

## Electrical Features

Power supply voltage	12 to 24 Vdc ((2.2 A) Polarity protection)
Input rated voltage	24 Vdc
Power consumption	5 W MIN
Rated Power	8 W
I max.	15 A

## Physical Characteristics

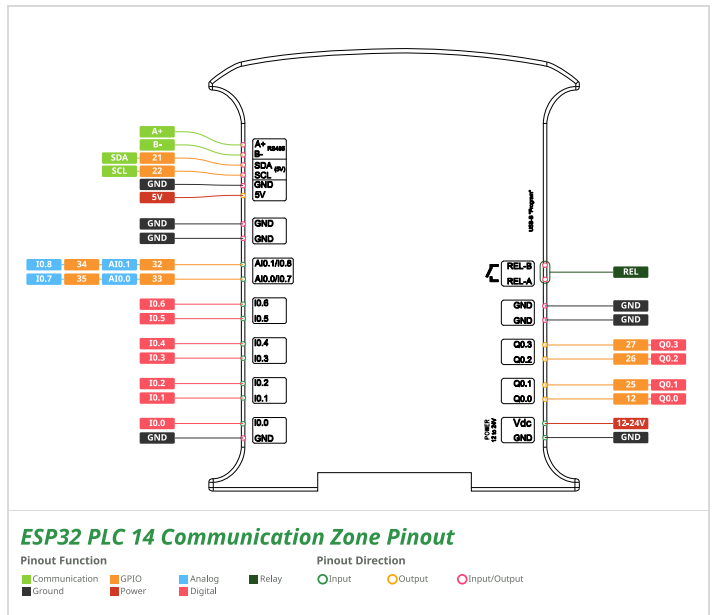
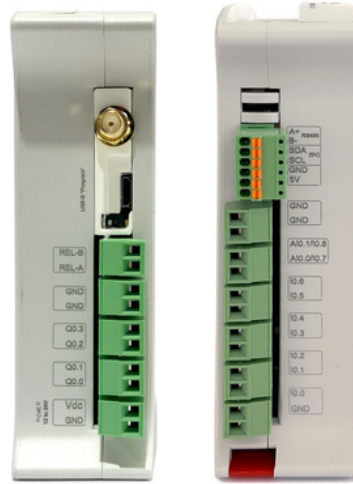
Dimensions H x W x D	100 x 45 x 115	
Weight	350 g MAX	
Connector specifications	Communication connector	20 - 26 AWG spring push-in
	Power supply connector	16 - 28 AWG screw
DIN Rail	TS35	
IP grade protection	IP20	
Ambient humidity (operating)	10 % to 90 % (no condensation)	
Ambient environment (operating)	With no corrosive gas	
Ambient temperature (storage)	-20 ° to 60 °C	

## Technical Features

CPU	ESP32, 16 MB Flash Memory
Clock speed	External: 80-240 MHz Internal: 8 MHz
SRAM	520 KB
RTC	DS3231 Real Time Clock, powered with button battery (CR1216 or CR1220)

## Interface Features

RS-485	Half Duplex, 120Ω termination resistor
I2C	5 V, direct from ESP32 CPU
Ethernet	x1 100 Mbit, RJ45 connector



### Digital Outputs (Q0.0 - Q0.3)

By default, Outputs Q0.0 to Q0.3 give 5V at HIGH level, but they can be changed to provide Vdc by software.

Vdc is Power Supply Voltage and it can be from 12 to 24 Vdc

### Analog Inputs (AI0.0 and AI0.1)

The analog inputs AI0.0 and AI0.1 support both 0-10 V and 4-20 mA modes.

The input mode can be selected via software.

### Digital Inputs (I0.0 - I0.8)

The 14 I/O digital inputs recognize HIGH signals at 3.3V DC or higher up to 24V DC, and signals below 3.3V DC are interpreted as LOW.

All of the digital inputs are optoisolated for protection and noise immunity.

