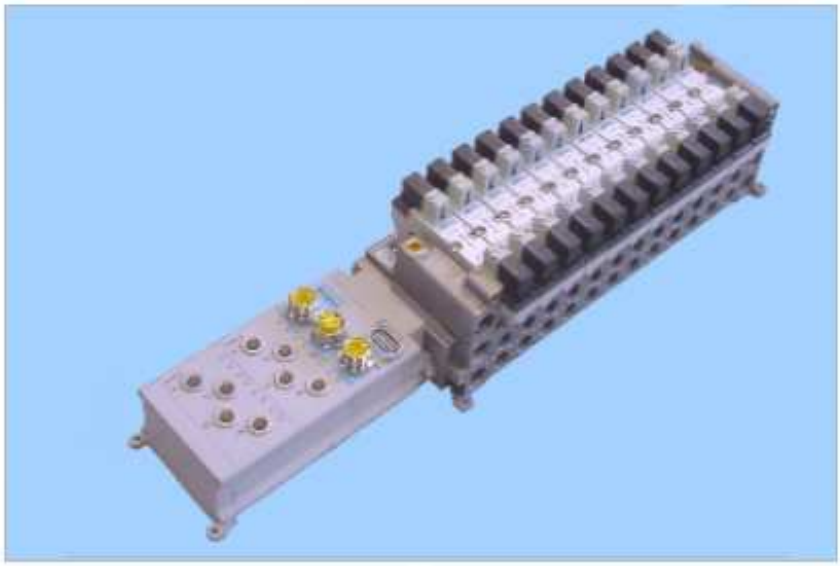


Mod.

TCxD

TCMD

TEXD

DeviceNet

FIELDBUS

MODULE

FOR

PNEUMATIC

MANIFOLD

VALVES

&

I/O SIGNAL

- ***Industry standard connection M8-M12-M23-7/8"***
- ***Integrated connection to manifold valves - ISO VDMA & Compact Series***
- ***24 coils valves capability***
- ***Auxiliary max capability of 64digital input + 64digital output***
- ***Optical & via network Diagnostic Monitor***
- ***IP 65 protection grade***

INDEX

Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded we would appreciate any information or ideas at any time.

/----------/

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally trademark or patent protected.

Important note

To ensure fast installation and start-up of the units described in this manual, we strongly recommend that the following information and explanations are carefully read and abided by.

Personnel Qualification

The use of the product detailed in this manual is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the valid standards. UNIVER S.p.A. declines all liability resulting from improper action and damage to UNIVER S.p.A. products and third party products due to non-observance of the information contained in this manual.

Intended Use

For each individual application, the components supplied are to work with a dedicated hardware and software configuration. Modifications are only permitted within the framework of the possibilities documented in the manuals.
All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of UNIVER S.p.A.
Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to UNIVER S.p.A.

Safety Notes

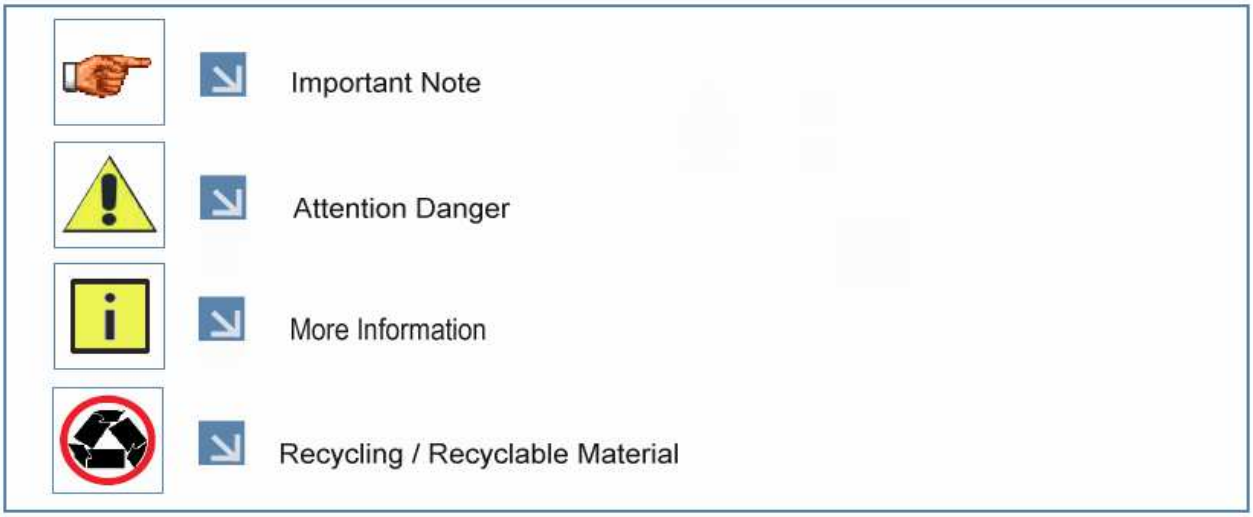
Attention
Switch off the system prior to working on bus modules!
In the event of deformed contacts, the module in question is to be replaced, as its functionality can no longer be ensured on a long-term basis.

ESD (Electrostatic Discharge)
The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, e.g. gold contacts.

Abbreviation

DI Digital Input
DO Digital Output
I/O Input/Output
ID Identifier
HW Hardware
SW Software
LSB Least Significant Digit
MSD Most Significant Digit
V+ V- Logic & Sensor power supply
VA24 Auxiliary Output power supply

