



USER'S MANUAL



SINGLE-PHASE HYBRID STORAGE INVERTERS

1PH HYD3000-HYD6000-ZSS-HP



ZUCCHETTI
Centro Sistemi





Hybrid Inverter

1PH HYD3000-HYD6000-ZSS-HP

User Manual



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General instructions

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

Please keep these instructions!

This manual must be considered an integral part of the equipment, and must be available at all times to everyone who interacts with the equipment. The manual must always accompany the equipment, even when it is transferred to another user or plant.

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Technical support

ZCS offers a support and technical consultancy service accessible by sending a request directly from the website www.zcsazzurro.com

The following toll-free number is available for the Italian territory: 800 72 74 64.

Preface

General information

Please read this manual carefully before installation, operation or maintenance.

This manual contains important safety instructions that must be followed during installation and maintenance of the system.

Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the 1PH HYD3000-HYD6000-ZSS-HP hybrid inverter.

Keep this manual so that it is accessible at all times.

Recipients

This manual is intended for qualified technical personnel (installers, technicians, electricians, technical support personnel or anyone who is qualified and certified to operate a photovoltaic system), who are responsible for installing and starting up the inverter in the photovoltaic and storage energy system and for operators of photovoltaic and storage systems.

1. Introduction

The 1PH HYD3000-HYD6000-ZSS-HP hybrid inverter is used in photovoltaic systems with battery storage. The system can be combined with AZZURRO, WeCo and Pylontech batteries supplied in kit form by ZCS Azzurro. The energy produced by the photovoltaic system will be optimised for maximum self-consumption.

The 1PH HYD3000-HYD6000-ZSS-HP inverter can operate in automatic mode and in time-of-use charge, charge/discharge mode. In automatic mode, when the energy produced by the PV field is greater than that required by the utilities, the 1PH HYD3000-HYD6000-ZSS-HP inverter charges the battery using the photovoltaic energy in excess, and when the photovoltaic energy is lower than that required, the inverter uses the energy stored in the battery to supply current to the local load.

In the event of a power failure (or by switching on the inverter in Off-Grid mode), the 1PH HYD3000-HYD6000-ZSS-HP inverter can operate in Emergency Power Supply (EPS) mode. The 1PH HYD3000-HYD6000-ZSS-HP inverter will use both the energy created by the photovoltaic panels and the energy stored in the battery to supply energy to the critical load.

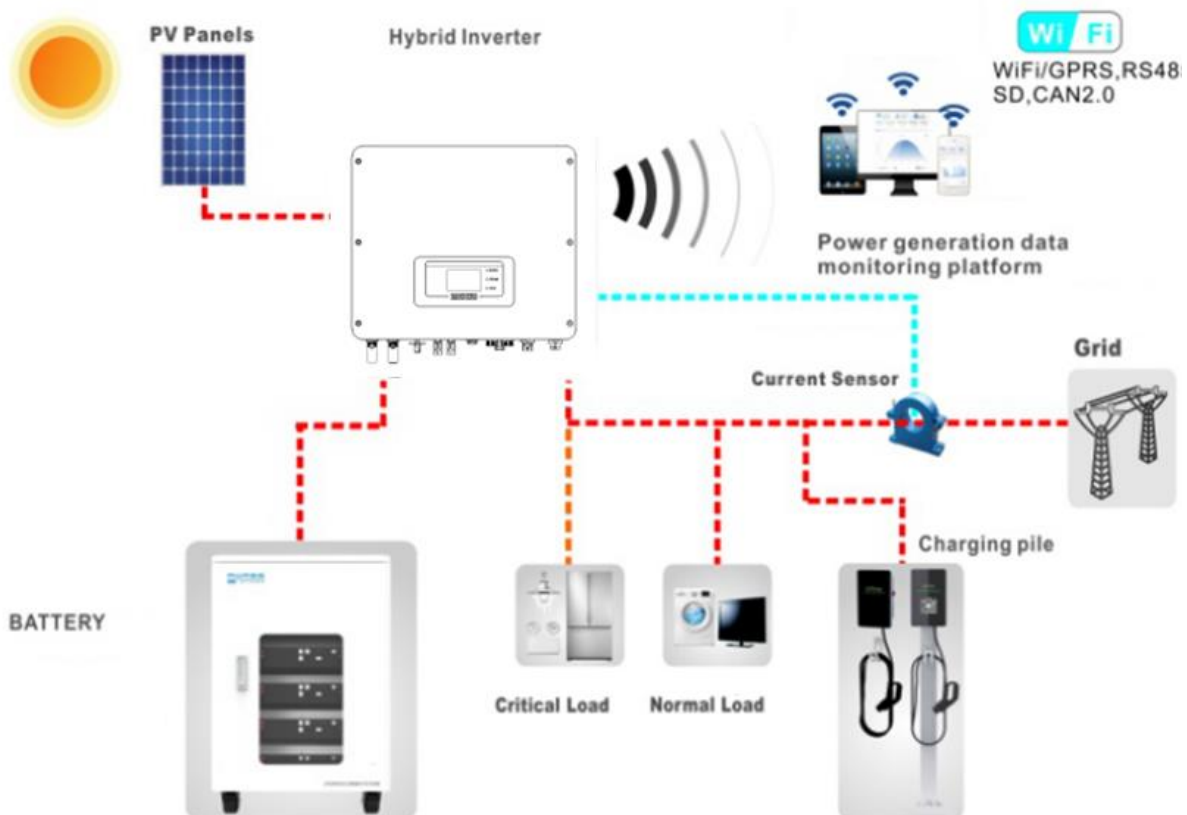


Figure 1 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZSS-HP hybrid is installed

2. Preliminary safety instructions

Before installation, please read this manual carefully and make sure you fully understand its contents. The 1PH HYD3000-HYD6000-ZSS-HP inverter strictly complies with the safety, design and testing regulations provided for by the national standards.

During installation, operation and maintenance, operators must carefully observe the local safety standards. Improper use may result in electrical shock and harm and damage to persons, the equipment and its components.

Contact the nearest authorised service centre for any repairs or maintenance. Contact your distributor for information on the nearest authorised service centre. **DO NOT** carry out repairs yourself, as this may result in injury or damage.

Ensure that the operator has the necessary skills and training to operate the equipment. Personnel responsible for the use and maintenance of the equipment must be qualified and capable of performing the activities described, and must also have appropriate knowledge on how to correctly interpret the contents of this manual. For safety reasons, this inverter can only be installed by a qualified electrician with the necessary training and/or skills and knowledge. Zucchetti Centro Sistemi S.p.A. declines all responsibility for damage to property or personal injury caused by incorrect use of the device.

Install and start the inverter according to the following instructions. Place the inverter on suitable load-bearing supports with sufficient load capacity (such as walls or racks) and make sure that the inverter is positioned vertically. Choose a suitable location for the installation of the electrical equipment. Make sure there is sufficient space for heat dispersion and to accommodate future maintenance. Maintain adequate ventilation and ensure that there is enough air circulation for cooling.

If you have problems with the packaging that could damage the inverter or if you find any visible damage, immediately notify the transport company. If necessary, request assistance from an installer of photovoltaic systems or from Zucchetti Centro Sistemi SpA. Transport of the equipment, especially by road, must be carried out with vehicles suitable to protect the components (in particular, electronic components) against violent knocks, humidity, vibrations, etc.

2.1. Safety Notes

- Electrical installation and maintenance of the system must be carried out by qualified and certified electricians in compliance with national regulations.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter may only be installed by qualified PERSONNEL and by those who have the appropriate certification, as required by the local authorities.
- **DO NOT** place materials explosives or flammable (e.g. gasoline, kerosene, oil, wood, cotton or similar) near the batteries or the 1PH HYD3000-HYD6000-ZSS-HP inverter.
- Before maintenance, disconnect the AC connection, then the batteries and the photovoltaic system (PV1&PV2), wait at least 5 minutes (capacitor discharge time) so as to prevent electric shock.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter must be completely disconnected (BAT, PV & AC) during

maintenance.

- The 1PH HYD3000-HYD6000-ZSS-HP inverter may reach high temperatures and have rotating parts inside during operation. Switch off the 1PH HYD3000-HYD6000-ZSS-HP inverter and wait for it to cool down before performing any maintenance.
- Keep children away from the batteries and from the 1PH HYD3000-HYD6000-ZSS-HP inverter.
- Do not open the front cover of the 1PH HYD3000-HYD6000-ZSS-HP inverter. Opening the front cover will void the product warranty.
- Damage caused by improper installation/operation is NOT covered by the product warranty.








2.2. Assembly and maintenance diagram

- The battery must be protected against short circuits during transport and installation.
- The inverter 1PH HYD3000-HYD6000-ZSS-HP/batteries must be located in well-ventilated areas. Do not place the 1PH HYD3000-HYD6000-ZSS-HP inverter/batteries in a cabinet or in an airtight or poorly ventilated location. This could be extremely hazardous to the performance and life of the system.
- Keep the 1PH HYD3000-HYD6000-ZSS-HP inverter and batteries away from direct sunlight. Do not bring the 1PH HYD3000-HYD6000-ZSS-HP inverter and batteries near ovens, flames or other heat sources as the battery may catch fire and cause an explosion.
- Use a multimeter to check the battery polarity and voltage before turning on the power. Make sure that the connections are made according to the instructions in this manual.
- Use the multimeter to check the PV voltage and polarity before closing the PV switch. Make sure that the connections are made according to the instructions in this manual.
- If you want to store the batteries without using them, disconnect them from the 1PH HYD3000-HYD6000-ZSS-HP inverter and store them in a cool, dry and well-ventilated area.
- Battery maintenance workers must have the skills and knowledge required to carry out this activity.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter does not have an isolation transformer so the positive and negative polarities of the PV string do NOT have to be grounded, otherwise the inverter may be damaged. All non-current-carrying metal parts (such as the PV module frame, PV rack, housing of the combiner box, and housing of the inverter) in the photovoltaic power system must be connected to the ground.
- Attention: Do not disassemble or break the battery. The electrolytes in the battery may be toxic and cause damage to skin and eyes.
- Attention: during installation and maintenance of the battery, please follow the rules below.
 - a) Remove watches, rings and other metal objects.
 - b) Only use tools with insulated handles.




- c) Wear rubber gloves and shoes.
- d) Do not place tools or metal objects on top of the battery.
- e) Turn off the 1PH HYD3000-HYD6000-ZSS-HP inverter and batteries before connecting/disconnecting the battery terminals.
- f) Both the positive and negative polarities must be isolated from the ground.

2.3. Symbols on the inverter

Some safety symbols are located on the inverter. Read and understand the content of the symbols before installing the inverter.

	<p>This symbol indicates a hazardous situation which, if not avoided, will result in injury.</p>
	<p>Risk of electric shock; wait at least 5 minutes before switching off the 1PH HYD3000-HYD6000-ZSS-HP inverter.</p>
	<p>Be careful of high voltage and electric shock.</p>
	<p>Be careful of hot surface.</p>
	<p>Comply with the European Conformity (EC) certification.</p>
	<p>Ground terminal.</p>
	<p>Read this manual before installing the 1PH HYD3000-HYD6000-ZSS-HP inverter.</p>




	<p>This indicates the degree of protection of the equipment in accordance with the IEC 70-1 (EN 60529 June 1997) standard.</p>
	<p>Positive polarity and negative polarity of the DC voltage (Photovoltaic and Battery).</p>
	<p>This side up. The 1PH HYD3000-HYD6000-ZSS-HP inverter must always be transported, handled and stored in such a way that the arrows are always pointing upwards.</p>



3. Installation

3.1. Product overview

The 1PH HYD3000-HYD6000-ZSS-HP inverter is subjected to strict controls and inspection before packaging and delivery. Do not turn the 1PH HYD3000-HYD6000-ZSS-HP inverter upside down during delivery.

	<p>Carefully check the packaging and product fittings before installation.</p>
<p>Caution</p>	

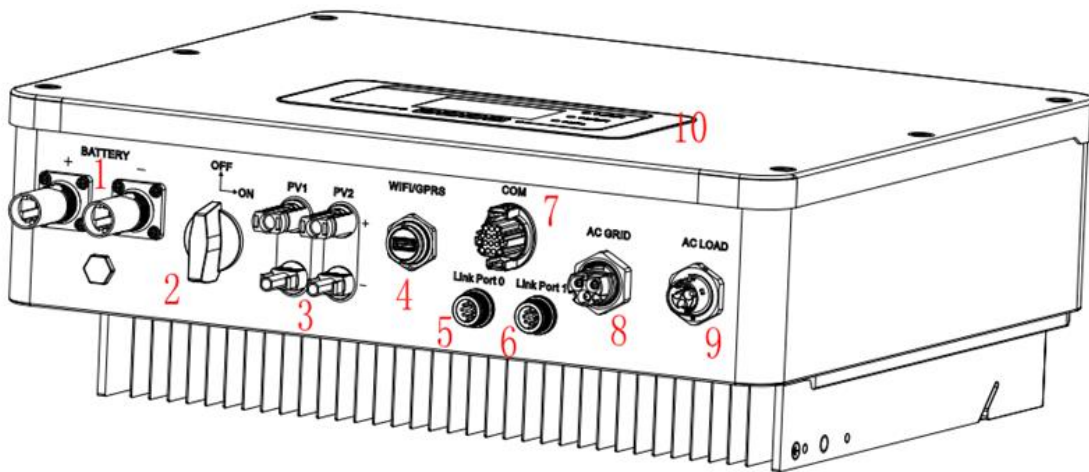


Figure 2 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZSS-HP hybrid is installed

1	Battery input terminals	6	Link Port 1
2	DC switch	7	COM
3	PV input terminals	8	Grid connection port
4	USB Wi-Fi/GPRS/Ethernet adaptor	9	Critical load connection port
5	Link Port 0	10	LCD

3.2. Contents of the packaging

Carefully inspect the packaging and accessories before installation. The packaging should contain the following accessories:




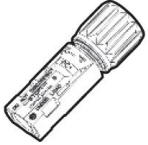


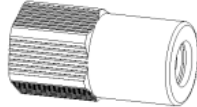
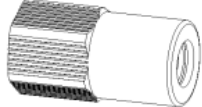

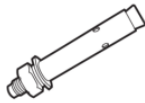
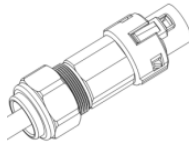
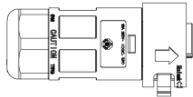

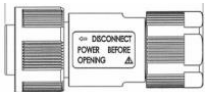
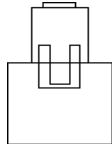
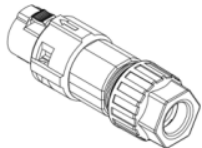
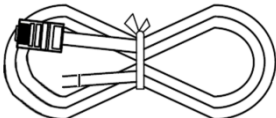



 <p>1 x inverter</p>	 <p>1 x Rear panel</p>	 <p>2 x PV+ input terminal</p>	 <p>2 x PV- input terminal</p>
 <p>2 x Metal terminals secured to PV+ input power cables</p>	 <p>2 x Metal terminals secured to PV- input power cables</p>	 <p>1 x BAT+ input terminal</p>	 <p>1 x BAT- input terminal</p>
 <p>3 x M6 Hexagon screws</p>	 <p>4 x M8*80 Expansion bolts use to secure the wall-mount bracket to the wall</p>	 <p>1 x AC Grid connector</p>	 <p>1 x Load Output connector</p>
 <p>1 x Link Port connector</p>	 <p>1 x 8 Pin terminal Matching terminal resistance (parallel system)</p>	 <p>1 x Current transformer</p>	 <p>1 x 16 Pin connector</p>
 <p>2 x Communication cable</p>	 <p>1 x User manual</p>	 <p>1 x Warranty</p>	 <p>1 x Quality certificate</p>

Figure 3 – Components and accessories inside in the packaging

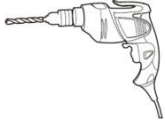


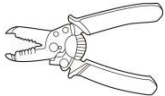
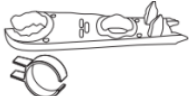

3.3. Installation environment

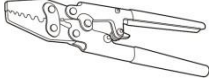
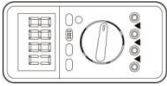


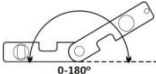



- Choose a dry, clean and orderly place, suitable for installation.

- Ambient temperature range: $-25^{\circ}\text{C} \sim 60^{\circ}\text{C}$.
- Relative humidity: $0 \sim 100\%$ (non-condensing).
- The 1PH HYD3000-HYD6000-ZSS-HP inverter must be installed in a well-ventilated area.
- Do not place flammable or explosive materials near the 1PH HYD3000-HYD6000-ZSS-HP inverter.
- The AC overvoltage of the 1PH HYD3000-HYD6000-ZSS-HP inverter belongs to Category III.
- Maximum altitude: 4000 m.

3.4. Installation tools

Prepare the following tools before installation:

Number	Tool	Model	Function
1		Percussion drill Recommended diameter: 10 mm	Used to make holes in the wall
2		Screwdriver	Used for the wiring
3		Cross screwdriver	Remove and install AC terminal screws
4		Cable stripper	Used for stripping the wires
5		Removal tool	Remove PV terminal
6		4mm Allen key	Used for tightening the screws to connect the rear panel to the inverter
7		Crimping tools	Used for crimping the power cables

			
8		Multi-meter	Used for checking the grounding connection
9		Marker	Used for marking
10		Tape measure	Used for measuring distances
11		Level	Used for making sure that the rear panel is installed correctly
12		ESD gloves	Must be worn by operators
13		Safety goggles	Must be worn by operators
14		Dust mask	Must be worn by operators

3.5. Wall installation position

The 1PH HYD3000-HYD6000-ZSS-HP inverter must be mounted vertically (to ensure rapid heat dissipation). Install the 1PH HYD3000-HYD6000-ZSS-HP inverter in a location protected from direct sunlight and from possible snow accumulation. Ensure that the installation position is well ventilated.



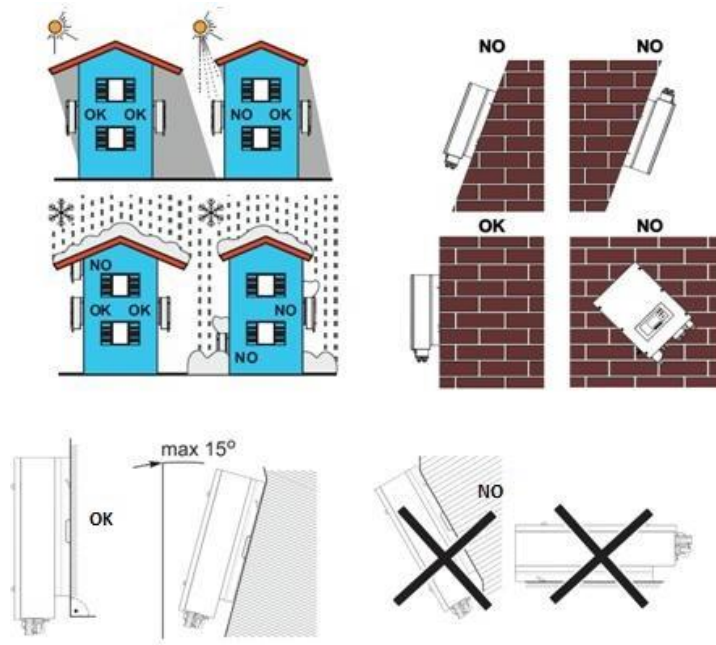


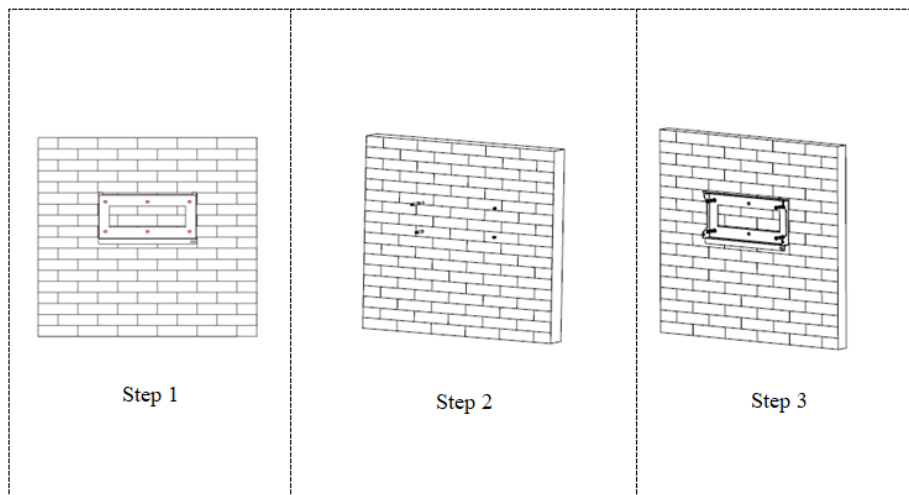
Figure 4 - Installation position of the 1PH HYD3000-HYD6000-ZSS-HP inverter

3.6. Assembly instructions

Step 1: Position the mounting bracket on the wall, mark the fixing points using the marker. Drill holes (10 mm drill bit) in the wall.

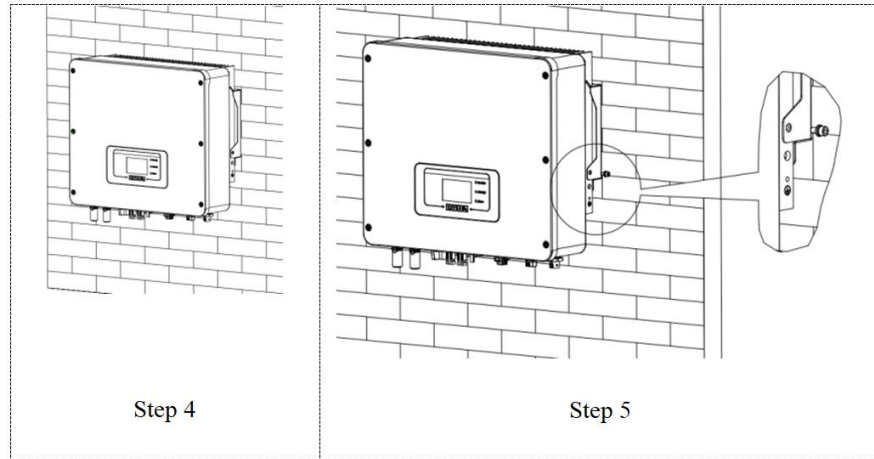
Step 2: Insert the expansion screws vertically into the hole, make sure that the insertion depth is neither too shallow nor too deep.

Step 3: Fix the mounting bracket to the wall using dowels and flat washers.



Step 4: Place the 1PH HYD3000-HYD6000-ZSS-HP inverter on the mounting bracket.

Step 5: Use the grounding hole of the heatsink to ground the 1PH HYD3000-HYD6000-ZSS-HP inverter.



Note: For safety reasons, ZCS Spa and/or its partners may not carry out any technical repairs or maintenance work, or move the inverter or battery packs from and to the ground if they are installed at a height of more than 180 cm from the ground.

Inverters and/or battery packs installed at higher heights must be moved to the ground before they can be repaired or serviced.

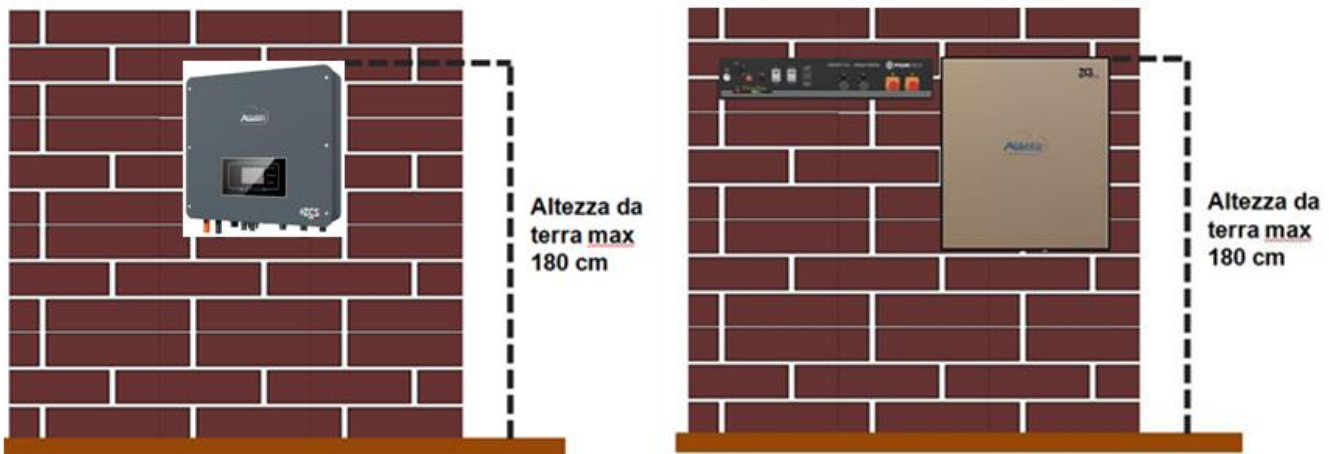


Figure 5 – Instructions for installing the storage inverter and battery pack

4. Electrical connections

- Carefully assess the risks deriving from electric shocks and chemical hazards!
- Use a multi-metre to check the DC polarity of the battery and cables before connecting the power supply between the batteries and inverter.

NOTE: an inverted polarity connection may cause irreparable damage to the inverter and batteries.

Note: all batteries supplied by ZCS do not require a disconnecting device for connecting to the storage inverter. The Cable kit, which includes crimped power cables for connecting the Pylontech and AZZURRO batteries to the 1PH HYD3000-HYD6000-ZSS-HP storage inverter, is supplied separately. Make sure your storage kit is equipped with this accessory. In the case of WeCo batteries, the connection kit is already inside the package.

- A 25A AC disconnecting device (circuit breaker) must be installed between the 1PH HYD3000-HYD6000-ZSS-HP inverter and the power grid. It is also recommended to use a differential with a trip threshold of 300 mA between the 1PH HYD3000-HYD6000-ZSS-HP inverter and power grid.
- For safety and proper functioning of the system, it is important to use a cable of the appropriate type and size for the electrical connections.
 - Battery connection: DC cable with cross-section of AWG8 or AWG6 (supplied).
 - Grid or load connection: AC cable with cross-section of AWG12.




!!!PLEASE NOTE!!!

If the storage capacity needs to be increased by adding one or more batteries to an existing system, make sure that all the batteries (installed and to be installed) are fully charged.

To check the charge status of each battery, connect them one at a time to the inverter and view the charge level on the display (all the instantaneous information can be accessed by pressing the “Down” key from the main menu).

The batteries can be recharged from the excess photovoltaic production or by using the forced charge mode indicated in the “% charge mode” section of this manual.

1PH HYD3000-HYD6000-ZSS-HP inverter is intended to be used in PV system with battery storage. If not used as intended, the protection provided by the equipment may be impaired.

	Installation and maintenance of inverter, must be operated by professional electrical engineer. Wear rubber gloves and protective clothing (protective glasses and boots) when working on high voltage/high current systems such as inverter and battery systems.
Attention	
	PV modules generate electric energy when exposed to sunlight and can create an electrical shock hazard. Therefore, before connecting DC input power cable, cover PV modules using opaque cloth.
Danger	
	For 1PH HYD3000-HYD6000-ZSS-HP, open-circuit voltage (Voc) of module arrays connected in series must be $\leq 580V$.
Note	

The connected PV modules must have an IEC 61730 Class A rating.

Model	IscPV(absolute maximum)	Maximum output over current protection
1PH HYD 3000 ZSS HP	18A/18A	15A
1PH HYD 3600 ZSS HP		16A
1PH HYD 4000 ZSS HP		20A
1PH HYD 4600 ZSS HP		20.9A
1PH HYD 5000 ZSS HP		21.7A
1PH HYD 6000 ZSS HP		27.3A

NOTE: The DVC is the voltage of a circuit which occurs continuously between any two live part in the worst-case rated operating condition when used as intended.

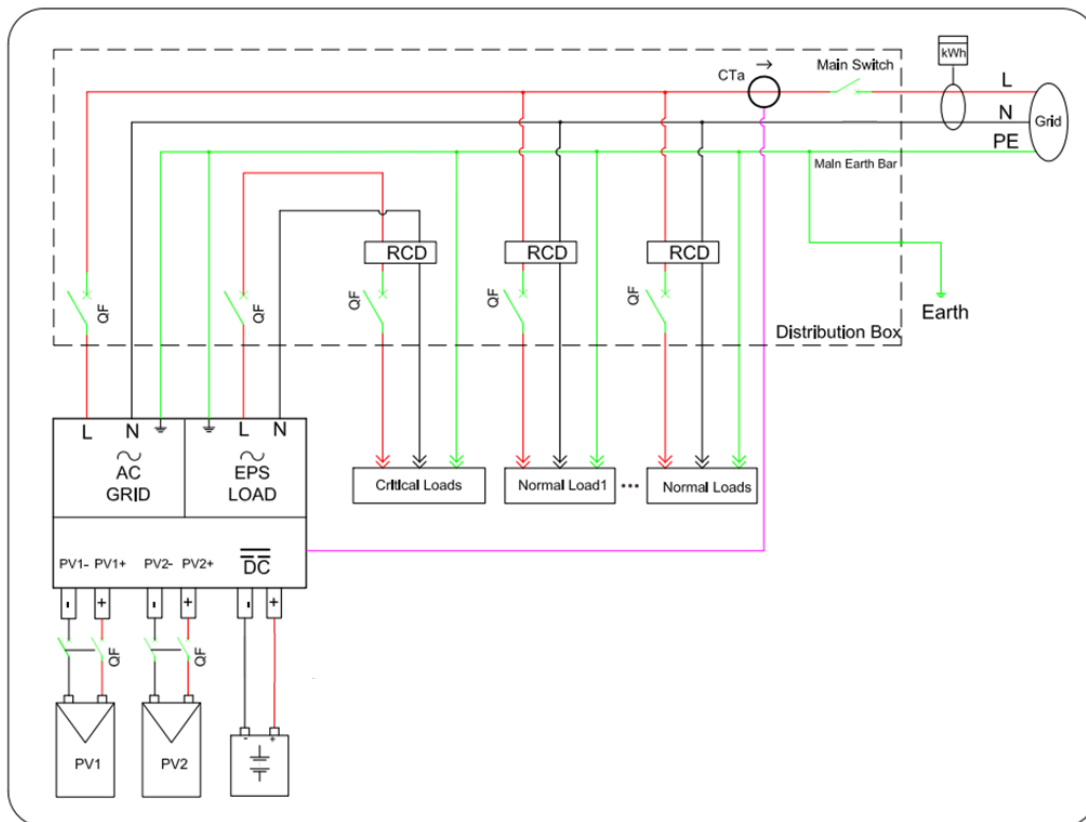
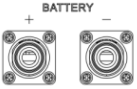
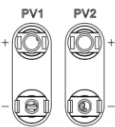




Figure 6 – Electrical Connections

4.1. Wire instructions

Component	Description		Recommended cable type	Recommended cable specifications
	+ : Connect the positive electrode of lithium battery		Outdoor multi-core copper cable	Conductor cross-sectional area: 16mm ² ~ 20mm ²
	- : Connect the negative electrode of lithium battery			
	+ : Connect the positive electrode of photovoltaic cell		Industry common outdoor photovoltaic cable	Conductor cross-sectional area: 4mm ² ~ 6mm ²
	- : Connect the negative electrode of photovoltaic cell			
	Load	L	Outdoor multi-core copper cable	Conductor cross-sectional area: 4mm ² ~ 6mm ²
		N		
		PE		
	AC	L	Outdoor multi-core copper cable	Conductor cross-sectional area: 5mm ² ~ 8mm ²
		N		
		PE		





4.2. Connecting the battery

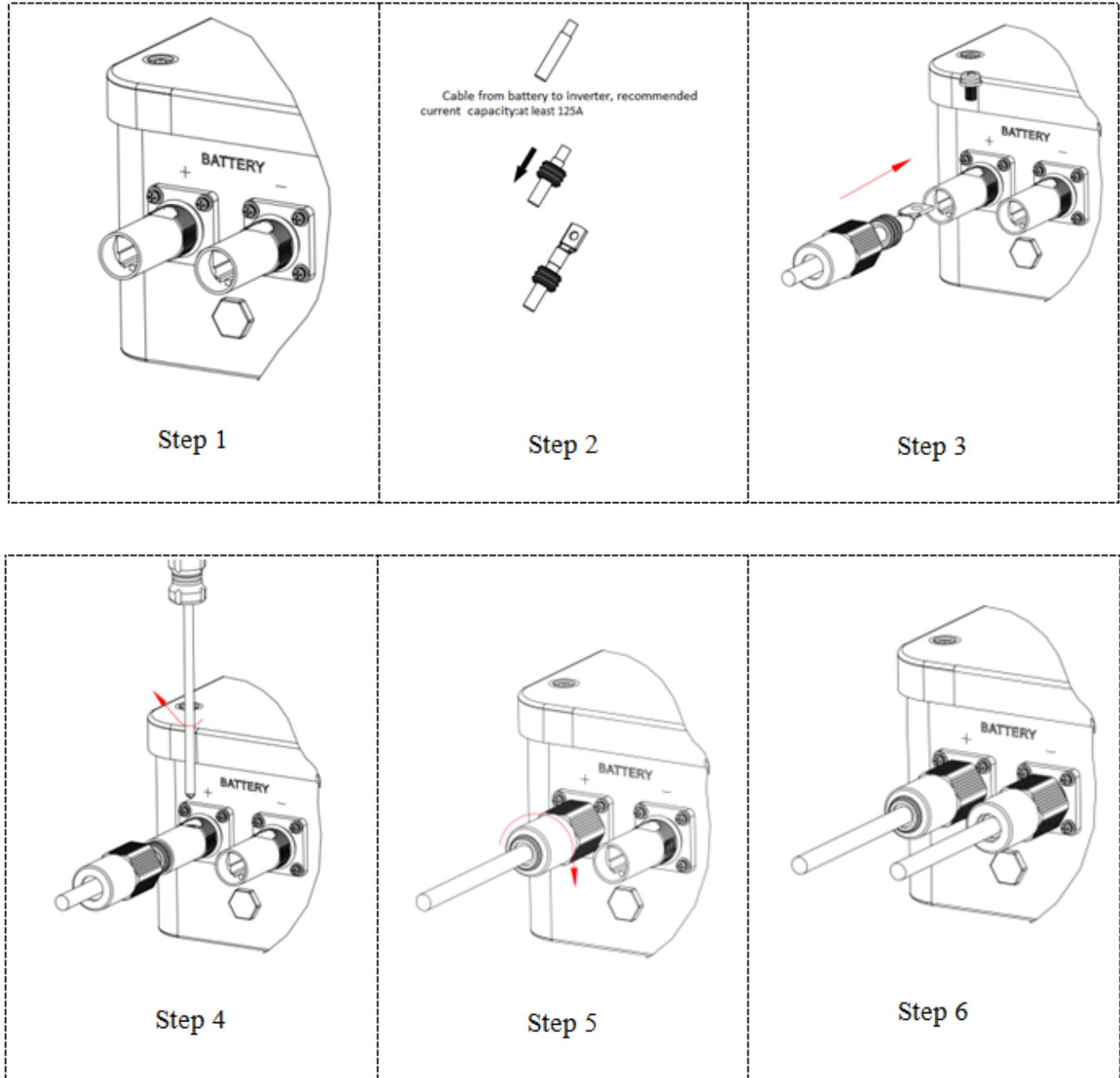


Figure 7 - Install battery connection

4.3. Connecting a Pylontech battery

4.3.1. Connecting a single battery

This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate connection:

1. In the case of Pylontech batteries, insert the plug into the BMS CAN port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN H (Blue cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (White-Blue cable)	

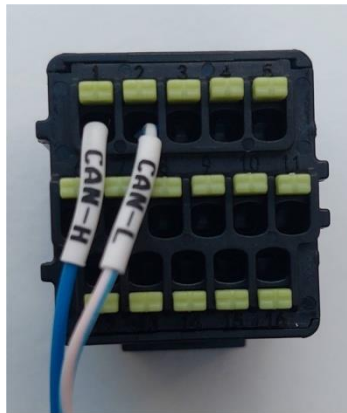


Figure 8 - Pylontech communication cable to be inserted into the battery communication input



2. Ensure that the order of the DIP switches remains at the factory settings (all down in the OFF position).
3. Connect the ground cable to the battery through the threaded hole.

NOTE: When connecting Pylontech batteries, use the communication cable contained in the inverter kit, as shown in the figure.



Figure 9 - Connecting the communication cable to the Pylontech battery

4.3.2. Connecting multiple batteries in parallel

If multiple batteries are present, check the parallel connections between one battery and another.

- a. In the case of Pylontech batteries, connect one of the two power cables (e.g. the positive, orange one) to the master battery, inserting the fast contact into the appropriate terminal; then connect the other cable (e.g. the negative, black one) to the last battery of the pack, as shown in the figure below. Finally, run the batteries in parallel using the short jumpers (supplied with the battery) or those with a length of 0.6 m or 1.5 m (available on request, codes ZST-CABLE-0.6M and ZST-CABLE-1.5M), connecting respectively the positive and negative polarities of one battery with those of the next battery.



Figure 10 - Connecting three Pylontech batteries in parallel

The communication cables must be connected starting from the master battery and inserting the short jumper (supplied with the battery) or a jumper with a length of 0.6 m or 1.5 m (available on request, codes ZST-CABLE-0.6M and ZST-CABLE-1.5M) in the LINK connection PORT; insert this cable in LINK CONNECTION PORT 0 of the second battery, which will be called Slave 1. If additional batteries are present, a new jumper must be inserted into LINK CONNECTION PORT 1 of the Slave 1 battery; insert the free end of this cable into the third battery, called Slave 2. This procedure will be repeated for all the elements of the battery pack. In the end, all the LINK PORTS will be occupied by the communication cable, except for the master battery (LINK PORT 0 free) and the last Slave battery (LINK PORT 1 free).

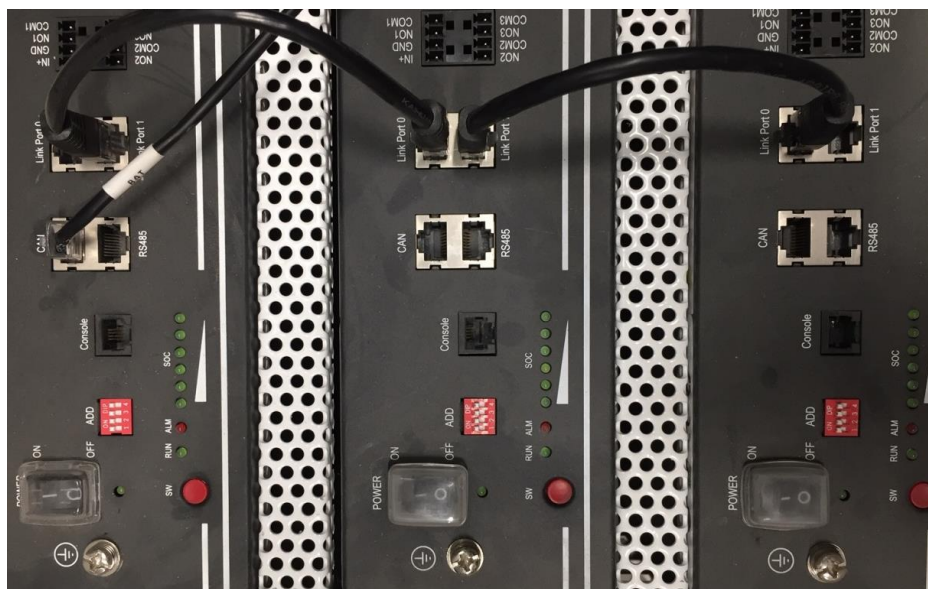


Figure 11 - Connecting the communication cable between three Pylontech batteries



NOTE: the position of the DIP switches (white on a red background, as shown in the figure below) should not be changed. If it is changed by accident, contact the ZCS Service Centre at the toll-free number 800 72 74 64 (available only in Italy) or open a ticket by going to the “support” section of our website <https://www.zcsazzurro.com/it/support>.

