EVD Web

IoT gateway for the EPoCA® system

User manual | ENGLISH
Code 144DWEBI104

PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

IMPORTANT

Read this document carefully before installation and before using the device and take all the prescribed precautions. Keep this document with the device for future reference. Only use the device in the ways described in this document.

Contents

1 INTRODUCTION

EVD Web is a gateway with Ethernet connectivity and data logging functions which allows users to remotely monitor and control up to 19 EVCO devices with EPoCA® technology using the EPoCA® cloud platform. It has been designed for use in the Ho.Re.Ca, refrigeration or air conditioning sectors. EVD Web can also send the current time to controllers which do not have a real time clock.

Equipped with 3 RS-485 master serial ports, each for a line of up to 6 controllers with the MODBUS RTU protocol, EVD Web also has a TTL serial port to connect another EVCO controller. Its three additional analogue inputs can be used for temperature sensors, which are also useful as a redundant detection system.

Data from controllers in the network can be shared with third-party supervision systems using the MODBUS TCP protocol. Systems of this kind can be used to gain information or interact with the machinery and can operate alongside EPoCA®.

If third-party controllers are among the devices connected to EVD Web, the network controlled by EVD Web can be managed exclusively with the MODBUS TCP protocol. It is possible to connect controllers of different parties, even if they have incompatible communication parameters, as each of the three RS-485 ports can be configured separately.

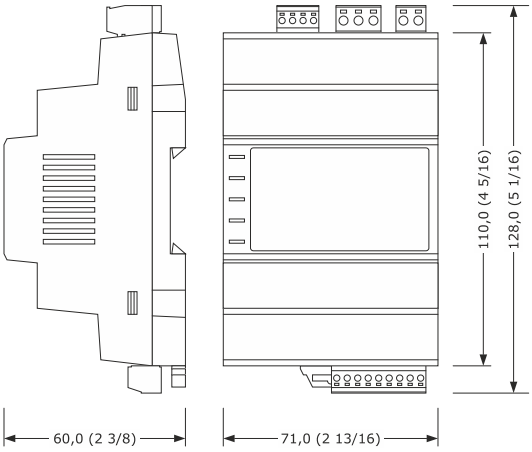
2 MAIN FEATURES OF THE MODELS AVAILABLE AND PURCHASING CODES

PURCHASING CODES	**EVDW01Z9**
FORMAT	
4 DIN modules	•
USER INTERFACE	
Blind version	•
INSTALLATION	
On a DIN rail	•
MAIN CONNECTIONS	
Plug-in screw terminal blocks	•
POWER SUPPLY	
115... 230 Vac	•
ANALOGUE INPUTS	
Pt 1000	3
COMMUNICATIONS PORTS	
Ethernet	1
RS-485 MODBUS master	3
TTL MODBUS	1
Micro USB	1
OTHER STANDARD FEATURES	
RTC	•

3 MEASUREMENTS AND INSTALLATION

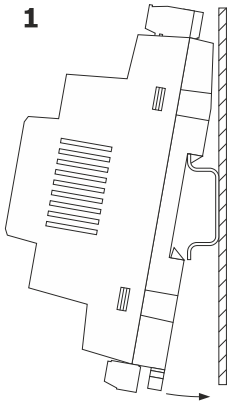
3.1 Measurements

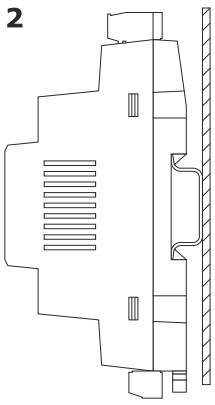
Measurements are expressed in mm (inches).



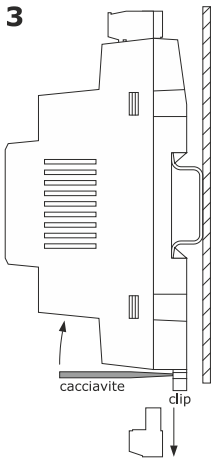
3.2 INSTALLATION

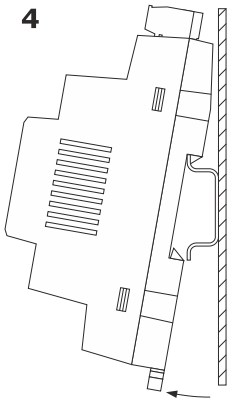
On a DIN rail in a control panel. To install the device, proceed as shown in figures 1 and 2.





To uninstall the device, first remove any plug-in screw terminal blocks at the bottom then proceed as shown in figures 3 and 4.



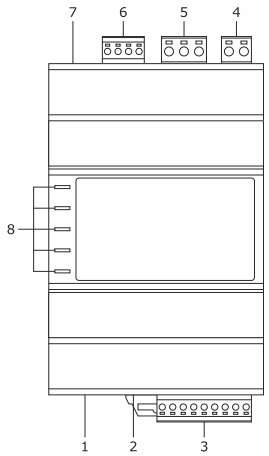


Before re-installing the device, press the clip fully in.

INSTALLATION PRECAUTIONS

- ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section
- do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks
- in compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them

4 DESCRIPTION

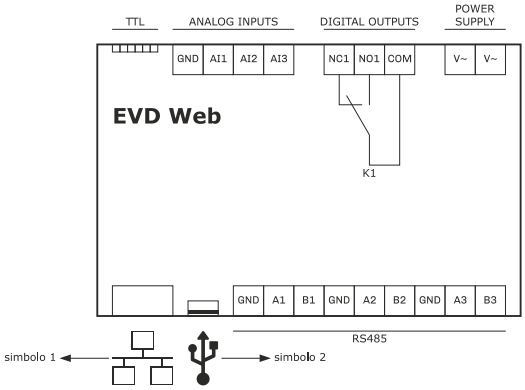


PART	DESCRIPTION
1	Ethernet port
2	Micro USB port
3	RS-485 MODBUS master ports
4	Power supply
5	Reserved
6	Analogue inputs
7	TTL MODBUS port
8	Signalling LED

5 ELECTRICAL CONNECTION

CAUTION
- use cables of an adequate section for the current running through them
- each of the power supplies of the controllers connected to the RS-485 networks must be galvanically isolated from the others
- to reduce any electromagnetic interference, connect the power cables as far away as possible from the signal cables and connect the RS-485 networks using a twisted pair
- the maximum number of controllers that may be connected to each RS-485 network is 6
- the compatibility of the connected controllers with the EPoCA® cloud platform depends on the type of controller: see the document *EPoCA - List of compatible controllers* which is available on the website *www.evco.it* or by scanning the QR code below:

5.1 Connectors



5.2 Description of connectors

symbol 1

Ethernet port.

symbol 2

Micro USB port.