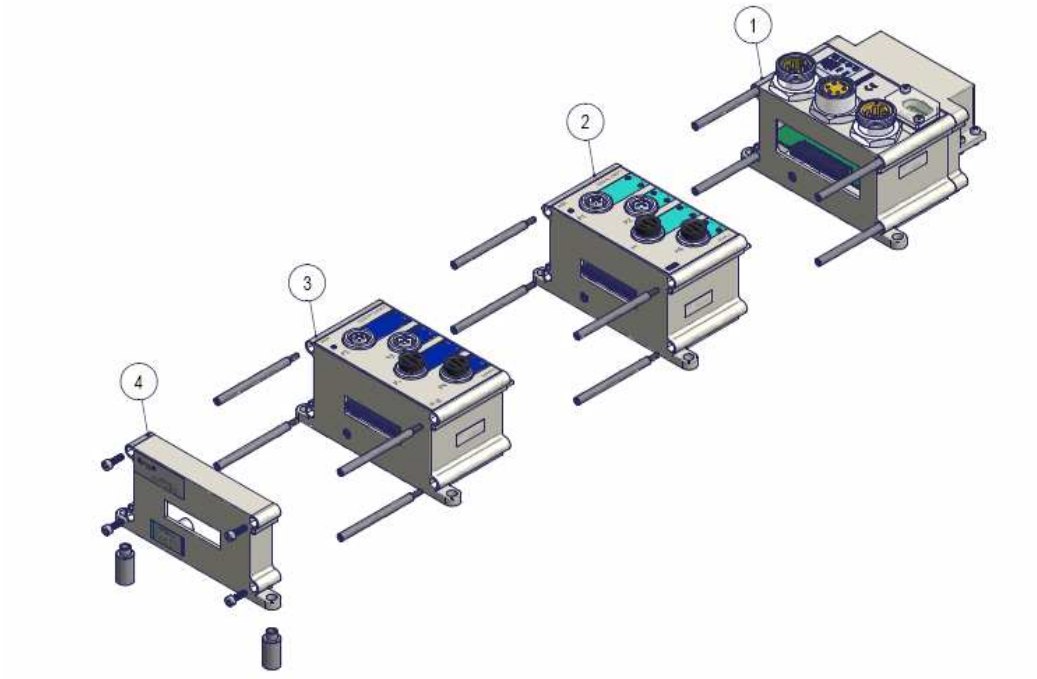
Legend of symbols



System descripiton

The TCxD is a modular fieldbus slave device for controlling manifold valve and digital input and output which use ***DeviceNet*** fieldbus.

The system structure here described consists of an MANIFOLD OUTPUT INTERFACE (1), of an FIELDBUS module (2) of an AUXILIARY DI/DO modules (3), the end module (4) completes the system.



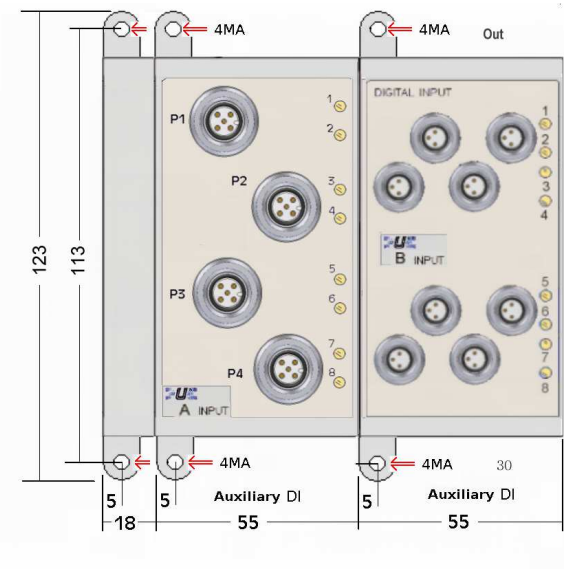
Module Specifications

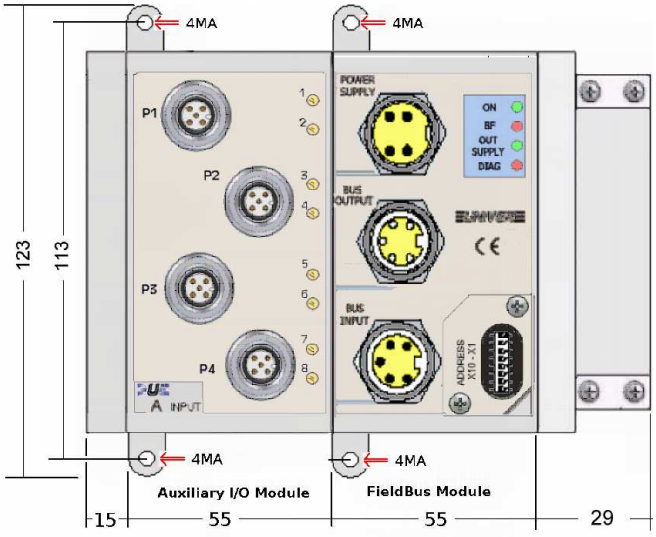
FieldBus Data		
Bus Input Connector	*Circular 7/8 Male 5 pins or M23 17 pins Male*	
Bus Output Connector	*Circular 7/8 Female 5 pins or M23 17 pins Female*	
Bus Function Displays	*Module NETWORK Status_red-green*	
Auxiliary Function display	*Logic Supply_green, Output Supply_green, Diag_red*	
Address Slave	*Switchable 00 to...63*	
Communication Rate - AutoBode mode	*125K,250,500KBaude*	
FieldBus Connection Mode	*Group 2 only-Polled-COS*	
EDS Filename	TCxDxxxxxxEDS	
Electrical Data		
Auxiliary output Supply connector	*Circular 7/8 Male 4 pins(1-VA24,4-OVA) or inside M23 17 pins Male*	
Logic - Digital Input Voltage Supply V+/V-	*24 Vdc +/- 20%*	
Logic Nominal Current	*100mA*	
Digital Inputs max Current	*1,5A @ 20°C - overload protected (20mA per input)*	
Output voltage Supply VA24	*24 Vdc -10+15% (valves coil range)*	
Output Current VA24 (all output)	*2,5A max - overload protected*	
Output Manifold Valves Capability	*24 coil max - (12 bistable valves - 1,5A per 12 coils)*	
Auxiliary Digital Output Capability	*max 40 digital output*	
Auxiliary Digital Input Capability	*max 64 digital input*	
Environmental Conditions		
weight	*370g*	
Dimentions	*85 x 123 x 75 mm*	
MTBF - Mean Time Between Failures	*197.359 Hours*	*50°C*
Protection Degree	*IP 65*	*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*
Vibration	*5g tested 10-500Hz*	*IEC 60068-2-6*
Shock operating	*22g peak*	*IEC 60068-2-27*

Module installation

Before installing the module, verify that all its parts are intact and have not been damaged during transport, pay attention to the overall dimentions.

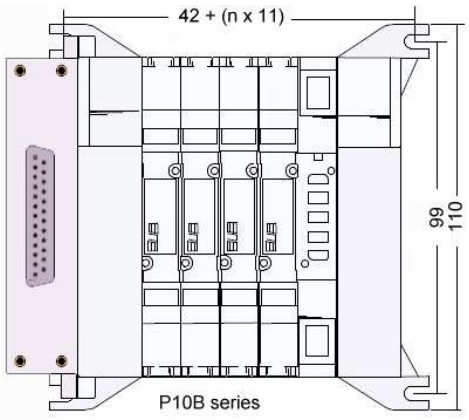
We do recommend to fix the device in the specified hole with M4 screws on a single metal surface to grant a good ground connection

