PLC

USER'S MANUAL for TPLC050

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

ME7079_00
10/18

INDEX

1 Introduction

To ensure a quick installation of the device please follow carefully the informations given in this manual.

1.1 Staff qualification

Products described here are to be used exclusively by personnel with experience in programming PLCs, or technician specialized in the use of electrical device for automation. MECT S.r.l. declines any responsibility for malfunctions or damages caused by improper use of MECT devices, due to the non-compliance with informations in this manual. In MECT S.r.l there is an help desk service.

1.2 Symbols

Danger
Follow these advices to avoid people injury.

Warning
Follow these advices to protect the device.

Caution
Follow this advice to have a more effective performance.

ESD (Electrostatic discharge)
Danger: possibility of components damage due to electrostatic discharge.

Note
Steps to follow for a correct installation

Additional informations

1.3 Terms

PLC:	TPLC050
Terminals:	MPNC020; MPNC030, MPNC035
Operator Panel:	TP1070
System:	PLC (TPLC050) with terminals
TBUS:	Internal bus for communication between TPLC050 and terminals

1.4 Security

Attention
Switch off the devices before connecting them.

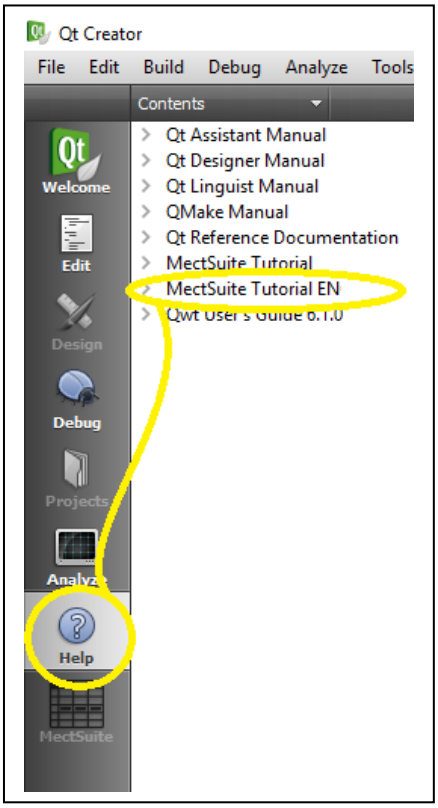
Attention
TPLC050 must be mounted inside cabinet or electrical switchboards whose access must be performed by qualified personnel.

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.

2 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.



2.1 System description

Il TPLC050 is an PLC equipped with digital I/O and analog inputs, fieldbus like Modbus, and a 100Mbit/s Ethernet interface. PLC TPLC050 is expandable with the modules of the MPNC family, including MPNC020; MPNC030; MPNC035.

The networks are managed simultaneously by TPLC050, and data from one network can be sent to another thus creating a bridge between the two networks.

On the PLC TPLC050 there is a USB host port, which allows the use of a key for software update and data log. Through a GPRS/UMTS or Wi-Fi key (optionally provided by Mect) it is possible to connect the operator panel to a Wi-Fi or Mobile network. The network setting is done from MENU → OPTIONS → NETWORK_CFG → tab “Wi-Fi” or tab “Mobile” via VNC.

It is possible to create a graphic page by which you manage plc (see chapter HMI).

On the PLC TPLC050 there are up to 192 retentive variables stored on flash and more than 4800 non retentive variables.

Figure 1: PLC TPLC050

The RS485 ModBus/RTU (slave or master) and Ethernet Modbus/TCP (client or server) interfaces allows the PLC TPLC050 to communicate with an operator panel, to display PLC variables.

Terminals of analog and digital type can be connected to the PLC TPLC050 (MPNC020; MPNC030; MPNC035); the communication between the terminals and the TPLC050 PLC takes place through an internal bus called TBUS.

2.2 Features

PLC hardware features	
PLC Processor	ARM926JE 454MHz
RAM	128MB
FLASH	128MB
Non volatile variables	On FLASH memory
Real Time Clock	Yes with rechargeable battery
Ethernet	10Mbit/s - 100Mbit/s self recognition
USB-A	Host 2.0
Micro SD	Not available
PLC software features	
OS	LINUX 2.35
PLC	IEC61131-3
Fieldbus	Modbus
Storage memory	Possibility of history storage
Fieldbus main features	
Modbus RTU	Master/Slave 2 wires
Modbus TCP	Server/Client

Power supply	
24VDC	± 15%
Absorption	150mA @ 24Vdc

Analog accuracy class	
Analog Inputs 1-2	0,5% Vfs

Mechanics	
Materials	Polycarbonate, Polyamide 6.6
Dimensions W x H x L	22 mm x 120 mm x 115 mm
Installation	DIN 35
Environmental conditions	
Operative temperature	0 °C ... 55 °C
Storage temperature	-20 °C ... +85 °C
Relative humidity	Da 5 % a 95 % no condensation
Electric isolation	
Air clearance	According to IEC 60664-1
Pollution according to IEC 61131-2	2
Degree of protection	
Rear protection	IP 20

		Input type	**Resolution**	**Note**
Analog inputs	N° 2	0÷20 mA	0.005mA	Input impedance 9Ω
		0÷10V	0.003V	Input impedance 500kΩ
		Thermocouples: J (0°C – 600°C) T (0°C – 400°C) K (0°C – 800°C) B (100°C – 1800°C) R (0°C – 1500°C) S (0°C – 1700°C)	1°C	Cold junction compensation
		PT100 E: -40°C +800°C	1°C	
		PT100 r: -40°C +200°C	0.1°C	

Configurable Digital I/O	N°8 (in1-in8 / out1 - out8)	PNP	PLC cycle time	200mA max for each output. 2A max all output.
Encoder Inputs	N°1 (in1 / in2)	PNP	PLC cycle time	Inputs **in1** and **in2** can be used as encoder Max input frequency: 40kHz din1: input A din2: input B

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.

Attention

Install the devices in electrical switchboards where temperature does not exceed 55 °C.

