USER'S MANUAL

AZZURRO ZCS

AZZURRO HUB

ZSM-HUB

ZUCCHETTI Centro Sistemi

GREEN INNOVATION

Azzurro HUB – monitoring and control system

User Manual

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Contents

Warnings

This manual contains important safety instructions which must be followed and observed during the installation and maintenance of the equipment.

Keep these instructions safe!

This manual must be regarded as an integral part of the equipment and must be available at all times to anyone who uses the equipment. The manual must always accompany the equipment, even when it is sold to another user or moved to another site.

Copyright Notice

Technical support

ZCS offers a technical support and consultancy service which can be accessed by submitting a request directly via the website www.zcsazzurro.com
For Italy, the freephone number is as follows: 800 72 74 64.

Foreword

General Information

Please read this manual carefully before installation, use or maintenance**.** This manual contains important safety instructions that must be followed during the installation and maintenance of the equipment.

Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the "Azzurro HUB" system. Keep this manual in a safe place so that it is accessible at all times.

Intended Audience

This manual is intended for qualified technical personnel (installers, technicians, electricians, technical support staff or anyone qualified and certified to work on electrical installations) responsible for installation and commissioning. The manual is also intended for end users, who may find useful information on managing their system via the "Azzurro-HUB" system.

Symbols used

This manual provides information on how to carry out work safely and uses certain symbols to ensure the safety of personnel and equipment, and to facilitate efficient use during normal operation.
It is important to understand this information to prevent accidents and damage to property. Please familiarise yourself with the symbols listed below and used in this manual.

 **Danger**	**Danger:** indicates a hazardous situation which, if not resolved or avoided, may result in serious personal injury, harm or death
 **Warning**	**Warning:** indicates a hazardous situation which, if not resolved or avoided, may result in serious personal injury, harm or death
	**Caution:** indicates a hazardous situation which, if not resolved or avoided, may result in minor or moderate personal injury

Caution	
 **Caution**	**Caution:** indicates a potentially hazardous situation which, if not resolved or avoided, may result in damage to the system, property or other items
 **Note**	**Note:** important advice for the correct and optimal operation of the product

1. Preliminary safety guidelines

 Note	**If you have any queries or difficulties in reading and understanding the following information, please contact Zucchetti Centro Sistemi S.p.A. via the official channels provided**

1.1. Safety Instructions

This section primarily sets out the safety instructions to be followed during the installation and use of the equipment.
Read and understand the instructions in this manual and familiarise yourself with the relevant safety symbols in this chapter; only then should you begin to install and commission the equipment. All installation work must be carried out by a qualified and competent electrician.
Contact your nearest authorised service centre should any repairs or maintenance be required. Contact your distributor for details of your nearest authorised service centre. DO NOT carry out repairs yourself; doing so may result in injury or damage.

Qualified personnel

Ensure that the operator has the necessary skills and training to carry out their duties. Staff responsible for the use and maintenance of the equipment must be competent, aware of and familiar with the activities described, as well as possessing the appropriate knowledge to correctly interpret the contents of this manual. For safety reasons, this system may only be installed by a qualified electrician who has received the necessary training and/or has demonstrated the requisite skills and knowledge in the installation and maintenance of the device. Zucchetti Centro Sistemi S.p.A. accepts no liability for damage to property or personal injury caused by the incorrect use of the device.
Do not attempt, under any circumstances, to repair or replace any system components without the assistance of qualified personnel.

Installation requirements

Install and commission the system in accordance with the following instructions. Choose a suitable location for the installation of electrical equipment. Ensure there is sufficient space to facilitate any necessary maintenance work.

Transport requirements

If you notice any issues with the packaging that could cause damage to the system, or if there is visible damage, please contact the responsible transport company immediately. If necessary, seek assistance from an installer or from Zucchetti Centro Sistemi S.p.A. The equipment must be transported, particularly by road, using suitable means to protect the components (in particular the electronic components) from severe impacts, moisture, vibrations, etc.

Electrical connections

All applicable electrical regulations regarding accident prevention must be observed.

 **Danger**	**Before making the electrical connection, ensure that the power supply to the AC connection cables is properly disconnected**
 **Warning**	**All installation work must be carried out exclusively by a qualified electrician!** **They must be properly trained and must read this manual carefully and understand the relevant topics**
 **Note**	**It is forbidden to remove the information label or tamper with the system** **Failure to do so will result in ZCS providing no warranty or support**

Operation

Do not use the product if it shows any defects, cracks, abrasions or leaks; instead, contact your retailer or our staff.

⚠ **Danger**	**Contact with the mains supply or the equipment's terminal may result in electric shock or fire!** • Do not touch the terminal or the conductor connected to the mains supply. • Observe all instructions and safety documents relating to connection to the mains
⚠ **Warning**	**In the event of abnormal operation:** • Disconnect the incoming and outgoing power supplies

Maintenance and repair

Keep the system clean and dry; if cleaning is required, use a clean, dry cloth.

Product label:

Figure 1 – Labels on the system

2. Product features

2.1. Product overview

Azzurro HUB is a control system capable of communicating with the Azzurro series electric vehicle charging stations and the Azzurro series photovoltaic and hybrid inverters. It is also capable of measuring consumption, monitoring the system, limiting the power fed into the grid and controlling domestic loads through the use of accessory sensors, external meters and digital outputs.

2.2. Local web server

When switched on, the Azzurro HUB broadcasts a Wi-Fi/Bluetooth access point to which you can connect by scanning the QR code on the product.
Once connected to the access point, the web server for product configuration will open automatically; it can also be accessed via the IP address 192.168.20.1:55560

After the initial connection to the router (via Ethernet or Wi-Fi), the web server can also be accessed by entering the IP address assigned by the router into a browser, using port 55560 (e.g. 192.168.1.100:55560)

2.3. Communication with devices

Communication with vehicle charging stations can be carried out, depending on the model, via the dedicated CAN serial port for up to 8 devices (VITA series Wallbox), via the RS485 serial port for 32 devices (Caro series Wallbox), or via Modbus TCP (DC series Wallbox), for up to 32 devices.

Communication with inverters can be carried out via a dedicated RS485 serial port; up to 32 inverters can be connected to the Azzurro HUB.

Communication with the meters can be carried out via a dedicated RS485 serial port; up to 32 meters can be connected to the Azzurro HUB.

2.4. Communication with the portal

To communicate with the web portal/mobile app, you must have an internet connection to which the Azzurro HUB can be connected.
The Azzurro HUB can be connected to any router via the RJ45 connector on the top of the device or via a Wi-Fi connection.

2.5. General product description

The Azzurro HUB can be mounted on a DIN rail (6-module width) and is powered by a 230V AC mains supply. Its connections allow for the connection of accessories, charging stations, Azzurro series inverters and the necessary power supplies.
There are two hardware versions of the Azzurro, designated:

- **Ver. A;**
- **Ver. B**

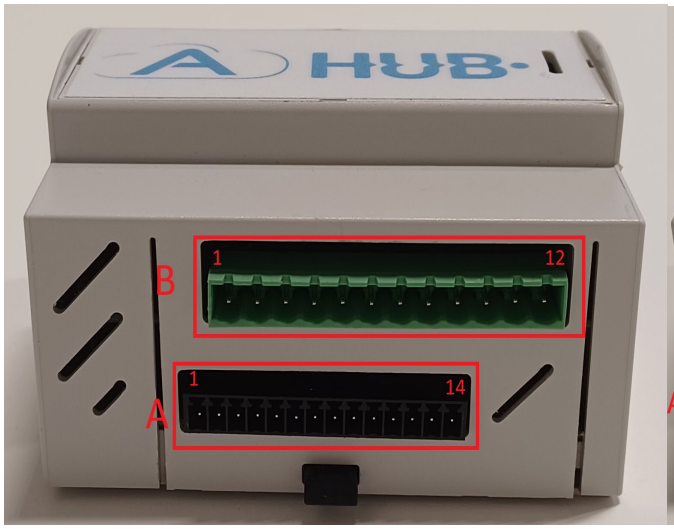


Figure 2 – Bottom view of Ver.A device

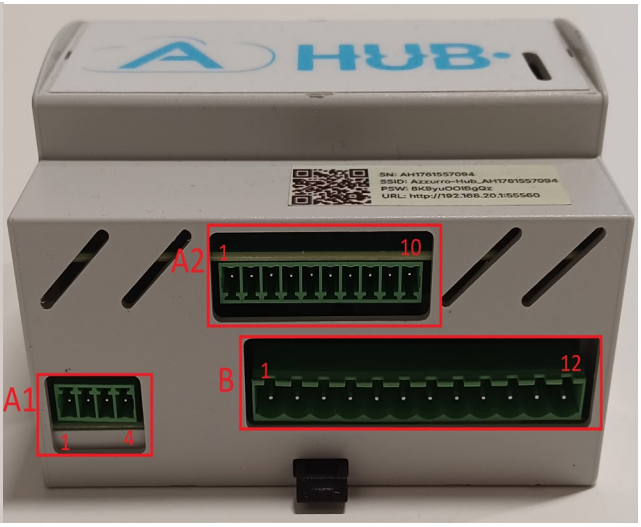


Figure 2 – Bottom view of Ver.B device

The system features a 14-pin terminal block (A) at the bottom for connecting devices (inverters, meters, wallboxes, etc.) and a 12-pin terminal block (B) for outputs (relay – dry contact).	On the underside, the system features two terminal blocks: one with 4 pins (A1) and the other with 10 pins (A2) for connecting devices (inverters, meters, wallboxes, etc.) and a 12-pin terminal block (B) for outputs (relays – dry contacts).

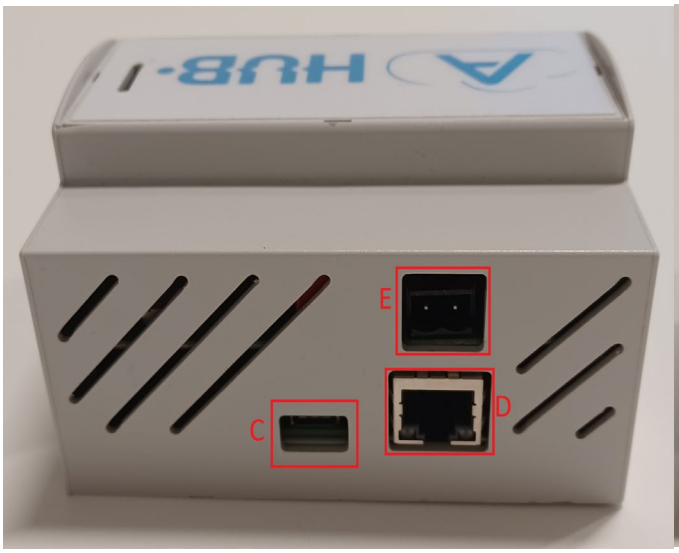


Figure 3 – Top view of Device Ver. A

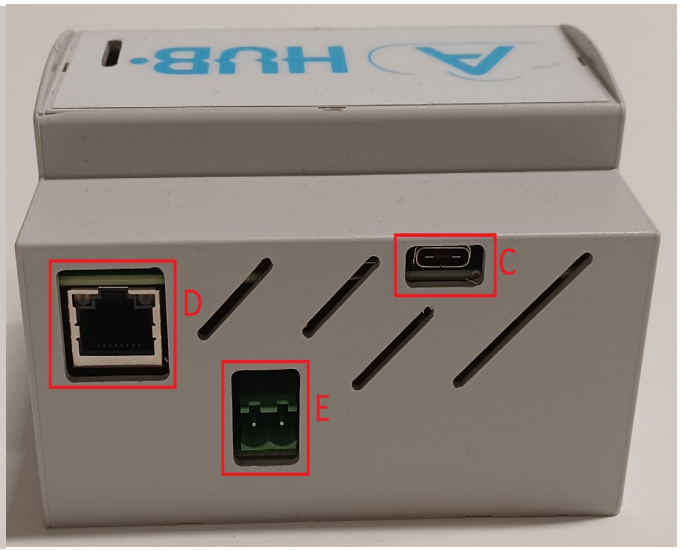


Figure 3 – Top view of Device Ver. B

The following is located at the top: the 230V AC power connector [E]. the USB-C connector [C] for future expansions, the RJ45 connector [D] for the Ethernet connection	The following are located at the top: the RJ45 connector [D] for the Ethernet connection the USB-C connector [C] for future expansion, the 230V AC power connector [E].

2.6. 14-pin COM connector [A]

Pinout of the **14-pin** connector **[A]**:

PIN Azzurro HUB [A]	Pin description for Azzurro HUB [A]	Description of the external device that can be connected	Connector on external device	Pins on external device
1	CAN-L	CAN wall box	RJ45 for CAN connection	5
2	CAN-H	CAN wall box	RJ45 for CAN connection	4
3	Analogue input 1+	PT100/PT1000 temperature sensor	/	/
4	Analogue input 1-	PT100/PT1000 temperature probe	/	/
5	CT exchange +	current sensor for exchange point, transformation ratio 3000:1 (max 80A on primary side)	/	/
6	Exchange CT -	current sensor for tap-change point, transformation ratio 3000:1 (max 80A on primary)	/	/
7	Generation CT +	Current sensor for external generation, transformation ratio 3000:1 (max 80A on primary side)	/	/
8	CT production –	current sensor for external production, transformation ratio 3000:1 (max 80A on primary side)	/	/
9	RS485 3A	External meter	RS485	24
10	RS485 3B	External meter	RS485	25
11	RS485 2A	CARO series wallbox	RS485	RS485 A
12	RS485 2B	CARO series Wallbox	RS485	RS485 B
13	RS485 1A	Azzurro V3 or HYD 3PH series inverter	COM	1-2
		Azzurro HYD 1PH inverter, HP series	COM	5
		Azzurro HYD 1PH ZP1 series inverter	COM	2
14	RS485 1B	Azzurro V3 or HYD 3PH series inverter	COM	3-4
		Azzurro HYD 1PH inverter, HP series	COM	6
		Azzurro HYD 1PH ZP1 series inverter	COM	3

2.7. 4-pin output connector [A1]

Pinout of the **4-pin** connector **[A]**:

PIN Azzurro HUB [A]	Azzurro HUB [A] pin description	Description of the external device that can be connected	Connector on external device	Pins on external device
1	CT exchange +	current sensor for switching point, transformation ratio 3000:1 (max 80A on primary side)	/	/
2	Exchange CT -	current sensor for tap-change point, transformation ratio 3000:1 (max 80A on primary)	/	/
3	Production CT +	current sensor for exchange point, transformation ratio 3000:1 (max 80A on primary)	/	/
4	Generation CT -	current sensor for exchange point, transformation ratio 3000:1 (max 80A on primary)	/	/

2.8. 10-pin output connector [A2]

Pinout of the **10-pin** connector **[A2]**:

PIN Azzurro HUB [A]	Azzurro HUB [A] pin description	Description of the external device that can be connected	Connector on external device	Pins on external device
1	Analogue input 1+	PT100/PT1000 temperature probe	/	/
2	Analogue input 1-	PT100/PT1000 temperature probe	/	/
3	RS485 1A	Azzurro V3 or HYD 3PH series inverter	COM	1-2
		Azzurro HYD 1PH inverter, HP series	COM	5
		Azzurro HYD 1PH ZP1 series inverter	COM	2
4	RS485 1B	Azzurro V3 or HYD 3PH series inverter	COM	3-4
		Azzurro HYD 1PH inverter, HP series	COM	6
		Azzurro HYD 1PH ZP1 series inverter	COM	3
5	RS485 3A	External meter	RS485	24

6	RS485 3B	External meter	RS485	25
7	RS485 2A	CARO series wallbox	RS485	RS485 A
8	RS485 2B	CARO series Wallbox	RS485	RS485 B
9	CAN-H	CAN Wallbox	RJ45 for CAN connection	5
10	CAN-L	CAN wall box	RJ45 for CAN connection	4

2.9. 12-pin output connector [B]

PIN Azzurro HUB [B]	Pin description for Azzurro HUB [B]	1. Rating
1	Relay output 1 NC	3A / 230V AC 3A / 48V DC
2	Relay output 1 COM	
3	Relay output 1 NO	
4	Relay 2 NC output	
5	Relay output 2 COM	
6	Relay output 2 NO	
7	Relay output 3 NC	
8	Relay output 3 COM	
9	Relay output 3 NO	
10	Relay output 4 NC	
11	Relay output 4 COM	
12	Relay output 4 NO	

Cables with a maximum recommended cross-section of $1.5\ mm^2$ can be connected to this connector.

