USER'S MANUAL

AZZURRO ZCS

THREE-PHASE HYBRID STORAGE INVERTERS

3PH HYD5000-HYD20000-ZSS

ZUCCHETTI Centro Sistemi

GREEN INNOVATION

3PH HYD5000-HYD20000-ZSS
hybrid inverter
User Manual

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Table of Contents

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.

Copyright statement

Technical support

ZCS offers full technical support and advice which can be accessed by making a request directly through the website www.zcsazzurro.com
The following toll-free number is available for Italy: 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.
This manual describes the installation, electrical connections, maintenance and troubleshooting of the following inverters:

3PH HYD5000 ZSS / 3PH HYD6000 ZSS / 3PH HYD8000 ZSS
3PH HYD10000 ZSS / 3PH HYD15000 ZSS / 3PH HYD20000 ZSS

- ### Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the HYD 5-20KTL-3PH range of inverters.
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 plant and for operators of photovoltaic and storage systems.

- ### Symbols used

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

 **Attention**	**Attention: indicates a potentially hazardous situation which, if not resolved or avoided, could result in damage to the system or other property**
 **Note**	**Note: provides important tips on the correct and optimal operation of the product**

1. Introduction

The 3PH HYD5000-HYD20000-ZSS hybrid inverter is used in photovoltaic systems with battery storage. The system can be combined with WeCo or Pylontech batteries supplied in kit form by ZCS Azzurro.
The basic operating scheme is shown in below, the inverter has direct access to the photovoltaic production and to the management of the batteries, so that they can be charged and discharged according to the current production needs and conditions and to the actual consumption.
It can also be connected to the Emergency Power Supply (EPS) and used to charge the battery as the main power source in case of off-grid operation or blackout.

Figure 1 - Diagram of a system with 3PH HYD5000-HYD20000-ZSS hybrid inverter

2. Preliminary safety instructions

Before installation, please read this manual carefully and make sure you fully understand its contents. The 3PH HYD5000-HYD20000-ZSS inverter strictly complies with the safety regulations if it is installed, connected and serviced according to the instructions in this manual. During installation, operation and maintenance, all operators must follow the local safety guidelines. Improper operation may result in electric discharges and/or damage to people and property, and will also void the Zucchetti Centro Sistemi S.p.A. warranty.

2.1. Safety Notes

Electrical installation and maintenance of the 3PH HYD5000-HYD20000-ZSS inverter must be carried out by competent persons in accordance with the local guidelines; qualified electricians and professionals must be duly certified and authorised.
According to national requirements, before connecting to the electricity grid, permission must be obtained from the local energy provider. All connections must be carried out by a qualified electrician.
DO NOT place explosive or flammable materials (e.g. gasoline, kerosene, diesel fuel, oil, wood, cotton or rags, etc.) near the batteries or the 3PH HYD5000-HYD20000-ZSS inverter.
Keep the inverter and batteries away from direct sunlight. Do not place the inverter and batteries near ovens, flames and other heat sources as they may catch fire and cause an explosion.
Keep children away from both the batteries and the 3PH HYD5000-HYD20000-ZSS inverter.
Do not open the front cover of the 3PH HYD5000-HYD20000-ZSS inverter. Opening the front cover will void the product warranty. Damage caused by improper installation/operation is NOT covered by the product warranty.
If you have any problems with the packaging that could damage the inverter or if you discover any visible damage, please notify the transport company immediately. If necessary, request assistance from an installer of solar 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, the electronic components) against violent knocks, humidity, vibrations, etc.
Zucchetti Centro Sistemi S.p.A. shall NOT be responsible for any damage or loss caused by improper installation.

2.2. Assembly and maintenance notes

In case of maintenance or repair, contact your service centre. Contact your nearest distributor for information or assistance. DO NOT repair the device yourself, as this may cause injury or damage to property.
The inverter must be completely disconnected (BAT, PV and AC) during maintenance. Before maintenance, disconnect the AC connection first, then the battery and the DC photovoltaic system (PV1 and PV2), and wait at least 5 minutes (capacitor discharge time) to avoid electric shock.
The inverter may reach high temperatures and have rotating parts inside during operation. Switch off the 3PH HYD5000-HYD20000-ZSS inverter and wait for it to cool down before performing any maintenance.
The inverter and batteries must be located in well-ventilated areas. Do not place the inverter in a cabinet or in an airtight or poorly ventilated location. This could be extremely hazardous to the performance and life of the system.