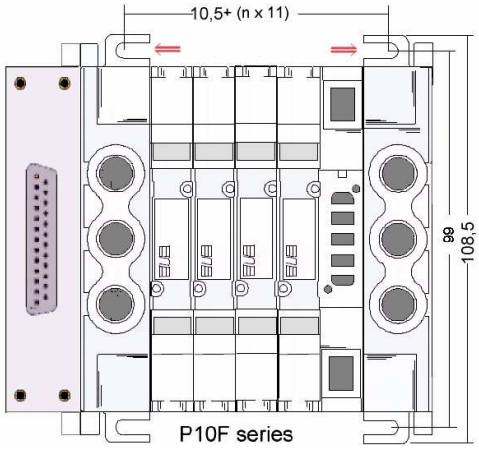




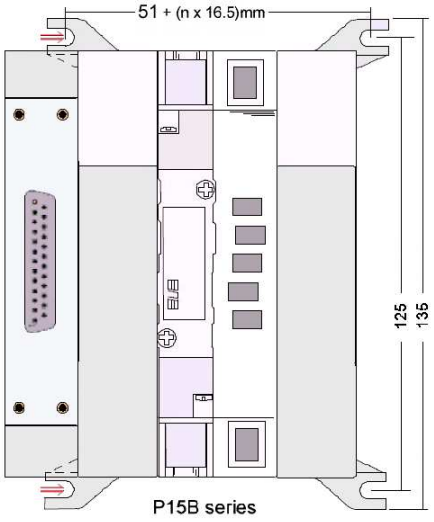
The overall length changes according to the numbers of the auxiliary I/O modules used and manifold valves type.

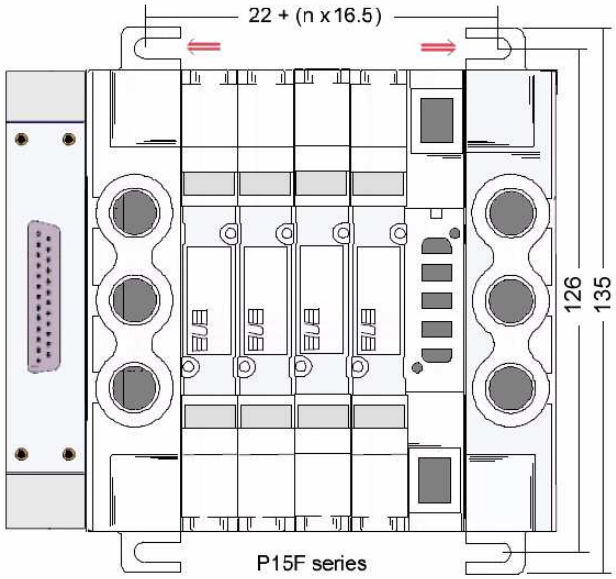
P10 Compact manifold dimentions



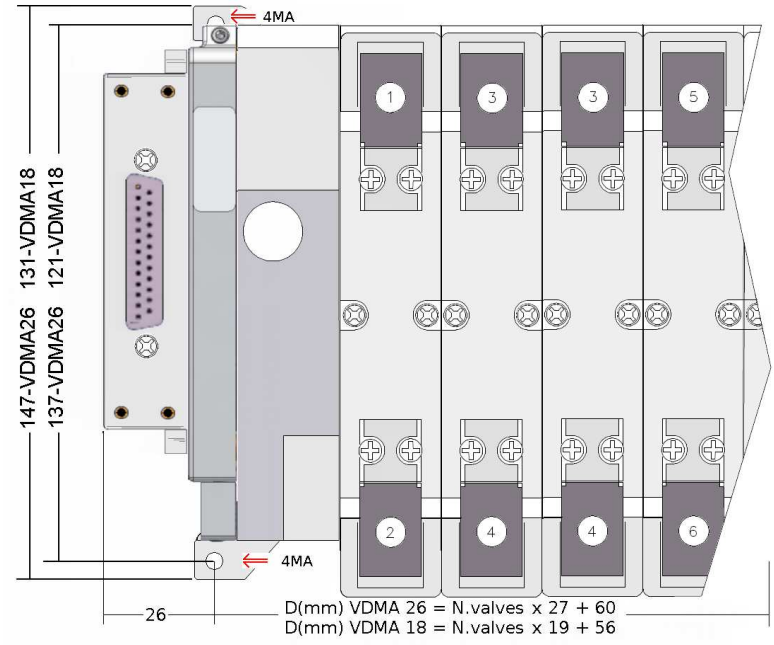


15 Compact manifold dimentions





ISO VDMA manifold dimentions

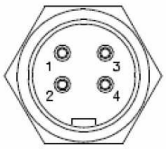


EDS file specification

EDS is an abbreviation of Electronic Data Sheet. EDS file on disk contains configuration data for specific device types, information about configurable attributes for a device, including object addresses of each parameter and provide for an open configuration tool while reading the device information and recognizing the device characteristics.

Connectors pin assignement

Mod.
TCXD
TEXD

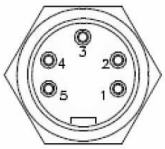


Aux Supply (MALE)
7/8 " 4 pins
view front connector

Pin	Function
1	VA24 AUX OUT Supply
2	/
3	/
4	0VA AUX Com Supply

DeviceNet

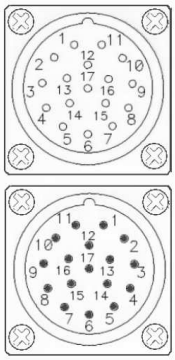
NET OUT (FEMALE)
7/8 " 5 pins
view front connector



