HMI - Operator Panel
TPX1070 Series
USER MANUAL

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1. Introduction

To ensure quick installation and commissioning of the devices described, we recommend that you carefully follow the information provided in this manual.

1.1. Staff qualification

The products described in this manual are to be used exclusively by personnel with experience in PLC programming, or technicians specialized in the use of electrical devices oriented to automation. MECT Srl declines all responsibility for malfunctions and damages caused by improper use of MECT devices, due to failure to comply with the information contained in this manual. MECT Srl has a technical assistance laboratory.

1.2. Symbols

Danger
Please follow this information to protect people from harm.

Warning
Please follow this information to protect your device.

Attention
Conditions that must be observed for a more effective installation

ESD (Electrostatic Discharge)
Warning: Possibility of damage to components due to electrostatic discharges

Note
Steps to follow for a correct installation

Additional Information

1.3. Nomenclature

PLC:	TP X1070
Terminals:	MPNC006;MPNC020; MPNC030; MPNC035
System:	PLC (TP X1070) plus terminals

1.4. Safety

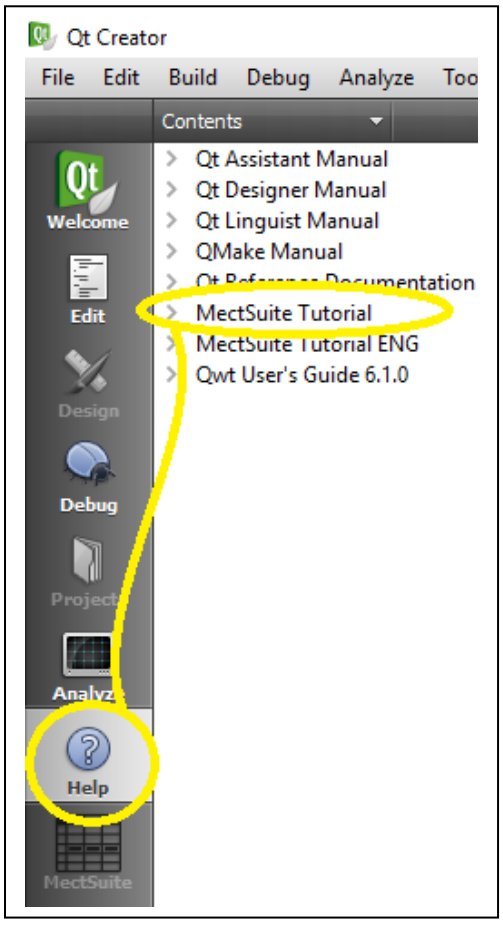
Attention
Turn off devices before working on terminals
ESD (Electrostatic Discharge)

The modules are equipped with electronic components that can be damaged by electrostatic discharge. Whenever you handle the modules, make sure that the environment is well grounded.

The instrument does not have an ON-OFF switch and an internal fuse, but it switches on immediately after supplying the correct supply voltage (check the supply voltage value indicated on the instrument label under the heading “Power”). Provide a power supply line that is as direct as possible and separate from the line that supplies the power elements .
For safety reasons, a two-phase disconnect switch with fuse must be provided near the appliance and easily accessible by the operator.
Avoid having power elements (contactors, motors, drives, etc.), excessive humidity, heat sources and corrosive gases in the same panel.
The instruments must be powered by safety transformers or SELV type power supplies.

1.5. REFERENCE MANUALS

Quick Start manuals (downloadable from the site) and **MectSuite Tutorial are the** MectSuite references for developing your own HMI and PLC applications.



2. System Description

7” touch -screen operator panel monitor with a resolution of 800 x 480 pixels and 262,000 colours.
The TPX1070 operator panel allows the supervision of devices connected to Modbus RTU and Modbus TCP networks. The networks are managed simultaneously by the TPX1070, and data from one network can be sent to another, thus creating a bridge between the two networks.
The TPX1070 operator panel also features two USB host ports . The USB allows the use of a USB stick for software updates and data logging.
On the TPX1070 there are up to 1kByte of retentive variables stored in flash.

