Mapping        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |
|----------------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Modbus TCP F   | Nodbus TCP Register Mapping |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |
|                | Reg                         | Bit 15 | Bit 14 | Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9  | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
| Inputs (RO)    | 0x0000                      | -      | -      | -      | -      | -      | -      | -      | -     | DI7   | DI6   | DI5   | DI4   | DI3   | DI2   | DI1   | DIO   |
| Status (RO)    | 0x0001                      | -      | FCE    | -      | -      | CFG    | COM    | V1 low | -     | -     | -     | -     | -     | -     | -     | -     | Diag  |
|                |                             |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       | Warn  |
| Diag (RO)      | 0x0002                      | -      | -      | -      | -      | -      | -      | -      | -     | -     | -     | -     | -     | -     | -     | -     | I/O   |
|                |                             |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       | Diag  |
| Outputs (RW)   | 0x0800                      | -      | -      | -      | -      | -      | -      | -      | -     | -     | -     | -     | -     | DO3   | DO2   | DO1   | DO0   |
| I/O Diag (RO)  | 0xA000                      | -      | -      | -      | -      | SCO3   | SCO2   | SCO1   | SCO0  | -     | -     | -     | -     | -     | -     | -     | IGS   |
|                |                             |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |



► At Modbus Slave Channel tab, click Add Channel.... button.

| Ethernet FEN20_4D          | IP_4DXP 🗙 | •           |         |             |         |                |              |   |
|----------------------------|-----------|-------------|---------|-------------|---------|----------------|--------------|---|
| General                    | Name      | Access Type | Trigger | READ Offset | Length  | Error Handling | WRITE Offset | L |
| Modbus Slave Channel       |           |             |         |             |         |                |              |   |
| Modbus Slave Init          |           |             |         |             |         |                |              |   |
| ModbusTCPSlave Parameters  |           |             |         |             |         |                |              |   |
| ModbusTCPSlave I/O Mapping |           |             |         |             |         |                |              |   |
| Status                     |           |             |         |             |         |                |              |   |
| Information                | •         |             |         | Ш           |         |                |              | • |
|                            |           |             |         | Add         | Channel | Delete         | Edit         |   |

- > Configure Channel 0 input data block, starting at address 0x0000 and data size 3 where:
- Address 0x0000 Input data
- Address 0x0001 Device status
- Address 0x0002
- IO Diagnostic warning bit

| ModbusChar | nnel    |                               |                 | ×      |
|------------|---------|-------------------------------|-----------------|--------|
| Channel    |         |                               |                 |        |
| Name       |         | Channel 0                     |                 |        |
| Access Ty  | /pe     | Read Input Registers (Functio | n Code 4)       | -      |
| Trigger    |         | Cyclic 👻                      | Cycle Time (ms) | 100    |
| Comment    | :       |                               |                 |        |
| -READ Reg  | jister  |                               |                 |        |
| Offset     |         | 0x0000                        |                 | •      |
| Length     |         | 3                             |                 |        |
| Error Han  | dling   | Keep last Value 👻             |                 |        |
| WRITE Re   | egister |                               |                 |        |
| Offset     |         |                               |                 | -      |
| Length     |         | 1                             |                 |        |
|            |         |                               | ОК              | Cancel |

> Configure Channel 1 output data block, starting at address 0x0800 and data size 1 where:

Address 0x0800 Output data

| Name           | Channel 1                                   |
|----------------|---|
| Access Type    | Write Multiple Registers (Function Code 16) |
| Trigger        | Cyclic    Cycle Time (ms) 100               |
| Comment        | Output data                                 |
| READ Register  |   |
| Offset         | <b></b>                                     |
| Length         | 1   |
| Error Handling | Keep last Value 👻                           |
| WRITE Register |   |
| Offset         | 0x0800+                                     |
| Length         | 1   |

- ► Add next channel for the IO diagnostics. It is read-only at:
- Address 0xA000 IO diagnostics

| M | odbusChannel   |  | x |
|---|----------------|--|---|
|   | Channel        |  | _ |
|   | Name           | Channel 2                                |   |
|   | Access Type    | Read Holding Registers (Function Code 3) |   |
|   | Trigger        | Cyclic   Cycle Time (ms) 100             |   |
|   | Comment        | Diag IO                                  |   |
|   | READ Register  |  |   |
|   | Offset         | 0xA000 👻                                 |   |
|   | Length         | 1  |   |
|   | Error Handling | Keep last Value                          |   |
|   | WRITE Register |  |   |
|   | Offset         | 0x0000 👻                                 |   |
|   | Length         | 1  |   |
|   |                | OK Cance                                 | : |