NET IN (MALE)
7/8 " 5 pins
view front connector

Pin	NET INP - OUT
1	Drain
2	V+
3	V-
4	CAN_High
5	CAN_Low

Mod.
TCMD



17pins M23

Bus OUT (FEMALE)
Looking into socket

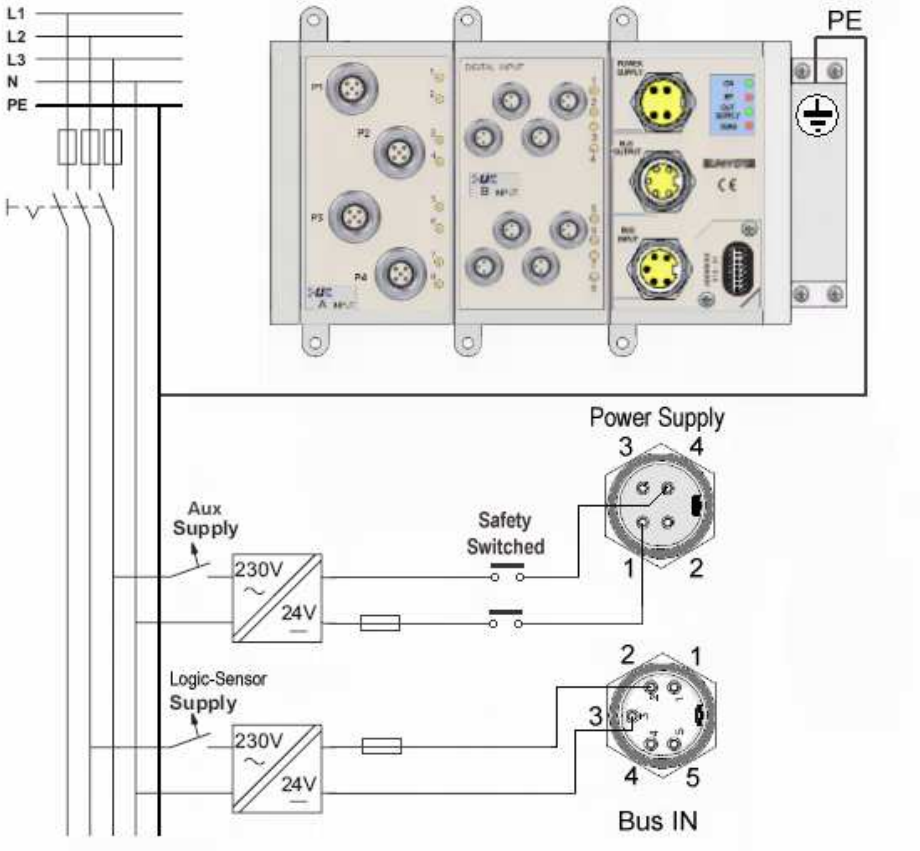
Bus IN (MALE)
Looking into pins

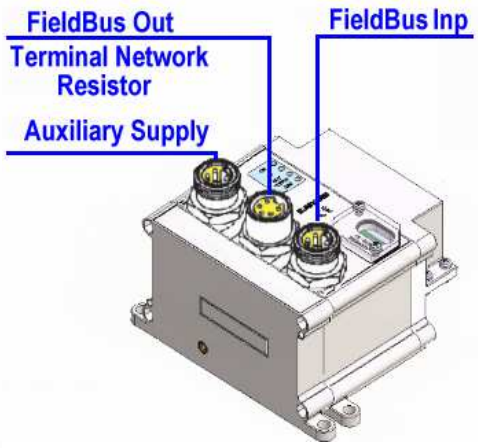
Pin	Function
1	V -
2	0VA
3	VA24
4	V +
5	PE
13	CAN_High
14	CAN_Low
15	Reserved
16	Reserved
	Case Connector PE

System supply connection

Connect the module to the appropriate DeviceNet network cable

The PE connection has to be connected externally to the ground





The fieldbus module requires a dual power supply:

V+/V- for the Logic & Sensor supply

VA24 (24Vdc -10%+15%) for output and manifold valves.

Supply Example

Network configuration

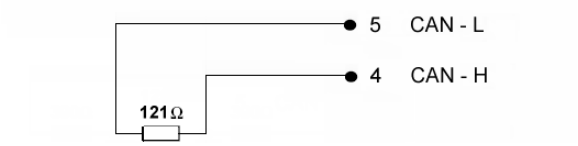
DeviceNet specifications defines for a maximum network distances the main trunk line and drop lines. Maximum distances depend on the baud rate used on the network:

Baud Rate	Trunk Line Length		Drop Length			
	Maximum Distance		Maximum		Cumulative	
	Meters	Feet	Meters	Feet	Meters	Feet
125k baud	5OO m	164O ft	6 m	2O ft	156 m	512 ft.
25Ok baud	25O m	82O ft	6 m	2O ft	78 m	256 ft.
5OOk baud	1OO m	328 ft	6 m	2O ft	39 m	128 ft.

Terminal network resistor

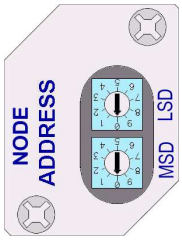
A DeviceNet must be terminated at each end of the trunk line. The host controller and the last slave on the network must always be terminated to eliminate reflections, even if only two nodes are present.
The DeviceNet specifications for the terminating resistor are:

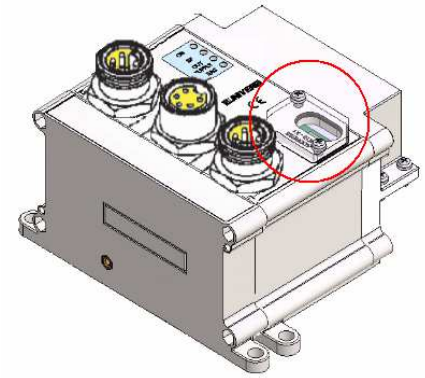
- 121 ohm
- 1% metal film
- ¼ Watt



How to Set the Module Address

Max Valid Node Address are **01** to **63**
Each module is delivered set for node address **63**
The Dip or Rotary switches, are located on the top panel.





Rotary Switch	MSD	LSD
Node Address	X10 ***M**ost **S**ignificant **D**igit*	X1 ***L**east **S**ignificant **D**igit*
Max add.	**6**	**3**

To set the address, remove the cover, tourn rotary switch to the desired address, tourn OFF the device and then tourn ON again(The address is read only at power up)
Remember to close the cover cap again to guarantee the protection degree

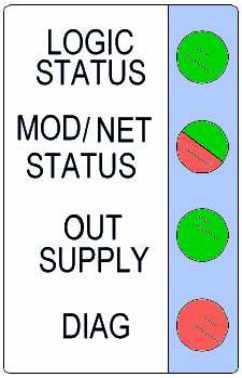
AutoBode function mode (from 5.4 version and grater)

The device scans the network connection speed as you firstly supply it.

The autobaude detection function is operative if you connect the device in a previously configured and running network.

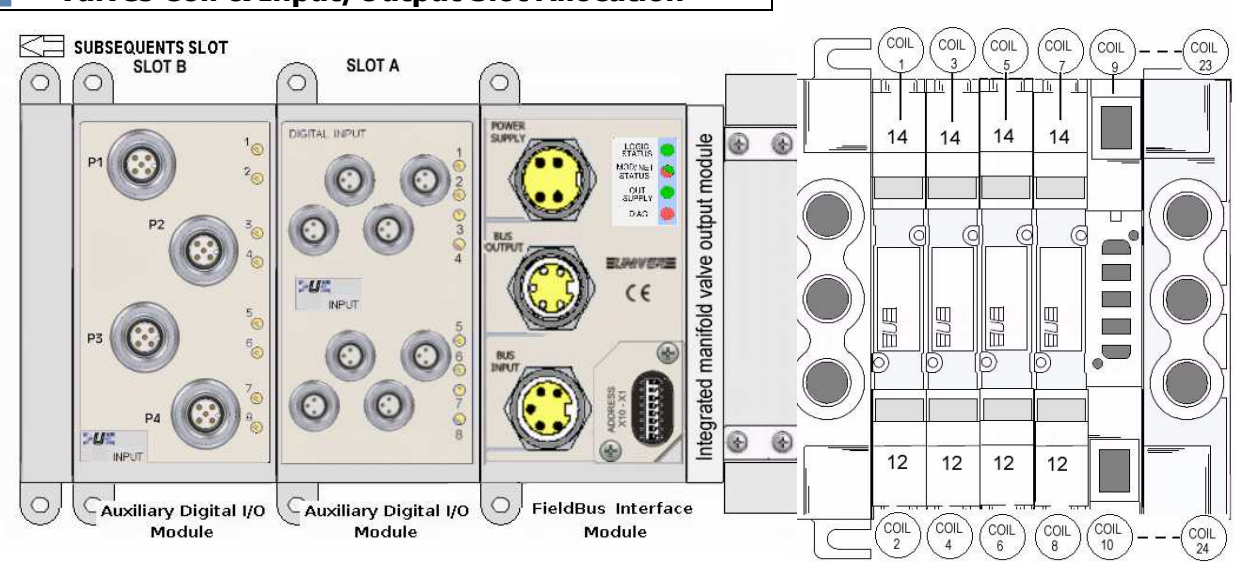
To change the operation speed it is necessary to set the master Offline, to edit the new baudrate, to turn off wait a few second and turn on the Slave.

