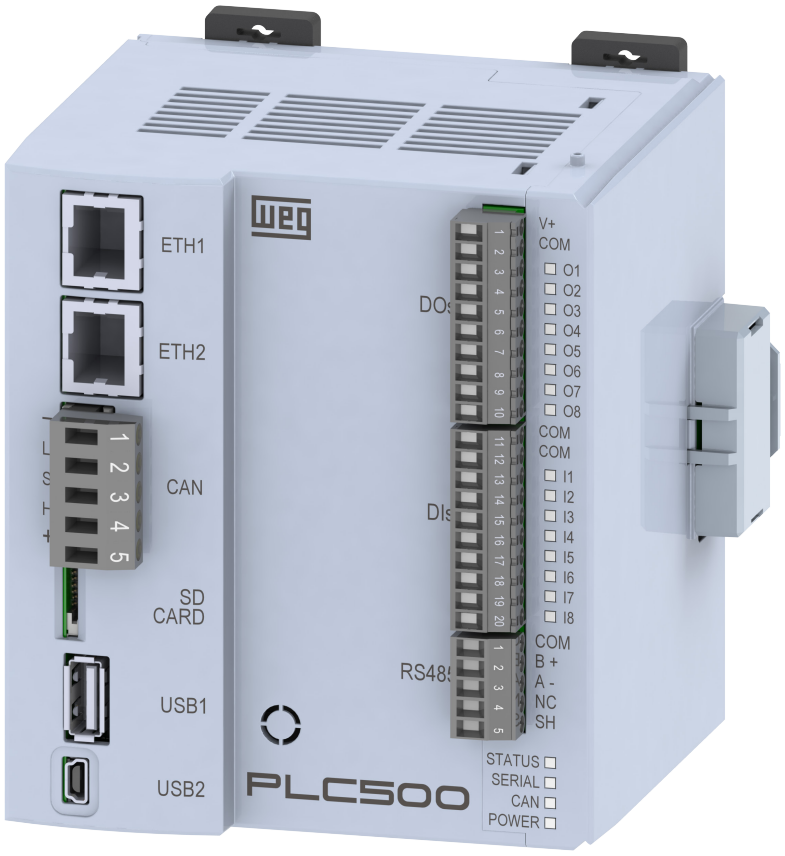
Programmable Logic Controller

PLC500, PLC500ED and PLC500MC

User's Manual



User's Manual

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Summary of Reviews

The information below describes the reviews made in this manual.

Version	Review	Description
-	R00	First edition
-	R01	PLC500ED and PLC500MC products added, and protocols updated

1 SAFETY INSTRUCTIONS

This manual contains the information for the correct use of the Programmable Logic Controller PLC500.

It was developed to be used by people with proper technical training or qualification to operate this kind of equipment.

This manual presents all the functions and parameters of the PLC500, but it is not intended to explain every possible application of the PLC500. WEG will not take any liabilities for applications not described in this manual.

This product is neither intended for applications whose purpose is to ensure physical integrity and/or life of people, nor for any other application in which a fault of the PLC500 may create a situation of risk to the physical integrity and/or life of people. The designer who uses the PLC500 must provide ways to ensure the safety of the installation even in case of a failure of the remote unit of the Programmable Logic Controller.

1.1 SAFETY WARNINGS IN THE MANUAL

The following safety warnings are used in this manual:

DANGER!
The procedures recommended in this warning aim at protecting the user against death, serious injuries and considerable material damages.

ATTENTION!
The procedures recommended in this warning aim at preventing material damages.

NOTE!
The text aims at providing important information for the full understanding and proper operation of the product.

1.2 SAFETY WARNINGS ON THE PRODUCT

The following symbols are attached to the product as safety warnings:

Mandatory connection to the protective earth (PE).

1

1.3 PRELIMINARY RECOMMENDATIONS

DANGER!
Only qualified personnel, familiar with the PLC500 and related equipment, must plan or perform the installation, operation and maintenance of this device.
Such personnel must follow the safety instructions described in this manual and/or defined by local standards.
Failure to comply with the safety instructions may cause risk of death and/or equipment damage.

NOTE!
For the purposes of this manual, qualified personnel are those trained in order to be able to:
1. Install, ground, power up and operate the PLC500 in accordance with this manual and the safety legal procedures in force.
2. Use the protective equipment in accordance with the relevant standards.
3. Give first aid.

ATTENTION!
Electronic boards have components sensitive to electrostatic discharges. Do not touch directly the component parts or connectors. If necessary, first touch the grounded metallic frame or use a proper grounding strap.

NOTE!
Read the whole user manual before installing or operating the PLC500.

2 GENERAL INFORMATION

2.1 ABOUT THE MANUAL

This manual contains the main technical characteristics, functionalities and installation and operation instructions of the PLC500, PLC500ED (Edge Device) and PLC500MC (Motion Controller).

For detailed information on parameter setting, functions and accessories, see the manuals and Application Notes available on the WEG website www.weg.net and also the CODESYS software help available in the online help help.codesys.com.

2.2 TERMS AND DEFINITIONS USED IN THE MANUAL

°C: degree Celsius.

A: ampere.

CAN: controller area network.

CODESYS: PLC500 programming software.

CPU: Central Processing Unit.

Gbyte: gigabyte = 10^9 bytes.

GHz: gigahertz = 10^9 hertz.

I/Os: inputs/outputs.

kHz: kilohertz = 1000 hertz.

mA: milliamp = 0.001 amp.

Memória FLASH: non-volatile memory that can be electrically written and erased.

MHz: megahertz = 10^6 hertz.

min: minute.

ms: millisecond = 0.001 seconds.

OTG: On The Go – function of the USB interface that enables the connection of other USB devices.

RTD: Resistance Temperature Detector.

s: second.

USB: Universal Serial Bus - type of serial communication interface designed to work according to the plug and play concept.

V: volts.

Webpage: webpage used to access information regarding the PLC500, as well as to configure network connections, update product firmware, among others.

Ω: ohms.

2.3 ABOUT THE PLC500

The PLC500 Programmable Logic Controller is a device developed to solve medium and large applications. It has high processing speed thanks to its CPU, composed of a Dual-core ARM Cortex-A7 processor running at 1 GHz, a coprocessor Real-Time ARM Cortex-M4 running at 200 MHz, 1 GByte RAM and 4 GByte Flash.

It has eight digital outputs, three of which have PWM functionality up to 300 kHz, and eight digital inputs, four of which can operate up to 150 kHz.

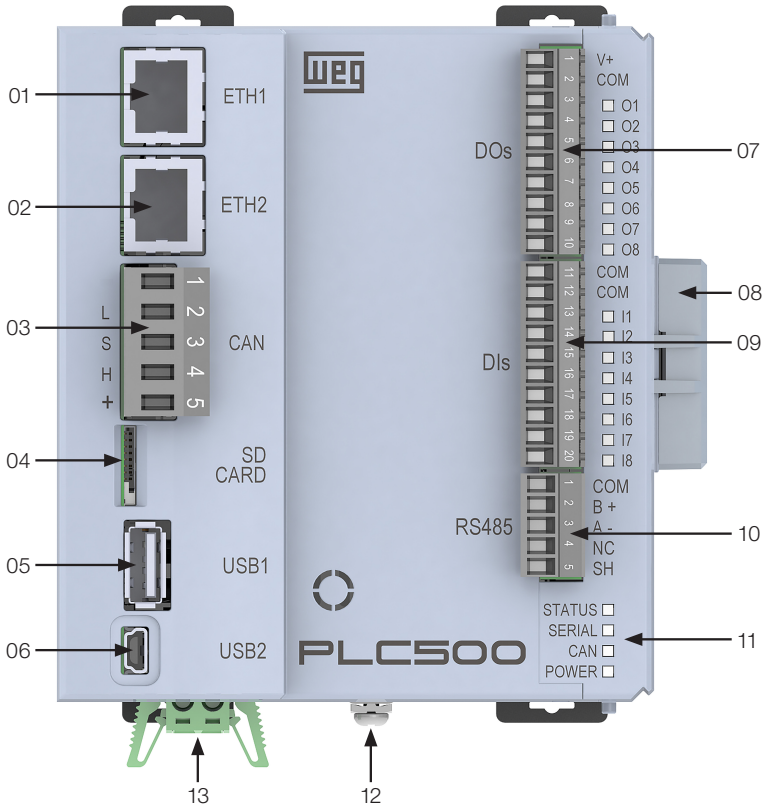
As communication interfaces, it has two independent Ethernet ports, CAN port, serial RS485, USB OTG, USB device and micro SD card.

Built-in supercapacitors are used for real time clock (RTC) and for saving retentive data to flash memory during power off, eliminating the need for batteries.

The PLC500 allows the connection of expansion boards for digital, analog, thermocouple, PT100, PT1000, load cell, relay and other inputs and outputs, making the applications more flexible. It has plug-in connectors and can be mounted on a DIN 35 rail or directly on the panel.

The PLC500 is programmed via CODESYS software, widely used in the industrial environment, allowing the use of numerous applications and functions already developed on the market, as well to import applications from other products.

Figure 2.1 on page 2-2 shows the PLC500 and the description of the communication interfaces, connections and indication LEDs.



No.	Information
1	Ethernet Connector 1
2	Ethernet Connector 2
3	CAN Connector
4	SD Card
5	USB1 OTG
6	USB2 Device
7	Digital Outputs Connector
8	Expansion Bus Closure
9	Digital Input Connector
10	Serial RS485 Connector
11	Indication LEDs
12	Grounding screw
13	+24 Vdc Power Supply

Figure 2.1: *PLC500*

2.4 MEMORY AREAS

The PLC500 has a large memory area available to the user. The memory usage of an application can be seen through the CODESYS at: View -> View memory usage.

The PLC500 memory is divided according to the table below.

Memory	PLC500	PLC500ED	PLC500MC	Information
Area 0 (DATA)	8 MB	64 MB	128 MB	Stores all local and global data (variables, function blocks, instances, etc.)
Area 1 (CODE)	16 MB	16 MB	32 MB	Stores all codes generated by the application and also the constant data
Area 2 (RETAIN)	64 kB	64 kB	64 kB	Stores retain-type variables (keeps the value after the controller reboot)
Area 3 (PERSISTENT)	16 kB	16 kB	16 kB	Stores persistent-type variables (keeps the value after reboot and after download when their layout remains identical)

2.5 INTERFACES, DIGITAL INPUTS AND OUTPUTS

The table below contains the number of communication interfaces and digital inputs and outputs of the PLC500.