4.4. Connecting a WeCo 4k4 battery

4.4.1. Connecting a single battery

The same cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate inlet:

- a. Insert the plug into the BMS CAN port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN (White-Orange cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (Orange cable)	

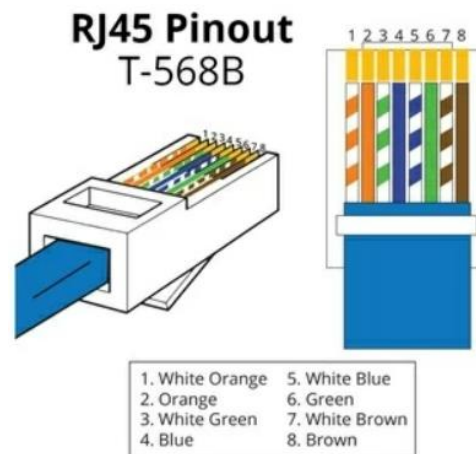
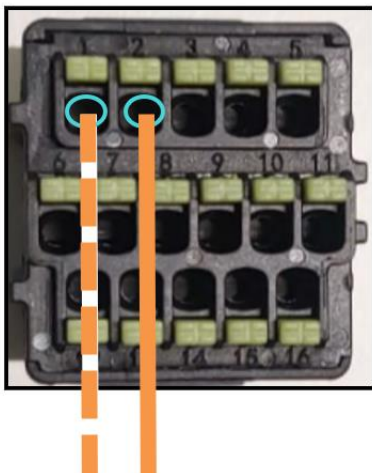




Figure 12 - Communication cable between the inverter and the WeCo 4k4 battery

- b. Make sure that the DIP switches are set as shown in the figure.
- c. Connect the ground cable to the battery through the threaded hole.

NOTE: To connect the WeCo batteries, use the black communication cable with the wording WECO contained within the inverter kit.

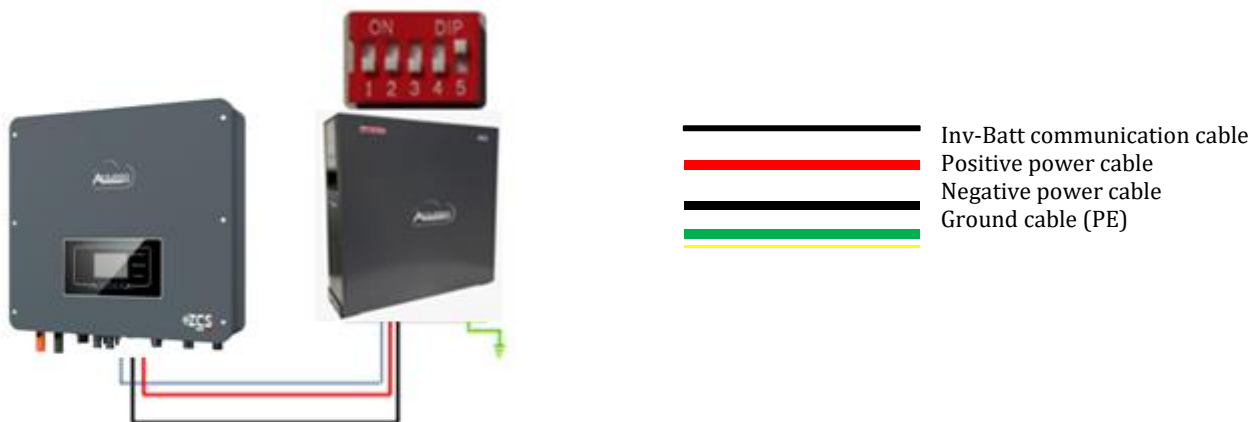


Figure 13 - Connecting the WeCo 4k4 battery

4.4.2. Connecting multiple batteries in parallel

If multiple batteries are present:

- a. Check that the batteries have the same voltage level by switching them on and disconnecting them one at a time, measuring the + and - terminals with the tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volts.
- b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off)
- c. Connect the communication cable inserted in the CAN port of the inverter to the CAN-BUS port of one of the batteries, this will now become the MASTER battery.
- d. The MASTER must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery. (**Attention: do not connect the RS485-A port to the Master battery**).



Figure 14 - Communication cable between WeCo 4k4 batteries

- e. In case of additional batteries, the communication cable will be connected as indicated above for connecting the MASTER battery to SLAVE 1.
- f. The last battery will only have the **RS485-A** port connected.

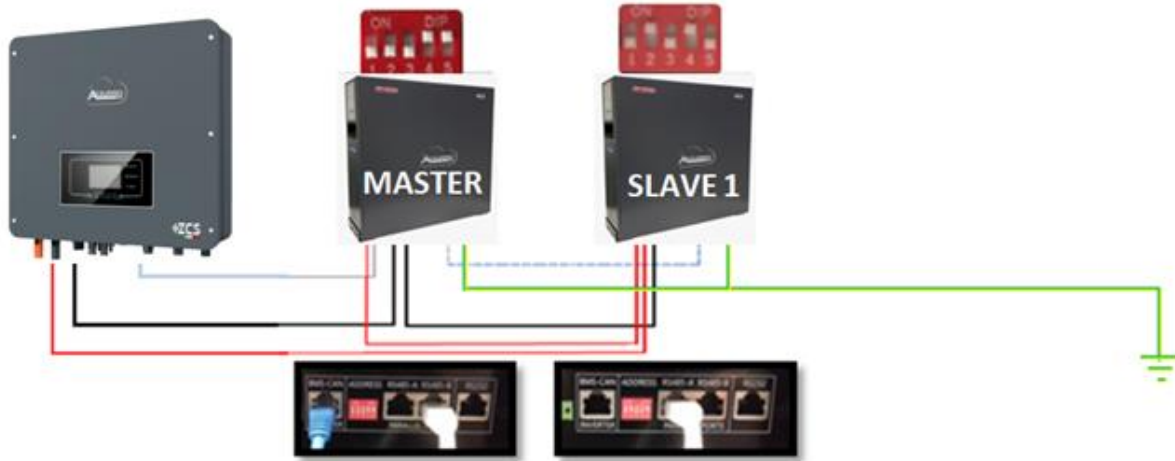


Figure 15 - Parallel connection of two WeCo 4k4 batteries

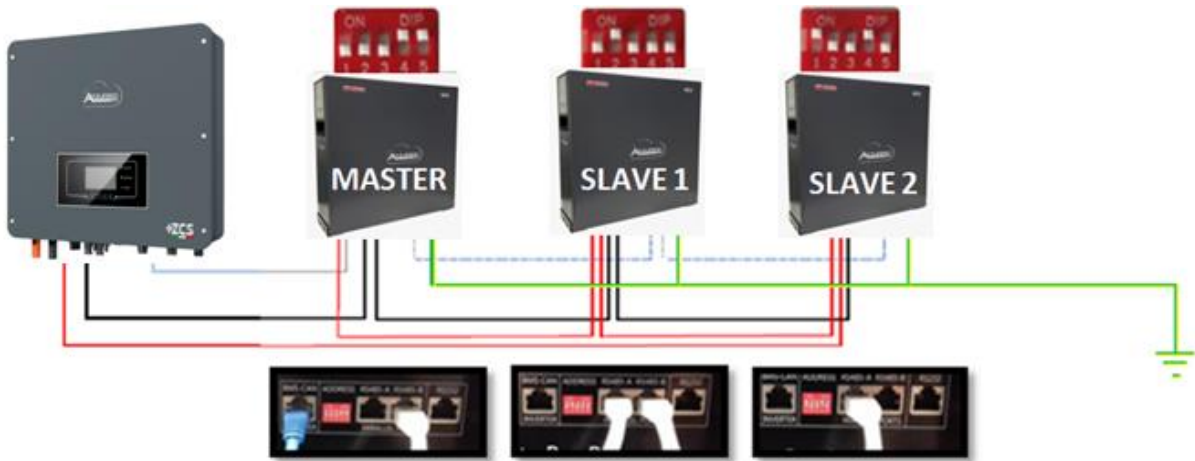


Figure 16 - Parallel connection of three WeCo 4k4 batteries

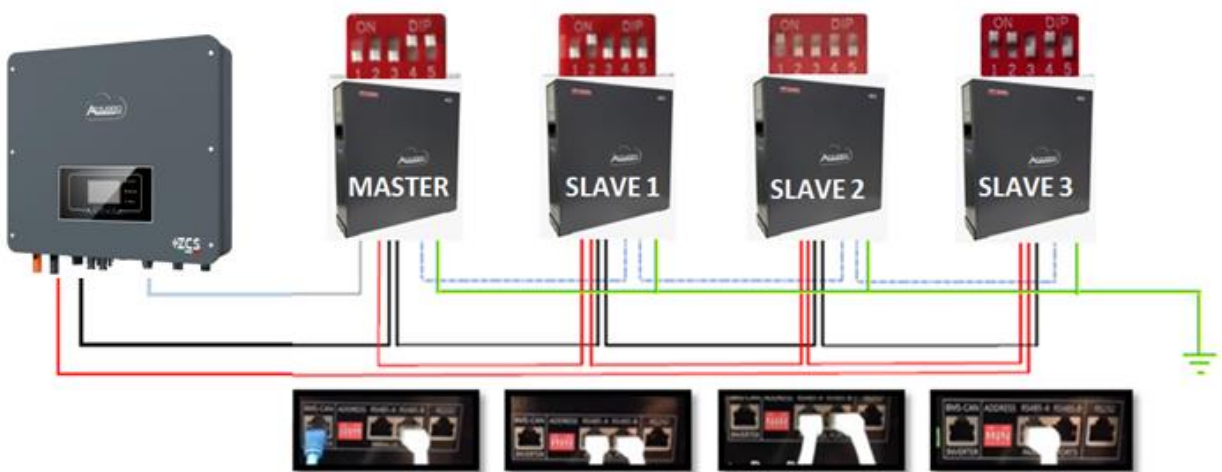


Figure 17 - Parallel connection of four WeCo 4k4 batteries



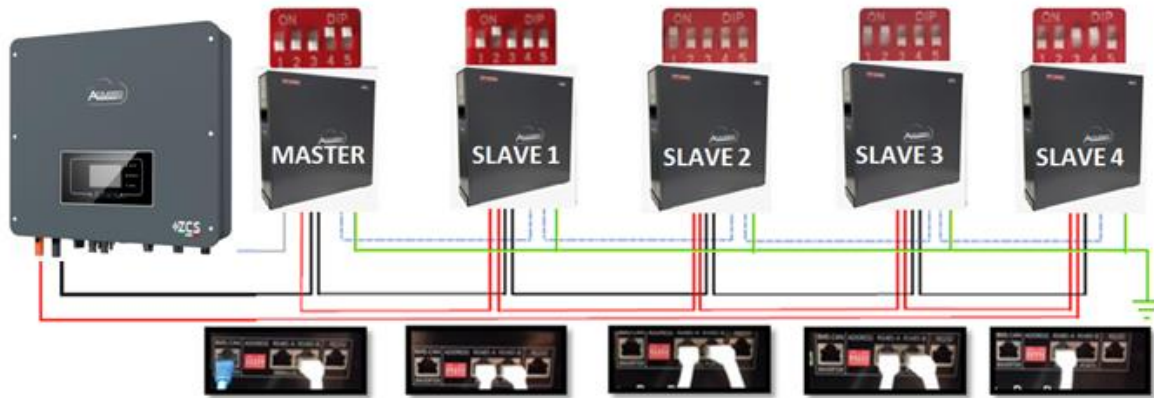


Figure 18 – Parallel connection of five WeCo 4k4 batteries

4.5. Connecting a WeCo 4k4 PRO battery

4.5.1. Connecting a single battery

The same cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate inlet:

- a. Insert the plug into the CAN-A port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN (White-Orange cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN Orange cable)	

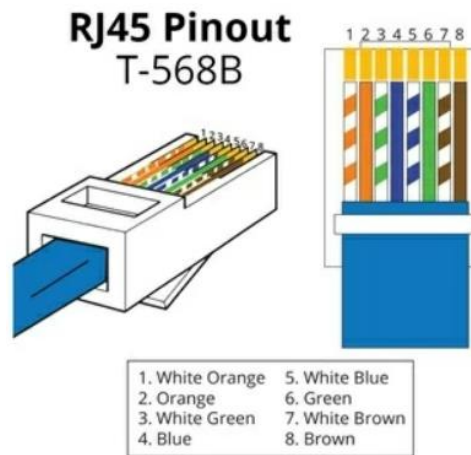
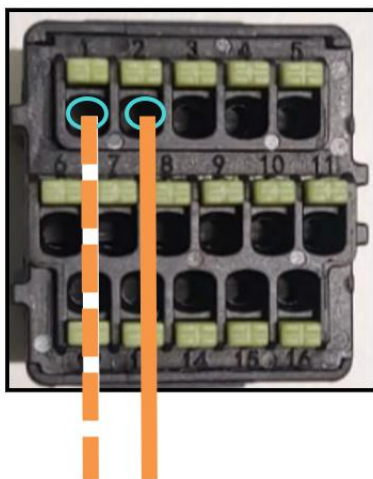




Figure 19 - Communication cable between the inverter and the WeCo 4k4 PRO battery

- b. Make sure that the DIP switches are set as shown in the figure.
- c. Connect the ground cable to the battery through the threaded hole.

NOTE: To connect the WeCo batteries, use the black communication cable with the wording WECO contained within the inverter kit.

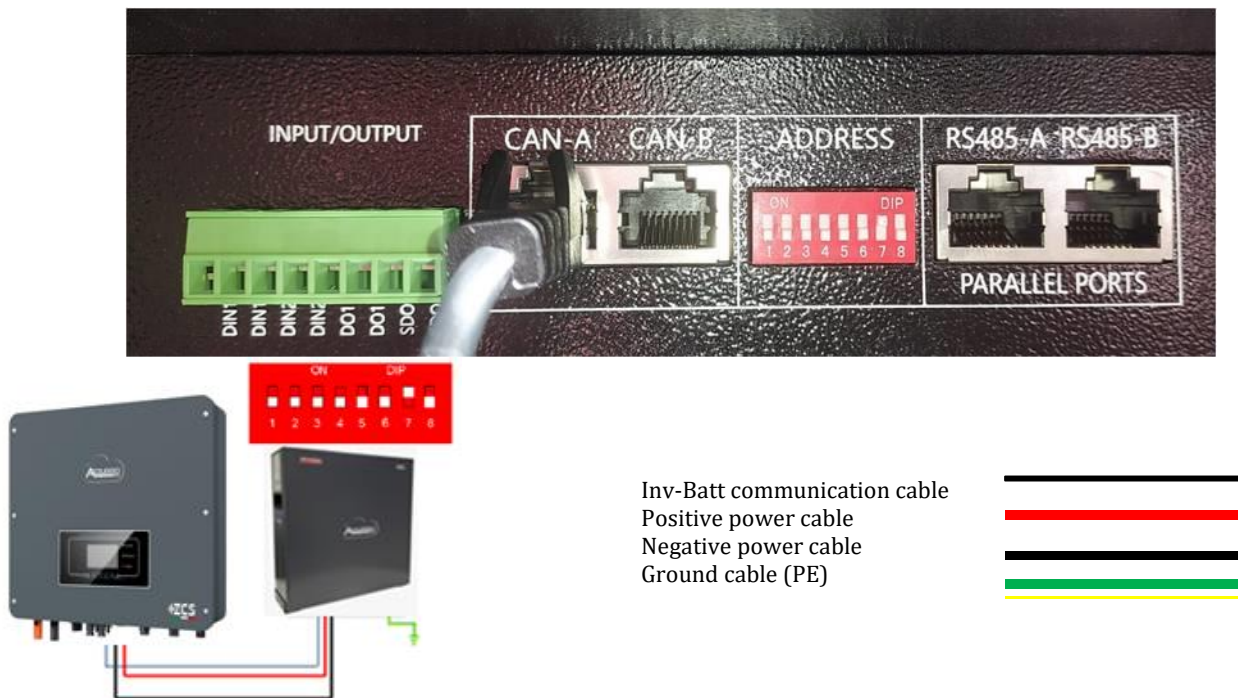


Figure 20 - Connecting the WeCo 4k4 PRO battery

4.5.2. Connecting multiple batteries in parallel

If multiple batteries are present:

- a. Check that the batteries have the same voltage level by switching them on and disconnecting them one at a time, measuring the + and - terminals with the tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volts.
- b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off)
- c. Connect the communication cable inserted in the CAN port of the inverter to the CAN-A port of one of the batteries, this will now become the MASTER battery.
- d. The MASTER must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery. (**Attention: do not connect the RS485-A port to the Master battery**).



Figure 21 – Communication cable between WeCo 4k4 PRO batteries

- e. In case of additional batteries, the communication cable will be connected as indicated above for connecting the MASTER battery to SLAVE 1.
- f. The last battery will only have the **RS485-A** port connected.

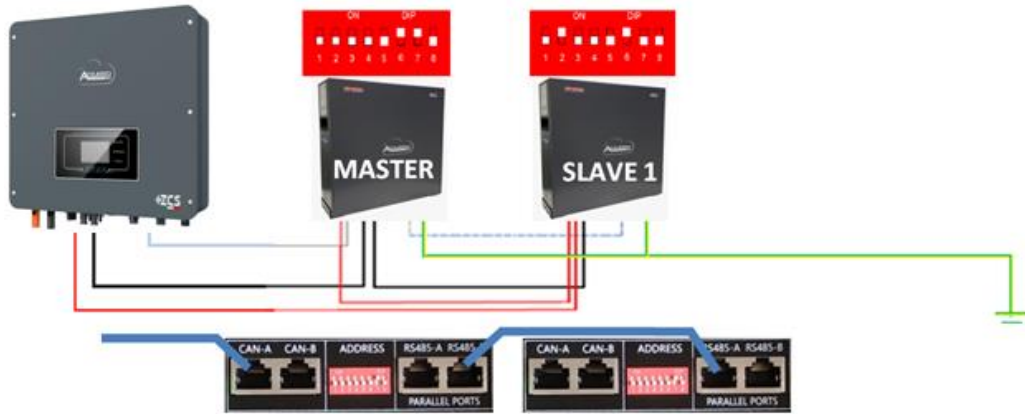


Figure 22 - Parallel connection of two WeCo 4k4 PRO batteries

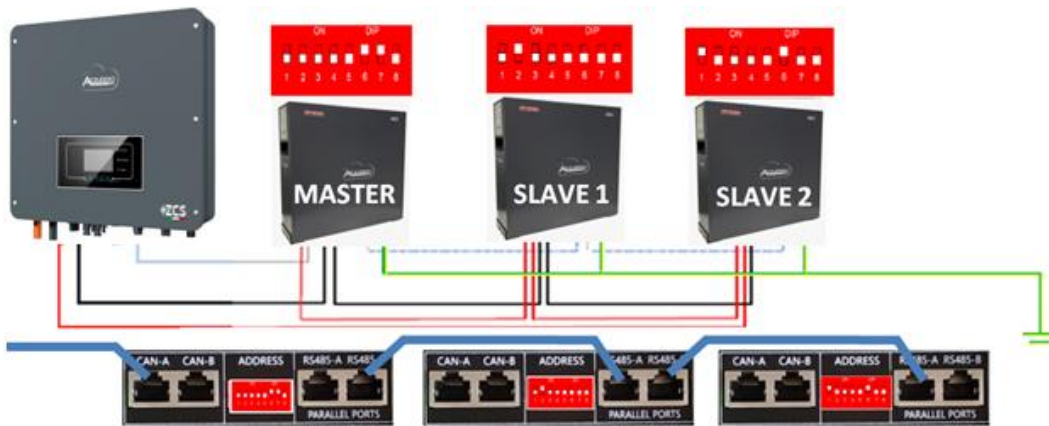


Figure 23 - Parallel connection of three WeCo 4k4 PRO batteries

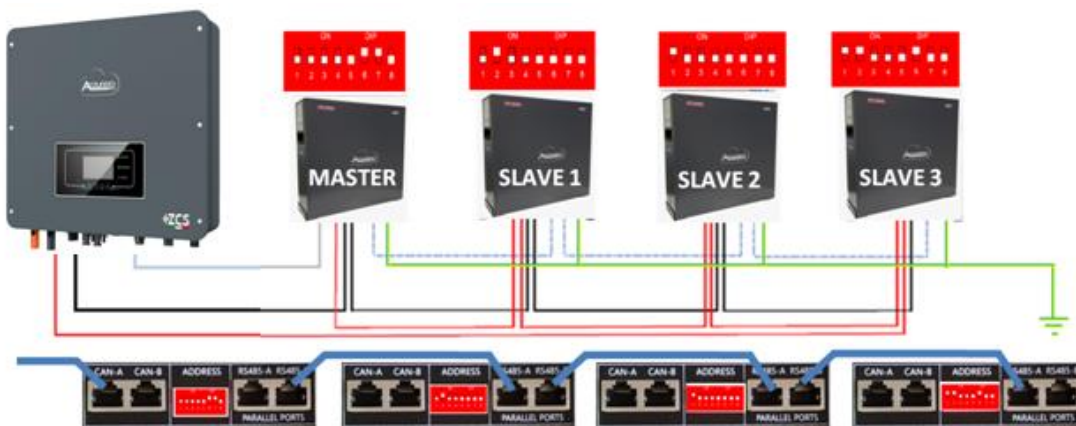


Figure 24 - Parallel connection of four WeCo 4k4 PRO batteries



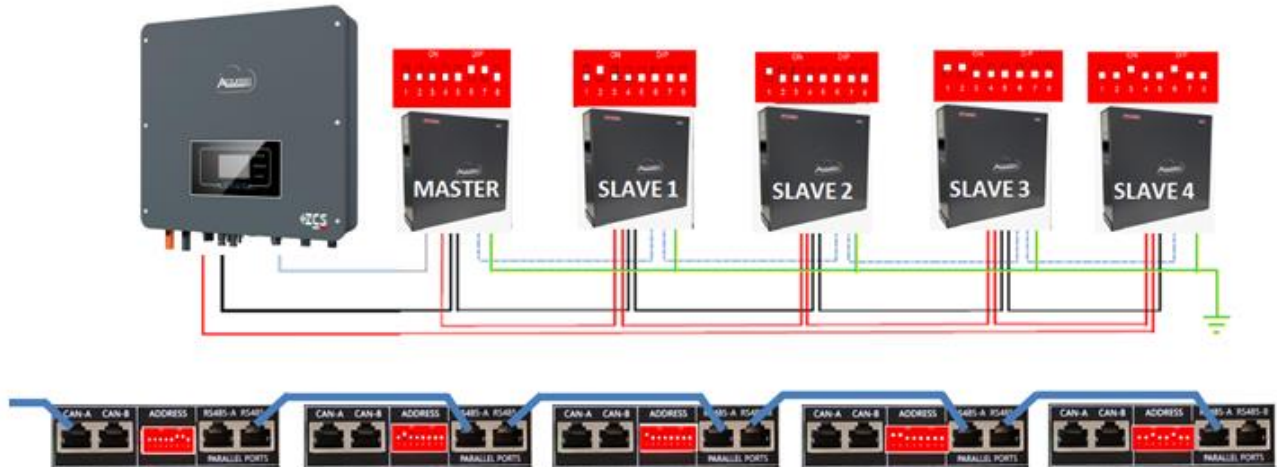


Figure 25 - Parallel connection of five WeCo 4k4 PRO batteries

4.6. Connecting a WeCo 5k3 battery

4.6.1. Connecting a single battery

NOTE: To connect the WeCo batteries, use the black communication cable contained in the inverter kit.

The same cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate inlet:

- Insert the plug into the BMS CAN port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN (White-Orange cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (Orange cable)	

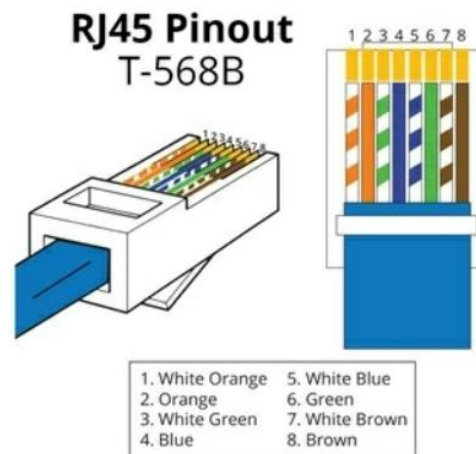
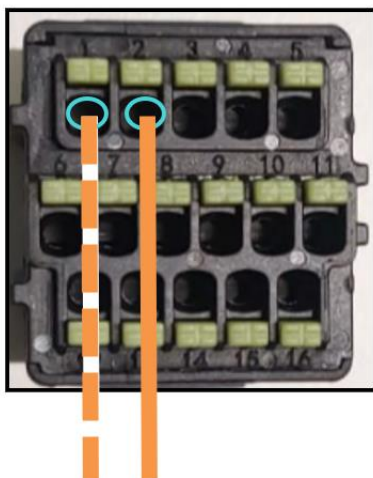




Figure 26 - Communication cable between the inverter and WeCo 5k3 battery

- b. Make sure that the DIP switches are set as shown in the figure.
- c. Connect the ground cable to the battery through the threaded hole.

Note: Switch off the batteries each time the position of the DIP switches is changed.

To access the battery connection, remove the cover of the LV section located on the left hand side by unscrewing the crosshead screws. See the figure to identify the LV section.



Attention: When connecting 5k3 batteries to 3000SP inverters or single-phase hybrid inverters, only the low voltage section must be used. To prevent damage to the batteries or inverters, do not use the high voltage section.

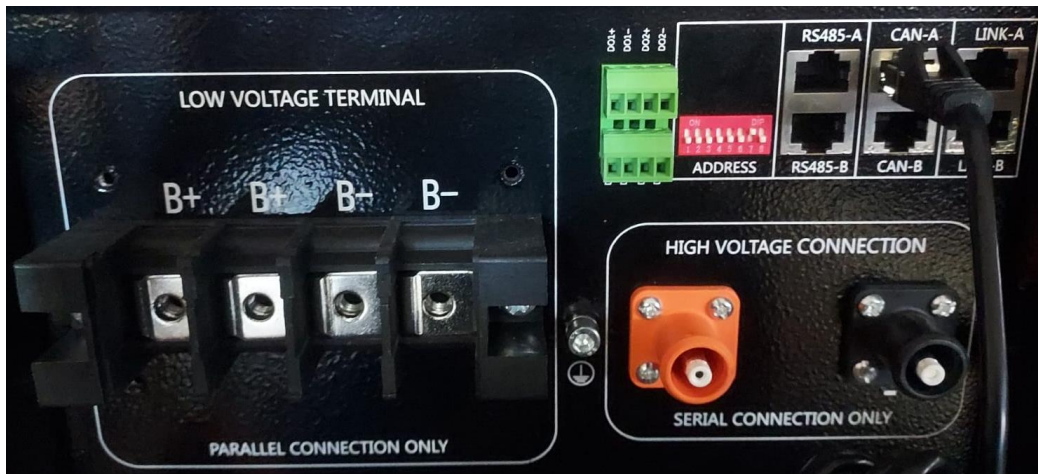
In case of a single battery:

1. Connect the CAN-A input
2. Set the DIP switches as shown in the figure.

3. The power connections must be made by attaching the appropriate B+ and B- connectors to the corresponding input.
4. Connect the ground cable to the battery through the threaded hole.



Inv-Batt communication cable
 Positive power cable
 Negative power cable
 Ground cable (PE)



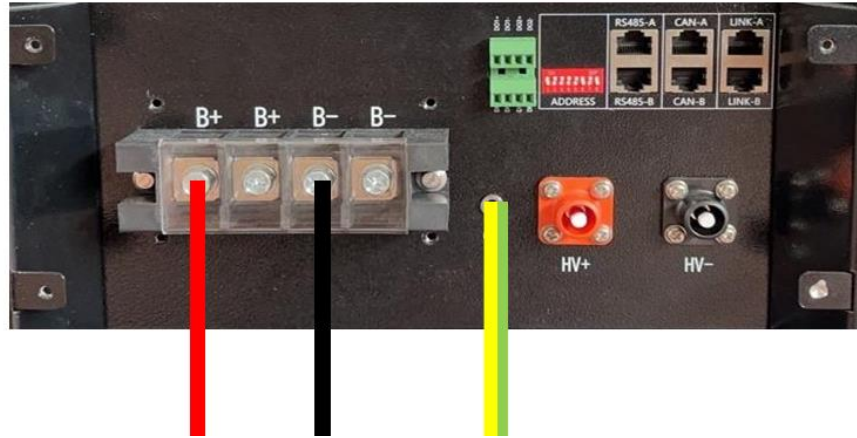


Figure 27 - Connecting the WeCo 5k3 battery

4.6.2. Connecting multiple batteries in parallel

If multiple batteries are present:

- a. Check that the batteries have the same voltage level by switching them on and disconnecting them one at a time, measuring the + and - terminals with the tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volts.
- b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off)
- c. Connect the communication cable inserted in the CAN port of the inverter to the CAN-A port of one of the batteries, this will now become the MASTER battery.
- d. From the MASTER battery, connect the communication cable from the **RS485-B** port to the **RS485-A** communication port of the Slave 1 battery. (**Attention: do not connect the RS485-A port to the Master battery**).



Figure 28 – Communication cable between WeCo 5k3 batteries

- e. In case of additional batteries, the communication cable will be connected as indicated for connecting the MASTER battery to SLAVE 1.
- f. The last battery will only have the **RS485-A** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 metres. The “**NEGATIVE**” power cable coming from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the “**POSITIVE**” power cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

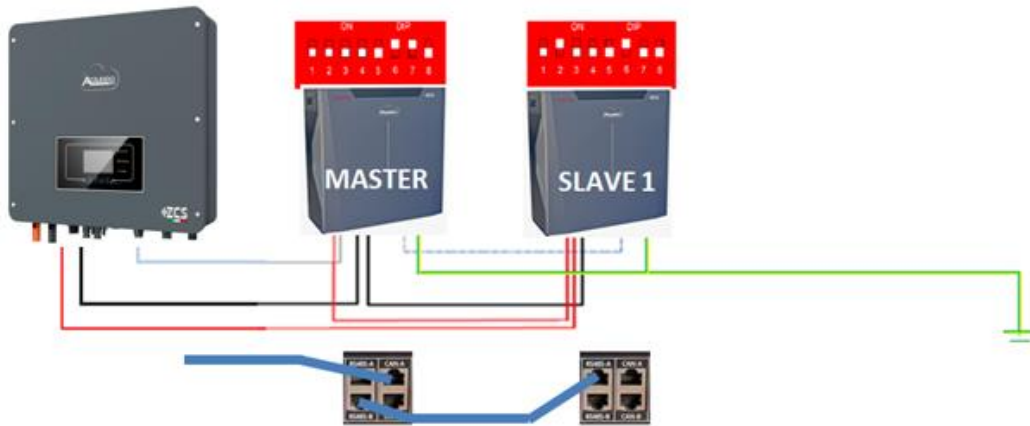


Figure 29 – Parallel connection of two WeCo 5k3 batteries

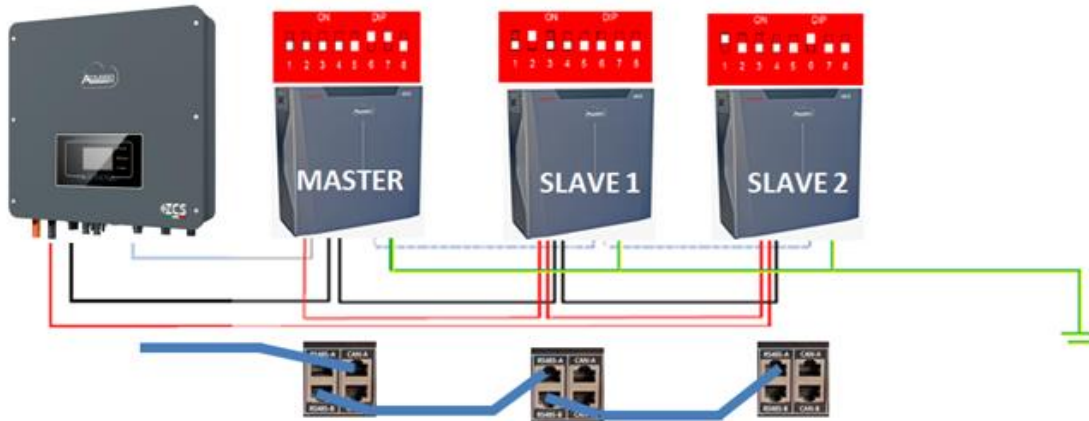


Figure 30 - Parallel connection of three WeCo 5k3 batteries

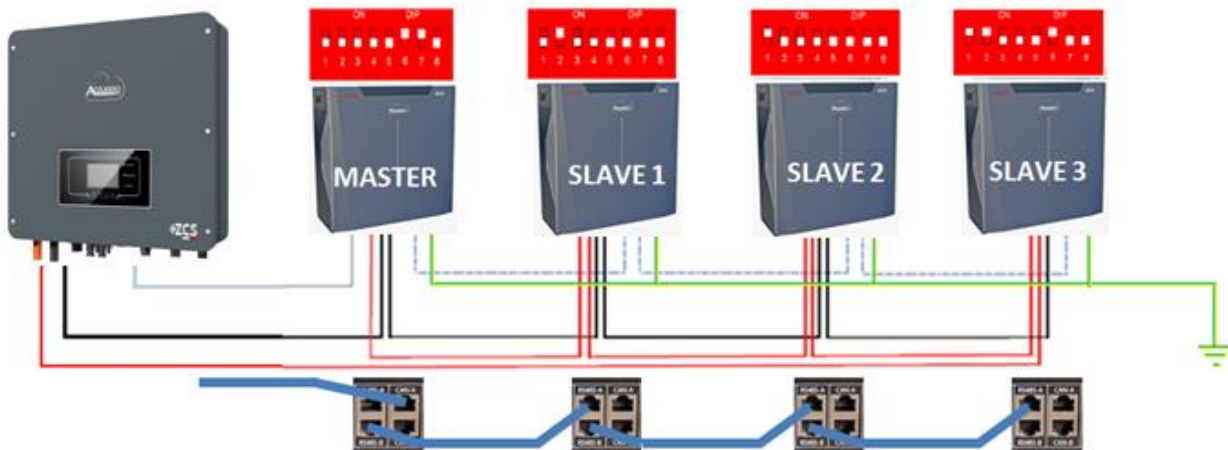


Figure 31 - Parallel connection of four WeCo 5k3 batteries

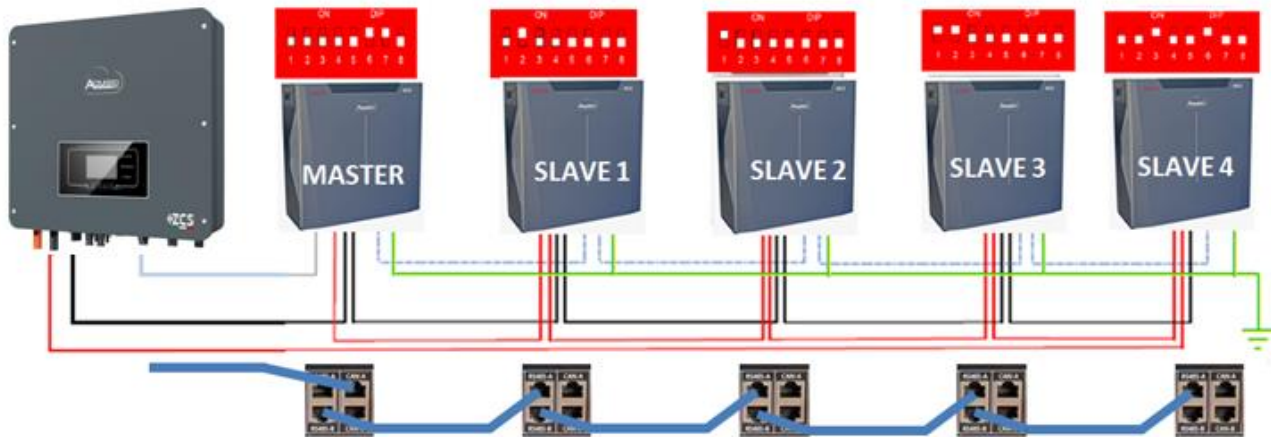


Figure 32 - Parallel connection of five WeCo 5k3 batteries



4.7. Connecting a WeCo 5K3XP battery

4.7.1. Connecting a single battery

NOTE: To connect the WeCo batteries, use the black communication cable contained in the inverter kit.

The same cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate inlet:

- d. Insert the plug into the BMS CAN port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN (White-Orange cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (Orange cable)	

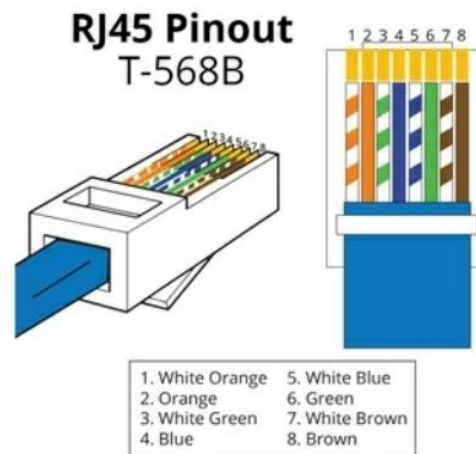
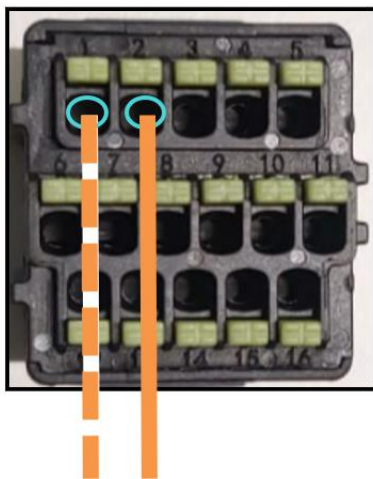


Figure 33 - Communication cable between the inverter and WeCo 5K3XP battery

- e. Make sure that the DIP switches are set as shown in the figure.
- f. Connect the ground cable to the battery through the threaded hole.

Note: Switch off the batteries each time the position of the DIP switches is changed.

To access the battery connection, remove the cover of the LV section located on the left hand side by unscrewing the crosshead screws. See the figure to identify the LV section.



Attention: When connecting 5K3XP batteries to 3000SP inverters or single-phase hybrid inverters, only the low voltage section must be used. To prevent damage to the batteries or inverters, do not use the high voltage section.

In case of a single battery:

5. Connect the CAN-A input
6. Set the DIP switches as shown in the figure.
7. The power connections must be made by attaching the appropriate B+ and B- connectors to the corresponding input.
8. Connect the ground cable to the battery through the threaded hole.

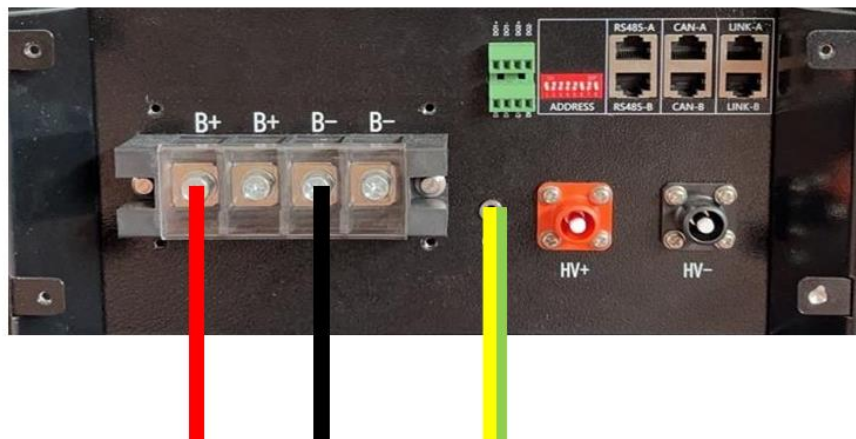
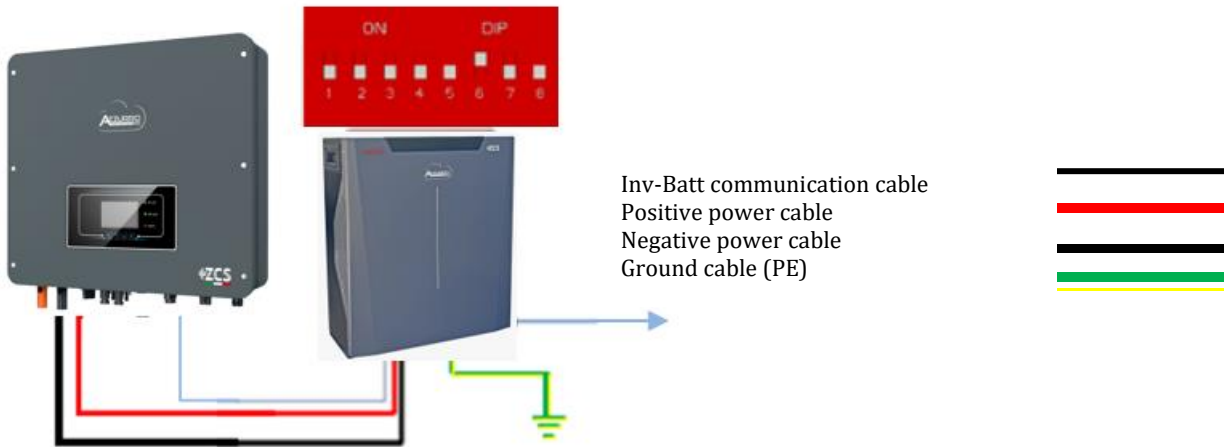


Figure 34 - Connecting the WeCo 5K3XP battery

4.7.2. Connecting multiple batteries in parallel

If multiple batteries are present:

- g. Check that the batteries have the same voltage level by switching them on and disconnecting them one at a time, measuring the + and - terminals with the tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volts.
- h. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off)
- i. Connect the communication cable inserted in the CAN port of the inverter to the CAN-A port of one of the batteries, this will now become the MASTER battery.
- j. From the MASTER battery, connect the communication cable from the **RS485-B** port to the **RS485-A** communication port of the Slave 1 battery. (**Attention: do not connect the RS485-A port to the Master battery**).



