# USER'S MANUAL for TPAC1007 04 series HMI with PLC

mechatronic thinking

Via Enrico Fermi, 57/59 - 10091 ALPIGNANO (TO)
☎ Telefono: +39 (0)11 9664616 Fax: +39 (0)11 9664610
E-mail: srlmect@mect.it - C.F. e P.I. 04056380019

ME7053_15
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## 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.

**Additional information**

## *1.3. Terms*

| | |
|---|---|
| PLC: | TPAC1007 |
| Terminals: | MPNC006, MPNC020, MPNC030, MPNC035<br>MPNE series |
| System: | PLC (TPAC1007) with terminals |

## *1.4. Security*

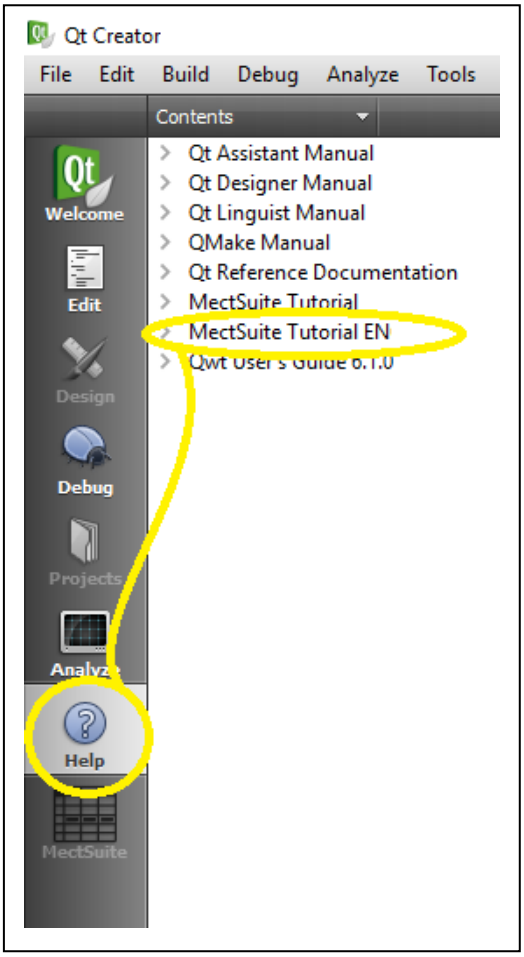
**Attention**
Switch off devices before connecting them.

**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

TPAC1007 is a device composed by a PLC and a HMI with touch-screen monitor 4.3” width and 480 x 272 pixel resolution with 262.000 colors.
TPAC1007 allows the supervision of networked Modbus RTU and Modbus TCP devices. The networks are managed simultaneously by TPAC1007 and data from a network can be sent to another in order to create a bridge between the two networks.
A Micro-USB host port allows, with a special 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 TPAC1007 there are up to 1 Kbyte for retentive variables stored on the internal flash memory.
The device is also able to manage an up to 64GB wide, micro SD card. The SD card is factory mounted on request.
A real-time clock maintains the date and time up to four months with the device turned off.
TPAC1007 is equipped with a micro PLC with several digital and analogue I/O to make a small automation of the process.
The device can be used in horizontal or in vertical orientation with the option "V" (see following pictures).


Figure 1: Front view TPAC1007 (horizontal version)


Figure 2: front view TPAC1007 (vertical version)

### *2.1 Specification*

TPAC1007 is based on a multiprocessor system. PLC and HMI are based on a 454MHz ARM9

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 | TFT 480 x 272 pixel 262k colors |
| Touch screen | Resistive 4 wires |
| Ethernet | 10Mbit/s - 100Mbit/s self recognition |
| Micro-USB | Host 2.0 |
| Micro SD | 64 GB |
| **PLC software characteristics** | |
| OS | LINUX 2.35 |
| PLC | IEC61131-3 |
| Graphics | Based on QT library |
| ModBus | Modbus RTU master |
| Storage memory | Possibility of history storage |
| **Field bus main features** | |
| Modbus RTU | Master/ Client 2 wires + Master/ Client 4 wires (TPAC100704AE only) |
| Modbus TCP | Master/ Client |

| **Power supply** | |
|---|---|
| 12÷28VDC | |
| Power | 3.5W digital output off |

| **Tightening torque** | |
|---|---|
| 0,07-0,08 Nm | |

## Electromagnetic compatibility

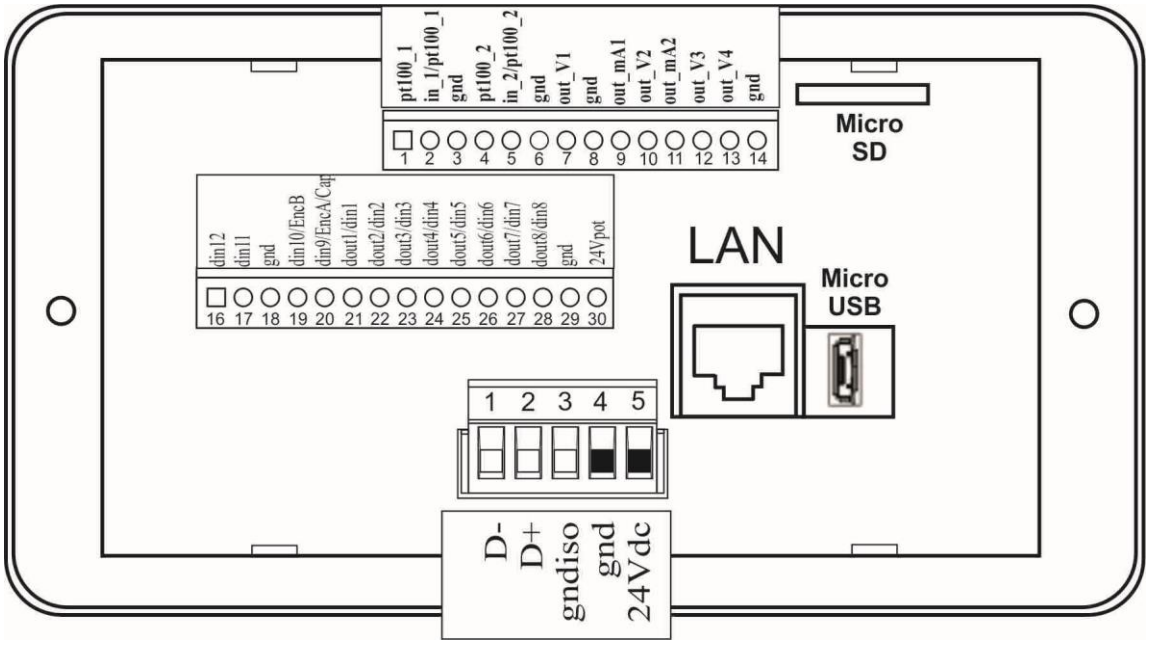
The electromagnetic compatibility tests have been carried out at accredited laboratories, according to EN 61326-1, EN 61131-2 and EN 61000-6-2standards.

