M-DUINO CONTROLLER PLC

The Liberalization of the Industry with Open Source Technology
**Inputs:**
- 19 Inputs:
  - (9x) Digital Optoisolated (5-24Vdc)
  - (10x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurables by software
  - (2x) Interrupt (5-24Vdc) "Are part of the Digital inputs (5-24Vdc)"

**Outputs:**
- 19 Outputs:
  - (3x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (8x) Relay (220Vac-5A)

**Inputs:**
- 12 Inputs:
  - (4x) Digital Optoisolated (5-24Vdc)
  - (8x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurables by software
  - (2x) Interrupt (5-24Vdc) "Are part of the Digital inputs (5-24Vdc)"

**Outputs:**
- 12 Outputs:
  - (5x) Digital Optoisolated (5-24Vdc)
  - (6x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (8x) Relay (220Vac-5A)

**Inputs:**
- 13 Inputs:
  - (7x) Digital Optoisolated (5-24Vdc).
  - (6x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurables by software
  - (2x) Interrupt (5-24Vdc). "Are part of the Digital inputs (5-24Vdc)"

**Outputs:**
- 8 Outputs:
  - (5x) Digital Optoisolated (5-24Vdc)
  - (3x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (8x) Relay (220Vac-5A)

**Inputs:**
- 6 Inputs:
  - (2x) Digital Optoisolated (5-24Vdc)
  - (4x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurables by software
  - (2x) Interrupt (5-24Vdc). "Are part of the Digital inputs (5-24Vdc)"

**Outputs:**
- 11 Outputs:
  - (3x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (8x) Relay (220Vac-5A)
M-DUINO PLC Arduino 57R

- **44 Inputs:**
  - (10x) Digital Optoisolated (5-24Vdc)
  - (12x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurable by software
  - (6x) Interrupt (5-24Vdc). "Are part of the Digital inputs (5-24Vdc)"

- **28 Outputs:**
  - (4x) Digital Optoisolated (5-24Vdc)
  - (8x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (16x) Relay (220Vac-5A)

M-DUINO PLC Arduino 57AAR

- **29 Inputs:**
  - (11x) Digital Optoisolated (5-24Vdc)
  - (14x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurable by software
  - (6x) Interrupt (5-24Vdc). "Are part of the Digital inputs (5-24Vdc)"

- **28 Outputs:**
  - (5x) Digital Optoisolated (5-24Vdc)
  - (8x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)
  - (15x) Relay (220Vac-5A)

M-DUINO PLC Arduino 58

- **36 Inputs:**
  - (20x) Digital Optoisolated (5-24Vdc)
  - (16x) Analog (0-10Vdc, 10bit) / Digital (5-24Vdc) configurable by software
  - (6x) Interrupt (5-24Vdc). "Are part of the Digital inputs (5-24Vdc)"

- **22 Outputs:**
  - (14x) Digital Optoisolated (5-24Vdc)
  - (8x) Analog (0-10Vdc, 8 bit) / Digital (5-24Vdc) / PWM Isolated (5-24Vdc)

**Industrial Standard Communications**

- RS485 - RS232 - SPI - TTL - I2C
- Ethernet - TCP / IP - Modbus RTU / TCP

**Original Arduino Mega included**

- EEPROM 4 KB | SRAM 8 KB
- Flash 256 KB | CPU Speed 16 MHz
# REFERENCE LIST - ETHERNET PLC

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<th>Reference</th>
<th>Description</th>
<th>Serial TTL (UART)</th>
<th>I2C</th>
<th>SPI</th>
<th>RS232</th>
<th>RS-485 Half / Full</th>
<th>Ethernet</th>
<th>GPRS / GSM</th>
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n.4: From the (Xx) Digital, (Yx) can be configured as Analog (Xx = Total Digital In, Yx = Number of Analog In) | n.5 : From the (Xx) Digital, (Zx) can be configured as Interrupt (Xx = Total Digital In, Zx = Number of Interrupt pins) | n.7 : If using pin 2 and pin 3, (x2) In are lost | n.11: USB Only meant for uploading or debugging, not always connected as serial in a project! | n.12: 2 Inputs are lost.
For all those projects that require wireless, our range of Wi-Fi PLC (programmable logic controllers) is a great solution.