2.10. Power supply connector [E]

A 230V 50Hz power supply can be connected to this connector; the maximum recommended cable cross-section is $1.5\ mm^2$.

2.11. Ethernet connector [D]

The Ethernet connector, fitted with two LEDs, enables a wired network connection.
All Azzurro HUB devices are already equipped for connection via both on-board Wi-Fi and a cable.

3. installation diagrams

This chapter describes the system's electrical connections.
Please read this section carefully before connecting the cables.
During the installation, repair and maintenance of the product, local, regional and national regulations must be observed.

Warning	**Before making any electrical connections, ensure that there is no AC power present. Zucchetti Centro Sistemi Spa accepts no liability for any consequences arising from the improper use of this product. Installation must be carried out by a qualified professional with the skills and knowledge required for the construction, installation and operation of electrical components, and who has received safety training to recognise and avoid potential hazards.**
Warning	**Installation and maintenance must be carried out by professional technicians or electricians.**

Note	**For safety reasons, ensure that correctly sized cables are used; otherwise, the current may cause excessive heating or overloading, which could lead to fires.**

Cable connection procedure

1) Before starting any work, ensure you are working in safe conditions by checking that the cables are de-energised.
2) Strip the protective sheath to the appropriate length as shown in the figure (A: 80–100 mm, B: 6–8 mm);

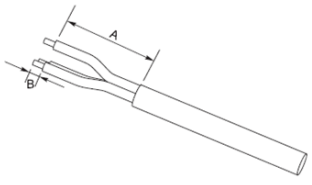


Figure 4 – Connecting the AC power cables

3) Connect the cable to the dedicated input (connector E – see Chapter 2).

3.1. System diagram with ZCS inverter for storage

INVERTER TYPE	COMPATIBLE INVERTER MODEL
1PH	BZT5000 - Retrofit
1PH	HYD 3000-ZSS HP/HYD 6000-ZSS HP
1-phase	HYD3000 HYD6000 ZP1 – One and All
3PH	HYD5000 HYD12000 ZP3 – One and All
3-phase	HYD 5000 ZSS/HYD 20000 ZSS

The diagram below is recommended when the system includes one or more storage inverters (1PH or 3PH) from the Azzurro ZCS range, as shown in the table above.

- ZCS pure photovoltaic inverters can be connected via RS485 to the Azzurro HUB for monitoring and control functions (e.g. zero feed-in)
- Pure photovoltaic inverters from other brands can be monitored using a dedicated external production meter connected to the master hybrid inverter (EXT Production Meter)
- Select the power exchange measurement mode: Master hybrid inverter

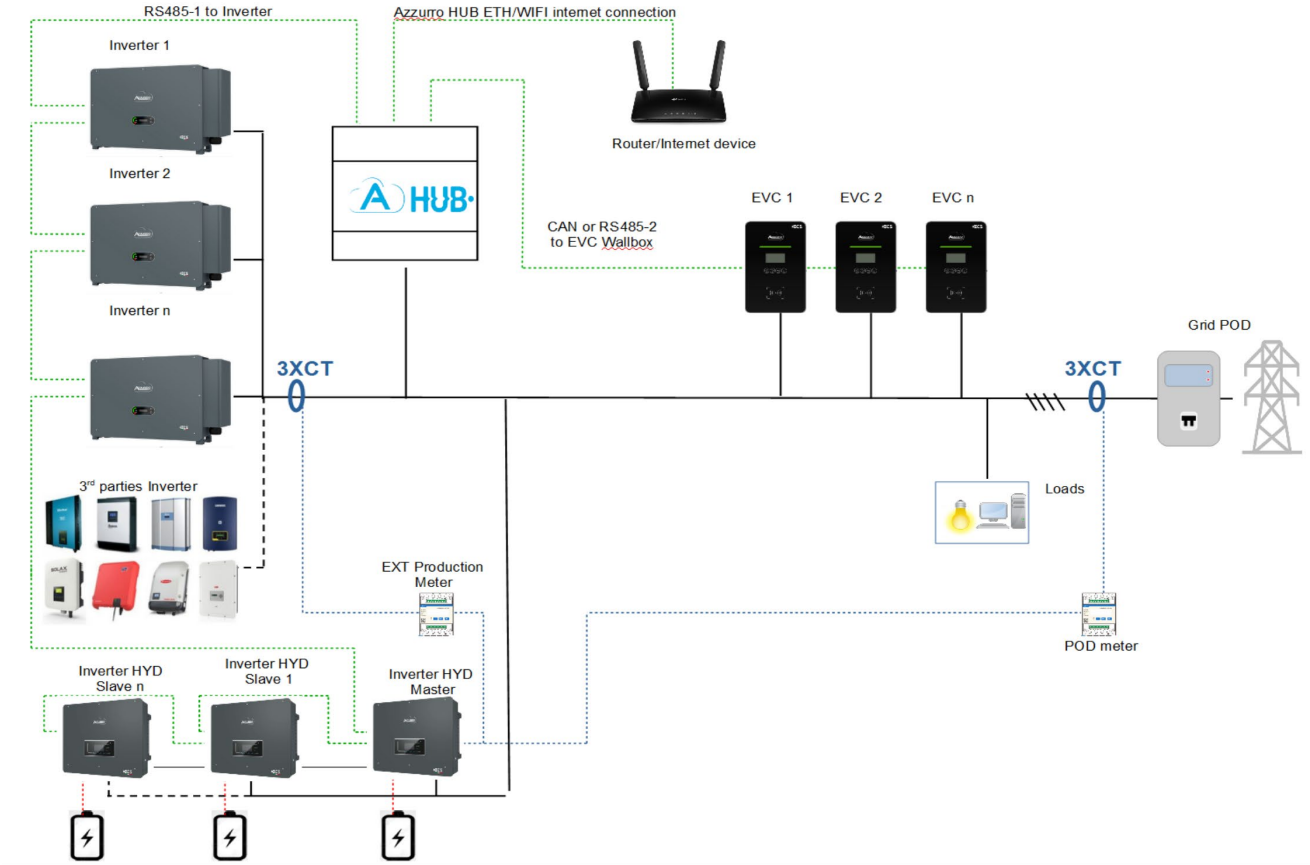


Figure 5 – System diagram with one or more hybrid inverters

3.2. System diagram with a 3-phase pure ZCS photovoltaic inverter

INVERTER TYPE	COMPATIBLE INVERTER MODEL
3PH	3.3KTL-V3/3PH 12KTL-V3
3PH	15000TL-V3/3PH 24000TL-V3
3PH	25KTL-V3/3PH 50KTL-V3
3PH	60KTL-V3/3PH 80KTL-V3
3PH	80KTL-LV/110KTL-LV
3PH	100KTL-V4/110KTL-V4
3PH	100KTL-HV/136KTL-HV
3-phase	250KTL-HV/255KTL-HV
3-phase	250KTL-HV Z0 / 330KTL-HV Z0 / 350KTL-HV Z0

Use this diagram when the system includes photovoltaic inverters (3-phase) from the ZCS Azzurro range, as shown in the table above.

NOTES:

- Stand-alone photovoltaic inverters from other brands can be monitored via the external production meter connected to the Azzurro HUB (EXT Production Meter)
- Select the exchange measurement mode: Meter

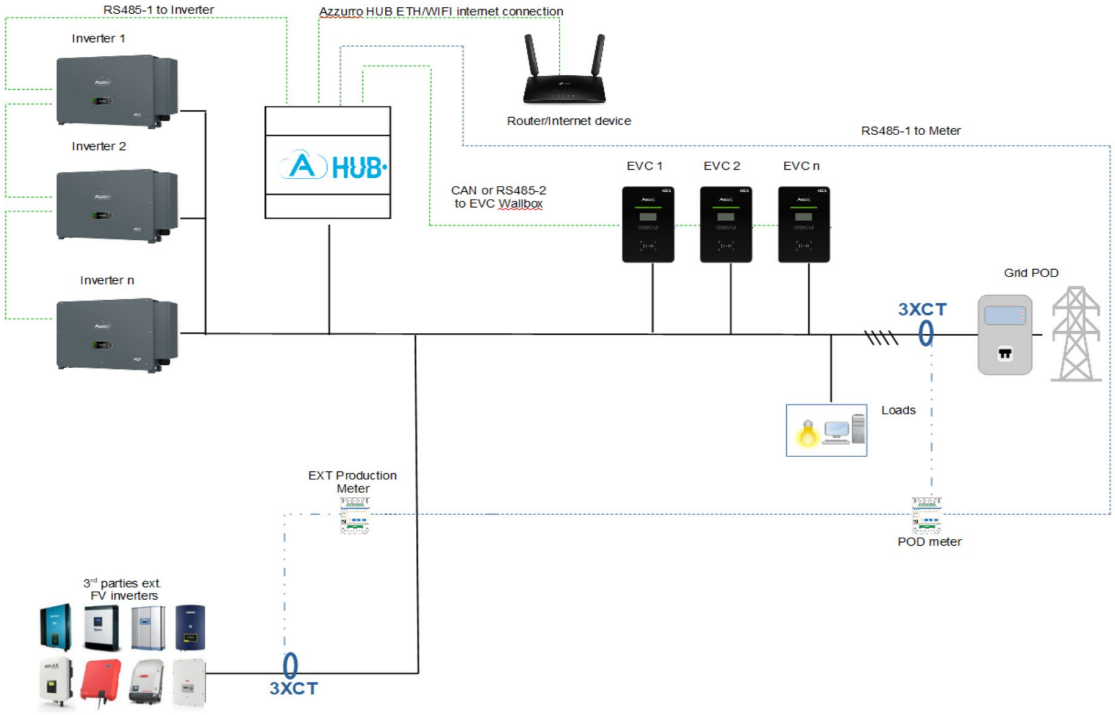


Figure 6 – System diagram with one or more 3-phase pure photovoltaic inverters

3.3. System diagram with ZCS HUB ---EMSc

NOTES:

- Inverters from other brands can be monitored using the external production meter connected to the Power Magic Master (EXT Production Meter)
- Select the power exchange measurement mode: Meter
- Enable EMS mode in the relevant menu
- In this mode, a wired master/slave connection is not required and the 'Parallel Settings' option must be disabled.

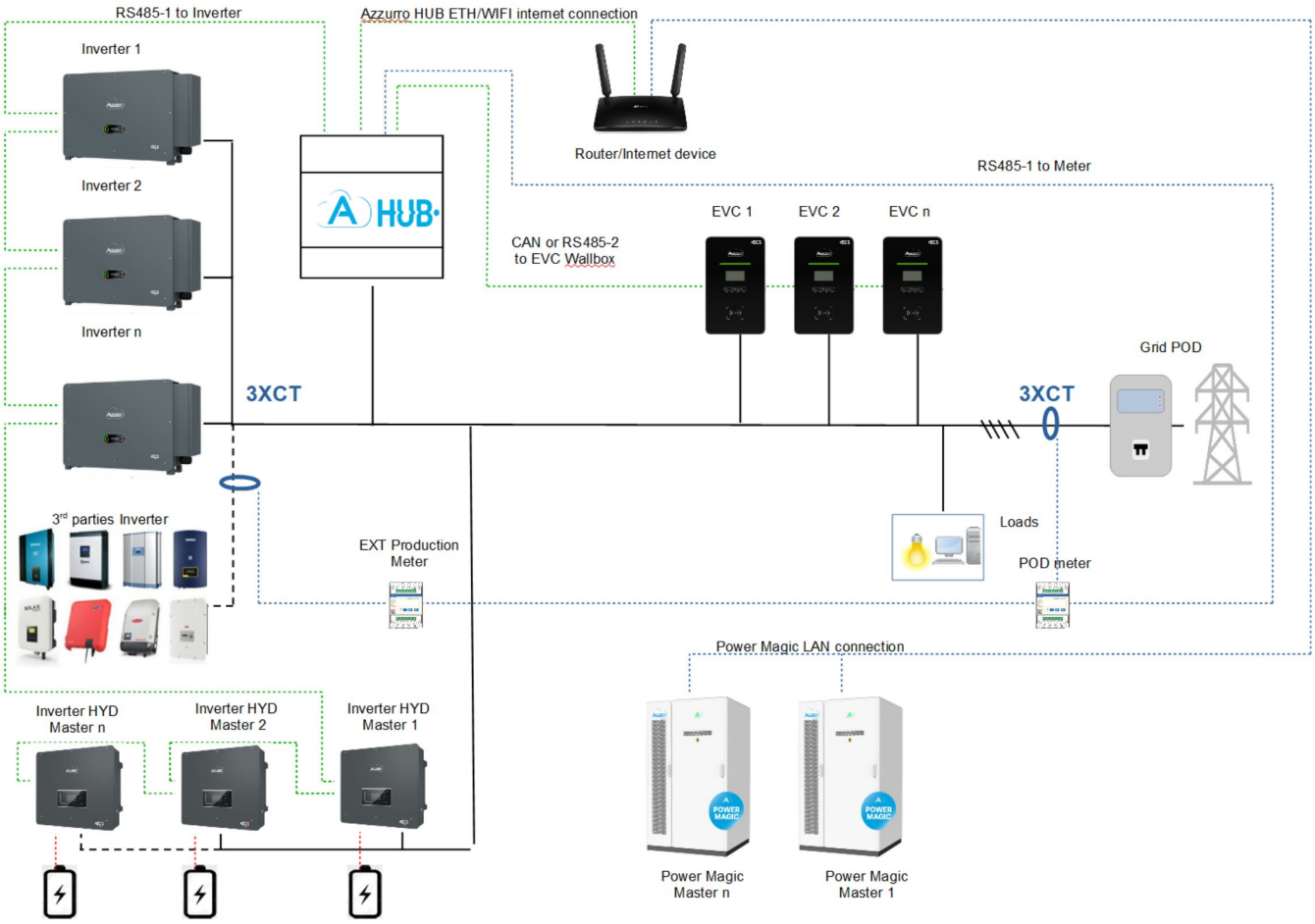


Figure 7 – EMSc System Diagram

3.4. System diagram with ZCS Power Magic

NOTES:

