

Installation Manual

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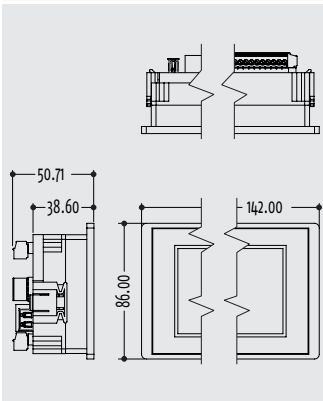
- Installation
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Integrated system, CPU module with on-board display and I/O



Installation

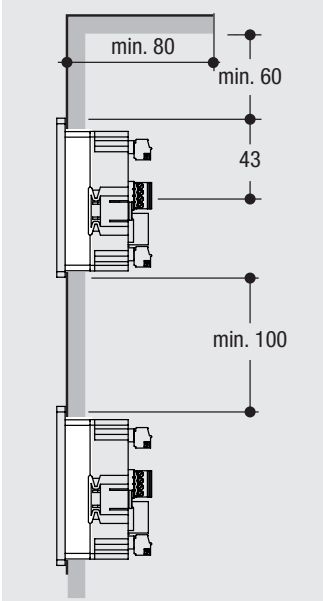
Dimensions (mm)



Mounting position

- Mount the CPU in a 75 x 130 mm hole;
- In order to help the air ventilation flow, respect the distances between the CPUs and walls or other CPUs.

Mounting position (mm)



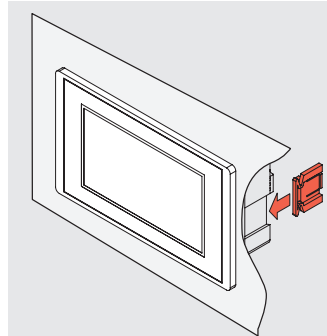
Disposal



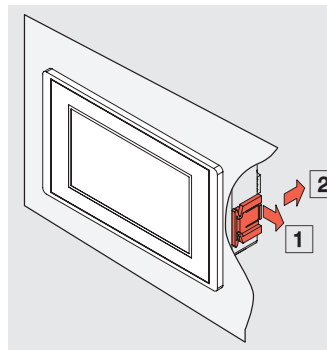
The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

Mount and remove the CPU

- 1 Open a 75 x 130 mm hole in the mounting panel;
- 2 Insert the CPU into the hole until the frame rests on the panel;
- 3 Mount the two red blocks and slide them until they are in contact with the panel and hold the CPU in place;



- 4 To remove the CPU, disconnect the terminals, then remove the red blocks and invert the mounting sequence.



Operating conditions

Environmental condition		ACCE	Suggestion
Operating conditions	Temperature	-20...+50°C	
	%Rh	Rh: 5... 95% non condensing	
Special conditions	Temperature	> 50°C	Use forced ventilation
	%Rh	> 95% RH	Warm up
Forbidden conditions	Conducting atmosphere		Use filter
	Corrosive atmosphere		
	Explosive atmosphere		

- For indoor use only.
- Max. usage altitude: 2000 m on the sea level.

Wiring rules

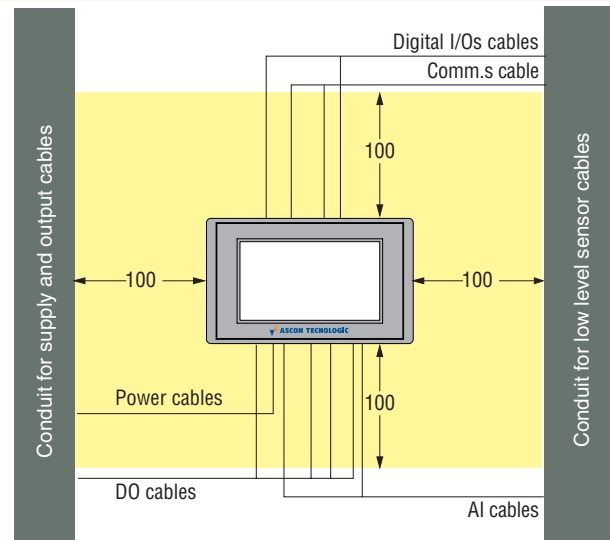
Description	Plugs of all terminals	
Flexible cable section:	Pitch 5 mm:	0.2... 2.5 mm ² (AWG24... AWG12)
	Pitch 3.5 mm:	0.14... 1.5 mm ² (AWG28... AWG16)
Stripped wire	Screw: 7mm	
Flat blade screwdriver	Pitch 5 mm: 0.6 x 3.5 mm	Pitch 3.5 mm: 0.4 x 2.5 mm
Tightening torque	Pitch 5 mm:	0.5... 0.6 Nm
	Pitch 3.5 mm:	0.22... 0.25 Nm