### *2.2Wiring description AA model*

See table for wiring of model TPAC1007 04 AA:

Table 2

| **TPAC1007 04 AA Expansion features** | | | | | |
|---|---|---|---|---|---|
| Universal analogue inputs | N° 2 (in1 – in2) | **Input type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.005mA | 12 | Input impedance 8Ω |
| | | 0÷10V | 0.003V | 12 | Input impedance 1MΩ |
| | | 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 r -40.0°C ÷ 200.0°C | 0.1°C | 12 | |
| | | PT100 E -40°C÷800°C | 1°C | 12 | |
| Analogue output | N° 2 (out1-out2) | **Output type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.01mA | 12 | Max impedance : 400Ω |
| | | 0÷10V | 0.01V | 12 | Min impedance : 1KΩ |
| | | PWM @250Hz | 1% | | Min impedance: 1KΩ |
| Analogue output | N° 2 (out3-out4) | 0-10V | 0.01V | 12 | Min impedance: 1KΩ |
| | | PWM @250Hz | 1% | | Min impedance: 1KΩ |
| Digital inputs | N°4 (din9-din12) | **Input type** | **Resolution** | | **Note** |
| | | PNP or NPN (factory preset) | PLC cycle time | | Inputs din9 and din10 can be used as incremental encoder max input frequency: 40kHz din9: input A / Capture(µs) din10: input B |
| Configurable Digital I/O | N°8 (din1-din8 / dout1 - dout8) | **I/O Type** | **Resolution** | | **Note** |
| | | PNP | PLC cycle time | | 200mA max for each output. 2 A max all outputs. |



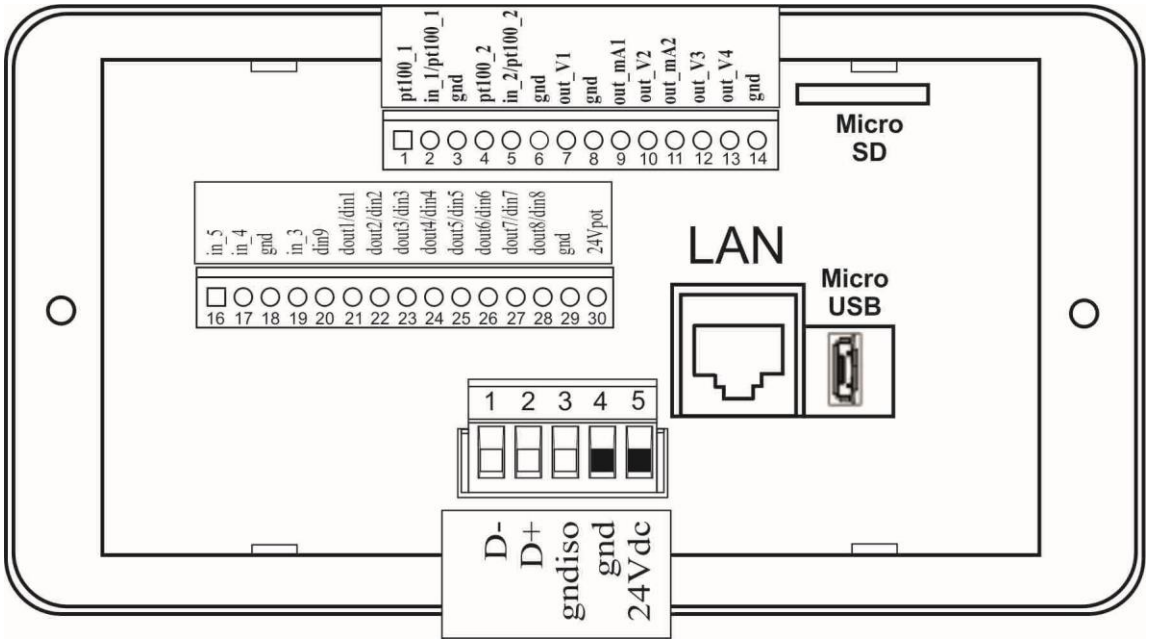

### *2.3Wiring description AB model*

See table for wiring of model TPAC1007 04 AB:

Table 3

| **TPAC1007 04 AB Expansion features** | | | | | |
|---|---|---|---|---|---|
| Universal analogue inputs | N° 2 (in1 – in2) | **Input type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.005mA | 12 | Input impedance 8Ω |
| | | 0÷10V | 0.003V | 12 | Input impedance 1MΩ |
| | | thermocouples<br>J(0°C ÷ 600°C)<br>T(0°C ÷ 400°C)<br>K(0°C ÷ 1200°C)<br>S(0°C ÷ 1710°C)<br>B(100°C ÷ 1800°C)<br>R(0°C ÷ 1500°C) | 1°C | 12 | Cold junction compensation |
| | | PT100 r -40.0°C ÷ 200.0°C | 0.1°C | 12 | |
| | | PT100 E<br>-40°C÷800°C | 1°C | 12 | |
| Analogue inputs | N°3 (in3-in5) | 0÷10V | 0.005V | 12 | Input impedance 25kΩ |
| Analogue output | N° 2 (out1-out2) | **Output type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.01mA | 12 | Max impedance: 400Ω |
| | | 0÷10V | 0.01V | 12 | Min impedance: 1KΩ |

| | | | | | |
|---|---|---|---|---|---|
| | | PWM @250Hz | 1% | | Min impedance : 1KΩ |
| Analogue output | N° 2 (out3-out4) | 0÷10V | 0.01V | 12 | Min impedance: 1KΩ |
| | | PWM @250Hz | 1% | | Min impedance: 1KΩ |
| Digital input | N°1 (din9) | **Input type** | **Resolution** | | **Note** |
| | | PNP o NPN (factory preset) | PLC cycle time | | |
| Configurable Digital I/O | N°8 (din1-din8 / dout1 - dout8) | **I/O Type** | **Resolution** | | **Note** |
| | | PNP | PLC cycle time | | 200mA max for each output. 2 A max all outputs. |

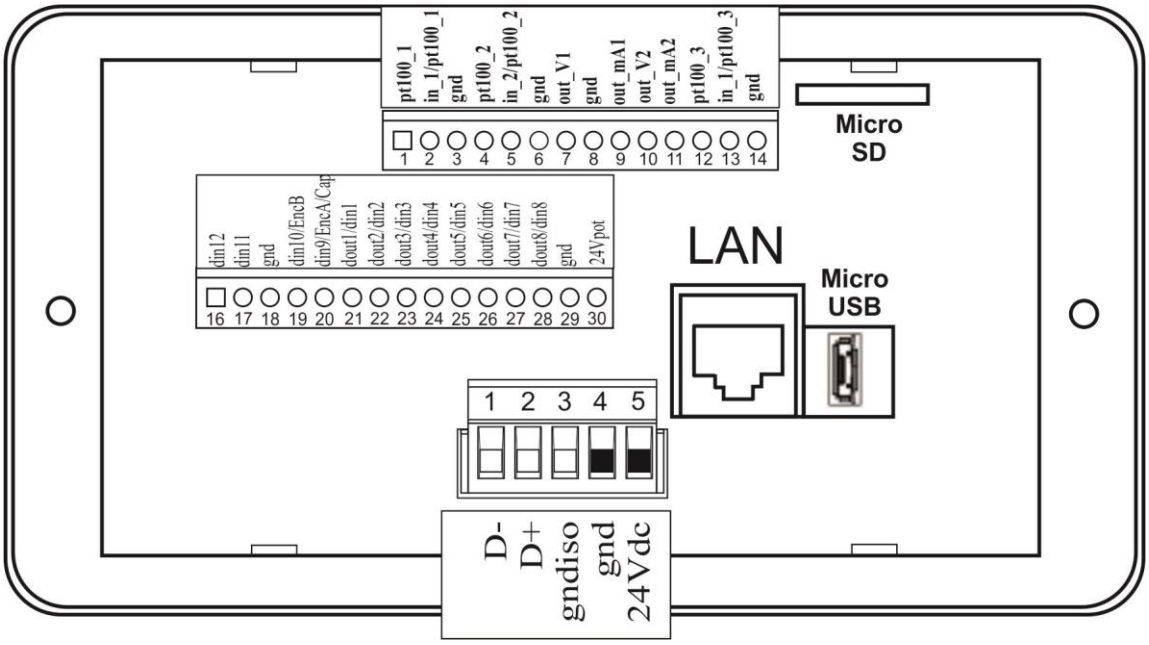


### *2.4 Wiring description AD model*

See table for wiring of model TPAC1007 04 AD:

Table 5

| **TPAC1007 04 AD Expansion features** | | | | | |
|---|---|---|---|---|---|
| Universal analogue inputs | N° 3 (in1 – in3) | **Input type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.005mA | 12 | Input impedance 8Ω |
| | | 0÷10V | 0.003V | 12 | Input impedance 1MΩ |
| | | 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 r -40.0°C ÷ 200.0°C | 0.1°C | 12 | |
| | | PT100 E -40°C÷800°C | 1°C | 12 | |
| Analogue output | N° 2 (out1-out2) | **Output type** | **Resolution** | **Bit** | **Note** |
| | | 0÷20 mA | 0.01mA | 12 | Max impedance : 400Ω |
| | | 0÷10V | 0.01V | 12 | Min impedance : 1KΩ |
| | | PWM @250Hz | 1% | | Min impedance: 1KΩ |
| Digital inputs | N°4 (din9-din12) | **Input type** | **Resolution** | | **Note** |
| | | PNP or NPN (factory preset) | PLC cycle time | | Inputs din9 and din10 can be used as incremental encoder max input frequency: 40kHz din9: input A / Capture(µs) din10: input B |
| Configurable Digital I/O | N°8 (din1-din8 / dout1 - dout8) | **I/O Type** | **Resolution** | | **Note** |
| | | PNP | PLC cycle time | | 200mA max for each output. 2 A max all outputs. |