Dimensions

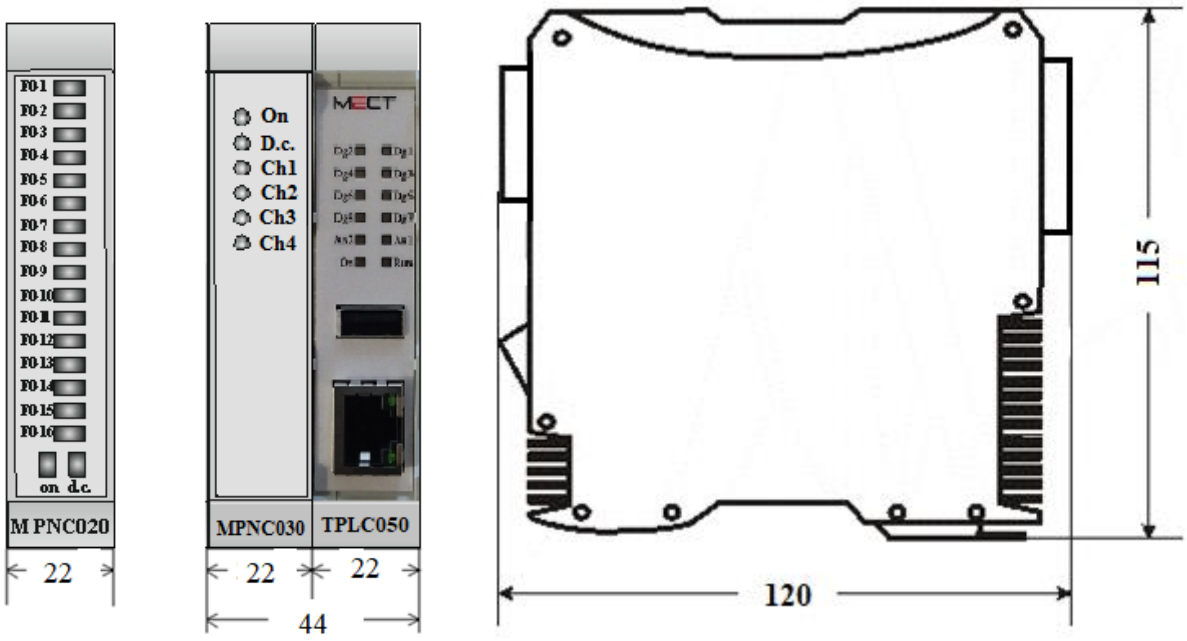


Figure 2: Dimensions

2.3 Installation

2.3.1 Distances

The system must be installed in a way that there is enough space for heat dissipation and cabling. Avoid cables superimposition to prevent EMC problems.

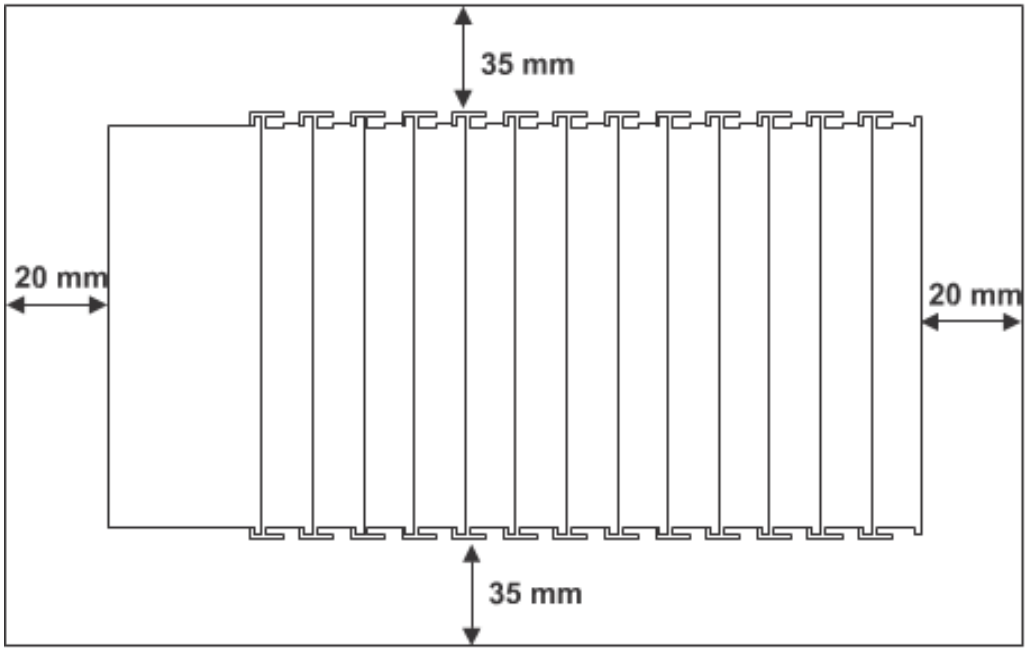


Figure 3

2.3.2 Insertion and removal of components

Attention
Before performing these operations make sure that devices are not supplied.

2.3.3 Assembly sequence

The insertion or removal of a single terminal is carried out by acting on the fastning hook to the DIN rail located at the base of the terminal itself as shown in the figure.

The sequence starts with the insertion of the PLC TPLC050, then the necessary terminals are inserted in sequence. The fixing to the DIN rail is guaranteed by the hooking spring of each terminal.

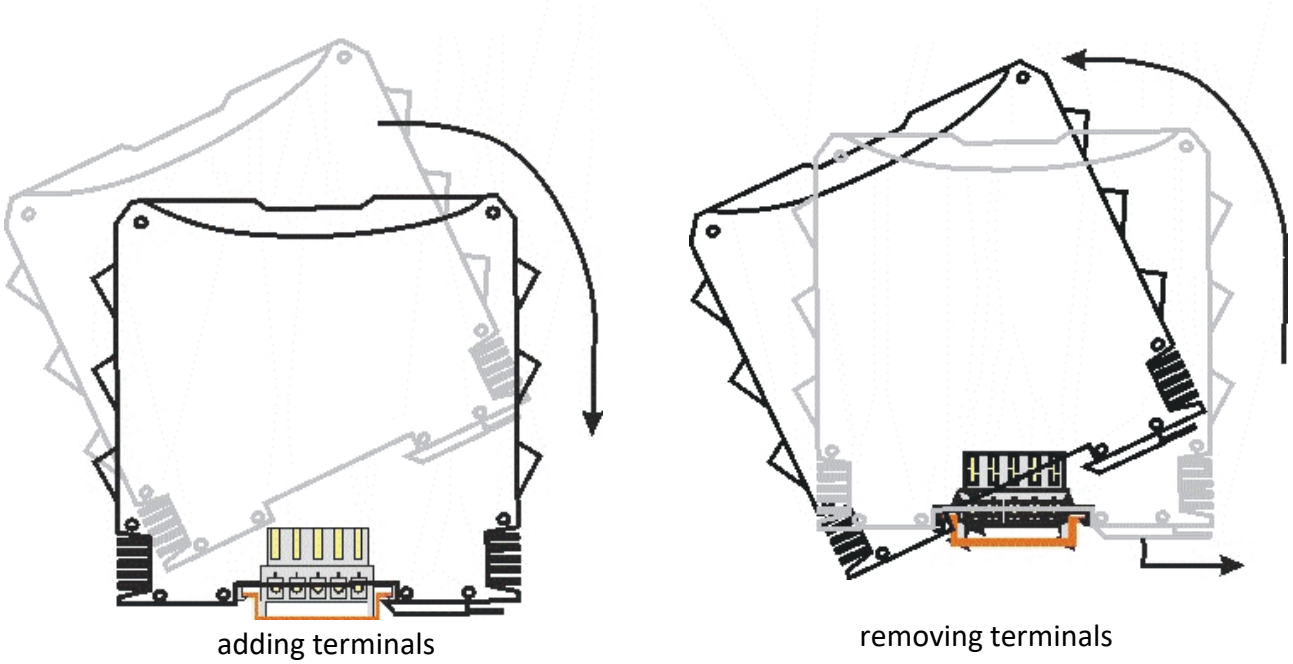


Figure 4: Insertion or removal of a terminal

The instruments must be assembled on the TBUS with the sequence shown in the figure.