RS485

CONN.	DESCRIPTION
GND	reference (GND) RS-485 MODBUS master port 1
A1	+ signal RS-485 MODBUS master port 1
B1	- signal RS-485 MODBUS master port 1
GND	reference (GND) RS-485 MODBUS master port 2
A2	+ signal RS-485 MODBUS master port 2
B2	- signal RS-485 MODBUS master port 2
GND	reference (GND) RS-485 MODBUS master port 3
A2	+ signal RS-485 MODBUS master port 3
B2	- signal RS-485 MODBUS master port 3

POWER SUPPLY

CONN.	DESCRIPTION
V~	device power supply (115... 230 Vac)
V~	device power supply (115... 230 Vac)

DIGITAL OUTPUTS

CONN.	DESCRIPTION
NC1	reserved
NO1	reserved
COM	reserved

ANALOGUE INPUTS

CONN.	DESCRIPTION
GND	reference (GND)
AI1	analogue input 1 (for Pt 1000 probes)
AI2	analogue input 2 (for Pt 1000 probes)
AI3	analogue input 3 (for Pt 1000 probes)

TTL

TTL MODBUS port.

PRECAUTIONS FOR ELECTRICAL CONNECTION

- if using an electrical or pneumatic screwdriver, adjust the tightening torque
- if the device is moved from a cold to a warm place, humidity may cause condensation to form inside. Wait for about an hour before switching on the power
- make sure that the supply voltage, electrical frequency and power are within the set limits. See the section *TECHNICAL SPECIFICATIONS*
- disconnect the power supply before carrying out any type of maintenance
- do not use the device as a safety device
- for repairs and further information, contact the EVCO sales network

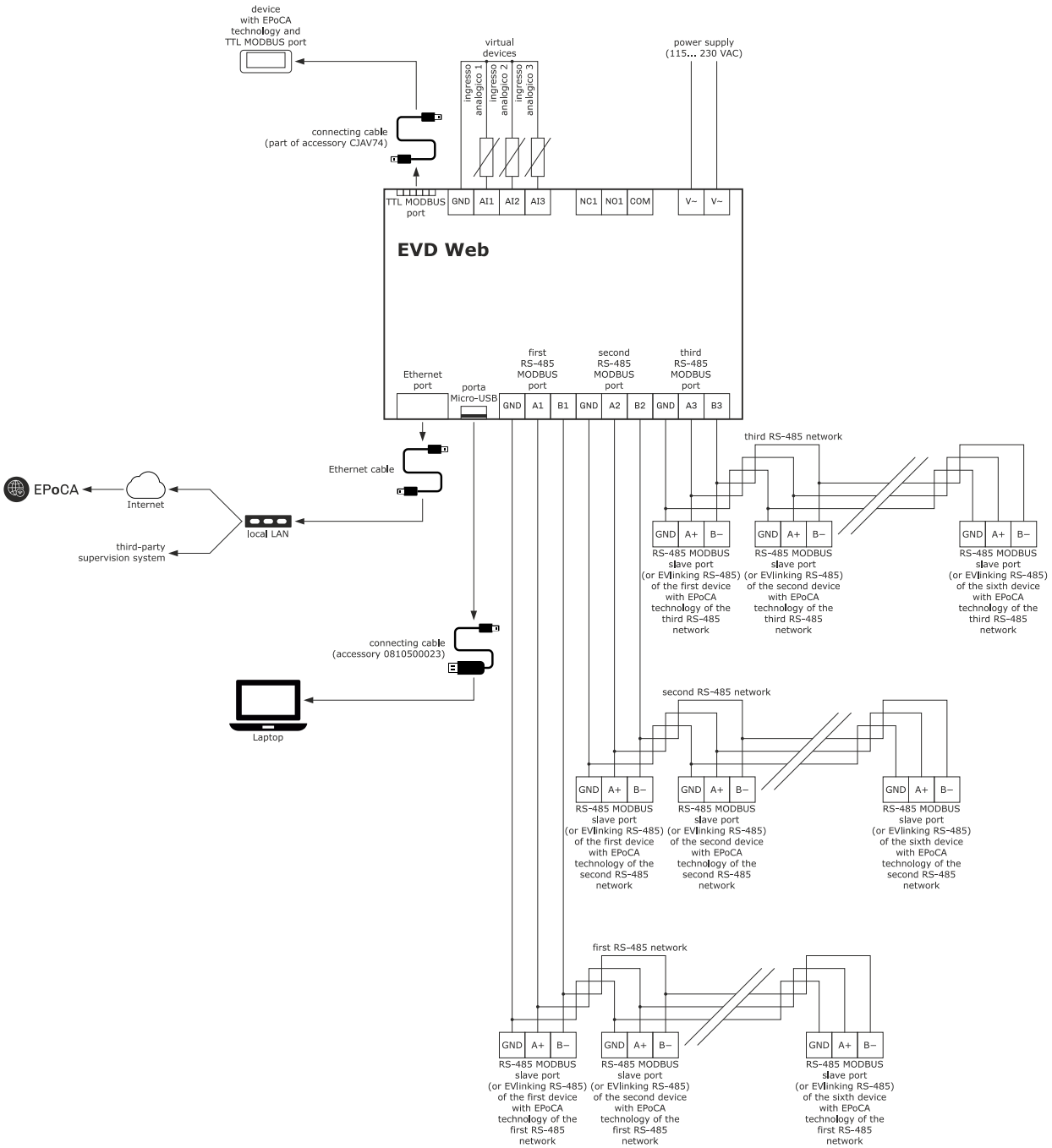
6 MAIN POSSIBLE SCENARIOS

6.1 Scenario 1

Management via the EPoCA® cloud platform of:

- up to 18 EVCO devices with EPoCA® technology connected in 3 RS-485 networks:
  - 6 connected to the first RS-485 MODBUS master port
  - 6 connected to the second RS-485 MODBUS master port
  - 6 connected to the third RS-485 MODBUS master port
  - 1 device with EPoCA® technology connected to the TTL MODBUS port
- up to 3 analogue inputs (virtual devices)

Devices in the network can also be managed in parallel by a third-party supervision system which uses the MODBUS TCP protocol.



