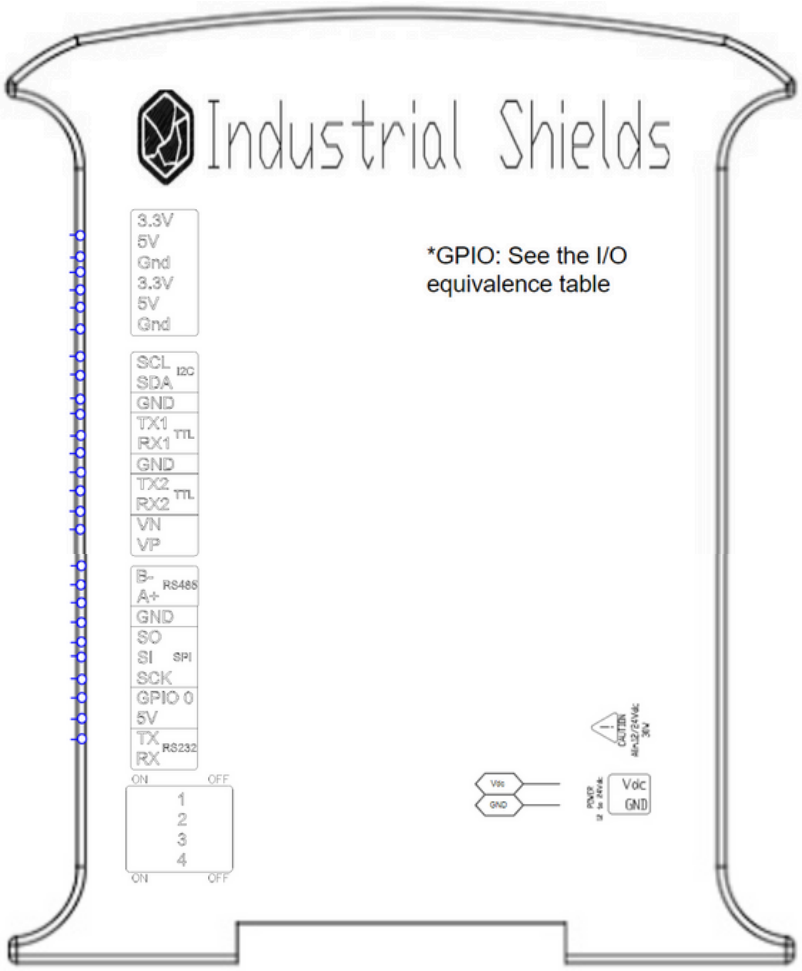
Technical Features ESP32 PLC Family

MODEL TYPE	034001000300 ESP32 ETHERNET&WIFI&BLUETOOTH PLC
Input Voltage	12 to 24Vdc (Fuse protection (2.5A) Polarity protection)
Input rated voltage	24 Vdc
Rated Power	30 W
I max.	1.5 A
Size	101x119.5x70.1 | 101x119.5x94.7 | 101x119.5x119.3
SRAM	520 KB
Communications & Accessories	I2C, Ethernet, SPI, RS485 (Half Duplex), RS232., mircoSD, RTC Bluetooth V4.2 BR/EDR and Bluetooth LE, Wi-Fi802.11b/g/n, SerialTTL, VN/VP
Network	ESP32 wifi/Eth cannot be connected to any cellular network

General Features

Power supply voltage	DC power supply	12 to 24 Vdc
Operating voltage range	DC power supply	11.4 to 25.4 Vdc
Power consumption	DC power supply	30 W MAX.
External power supply	Power supply voltage	24 Vdc
	Power supply current	700 mA
Dielectric strength	1500 Vac at 50/60 Hz for one minute with a leakage current of 10 mA max.	
Shock resistance	50 m/s² in the X, Y and Z direction 3 times each, complying with the IEC-60068-2-27:2008 standard.	
Ambient temperature (operating)	-20 ° to 70 °C	
Ambient humidity (operating)	10 % to 90 % (no condensation)	
Ambient environment (operating)	With no corrosive gas	
Ambient temperature (storage)	-20 ° to 70 °C	
Power supply holding time	2 ms min.	
Weight	380g/490g/600g (Check dimensions/weight table)	

