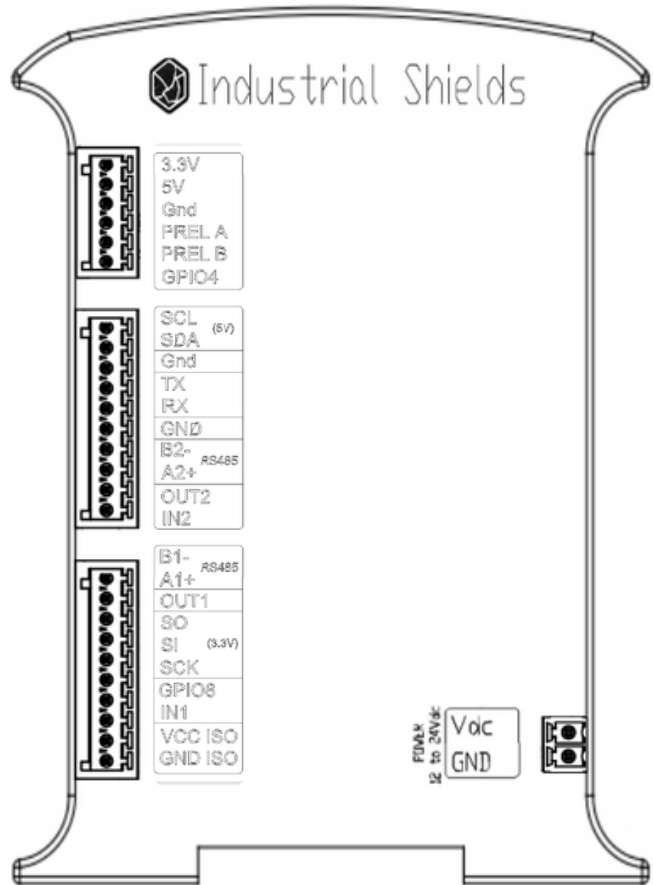


## Technical Features CONECTABLE PLC RASPBERRY PI 24Vcc

|                     |   |
|---------------------|---|
| MODEL TYPE          | Raspberry PLC   |
| Input Voltage       | 12 to 24Vdc (Fuse protection (2.5A) Polarity protection)  |
| Input rated voltage | 24Vdc   |
| Rated Power         | 30 W  |
| I max.              | 15A   |
| Size                | Check the Measures Table  |
| SRAM                | 2/4/8 GB  |
| Communications      | I2C, Ethernet (x2), USB (x4), RS485 (x2 HALF-Duplex), SPI, Wi-Fi, Bluetooth, Serial TTL, µSD, RTC, µHDMI (x2) |

## 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 MIN.       |
| External power supply           | Power supply voltage   | 24Vdc           |
| Insulation resistance           | 20mΩ 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/s <sup>2</sup> in the X, Y and Z direction 2 times each.   |                 |
| Ambient temperature (operating) | 0° to 50°C with Raspberry OS Lite  |                 |
| Ambient humidity (operating)    | 10% to 90% (no condensation)   |                 |
| Ambient environment (operating) | With no corrosive gas  |                 |
| Ambient temperature (storage)   | -20° to 60°C   |                 |
| Power supply holding time       | 2ms min.   |                 |
| Weight                          | Review at the Measures Table   |                 |



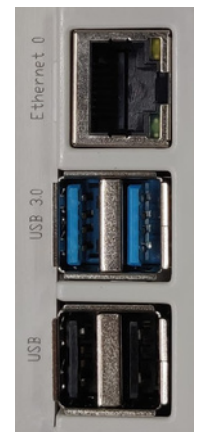
Left side



Upper side 2



Right Side



## ❗ x2 EXPANSION BOARDS SLOTS

Customize up to two additional communication expansions on your Raspberry PLC and prepare your custom-made project