Technical data:

- The green terminals are male connectors (pitch 3.5 or 5 mm), the correspondent female connectors have screw or spring terminals for connecting the wires;
- Made with self extinguishing material as required by UL94 V0 standard;
- Overvoltage category/pollution degree II/2;
- Max. load current/section 8A/2.5mm² at 65°C;
- Test pulse voltage: 4 kVp.

- ⚠ **Make sure that the overall current absorption (modules and field devices) matches the power supply.**
- ⚠ **In order to avoid excessive voltage drops, install the most power consuming modules closer to the power supply.**

Suggested wires routing



- ⚠ **Despite the fact that the instrument has been designed to work in an harsh and noisy environment, it is strongly recommended to follow the following suggestions.**

All the wiring must comply with the local regulations. Avoid to use electromagnetic contactors, power relays and high power motors nearby. Avoid power units nearby, especially if controlled in phase angle. Keep the low level sensor input wires away from power lines and output cables. Power lines and output cables must also be at **100 mm** (min.) away from the CPU. If this is not achievable, use shielded cables on the sensor inputs, with the shield connected to earth at only one side.

- ⚠ **Warning!** Whenever a failure or a malfunction of the device may cause dangerous situations for persons, things or animals, please remember that the plant must be equipped with additional devices which will guarantee safety.

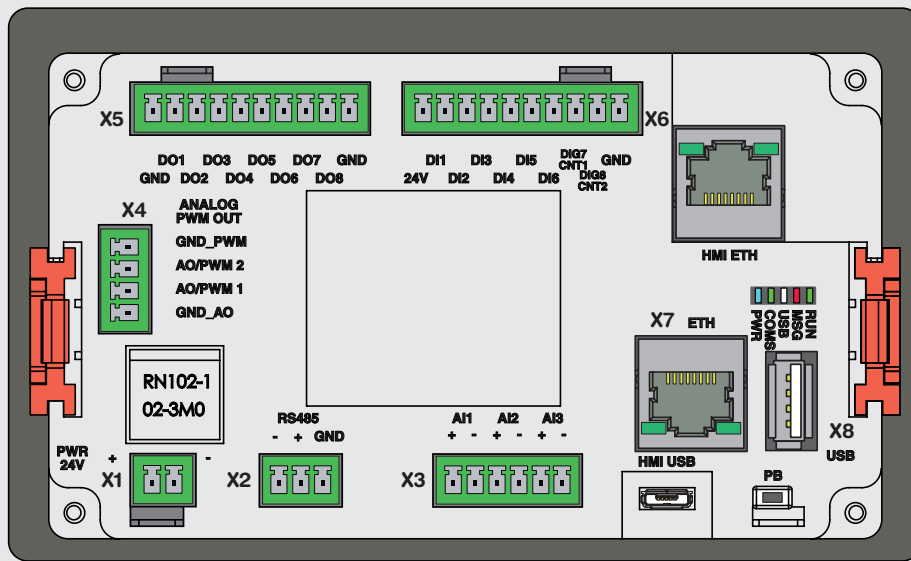
Electrical connections

Terminals connections and plugs



Warning!

In the drawing and in the table that follow, are listed and briefly described all the terminals present on the vP4 system. The different Digital input options (8 DI or 6 DI + 2 Frequency Counter inputs) must be specified while composing the Order Code.