A RAM-backed clock-calendar allows the date and time to be maintained for up to four months with the device turned off.
The TPX1070 operator panel is equipped with a soft PLC to perform process automation.
The instrument can be requested in horizontal execution or in vertical execution with the “V” option (see following figures).

Figure 1: TPX1070 front view (horizontal version)

Figure 2: TPX1070 front view (vertical version)

2.1. Characteristics

The TPX1070 operator panel is based on a microprocessor system implemented by a 454MHz ARM9.

Table 1

Hardware Features	
Processor	ARM926JE 454MHz
RAM	128MB
FLASH	128MB
Retentive variables	On FLASH memory
Real Time Clock	Present with rechargeable buffer battery
7” screen	TFT 800 x 480 pixels 262k colors
Touch screen	4 wire resistive
Ethernet	10Mbit/s - 100Mbit/s in self-recognition
2 USB	Host 2.0
2 Serial outputs	RS485 full duplex (via hardware configuration)
	RS485 half duplex
4 Digital output	0-24VDC - PNP
4 Digital input	0-24VDC - PNP
Software Features	
Operating system	LINUX
PLC	IEC61131-3
Graphics	Based on QT libraries
Modbus fieldbus	Modbus RTU Master/Slave
Mass storage	Possibility to save historical data
Fieldbus Features	
Modbus -RTU	Master / slave 2 or 4 wires
ModbusTCP	Client / Server
Model E (audio output)	
exits	2 x 8ohm speakers
entrance	1 microphone

Electromagnetic compatibility

Electromagnetic compatibility tests have been carried out at accredited laboratories, as required by the EN 61326-1, EN 61131-2 and EN 61000-6-2 standards.

3. Hardware Installation

The following figures show the mechanical dimensions of the operator panel. TPX1070.