- SARA-R412M-02B-03 4G LTE:**
  - Model: SARA-R412M-02B-03
  - Type: 2G EGPRS, GSM/4G LTE, M1/NB1 (Narrow-Band)
  - Key Features: LTE FDD Bands (2/3/4/5/8/12/13/20/26/28), 2G Bands (850-1900MHz), LTE Category M1/NB1, 2G GMSK, 2G 8-PSK, LTE Category M1, LTE Category NB1, GPRS Multi-slot class 33, EGPRS multi-slot class 33
  - Applications: Remote monitoring automation, asset tracking, surveillance and security, home automation systems, point of sales terminals etc.
- CAN:**
  - Model: MCP2515
  - Type: CAN V2.0B
  - Key Features: Speed of 1Mb/s, receive buffers, masks and filters, data byte filtering on the first two data bytes, three transmit buffers with prioritization and abort features, high speed SPI interface (10MHz), etc.
  - Applications: communication with all kinds of CAN devices and the protocols that can be applied to this communication method
- LoRa:**
  - Model: RN2483 (for Europe/Asia), RN2903 (for NA/Australia)
  - Type: LoRa
  - Key Features: On-board LoRaWAN protocol stack, ASCII command interface over UART, Castellated SMT pads for easy and reliable PCB mounting, Environmentally friendly, RoHS compliant, Device Firmware Upgrade (DFU) over UART, etc.
  - Applications: Automated Meter Reading, Home and Building Automation, Wireless Alarm and Security System, Industrial Monitoring and Control, Machine to Machine (M2M), Internet of Things (IoT), etc.

## ❗ GPIO(x2)

Digital GPIO4 (3.3V) / Interrupt 31  
Digital GPIO8 (3.3V) / Chip Select (SPI)

### Expandability

I2C - 127 elements  
(x2) RS485 - 32 elements using Modbus RTU

## ❗ Relay(x1)

PREL A, PRELB  
48 V max bidirectional

## ❗ Digital OPTO

IN1 - OUT1  
IN2 - OUT2

| Model                      | Measures Table |            |            |            |
|----------------------------|----------------|------------|------------|------------|
|                            | Height (mm)    | Width (mm) | Depth (mm) | Weight (g) |
| Raspberry PLC Ethernet CPU | 119.5          | 84.60      | 101        | 373        |
| Raspberry PLC 21+          | 119.5          | 109.20     | 101        | 490        |
| Raspberry PLC 42+          | 119.5          | 133.80     | 101        | 598        |
| Raspberry PLC 58+          | 119.5          | 158.40     | 101        | 710.5      |
| Raspberry PLC 19R+         | 119.5          | 109.20     | 101        | 490        |
| Raspberry PLC 38R+         | 119.5          | 133.80     | 101        | 598        |
| Raspberry PLC 57R+         | 119.5          | 158.40     | 101        | 710.5      |
| Raspberry PLC 38AR+        | 119.5          | 133.80     | 101        | 598        |
| Raspberry PLC 53ARR+       | 119.5          | 158.40     | 101        | 710.5      |
| Raspberry PLC 57AAR+       | 119.5          | 158.40     | 101        | 710.5      |
| Raspberry PLC 54ARA+       | 119.5          | 158.40     | 101        | 710.5      |
| Raspberry PLC 50RRA+       | 119.5          | 158.40     | 101        | 710.5      |

## I/Os Table

| Model  | Reference    | Digital/Analog Input* | Digital Isolated Input | Digital Isolated Output | Digital/Analog Output* | Relay output |
|--------|--------------|-----------------------|------------------------|-------------------------|------------------------|--------------|
| 19R+   | 012XXX000100 | 4                     | 2                      | 0                       | 3                      | 8            |
| 21+    | 012XXX000200 | 6                     | 7                      | 5                       | 3                      | 0            |
| 38AR+  | 012XXX000700 | 10                    | 9                      | 5                       | 6                      | 8            |
| 38R+   | 012XXX000300 | 8                     | 4                      | 0                       | 6                      | 16           |
| 42+    | 012XXX000400 | 12                    | 14                     | 10                      | 6                      | 0            |
| 50RRA+ | 012XXX000900 | 14                    | 11                     | 5                       | 9                      | 16           |
| 53ARR+ | 012XXX001000 | 14                    | 11                     | 5                       | 9                      | 16           |
| 54ARA+ | 012XXX001100 | 16                    | 16                     | 10                      | 9                      | 8            |
| 57AAR+ | 012XXX000800 | 16                    | 16                     | 10                      | 9                      | 8            |
| 57R+   | 012XXX000500 | 12                    | 6                      | 0                       | 9                      | 24           |
| 58+    | 012XXX000600 | 18                    | 21                     | 15                      | 9                      | 0            |

