

TC and TE Fieldbus Modules



- Industrial standard connections M8 or M12.
- Integrated connections with ISO VDMA manifolds and compact valves 10/15/22 mm..
- Integrated 24 coils controls for TC version only..
- Expansion capability till 64 digital inputs or 88 digital outputs according to the model.
- Visual diagnostic with LED screen and through filedbus.
- IP65 protection degree.
- Separate logic supply of input and outputs, so that it is possible to cut off the outputs only.

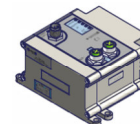


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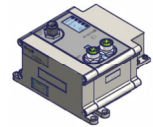
Every action was intended to guarantee the accuracy and completeness of this document. However, we cannot completely exclude that there might be mistakes, therefore we will appreciate any kind of notification..

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We would like to highlight that hardware and software terms, as well as trademarks used or mentioned in this manual are usually registered trademarks or patents.

Note: all information can be changed without prior notice.





Important information

To guarantee a quick installation and set up of the device described in this manual, we highly recommend that the following information and explanations are carefully read and observed.

Qualified Personnel

The usage of the products described in this manual, are addressed exclusively to qualified personnel in the PLC programming, electrical specialists or people who act in place of specialized electricians and who are familiar with the existing rules. UNIVER S.p.A. declines any responsibilities resulting from improper actions and damages caused by the non-compliance to the prescriptions contained in this manual.

Designated use

For each single application, the supplied components must work with the appropriate Hardware and Software configuration. Adjustments are allowed only for the possibilities explained in this manual.

Every change to the Hardware and/or Software and/or the not compliant use of the components entails automatically the exclusion of liability by UNIVER S.p.A. and loss of the guarantee.

For specific requests and/or configuration consult UNIVER S.p.A

Safety notes

Attention. Remove all supplies and wait for at least 1 minute before working on the device and its modules.

In case of bended contacts, the affected module must be replaced, because its long-term functionality may be compromised.

ESD (electrostatic charges)

The modules have electronic components that may be damaged by electrostatic charges. When working with the modules, make sure that the environment (people, work station, packages) are well grounded or antistatic.

Avoid touching metal parts such as gold connections

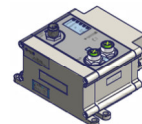
Do not supply the devices with voltage outside of the indicated range.

Remember to connect the ground to the device, since some internal protections need such a connection to operate correctly.

No connection to the ground could damage the device.

Definitions

DI	Digital input
DO	Digital output
I/O	Input/Output
HW	Hardware
SW	Software
LSB	Less significant Byte
MSD	Most significant Byte



Symbol Legend

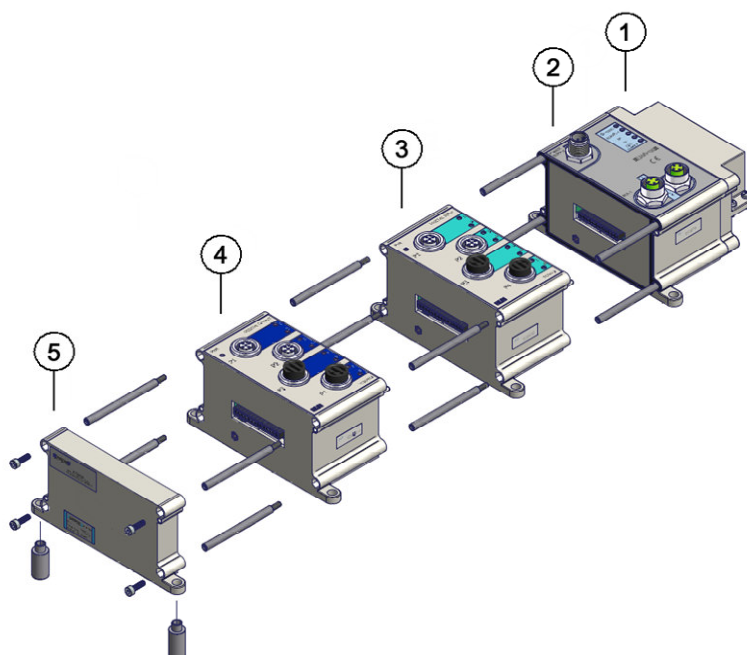
		Important NOTICE
		Attention Danger
		Additional information
		Recycle / Eco compatible materials

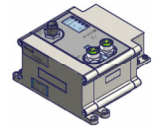
Description of the modular system

TC and TE series are slave devices for fieldbus to control of valves, digital inputs and outputs.

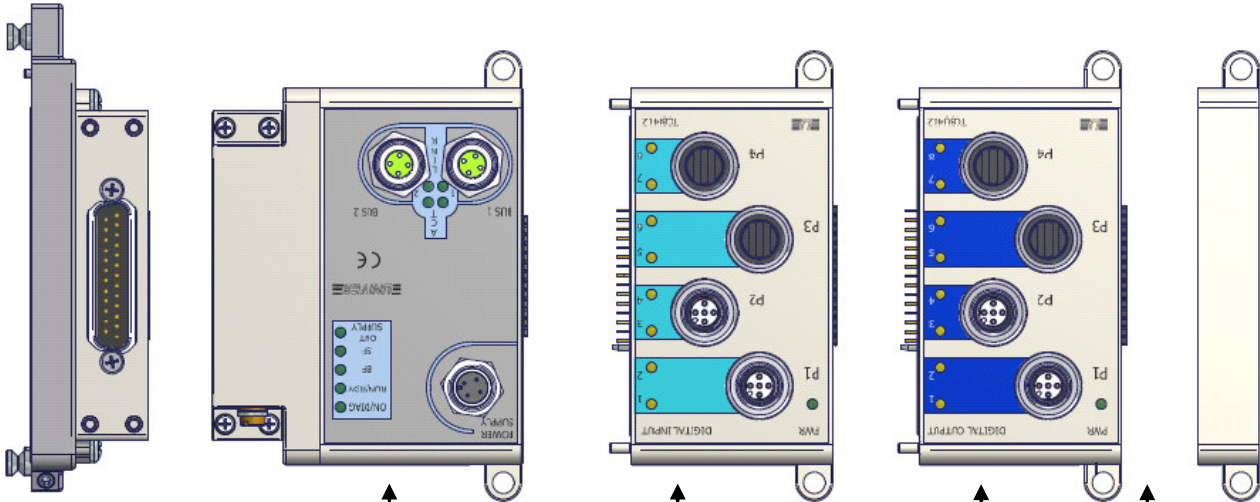
The system structure taken as an example below consists of the interface module for the valve manifold (1) and already included in the TC, the communication field module (2), (DeviceNet, CANopen, Profibus, Profinet, EtherNet/IP, EtherCAT), the digital input module (3), the digital output module (4), and the end cover (5).

Since this is a modular system, other modules can be added.





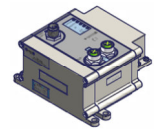
Codification key



TC x EN 08 S 08

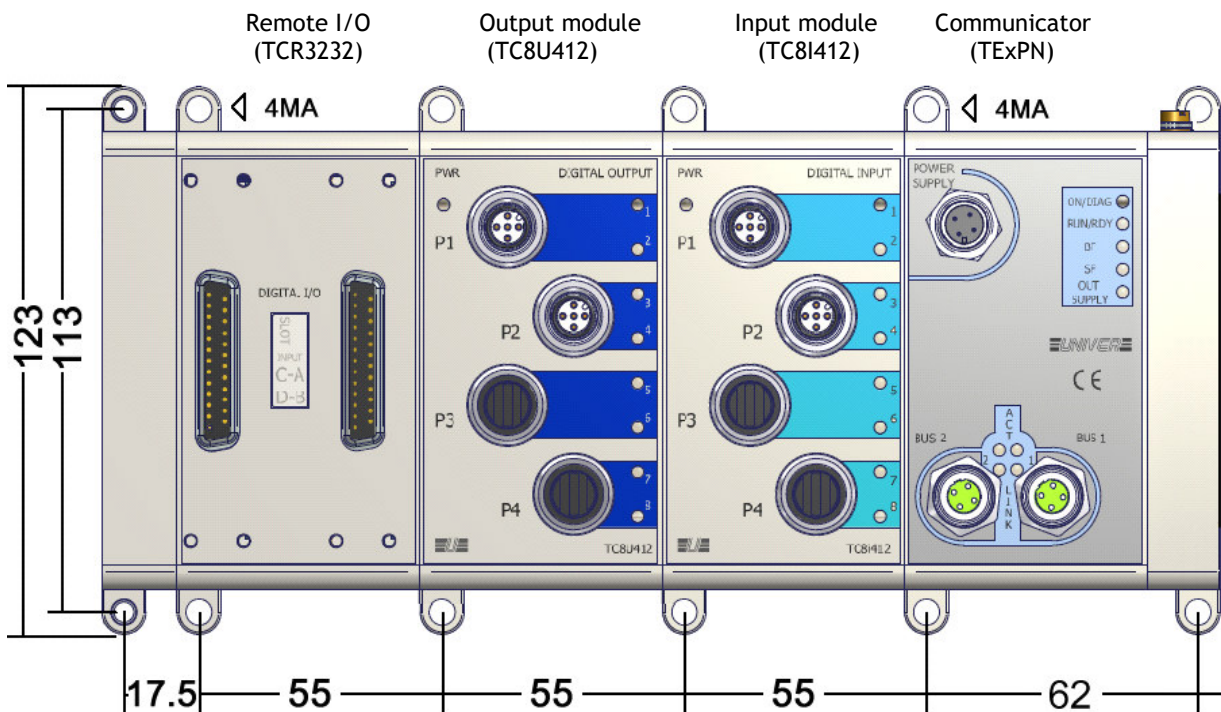
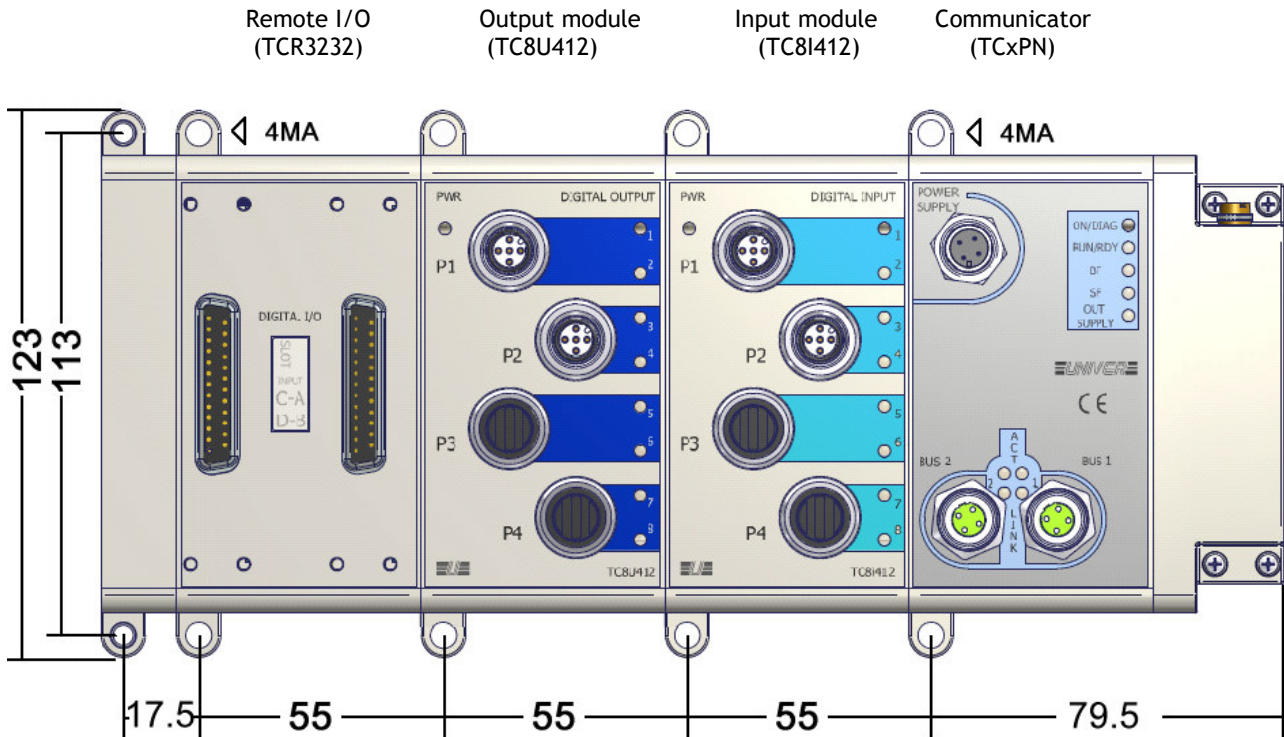
SERIES						
TC	I/O Module + Valve interface					
TE	I/O Module					
x	M12 standard connection					
7	7/8 auxiliary connection (2)					
M	M23 Multibus connection (1)					
FIELDBUS						
C	CANopen 64+64 I/O					
D	DeviceNet 64+64 I/O					
P	Profibus DP 64+64 I/O					
PN	Profinet 64+88 I/O					
EN	EtherNet/IP 64+88 I/O					
EC	EtherCAT 64+88 I/O					
LKA	IO-Link Class A 24 Coils					
LKB	IO-Link Class B 24 Coils					
DIGITAL INPUTS						
	No input module = 00					
N°	00-08-16-24-32-40-48-56-64					
INPUT CONNECTOR DIMENSIONS						
S	M12 Standard digital input (4x2)					
H	M12 High-Density digital input (TC16I812 8x2)					
H2	M12 High-Density digital input (TC16I812-2F 8x2) electronic 2-wires support					
8	M08 digital input (8x1)					
	Blank with the expansion module only					
DIGITAL OUTPUTS						
	No output module = 00					
N°	00-08-16-24-32-40-48-56-64					
EXPANSIONS digital inputs and outputs						
	Blank with no expansion module					
32IN	1 Module TCR32ID 16+16 digital inputs (2xDSUB 25)					
64IN	2 Modules TCR32ID 16+16 digital inputs (2xDSUB 25)					
32UD	1 Module TCR32UD 16+16 digital outputs (2xDSUB 25)					
64UD	2 Modules TCR32UD 16+16 digital outputs (2xDSUB 25)					
1616	1 Module TCR1616 16 digital inputs + 16 digital outputs (2xDSUB 25) (3)					
3232	1 Module TCR32ID + 1 Module TCR32UD					
6464	2 Modules TCR32ID + 2 Module TCR32UD					
A1C	1 Module TC-ECSM + 1 Module TC-2ECD for 2 Electric Clamps					
A2C	1 Module TC-ECSM + 2 Modules TC-2ECD for 4 Electric Clamps					