3.1. Mechanical dimensions

View Side

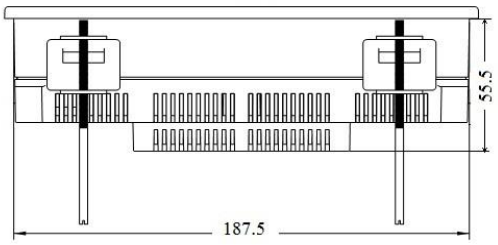


Figure 3

Rear View

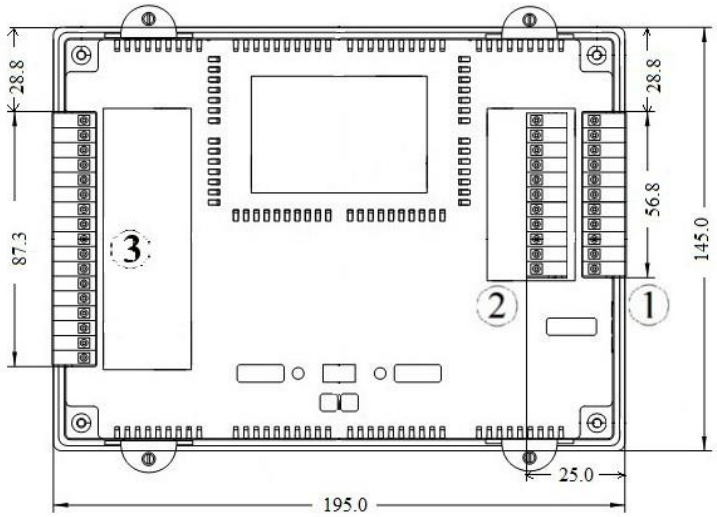


Figure 4

View Side

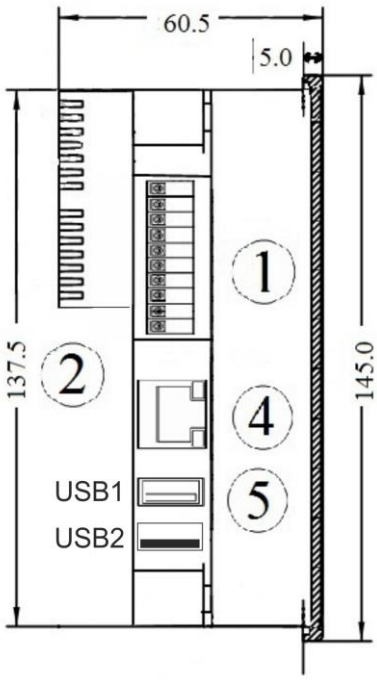


Figure 5

Table 2

MECHANICS	
Material	Polycarbonate , Polyamide 6 .6
Dimensions W x L x H	195 m m x 145 m m x 60.5 m m
Drilling template	138mm x 188mm
Instalatio n	front panel
Weather conditions	
Operating temperature	0 °C . . . 55 °C
Storage temperature	-20 °C ... + 8 5 °C
Relative humidity	5 % at 9 5 % without condensation
Electrical insulation	
Distance in air	In agreement with IEC 60664-1
Degree of pollution In agreement with IEC 61131-2	2
Degree of protection	
Rear protection level	IP 20
Front protection level	IP65

Attention
Install devices in electrical panels that do not exceed a temperature of 55°C.

3.2. Panel mounting

3.2.1. Distances

The system must be installed so that there is sufficient space for heat transfer, installation and wiring. Avoid overlapping cables to prevent electromagnetic compatibility problems.