Interface	Quantity
Gigabit Ethernet	2
CAN	1
USB Device	1
USB OTG	1
Isolated Serial RS485	1
Total Digital Inputs	8
Fast Digital Inputs	4
Total Digital Outputs	8
Fast Digital Outputs	3

2.6 PROTOCOLS

The table below contains the existing protocols and their respective functions. Protocols marked as "Future" will be available in future updates.

Protocolo	Função	Interface			
		ETH1	ETH2	CAN	RS485
Modbus TCP	Server	Yes	Yes		
	Client	Yes	Yes		
Modbus RTU	Master				Yes
	Slave				Yes
CANopen	Master			Yes	
	Slave			Future	
EtherNet/IP	Scanner	Future	Future		
	Adapter	Yes	Yes		
EtherCAT	Master	Yes	Yes		
	Slave				
OPC UA	Server	Future	Future		
	Client	Future	Future		
OPC DA	Server	Future	Future		
	Client	Future	Future		
MQTT	Broker	Yes	Yes		
	Client	Yes	Yes		

2.7 RECEIVING AND STORAGE

The PLC500 is supplied packed in a cardboard box. At the receipt of the product, check if:

- The identification label of the PLC500 corresponds to the purchased model.
- Damages during transportation.

If any problem is detected, report it to the Carrier immediately.

If the PLC500 is not installed soon, store it in a clean and dry location [temperature between -25 °C and 60 °C (-13 °F and 140 °F) with a cover to prevent dust accumulation inside of the Programable Logic Controller.

2.8 CONTENT OF THE PACKAGE

- PLC500 with plug-in connectors.
- Installation, configuration and operation quick guide.
- Grounding plates.
- Closure of the communication busbar.

3 MECHANICAL INSTALLATION

The directions and suggestions must be followed aiming at the safety of people and the correct operation of the equipment.

3.1 MOUNTING

The PLC500 and its accessories can be installed on a 35 mm DIN rail as shown in Figure 3.1 on page 3-1. In order to do so, proceed as follows:

a) Move the four latches away.

b) Position the controller on the DIN rail.

c) Close the four latches again.

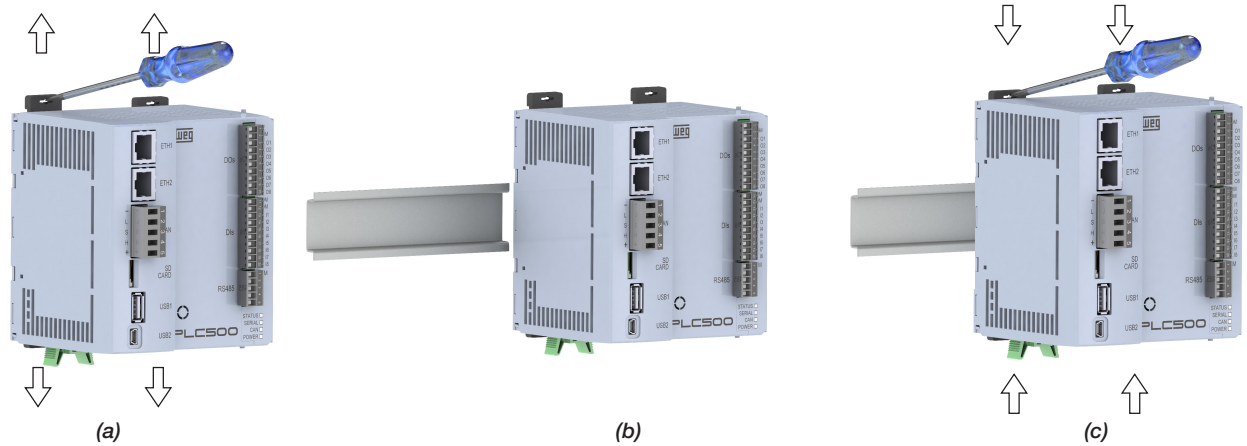


Figure 3.1: *Mechanical mounting on DIN rail*

In addition to the DIN rail, the PLC500 can also be mounted directly to the panel using M3 screws, as shown in Figure 3.2 on page 3-1, in order to do so:

a) Move the four latches away.

b) Screw the controller unit on the panel.

