USER'S MANUAL for TPAC1008 02 series HMI with PLC

ME7030_16
02/23

INDEX

1. Introduction

To grant a fast setup of the device please follow carefully the information in this manual.

1.1. Staff skill

Products described in this manual are devoted to PLC programmers or automation experts only. MECT S.r.l. declines any responsibility about malfunctioning or damage caused by incorrect use of MECT devices, due to noncompliance to this manual information. MECT S.r.l has an help desk.

1.2. Symbols

Danger
Follow this advice to avoid people injury.

Warning
Follow this advice to protect the device.

Caution
Follow this advice to have a more effective performance.

ESD (Electrostatic discharge)
Danger: possibly damage due to Electrostatic discharge.

Note
Step to follow for a correct installation

i Additional information

1.3. Terms

PLC:	TPAC1008 02
Terminals:	MPNC006; MPNC020; MPNC030; MPNC035
Systems:	PLC (TPAC1008 02) with terminals

1.4. Security

⚠️ **Attention**

Switch off devices before connecting them.

ESD (Electrostatic discharge)

Modules have electronic components that can be damaged by. electrostatic discharge. Be sure to be connected to ground when handle the devices.

The instrument has no power switch and no internal fuse, but it powers on immediately after connecting a correct power supply input (check the power supply value on the instrument label). Keep the power supply line as short as possible and keep it separate from other power lines.

For security reasons it is necessary to have a 2 section power switch with a fuse near the instrument and easily replaceable.

Avoid the presence of other power actuators in the same control panel, high humidity, excessive heat and corrosive gas.

Instruments must have a power supply from security transformers or SELV transformers.

1.5. REFERENCE MANUAL

The **Quick Start** (downloadable from the web site) and **MectSuite Tutorial** are the reference manuals for MectSuite to develop HMI and PLC applications.
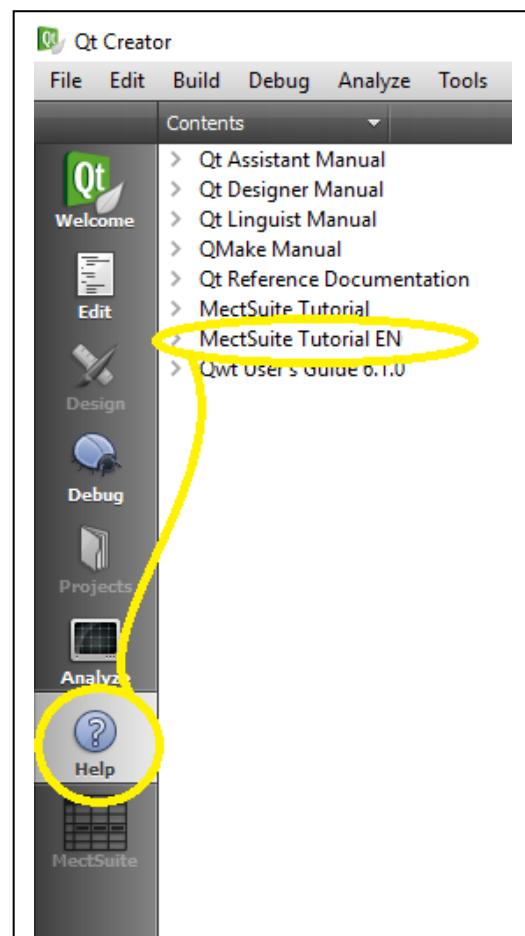
2. System description

TPAC1008 02 is a device composed by a PLC and a HMI with touch-screen monitor 7" width and 800 x 480 pixel resolution with 262.000 colors. TPAC1008 02 has digital and analogue input output, CanOpen and Modbus fieldbus, and a 100Mbit/s Ethernet interface.

The networks are managed simultaneously by TPAC1008 02 and data from a network can be sent to another thus creating a bridge between the two networks.

On TPAC1008 02 a USB host port is present, that allows, with an adapter, the use of an USB pen drive for software updates and data log. Through a GPRS/UMTS or Wi-Fi key (optionally sold by Mect) is possible to connect the operator panel to a Wi-Fi or Mobile network. Settings under MENU → OPTIONS → NETWORK_CFG → tab "Wi-Fi" or tab "Mobile"

On TPAC1008 02 are up to 1 Kbyte of retentive variables stored on flash.

Instrument can be ordered with landscape or vertical (V option) orientation (see following figures).

Figure 1: front view TPAC1008 02 (landscape version)

Figure 2: front view TPAC1008 02 (vertical version)

2.1. *Specification*

Il TPAC1008 02 is based on a multiprocessor system. PLC and HMI are based on a 454MHz ARM9, I/O interface and acquisition is managed by a Cortex M3 processor. Two systems are on different boards and communicate via a CAN interface.

Table 1

PLC Hardware characteristics		
PLC Processor		ARM926JE 454MHz
RAM		128MB
FLASH		128MB
Non volatile variables		On FLASH memory
Real Time Clock		Yes with rechargeable battery
Screen 7"		TFT 800 x 480 pixel 262k colors
Touch screen		Resistive 4 wires
Ethernet		10Mbit/s - 100Mbit/s self recognition
USB		Host 2.0
CANOpen		1 channel
		Max Bit rate: 1Mbit/sec
		Cycle time: 10msec
Serial output		RS485 full duplex (hardware configuration)
Hardware I/O characteristics		
Processor		Cortex-M3 72MHz
PLC software characteristics		
OS		LINUX 2.35
PLC		IEC61131-3
Graphics		Based onQT library
CAN Bus		CanOpen 2.0
ModBus		Modbus RTU master
Storage memory massa		Possibility of history storage
TPAC1008_02_AA - TPAC1008_02_AB		
Digital input	8	Input Range 0 - 24Vdc +/- 15% 2 of them can be for mono/bidirectional encoder or counter and 2 capture (ms)
Digital output	12	Max output current: 200mAdc@24Vdc
Analogue input	4	PT100, TCJ, TCK,TCT, S, B, R, 0÷10Vdc, 0÷20mA
Analogue output	2	0÷10Vdc, 0÷20mA, PWM @250Hz
Power		10 W without loads
TPAC1008_02_AD		
Digital input	8	Input Range 0 - 24Vdc +/- 15% 2 of them can be for mono/bidirectional encoder or counter and 2 capture (ms)

Digital output	12	Max output current: 200mAdc@24Vdc
Analogue input	4	PT100, TCJ, TCK,TCT, S, B, R, 0÷10Vdc, 0÷20mA
Analogue output	2	0÷10Vdc, 0÷20mA, PWM @250Hz
Analogue output	2	0÷10Vdc, PWM @250Hz
Power		10 W without loads

TPAC1008_02_AE		
Digital input	8	Input Range 0 - 24Vdc +/- 15% 2 of them can be for mono/bidirectional encoder or counter and 2 capture (ms)
Digital output	12	Max output current: 200mAdc@24Vdc
Analogue input	4	PT100, TCJ, TCK,TCT, S, B, R, 0÷10Vdc, 0÷20mA
Analogue output	2	0÷10Vdc, 0÷20mA, PWM @250Hz
Analogue output	2	0÷20mA
Power		10 W without loads

TPAC1008_02_AF		
Digital input	8	Input Range 0 - 24Vdc +/- 15% 2 of them can be for mono/bidirectional encoder or counter and 2 capture (ms)
Digital output	12	Max output current: 200mAdc@24Vdc
Analogue input	4	PT100, TCJ, TCK,TCT, S, B, R, 0÷10Vdc, 0÷20mA
Analogue output	2	0÷10Vdc, 0÷20mA, PWM @250Hz
Analogue output	1	0÷20mA
Analogue output	1	0÷10Vdc, PWM @250Hz
Power		10 W without loads

Power supply	
12÷36VDC	
Power	3.5W digital output off

Electromagnetic compatibility

The electromagnetic compatibility tests have been carried out at accredited laboratories, according to EN 61326-1, EN 61131-2 and EN 61000-6-2standards.