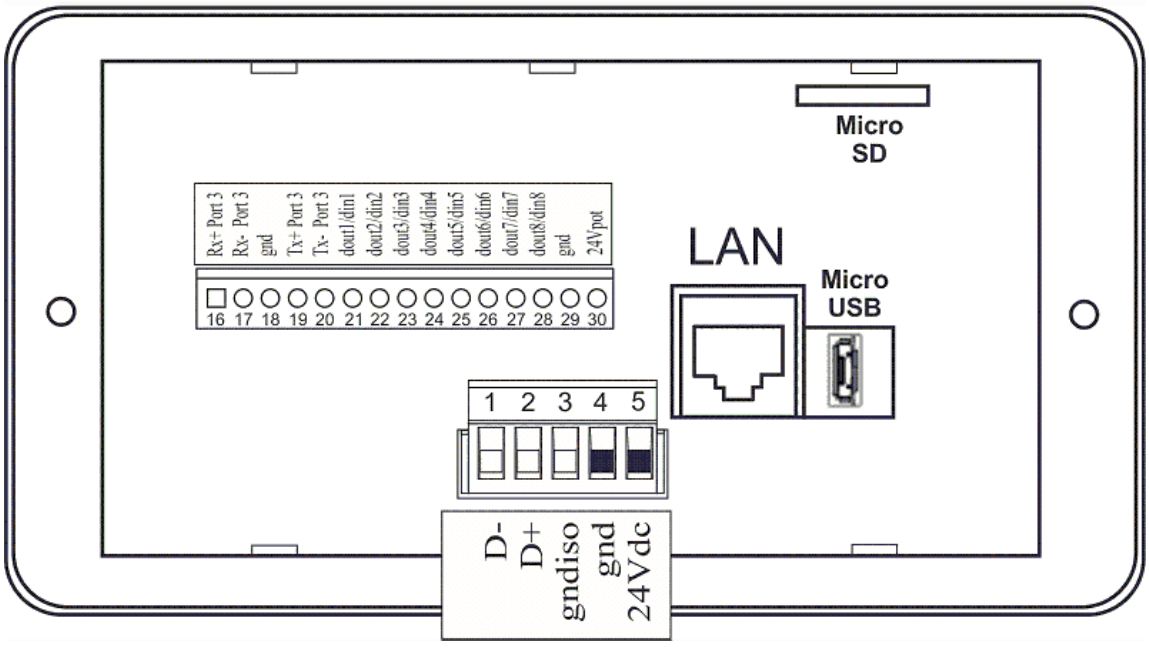



### *2.5 Wiring description AE model*

See table for wiring of model TPAC1007 04 AE:

Table 6

| TPAC1007 04 AE Expansion features | | | | | |
|---|---|---|---|---|---|
| Configurable Digital I/O | N°8 (din1-din8 / dout1 - dout8) | **I/O Type** | **Resolution** | | **Note** |
| | | PNP | PLC cycle time | | 200mA max for each output. 2 A max all outputs. |
| Modbus RTU **PORT 3** | Master/Client 4 wires | | | | |

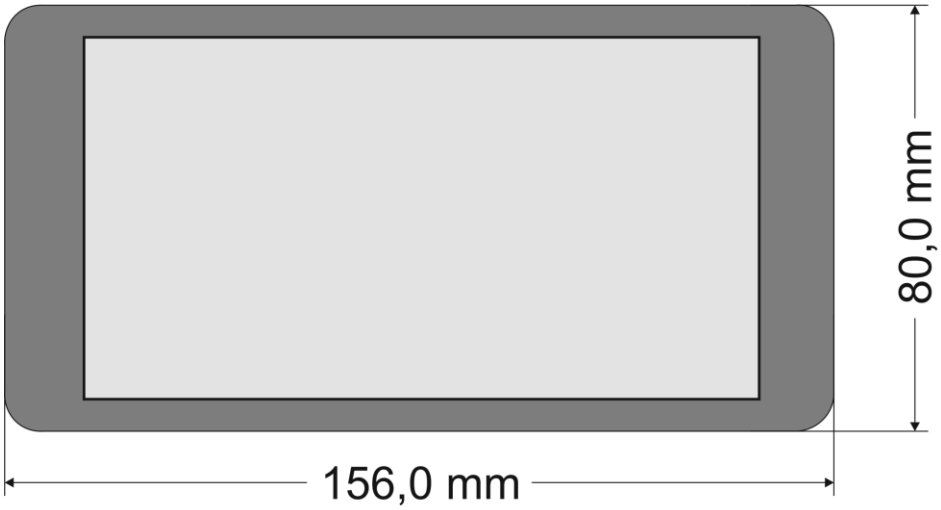


### *2.6 Mechanical dimensions*

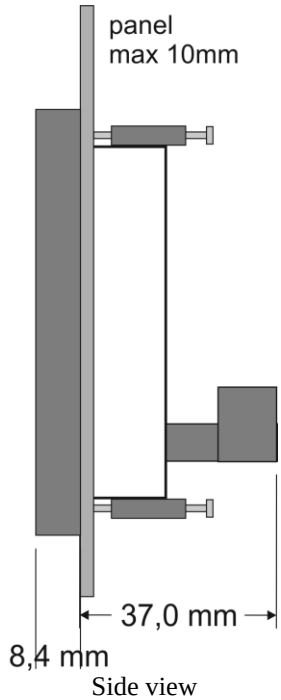
In the following figures see the TPAC1007 dimensions.

