Datasheet
M-Duino 58+
LoRa

Industrial Shields®
**Technical Features**

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

### Model Type
M-Duino LoRa

### 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
- 700Ma

### Insulation Resistance
20MO 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
- 597g max.

### Communications & Accessories
LoRa - I2C - Ethernet - USB - RS485 - RS232 - SPI - RTC - microSD

### USB Consideration
Only for uploading or debugging. NOT connected as a serial

### Size
101x119.3x119.5

### INPUTS (x35)

#### Analog/Digital Input 10bit
(0-10Vcc) - (x16)
- Input Impedance: 39K
- Separated PCB ground
- Rated Voltage: 10Vac
- I max: 2 to 12 mA
- Galvanic Isolation
- Rated Voltage: 24Vdc

#### Digital Isolated Input
(24Vcc) - (x14)
- I max: 70 mA
- Galvanic Isolation
- Diode Protected for Digital Isolated Output
- Rated Voltage: 24Vdc

#### Interrupt Isolated Input
HS (24Vcc) - (x5)
- The Interrupt isolated Inputs can also work as Digital isolated Inputs
- The configuration between Analog and PWM isolated Outputs can be done by switch.

### OUTPUTS (x22)

#### Analog Output 8bit (0-10Vcc) / PWM Isolated Output 8bit
(24Vcc) - (x8) | (x6 of which PWM)
- The Analog & PWM outputs can also work as Digital outputs.
- The configuration between Analog and PWM isolated Outputs can be done by switch.

#### Digital Isolated Output
(24Vcc) - (x14)
- I max: 20 mA
- Separated PCB ground
- Rated Voltage: 10Vcc
- PWM Isolated Output
- 5 to 24Vdc
- I max: 70 mA
- Galvanic Isolation
- Diode Protected for Digital Isolated Output
- Rated Voltage: 24Vdc

### Analog Output
0 to 10Vac
- I max: 20 mA
- Separated PCB ground
- Rated Voltage: 10Vac
- I min: 2 to 12 mA
- Galvanic Isolation
- Rated Voltage: 24Vdc

### Features

- **Model Type**: M-Duino LoRa
- **Input Voltage**: 12 to 24Vdc (Fuse protection (2.5A) Polarity protection)
- **Input rated voltage**: 24Vdc
- **Rated Power**: 30 W
- **I max.**: 15A
- **Size**: 101x119.3x119.5
- **Clock Frequency**: 16MHz
- **Flash Memory**: 256KB of which 8KB used by bootloader
- **SRAM**: 8KB
- **EEPROM**: 4KB
- **Expansion**
- **Input Voltage**: 5 to 24Vdc
- **Power supply voltage**: 5 to 24Vdc
- **I min**: 2 to 12 mA
- **Galvanic Isolation**
- **Rated Voltage**: 24Vdc
- **Input Impedance**: 39K
- **Digital Isolated output**
- **Analog Output**: 8bit (0-10Vac) / PWM Isolated Output 8bit
- **I max**: 70 mA
- **Galvanic Isolation**
- **Diode Protected for Digital Isolated Output**
- **Rated Voltage**: 24Vdc
- **Analog Output**: 0 to 10Vac
- **I max**: 20 mA
- **Galvanic Isolation**
- **Rated Voltage**: 10Vac
- **I min**: 2 to 12 mA
- **Digital Isolated Output**
- **PWM Isolated Output**
- **Expansion**
- **Power supply voltage**: 24Vdc
- **Power consumption**: 700Ma
- **Insulation resistance**: 20MO 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**: 597g max.

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**Technical Details**

- **INPUTS**:
  - **Analog Output**: 10bit (0-10Vcc) - (x16)
  - **Digital Isolated Input**: (24Vcc) - (x14)
  - **Interrupt Isolated Input**: HS (24Vcc) - (x5)

- **OUTPUTS**:
  - **Analog Output**: 8bit (0-10Vcc) / PWM Isolated Output 8bit
  - **Digital Isolated Output**: (24Vcc) - (x14)

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

Original 
**ARDUINO**

Mega included
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

### 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.

Industral 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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<tbody>
<tr>
<td><img src="image1" 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" alt="Symbol" /></td>
<td>Indicates that the equipment is suitable for alternating current only, to identify relevant terminals</td>
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<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>To identify the control by which a pulse is started.</td>
</tr>
<tr>
<td><img src="image4" 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" alt="Symbol" /></td>
<td>To identify the switch by means of which the signal lamp(s) is (are) switched on or off.</td>
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<tr>
<td><img src="image6" alt="Symbol" /></td>
<td>CE marking indicates that a product complies with applicable European Union regulations</td>
</tr>
<tr>
<td><img src="image7" 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" alt="Symbol" /></td>
<td>To indicate hazards arising from dangerous voltages</td>
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### Technical Support

You can contact with us using the best channel for you:

- support@industrialshields.com
- [www.industrialshields.com](http://www.industrialshields.com)
- Visit our Blog, Forum or Ticketing system
- Use our chat service
- Check the user guides
- Visit our Channel