Figure 35 – Communication cable between WeCo 5K3XP batteries

- k. In case of additional batteries, the communication cable will be connected as indicated for connecting the MASTER battery to SLAVE 1.
- l. The last battery will only have the **RS485-A** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 metres.

The “**NEGATIVE**” power cable coming from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the “**POSITIVE**” power cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

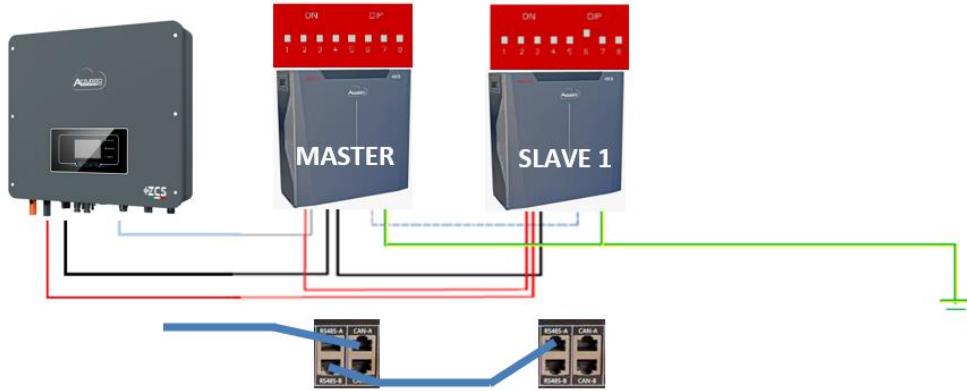


Figure 36 - Parallel connection of two WeCo 5K3XP batteries

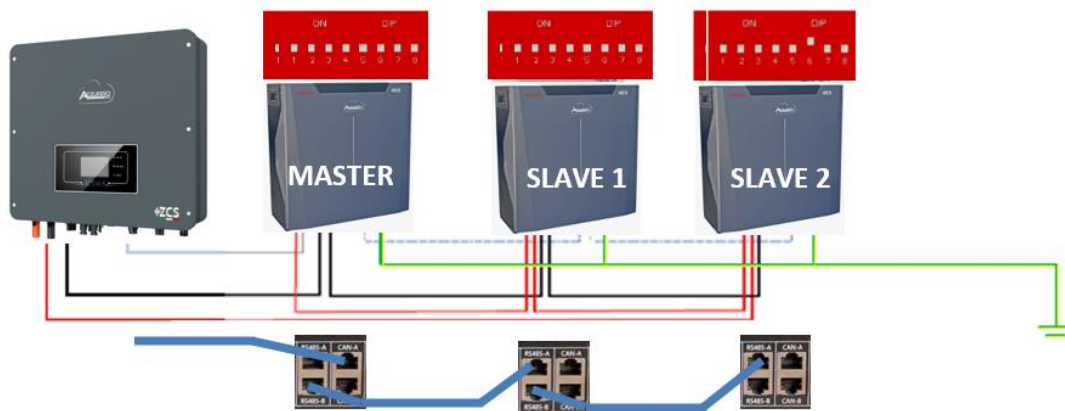


Figure 37 - Parallel connection of three WeCo 5K3XP batteries

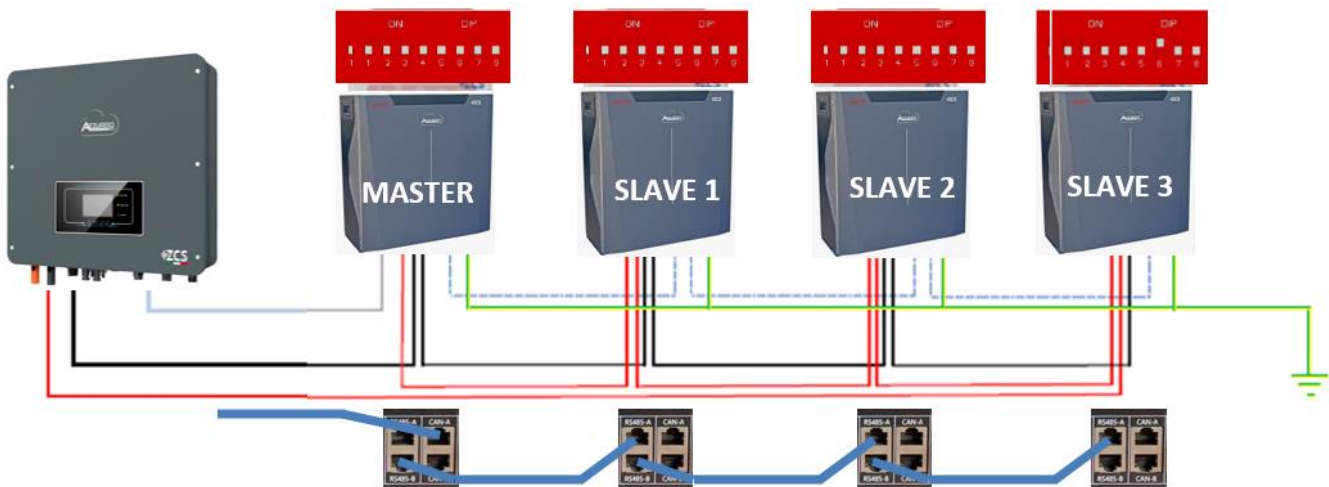


Figure 38 - Parallel connection of four WeCo 5K3XP batteries



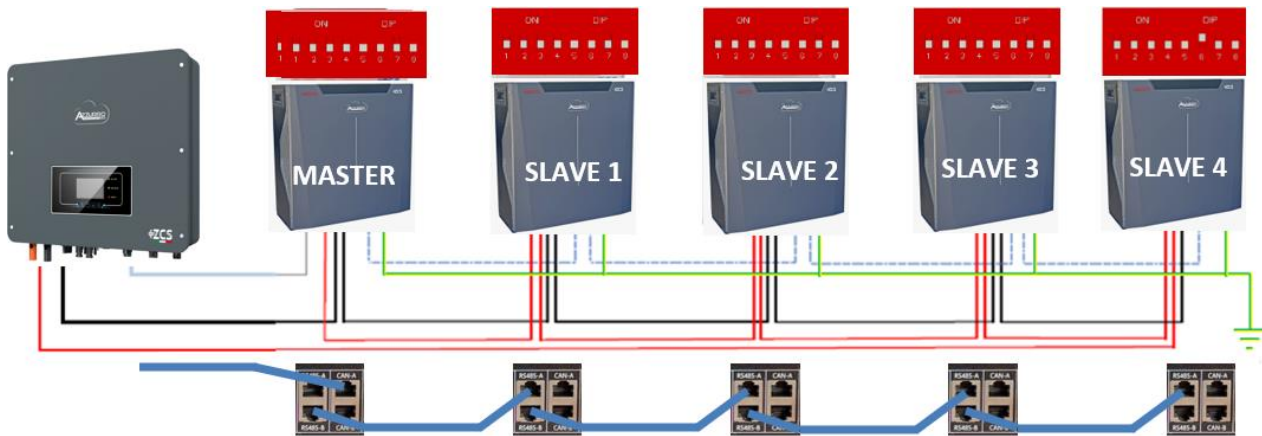


Figure 39 - Parallel connection of five WeCo 5K3XP batteries

4.7.3. Weco 5K3XP battery and 5K3 batteries in parallel

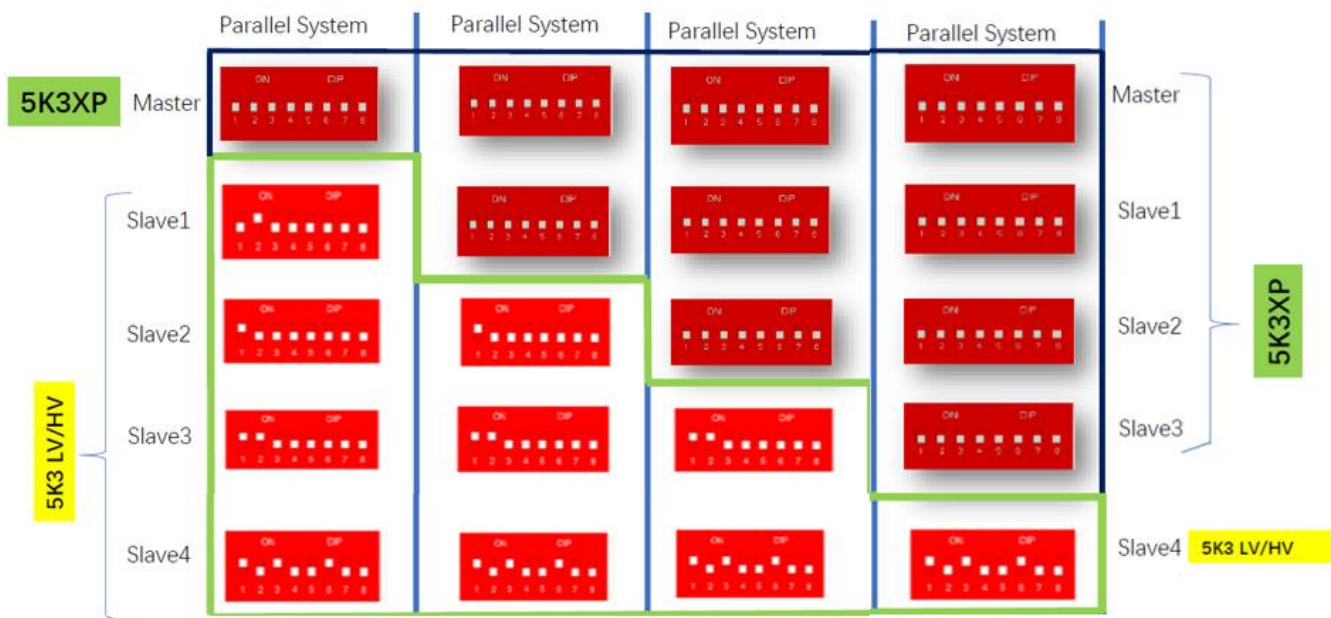


Figure 34 - Parallel connection of WeCo 5K3XP and WeCo 5K3XP batteries

In case of 5K3XP and 5K3 in parallel:

- ✓ Always provide as master the 5K3XP battery (if they are more than one set them as first Slaves);
- ✓ The setting of the DIP switches of the last 5K3 battery must be set as indicated in the example table - Slave 4;
- ✓ The DIP switches of the 5K3 batteries must be set according to the Slave number as shown in the table above (example DIP switch: Master 5K3XP - 00000000, Slave 1 5K3XP - 00000000, Slave 2 5K3 - 10000000 and Slave 3 5K3 - 10100100).

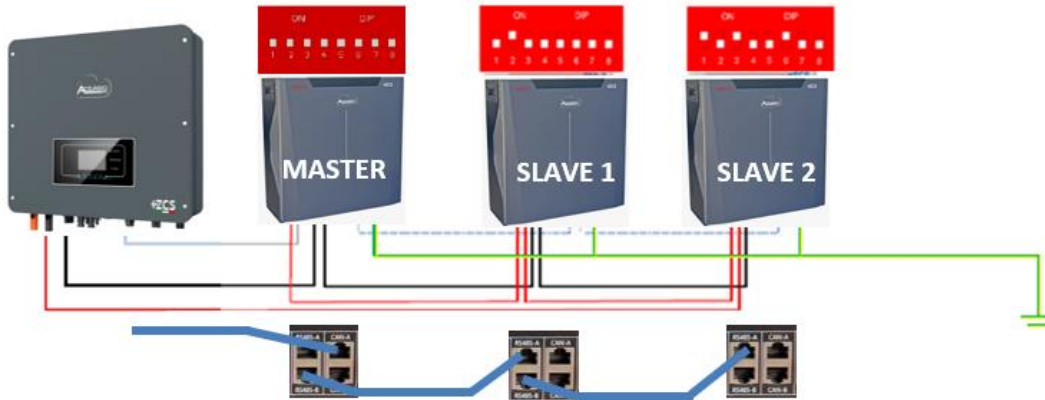


Figure 35 - Parallel connection of WeCo 5K3XP and WeCo 5K3XP batteries

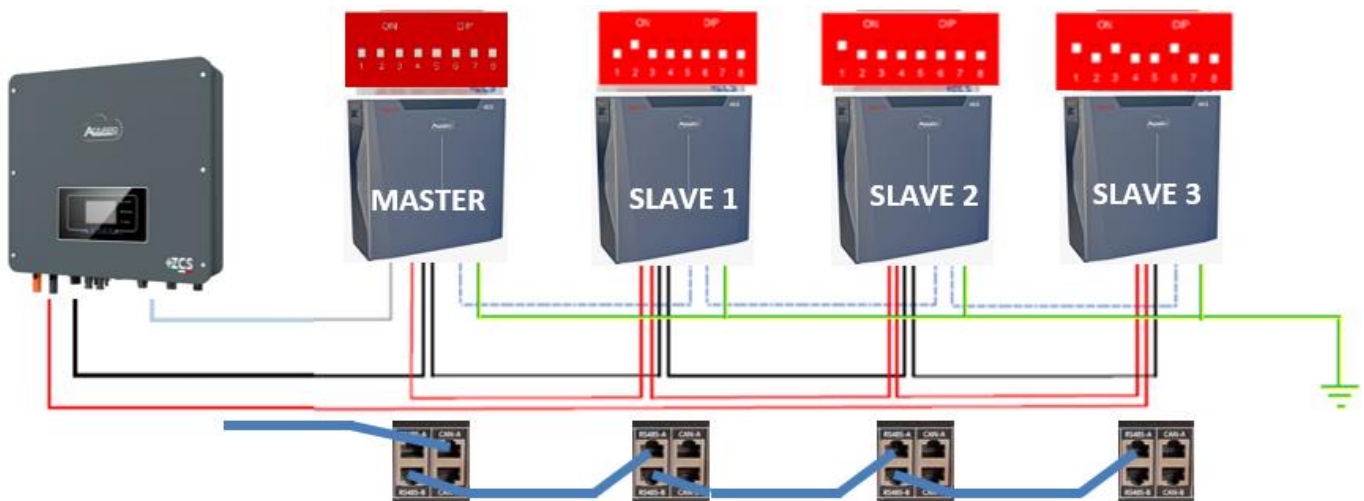


Figure 36 - Parallel connection of WeCo 5K3XP and WeCo 5K3XP batteries

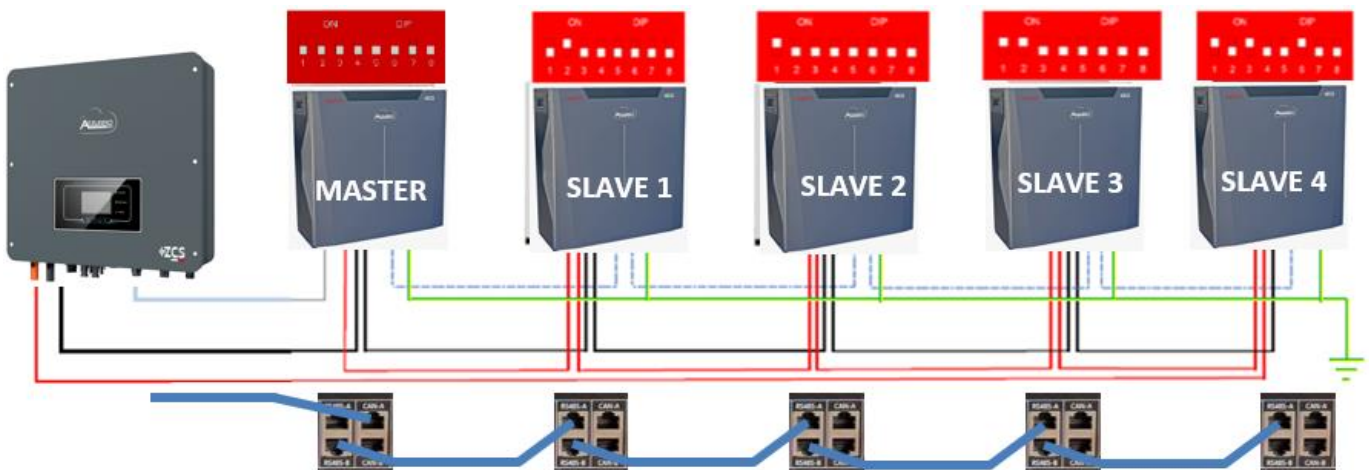


Figure 37 - Parallel connection of WeCo 5K3XP and WeCo 5K3XP batteries

1.1. Connecting an AZZURRO 5000 battery

1.1.1. Connecting a single battery

The same cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate inlet:

- a. Insert the plug into the CAN port of the single battery.

PIN Inverter	Battery communication	Note
1	CAN H (Blue cable)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (White-Blue cable)	

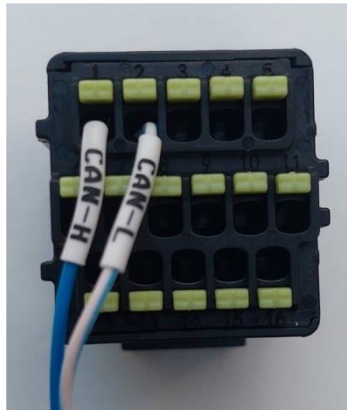


Figure 38 - Communication cable between the inverter and AZZURRO 5000 battery

- b. Connect the ground cable to the battery through the appropriate contact.

NOTE: The communication cable is located inside the kit in the inverter box.

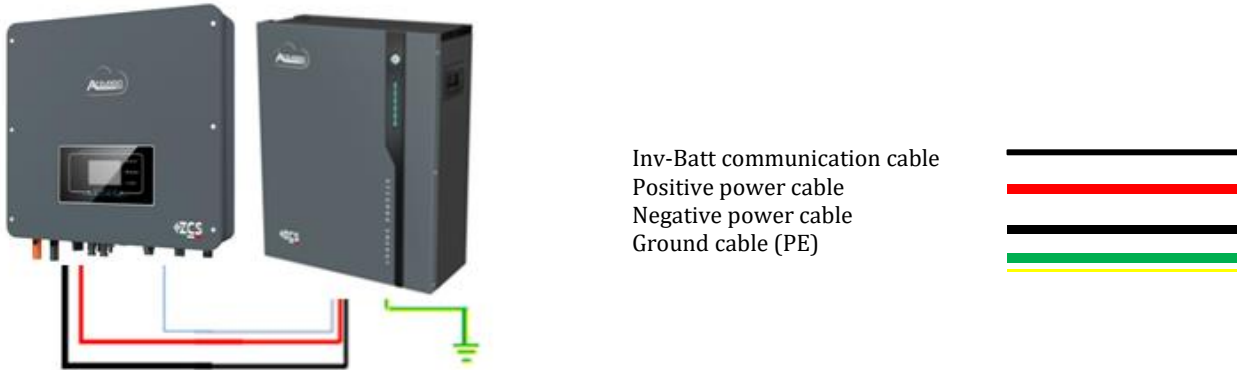


Figure 39 - Connecting the AZZURRO 5000 battery

In case of a SINGLE BATTERY:

1. Connect the **CAN** input for communication between the inverter and battery.
2. The power connections must be made by attaching the appropriate P+ and P- connectors to the corresponding input (as shown in the figure).

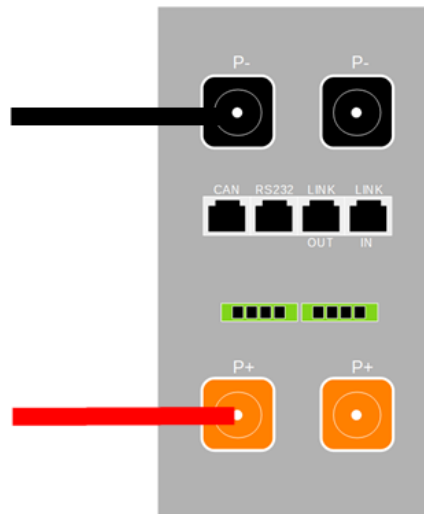


Figure 40 - Terminal block of the AZZURRO 5000 battery

3. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
4. Press the button on the front of the battery to switch it on.



Figure 41 - POWER button of the AZZURRO 5000 battery

1.1.2. Connecting multiple batteries in parallel

If multiple batteries are present:

- a. In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and working, make sure that the difference between the voltages of all the batteries is less than 1.5 Volt. Each battery must be measured individually, so make sure the batteries are not connected to each other. (If the value is higher than 1.5 Volt, contact Technical Support)
- b. Connect the communication cable from the CAN port of the inverter to the CAN port of the MASTER battery. The MASTER battery must be connected to the communication cable found inside the battery box starting from the **LINK OUT** port and arriving at the **LINK IN** communication port of the Slave 1 battery. **(Attention: do not connect the LINK IN port to the Master battery).**

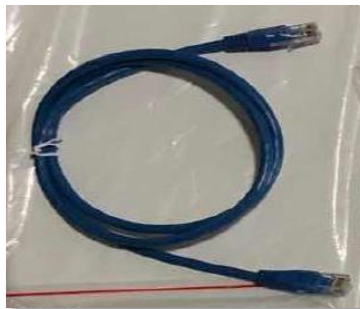


Figure 42 - Communication cable between AZZURRO 5000 batteries

- c. In case of additional batteries, the communication cable will be connected as indicated above for connecting the MASTER battery to SLAVE 1.
- d. The last battery will only have the **LINK IN** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 metres.
The **“NEGATIVE”** power cable coming out from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **“POSITIVE”** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

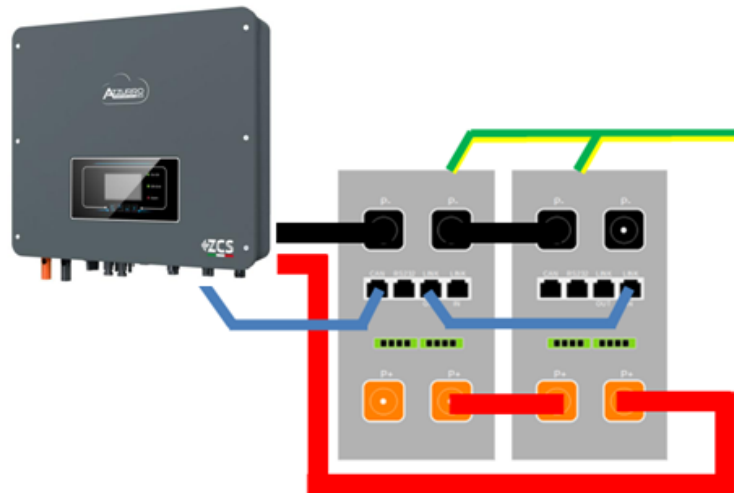


Figure 43 – Parallel connection of two AZZURRO 5000 batteries

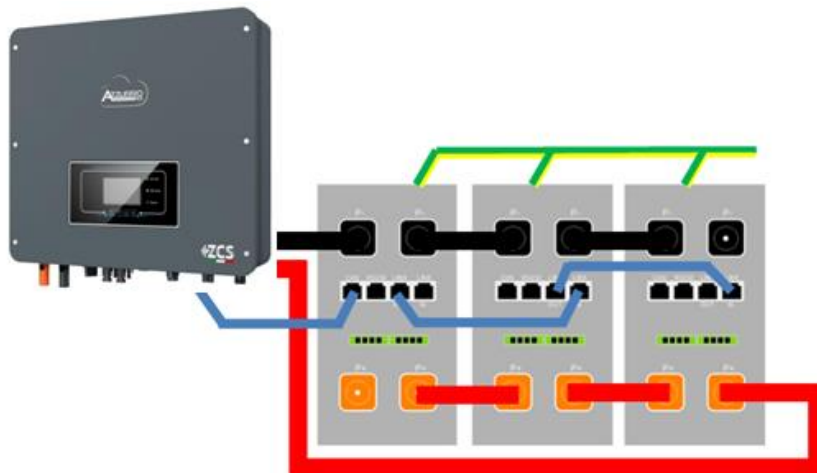


Figure 44 – Parallel connection of three AZZURRO 5000 batteries

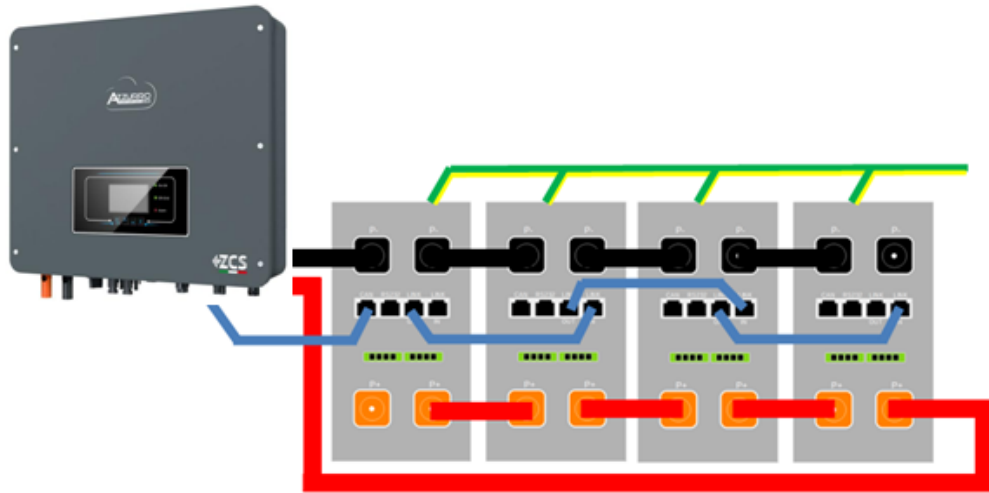


Figure 45 – Parallel connection of four AZZURRO 5000 batteries

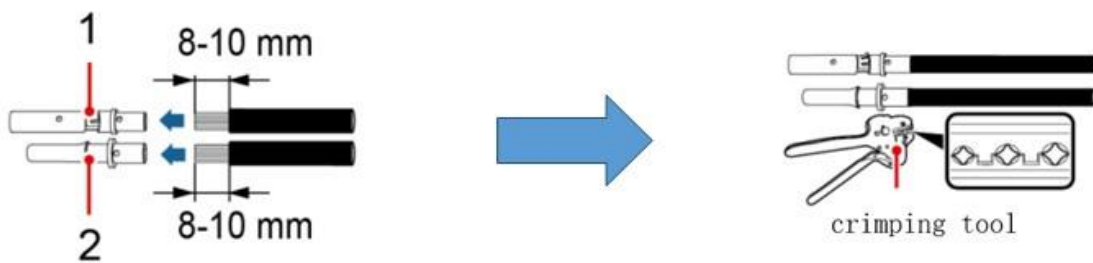
1.2. Photovoltaic connection

Recommended specifications for DC input cables

Cross-sectional area (mm ² / AWG)		Outer diameter of cable (mm ²)
Range	Recommended value	
4.0-6.0 / 11-9	4.0 / 11	4.5~7.8

Procedure:

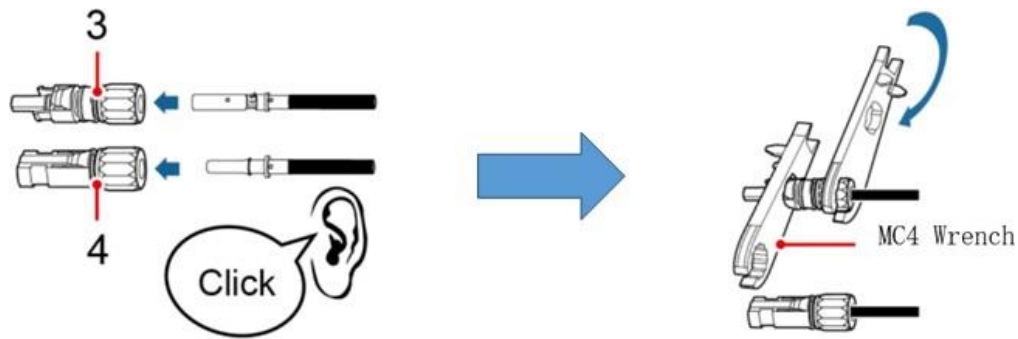
Step 1: Prepare the positive and negative photovoltaic cables.



1. Contatto positivo 2. Contatto negativo

Figure 46 – Preparing the positive and negative photovoltaic cables

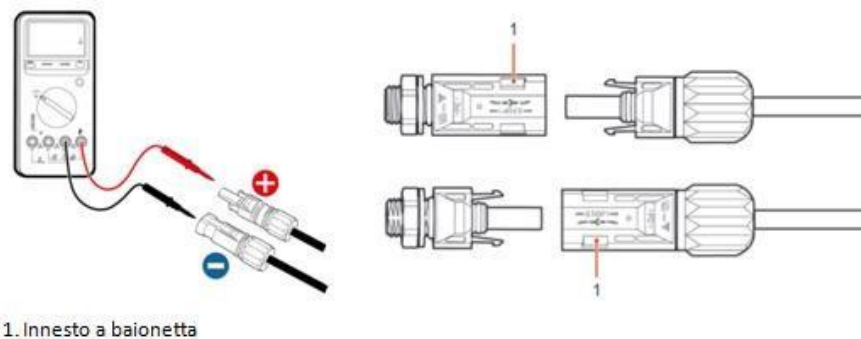
Step 2: Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.



3. Connettore positivo 4. Connettore negativo

Figure 47 - Preparing the positive and negative photovoltaic connectors

Step 3: Make sure that the DC voltage of each photovoltaic string is less than 600V DC and that the polarities of the photovoltaic cables are correct. Insert the positive and negative connectors in the 1PH HYD3000-HYD6000-ZSS-HP inverter until you hear a “click” sound.



1. Innesto a baionetta

Figure 48 - Connecting the photovoltaic connectors



Caution

Before removing the positive and negative PV connectors, make sure that the DC CIRCUIT BREAKER is OPEN.

Removal procedure

Use a MC4 wrench to disconnect the photovoltaic connectors.

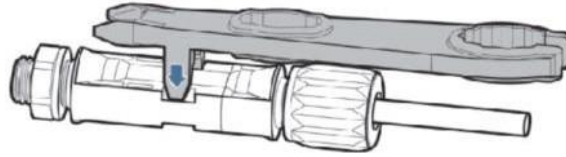


Figure 49 - Disconnecting the photovoltaic connectors

Connect the 1PH HYD3000-HYD6000-ZSS-HP inverter to the photovoltaic strings using the DC input power cables.

Select the input mode: the 1PH HYD3000-HYD6000-ZSS-HP inverter has two MPPTs, which can function either independently or in parallel. The user can choose the appropriate MPPT operating mode according to the design of the system.

Independent mode (default):

If the strings are different (e.g. installed on two separate flaps or consisting of a different number of panels), the input model must be set to “independent mode.”

Parallel mode:

If the strings are connected in parallel, the input mode must be set to “parallel mode.”

Note:

Depending on the type of inverter, select the appropriate inverter accessories (cables, fuse holders, fuses, switches, etc). The open-circuit voltage of the photovoltaic system must be lower than the maximum DC input voltage of the inverter. The output voltage of the strings must be compatible with the MPPT voltage range.

The positive and negative polarities of the panel on the inverter must be connected separately. The power cable must be suitable for photovoltaic applications.

Note:

Both MPPT inputs of the inverter should be populated, even if the system only has one string. If the strings are arranged in parallel, it is recommended to use a Y or T connection cable to double the input currents from the PV field and to populate both MPPT inputs of the inverter, as shown in the figure. If the string arrangement is independent, simply connect the two strings to the two MPPTs of the inverter.



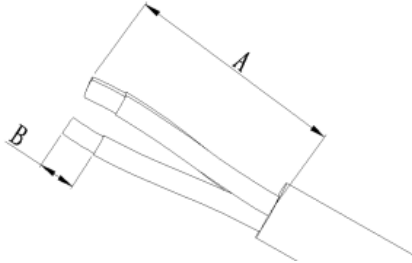
Figure 50 - Y-branch connection cable for solar panels

1.3. Grid connection

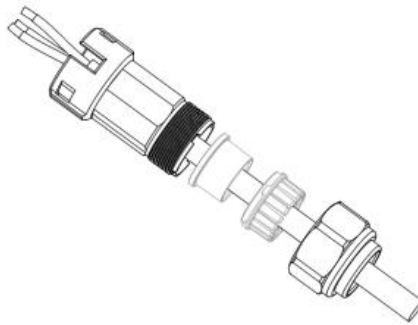
The inverter is equipped with an integrated residual current monitoring unit. When the inverter detects that the residual current exceeds 300mA, the connection to the power grid will be quickly disconnected.

If the external ac switch has leakage protection function, its rated leakage action current is required to be $\geq 300\text{mA}$.

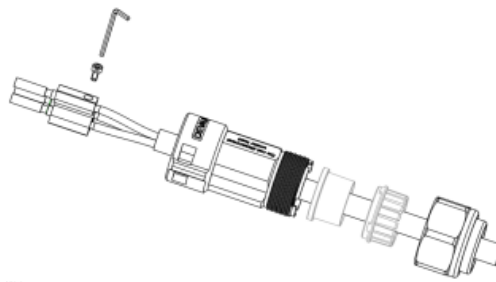
Step 1: Select the appropriate cable type and specifications. A:30~50mm; B:3~5mm.



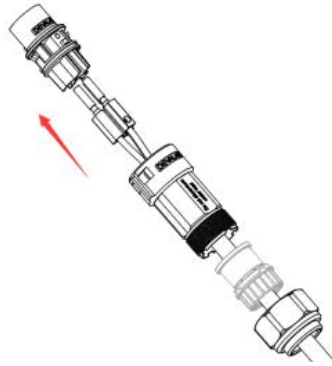
Step 2: Pass the wire through the terminal.



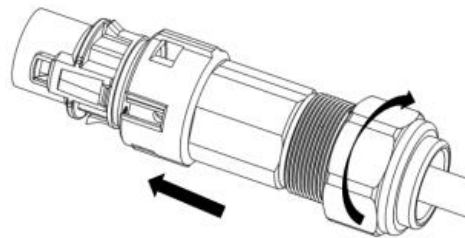
Step 3: According to the mark, lock the wire into the keyhole on the terminal and tighten it with the hexagon socket wrench.



Step 4: Push the terminal forward until the sound of "click" is heard.

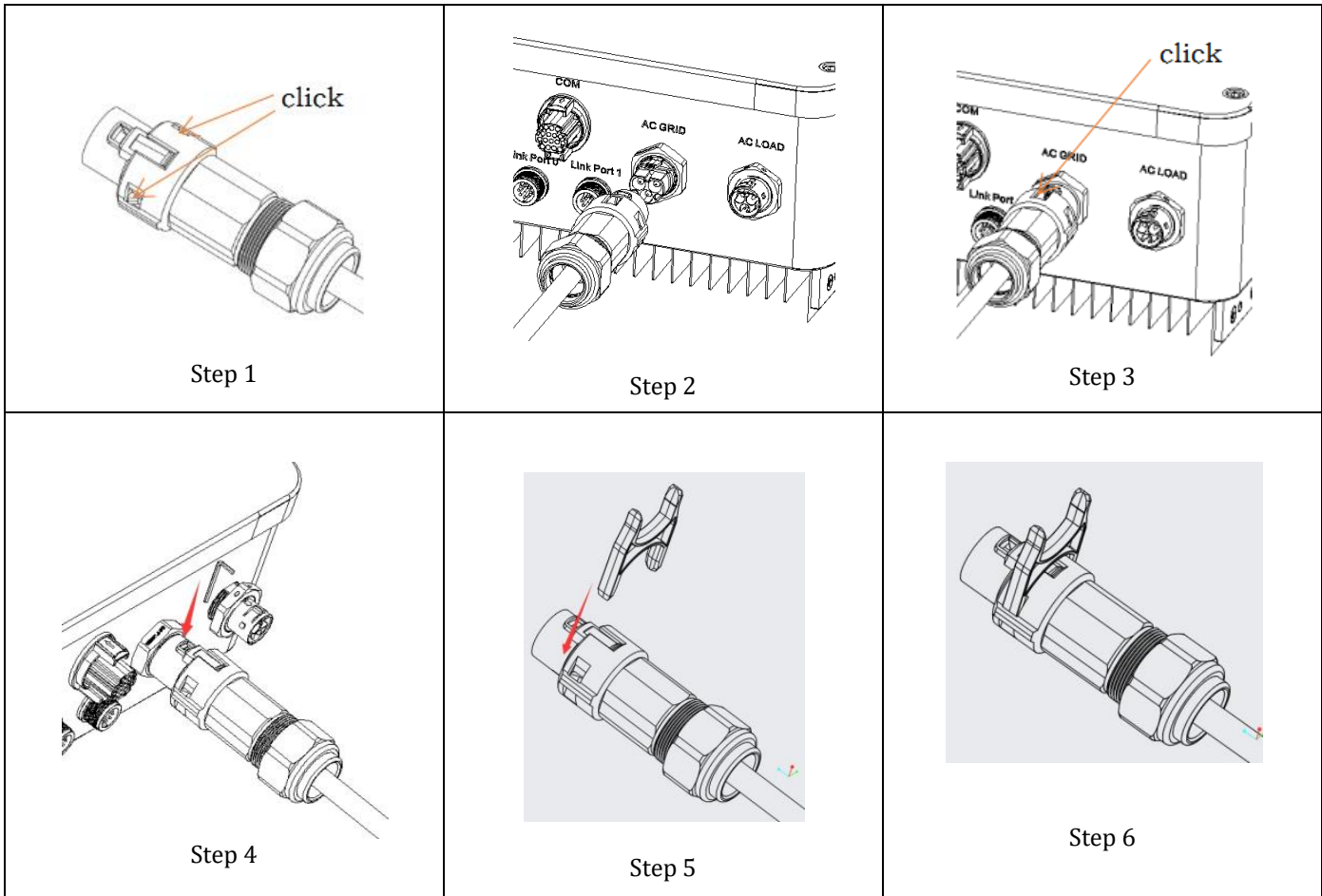


Step 5: Connect the connected load terminal to the inverter load port, and push the terminal forward until the sound of "click" is heard, and the terminal connection is completed.



Steps 1, 2 and 3 indicate the steps for inserting the connector on the AC terminal block.

Steps 4, 5 and 6 indicate the steps for disconnection of the connector from the AC terminal block.



1.4. Connecting a Critical Load (EPS function)

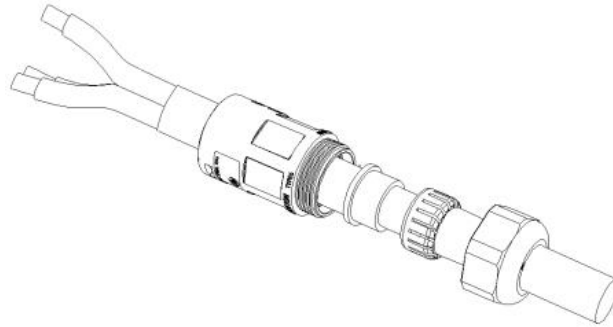
Critical Load (LOAD): in the event of a power failure (or operation in Off-Grid mode), if the EPS function is enabled, the 1PH HYD3000-HYD6000-ZSS-HP inverter will work in Emergency Power Supply (EPS) mode, using the energy stored in the battery to supply energy to the critical load via the LOAD connection port.

