Industrial Shields Raspberry PLC Family Datasheet

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.	1.5A
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)
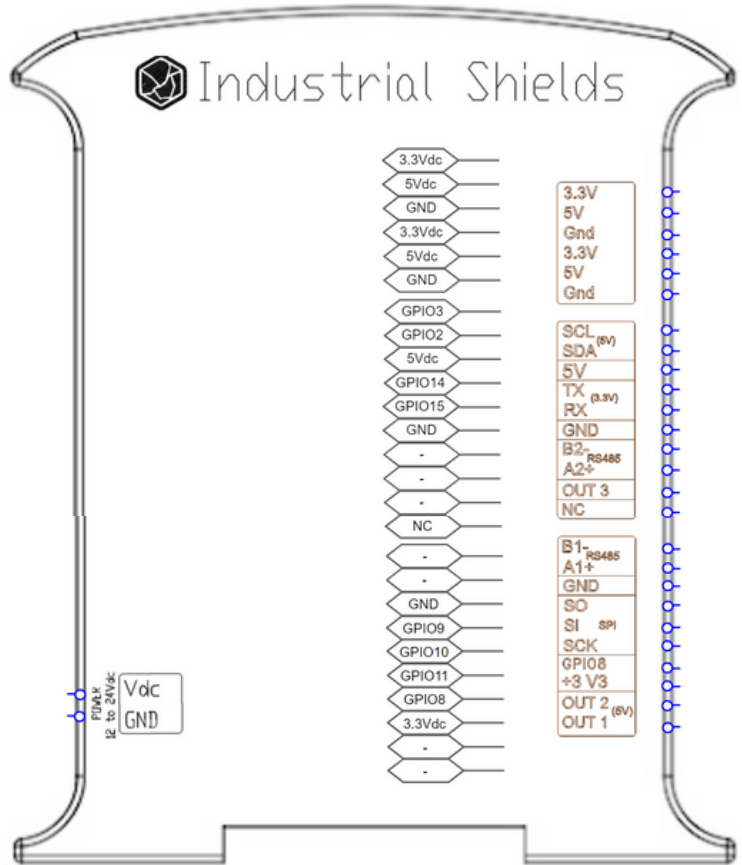
General Features

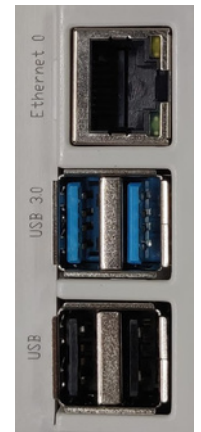| Power supply voltage	DC power supply	12 to 24Vdc
Operating voltage range	DC power supply	11.4 to 25.4Vdc
Power consumption	DC power supply	30 W MIN. .
External power supply	Power supply voltage	24Vdc
Insulation resistance		20mΩ min.at 500Vdc between the AC terminals and the protective earth terminal.
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/s2 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

ⓘ 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.

Left side

Upper side 2

Right Side

ⓘ GPIO(x1)

Digital GPIO8 (3.3 V)

Expandability

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

	Measures Table			
Model	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[1]	IOs Table				
		Analog Input[2]	Digital Isolated Input	Digital Isolated Output	Digital/Analogic Output	Relay Output
Normal	012XXX000000	0	1	0	0	0
21+	012XXX000200	6	7	5	3	0
42+	012XXX000400	12	14	10	6	0
58+	012XXX000600	18	21	15	9	0
19R	012XXX000100	4	2	0	3	8
38R	012XXX000300	8	4	0	6	16
57R	012XXX000500	12	6	0	9	24
38AR	012XXX000700	10	9	5	6	8
57AAR	012XXX000800	16	16	10	9	8
50RRA	012XXX000900	14	11	5	9	16
53ARR	012XXX001000	14	11	5	9	16
54ARA	012XXX001100	16	16	10	9	8

Reference Table

Model	RAM Memory		
	2GB RAM	4GB RAM	8GB RAM
PLC Raspberry General Family			
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	012XXX3000500	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/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)

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 V4 family products! Heater passive elements installed by default.

Zones Table for Raspberry PLC V4 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

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	https://www.raspberrypi.org/

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.

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	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:

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