- Inverters from other brands can be monitored using the external production meter connected to the Power Magic Master (EXT Production Meter)
- Select the Exchange Measurement mode: Power Magic

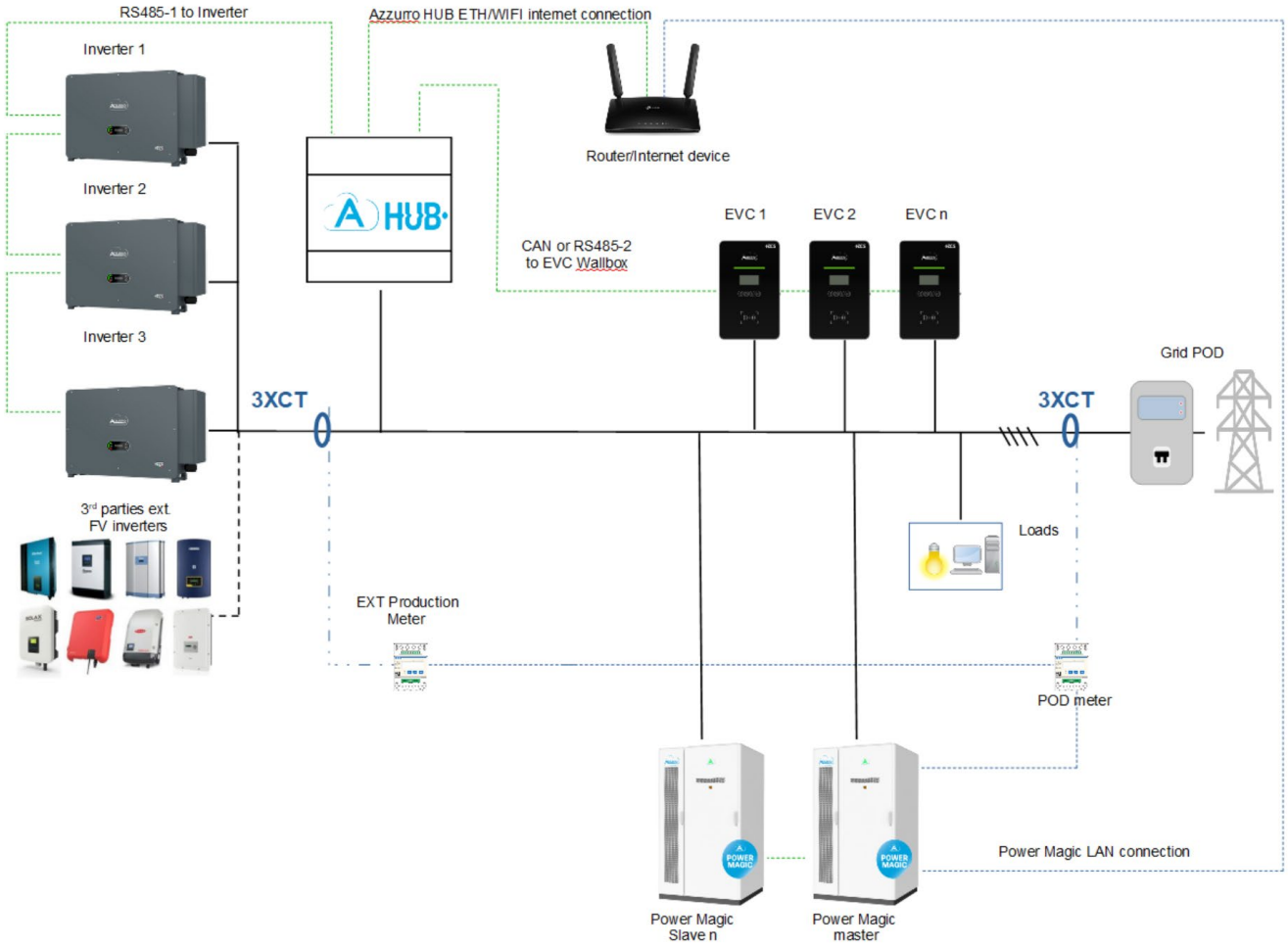


Figure 8 – POWER MAGIC System Diagram

3.5. System diagram with current transformers (CTs) connected directly to the Azzurro HUB

This solution can only be used on single-phase (1PH) systems, using current transformers (CTs) with a 3000:1 transformation ratio supplied by ZCS (e.g. ZST-ACC-TA).

1. Pure photovoltaic inverters from other brands can be monitored using the (EXT Production) sensor
2. Select the power flow measurement mode: Internal Sensors

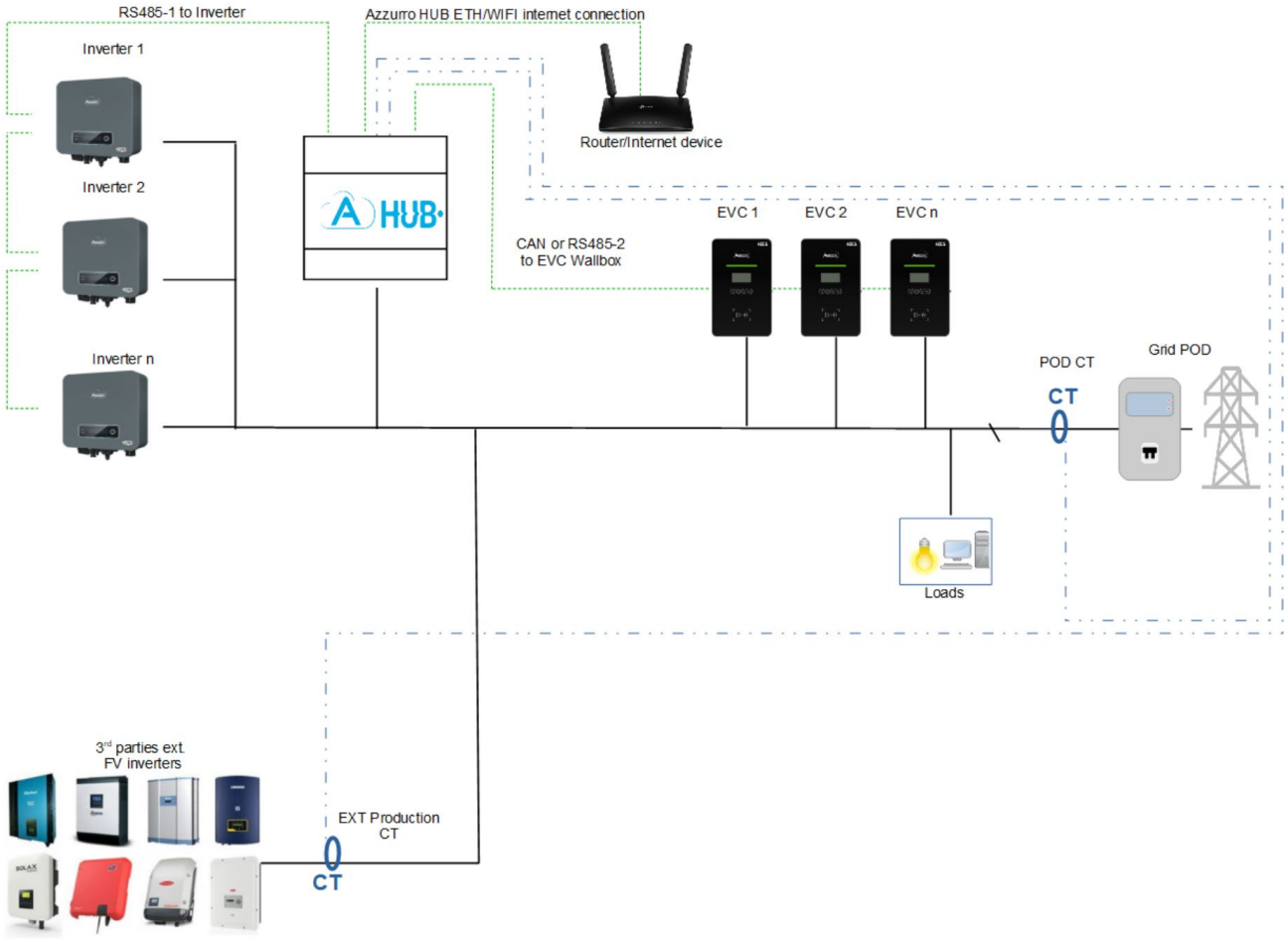
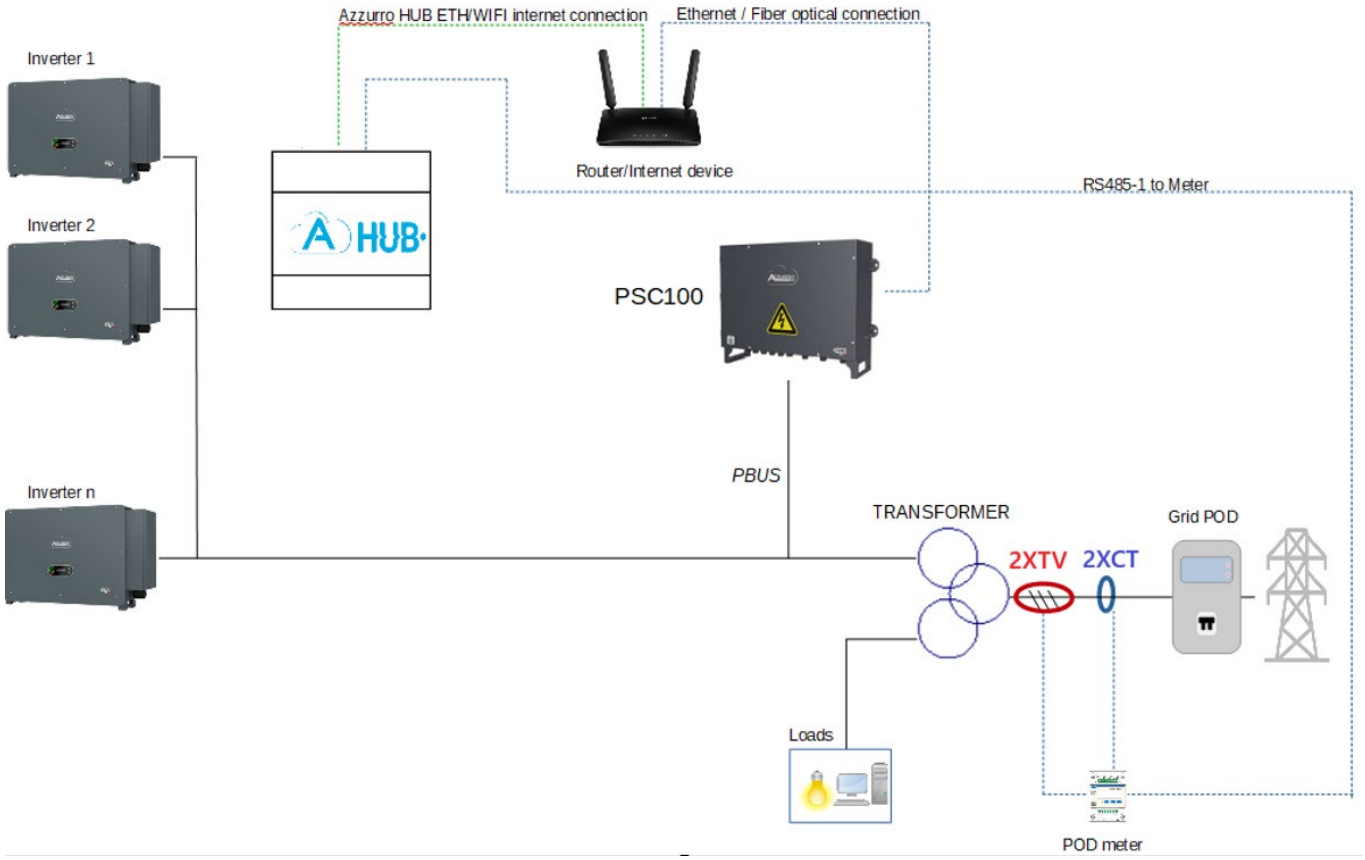


Figure 9 – System diagram: SENSORS connected directly to the Azzurro HUB

3.6. System diagram with PSC100 (only 250KTL-HV Z0 / 330KTL-HV Z0 / 350KTL-HV Z0 inverters)

Select the exchange measurement mode: “Meter” or “None” if no meter is present.
The HUB, via the PSC100s, performs read-only functions.
A CCI, if present, can send control commands via the PSC100s.