Use a multimeter to check the polarity and voltage of the battery before turning on the power, and also the PV voltage and polarity before closing the PV switch. Make sure that the connections are carried out according to the instructions in this manual and refer to the detailed installation notes available at www.zcsazzurro.com.
If you want to store the batteries without using them, disconnect them from the 3PH HYD5000-HYD20000-ZSS inverters and store in a cool, dry and well-ventilated area.
Secure the inverter to appropriate objects with sufficient load capacity (walls, PV brackets, etc.) and ensure that it is positioned vertically.

Attention: follow the rules below during installation/maintenance of the battery:

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 inverter and batteries before connecting/disconnecting the battery terminals;

f) Both the positive and negative polarities must be isolated from the ground.

⚠ **Danger**	**Electromagnetic radiation from the inverter can be harmful to health!** Do not stay closer than 20 cm to the inverter while it is on or operating.

Maintenance

The inverters do not require any daily or periodic maintenance. The heat exchangers and cooling fans must not be obstructed or clogged by dust, dirt or other objects. Before cleaning, ensure that the DC switch is OFF, the battery is switched OFF and the switch between the inverter and mains grid is OFF; wait at least 5 minutes before cleaning.

To ensure good long-term functioning, make sure that there is enough space around the heat exchangers for air to pass through and that no dust, dirt, etc. accumulates.

Clean the inverter and heat exchangers with air, a soft dry cloth or soft-bristled brush; DO NOT clean the inverter and heat exchangers with water, corrosive substances, detergents, etc.

2.3. Symbols on the inverter

Labels must NOT be hidden by foreign objects and parts (rags, boxes, equipment, etc.); they must be clean to ensure legibility.