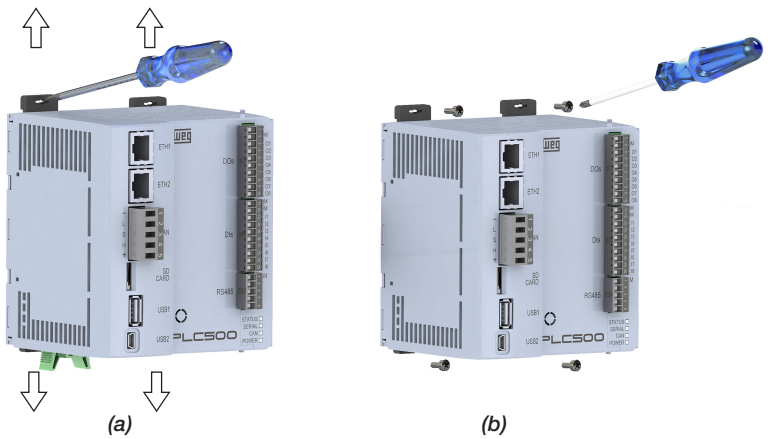


Figure 3.2: *Mounting directly to the panel*

3.2 DIMENSIONS

3.2.1 PLC500 Dimensions

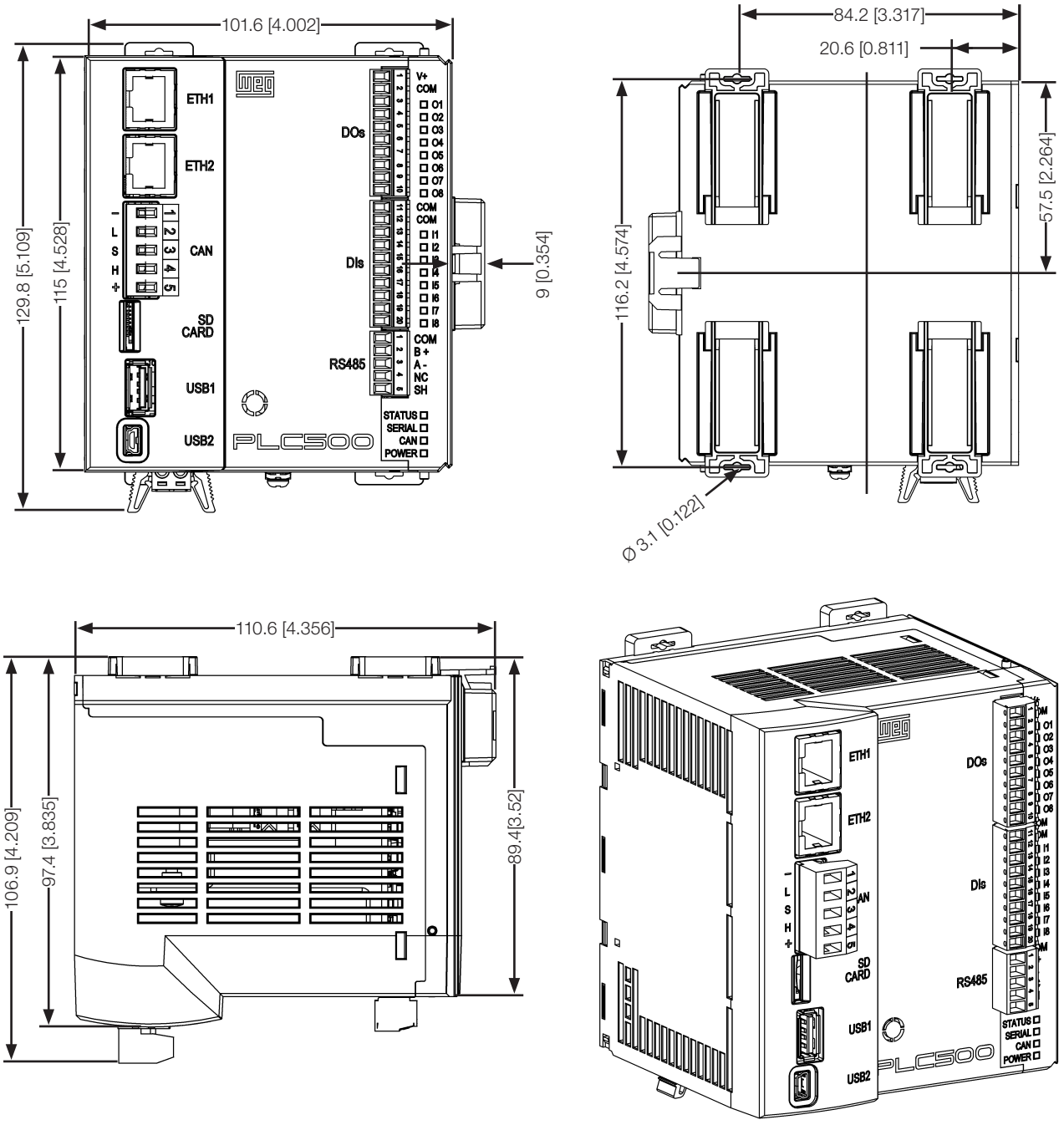


Figure 3.3: *PLC500 dimensions in mm [in]*

3.2.2 Accessory Dimensions

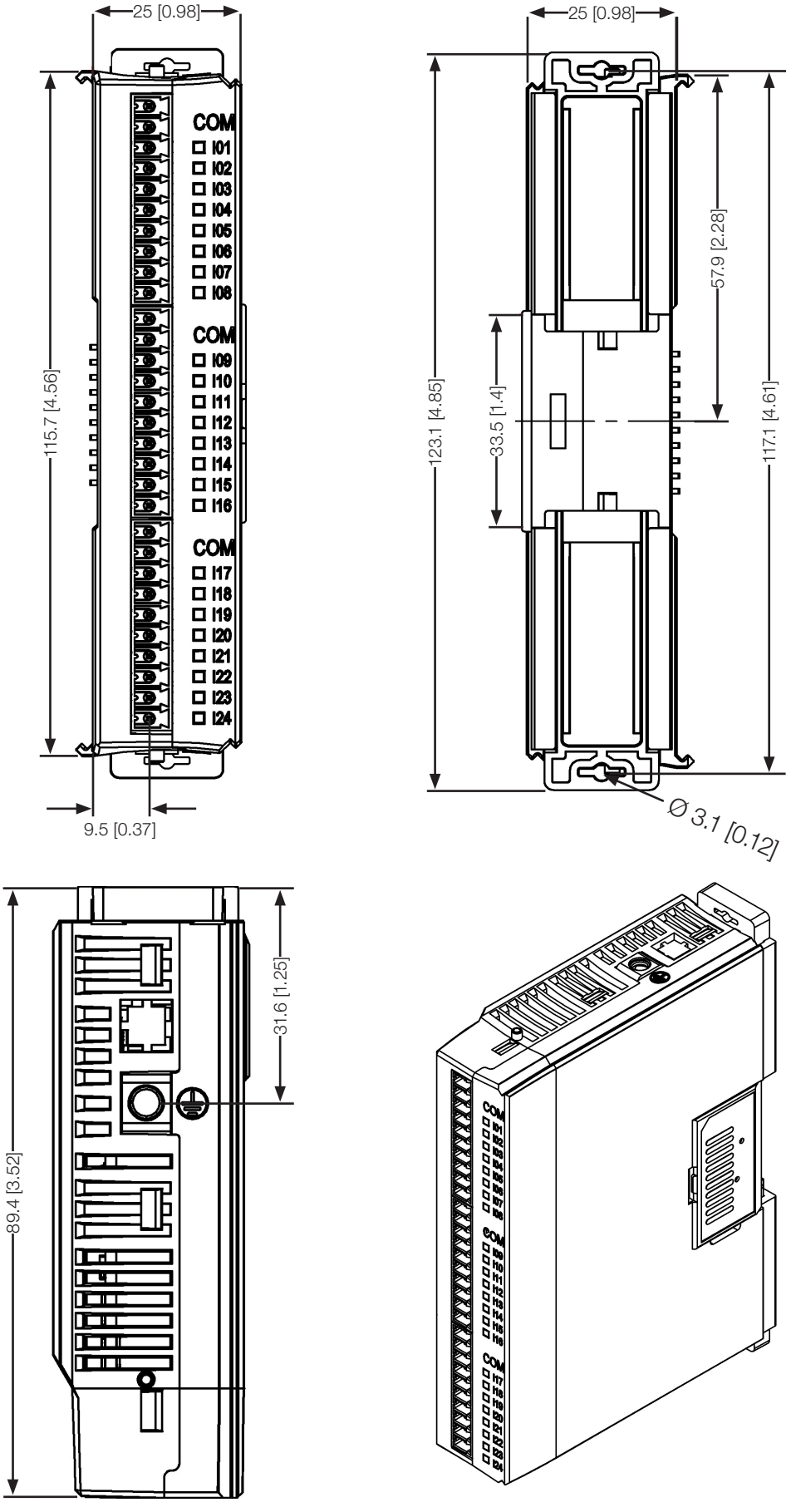


Figure 3.4: *Accessory dimensions in mm [in]*

3.3 ACCESSORY CONNECTION

The accessories must be inserted in the direction of the figure below. Before adding a new accessory, the closure of the modules must be removed and reinstalled after connecting the accessory.

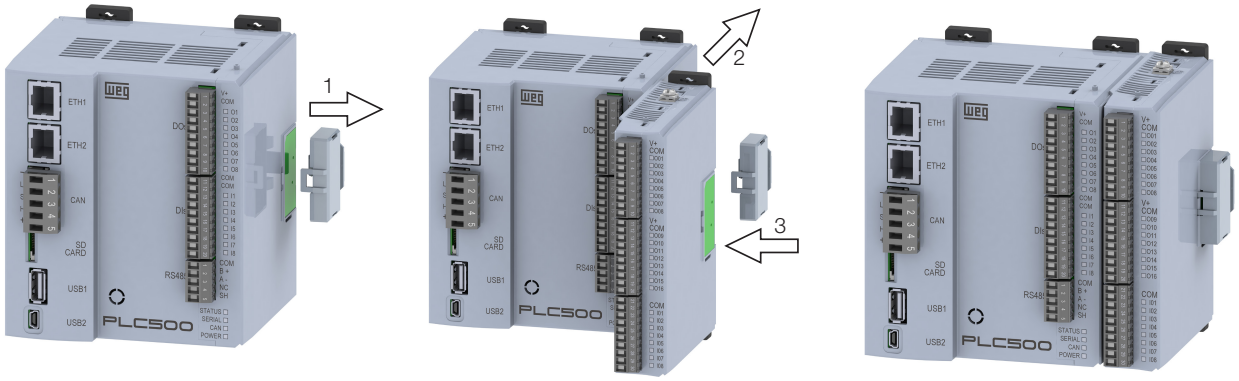


Figure 3.5: *Accessory Connection*

Connecting the closure of the PLC500 communication busbar is essential for its operation.

To install the closure correctly, first fit the part highlighted in red (1), then, with a small rotation movement, fit part 2 that is close to the rail or panel.

ATTENTION!!
Accessories must be installed or removed with the PLC500 de-energized to avoid burning components and to allow them to be identified.

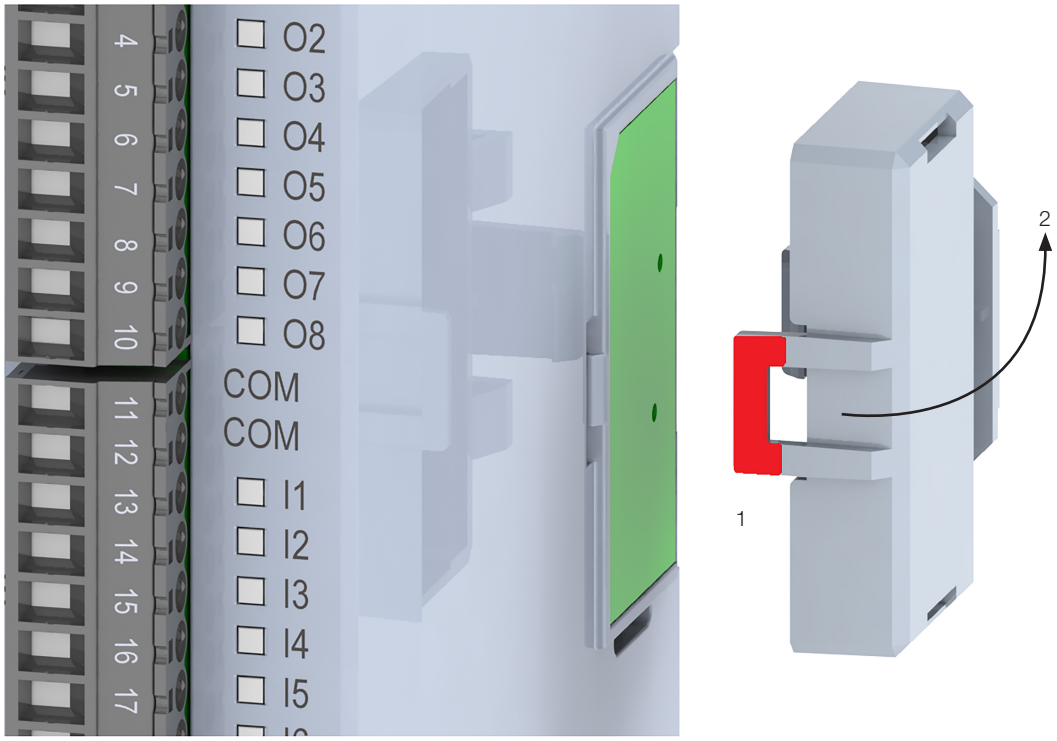


Figure 3.6: Closure fitting

4 ELECTRICAL INSTALLATION

4.1 POWER SUPPLY

The PLC500 must be powered by an external 24 Vdc power supply with a current capacity of at least 3 A. The minimum supply voltage is 20.4 Vdc, and the maximum is 28.8 Vdc.

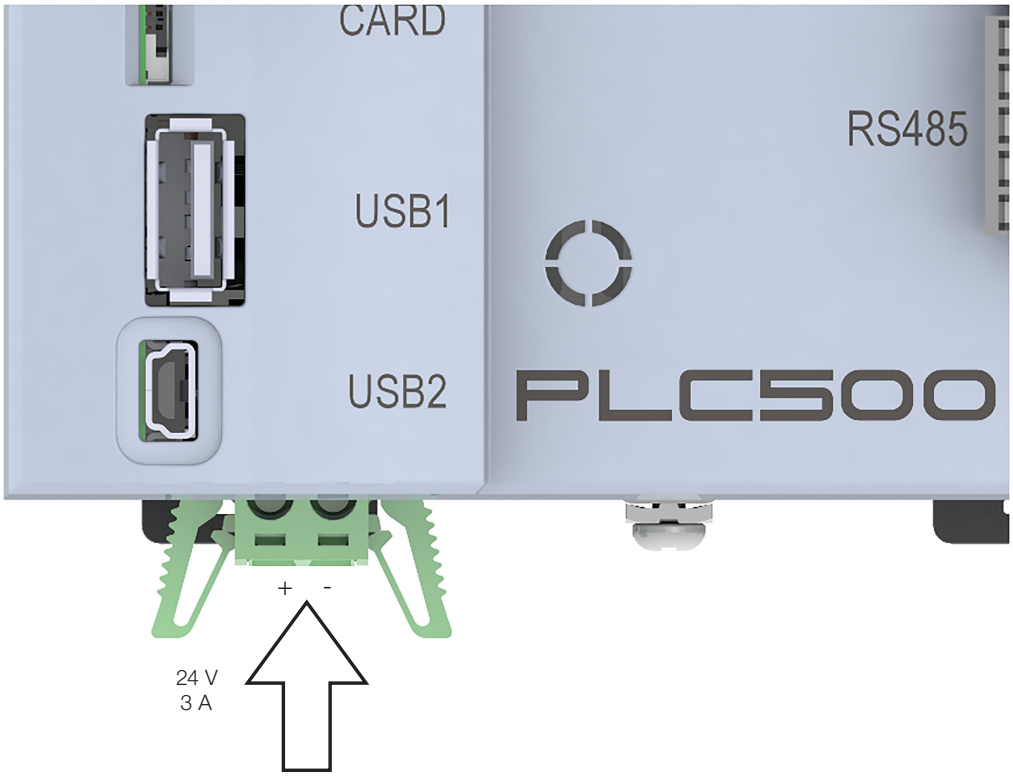


Figure 4.1: *Power supply*

4.2 GROUNDING CONNECTION

Use the screws indicated on Figure 4.2 on page 4-2 to ground the product.