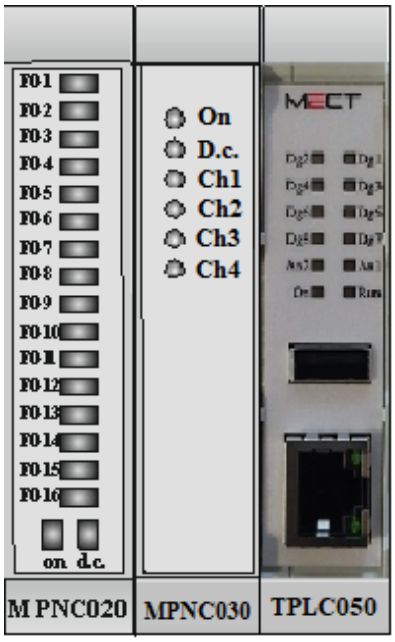


Figure 5: Assembly

2.3.4 Properties of DIN rail and TBUS

All the modules must be hooked directly onto DIN rail of type EN 50022 (DIN 35) on which the TBUS connection modules have been inserted, which creates the internal communication between the PLC (TPLC050) and terminals.

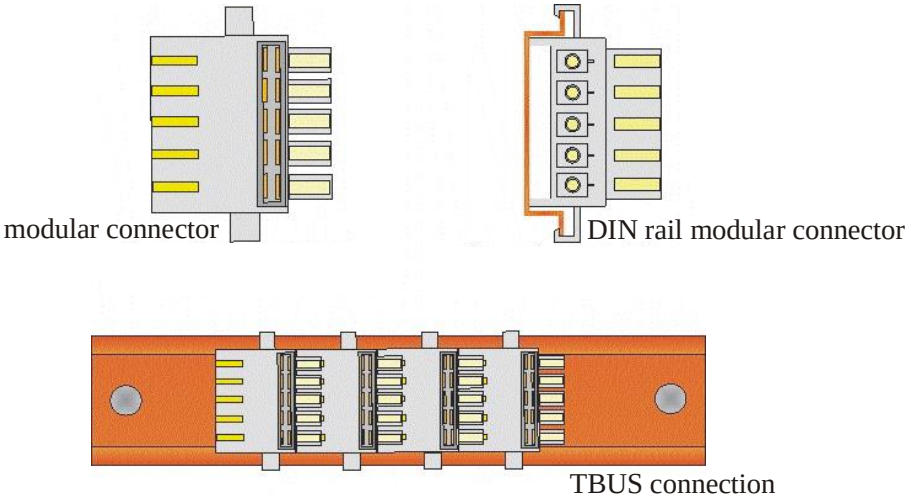


Figure 6: TBUS

3 TPLC050 Wiring

3.1 Power supply

3.1.1 Isolation

There are no galvanic isolation zones.

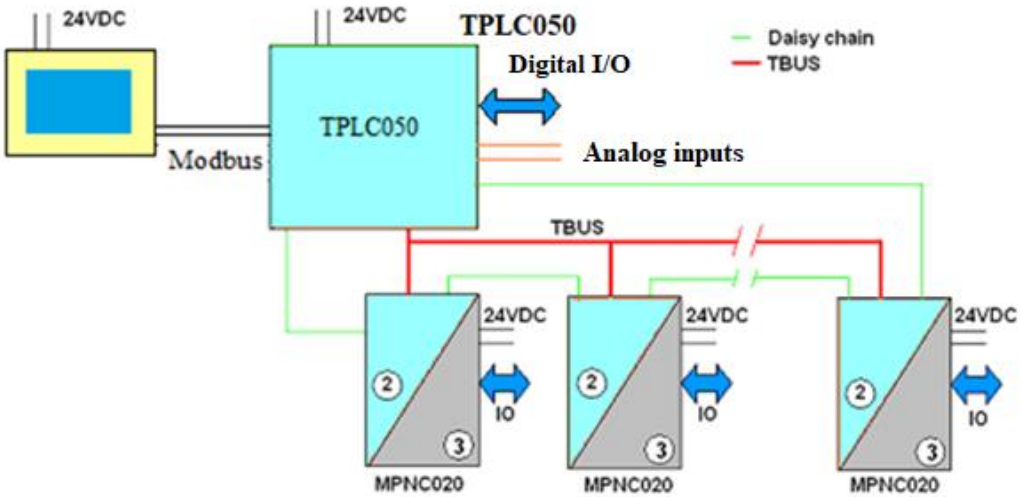


Figure 7: Logical wiring scheme

As you notice from the figure, on the PLC TPLC050 there are no zones that create an isolation between the main power supply and the internal bus (TBUS). Only on each terminal has an isolation barrier been created which allows the masses of each terminal to be separated from one another.

3.1.2 System power supply

The PLC TPLC050 requires a 24VDC (±15%) power supply as shown in the figure. The system is protected from the power supply polarity inversion.

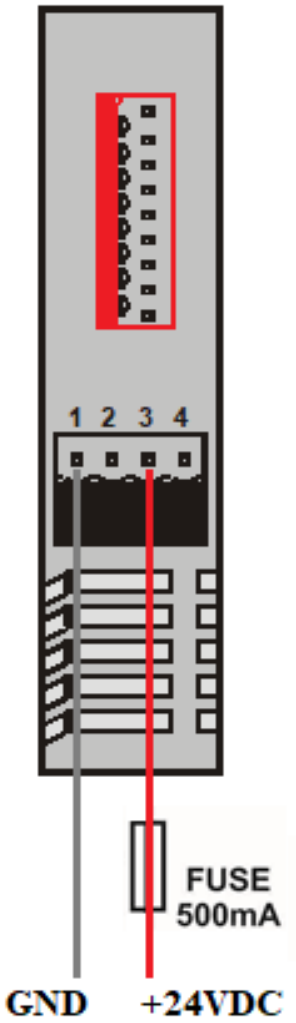


Figure 8: Power supply

Attention

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

3.1.3 Digital outputs power supply

The digital outputs of the TPLC050 can provide up to 2A maximum current at 24V. The maximum allowable current per single output is 200mA. The current supplied by the outputs is supplied by the power supply of the terminal itself: it is the responsibility of the installer to correctly size the power supply to guarantee the necessary current .