NOTES:
Communication between the PSC100 and the inverter takes place via PBUS (power line communication). For installation of the PSC100, refer to the relevant Manual and the document “Commissioning_PSC100_RevX.X”

4. Connection to external devices

4.1. Connection to VITA series charging stations

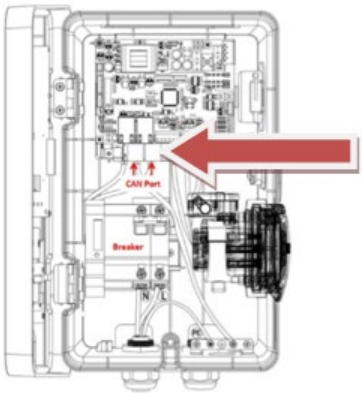
	EV CHARGER TYPE	COMPATIBLE EV CHARGER MODEL	PIN Azzurro HUB [A]	Blue PIN HUB [A1]
	1PH	7KW EV CHARGER	CAN-L 1 CAN-H 2	CAN-L 9 CAN-H 10
	3-phase	EV CHARGER 22KW		

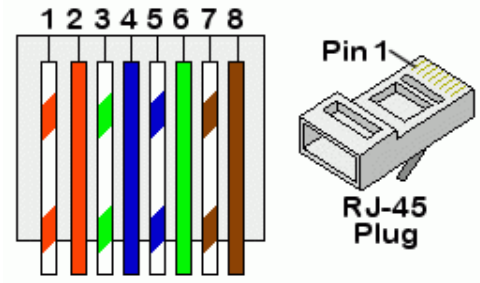
Up to 8 Azzurro EV charging stations can be connected in series.

The Azzurro HUB must be connected to the first charging station by following the instructions provided here.

1) Connect the 8-pin cable to the ports labelled 'CAN port' in the relevant diagram using an RJ45 connector.

2) For clarity, the pin-out of the RJ45 connector is shown in **the figure below**.





3) Connect the prepared cables as shown in the diagram below.

RJ45 pin VITA	Cable colour	Signal description	Light blue HUB pin [A]	Light blue HUB [A1]
4	Blue	CAN-H	1	9
5	White-Blue	CAN -L	2	10

4) Connect any other wallboxes in series using the RJ45 connectors on the CAN ports as 'input-output'. Only the first wallbox is connected to the Azzurro HUB.

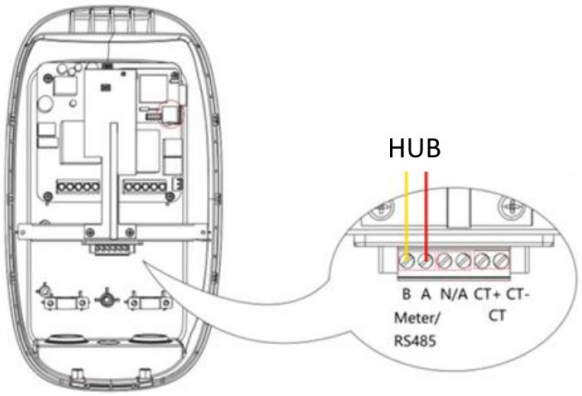
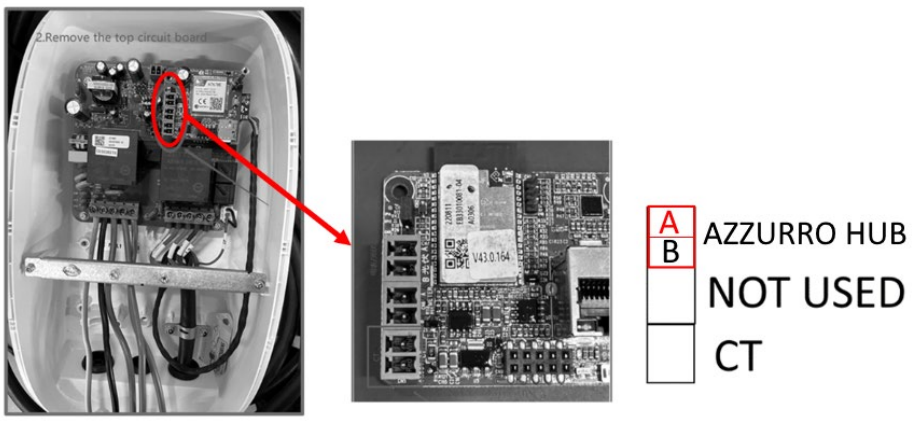
 **Note**	**Note on RS-485 cabling** For the connection, use only certified shielded twisted-pair cables for RS-485 communications. The shielding must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

Set the wallbox to 'Plug&Play' via the display.

4.2. Connection to CARO series charging stations

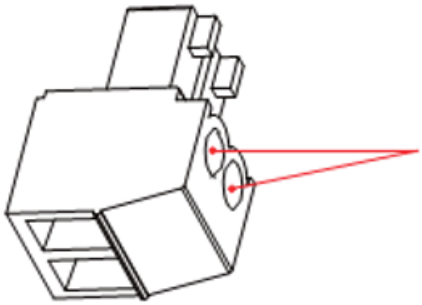
	EV CHARGER TYPE	COMPATIBLE EV CHARGER MODEL	Blue PIN HUB [A]	Blue PIN HUB [A1]
	1PH	EV CHARGER 7KW	RS485 2A 11 RS485 2B 12	RS485 2A 7 RS485 2B 8
	3-phase	EV CHARGER 11KW		

Connect the 2-pole cable to the charging station port. Follow the polarity shown in the diagram and the pinout in the table above

VERSION 'A'	
VERSION 'B'	

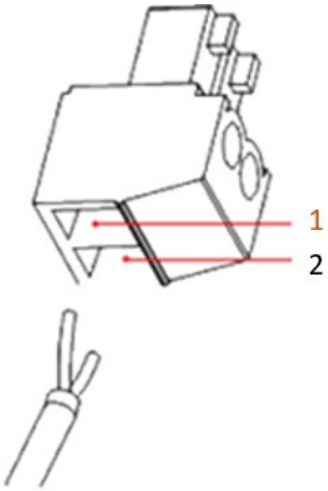
STEP 1

Loosen the two screws using a flat-bladed screwdriver (2 mm).



STEP 2

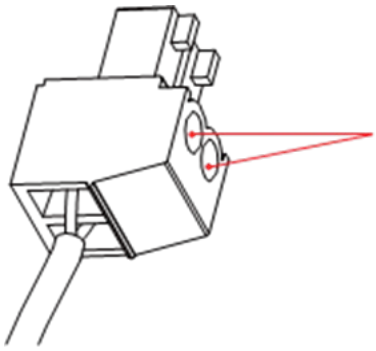
Insert the brown and black cables into the corresponding sockets



1	Brown wire
2	Black wire

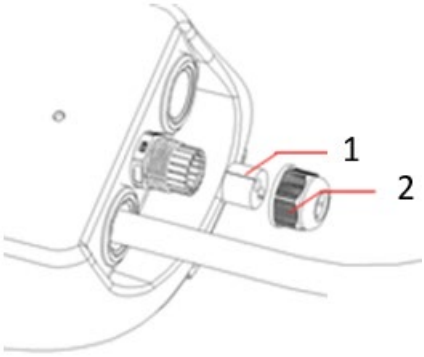
STEP 3

Tighten the two screws with the flat-bladed screwdriver (flat head size: 2 mm) to crimp the two conductors.



STEP 4

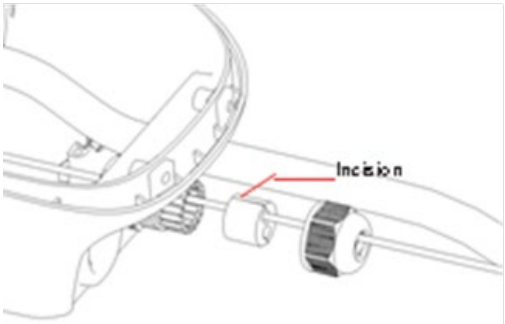
Unscrew the waterproof cap and remove the rubber cap.



1	Cable gland
2	Waterproof ring nut

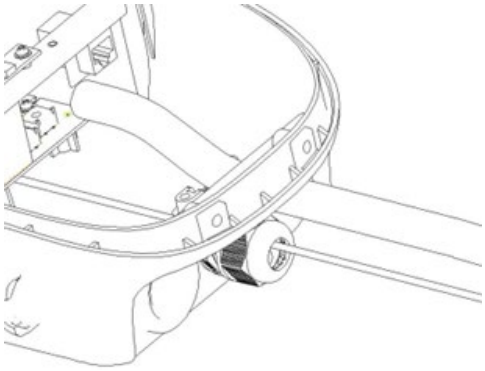
STEP 5

Feed the cable connected to the meter's connector through the cable gland.

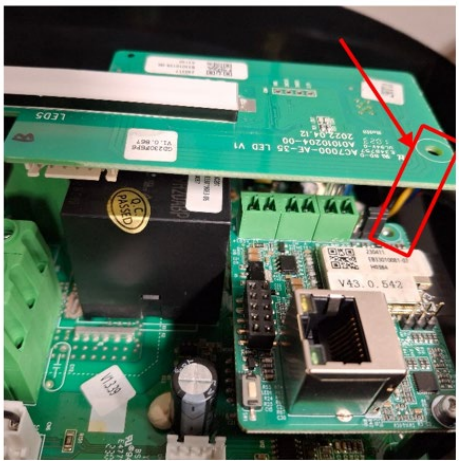


STEP 6

Tighten the ring nut

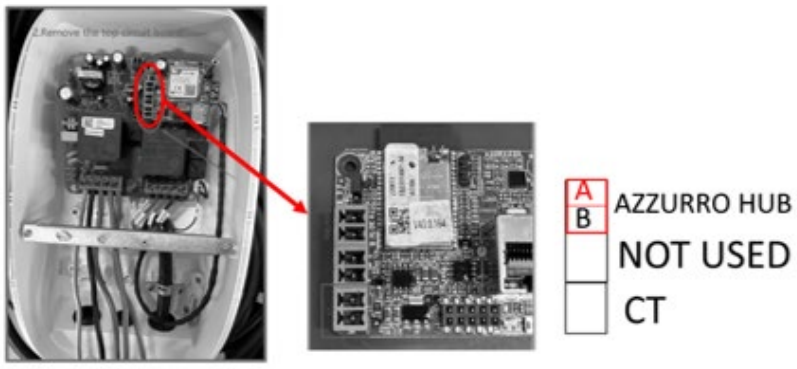


Open the front cover and remove the turret shown in the figure.



Once the terminal block has been unscrewed, lift the circuit board slightly so that you can insert the connector into the pins shown

Make the connection to the marked terminal



Cable colour	Connection	Light blue HUB pin [A]	Light blue HUB [A1]
RED	RS485-A	11	7
BLACK	RS485-B	12	8

 **Note**	**Note on RS-485 wiring** For the connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.2.1. Software configuration – CARO series

AP mode, also known as access point mode, is a versatile wireless networking feature that allows devices such as the Ev Charger for electric vehicles to function as Wi-Fi access points, establishing a dedicated hotspot.

Users can easily connect their smartphones or other mobile devices to this hotspot and manage the device via a web interface by navigating to a specific IP address, such as 192.168.4.1.

1. **Activate the hotspot:**

Activate the EV Charger's hotspot by restarting the power supply.

The EV Charger's hotspot remains available for 15 minutes after the charger has been restarted.

2. **Connect to the charger's hotspot:**

Switch on your smartphone's Wi-Fi and connect to the EV Charger's hotspot.

If you are unable to connect, try switching to aeroplane mode.

The Wi-Fi hotspot name begins with the EV Charger's SN number, i.e. "SN..." .

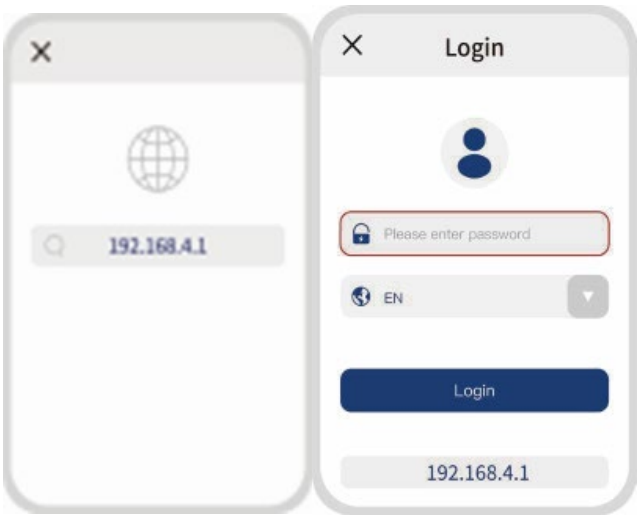
The password is **admin123**

3. Login

Open your smartphone's browser and enter 192.168.4.1 into the address bar.

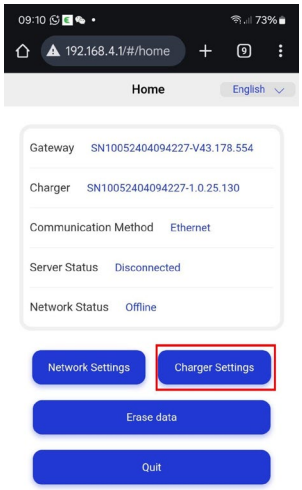
Log in using the four-digit PIN found on the last page of the printed CARO EV Charger manual or inside the box.

Once logged in, the functions menu will appear.

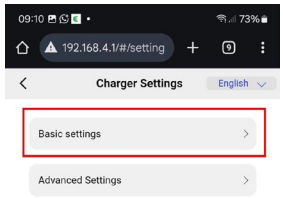


4. Configuration

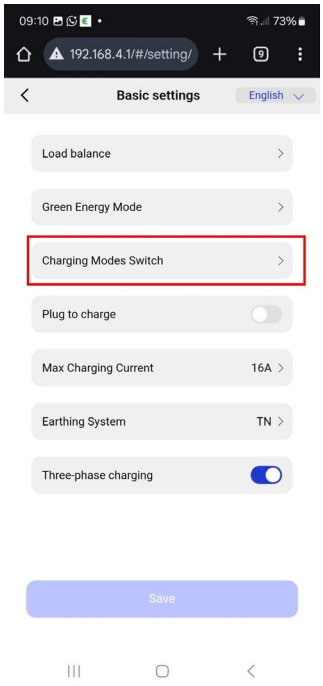
Go to ‘Charger Settings’



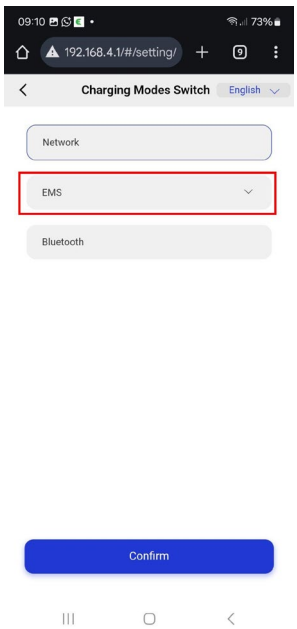
Go to ‘Basic Settings’



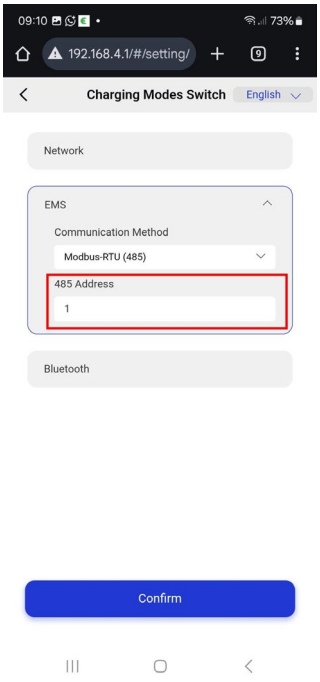
Go to ‘Charging Modes Switch’



Click on ‘EMS’



Set the desired Modbus address



NOTE: If multiple EV Chargers are installed, set unique Modbus addresses.