## i Notes

- There are XXX on the reference number show:
  - **First two characters** are related to the expansion modules connected to the PLC unit and the RAM Memory model.
  - **The third character** is related to the CPU RAM memory space:
    - See the Reference Table. Example:
      - xxxxx2xxxxxx - 2GB RAM Memory
      - xxxxx3xxxxxx - 4GB RAM Memory
      - xxxxx4xxxxxx - 8GB RAM Memory
- The analog inputs has a 3% of tolerance.

## Reference Table

| Reference Table  |              |              |              |
|--|--------------|--------------|--------------|
| Model  | RAM Memory   |              |              |
|  | 2GB RAM      | 4GB RAM      | 8GB RAM      |
| <b>PLC Raspberry General Family</b>  |              |              |              |
| Raspberry PLC Ethernet CPU (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)                            | 012XXX000000 | 012XXX000000 | 012XXX000000 |
| Raspberry PLC Ethernet 21 I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)    | 012XXX000200 | 012XXX000200 | 012XXX000200 |
| Raspberry PLC Ethernet 42 I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)    | 012XXX000400 | 012XXX000400 | 012XXX000400 |
| Raspberry PLC Ethernet 58 I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)    | 012XXX000600 | 012XXX000600 | 012XXX000600 |
| Raspberry PLC Ethernet 19R I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)   | 012XXX000100 | 012XXX000100 | 012XXX000100 |
| Raspberry PLC Ethernet 38R I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)   | 012XXX000300 | 012XXX000300 | 012XXX000300 |
| Raspberry PLC Ethernet 57R I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)   | 012XXX000500 | 012XXX000500 | 012XXX000500 |
| Raspberry PLC Ethernet 38AR I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux)  | 012XXX000700 | 012XXX000700 | 012XXX000700 |
| Raspberry PLC Ethernet 57AAR I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux) | 012XXX000800 | 012XXX000800 | 012XXX000800 |
| Raspberry PLC Ethernet 50RRA I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux) | 012XXX000900 | 012XXX000900 | 012XXX000900 |
| Raspberry PLC Ethernet 53ARR I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux) | 012XXX001000 | 012XXX001000 | 012XXX001000 |
| Raspberry PLC Ethernet 54ARA I/Os Analog/Digital PLUS (Raspberry Pi 4B X GB RAM Included + 8GB pSLC SIM W/Linux) | 012XXX001100 | 012XXX001100 | 012XXX001100 |

## i I/Os Ranges

- Analogic I/Os voltage: 0 - 10 Vdc
- Digital I/Os voltage: 5 - 24 Vdc (300 mA)
- Relay's voltage: 30 Vdc (3A) / 250 Vac (5 A)

## i Main changes compared to previous versions

- Customize up to two additional communication expansions on your Raspberry PLC and prepare your custom-made project
- Communication pins upgrade! Now located next to USB Ports instead of microSD layer
- CAN Bus is not available by default. Select it as expansion board if required.
- No FAN is required at RPI PLC V6 family products! Heater passive elements installed by default.