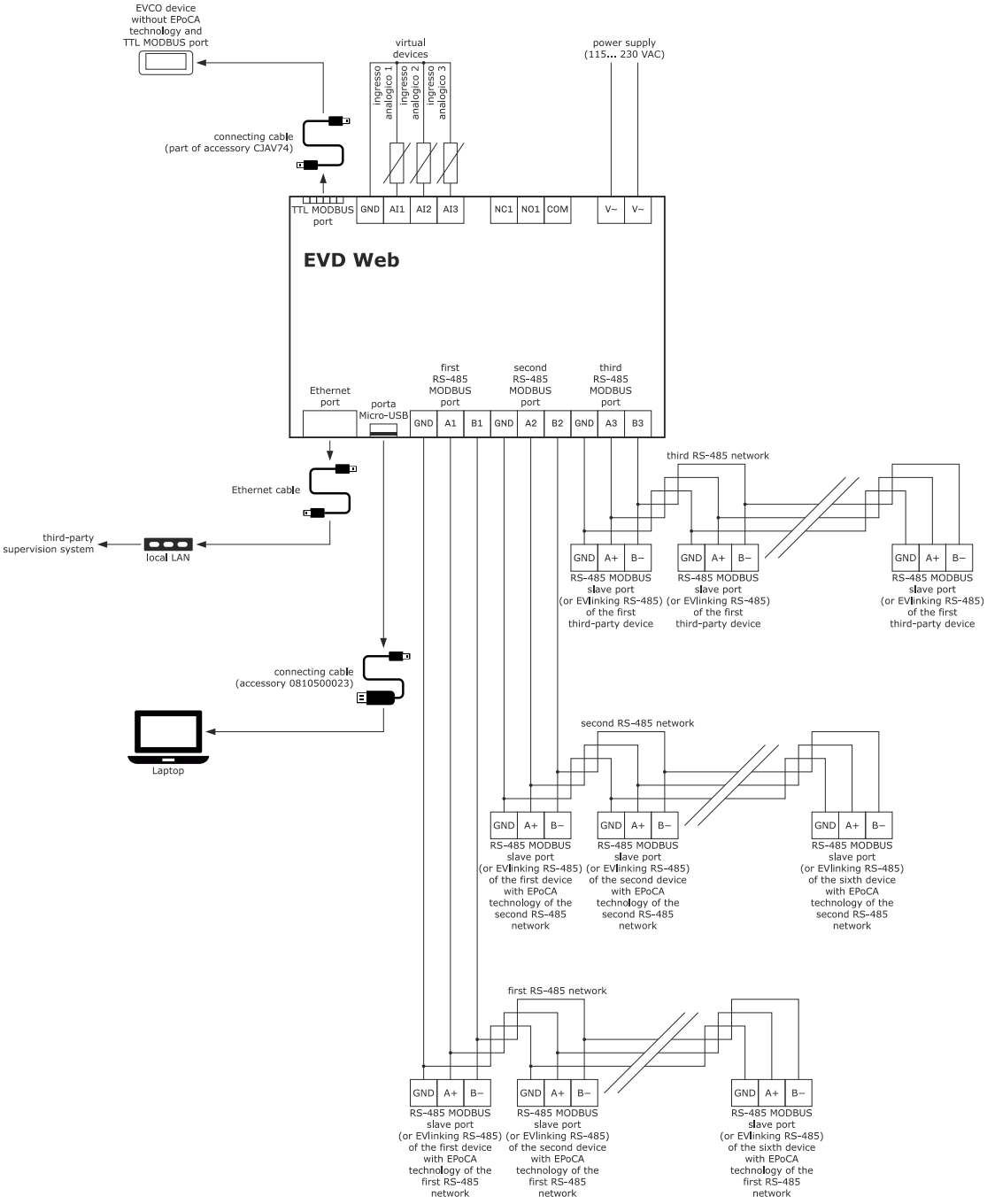
6.2 Scenario 2

Management via a third-party supervision system which uses MODBUS TCP of:

- up to 18 EVCO or third-party devices with the MODBUS RTU protocol:
  - 6 with the same connection parameters (baud rate, parity, stop bits) connected to the first RS-485 MODBUS master port
  - 6 with the same connection parameters (baud rate, parity, stop bits) connected to the second RS-485 MODBUS master port
  - 6 with the same connection parameters (baud rate, parity, stop bits) connected to the third RS-485 MODBUS master port
  - 1 EVCO device connected to the TTL MODBUS port
- up to 3 analogue inputs (virtual devices)

In the example in the figure below:

- 6 devices with EPoCA® technology are connected to the first RS-485 network
- 6 devices with EPoCA® technology are connected to the second RS-485 network
- 6 third-party devices are connected to the third RS-485 network
- 1 EVCO device is connected to the TTL MODBUS port.



7 FIRST-TIME USE

N.B.
- Users will need a PC (or laptop) which has the Windows 10 or later operating system installed, a free USB port, a web browser installed and Internet access
- Make sure there is a router with Internet access and that the router has a free Ethernet port. Alternatively, make sure there is a free Ethernet port in an Ethernet hub connected to a local network. If a third-party supervision system is used, rather than the EPoCA® cloud platform, it must be installed on a PC or laptop which is connected to the same Ethernet network as EVD Web and the EVD Web IP address must be static
- The device uses an encrypted connection with TLS technology and occupies the TCP 8883 port. Make sure this firewall port (both the port of the user's local network and the one managed by the Internet service provider) is open for outgoing communications (contact the IT manager).

7.1 First-time use of EVD Web

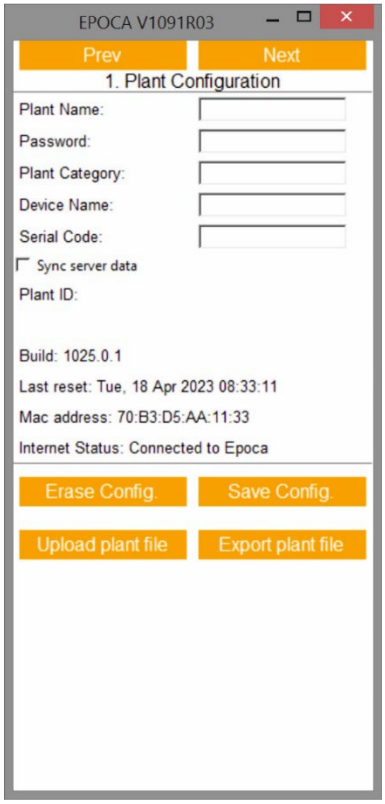
1. When configuring the networks of EVCO devices connected to EVD Web, the procedure depends on whether they have or do not have EPoCA® technology: - if the EVCO device does not have EPoCA® technology, parameter **LA** (MODBUS address) must be set as shown in the table below. The remaining connection parameters of the devices connected to the same port must all be the same.
   - if the EVCO device has EPoCA® technology, parameter **bLE** (EPoCA® local network address) which automatically configures the other connection parameters (19200 baud rate, even parity) must be set as shown in the table below. The setting of parameter **LA** (MODBUS address) in these devices is not relevant and does not affect network configuration.