- (1) Only for DeviceNet and Profibus.
- (2) This solution consists of an additional module (TCxUS78) equipped with 7/8 connectors (the POWER SUPPLY connector of the standard module is removed)
- (3) From 2022 no longer available.

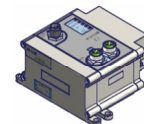


Installation

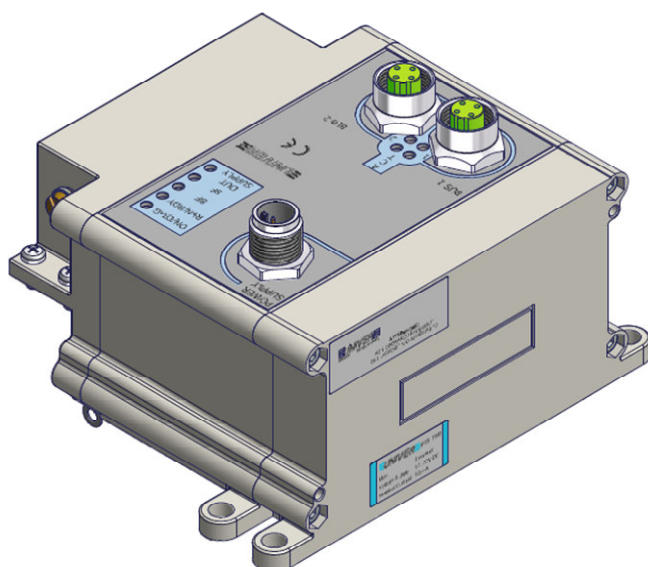
Before installing the device, be sure that it was not damaged during transport. Pay attention to the dimensions.



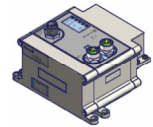
We recommend to fix the device through the proper holes with M4 screws.
The total length changes in accordance to the number of installed modules and according to the assembled valve manifold.



TCxPN e TExPN modules - Profinet

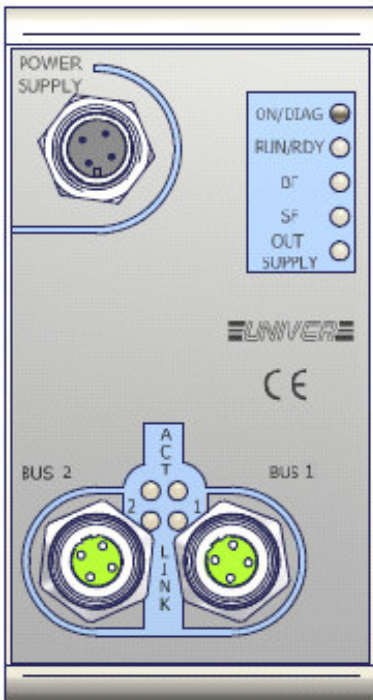


Fieldbus data		PROFINET IO	
Bus 1 and Bus 2 connectors	Circular M12 Female 4 pin D code 10Base-T/100Base-TX, Half/Full Duplex Auto Crossover Function; Auto-Negotiation RT/IRT Support FSU Support		
System LEDs	ON/DIAG	Green/Red	
	RUN/RDY	Green/Red	
Auxiliary LEDs	Out Supply	Green	
BUS LED	BF	Red	
	SF	Red	
	LINK 1 2	Green	
	ACT 1 2	Yellow	
Electrical data			
Supply connector	Circular M12 male 4 pin A code		
Logic voltage / digital inputs (VLS24)	24 Vdc \pm 15%		
Nominal power	150mA (TCxPN)		
Maximal power for digital inputs	1,5A @ 20 °C - overload protection (20mA for input)		
Manifolds/outputs voltage (VA24)	24 Vdc -10% +15% (valves limit)		
Maximal power for all outputs (VA24)	2,5A max - overload protection		
Manageable outputs for valve manifolds	24 max coils - (12 bistable valves - 1,5A for 12 coils)		
Manageable auxiliary digital outputs	64 digital outputs (88 total outputs with 24 manifold coils)		
Manageable auxiliary digital inputs	64 digital inputs		
Environmental conditions			
Weight	TCxPN/TExPN	290g/260g	
Module overall dimensions	100x123x75 mm / 90x123x75 mm		
Protection degree	IP 65 (a connettori inseriti)	IEC 60529	
Relative humidity	5 to 85%	IEC 60068-2-30	
Operating temperature	5 °C \div 50 °C	IEC 60068-2-1	
Storage temperature	-25 °C \div 80 °C	IEC 60068-2-2	
Vibrations	5g tested 10-500Hz	IEC 60068-2-6	
Shock	22g	IEC 60068-2-27	



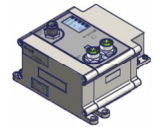
M12 connectors pinout for Profinet modules

TCxPN - TExPN



	<p>Logic supply and outputs. (M12 Male A code) Connector side view.</p>	<table border="1"> <thead> <tr> <th>Pin</th> <th>POWER SUPPLY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Positive logic supply and inputs (VLS24)</td> </tr> <tr> <td>2</td> <td>Negative output supply (OVA)</td> </tr> <tr> <td>3</td> <td>Negative logic supply and inputs (OVLS)</td> </tr> <tr> <td>4</td> <td>Positive output supply (VA24)</td> </tr> <tr> <td>Case</td> <td>Screen</td> </tr> </tbody> </table>	Pin	POWER SUPPLY	1	Positive logic supply and inputs (VLS24)	2	Negative output supply (OVA)	3	Negative logic supply and inputs (OVLS)	4	Positive output supply (VA24)	Case	Screen				
		Pin	POWER SUPPLY															
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2	Negative output supply (OVA)																	
3	Negative logic supply and inputs (OVLS)																	
4	Positive output supply (VA24)																	
Case	Screen																	
<table border="1"> <thead> <tr> <th>Pin</th> <th>BUS 1</th> <th>BUS 2</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TD+</td> <td>TD+</td> </tr> <tr> <td>2</td> <td>RD+</td> <td>RD+</td> </tr> <tr> <td>3</td> <td>TD-</td> <td>TD-</td> </tr> <tr> <td>4</td> <td>RD-</td> <td>RD-</td> </tr> <tr> <td>Case</td> <td>Screen</td> <td>Screen</td> </tr> </tbody> </table>	Pin	BUS 1	BUS 2	1	TD+	TD+	2	RD+	RD+	3	TD-	TD-	4	RD-	RD-	Case	Screen	Screen
Pin	BUS 1	BUS 2																
1	TD+	TD+																
2	RD+	RD+																
3	TD-	TD-																
4	RD-	RD-																
Case	Screen	Screen																
	<p>BUS1 e BUS2. (M12 Female D code) Connector side view</p>																	

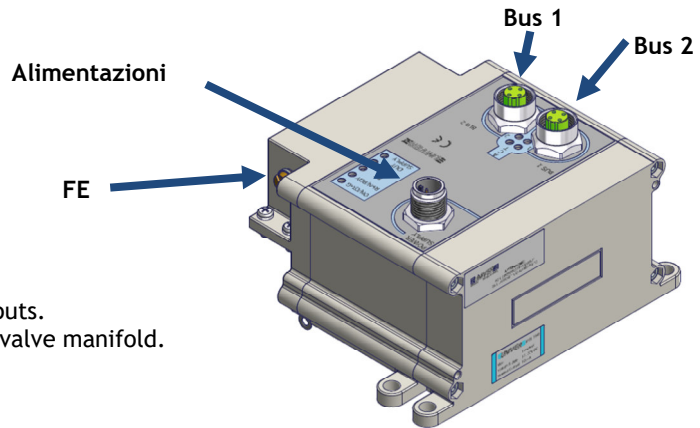
Bus 1 and Bus 2 can be used either as input or output of the fieldbus.