Module Diagnostic and Status indicators



Des.	Colour	Meaning
LOGIC STATUS	Green LED	System ready
	ON:	Node power ON
	OFF:	Node off-line or not powered
MOD/NET STATUS	Green LED	Net Status
	ON:	On line connected
	OFF:	Not On line
	FLASH:	On line Not connected
	Red LED	Fault Status
	ON:	Unrecoverable fault
	FLASH:	Recoverable fault
OUT SUPPLY	Green LED	Actuator Supply
	ON:	Actuator Supply present
	OFF:	Actuator Supply missing
DIAG	Red LED	Diagnostic
	OFF:	No error
	FLASH:1	Actuator supply missing
	FLASH:2	Output overload
	FLASH:3	High noise level
	FLASH:4	Auxiliary Modules Fail
	FLASH:5	No I/O module detected
	FLASH:6	Reserved
	FLASH:7	Reserved
	FLASH:8	Reserved
	FLASH:9	Auxiliary inputs module supply missing
	FLASH:10	Reserved
	FLASH:11	More modules than those supported

Valves Coil & Input/Output Slot Allocation



The physical position of the I/O expansion modules establishes the increment of the Data-Byte allocation according to a sequence which evolves increasingly from the FieldBus module to the left.

Output manifold valves consumes-data definition

		Coil	Byte-Bit Consumes	Coil	Byte-Bit Consumes	Coil	Byte-Bit Consumes
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

The digital output manifold valves use always 24 Bit(3 Byte).

Auxiliary Digital OUTPUT consumes-data definition.

		Byte-Bit Consumes				
Module Slot		A	B	C	D	E
Port-Pin Function	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 maximum auxiliary digital output configurable are 40 Bit(5 Byte).

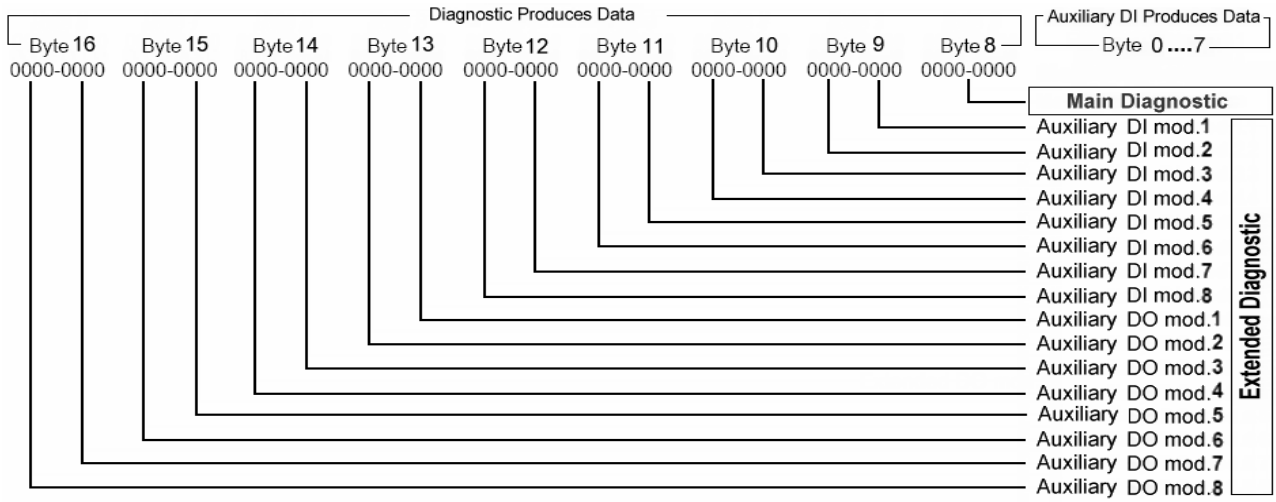
Auxiliary Digital INPUT produces-data definition

		Byte-Bit Produces						
Module Slot		A	B	C	D	E	G	H
Port-Pin Function	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 maximum auxiliary digital input configurable are 64 Bit(8 Byte).

Diagnostic definition and configuration

Is possible to setting diagnostic function in two different mode: **MAIN** and **EXTENDED**.
The default setting of device diagnostic mode is **"MAIN"**.
For change the diagnostic mode in **"EXTENDED",** set address to **99**, turn off the device, wait a few second and turn on the device, set the real address network and turn off the device, wait a few second and turn on the device.
To return in the **"MAIN"** mode repeat the operation using the address **88.**
Important: The diagnostic Data Bytes is available as Produces Data Byte **subsequent** to the Auxiliary Digital Inputs Produces Data Byte.



The **MAIN diagnostic** mode produce one(1) Byte which summarizes all the system errors.

MAIN DIAGNOSTIC BITS FUNCTION		
Bit	***Name***	***Description***
0	VA24 Aux power loss	This Bit becomes active when the VA24 is no power supply (Power Supply connector). In this condition the coils of the valves are not supplied to even if the logic command is ON.
1	Module fail	This Bit becomes active when the module is in fault condition (replace the module)
2	Output fail	This Bit becomes active, when one or more outputs are overloaded or in short circuit condition for the auxiliary output module or for the manifold outputs, for device manufactured from Jenuary 2011 (see note **(1)**). Not supported on TB3D and TB4D module.
3	High noise level	This Bit becomes active, when internal bus communication errors are detected, caused by an high level of noise coupling the cables connected to the module
4	Input power supply loss	This Bit becomes active when an overload or short circuit is present in one or more input module connectors
5-6	Reserved	
7	Module info Monitor	This Bit becomes active, when module extended diagnostic are present

(1) If the error is generated from the onboard manifold it is possible to reset the error by switching OFF all the 24 manifold outputs, wait 1 second, and then apply the right outputs states again. In case of short circuit or over load all the 24 manifold outputs are switched OFF.