3. Hardware installation

In the following figure there are mechanical dimensions of TPAC1008 02.

3.1.   Mechanical dimensions

Side view   Rear view
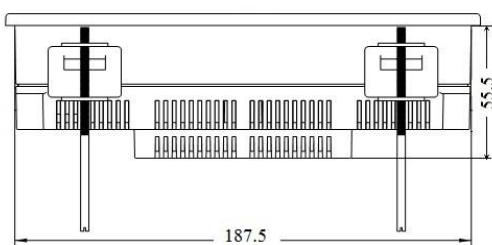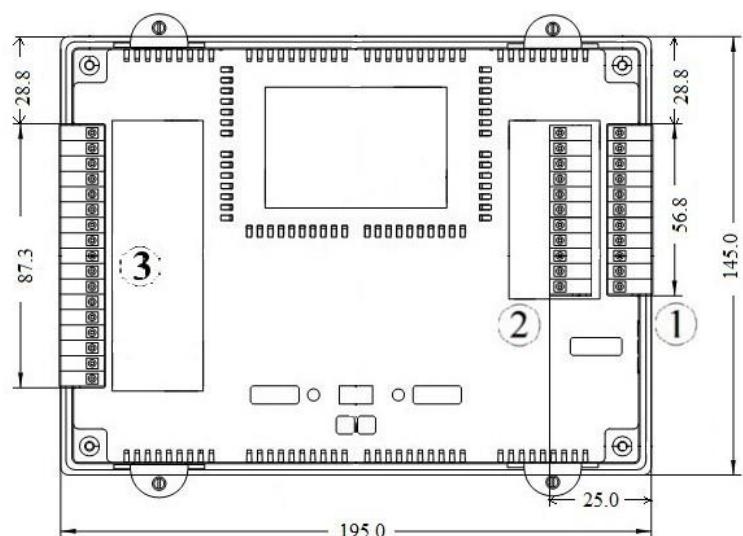
Figure 3

Figure 4

Side view
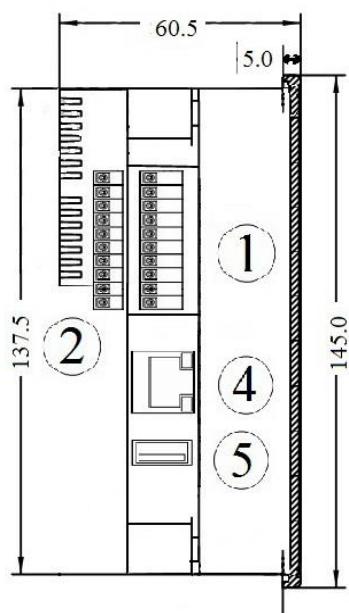
Figure 5

Table 2

MECHANICAL	
Material	Polycarbonate, Polyamide 6.6
Dimensions W x L x H	195 mm x 145 mm x 60.5 mm
Mounting plate	138mm x 188mm
Installation	Panel installation
Environmental conditions	
Operating Temperature	0 °C ... 55 °C
Storage Temperature	-20 °C ... +85 °C
Relative Humidity	5 % a 95 % without condensation
Electric isolation	
Air clearance	According to IEC 60664-1
Pollution according to IEC 61131-2	2
Protection	
Rear protection	IP 20
Front protection	IP65

⚠ **Attention**
Install the device in a panel with no more than 55 °C.

3.2.   Panel mount

3.2.1.   Distance

System must be installed with a space for heat dissipation and cabling. Avoid cabling superimposing to avoid EMC problems.
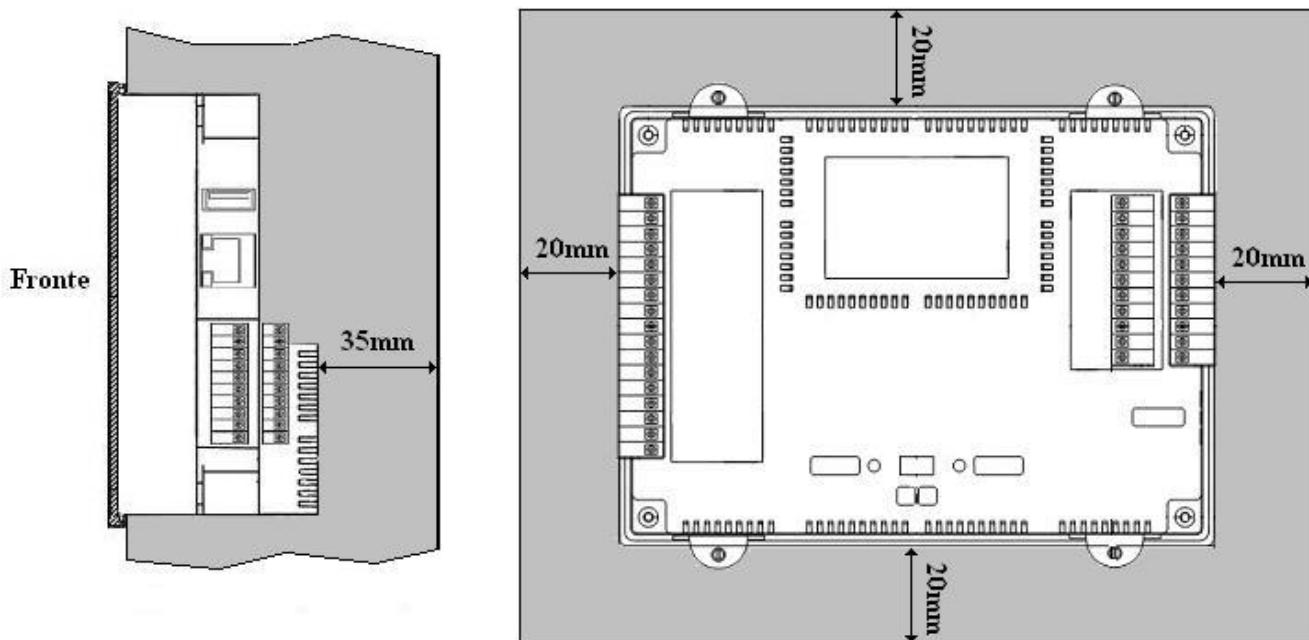