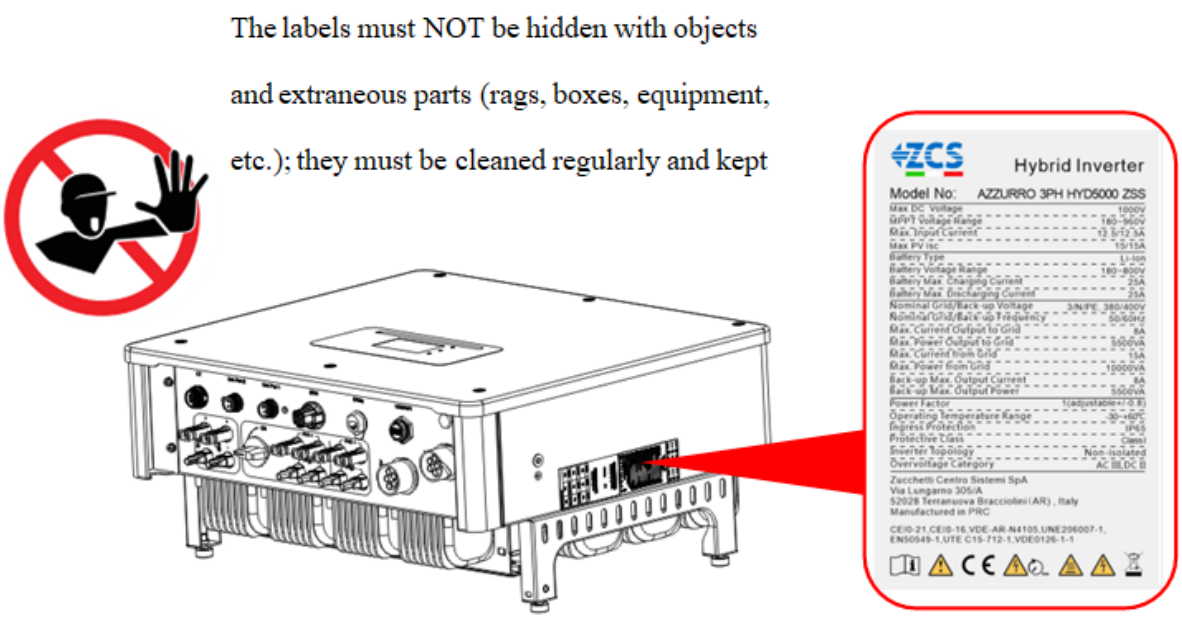


Figure 2 - Labels on the device

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

	This symbol indicates a hazardous situation which, if not avoided, will result in injury
	Risk of electric shock; wait at least 5 minutes before opening the cover of the 3PH HYD5000-HYD20000-ZSS inverter.
	Beware of high voltage and electric shocks
	Beware of hot surfaces
	Complies with the European (EC) Conformity certification.
	Ground terminal

	Read this manual before installing the 3PH HYD5000-HYD20000-ZSS inverter
	This value indicates the degree of protection of the equipment in accordance with the IEC 70-1 (EN 60529 June 1997) standard.
	Positive and negative polarities of DC voltage (Photovoltaic and Battery)
	This side up. The 3PH HYD5000-HYD20000-ZSS inverter must always be transported, handled and stored in such a way that the arrows are always pointing upwards.

Table 1 – Symbols on the device

3. Installation

The 3PH HYD5000-HYD20000-ZSS inverters are subjected to strict controls and inspection before packaging and delivery. Do not turn the inverter upside down during delivery.

	**Carefully check the packaging and product fittings before installation.**

Caution	

Figure 3 - Installation process

The 3PH HYD5000-HYD20000-ZSS 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 3PH HYD5000-HYD20000-ZSS 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.

3.1. Product overview

The 3PH HYD5000-HYD20000-ZSS storage inverters allow up to 10% overload to maximum power output and the Emergency Power Supply (EPS) mode can support inductive loads, such as air conditioners or refrigerators with an automatic switching time of less than 20 milliseconds.

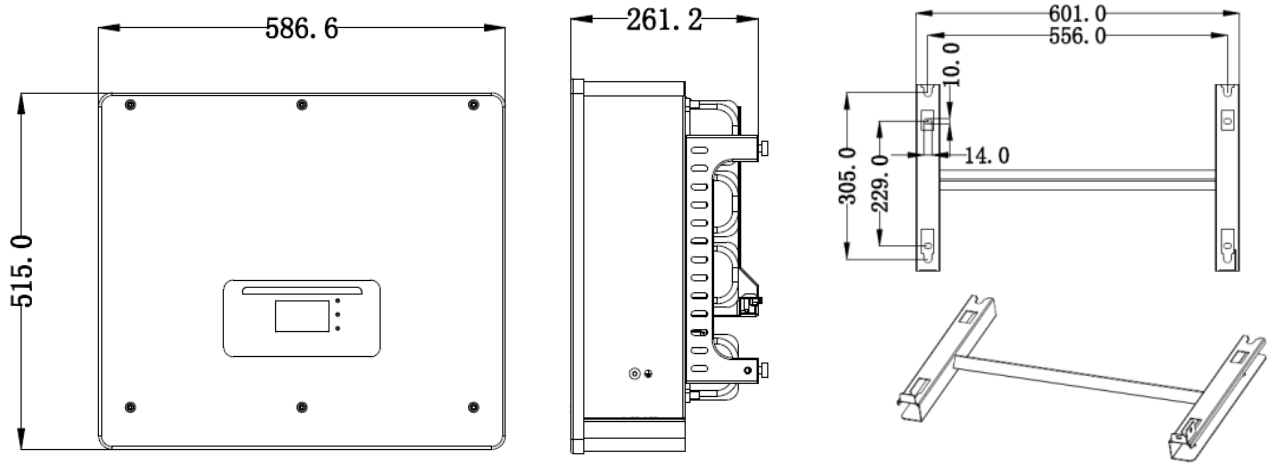


Figure 4 - Inverter dimensions and accessories

Main product features:

a. Double MPPT tracker with allowable DC overload of up to 1.5 times.

b. Flexible and fast switching between on-grid and off-grid modes.

c. Maximum efficiency of battery charging and discharging of 97.7%

d. 1 battery input strings (3PH HYD5000-8000-ZSS), 2 battery input strings (3PH HYD10000-20000-ZSS) with maximum charge and discharge of 25A per string.

e. Wide battery voltage range (200-700V).

f. Off-grid output can be connected to an unbalanced load.

g. Multi-parallel AC function, more flexible solution.

h. Intelligent monitoring, RS485/Wi-Fi/Bluetooth/GPRS/Ethernet (optional).