**Panel with frame mounting and hooks fastening:**

Encumbrance

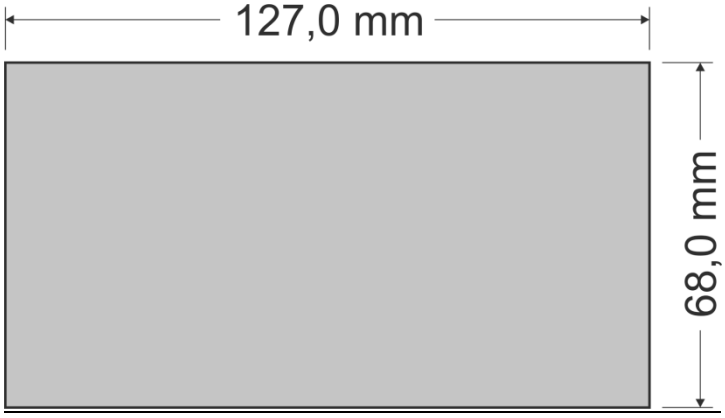



Front view



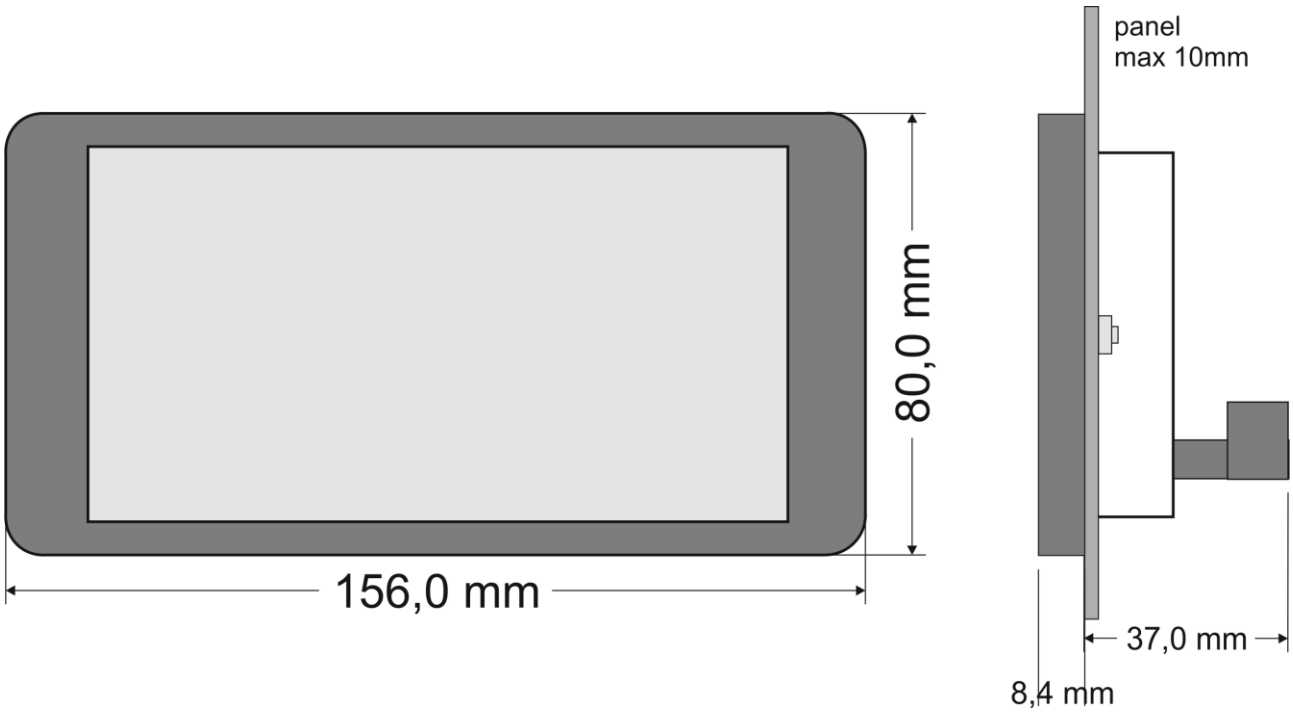

Side view

Mounting plate



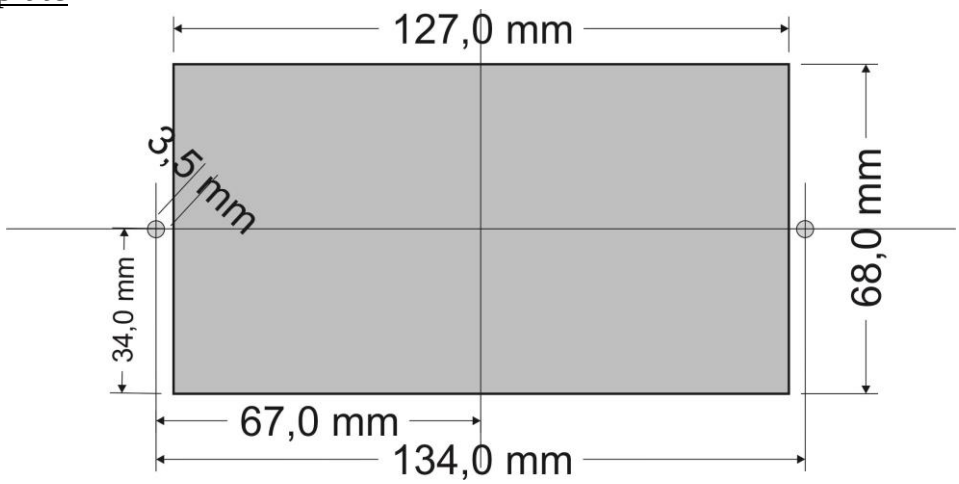
**Panel with frame mounting and screws fastening:**

Encumbrance

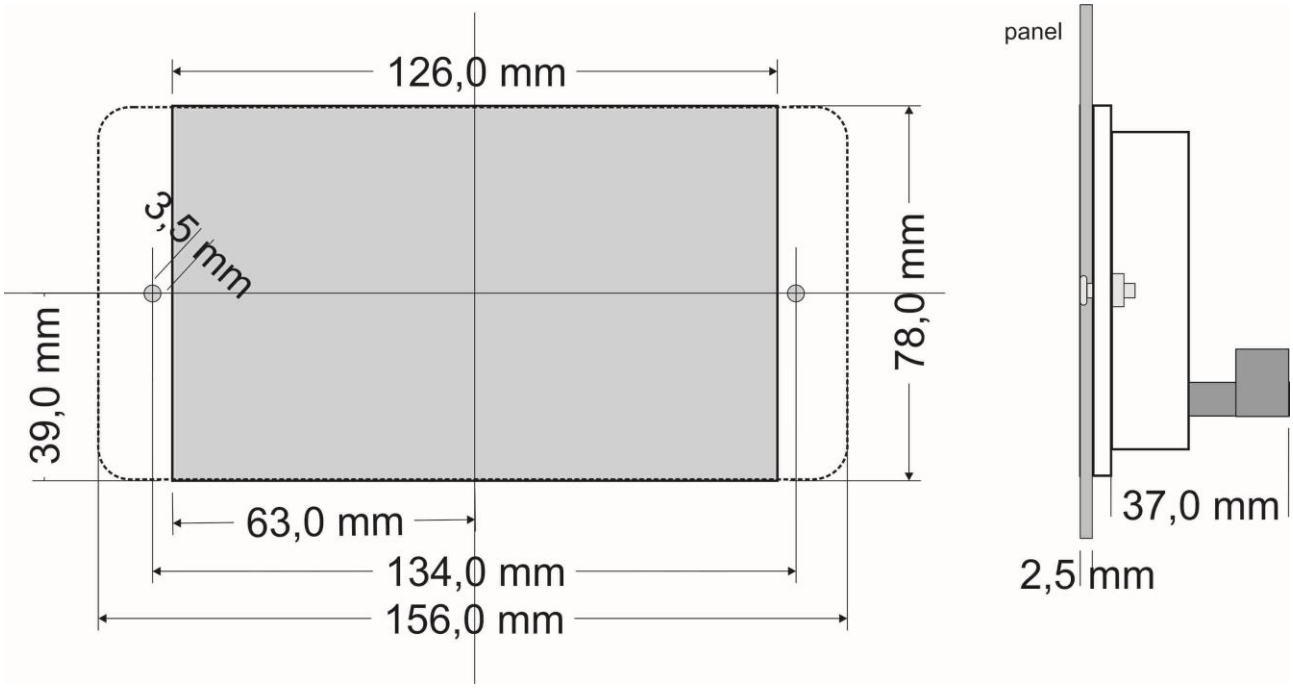



Front view Side view

Mounting plate



**Panel without frame mounting:**
In this case, the display has to be exactly at the same height of the panel, so for metal panels below 2,5mm it needs to insert a spacer to reach the exact height.




Front view Side view

## Technical specification

Table 7

| | |
|---|---|
| **MECHANICAL** | |
| Material | ABS, Polycarbonate |
| Installation | Panel installation |
| **Environmental conditions** | |
| Operative temperature | 0 °C ... 55 °C |
| Storage Temperature | -20 °C ... +85 °C |
| Relative Humidity | 5 % a 95 % no condensation |
| **Electric isolation** | |
| Air clearance | According to IEC 60664-1 |
| Pollution<br>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.

### *2.7 Panel mounting*

#### 2.7.1 Distance

The device must be installed with some space between other devices to allow the right heat dissipation and cabling. In order to avoid EMC issues, you should not overlap cables.