Figure 6A – Horizontal mounting
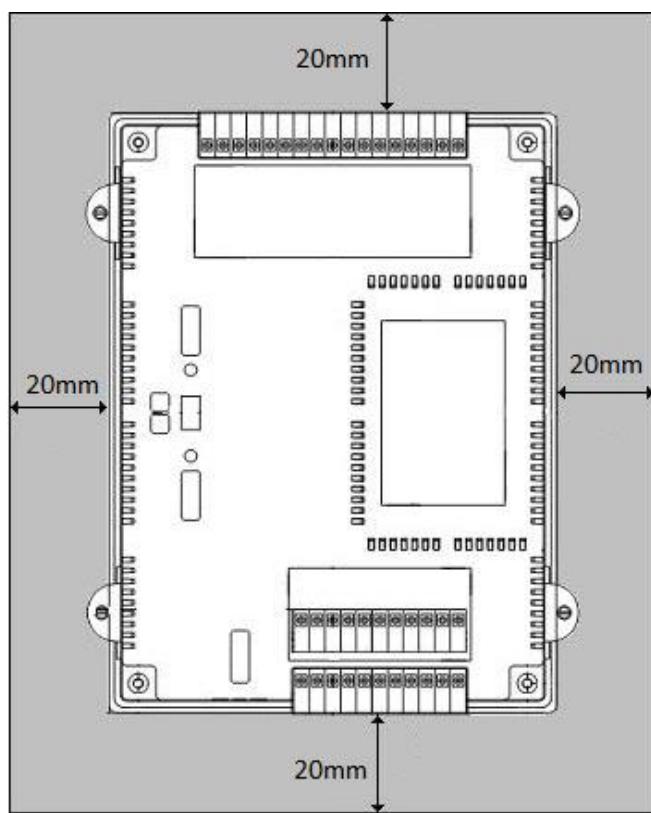
Figure 6B – Vertical mounting

4. TPAC1008 02 wiring

4.1. Connections

In the following figure see the wiring diagram with the available I/O.
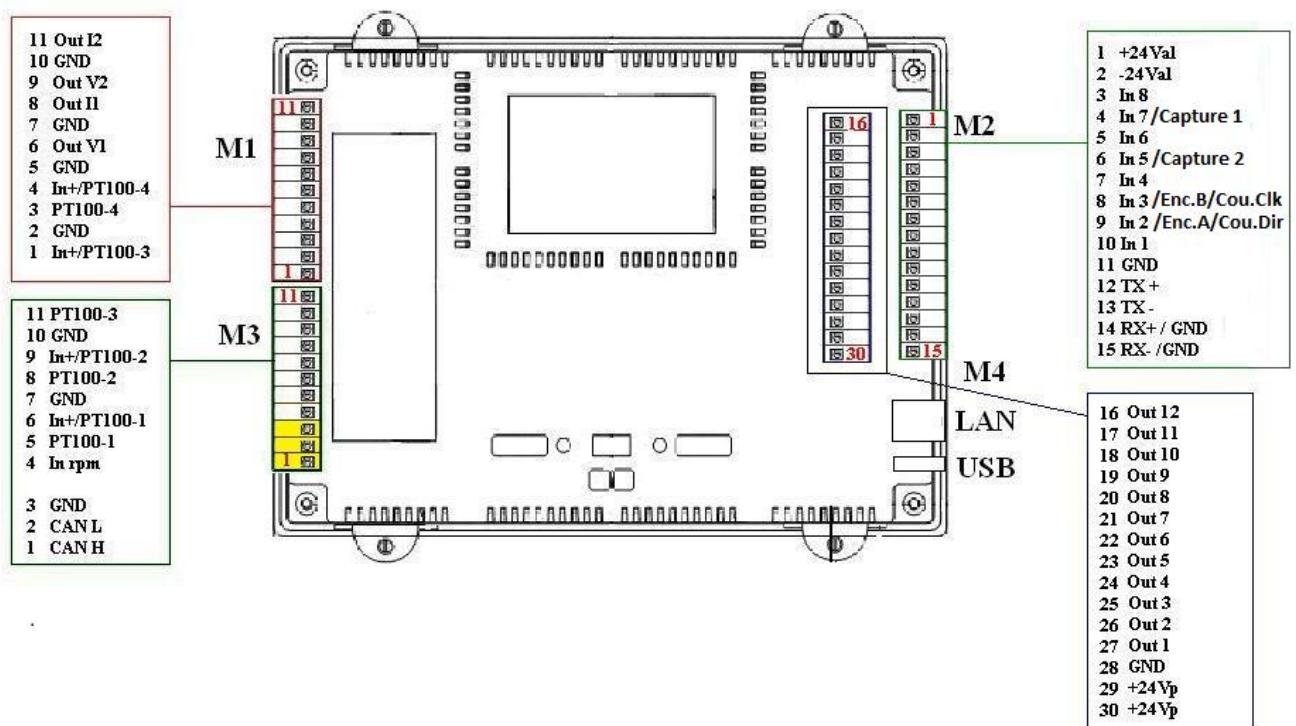
Figure 7

Bidirectional encoder:
- Input A Encoder: IN 2
- Input B Encoder: IN 3

Counter:
- Direction input Counter: IN 2 (0: count up, 1: count down)
- Clock input Counter: IN 3

9

Connecting to bidirectional encoder.
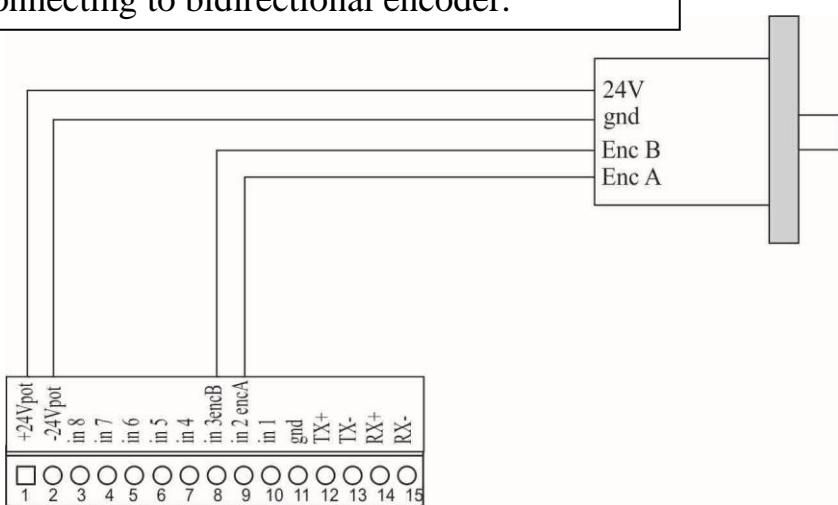
Connecting to mono directional encoder.
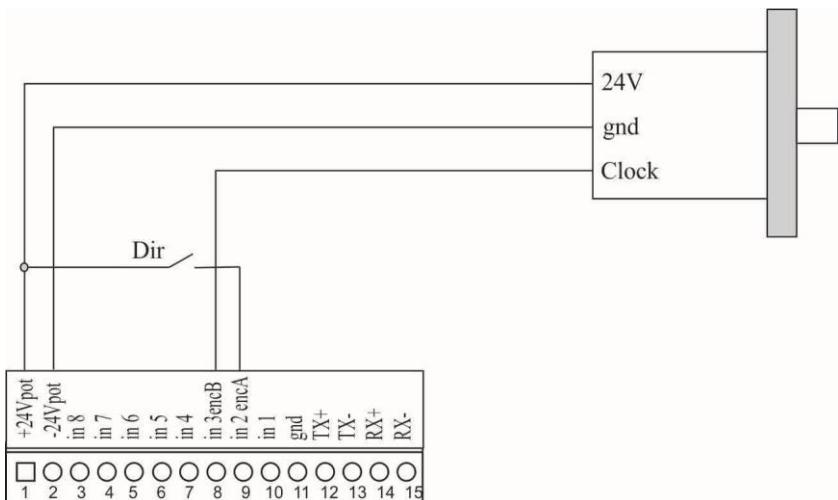
* 2 Capture signals are available from 2.08 firmware version (see "PLC_Versione" variable)

Capture 1 : IN 7

Capture 2: IN 5

The three pins of the M3 terminal (yellow highlighted) can be different related to the model. The above image shows the TPAC1008_02_AA configuration.
You can find in sections 4.7, 4.8 and 4.9 all the configurations available.