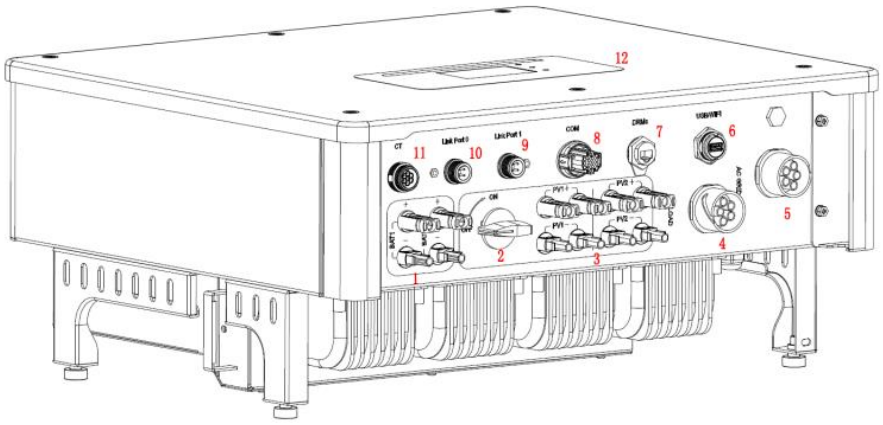


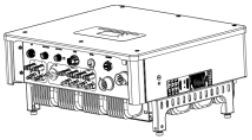
Figure 5 - Inverter overview

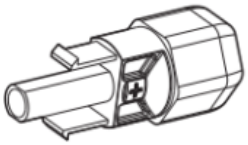
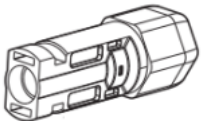
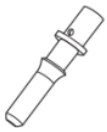
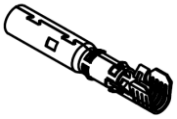
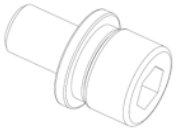
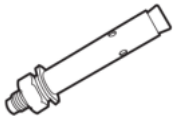
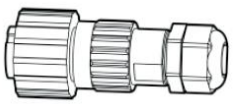
1	Battery input terminals	7	DRMs (active management of limitations)*
2	DC Switch	8	COM
3	PV input terminals	9	Port 1 for parallel connection
4	Privileged load connection port	10	Port 0 for parallel connection
5	Grid connection port	11	CT (current sensors)
6	USB/Wi-Fi	12	LCD

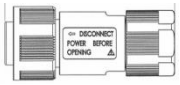
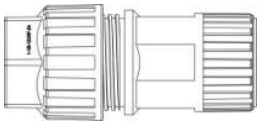
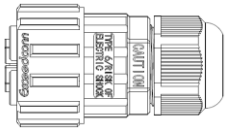
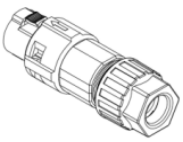
* depends on national regulations

Table 2 - Inverter overview

3.2. Package contents

No.	Part		Qty
1		Inverter	1
2		Bracket	1

3		PV+ clamp terminals	4
4		PV- clamp terminals	4
5		Metal clamp terminals fixed to PV+ input power cables	4
6		Metal clamp terminals fixed to PV- input power cables	4
7		Metal clamp terminals fixed to BAT+ input power cables	2
8		Metal clamp terminals fixed to BAT- input power cables	2
9		M6 hexagonal screws	2
10		M8x80 expansion plugs to secure the bracket to the wall	4
11		AC Grid Connector	1

12		Critical load connector	1
13		Connection port connector (for parallel function)	2
14		8 pin terminal Matching terminal resistance（parallel system）	1pcs
15		DRMs connector	1
16		6-pin CT connector	1
17		Current sensor	3
18		16-pin COM connector	1
19		Manual	1
20		Warranty	1