Supply connection for Profinet

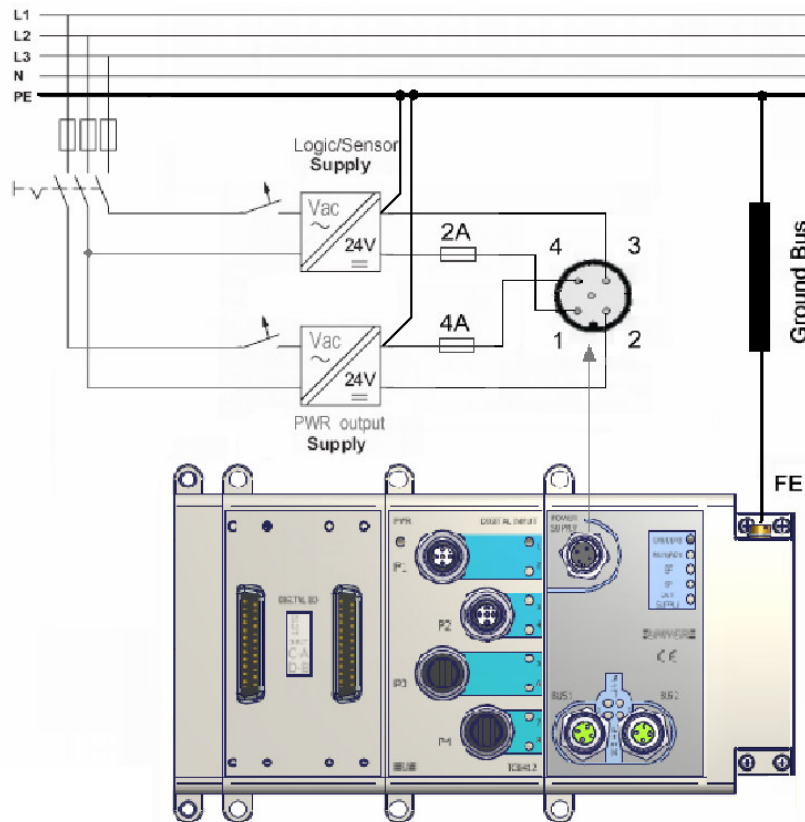


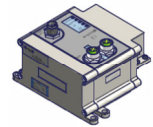
FE connection must be connected externally to the ground.



The module required 2 supplies,
 One 24 VDC (-10% or +15 %) for logic and inputs.
 Pnc 24 VDC (-10% or +15 %) for outputs and valve manifold.

Supply connections



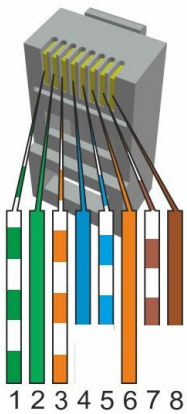


Connection to the Profinet fieldbus network



Connect the module with the appropriate network cable in accordance with the following table:

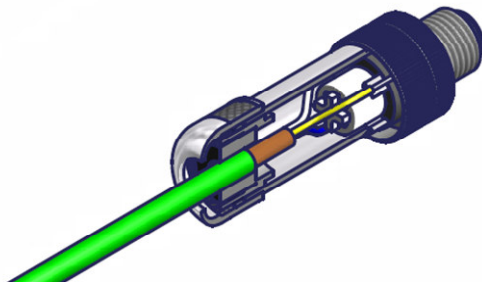
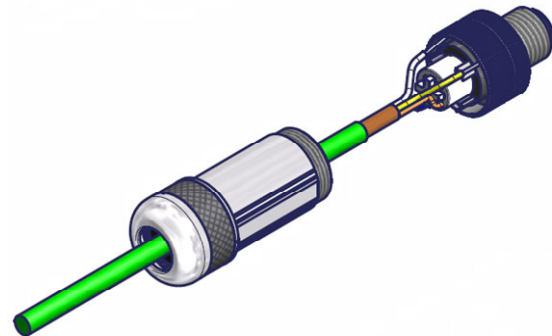
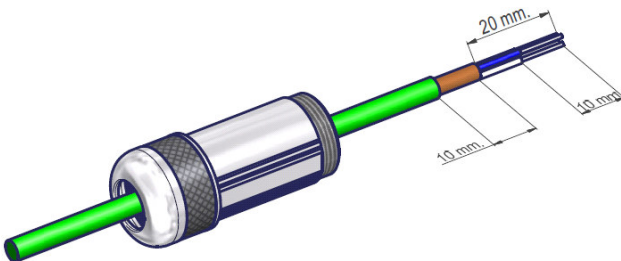
Ethernet cable specifications



Pin	Description	10base-T	100Base-T
1	Transmit Data+ or BiDirectional	TX+	TX+
2	Transmit Data- or BiDirectional	TX-	TX-
3	Receive Data+ or BiDirectional	RX+	RX+
4	Not connected or BiDirectional	n/c	n/c
5	Not connected or BiDirectional	n/c	n/c
6	Receive Data- or BiDirectional	RX-	RX-
7	Not connected or BiDirectional	n/c	n/c
8	Not connected or BiDirectional	n/c	n/c

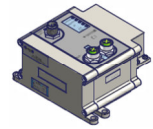
Description	Features
ISO/IEC 11801 Ed. 2.0, category 5	(Category)
ISO/IEC 11801 Ed. 2.0 Class D	(Transmission performances)
Conductor cross-section	AWG 22
Maximal operating voltage	300V RMS
Massimal resistance at 20°C	57.1 Ohm / km
Transfer Impedance at 10 MHz	< 40 mOhm / m
Nominal propagation speed	68%
Delay	< 5.3 ns / m
Impedance at 1 – 100 MHz	100 +/- 15 Ohm

Connector for fieldbus TZ-M4M12-D to be connected to BUS 1 and BUS 2.



Pin	Cable color
1	Yellow
2	White
3	Orange
4	Blue
Case	Shield





How to set Profinet network address

Profinet

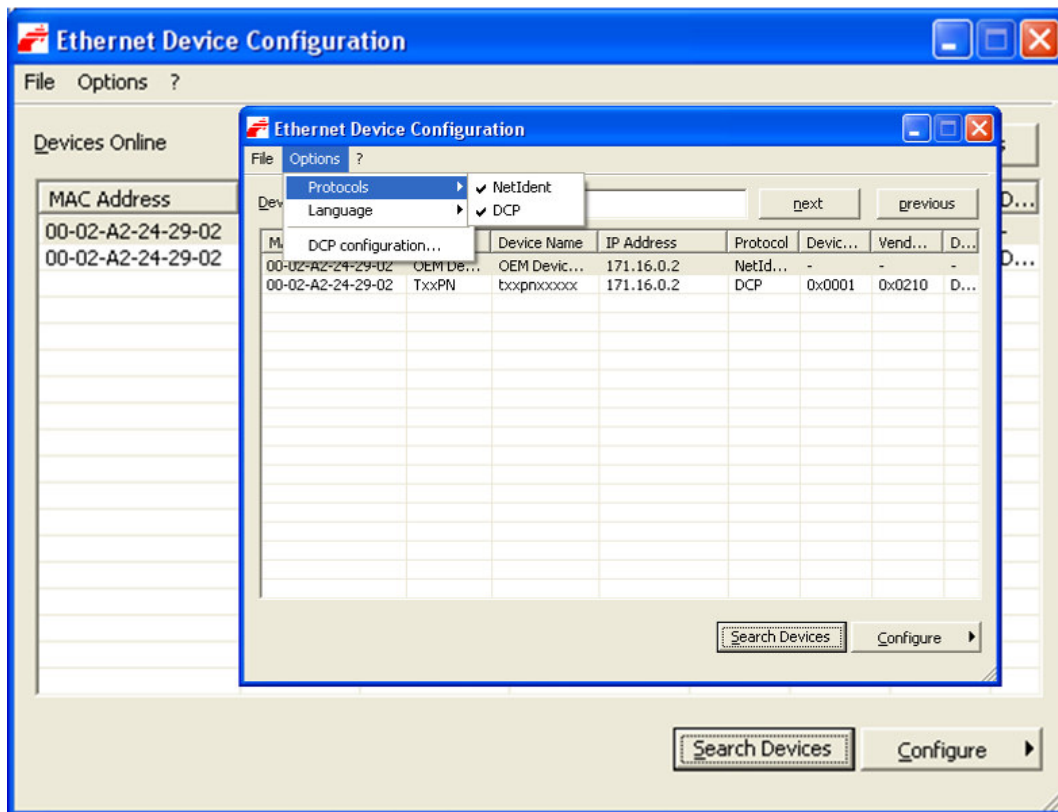
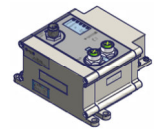
The device has the following factory settings:

Name: **txxpnxxxxx**
IP Address: **171.16.0.10**
IP Mask: **255.255.255.0**
Gateway: **0.0.0.0**

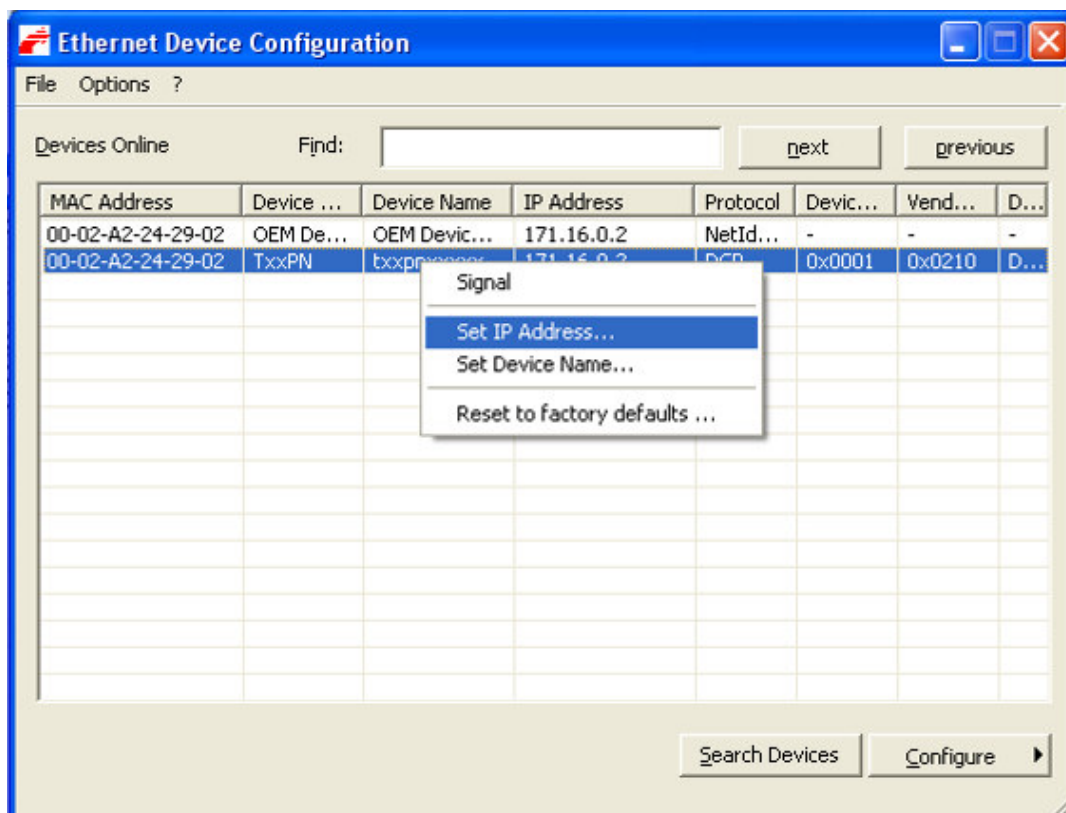


To configure these devices it is possible to use the master software (i.e. TIA Portal for Profinet) or the “Ethernet/IP Device Configuration” software available on our website.