Table 3

TPAC1008 02 AA					
Analogue inputs	N° 4	**Input type**	**Resolution**	**BIT**	**Note**
		0÷20 mA	0.005mA	12	Input impedance 8Ω
		0÷10V	0.003V	12	Input impedance 500KΩ
		Thermocouples: J(0°C ÷ 600°C), T(0°C ÷ 400°C), K(0°C ÷ 1200°C), S(0°C ÷ 1710°C), B(100°C ÷ 1800°C), R(0°C ÷ 1500°C),	1°C	12	Cold junction compensation
		PT100 narrow range -40.0°C ÷ 200.0°C	0.1°C	12	
		PT100 wide range -40°C÷800°C	1°C	12	
Analogue outputs	N° 2	**Output type**	**Resolution**	**BIT**	**Note**
		0÷20 mA	0.005mA	12	Max impedance: 400 Ω
		0÷10V	0.003V	12	Min impedance: 1KΩ
		PWM @250Hz	1%		
Input (rpm)	N° 1	**Input type**	**Resolution**	**BIT**	**Note**
		rpm	Max Frequency 655Hz (39300 rpm)		
digital input/ Encoder input	N°8	**Input type**	**Resolution**	**BIT**	**Note**
		PNP	Max Frequency 500Hz		IN 2 and IN 3 can be used as incremental encoder input Fmax 40kHz IN2: A IN3: B Counter: IN 2: direction (0: count up, 1: count down) IN 3: clock IN7 capture time 1 (µs) IN5 capture time 2 (µs)
Digital output	N°12	**Output type**	**Resolution**	**BIT**	**Note**
		PNP	Max Frequency 500Hz		Max 200mA for each output. 2 A max total

4.2. Power supply

4.2.1. Isolation

Device has no galvanic isolation between input, output and power supply.

4.2.2. System power supply

The TPAC1008 02 has a 24Vdc (12-36Vdc) supply acording to the scheme in the figure. System is protected against reverse power supply.

As shown in the figure, the digital outputs must have a separate power supply respect the main power supply of the instrument.

4.2.3. Digital output power supply

Digital outputs must have a separate power supply respect the main power supply of the instrument to avoid consequences on control system due to I/O problems.

4.2.4. Fuse

System has no internal fuse , so is suggested the use of an external 1A fuse for the panel power supply, and an external 3A delayed fuse for the I/O power supply.
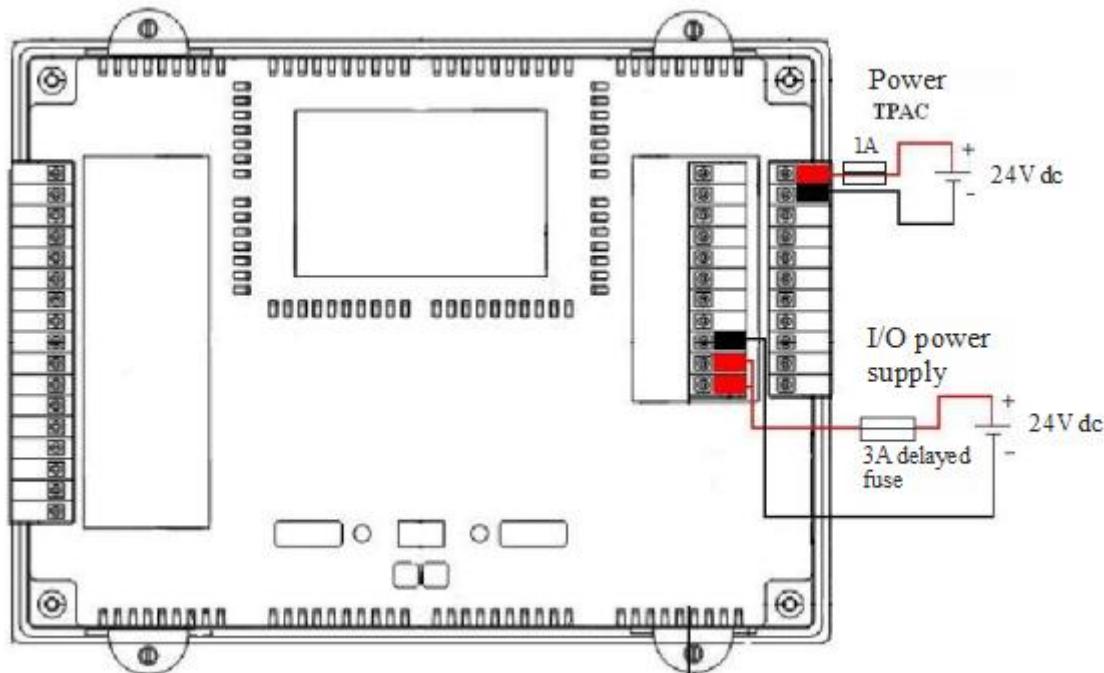

Figure 8

         ⚠️   **Attention**
A wrong value for the power supply can cause a damage to the device.

4.3.   Digital input/output wiring

The digital I/Os are PNP type, the wiring must follow the scheme below**.**
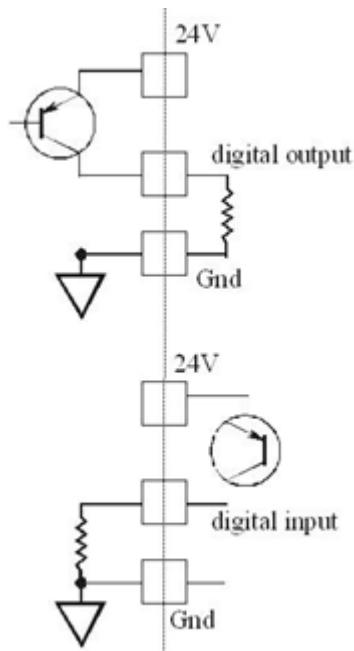
Figure 9

Each digital output can source a 200mA max, and the total current can be lower than 2A.

4.4.   Analogue input wiring

By means of the PLC program the TPAC1008 02 can be configured to connect several analogue input type. Configuration is done by the setup of a system variable in the PLC program. Configuration can be set up and modified in any moment.