The LOAD connection port is only for connecting critical loads.

The procedure for connecting the LOAD port is the same as that for connecting the grid.

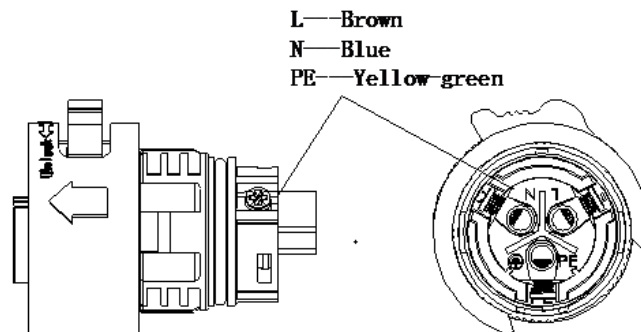
Step 1: Select appropriate cables according to Table4-3, Remove the insulation layer of the load output cable using a wire stripper according to the figure shown below: A:15~25mm B:6~8mm.

Step 2: Disassemble the load connector according to the figure shown below. Insert the load output cable (with its insulation layer stripped according to step 1) through the waterproof locking cable gland.

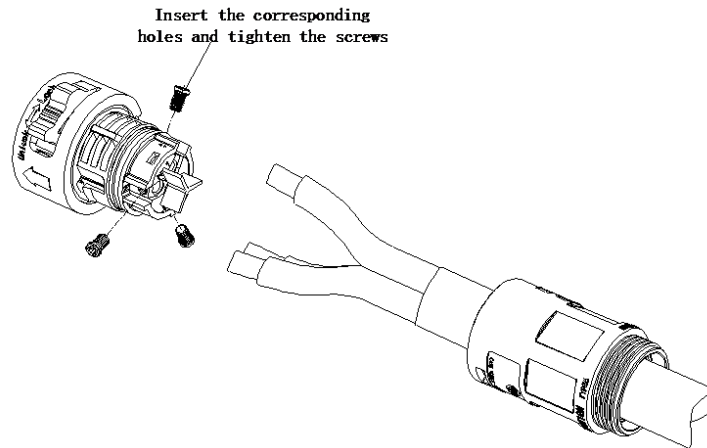


Step 3: Connect load output cable as per the following requirements:

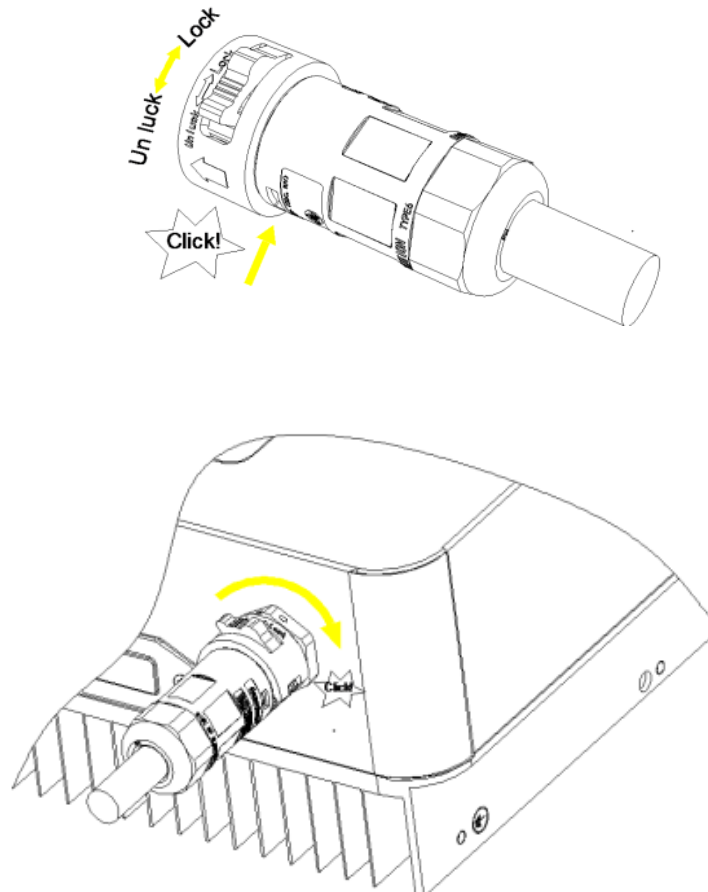
- Connect the yellow-green wire to the hole labeled "PE", fasten the wire using an Cross screwdriver;
- Connect the brown wire to the hole labeled "L", fasten the wire using an Cross screwdriver;
- Connect the blue wire to the hole labeled "N", fasten the wire using an Cross screwdriver.



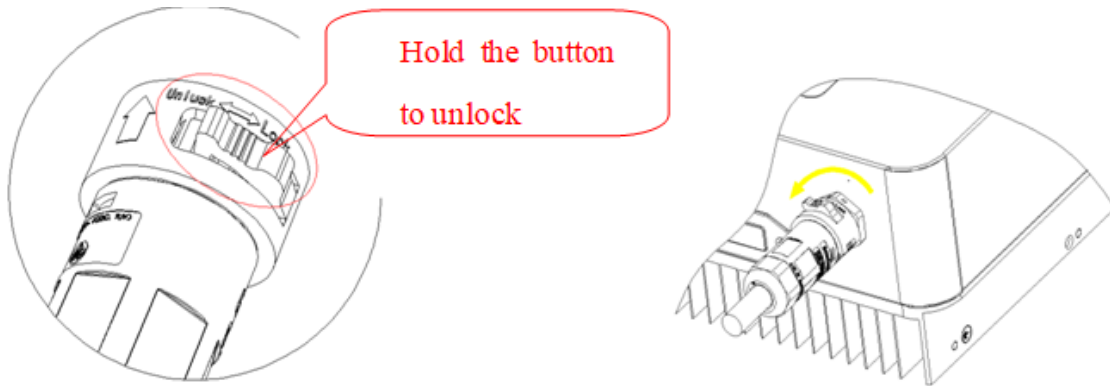
Step 4: Insert the load connector and hear "click", then tighten the waterproof nut at the instantaneous value, as shown in the figure below, to ensure that the cable is firmly connected.



Step 5: Connect the connected load connector to the load connector of the inverter. Turn the ac connector knob to lock until you hear a "click" and the clasp is in place.




Removing the load connector: Hold the button to unlock and rotate the knob counterclockwise to the unlock position, then pull out the load connector. Make sure the grid is disconnected before removing the load connector .



A change-over switch must be inserted between the EPS output of the inverter and the critical loads.

Change-over positions

	<p>The change-over switch is necessary.</p> <p>When checking/repairing critical loads, make sure that the change-over switch is in the 0 position.</p> <p>When checking/repairing the 1PH HYD3000-HYD6000-ZSS-HP inverter, make sure that the change-over switch is in the 0 position, and that the 1PH HYD3000-HYD6000-ZSS-HP inverter is disconnected from the grid.</p>
Caution	

- Under normal conditions: change-over switch is in position 1. The 1PH HYD3000-HYD6000-ZSS-HP inverter can supply power to critical loads in the event of a power failure.
- If the 1PH HYD3000-HYD6000-ZSS-HP inverter is faulty, manually move the switch to position 2. The grid will supply energy to the critical load.

Note: If the system is equipped with a production metre, take into account that the energy for the critical load is drawn before the meter and therefore this energy, even if produced by photovoltaic panels, is not counted as energy produced. If necessary, the system designer can use appropriate external switch contactors to ensure that the energy for the critical load is drawn downstream of the production meter during normal grid operation and that it only changes over to the EPS output of the inverter in the event of a power failure.

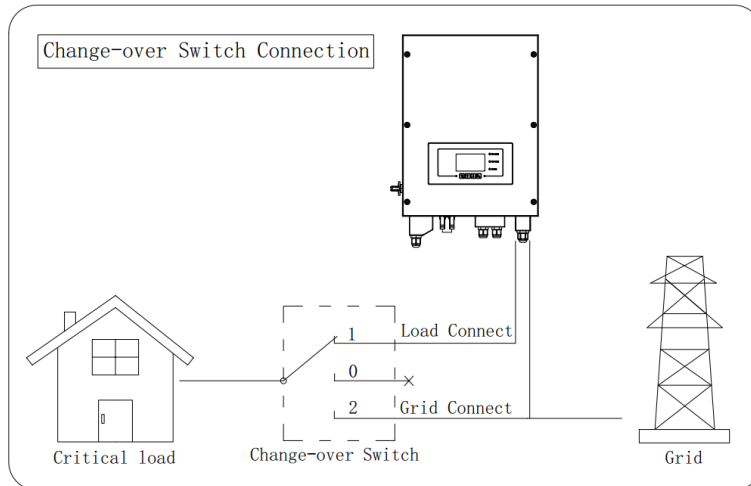


Figure 51 - Connecting the change-over switch

1.5. Connecting PGND Cables

Connect the inverter to the grounding electrode using protection ground (PGND) cables for grounding purpose.



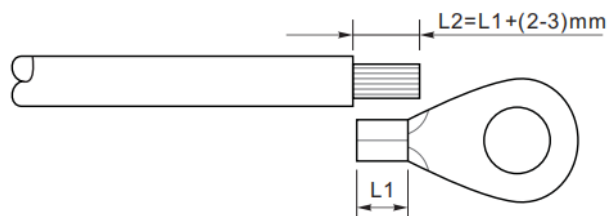
Attention

The inverter is transformer-less, requires the positive pole and negative pole of the PV array are NOT grounded. Otherwise it will cause inverter failure. In the PV power system, all non current carrying metal parts (such as: PV module frame, PV rack, combiner box enclosure, inverter enclosure) should be connected to earth.

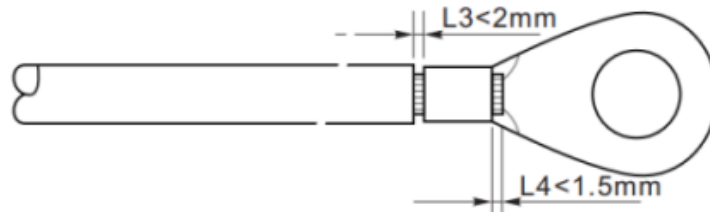
The PGND cables are prepared ($\geq 4\text{mm}^2$ outdoor power cables are recommended for grounding purposes), the colour of cable should be yellow-green.

Procedure:

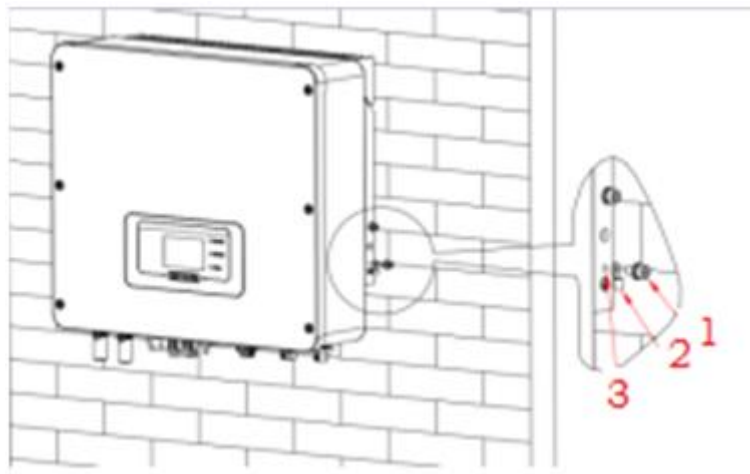
Step 1: Remove the insulation layer with an appropriate length using a wire stripper.



Step 2: Insert the exposed core wires into the OT terminal and crimp them by using a crimping tool.



Step 3: Install the crimped OT terminal, flat washer using M5 screw, and tighten the screw to a torque of 3 N.m using an Allen wrench. 1.Screw; 2.OT Terminal; 3.Tapped hole.



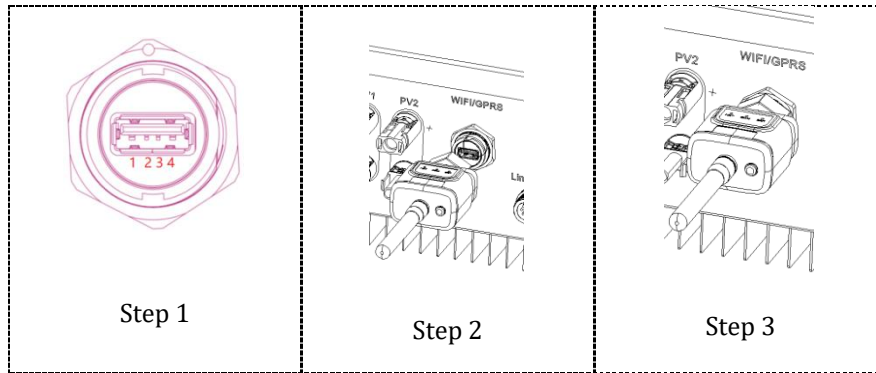
Note 1: L3 is the length between the insulation layer of the ground cable and the crimped part.L4 is the distance between the crimped part and core wires protruding from the crimped part.

Note 2: The cavity formed after crimping the conductor crimp strip shall wrap the core wires completely. The core wires shall contact the terminal closely.

1.6. External communication interface

1.6.1. USB/WIFI communication interface

USB/WIFI communication interface.

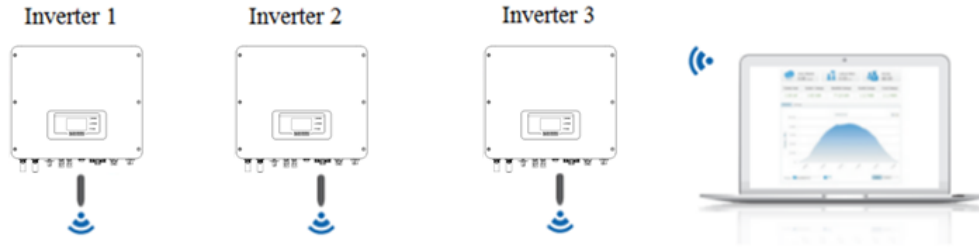


Interface description.

PIN	Definition	Function	Note
1	GND.S	USB power -	The USB power supply is 5V/1A; Cannot be used for external device charging
2	DP	USB data +	
3	DM	USB data -	
4	VBUS	USB power +	

Refer to the figure shown below.



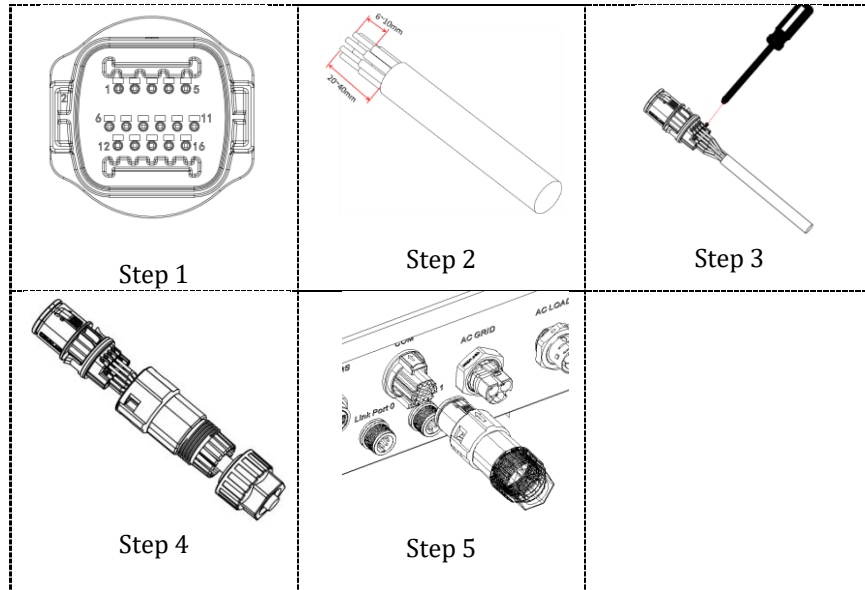


The operation information (generated energy, alert, operation status) of the inverter can be transferred to PC or uploaded to the server via WiFi/GPRS/Ethernet Users can choose to use web or APP for monitoring and viewing according to their needs.

1.6.2. COM-Multifunction communication interface

Interface description.

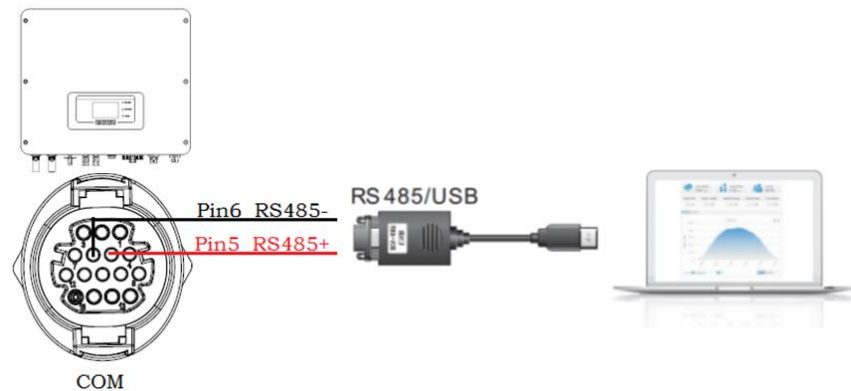
PIN	Definition	Function	Note
1	CAN	CAN data transmission	Communication with lithium battery BMS, the inverter CAN be adaptive to lithium battery BMS to provide CAN communication and RS485 communication
2	CAN	CAN data transmission	
3	485-2TX+	RS485 differential signal +	
4	485-2TX-	RS485 differential signal -	
5	485-1TX+	RS485 differential signal +	Wired monitoring or inverter cascade monitoring
6	485-1TX-	RS485 differential signal -	
7	GND-S	(DRMS) logic interfaces are applicable to the following safety standards: Australia (AS4777), European General (50549), Germany (4105)	Logic interface connections
8	DRMS1/5		
9	DRMS2/6		
10	DRMS3/7		
11	DRMS4/8		
12	DRMS0		
13	CT-	The current sensor outputs a negative electrode	Connect current sensor of power grid
14	CT+	The current sensor outputs a positive electrode	
15	RS485-B	RS485 differential signal +	Meter communication
16	RS485-A	RS485 differential signal -	



1. RS485 (Wired monitoring or inverter cascade monitoring)

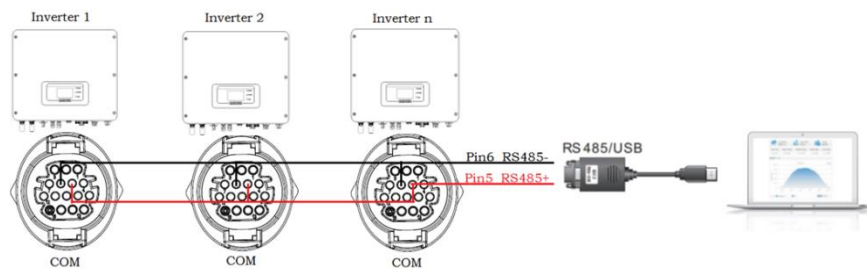
Refer to the figure shown below, connect the RS485+ and RS485- of the inverter to the TX+ and TX- of the RS485 → USB adapter, and connect the USB port of the adapter to the computer.

(NOTE: The length of the RS485 communication cable should be less than 1000 m).



RS485 wires are connected in parallel between inverters.

(NOTE: When multiple inverters are connected via RS485 wires, set communication address to differentiate the inverters).



2. Logic interface

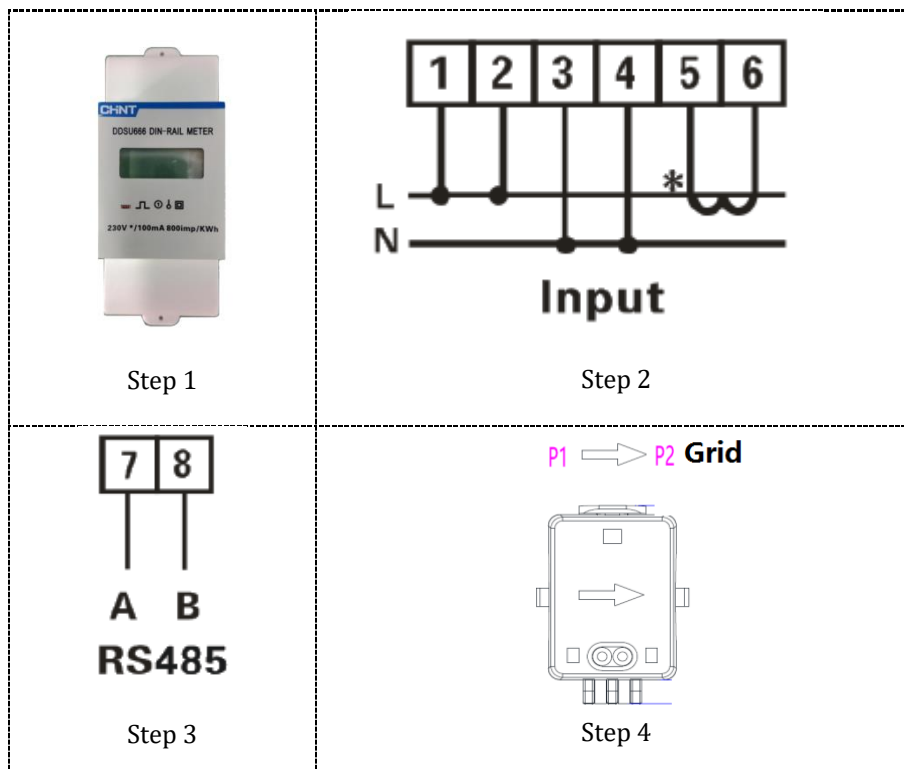
This feature must be disabled.

3. Meter/CT

PIN15 and PIN16 are used for meter communication, the electricity meter is shown in the “Step 1”, PIN15 and PIN16 correspond to 7,8 respectively on the electricity meter, as shown in “Step 3”.

The connection mode is shown in “Step 2”. The 1/2 and 3/4 on the electricity meter are connected to voltage signals L and N respectively. And the current needs to be connected through the current transformer, 5,6 correspond to the current transformer.

NOTE: The direction of the current transformer is shown in “Step 4”.



If you need to use the CT alone, attach the CT to PIN13 and PIN14.

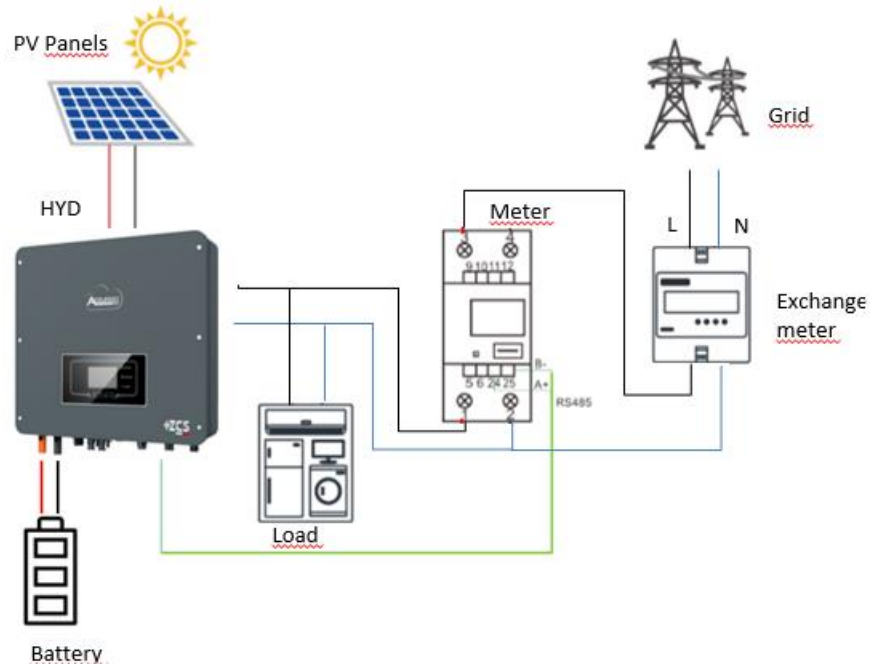
There are two ways to get grid current information :

- CT
- Meter +CT

1.6.3. Measurement of the exchange power through Meter

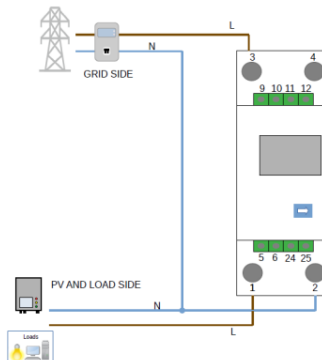


INVERTER PIN	METER PIN	Nota
16	24	Exchange meter communication
15	25	



Meter connecting:


1. Connect Meter and inverter through the RS485 port. On the Meter this port is identified by PIN 24 e 25. On the inverter this port is identified by PIN 16 e 15 on the COM connector
2. Connect the Meter as shown in the picture:
 - ✓ Connect Neutral cable (N) to Meter's PIN 2;
 - ✓ Connect phase cable (exchange meter side) to Meter's PIN 3;
 - ✓ Connect phase cable (Solar inverter and loads side) to Meter's PIN 1.



NOTE: for distances between Inverter and Meter above 100 m is recommended to connect in the 485 days chain 2 120 Ohm resistors, one between PIN 15 and PIN 16 in the inverter COM port and between PIN 24 and PIN 25 on the meter.

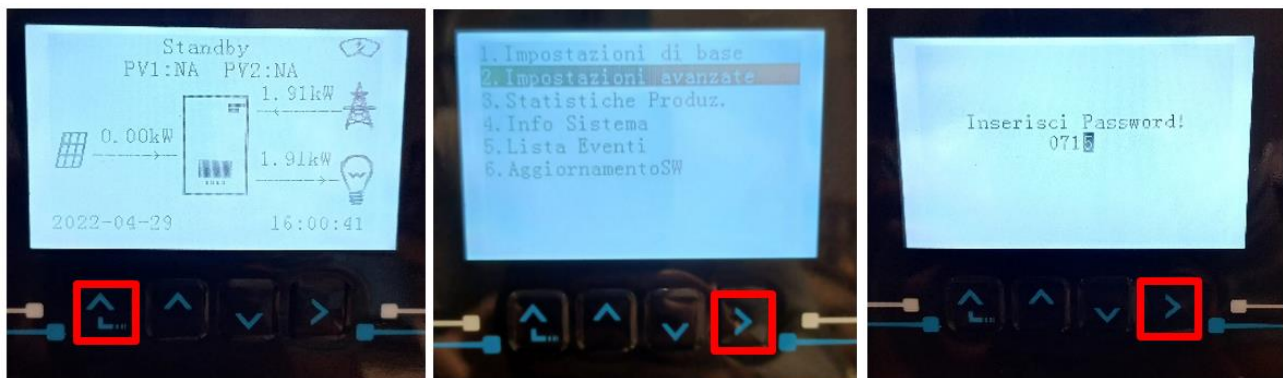


Setting Meter for the exchange power

1. Verify, using the push button  That the Meter is 001. In the Meter display are visible also:
 - ✓ Current;
 - ✓ Voltage;
 - ✓ Power Factor ;
 - ✓ Power.

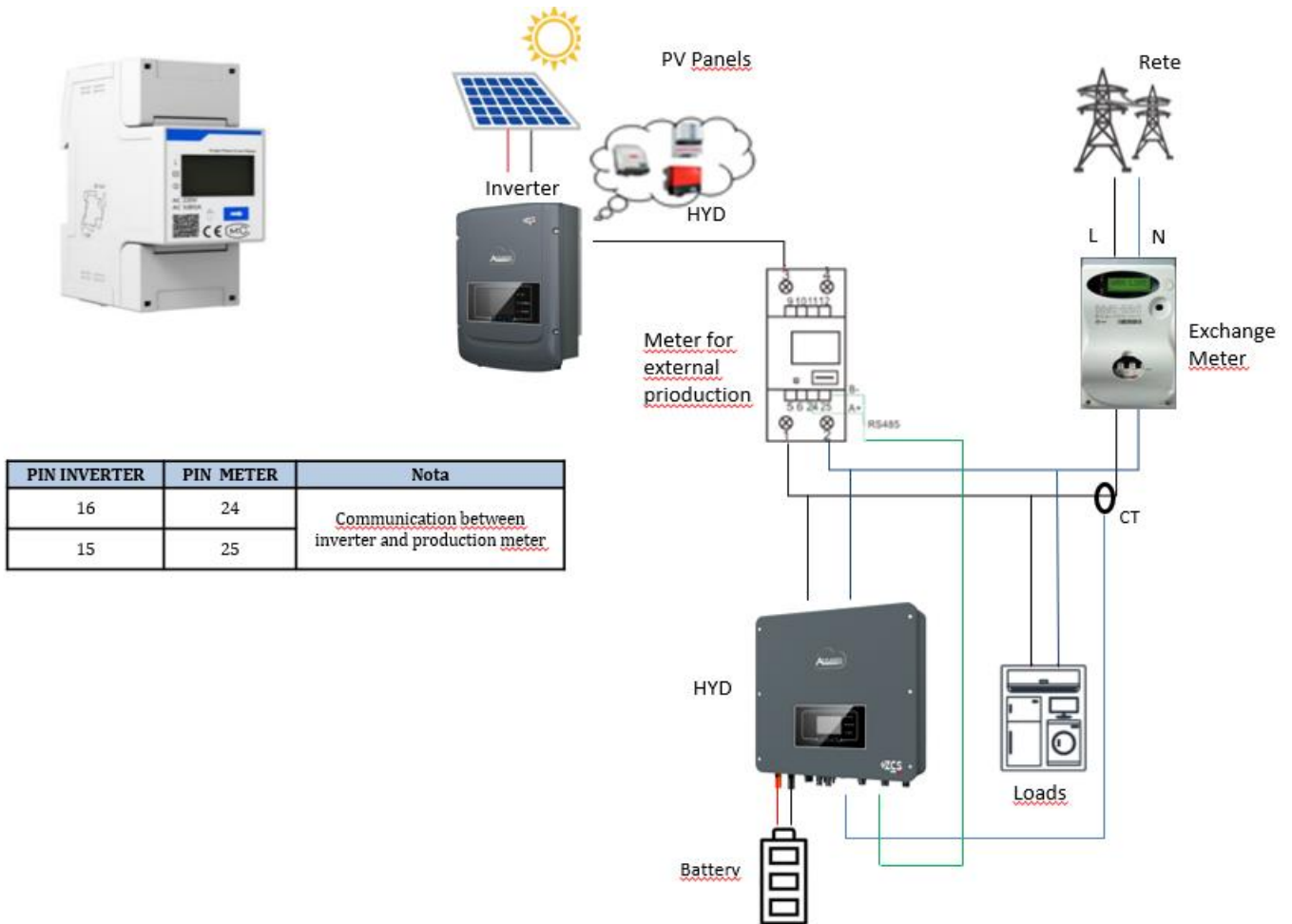


2. In order to configure the meter reading on the inverter is required to access the display (see picture):
 - ✓ Press the first push button on the inverter;
 - ✓ Access the advanced setting on the menu;
 - ✓ Enter the PWD «0715»;
 - ✓ Access submenu 10. Set PCC Meter;
 - ✓ Select Enable;
 - ✓ Press Ok.



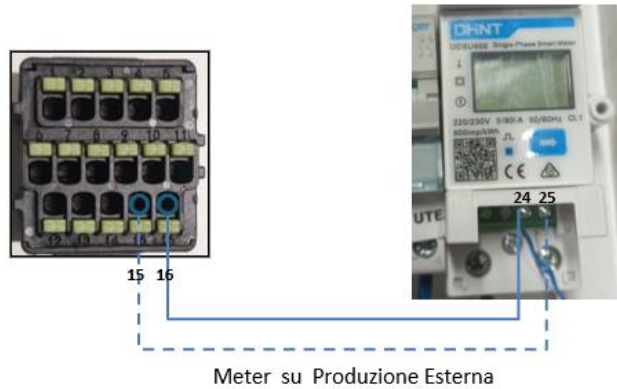


1.6.4. Measurement of external production through Meter

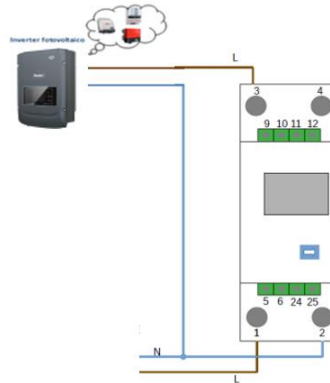


Connections Meter:

1. Connect Meter and inverter through the RS485 port. On the Meter this port is identified by PIN 24 e 25. On the inverter this port is identified by PIN 16 e 15 on the COM connector




2. Connect the Meter as shown in the picture:
 - ✓ Connect Neutral cable (N) to Meter's PIN 2;
 - ✓ Connect phase cable (external inverter side) to Meter's PIN 3
 - ✓ Connect phase cable (loads side) to Meter's PIN 1.



NOTE: for distances between Inverter and Meter above 100 m is recommended to connect in the 485 daysy chain 2 120 Ohm resistors, one between PIN 15 and PIN 16 in the inverter COM port and between PIN 24 and PIN 25 on the meter.



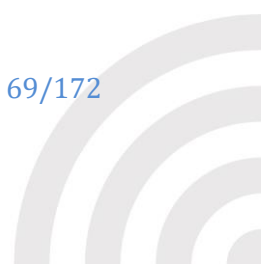
Setting Meter for external production

3. Verify, using the push button  that the Meter is **002**. In the Meter display are visible also:
- ✓ Current;
 - ✓ Voltage;
 - ✓ Power Factor ;
 - ✓ Power.

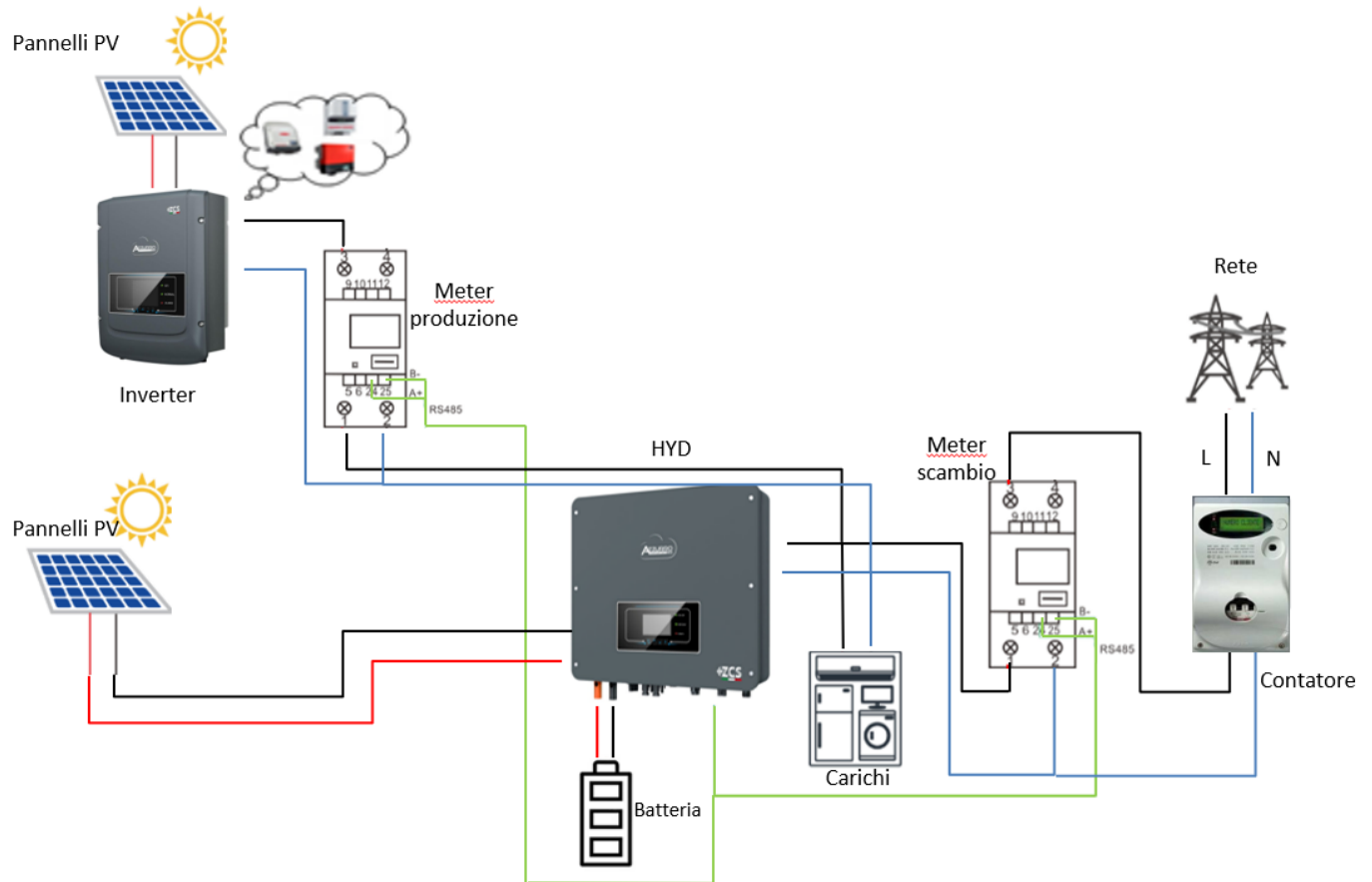


To change the parameters of the Meter and set it to external production:


<p>Press for 5 seconds </p> <p>In order to enter setting menu</p>		<p>The display will <u>alternatively</u> show the <u>procoll</u> and the <u>modbus</u> address.</p>		<p>Once the screen with the <u>modbus</u> address appears press the <u>arrow</u>  to increase the <u>digit</u>.</p>	
--	---	---	--	--	---



1.6.5. Measurement of external production through Meter and the exchange power



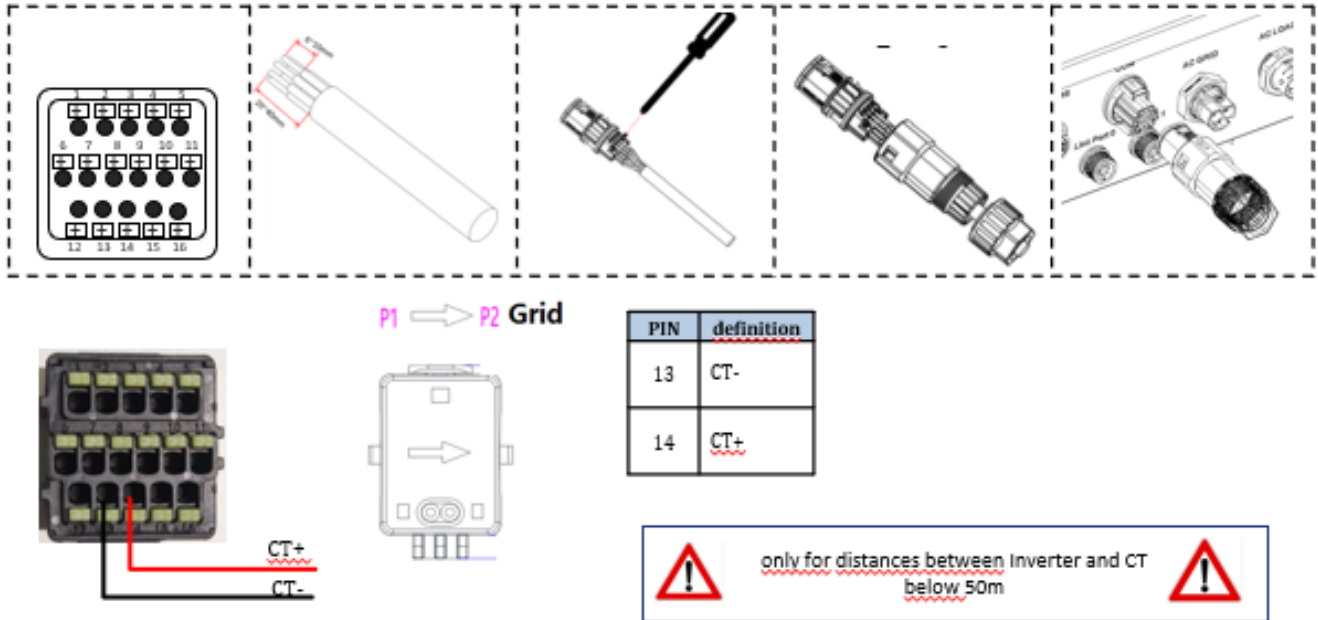
1.6.6. Meter reading verification

In order to verify the correct reading on the exchange meter in required to turn off the PV production, turn on some loads and using the arrow  verify that the Power is consistent with the expected power consumption and the value is Negative (-).