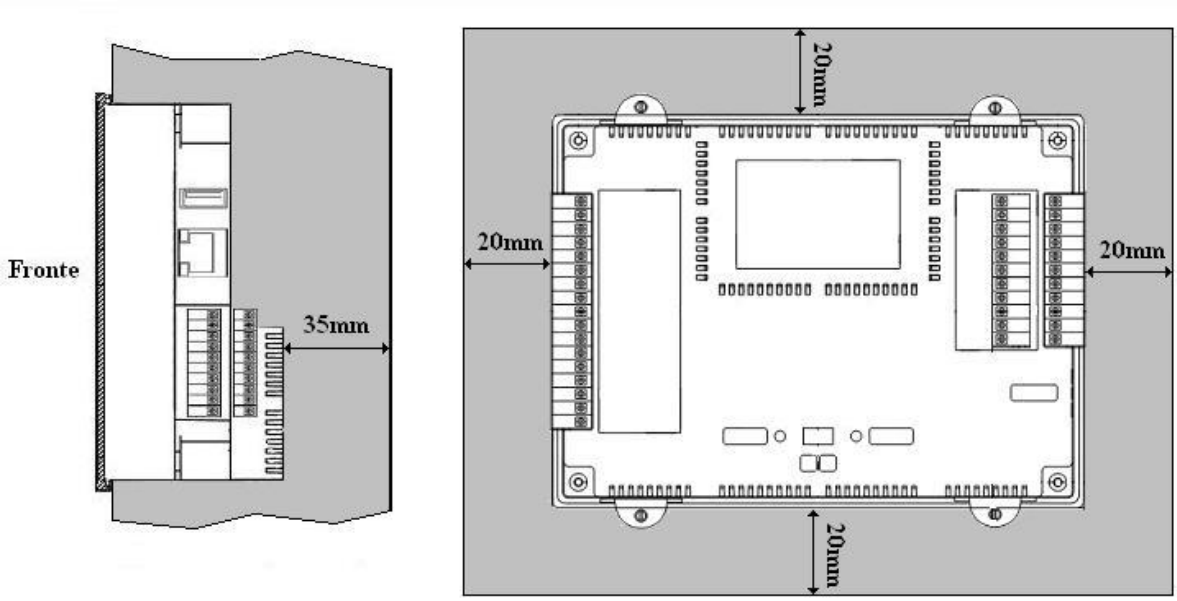


Figure 6A – Horizontal Mounting

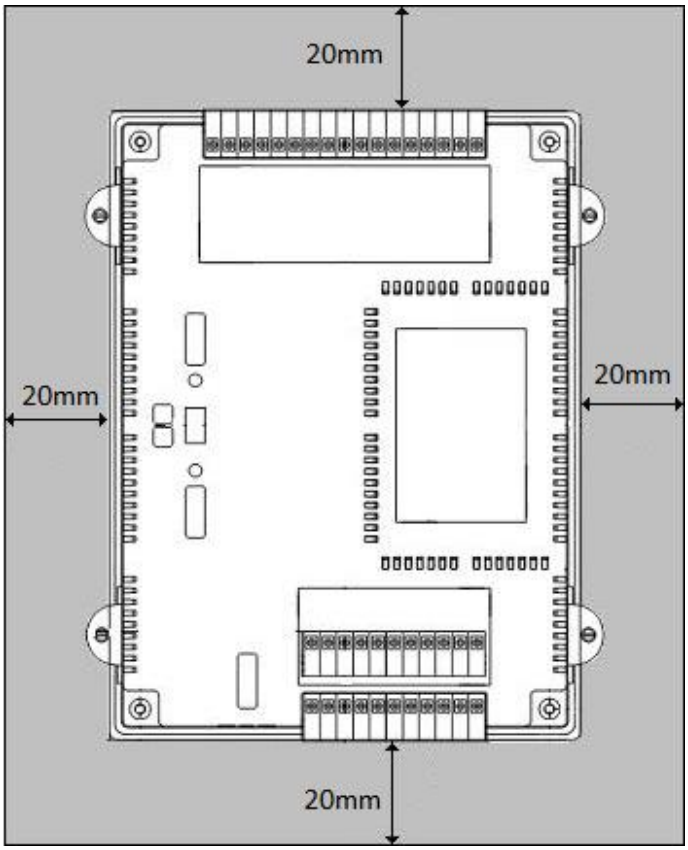


Figure 6B – Vertical mounting

4. TPX1070 Model D Wiring

4.1. Connections

The following figure shows the connection diagram with the various available inputs/outputs.