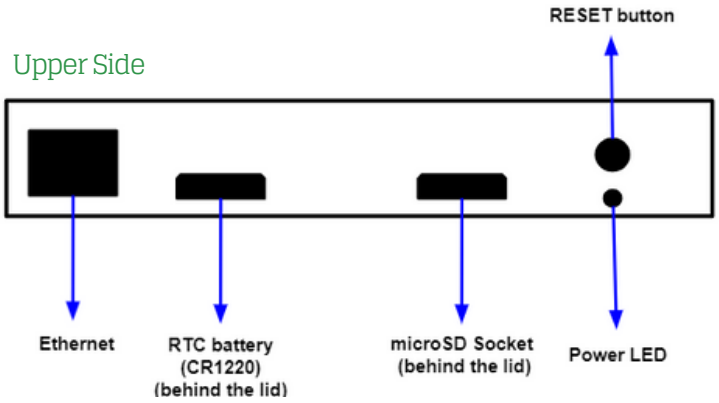


x2 EXPANSION BOARDS SLOTS

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.
- **GPS:**
  - **Model**: L80-M39
  - **Type**: GPS
  - **Key Features**: GPS L1 1575.42 MHz C/A Code, 66 search channels, 22 simultaneous tracking channel, Max Update Rate up to 10 Hz, 1 Hz by default, Velocity Accuracy without aid: 0.1 m/s, Acceleration Accuracy without aid: 0.1 m/s², etc.
  - **Applications**: GPS L1 1575.42 MHz C/A Code, 66 search channels, 22 simultaneous tracking channel, Max Update Rate up to 10 Hz, 1 Hz by default, Velocity Accuracy without aid: 0.1 m/s, Acceleration Accuracy without aid: 0.1 m/s², etc

Upper Side



GPIO(x1)

Digital GPIO 0 (3.3V)

Expandability

I2C - 127 elements ModbusRTU with RS485: 32 elements

Wireless Operation details

Operating Frequency	WiFi	2.4 GHz to 2.5 GHz
	BLE	2402-2480 MHz (40 Channels)
Transmission Power (EIRP)	WiFi	at 2.5 GHz; Power : 9dBm
	BLE	at 2480 MHz; Power: 2,7dBm

Peripherial ports - USB & SIM Card Slot & Antennas

- The microUSB type B port for programming is located at the right side of the PLC enclosure
- The SIM Card Slot is also located at the right side of the PLC enclosure
- Additional Wi-Fi Antenna with SMA famale connector (on the frontal top side) included on the PLC
- Expansion Board Antenna (if required) with SMA female connector (on the frontal top side) included on the PLC

I/Os Table

Model	Reference	Digital/Analog Input*	Digital Isolated Input	Digital Isolated Output	Digital/Analog Output*	Relay output
19R+	01200X000100	4	2	0	3	8
21+	01200X000200	6	7	5	3	0
38AR+	01200X000700	10	9	5	6	8
38R+	01200X000300	8	4	0	6	16
42+	01200X000400	12	14	10	6	0
50RRA+	01200X000900	14	11	5	9	16
53ARR+	01200X001000	14	11	5	9	16
54ARA+	01200X001100	16	16	10	9	8
57AAR+	01200X000800	16	16	10	9	8
57R+	01200X000500	12	6	0	9	24
58+	01200X000600	18	21	15	9	0

Notes

*The Digital/Analog input can be used as either digital or analog.

*The Digital/Analog output can be used as either digital or analog, as well as PWM.

I/Os Ranges

- Analog Inputs voltage: 0 - 10 Vdc (Imin = 2 to 12 mA) | Analog Outputs Voltage: 0 - 10 Vdc (Imax = 20 mA)
- Digital Inputs voltage: 5 - 24 Vdc (Imin = 2 to 12 mA) | Digital Outputs voltage: 5 - 24 Vdc (Imax = 70 mA)
- Relay's voltage: 30 Vdc (3A) | 220 Vac (5 A)

