Datasheet
M-Duino 38AR+ GPRS

Industrial Shields®
Technical Features

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

**Inputs (x16)**

- **(x10) - An/Dig Input 10bit (0-10Vac)**
  - 0 to 10Vac
  - Input Impedance: 39K
  - Separated P32 ground
  - Rated Voltage: 10Vac
  - 5 to 24Vac:
    - I max: 2 to 12 mA
    - Galvanic Isolation
    - Rated Voltage: 2.4 Vdc

- **(x6) - Digital Isolated Input (24Vac)**
  - 5 to 24Vac:
  - I max: 2 to 12 mA
  - Galvanic Isolation
  - Rated Voltage: 2.4 Vdc

  *The Interrupt isolated inputs can also work as Digital isolated inputs.*

**Outputs (x19)**

- **(x6) - Analog Output 8bit (0-10Vac)**
  - 0 to 10Vac
  - I max: 20 mA
  - Separated P32 ground
  - Rated Voltage: 10Vac

- **(x5) - Digital Isolated Output (24Vac)**
  - 5 to 24Vac:
  - I max: 70 mA
  - Galvanic Isolation
  - Diode Protected for Relay
  - Rated Voltage: 2.4Vdc

- **(x6) - PWM Isolated Output 8bit (24Vac)**
  - 5 to 24Vac:
  - I max: 70 mA
  - Galvanic Isolation
  - Diode Protected for Relay
  - Rated Voltage: 2.4Vdc

  *The PWM outputs can also work as Digital outputs.*

- **(x8) - Digital Isolated Output Relay**
  - 220Vac:
  - I max: 5A
  - Galvanic Isolation
  - Diode protected for Relay
  - I max: 24Vac: 410 mA

**General Features**

- **Power supply voltage**: DC power supply 12 to 24Vac; Power supply voltage: 24Vac
- **Operating voltage range**: DC power supply 11.4 to 25.6Vac
- **External power supply**: Power supply voltage 30 W MAX
- **Insulation resistance**: 20MO min at 500Vac; between all external AC terminals and the protective earth terminal
- **Dielectric strength**: 2300 Vac at 50/60 Hz for one minute with a leakage current of 10mA max. Between all external AC terminals and the protective earth 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**: 561g max.

**Expandability**

- DC - 127 elements - Serial Port RS232/RS485

**USB Consideration!**

- Only for uploading or debugging. NOT connected as a serial cannot be working in a final application.

**Select the correct size.**

- 30 W MAX. 700mA

**Weight**

- 101x94x119.5 mm

**Data Sheet Rev. 20230420**
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

• 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

**Warnings**

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.

**Symbology**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Symbol" /></td>
<td>Indicates that the equipment is suitable for direct current only; to identify relevant terminals</td>
</tr>
<tr>
<td><img src="image2.png" alt="Symbol" /></td>
<td>Indicates that the equipment is suitable for alternating current only; to identify relevant terminals</td>
</tr>
<tr>
<td><img src="image3.png" alt="Symbol" /></td>
<td>To identify the control by which a pulse is started.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Symbol" /></td>
<td>To identify an earth (ground) terminal in cases where neither the symbol 5018 nor 5019 is explicitly required.</td>
</tr>
<tr>
<td><img src="image5.png" alt="Symbol" /></td>
<td>To identify the switch by means of which the signal lamp(s) is (are) switched on or off.</td>
</tr>
<tr>
<td><img src="image6.png" alt="Symbol" /></td>
<td>CE marking indicates that a product complies with applicable European Union regulations</td>
</tr>
<tr>
<td><img src="image7.png" alt="Symbol" /></td>
<td>Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury</td>
</tr>
<tr>
<td><img src="image8.png" alt="Symbol" /></td>
<td>To indicate hazards arising from dangerous voltages</td>
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**Technical Support**

You can contact us using the best channel for you:

- support@industrialshields.com
- www.industrialshields.com
- Visit our Blog, Forum or Ticketing system
- Use our chat service
- Check the user guides
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**Performance Specifications**

<table>
<thead>
<tr>
<th>Arduino Board</th>
<th>Arduino Mega2560</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control method</td>
<td>Stored program method</td>
</tr>
<tr>
<td>I/O control method</td>
<td>Combination of the cyclic scan and immediate refresh processing methods.</td>
</tr>
<tr>
<td>Programming language</td>
<td>Arduino IDE. Based on wiring (Wiring is an Open Source electronics platform composed of a programming language, &quot;similar to the C&quot;)</td>
</tr>
<tr>
<td>Microcontroller</td>
<td>ATmega2560</td>
</tr>
</tbody>
</table>

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