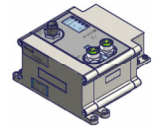
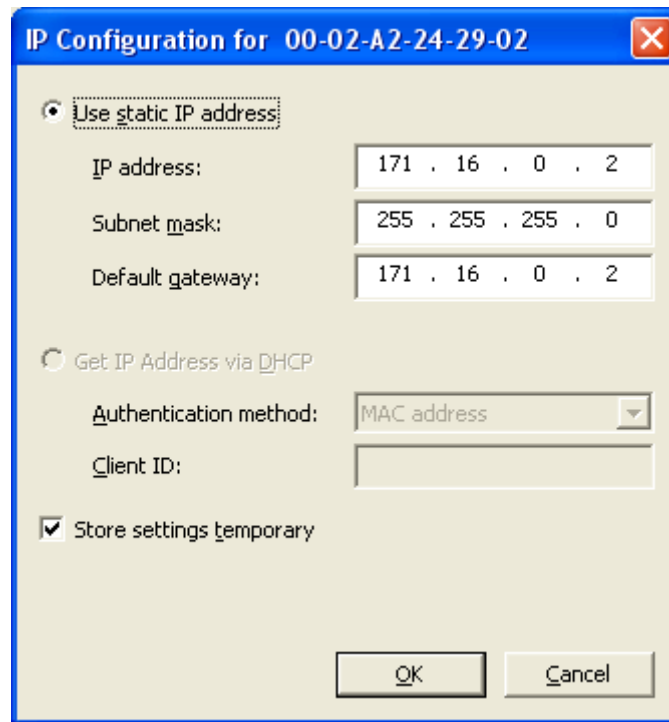
Here below an example on how to use the “Ethernet Device Configuration” software to set the IP address.
Be sure that in the “Options” “Protocols” both “NetIdent” and “DCP” are ticked



Click on "Search Devices" to perform a network scanning and to recognize the connected devices. Select from the list, the device whose MAC Address corresponds to the one of the object you want to change (the MAC Address is written on the device connector) and click the mouse's right button.



Now it is possible to modify the IP address, the subnet mask and the Gateway address.

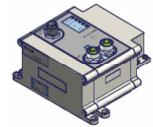
In protocols where it is foreseen, the checkbox “Set Device Name” will be active, and you can set the device name as well. The procedure is like the one used to install the IP address. For more details on the use of the program, refer to the program “Help”.



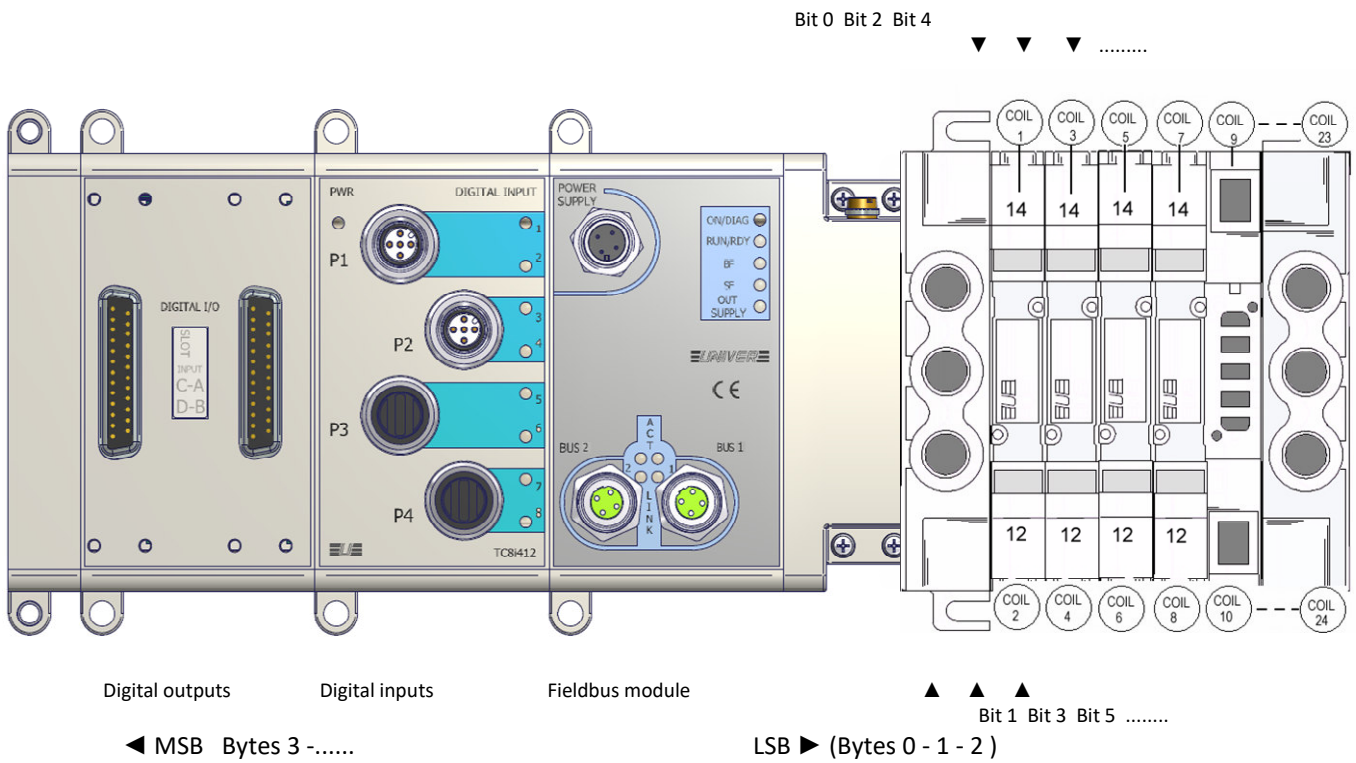
To be sure that the configured parameters become permanent, remember to remove the tick from “Store setting temporary” before clicking on “OK”, otherwise the new setting will be erased at the first device shutdown.



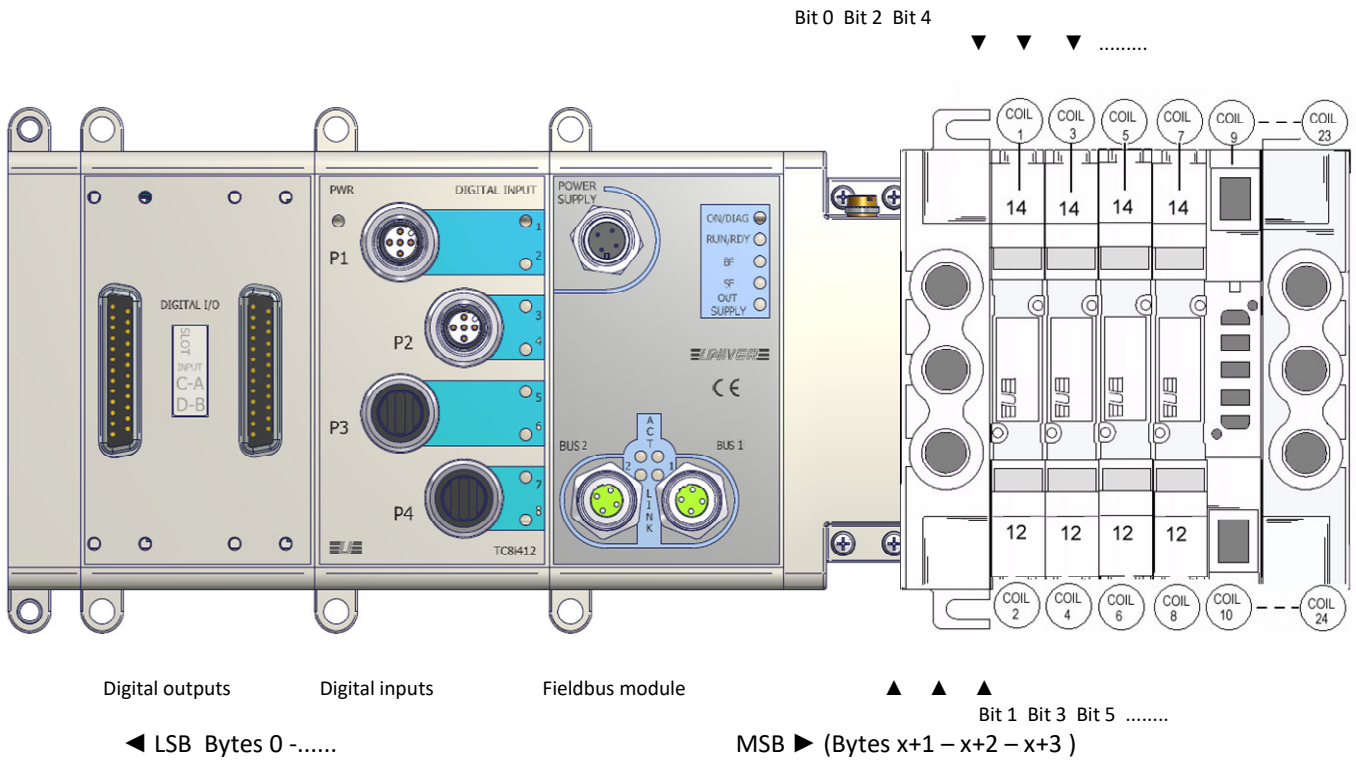
To be able to use the program correctly it is necessary that the PC network card is set on the same device network. (example 171.16.0.1).



Coils, inputs and outputs addressing

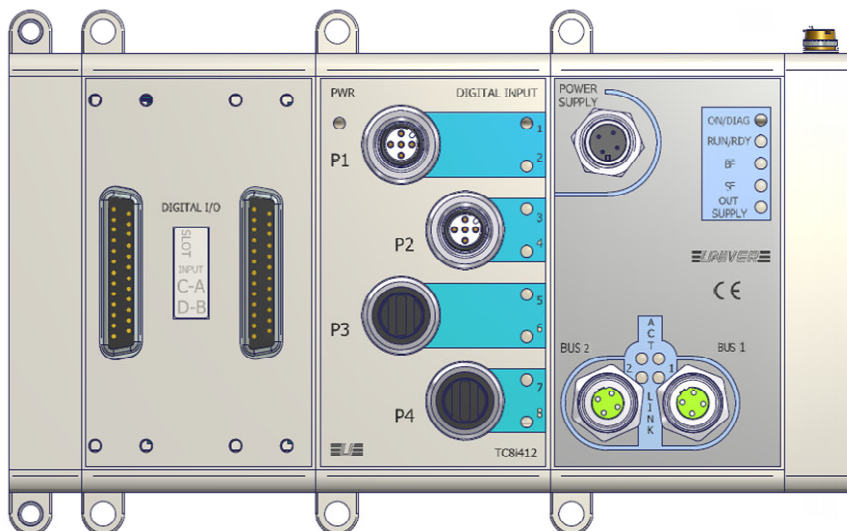
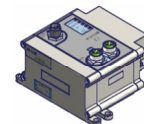


(Manifold First = TRUE or Valve manifold first = Right, ecc.) (1)



(Manifold First = FALSE or Valve manifold first = False, etc.) (1)





Digital outputs

Digital inputs

Fieldbus module

◀ MSB Bytes 0 -.....