Conn.	Label	Connection	Signals
X1	PWR 24 V	+	+24 Vdc Power Supply
		-	0 Vdc Power Supply
X2	COM	D-	RS485 Serial Port
		D+	
		C	
X3	IN1... IN3	-	Generic Analogue Input 1... 3 terminals (mA, TC, Pt100, Pt1000, NTC, Potentiometer, Voltage)
		+	
X4	AO/PWM	PWM Ground	Generic PWM Outputs Ground
		AO/PWM2	Generic Output 2 (mA, PWM DO)
		AO/PWM1	Generic Output 1 (mA, PWM DO)
		AO Ground	Generic AO Ground
X5	DO1... DO8	GND	Ground reference for Digital Output (max. current: 1.6 A)
		DO1... DO8	Digital Output 1... 8 (24 V, 0.5 A each max.)(Warning)
		24V	+24 Vdc Digital Inputs Power Supply
		DI1... DI8	24 Vdc Digital Input 1... 8 (EN61131 - type 1, 2 and 3) (Warning)
X6	DI1... DI8	GND	Ground reference for Digital Inputs
		GND	Special Inputs 1... 2 Common Terminal
	CNT1... CNT2	CNT1... CNT2	Pulse Counter, Frequency Meter CNT1... CNT2 or Digital Input 7... 8 (Warning)
X8	USB		USB type A port
X7	ETH		RJ45 10/100 Ethernet port

Near the X8 USB connector are present 5 diagnostic LEDs (COM, USB, MSG, PWR) fully described in the vP4 User Guide.



Warning!

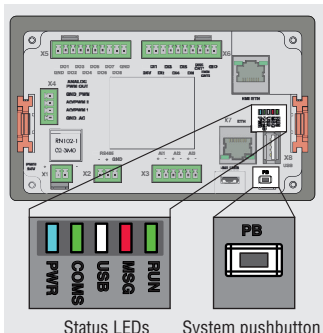
Digital Outputs DO1... DO8 (connector X5) are 24 V active outputs. **The current consumption of each output must not exceed 0.5 A and their cumulative output current must be less than 1.6 A** (whatever the feeding method).



Warning!

Counter Inputs CNT1 and CNT2 are installed as an alternative to Digital Inputs DI7 and DI8

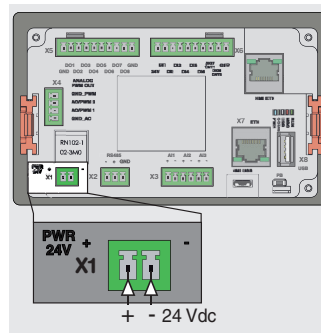
System Pushbutton and Status LEDs



- Near the X8 USB connector is present the System Pushbutton fully described in the vP4 User Guide
- The 5 Status LEDs are: COM (green), USB (white), MSG (RED), PWR (blue) and RUN (green).
- The meaning of the various LEDs behaviours are fully described in the "vP4 User Manual".

The system pushbutton performs different operations accordingly to the system status but does not restart the CPU or the 1131 application.

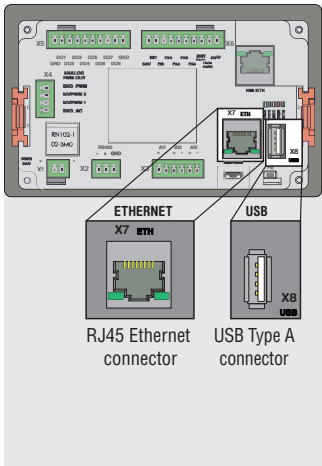
X1 - Power supply



- Connector X1: 24 Vdc (-10... +15%);
- Device power consumption: **10 W max..**

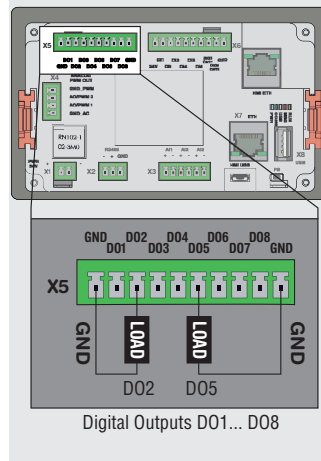
Add a standard 24 V, 8 A fuse to protect the vP4.

X7, X8 - Ethernet + USB port



- USB type A port (X8) to connect a flash drive (Firmware, system files upload/download or data logging).
- The Ethernet connection is made through a standard RJ45 connector, the 2 green LEDs in the Ethernet connector show the port status and the communication traffic.

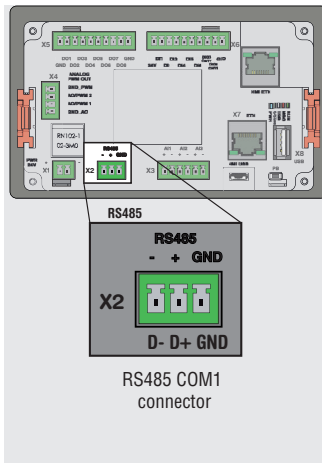
X5 - DO1... DO8 Digital Outputs Connections



- The 8 digital output loads must not exceed **0.5 A each**;
- In the drawing are connected only 2 outputs as an example (DO2 and DO5);
- The load circuit is closed by the negative (-) pole (**GND**).

