Datasheet
M-Duino 38R+

Industrial Shields®
### Technical Features

**CONECTABLE PLC ARDUINO 24Vcc M-DUINO**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL TYPE</td>
<td>M-Duino</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>12 to 24Vdc (Fuse protection (2.5A) Polarity protection)</td>
</tr>
<tr>
<td>Input rated voltage</td>
<td>24Vdc</td>
</tr>
<tr>
<td>Rated Power</td>
<td>30 W</td>
</tr>
<tr>
<td>I max.</td>
<td>1.5A</td>
</tr>
<tr>
<td>Size</td>
<td>10x144 x 119.5 mm</td>
</tr>
<tr>
<td>Clock Speed</td>
<td>16MHz</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>256KB of which 8KB used by bootloader</td>
</tr>
<tr>
<td>SRAM</td>
<td>8KB</td>
</tr>
<tr>
<td>EEPROM</td>
<td>4KB</td>
</tr>
<tr>
<td>Communications</td>
<td>12V, Ethernet, USB, RS485, RS232, SPI (I/O pins) Max232/MAX485/MAX48500</td>
</tr>
<tr>
<td>USB consideration</td>
<td>Only for uploading or debugging, NOT connected as a serial cannot be working in a final application</td>
</tr>
</tbody>
</table>

#### General Features

**Power supply voltage**
- DC power supply: 12 to 24Vdc

**Operating voltage range**
- DC power supply: 11.4 to 25.4Vdc

**Power consumption**
- DC power supply: 30 W MAX

**External power supply**
- Power supply voltage: 24Vdc

**Insulation resistance**
- 20MO min at 500Vdc: between the AC terminals and the protective earth terminal

**Dielectric strength**
- 2,300 VAC at 50/60 Hz for one minute with a leakage current of 10mA max. Between all the external AC terminals and the protective ground terminal.

**Shock resistance**
- 80m/s² in the X, Y and Z direction 2 times each.

**Ambient temperature (operating)**
- 0°C to 60°C

**Ambient humidity (operating)**
- 10% to 90% (no condensation)

**Ambient environment (operating)**
- With no corrosive gas

**Ambient temperature (storage)**
- -20°C to 60°C

**Power supply holding time**
- 2ms min

**Weight**
- 609.4g max

#### Inputs (x12)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog/Dig Input 10bit (0-10Vcc) - (x6)</td>
<td>0 to 10Vdc: Input Impedance: 39K  Separated POB ground  Rated Voltage: 10Vdc: 7 to 24Vdc  I max: 2 to 12 mA  Galvanic Isolation  Rated Voltage: 24 Vdc:</td>
</tr>
<tr>
<td>Digital Isolated Input (24Vcc) - (x6)</td>
<td>7 to 24Vdc:  I max: 2 to 12 mA  Galvanic Isolation  Rated Voltage: 24 Vdc:</td>
</tr>
</tbody>
</table>

#### Outputs (x22)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Output Bit (0-10Vcc) - (x6)</td>
<td>0 to 10Vdc:  I max: 20 mA  Separated POB ground  Rated Voltage: 10Vcc:</td>
</tr>
<tr>
<td>Digital Isolated Output (24Vcc) - (x6)</td>
<td>5 to 24Vdc:  I max: 70 mA  Galvanic Isolation  Diode protected for Relay Rated Voltage: 24Vdc:</td>
</tr>
<tr>
<td>Digital Isolated Output Relay - (x6)</td>
<td>220Vdc:  I max: 5A  Galvanic Isolation  Diode protected for Relay Rated Voltage: 24Vdc:</td>
</tr>
<tr>
<td>PWM Isolated Output 8bit (24Vcc) - (x6)</td>
<td>5 to 24Vdc:  I max: 70 mA  Galvanic Isolation  Diode protected for Relay Rated Voltage: 24Vdc:</td>
</tr>
</tbody>
</table>

#### Expansion

- I2C, Ethernet, USB, RS485, RS232, SPI (2x) Rx, Tx (Arduino pins)
- Max232/MAX485/MAX48500

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**Data Sheet Rev. 20230428**
The steps to follow to install our equipment’s to Arduino IDE are:

• Open the Arduino IDE, versión 1.8.0 or superior. If you don’t have it yet, you can download here https://www.arduino.cc/en/Main/Software.

• Press the “Preferences” option to “File” menu and open the preferences window.

• In the text box “Additional boards manager URLs”, add the direction: http://apps.industrialshields.com/main/arduino/boards/package_industrialshields_index.json

• Close the preferences window with the “OK” button.

• Click on “Tools” menu, and open the “Boards” submenu, and click the “Boards Manager” option, to open the Boards Manager window.

• Search “industrialshields” to the search filter and select to the list and click “Install”.

• Close the “Boards Manager”. Once it is performed that steps, you are available to select each PLC that you wish to work on “Tools” -> “Boards” : M-Duino…

To get more information: https://www.industrialshields.com/first-steps-with-the-industrial-arduino-based-plc-s-and-the-panel-pc-s-raspberry-pi-based#boards

Unused pins should not be connected. Ignoring the directive may damage the controller.

Before using this product, it is the responsibility of the user to read the product’s User Guide and all accompanying documentation.

Industrial Shields PLCs must be powered between 12Vdc and 24Vdc. If a higher voltage is supplied to the equipment can suffer irreversible damage.

Maintenance must be performed by qualified personnel familiarized with the construction, operation, and hazards involved with the control.

Maintenance should be performed with the control out of operation and disconnected from all sources of power.

The Industrial Shields Family PLCs are Open Type Controllers. It is required that you install the M-Duino PLC in a housing, cabinet, or electric control room. Entry to the housing, cabinet, or electric control room should be limited to authorized personnel.

Inside the housing, cabinet or electric control room, the Industrial Shields PLC must be at a minimum distance from the rest of the components of a minimum of 25 cm, it can be severely damaged.

Failure to follow these installation requirements could result in severe personal injury and/or property damage. Always follow these requirements when installing M-Duino family PLCs.

In case of installation or maintenance of the M-Duino please follow the instructions marked in the Installation and Maintenance section on the User Guide.

Do not disconnect equipment when a flammable or combustible atmosphere is present.

Disconnection of equipment when a flammable or combustible atmosphere is present may cause a fire or explosion which could result in death, serious injury and/or property damage.