- (1) The wording may vary according to the used protocol and according to the selected language, if supported by the configuration file.

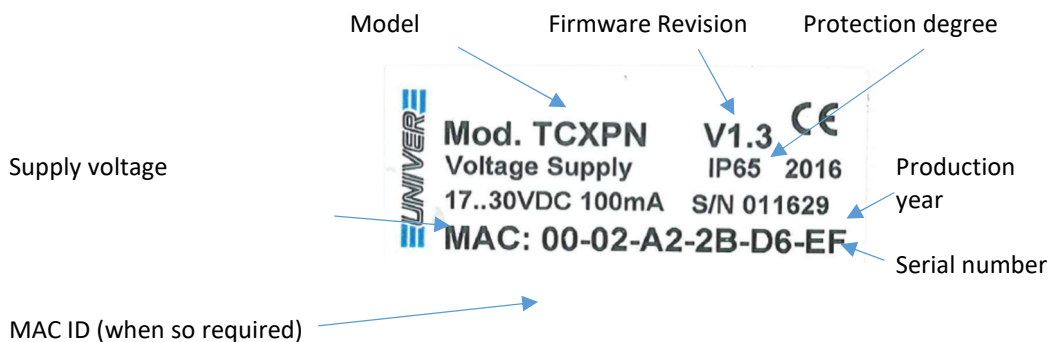


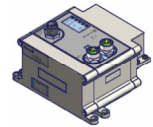
The physical position of the modules determines the rising of the given Bytes, according to a sequence that always evolves from the fieldbus module to the left.

A specific sequence of the module installation must be observed to ensure that the system works properly.

First the input modules (TC8I412, TC16I812, TC8I808, TCR32ID), then the additional modules TCR1616 (discontinues), after the output modules (TC8U412 or TCR32UD) and in the end the possible modules for the electric clamps (TC-ECSM, TC-2ECD).

Product identification label





Allocation of manifold valve Byte/Bit

		Coil	Consume Byte-Bit	Coil	Consume Byte-Bit	Coil	Consume Byte-Bit
Valve function	side14	1	0-0	9	1-0	17	2-0
	side12	2	0-1	10	1-1	18	2-1
	side14	3	0-2	11	1-2	19	2-2
	side12	4	0-3	12	1-3	20	2-3
	side14	5	0-4	13	1-4	21	2-4
	side12	6	0-5	14	1-5	22	2-5
	side14	7	0-6	15	1-6	23	2-6
	side12	8	0-7	16	1-7	24	2-7



TC modules always use 24 Bit (3 Bytes) regardless of the actual number of valves.

Allocation of Byte/Bit of further output modules

		Byte-Bit Consumes				
Slot		1	2	3	4	5
Pin-port	P 1-4	3-0	4-0	5-0	6-0	7-0
	P 1-2	3-1	4-1	5-1	6-1	7-1
	P 2-4	3-2	4-2	5-2	6-2	7-2
	P 2-2	3-3	4-3	5-3	6-3	7-3
	P 3-4	3-4	4-4	5-4	6-4	7-4
	P 3-2	3-5	4-5	5-5	6-5	7-5
	P 4-4	3-6	4-6	5-6	6-6	7-6
	P 4-2	3-7	4-7	5-7	6-7	7-7



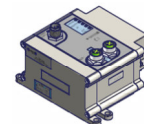
The maximal number of configurable digital outputs is 64/88 Bit (8/11 Bytes), based on the models of the used connectors.

Allocation of Byte/Bit of further output modules

		Byte-Bit Produces						
Slot		1	2	3	4	5	6	7
Pin-port	P 1-4	0-0	1-0	2-0	3-0	4-0	5-0	6-0
	P 1-2	0-1	1-1	2-1	3-1	4-1	5-1	6-1
	P 2-4	0-2	1-2	2-2	3-2	4-2	5-2	6-2
	P 2-2	0-3	1-3	2-3	3-3	4-3	5-3	6-3
	P 3-4	0-4	1-4	2-4	3-4	4-4	5-4	6-4
	P 3-2	0-5	1-5	2-5	3-5	4-5	5-5	6-5
	P 4-4	0-6	1-6	2-6	3-6	4-6	5-6	6-6
	P 4-2	0-7	1-7	2-7	3-7	4-7	5-7	6-7



The maximal number of configurable digital inputs is 64 Bit (8 Byte).

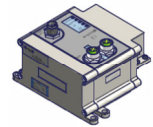


Allocation of Byte/Bit of electric clamp modules

Module	Clamp	Byte-Bit Inputs			Byte-Bit Outputs	
		Opening	Closing	Fault	Opening	Closing
1	1	0-0	0-1	0-2	0-0	0-1
	2	0-3	0-4	0-5	0-2	0-3
2	3	1-0	1-1	1-2	0-4	0-5
	4	1-3	1-4	1-5	0-6	0-7
3	5	2-0	2-1	2-2	1-0	1-1
	6	2-3	2-4	2-5	1-2	1-3
4	7	3-0	3-1	3-2	1-4	1-5
	8	3-3	3-4	3-5	1-6	1-7



Input and Output bytes of electric power clamps modules are subsequent to the input and output modules already in the system.



Auxiliary input and output modules

COD. TC8I412

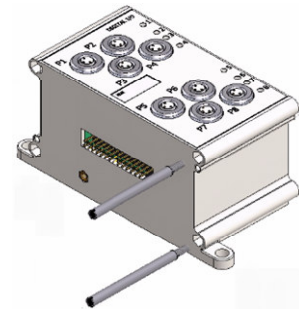
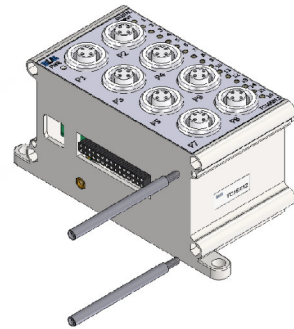
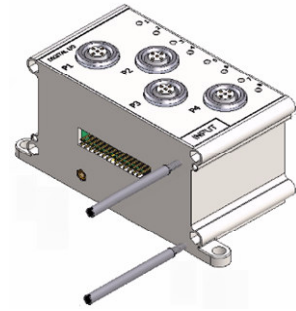
N.8 digital inputs - M12

COD. TC16I812

N.16 digital inputs - M12

COD. TC8U412

N.8 digital outputs - M12



M12 Female A code
Contact side view

Pin	TC8I412 TC16I812	TC8U412
1	VLS24	-
2	Input 2	Output 2
3	0VLS	0VA
4	Input 1	Output 1
Case	Shield	Shield

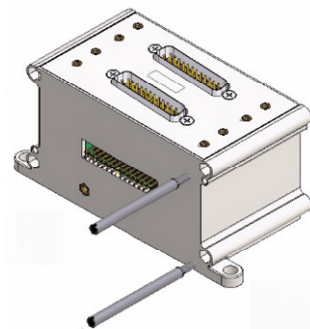
COD. TC8I808

N.8 digital input - M8



M8 Female
Contact side view

Pin	TC8I808
1	VLS24
3	0VLS
4	Input



P1-P2 Pin N.	TCR32ID	TCR32UD
1	Input 0-0	Output 0-0
2	Input 0-1	Output 0-1
3	Input 0-2	Output 0-2
4	Input 0-3	Output 0-3
5	Input 0-4	Output 0-4
6	Input 0-5	Output 0-5
7	Input 0-6	Output 0-6
8	Input 0-7	Output 0-7
9	Input 1-0	Output 1-0
10	Input 1-1	Output 1-1
11	Input 1-2	Output 1-2
12	Input 1-3	Output 1-3
13	Input 1-4	Output 1-4
14	Input 1-5	Output 1-5
15	Input 1-6	Output 1-6
16	Input 1-7	Output 1-7
17/18	-	-
19/20	0VLS	-
21/22	VLS24	-
23/24	-	0VA
25	-	-
Case	Shield	Shield

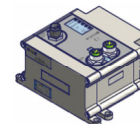


COD. TCR32UD

16+16 digital output
Remote module

COD. TCR32ID

16+16 digital input
Remote module



Auxiliary input and output modules (features)

Input module specifications

Code	TC8I412	TC16I812 TC16I812-2F	TC8I808	TCR32ID
Connector Type	Circular 4 x M12	Circular 8 x M12	Circular 8 x M8	DSub 2 x 25pins
Input for each module	8	16	8	16+16
Commutation logic	Devices with 2 or 3 wires PNP (for 2-wires connector use -2F version)			
Supply voltage (VLS24)	24Vdc +/- 15%			
Maximal supply power for input	20mA (13mA for version -2F) (2)			10mA (3)
Input level "OFF"	0Vdc to 5Vdc			
Input level "ON"	10Vdc to 30Vdc			
Typical power for active input	5mA			
Signal input "ON"	LED Green			
Signal power supply	LED Green			

Output module specifications

Code	TC8U412	TCR32UD
Connector type	Circular 4 x M12	DSub 2 x 25pins
Output for each module	8	16+16
Commutation logic	PNP	
Output voltage	24 Vdc -10% + 15% (valve limit)	
Power for each output	0.3A	
Power for each output	1.0A	
Overload protection	1.2°	
Power for each module	1.5A (1)	
Signal output "ON"	LED Yellow	

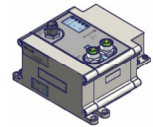
Environmental conditions

Weight	from 170g to 350g based on the module	
Module overall dimensions	55x125x75 mm	
Protection degree	IP 65 (with connectors)	IEC 60529
Relative humidity	5 to 85%	IEC 60068-2-30
Operating temperature	5°C ÷ 50°C	IEC 60068-2-1
Storage temperature	-25°C ÷ 80°C	IEC 60068-2-2
Vibrations	5g tested 10-500Hz	IEC 60068-2-6
Shock	22g peak	IEC 60068-2-27



**Make sure that all connectors are perfectly screwed, and those not used are blocked with appropriate plugs (ZJM12-, ZJM08- TSCFN24SCAT), in order to guarantee the IP65 requirements.
The maximum length of the input and / or output cables allowed is 10 meters.**

- (1) The maximal power for all output modules, included the valve manifold is 2.5A.
- (2) The maximal power for each single group of 8 inputs is 160mA (100mA for versions -2F).
- (3) The maximal power for each single group of 16 inputs is 160mA.



