Configuration via Jumpers

The motherboard of the system includes a set of configuration jumpers that allow the user to adjust various operational parameters. These jumpers are of two types:

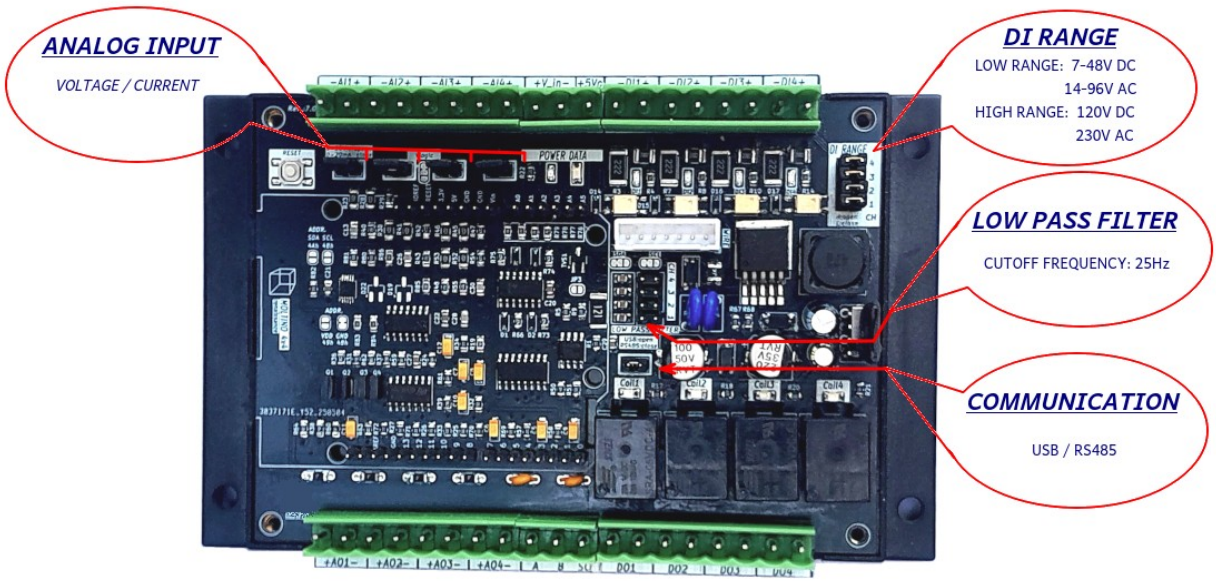
- Removable jumpers: used to change the functional modes of the system.
- Solder jumpers: used to adjust hardware-level settings that adapt the motherboard to the specific characteristics of the processor board in use.

Removable Jumpers

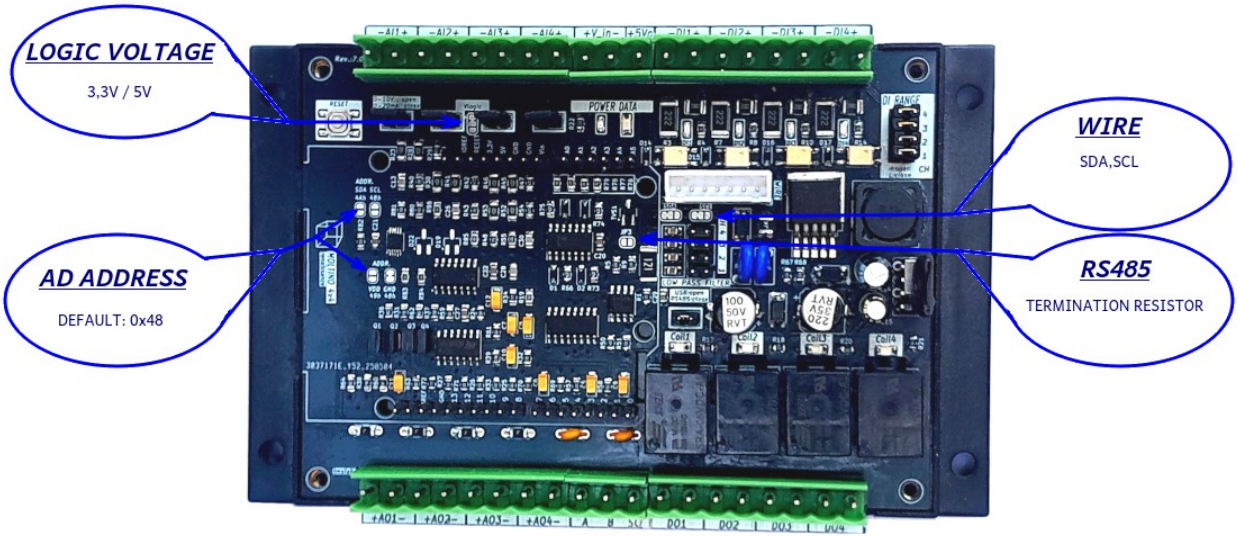
- Select the type of analog input signal: voltage or current.
- Adjust the sensitivity range for digital inputs.
- Enable or disable the low-pass filter for digital inputs.
- Select the wired communication mode: USB or RS485.

Solder Jumpers

- Select the logic voltage of the motherboard: 5 V or 3.3 V.
- Set the I²C address of the analog-to-digital converter.
- Adjust the SDA/SCL line mapping according to the Arduino board in use.
- Insert or omit the termination resistor (120 Ω) on the RS485 line.



Removable jumpers



Solder jumpers

Detailed Functions of Removable Jumpers

Analog Input Mode Selection

Each analog input channel is equipped with a "MODE" jumper that selects the measurement mode:
- Closed jumper: current measurement (0–20 mA)
- Open jumper: voltage measurement (0–10 V)

These jumpers are located directly behind each analog input terminal to facilitate identification.

Digital Input Range Selection – "RANGE DI"

The "RANGE DI" jumpers configure the input voltage range and sensitivity of the digital input channels. Each input has its own dedicated jumper.

Digital inputs are compatible with both AC and DC signals and are galvanically isolated from the motherboard using optocouplers. They operate independently and support signal frequencies up to 40 kHz.

Voltage Ranges:
- Low Range: 7–48 VDC or 14–96 VAC
- High Range: …–120 VDC or …–230 VAC (exact values to be defined)

⚠ Warning: Incorrect jumper configuration may damage the device.

Low-Pass Filter

A built-in low-pass filter is present on each digital input channel. This filter helps eliminate noise and transient peaks, and assists in detecting the presence or absence of AC signals to determine the state of the input.

Each input channel has an individual jumper to enable or disable the filter. These jumpers are located on the motherboard.

- Cut-off frequency: 25 Hz

Communication Interface Selection

The MOLTINO 4x4 can communicate via USB (through the Arduino) or RS485 (through the motherboard). Only one communication mode can be active at a time.

The selection is made using a dedicated communication jumper:
- Open jumper: USB mode
- Closed jumper: RS485 mode

⚠ When uploading firmware to the Arduino, ensure the jumper is set to USB mode.