The **EXTENDED diagnostic** mode produce eight (8) Byte in which they come defined the diagnostic functions of the single auxiliary modules.

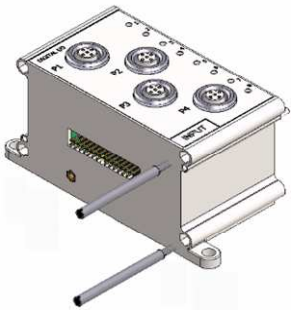
EXTENDED DIAGNOSTIC NIBBLE FUNCTION	
Bin.Code	***Description***
0000	This Value indicate no error present
0001	This Value indicate VA24 voltage missing, only auxiliary output module **(2)**
0010	This Value indicate one or more outputs in overloaded or in short circuit condition **(2)**
0011	This Value indicate detection of internal bus communication errors, caused by an high level of noise coupling the cables connected to the module
0100	This Value indicate module fail
0101	This Value indicate overload or short circuit is present in one or more input module connectors

Code value from **0110** to **1111** are not assigned

(2) Output module only.

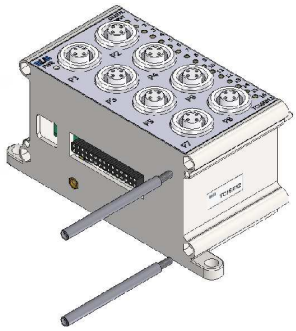
Auxiliary Digital I/O modules connection

COD.**TC8I412**
N.8 Digital Input - M12
COD.**TC16I812**
N.16 Digital Input - M12
COD.**TC8U412**
N.8 Digital Output - M12

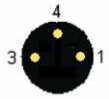


Input M12 (Female)
Output M12 (Female)
Looking into sockets

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

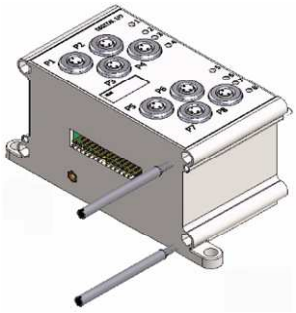


COD.**TC8I808**
N.8 Digital Input - M8

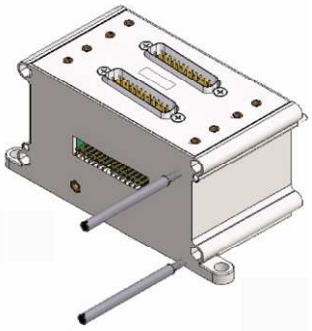


Input M8 (Female)
Looking into sockets

Pin	TC8I808
1	VLS24
3	0VLS
4	Input



P1-P2 Pin No.	Part Number TCR32ID	Part Number 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	0V Input	-
21/22	+24V Input	-
23/24	-	0VA
25	-	-
Case	Cable Shield	Cable Shield



COD. **TCR32UD**
16+16 Digital Output
Remote module

COD. **TCR32ID**
16+16 Digital Input
Remote module

COD. **TCR1616**
16Digital Input
16Digital Output
Remote module

Auxiliary Digital I/O modules specifications

Input Module Specification				
Part Code	**TC8I412**	**TC16I812**	**TC8I808**	**TCR32ID**
Termination type	*Circularr 4 x M12*	*Circularr 8 x M12*	*Circular 8 x M8*	*Sub D 2 x 25pins*
Input per Module	*8*	*16*	*8*	*16+16*
Switching Logic	*2 or 3 wire PNP devices*			
*Operating Voltage Supply **VS24***	*24V dc+/- 15%*			
Sensor Source Current per input max	*20mA*			
Signal logic "OFF"	*0V dc to 5V dc*			
Signal logic"ON"	*10Vdc to 30V dc*			
Typical input Current ON state max	*5mA*			
Status Display	*Valid Input - green indicator ON*			

Output Module Specification		
Part Code	**TC8U412**	**TCR32UD**
Termination type	*Circular 4 x M12 size*	*Sub D 2 x 25pins*
Output per module	*8*	*16+16*
Switching Logic	*Sourcing Output*	
*Output Voltage Supply **VA24***	*24 V dc -10% + 15% (valves coil range)*	
ON state Current per Output	*0.3A*	
ON state Surge Current per Output 10mS	*1.0A*	
Overload protected per Output	*1.2°*	
Module Current rating max	*1.5A* **(1)**	
Status Display	*Energized Output - yellow indicator ON*	

Environmental Conditions		
Weight	*170g-300g*	
Overall Dimentions	*55 x 123 x 75 mm*	
MTBF - Mean Time Between Failures	*(under testing)*	*50°C*
Protection Degree	*IP 65*	*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*
Vibration	*5g tested 10-500Hz*	*IEC 60068-2-6*
Shock operating	*22g peak*	*IEC 60068-2-27*

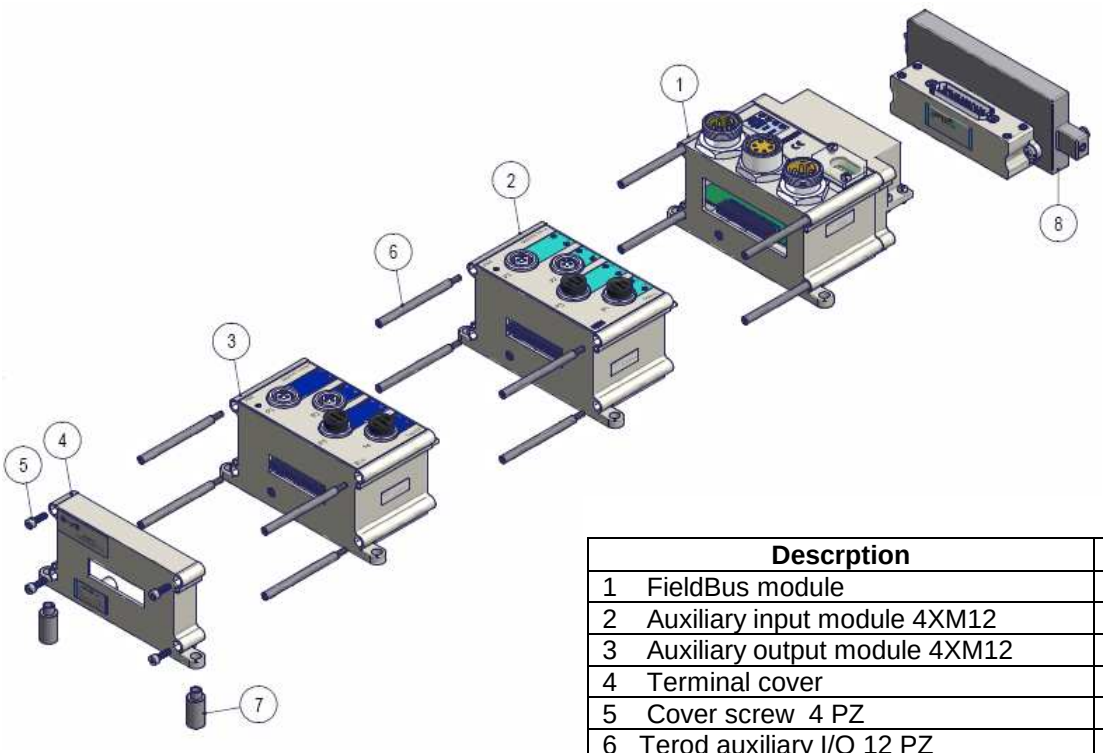
Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP65 requirements. I/O cable length should be less than 10 meters

(1) The max current available for all output modules included into the system is 2.5Amax.