			POSITION OF DEVICE IN THE NETWORK					
COMMUNICATIONS PORT	DEVICE WITH EPOCA® TECHNOLOGY	PARAMETER	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
First RS-485 MODBUS master port	yes	LA	N/A	N/A	N/A	N/A	N/A	N/A
		bLE	1	2	3	4	5	6
	no	LA	1	2	3	4	5	6
		bLE	not avail.	not avail.	not avail.	not avail.	not avail.	not avail.
Second RS-485 MODBUS master port	yes	LA	N/A	N/A	N/A	N/A	N/A	N/A
		bLE	1	2	3	4	5	6
	no	LA	1	2	3	4	5	6
		bLE	not avail.	not avail.	not avail.	not avail.	not avail.	not avail.
Third RS-485 MODBUS master port	yes	LA	N/A	N/A	N/A	N/A	N/A	N/A
		bLE	1	2	3	4	5	6
	no	LA	1	2	3	4	5	6
		bLE	not avail.	not avail.	not avail.	not avail.	not avail.	not avail.
TTL MODBUS port	yes	LA	N/A	-	-	-	-	-
		bLE	1	-	-	-	-	-
	no	LA	1	-	-	-	-	-
		bLE	not avail.	-	-	-	-	-

2. Disconnect power from each device and then reconnect it again.
3. Carry out the installation of EVD Web as shown in the section MEASUREMENTS AND INSTALLATION.
4. Connect the power supply, analogue inputs, RS-485 MODBUS master ports and TTL MODBUS port of EVD Web as shown in the sections ELECTRIC CONNECTION and MAIN POSSIBLE SCENARIOS without powering it up.
5. Download the *EPoCA.exe* app to a PC (or laptop). The app is available on the website *www.evco.it* or by scanning the QR code below:
6. Connect the micro USB port on EVD Web to the free USB port on the PC (or laptop) using connecting cable 0810500023.
7. Connect the Ethernet port on EVD Web to the free Ethernet port on the router (or to the free Ethernet port of the Ethernet hub connected to the local network) using an Ethernet cable.
8. Power up EVD Web.

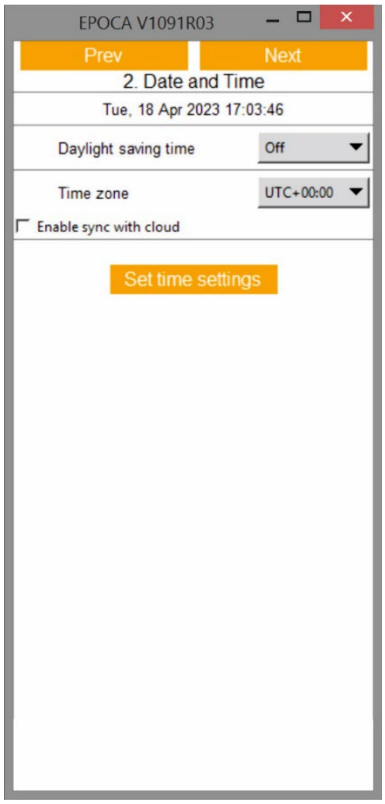
9. Run the *EPoCA.exe* app on the PC (or laptop).
The **Device selection** screen will appear.

10. Select the device then press **Next** (only click **Device web page** for extremely advanced configurations).
The **Plant Configuration** dialogue box will appear.



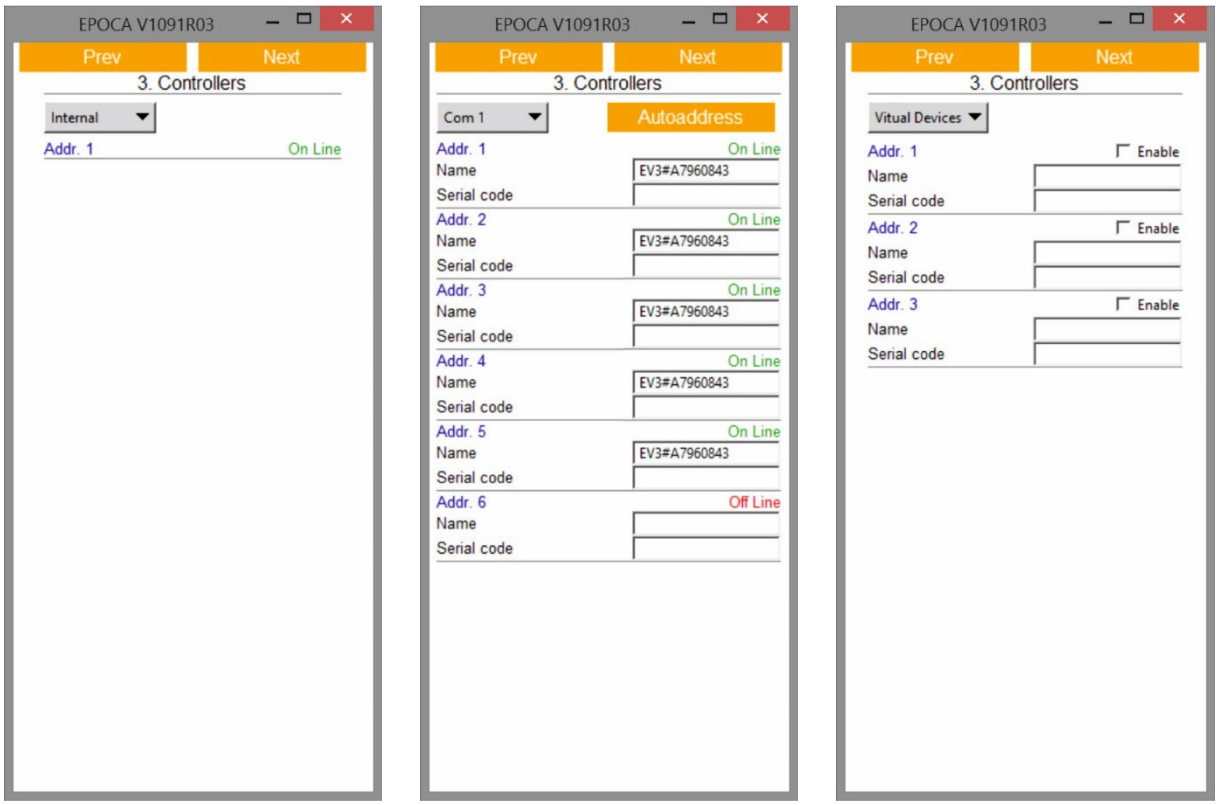
11. Enter a name for the plant (for example **Blacks Supermarket**) in the **Plant Name** box.
12. Enter a password for the plant in the **Password** box.
13. Enter a category for the plant (for example **Deli counter**) in the **Plant Category** box. This is optional.
14. Enter a name for the device (for example **Device 01**) in the **Device name** box. This is optional.
15. Enter a serial code for the device (for example the ID field on the device's data label) in the **Serial Code** box. This is optional.