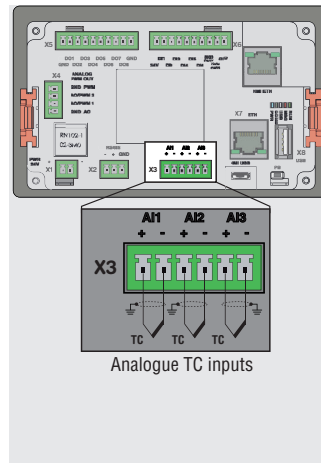
⚠ 24 V active outputs, each output must not exceed 0.5 A and the total Output current must be less than 1.6 A.

X2 - COM1 RS485 Serial Communications Port



- Connect an RS485 terminal (also for setup purposes). Through this port, using the Modbus RTU Master protocol the PLC can connect a fieldbus network;

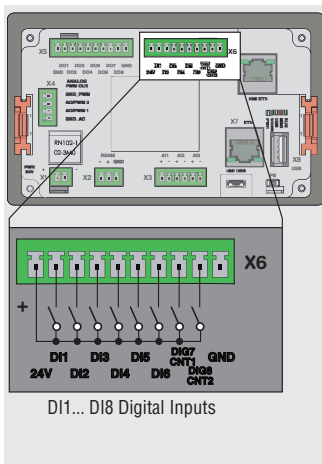
X8 - AI1... AI3 Analogue Input Connections



- Respect the polarity shown;
- When required, pay attention to correctly connect the external power source (5/12 Vdc);
- Type: 0/4... 20 mA, 0/1... 5 V, 0/2... 10 V, TC (J, K, L, N, R, S, T) PT100 (2 wires), PT1000, NTC, Potentiometer;
- Resolution: 16 bit;
- Accuracy: 0.5% of span (linear inputs), 0.5% (temp.) ±1°C (cold junction);
- Input impedance: 120 kΩ (V), <200 Ω (mA).

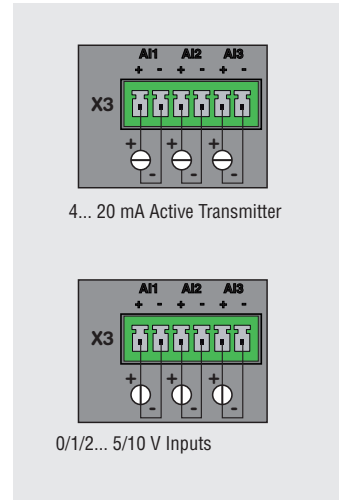
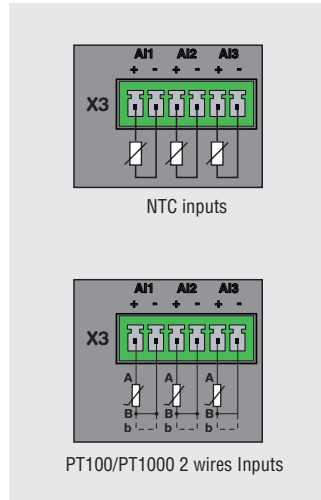
⚠ Verify the option ordered for IN1... IN3 Inputs.

X6 - DI1... DI8 Digital Inputs Connections (note)

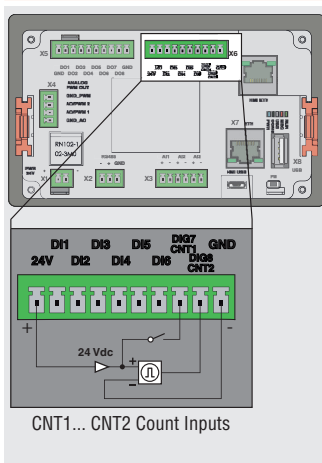


- DI1... DI8 connection example;
- The input circuit is internally closed to the System negative (-) pole (connector X1).

⚠ DI7 and DI8 can be ordered as Special Counter inputs. The description on how they must be connected follows.

