Your Global Automation Partner



# PROFINET Controller/Device Commissioning in CODESYS 3



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## 1 About these instructions

These instructions describe the commissioning of the CODESYS 3 programmable Turck devices as PROFINET Controller and PROFINET Device on the example of the compact controller TBEN-L...-PLC-10.

The instructions are valid for the following devices:

	Compact controller	HMI/PLC	Programmable gateways
	TBEN-LPLC	TX500 series	BL20-PG-EN-V3/ BL67-PG-EN-V3
PROFINET Controller	<b>v</b>	<b>v</b>	-
PROFINET Device	<b>v</b>	-	<ul> <li>✓</li> </ul>

#### 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

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



# 2 Creating a CODESYS Project and Configuring the Network

Turck provides the CODESYS version actually released for the devices under www.turck.com. This version contains the necessary Turck device packages.

- > Download CODESYS from www.turck.com and install it.
- ➡ The installed CODESYS version contains all necessary CODESYS packages and device description files.

### 2.1 Installing a CODESYS package

If another CODESYS version is used, first of all the package for the used Turck device has to be installed.

- Download the CODESYS package for the used device under www.turck.com. In the following example, the TBEN-L...-PLC-10 is used.
- ➤ Install the package using the CODESYS Package Manager "Tools → Package Manager".

0	Package Manager					×
	Currently installed packages: Refresh			Sort by	: Name 💌	Install
	Name	Version	Installation date	Update info	License info	Uninstall
	CODESYS SoftMotion	4.0.0.1	23.11.2016	Version 4.1.1.0 available!	No license required	Details
	TBEN-Lx-PLC-10	1.0.3.0	24.01.2017		No license required	
						Updates Search updates Download CODESYS Store Rating CODESYS Store
	Display versions 🛛 Sear	ch updates i	n background			Close

Fig. 1: Package Manager in CODESYS

The CODESYS package contains all necessary files:

- CODESYS Device Description,
- CODESYS libraries,
- GSDML file,
- EDS-file,
- ····

## 2.2 Create CODESYS Standard Project with TBEN-L...-PLC-...

> Create a new standard project with TBEN-L...-PLC-... as CODESYS device.

Standard Pi	roject		×
	You are about objects within - One program - A program PI - A cyclic task - A reference I	to create a new standard project. This wizard will create the following this project: mable device as specified below LC_PRG in the language specified below which calls PLC_PRG to the newest version of the Standard library currently installed.	
	<u>D</u> evice: PLC_PRG in:	TBEN-Lx-PLC-1x (Turck) Structured Text (ST) OK Cance	•

Fig. 2: Selecting the TBEN-L...-PLC-... as CODESYS device

→ The CODESYS project is created.

le Edit View Project Build Online Det	ug Iools Window Help Matika       - [î	∣oçică → = ⊀	[≡ e≡ q≡ +≡ \$	◇   🛒   🖶		
vices 👻 🕈 🗙	EDs X					
TBEN-Lx_PLC-10         Image: Comparison of the comp	LEDs I/O Mapping	Find		Filter Show a	11	
PLC Logic	Chabura	Variable	M. Channel	Address	Туре	l Description
= 💭 Application	Juarus	<b>*</b> >	LED 4 (green)	%QX8000.0	BIT	LED 4 (green)
Library Manager	Information	- <b>*</b> ø	LED 4 (red)	%QX8000.1	BIT	LED 4 (red)
PLC_PRG (PRG)		<b>*</b> @	LED 5 (green)	%QX8000.2	BIT	LED 5 (green)
Task Configuration			LED 5 (red)	%QX8000.3	BIT	LED 5 (red)
🖿 💓 MainTask			LED 6 (green)	%QX8000.4	BIT	LED 6 (green)
PLC_PRG		**	LED 6 (red)	%QX8000.5	BIT	LED 6 (red)
LEDs (LEDs)		<b>K</b> ø	LED 7 (green)	%QX8000.6	BIT	LED 7 (green)
Local_IO (Local IO)		<b>*</b> ø	LED 7 (red)	%QX8000.7	BIT	LED 7 (red)
DXP (DXP)		<b>K</b> ø	APPL LED (green)	%QX8001.0	BIT	APPL LED (gree
Diagnostics (Diagnostics)		- <b>K</b>	APPL LED (red)	%QX8001.1	BIT	APPL LED (red)
		LED 4 (green)	Reset Mapping Alwa	ys update variables: = Map to existing va	Use pare	nt device setting
• III		Bus Cycle Ta	use parent bus cy	cle setting 👻		

Fig. 3: CODESYS project



Additionally to the PLC logic, the project contains:

- 5 LEDs for free use in the program (LEDs)
  - Each LED uses 2 bit in the process output data of the device. They are automatically mapped to the output bits %QX8000.0 to QX8001.1 (see Fig. 3: CODESYS project (page 6)).
- Local IO (Local\_IO)
  - Process data and configuration of the device's local I/Os and the VAUX diagnostics
  - Diagnostics of the local I/Os and module status.
- 2 serial interfaces (COM0 and COM1)
  - Connection of RS232 and RS485 devices
- 1 CAN interface (CANbus)
  - Use of the device as CANopen Device, CANopen Manager or as SAE J1939 Manager

#### 2.3 Configuring the Network

Double clicking the entry "Device (TBEN-Lx-PLC-1x)" opens the "device" tab.

> Scan the network for TBEN-L...-PLC-10 via the "scan network..." button and select the device.



Fig. 4: Scan the network and select TBEN-L...-PLC-10 as device

#### 2.3.1 Configuring the Ethernet Interface

Right clicking the entry "Device (TBEN-Lx-PLC-1x)" opens context menu.

> Add the Ethernet interface via the "Add device..." function.

Eile Edit View Project Build	Debug Tools Window Help	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<   內4 44。  陽   20 + 17   四   99 ( ) Add Device	
Devices	Name:     Ethernet       Action:     Action:       action:     Action:       append device     Insert device       bevice:     Vendor:       Vendor:     Call vendors>       Vendor:     Call vendors>       Vendor:     Fieldbusses       Id Folder     If Ethernet       Turck     3.5.8.10	•
a comi a comi a cantous	ab clerkce       # ## Profinet IO         pdate Device       # to Object         skt Object With       # Display all versions (for experts only)         pott mappings from CSV       Display all versions (for experts only)         pott mappings from CSV       Display all versions (for experts only)         pott mappings from CSV       Display all versions (for experts only)         Display outdated versions       Information:         esset origin device [Device]       ## ## Profinet IO         wice Configuration       •         • (You can select another target node in the navisator while this window is open.)	D0:07:46
III     POUs      Pous	Add Device Close	•

Fig. 5: Adding the Ethernet interface

→ The Ethernet interface is added to the project tree.