16. Check the **Sync server data** box to be able to send data to the EPoCA® cloud platform.
17. Select **Save Config.** to save the plant configuration data. As it is the first time the device is used, the system will suggest downloading the configuration file (hereinafter also called *plant file*) to the PC (or laptop). This prompt will also appear every time the plant configuration is saved following a change to it.
    Keep this file safe as it will be needed to upload the plant configuration to the EPoCA® cloud platform and/or other devices (the plant password will be requested).
18. Select **Export plant file** to download the *plant file* to the PC (or laptop).
    Keep this file safe as it will be needed to upload the plant configuration to the EPoCA® cloud platform and/or other devices (the plant password will be requested).
19. Select **Upload plant file** to upload another *plant file* to the device (the plant password will be requested).
20. Select **Erase Config.** to delete the device's configuration settings.
21. Once plant configuration is complete, select **Next**.
    The **Date and Time** dialogue box will appear.



22. Select the relevant geographical location from the **Daylight saving time** drop-down menu to automatically update the time on the device's clock when the clocks go back and forward.
23. Select the relevant time zone with respect to the UTC from the **Time zone** drop-down menu.
24. Check the **Enable sync with cloud** box to sync the time on the device's clock with that of the PC (or laptop).
25. Select **Set time settings** to save the configured date and time.

26. Once date and time configuration is complete, select **Next**.
The **Controllers** dialogue box will appear.



27. Select the position of EVD Web, which the physical and virtual devices are connected to, from the drop-down menu:
- **Internal** for the TTL MODBUS port
- **Com 1** for the first RS-485 MODBUS master port
- **Com 2** for the second RS-485 MODBUS master port
- **Com 3** for the third RS-485 MODBUS master port
- **Virtual Devices** for the analogue inputs.

The **Custom** value is reserved.

28. Click **Addr. X** to view the **Erase memory** pop-up window then select one of the following buttons:
- **Device configuration** to delete the configuration settings of the connected device
- **Device data recording** to delete the data recorded by the connected device.

This procedure is only possible if the connected device is recognised by EVD Web, namely if **On Line** and not **Off Line** appears to the right of **Addr. X.**

29. Enter a name for the connected device (for example **Sliced meats counter 01**) in the **Name** box. This is optional.
This procedure is only possible if the connected device is recognised by EVD Web, namely if **On Line** and not **Off Line** appears to the right of **Addr. X.**

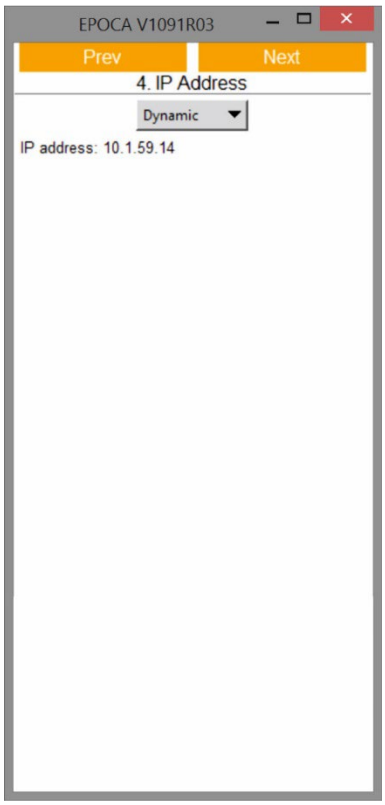
30. Enter a serial code for the connected device (for example the ID field on the device's data label) in the **Serial code** box. This is optional.
This procedure is only possible if the connected device is recognised by EVD Web, namely if **On Line** and not **Off Line** appears to the right of **Addr. X.**

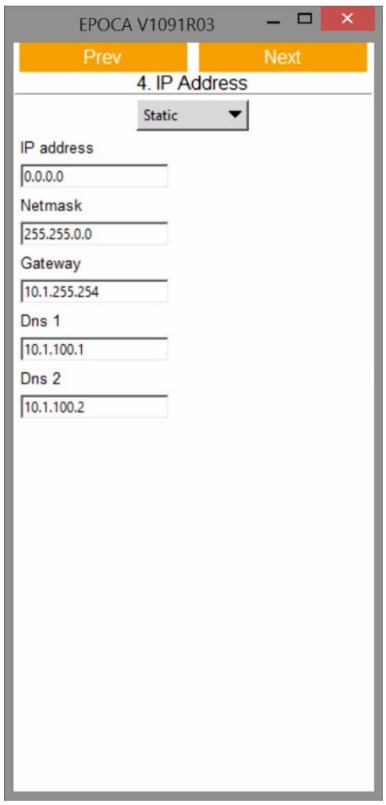
31. Select **Autoaddress** to:
- assign the device with EPoCA® technology, which is already connected to EVD Web and has parameter **bLE** set to 1, the first available value above the factory set value for this parameter
- switch the device off and on again

As the parameter **bLE** value of EVCO devices is normally factory set to 1, the **Autoaddress** function allows the user to connect other devices to EVD Web one at a time, without creating network conflicts due to the value of parameter **bLE** and without having to programme any of the devices.

32. Check the **Enable** box to enable a virtual device.

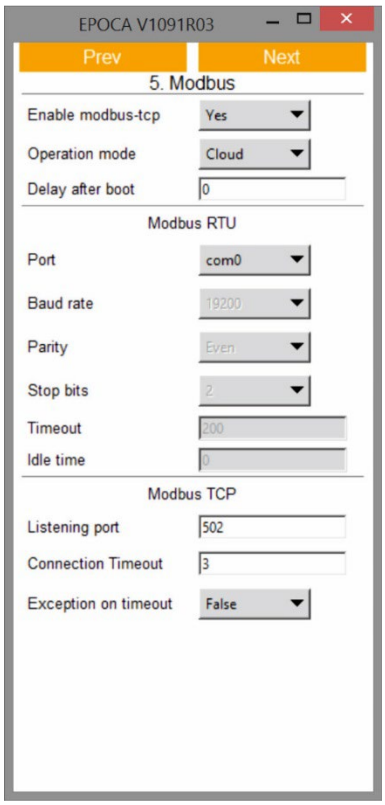
33. Once device configuration is complete, select **Next**.
The **IT Address** dialogue box will appear.