## Performance Specifications

|                      |  |
|----------------------|--|
| Raspberry Board      | Raspberry Pi 4 B   |
| I/O control method   | Combination of the cyclic scan and immediate refresh processing methods. |
| Programming language | Linux applications: Bash Scripts, Python, C++, Node-Red and more!        |
| CPU                  | Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz      |
| Website              | <a href="https://www.raspberrypi.org/">https://www.raspberrypi.org/</a>  |

## Zones Table for Raspberry PLC V6 Family products

| Model                      | Zones Table |                  |                  |                  |
|----------------------------|-------------|------------------|------------------|------------------|
|                            | Zone 0      | Zone A           | Zone B           | Zone C           |
| Raspberry PLC Ethernet CPU | ☑           | -                | -                | -                |
| Raspberry PLC 21+          | ☑           | Analog / Digital | -                | -                |
| Raspberry PLC 42+          | ☑           | Analog / Digital | Analog / Digital | -                |
| Raspberry PLC 58+          | ☑           | Analog / Digital | Analog / Digital | Analog / Digital |
| Raspberry PLC 19R+         | ☑           | Relay            | -                | -                |
| Raspberry PLC 38R+         | ☑           | Relay            | Relay            | -                |
| Raspberry PLC 57R+         | ☑           | Relay            | Relay            | Relay            |
| Raspberry PLC 38AR+        | ☑           | Analog / Digital | Relay            | -                |
| Raspberry PLC 53ARR+       | ☑           | Analog / Digital | Relay            | Relay            |
| Raspberry PLC 57AAR+       | ☑           | Analog / Digital | Analog / Digital | Relay            |
| Raspberry PLC 54ARA+       | ☑           | Analog / Digital | Relay            | Analog / Digital |
| Raspberry PLC 50RRA+       | ☑           | Relay            | Relay            | Analog / Digital |

### Raspberry PLC Access

How to access to the Raspberry PLC:

-Linux users: using ssh specifying the IP address: 10.10.10.20/24 (eth0) and 10.10.11.20/24 (eth1).

-Windows users: we recommend to use PuTTY ssh client. The IP address have to be specified: 10.10.10.20/24 (eth0) and 10.10.11.20/24 (eth1).

You can download the latest release of PuTTY here:  
<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

### UPS Shield

This PLC has integrated an UPS Shield, a device which provides an anti-voltage drop protection system designed to avoid data corruption when the current is suddenly cut off.

### RTC

This PLC has integrated the DS3231 Real Time Clock model which is powered by a button battery (CR1216 or CR1220).

### Heater

This PLC family products include an external heater to refrigerate the CPU and the other components connected internally.

### Eth1

This Ethernet port is configured at 10BT Half-Duplex auto-negotiation disabled.

### Outputs

After a reboot/power disconnection and reconnection, the UPS will be activated and, until the device is fully initialized again (it will take some seconds), the outputs will maintain their last activation state. For more information about that consult the User Guide.

### 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 Raspberry 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 Raspberry family PLCs.

In case of installation or maintenance of the PLC 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.

Inside the encapsulated, there are supercapacitors if 25F which can be dangerous. Be careful with them.

This equipment does **not include galvanic isolation between the grounds** of the different systems. This means that if an external device or sensor that shares the same ground reference (GND) with the system is connected, any potential difference between these grounds could damage the connected components. To avoid issues with interference, ground loops, or damage to external equipment, ensure that all connected devices share the same ground reference or use systems with appropriate isolation. The recommendations in this case are:

- **Connection Review:** Verify that all ground connections are properly made and that there are no significant potential differences between them.
- **Use of Isolation:** Consider using **galvanic isolators** or **isolation transformers** if it is necessary to connect equipment with different ground references.

### Symbology

|  |  |
|--|--|
|  | Indicates that the equipment is suitable for direct current only; to identify relevant terminals               |
|  | Indicates that the equipment is suitable for alternating current only; to identify relevant terminals          |
|  | To identify the control by which a pulse is started.   |
|  | To identify an earth (ground) terminal in cases where neither the symbol 5018 nor 5019 is explicitly required. |
|  | To identify the switch by means of which the signal lamp(s) is (are) switched on or off.                       |
|  | CE marking indicates that a product complies with applicable European Union regulations                        |
|  | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury     |
|  | To indicate hazards arising from dangerous voltages  |

### Technical Support


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

 [support@industrialshields.com](mailto:support@industrialshields.com)

 [www.industrialshields.com](http://www.industrialshields.com)

 Visit our Blog, Forum or Ticketing system

 Check the user guides

 Visit our Channel