It is an ideal automation solution for remote monitoring, diagnostics and control. Those PLC can directly work with humidity sensors, water level sensors, pressure transducers, flow sensors, etc.

It can be used as an access point to create the wireless network infrastructure, such as bridge to connect computers in the network.

**Industrial Standard Communications**
- RS485 - RS232 - SPI - TTL - I2C
- Ethernet - TCP / IP - Modbus RTU / TCP

**The WiFi and Bluetooth integrated module consists in a single 2.4 GHz Wi-Fi and Bluetooth combo chip designed with the TSMC ultra-low-power 40 nm technology.**

It is designed to achieve the best power and RF performance, showing robustness, versatility and reliability in a wide variety of applications and power scenarios.

Some applications are:
- Generic Low-power IoT Sensor Hub
- Generic Low-power IoT Data Loggers
- Mesh Network.

It is designed for Internet-of-Things (IoT) applications.

The GPRS/GSM family offers the possibility to expand up to 127 modules through I2C, which means that you can have until 7100 Inputs / Outputs in Master-Slave connections, additionally to sensors, etc…

**EEPROM 4 KB | SRAM 8 KB**

**Flash 256 KB | CPU Speed 16 MHz**

**The GPRS PLC ARDUINO family**

**The GPRS PLC ARDUINO GPRS family**

<table>
<thead>
<tr>
<th>M-DUINO PLC ARDUINO WiFi &amp; BLE</th>
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<td>Original Arduino Mega included</td>
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**M-DUINO WIFI**

The WiFi and Bluetooth integrated module consists in a single 2.4 GHz Wi-Fi and Bluetooth combo chip designed with the TSMC ultra-low-power 40 nm technology.

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It can be used as an access point to create the wireless network infrastructure, such as bridge to connect computers in the network.
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<th>Wi-Fi &amp; BLE</th>
<th>GPRS / GSM</th>
<th>Analog Inputs</th>
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n.4: From the (Xx) Digital, (Yx) can be configured as Analog (Xx = Total Digital In, Yx = Number of Analog In). n.5: From the (Xx) Digital, (Zx) can be configured as Interrupt (Xx = Total Digital In, Zx = Number of Interrupt pins). They are counted as Digital Inputs. n.7: If using pin 2 and pin 3, (x2) In are lost. n.12: 2 Inputs are lost. n.13: If using Serial 1, GPRS/GSM not available. n.14: If using GPRS/GSM, Serial 1 is not available.
## REFERENCE LIST - WIFI PLC

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<th>Communications</th>
<th>Inputs / Outputs</th>
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- n.4: Can be used as Analog/Digital |
- n.5: From the (Xx) Digital, (Zx) can be configured as Interrupt (Xx = Total Digital In, Zx = Number of Interrupt pins) |
- n.7: If using pin 2 and pin 3, (x2) In are lost |
- n.12: 2 Inputs are lost |
- n.13: If using Serial 1. GPRS/GSM not available |
- n.14: If using GPRS/GSM, Serial 1 is not available |
The M-Duino range with LoRa technology, will allow you to work with this wireless communication system, the versatility of the Arduino board and this all-in-one solution in an industrial PLC with up to 58 Inputs and Outputs.

Dali is used in street lighting and building automation to control individual lights and lighting groups.

Integrating this feature in the Arduino PLC allows you to control huge range of lighting areas and at the same time it is an easily growing system.