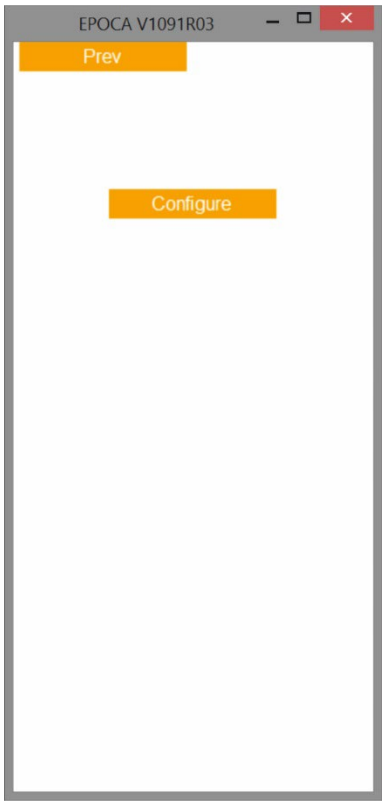
34. Select the criterion for assigning the EVD Web IP address from the drop-down menu:
- **Dynamic** if the address is assigned automatically by a router
  If the router does not assign an IP address to EVD Web within 90 s, the device will automatically be allocated:
  - IP address 192.168.4.1
  - subnet mask 255.255.255.0
- **Static** if the address is assigned manually by an IT engineer. In this case:
  - Enter an IP address in the **IP address** box
  - Enter the address of a subnet mask in the **Netmask** box
  - Enter the address of a gateway in the **Gateway** box
  - Enter the address of a primary DNS in the **Dns 1** box
  - Enter the address of a secondary DNS in the **Dns 2** box

35. Once IP address configuration is complete, select **Next**.
The **Modbus** dialogue box will appear.



36. Choose whether or not to enable the MODBUS TCP protocol from the **Enable modbus-tcp** drop-down menu.
If all the connected devices have EPoCA® technology, the recommended option is **No**. In this case, go directly to point 39, select **Next** and go to point 49.
37. Select the desired EVD Web operation mode from the **Operation mode** drop-down menu:
    - **Raw bridge** in order to then configure a communications port which EVCO devices without EPoCA® technology are connected to (the remaining connected devices must have EPoCA® technology to ensure correct operation)
    - **Cloud** if all the connected devices have EPoCA® technology.
38. Enter the minimum time in milliseconds that must elapse between rebooting a connected device and the beginning of communication with EVD Web in the **Delay after boot** box.
39. Select a communications port which the EVCO devices without EPoCA® technology are connected to from the drop-down **Port** menu of the **Modbus RTU** group:
    - **com0** for the TTL MODBUS port
    - **com1** for the first RS-485 MODBUS master port
    - **com 2** for the second RS-485 MODBUS master port
    - **com 3** for the third RS-485 MODBUS master port.
40. Select the MODBUS baud rate of the RS-485 network of EVCO devices without EPoCA® technology from the drop-down **Baud rate** menu of the **Modbus RTU** group.
41. Select the MODBUS parity of the RS-485 network of EVCO devices without EPoCA® technology from the drop-down **Parity** menu of the **Modbus RTU** group.
42. Select the number of MODBUS stop bits of the RS-485 network of EVCO devices without EPoCA® technology from the drop-down **Stop bits** menu of the **Modbus RTU** group.
43. In the **Timeout** box of the **Modbus RTU** group, enter the maximum time in milliseconds allowed for a device in the RS-485 network of EVCO devices without EPoCA® technology to respond to a request from EVD Web.
44. In the **Idle time** box of the **Modbus RTU** group, enter the minimum time in milliseconds that must elapse between EVD Web receiving a response from a device in the RS-485 network of EVCO devices without EPoCA® technology and sending the next request.
45. In the **Listening port** box of the **Modbus TCP** group, enter the number of a MODBUS TCP port EVD Web is awaiting connection requests from.
46. In the **Connection Timeout** box of the **Modbus TCP** group, enter the maximum time in seconds with no communication before the connection is interrupted.
47. Select whether or not to send an error code when the time set in point 44 has elapsed from the drop-down **Exception on timeout** menu of the **Modbus TCP** group:
    - **False** do not send the error code
    - **True** send the error code.

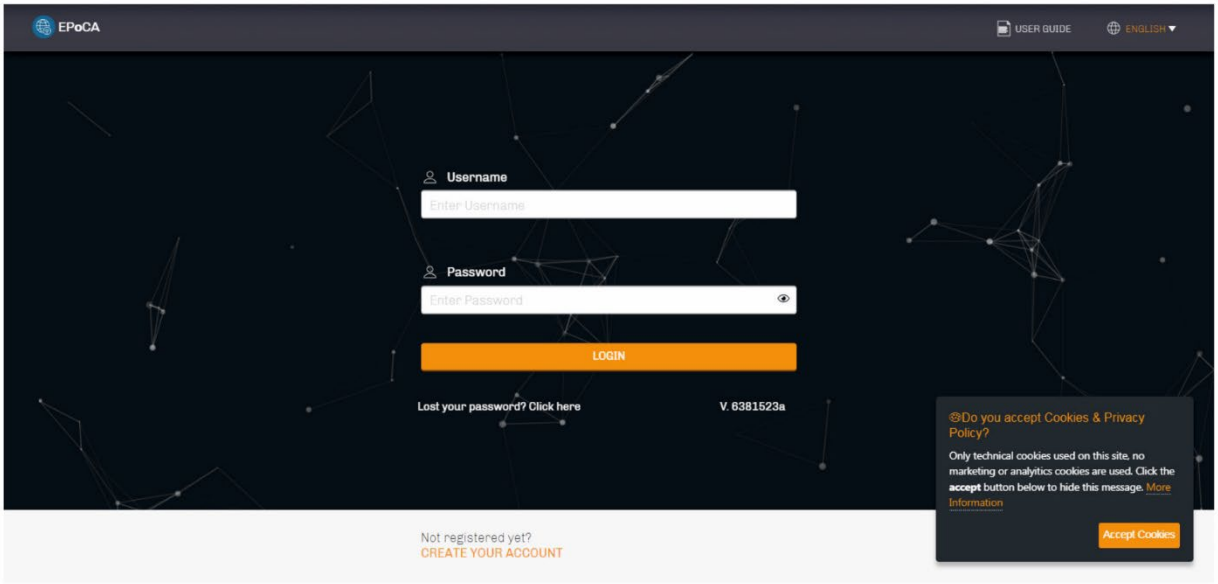
48. Once MODBUS configuration is complete, select **Next**.
The following screen will appear.