> Open the "Ethernet" tab by double clicking the Ethernet interface in the project tree.

TBEN-L5_PLC-10_PN.project* - CODESYS	
<u>Eile Edit View P</u> roject <u>Build O</u> nline <u>D</u> ebug <u>T</u> ools <u>Wi</u> ndow <u>H</u> elp	
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Devices V A X	-
B TBENLIS_PIC-10_PN	•
E Device [connected] (TBEN-Lx-PLC- General	
PLC Logic	<u> </u>
Application     Status     Output     Status     Output     Status     Output     Status     Output     Status	
Library Manager	
E PLC PKG (PKg)	
IP Address 192 , 168 , 0 , 1	
PLC_PRG Subnet Mask 255 . 255 . 0	
- LEDs (LEDs) Network Adapters	<b>—</b>
Energia Local_IO (Local IO)	
A COMO	
eth0 1921681111	
eth1 0000	
eth2 0000	
usb0 10.0.1	
IP Address 192 . 168 . 1 . 111	
Subnet Mask 255 255 0	
Derauk dateway	
MAC Address 00:07:46:FF:A2:DA	
POUs Revices	UNL
Last build: 📀 0 😗 0 Precompile: 📀	Current user: (nobody)

Fig. 6: Configuring the Ethernet interface

The IP address of the network interface corresponds to the IP address of the TBEN-L...-PLC-....

- > Select "eth0" under "network interface".
- → The IP address is set automatically.



## 3 Using the Device as PROFINET Controller

#### Used Hardware

- PLC:
  - TBEN-L5-PLC-10
- I/Os:
  - TBEN-S1-8DXP
  - TBEN-S2-4IOL with:

IO-Link port 1: Turck temperature sensor, TS-530-LI2UPN8X-H1141-L016, IO-Link V1.0 IO-Link port 2: generic port configuration, one bit each in- and output data IO-Link port 3: Turck ultrasonic sensor, RU40U-M18E-LiU2PN8X2T-H1151, IO-Link V1.1 IO-Link port 4: generic port configuration, used as digital input

BL20-E-GW-EN with:
 I/O module 1: BL20-E-2CNT-2PWM
 I/O module 2: BL20-2DO-24VDC-0.5A-P
 I/O module 3: BL20-2AI-I(0/4...20MA)

#### Used Software

- CODESYS V3, 3.5.8.10
- TBEN-L...-PLC-1...\_V1.0.3.0.package

## 3.1 Creating a CODESYS Project and Configuring the Network

 Create CODESYS project and configure the network according to Kapitel 2, Creating a CODE-SYS Project and Configuring the Network.

#### 3.2 Configuring the Device as PROFINET Controller

Properties	Compact controller TBEN-LPLC-10	HMI/PLC TX500
Max. number of devices	64	64
Min. cycle time	1 ms	1 ms
Max. number of devices at 1 ms <b>A</b>	8	1

A This information refers to standard PROFINET devices with up to 4 byte of process data as for example digital I/O modules. For PROFINET devices with much more process data (50 ... 400 byte) as for example IO-Link, RFID or serial COM interfaces, the cycle time has to be increased to 2, 4 or 8 ms.

#### 3.2.1 Adding the PROFINET Controller to the Project

The PN-Controller from 3S – Smart Software Solutions GmbH is used.

> Add the PN-Controller to the Ethernet interface using the "Add device..." function.



Fig. 7: Adding the PN-Controller



→ The PROFINET controller is added to the project tree.

TBEN-L5_PLC-10_PN.project* - CODESY:	s		- • ×
Eile Edit View Project Build Online	<u>D</u> ebug <u>T</u> ools <u>W</u> indow <u>H</u> elp		
No al a la la al la al la al	< 144 (0.1 Ph. 186 - 181 199 1)		
		and and the second seco	
Devices 👻 🕂 🗙	Device Ethernet	PN_Controller ×	•
= · · · · · · · · · · · · · · · · · · ·			
Device (TBEN-Lx-PLC-1x)	General	Station Name controller	
E ELC Logic			
C Application	PNIO I/O Mapping	Default Slave IP Parameter	
ibrary Manager	Statue	First IP Address 192 . 168 . 1 . 2	
PLC_PRG (PRG)			
Task Configuration	Information	Last IP Address 192 . 168 . 1 . 254	
🗏 😂 MainTask		Subnet Mask 255 . 255 . 255 . 0	
		Default Gateway 0 . 0 . 0 . 0	
Profinet_Commun			
Promet_JOTask			
EEDS (LEDS)			
- COMI			
CANhurs			
Ethernet (Ethernet)			
PN Controller (PN-Control			
4			
POUs 🔀 Devices			]
		Last build: 😳 0 🕐 0 Precompile: 😏 Current user:	(nobody)

Fig. 8: PN-Controller in project tree



#### NOTE

The Device addresses under "Default Slave IP Parameter" and the Ethernet interface of the TBEN-L...-PLC-... have to be in the same subnet.

#### 3.2.2 PROFINET tasks in CODESYS

The following PROFINET tasks are automatically added to the project as soon as a PROFINET controller is added to the Ethernet interface.

Profinet\_CommunicationTask

This task includes the acyclic communication services, such as establishing connections, configuration of slaves and diagnostics. These services are not time-critical due to very weak real-time requirements. Therefore the task is low priority (default: priority 30, interval 10 ms). In applications with a large amount of slaves it can be necessary to extend the cycle time.

Profinet\_IOTask

This task is responsible for the PROFINET IO real-time data exchange. It controls the PROFINET-Master-Stack. The task should be set to high priority (default: priority 1, interval 1 ms).

## 3.3 Configuring PROFINET Devices

In this example, the following Turck multiprotocol devices are used as PROFINET devices:

- TBEN-S1-8DXP
- TBEN-S2-4IOL
- BL20-E-GW-EN
- 3.3.1 Installing the GSDML-files
  - Download the GSDML files from www.turck.com and install them in the CODESYS Device Repository.

Ele Edit View Project Build Online Debug   Ele Edit View Project Build Online Debug   Image: State Project Build Debug	TREN-PLC-10-PNDevice project* - CODESVS		
Installed degice descriptions: Installed degice descriptions:	TBEN-PLC-10-PNDevice.project* - CODESYS  File Edit View Project Build Online Debu  To a state of the state o	g Tools       Window Help         If       Bedkage Manager         If       Library Repository         If       Device Repository         If       Usualization Styles Repository         If       Device Repository         If       C:(ProgramData)CODESYS\Devices)	Edt Locations
CoMo     Com		Installed degree descriptions:       Name     Vendor     Version       Image: State of the sta	Install
Image: Contract of the set of th	COM1     COM1     CANEu     Com1     CANEu     Com1     Com1     Com1     Com1     Com1     Controller (PN-Controller)		Details
Last build: 10 0 10 0 Precompile: 10 Current user: (nohody)			
		Last build: 0 0 0 Precompile: 1	► Luser: (nobody)

Fig. 9: CODESYS Device Repository



#### 3.3.2 Scan Network for PROFINET Devices

> Start the device search via the "Scan for devices..." function at the PROFINET controller.