To connect the ground to the expansions, use the metal plate that comes with the product, as indicated by arrow 1 on Figure 4.2 on page 4-2. To connect the other expansions, use the metal plate indicated by arrow 2 on Figure 4.2 on page 4-2.

For analog expansion modules, it is recommended to use cables with the shield properly connected to the ground-grid.

The shield of analog cables must be grounded using the metallic clamp that comes with the expansion. The grounding of the shield minimizes occasional electromagnetic interferences.

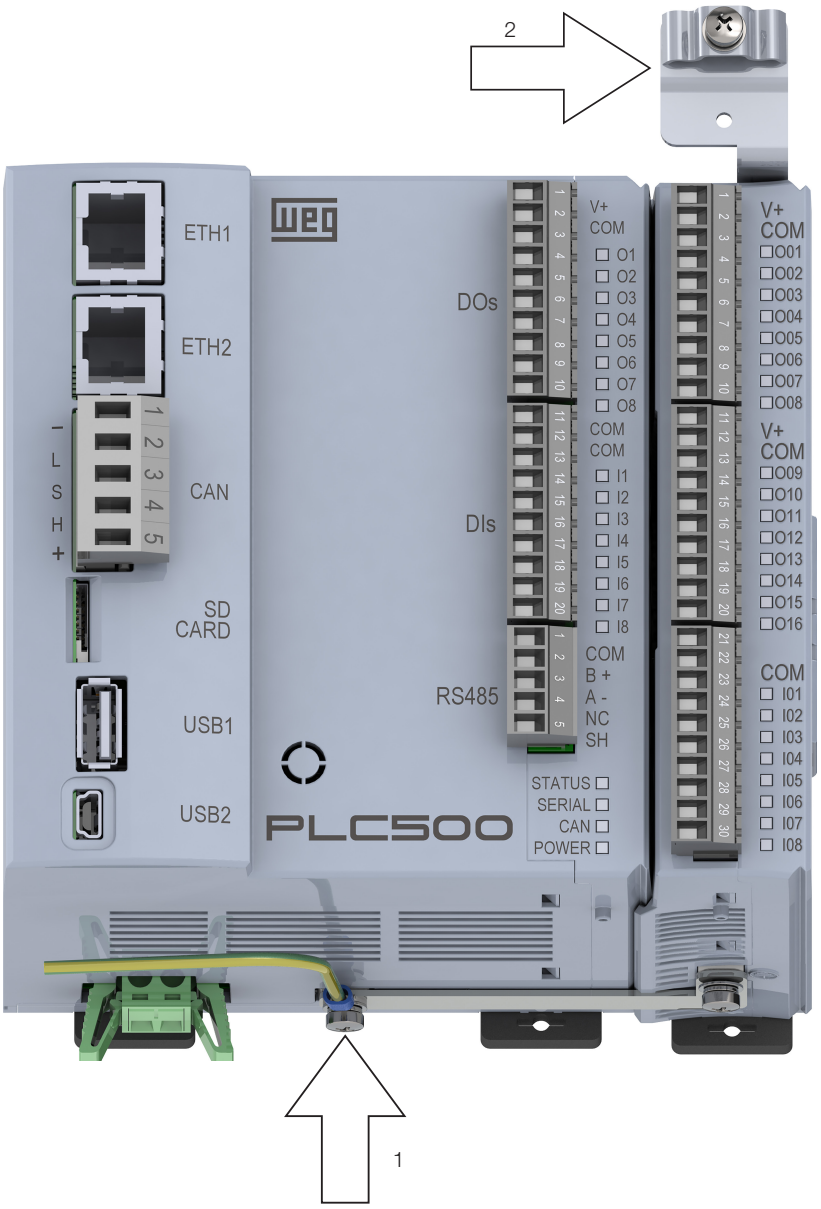


Figure 4.2: *Product Grounding Screw*

5 ETHERNET COMMUNICATION INTERFACES

The PLC500 has two independent Ethernet ports that can operate at a speed of 10/100/1000 Mbps, called ETH1 and ETH2.

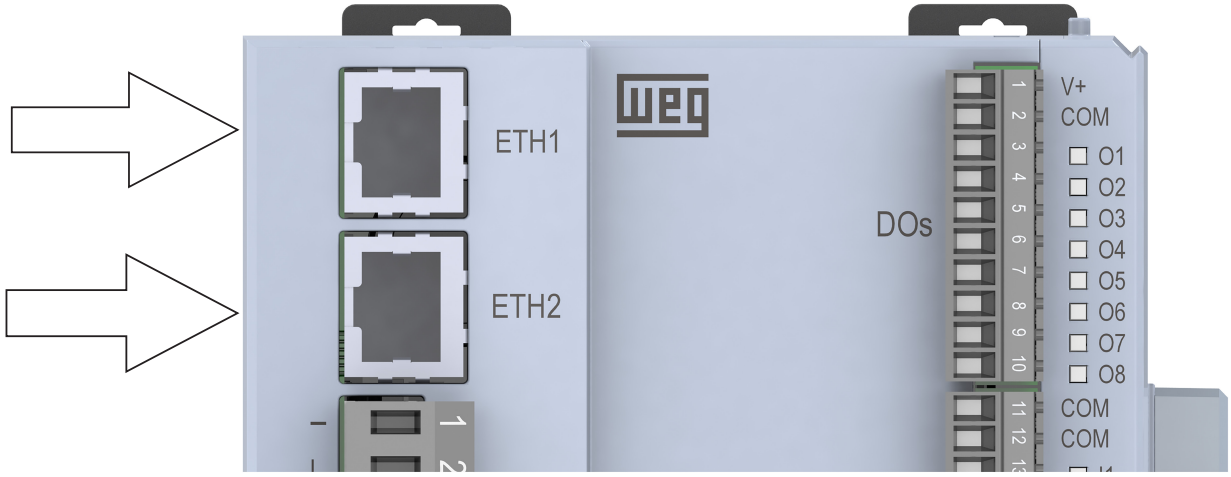


Figure 5.1: *Ethernet Connectors*

For the installation, it is recommended to use shielded Ethernet cables specific for industrial environments.

ETH1 port has default IP **192.168.1.10** while ETH2 port has default IP **192.168.2.10**.

Such values and other settings can be made by the product setup through CODESYS. Another option is to access it via webpage Capítulo 15 ACCESS VIA WEBPAGE on page 15-1.

Setup

Setup Parameters

Setup I/O Mapping

Parameter	Type	Value	Default Value
Firmware			
Firmware version	STRING	'Not connected'	'Not connected'
Update available	STRING	'Not connected'	'Not connected'
Update	Enumeration of BYTE	No	No
Date and Time			
Date	STRING	'2021-12-31'	'2021-12-31'
Time	STRING	'00:00:00'	'00:00:00'
Termination Resistors			
RS485	Enumeration of BYTE	Not Connected	Not Connected
CAN	Enumeration of BYTE	Not Connected	Not Connected
Ethernet 1			
IP	STRING	'192.168.1.10'	'192.168.1.10'
NetMask	STRING	'255.255.255.0'	'255.255.255.0'
IP assignment	Enumeration of BYTE	Static	Static
Ethernet 2			
IP	STRING	'192.168.2.10'	'192.168.2.10'
NetMask	STRING	'255.255.255.0'	'255.255.255.0'
IP assignment	Enumeration of BYTE	Static	Static

Figure 5.2: *Ethernet setup via CODESYS*

NOTE!
The Ethernet ports are independent and must operate on separate networks.

For further details, see the Application Notes available on WEG's website.

6 CAN COMMUNICATION INTERFACE

The PLC500 interface has isolated CAN and its own internal power supply. The 5-way plug-in connector to connect the Modbus network has the following pinout:

Pin	Name	Lettering	Function
1	COM	-	Common in the CAN network (connected to the negative pole of the CAN network)
2	CAN_L	L	L CAN_L communication signal
3	SHIELD	S	Cable shield
4	CAN_L	H	CAN_H communication signal
5	NC	+	Not connected (can receive the positive pole of the CAN network)

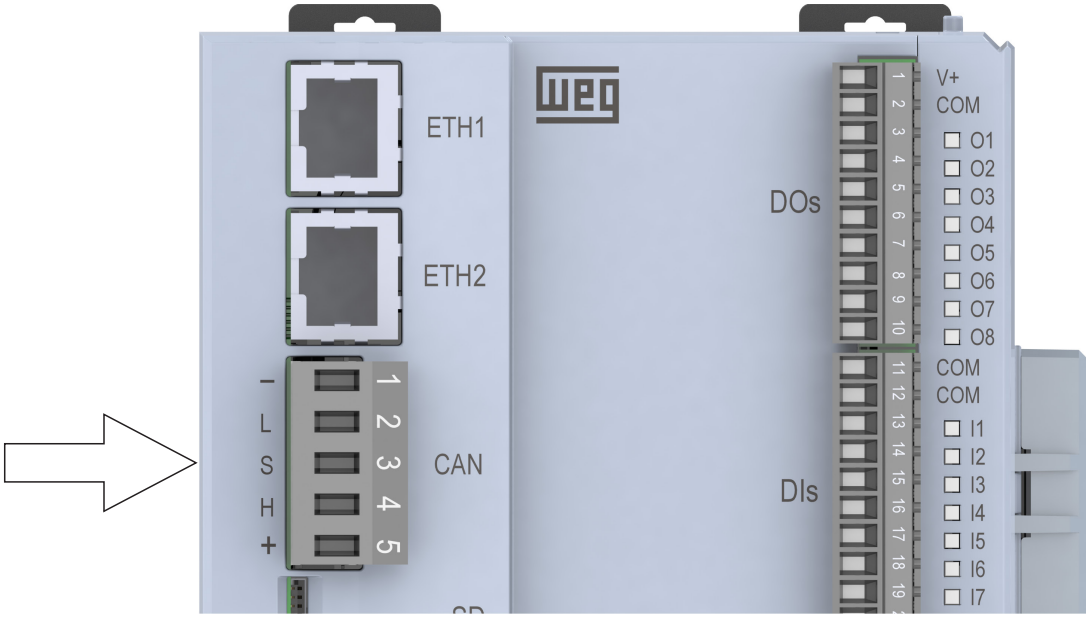


Figure 6.1: *CAN Connector*

The PLC500 has an internal power supply for the CAN network, so it is not necessary for pin 5 to be connected.