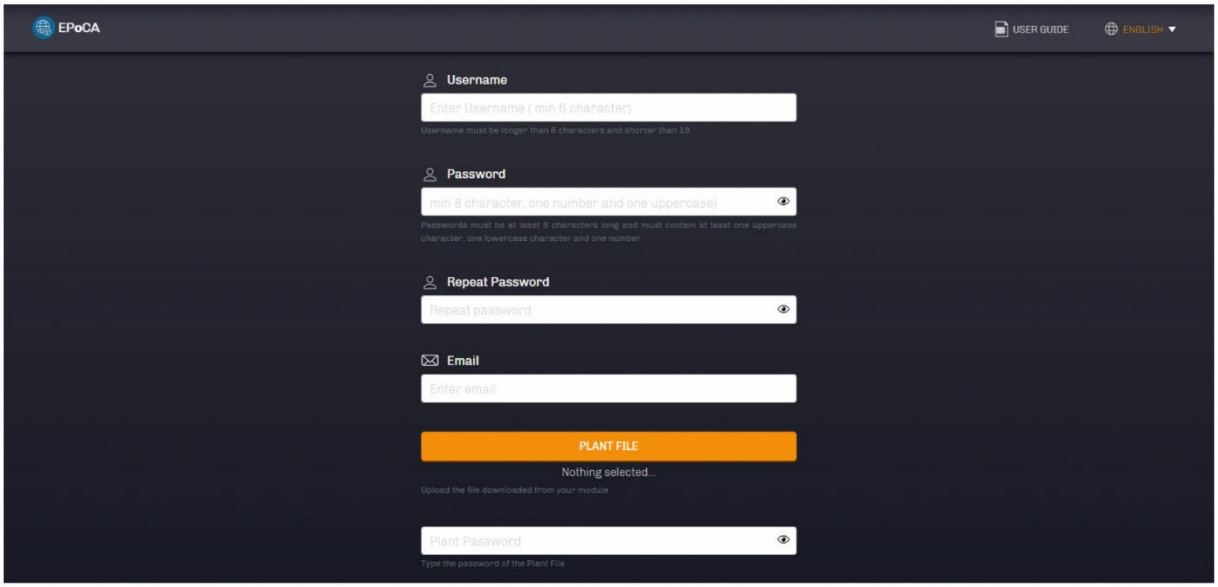
49. Select **Configure**: the *EPoCA.exe* app will close.

7.2 First access to the EPoCA® cloud platform

1. Open the web browser on the PC (or laptop) and open the web page **epoca.cloud**.
   The following screen will appear.

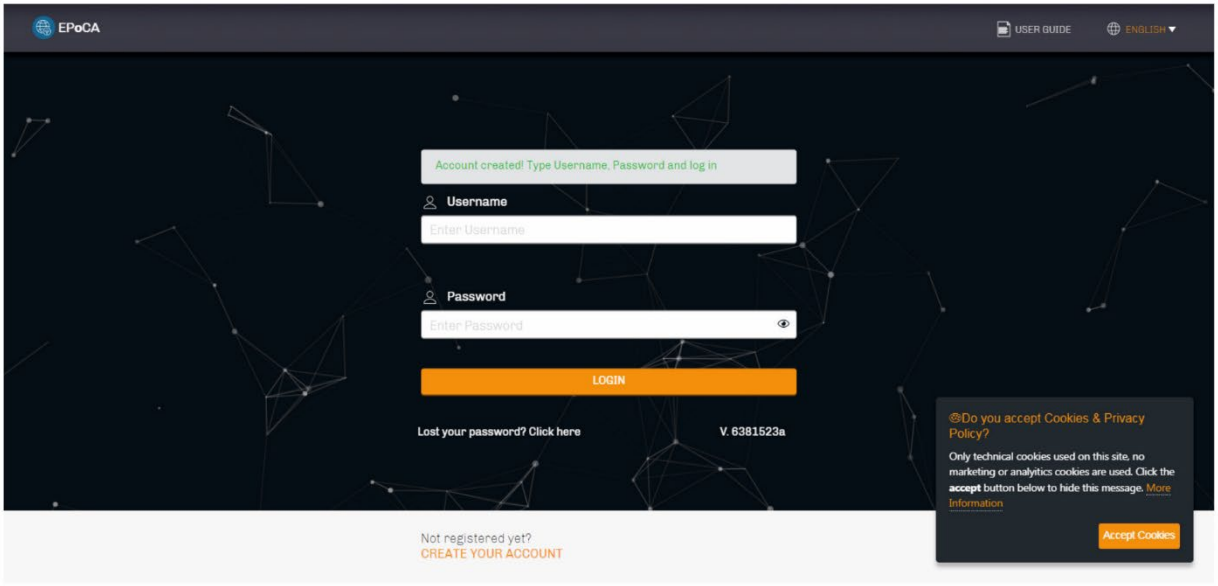


2. Select **CREATE YOUR ACCOUNT**.
   The following screen will appear.



3. Enter a username for the account (for example **johnsmith**) in the **Username** box.
4. Enter a password for the account in the **Password** box.
5. Enter the password for the account again in the **Repeat Password** box.
6. Enter an email address for the account in the **Email** box.
7. Select **PLANT FILE** to upload a *plant file* (see point 18, section 7.1).
8. Enter the plant password in the **Plant Password** box (see point 13, section 7.1).
9. Check the **You must accept the LICENSE AGREEMENT to continue** box.

10. Select **REGISTER**.
The following screen will appear.



11. Enter the username for the account in the **Username** box (see point 3).
12. Enter the password for the account in the **Password** box (see point 4).
13. Select **LOGIN**.