Identification Label

Modules Assembly System

The auxiliary inputs and outputs modules will be connected to FieldBus module on the opposite side of the manifold valves.



	Descrption	Part code
1	FieldBus module	TCxD
2	Auxiliary input module 4XM12	TC8I412
3	Auxiliary output module 4XM12	TC8U412
4	Terminal cover	included
5	Cover screw 4 PZ	included
6	Terod auxiliary I/O 12 PZ	included
7	Assembly support I/O 4PZ	included
8	Manifold multi way sub D25 pins adpt	included

FieldBus Accessories ordering code

	Code	Description	Size	Protection Degree
	TZ-M578T	DeviceNet (5-pins, male) Network termination (120ohm)	7/8	IP65
	TZ-F578	DeviceNet (5-pins, female)	7/8	IP65
	TZ-M578	DeviceNet (5-pins, male)	7/8	IP65
	TZ-M578T	DeviceNet (5-pins, male) Network termination (120ohm)	7/8	IP65

Additional accessories for connecting can be found on www.univer-group.com webside

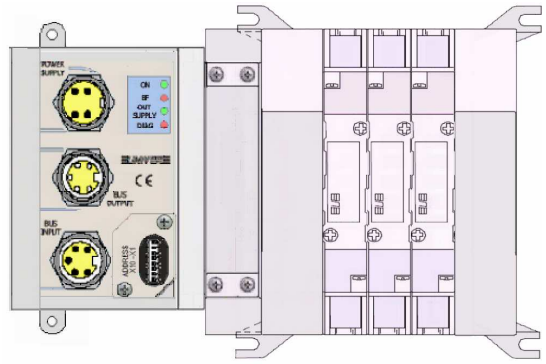
Conformity Declaration

Univer S.p.A. declares under the own responsibility that the Device in object is in compliance with the EMC directive 2004/108/EC, with amendaments for 92/31/EEC and 93/68/EEC through conformance with the following Harmonised European standards:

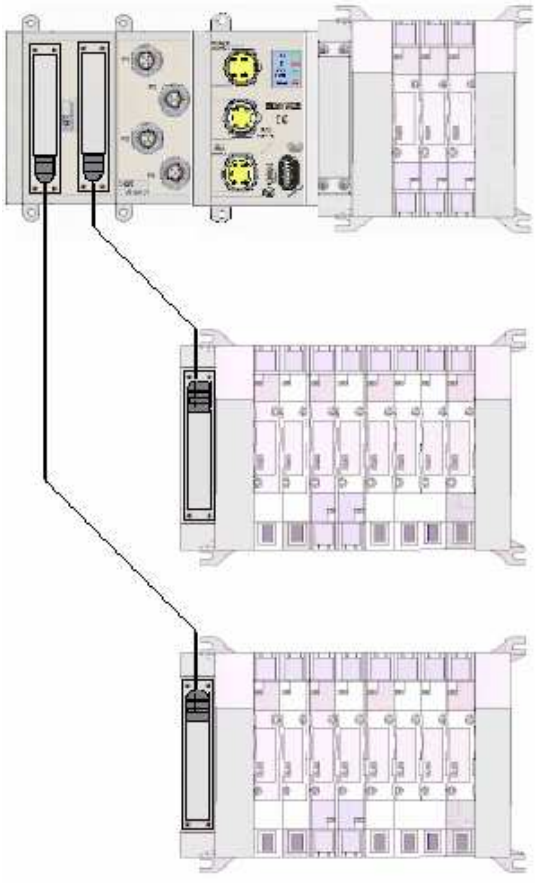
Date:	22 of February, 2007	**Harmonised European standards:**
Device:	Multi I/O Manifold Valves Control	EN 61000-4-3 (1996) EN 61000-4-6 (1996) EN 61000-4-2 (1996) EN 61000-4-4 (1996) EN 61000-4-5 (1995) EN 61000-4-6 (1996) EN 61000-4-8 EN 61000-4-11 EN 61000-6-2 (1995) EN 61000-6-4 (1993)
Term:	TCxD	
Manufacturer:	Univer S.p.A. Via Eraclito, 31 20128 Milano ITALY tel. +39 02252981 fax. +39 0225298310	
CE		

R&D Manager signature: _____

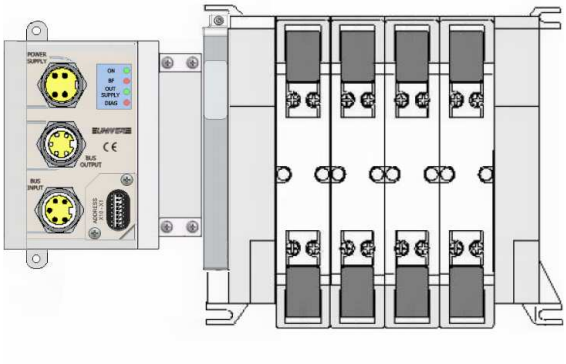
System configuration examples



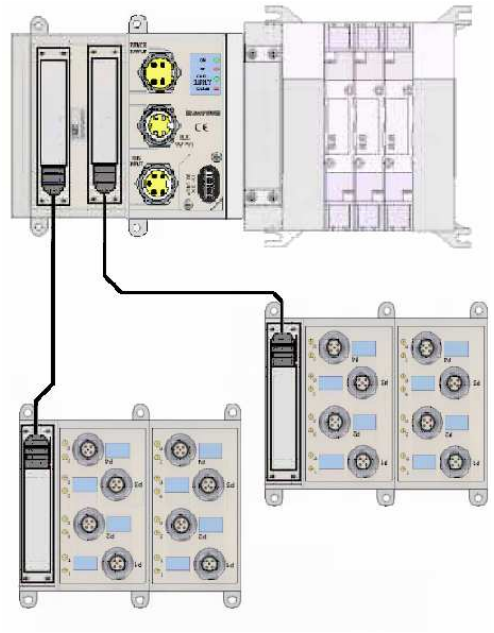
TCxx fieldbus device with
integrated COMPACT MANIFOLD