#### The IO data map overview:

| Channel 0         Read Input Registers (Function Code 04)         Cyclic, t # 100ms         16 # 0000         3         Keep last Value         Input registers           - Channel 1         Write Multiple Registers (Function Code 16)         Cyclic, t # 100ms         16 # 0000         1         Output data | Name      | Access Type                                 | Trigger         | READ Offset | Length | Error Handling  | WRITE Offset | Length | Comment         |
|---|-----------|---|-----------------|-------------|--------|-----------------|--------------|--------|-----------------|
| Channel 1 Write Multiple Registers (Function Code 16) Cyclic, t#100ms 16#0000 1 Output data   | Channel 0 | Read Input Registers (Function Code 04)     | Cyclic, t#100ms | 16#0000     | 3      | Keep last Value |              |        | Input registers |
|   | Channel 1 | Write Multiple Registers (Function Code 16) | Cyclic, t#100ms |             |        |                 | 16#0000      | 1      | Output data     |
| Channel 2 Read Holding Registers (Function Code 03) Cyclic, t#100ms 16#A000 1 Keep last Value Diag IO   | Channel 2 | Read Holding Registers (Function Code 03)   | Cyclic, t#100ms | 16#A000     | 1      | Keep last Value |              |        | Diag IO         |

#### ► Select how are channels updated at Always update variables field as follows.

| Always update variables: | Enabled 2 (always in bus cycle task) |  |
|--------------------------|--------------------------------------|--|
|                          |                                      |  |

| General  | Channels                | Channels |                     |             |   |   |                                  |  |  |  |
|--|-------------------------|----------|---------------------|-------------|---|---|----------------------------------|--|--|--|
|  | Variable                | Ma       | Channel             | Address     | Туре  | Defa  | U                                | Description  |  |  |
| Iodbus Slave Channel   | 🖳 🍫                     |          | Channel 0           | %IW50       | ARRAY [02] OF WORD                              |   |                                  | Read Input Registers   |  |  |
|  | 😟 - 🍢                   |          | Channel 1           | %QW50       | ARRAY [00] OF WORD                              |   |                                  | Write Multiple Registers                                       |  |  |
| 10dbus Slave Init  | 😟 🍫                     |          | Channel 2           | %IW53       | ARRAY [00] OF WORD                              |   |                                  | Read Holding Registers   |  |  |
| ModbusTCPSlave Parameters  |                         |          |                     |             |   |   |                                  |  |  |  |
| 1odbusTCPSlave Parameters<br>1odbusTCPSlave I/O Mapping<br>itatus              |                         |          | Reset Ma            | pping Alway | ys update variables: Use pa                     | rent device   | sett                             | ing  |  |  |
| AodbusTCPSIave Parameters<br>AodbusTCPSIave 1/0 Mapping<br>Status              | IEC Objects             |          | Reset Ma            | pping Alway | ys update variables: Use pa<br>Use pa<br>Enable | rent device<br>rent device<br>d 1 (use bus                | setti<br>setti                   | ing<br>ing<br>le task if not used in any task                  |  |  |
| ModbusTCPSlave Parameters<br>ModbusTCPSlave I/O Mapping<br>Ratus<br>nformation | IEC Objects<br>Variable |          | Reset Ma<br>Mapping | pping Alway | ys update variables: Use pa<br>Enable<br>Enable | rent device<br>rent device<br>d 1 (use bus<br>d 2 (always | setti<br>setti<br>s cyd<br>in bu | ing<br>ing<br>le task if not used in any tasi<br>us cyde task) |  |  |

#### ► Online menu, Login:

| TX500_MOD_Master_r1.project - CODESYS      |                           |              |                |                        |               |            |               |               |                |              |
|--|---------------------------|--------------|----------------|------------------------|---------------|------------|---------------|---------------|----------------|--------------|
| <u>F</u> ile                               | <u>E</u> dit              | <u>V</u> iew | <u>Project</u> | <u>B</u> uild          | <u>O</u> nlii | ne         | <u>D</u> ebug | <u>T</u> ools | <u>W</u> indow | <u>H</u> elp |
| 管口   | 2 🔛                       | 14           |                | XB                     | ĊŞ,           | Lo         | gin           |               |                | Alt+F8       |
| _  |                           |              |                |                        | 0ğ            | Lo         | <u>go</u> ut  |               |                | Ctrl+F8      |
| Device                                     | es                        |              |                |                        |               | <u>C</u> r | eate boot     | t applicat    | tion           |              |
| TX500_MOD_Master_r1                        |                           |              | Do             | wnload                 |               |            |               |               |                |              |
| Ē  | 🖻 📕 Device (TX507-P3CV01) |              |                | Online Cha <u>n</u> ge |               |            |               |               |                |              |
| lar la |                           |              |                | Se                     | urce dow      | nload to   | connected     | device        |                |              |



➤ The FEN20-4DIP-4DXP configuration is completed and the project is running.

➤ Create Boot application and download to the device.





# 9 Turck subsidiaries - contact information

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