Configuring input as thermocouple it is possible to connect up to 4 of the following type:

$$J(0°C \div 600°C)$$
$$T(0°C \div 400°C)$$
$$K(0°C \div 1200°C)$$
$$S(0°C \div 1710°C)$$
$$B(100°C \div 1800°C)$$
$$R(0°C \div 1500°C)$$
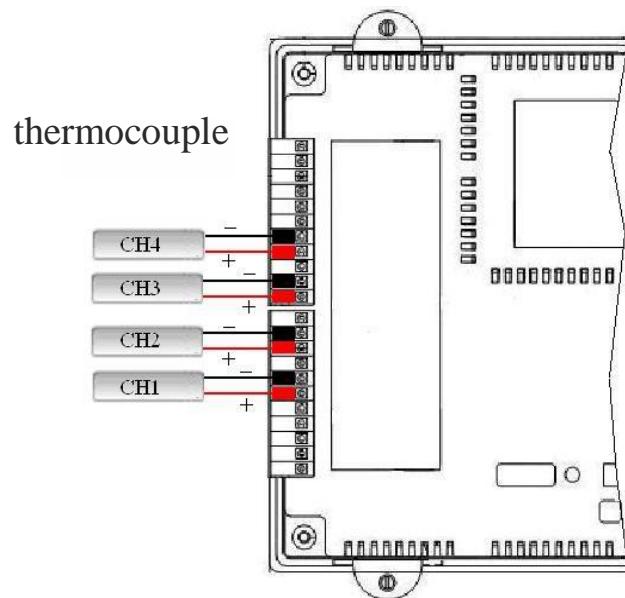
Figure 10

TPAC1008 02 can be connected to PT100. 2 different scales are possible:
- Da –40.0 °C a 200.0°C
- Da –40 °C a 800°C

The scale –40.0°C to 200.0°C has a resolution of 0.1°C.
The scale –40°C to 800°C has a resolution of 1°C.
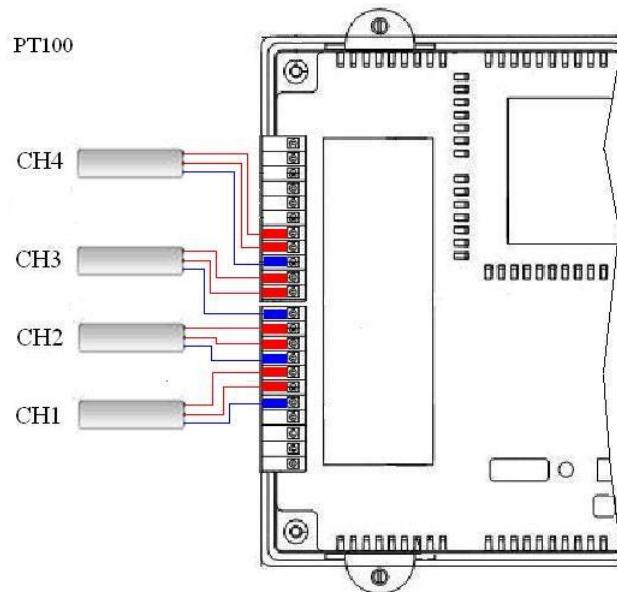
Figure 11

Configuring input as 0÷10V or 4÷20mA is possible to connect up to 4:
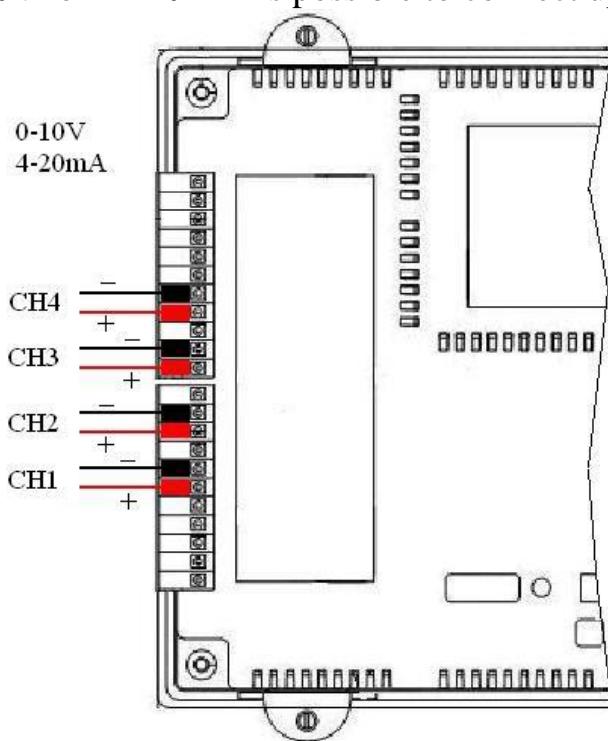
Figure 12

mA/V Input. Analogue inputs 4÷20mA and 0÷10V are connected to input and GND terminals. See figure to connect a 2 wire transducer with external power supply.
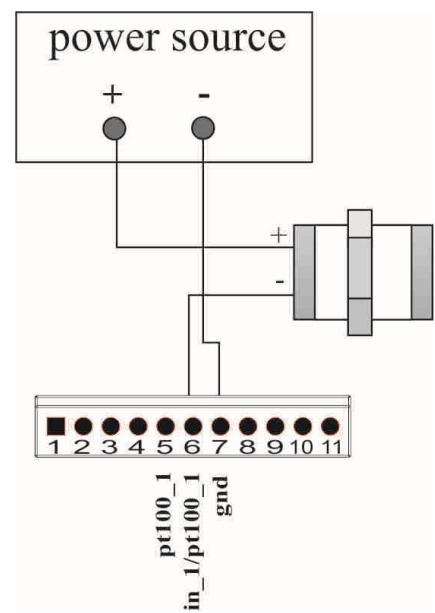
4.5.   *Analogue output wiring*

2 analogue output channels are available.
See in the figure the current analogue output wiring.
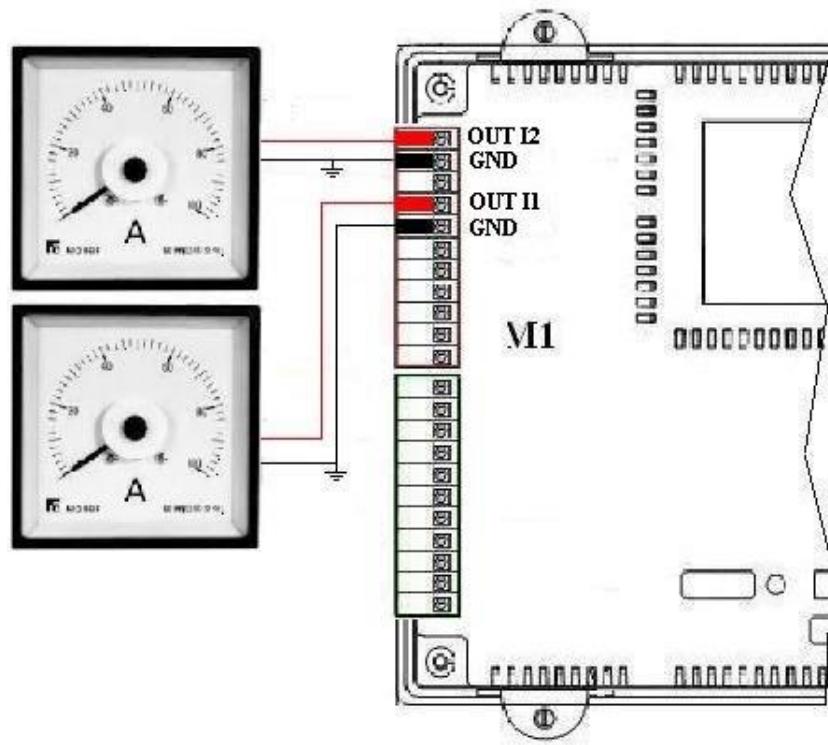
Figure 13

See in the figure the voltage analogue output wiring.