Fig. 10: Search devices

The found devices can either be selected separately or all found devices can be added to the project via the "Copy All Devices to Project" button.

Devicename	Devicetype	Station Name	Ident-No.	
= turck_tben_s2_4iol	TBEN-S2-4IOL	turck-tben-s2-4iol	16#62200001	
Attention! The device was not found in the reposito	ry -		16#00102102	
urck_tben_s1_8dxp	TBEN-S1-8DXP	turck-tben-s1-8d	16#50030005	
turck_tben_s1_8dxp_1	8DXP		16#60554400	
≡ <sup></sup> turck_bl20_e	BL20-E-GW-EN	turck-bl20-e	16#0150801F	
turck_bl20_e_1	BL20-E-2CNT-2PWM		16#017BCC00	
turck_bl20_e_2	BL20-2D0-24VDC-0.5A-P		16#21200200	
turck_bl20_e_3	BL20-2AI-I(0/420MA)		16#22557000	
(				•
ध्रM Auto IP <> reset Blink LED Set Name	+IP Show Only Unnamed Station	s 📃 Show	Differences to Proje	ct

Fig. 11: Searching devices

- → The devices are added to the project tree.
- ➡ Modular Turck devices, as the BL20 station in the example, are added with all connected I/O modules.
- ➡ The configuration of the IO-Link ports of the TBEN-S2-4IOL in the example is done manually afterwards (see Configuring the TBEN-S2-4IOL (IO-Link Master) (page 20)).



-----

Gate

•

Current user: (nobody)

#### 3.3.3 Adding PROFINET Devices Manually

🗋 POUs 😤 Devices

As an alternative for the scanning of the network, PROFINET devices can also be add manually to PROFINET.

TBEN-L5\_PLC-10\_PN.project\* - CODESYS - • • Elle Edit View Project Build Online Debug Tools Window Help 🎦 🚅 🔜 😂 🗠 🕹 🖻 🖹 🗙 🖓 🔚 🎘 • 🕤 🕮 😻 🖗 🔰 📲 🌂 💷 역 12 중 1 ㅎ 1 ਵ Devices **-** ₽ X Device 🗙 📆 Ethernet 🛛 🗃 PN\_Controller BEN-L5\_PLC-10\_PN Scan network... Gateway - Device -Communication Settings PLC Logic Application
 Description
 Description
 Description
 Description
 Description Applications Backup and Restore Files 😑 🥩 MainTask Profinet\_CommunicationTask Log PLC settings IP-Address: - Profinet\_IOTask 😑 LEDs (LEDs) PLC shell Complete Co Port: 1217 Users and Groups Parameters Ethernet (Ethernet) Task deployment 🐰 Cut Status PN\_Controller (PN-Controller) Paste Information × Delete Refactoring

•

Last build: 🔕 0 😗 0 🛛 Precompile: 😡

> Add external PROFINET devices using the "Add device..." function.

Fig. 12: Adding external PROFINET devices

Properties... Add Object Add Folder Add Device. Insert Device. Scan For Devices... Disable Device

Update Device...

Edit Object With... Edit IO mapping Import mappings from CSV... Export mappings to CSV... Simulation Device Configuration

🕤 Edit Object

> Select the PROFINET devices from the device catalog and add them to the project.



Fig. 13: Adding external PROFINET devices



#### 3.3.4 Configuring the BL20 station

- ➤ For modular PROFINET devices, first of all select the gateway (in this example the BL20-E- GW-EN).
- Right-click the gateway and use the "Add device" function to add the I/O modules in the order in which they follow the gateway.

TBEN-15_PLC-10_PN.project* - CODESYS Ele Edit View Project Build Online Debug Iools Window Help     D	≝I <b>0;0; → = ≪</b> I(⊒ •⊒ •⊒ •⊒ \$   +   <del>=</del>	
Devices         Image: Split Spl	Add Device       X         Action:       Action: <ul> <li>Append device</li> <li>Insert device</li> <li>Plug device</li> <li>Update device</li> </ul> Device:       Vendor       Version         Vendor:       All vendors>       Vendor         Vendor:       All vendors>       Vendor         Vendor:       All vendors>       Vendor         Vendor:       BL20-LAI-IQ(N.200A)       Turck         BL20-LAI-IQ(N.200A)       Turck       SW=SW V I.3.0, HW=HI         BL20-LAI-IQ(N.200A)       Turck       SW=SW V I.3.0, HW=HI         BL20-ZAI-IQ(N.200A)       Turck       SW=SW V I.3.0, HW=HI         Wire for experts only)       Display auddated versions       Information:         Information:       Image: State child of BL20_E_GW_EN       Image: State child of BL20_E_GW_EN         BL20_E_GW_EN       (You can select another target no	Gate
✓ !!!		k k

Fig. 14: Adding I/O modules to the BL20 gateway

#### 3.3.5 Configuring the TBEN-S2-4IOL (IO-Link Master)

The TBEN-S2-4IOL is shown in the project tree as a modular slave with one basic slot and seven empty slots.



Fig. 15: TBEN-S2-4IOL in the project tree

Slot/empty slot		Meaning
1	Basic	DXP-channels of the device (DXP 2, 4, 6, and 8)
2 - 5	IO-Link ports	For the configuration of the four IO-Link ports. Specific or generic configuration of the IO-Link ports (see Configuring the Empty Slots 2 – 5 (IO- Link-Ports) (page 21)).
6	Diagnostics	Optional mapping of the diagnostics (IO-Link and DXP-diagnostics) into the master's process image.
7	IO-Link Events	Optional mapping of the diagnostics (IO-Link and DXP-diagnostics) into the master's process image.
8	Module status	Optional mapping of the diagnostics (IO-Link and DXP-diagnostics) into the master's process image.



#### Configuring the Empty Slots 2 – 5 (IO-Link-Ports)

Device configuration in the example:

TBEN-S2-4IOL with:

IO-Link port 1: Turck temperature sensor, TS-530-LI2UPN8X-H1141-L016, IO-Link V1.0 IO-Link port 2: generic port configuration, one bit each in- and output data IO-Link port 3: Turck ultrasonic sensor, RU40U-M18E-LiU2PN8X2T-H1151, IO-Link V1.1 IO-Link port 4: generic port configuration, used as digital input

> Use the "Plug device..." function to select an IO-Link device for the respective empty slot.