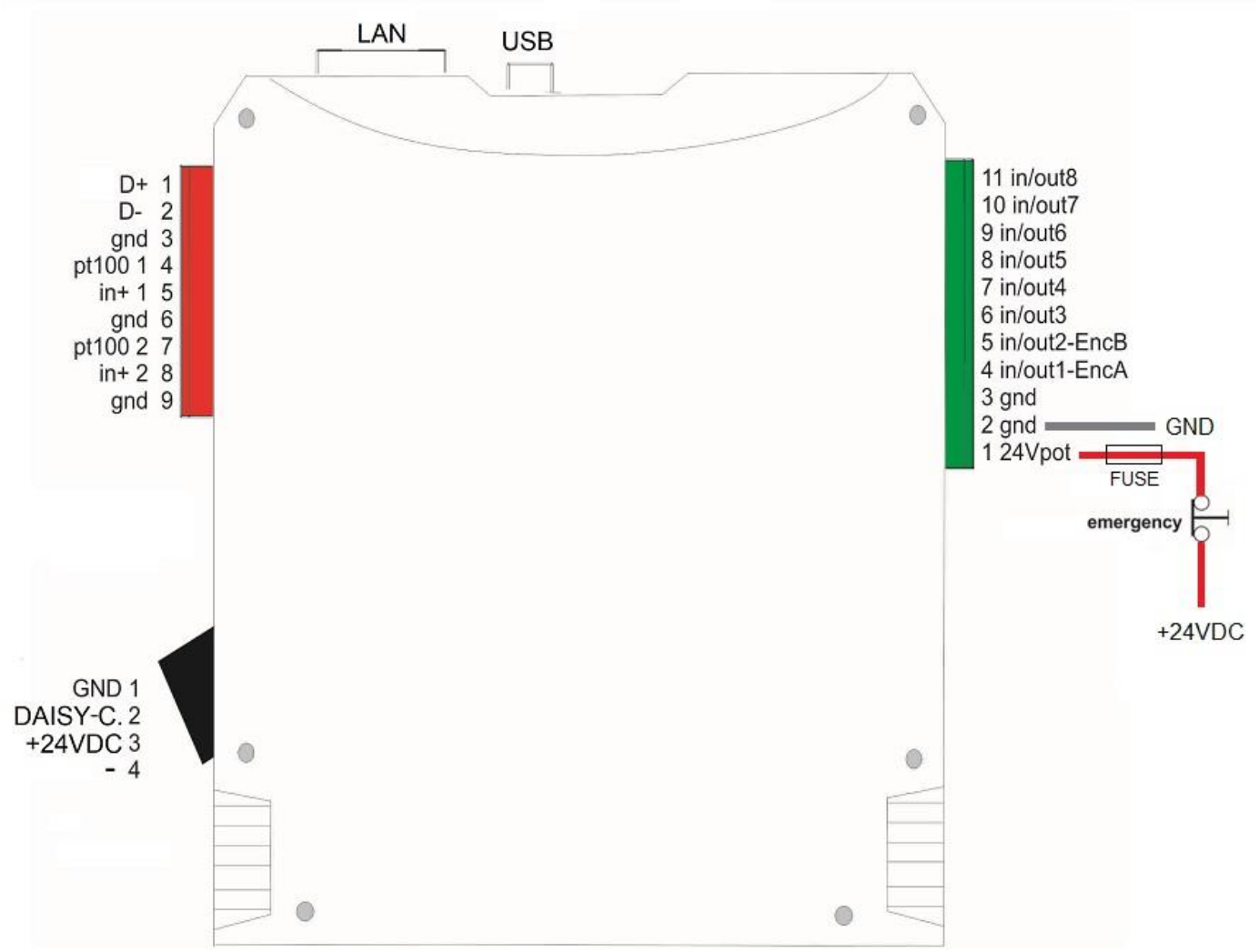


Figure 9

3.1.4 Fuses

The system has no fuses internally; however, for the protection of the input of the TPLC050 PLC power supply, it is recommended to insert a 0.5A fuse, while for the power it is necessary to put a 2,5A fuse.

3.1.5 Grounding

The DIN rail on which are mounted the PLC TPLC050 and the terminals must be carefully grounded in order to increase the rejection of electromagnetic disturbances.

3.1.6 Cable screen

To make the system less sensible to disturbances, the connection cable between the operator panel and the PLC TPLC050 should be screened and connected to both devices GND.

3.2 The daisy chain

The communication between the modules take place through a chain that propagates from the PLC TPLC050 till the last terminal . Make the connection as shown in the figure.

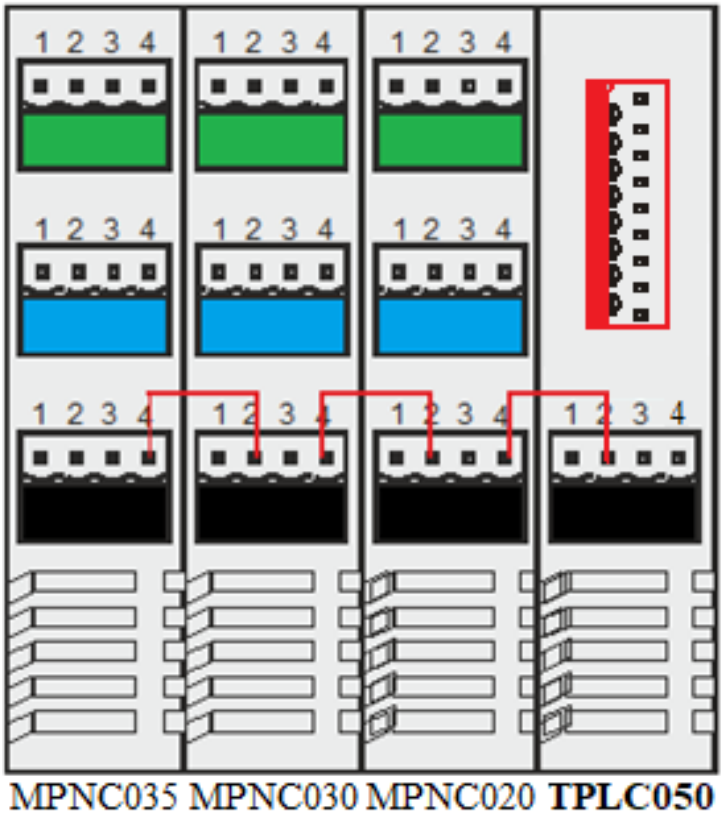


Figure 10: Wiring daisy chain

3.3 Inputs/Outputs connection

The TPLC050 is a PLC that can be used in its own way, it can be connected to a series of terminals of the MPNC series and connected via ModBus or Ethernet to a graphic terminal .

On the PLC TPLC050 are available:

- 8 Inputs – Output configurable via software
- 2 Universal analog inputs configurable via software

The figure below shows the terminal blocks for the connections on the PLC TPLC050.