Supply module and disconnecter

COD.TCXUS78
Supply / 7/8 Disconnecter

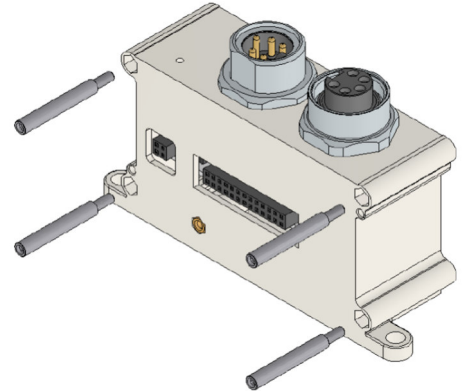


Power Supply IN
7/8 Male 5 pole
Contact side view

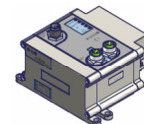


Power Supply OUT
7/8 Female 5 pole
Contact side view

Pin	TCXSM12
1	Negative output supply (OVA)
2	Negative logic and input supply (0VLS)
3	FE
4	Positive logic and input supply (VLS24)
5	Positive output supply (VA24)
Case	Shield (PE)

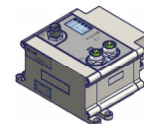


*When using one of these modules with standard communication systems, keep in mind that its male power connector (which has uncovered pins) is energized, being connected in parallel, therefore, if not used, it must be protected with a special cap.
To use the module as "Disconnecter" simply remove the JP1 Jumper located on the lower printed circuit near the 26-pole connector*


























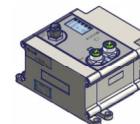
Supply modules and disconnecter (features)

Output module specifications		
Code	TCXUSM12	TCXUS78
<i>Input connector</i>	<i>Circular M12 male 4 poles</i>	<i>Circular 7/8 male 5 poles</i>
<i>Output connector</i>	<i>Circular M12 male 4 poles</i>	<i>Circular 7/8 female 5 poles</i>
<i>Supply voltage</i>	<i>24 Vdc -10% + 15% (valve limit)</i>	
<i>Manageable supply input/output</i>	<i>4A</i>	<i>12A</i>
<i>Overload protection - Logic</i>	<i>1.2A</i>	
<i>Overload protection - outputs</i>	<i>2.5A</i>	
<i>Supply signal "Out Supply"</i>	<i>LED green</i>	
Environmental conditions		
<i>Weight</i>		
<i>Module overall dimensions</i>	<i>35x125x75 mm</i>	
<i>Protection degree</i>	<i>IP 65 (with connectors)</i>	<i>IEC 60529</i>
<i>Relative humidity</i>	<i>5 to 85%</i>	<i>IEC 60068-2-30</i>
<i>Operating temperature</i>	<i>5 °C ÷ 50 °C</i>	<i>IEC 60068-2-1</i>
<i>Storage temperature</i>	<i>-25 °C ÷ 80 °C</i>	<i>IEC 60068-2-2</i>
<i>Vibrations</i>	<i>5g tested 10-500Hz</i>	<i>IEC 60068-2-6</i>
<i>Shock</i>	<i>22g peak</i>	<i>IEC 60068-2-27</i>



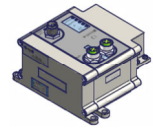
Profinet LED Status and Diagnostics

LED	Color	Status	Meaning
ON/Diag		On	No error
		Flashing	Error, see error codes table for further details
		Flashing	Fatal error, see error codes table for further details.
Run/Rdy		On	Operative system completely loaded and ready
		On	Error by loading the operative system or the configuration
		Flashing	Boot loader mode active (6 Blink No 2nd Stage Loader Loaded).
		Flashing	Operating system missing (2nd Stage Loader Loaded).
BF		On	System not configured; no actual connection to the bus; Master not communicating.
		Flashing	No data exchange (Wrong configuration on the master).
		Off	No error
SF		On	Generic or extended diagnostics present; watchdog timeout; system error.
		Flashing	DCP service signal sent via BUS.
		Off	No error
OUT SUPPLY		On	Power supply (24VA) on. (manifold and output supply).
		Off	Missing power supply (24VA). (manifold and output supply).
LINK 1		On	Ethernet connection on channel 1.
		Off	No Ethernet connection on channel 1.
LINK 2		On	No Ethernet connection on channel 2.
		Off	Nessuna connessione Ethernet sul canale 2.
ACT 1		Flashing	Message Transmission/Receipt on channel 1.
		Off	No Message Transmission/Receipt on channel 1.
ACT 2		Flashing	Message Transmission/Receipt on channel e 2.
		Off	No Message Transmission/Receipt on channel 2.



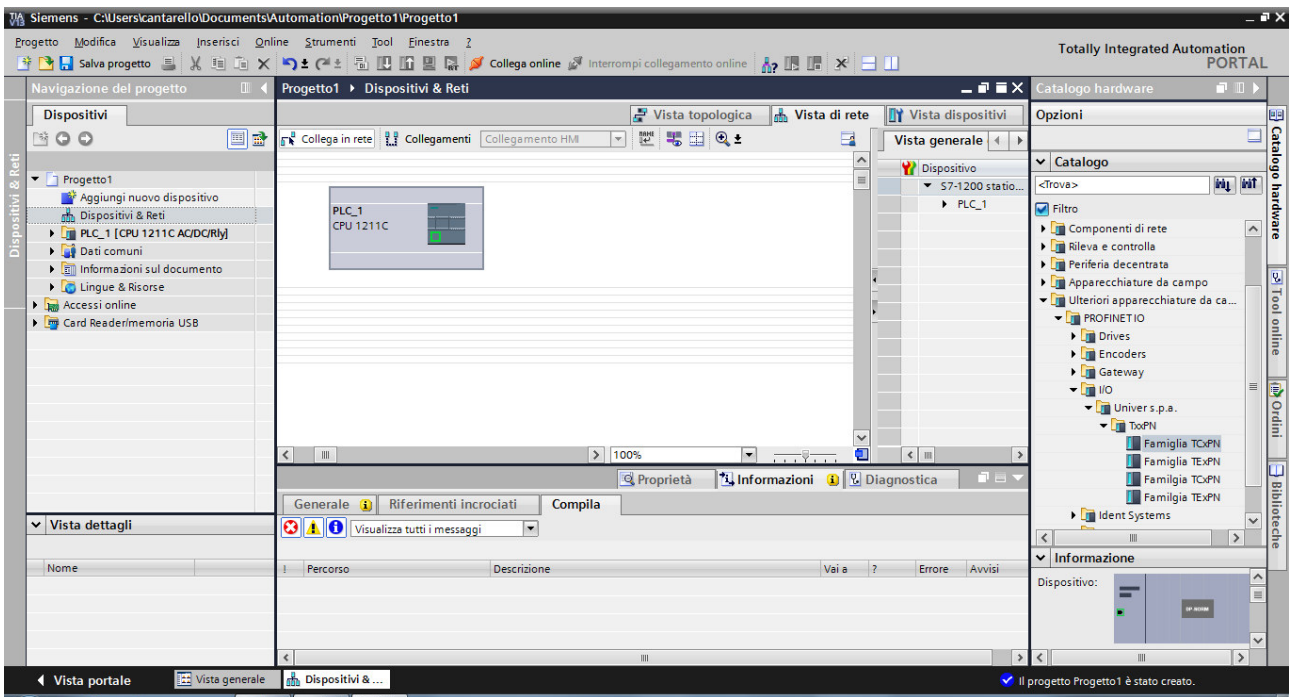
Error codes Profinet

	Color	Status	Meaning
ON/Diag		1 Flashing	Lack of general supply power (24VA).
		2 Flashings	One or more output are in short circuit or overloaded
		3 Flashings	Attention, high level of disturbance.
		4 Flashings	Module error (one or more modules are not working).
		5 Flashings	No inputs or outputs module detected
		6 Flashings	Reserved (WDT).
		7 Flashings	Reserved.
		8 Flashings	Reserved (IO Configuration Fail).
		9 Flashings	Lack of supply +24V for input (overload).
		10 Flashings	Lack of power supply module
		11 Flashings	Reserved (EEPROM Fail).
		12 Flashings	Electric clamps in error
		13 Flashings	Short circuit or overload on the outputs of the electric clamps
		1 Flashing	Reserved (FW Cookie not valid).
		2 Flashings	Reserved (Map Channel not valid).
		3 Flashings	Reserved (FW not valid).
		4 Flashings	Reserved (Hand Shake Invalid).
		5 Flashings	Reserved (Configuration Failed).
		6 Flashings	Reserved (Lock Failed).
		7 Flashings	Reserved (Register Failed).
	8 Flashings	Reserved (Device Ready Timeout).	



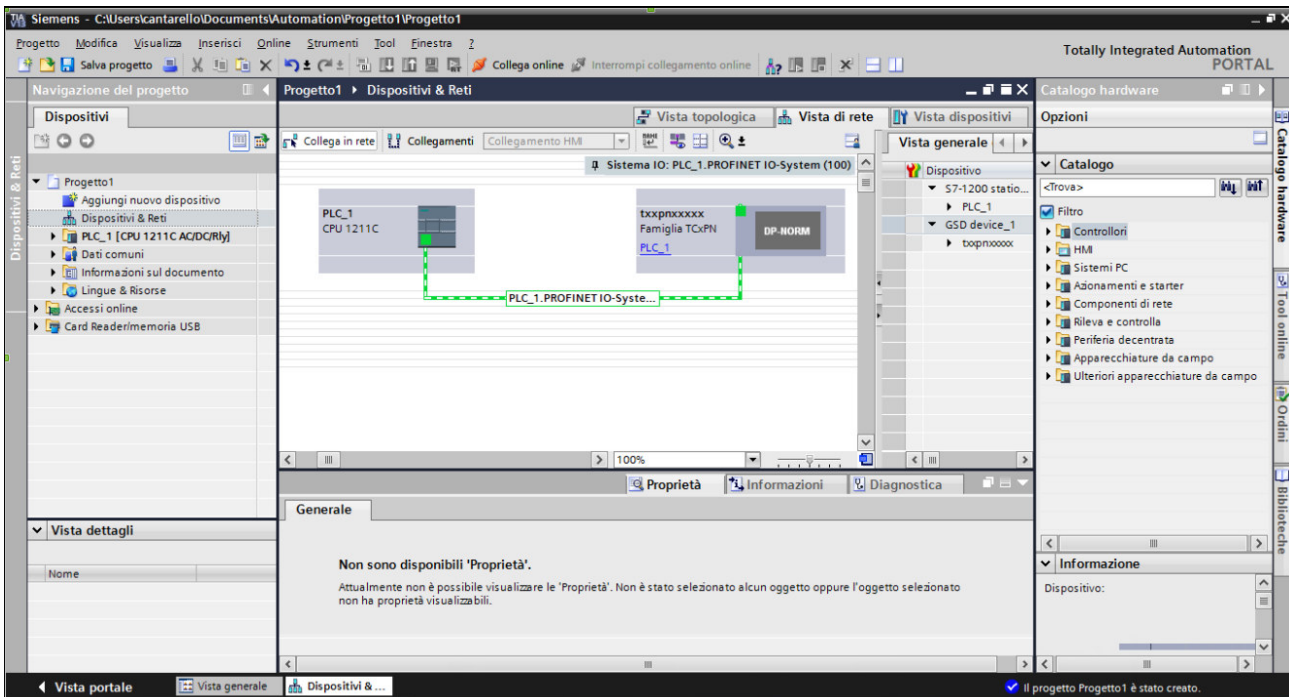
Parameter for Profinet configuration

Here below an example by using "TIA Portal" software by Siemens.
Place the master in the window "Devices & Nets"