The configuration is either done via SIDI (Simple IO-Link Device Integration) or as generic configuration. In this example port 1 and 3 are used with a specific sensor, port 2 with a generic sensor with one byte IO-Link input data and one byte IO-link output data. Port 4 is configured generically as digital input.



#### NOTE

By means of the "Simple IO-Link Device Integration (SIDI)", Turck IO-Link devices can directly be selected from the device GSDML in PROFINET.



Fig. 16: TBEN-S2-4IOL, "Plug device..." and select port configuration

 Select the entry of the temperature sensor "TS-530-LI2UPN8X-family" under "Port configuration generic" and plug the device.
 Select "TS-530-LI2UPN8X-family" and "Plug device...".



Fig. 17: Select TS-530-LI2UPN8X-family





> Configure port 2 generically and select the entry "IN 1 BYTE/OUT 1 BYTE".

Fig. 18: Generic port configuration

Select the entry of the ultrasonic sensor "RU40U-M18E-LiU2PN8X2T-H1151" under "Port configuration specific" and plug the device.

- TBEN-L5\_PLC-10\_PN.project\* CODESYS <u>File Edit View Project Build Online Debug Tools Window Help</u> Devices **→** ₽ X 🗏 🍈 TBEN-L5\_PLC-10\_PN -Device (TBEN-Lx-PLC-1x) 🖻 🗐 PLC Logic 😑 💮 Application 🎁 Library Manager - DLC\_PRG (PRG) 🖮 🌉 Task Configuration 🖶 🥩 MainTask - 📳 PLC\_PRG 🖶 😻 Profinet\_CommunicationTask PN\_Controller.CommCycle Profinet\_IOTask - 🥘 LEDs (LEDs) 🕸 📆 Local\_IO (Local IO) 👌 сомо 🔈 COM1 👌 CANbus 🖮 📆 Ethernet (Ethernet) PN\_Controller (PN-Controller) 🖷 📶 TBEN\_S1\_8DXP (TBEN-S1-8DXP) TBEN\_S2\_4IOL (TBEN-S2-4IOL) Basic (Basic) T5\_xxx\_LI2UPN8X\_family (T5-xxx-LI2UPN8X-family) IN\_1\_BYTE\_OUT\_1\_BYTE (IN 1 BYTE/OUT 1 BYTE) - 🗐 RU40U\_M18E\_LIU2PN8X2T\_H1151 (RU40U-M18E-LIU2PN8X2T-H11 🗐 DI (DI) K <Empty>(<Empty>) --K <Empty>(<Empty>) 🖻 👘 BL20\_E\_GW\_EN (BL20-E-GW-EN)
- ➤ Configure port 4 generically and select the entry "DI".

Fig. 19: IO-Link Port Configuration



Configuring the Empty Slots 6 – 8 (Diagnostics, IO-Link-Events, Module Status)

The empty slots 6 to 8 allow the mapping of channel diagnostics, IO-Link Events and the modules status to the process image of the IO-Link master.

> Select the entry for the respective empty slot using the "Plug device..." function.



Fig. 20: TBEN-S2-4IOL: Add diagnostics, IO-Link Events and module status

Diagnostics

TBEN-L5_PLC-10_PN.project* - CODESY	5							
<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> ools <u>W</u> indow <u>H</u> elp							
	∠ IAA ≬čim≞ika - r⊰ima	1.02.08		e i c	= ⊊= ८= +≡ २१   त.   =	-		
		1.00.00		⊚ ∣ ե.	= *= *= ·= ¢   •   •	•		
Devices 🗸 🗸 🗶	Device :+ Diagnostics	×						•
EN-L5_PLC-10_PN								
Device [connected] (TBEN-Lx-PLC-1x)	General	Channels				1		
PLC Logic		Variable	2	M.,	Channel	Address	Туре	Current Valu
🖹 🔘 Application [run]	PNIO Module I/O Mapping	🖃 ᡟ			Inputs	%IB18		
👘 Library Manager	Chabur	- ÷	*		DXP channel	%IB18	USINT	16#00
PLC_PRG (PRG)	Status		···· ᡝ		Output overcurrent Ch1	%IX18.1	BOOL	FALSE
🖹 🎆 Task Configuration	Information		···· 🍬		Output overcurrent Ch3	%IX18.3	BOOL	FALSE
🖻 🕸 MainTask	Inomaton		···· 🍬		Output overcurrent Ch5	%IX18.5	BOOL	FALSE
PLC_PRG			🍬		Output overcurrent Ch7	%IX18.7	BOOL	FALSE
🖶 👙 Profinet_CommunicationTask		<sup>1</sup>	*		Reserviert	%IB19	USINT	16#00
PN_Controller.CommCyc		<b>B</b> - 1	*		IO-Link channel	%IB20	USINT	16#24
Profinet_IOTask			···· 🏘		Port parameterization erro	%IX20.1	BOOL	FALSE
			🍬		Wrong or missing device Ch0	%IX20.2	BOOL	TRUE
- 😏 🔟 Local_IO (Local IO)			···· 🍬		Data storage error Ch0	%IX20.3	BOOL	FALSE
- 😌 🏅 СОМВ			🍫		Hardware error Ch0	%IX20.4	BOOL	FALSE
- 🧐 沾 COM1			🍫		Process input data invalid	%IX20.5	BOOL	TRUE
👓 🚱 👌 CANbus			🍫		Maintenance events Ch0	%IX20.6	BOOL	FALSE
- 🧐 👔 Ethernet (Ethernet)			i 🍫		Out of spec. error Ch0	%IX20.7	BOOL	FALSE
😑 🧐 PN_Controller (PN-Controller)		. E	*		IO-Link channel	%IB21	USINT	16#00
🖲 😳 🗐 TBEN_S1_8DXP (TBEN-S1-8D		<u>ا</u> ۲	*		IO-Link channel	%IB22	USINT	16#24
🖶 😏 🗐 TBEN_S2_4IOL (TBEN-S2-4IC		. E	*		IO-Link channel	%IB23	USINT	16#00
- 😏 🕕 Basic (Basic)		Ē 3	*		IO-Link channel	%IB24	USINT	16#20
S_xxx_LI2UPN8X_fam			🍫		Port parameterization erro	%IX24.1	BOOL	FALSE
- 🍜 🖼 🗍 IN_1_BYTE_OUT_1_BY			🍫		Wrong or missing device Ch4	%IX24.2	BOOL	FALSE
Sector State			🍫		Data storage error Ch4	%IX24.3	BOOL	FALSE
			🍫		Hardware error Ch4	%IX24.4	BOOL	FALSE
🖓 🚱 Diagnostics (Diagnostics			ᡟ		Process input data invalid	%IX24.5	BOOL	TRUE
- 😔 🗑 🗍 IO_Link_Events (IO-Lin			🍫		Maintenance events Ch4	%IX24.6	BOOL	FALSE
😔 🕄 🗊 Module_status (Module					Out of spec. error Ch4	%IX24.7	BOOL	FALSE
🖻 😏 🗐 BL20_E_GW_EN (BL20-E-GW		<u>.</u>	*		IO-Link channel	%IB25	USINT	16#00
		•						
	Reset Mapping Always update variables: Use parent device setting							
۰ III ا		🍫 = Cre	eate new v	/ariable	e 🎲 = Map to exist	ing variable		
POUs I Modules 🕱 Devices		•						4
Last build: 😳 0 😗 1 🛛 Precompile: 😗	n RUN Pr	ogram loadeo	Н		Program unchanged		Currer	nt user: (nobody)