Once you have finished, click on 'Confirm'

4.3. Connection to ZCS V3-HYD 3PH series inverter

INVERTER TYPE	COMPATIBLE INVERTER MODEL
1PH	1PH 3000TLM-V3/1PH 6000TLM-V3
3PH	3.3KTL-V3/3PH 12KTL-V3
3PH	15000TL-V3/3PH 24000TL-V3
3PH	HYD5000 HYD12000 ZP3 – One and All
3PH	HYD 5000 ZSS/HYD 20000 ZSS
3PH	25KTL-V3/3PH 50KTL-V3
3-phase	60KTL-V3/3-phase 80KTL-V3
3-phase	80KTL-LV/110KTL-LV
3PH	100KTL-V4/110KTL-V4
3PH	100KTL-HV/136KTL-HV
3-phase	250KTL-HV/255KTL-HV
3-phase	250KTL-HV Z0 / 330KTL-HV Z0 / 350KTL-HV Z0

NOTE: Sensors or meters for measuring power exchange must be connected to the inverter in accordance with the manual

To connect the RS485 port to an inverter from the HYD 5000 ZSS/HYD 20000 ZSS series, connect the 2-pin cable to the port on the hybrid inverter marked 'COM'.
Follow the polarity shown in the figure and the pinout in the table.

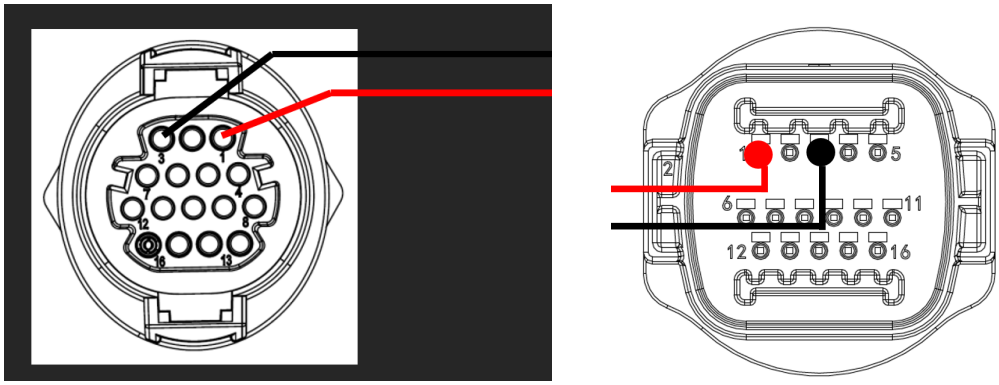


Figure 27 – Connections on the COM port (screw and plug-in)

1	Red cable
3	Black cable

 **Note**	**Note on RS-485 cabling** For the connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.4. Connection to ZCS ZP1 series inverters (One and All)

INVERTER TYPE	COMPATIBLE INVERTER MODEL
1PH	HYD3000 HYD6000 ZP1 – One and All

Note: Sensors or meters for measuring power exchange must be connected to the inverter in accordance with the manual

To connect the RS485 port to an inverter from the HYD3000, HYD6000, ZP1 – One and All series, connect the 2-pin cable to the port on the hybrid inverter marked 'COM'.
Follow the polarity shown in the figure and the pinout in the table.

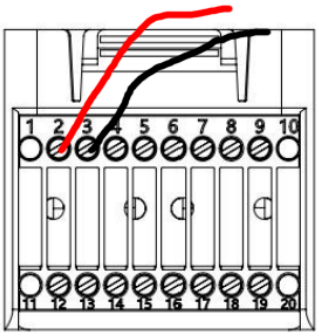


Figure 28 – Connections on the COM port

2	Red cable
3	Black cable

Note	**Note on RS-485 cabling** For the connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.5. Connection to ZCS HP series inverters

INVERTER TYPE	COMPATIBLE INVERTER MODEL
1PH	HYD3000 HYD6000 HP

Note: Sensors or meters for measuring power exchange must be connected to the inverter as per the manual

To connect the RS485 port to an inverter from the HYD3000-6000 HP series, connect the 2-pin cable to the port on the hybrid inverter marked 'COM'.
Follow the polarity shown in the figure and the pinout in the table.

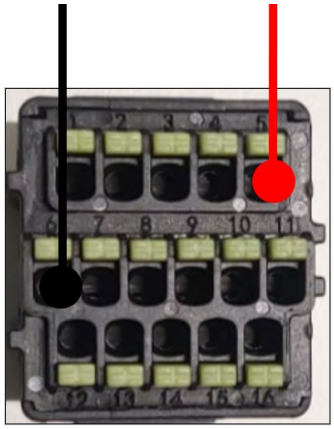


Figure 29 – Connections on the COM port

5	Red cable
6	Black cable

Note	**Note on RS-485 cabling** For the connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.6. Connection to ZCS BZT5000 series inverters

INVERTER TYPE	COMPATIBLE INVERTER MODEL
1PH	BZT5000

Note: Sensors or meters for measuring power exchange must be connected to the inverter in accordance with the manual

To connect the RS485 port to a BZT500 series inverter, connect the cable to the port on the hybrid inverter labelled RS485, using the white-orange and orange cables (respectively) for PIN 1 and PIN 2 of the RJ45 connector.
Follow the polarity shown in the figure and the pinout in the table.

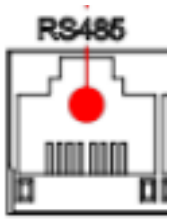
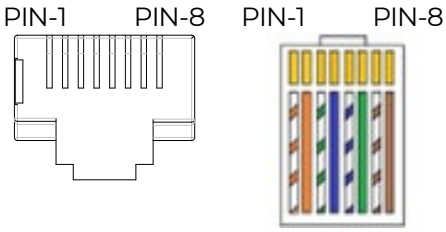


Figure 28 – COM port connections



1	White-orange cable	RS485+
2	Orange cable	RS485-

Note	**Note on RS-485 cabling** For connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.7. Connection to ZCS ZP3 series inverters (One and All)

INVERTER TYPE	COMPATIBLE INVERTER MODEL
3PH	HYD5000 HYD12000 ZP3 – One and All

Note: Sensors or meters for measuring power exchange must be connected to the inverter in accordance with the manual

To connect the RS485 port to an inverter from the HYD5000-12000 ZP3 – One and All series, connect the cable to the port on the hybrid inverter labelled 'Link0', using the white-orange and orange cables (respectively) for PIN 1 and PIN 2 of the RJ45 connector.
Follow the polarity shown in the diagram and the pinout in the table.

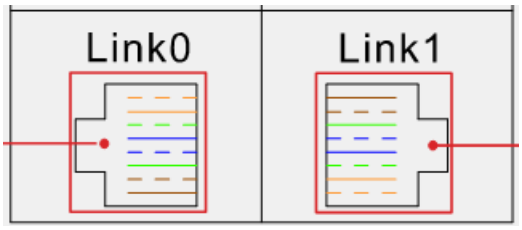
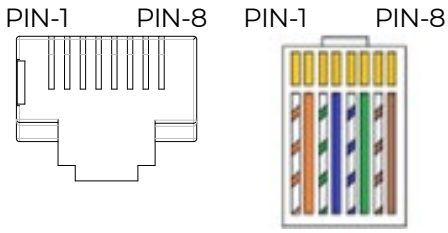


Figure 28 – COM port connections



1	White-orange cable	RS485+
2	Orange cable	RS485-

Note	**Note on RS-485 cabling** For connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.8. Connection to ZCS 3PH and 1PH Meters (ZSM-METER-DDSU/ ZSM-METER-DTSU)

METER TYPE	COMPATIBLE METER MODEL
1PH	ZSM-METER-DDSU
3PH	ZSM-METER-DTSU

To connect via RS485 to the DDSU/DTSU meters, connect the 2-pin cable to the appropriate pins on the connector
Follow the polarity shown in the figure and the pinout in the table.

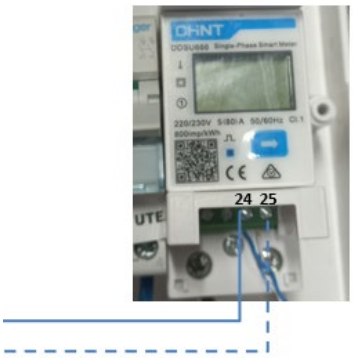


Figure 29 - ZSM-METER-DDSU Meter PIN Connections

PIN ZSM-METER-DDSU	Cable colour	PIN LIGHT BLUE HUB [A]	PIN LIGHT BLUE HUB [A2]
24	Blue cable	9	5
25	Blue-white cable	10	6

Note	**Note on RS-485 cabling** For connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

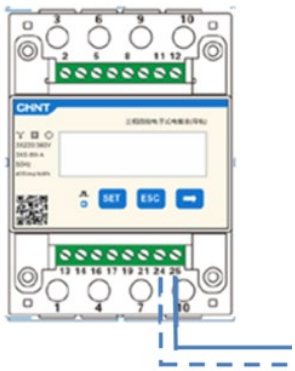


Figure 30 – ZSM-METER-DTSU Meter PIN Connections

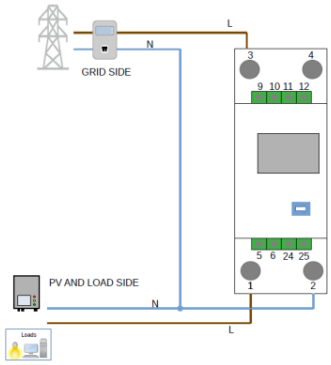
PIN ZSM-METER-DTSU		PIN LIGHT BLUE HUB [A]	PIN AZZURRO HUB [A2]
24	Blue cable	9	5
25	Blue-white cable	10	6

Note	**Note on RS-485 cabling** For connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.

4.8.1. ZSM-METER-DDSU meter settings

Connect the meter in 'direct connection' mode as follows:

- ✓ Connect PIN 2 of the meter to the neutral (N) cable;
- ✓ Connect PIN 3 to the phase leading to the exchange meter;
- ✓ Connect PIN 1 to the phase leading to the photovoltaic system and loads.



Meter Configuration

Press the '➡' button to check that the meter's address is set to 001 (address 01 for exchange meters, 002/003/004 for external generation meters) and that the protocol is set to 8n1.

4.8.2. ZSM-METER-DTSU Meter Settings

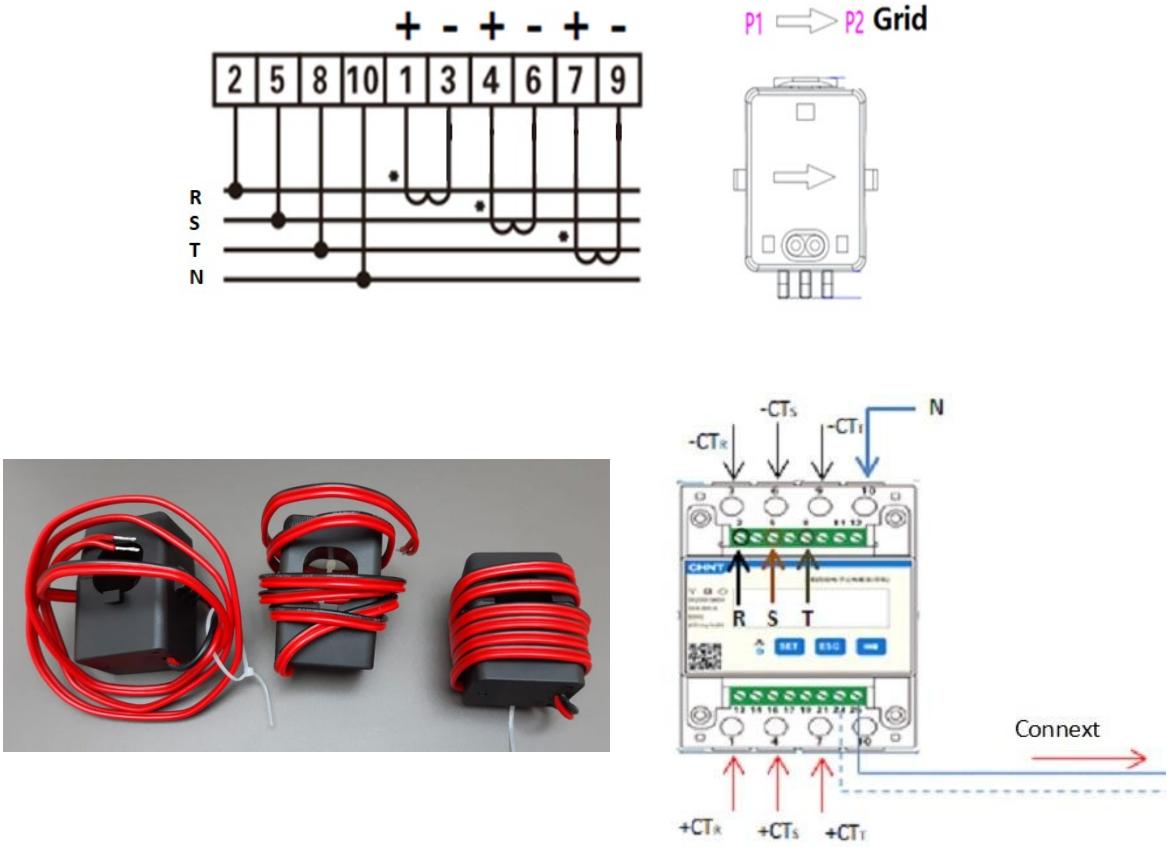
The power cables for phases R, S, T and the neutral (N) cable are connected to the meter via pins 2, 5, 8 and 10 respectively. The CTs for current measurement are connected as follows:

- Phase R measurement with terminals connected to PIN 1 (red wire) and PIN 3 (black wire)
- Phase S measurement with terminals connected to PIN 4 (red wire) and PIN 6 (black wire).
- Measure phase T with the terminals connected to PIN 7 (red wire) and PIN 9 (black wire).