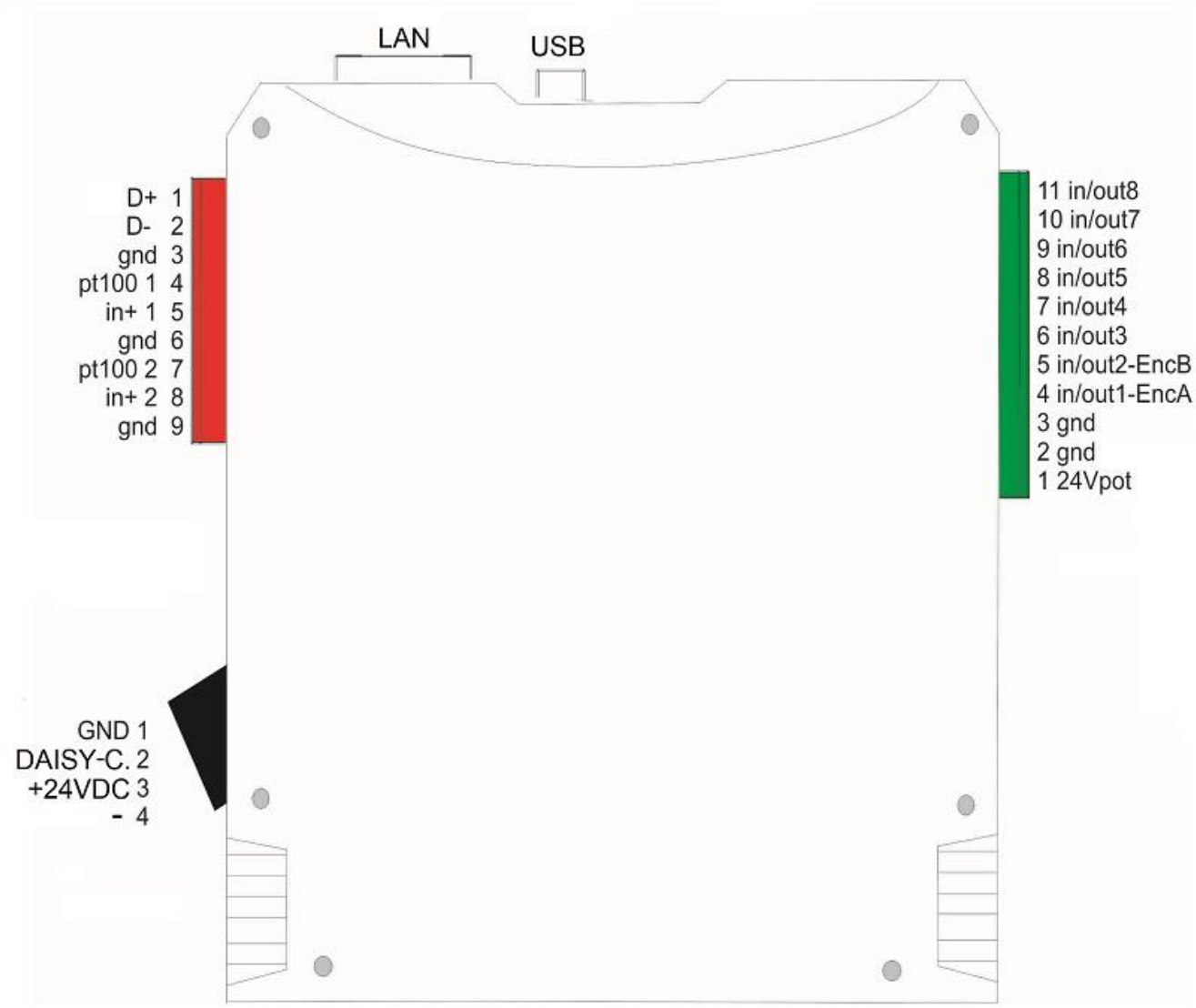


Figure 11: Connections

3.3.1 Analog inputs connection

3.3.1.1 Thermocouples wiring

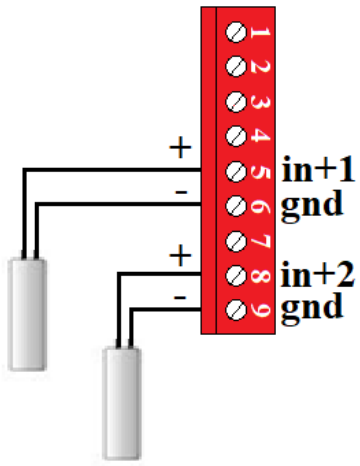


Figure 12: Analog inputs – thermocouples

3.3.1.2 Wiring for 4-20mA and 0-10V

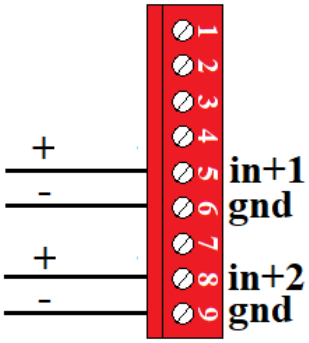


Figure 13: Analog inputs – voltage and current

Connection of a two wires transducer supplied by an external power supply:

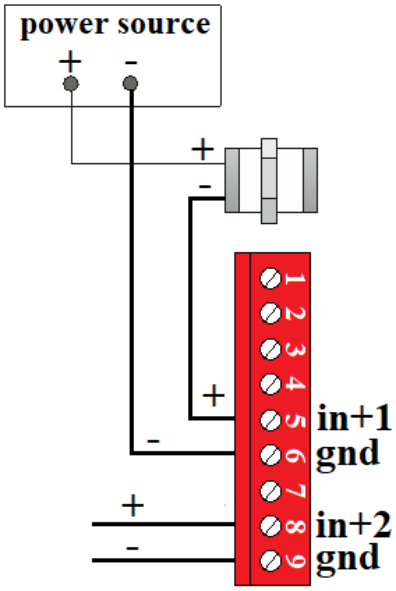


Figure 14: Analog inputs – voltage and current with external power supply

3.3.1.3 Wiring for PT100

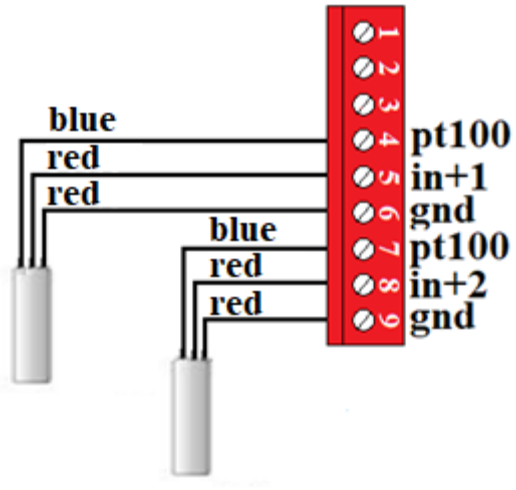


Figure 15: Analog inputs – PT100

3.3.2 Analog inputs configuration

The two analog inputs can be configured via software by setting the appropriate value in the configuration variable associated with the input.