Fig. 21: TBEN-S2-4IOL: Diagnostics in the process image



#### IO-Link Events

TBEN-L5_PLC-10_PN.project* - CODESY	S						• •
<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> ools <u>W</u> indow <u>H</u> elp						
ar ∎ la lo a V b A '	× (MA / C) (201 ) (201 ) (201 )	105 08					
		1.43.49					
Devices	Device :+ Diagnostics	🔄 🖓 IO_Link	_Events 🗙				-
EN-15_PLC-10_PN		Channella					
Device [connected] (TBEN-Lx-PLC-1x)	General	Channels					
PLC Logic		Variable	Channel	Address	Туре	Current Value	Prepare
Application [run]	PNIO Module I/O Mapping		Inputs	%IW14			
📶 Library Manager	Chabus	🍫	Event1 Qualifier	%IB28	USINT	16#00	
PLC_PRG (PRG)	Status	<b>*</b> >	Event1 Port	%IB29	USINT	16#00	
🖻 🎆 Task Configuration	Information	¥ø	Event1 Event code	%IW15	UINT	16#0000	
🗏 🗳 MainTask		<b>*</b> >	Event2 Qualifier	%IB32	USINT	16#00	
PLC_PRG		<b>*</b> >	Event2 Port	%IB33	USINT	16#00	
Profinet_CommunicationTask		*•	Event2 Event code	%IW17	UINT	16#0000	
PN_Controller.CommCyd		<b>*</b> >	Event3 Qualifier	%IB36	USINT	16#00	
Profinet_IOTask		<b>*</b> >	Event3 Port	%IB37	USINT	16#00	
- 😌 🕒 LEDs (LEDs)		<b>*</b> >	Event3 Event code	%IW19	UINT	16#0000	
😏 🔟 Local_IO (Local IO)		<b>*</b> ø	Event4 Qualifier	%IB40	USINT	16#00	
-😌 🏅 СОМО		¥ø	Event4 Port	%IB41	USINT	16#00	
- 😌 🚡 COM1		🍫	Event4 Event code	%IW21	UINT	16#0000	
- 😔 🏅 CANbus		🍫	Event5 Qualifier	%IB44	USINT	16#00	
- 😏 🔟 Ethernet (Ethernet)		🍫	Event5 Port	%IB45	USINT	16#00	
😑 🧐 PN_Controller (PN-Controller)		🍫	Event5 Event code	%IW23	UINT	16#0000	
🕸 😏 📶 TBEN_S1_8DXP (TBEN-S1-8D		🍫	Event6 Qualifier	%IB48	USINT	16#00	
📄 🧐 👘 TBEN_S2_4IOL (TBEN-S2-4IC		🍫	Event6 Port	%IB49	USINT	16#00	
- 🧐 🗊 Basic (Basic)		¥ø	Event6 Event code	%IW25	UINT	16#0000	
5 TS_xxx_LI2UPN8X_fam		🍫	Event7 Qualifier	%IB52	USINT	16#00	
- 🥵 🗑 ₪ IN_1_BYTE_OUT_1_BY		¥ø	Event7 Port	%IB53	USINT	16#00	
- S R RU40U_M18E_LIU2PN8		🍫	Event7 Event code	%IW27	UINT	16#0000	
- 😔 🖼 🗍 🛛 🖓 🖂		<b>*</b> >	Event8 Qualifier	%IB56	USINT	16#00	
😔 😳 🖓 Diagnostics (Diagnostics		🍫	Event8 Port	%IB57	USINT	16#00	
- 😔 🕅 IO_Link_Events (IO-Lin		<b>*</b> >	Event8 Event code	%IW29	UINT	16#0000	
😔 🖓 🗊 Module_status (Module		¥ø	Event9 Qualifier	%IB60	USINT	16#00	
🖻 😏 🗐 BL20_E_GW_EN (BL20-E-GW		¥ø	Event9 Port	%IB61	USINT	16#00	
		•					
			Reset Mapping Always u	update variables:	Use pare	ent device setting	
		🌾 = Create ne	ew variable 🏾 🌍 = M	lap to existing va	riable		
POUs W Modules R Devices		•					Þ
Last build: 🔇 0 😗 1 Precompile: 🕐	RUN Pr	ogram loaded	Program u	inchanged		Current user: (nobo	ody) 🔡

Fig. 22: TBEN-S2-4IOL: IO-Link Events in the process image

#### Module status

💗 TBEN-L5_PLC-10_PN.project* - CODESY	s									
<u>File Edit View Project Build Online Debug Tools Window H</u> elp										
約62 ■ ● ● ● ▲ ● ● × ● 43 ■ ◎ ・13 ● ◎ 43 ↓ ■ ※ 目空生きえ → =										
Devices - 4 X	Device III Diagnostics	- Eni	I IO_l	.ink_Ev	ents 🦳 🖓 Module_status 🕽	K		-		
EN-15_PLC-10_PN		Chap	pole							
Device [connected] (TBEN-Lx-PLC-1x)	General						Ŧ			
PLC Logic	PNIO Module I/O Mapping	Vari	able	M	Channel	Address	Type	Current Valu		
= O Application [run]	PNIO Module I/O Mapping		<b>)</b>		Module state	%IW46	UINT	16#0001		
Library Manager	Status		🍫		Module diagnostics available	%IX92.0	BOOL	TRUE		
PLC_PRG (PRG)			🍫		Undervoltage V2	%IX92.7	BOOL	FALSE		
Task Configuration	Information		••• 🐤		Undervoltage V1	%IX93.1	BOOL	FALSE		
🗏 📚 MainTask	· · · · · · · · · · · · · · · · · · ·		🍫		Internal error	%IX93.2	BOOL	FALSE		
PLC_PRG			···· 🍫		I/O-ASSISTANT Force Mode active	%IX93.6	BOOL	FALSE		
Profinet_CommunicationTast										
PN_Controller.CommCyd										
Profinet_IOTask										
LEDS (LEDS)										
Cocal_IO (Local IO)										
CANbus										
Ethernet (Ethernet)										
PN_Controller (PN-Controller)										
■ ••••••••••••••••••••••••••••••••••••										
Basic (Basic)										
C C C C C C C C C C C C C C C C C C C										
Modulo, status (IO-LIN										
		•								
					sof Mapping	Alex Due				
					Always update varia	use par	ent device	e setting		
4		* =	Create	e new v	ariable 🏾 🌍 = Map to exist	ing variable				
POUs   W Modules 😪 Devices		•			III			•		
Last build: 😳 0 🕐 1 Precompile: 🕐	RUN Prog	gram loa	aded		Program unchanged		Currer	nt user: (nobody)		