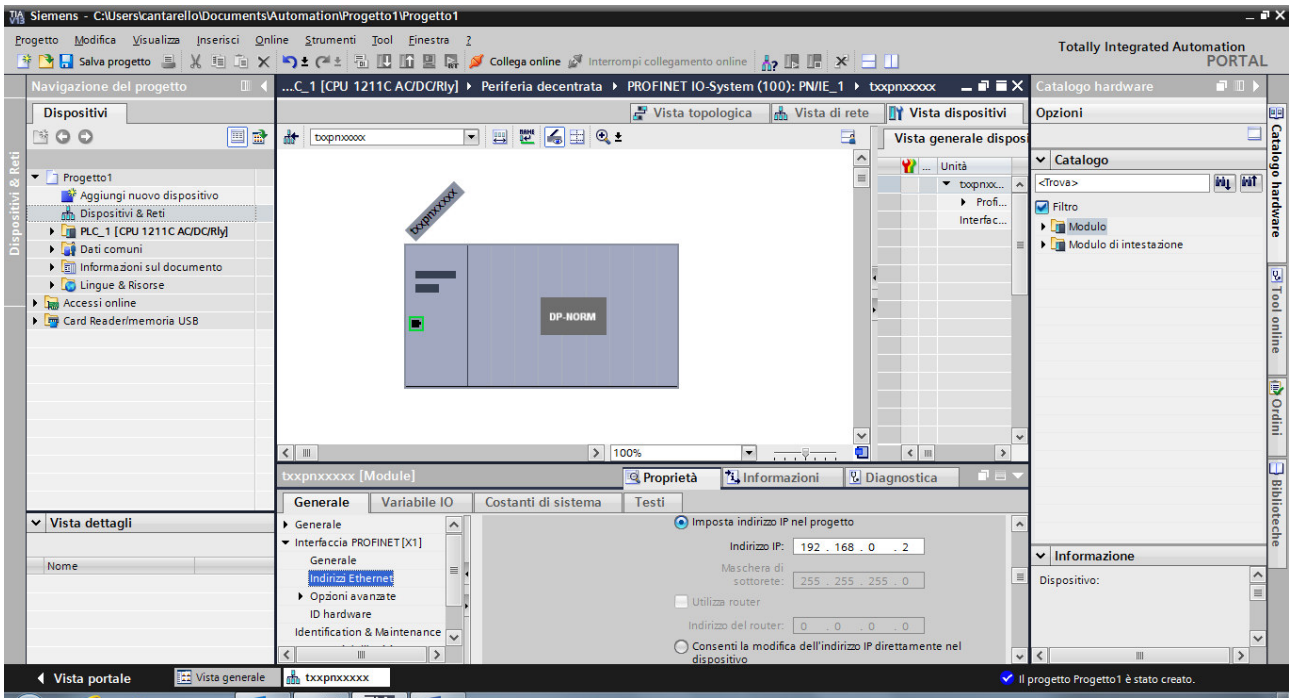
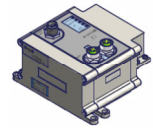
Import the GSDML device file from the CD or Internet website.

In "Hardware catalogue", "Further Fieldbus devices" "I/O/PROFINET" "I/O" the folder "Univer S.p.A." will appear. Click the device from the list and put it into the window "Devices and Nets".

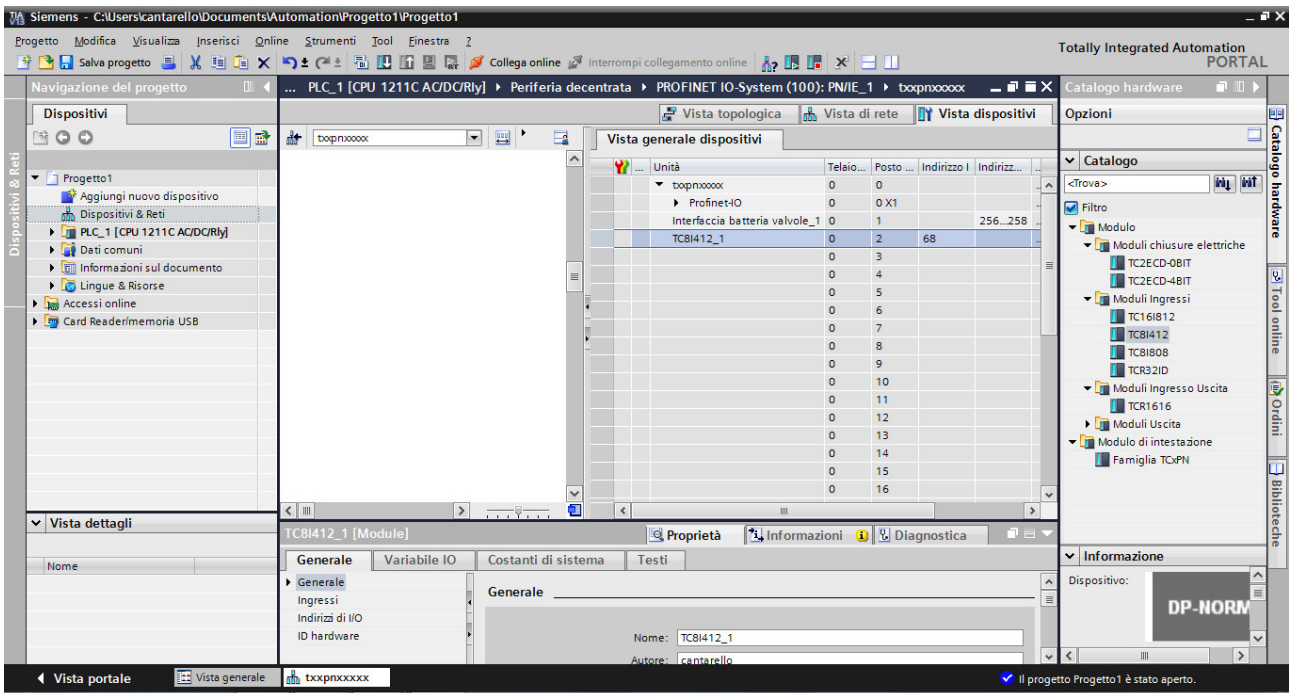


Connect the BUS between the master and the slave "green line".

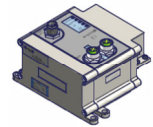
Allocate the IP address, the name and the other options/parameters needed for the application.



Put into the slots the different modules building the device and allocate the related addressed for the inputs and the outputs.



(in the example further to the integrated interface for the valve manifold, there is also an input module - 8 inputs M12)



From the master configuration programme it is possible to enable or disable the creation of some errors, and set some device options.

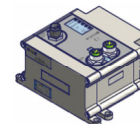
If the option “Further module diagnostics” is disabled, no module error is generated.

Parameter table

Diag: Lack of actuators supply 24V	Enable or disable the creation of the diagnostics in case of lack of power supply for outputs (VA24).
Diag: Faulty module	Enable or disable the creation of the diagnostics in case of faulty module.
Diag: Output error	Enable or disable the creation of the diagnostics in case of overload or short circuit of the outputs.
Diag: High level of noise	Enable or disable the creation of the diagnostics in case of high level of noise.
Diag: Lack of input supply 24V	Enable or disable the creation of the diagnostics in case of lack of supply on the input modules.
Input response time	Low: Environment Input filter very disturbed (> 50mS). Fast: Max. input sampling rate (< 50mS). The response time depends on the number of inputs and outputs of the system. Default Low.
Further module diagnostics	If enabled one dignostics for each module will be created.
Valve manifold first	If True, the integrated manifold will use the first 3 bytes of the allocated address. If False, the integrated manifold will use the last 3 bytes of the allocated address.
What to do in case of CPU STOP	Select the desired behaviour in case of master CPU STOP. “Switch off the outputs” if you want to switch off automatically all the outputs. “Keep the last value” if you want to keep all the outputs like they were in the latest status. (in that case pay attention to the dangerous conditions that may be generated in the system). Default “Switch off all the outputs”.
Diag: Power Clamp error	Enable or disable the creation of a diagnostics in case of error by the electric power clamp (FAIL output of the power clamp activated).
Diag: Power Clamp control error	Enable or disable the creation of a diagnostics in case of overload or short circuit of one or more outputs on one or more power clamp control output.
Power Clamp phase shift	Phase shift time between the control of one electric power clamps to the following one (25...400mS in steps of 25mS). Default 150mS.
Simultaneous Power Clamps	Number of power clamps that may be activated in the same moment (1...8). Default 8.

Note: if not configured, all the functions are enabled.

The procedure to modify the configuration parameters depends on the used master software. In the following page you can see an example of the menu shown in “Unit parameters” of the software “TIA Porta” di Siemens.



bxpxnxxxxx [Module] Proprietà Informazioni

Generale | Variabile IO | Costanti di sistema | Testi

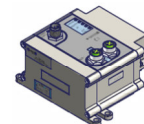
▸ Generale
 ▸ Interfaccia PROFINET [X1]
 Identification & Maintenance
Parametri dell'unità
 Indirizzi di diagnostica

Parametri dell'unità

Parametri

Diag.: Mancanza 24V attuatori:	Abilitato
Diag.: Modulo guasto:	Abilitato
Diag.: Uscita in errore:	Abilitato
Diag.: Livello di rumore elevato:	Abilitato
Diag.: Mancanza 24V Ingressi:	Abilitato
Tempo di risposta Ingressi:	Lento
Ulteriore diagnostica dal modulo:	Abilitato
Batteria Valvole per prima:	Vero
Comportamento in caso di STOP della CPU:	Spegni le uscite
Diag.: Chiusura Elettrica in errore:	Abilitato
Diag.: Errore comando Chiusura Elettrica:	Abilitato
Tempo Sfasamento Chiusure Elettriche:	150
Chiusure Elettriche contemporanee:	8

(example from TIA Portal V13)



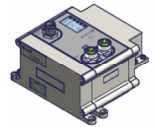
Error codes of the Profinet diagnostics messaging

The device can generate the following diagnostics messages:

DIAGNOSTICS CODES		
<i>Error code</i>	<i>Name</i>	<i>Description</i>
256	Lack of output 24VA	Lack of 24VA supply (pin 4 of the supply connector). In such a condition the coils are not supplied even if the outputs are activated.
257	Lack of input 24VA	Overload or short circuit in one or more connectors of the input module.
258	Attention: High noise level	Communication error on the internal device bus, caused by high noise level (bad cabling, lack of grounding or capacitive coupling of the cables)
259	Module damage	Module error (module to be changed).
260	One or more outputs are overloaded or have short circuit	One or more outputs of the auxiliary output module are overloaded or in short circuit, see note (1).
261	Electric Clamp in error	Error in the electric clamp (power clamp FAIL output is active).
262	Electric clamp control output is overloaded or in short circuit	One of the control outputs of the electric clamp is overloaded or in short circuit.