8 SUBSEQUENT USES

8.1 Subsequent uses of EVD Web

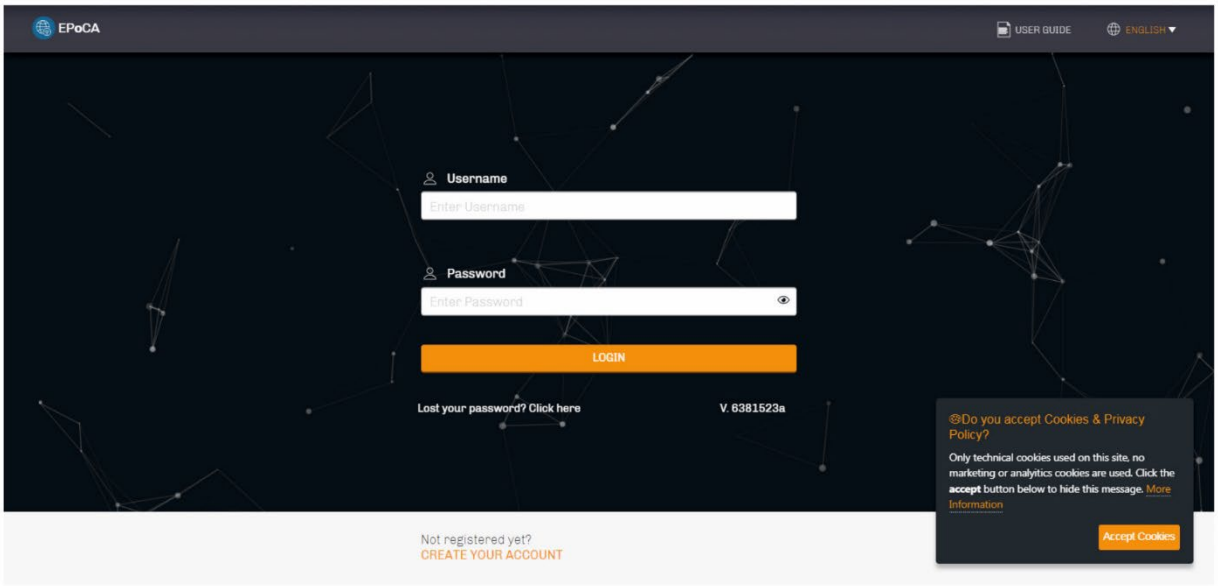
1. From point 10 of section 7.1.
2. Run the *EPoCA.exe* app on the PC (or laptop).
   The **Device selection** screen will appear.

3. Select the device then press **Next** (only click **Device web page** for extremely advanced configurations).
   The **Plant Login** dialogue box will appear.

4. Enter the name for the plant in the **Plant name** box (see point 12, section 7.1).
5. Enter the password for the plant in the **Password** box (see point 13, section 7.1).
6. Select **Next**.

8.2 Subsequent accesses to the EPoCA® cloud platform

1. Open the web browser on the PC (or laptop) and open the web page **epoca.cloud**.
   The following screen will appear.



2. Enter the username for the account in the **Username** box (see point 3 of section 7.2).
3. Enter the password for the account in the **Password** box (see point 4, section 7.2).
4. Select **LOGIN**.

9 SIGNALLING LEDS

LED	ON	OFF	FLASHING	BLINKING
COM0 (communication status TTL MODBUS port)	-	no MODBUS activity	.	MODBUS activity
COM1 (communication status RS-485 MODBUS master port 1)	-	no MODBUS activity	.	MODBUS activity
COM2 (communication status RS-485 MODBUS master port 2)	-	no MODBUS activity	.	MODBUS activity
COM3 (communication status RS-485 MODBUS master port 3)	-	no MODBUS activity	.	MODBUS activity
STATUS (communication status Ethernet)	connection to the EPoCA® cloud platform active	-	no connection to the EPoCA® cloud platform	-

10 ACCESSORIES

10.1 Connecting cable for Personal Computer

0810500023

Allows connection from the device to a PC via a USB.

Length: 1 m (3.28 ft).

10.2 Connection kit

CJAV74

Makes it possible to cable the device.

11 TECHNICAL SPECIFICATIONS

Housing	Grey, self-extinguishing	
Category of heat and fire resistance	D	
Measurements	4 DIN modules: 71.0 x 110.0 x 60.0 mm (2 13/16 x 4 5/16 x 2 3/8 in)	
Mounting methods for the control device	On a DIN rail in a control panel	
Degree of protection provided by the casing	IP40	
Connection method		
Plug-in screw terminal blocks for wires up to 1.5 mm²	Plug-in screw terminal blocks for wires up to 2.5 mm²	
RJ45 F telephone connector	Pico-Blade connector	Micro USB connector
Maximum permitted length for connection cables		
Power supply: 10 m (32.8 ft)	Analogue inputs: 10 m (32.8 ft)	
RS-485 MODBUS master port: 1,000 m (3,280 ft)	Micro USB port: 1 m (3.28 ft)	
We recommend using the CJAV74 connection kit to cable the device (to be ordered separately)		
Operating temperature	From 0 to 60 °C (from 32 to 140 °F)	
Storage temperature	From -20 to 70 °C (from -4 to 158 °F)	
Operating humidity	Relative humidity without condensate from 5 to 95%	
Pollution status of the control device	2	
Compliance		
RoHS 2011/65/EC	WEEE 2012/19/EU	REACH (EC) Regulation no. 1907/2006
EMC 2014/30/EU	LVD 2014/35/EU	
Power supply	115... 230 Vac (+10 % -15 %), 50/60 Hz (±3 Hz), max. 4 VA, 2 W	
Earthing methods for the control device	None	
Rated impulse-withstand voltage	2.5 KV	
Over-voltage category	II	
Software class and structure	A	
Clock	Supercap	
Clock battery autonomy in the absence of a power supply	1 day at 25 °C (77 °F)	
Clock battery charging time	30 min (the battery is charged by the power supply of the device)	
Analogue inputs	3 for Pt 1000 probes	
Pt 1000 probes	Sensor type	1 KΩ @ 0 °C, 32 °F
	Measurement field	From -100 to 600 °C (from -148 to 1,112 °F)
	Resolution	0.1 °C (1 °F)
	Precision	±2.5 °C

The device guarantees:

- reinforced insulation between the powered parts and the SELV circuits
- main insulation between the powered parts of opposite polarity (line-neutral)

Communications ports	
1 Ethernet port	3 RS-485 MODBUS master ports
1 TTL MODBUS port	1 micro USB port
Storage capacity	When 19 EVCO devices with EPoCA® technology are connected, if 3 values for each device are saved with a sampling time of 1 min and if 10 events occur in one hour for each device, the storage capacity is approximately 300 days

EVD Web
User manual ver. 1.0 rev. C
PT - 44/24
Code 144DWEBI104

	CAUTION The device must be disposed of according to local regulations governing the collection of electrical and electronic equipment.

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