Fig. 23: TBEN-S2-4IOL: Module status in the process image



#### 3.4 Communication Settings for PROFINET Devices

 Open the device's configuration tab by double clicking the entry of the respective PROFINET device in the project tree.

#### 3.4.1 Assigning the IP Address and the Station Name

 Assign a PROFINET device name and an IP address and, if necessary, adapt the parameters "Send Clock", "Reduction Ratio2 and "Phase" to the application.

## NOTE

Assigning an IP address or a station name to the devices is not necessary if the devices have been automatically read in using the "Scan for Devices" function (see Scan Network for PROFINET Devices (page 15)).



Fig. 24: Configuring external PROFINET devices

#### NOTE

The IP addresses of the PROFINET Devices and the PN Controller have to be in the same subnet.

#### 3.4.2 Setting the communication parameters (Send Clock, Reduction Ratio, Phase)

- Send Clock (ms): Send clock time in milliseconds
- Reduction Ratio:
  - Scaling factor

The transmission interval results from the Send Clock × Reduction Ratio. Therefore, a Send Clock of 1ms and a Reduction Ratio of 4 means that I/O data is sent every 4 ms.

Phase:

With a Reduction Ratio of n, the transmission interval is subdivided into phases 1 to n (where transmission is in one phase only). The phase for transmission can be determined for the purpose of load distribution.

PROFINET Update Time      PROFINET Update Time						
- Send Clock -						
Phase 1	Phase 2	Phase 3	Phase 4			
Reduction Ratio = Anzahl der Phasen						

#### Fig. 25: PROFINET Update Time

Communication			
Send Clock (ms)	1 •	Watchdog (ms)	12 🊔
Reduction Ratio	4 🔹	VLAN ID	ጋ 🚔
Phase	-		
RT Class	RT Class 1	•	

Fig. 26: Settings for the PROFINET device

With the settings "Send Clock" = 1 ms and "Reduction Ratio" = 4 the PROFINET Cycle Time (or Update Time) is divided into four phases of 1 ms each. A PROFINET device with these settings is updated every 4 ms. The PROFINET Update Time is thus the result of the multiplication of "Send Clock" and "Reduction Ratio".

PROFINET Update Time = Send Clock × Reduction Ratio

The parameter "Phase" defines in which phase this PROFINET device is updated. In PROFINET networks with several devices the devices can be split to the different phases. This helps the master to optimize the PN data transfer.



#### 3.5 Requesting the Device Status in the Program

The device status can be requested in the program by entering the PROFINET device instance and the requested function.

Instance.Status;

#### Example:

Request, if the device is in cyclic data exchange:

tben\_s2\_4IOL.xRunning;



Fig. 27: Requesting the device status in the program

#### 3.6 Using IO-Link Function Blocks for CODESYS

For acyclic access to the Turck IO-Link master devices (in the example TBEN-S2-4IOL) as well as to the connected IO-Link devices, Turck offers the following function blocks:

- IOL\_CALL (in accordance with IO-Link specification) single acyclic accesses
- IOL\_WriteParamterList: sending a parameter list for e. g. initial parameterization of IO-Link devices

The function blocks are part of the turck CODEYS library "IO-Link CALL PROFINET", V1.0.2.0 or higher.

Further information about the function blocks and their usage can be found in the operating instructions of the Turck IO-Link master or in the function block description in CODESYS.



Fig. 28: Function block IOL\_CALL





Fig. 29: Function block IOL\_WriteParameterList



## 4 Using the Device as PROFINET Device

#### Properties

max. number of I/O data 1024 byte in total (512 IN + 512 OUT)

Used Hardware

- Controller.
  - Siemens CPU 1515-2 PN
- Device:
  - TBEN-L5-PLC-10

Used Software

- CODESYS V3, 3.5.8.10
- TBEN-L...-PLC-1...\_V1.0.3.0.package
- TIA Portal V13
- GSDML-V2.3-TURCK-CDS3\_PN\_Device-20151208-010322.xml

### 4.1 Creating a CODESYS Project and Configuring the Network

Create CODESYS project and configure the network according to Kapitel 2, Creating a CODE-SYS Project and Configuring the Network.

## 4.2 Configuring the PROFINET Device

#### 4.2.1 Adding the PROFINET Device to the Project

The Turck PROFINET Device is used.

> Add the Profinet\_Device to Ethernet using the "Add Device" function.

TREN-PLC-10-PNDevice project* - CODESY	2		
File Edit View Project Build Online D	ehua	Tools Window Help	
	1.44		
			I Add Device
Devices		- <b>4 X</b>	Name: Profinet Device
TBEN-PLC-10-PNDevice			Action
BEN_LX_PLC_IX (IBEN-LX-PLC-IX)			Annend device     O Insert device     O Plug device     O Undate device
- O Application			
👘 Library Manager			Device:
- e LEDs (LEDs)			Vendor: <all vendors=""></all>
E- 👔 Local_IO (Local IO)			Name Vendor Version
Diagnostics (Diagnostics)			B- 1 Fieldbusses
VAUX control (VAUX control)			the isote the second s
Module_status (Module statu	s)		methodology     methodolo
- 🚡 COMD			- ## Profinet IO Device
COM1			Profinet Device Turck 1.0.6.0
CANDUS	_		🗟 - 🛲 Profinet IO Master
	*	Cut	
Ethernet (Ethernet)		Сору	
	Ē.	Paste	
	$\times$	Delete	
		Refactoring +	
	R.	Properties	Group by category
l 🖌 🖌	111	Add Object	Display all versions (for experts only)
		Add Folder	Display outdated versions
		Add Device	
		Disable Device	Information:
		Update Device	
	Dĩ	Edit Object	Append selected device as last child of Ethernet
		Edit Object With	(You can select another target node in the navity or while this window is
		Edit IO mapping	
		Import mappings from CSV	Add Device Close
POUs 💥 Devices		Export mappings to CSV	
		Simulation	Last build: 😋 0 😗 0 Precompile: 🗸 Current user: (nobody)
		Device Configuration	

Fig. 30: Add PROFINET Device



 Configure the in- and output data lengths which have to be exchanged with the higher-level PROFINET Master. Therefore add the respective process data entries.