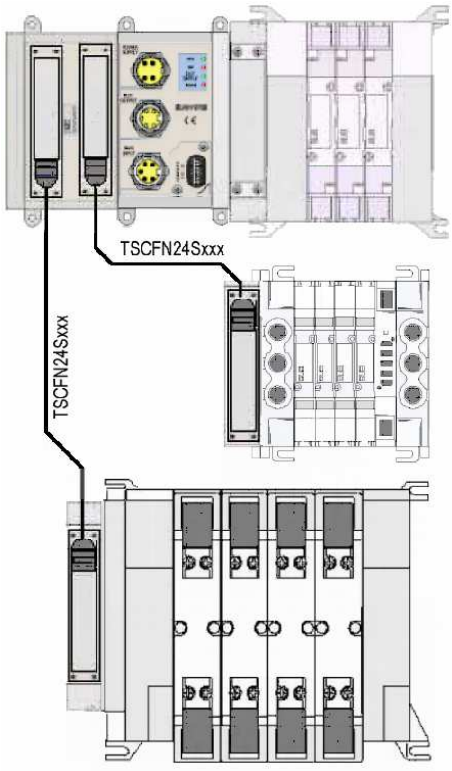
TCxx fieldbus device with
integrated COMPACT MANIFOLD
and remote expantion module
for distribuited manifolds connection



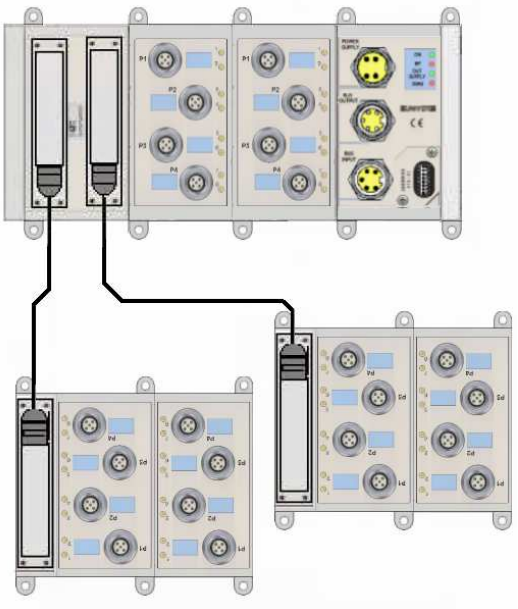
TCxx fieldbus device with
integrated ISO VDMA MANIFOLD



TCxx fieldbus device with
integrated COMPACT MANIFOLD
and remote expantion module
for distribuited manifolds connection



TCxx fieldbus device with
integrated COMPACT MANIFOLD
and remote expantion module
for passive MULTIBOX modules



TExx fieldbus device with
remote expantion module
for passive MULTIBOX modules

Dangers and residual risks

There aren't residual risks that may cause damage to the health of the person exposed. In case of maintenance, the operator is alerted by a visual sign placed near the high-risky areas, where there could be voltage dangers.

Dangers caused by Improper use

It is recommended to use only original spare parts. They are to be considered including the "misuse conditions " of any modifications or changes of any kind, that the user arbitrarily.

Correct and incorrect Use

The FieldBus Slave control unit, in all its models can be used only as reported on the operative manual manufacturer. The requirements of security and reliability of the unit are guaranteed only by using original components.

Frequency of programmed maintenance

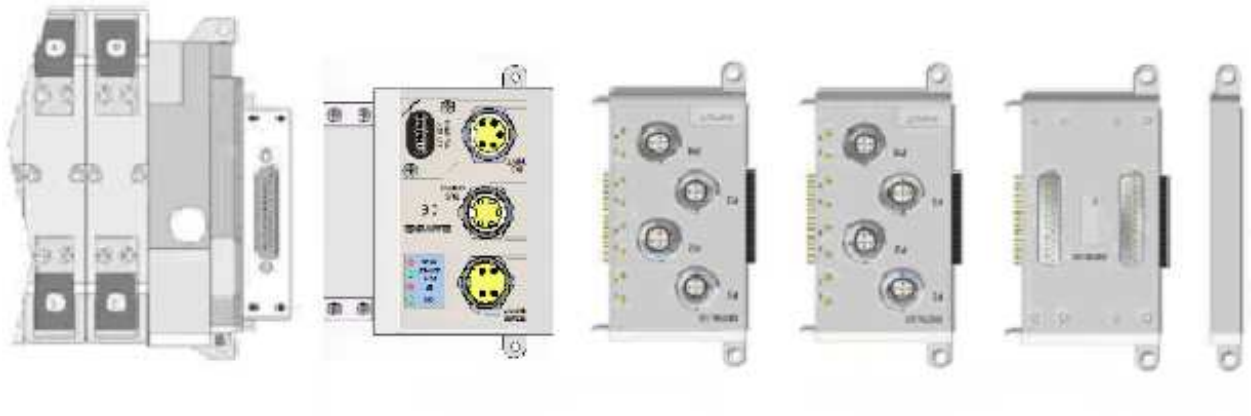
The unit was designed and built so as not to require a specific scheduled maintenance.

Instructions regarding removal / elimination of waste materials

If you wont to disassemble the unit is necessary to observe some basic rules to safeguard the health and the environment.

Cables, liners and plastic components, must be disposed separately from all other materials
The metal parts must be grouped by type of material.

Ordering string of fieldbus modules



TC	x	EN	08	S	08	

SERIES	
TC	Manifold plugin & I/O module
TE	I/O module

SIZE	
x	Standard M12 connection
M	Multibus M23 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	EthernetCAT	64+88 I/O

AUXILIARY DIGITAL INPUT	
	If no other module present (Leave Blank)
N° 00-08-16-24-32-40-48-56-64	

DIGITAL INPUT CONNECTOR SIZE	
	If no other module present (Leave Blank)
S	M12 Standard digital input (4x2)
H	M12 High-Density digital input (TC16I812 8x2)
8	M08 digital input (8x1)
0	If only remote module present

AUXILIARY DIGITAL OUTPUT	
	If no other module present (Leave Blank)
N° 00-08-16-24-32-40-48-56-64	

DIGITAL I/O REMOTE MODULE	
	If no remote module present (Leave Blank)
32IN	One TCR32ID module 16+16 digital input
64IN	Two TCR32ID module 16+16 digital input
32UD	One TCR32UD module 16+16 digital output
64UD	Two TCR32UD module 16+16 digital output
1616	One TCR1616 module 16 digital input + 16 digital output
3232	One TCR32ID module 16+16 digital input + One TCR32UD module 16+16 digital output
6464	Two TCR32ID module 16+16 digital input + Two TCR32UD module 16+16 digital output

(1) **Only for Devicenet and Profibus**