The configuration variables defined in Crosstable are as follows:

Table 1

Variables	I	V	TC J	TC K	TC T	TC B	TC R	TC S	PT10R	PT100 E
PLC_AnInConf_1	1	2	3	4	5	8	9	10	7	6
PLC_AnInConf_2	1	2	3	4	5	8	9	10	7	6

Example:

Analogue input 1 configured as thermocouple J and analogue input 2 as voltage:

PLC_AnInConf_1 := 3;

PLC_AnInConf_2 := 2;

The configuration must take place within the "Init" program present in the PLC development software.

Once the configurations are set, the values are read in the variables:

Table 2

Variable	Current configuration resolution	Voltage configuration resolution
PLC_AnIn_1	0.005mA	0.003V
PLC_AnIn_2	0.005mA	0.003V

3.3.3 Digital input connection

If configured as inputs, the digital lines are of PNP type.

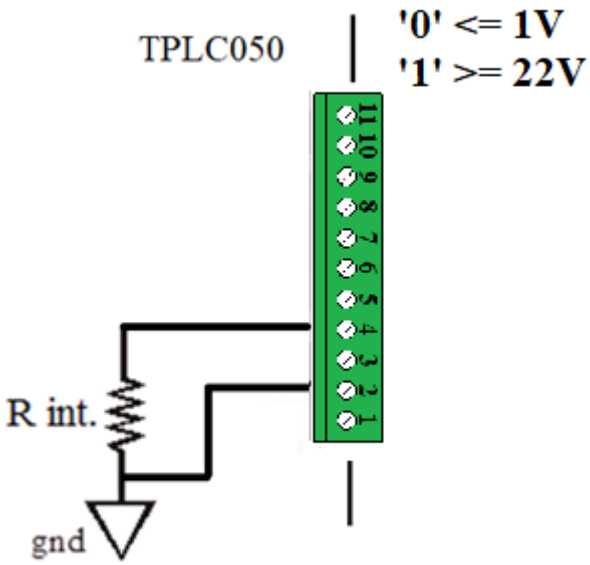


Figure 16: Digital inputs

3.3.3.1 Encoder connection

Bidirectional:

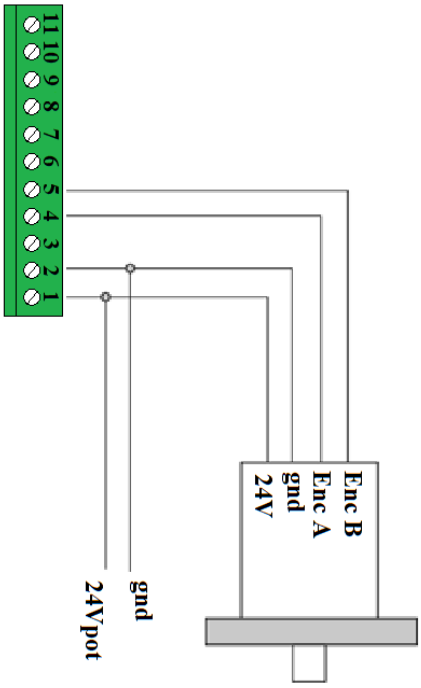


Figure 17: Digital inputs – bidirectional encoder

Monodirectional:

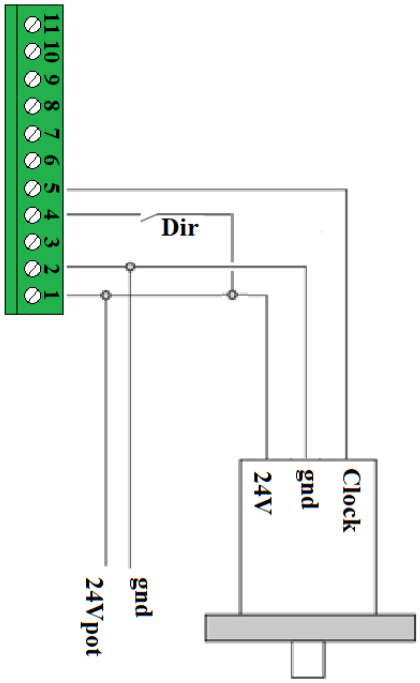


Figure 18: Digital inputs – monodirectional encoder

Connect the count(Clock) to the "din2" input while at the "din1" input the direction:

- din1 = 0 counter UP
- din1 = 1 (24V) counter down

3.3.4 Digital outputs connection

If configured as outputs, the digital lines are of PNP type.

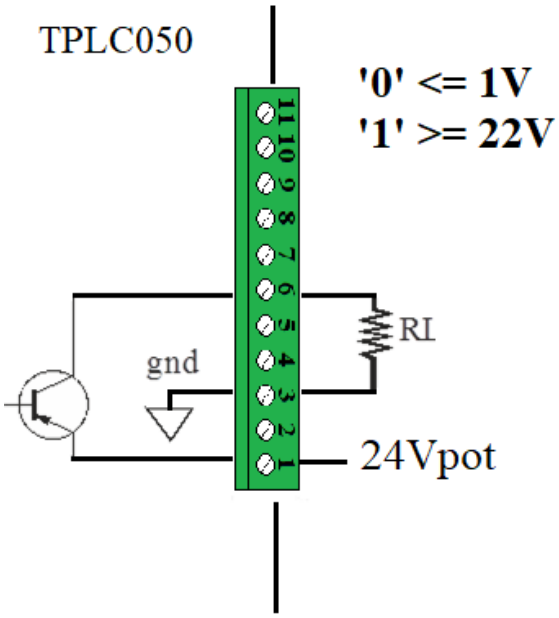


Figure 19: Digital outputs

3.3.5 Digital inputs and outputs configuration

The 8 digital lines can be configured via software by setting the appropriate value in the configuration variable.

The configuration variables defined in Crosstable is as follows:

Table 3

Variable	Input	Output
PLC_DigDir_1	0	1
PLC_DigDir_2	0	1
PLC_DigDir_3	0	1
PLC_DigDir_4	0	1
PLC_DigDir_5	0	1
PLC_DigDir_6	0	1
PLC_DigDir_7	0	1
PLC_DigDir_8	0	1

Example:

Digital Line 1 configuration as input and Digital Line 2 as output:

PLC_DigDir_1 := 0;

PLC_DigDir_2 := 1;

The configuration must take place within the "Init" program present in the PLC development software.

Once the configurations are set, the values are read/driven by the variables:

PLC_DigIn_1 (input)

PLC_DigOut_2 (output)

3.4 ModBus RTU connection

The ModBus RTU interface on the TPLC050 PLC is a 2-wire RS485 serial, realized on the 9-pole terminal block.