If a Production meter is present in order to verify the correct reading is required to read the power in the display using the Arrow and verify that the value is the same as read in the external solar inverter display and the Value is Positive (+).

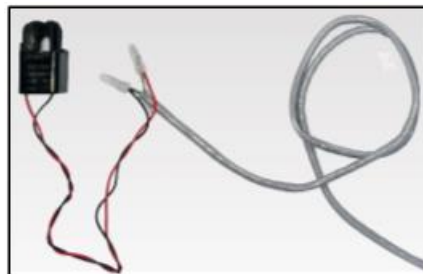
4.7.4. Measurement of the exchange through current sensor

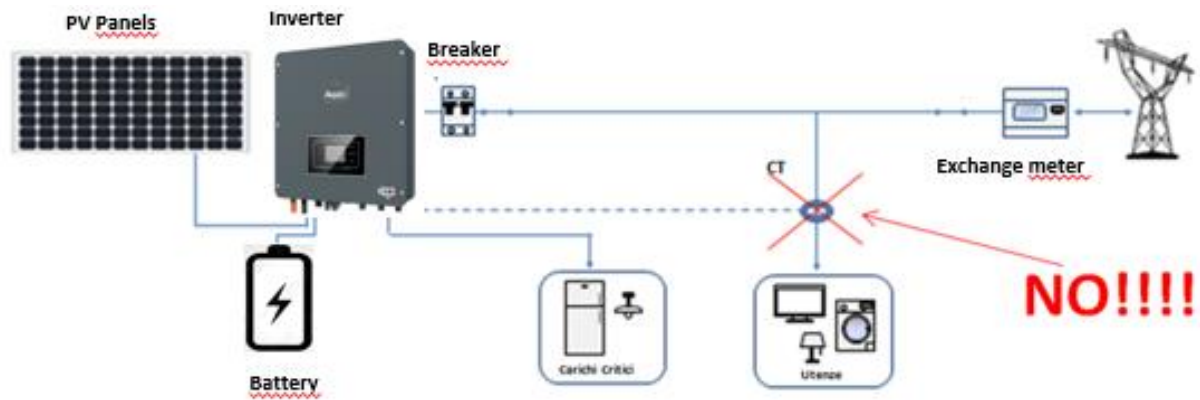
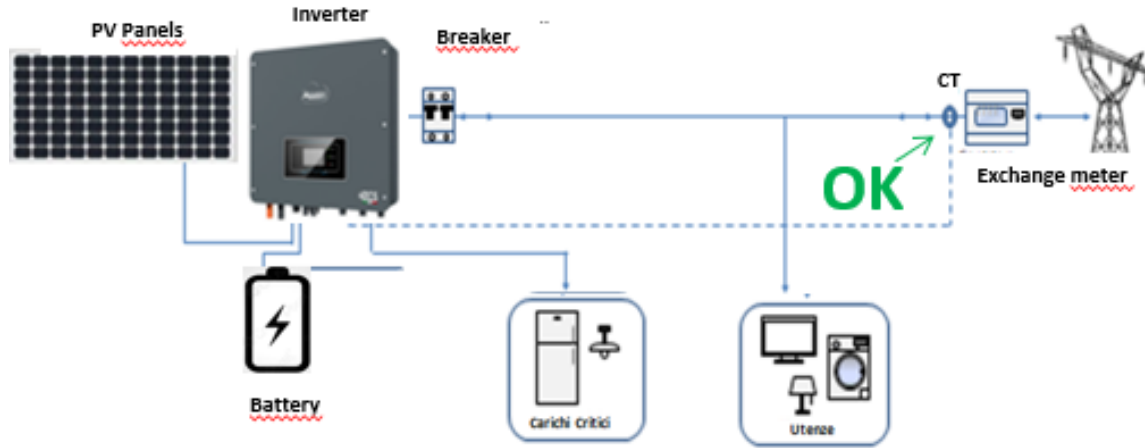


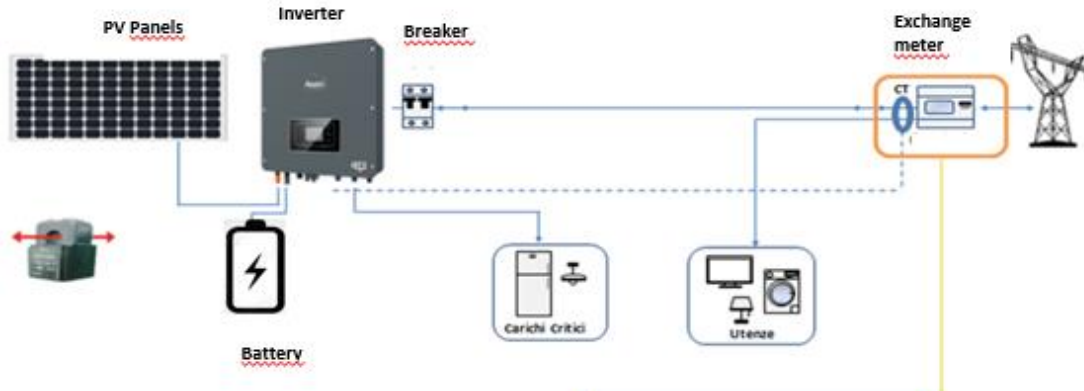
Connect the sensor negative wire in input 13 of the COM connector
 Connect the sensor positive wire in input 14 of the COM connector
 Correct placement of the current sensor:

- **The CT** measure the current exchange with the grid, shall be placed at the utility power meter and include all the phase cable coming out from the meter.
- ✓ The direction of the CT is not important since the system recognize it at the first power on.

For the extension cable is recommended to use a STP cable cat 6 (8 wires) connecting 4 wire to the positive CT terminal and 4 wire to the negative, or a 2x0,5 mm² shielded cable, is recommended to use flexible wire.



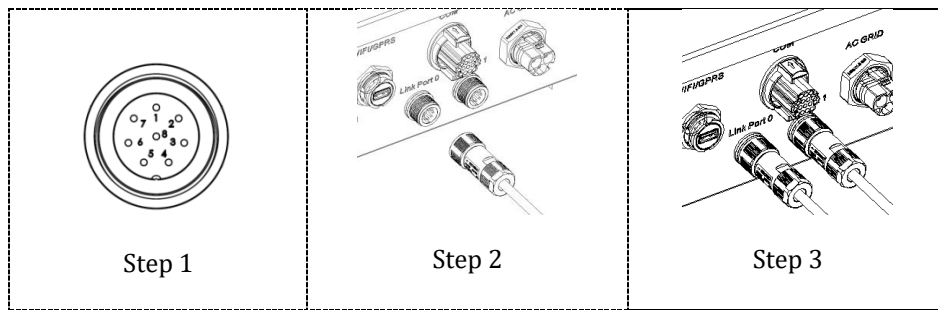




The sensor must include all phase cables entering or leaving the meter.



1.6.7. Link Port 0&1-Cascade communication interface

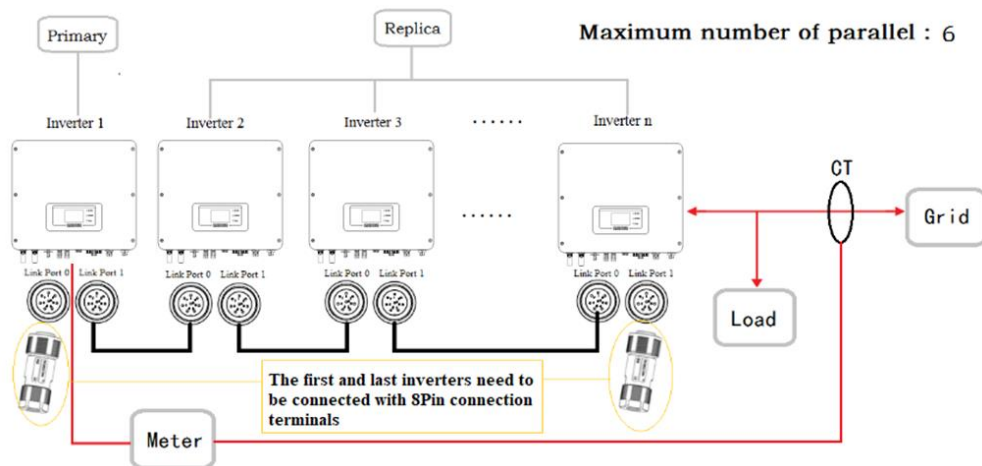


When using the parallel system, the inverter settings and notes please refer to the "Parallel Setting" part of this manual.

Note(AC LOAD is also parallel for parallel machines):

1. The first and last inverters need to be connected with 8Pin connection terminals.

2. The cable length of the AC LOAD terminal connected from the LOAD terminal to each machine shall be consistent with the specification of the cable length, so as to ensure that the loop impedance is consistent and the current of the LOAD current diverted to each machine is nearly equal.
3. When the total power of AC Load is greater than 110% of the rated power of the machine (for example, one inverter AC LOAD has a maximum allowable power of 5.5kVA and six parallel machines AC LOAD has a maximum allowable power of 33kVA), the Load should not be connected to AC Load and should be connected to AC Grid.
4. When inverters in parallel, all AC grid should be shared a total air switch; all AC LOAD should be shared another total air switch .



2. Buttons and indicator lights

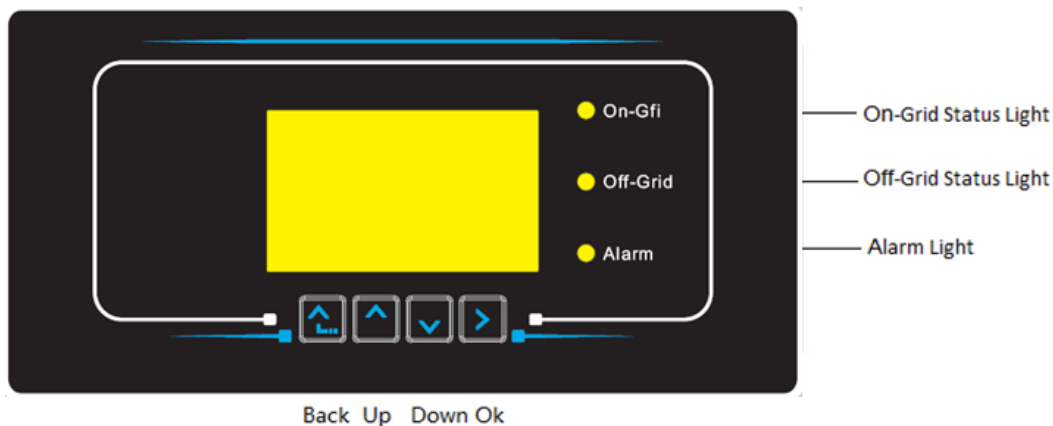


Figure 52 – Buttons and indicator lights

2.1. Buttons:

- Press “Back” to go back to the previous screen or to enter the main interface.
- Press “Up” to enter the upper menu or to increase the value by 1.
- Press “Down” to enter the lower menu or to decrease the value by 1.
- Press “OK” to select the option of the current menu or to move to the next number.

2.2. Indicator lights and operating status

Status	On Grid Green light	Off-Grid Green light	Alarm Red light
On-grid	On		
Standby (On-Grid)	Intermittent		
Off-Grid		On	
Standby (Off-Grid)		Intermittent	
Alarm			On

3. Operation

3.1. Preliminary checks

Before starting the system, please check that:

1. The 1PH HYD3000-HYD6000-ZSS-HP inverter is securely fixed to the mounting bracket;
2. The PV+/PV- cables are securely connected, and the polarity and voltage are correct;
3. The BAT+/BAT- cables are securely connected, and the polarity and voltage are correct;
4. The GRID/LOAD cables are securely/correctly connected;
5. An AC switch is correctly connected between the GRID port of the 1PH HYD3000-HYD6000-ZSS-HP inverter and the grid, and the switch is OFF.
6. An AC switch is correctly connected between the LOAD port of the 1PH HYD3000-HYD6000-ZSS-HP inverter and the critical load, and the switch is OFF.
7. The communication cable for lithium batteries has been correctly connected.

3.2. First start-up of the inverter

1. Make sure that the AC-side switch of the inverter is lowered so that no power is supplied to the device

2. Make sure that the rotating disconnection switch is in the OFF position



Figure 53 - Photovoltaic disconnecting switch

3. Make sure that the utility has a consumption of at least 200 W. Recommended loads for this operation are hair dryers ($800W < P < 1600W$), electric heaters ($1000W < P < 2000W$) and ovens ($P > 1500W$). Other types of loads, such as washing machines or heat pumps, although characterised by high energy consumption, may take some time to reach this level of absorption after starting.

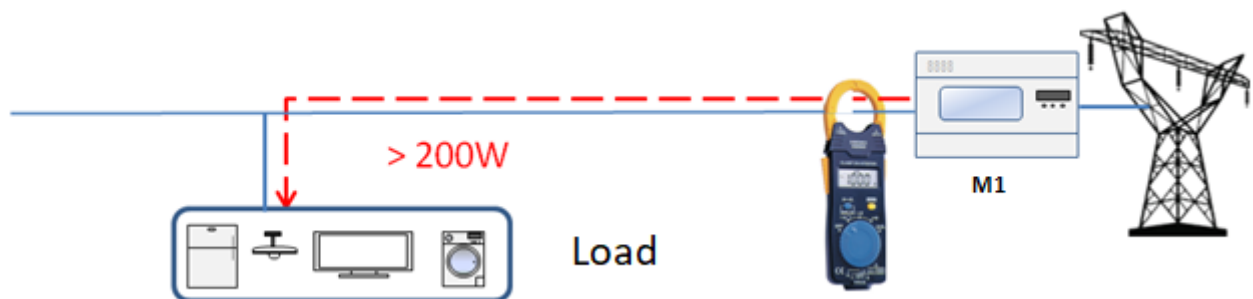


Figure 54 - Checking that the power consumption is above 200W

4. Supply DC power to the inverter by correctly switching on the batteries:
In the case of Pylontech batteries, set the POWER switch of the battery, or (in the case of multiple units) of all the batteries, to I (ON position), then press the red SW button of the master battery for about one second; at this point the LEDs of all the batteries will light up in sequence, and after a few seconds will turn off, except for the RUN indicating LED. After this, wait for the display to turn on.



Figure 55 – Battery status after setting the POWER switch to ON and pressing the SW button

In the case of WeCo and AZZURRO batteries, press the RUN button for about one second; after releasing it, wait for the sound inside the battery indicating the closure of the relay. Repeat the operation for all the subsequent batteries in the system.

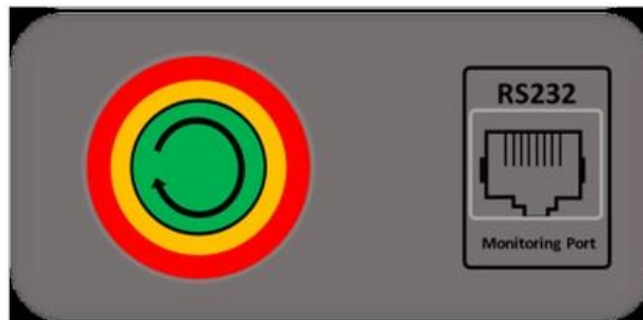


Figure 56 - View of WeCo battery ON button

- Supply AC power through the dedicated protection switch of the storage inverter. If there is more than one switch protecting the inverter (e.g. a circuit breaker and differential switch), they must all be set to ON to allow the inverter to be connected to the grid.



Figure 57 – Example of AC switch protecting the inverter

The following parameters must be configured before the 1PH HYD3000-HYD6000-ZSS-HP inverter starts working.

Parameter	Note
1.OSD Language Option	The default English.
2.System time setting and confirmation	If you are connected to the host computer such as collector or mobile phone APP, the time should have been calibrated to the local time.
*3.Safety parameter import	You need to find the safety parameters file (named after the corresponding safety country) on the website, download it to the USB flash drive, and import it.
*4.Set battery parameters	Default values can be displayed according to the input channel configuration.
5. Setup is complete	

2) Setting of system time

The system time format is “Year-Month-Day-Hour-Minutes-Seconds”, press “Up” or “Down” to change the first number, press “OK” to move to the next number, press “OK” to complete the setting. Once the time has been set, the “Set Country” menu will pop up.

3) Safety parameter

Code		Country	Code	Country			
00	00	Germany	VDE4105	18	00	EU	EN50438
	01		BDEW				01
	02		VDE0126	19	00	IEC EN61727	
01	00	Italia	CEI-021 Internal	20	00	Korea	
	01		CEI-016 Italia	21	00	Sweden	
	02		CEI-021 External	22	00	Europe General	
	03		CEI-021 In Areti	24	00	Cyprus	
02	00	Australia		25	00	India	
	01		AU-WA	26	00	Philippines	
	02		AU-SA	27	00	New Zealand	
	03		AU-VIC	28	00	Brazil	LV
	04		AU-QLD		01		



	05		AU-VAR		02		230
	06		AUSGRID		03		254
	07		Horizon		00		VSD
03	00	Spain	RD1699	29	01	Slovakia	SSE
04	00	Turkey			02		ZSD
05	00	Denmark		33		Ukraine	
	01		TR322	35	00	Mexico	LV
06	00	Greece	Continent	38		Wide-Range-60Hz	
	01		island	39		Ireland EN50438	
07	00	Netherland		40	00	Thailand	PEA
08	00	Belgium			01		MEA
09	00	UK	G99	42	00	LV-Range-50Hz	
	01		G98	44	00	South Africa	
10	00	China		46	00	Dubai	DEWG
	01		Taiwan		01		DEWG MV
11	00	France		107	00	Croatia	
	01		FAR Arrete23	108	00	Lithuania	



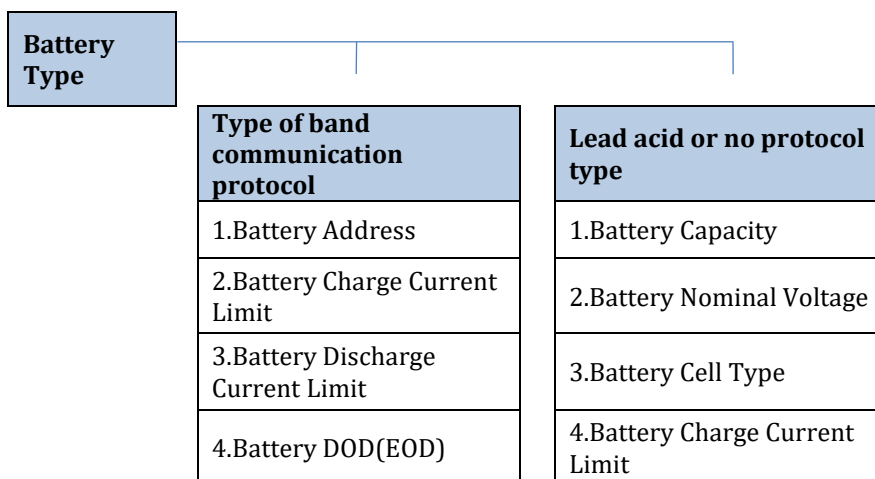
Caution

It is essential to make sure that you have selected the correct country code according to the requirements of the local authority.

For this purpose, consult a professional electrician or qualified personnel from the electrical safety authorities.

ZCS accepts no responsibility for consequences deriving from the selection of an incorrect country code.

4) Select type of battery



5. Battery Discharge Current Limit

6. Battery DOD(EOD)

Press “Up” or “Down” to select the battery type, press “OK” to complete the selection.

3.3. Commissioning

Main interface:

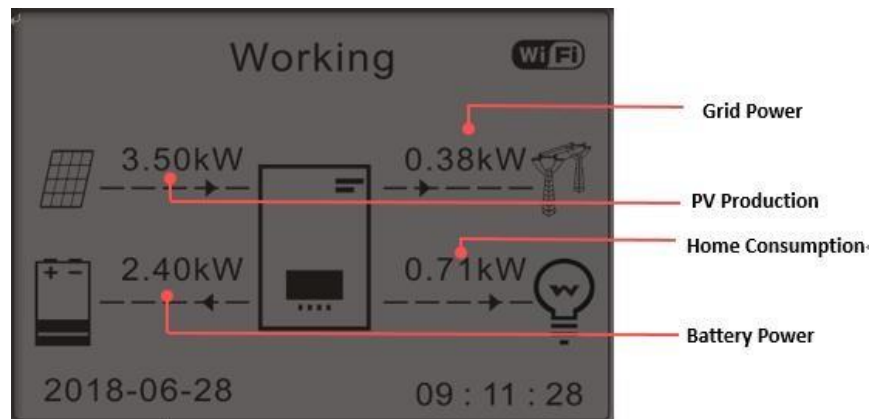


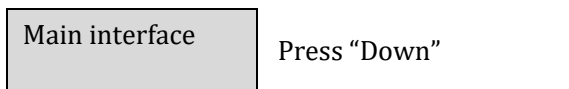
Figure 58 – Main interface

The default setting of the 1PH HYD3000-HYD6000-ZSS-HP inverter is “Self Use Mode” so if the setting has not been changed, the operating mode will be as follows:

- When “Photovoltaic Production” > “Household Consumption”
If the battery is not charged, the 1PH HYD3000-HYD6000-ZSS-HP inverter will charge the battery.
- When “Photovoltaic Production” < “Household Consumption”
If the battery is not discharged, the 1PH HYD3000-HYD6000-ZSS-HP inverter will discharge the battery and provide power to the domestic load.

3.4. Main menu

In the main interface, press the “Down” button to enter the page with the grid/battery settings:



1. Grid(V)
2. Grid(A)
3. Frequency
4. Battery(V)
5. Charge current
6. Discharge current
7. Charge level
8. Battery cycles
9. Battery time

In the main interface, press the “Up” button to enter the page with the photovoltaic settings:

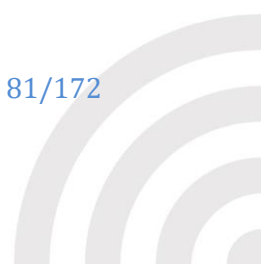
Main interface	Press “OK”
	1. PV1 Voltage
	2. PV1 Current
	3. PV1 Power
	4. PV2 Voltage
	5. PV2 Current
	6. PV2 Power
	7. Inverter Temp.

In the main interface, press “Back” to enter the main menu. The main menu has the following five options:

Main interface	Press “Back”	
	1. Settings	
	2. Advanced settings	
	“Up” ↑	3. Prod. Statistics
	“Down” ↓	4. System Info
	5. Event list	
6. SW Update		

3.4.1. Basic settings

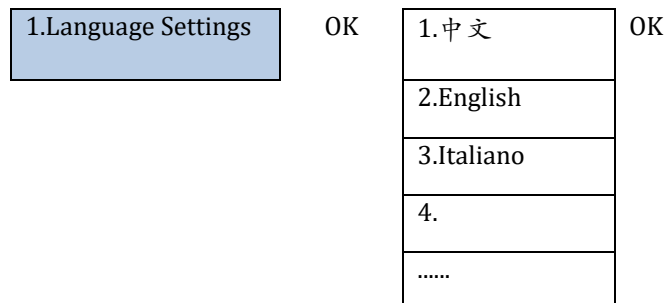
1. Settings	Press “OK”
	1. Language



“Up”↑ “Down” ↓	2. Date and Time
	3. Safety Param.
	4. Energy Storage Mode
	5. Autotest (Only for Italy)
	6. EPS mode
	7. Communication address

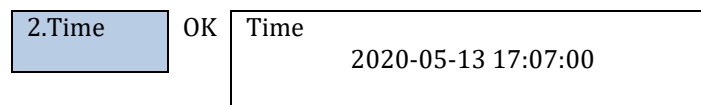
1. Set language

Used to set the menu display language.



2. Set Time

Select “2. Time”, press “OK” to enter the menu for setting the time, the format is Year-Month-Day Hours:Minutes:Seconds.



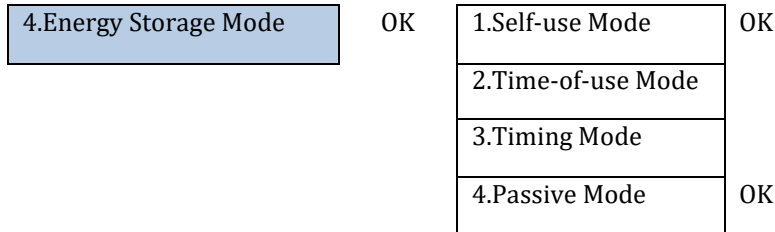
3. Safety Parameter

User can modify the Safety Parameter of the machine through the USB flash disk, and the user needs to copy the parameter information that needs to be modified into the USB flash disk card in advance.

Note: to enable this feature, please contact Zucchetti Centro Sistemi technical support.

4. Energy Storage Mode

Select “4. Energy Storage Mode” and press “OK” to enter the interface for setting the energy storage mode.

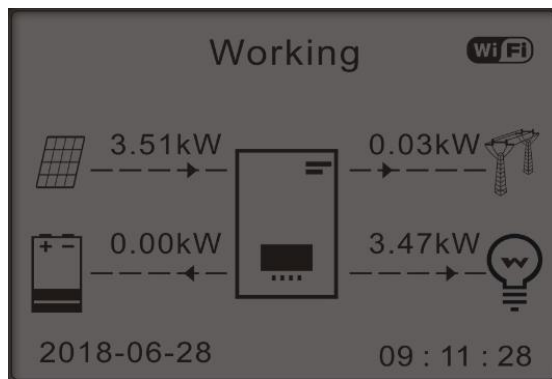


1) Select automatic mode

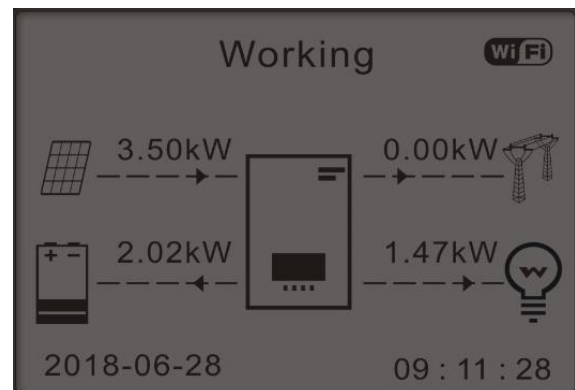
Select “1. Select Self Use Mode,” then press “OK.”

In Self Use Mode, the inverter will automatically charge and discharge the battery.

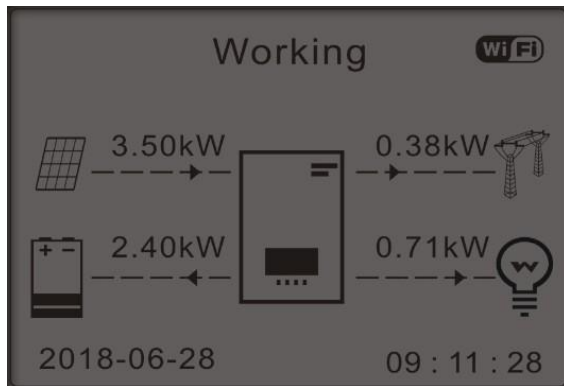
1) If PV production = LOAD consumption ($\Delta P < 100W$) the 1PH HYD3000-HYD6000-ZSS-HP inverter will not charge or discharge the battery.



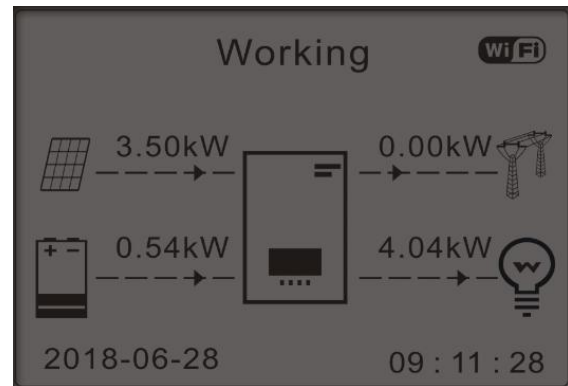
2) If PV production > LOAD consumption, the surplus power will be stored in the battery.



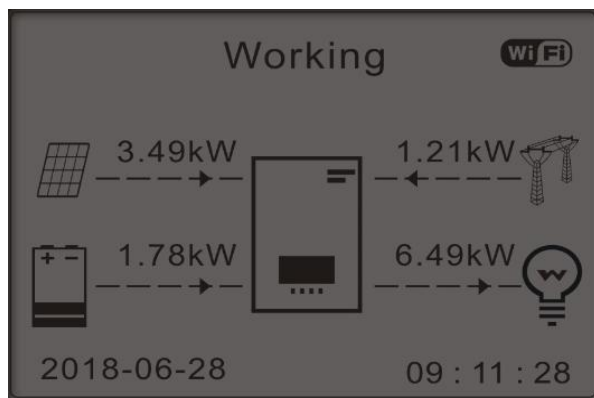
3) If the battery is fully charged (or already at max charge power), the surplus energy will be exported to the grid.



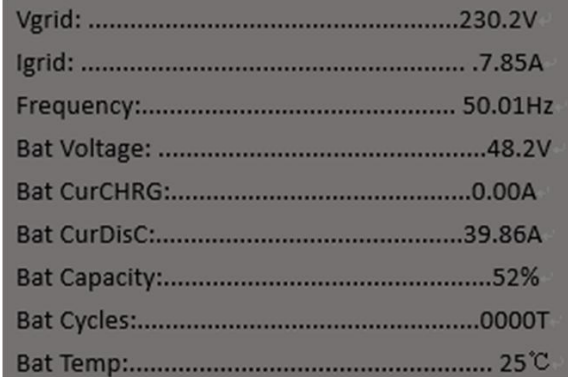
4) If PV production < LOAD consumption, then it will discharge the battery to supply power to the load.



5) If PV production + battery < LOAD consumption, the missing energy to feed the loads will be imported from the grid.



6) Press "DOWN" to display the current grid/battery parameters, press "UP" to go back to the main interface.



2) Time-of-use Mode

If electricity is more expensive in high demand time (peak rate) & electricity is much cheaper in low demand time (off-peak rate).

You can select an off-peak period to charge your battery. Outside the off-peak charge period, inverter is working in Auto Mode.

If your family normally go to work/school on weekdays & stay at home on weekends, which means the home electricity consumption is much higher on weekends. Thus, you need to store some cheap electricity on weekends only. This is possible using our Time-of-use mode.

In summer, if your PV system can produce more electricity than your home electricity consumption. Then you don't need to set an off-peak charge period to charge your battery in summer at all. You can select an effective date (normally winter) for Time-of-use mode in this case. Outside the effective date, inverter is working in Auto Mode.

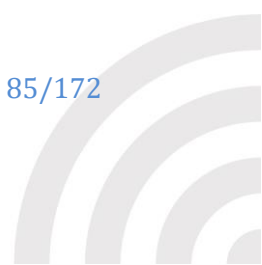
You can set multiple Time-of-use rules to meet your more complex requirement. Right now we support 4 rules maximum (rule 0/1/2/3).

2.Time-of-use Mode	OK	Set Time-of-use Mode			
		Rules. 0:	Enabled/Disabled		
		From	To	SOC	Charge
		02h00m - 04h00m		070%	01000 W
		Effective date			
		Dec. 22	-	Mar. 21	
		Weekday select			
		Mon. Tue. Wed. Thu.			
		Fri. Sat. Sun.			

3) Set Timing Mode

Changing the value of a rule can set multiple timing rules.

3.Timing Mode	OK	Timing Mode	
		Rules. 0:	Enabled/Disabled
		Charge Start	22 h 00 m
		Charge End	05 h 00 m
		Charge Power	02000 W
		DisCharge Start	14 h 00m



DisCharge End	16 h 00m
DisCharge Power	02500 W

4) Passive Mode

For more detailed information, please ask representative of Zucchetti Centro Sistemi S.p.A. to get a copy of passive mode communication protocol.

5. Auto Test (ONLY for Italy)

5.Auto Test	OK	1.Autotest Fast
		2.Autotest STD

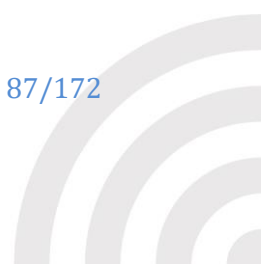
1) Autotest Fast

1. Autotest Fast	OK	Start Autotest	Press "Ok" to start
		Testing 59.S1...	Wait
		↓	
		Test 59.S1 OK!	Wait
		↓	
		Testing 59.S2...	Wait
		↓	
		Test 59.S2 OK!	Wait
		↓	
		Testing 27.S1...	Wait
		↓	
		Test 27.S1 OK!	Wait
		↓	
		Testing 27.S2...	Wait
		↓	
		Test 27.S2 OK!	Wait
		↓	
Testing 81>S1...	Wait		
↓			
Test 81>S1 OK!	Wait		
↓			



Testing 81>S2...	
↓	Wait
Test 81>S2 OK!	
↓	Wait
Testing 81<S1...	
↓	Wait
Test 81<S1 OK!	
↓	Wait
Testing 81<S2...	
↓	Wait
Test 81<S2 OK!	
↓	Press "Ok"
Auto Test OK!	
↓	Press "Down"
59.S1 threshold 253V 900ms	
↓	Press "Down"
59.S1: 228V 902ms	
↓	Press "Down"
59.S2 threshold 264.5V 200ms	
↓	Press "Down"
59.S2: 229V 204ms	
↓	Press "Down"
27.S1 threshold 195.5V 1500ms	
↓	Press "Down"
27.S1: 228V 1500ms	
↓	Press "Down"
27.S2 threshold 34.5V 200ms	
↓	Press "Down"
27.S2: 227V 205ms	
↓	Press "Down"
81>.S1 threshold 50.5Hz 100ms	
↓	Press "Down"
81>.S1 49.9Hz 103ms	
↓	Press "Down"
81>.S2 threshold 51.5Hz 100ms	
↓	Press "Down"
81>.S2 49.9Hz 107ms	
↓	Press "Down"
81<.S1 threshold 49.5Hz 100ms	
↓	Press "Down"
81<.S1 50.0Hz 105ms	
↓	Press "Down"
81<.S2 threshold 47.5Hz 100ms	
↓	Press "Down"
81<.S2 50.1Hz 107ms	

2) Autotest STD



2.Autotest STD

Press OK to start

The test procedure is same as Autotest Fast, but it's much more time consuming.

- PF Time Setting

Select "PF Time Setting", then press "OK". The following will appear on the screen:

Set: *.*** s

Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing all the digits, press "OK".

- QV Time Setting

Select "QV Time Setting", then press "OK". The following will appear on the screen:

Set: ** s

Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing all the digits, press "OK".

- Control 81.S1

Select "Control 81.S1" and press "OK." Press "Up" or "Down" to "Enable 81.S1" or "Disable 81.S1", press "OK."

6. EPS Mode

The EPS mode allows enabling the EPS output for critical loads.

6.EPS Mode

OK

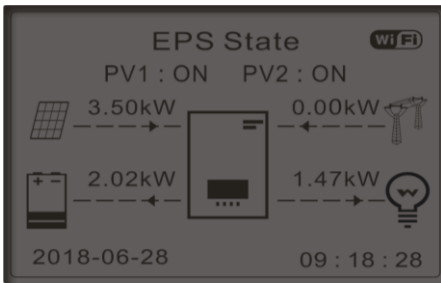
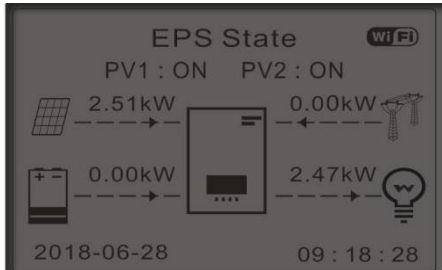
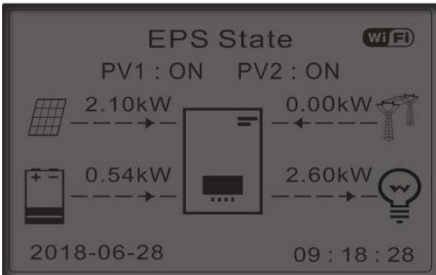
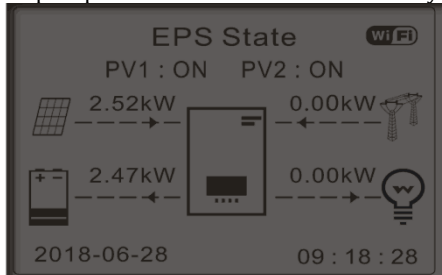
1.EPS Mode Control

OK

1.Enable EPS Mode

OK

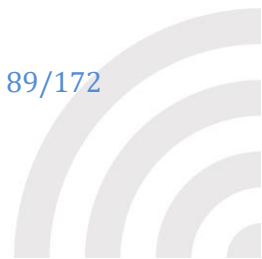
2.Disable EPS Mode

<p>1) If PV generation > LOAD consumption ($\Delta P > 100W$), inverter will charge battery.</p> 	<p>2) If PV generation = LOAD consumption, inverter won't charge or discharge battery.</p> 
<p>3) If PV generation < LOAD consumption ($\Delta P > 100W$), inverter will discharge battery.</p> 	<p>4) If PV generation is normal, but LOAD consumption=0, the surplus power will be stored in the battery.</p> 

7. Communication address

Select "Communication Address", then press "OK". Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing the communication address-485 (**default: 01**), press "OK".

7.Communication Addr	OK	1.Communication Addr	OK
		2.Baud Rate	OK



3.4.2. Advanced settings

2.Advanced setting	OK	Input 0001
		1.Battery Parameter
		2.Anti Reflux
		3.IV Curve Scan
		4.Logic interface
		5.Factory Reset
		6.Parallel setting
		7.Bluetooth Reset
		8.CT Calibration

Select “Advanced Settings” and press “OK”, “Enter password” appears. Enter the password “0715”, press “Up” or “Down” to change the first digit, press “OK” to move to the next digit, when “0715” appears on the screen press “OK” to enter the “Advanced Settings” interface.

If “Wrong, Try Again” appears on the screen, press “Back” and enter the password again.

1) Battery parameters

1.Battery Parameter	OK	1.Battery Type	5.Max Charge (A)
		2.Battery Capacity	6.Max Discharge (A)
		3.Nominal Bat Voltage	7.*Discharg Depth
		4.Battery Cell Type	8.Save

OK

- Depth of Discharge

For example: if Discharge Depth = 50% & EPS Discharge Depth = 80%.

While grid is connected: Inverter won't discharge the battery when its SOC is less than 50%.

In case of blackout: Inverter will work in EPS mode (if EPS mode is enabled) & keep discharging the battery till battery SOC is less than 20%.

7.Depth of Discharge	OK	Discharge Depth 50%
		EPS Discharge Depth 80%
		EPS Restore Depth 20%

2) Anti Reflux

The user can enable “Anti Reflux Control” to limit the max export power to grid Reflux Power set is desired max export power to grid.

2.Anti Reflux	OK	1.Anti Reflux Control	OK	Enable
		2.Reflux Power	OK	Disable
				***KW

3) IV Curve Scan

The user can enable “IV Curve Scan” (MPPT scan) to make inverter to find the global max power point periodically to deliver max power from a partially shaded PV array.

The user can input scan period or make inverter to perform a scan right away.

3.IV Curve Scan	OK	1.Scan Control	OK	Enable
		2.Scan Period	OK	Disable
				***min

3.Force Scan OK

4) Logic interface Control

This feature must be disabled.

4.Logic interface Control OK

Enable	OK
Disable	OK

5) Factory Reset

5.Factory Reset OK

1.Clear Energy Data	OK
2.Clear Events	OK

Clean the inverter of the total power generation.

1.Clear Energy Data OK

Input password OK **Input 0001**

Clean up the historical events recorded in the inverter.

2..Clear Events OK

Clear Events? OK

6) Parallel setting

Please Link Port 0&1-Cascade communication interface for the connection method of the parallel system.