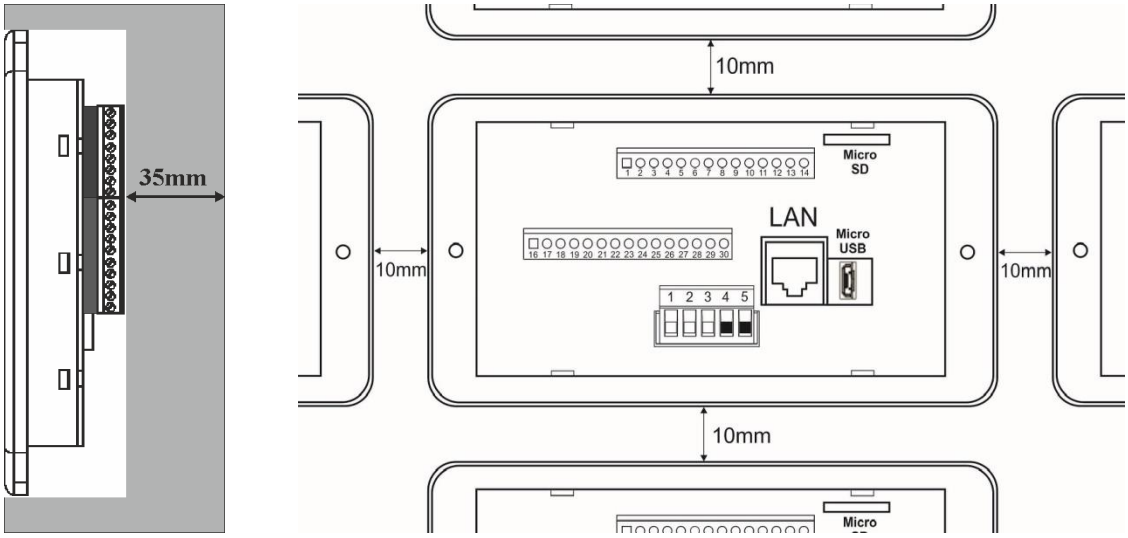



Figure 6A – Horizontal mounting

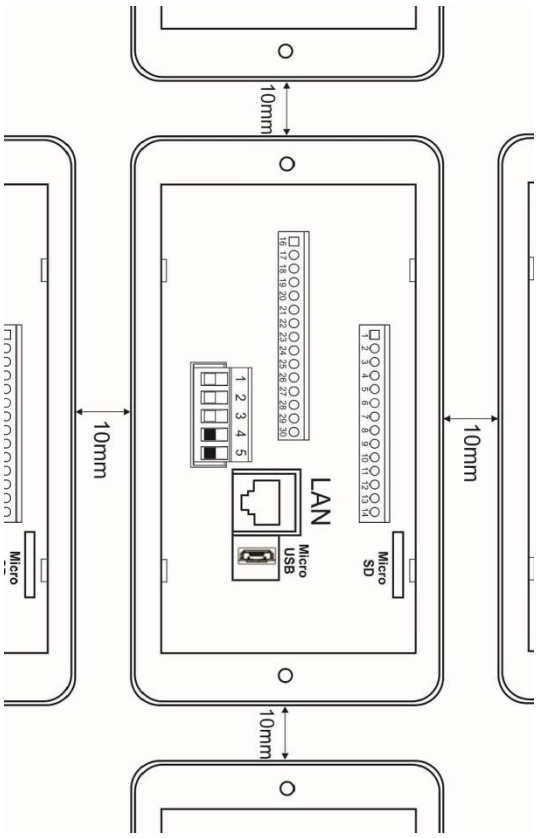



Figure 6B – Vertical mounting

# 3 Connections TPAC1007 04

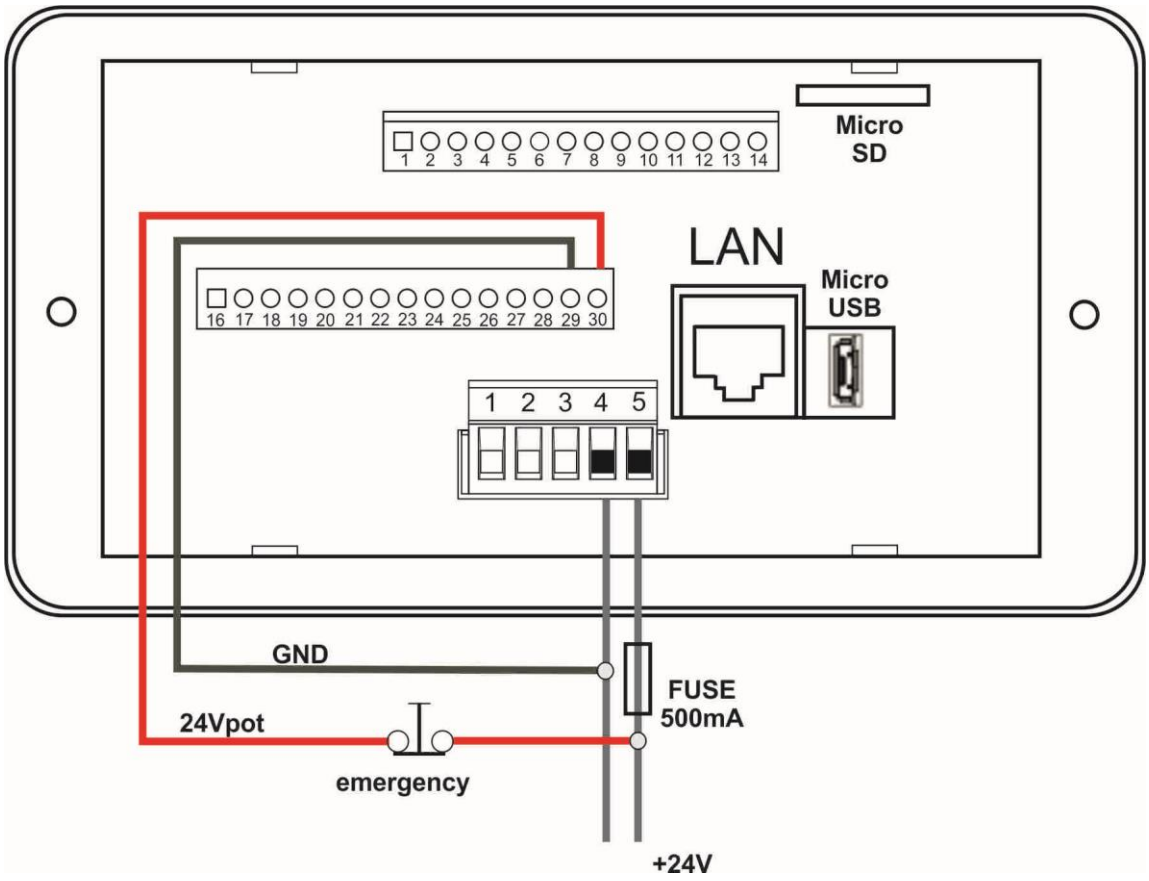
***Power supply***

## 3.1 Isolation

Device has a galvanic isolation between power supply and RS485 (2 wires) serial interface.

## 3.2 System power supply

TPAC1007 04 has a 12Vdc to 28Vdc power supply for the main board and the expansion board as well, according to the schematic in the figure below. Both input power can be connected to the same power supply.
Digital outputs circuitry is powered by the 29 (-) and the 30 (+) terminals. This part of the circuit can be separated by an external power switch.
The divice is protected against revers polarity power supply.




**Attention**
A wrong power supply voltage can damage the device.

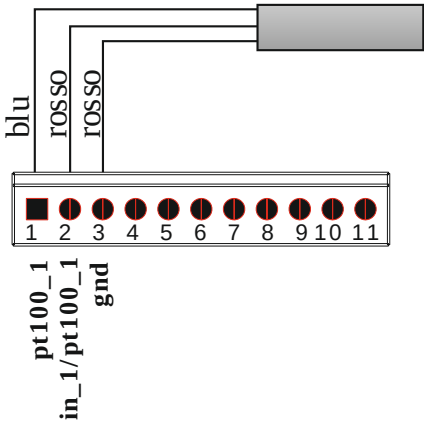
### 3.2.1 Fuse

The device has no internal fuse protection, so it is suggested the use of an external 500mA fuse for the panel power supply.

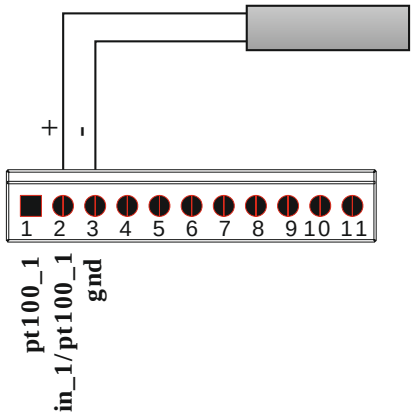
## *3.3* IO wiring

Analogue and digital wiring

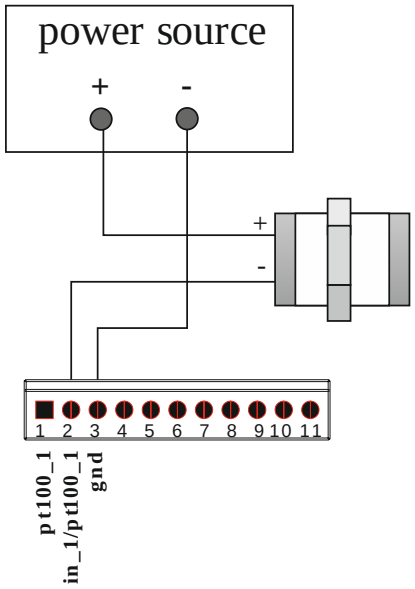
3 wire PT100 input. Wiring with too high resistance can cause measure errors. To use 2 wire PT100 short terminals 2 and 3.