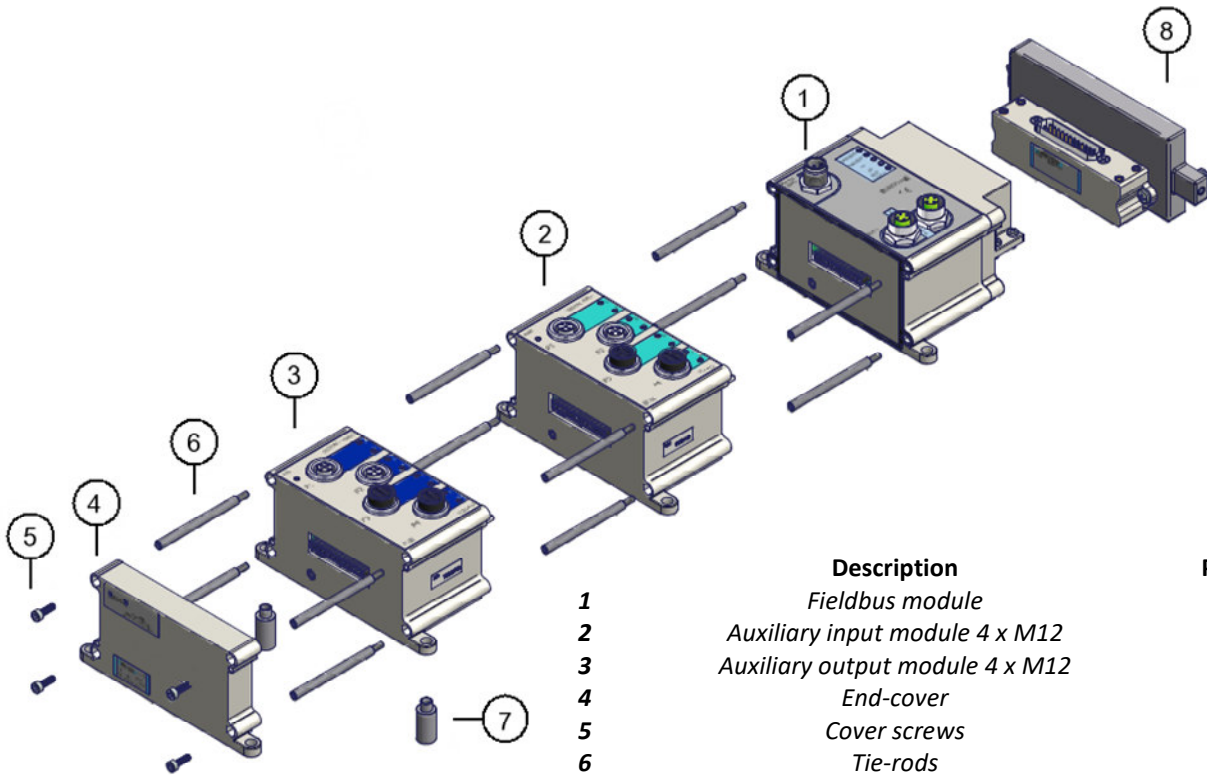
If the option "Further Module Diagnostics" is enabled, an error message is generated for each sub-module (Slot 1...17), if it is disabled one single error message is generated for the general module (Slot 0).

- (1) If the error is caused by the integrated manifold, it is possible to reset the error by switching off all the 24 outputs, wait for at least 7 seconds and restart the needed output once again.
In case of short circuit or overload all the 24 outputs are switched off.
- (2) On output module.



How to assemble the modules

Auxiliary input and output modules are connected to the fieldbus module on the valve manifold opposite side.

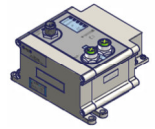


1	Description	Part Number
1	Fieldbus module	TCxPN
2	Auxiliary input module 4 x M12	TC8I412
3	Auxiliary output module 4 x M12	TC8U412
4	End-cover	PR2895-
5	Cover screws	Included
6	Tie-rods	Included
7	Supports	Included
8	Adaptor for valve manifold	BDF-x130TIM BDF-x140TIM

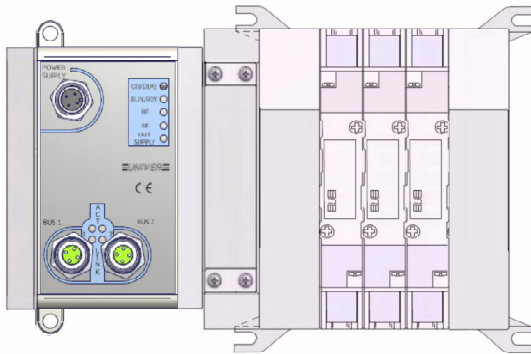


Be sure that the module sequence is always as follows:

Serial communicator (TCxxx o Texxx).
 TCXUS78 if any.
 Input modules (TC8I412, TC16I812, TC8I808) if any.
 Output modules (TC8U412, TCR32UD (must be the last one, if any) if any).
 TC-ECSM if any.
 TC-2ECD if any.

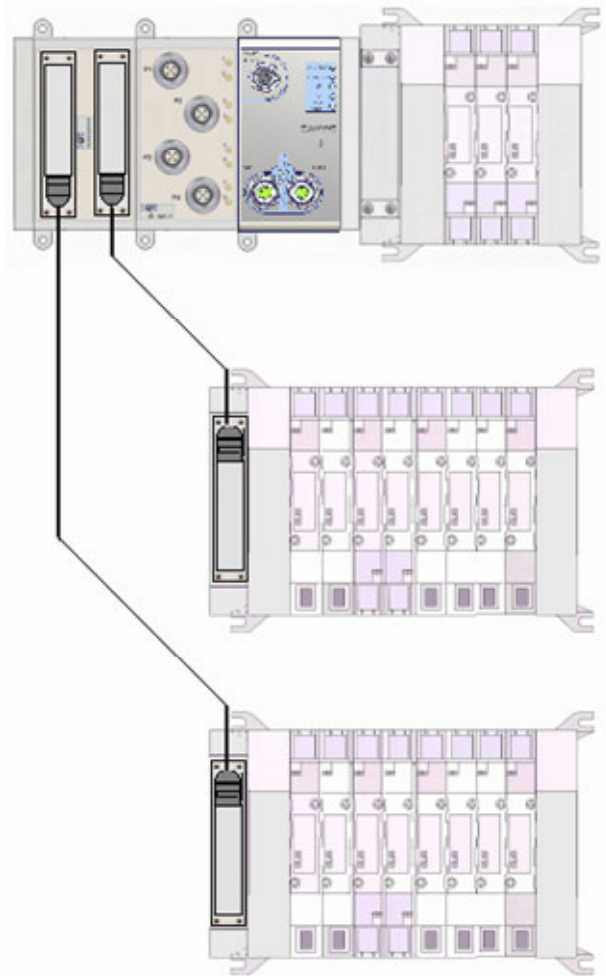


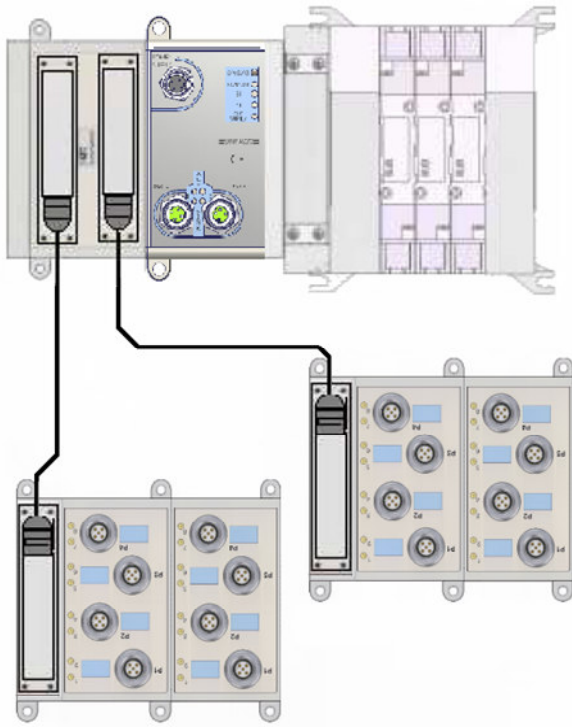
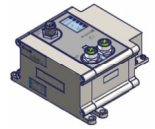
Examples of possible configurations



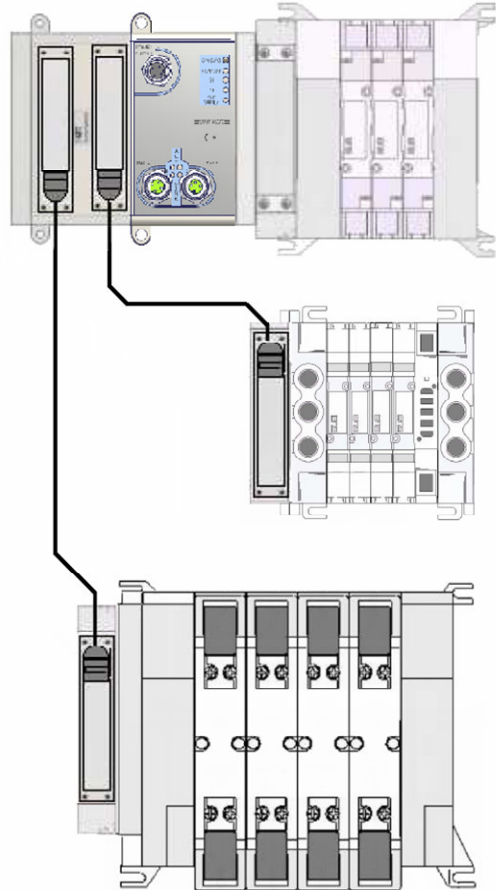
Module TCxPN with integrated compact valve manifold

Module TCxPN with integrated compact manifold and M12 outside modules and expansion modules to connect remote valve manifolds
 ↓



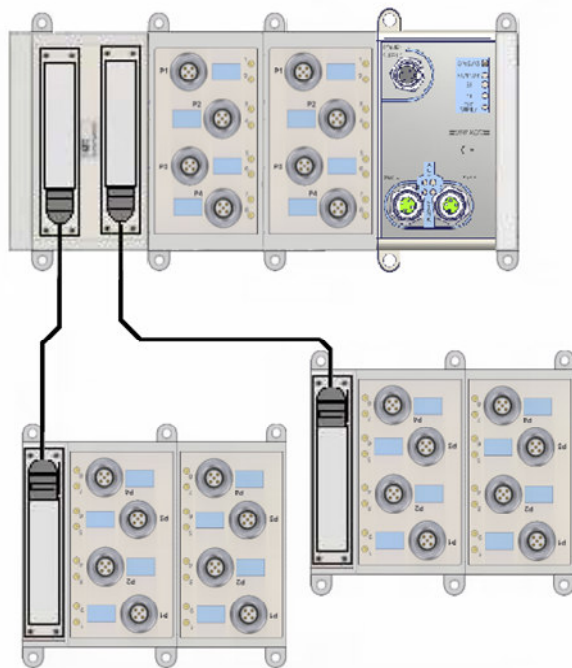


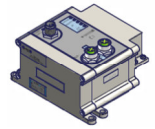
Module TCxPN with integrated compact manifold and expansion module to connect remote valve manifolds
 ↓



↖ Module TCxPN with integrated compact manifold and expansion module to connect remote passive modules

Module TExPN with expansion module to connect remote passive modules
 ↓





Damages due to improper use



We recommend the use of original spare parts. Every change or alteration of the product made autonomously by the user must be considered as abuse of the conditions, therefore every guarantee is void.
Follow the instructions of the manufacturer and analyse possible risks that the use of that component may cause to the system where it is installed, and foresee proper actions to guarantee the operator safety.

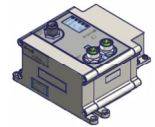
Correct or incorrect use



The slave fieldbus control unit in all models can be used only as written by the manufacturer in the operative handbook.
The safety and reliability requirements of the machine are guaranteed only by using original components and if installed by following proper instructions.

Planned service frequency

The unit has been designed and built so that no specific maintenance is required.



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