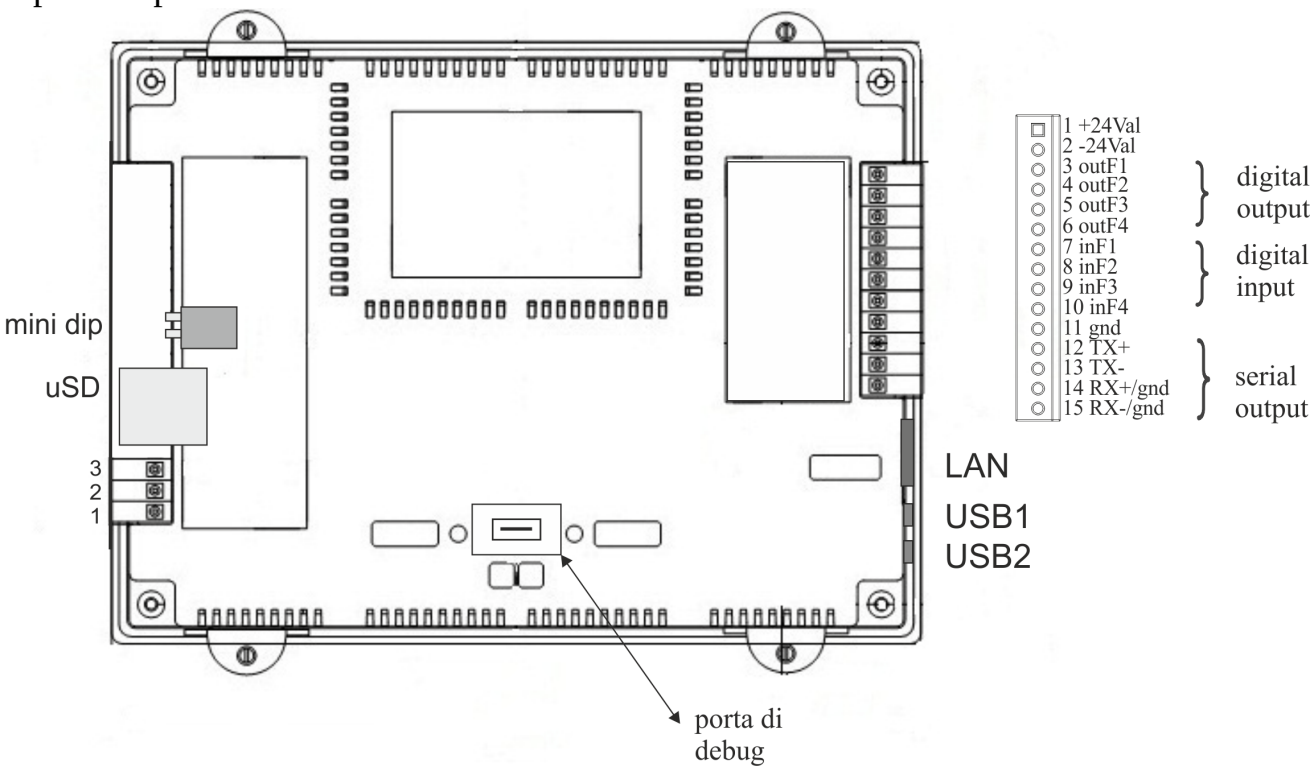


Figure 7

Model E:

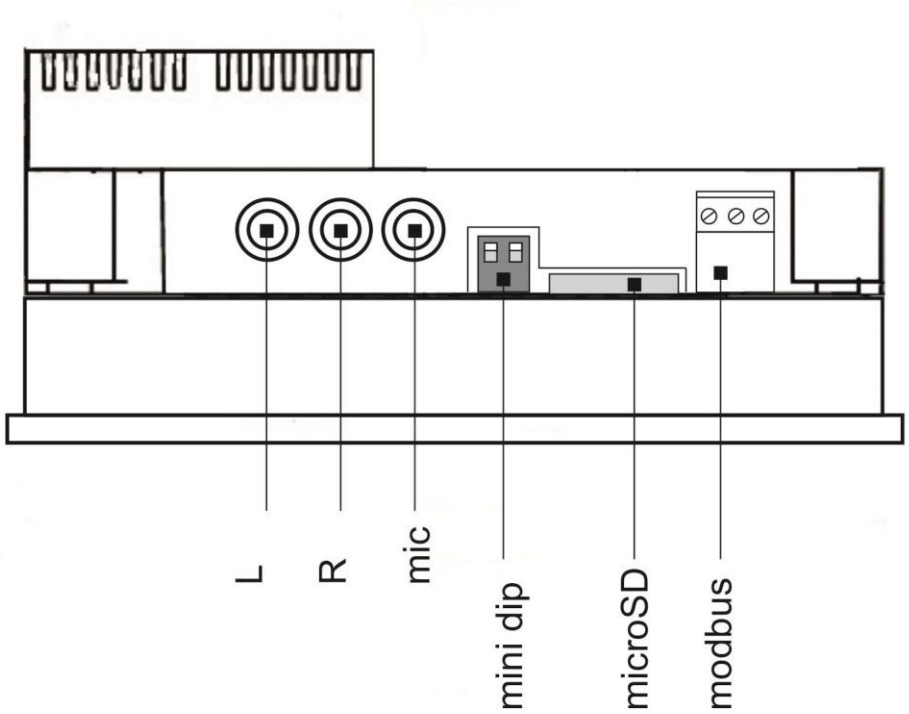


Figure 8

4.2. Power supply

4.2.1. System power supply

The TPX1070 requires a 12 ÷ 36Vdc power supply according to the diagram shown in the figure. The system is protected against reverse polarity of the power supply.