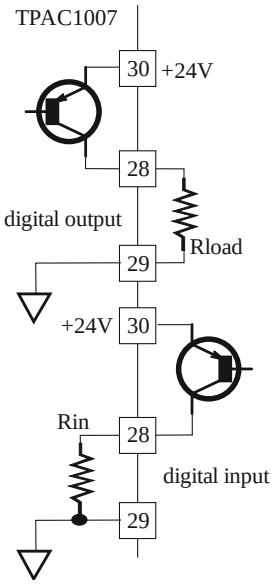

T/C input. Thermocouples must be isolated type. Use only proper thermocouples wire.



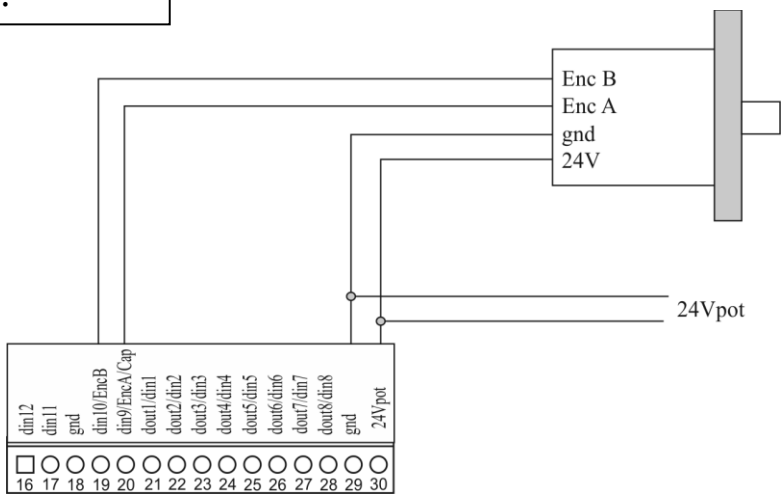

mA/V Input. Analogue inputs 4÷20mA and 0÷10V are connected to input and GND terminals. See figure to connect a 2 wire transducer with external power supply.



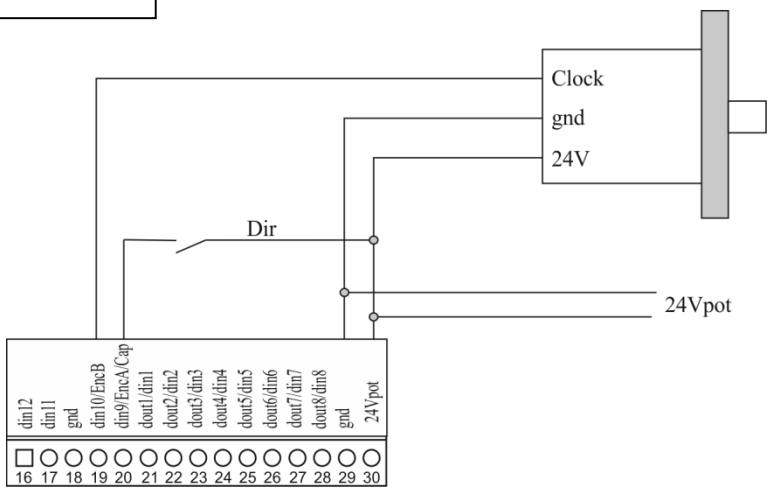
Digital I/O. Terminals 21 ÷ 28 can be configured as digital input or output . See in the figure the 28 terminal connection.
Terminals “17, 19 and 20” are high speed inputs (freq, ect)




Connecting to bidirectional encoder.




Connecting to mono directional encoder.




Connect to the input “DIN10” count (Clock) while in the input “DIN9” the direction:
• DIN9 = 0 counter DOWN
• DIN9 = 1 (24V) counter UP

### *3.4 ModBus wiring*

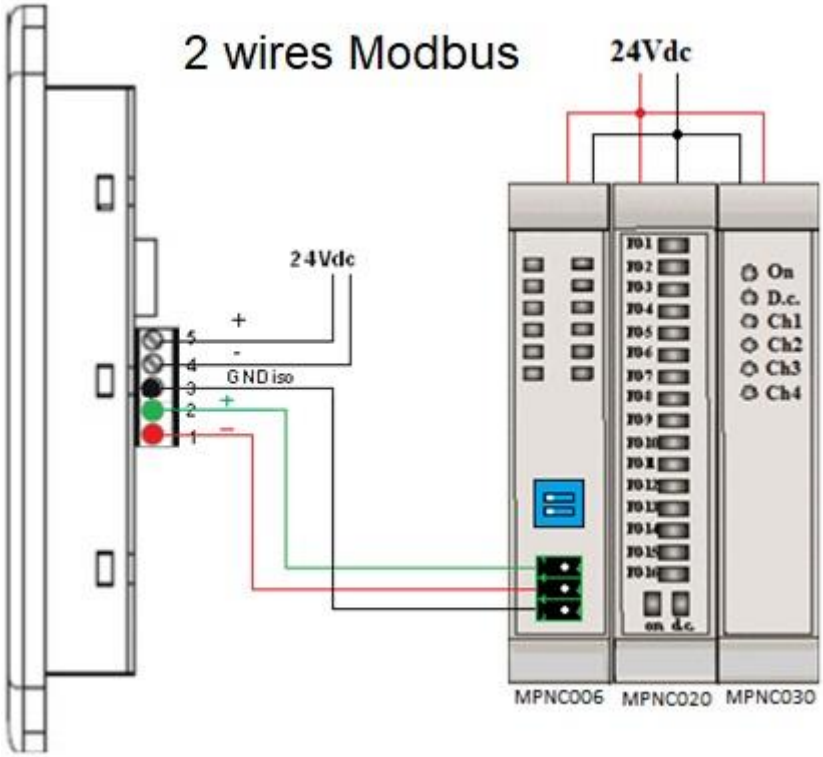
ModBus on TPAC1007 is a optoisolated 2 wires RS485 serial line, on the terminal board on pins:

Table 9

| Pin | Signal | Description |
|---|---|---|
| 3 | GNDiso | |
| 2 | D + | Line + |
| 1 | D - | Line - |

Example of a wiring of a system composed by:

- MPNC006
- MPNC020
- MPNC030
- TPAC1007



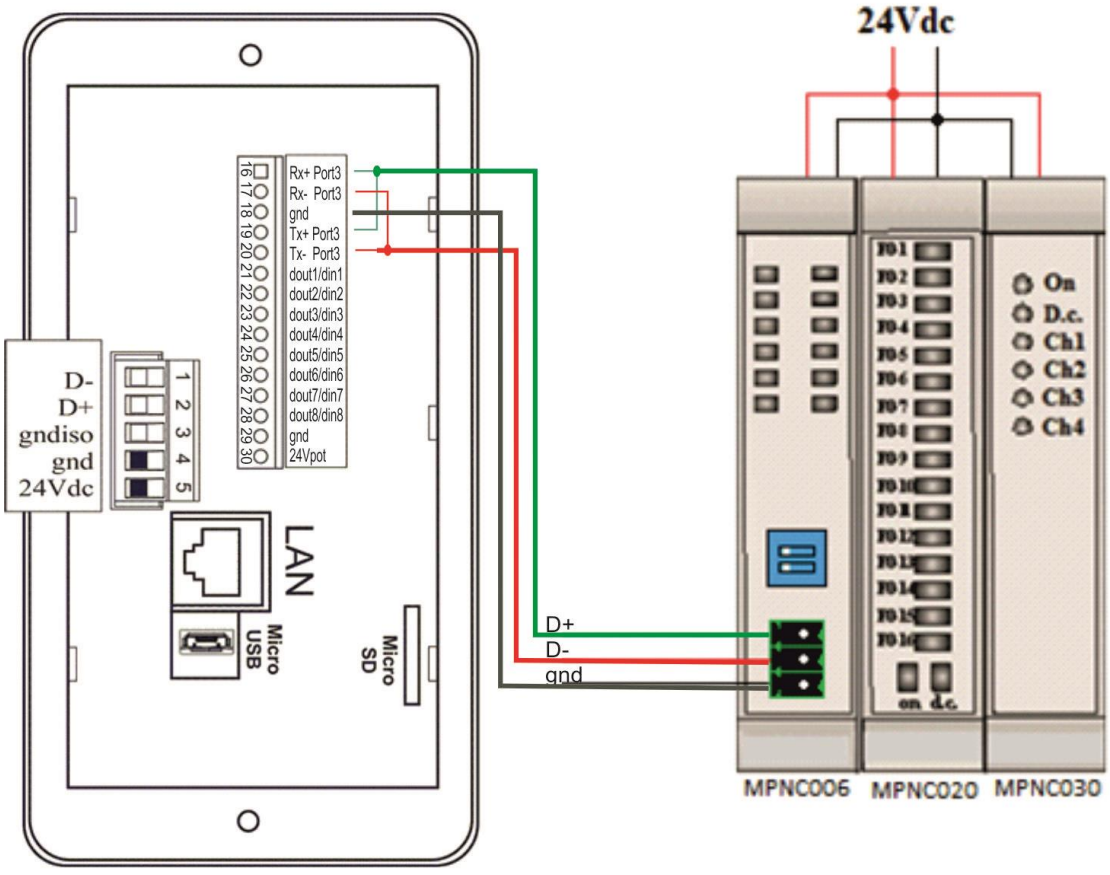
The additional ModBus on **TPAC100704AE** is a 4 wire RS485 serial line, on the black terminal board on pins (**RTU3**).
**Limitations:** this serial can only be used by MASTER. It cannot control slaves with addresses (Node ID) equal to 20. Non modifiable communication parameters: Baudrate = 38400; Parity = N; Databits = 8; Stopbits = 1.

Table 10

| Pin | Signal | Description |
|---|---|---|
| 16 | RX + | Rx + line |
| 17 | RX - | Rx - line |
| 18 | GND | |
| 19 | TX + | Tx + line |
| 20 | TX - | Tx - line |

Example of a wiring of a system composed by:

- MPNC006
- MPNC020
- MPNC030
- TPAC100704AE



# 4 Peripherals

## *4.1 USB*

TPAC1007 has a Micro-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.**

## *4.2 Ethernet*

TPAC1007 has a 10/100Mbit/s Ethernet port with auto-configuration, the connection cable between TPAC1007 and a personal computer can be either straight or cross.

## *4.3 Micro SD-Card*

On TPAC1007 is it possible to insert a micro SD card up to 64 GB to use applications or data or data logging. System automatically manage the memory.

### *4.4 Configuration DIP switches*

In the rear part of panel, there is a two pole DIP switch, these switches are used for boot configuration.

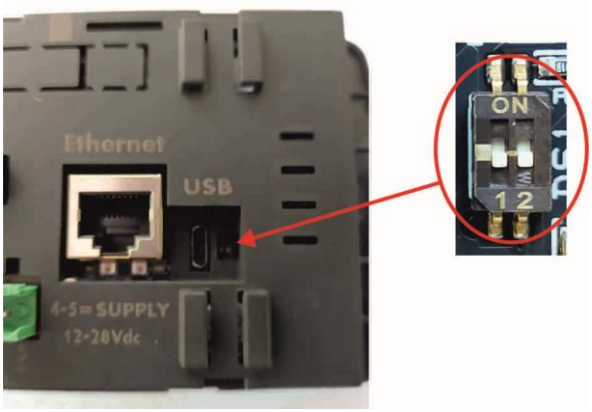
The TPAC1007 is able to boot in three different modes:

- Internal FLASH
- SD card
- USB

To select the needed boot mode is sufficient to set the switches before power up the panel.

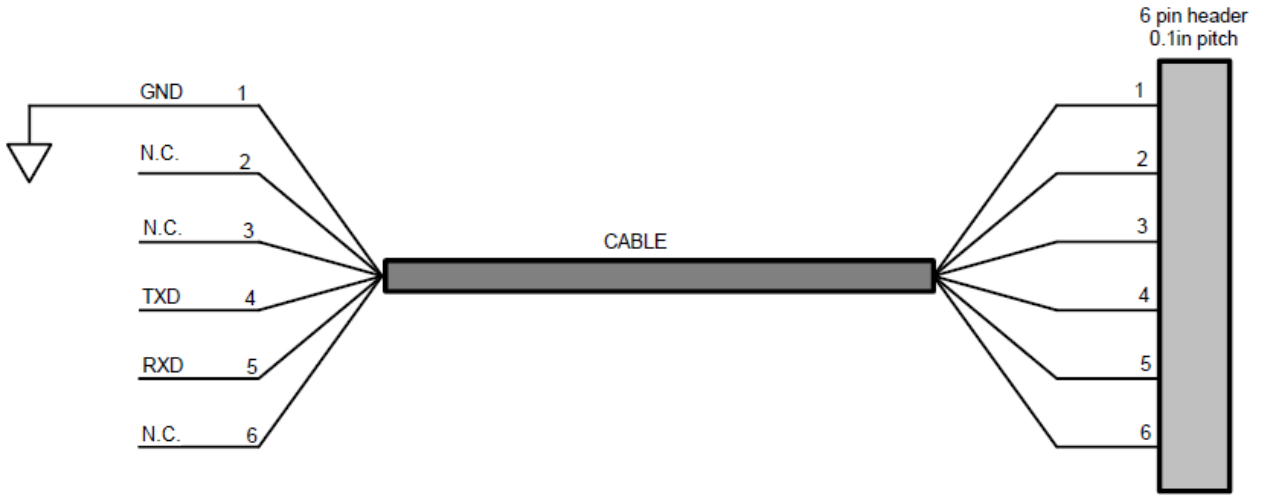
Switches configuration is shown in the next table

| SW1 | SW2 | Boot mode | Note |
|---|---|---|---|
| OFF | OFF | Internal Flash (default) | Default configuration |
| OFF | ON | USB | Factory firmware upgrade do not use |
| ON | ON | SD card | |
| ON | OFF | SD card | |



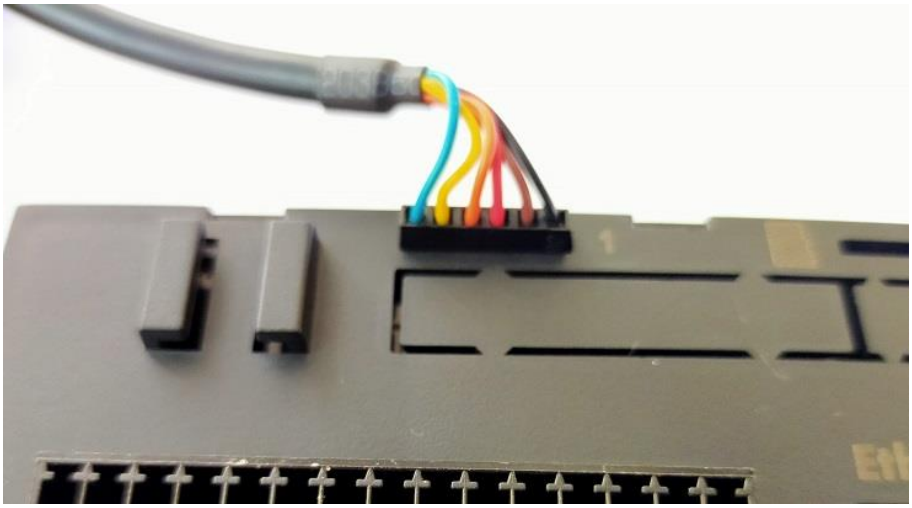
### *4.5 UART debug*

In the bottom side of the rear panel there is six pole header for debug purpose, the port is a TTL UART with the following pinout.