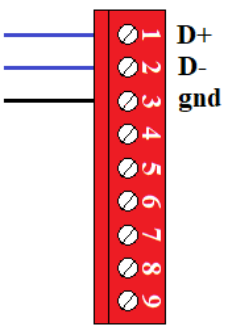


Figure 20: ModBus serial

4 State Led

The operative conditions of the TPLC050 PLC are indicated by the LEDs present on the rear part of the device.

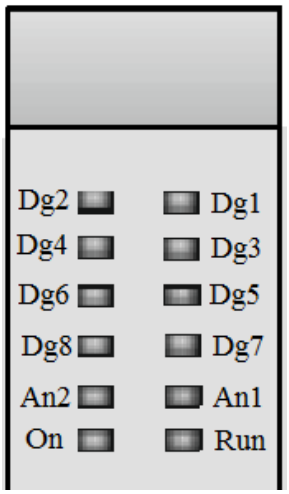


Figure 21: State Led

LED	Color	Signification
On LED	Green	System's life Led
Run LED	Red	Expansion modules presence or comunication with expansion modules Led
An-1 LED	Red	Analog channel 1 overflow Led
An-2 LED	Red	Analog channel 2 overflow Led

4.1 On Led

The on led flashes indicate that the TPLC050 PLC is switched on and in communication with the IO part.

4.2 Run Led

The Run led is responsible for signaling if the PLC is communicating correctly with the expansion modules; it is off if there are no expansion modules or if there are errors in configuration of the same.

4.3 Overflow Led

The overflow LEDs indicate if the signals on the analog inputs have exceeded the allowed values. The allowed value depends on the set configuration .

4.4 Digital I/O Leds

The eight LEDs of the digital I/O indicate if there is a voltage of 24V on the associated line.

5 System Variables

Variable Name	Description	R/W	Note
PLC_FirmwareVer	Revision	RO	Firmware Revision
PLC_HWconfig	HW Configuration	RO	
PLC_DigDir_1 PLC_DigDir_2 PLC_DigDir_3 PLC_DigDir_4 PLC_DigDir_4 PLC_DigDir_5 PLC_DigDir_6 PLC_DigDir_7 PLC_DigDir_8	Digital I/O type	RW	1 bit from 1 to 8: if 1 output if 0 input
PLC_DigIn_1 PLC_DigIn_2 PLC_DigIn_3 PLC_DigIn_4 PLC_DigIn_5 PLC_DigIn_6 PLC_DigIn_7 PLC_DigIn_8	Digital inputs	RO	Digital input value
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 outputs	RW	Digital outputs driving
PLC_AnInConf_1	Analog input 1 configuration	RW	Analog input configuration 4 bit per 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°C +800°C • 7 PT100R (0.1 digit Resolution) range: -40.0°C +200.0°C • 8 TCS (S type thermocouple) • 9 TCB (B type thermocouple) • 10 TCR (R type thermocouple)

PLC_AnInConf_2	Analog input 2 configuration	RW	Analog input configuration 4 bit per 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°C +800°C • 7 PT100R (0.1 digit Resolution) range: -40.0°C +200.0°C • 8 TCS (S type thermocouple) • 9 TCB (B type thermocouple) • 10 TCR (R type thermocouple)	
PLC_AnIn_1	Analog input value 1	RO	Conf 1: 0 ÷ 20000 resolution 5 digit	values: 0.0 ÷ 20.000mA
			Conf 2: 0 ÷ 10000 resolution 3 digit	values: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	values: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	values: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	values: 0 ÷ 400°C
			Conf 6: -40 ÷ 800 resolution 1 digit	values: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000 resolution 1 digit	values: -40.0 ÷ 200.0°C
			Conf 8: 0 ÷ 1710 resolution 1 digit	values: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	values: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	values: 0 ÷ 1500°C
PLC_AnIn_2	Analog input value 2	RO	Conf 1: 0 ÷ 20000 resolution 5 digit	values: 0.0 ÷ 20.000mA
			Conf 2: 0 ÷ 10000 resolution 3 digit	values: 0.0 ÷ 10.000V
			Conf 3: 0 ÷ 600 resolution 1 digit	values: 0 ÷ 600°C
			Conf 4: 0 ÷ 1200 resolution 1 digit	values: 0 ÷ 1200°C
			Conf 5: 0 ÷ 400 resolution 1 digit	values: 0 ÷ 400°C
			Conf 6: -40 ÷ 800 resolution 1 digit	values: -40 ÷ 800°C
			Conf 7: -400 ÷ 2000	values: -40.0 ÷ 200.0°C

			resolution 1 digit	
			Conf 8: 0 ÷ 1710 resolution 1 digit	values: 0 ÷ 1710°C
			Conf 9: 100 ÷ 1800 resolution 1 digit	values: 100 ÷ 1800°C
			Conf 10: 0 ÷ 1500 resolution 1 digit	values: 0 ÷ 1500°C
PLC_ColdJunctionT	Cold junction compensation	RO	0 ÷ 1000 resolution 1 digit	values: 0.0 ÷ 100.0
PLC_EncoderCounter	Encoder value	RO	encoder/counter value	
PLC_EnableEncoder	Enable encoder	RW	1: sets bidirectional encoder 2: sets counter 2: Input A = 0 counter UP Input A = 1 counter down Input B clock	
PLC_ResetCounter	Reset Encoder	RW	1: encoder/counter reset	
PLC_Heartbeat	Heartbeat	RO	I/O board working check	
PLC_Reboot	Daisy-chain	RW	daisy-chain reboot	
PLC_ModulesNumber	Nodes number	RO	number of nodes connected to the PLC	
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_AnInFltr_1…2	Filter	RW	analog input 1 average	
PLC_timeWin	Time window	RW	graph window	
PLC_Version	PLC	RO	PLC run time version	
PLC_EngineStatus	Status	RO	PLC status	
PLC_ResetValues	Reset	RW	diagnostic variables reset	
PLC_StatusWord	Status	RO	Device status. Bit 0: CPU recognized Bit 1: Tbus error Bit 2: connection with CPU Bit 3: over range value for analog input 1 Bit 4 over range value for analog input 2	

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	Buzzer	RW	beep volume (when buzzerOn)
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 Map register of additional modules (Inputs / Outputs)

The PLC TPLC050 can manage Mect terminals of MPNC series: MPNC020, MPNC030, MPNC035. The memory map in the following table.

WARNING: it is possible to directly import the variables associated to the registers into the Crosstable Editor. Press the right button in the table and select "Paste TPLC050 Modules". See the Crosstable variable (bold) in column "Notes" in the following table.