Fig. 31: Configuring the PROFINET Device

#### NOTE

Please observe the following for the configuration of the I/O data: The CODESYS input data have to be have to be configured as output data in the PROFINET Controller configuration, the CODESYS output data have to be configured as input data. The data thus have to be configured in reverse order in the PROFINET Controller configuration (see also **Configuring the in- and output data (page 41**)). Which data will be mapped into the configured input and output data, depends on assignments in the PLC program or in the I/O mapping of the TBEN-L...-PLC-....

TBEN-PLC-10-PNDevice.project - CODESYS						
<u>File Edit View Project Build Online D</u> ebug	<u>T</u> ools <u>W</u> indow <u>H</u> elp					
1 🖆 🚅 📑 📾 🗠 🗠 🖓 🖻 🛍 🗙 🔥 1	(승) 📾 ( 海 - 머리) 🕮 ( 🥨 🥰	N N 103 9	1 da +1 8	\$		
Devices $    -$	HI VAUX_control	_PRG OUT_1	_word x	IN_1_BYTE	🛛 👙 Ma	inTask 🛛 🔻
TBEN-PLC-10-PNDevice		Channels				
= to TBEN_LX_PLC_1x [connected] (TBEN-Lx-	General		<u> </u>		T	
= - III PLC Logic	PATODau Madula I/O Manaira	Variable	Channel	Address	Type	Curre
= O Application [run]	PNIODEV-Module I/O Mapping	Application.	PL Dut16	<del>%Q₩1</del>	UINT	-31689
Library Manager	Status	· · · · · · · · · · · · · · · · · · ·	BitO	%QX2.0	BOOL	TRUE
PLC_PRG (PRG)	Status	· · · · · · · · · · · · · · · · · · ·	Bit1	%QX2.1	BOOL	TRUE
= 🔛 Task Configuration	Information	· · · · · · · · · · · · · · · · · · ·	Bit2	%QX2.2	BOOL	TRUE
🗏 🎯 MainTask		· · · · · · · · · · · · · · · · · · ·	Bit3	%QX2.3	BOOL	FALSE
		· · · · · · · · · · · · · · · · · · ·	Bit4	%QX2.4	BOOL	TRUE
LEDs (LEDs)		<b>?</b>	Bit5	%QX2.5	BOOL	TRUE
🖬 🏷 🎁 Local_IO (Local IO)		· · · · · ·	Bit6	%QX2.6	BOOL	FALSE
OXP (DXP)		<u>`</u> @	Bit7	%QX2.7	BOOL	FALSE
Diagnostics (Diagnostics)		· · · · ·	Bit8	%QX3.0	BOOL	FALSE
VAUX_control (VAUX control)		· · · · · · · · · · · · · · · · · · ·	Bit9	%QX3.1	BOOL	FALSE
		· · · · ·	Bit10	%QX3.2	BOOL	TRUE
- 😔 🚡 COMO		- <u>`</u>	Bit11	%QX3.3	BOOL	FALSE
- 😳 🚡 COM1		<b>*</b> @	Bit12	%QX3.4	BOOL	FALSE
CANbus		<b>*</b>	Bit13	%QX3.5	BOOL	FALSE
Ethernet (Ethernet)		· · · · · ·	Bit14	%QX3.6	BOOL	FALSE
Profinet_Device (Profinet Device		L. 🍫	Bit15	%QX3.7	BOOL	TRUE
IN_1_BYTE (IN 1 BYTE)						
- 🧐 OUT_1_WORD (OUT 1 WOR		•				
		Re	set Mapping	lways update va	riables:	se parent devi-
						o parone dovi
		🌾 = Create new va	ariable	🍫 = Map to ex	isting variabl	e
POUs W Modules 2 Devices		•				4
Last build: 📀 0 😗 0 Precompile: 🗸 🍙 🛛 RL	JN Program loaded	Progr	am unchanged	CL	urrent user: (	nobody)

Fig. 32: PROFINET Device data mapping



The PROFINET Device shows an error as long as a connection to the PROFINET Controller is established.



### 4.2.2 Configuring the PROFINET Device (CDS3 PN-Device) in TIA Portal

The following example shows the CDS3 PN-Device configuration in TIA Portal V13 from Siemens.

#### The PROFINET-CODESYS-device is configured as standard PROFINET Device in TIA Portal.

#### Installing the GSDML-file

- Install the device's GSDML-file (GSDML-V2.3-TURCK-CDS3\_PN\_Device-...-...xml) in TIA Portal. It can be downloaded at the respective product fromwww.turck.com.
- → The device is added to the hardware catalog "CDS 3 PN Device".

Via	Siemens - C:\Users\sch	euech\AppData\Local\Siemens\TBEN-PLC_PN_Device\TBEN-PLC_PN_Device				-	- <b>-</b> x
Er	oject <u>E</u> dit ⊻iew Inser	t <u>O</u> nline Optio <u>n</u> s <u>T</u> ools <u>W</u> indow <u>H</u> elp			Totally Integrated Aut	omation	
	🛉 🎦 🔚 Save project  昌	🐰 🗎 🗎 🗙 🥱 🛨 🥵 🗓 🛄 🛄 🔛 🦝 🖉 Go online 🖉 Go offline	<u>Å?</u> 🛙		I × ⊟'	PORTA	AL
	Project tree 🛛 🔳 📢	TBEN-PLC_PN_Device > Devices & networks		iХ	Hardware catalog		
	Devices	🛃 Topology view 🛛 🚠 Network view 🛛 🛐 Devic	e view		Options		
		💦 Network 🚼 Connections HMI connection 🔽 📰 🔍 🛨					크 곱
rks			~		✓ Catalog		d
-two	▼ 🛅 TBEN-PLC_PN				<search></search>	iti jiti	t e
E a	📑 Add new de	PLC 1 turck-cds3-nn-	=		Filter		ata
s	Devices & n	CPU 1515-2 PN CDS3 PN Device			Phoenix Contact GmbH		< log
evic	Common d	PLC_1 CODESYS			TURCK		
Ō	Documenta				- TURCK		8
	🕨 🔯 Languages	DN/RE 1	_		🕨 🥅 BL Compact		0
	🕨 🚂 Online access	PN/IE_1			▶ []] BL20		- III
	🕨 🥞 Card Reader/U		_		• 📠 BL67		e e
					✓ ☐ CODESYS3		0
	<		_	-	CDS3 PN Device	T	<b>~</b>  ″
	✓ Details view			ξ.	FEN20		
				- Ŷr	FILE TBEN-A		4
	Name			≻ de	▶ 🛄 TBEN-L	1	≣ le
			1	- 5	▶ 🛄 TBEN-S		6
					Image: TBPN-Safe		
			_		Lim Turck		- 🛄
					🕨 🧾 Ident Systems		- 5
			_		In Network Components		Щą.
			- 11		✓ Information		- es
					Device:		<u> </u>
					-		
					•		=
					CDS3 PN Device		
			×				
			. 2		Article no.:		
	< III >	🖳 Properties 👘 🚹 Info 🔒 💟 Diagnostics					~
	Portal view	🖽 Overview 💼 Devices & ne 🍸 Settings					