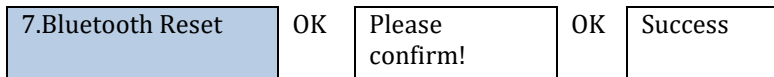
6.Parallel setting OK

1.Parallel Control
2.Parallel Primary-Replica
3.Parallel Address

4.Save

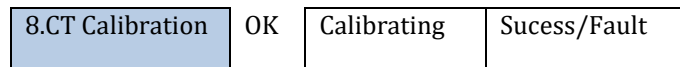
- Parallel Control: Enable or disable parallel functions. Both the master and the slave must enable this function.
- Parallel Primary-Replica: Set up the Primary and Replica. Select one inverter as the Primary and set the others to Replica.
- Parallel Address: Set the parallel address. Each inverter needs to set a parallel address, and the parallel address in a parallel system cannot be repeated. (NOTE: The parallel address is different from the communication address used for monitoring).
- Save: Save after the setup is complete.

7) Bluetooth Reset



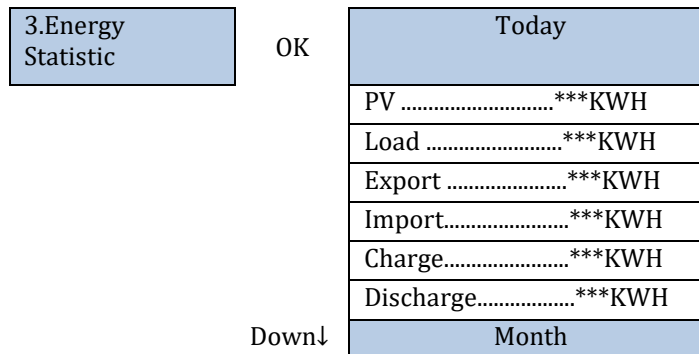
8) CT Calibration

To calibrate the direction and phase of the CT, the battery should be charged or discharged when using this function.



Check if the battery is charging or discharging when calibration fails.

3.4.3. Energy Statistic



	PV***KWH
	Load***KWH
	Export***KWH
	Import.....***KWH
	Charge.....***KWH
	Discharge.....***KWH
Down↓	Year
	PV***KWH
	Load***KWH
	Export***KWH
	Import.....***KWH
	Charge.....***KWH
	Discharge.....***KWH
Down↓	Lifetime
	PV***KWH
	Load***KWH
	Export***KWH
	Import.....***KWH
	Charge.....***KWH
	Discharge.....***KWH

3.4.4. System information

4.System information	OK	1.Inverter Info
		2.Battery Info
		3.Safety Param.

1.Inverter Info	OK	Inverter Info (1)
		Product SN
		Software Version
		DSP1 Software Version
		DSP2 Software Version
	Down↓	Inverter Info (2)
		Hardware Version
		Power Level
		Country





Down↓	Inverter Info (3)
	PV Input Mode
	Energy Storage Mode
	RS485 Address
	EPS Mode
Down↓	Inverter Info (4)
	IV Curve Scan
	Logic Interface Control
	PF Time Setting
	QV Time Setting
Down↓	Inverter Info (5)
	Power Factor
	Anti Reflux
	Insulation resistance

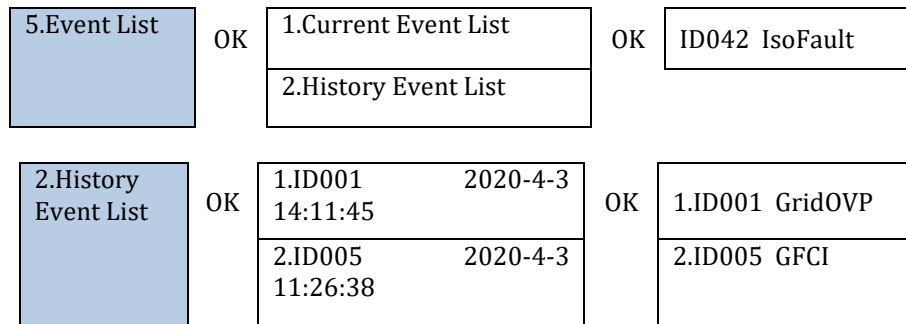
2.Battery Info	OK	Battery1/2 info(1)
		Battery Type
		Battery Capacity
		Over (V) Protection
		Discharge Depth
	Down↓	Inverter1/2 Info (2)
		Max Charge (A)
		Max Charge (V)
		Max Discharge (A)
		Min Discharge (V)
	Down↓	Inverter1/2 Info (3)
		Low(V)Protection

3.Safety Param.	OK	Safety Param.(1)
		OVP 1
		OVP 2
		UVP 1
		UVP 2
	Down↓	Safety Param. (2)
		OFP 1
		OFP 2
		UFP 1
		UFP 2
	Down↓	Safety Param. (3)
		OVP 10mins



3.4.5. Event List

Event List is used to display the real-time event records, including the total number of events and each specific ID No. and happening time. User can enter Event List interface through main interface to check details of real-time event records, Event will be listed by the happening time, and recent events will be listed in the front.



3.4.6. Software Update

1PH HYD3000-HYD6000-ZSS-HP inverters offer software upgrade via USB flash drive to maximize inverter performance and avoid inverter operation error caused by software bugs.

Upgrade file folder name is firmwareHYD-EP. The three upgrade file names are HYD-EP_ARM.bin, HYD-EP_DSPM.bin, HYD-EP_DSPS.bin.

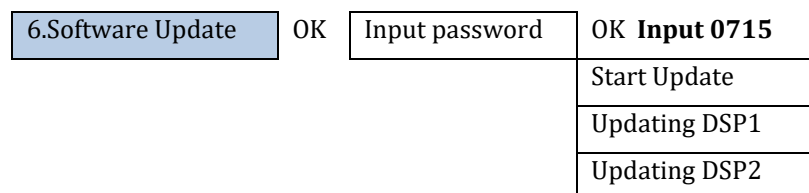
Step 1: Insert the USB flash drive into the compute.

Step 2: Inside the website <https://www.zcsazzurro.com/it/> you will find the latest version of the software to carry out the update.. After user receive the file, please decompressing file and cover the original file in USB flash drive.

Step 3: Insert the USB flash drive into the USB/Wifi interface.

Step 4: Then turn on DC switch.

Step 5:



Updating ARM

Step 6: If the following errors occur, please upgrade again. If this continues many times, contact technical support for help.

USB Fault	MDSP File Error	SDSP File Error
ARM File Error	Update DSP1 Fail	Update DSP2 Fail
Update ARM Fail		

Step 7: After the update is completed, turn off the DC breaker, wait for the LCD screen to extinguish, then restore the WiFi connection and then turn on the DC breaker and AC breaker again, the inverter will enter the running state. User can check the current software version in SystemInfo>>SoftVersion.

4. Verification of proper functioning

To check the proper functioning of the inverter, follow these steps:

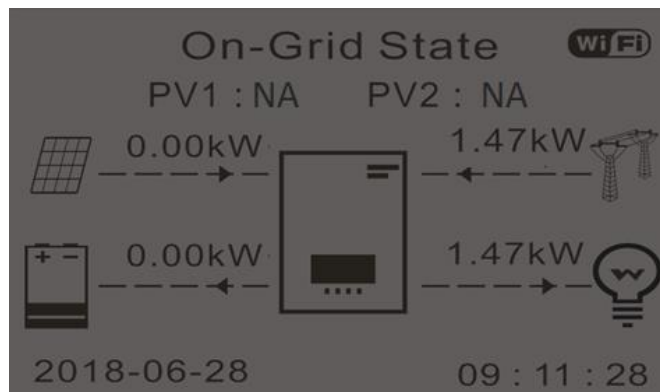
1. Switch off any source of photovoltaic generation by turning the circuit breaker to the OFF position.
2. Lower the protection switch of the 1PH HYD3000-HYD6000-ZSS-HP inverter. The inverter will remain switched on but will go into error due to a lack of AC power (if the EPS function is enabled, it will feed the priority loads).



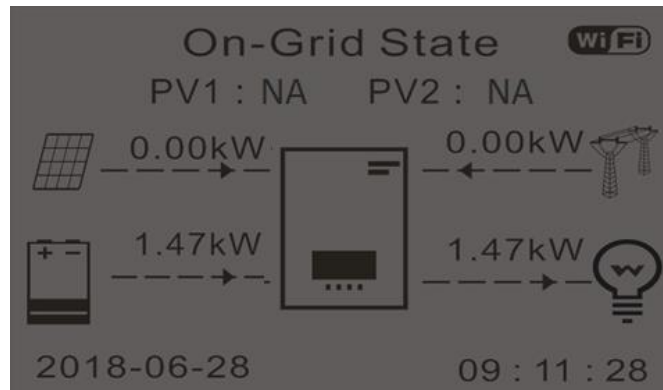
3. Power up the inverter by pulling up the AC switch.



4. After pulling up the AC switch, the countdown will start according to the country code set (for CEI021-Internal, it will be 300s) to reconnect to the grid. During this period, check that the household loads are only powered by the grid and that there are no other power flows from either the photovoltaic system or the battery.



5. Once the countdown is over, the batteries will start to deliver power according to the availability towards the utility, trying to reset the consumption from the grid. During this period, check that the
 - a. value of the consumption remains constant* as the power supplied by the battery increases during discharge.
 - b. The power taken from the grid should decrease by an amount equal to the power supplied by the battery.

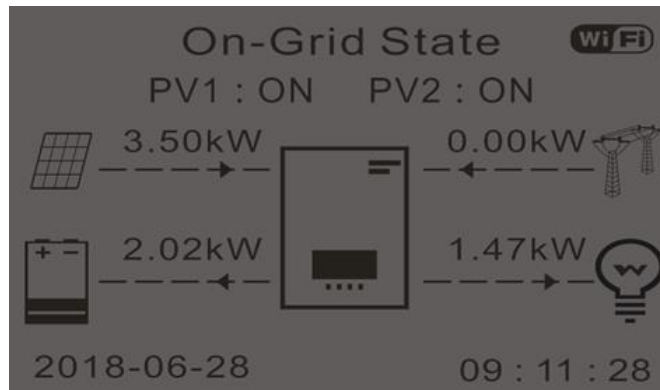


6. Switch on the photovoltaic system by turning the switch to the ON position.



7. Once the photovoltaic system has been activated, check that:

- a. The value of consumption shown on the screen remains constant as the photovoltaic power increases.
- b. Depending on the photovoltaic production, the system will operate according to its working mode.
- c. The value of PV production shown on the display is in line with the real photovoltaic production visible on the photovoltaic inverter.



8. If the above are not verified, check the positioning of the CTs and the direction by consulting the correct installation and initial start-up procedures.

4.1. Checking the settings

1. Below is a summary of all the settings on the device, which you can find in the system info menu. In particular, it is necessary to check that the parameters circled in red are correct. To access this menu, from the main screen:

- 1.1. Press the first key from the left;
- 1.2. Press the third ↓ key twice;
- 1.3. Enter the “System Info” menu by pressing the fourth key;
- 1.4. To scroll through the images, press the third ↓ key.

Info Sistema (1)	Inverter Info(2)
Seriale : ZE1ES330J28307 Versione Software : V2.00 Versione Hardware : V1.00 Livello di potenza: 3kW	Paese : CEI-021 Internal Codice Servizio V2.10 Modalità Ingresso PV: Indipendente Modalità di Lavoro: Modalità automatica

Country: Check that the country code is correct for the regulation in force

PV Input Mode : Check that the correct setting has been set according to the system configuration.

Working mode: in order to minimise exchanges with the grid, the correct mode will be “Automatic Mode.”

Inverter Info(3)		Info Sistema (4)	
Indirizzo RS485 :	01	Controllo DRMs0 :	Disabilitato
EPS :	Disabilitato	Imposta tempo PF :	DFLT : 0.000s SET : 0.000s
Scansione Curva IV :	Disabilitato	Imposta tempo QV :	DFLT : 3.0s SET : 3.0s
Modalità 0 Immissione :	Disabilitato	Fattore Potenza :	100%

RS485 Address: check that it has a value of 01 so that you can monitor your systems via the app or website.

EPS: check that the setting is enabled when using EPS mode.

IV Curve Scan: to be enabled if there is constant shading on the panels.

0 In-feed Mode: to be enabled if you want to avoid feeding into the grid.

DRMs0 Control (or Logical Interface): it must be disabled.

Info Sistema (5)	
Batteria attiva :	Disabilitato
Direzione CT :	Unfrozen
Insulation resistance :	7000KOhm

CT Direction: check the blocking status of the CTs.

Insulation resistance: check that the value of the insulation resistance is higher than the limits imposed by the standard.

Info Batteria (1)		Info Batteria (1)	
Tipo Batteria :	Pylon	Tipo Batteria :	WeCoHeSU V0.3.54
Capacità Batteria :	50Ah	Capacità Batteria :	86Ah
Profondità Scarica :	80% (EPS) 80%	Profondità Scarica :	80% (EPS) 90%
Corr. Carica max (A) :	BMS : 25.00A SET : 65.00A	Corr. Carica max (A) :	BMS : 65.00A SET : 65.00A

Battery type: check if the battery model on the display is consistent with the batteries installed.

Battery capacity: the system will show the total capacity of the batteries:

- 1 Pylontech → 50 Ah;
- 2 Pylontech → 100Ah
- n Pylontech → n x 50Ah
- 1 WeCo → 86 Ah;



- 2 WeCo → 172Ah
- n WeCo → n x 86Ah

- 1 AZZURRO → 100 Ah;
- 2 AZZURRO → 200Ah
- n AZZURRO → n x 100Ah

Depth of discharge: check the depth of discharge values set in On-grid and EPS mode.

Info Batteria (2)		Info Batteria (2)		Info Batteria (3)	
Soglia sovratensione :	54.0V	Soglia sovratensione :	59.3V	EPS Safety Buffer:	10%
Soglia carica max (V) :	53.2V	Soglia carica max (V) :	58.4V		
Corr. max Scarica (A) :		Corr. max Scarica (A) :			
BMS : 25.00A SET : 65.00A		BMS : 65.00A SET : 65.00A			
Tensione min scarica :	47.0V	Tensione min scarica :	48.0V		





5. Technical specifications

TECHNICAL DATA	1PH HYD 3000 ZSS HP	1PH HYD 3600 ZSS HP	1PH HYD 4000 ZSS HP	1PH HYD 4600 ZSS HP	1PH HYD 5000 ZSS HP	1PH HYD 6000 ZSS HP
DC input data (photovoltaic)						
Typical DC power*	4500 W	5400 W	6000 W	6900	7500 W	9000 W
Maximum DC power for each MPPT	3500W (270V-520V)					
No. of independent MPPTs / No. of strings per MPPT	2/1					
Maximum input voltage	600V					
Start-up voltage	100V					
Rated input voltage	360V					
MPPT DC voltage range	90V-580V					
DC voltage range at full load	160V-520V	180V-520V	200V-520V	230V-520V	250V-520V	300V-520V
Maximum input current for each MPPT	13A/13A					
Maximum absolute current for each MPPT	18A/18A					
Battery connection data						
Type of compatible battery	Lithium-ion (supplied by Zucchetti)					
Rated voltage	48V					
Allowable voltage range	42V-58V					
Maximum charge/discharge power	5000W/3000W	5000W/3600W	5000W/4000W	5000W/4600W	5000W/5000W	
Allowable temperature range**	-10°C/+50°C					
Maximum charge current	100A (programmable)					
Maximum discharge current	100A (programmable)					
Charge curve	Managed by the battery's BMS					
Depth of Discharge (DoD)	0%-90% (programmable)					
AC output (grid side)						
Rated power	3000 W	3680 W	4000 W	4600 W	5000 W	6000 W
Maximum Power	3300VA	3680VA	4400VA	4600VA	5500VA	6000VA
Maximum current	15A	16A	20A	20.9A	25A	27.3A
Connection type/Rated voltage	Single-phase L/N/PE 220, 230, 240V					
AC voltage range	180V-276V (according to the local standards)					
Rated frequency	50Hz/60Hz					
AC frequency range	44Hz -55Hz / 54Hz -66Hz (according to the local standards)					
Total harmonic distortion	< 3%					
Power factor	1 default (Programmable +/- 0.8)					
Grid feed-in limit	Programmable from display					
EPS Output (Emergency Power Supply)						
Maximum power supplied in EPS mode***	3000VA (3600VA for 60s)	3680VA (4400VA for 60s)	4000VA (4800VA for 60s)	4600VA (5520VA for 60s)	5000VA (6000VA for 60s)	
EPS output voltage and frequency	Single-phase 230V 50Hz/60Hz					
Current supplied in EPS mode	13.6A	16A	18.2A	20.9A	22.7A	
Total harmonic distortion	< 3%					
Switch time	< 10ms					
Efficiency						
Maximum efficiency	97.6%				97.8%	98.0%
Weighted efficiency (EURO)	97.2%				97.3%	97.5%
MPPT efficiency	>99.9%					
Maximum battery charge/discharge efficiency	94.6%					
Consumption in stand-by	< 10W					
Protections						
Internal interface protection	Yes					
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring					
Reverse polarity protection DC	Yes					
DC circuit breaker	Integrated					
Overheating protection	Yes					
Overvoltage category/Protection class	Overvoltage Category III / Protection class I					
Integrated dischargers	AC/DC MOV: Type 3 Standard					
Battery soft start	Yes					
Standard						
EMC	EN 61000-3-2/3/11/12, EN 61000-6-2/3					
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2					
Grid connection standard	Connection certificates and standards available on www.zcsazzurro.com					
Communication						
Communication interfaces	Wi-Fi/4G/Ethernet (optional), RS485 (proprietary protocol), USB, CAN 2.0 (for battery connection)					
Additional inputs or connections	Input for current sensor connection or meter					
General information						
Allowable ambient temperature range	-30°C...+60°C (power limit above 45°C)					
Topology	Transformerless / High-frequency isolation battery output					
Environmental protection class	IP65					
Allowable relative humidity range	0%.....95% non-condensing					
Maximum operating altitude	4000m					
Noise level	< 25dB @ 1mt					
Weight	22.5Kg					
Cooling	Natural convection					
Dimensions (H x L x D)	482mm x 503mm x 183mm					
Display	LED display and APP					
Warranty	10 years					

* The typical DC power does not represent a maximum applicable power limit. The online configurator available at www.zcsazzurro.com will provide any applicable configurations.

** Standard value for lithium batteries; maximum operating range between +10°C and +40°C

*** Power output in EPS mode depends on the number and type of batteries, and the status of the system (e.g. residual capacity, temperature)

6. Troubleshooting

Code	Name	Description	Solution
ID001	GridOVP	The grid voltage is too high	<p>If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. Inverter will automatically return to normal operating status when the electric grid's back to normal.</p> <p>If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If yes, please check the AC circuit breaker and AC wiring of the inverter.</p> <p>If the grid voltage/frequency is NOT within the acceptable range and AC wiring is correct, but the alarm occurs repeatedly, contact technical support to change the grid over-voltage, under-voltage, over-frequency, under-frequency protection points after obtaining approval from the local electrical grid operator.</p>
ID002	GridUVP	The grid voltage is too low	
ID003	GridOFP	The grid frequency is too high	
ID004	GridUFP	The grid frequency is too low	
ID005	GFCI	Charge Leakage Fault	
ID006	OVRT fault	OVRT function is faulty	



ID007	LVRT fault	LVRT function is faulty
ID008	IslandFault	Island protection error
ID009	GridOVPIstant1	Transient overvoltage of grid voltage 1
ID010	GridOVPIstant2	Transient overvoltage of grid voltage 2
ID011	VGridLineFault	Power grid line voltage error
ID012	InvOVP	Inverter voltage overvoltage
ID017	HwADFaultIGrid	Power grid current sampling error





ID018	HwADFaultDCI	Wrong sampling of dc component of grid current
ID019	HwADFaultVGrid(DC)	Power grid voltage sampling error (DC)
ID020	HwADFaultVGrid(AC)	Power grid voltage sampling error (AC)
ID021	GFCIDeviceFault(DC)	Leakage current sampling error (DC)
ID022	GFCIDeviceFault(AC)	Leakage current sampling error (AC)
ID023	HwADFaultDCV	Error in dc component sampling of load voltage
ID024	HwADFaultIdc	Dc input current sampling error





ID029	ConsistentFault_GFCI	Leakage current consistency error
ID030	ConsistentFault_Vgrid	Grid voltage consistency error
ID033	SpiCommFault(DC)	SPI communication error (DC)
ID034	SpiCommFault(AC)	SPI communication error (AC)
ID035	SChip_Fault	Chip error (DC)
ID036	MChip_Fault	Chip error (AC)
ID037	HwAuxPowerFault	Auxiliary power error



ID041	RelayFail	Relay detection failure	
ID042	IsoFault	Low insulation impedance	Check the insulation resistance between the photovoltaic array and ground (ground), if there is a short circuit, the fault should be repaired in time.
ID043	PEConnectFault	Ground fault	Check ac output PE wire for grounding.
ID044	PvConfigError	Error setting input mode	Check the PV input mode (parallel/independent mode) settings for the inverter. If not, change the PV input mode.
ID045	CTDisconnect	CT error	Check whether the CT wiring is correct.
ID048	FanFault	FanFault	Please check whether the fan 1 of inverter is running normally.
ID049	TempFault_Bat	Battery temperature protection	Make sure the inverter is installed where there is no direct sunlight. Please ensure that the inverter is installed in a cool/well ventilated place. Ensure the inverter is installed vertically and the ambient temperature is below the inverter temperature limit.

ID050	TempFault_HeatSink1	Radiator 1 temperature protection
ID051	TempFault_HeatSink2	Radiator 2 temperature protection
ID052	TempFault_HeatSin3	Radiator 3 temperature protection
ID053	TempFault_HeatSink4	Radiator 4 temperature protection
ID054	TempFault_HeatSin5	Radiator 5 temperature protection
ID055	TempFault_HeatSin6	Radiator 6 temperature protection
ID057	TempFault_Env1	Ambient temperature 1 protection



ID058	TempFault_Env2	Ambient temperature 2 protection	
ID059	TempFault_Inv1	Module 1 temperature protection	
ID060	TempFault_Inv2	Module 2 temperature protection	
ID061	TempFault_Inv3	Module 3 temperature protection	
ID065	VbusRmsUnbalance	Unbalanced bus voltage RMS	<p>Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.</p>
ID066	VbusInstantUnbalance	The transient value of bus voltage is unbalanced	
ID067	BusUVP	Busbar undervoltage during grid-connection	

ID068	BusZVP	Bus voltage low	
ID069	PVOVP	PV over-voltage	Check whether the PV series voltage (Voc) is higher than the maximum input voltage of the inverter. If so, adjust the number of PV modules in series and reduce the PV series voltage to fit the input voltage range of the inverter. After correction, the inverter will automatically return to its normal state.
ID070	BatOVP	Battery over-voltage	Check whether the battery overvoltage setting is inconsistent with the battery specification.
ID071	LLCBusOVP	LLC BUS overvoltage protection	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID072	SwBusRmsOVP	Inverter bus voltage RMS software overvoltage	
ID073	SwBusInstantOVP	Inverter bus voltage instantaneous value software overvoltage	
ID081	SwBatOCP	Battery overcurrent software protection	



ID082	DciOCP	Dci overcurrent protection
ID083	SwOCPInstant	Output instantaneous current protection
ID084	SwBuckBoostOCP	BuckBoost software flow
ID085	SwAcRmsOCP	Output effective value current protection
ID086	SwPvOCPInstant	PV overcurrent software protection
ID087	IpvUnbalance	PV flows in uneven parallel
ID088	IacUnbalance	Unbalanced output current



ID097	HwLLCBusOVP	LLC bus hardware overvoltage	
ID098	HwBusOVP	Inverter bus hardware overvoltage	
ID099	HwBuckBoostOCP	BuckBoost hardware overflows	
ID100	HwBatOCP	Battery hardware overflows	
ID102	HwPVOCP	PV hardware overflows	
ID103	HwACOCP	Ac output hardware overflows	
ID110	Overload1	Overload protection 1	Please check whether the inverter is operating under overload.



ID111	Overload2	Overload protection 2	
ID112	Overload3	Overload protection 3	
ID113	OverTempDerating	Internal temperature is too high.	Make sure the inverter is installed where there is no direct sunlight. Please ensure that the inverter is installed in a cool/well ventilated place. Ensure the inverter is installed vertically and the ambient temperature is below the inverter temperature limit.
ID114	FreqDerating	AC frequency is too high	Please make sure the grid frequency and voltage is within the acceptable range.
ID115	FreqLoading	AC frequency is too low	
ID116	VoltDerating	AC voltage is too high	
ID117	VoltLoading	AC voltage is too low	





ID124	BatLowVoltageAlarm	Battery low voltage protection	Please check whether the battery voltage of the inverter is too low.
ID125	BatLowVoltageShut	Battery low voltage shutdown	
ID129	unrecoverHwAcOCP	Output hardware overcurrent permanent failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.
ID130	unrecoverBusOVP	Permanent Bus overvoltage failure	
ID131	unrecoverHwBusOVP	Permanent Bus hardware overvoltage failure	
ID132	unrecoverIpvUnbalance	PV uneven flow permanent failure	
ID133	unrecoverEPSBatOCP	Permanent battery overcurrent failure in EPS mode	



ID134	unrecoverAcOCPIstant	Output transient overcurrent permanent failure	
ID135	unrecoverIacUnbalance	Permanent failure of unbalanced output current	
ID137	unrecoverPvConfigError	Input mode setting error permanent failure	<p>Check the PV input mode (parallel/independent mode) Settings for the inverter. If not, change the PV input mode.</p>
ID138	unrecoverPVOCPInstant	Input overcurrent permanent fault	
ID139	unrecoverHwPVOCP	Input hardware overcurrent permanent failure	<p>Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.</p>
ID140	unrecoverRelayFail	Permanent relay failure	
ID141	unrecoverVbusUnbalance	Bus voltage unbalanced permanent failure	

ID145	USBFault	USB fault	Check the USB port of the inverter
ID146	WifiFault	Wifi fault	Check the Wifi port of the inverter
ID147	BluetoothFault	Bluetooth fault	Check the bluetooth connection of the inverter
ID148	RTCFault	RTC clock failure	<p>Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If no, please contact technical support.</p>
ID149	CommEEPROMFault	Communication board EEPROM error	
ID150	FlashFault	Communication board FLASH error	
ID153	SciCommLose(DC)	SCI communication error (DC)	



ID154	SciCommLose(AC)	SCI communication error (AC)	
ID155	SciCommLose(Fuse)	SCI communication error (Fuse)	
ID156	SoftVerError	Inconsistent software versions	Contact ZCS technical support and software upgrades.
ID157	BMSCommunicationFault	Communication failure of lithium battery	Make sure your battery is compatible with the inverter. CAN communication is recommended. Check the communication line or port of the battery and inverter for faults.
ID161	ForceShutdown	Force shutdown	The inverter is performed a forced shutdown
ID162	RemoteShutdown	Remote shutdown	The inverter is performed a remote shutdown.
ID163	Drms0Shutdown	Drms0 shutdown	The inverter is performed with a Drms0 shutdown.



ID165	RemoteDerating	Remote derating	The inverter is performed for remote load reduction.
ID166	LogicInterfaceDerating	Logic interface derating	The inverter is loaded by the execution logic interface.
ID167	AlarmAntiRefluxing	Anti reflux derating	The inverter is implemented to prevent counter current load drop.
ID177	BMS OVP	BMS over-voltage alarm	Internal failure of lithium battery, close inverter and lithium battery, and wait 5 minutes to open inverter and lithium battery. Check that the problem is resolved. If not, please contact technical support.
ID178	BMS UVP	BMS under-voltage alarm	
ID179	BMS OTP	BMS high temperature warning	
ID180	BMS UTP	BMS low temperature alarm	

ID181	BMS OCP	Warning of overload in charge and discharge of BMS	
ID182	BMS Short	BMS short circuit alarm	

6.1. Maintenance

Inverters generally do not require daily or routine maintenance. In any case, for proper long-term operation of the inverter, make sure that the heatsink for cooling the inverter has enough space to ensure adequate ventilation and that it is not obstructed by dust or other items.

Cleaning the inverter

Use an air compressor, a soft dry cloth or a soft-bristled brush to clean the inverter. Do not use water, corrosive chemicals or aggressive detergents to clean the inverter. Disconnect the AC and DC power to the inverter before performing any cleaning operations.

Cleaning the heatsink

Use an air compressor, a soft dry cloth or soft-bristled brush to clean the heatsink. Do not use water, corrosive chemical substances or aggressive detergents to clean the heatsink. Disconnect the AC and DC power to the inverter before performing any cleaning operations.

7. Uninstalling

7.1. Uninstallation steps

- Disconnect the inverter from the AC grid.
- Disconnect the DC switch (located on the battery or installed on the wall)
- Wait 5 minutes
- To remove the DC connectors from the inverter
- Remove the connectors for communication with the batteries, current sensors and NTC temperature probe.
- Remove the AC terminals.
- Unscrew the fixing bolt of the bracket and remove the inverter from the wall.

7.2. Packaging

If possible, pack the inverter in its original packaging.

7.3. Storage

Store the inverter in a dry place where the ambient temperature is between -25 and +60°C.

7.4. Disposal

Zucchetti Centro Sistemi S.p.a. is not liable for the disposal of the equipment, or parts thereof, that does not take place according to the regulations and standards in force in the country of installation.



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

This product must be handed over to the waste collection point in your local community for recycling.

For more information, please contact the waste collection authority in your country.

Inappropriate waste disposal could have negative effects on the environment and on human health due to potentially hazardous substances.

With your cooperation in the correct disposal of this product, you contribute to the reuse, recycling and recovery of the product, and to the protection of our environment.

8. Monitoring systems

8.1. External Wi-Fi adapter

8.1.1. Installation

Unlike the internal Wi-Fi card, the external adapter must be installed for all compatible inverters. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

Installation tools:

- Cross screwdriver
- External Wi-Fi adapter

- 1) Switch off the inverter following the procedure described in this manual.
- 2) Remove the cover for accessing the Wi-Fi connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), as shown in the figure.



Figure 59 – Port for external Wi-Fi adapter

- 3) Connect the Wi-Fi adapter to the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts.

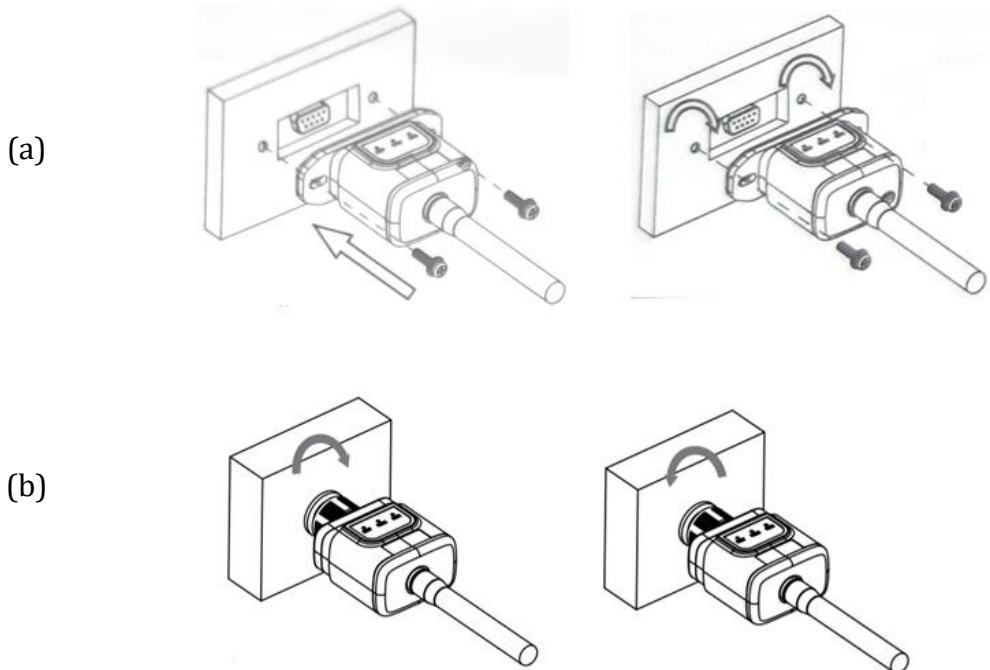


Figure 60 - Inserting and securing the external Wi-Fi adapter

4) Switch on the inverter by following the procedure described in the manual.

8.1.2. Configuration

Configuration of the Wi-Fi adapter requires the presence of a Wi-Fi network near the inverter in order to achieve stable transmission of data from the inverter adapter to the Wi-Fi modem.

Tools required for configuration:

- Smartphone, PC or tablet

Go to front of the inverter and search for the Wi-Fi network using a smartphone, PC or tablet, making sure that the signal from the home Wi-Fi network reaches the place where the inverter is installed.

If the Wi-Fi signal is present at the location where the inverter is installed, the configuration procedure can begin.

If the Wi-Fi signal does not reach the inverter, a system must be installed to amplify the signal and bring it to the installation location.

- 1) Activate the search for the Wi-Fi networks on your telephone or PC so that all the networks visible by your device are displayed.

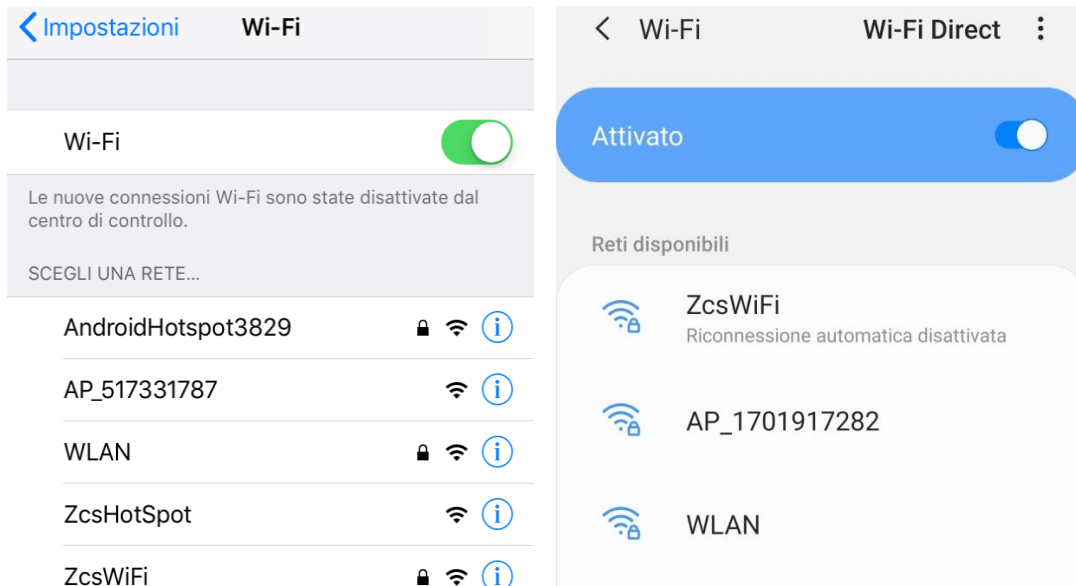


Figure 61 - Search for Wi-Fi networks on iOS smartphone (left) and Android smartphone (right)

Note: Disconnect from any Wi-Fi networks to which you are connected by removing automatic access.



Figure 62 – Disabling automatic reconnection to a network

- 2) Connect to a Wi-Fi network generated by the inverter's Wi-Fi adapter (i.e. AP_*****, where ***** indicates the serial number of the Wi-Fi adapter shown on the label of the device), which operates as an access point.



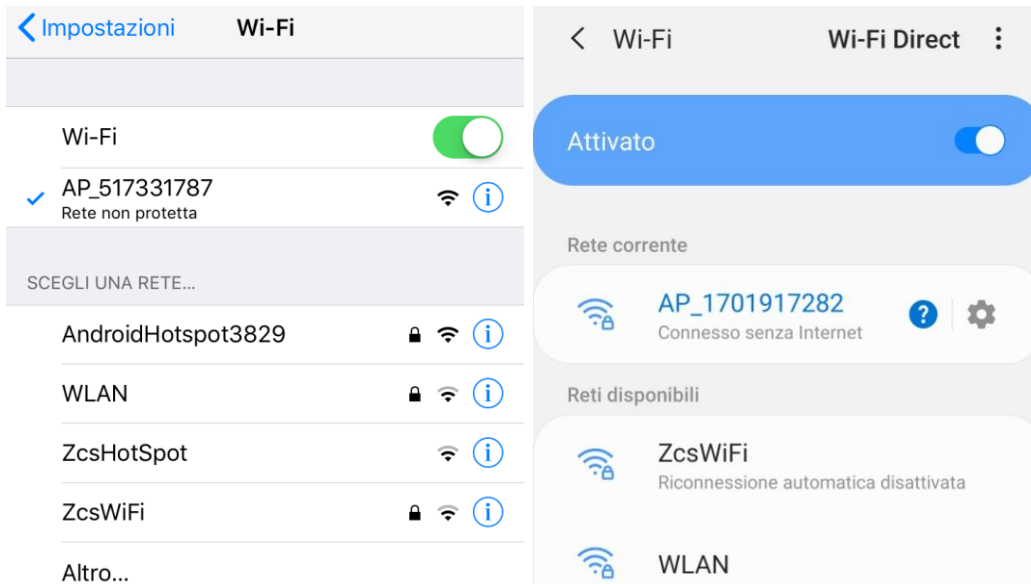


Figure 63 - Connection to Access Point for Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

- 3) If you are using a second-generation Wi-Fi adapter, you will be prompted for a password to connect to the inverter's Wi-Fi network. Use the password found on the box or on the Wi-Fi adapter.



Figure 64 - Password of external Wi-Fi adapter

Note: To ensure that the adapter is connected to the PC or smartphone during the configuration procedure, enable automatic reconnection of the AP_***** network.

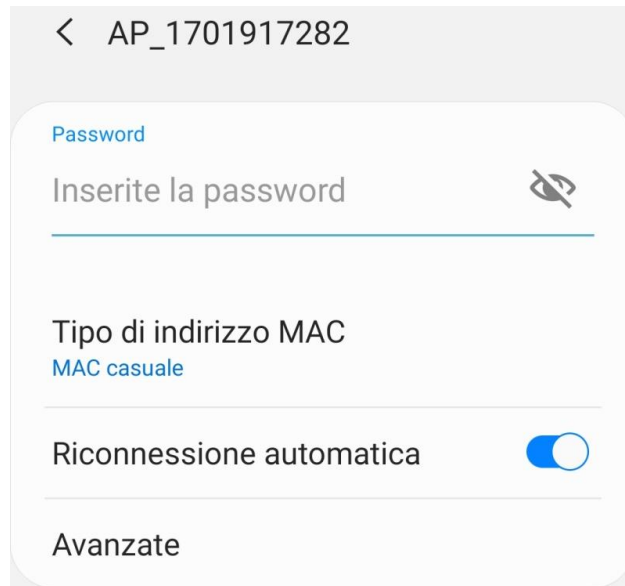


Figure 65 – Password entry prompt

Note: the Access Point is not able to provide internet access; confirm to maintain the Wi-Fi connection, even if the internet is not available



Figure 66 – Screen indicating that the Internet cannot be accessed

- 4) Open a browser (Google Chrome, Safari, Firefox) and enter the IP address 10.10.100.254 in the address bar at the top of the screen.
In the box that appears, enter “admin” as both the Username and Password.



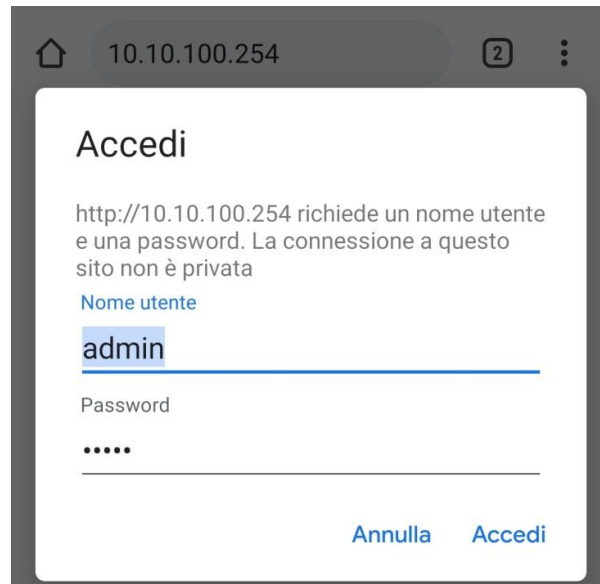


Figure 67 – Screen for accessing the web server to configure the Wi-Fi adapter

- 5) The status screen will open, showing the logger information such as the serial number and firmware version.