Register	Description	Notes	Type
22	Configuration MPNC30 (ANALOGUE INPUT) Module 1 channel 1 bit 0..3 channel 2 bit 4..7 channel 3 bit 8..11 channel 4 bit 12..15 configuration values: Hex 01: 0-20mA Hex 02: 0-10V Hex 03: Thermocouple J Hex 04: Thermocouple K Hex 05: Thermocouple T Hex 06: PT100E -40°C 800°C Hex 07: PT100R -40.0°C 200.0°C Hex 08: not configured	Saved in permanent storage variables: 0-10V default configuration PLC configuration example: Channel 1 = PT100E Channel 2 = 0-10V Channel 3 = Termocop. J Channel 4 = Termocop.K **YY_AnInConf_A := 16#4326;**	R/W
23	Configuration MPNC30 Module 2: See module 1	**YY_AnInConf_B**	R/W
24	Configuration MPNC30 Module 3: See module 1	**YY_AnInConf_C**	R/W
25	Configuration MPNC30 Module 4: See module 1	**YY_AnInConf_D**	R/W
26	channel 1 value module 1 current configuration: values 0..20000(milliampere x 1000) voltage configuration: values 0..10000 (volts x 1000) Thermocouple J : (Celsius deg) Thermocouple K : (Celsius deg) Thermocouple T : (Celsius deg) PT100E (Celsius deg) PT100R (Celsius deg per 10)	**YY_AnIn_A_1**	R
27	Channel 2 value module 1 MPNC030	See description module 1 **YY_AnIn_A_2**	R
28	Channel 3 value module 1 MPNC030	See description module 1 **YY_AnIn_A_3**	R
29	Channel 4 value module 1 MPNC030	See description module 1 **YY_AnIn_A_4**	R
30	Channel 1 value module 2 MPNC030	See description module 1 **YY_AnIn_B_1**	R
31	Channel 2 value module 2 MPNC030	See description module 1 **YY_AnIn_B_2**	R

32	Channel 3 value module 2 MPNC030	See description module 1 **YY_AnIn_B_3**	R
33	Channel 4 value module 2 MPNC030	See description module 1 **YY_AnIn_B_4**	R
34	Channel 1 value module 3 MPNC030	See description module 1 **YY_AnIn_C_1**	R
35	Channel 2 value module 3 MPNC030	See description module 1 **YY_AnIn_C_2**	R
36	Channel 3 value module 3 MPNC030	See description module 1 **YY_AnIn_C_3**	R
37	Channel 4 value module 3 MPNC030	See description module 1 **YY_AnIn_C_4**	R
38	Channel 1 value module 4 MPNC030	See description module 1 **YY_AnIn_D_1**	R
39	Channel 2 value module 4 MPNC030	See description module 1 **YY_AnIn_D_2**	R
40	Channel 3 value module 4 MPNC030	See description module 1 **YY_AnIn_D_3**	R
41	Channel 4 value module 4 MPNC030	See description module 1 **YY_AnIn_D_4**	R
42	DIGITAL OUTPUT values module 01 MPNC020 02 Bit 1..16	**YY_DigOut_A_1** **…..** **YY_DigOut_A_16**	R/W
43	DIGITAL OUTPUT values module 02 MPNC020 02 Bit 1..16	**YY_DigOut_B_1** **…..** **YY_DigOut_B_16**	R/W
44	DIGITAL OUTPUT values module 03 MPNC020 02 Bit 1..16	**YY_DigOut_C_1** **…..** **YY_DigOut_C_16**	R/W
45	DIGITAL OUTPUT values module 04 MPNC020 02 Bit 1..16	**YY_DigOut_D_1** **…..** **YY_DigOut_D_16**	R/W
46	DIGITAL INPUT values module 1 MPNC020 01 Bit 1..16	**YY_DigIn_A_1** **…..** **YY_DigIn_A_16**	R
47	DIGITAL INPUT values module 2 MPNC020 01 Bit 1..16	**YY_DigIn_B_1** **…..** **YY_DigIn_B_16**	R
48	DIGITAL INPUT values module 3 MPNC020 01 Bit 1..16	**YY_DigIn_C_1** **…..** **YY_DigIn_C_16**	R
49	DIGITAL INPUT values module 4 MPNC020 01 Bit 1..16	**YY_DigIn_D_1** **…..** **YY_DigIn_D_16**	R
50	Configuration MPNC035 (ANALOGUE OUTPUTS)	Configuration example in	

	Module 1 channel 1 bit 0..3 channel 2 bit 4..7 channel 3 bit 8..11 channel 4 bit 12..15 Configuration values: Hex 01: 0-20mA Hex 02: 0-10V	PLC: Channel 1 = mA Channel 2 = mA Channel 3 = V Channel 4 = V **YY_AnOutConf_A := 16#2211;**	
51	Configuration MPNC035 Module 2: See module 1	**YY_AnOutConf_B**	R/W
52	Configuration MPNC035 Module 3: See module 1	**YY_AnOutConf_C**	R/W
53	Configuration MPNC035 Module 4: See module 1	**YY_AnOutConf_D**	R/W
54	Channel 1 value module 1 MPNC035 current configuration: values 0..20000(milliampere x 1000) voltage configuration: values 0..10000 (volts x 1000)	**YY_AnOut_A_1**	R/W
55	Channel 2 value module 1 MPNC035	**YY_AnOut_A_2**	R/W
56	Channel 3 value module 1 MPNC035	**YY_AnOut_A_3**	R/W
57	Channel 4 value module 1 MPNC035	**YY_AnOut_A_4**	R/W
58	Channel 1 value module 2 MPNC035	**YY_AnOut_B_1**	R/W
59	Channel 2 value module 2 MPNC035	**YY_AnOut_B_2**	R/W
60	Channel 3 value module 2 MPNC035	**YY_AnOut_B_3**	R/W
61	Channel 4 value module 2 MPNC035	**YY_AnOut_B_4**	R/W
62	Channel 1 value module 3 MPNC035	**YY_AnOut_C_1**	R/W
63	Channel 2 value module 3 MPNC035	**YY_AnOut_C_2**	R/W
64	Channel 3 value module 3 MPNC035	**YY_AnOut_C_3**	R/W
65	Channel 4 value module 3 MPNC035	**YY_AnOut_C_4**	R/W
66	Channel 1 value module 4 MPNC035	**YY_AnOut_D_1**	R/W
67	Channel 2 value module 4 MPNC035	**YY_AnOut_D_2**	R/W
68	Channel 3 value module 4 MPNC035	**YY_AnOut_D_3**	R/W
69	Channel 4 value module 4 MPNC035	**YY_AnOut_D_4**	R/W

7 Peripherals

7.1 USB

The PLC model TPLC050 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.

7.2 Ethernet

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

The PLC model TPLC050, by Ethernet, can be controlled by a personal computer, it is possible to control the I/O of PLC by means of a program on a PC.

8 HMI

With PLC TPLC050, also if it has not a PLC interface monitor, it is possible to create graphic pages in order to manage/visualize/control the machinery.

You can look at the graphic page:

- On field, using a pc and a VNC connection;
- Remotely, thanks to the sMily remote connection service that allows you to manage the PLC from your smartphone and/or pc.