Nevertheless, it is recommended that pin 1 (COM) be connected to the master and the other slaves to leave the CAN network in the same voltage reference.

The CAN interface requires 120 Ω termination resistors at the end devices connected to the CAN network. The PLC500 has these resistors internally, which can be connected and disconnected via the CODESYS software setup.

The CANopen network address and baud rate are set through the programming software.

For further details, see the CANopen Application Notes available on WEG's website.

7 RS485 CAN COMMUNICATION INTERFACE

Isolated, multipoint serial interface intended for network communication. It operates as master or slave in the Modbus RTU protocol.

The 5-way plug-in connector to connect the Modbus network has the following pinout:

Pin	Name	Function
1	COM	Common of RS485
2	B +	Communication signal B +
3	A -	Communication signal A -
4	NC	Not connected
5	SHIELD	Cable shield

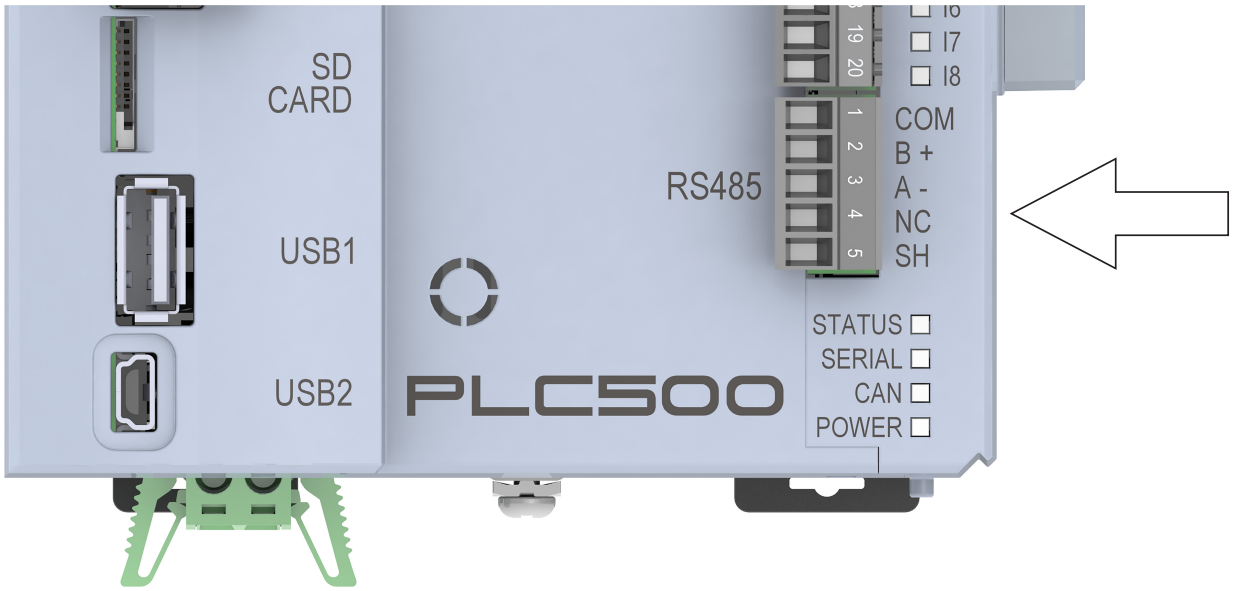


Figure 7.1: *RS485 connector*

The RS485 serial communication address, baud rate and bytes are set via the product programming software. Built-in termination resistors can also be added to the RS485 network through the CODESYS Setup.

For further details, see the Modbus RTU Application Notes available on WEG's website.

8 USB OTG INTERFACE (HOST)

The PLC500 has a USB OTG Type A (USB1) port that allows the product to operate as a host for USB communication. This port can receive plug and play devices such as flash drives for reading and storing data.

ATTENTION!!
As this is a non-isolated interface, it should not be used to exchange data between PLCs or other devices forming a network. If a cable is used to communicate with a device. It must not exceed three meters.

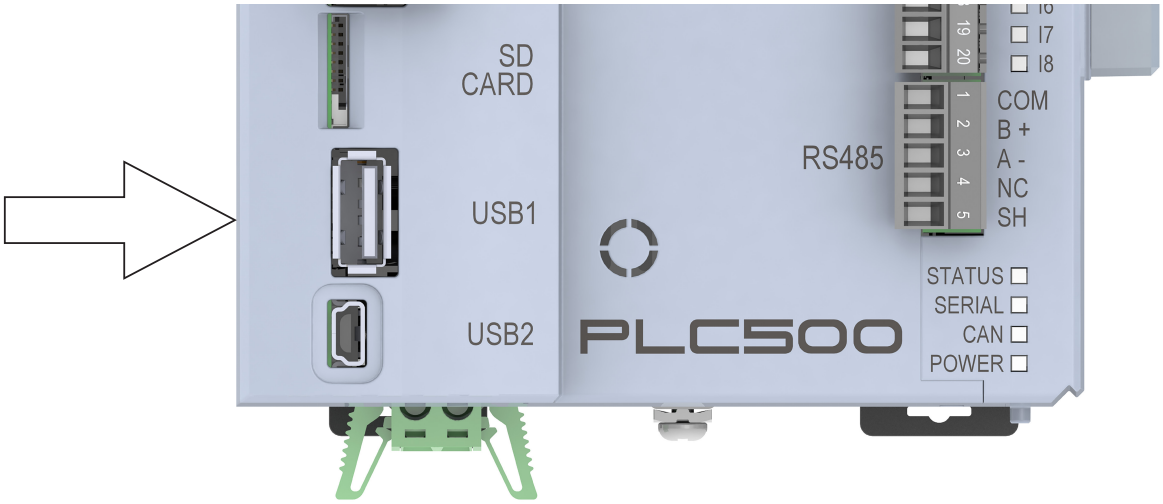


Figure 8.1: *USB HOST Connector*

9 USB DEVICE INTERFACE

The PLC500 has a Mini USB port (USB2) that emulates an Ethernet port exclusive for programming, parameter setting and product monitoring through a computer. The IP address of this port is fixed: **192.168.234.234**.

As this is a non-isolated interface, it must not be used for the PLC500 operation. It must only be used for configuration at start-up.

The cable used for this connection must be a shielded mini USB type B, limited to three meters in length. Cables without shield may cause communication errors.

To access this interface, proceed as follows:

1) Connect the mini USB cable to the USB2 port and to the computer.

2) Install the RNDIS Ethernet USB Driver.

3) In the properties of the IPv4 Protocol, set the IP as static, within the same network (e.g.: **192.168.234.100**) as shown in Figure 9.1 on page 9-1.

By doing so, the PLC500 will be ready to be accessed through the CODESYS.

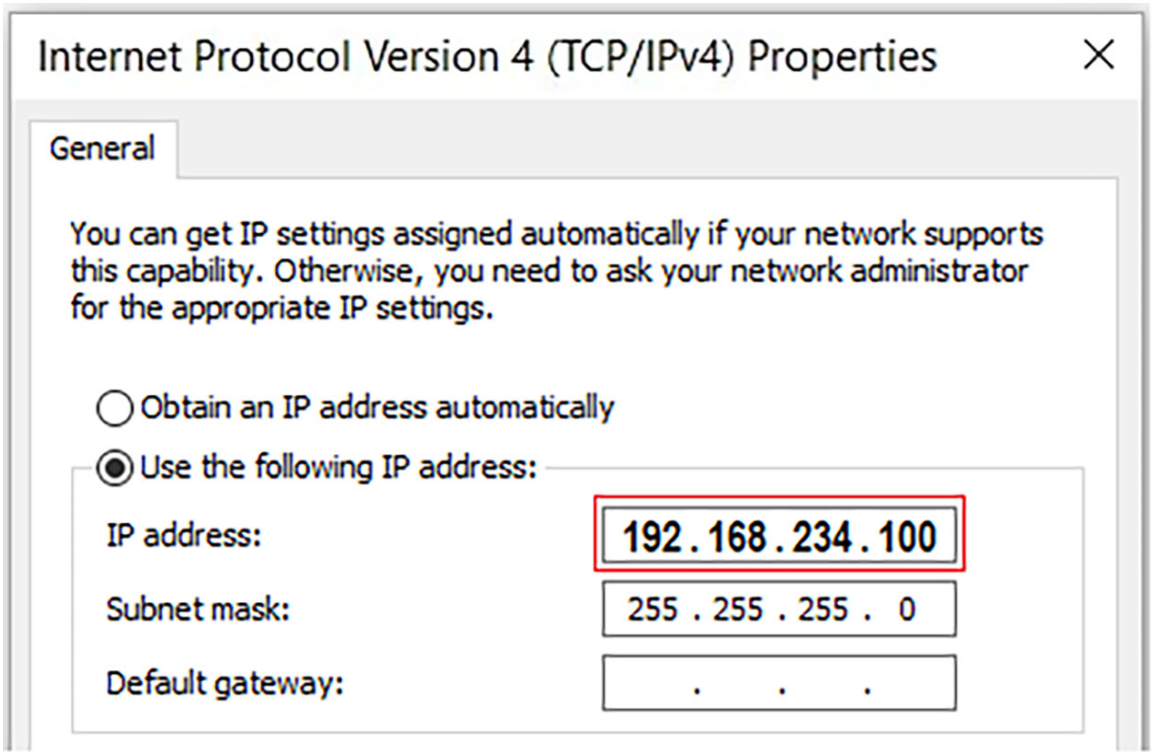


Figure 9.1: *Properties of the USB Device emulating an Ethernet port*

ATTENTION!!
The PLC500 and the computer must be at the same ground potential. It is recommended to use laptops (portable) instead of desktop computers.

