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# 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 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 FEN20 can be converted into a simple Field Logic Controller (i.e. PLC) that can execute a stand-alone application or become a distributed control component of the EtherNet/IP, Modbus TCP or PROFINET based control system. FLC solutions by Turck are made possible using ARGEE (A Really Great Engineering Environment), a web-based programming environ- ment that allows users to set conditions and actions directly at the field level. By utilizing HTML5, Turck provides a complete engineering envi- ronment for users to write, run, simulate, debug, and monitor code, all without requiring the use of a PLC.
BEEP	Backplane Ethernet Extension Protocol BEEP is a technology feature of many Turck Multiprotocol digital block I/O modules. BEEP allows a network of up to 33 devices (1 master + 32 slaves) or 480 bytes of data, to appear to the PLC as a single device 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> 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 Clipboard – copies selected connection Language – Selects between English and German text 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 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 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 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—								 
	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 9:24:15	DHCP	00:0	7:46:25:E 7:46:25:E	32:E9 32:E9				
	9:24:13	DHCP	00:0	7:46:25:E	2:E9				
	9:24:11 9:24:09	DHCP	- 00:0 - 44:8	7:46:25:E A:5B:4A:I	32:E9 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> 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 16:00:07	DHCP	00:17:08 00:07:46	8:61:44:10 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 Actions	(F4)	 oard Li	<b>EN</b> 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 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 No I 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		*
✓ ✓ ✓	Analog CIP Motion Converter Communication	r		▼ ▼ ▼	Allen-Bradley Advanced Energy Industries, Inc. 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> Type: Vendor: Parent: Name: Description:	sction Module Info Inte 6931090 FEN20-4DIP-4E TURCK Local FEN20 FEN20-4DIP-4DXP	net Protocol   Port Configu XP	Ethernet Address   Private Network: 192.168.1. 44   IP Address:  Host Name:	
Module Defini Revision: Electronic Ke Connections:	tion 2.005 ying: Compatible Module Exclusive Owner	• 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 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 DINT 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 GE Intelligent Platforms PACSy GE Intelligent Platforms Remoti GE Intelligent Platforms Remoti GE Intelligent Platforms Remoti GE Intelligent Platforms Remoti GE Intelligent Platforms Series GE Intelligent Platforms Series GE Intelligent Platforms Series GE Intelligent Platforms Series GE Intelligent Platforms Versalw GE Intelligent Platforms Versalw GE Intelligent Platforms Versalw	stems RX3i stems RX7i e I/O - PACSystems RX3i e I/O - Series 90-30 Ether e I/O - Series 90-70 Geniu e I/O - VersaMax Ethernet e I/O - VersaMax Ethernet e I/O - VersaMax Ethernet go Micro PLC 90-30 PLC 1ax Nano/Micro PLC 1ax PLC t	Etherne net t	i target
	e arget 1 Data Watch Lists Hardware Configuration Logic 	Target1: Data Watch Lists: Hardware Configuration: Logic Program Blocks: Reference View Tables: Supplemental Files:	PACSyste Empty Default P RX3i Contains _MAIN LD Contains RVTs Contains folders	ms RX3i ACSystems empty Block Default 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)		
😟 🖓 🗊 🗊 🗓 🗓	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: Vendor ID:	Device 013D			Subnet Mask: Gateway:	255.255.255.0 192.168.1.1		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 MAC Address: 00-07-46-FF-40-CF Device Type: FEN20-16DXP	Vendor ID: 013D Device ID: 9001 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 Import Drawer Import Drawer	Del				
Export Drawer Import Drawer Import Drawer as Co Scan for new objects	Del py				
Delete Drawer Export Drawer Import Drawer Import Drawer as Co Scan for new objects New Folder	Del				
Delete Drawer Export Drawer Import Drawer Import Drawer as Co Scan for new objects New Folder Assistants	Del	d G5D File			
Delete Drawer Export Drawer Import Drawer Import Drawer as Co Scan for new objects New Folder Assistants	Del	d GSD File 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 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 Action:	hernet	ica 🔿 Plu	a davira .	Lindata davis		]				
Device: Vendor: <all vendors=""></all>										
Name	<u></u>	Vendor	Version			Ĩ				
Group Displa	Group by category     Display all versions (for experts only)     Display outdated versions									
Information										
Name: Ethernet Vendor: Turck Categories: Ethernet Adapter, Ethernet Adapter, Ethernet Adapter Version: 3.5.7.20 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: TX507-P3CV01
	Device Address: Wink Wink
	Target Version: 1.0.4.0
	Target Vendor: Turck
	Target ID: 10CD 0203
	Target Name: Turck/ARM/WinCE TV
	Target Type: 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 1odbusTCPSlave I/O Mapping itatus			Reset Ma	pping Alway	ys update variables: Use pa	rent device	sett	ing		
AodbusTCPSIave Parameters AodbusTCPSIave 1/0 Mapping Status	IEC Objects		Reset Ma	pping Alway	ys update variables: Use pa Use pa Enable	rent device rent device d 1 (use bus	setti setti	ing ing le task if not used in any task		
ModbusTCPSlave Parameters ModbusTCPSlave I/O Mapping Ratus nformation	IEC Objects Variable		Reset Ma Mapping	pping Alway	ys update variables: Use pa Enable Enable	rent device rent device d 1 (use bus d 2 (always	setti setti s cyd in bu	ing ing le task if not used in any tasi 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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