OVARRO
CONNECTING TECHNOLOGIES

TBOX MS-COMBO

Version 3.07

TBOX
AN OVARRO TECHNOLOGY

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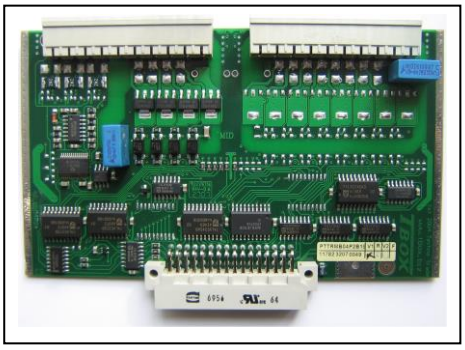
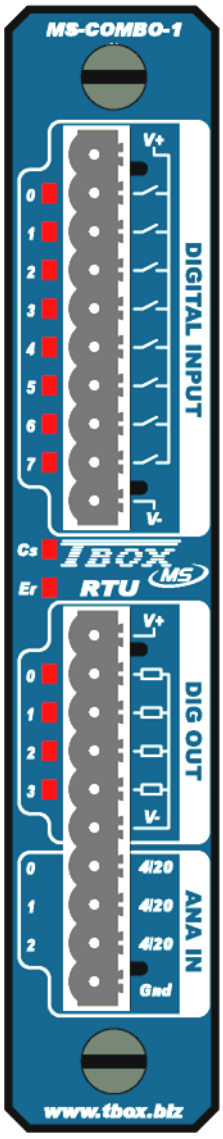


- 1 group isolated of 8 x Digital Inputs
- 1 group isolated of 4 x Digital Outputs
- 1 group non isolated of 3 x Analog Inputs (4..20mA)

Technical Specifications



General

Quantity	8 x DI ; 4 x DO ; 3 x AI
Consumption	40 mA
Replacement	**Hot insertable/removable.** There is no risk to damage hardware, but a reset is required.
Test	Automatic test of the access of the card by the CPU (see LED 'CS' below)
Connector	Screw connector (10x5.08mm) Wire range: 0.14 – 2.5 mm² (or max. 12 AWG)

LED

Individual	LED corresponding to the activation of each digital output. By software, possibility to disable the LED to save energy
Cs	**Card Selection:** card corresponding to card declared in TWinSoft.
ER	**Error:** card type not corresponding to the one declared in TWinSoft.

Isolation

2 groups isolated	group of 8 digital inputs and group of 4 digital outputs isolated
Level of isolation	1500 Vrms - between groups - between group and ground - between group and earth
1 group not isolated	group of 3 analog inputs not isolated

Environment

Temperature storage	-40°C to 85°C
Temperature working (ambient)	**Industrial Temperature:** -40°C to 70°C
Humidity	15 to 95 % without condensation
Altitude	Max. 5000 m

Dimensions

Without connector	Height x Depth x Width: **150** x **83** x **29 mm** (5.906 x 3.27 x 1.142 inches)
Weight	258 g

I/O Specifications

Digital Inputs

Voltage at input	
Typical	24 VDC
Maximum for a LOW level	5 VDC
Minimum for a HIGH level	11 VDC
Maximum	60 VDC
Compatibility	with type 1 and 2 of **IEC61131-2**
Current	
Maximum at the input	2.0 mA at 30 VDC 4.5 mA at 60 VDC
Resistance	12 kΩ
Sampling	
Minimum period LOW – HIGH	Task switching between process cycle has to be taken into account, as well as cycle time itself: MS-CPU16: 10 ms. + cycle time. MS-CPU32: 4 ms. + cycle time.
Protection	
RC filter	1592 Hz
Voltage inversion	Up to 55 VDC

Digital Outputs

Voltage / Current	
Working voltage on V+	12 to 60 VDC
Current per output	Maximum: 200 mA
Voltage per output	Maximum: 60 VDC (depending on V+)
Short-Circuit current	Minimum: 0.2 A Typical: 0.9A Maximum: 1.2A
Impedance	Typical: 1 ohm Maximum: 10 ohms
Protection	
Protection diode	Protection against inverted voltage when working with inductive load **WARNING: when the output is connected to a DC relay driving an AC relay, the AC relay must be protected with a RC circuit**
Over load	Maximum: 60 VDC
Reverse voltage	Maximum: 55 VDC
Short-Circuit + Over load	Thermal protection with automatic recovery

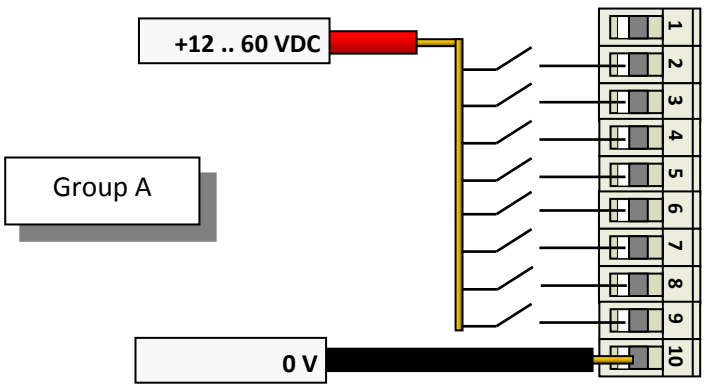
Analog Inputs

General	
Model	4..20mA; passive. Input stage powered internally.
Mode 4..20mA	
Resolution	14 Bits 2.935 µA
Accuracy @ 25°C	+/- 0.22 % FS
Impedance	Typical: 23.9 Ω
Max. measured current	24 mA
Digital Input	
Validity input (DI)	Returns '0' when signal < 2.4mA and > 21.6 mA Returns '1' when the 4..20mA signal is valid
Protection	
Protection diode	Protection against inverted voltage when working with inductive load **WARNING: when the output is connected to a DC relay driving an AC relay, the AC relay must be protected with a RC circuit**
Over load	Maximum: 60 VDC
Reverse voltage	Maximum: 55 VDC
Short-Circuit + Over load	Thermal protection with automatic recovery
Cabling	
Twisted pair	Maximum: 50 m
Approvals	
	CE, UL, CSA, C-Tick