4.2.2. Fuses

The system does not provide internal fuses, however, to protect the input stage of the TPX1070 operator panel power supply, it is recommended to insert a 1A fuse.

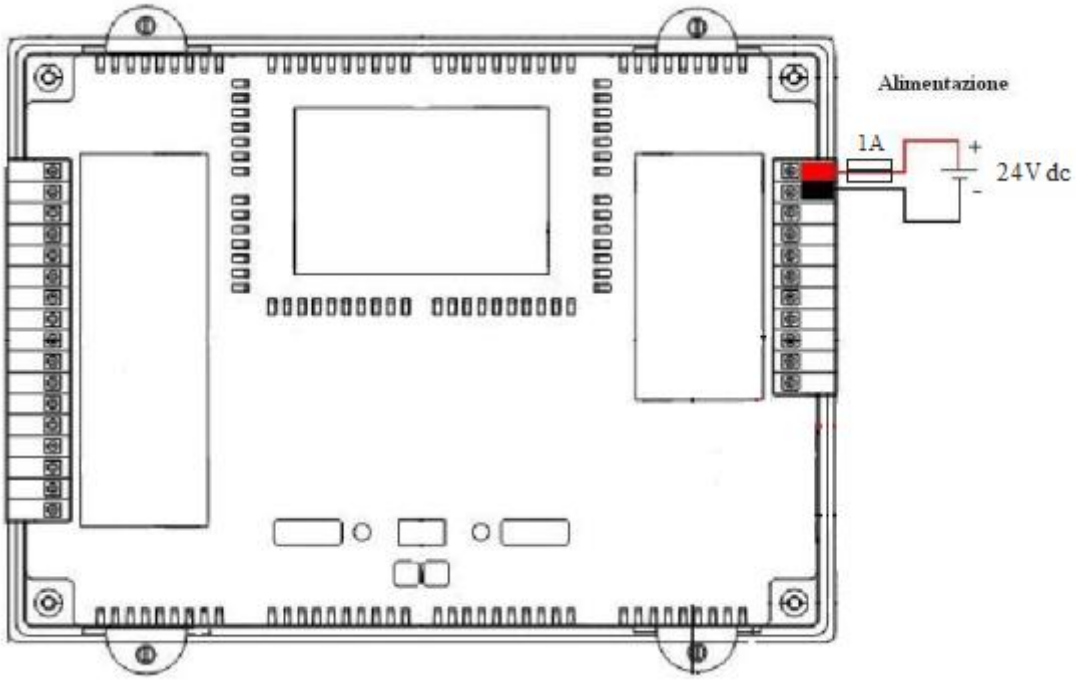


Figure 9

Attention
Using an incorrect power supply voltage may cause irreversible damage to the devices.

4.3. Modbus Connections - Full duplex

The Modbus interface on the TPX1070 operator panel is a 4-wire RS485 serial interface, made on the M2 terminal block at the pins indicated in the table.

Table 3

Pin	Signal	Description
11	GND	
12	TX +	Line + Transmission
13	TX -	Line - Transmission
14	RX +	Line + Reception
15	RX -	Line - Reception

This paragraph describes the example for the commissioning of a system composed of:

- MPNC006
- MPNC020
- MPNC030
- TPX1070

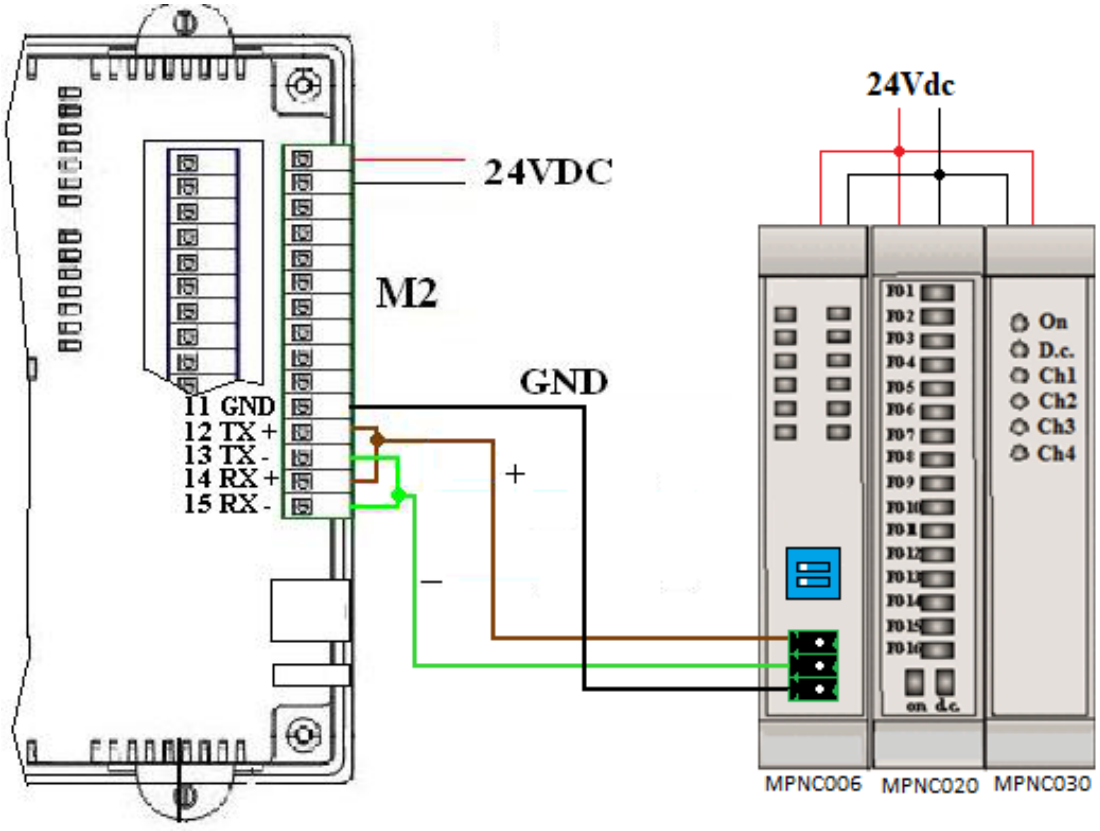


Figure 10

4.4. Modbus Connections - Half duplex

The TPX1070 operator panel provides a Modbus interface connected to the M3 terminal block at the pins indicated in the table.

Table 6

Pin	Signal
1	D+
2	D-
3	GNDiso

5. Peripherals

5.1. USB

The TPX1070 features two USB 2.0 host ports , which can be used for:

- update any existing software.
- save process data: datalogger .
- connect peripherals with USB interface such as printers, mouse, barcode reader,etc.

The connection of specific external peripherals is carried out upon customer request.

5.2. Ethernet

The TPX1070 operator panel is equipped with a 10/100Mbit/s auto-negotiating Ethernet port . Furthermore, the connection cable between the TPX1070 and a personal computer can be either direct or crossed.
The TPX1070 operator panel can be controlled by a personal computer via Ethernet. In practice, it is possible to control the inputs and outputs of the TPX1070 via the Ethernet network with a PC program.

6. HMI

To program the TPX1070 operator panel, it is necessary to develop software with the MectSuite, *QT Creator development environment,* customized for use with MECT operator panels, based on QT libraries. The use of the development software is the subject of a specific manual.
The QT Creator programming suite is available for Windows .

6.1. System variables

The system provides for the use of a maximum of 5472 variables which include: variables for internal use, variables for exchange with instruments on the Modbus network , retentive variables. The variables are defined with a tool made available by MECT.