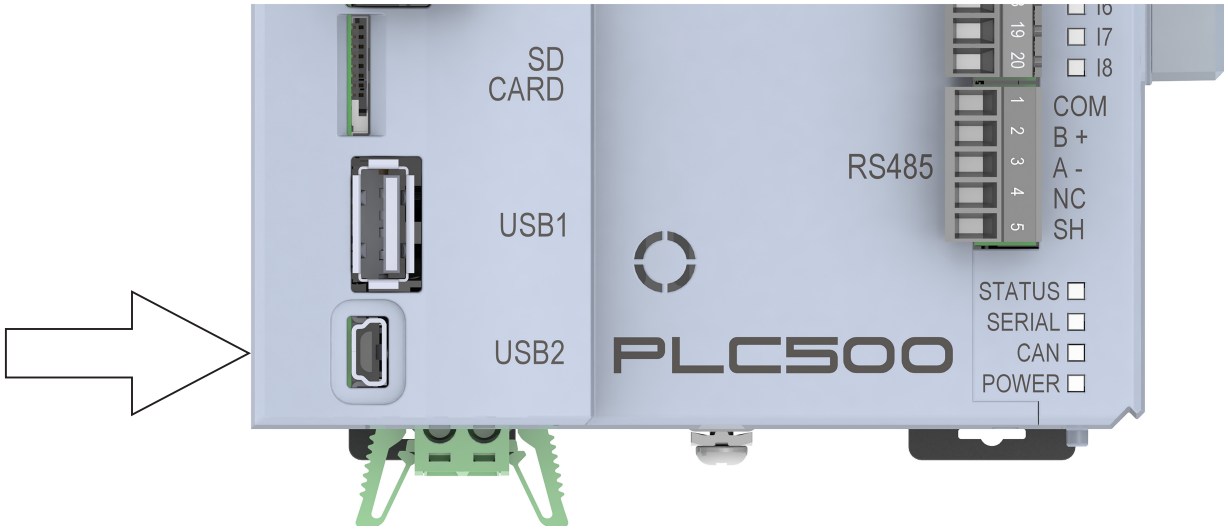


Figure 9.2: *USB Device Connector*

10 INDICATION LEDS

The PLC500 has LEDs to indicate the status of the controller, communication networks and digital inputs and outputs, as shown in the figure:

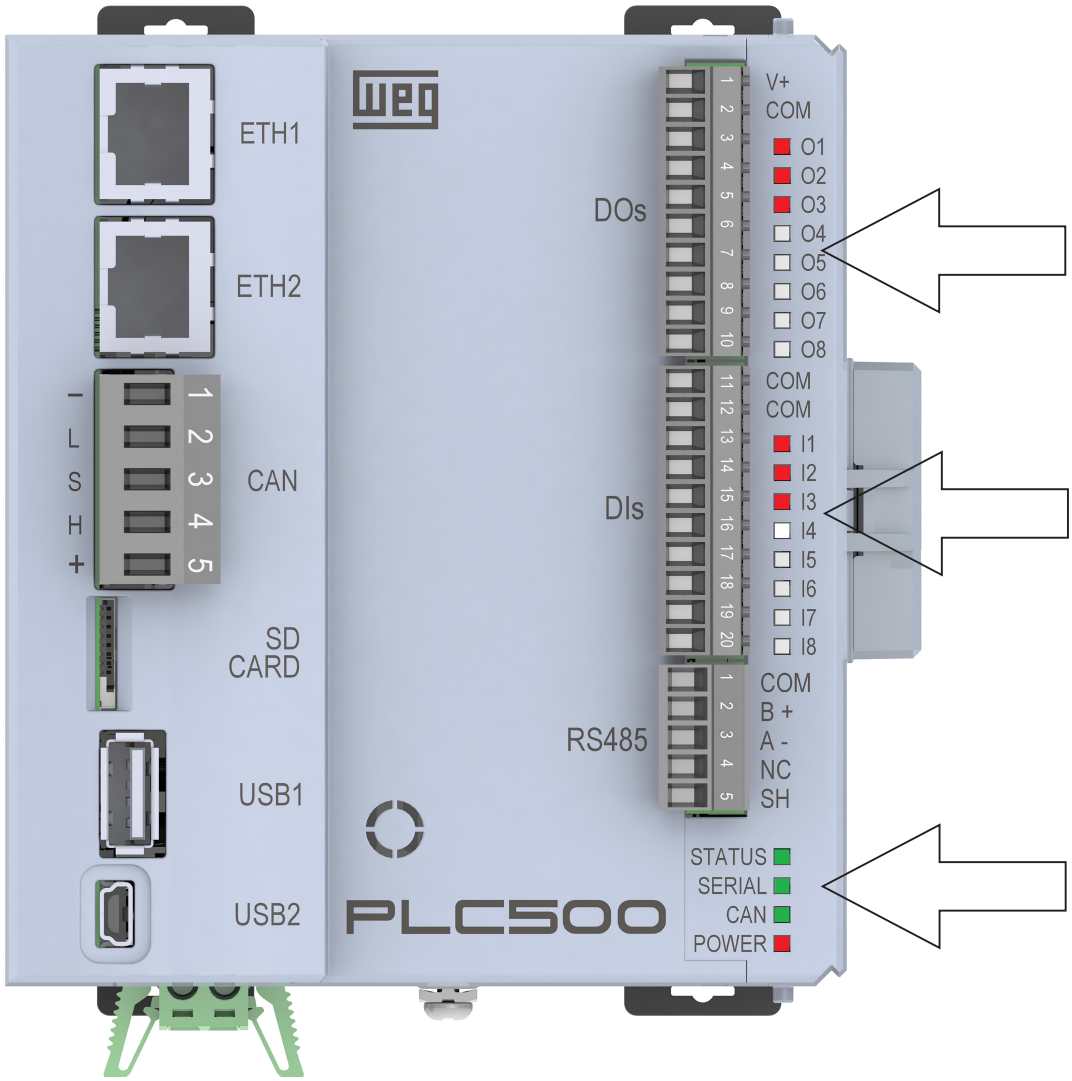


Figure 10.1: *LEDs*

10.1 STATUS LED

Indicates the controller application status, as shown in the table:

LED	Description
GREEN	Application running
RED	Application stopped
OFF	No application

10.2 SERIAL LED

Bicolor LED that indicates the status of the Serial RS485 communication. Check the Modbus RTU Application Notes, available on WEG's website.

10.3 CAN LED

Bicolor LED that indicates the status of the CAN communication interface. Check the CANopen Application Notes, available on WEG's website.

10.4 POWER LED

Red LED that indicates that the PLC500 is energized.

10.5 DIGITAL INPUT LEDS

LEDs I1 to I8 represent, respectively, digital inputs DI1 to DI8.

Digital input LEDs light up in red when the input is energized.

10.6 DIGITAL OUTPUT LEDS

LEDs O1 to O8 represent, respectively, outputs DO1 to DO8. On the PLC500, the digital output LEDs light up in red whenever the digital output is active.

11 DIGITAL OUTPUTS

The PLC500 has 8 isolated digital outputs. The digital output circuit must be powered externally by a 24 V power supply connected to pins 1 (V+) and 2 (COM) of the DOs connector, as shown in Figure 11.1 on page 11-1 below.

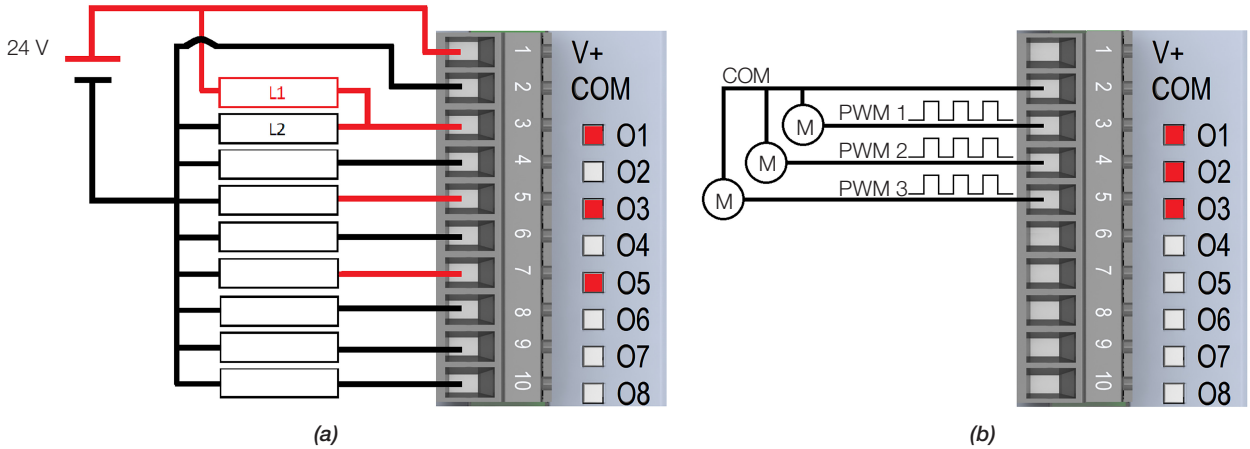
Digital outputs DO1, DO2 and DO3 are push-pull, that is, they activate the load connected to both V+ and COM. These 3 outputs can be used as regular digital outputs or as independent PWM outputs, with variable duty cycle from 0 to 100 % at up to 300 kHz. The current capacity of each is 100 mA.

Digital outputs DO4, DO5, DO6, DO7 and DO8 are PNP, that is, they activate the load connected to the COM and can supply a current of up to 500 mA each.

The table below shows the name and function of each connector pins of the digital outputs. For this connector, use AWG 30-16 cables.

Pin	Name	Function 1	Function 2
1	V+	Power positive of the outputs	
2	COM	Negative or common of the outputs	
3	DO1	Digital output 1	PWM 1 (300 kHz)
4	DO2	Digital output 2	PWM 2 (300 kHz)
5	DO3	Digital output 3	PWM 3 (300 kHz)
6	DO4	Digital output 4	
7	DO5	Digital output 5	
8	DO6	Digital output 6	
9	DO7	Digital output 7	
10	DO8	Digital output 8	

The example of Figure 11.1 on page 11-1 (a) shows two loads connected to output DO1 in the push-pull configuration, that is, when L1 is energized, L2 is not, and vice versa. Other seven loads are connected to outputs DO2 to DO8, which, when activated, apply V+ to the loads and indicate through the respective red LED. In this case, only outputs DO1, DO3 and DO5 are activated. Na Figure 11.1 on page 11-1 shows the three PWM outputs activated.



(a) *(b)*

Figure 11.1: *PLC500 Digital and PWM Outputs*

12 DIGITAL INPUTS

The PLC500 has 8 isolated digital inputs that must be excited by an external 24 Vdc power supply. The levels to activate the inputs are 10 to 28.8 V for high level, and below 3 V for low level.

Inputs DI1, DI2, DI3 and DI4 are fast and can be used for counting pulses or reading quadrature encoder. To this end, configure the function of each input in the setup via CODESYS and use the available blocks.

For these connectors, use AWG 30-16 cables. The table below displays the name and function of each Digital Input connector pins.