Figure 14

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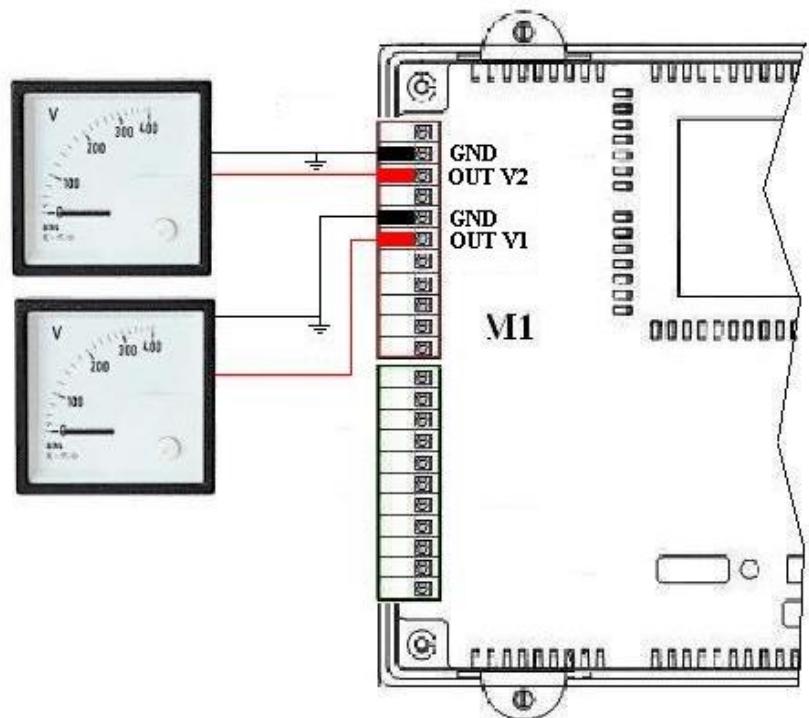
4.6.   CanOpen (TPAC1008 02 AA model)

Can interface on TPAC1008 02 AA is on M3 terminal board on pins.

Table 4

Pin	Signal
1	CAN H
2	CAN L
3	GNDiso

Example of a wiring of a system composed by:

- MPNC010
- MPNC020
- MPNC030
- TPAC1008
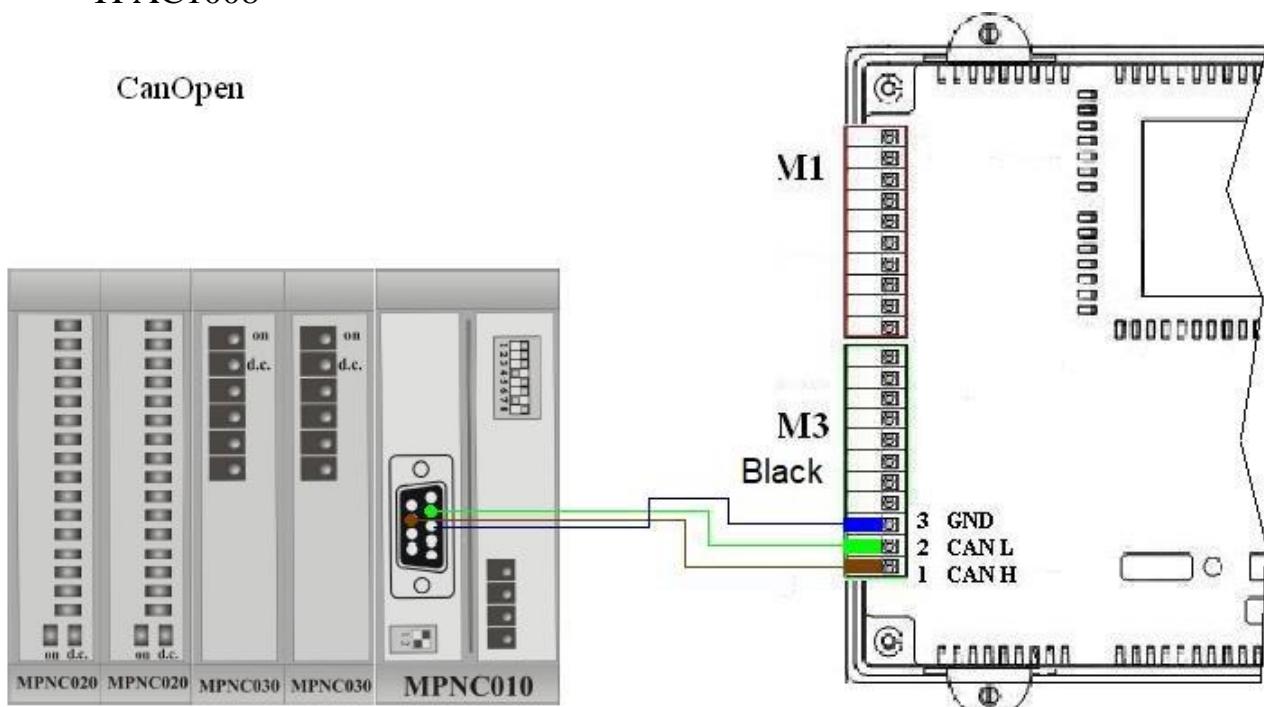
Figure 15

Cable type

Cable between TPAC1008 02 and CANopen slave must be a shielded twisted pair, and to avoid external disturbances the shield must be connected to both 0V of the communicating systems. The cable length is a function of the baud rate as follows.

Table 5

Baud rate	Bus lenght
1 Mbit/s	10 m
800 kbit/s	50 m
500 kbit/s	100 m
250 kbit/s	250 m
125 kbit/s	500 m
50 kbit/s	1000 m

Terminal resistence

Inside the TPAC1008 02 there is a resistance of 120Ω to terminate properly the bus on the master side.

To configure the CAN communication see the **CAN Builder** tutorial.

4.7. *ModBus wiring (TPAC1008 02 AB model)*

ModBus on TPAC1008 02 AB is a 4 wire RS485 serial line, on the M3 terminal (**RTU0**) board on pins.

Table 6

Pin	Signal
1	D+
2	D-
3	GNDiso

4.8. *Analogue outputs wiring (TPAC1008 02 AD/AE/AF models)*

Model TPAC1008 02 has 2 analogue outputs (more) with codes:

TPAC1008 02 AD: 2 analogue outputs 0-10V

TPAC1008 02 AE: 2 analogue outputs 0-20mA

TPAC1008 02 AF: 1 analogue output 3 = 0-10V + 1 analogue output 4 = 0-20mA

Table 8

Pin	Signal
1	Analogue output 4
2	Analogue output 3
3	GND

4.9. *ModBus wiring (on all models)*

ModBus on TPAC1008 02 is a 4 wire RS485 serial line, on the M2 terminal (**RTU3**) board on pins.

Table 9

Pin	Signal	Description
11	GND	
12	TX +	Tx + line
13	TX -	Tx - line
14	RX +	Rx + line
15	RX -	Rx - line

Example of a wiring of a system composed by:
- MPNC006
- MPNC020
- MPNC030
- TPAC1008 02