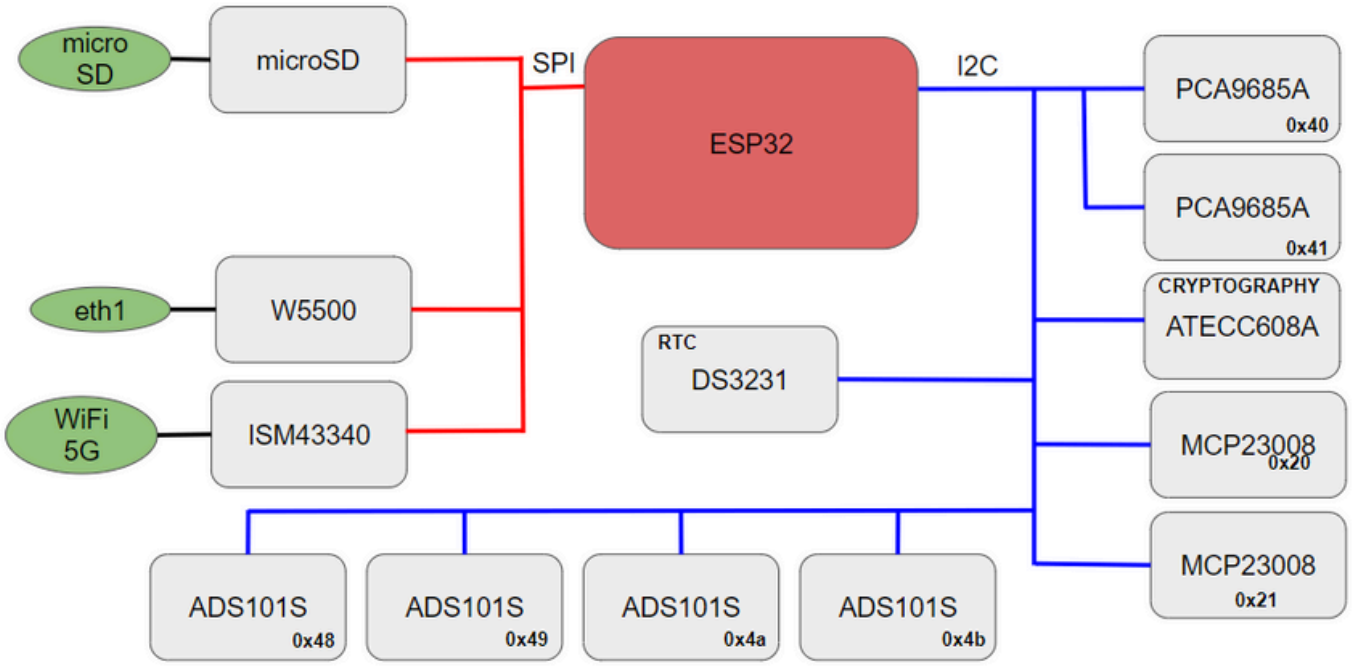
Mechanical dimensions and weights

	Measurements			
MODEL	Height (mm)	Width (mm)	Depth (mm)	Max Weight (g)
19R+	119.5	70.1	101	380
21+	119.5	70.1	101	380
38AR+	119.5	94.7	101	490
38R+	119.5	94.7	101	490
42+	119.5	94.7	101	490
50RRA+	119.5	119.3	101	600
53ARR+	119.5	119.3	101	600
54ARA+	119.5	119.3	101	600
57AAR+	119.5	119.3	101	600
57R+	119.5	119.3	101	600
58+	119.5	119.3	101	600

Zones table

	Zones Table			
MODEL	Zone A	Zone B	Zone C	Zone D
19R+	✓	Relay	-	-
21+	✓	Analog/Digital	-	-
38AR+	✓	Analog/Digital	Relay	-
38R+	✓	Relay	Relay	-
42+	✓	Analog/Digital	Analog/Digital	-
50RRA+	✓	Relay	Relay	Analog/Digital
53ARR+	✓	Analog/Digital	Relay	Relay
54ARA+	✓	Analog/Digital	Relay	Analog/Digital
57AAR+	✓	Analog/Digital	Analog/Digital	Relay
57R+	✓	Relay	Relay	Relay
58+	✓	Analog/Digital	Analog/Digital	Analog/Digital

Internal Scheme



Performance Specifications

Raspberry Board	ESP32-WROOM-32UE
I/O control method	Combination of the cyclic scan and immediate refresh processing methods.
Programming language	Arduino IDE
Website	https://www.espressif.com/

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 ESP32 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 housting, 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 ESP32 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.

Warnings

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.

Communication Switch mapping

SWITCH CONFIGURATION

	1	2	3	4
RS485	X	X	OFF	X
TX1/RX1	X	X	ON	X
RS232	X	OFF	X	X
TX2/RX2	X	ON	X	OFF
EXP 2	X	ON	X	ON

RTC

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

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 explicily 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
ϟ	To indicate hazards arising from dangerous voltages

Technical Support

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- www.industrialshields.com
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