A commercial adapter is available from FTDI: TTL-232R.

This interface is only available for debugging, it cannot be absolutely used for functional purposes at all.
The use of this port is recommended for advanced users.



# 5 HMI / PLC

The device is programmed by a development suite (Mect Suite - QT based), tailored to MECT products.
A tutorial specifically made for the device is available.
The Mect suite software run on Windows operative system.

## *5.1 System variables*

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".

Table 8

| Variable name | Description | R/W | Description |
|---|---|---|---|
| PLC_FWrevision | Revision | RO | Expansion firmware revision |
| PLC_HWconfig | HW configuration | RO | |
| PLC_DigDir_1<br>PLC_DigDir_2<br>PLC_DigDir_3<br>PLC_DigDir_4<br>PLC_DigDir_4<br>PLC_DigDir_5<br>PLC_DigDir_6<br>PLC_DigDir_7<br>PLC_DigDir_8 | Digital I/O type | RW | 1 bit to 8<br>1 output<br>0 input<br>bit 9 to 16 not used |
| PLC_AnInConf_1 | Analogue input configuration 1 | RW | Bit 0..3 input 1 configuration<br>• analogue input configuration 4 bit for each channel<br>• 0 not configured<br>• 1 current<br>• 2 voltage<br>• 3 TCJ (J type thermocouple)<br>• 4 TCK (K type thermocouple)<br>• 5 TCT (T type thermocouple)<br>• 6 PT100E (1 digit Resolution) range:<br>-40 +800°C<br>• 7 PT100R (0.1 digit Resolution) range:<br>-40 +200°C<br>• 8 TCS (S type thermocouple)<br>• 9 TCB (B type thermocouple)<br>• 10 TCR (R type thermocouple) |
| PLC_AnInConf_2 | Analogue input configuration 2 | RW | Bit 0..3 input 2 configuration<br>• analogue input configuration 4 bit |

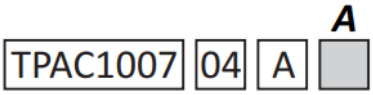
| | | | |
|---|---|---|---|
| | | | for each channel:<br>• 0 not configured<br>• 1 current<br>• 2 voltage<br>• 3 TCJ (J type thermocouple)<br>• 4 TCK (K type thermocouple)<br>• 5 TCT (T type thermocouple)<br>• 6 PT100E (1 digit Resolution) range:<br>-40 +800°C<br>• 7 PT100R (0.1 digit Resolution) range:<br>-40 +200°C<br>• 8 TCS (S type thermocouple)<br>• 9 TCB (B type thermocouple)<br>• 10 TCR (R type thermocouple) |
| PLC_AnInConf_3 | Analogue input configuration 3 | RW | Bit 0..3 input 3 configuration<br>• analogue input configuration 4 bit for each channel:<br>• 0 not configured<br>• 1 current<br>• 2 voltage<br>• 3 TCJ (J type thermocouple)<br>• 4 TCK (K type thermocouple)<br>• 5 TCT (T type thermocouple)<br>• 6 PT100E (1 digit Resolution) range:<br>-40 +800°C<br>• 7 PT100R (0.1 digit Resolution) range:<br>-40 +200°C<br>• 8 TCS (S type thermocouple)<br>• 9 TCB (B type thermocouple)<br>• 10 TCR (R type thermocouple) |
| PLC_AnOutConf_1 | Analogue output configuration 1 | RW | • 0 not configured<br>• 1 current<br>• 2 voltage<br>• 3 pwm |
| PLC_AnOutConf_2 | Analogue output configuration 2 | RW | • 0 not configured<br>• 1 current<br>• 2 voltage<br>• 3 pwm |
| PLC_AnOutConf_3 | Analogue output configuration 3 | RW | • 0 not configured<br>• 1 NOT USED<br>• 2 voltage<br>• 3 pwm |
| PLC_AnOutConf_4 | Analogue output configuration 4 | RW | • 0 not configured<br>• 1 NOT USED |

| | | | | |
|---|---|---|---|---|
| | | | • 2 voltage<br>• 3 pwm | |
| PLC_AnIn_1 | Analog input value 1 | 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: 0 ÷ 1800°C |
| | | | Conf 10: 0 ÷ 1500 resolution 1 digit | value: 0 ÷ 1500°C |
| PLC_AnIn_2 | Analog 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 | Analog 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 | value: 0 ÷ 600°C |

| | | | | |
|---|---|---|---|---|
| | | | resolution 1 digit | |
| | | | 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 temperature | RO | 0 ÷ 1000 resolution 1 digit | value: 0.0 ÷ 100.0 |
| PLC_Encoder | encoder value | RO | encoder value | |
| PLC_DigIn_1<br>PLC_DigIn_2<br>PLC_DigIn_3<br>PLC_DigIn_4<br>PLC_DigIn_5<br>PLC_DigIn_6<br>PLC_DigIn_7<br>PLC_DigIn_8<br>PLC_DigIn_9<br>PLC_DigIn_10<br>PLC_DigIn_11<br>PLC_DigIn_12 | digital input | RO | digital input value | |
| PLC_DigOut_1<br>PLC_DigOut_2<br>PLC_DigOut_3<br>PLC_DigOut_4<br>PLC_DigOut_5<br>PLC_DigOut_6<br>PLC_DigOut_7<br>PLC_DigOut_8 | digital outputs | RW | digital output command | |
| 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 2 | 0 ÷ 1000 |
| | | | Conf 3 | 0 ÷ 100 |
| PLC_AnOut_4 | Analogue output | RW | Conf 2 | 0 ÷ 1000 |

| | | | | |
|---|---|---|---|---|
| | 4 | | Conf 3 | 0 ÷ 100 |
| PLC_EncoderStart | Enable encoder | RW | 1: enable bidirectional encoder<br>2: enable up count only encoder<br>Input A = 0 counter UP<br>Input A = 1 counter down<br>Input B counter | |
| PLC_EncoderReset | Reset Encoder | RW | 1: encoder/counter reset | |
| PLC_ Heartbeat | Heartbeat | RO | I/O board Heartbeat | |
| PLC_time | Time | RO | time elapsed [s] | |
| PLC_timeMin | Time min | RO | start window 10 seconds | |
| PLC_timeMax | Time max | RO | end window 10 seconds | |
| PLC_AnIn…Filter | Average | RW | analogue input average | |
| PLC_timeWin | Time window | RW | graph window | |
| PLC_Version | PLC | RO | PLC version | |
| PLC_EngineStatus | Status | RO | PLC status | |
| PLC_ResetValues | Reset | RW | diagnostic variables reset | |
| PLC_Capture | | RO | time in (µs) between 2 edges of digital input IN9 | |
| PLC_buzzerOn | Buzzer | RW | buzzer sound (enable = 1 / disable = 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 (when alarm ) | RW | | |
| PLC_BUZZER | Buzzer | RW | enable dynamic buzzer sound (0x44332211 up=0x11(%) on=0x22(cs) off=0x33(cs) rep=0x44(times)) | |

# 6 How to order




***A*** *- Configuration*

| Option A | Option B | Option D | Option E | Configurations<br>Inputs / outputs |
|---|---|---|---|---|
| 2 | 2 | 3 | --- | Analog inputs 0÷10V, 0÷20mA, 4÷20mA, PT100, J, K, T, S, B, R |
| 2 | 2 | 2 | --- | Analog outputs 0÷10V, 0÷20mA, 4÷20mA, PWM |
| 2 | 2 | --- | --- | Analog outputs 0÷10V, PWM |
| 4* | 1 | 4* | --- | Digital inputs |
| 8 | 8 | 8 | 8 | Programmable digital inputs/outputs |
| --- | 3 | --- | --- | Analog inputs 0÷10V |
| 1 | 1 | 1 | 1 | RS485 2 wires optoisolated |
| --- | --- | --- | 1 | RS485 4 wires not optoisolated |

*** As an alternative A and D option: 1 mono/bidirectional encoder and 2 digital inputs**

All models are available in both **portrait** and **landscape** versions.

All models can use the **sMily remote connection and monitoring service.**