Figure 16

ME7030_16   02/23
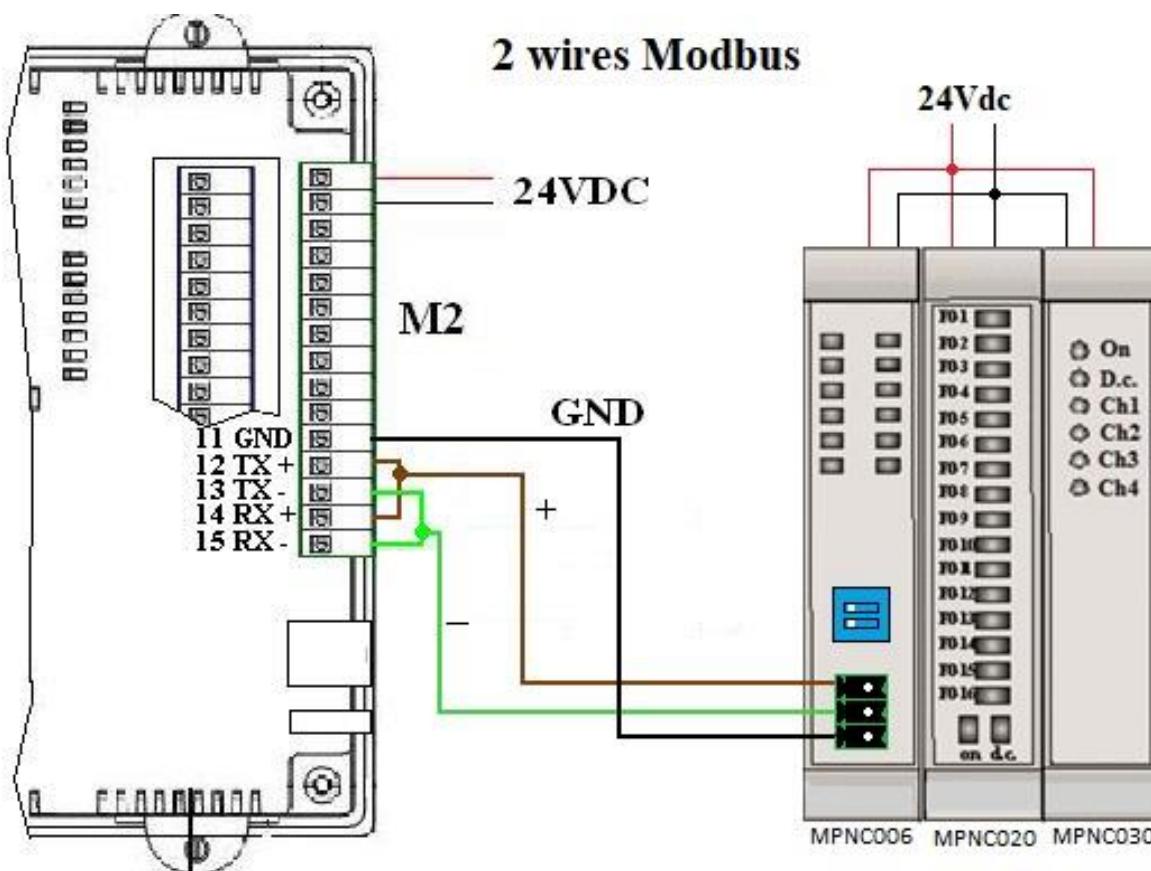
5. Peripherals

5.1. USB

TPAC1008 02 has an USB 2.0 host for:
- software update
- data storage: data logger
- connect USB peripherals as printers, mouse, etc.
- connect a Wi-Fi or Mobile key (optionally supplied by Mect) to connect to a different network from LAN.

Specific connection of external peripherals are implemented on request.

5.2. Ethernet

TPAC1008 02 has a 10/100Mbit/s Ethernet port with auto configuration, with direct or inverse connection cable.

Il TPAC1008, by Ethernet, can be controlled by a personal computer, it is possible to control the I/O of TPAC1008 by means of a program on a PC.

6. PLC and HMI

To program TPAC1008 02 it is necessary to develop 2 software.
A PLC program written with the PLC program IDE software.
A human machine interface program (HMI) written with Qt Creator

A PLC program can be written using one of the following standard IEC 61131-3 languages:

Table 10

FBD	Functional Block Diagram	Graphic	Contact scheme
LD	Ladder	Graphic	Ladder scheme
SFC	Sequential Function Chart	Graphic	State diagram
ST	Structured Text	Text	Pascal-like language
IL (AWL)	Instruction List	Text	Assembler-like language

The 2 programming environment (PLC and HMI) are for Windows OS.

6.1. *System variables*

Here some system variables available for PLC program.

Table 11

Variable Name	Type	R/W	Description
PLC_Revisione	Revision	RO	firmware revision
PLC_HWconfig	HW Configuration	RO	
PLC_AnInConf_1	Analogue input configuration 1	RW	Bit 0..3 input configuration 1 Analogue input configuration 4 bit for each channel: • 0 not configured • 1 current • 2 voltage • 3 TCJ (J type thermocouple) • 4 TCK (K type thermocouple) • 5 TCT (T type thermocouple) • 6 PT100E (1 digit Resolution) range: -40 +800°C • 7 PT100R (0.1 digit Resolution) range: -40 +200°C • 8 TCS (S type thermocouple) • 9 TCB (B type thermocouple) • 10 TCR (R type thermocouple)
PLC_AnInConf_2	analogue input configuration 2	RW	Bit 0..3 input configuration 2 Analogue input configuration 4 bit for each channel: • 0 not configured • 1 current • 2 voltage • 3 TCJ (J type thermocouple) • 4 TCK (K type thermocouple) • 5 TCT (T type thermocouple) • 6 PT100E (1 digit Resolution) range: -40 +800°C • 7 PT100R (0.1 digit Resolution) range: -40 +200°C • 8 TCS (S type thermocouple) • 9 TCB (B type thermocouple) • 10 TCR (R type thermocouple)
PLC_AnInConf_3	analogue input configuration 3	RW	Bit 0..3 input configuration 2 Analogue input configuration 4 bit for each channel: • 0 not configured • 1 current • 2 voltage

			3 TCJ (J type thermocouple) 4 TCK (K type thermocouple) 5 TCT (T type thermocouple) 6 PT100E (1 digit Resolution) range: -40 +800°C 7 PT100R (0.1 digit Resolution) range: -40 +200°C 8 TCS (S type thermocouple) 9 TCB (B type thermocouple) 10 TCR (R type thermocouple)
PLC_AnInConf_4	analogue input configuration 4	RW	Bit 0..3 input configuration 2 Analogue input configuration 4 bit for each channel: 0 not configured 1 current 2 voltage 3 TCJ (J type thermocouple) 4 TCK (K type thermocouple) 5 TCT (T type thermocouple) 6 PT100E (1 digit Resolution) range: -40 +800°C 7 PT100R (0.1 digit Resolution) range: -40 +200°C 8 TCS (S type thermocouple) 9 TCB (B type thermocouple) 10 TCR (R type thermocouple)
PLC_AnOutConf_1	analogue output configuration 1	RW	0 not configured 1 current 2 voltage 3 pwm
PLC_AnOutConf_2	analogue output configuration 2	RW	0 not configured 1 current 2 voltage 3 pwm
PLC_AnOutConf_3	analogue output configuration 3	RW	0 not configured (TPAC .AA, ..AB models) 1 current (TPAC….AE, ..AF models) 2 voltage (TPAC….AD models) 3 pwm (TPAC….AD, ..AF models)
PLC_AnOutConf_4	analogue output configuration 4	RW	0 not configured (TPAC .AA, ..AB models) 1 current (TPAC….AE models) 2 voltage (TPAC….AD,..AF models) 3 pwm (TPAC….AD, ..AF models)
PLC_AnIn_1	analogue input value 1	RO	Conf 1: 0 ÷ 20000 value: 0.0 ÷ resolution 5 digit 20.000mA