Position the sensors, paying attention to the arrow on the sensor itself.

CAUTION: Only connect the CTs to the phases after you have connected them to the Meter.

The connection between the Meter and the Azzurro HUB is made via the RS485 serial port. On the Meter, this port is identified by pins 24 and 25; on the Azzurro HUB, they are pins 9 and 10



respectively.

Figure 75 – Meter connections

Press to:
"Confirm"
"Move the cursor (to enter digits)
Press to "go back"
Press to "add"

Figure 89 – Meter Legend

Meter Configuration

To configure the device in read mode, you must access the settings menu as follows:

1. Press **SET;** the word **CODE** will appear

2. Press **SET** again; the number "600" will appear:

3. Enter the number "701":
   a. From the first screen where the number "600" appears, press the "→" button once to enter the number "601".
   b. Press "SET" twice to move the cursor to the left, highlighting "601";
   c. Press the "→" key once more until the number "701" is displayed

Note: If an error occurs, press "ESC" and then "SET" again to reset the required code.

4. Confirm by pressing **SET** until you enter the settings menu.
5. Access the following menus and set the parameters as indicated:
   a. **CT**:
      i. Press **SET** to enter the menu
      ii. Enter "40":
         1. From the first screen where "1" appears, press the "→" button several times until the number "10" is displayed.
         2. Press "SET" once to move the cursor to the left, highlighting "10"
         3. Press the "→" button several times until the number "40" is displayed

      Note: If an error occurs, press "SET" until the thousands digit is highlighted, then press "→" until only the number "1" is displayed;
      at this point, repeat the procedure described above.

      i. Press "ESC" to confirm and "→" to move to the next setting.

   b. **ADDRESS**:
      i. Press **SET** to enter the menu:
      ii. Enter "**" (by pressing "→" once from the "01" screen). (Address 01 for exchange meter, 02/03/04 for external production meters)
   iii. Press "ESC" to confirm.

4.9. Connection of the ZSM-IRR-TEMP-LM5 radiation and temperature sensor

METER TYPE	COMPATIBLE SENSOR MODEL
1PH	ZSM-IRR-TEMP-LM5
3PH	

To connect the RS485 to the radiation and temperature sensor, connect the 2-pin cable to the appropriate pins on the connector.
For the power supply connection, an external 12V power supply is required, to be connected to the appropriate pins on the connector
Follow the polarity shown in the figure and the pinout in the table.

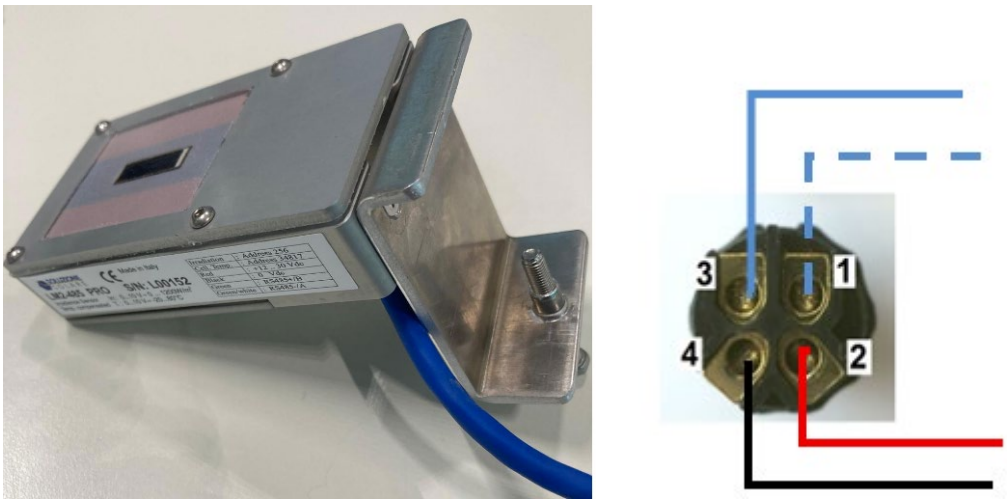


Figure 34 – ZSM-IRR-TEMP-LM5 Sensor PIN Connections

PIN ZSM-IRR-TEMP-LM5		PIN LIGHT BLUE HUB [A]	PIN AZZURRO HUB [A2]
1	Blue and white cable	9	7
3	Blue cable	10	8
2	Positive power cable (+12Vdc)		
4	Negative power cable (0 Vdc)		

Note	**Note on RS-485 cabling** For connection, use only certified shielded twisted-pair cables for RS-485 communications. The shield must be earthed at only one end of the cable (typically the master/main device side), in order to prevent the formation of ground loops and reduce electromagnetic interference.
Note	**Note on the HUB's firmware version** The ZSM-IRR-TEMP-LM5 radiation and temperature sensor has been implemented from HUB software version 900.200 onwards. If the HUB is running an earlier software version, please update it to the latest available version using the appropriate procedure.

The irradiance and temperature data measured by the sensor will be visible on the ZCS Azzurro Portal, on the system's dedicated page.

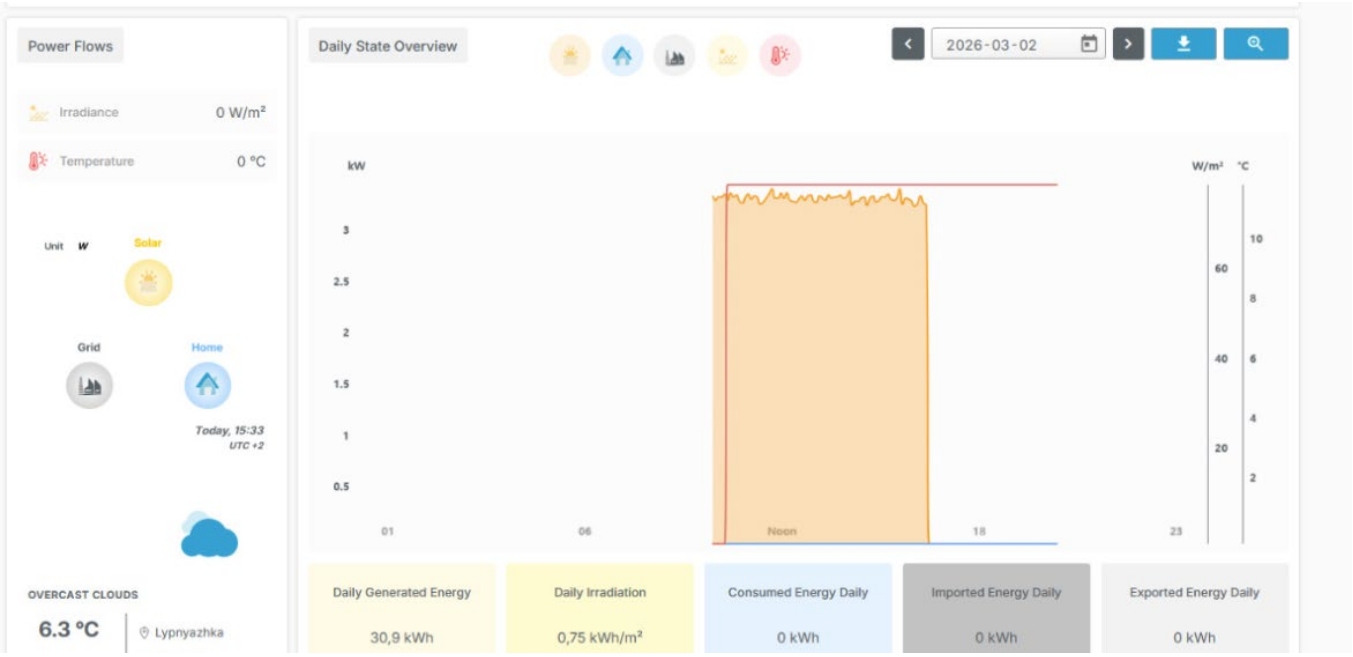


Figure 35 – Screen showing the temperature/irradiation sensor on the monitoring portal

5. Initial start-up and configuration of the Azzurro HUB

The Azzurro HUB allows for simple commissioning via a mobile device by simply using a web server accessible locally via an access point. The steps outlined below allow you to configure the device once all connections to ZCS inverters, ZCS EV chargers, ZCS meters, ZCS heat pumps and the LAN network (if used) have been correctly established.

Note	**The images shown below may differ slightly from the actual ones due to possible software updates**

5.1. Step 1 – Connecting to the Access Point

Follow the steps below to connect:

1) Locate the QR code on the side of the Azzurro HUB and scan it using your mobile device
2) Your mobile device will ask for permission to connect to the network created by the Azzurro HUB; grant permission and tap the “Go to Azzurro HUB” button
3) Your mobile device will open the home page at the IP address 192.168.20.1:55560

5.2. Step 2 – Configuration wizard

Azzurro HUB features a configuration wizard, which can be accessed by clicking the 'Configuration Wizard' button on the home screen

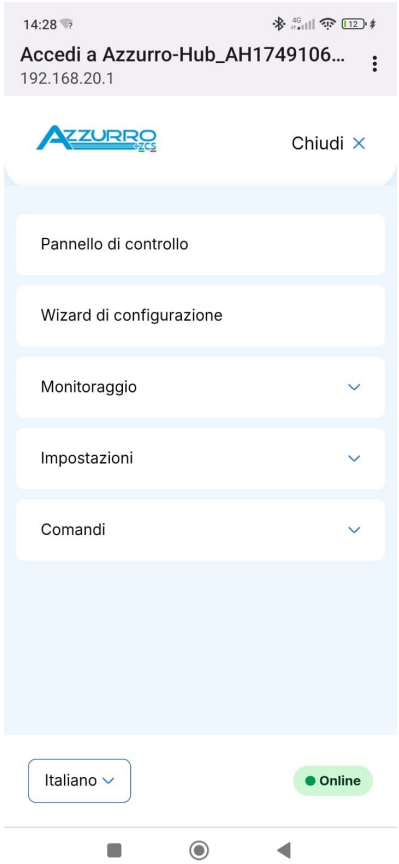


Figure 12 – Home screen

The wizard consists of 8 sequential steps that guide you through the entire configuration process

5.2.1. Step 3 – Internal clock and connectivity

Select the correct time zone for the internal clock and choose either Wi-Fi or Ethernet cable connection

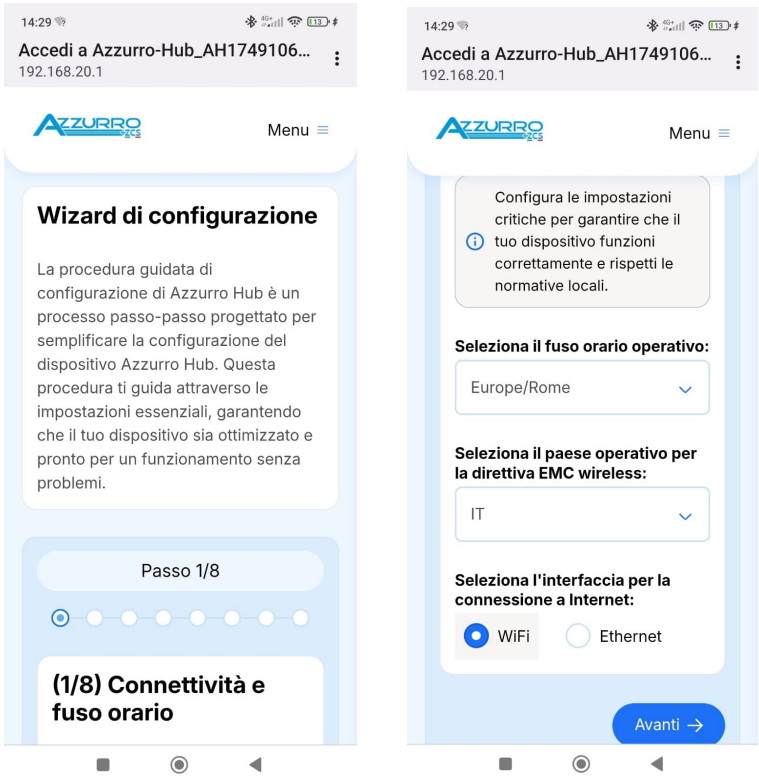


Figure 12 – Time zone and connectivity

Note: for systems with a PSC100, use the Ethernet option only

5.2.2. Step 4 – Wi-Fi network connection

Scan for Wi-Fi networks within range of the Azzuro HUB and select the network to connect to, entering the correct network password.