Check that the Inverter Information fields are filled in with the inverter information.

The language of the page can be changed using the command in the top right-hand corner.



中文 | English

Status																										
Wizard	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">- Inverter information</td> </tr> <tr> <td>Inverter serial number</td> <td>ZH1ES160J3E488</td> </tr> <tr> <td>Firmware version (main)</td> <td>V210</td> </tr> <tr> <td>Firmware version (slave)</td> <td>---</td> </tr> <tr> <td>Inverter model</td> <td>ZH1ES160</td> </tr> <tr> <td>Rated power</td> <td>--- W</td> </tr> <tr> <td>Current power</td> <td>--- W</td> </tr> <tr> <td>Yield today</td> <td>11.2 kWh</td> </tr> <tr> <td>Total yield</td> <td>9696.0 kWh</td> </tr> <tr> <td>Alerts</td> <td>F12F14</td> </tr> <tr> <td>Last updated</td> <td>0</td> </tr> </table>	- Inverter information		Inverter serial number	ZH1ES160J3E488	Firmware version (main)	V210	Firmware version (slave)	---	Inverter model	ZH1ES160	Rated power	--- W	Current power	--- W	Yield today	11.2 kWh	Total yield	9696.0 kWh	Alerts	F12F14	Last updated	0	Help		
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Firmware version (slave)	---																									
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Advanced	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">- Remote server information</td> </tr> <tr> <td>Remote server A</td> <td>Not connected</td> </tr> <tr> <td>Remote server B</td> <td>Not connected</td> </tr> </table>	- Remote server information		Remote server A	Not connected	Remote server B	Not connected	Help																		
- Remote server information																										
Remote server A	Not connected																									
Remote server B	Not connected																									
Upgrade		Help																								
Restart			Help																							
Reset		Help																								

Figure 68 – Status screen

- 6) Click on the Wizard setup button in the left-hand column.
- 7) In the new screen that opens, select the Wi-Fi network to which you want to connect the Wi-Fi adapter, making sure that the Received Signal Strength Indicator (RSSI) is greater than 30%. If the network is not visible, press the Refresh button.
Note: check that the signal strength is greater than 30%, if not, bring the router closer or install a repeater or signal amplifier.
Click Next.

Please select your current wireless network:

Site Survey

SSID	BSSID	RSSI	Channel
<input checked="" type="radio"/> iPhone di Giacomo	EE:25:EF:6C:31:18	100	6
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C3:9	86	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C3:9	86	1
<input type="radio"/> WLAN	E:EC:DA:1D:C3:9	86	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C8:A3	57	11
<input type="radio"/> WLAN	E:EC:DA:1D:C8:A3	57	11
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C8:A3	54	11
<input type="radio"/> WLAN	E:EC:DA:1D:C8:8B	45	1
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C8:8B	37	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C8:8B	35	1

★Note: When RSSI of the selected WiFi network is lower than 15%, the connection may be unstable, please select other available network or shorten the distance between the device and router.

Refresh

Add wireless network manually:

Network name (SSID)
(Note: case sensitive)

Encryption method

Encryption algorithm

Next

1 2 3 4

Figure 69 – Screen for selecting the available wireless network (1)

- 8) Enter the password of the Wi-Fi network (Wi-Fi modem), clicking on Show Password to make sure it is correct; the password should not contain special characters (&, #, %) and spaces.
Note: During this step, the system is not able to ensure that the password entered is the one actually requested by the modem, therefore please make sure you enter the correct password.
Also check that the box below is set to Enable.
Then click “Next” and wait a few seconds for verification.

Please fill in the following information:

Password (8-64 bytes)
(Note: case sensitive)
 Show Password

Obtain an IP address
automatically **Enable** ▼

IP address

Subnet mask

Gateway address

DNS server address

Back **Next**

1 2 3 4

Figure 70 – Screen for entering the password of the wireless network (2)

9) Click “Next” again without ticking any of the options relating to the system security.

Enhance Security

You can enhance your system security by choosing the following methods

- Hide AP
- Change the encryption mode for AP
- Change the user name and password for Web server

Back **Next**

1 2 3 4

Figure 71 - Screen for setting the security options (3)

10) Click “OK”.

Setting complete!

Click OK, the settings will take effect and the system will restart immediately.

If you leave this interface without clicking OK, the settings will be ineffective.



Figure 72 - Final configuration screen (4)

- 11) At this point, if the configuration of the adapter is successful, the last configuration screen will appear, and the telephone or PC will unpair from the inverter's Wi-Fi network.
- 12) Manually close the web page with the Close key on the PC or remove it from the background of the telephone.

Setting complete! Please close this page manually!

Please login our management portal to monitor and manage your PV system.(Please register an account if you do not have one.)

To re-login the configuration interface, please make sure that your computer or smart phone

Web Ver:1.0.24

Figure 73 - Successful configuration screen

8.1.3. Verification

To verify the correct configuration, connect to it again and access the status page. Check the following information:

- a. Wireless STA mode
 - i. Router SSID > Router name
 - ii. Signal Quality > other than 0%
 - iii. IP address > other than 0.0.0.0
- b. Remote server information
 - i. Remote server A > Connected

Wireless STA mode	Enable
Router SSID	iPhone di Giacomo
Signal Quality	0%
IP address	0.0.0.0
MAC address	98:d8:63:54:0a:86
Remote server information	
Remote server A	Not connected

Figure 75 – Status screen

Status of LEDs present on the adapter

- 1) Initial status:
 - NET (left LED): off
 - COM (central LED): steady on
 - READY (right LED): flashing on



Figure 76 - Initial status of LEDs



- 2) Final status:
NET (left LED): steady on
COM (central LED): steady on
READY (right LED): flashing on



Figure 77 - Final status of LEDs

If the NET LED does not light up or if the Remote Server A option in the Status page still shows “Not Connected”, the configuration was not successful, i.e. the wrong router password was entered or the device was disconnected during connection.

It is necessary to reset the adapter:

- Press the Reset button for 10 seconds and release
- After a few seconds, the LEDs will turn off and READY will start to flash quickly
- The adapter has now returned to its initial state. At this point, the configuration procedure can be repeated again.

The adapter can only be reset when the inverter is switched on.



Figure 78 – Reset button on the Wi-Fi adapter

8.1.4. Troubleshooting

Status of LEDs present on the adapter

- 1) Irregular communication with inverter
- NET (left LED): steady on
 - COM (central LED): off
 - READY (right LED): flashing on



Figure 79 - Irregular communication status between inverter and Wi-Fi

- Check the Modbus address set on the inverter:

Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).

If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.

- Check that the Wi-Fi adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided.
- Check that the Wi-Fi symbol is present in the top right-hand corner of the inverter's display (steady or flashing).



Figure 80 - Icons on the display of LITE single-phase inverters (left) and three-phase or hybrid inverters (right)

- Restart the adapter:
 - Press the reset button for 5 seconds and release
 - After a few seconds, the LEDs will turn off and will start to flash quickly
 - The adapter will now be reset without having lost the configuration with the router

2) Irregular communication with remote server

- NET (left LED): off
- COM (central LED): on
- READY (right LED): flashing on



Figure 81 - Irregular communication status between Wi-Fi and remote server

- Check that the configuration procedure has been carried out correctly and that the correct network password has been entered.
- When searching for the Wi-Fi network using a smartphone or PC, make sure that the Wi-Fi signal is strong enough (a minimum RSSI signal strength of 30% is required during configuration). If necessary, increase it by using a network extender or a router dedicated to inverter monitoring.
- Check that the router has access to the network and that the connection is stable; check that a PC or smartphone can access the Internet
- Check that port 80 of the router is open and enabled to send data
- Reset the adapter as described in the previous section

If, at the end of the previous checks and subsequent configuration, Remote server A is still “Not Connected” or the NET LED is off, there may be a transmission problem at the home network level and, more specifically, that data between the router and server is not being transmitted correctly. In this case, it is advisable to carry out checks at the router level in order to ensure that there are no obstructions on the output of data packets to our server.

To make sure that the problem lies in the home router and to exclude problems with the Wi-Fi adapter, configure the adapter using the Wi-Fi hotspot function on your smartphone as a reference wireless network.

- **Using an Android mobile phone as a modem**

- Check that the 3G/LTE connection is active on your smartphone. Go to the Settings menu of the operating system (the gear icon on the screen with a list of all the apps installed on the phone), select “Other” from the Wireless and networks menu and make sure that the Network type is set to 3G/4G/5G.
- In the Android settings menu, go to Wireless & networks > Other. Select Mobile Hotspot/Tethering, and then enable the Wi-Fi mobile hotspot option; wait a few seconds for the wireless network to be created. To change the name of the wireless network (SSID) or your password, select Configure Wi-Fi hotspot.

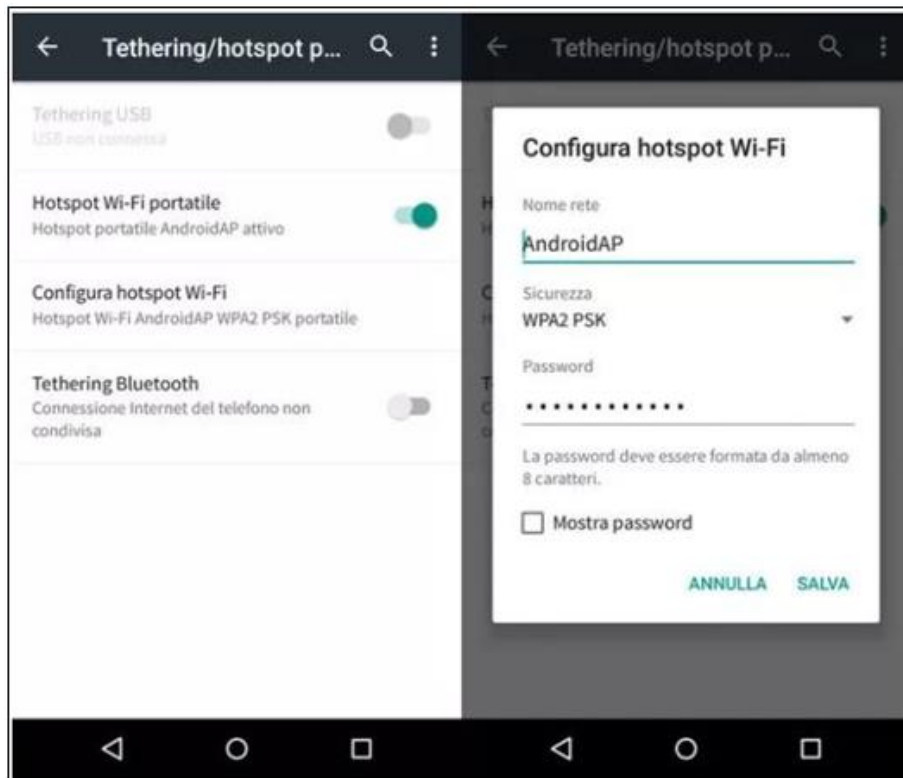


Figure 82 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

- In order to share the iPhone connection, verify that the 3G/LTE network is active by going to Settings > Mobile Phone, and making sure that the “Voice and data” option is set to 5G, 4G or 3G. To enter the iOS settings menu, click the grey gear icon on the home screen of your phone.
- Go to the Settings menu > Personal Hotspot and turn on the Personal Hotspot option. The hotspot is now enabled. To change the password of the Wi-Fi network, select Wi-Fi password from the personal hotspot menu.

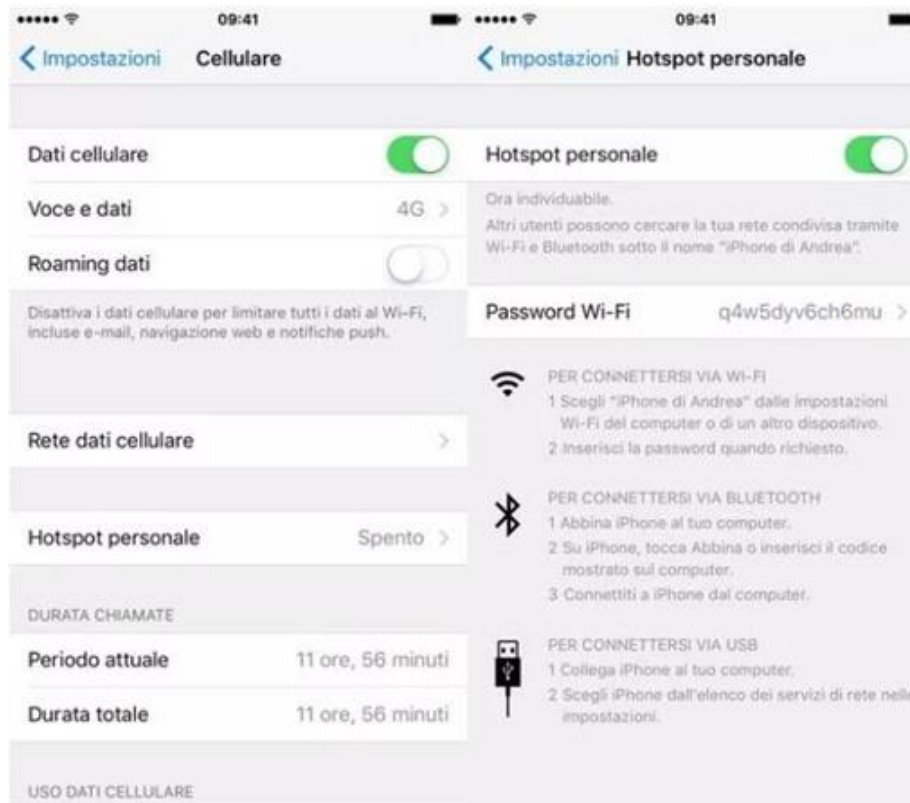


Figure 83 - Configuration of an iOS smartphone as a hotspot router

At this point, it is necessary to re-configure the Wi-Fi adapter using a PC or smartphone other than the one used as a modem.

During this procedure, when asked to select the Wi-Fi network, choose the one activated by the smartphone and then enter the password associated with it (which can be changed from the personal hotspot settings). If at the end of configuration, "Connected" appears next to "Remote Server A", then the problem is with the home router.

It is therefore advisable to check the brand and model of the home router you are trying to connect to the Wi-Fi adapter; some router brands may have closed communication ports. In this case, contact the customer service of the router's manufacturer and ask them to open port 80 (direct from the network to external users).



8.2. Ethernet adapter

8.2.1. Installation

Installation must be carried out for all inverters compatible with the adapter. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter. Proper operation of the device requires the presence of a modem correctly connected to the network and in operation in order to achieve stable data transmission from the inverter to the server.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

Installation tools:

- Cross screwdriver
- Ethernet adapter
- Shielded network (Cat. 5 or Cat. 6) crimped with RJ45 connectors

- 1) Switch off the inverter following the procedure described in this manual.
- 2) Remove the cover for accessing the Wi-Fi/Eth connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), depending on the inverter model, as shown in the figure.



Figure 84 – Port of the Ethernet adapter

- 3) Remove the ring nut and the waterproof cable gland from the adapter to allow the network cable to pass through; then insert the network cable network into the appropriate port on the inside of the adapter and tighten the ring nut and cable gland to ensure a stable connection.

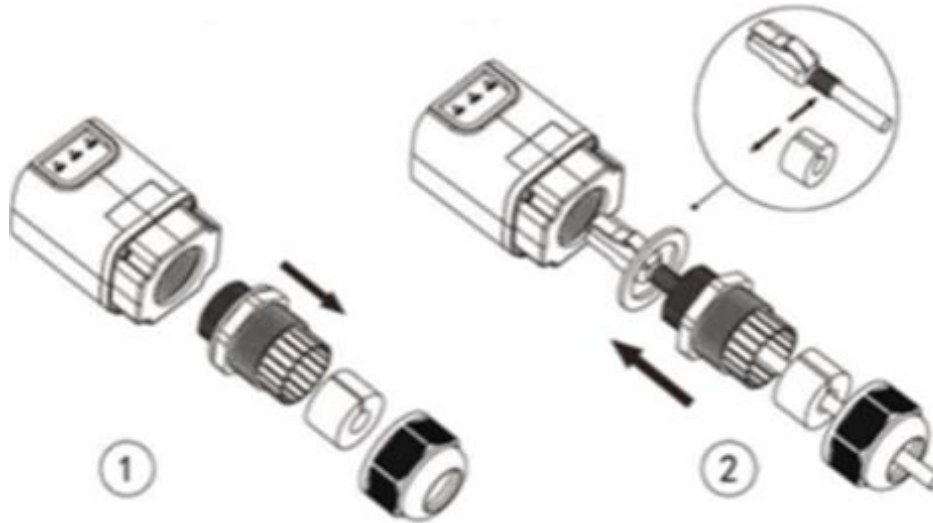


Figure 85 - Inserting the network cable inside the device

- 4) Connect the Ethernet adapter to the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts.

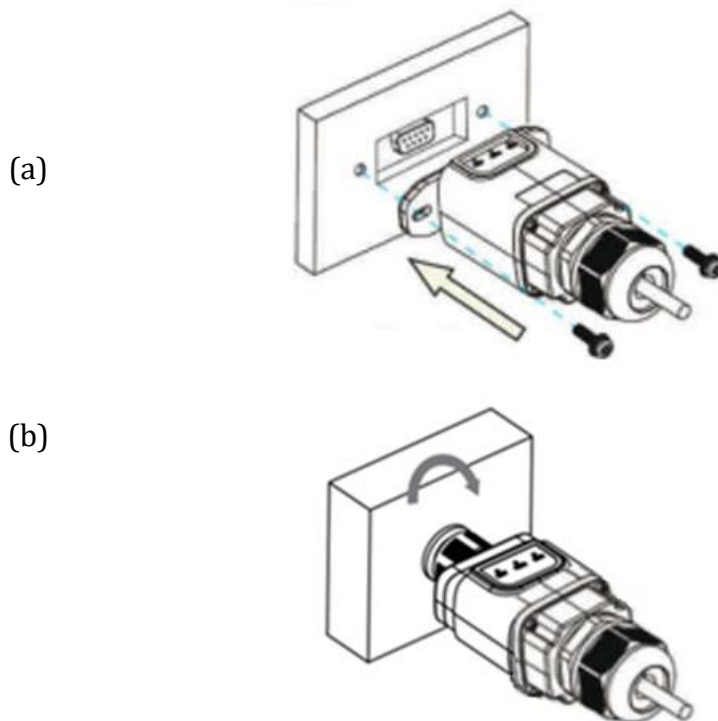


Figure 86 - Inserting and securing the ethernet adapter

- 5) Connect the other end of the network cable to the ETH output (or equivalent) of the modem or a suitable data transmission device.

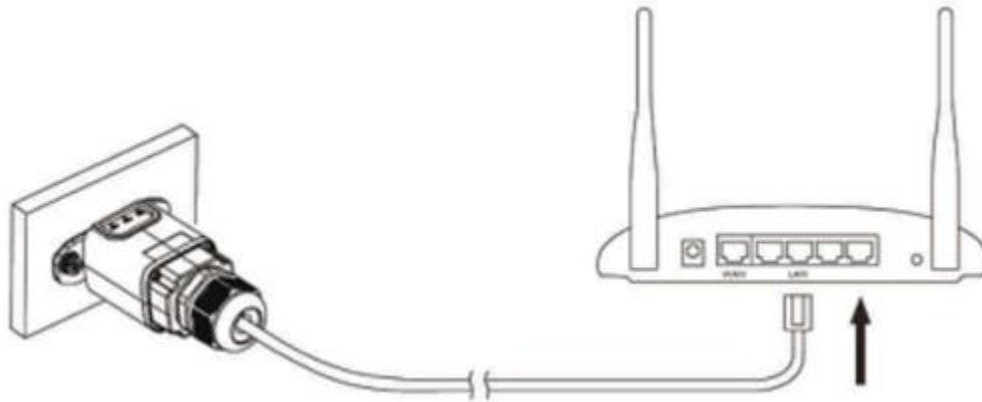


Figure 87 - Connecting the network cable to the modem

- 6) Switch on the inverter by following the procedure described in the manual.
- 7) Unlike Wi-Fi cards, the Ethernet adapter does not need to be configured and starts transmitting data shortly after the inverter is switched on.

8.2.2. Verification

Wait two minutes after installing the adapter, and check the status of the LEDs on the device.

Status of LEDs present on the adapter

- 1) Initial status:
 - NET (left LED): off
 - COM (central LED): steady on
 - SER (right LED): flashing on



Figure 88 - Initial status of LEDs

- 2) Final status:



NET (left LED): steady on
COM (central LED): steady on
SER (right LED): flashing on



Figure 89 - Final status of LEDs

8.2.3. Troubleshooting

Status of LEDs present on the adapter

- 1) Irregular communication with inverter
 - NET (left LED): steady on
 - COM (central LED): off
 - SER (right LED): flashing on



Figure 90 - Irregular communication status between the inverter and adapter

- Check the Modbus address set on the inverter:
Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to

enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).

If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.

- Check that the Ethernet adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided. Check that the network cable is correctly inserted into the device and modem, and that the RJ45 connector is correctly crimped.

2) Irregular communication with remote server

- NET (left LED): off
- COM (central LED): on
- SER (right LED): flashing on



Figure 91 - Irregular communication status between the adapter and remote server

- Check that the router has access to the network and that the connection is stable; check that a PC can access the Internet

Check that port 80 of the router is open and enabled to send data.

It is advisable to check the brand and model of the home router you are trying to connect to the Ethernet adapter; some router brands may have closed communication ports. In this case, contact the customer service of the router’s manufacturer and ask them to open port 80 (direct from the network to external users).

8.3. 4G adapter

The ZCS 4G adapters are sold with a virtual SIM integrated into the device with data traffic fee included for 10 years, which is adequate for the proper transmission of data to monitor the inverter.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

8.3.1. Installation

Installation must be carried out for all inverters compatible with the adapter. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter.

Installation tools:

- Cross screwdriver
- 4G adapter

- 1) Switch off the inverter following the procedure described in this manual.
- 2) Remove the cover for accessing the Wi-Fi/ GPRS connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), depending on the inverter model, as shown in the figure.



Figure 92 - Port of the 4G adapter

- 3) Insert the 4G adapter into the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts. Secure the 4G adapter by tightening the two screws inside the package.



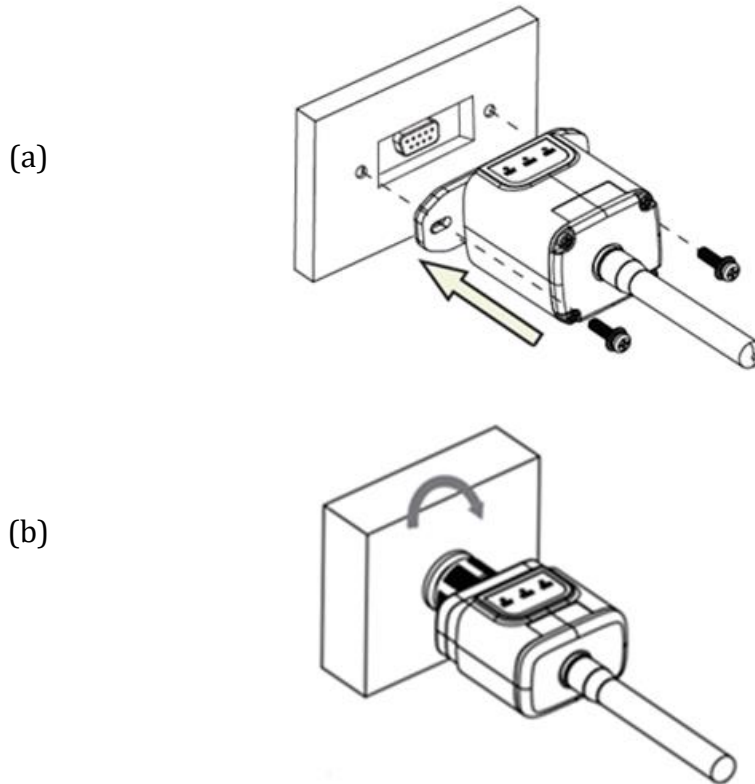


Figure 93 - Inserting and securing the 4G adapter

- 4) Switch on the inverter by following the procedure described in the manual.
- 5) Unlike Wi-Fi cards, the 4G adapter does not need to be configured and starts transmitting data shortly after the inverter is switched on.

8.3.2. Verification

After installing the adapter, within the next 3 minutes check the status of the LEDs on the device to ensure that the device is configured correctly.

Status of LEDs present on the adapter

- 1) Initial status:
 - NET (left LED): off
 - COM (central LED): flashing on
 - SER (right LED): flashing on



Figure 94 - Initial status of LEDs

2) Registration:

- NET (left LED): flashes rapidly for about 50 seconds; the registration process takes about 30 seconds
- COM (central LED): flashes rapidly 3 times after 50 seconds

3) Final status (approx. 150 seconds after the inverter has started):

- NET (left LED): flashing on (off and on at equal intervals)
- COM (central LED): steady on
- SER (right LED): steady on



Figure 95 - Final status of LEDs

Status of LEDs present on the adapter

1) Irregular communication with inverter

- NET (left LED): on
- COM (central LED): off
- SER (right LED): on



Figure 96 - Irregular communication status between inverter and adapter

- Check the Modbus address set on the inverter:
Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).

If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.
- Check that the 4G adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided.

2) Irregular communication with remote server:

- NET (left LED): flashing on
- COM (central LED): on
- SER (right LED): flashing on



Figure 97 - Irregular communication status between the adapter and remote server

- Check that the 4G signal is present in the installation location (the adapter uses the Vodafone network for 4G transmission; if this network is not present or the signal is weak, the SIM will

use a different network or will limit the data transmission speed). Ensure that the installation location is suitable for 4G signal transmission and that there are no obstacles that could affect data transmission.

- Check the status of the 4G adapter and that there are no external signs of wear or damage.

8.4. Datalogger

8.4.1. Preliminary notes on how to configure the datalogger

The Azzurro ZCS inverters can be monitored via a datalogger connected to a Wi-Fi network present at the place of installation or via an ethernet cable connected to a modem.

The inverters are connected in a daisy chain to the datalogger via a RS485 serial line.

- Datalogger up to 4 inverters (code ZSM-DATALOG-04): allows to monitor up to 4 inverters. It can be connected to the network via an Ethernet or Wi-Fi network.
- Datalogger up to 10 inverters (code ZSM-DATALOG-10): allows to monitor up to 10 inverters. It can be connected to the network via an Ethernet or Wi-Fi network.



Figure 98 - Diagram for connecting the ZSM-DATALOG-04 / ZSM-DATALOG-10 datalogger

- Datalogger up to 31 inverters (code ZSM-RMS001/M200): allows to monitor up to 31 inverters or a system with a maximum installed power of 200kW. It can be connected to the network via an Ethernet cable.
- Datalogger up to 31 inverters (code ZSM-RMS001/M1000): allows to monitor a maximum of 31 inverters or a system with a maximum installed power of 1000kW. It can be connected to the network via an Ethernet cable.



Figure 99 – Diagram showing the operation of the ZSM-RMS001/M200 / ZSM-RMS001/M1000 datalogger

All these devices carry out the same function, i.e. they transmit data from the inverters to a web server to allow remote monitoring of the system either through the “Azzurro Monitoring” app or through the “www.zcsazzurroportal.com” website.

All the Azzurro ZCS inverters can be monitored using the datalogger; different models or families of inverters can also be monitored.

8.4.2. Electrical connections and configuration

All the Azzurro ZCS inverters have at least one RS485 connection point.

The connections can be made via the green terminal block or via the RJ45 plug inside the inverter.

Use positive and negative conductors. There is no need to use a conductor for the GND. This applies to both the terminal block and the plug.

The serial line can be created using a Cat. 5 or Cat. 6 network cable, or a classic RS485 2x0.5mm² cable.

- 1) In the case of three-phase inverters, a suitably crimped network cable with a RJ45 connector can also be used:
 - a. Place the blue cable in position 4 of the RJ45 connector and the white-blue cable in position 5 of the RJ45 connector, as shown in the figure below.
 - b. Insert the connector into the 485-OUT terminal.
 - c. If there is more than one three-phase inverter, insert another connector in the 485-IN terminal to connect to the 485-OUT input of the next inverter.



RJ 45	Colore	Monofase	Trifase
4	Blu	TX +	485 A
5	Bianco-Blu	TX -	485 B

Figure 100 – Pin out for connecting the RJ45 connector

- 2) Daisy chain

- a. Insert the blue cable into input A1 and the white-blue cable into input B1.
- b. If there is more than one three-phase inverter, insert a blue cable into input A2 and a white-blue cable into input B2 and connect them to the respective A1 and B1 inputs of the next inverter.

Some inverters have both an RS485 terminal block and RJ45 plugs. This is shown in detail in the figure below.

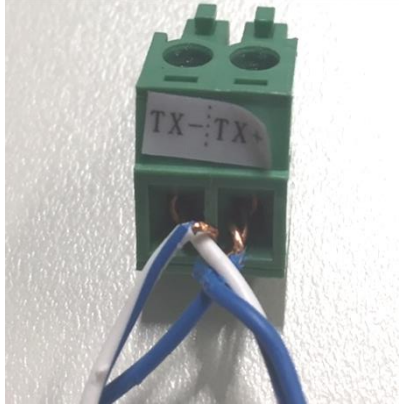


Figure 101 – Tightening the network cable to the RS485 terminal block

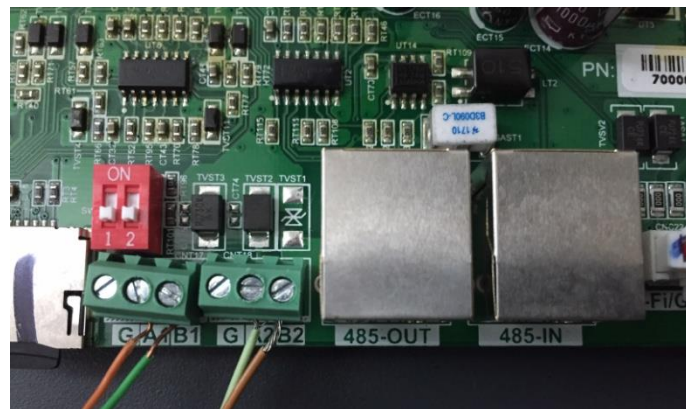


Figure 102 – Connecting the serial line via the RS485 terminal block and via the RJ45 plug

For the 3PH HYD5000-HYD20000-ZSS three-phase hybrid inverter, use only one positive and one negative of those shown in the figure below.

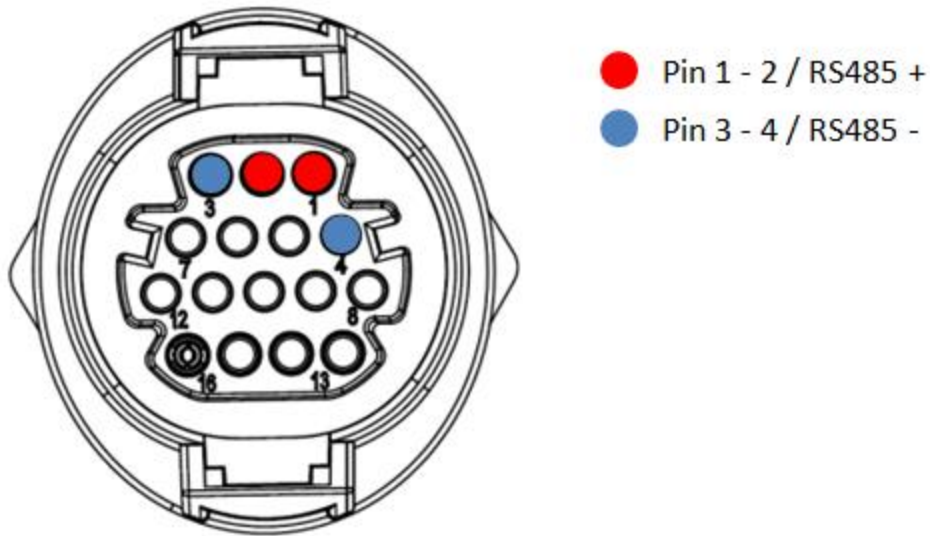


Figure 103a - Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS

For the 3PH HYD5000-HYD20000-ZSS three-phase hybrid inverter and the 3000-6000 TLM-V3 photovoltaic inverter, use only one positive and one negative of those shown in the figure below.

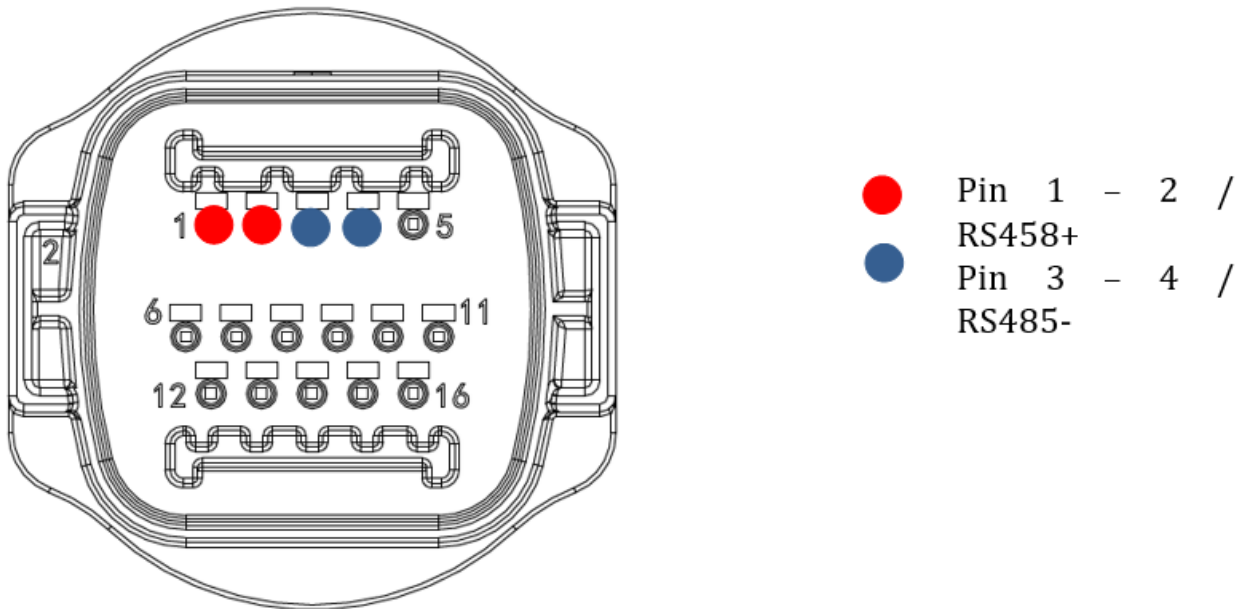


Figure 103b - Connecting the serial line via the communication connector for 1PH 3000-6000 TLM-V3, 3PH HYD5000-HYD20000-ZSS

For the 1PH HYD3000-HYD6000-ZSS-HP single-phase hybrid inverter, use only one positive and one negative of those shown in the figure below.



- Pin 3 - 5 / RS485 +
- Pin 4 - 6 / RS485 -

Figure 103c – Connecting the serial line via the communication connector for 1PH HYD3000-HYD6000-HP

- c. Position the dip switches of the last inverter of the daisy chain as shown in the figure below for activating the 120 Ohm resistor and closing the communication chain. If there are no switches, physically connect a 120 Ohm resistor to terminate the bus.

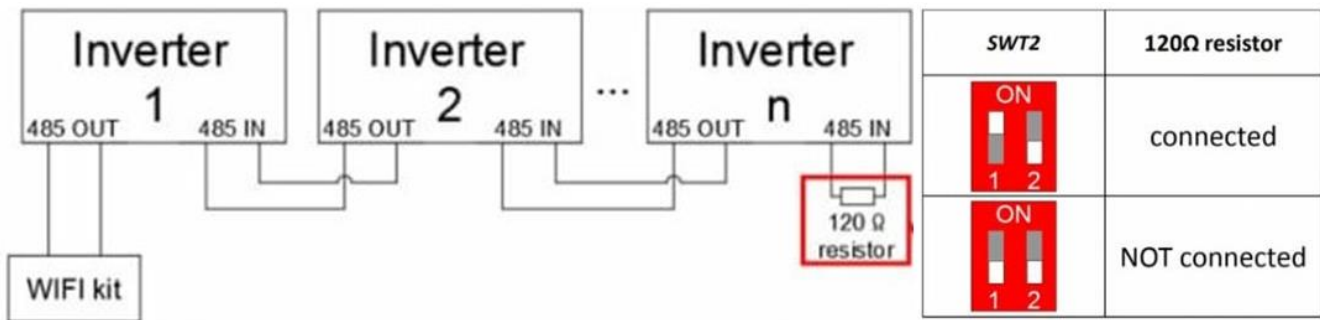


Figure 104 – Positioning of dip switches to connect the isolation resistor

- 3) Check that the RS485 icon is shown on the display of all the inverters. This indicates that the inverters are actually connected via the serial line. If this symbol does not appear, check that the connection is correct, as indicated in this guide.

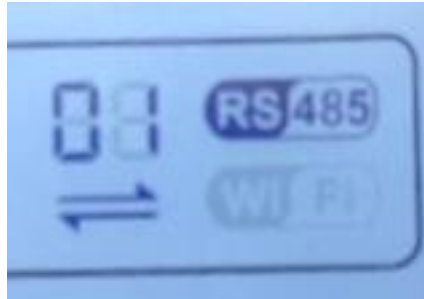


Figure 105 – RS485 symbol on the display of the inverter

- 4) Set a sequential Modbus address on each inverter connected:
 - a. Enter the “Settings” menu.
 - b. Scroll to the submenu “Modbus Address.”
 - c. Change the digits and set an increasing address on each inverter, starting from 01 (first inverter) to the last inverter connected. The Modbus address will be shown on the display of the inverter alongside the RS485 symbol. There should be no inverters with the same Modbus address.

8.4.3. ZSM-DATALOG-04 AND ZSM-DATALOG-10 DEVICES

The initial status of the LEDs on the datalogger will be:

- POWER steady on
- 485 steady on
- LINK off
- STATUS steady on

8.4.4. WI-FI CONFIGURATION

To configure the datalogger via Wi-Fi, please refer to the chapter on monitoring systems, as the configuration is similar to that of any type of Wi-Fi adapter.

8.4.5. Ethernet configuration

- 1) Insert the RJ45 connector of the Ethernet cable in the ETHERNET input of the datalogger.



Figure 106 – Ethernet cable connected to the datalogger

- 2) Connect the other end of the Ethernet cable to the ETH output (or equivalent) of the modem or a suitable data transmission device.
- 3) Activate the search for Wi-Fi networks on your phone or PC in order to display all the networks visible from your device.

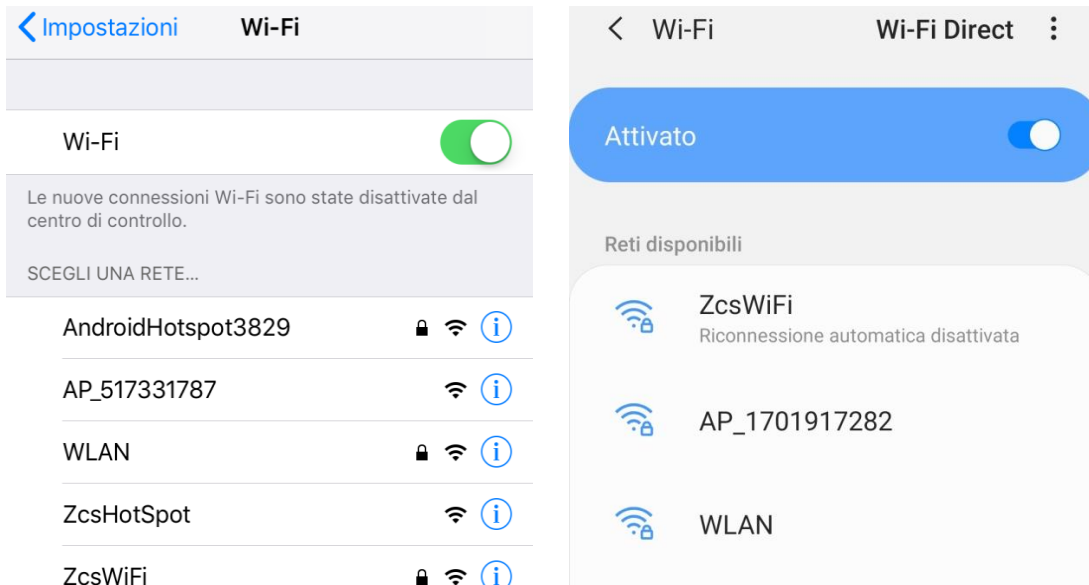


Figure 102 - Wi-Fi network search on iOS smartphone (left) and Android (right)

Note: Disconnect from any Wi-Fi networks to which you are connected by removing automatic access.