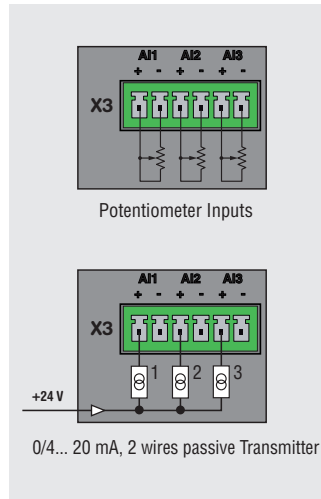


X6 - CNT1... CNT2 Special Counter Inputs Connections

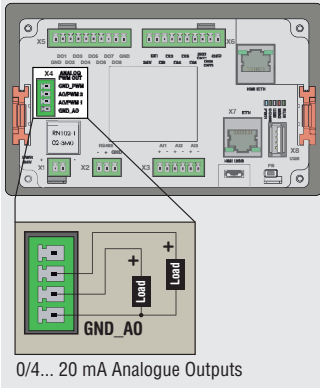


- In the drawing are connected the counter inputs as an example (CNT1 and CNT2).
- Frequency meter input:**
- The channels can manage up to 10 kHz signals having a duty-cycle that guarantees minimum of ON/OFF signal of 20 μs;
- Impulse counter input:**
- The minimum time of an impulse must be 20 μs;
- Digital input:**
- The input circuit is internally closed to the System negative (-) pole (connector X1).

⚠ Verify the option ordered for CNT1... CNT2 Inputs.



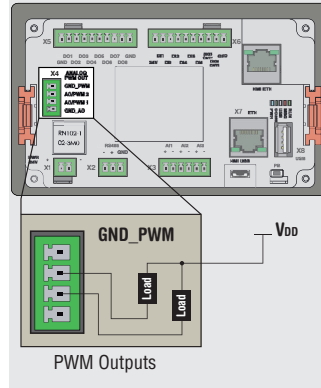
X6 - OT1... OT2 0/4... 20 mA Analogue Output Connections



- Respect the polarity shown;
 - Resolution: 14 bit;
 - Accuracy: 0.1%;
 - In the drawing are connected only 2 outputs as an example (OT3 and OT4).
- 0/4... 20 mA analogue output:**
- Type: 0/4... 20 mA;
 - Load: < 500 Ω;

⚠ Verify the option ordered for OT1... OT2 Outputs.

X6 - OT1... OT2 PWM/Frequency Output Connections



- Respect the polarity shown;
- Output range: 0.1... 200000 Hz;
- Max. Output load: 10 mA;
- VDD should be less than or equal to Power Supply (24 Vdc);
- The terminal PWM_GND can be used as Ground reference;

PWM Output:

- 0.1... 500 Hz selectable duty-cycle with 0.1% accuracy,
- 0.5... 3 kHz selectable duty-cycle with 1% accuracy,

Frequency Output:

- 3... 10 kHz duty-cycle: fixed at 50%.

⚠ Verify the option ordered for OT1... OT2 Outputs.

How to Order

vp4 = visualPac (CPU of the Programmable Logic Controller with integrated I/O and Display)

LCD Display
S = 4.3" Graphic display

A11 and A12 Analogue Inputs

- AA** = 2 x 0/4... 20 mA Analogue Inputs
- CC** = 2 x PT100 Analogue Inputs
- MM** = 2 x PT1000 Analogue Inputs
- NN** = 2 x NTC Analogue Inputs
- TT** = 2 x TC (Thermocouple) Analogue Inputs
- VV** = 2 x 0/1... 5 V or 0/2... 10 V Analogue Inputs

A13 Analogue Input

- = Not present
- A** = 2 x 0/4... 20 mA Analogue Input
- C** = 2 x PT100 Analogue Input
- M** = 2 x PT1000 Analogue Input
- N** = 2 x NTC Analogue Input
- T** = 2 x TC (Thermocouple) Analogue Input
- V** = 2 x 0/1... 5 V or 0/2... 10 V Analogue Input

OT1... OT2 Analogue Output

- = Not present
- A** = 2 x 0/4... 20 mA Analogue Output
- F** = 2 x Frequency (PWM) Analogue Output

D11... D18/D11... D16 + 2 CNT + 8 Digital Inputs

- 62** = 6 Digital Inputs + 2 CNT Digital Inputs + 8 Digital Outputs
- 88** = 8 Digital Inputs + 8 Digital Outputs

Packaging and Case

- A** = Gray case + neutral packaging
- G** = Gray case + Ascon Technologic packaging