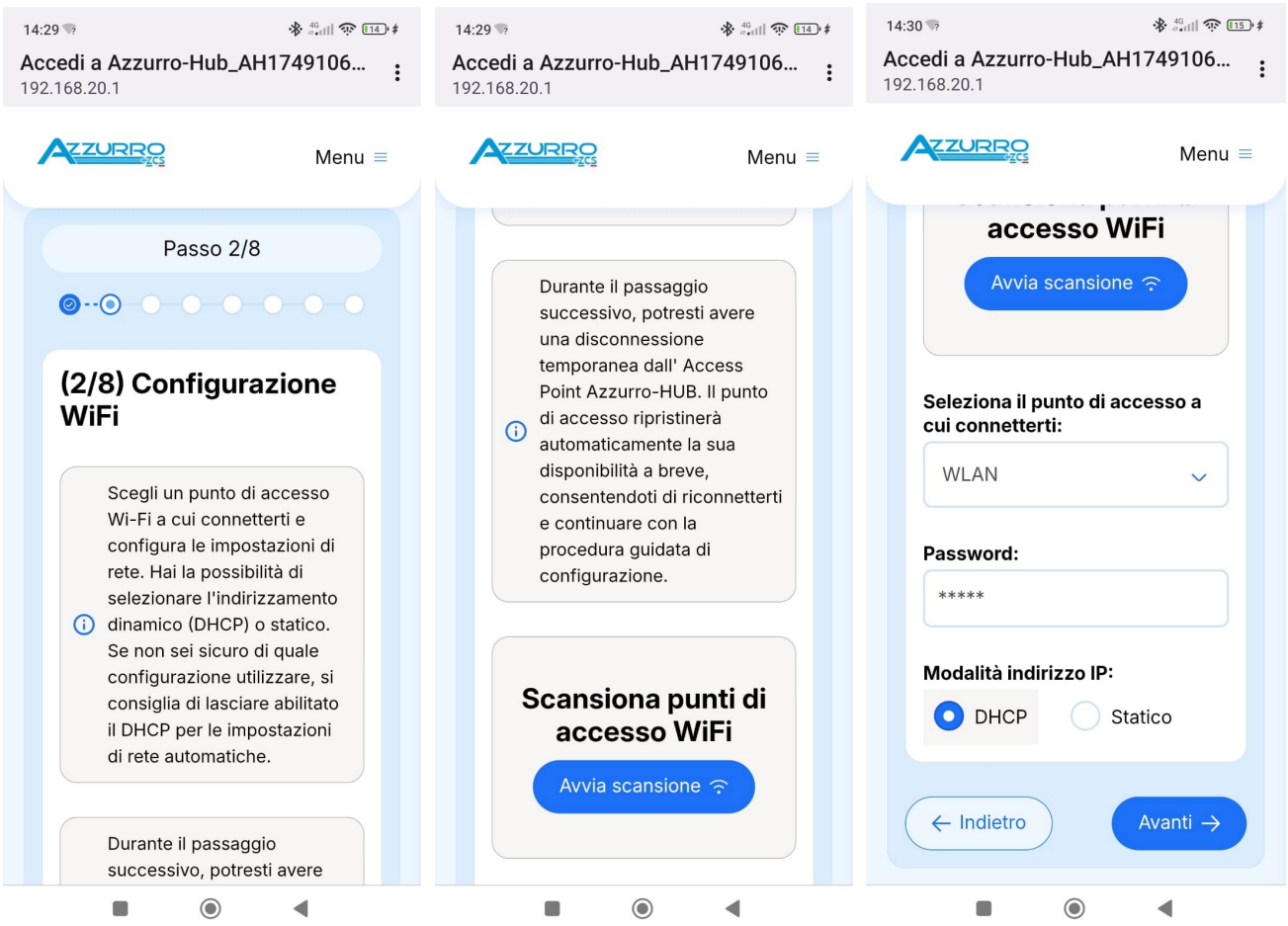


Figure 12 – Wi-Fi

The HUB device can also be configured to operate with a static IP address by selecting this option in the settings.

Figure 12 – Static IP configuration

Note: the HUB's IP address must be on the same subnet as the IP addresses set on the PSC100s

5.2.3. Step 5 – Connectivity test

Once the Wi-Fi has been set up correctly, or if you have already connected the Ethernet cable to the router or local network switch, the system performs a connectivity test

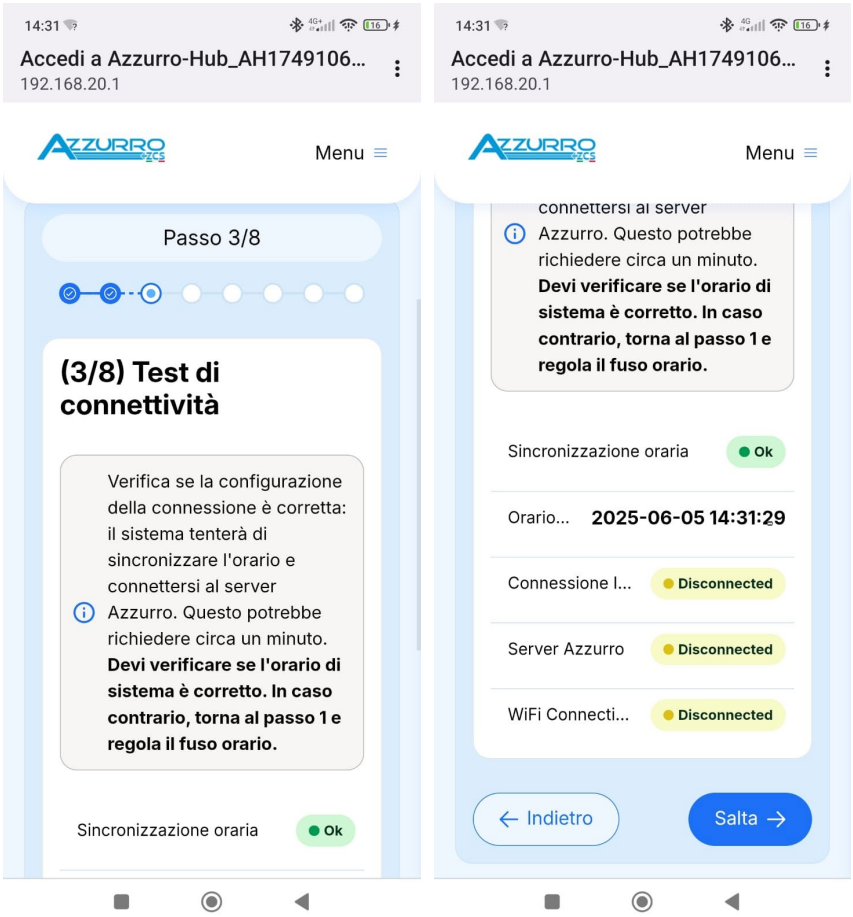


Figure 12 – Connectivity test result

If any of the connectivity tests fail, it will not be possible to view the data correctly on monitoring systems such as apps and portals.
If the result shows 'disconnected', check that the Wi-Fi passwords are set correctly and that port 80 on the router is open.

5.2.4. Step 6 – Electrical Installation

This step of the configuration requires details of the electrical installation to which the devices are connected.
These steps must be carried out carefully to provide the correct information to Azzurro HUB.
Firstly, the HUB asks whether the system is single-phase or three-phase, referring to the electrical system connected to the network operator; enter 'single-phase' if the exchange meter is single-phase, or 'three-phase' if the exchange meter is three-phase

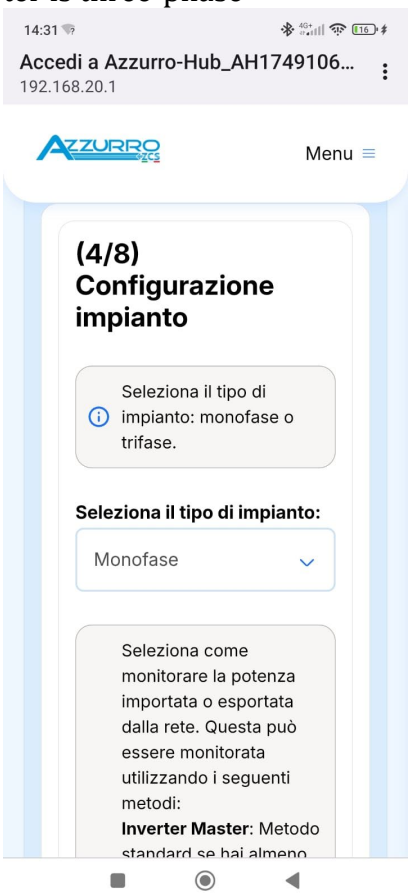


Figure 12 – Connection system type

HUB also asks which device performs the measurements at the interconnection point, offering four options:

- ***MASTER hybrid inverter*** – use this option if there is one or more hybrid inverters; in this case, the master performs the net metering measurements and the HUB obtains these measurements by requesting them from the master
- ***Meter*** – use this function when there are no hybrid inverters and the feed-in point reading is taken by a meter directly connected to the Azzurro HUB

- ***Internal sensor*** – use this option if the grid reading is taken by a current sensor directly connected to the Azzurro HUB
- ***Power Magic*** – use this function if the Azzurro HUB is connected to a Power Magic
- ***None*** – use this function if there is no need to monitor the interconnection point

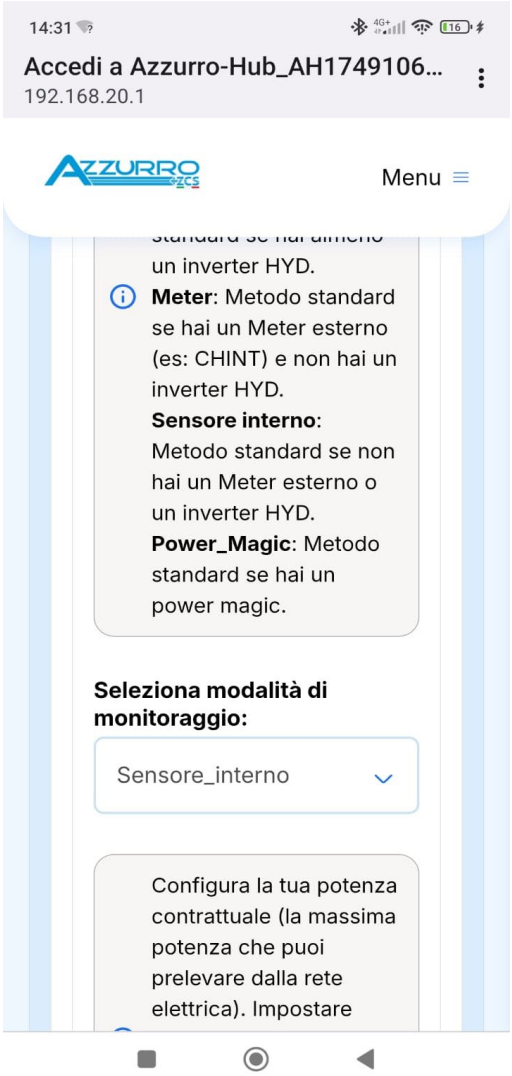


Figure 12 – Net metering measurement mode

The HUB also asks for the contracted power, meaning the power specified in the contract with the network operator for electricity consumption.

Note	**DO NOT enter the power rating of the photovoltaic system here; instead, enter the contracted power rating for electricity consumption with the network operator**

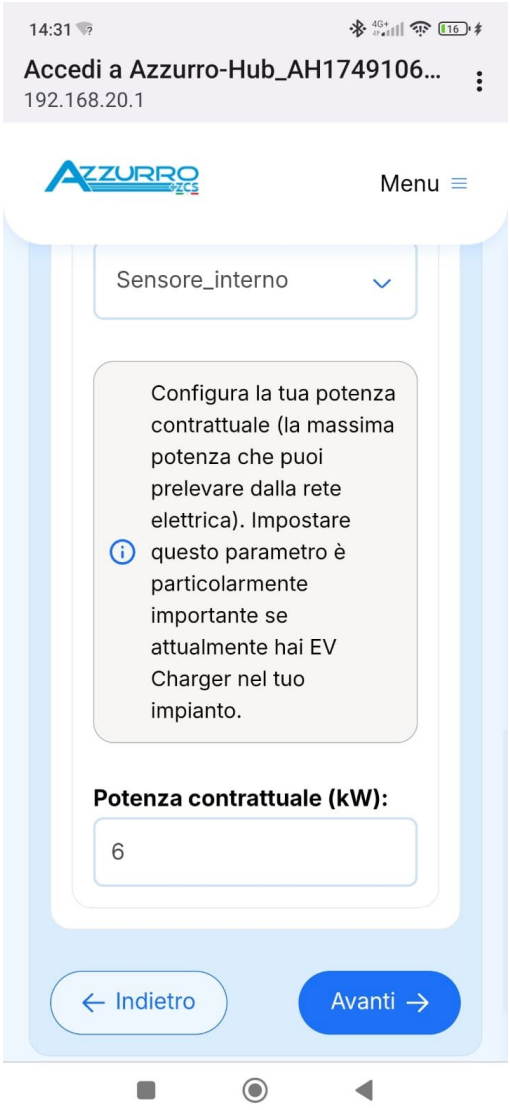


Figure 12 – Contracted power

5.2.5. Step 7 – Connected devices

By clicking on 'Start scan', the system will automatically detect any inverters, meters or EV chargers correctly connected to the RS485 serial ports

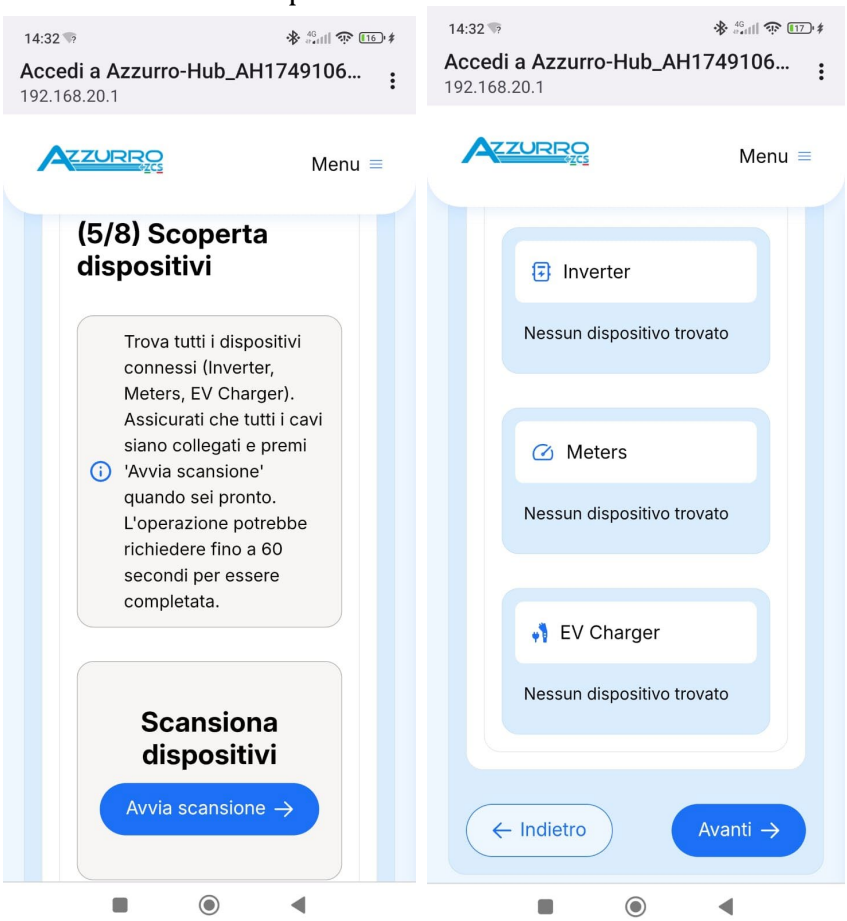


Figure 12 – Serial scan

Note: if you are pairing the HUB with the PSC100, skip this scan.