Fig. 33: Configuring the PROFINET Device in TIA Portal

## Configuring the PROFINET parameters

Like for all other PROFINET Device, the PROFINET-interface has to be configured for the CDS3 PN-Device" in the project.

 Set all necessary IP-settings and assign a PROFINET Device name or use the device name which has already been assigned to the device.

Siemens - C:Wsers\schu           Project         Edit         View         Inser           Image: State project         Image: State project         Image: State project         Image: State project	heuech/AppDataUocal/Siemens/TBEN-PLC_PN_Device/TBEN-PLC_PN_Device rr: Online Options Iools Window Help ▲ X := ① X := D := C := 1 ID	_ □ × Totally Integrated Automation PORTAL
Project tree 🛛 🛛 🗸	rice → PLC_1 [CPU 1515-2 PN] → Distributed VO → PROFINET IO-System (100): PN/II	E_2 > turck-cds3-pn-device 🛛 🗕 🖬 🗮 🗙 📢
Devices	🛃 Topology view	🔒 Network view 📑 Device view 💷
	🔐 turck-ods3-pn-device 💌 🔠 📅 🎽 🔂 Device overview	품
<ul> <li>TBEN-FLC_FN</li> <li>Add new de</li> <li>Devices &amp; n</li> <li>PLC_1 (FU)</li> <li>Common d</li> <li>To ocumenta</li> <li>Languages</li> <li>Conline access</li> <li>Card Reader/U</li> </ul>		Rack         Slot         I address         Q addr          Auge         Galage           0
	turck-cds3-pn-device [Module]	🚹 Info 🔒 🔮 Diagnostics 🔹 🖛 🖏
< III >	General IO tags System constants Texts	
V Details view	General     Catalog information     PROFINET interface [X1]     General     Ethermet addresses     Advanced options     Interface options     Media redundancy     Real time settings     Port [X1 = 1]     Porture	ect 168 . 1 111
<	For 2 [X1 22 8] Hardware identifier Identification & Maintenance Module parameters Hardware identifier Device number:	e name automatically
Portal view	🔯 Overview 🍈 turck-cds3-p 🍸 Settings	

Fig. 34: Settings PROFINET-interface (CDS3 PN Device)



#### Configuring the in- and output data

> Configure the in- and output data, which have to be exchanged with the CODESYS-device.



#### NOTE

The configuration of the data in TIA Portal has to be done in reverse order compared to the configuration in CODESYS. Input data in TIA Portal are output-data in CODESYS, and vice versa.

The configured data lengths have to match.



Fig. 35: Configuration of in- and output data in TIA Portal/CODESYS

After configuring the PROFINET Device in TIA Portal and starting the PN controller, the CODESYS application with the PROFINET Device is running error free.

TREN DLC 10 DND wine president CODESVS						
TBEN-PLC-10-PNDevice.project - CODESTS						
Eile Edit Yiew Project Build Online Debug	<u>T</u> ools <u>W</u> indow <u>H</u> elp					
🎦 🚅 🔚 I 🚭 🗠 🖂 🕺 🛅 🖀 🗶 I 👫 I	🕼   🛍   🛅 - 👘   🎬   👒 🝳	🖌 🖌 👋 l 🗇 👘	41 41 8	⇔   ≕		
	_					
Devices a stall						
	Tenil VAUX_control		WORD X	IN_1_BYTE	_ 🔅 M	ainTask 🛛 🗨
	Canaval	Channels				
BI DI CLASIC	General	Variable	Channel	Address	Tune	Curre
Elly PLC Logic	PNIODev-Module I/O Mapping		Channel	Auuress	Type	Curre
Application [run]	The boot he date for happing	Application.PL	Dut16	*cQW1	UINI	-31669
	Status		BIEU	*6QX2.8	BOOL	TRUE
			Bit1	%QX2.1	BOOL	TRUE
Task Configuration	Information		Bit2	%QX2.2	BOOL	
	· · · · · · · · · · · · · · · · · · ·		Bit3	%QX2.3	BOOL	FALSE
			Bit4	%QX2.4	BOOL	TRUE
			Bit5	%QX2.5	BOOL	TRUE
Eccal_IO (Local IO)			Bit6	%QX2.6	BOOL	FALSE
			Bit7	%QX2.7	BOOL	FALSE
Diagnostics (Diagnostics)			Bit8	%QX3.0	BOOL	FALSE
VAUX_control (VAUX control)			Bit9	%QX3.1	BOOL	FALSE
Module_status (Module status)			Bit10	%QX3.2	BOOL	TRUE
COMU		······································	Bit11	%QX3.3	BOOL	FALSE
COM1		· · · · · · · · · · · · · · · · · · ·	Bit12	%QX3.4	BOOL	FALSE
CANbus			Bit13	%QX3.5	BOOL	FALSE
Ethernet (Ethernet)		· · · · · · · · · · · · · · · · · · ·	Bit14	%QX3.6	BOOL	FALSE
Profinet_Device (Profinet Device)		· · · · · · · · · · · · · · · · · · ·	Bit15	%QX3.7	BOOL	TRUE
IN_1_BYTE (IN 1 BYTE)						
** 🗂 OUT_1_WORD (OUT 1 WOR		•				
		Rese	et Mapping 🛛 A	lways update va	riables: U	lse parent devi
		🍫 = Create new vari	iable	🍫 = Map to ex	isting variab	le
POUs W Modules 2 Devices		•	III			۲
Last build: 😳 0 😗 0 Precompile: 🧹 🍙 🛛 RI	JN Program loaded	Program	n unchanged	CL	irrent user:	(nobody)

Fig. 36: CODESYS application with PROFINET Device



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