Cabling

Digital Input Cabling

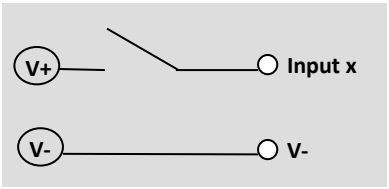
Connector: Screw connector



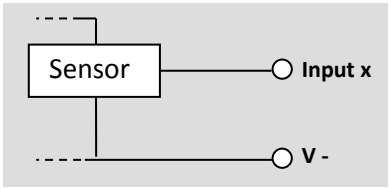
Pin Out:

1	NC
2	Input 0
3	Input 1
4	Input 2
5	Input 3
6	Input 4
7	Input 5
8	Input 6
9	Input 7
10	V-

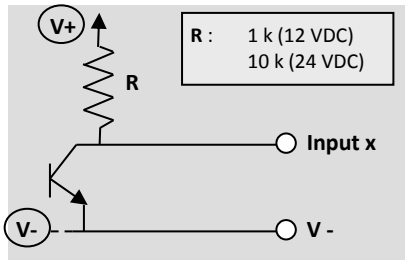
Cabling to Dry Contact



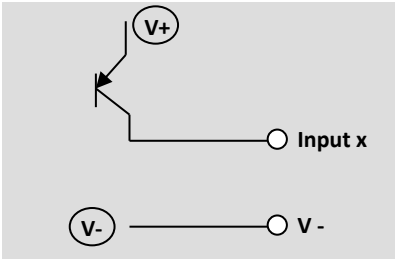
Cabling to voltage sensor



Cabling to NPN transistor

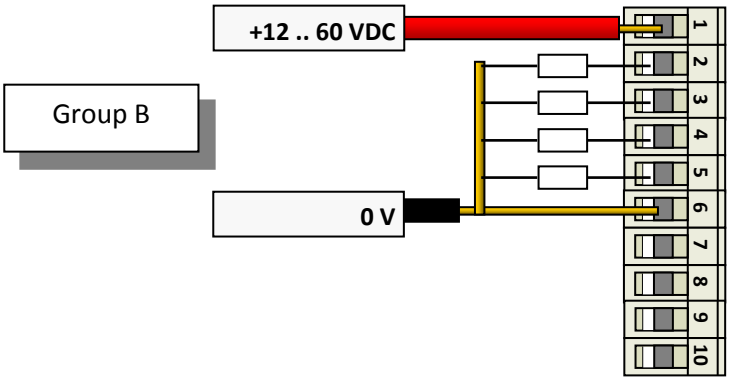


Cabling to PNP transistor (or OPTO)



Digital Outputs Cabling

Connector: **Screw connector**

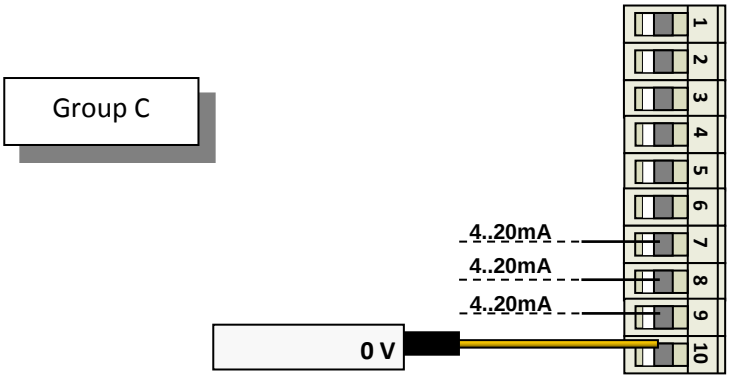


Pin Out:

1	V+
2	Output 1
3	Output 2
4	Output 3
5	Output 4
6	V-

Analog Input Cabling

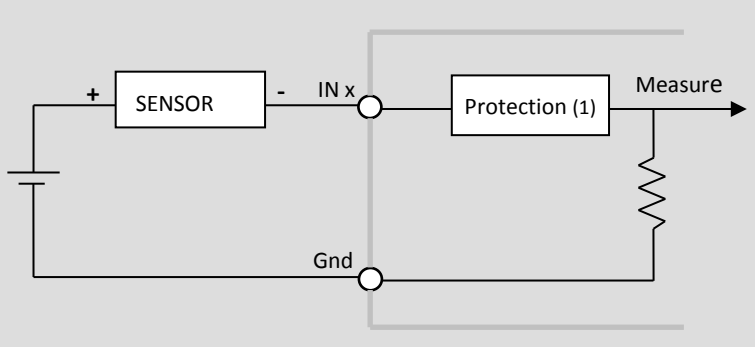
Connector: Screw connector



Pin Out:

7	Input 0
8	Input 1
9	Input 3
10	Gnd

Cabling to 2 Wires sensor (current/voltage)



Cabling to 4 Wires sensor (current/voltage)