5.2.6. Step 8 – Feed-in 0 function

In this section, you can enable the feed-in function 0 for the system and set the desired target power

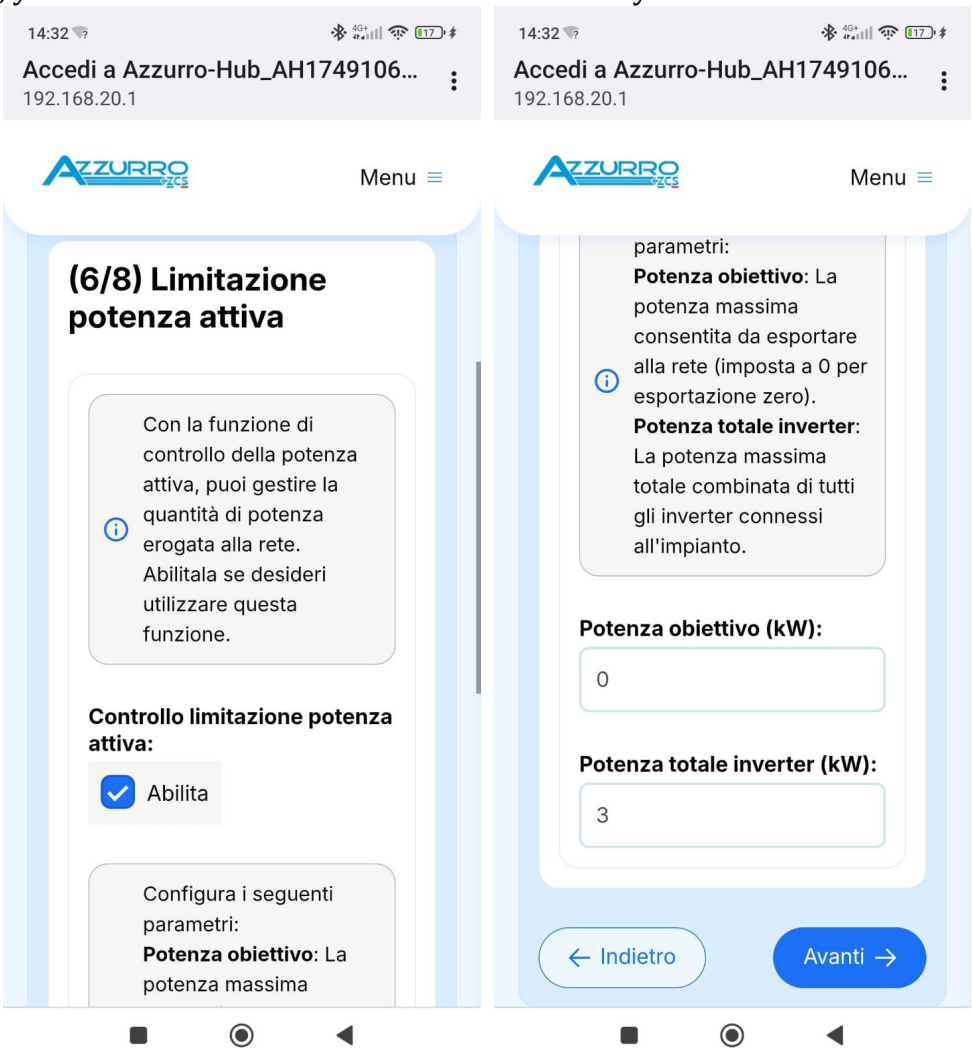


Figure 12 – Feed-in 0 function

Note: If you are connecting the HUB to a PSC100, this function must not be enabled

5.2.7. Step 9 – Selecting the inverter connection standard

Click on the section “Select country/region for inverter safety standards:” and select the correct connection standard.

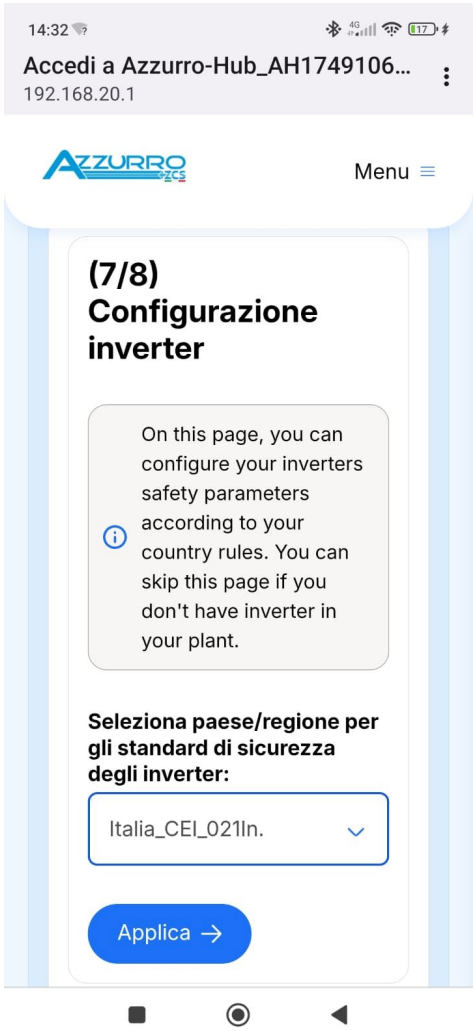


Figure 12 – Country selection

5.2.8. Step 10 – End of procedure

Once the configuration procedure is complete, you will be able to access the Azzurro HUB dashboard to make adjustments, changes or simply check the settings

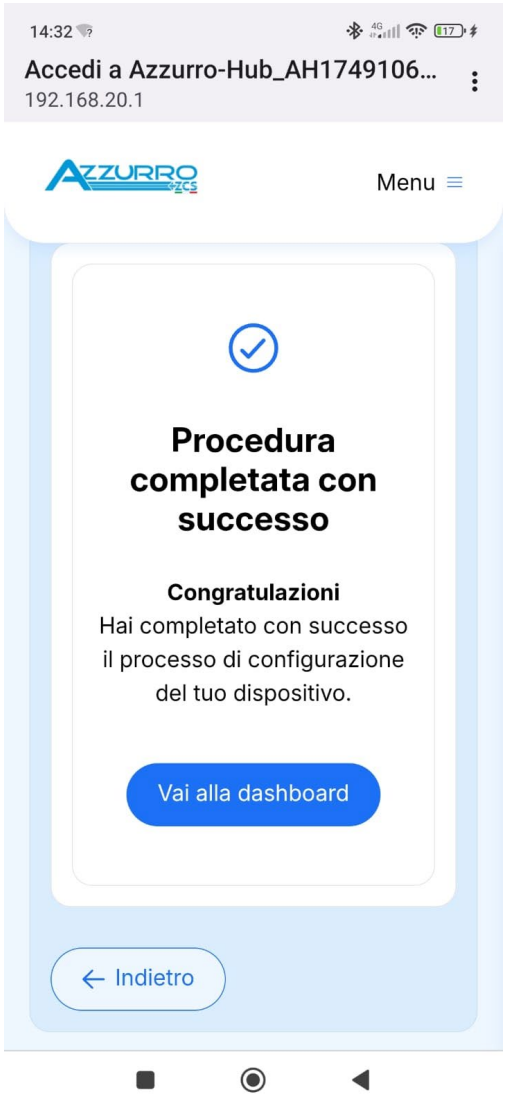


Figure 12 – End of procedure

Note: if you are linking the HUB to a PSC100, proceed to Step 11

5.2.9. Step 11 – PSC100 configuration

From the “Settings” menu, select “PSC100 Configuration” (Password: 0715)
By ticking “Enable”, you will be able to register the static IP address already configured in the PSC100. See the document “Commissioning_PSC100_RevX.X”

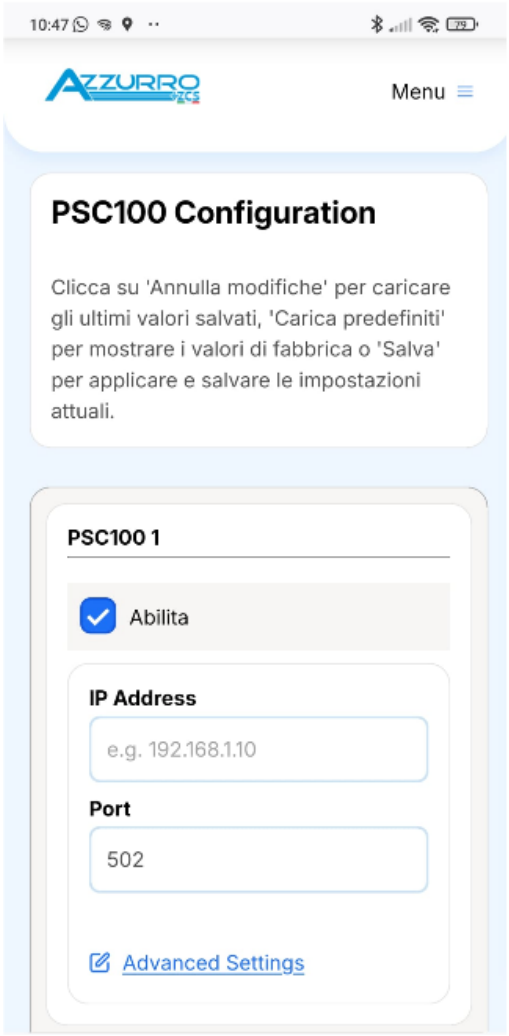
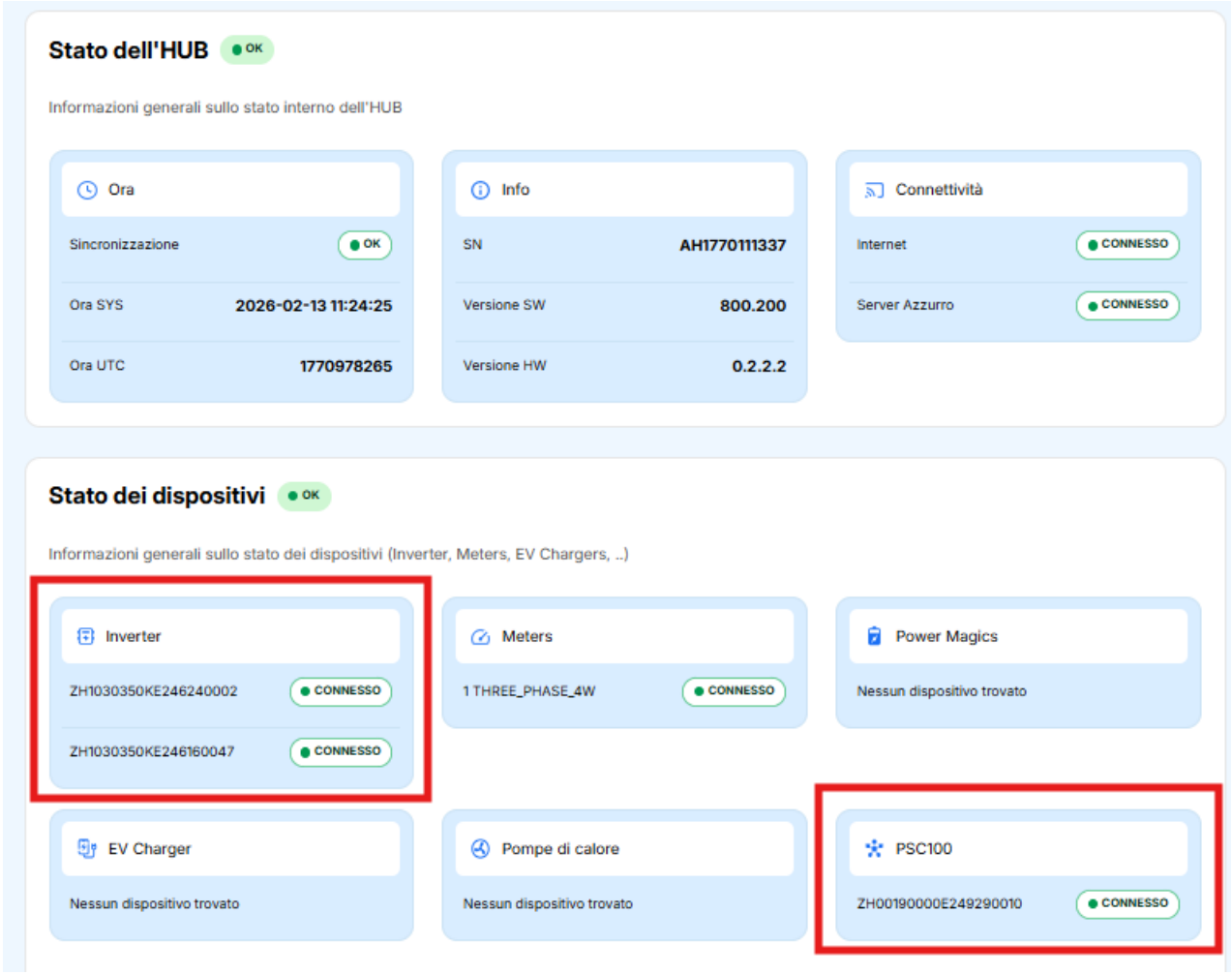


Figure 46 – PSC100 IP registration

Note: After clicking “Save”, you will be able to access the PSC100 homepage via Advanced Settings, if necessary. For instructions, please refer to the “Commissioning_PSC100_RevX.X” guide

Once this operation is complete, the PSC100 and the inverters connected to it will be visible in the “Control Panel”:



6. Uninstallation

6.1. Uninstallation steps

- Disconnect the system/device from the power supply.
- Disconnect the device from the AC mains.
- To remove the signal cables from the device:
- Remove the device from the DIN rail.

6.2. packaging

If possible, pack the device in its original packaging.

6.3. Storage

Store the device in a dry place at a temperature between -25 and +60°C.

6.4. Disposal

Zucchetti Centro Sistemi S.p.A. is not responsible for the disposal of the equipment, or any parts thereof, if this does not comply with the regulations and standards in force in the country of installation.

The crossed-out wheelie bin symbol indicates that the equipment, at the end of its useful life, must be disposed of separately from household waste.

This product must be taken to your local authority's waste collection point for recycling.

For further information, contact your local waste collection authority.

Inappropriate waste disposal may have a negative impact on the environment and human health due to potentially hazardous substances.

By helping to ensure this product is disposed of correctly, you are contributing to its reuse, recycling and recovery, and to the protection of the environment.

7. Warranty Terms and Conditions

To view the warranty terms and conditions offered by Zcs Azzurro, please refer to the documentation included in the product box and on the website www.zcsazzurro.com.

zcsazzurro.com

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