Pin	Name	Function 1	Function 2	Function 3
11	COM	Common		
12	COM	Common		
13	DI1	Digital input 1	Pulse quadrature A (enc 1)	Pulse input (enc 1)
14	DI2	Digital input 2	Pulse quadrature B (enc 1)	Pulse direction (enc 1)
15	DI3	Digital input 3	Pulse quadrature A (enc 2)	Pulse input (enc 2)
16	DI4	Digital input 4	Pulse quadrature B (enc 2)	Pulse direction (enc 2)
17	DI5	Digital input 5		
18	DI6	Digital input 6		
19	DI7	Digital input 7		
20	DI8	Digital input 8		

The example of Figure 12.1 on page 12-1 shows Digital Inputs DI1, DI3 and DI5 activated through the positive terminal of the source (PNP).

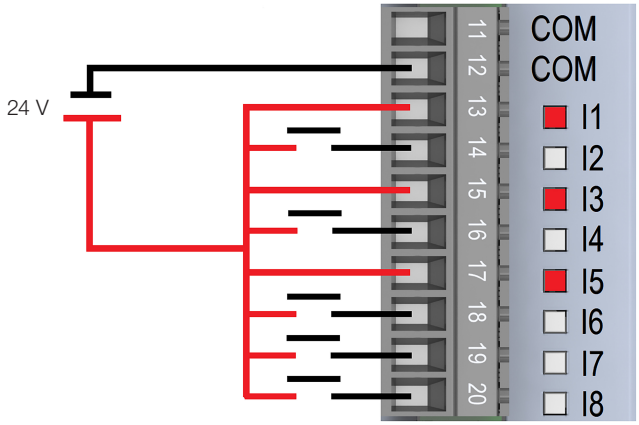


Figure 12.1: *PLC500 Digital Inputs*

The example of Figure 12.2 on page 12-2 (a), shows the connection of two quadrature encoders and Figure 12.2 on page 12-2 (b), shows the connection of two pulse and direction inputs.

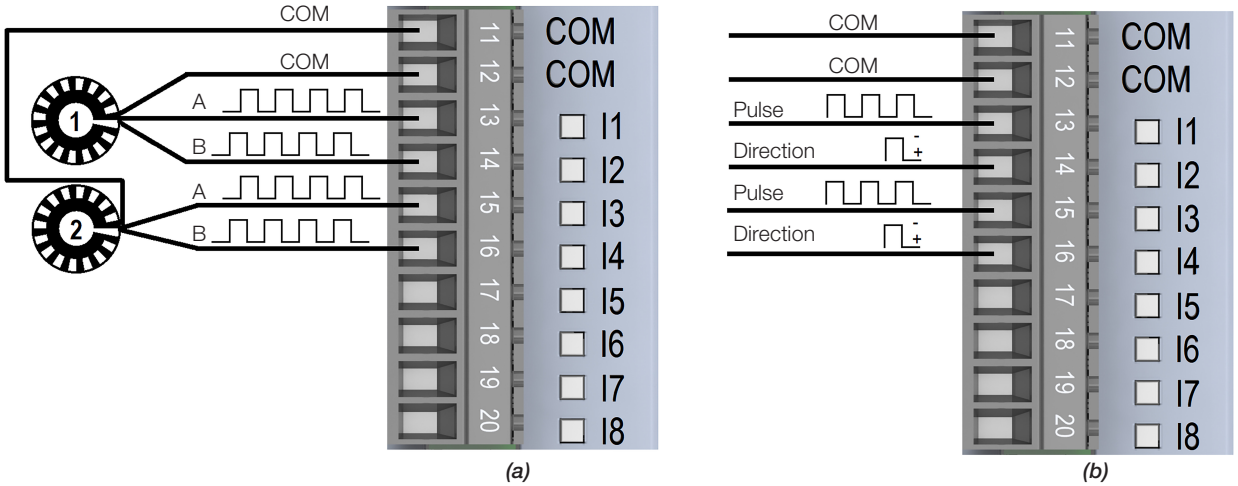


Figure 12.2: *Wiring of fast inputs for encoder and pulse*

13 EXPANSION BOARDS

The PLC500 has a bus that allows the connection of up to 8 expansion boards, as shown in the image:

Figure 13.1: *PLC500 with eight expansions*

The user fast and easily incorporates the expansion boards to the PLC500 through the plug and play concept. When the PLC500 is powered up, the electronic circuit identifies the number of connected expansions, the model and the firmware version of each one. They also receive an address according to their position so that it is possible to access them through the communication bus.

ATTENTION!!
Accessories must be installed or removed with the PLC500 de-energized to avoid burning components and to allow them to be identified.

13.1 AVAILABLE MODELS

The table below presents a summary of each expansion available for the PLC500. For further details, see the manual for each accessory.

Model	Characteristic
MOD1.00 - 24DIs	24 bidirectional digital inputs
MOD1.00 - 24DIs	24 isolated digital outputs 24 V/500 mA
MOD1.20 - 16DO/8DI	16 isolated 24 V/500 mA digital outputs and 8 bidirectional digital inputs
MOD1.30 - 08DO/16DI	8 isolated 24 V/500 mA digital outputs and 16 bidirectional digital inputs
MOD2.00 - 7AI	7 voltage or current analog inputs
MOD3.00 - 8AO	8 analog outputs with voltage 0 to 10 V and 4 with current 0 to 20 mA
MOD4.00 - 7TH	7 thermocouple inputs type J, K and T
MOD5.00 - 4RTD	4 PT100 and PT1000 thermistor inputs
MOD6.00 - 2SG	2 load cell inputs
MOD7.00 - 6RE	6 relay outputs

13.2 ACCESSORY LIMIT

The PLC500 allows coupling up to 8 expansion modules. However, there is a 500 mA limitation on the +/-15 V supply that powers part of the circuit of some expansions.

To find out how many accessories can be coupled, use the table below with the current consumption values of each module:

Model	Consumption
MOD1	0 mA
MOD2	40 mA
MOD3	150 mA
MOD4	0 mA
MOD5	0 mA
MOD6	30 mA
MOD7	50 mA

13.2.1 Configuration and Consumption Examples

Ex1: 3 x MOD3 + 1 x MOD2 + 4 x MOD1 = 3 x 150 + 1 x 40 + 4x0 = 490 mA (OK).

Ex2: 2 x MOD3 + 4 x MOD6 + 1 x MOD7 = 2 x 150 + 4 x 30 + 1x50 = 470 mA (OK).

Ex3: 2 x MOD3 + 3 x MOD6 + 3 x MOD7 = 2 x 150 + 3 x 30 + 3x50 = 540 mA (Current limit exceeded).

NOTE!
The sum of consumption cannot exceed 500 mA, and the maximum number of accessories is 8. The CODESYS programming software will generate an error if this limit is exceeded.

14 CODESYS PROGRAMMING SOFTWARE

The PLC500 is programmed through the CODESYS V3.5 software (or above), available for download on WEG's website and on the manufacturer's website. This programming tool is widely used in the industrial environment for various automation types, from simple to complex logics, such as robotics and motion control, while also being employed in industry 4.0.

A multitude of ready blocks and functions are available to CODESYS through libraries that can be added to the project. In addition, logics developed for other controllers can be imported and adapted to be used in the PLC500.

All five programming languages defined in IEC 61131-3[2] are available in the CODESYS development interface and can be used in the same application. They are:

- LD (Ladder).
- ST (Structured Text).
- SFC (Sequential Flow Chart).
- FBD (Function Block Diagram).

The CODESYS also contains the CFC (Continuous Function Chart) graphic language, which is not described in IEC 61131-3. It can be understood as a block diagram with free positioning, where the programmer can position the blocks and perform the data connections using the mouse with drag and drop functions.

For further details about the CODESYS, go to: www.codesys.com.

14.1 FIRST STEPS

1) Download the CODESYS software directly from WEG's website or from the manufacturer's website and install it.

2) Download the PLC500 package for CODESYS on WEG's website.

3) After installing the CODESYS software, enter the installation directory (C:\Program Files (x86)\CODESYS\APInstaller) and run the **APInstaller.GUI** application. The CODESYS Installer will open, where you can update the software version and add or remove packages.

4) All CODESYS installations present on the computer will be displayed. Choose the version of interest and click on **Change**, as shown in Figure 14.1 on page 14-2.

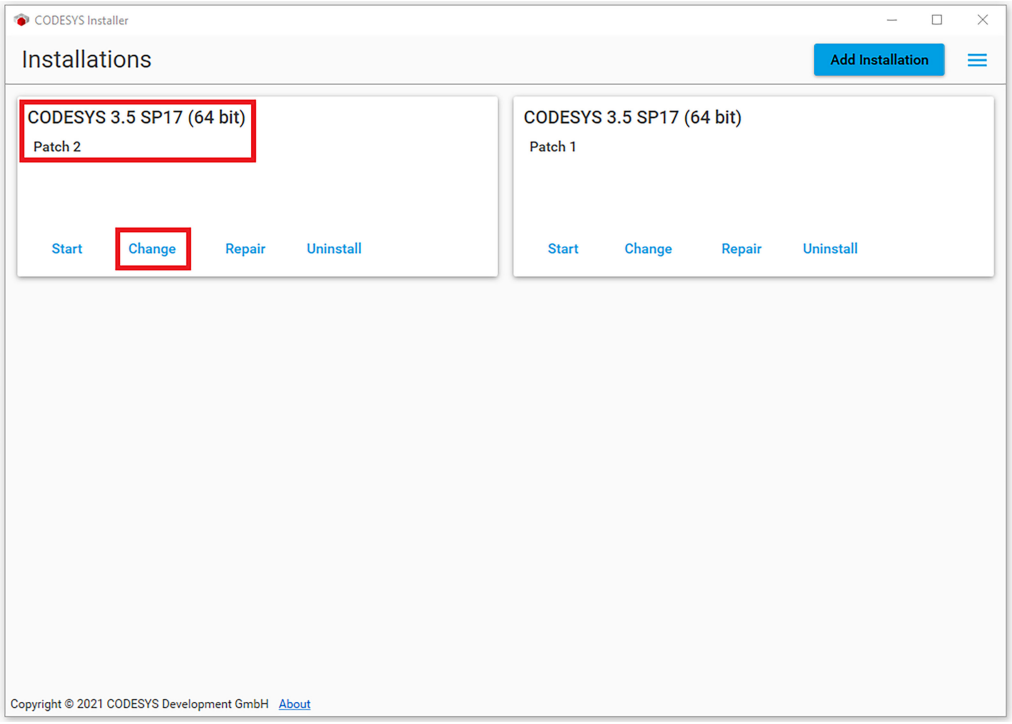


Figure 14.1: *CODESYS Installer main screen. Installing a new package*

5) A new window will open, where you can see the software version. Click on **Install File** and search for the PLC500 package downloaded from WEG's website. click on **OK** and then on **Continue**. The package will be installed. Figure 14.2 on page 14-3 shows the screen with the mentioned data.