## Available Expansion Boards

Customize one additional communication expansion on your ESP32 PLC 14:

LTE Cat 1	LoRa
<ul style="list-style-type: none"> <li>Model: SARA-R412M</li> <li>Type: 2G EGPRS, GSM/LTE,</li> <li>Key Features: GSM Quad-band 850/1900, 900/1800 MHz, Maximum output power -8dBm, IPv4/IPv6, dual-stack.</li> </ul>	<ul style="list-style-type: none"> <li>Model: RN2483 (EU/Asia), RN2903 (USA/AU)</li> <li>Type: LoRa Module</li> <li>Key Features: Integrated LoRaWAN stack, UART with ASCII command interface, DFU over UART, castellated SMT pads, RoHS compliant, etc.</li> </ul>
GPS	CAN
<ul style="list-style-type: none"> <li>Model: L80-M39</li> <li>Type: GPS Module</li> <li>Key Features: L1 1575.42 MHz, 66 search / 22 tracking channels, up to 10 Hz update rate, 0.1 m/s<sup>2</sup> velocity and 0.1 m/s<sup>2</sup> acceleration accuracy (no aid).</li> </ul>	<ul style="list-style-type: none"> <li>Model: MCP2515</li> <li>Type: CAN V2.0B</li> <li>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.</li> </ul>

### Dig. Isolated Inputs

Parameter	Value
Range	5 to 24 Vdc
Rated Voltage	24 Vdc
I min.	2 mA
Max. Freq.	1 KHz
Isolation	Optocoupled

### Analog Inputs

Parameter	Value
Resolution	11 bit
Range (0-10V mode)	0 to 10 Vdc
Rated Voltage (0-10V mode)	10 Vdc
Range (4-20mA mode)	4 to 20 mA
Rated Voltage (4-20mA mode)	24 Vdc
I min.	2 mA
Max Freq.	160 Hz

### Dig. Isolated Outputs

Parameter	Value
Range	5 / Rated Voltage
Rated Voltage	24 Vdc
I max.	70 mA
Max. Freq. (5V)	10 KHz
Max Freq (24V)	7.5 KHz
Isolation	Optocoupled
Protection	Diode Protected for Inductive Loads

### Relay

Parameter	Value
Operating Mode	+Resistive Load
Voltage Range	230 Vac (AC)
	24 Vdc (DC)
Maximum Current	4 A (AC)
	2 A (DC)
Isolation	Optocoupled

Use an RC snubber for inductive loads. Choose RC values based on the load specifications.

**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

**Install Arduino IDE and the Industrial Shields boards**

The steps to follow to install our equipment's to Arduino IDE are:

1. Open the Arduino IDE, versión 1.8.0 or superior. You can download here: <https://www.arduino.cc/en/Main/Software>.
2. Press the "Preferences" option in "File" menu.
3. In the text box "Additional boards manager URLs", add the direction:  
[http://apps.industrialshields.com/main/arduino/boards/package\\_industrialshields\\_index.json](http://apps.industrialshields.com/main/arduino/boards/package_industrialshields_index.json)
4. Close the preferences window with the "OK" button.
5. Click on "Tools" -> "Boards". Click the "Boards Manager" option, to open the Boards Manager window.
6. Search for "industrialshields-esp32" to the search filter and select to the list and click "Install"
7. Once it has performed that steps, you are available to select each PLC with: "Tools" -> "Board" -> Industrial Shields ESP32...

**References**

The references are: 0130000X0001

X stands for Expansion Board Slot

- X = 0: No Expansion Board Slot
- X = 1-9: With Expansion Board Slot

**Occupied I2C addresses**

- 0x20
- 0x78

 **Mico USB-B cable warning**

ESP32 PLC 14 must be used a long micro USB-B type cable with the thin plastic part (contour of 2mm).


 **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 14 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 ESP32 14 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.

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)

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