It maximizes flexibility by adjusting lighting control to have the optimal conditions for rational consumption.
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n.4: From the (Xx) Digital, (Yx) can be configured as Analog (Xx = Total Digital In, Yx = Number of Analog In) | n.5: From the (Xx) Digital, (Zx) can be configured as Interrupt (Xx = Total Digital In, Zx = Number of Interrupt pins) | n.7: If using pin 2 and pin 3, (x2) In are lost | n.12: 2 Inputs are lost | n.13: If using Serial 1, LoRa not available | n.14: If using LoRa, Serial 1 is not available
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<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Serial TTL(UART)</th>
<th>I2C</th>
<th>SPI</th>
<th>RS232</th>
<th>RS485 Half/Full</th>
<th>Ethernet</th>
<th>WiFi &amp; BLE</th>
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<th>Analog Inputs</th>
<th>Interrupt Inputs</th>
<th>Digital Outputs</th>
<th>Analog Outputs</th>
<th>Relay Outputs</th>
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**Communications**

- Serial TTL (UART)
- SPI
- RS232
- RS485 Half/Full
- Ethernet
- WiFi & BLE

**Inputs / Outputs**

- Digital Inputs
- Analog Inputs
- Interrupt Inputs
- Digital Outputs
- Analog Outputs
- Relay Outputs
- In/Out 5Vdc

**Digital Addressable Lighting Interface**

DALI
With our PLC’s you can communicate using several protocols like RS-232, RS-485, Modbus TCP, or using ethernet, etc. It’s possible to send and receive information from several server types (HTTP, NTP, MQTT) or DB Servers.
Arduino IDE is the Original platform to program Arduino boards

Our Arduino based PLCs use Original Arduino boards assembled inside all devices

- Free software licenses
- Standard Libraries available
- Documentation and examples available, ready to use
- Industrial Shields libraries available to facilitate the programming of our PLCs

NodeRED. Platform to develop Apps, Servers, Dashboards and more.

Node-Red is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It is very intuitive, easy and fast-programming. It is an excellent tool for working graphically.

- It provides a browser-based editor that makes it easy to connect flows using nodes.
- Online debugging application

Our PLCs can be programmed with all software platforms compatible with Arduino IDE.

Our Panel PCs can work with Linux and Android which means that, if your team has enough knowledge, you can create a custom applications for the Panel PCs. You will have more flexibility to fit the needs of your installation or application.
**Industrial Shields** was born in October 2012 from the hand of an engineer, who, searching for a more flexible PLC equipment and a better price, decided to develop his own solution using **Open Source Hardware**.

Therefore **Industrial Shields** is the brand that provides **Open Source Hardware** for industrial use, including all design and safety required, combining the best of two worlds.

**Industrial Shields**, designs, produces and markets the range of products based on **Open Source Hardware**.

Boot & Work Corp. S.L. is a company committed to the promotion, development, manufacture and sale of products based on Open Source technology to liberalize the industrial sector and boost the growth of its customers.

The aim of our company is to provide low-cost solutions for automation in industrial environments. **Open Source Hardware** solutions are not yet widely introduced in the industrial sector, it is a growing market and we are its pioneers.

The balance between quality and cost is very important for us and therefore for the market, using Open Source solutions we can provide more specifications at a better price.

In addition, the Open Source solutions are more flexible and accessible than standard industrial solutions and, furthermore, the software is license free.

**Industrial Shields** is convinced with a focus on **Industry 4.0 and the Internet of Things**.

**Quality**

In compliance with:

Industrial Shields has been working worldwide through distributors, or in direct contact with customers. We have been working since 2016 with major market players who are selling our products on their websites.

Our sales, technical and support team will assist you by phone, email, Skype; or by using the ticket system or chatting directly on our website.

Get in touch with us. We are here, glad to help and support you.

Camí del Grau, 25
Sant Fruïtós de Bages 08272 (Barcelona)
Spain

Tel: (+34) 938 760 191

industrialshields@industrialshields.com

https://www.industrialshields.com