Figure 107 - Disabling automatic reconnection to a network

- 4) Connect to a Wi-Fi network generated by the datalogger (i.e. AP_*****, where ***** indicates the serial number of the datalogger shown on the label of the device), which operates as an Access Point.
- 5) Note: To ensure that the datalogger is connected to the PC or smartphone during the configuration procedure, enable automatic reconnection of the AP_***** network.

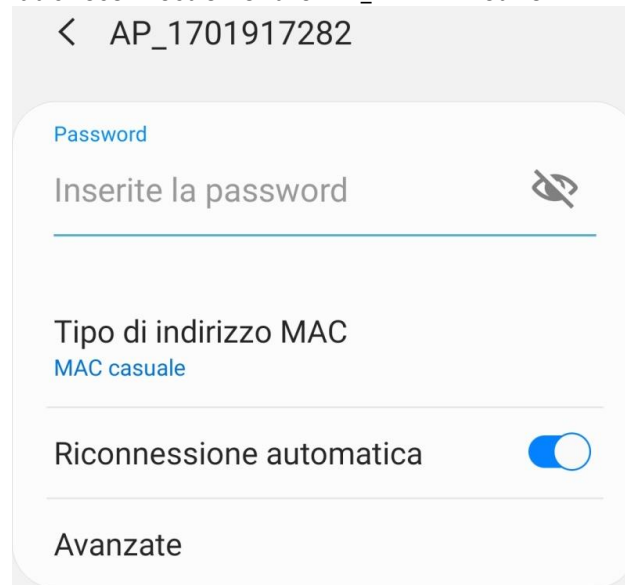


Figure 108 - Password entry prompt

Note: the Access Point is not able to provide internet access; confirm to maintain the Wi-Fi connection, even if internet is not available.

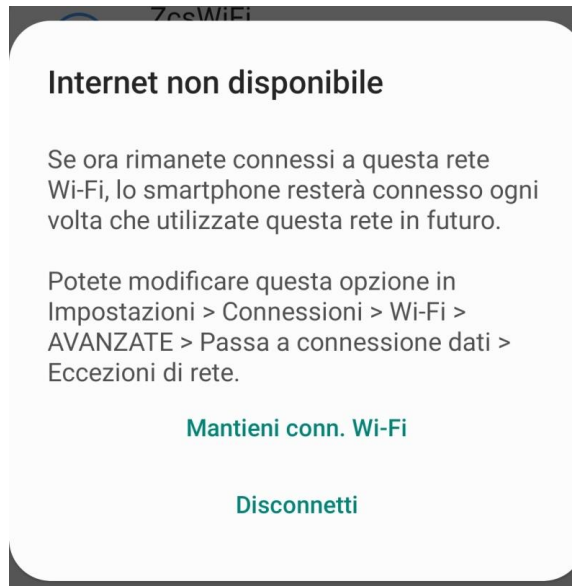


Figure 109 - Screen showing that the Internet cannot be accessed

- 6) Open a browser (Google Chrome, Safari, Firefox) and enter the IP address 10.10.100.254 in the address bar at the top of the screen.
In the box that appears, enter “admin” as both Username and Password.

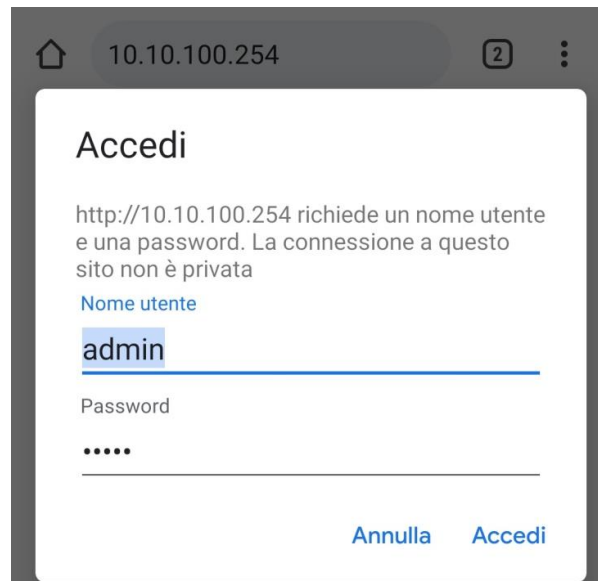


Figure 110 - Screen for logging into the web server to configure the datalogger

- 7) The status screen will open, showing the datalogger information such as serial number and firmware version.

Check that the fields relating to the Inverter Information are filled in with the information of all the inverters connected.

中文 | English

Status

Wizard

Wireless

Cable

Advanced

Upgrade

Restart

Reset

Device information

Device serial number	808032156
Firmware version	H4.01.51MW.2.01W1.0.65(2018-02-271-D)
Wireless AP mode	Enable
SSID	AP_808032156
IP address	10.10.100.254
MAC address	F0:FE:6B:C4:CC:A8
Wireless STA mode	Enable
Router SSID	AP_SOLAR_PORTAL_M2M_20120615
Signal quality	0%
IP address	0.0.0.0
MAC address	F0:FE:6B:C4:CC:A9
Cable mode	Disable
IP address	
MAC address	

Connected Inverter

Number	0
--------	---

Remote server information

Remote server A	Unpingable
-----------------	------------

Help

The device can be used as a wireless access point (AP mode) to facilitate users to configure the device, or it can also be used as a wireless information terminal (STA mode) to connect the remote server via wireless router.

Figure 111 – Status Screen

- 8) Click on the Wizard setup button in the left-hand column.
- 9) Now click on the Start button to start the configuration wizard.

Dear user:

Thank you for choosing our device.
Next, you can follow the setup wizard to complete the network setting step by step;
or you can select the left menu for detailed settings.

★Note: Before setting, please make sure that your wireless or cable network is working.

Start



Figure 112 – Screen for starting (1) the Setup Wizard

10) Check the “Cable Connection” option and then click “Next.”

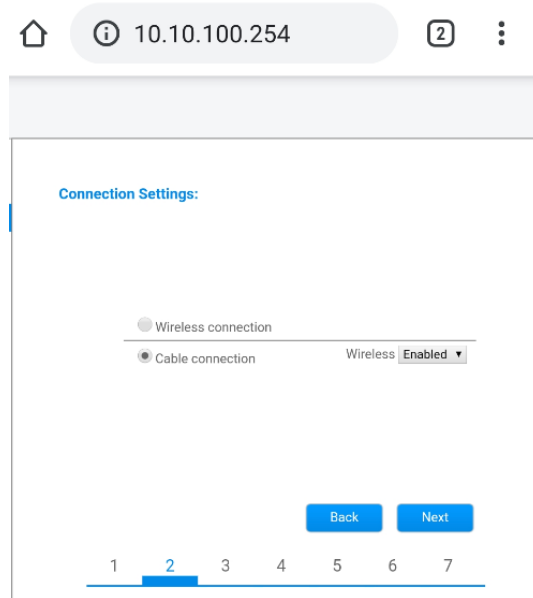


Figure 113 - Screen for the selection of “Cable connection”

11) Make sure that the “Enable” option is selected to automatically obtain the IP address from your router, then click Next.

Please fill in the following information:

Obtain an IP address automatically	Enable ▾
IP address	0.0.0.0
Subnet mask	0.0.0.0
Gateway address	0.0.0.0
DNS server address	

Back Next

1 2 3 4 **5** 6 7

Figure 114 - Screen for automatically obtaining the IP address (5)

12) Click on Next without making any changes.

Enhance Security

You can enhance your system security by choosing the following methods

Hide AP

Change the encryption mode for AP

Change the user name and password for Web server

Back

Next

1 2 3 4 5 6 7

Figure 115 - Screen for setting the security options (6)

13) Complete the configuration procedure by clicking OK, as shown in the following screen.

Configuration completed!

Click OK, the settings will take effect and the system will restart immediately.

If you leave this interface without clicking OK, the settings will be ineffective.

Back

OK

1 2 3 4 5 6 7

Figure 116 - Final configuration screen (7)

14) If the configuration procedure is successful, the following screen will appear.

If this screen does not appear, try refreshing the browser page.

The screen will prompt you to manually close the page; close the page from the background of your phone or from the close button on your PC.

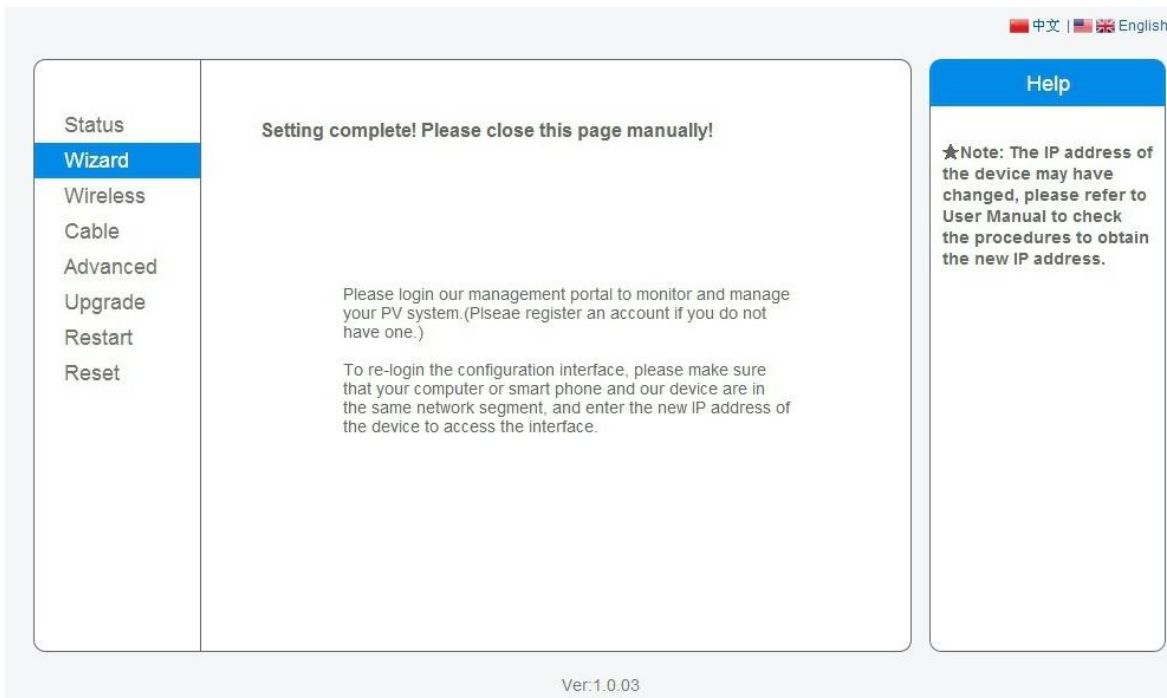


Figure 117 – Successful configuration screen

8.4.6. Checking that the datalogger has been configured correctly

Wait two minutes after completing the configuration of the device. First of all, check that the LINK LED on the device is on and steady.



Figure 118 – LED indicating the correct configuration of the datalogger

Enter the IP address 10.10.100.254 again, and the login credentials (“admin” for both username and password). Once logged in, the Status screen will appear, where the following information can be checked:



- Check Wireless STA mode (if the datalogger has been configured via Wi-Fi)
 - Router SSID > Router name
 - Signal Quality > other than 0%
 - IP address > other than 0.0.0.0
- Check Cable mode (if the datalogger has been configured via Ethernet cable)
 - IP address > other than 0.0.0.0
- Check Remote server information
 - Remote server A > Pingable

Device information	
Device serial number	508263482
Firmware version	H4.01.51MW.2.01W1.0.74(2019-03-143-D)
Wireless AP mode	Enable
SSID	AP_508263482
IP address	10.10.100.254
MAC address	BC:54:F9:F6:B9:74
Wireless STA mode	Enable
Router SSID	iPhone di Giacomo
Signal quality	100%
IP address	172.20.10.10
MAC address	BC:54:F9:F6:B9:75
Cable mode	Disable
IP address	
MAC address	
Connected Inverter	
Type	ZCS
Number	1
Inverter serial number	ZA1ES111G8R273 ▾
Firmware version (main)	V550
Firmware version (slave)	---
Inverter model	ZA1ES111
Rated power	1 00 W
Current power	0 W
Yield today	0 kWh
Total yield	0 kWh
Alerts	F12F14
Last updated	0 min ago
Remote server information	
Remote server A	Pingable

Figure 119 – Main status screen and checking of correct configuration



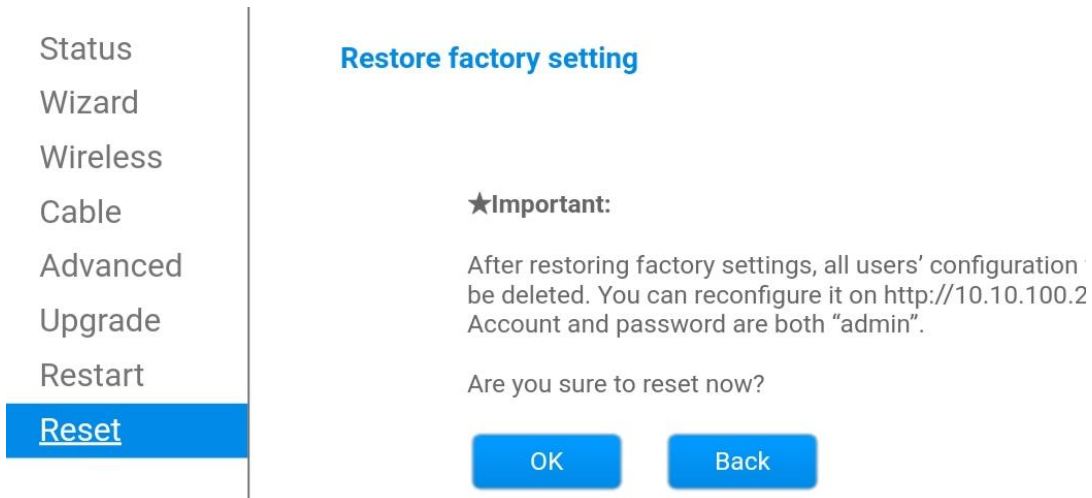
Cable mode	Enable
IP address	192.168.0.177
MAC address	BC:54:F9:F6:B9:77

Figure 120 - main status screen and checking of correct configuration

If the Remote Server A item in the Status page is still “Unpingable”, the configuration was not successful, i.e. the incorrect router password was entered or the device was disconnected during connection.

It is necessary to reset the device:

- Select the Reset button in the left-hand column
- Press the OK button to confirm
- Close the web page and enter the Status page again. At this point, the configuration procedure can be repeated again.



The screenshot shows a web interface with a left-hand navigation menu and a main content area. The menu items are: Status, Wizard, Wireless, Cable, Advanced, Upgrade, Restart, and **Reset** (highlighted in blue). The main content area is titled "Restore factory setting" and contains the following text:

★Important:

After restoring factory settings, all users' configuration be deleted. You can reconfigure it on <http://10.10.100.2> Account and password are both “admin”.

Are you sure to reset now?

There are two buttons: **OK** and **Back**.

Figure 121 – Reset Screen

8.4.7. ZSM-RMS001/M200 and ZSM-RMS001/M1000 Devices

8.4.7.1. Mechanical description and Datalogger interface

Mechanical Dimensions: 127mm x 134 x 52 mm

Protection rating: IP20

The usable ports are indicated below.

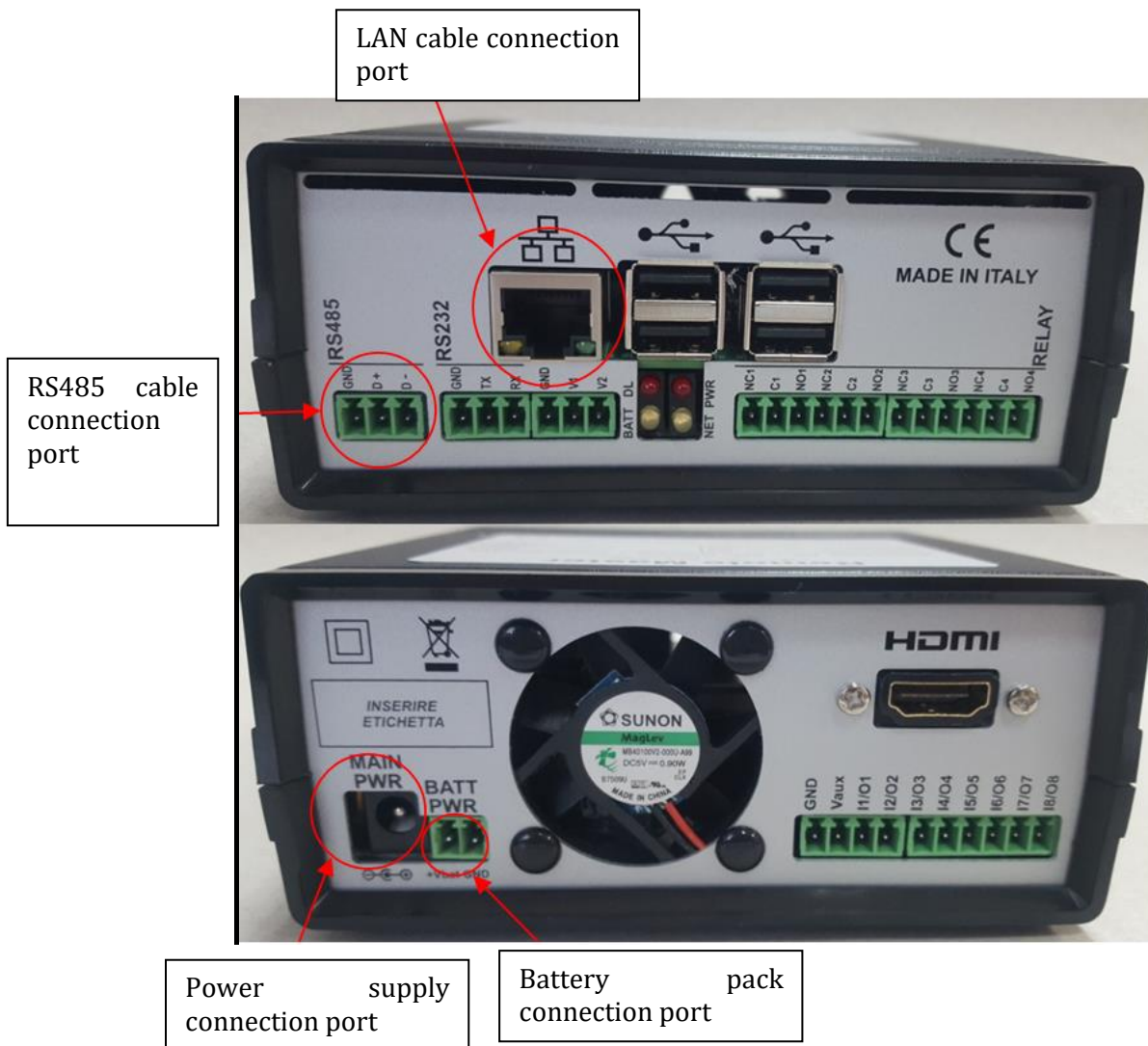


Figure 122 - Datalogger rear panel

8.4.7.2. Connecting the Datalogger to the inverters

A serial communication via RS485 cable is provided for connecting to the inverters. The GND cable does not need to be connected to the inverters. Follow the connections as shown in the table below.

Datalogger SIDE	BUS Signal	SENSOR SIDE (ZSM-IRR-TEMP-LM2)	Inverter SIDE
D+ terminal	+	RS485 +IB terminal	+Tx terminal
D- terminal	-	RS485 -IA terminal	-Tx terminal

Table 3: Connecting the Datalogger to the inverters

8.4.7.3. Internet connection via Ethernet cable

In order to display the data measured and processed by the Datalogger in the portal, it is necessary to connect to the internet via LAN cable and open the following router ports:

- VPN ports: 22 and 1194
- HTTP ports: 80
- DB ports: 3050
- FTP ports: 20 and 21

The local network of the device is configured for DHCP, and it is not necessary to activate any communication port on the router. If you want to set a fixed network address, this must be provided at the time of ordering together with the gateway address.

8.4.7.4. Connecting the power supply and battery pack to the Datalogger

Once the RS485 Half Duplex cable has been connected, power the Datalogger by connecting the power supply unit (supplied with the datalogger) to the MAIN PWR input (12V DC - 1A).

In order to prevent possible voltage drops and/or power failures, it is recommended to also connect the battery pack, which is supplied with the datalogger. The battery pack should be connected to the +V_{bat} and GND inputs of the BATT PWR connector, positive and negative respectively (i.e. red to the +V_{bat} input and black to the GND input).

The battery pack (ZSM-UPS-001) can be purchased separately.

8.4.7.5. Connecting the LM2-485 PRO cell irradiance and temperature sensor to the datalogger

For proper installation, make sure to connect the sensor signal cable and the power cable.



In particular, the sensor of the signal cables must be connected in a daisy chain configuration to the remaining devices on the RS485 bus, as shown in the table below.

Datalogger SIDE	BUS Signal	SENSOR SIDE (ZSM-IRR-TEMP-LM2)	Inverter SIDE
D+ terminal	+	RS485- IB terminal	+Tx terminal
D- terminal	-	RS485- IA terminal	-Tx terminal

To supply power to the sensor, the datalogger can be directly connected to the mains power, as shown in the table below, or connected to an external +12Vdc power supply.

Datalogger SIDE	SENSOR SIDE
V1 terminal (12Vdc output voltage)	RED +12V Terminal
GND terminal (GND/RTN)	BLACK 0V Terminal
V2 terminal (12Vdc driveable voltage)	

Table 4 - Electrical connection of the sensor to the datalogger (power supply)

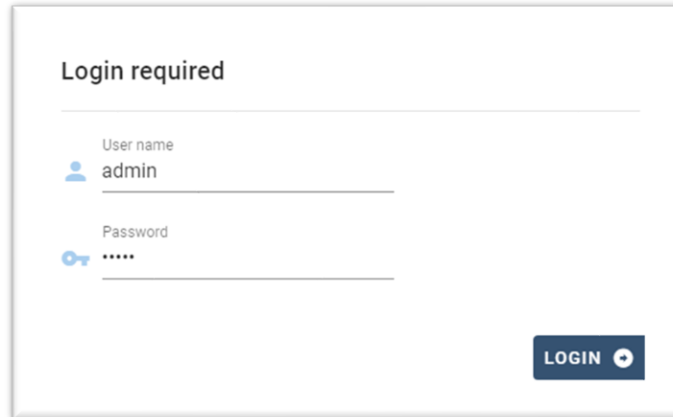
A stable communication in terms of signal and power supply, up to 200m, is guaranteed by using the RS485 cable, type Te.Co. 15166 (2x2x0,22+1x0,22)st/pu.

For longer distances, a connection to the signal side of the datalogger is recommended, and a connection to

the +12V power supply via an external power supply unit.

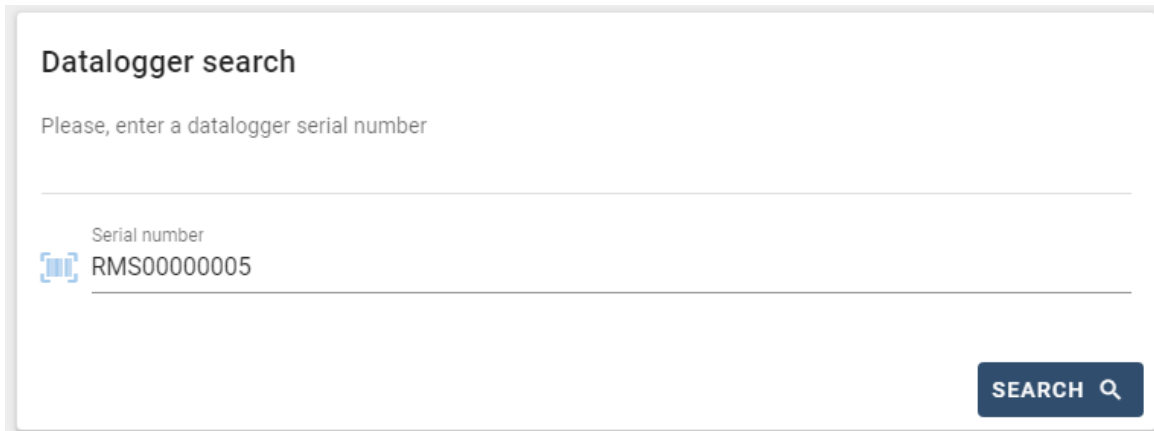
8.4.8. Configuring the Datalogger

Connect to the website dlconfig.it and login by entering the temporary credentials: Username = admin and Password = admin.



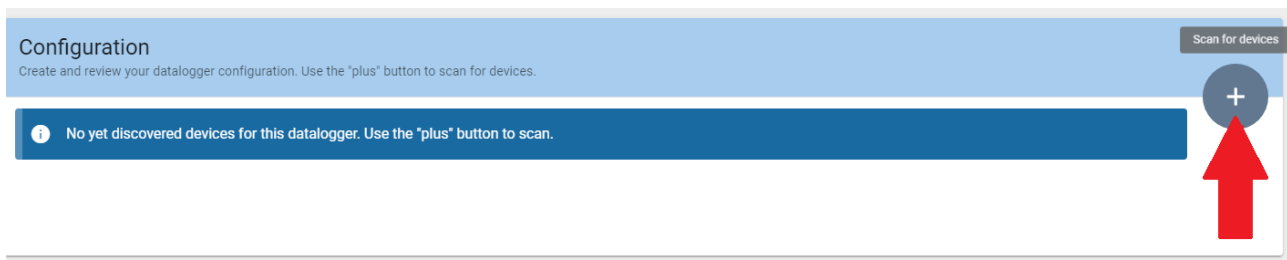
A login form titled "Login required". It contains two input fields: "User name" with the value "admin" and "Password" with masked characters ".....". A "LOGIN" button with a right-pointing arrow is located at the bottom right of the form.

In the screen that opens, enter the serial number(S/N) of the datalogger to be configured and click "SEARCH".



A "Datalogger search" form. It prompts the user to "Please, enter a datalogger serial number". Below this is a text input field containing the serial number "RMS00000005". A "SEARCH" button with a magnifying glass icon is at the bottom right.

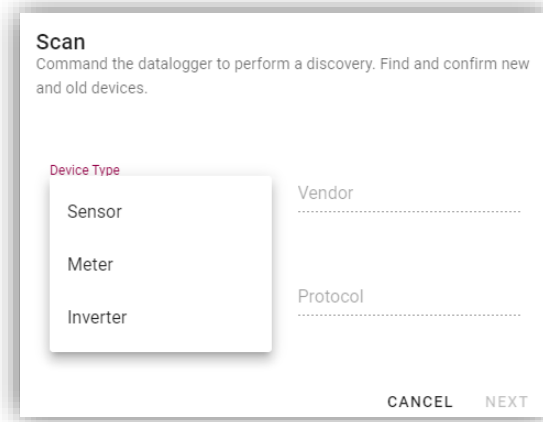
In the configuration page, you can search for any devices connected to the datalogger (inverter, meter or sensors) by clicking the + button, as shown in the figure.



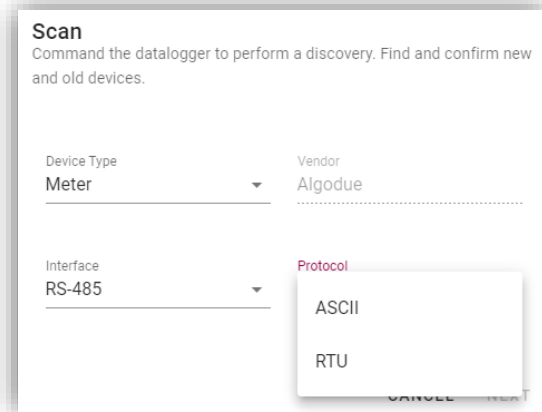
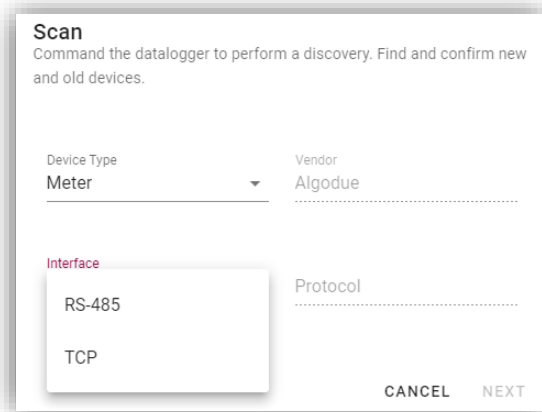
A "Configuration" page header with the text "Create and review your datalogger configuration. Use the 'plus' button to scan for devices." Below the header is a blue message box that says "No yet discovered devices for this datalogger. Use the 'plus' button to scan." On the right side of the page, there is a "Scan for devices" button with a plus sign icon. A red arrow points to this button.



A window will open where you can search for each type of device connected to the Datalogger, after indicating the range of addresses associated with the relative devices.



If a meter is one of the devices connected to the Datalogger, select the type of Meter/Datalogger communication interface and the relative communication protocol.



Once this operation has been completed, update the new configuration by clicking “Confirm,” which will allow you to register the devices associated with the datalogger.

Confirm changes

State

Confirming new 1

Total now 1

CONFIRM

From this moment, the datalogger is correctly configured (all devices must be in the “saved” status) and therefore a new installation can be created on the ZCS Azzurro portal for associating the datalogger and the devices connected to it.

Configuration
Create and review your datalogger configuration. Use the "plus" button to scan for devices.

Scan for devices
+

Device Type	Direction	Vendor	Interface	Protocol	Serial number	Slave Id	Status	
Inverter		ZCS	RS-485	RTU	ZM1ES030JC4258	1	Saved	⋮

8.4.8.1. Configuring the Datalogger on the ZCS Azzurro portal

Access the ZCS Azzurro portal (<https://www.zcsazzurroportal.com>). For new users, click “Sign up now” to register on the portal by entering your email, username and password. After logging into the portal, click “Configuration Panel”, and then select the option “Create field with Datalogger.” The “Create New Field” operation will be possible only if the user’s privileges allow acquiring new fields (at the time of registration the limit will be equal to 1, an upgrade is required to increase the limit).

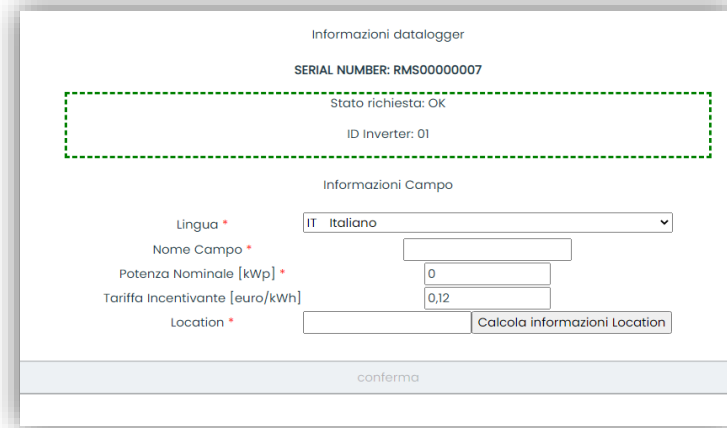


Crea campo con datalogger
Acquisisci Campo
Impostazioni Campo

Informazioni datalogger

Serial number: Check Rms

Enter the serial number (S/N) of the datalogger and click “Check RMS”. If the datalogger has been configured correctly, a screen will open where you can enter the required information relating to the field to be installed.

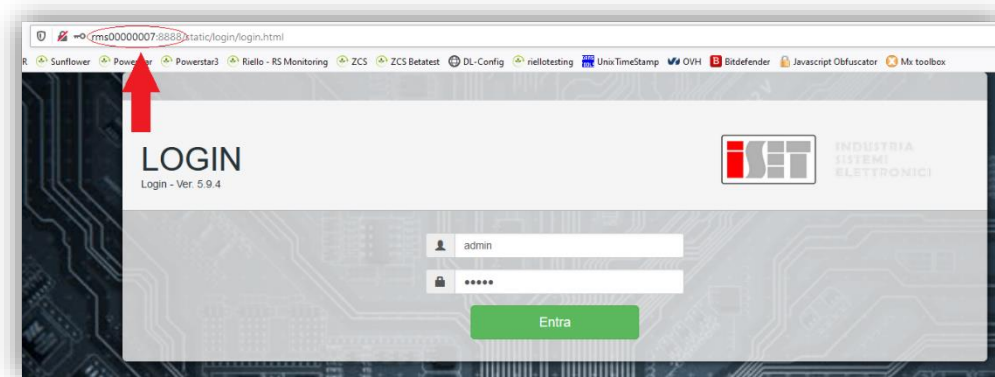


Once the “location” of the field has been entered, click “Calculate Location Information” to allow the system to obtain the latitude, longitude and time zone of the installation. Click “Confirm” to complete the configuration of the field. You only need to wait a few minutes to view the data flow on the ZCS Azzurro portal.

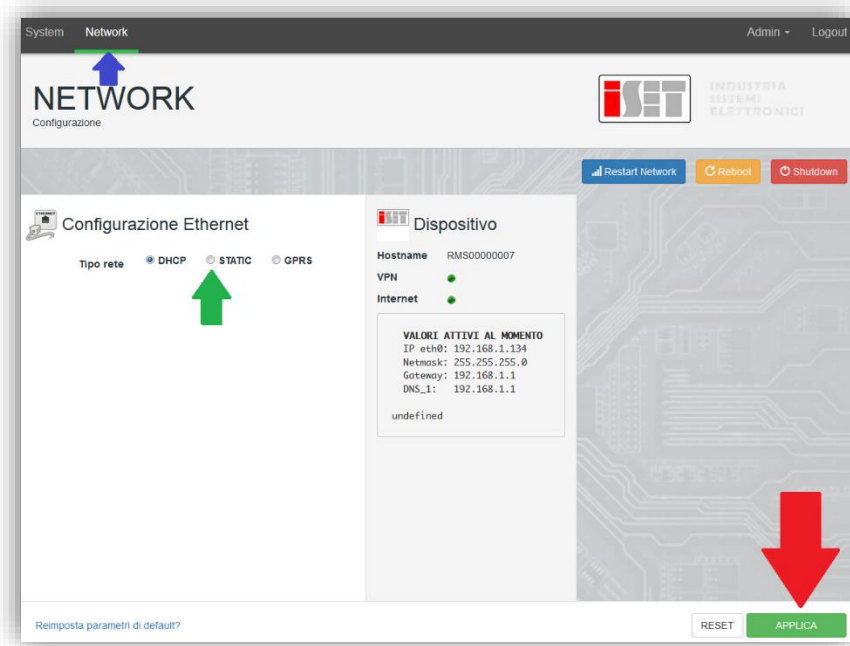
ATTENTION: The location data is essential for the correct operation of the datalogger in the ZCS system. It is important to define it very carefully.

8.4.8.2. Network configuration

At the time of purchase, the Datalogger is configured in DHCP, i.e. dynamic configuration. However, if you want to set up a static configuration for your Datalogger, you can access the internet page via the link RMSxxxxxxx: 8888, as shown in the figure (e.g. RMS00000007).



By entering the credentials: username = admin and password = admin, you can change the configuration from dynamic to static by selecting the network window (see [blue arrow](#)) and then the “STATIC” option (see [green arrow](#)).



To complete the operation, click “Apply” (see **red arrow**).

8.4.9. Local monitoring

The datalogger makes it possible to obtain an additional monitoring system (**local monitoring**), which can be used locally on a web page (therefore, also without an internet connection) and accessed from any device present in the same local network as the datalogger.

8.4.9.1. Requirements for installation of local monitoring

In order to install the local monitoring system on the datalogger, the customer must ensure that:

- The datalogger is connected to the local network and to the internet (the internet connection is only required during installation and configuration of the local monitoring system).
- A static address (to be provided by the customer) with gateway and subnet mask is available for viewing the page locally.

8.4.9.2. Features of local monitoring

After installation and configuration, local monitoring makes it possible to monitor the fundamental parameters of the photovoltaic system, even without an internet connection, from any device connected to the same local network.

In particular, it is possible to monitor the power and energy of the inverters and the storage systems over the last 7 days. It is also possible to view alarms, and other information such as temperature, peak daily power, CO₂ gains and savings.

Below is an example of a local monitoring page.

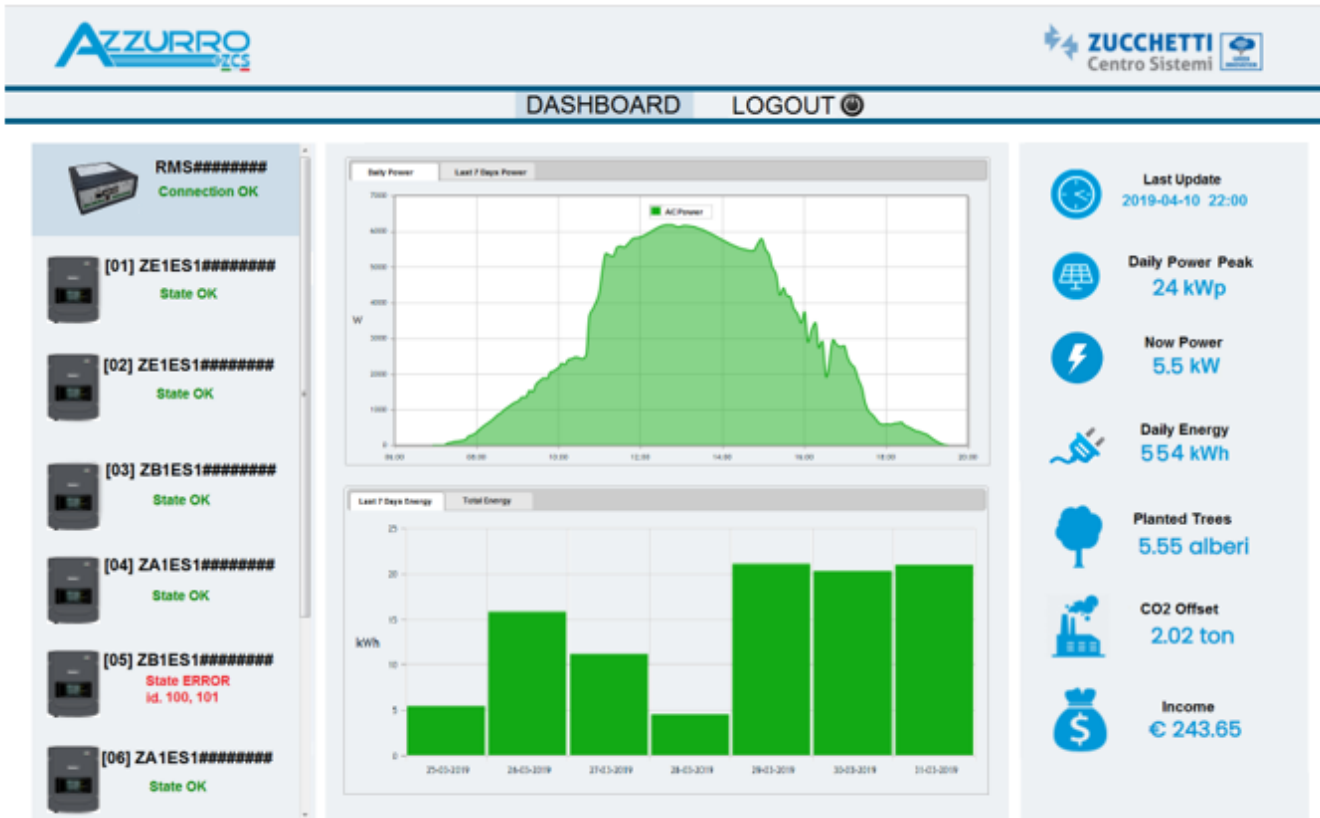


Figure 123 - Example of local monitoring page

9. Warranty terms and conditions

To view the “Warranty Terms and Conditions” offered by ZCS Azzurro, please refer to the documentation inside the product box and on the website www.zcsazzurro.com.



THE INVERTER THAT LOOKS AT THE FUTURE

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