			Conf 2: 0 ÷ 10000 resolution 3 digit	value: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	value: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	value: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	value: 0 ÷ 400°C
			Conf 6: -40 ÷ 800 resolution 1 digit	value: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000 resolution 1 digit	value: -40.0 ÷ 200.0°C
			Conf 8: 0 ÷ 1710 resolution 1 digit	value: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	value: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	value: 0 ÷ 1500°C
PLC_AnIn_2	analogue input value 2	RO	Conf 1: 0 ÷ 20000 resolution 5 digit	value: 0.0 ÷ 20.000mA
			Conf 2: 0 ÷ 10000 resolution 3 digit	value: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	value: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	value: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	value: 0 ÷ 400°C
			Conf 6: -40 ÷ 800 resolution 1 digit	value: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000 resolution 1 digit	value: -40.0 ÷ 200.0°C
			Conf 8: 0 ÷ 1710 resolution 1 digit	value: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	value: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	value: 0 ÷ 1500°C
PLC_AnIn_3	analogue input value 3	RO	Conf 1: 0 ÷ 20000 resolution 5 digit	value: 0.0 ÷ 20.000mA
			Conf 2: 0 ÷ 10000 resolution 3 digit	value: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	value: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	value: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	value: 0 ÷ 400°C

			Conf 6: -40 ÷ 800 resolution 1 digit	value: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000 resolution 1 digit	value: -40.0 ÷ 200.0°C
			Conf 8: 0 ÷ 1710 resolution 1 digit	value: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	value: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	value: 0 ÷ 1500°C
PLC_AnIn_4	analogue input value 4	RO	Conf 1: 0 ÷ 20000 resolution 5 digit	value: 0.0 ÷ 20.000mA
			Conf 2: 0 ÷ 10000 resolution 3 digit	value: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	value: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	value: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	value: 0 ÷ 400°C
			Conf 6: -40 ÷ 800 resolution 1 digit	value: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000 resolution 1 digit	value: -40.0 ÷ 200.0°C
			Conf 8: 0 ÷ 1710 resolution 1 digit	value: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	value: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	value: 0 ÷ 1500°C
PLC_Tamb	Cold junction compensation	RO	0 ÷ 1000 resolution 1 digit	Value: 0.0 ÷ 100.0
PLC_EncoderCo_Lo	encoder value LOW	RO		
PLC_EncoderCo_Hi	encoder value HIGH	RO		
PLC_RPM	Input frequency	RO	Reading in Herz max reading frequency 655.00Hz If input frequency is over 655Hz variable value is 65535	
PLC_DigOut_1 PLC_DigOut_2 PLC_DigOut_3 PLC_DigOut_4 PLC_DigOut_5 PLC_DigOut_6 PLC_DigOut_7 PLC_DigOut_8	Digital output	RW	Value	

PLC_AnOut_1	Analogue output 1	RW	Conf 1	0 ÷ 2000
			Conf 2	0 ÷ 1000
			Conf 3	0 ÷ 100
PLC_AnOut_2	Analogue output 2	RW	Conf 1	0 ÷ 2000
			Conf 2	0 ÷ 1000
			Conf 3	0 ÷ 100
PLC_AnOut_3	Analogue output 3	RW	Conf 1	0 ÷ 2000
			Conf 2	0 ÷ 1000
			Conf 3	0 ÷ 100
PLC_AnOut_4	Analogue output 4	RW	Conf 1	0 ÷ 2000
			Conf 2	0 ÷ 1000
			Conf 3	0 ÷ 100
PLC_EnableEnc	Enable encoder	RW	1: sets bidirectional encoder 2: sets counter	
PLC_ResetCount	Reset Encoder	RW	1: encoder/counter reset	
PLC_Heartbeat	Heartbeat	RO	I/O board Heartbeat	
PLC_time	Time	RO	time elapsed	
PLC_timeMin	Time min	RO	start window 10 seconds	
PLC_timeMax	Time max	RO	end window 10 seconds	
PLC_FiltAnIn_1	Average	RW	analogue input 1 average	
PLC_FiltAnIn_2	Average	RW	analogue input 2 average	
PLC_FiltAnIn_3	Average	RW	analogue input 3 average	
PLC_FiltAnIn_4	Average	RW	analogue input 4 average	
PLC_timeWin	Time window	RW	graph window	
PLC_Version	PLC	RO	run time PLC version	
PLC_EngineStatus	Status	RO	PLC status	
PLC_ResetValues	Reset	RW	diagnostic variables reset	
PLC_CaptureT1_Lo	Capture	RO	time (µs) between 2 edges of digital input IN7 low register	
PLC_CaptureT1_Hi	Capture	RO	time (µs) between 2 edges of digital input IN7 high register	
PLC_CaptureT2_Lo	Capture	RO	time (µs) between 2 edges of digital input IN5 low register	
PLC_CaptureT2_Hi	Capture	RO	time (µs) between 2 edges of digital input IN5 high register	
PLC_buzzerOn	Buzzer sound	RW	if 1 enables buzzer that sounds until variable is reset to 0	
PLC_PLC_Version	PLC version	RW		
PLC_HMI_Version	HMI version	RW		
PLC_Year	currently year	RO		
PLC_Month	currently month	RO		
PLC_Day	currently day	RO		
PLC_Hours	currently hour	RO		
PLC_Minutes	currently minutes	RO		
PLC_Seconds	currently seconds	RO		
PLC_WATCHDOGEN	Watchdog	RW	enable Watchdog	
PLC_WATCHDOG_ms	Watchdog	RW	reset Watchdog timer	
PLC_BEEP_VOLUME	beep volume (when buzzerOn)	RW		
PLC_TOUCH_VOLUME	touch volume	RW		
PLC_ALARM_VOLUME	alarm volume	RW		

	(when alarm)		
PLC_BUZZER	Buzzer	RW	enable dynamic buzzer sound (0x44332211 up=0x11(%) on=0x22(cs) off=0x33(cs) rep=0x44(times))
CH0_NETRUN	active channel	RO	
CH0_NETGOOD	channel configuration	RO	
CH0_NETERR	bus status	RO	
CH0_NETRST	bus reset	RW	
CH0_NETDIS	disable the bus	RW	
CH0_01_NODERUN	In Out board - active channel	RO	
CH0_01_NODEGOOD	In Out board - channel configuration	RO	
CH0_01_NODEERR	In Out board - bus status	RO	
CH0_01_NODERST	In Out board - bus reset	RW	
CH0_01_NODEDIS	In Out board - disable the bus	RW	

After that the variables are available in read / write mode as described in the program tutorial. The system can use 5472 interchange variables between HMI and automation (at maximum) which include:
internal variables, interchange variables on Modbus network, retentive variables.
The variables are defined by a software "Mect Suite".

7. How to order
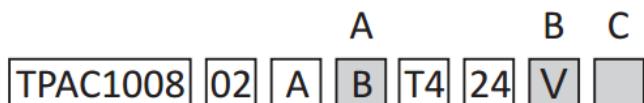
TPAC1008 02 A - *Existing interfaces*

1 RS485 4 wires
12 Digital outputs (PNP 0-24Vdc)
8 Digital inputs (PNP 0-24Vdc)
4 Analog inputs (0÷10V, 0÷20mA, Pt100, J, K, T, S, B, R) resolution 12bit
2 Analog outputs (0÷10V or 0÷20mA or PWM @250Hz) resolution 12bit
1 Ethernet 10/100 Base-T
1 USB 2.0 host port

A - *Interface*

A = CAN
B = RS485
D = 2 analog outputs 0÷10V or PWM @250Hz
E = 2 analog outputs 0÷20mA
F = 1 analog output 0÷10V or PWM @250Hz
        1 analog output 0÷20mA

B - *Orientation*

Blank = Horizontal
V = Vertical

C - *Options*

Upon customer's request