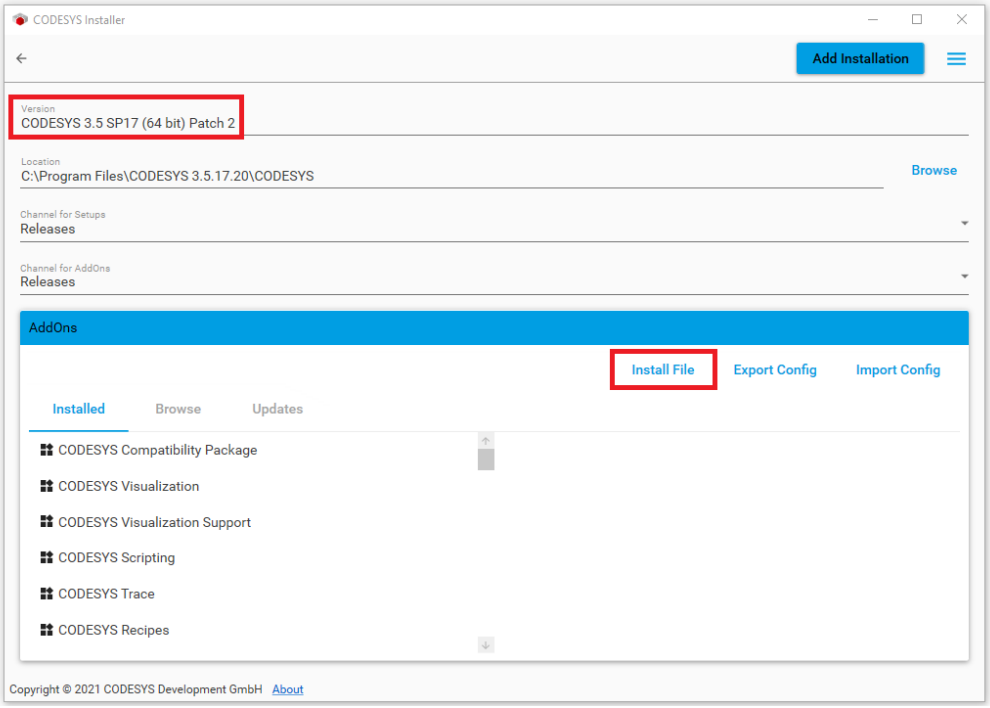


Figure 14.2: *Installing the WEG package for CODESYS*

6) Connect the PLC500 to the Computer using one of the Ethernet ports or the USB2 port. For further details on these connections, see the respective chapter.

7) Create a new project in **File -> New Project**. Select **Standard Project**, define the name and location to be saved. Select the PLC500-WEG Device and the desired programming language, as shown in Figure 14.3 on page 14-3.

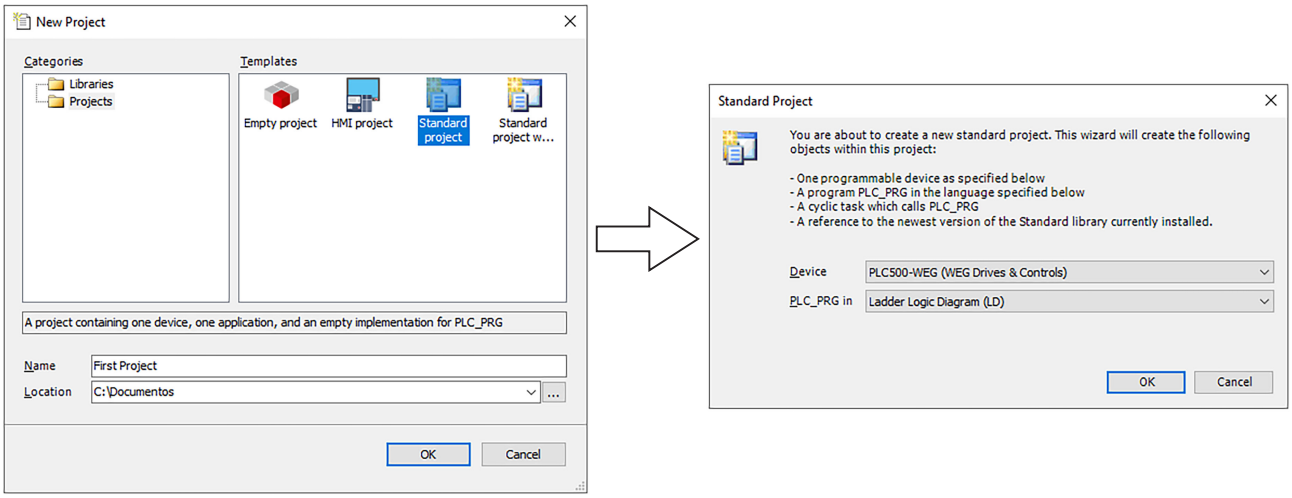


Figure 14.3: *Creating a new project*

15 ACCESS VIA WEBPAGE

The PLC500 has a specific webpage for checking product information, configuring network connections, viewing the status of digital inputs and outputs and updating firmware.

To access the webpage, proceed as follows:

1) Connect the PLC500 to the computer using one of the Ethernet ports or the USB2 port. For further details on these connections, see the respective chapter.

2) The table below contains the standard IP addresses of the communication ports to access the webpage. The Computer must be configured with a static IP within the same network used. E.g.: 192.168.1.100 for ETH1.

Connection	Default IP
ETH1	192.168.1.10
ETH2	192.168.2.10
USB2	192.168.234.234

3) Open a web browser and enter the corresponding connection IP. The webpage will open, as shown in Figure 15.1 on page 15-1, and it will display the product login screen. In the first login, use "weg" for Username and Password.

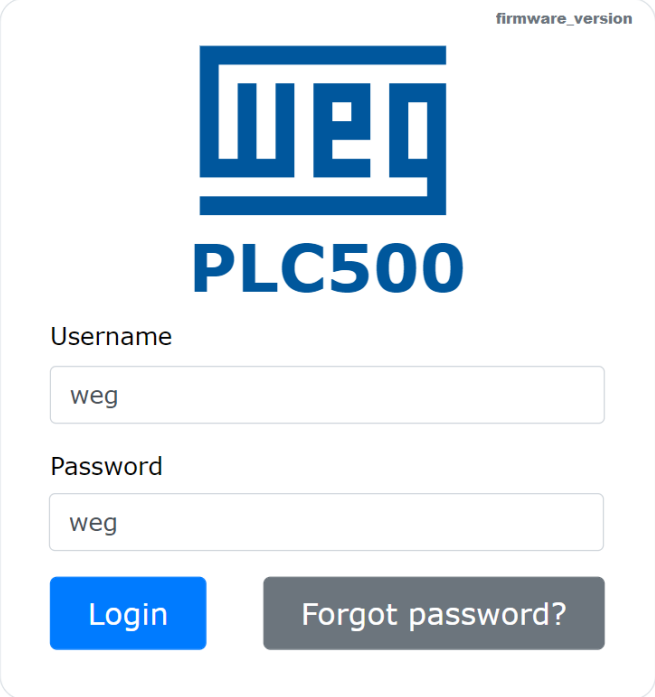


Figure 15.1: *PLC500 Webpage*

For further details on the webpage, see the Application Notes available on WEG's website.

16 TECHNICAL DATA

Power Supply		Recommended voltage: 24 V DC (20.4 V to 28.8 V)
		Recommended power supply: 3 A minimum capacity
PLC500 Consumption		150 mA (on duty, without accessories, without networks)
Expansion Consumption		Approximately 50 mA
Processor		IMX7 Dual Core @1 GHz + Coprocessor @200 MHz
Linux Kernel		V4.14.98 (with Real Time)
Cycle time	**100 Thousand Instructions**	Total Time 1.19 ms
	Per Instruction	12 ns
Memory	**RAM**	1 GB
	Flash	4 GB
Maximum Instruction Capacity		Approximately 6 million simple instructions
Digital Inputs		8 x PNP
		Maximum input voltage of 28.8 V
		Fast inputs: DI1 to DI4 - 150 kHz Per Channel
		High level: Vin ≥ 10 V
		Low level: Vin ≤ 5 V
		Consumption at 24 V: 2.1 mA
		Insulation voltage: 500 V
		Max. DI number via expansion cards: 200 Points
Digital Outputs	**Fast DO1, DO2 and DO3**	Push-Pull
		Recommended voltage V+: 24 V
		Maximum voltage V+: 28.8 V
		Maximum frequency: 300 kHz
		PWM width: 0.0 % to 100.0 %
		Max current: 100 mA/output
	Regular DO4...DO8	PNP
		Recommended voltage V+: 24 V
		Maximum voltage V+: 28.8 V
		Maximum current of outputs DO4...DO8: 500 mA/output
Communication Ports	**Mini USB Device**	Program transfer and monitoring (emulates an Ethernet)
	CAN	CANopen (Master)
		Max. number of slaves: 126
	RS485	Modbus RTU (Master/Slave)
		Max. number of slaves: 246
	USB Host	USB 2.0 (Flash Drive)
	Ethernet	2 x Ports 10/100/1000 (RJ45) - Modbus TCP - Ethernet/IP
	SD Card	Up to 2 TB
Expansion Boards	**Maximum Number**	8
	Number of DOs	200
	Number of DIs	200
	Analog Inputs	56
	Thermocouple Inputs	56
	PT100/PT100 Inputs	32
	Load Cells	16 channels (up to 4 in parallel per channel)
	Relays	48

Operating Temperature	0 ° to 50 °C
Storage Temperature	-25 °C to 60 °C
Protection Rating	IP20
Pollution Degree	2 (according to EN50178 and UL508C), with non-conductive pollution
Mounting	On DIN rail or on panel with screws
Software	CODESYS® (V3.5 SP18 or above)
Programming Language	LD (Ladder) - ST (Structured Text) - CFC (Continuous Function Chart) - SFC (Sequential Function Chart) - FBD (Function Block Diagram)
Certifications	CE
Dimensions	129.8 x 101.6 x 106.9 mm (H x W x D)
Weight	0.540 kg