21		Registration form	1

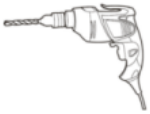
Table 3- Package contents

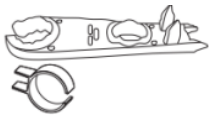
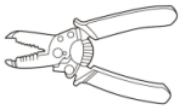
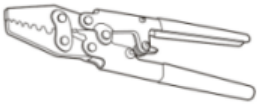
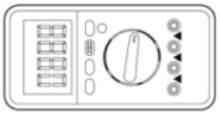
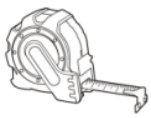
3.3. Requirements for the installation environment

 **Danger**	**DO NOT install the 3PH HYD5000-HYD20000-ZSS on flammable material.** **DO NOT install the 3PH HYD5000-HYD20000-ZSS in an area used for the storage of flammable or explosive materials**
 **Caution**	**The casing and heat sink are very hot while the inverter is running, therefore DO NOT install the 3PH HYD5000-HYD20000-ZSS in places where it can be accidentally touched**
 **Attention**	**Consider the weight of the 3PH HYD5000-HYD20000-ZSS when transporting and moving the inverters. Choose an appropriate mounting position and surface. Assign at least two people to install the inverter**

The packaging materials and components can be damaged during transport. Therefore, check the outer packaging before installation; check that the materials are not damaged. In case of damage, contact the dealer as soon as possible.
It is recommended to remove the packing materials within 24 hours before installing the inverter.

3.4. Installation tools

No.	Tool	Model	Function
1		Drill (recommended: 6mm drill bit)	To make a hole in the wall

2		Screwdriver	To screw in the electrical circuits
3		Star screwdriver	To remove the AC terminal screws
4		Removal wrench	To remove the PV terminals
5		Wire stripper	To strip the wires
6		4mm hex key	To connect the bracket with the inverter
7		Crimping tool	To crimp the power cables
8		Multi-meter	To meter the ground protection
9		Marker	To mark the references
10		Tape measure	To measure distances

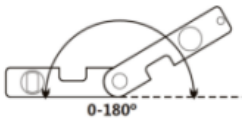
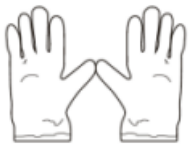
11		Level	To make sure the support is level and aligned correctly
12		ESD gloves	For the operator's protection
13		Safety goggles	For the operator's protection
14		Dust mask	For the operator's protection

Table 4 – Installation tools

3.5. Wall installation position

The inverter must be placed in a dry and clean place for proper functioning. The area must be tidy and convenient for installation, and well-ventilated to prevent overheating. DO NOT place it near flammable or explosive materials.
The AC overvoltage of the 3PH HYD5000-HYD20000-ZSS inverter belongs to Category III.
Maximum operating altitude: 2000 m.
Ambient temperature range: -25°C ~ 60°C.
Relative humidity: 0 ~ 100% (non-condensing).

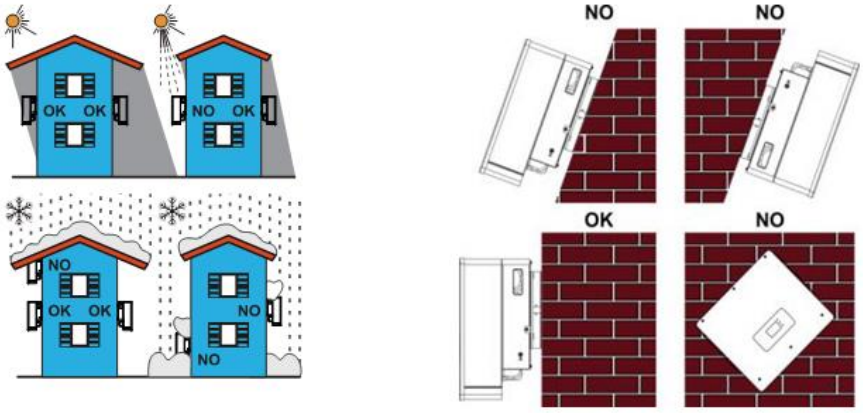


Figure 6 - Correct positioning of the inverter (1)

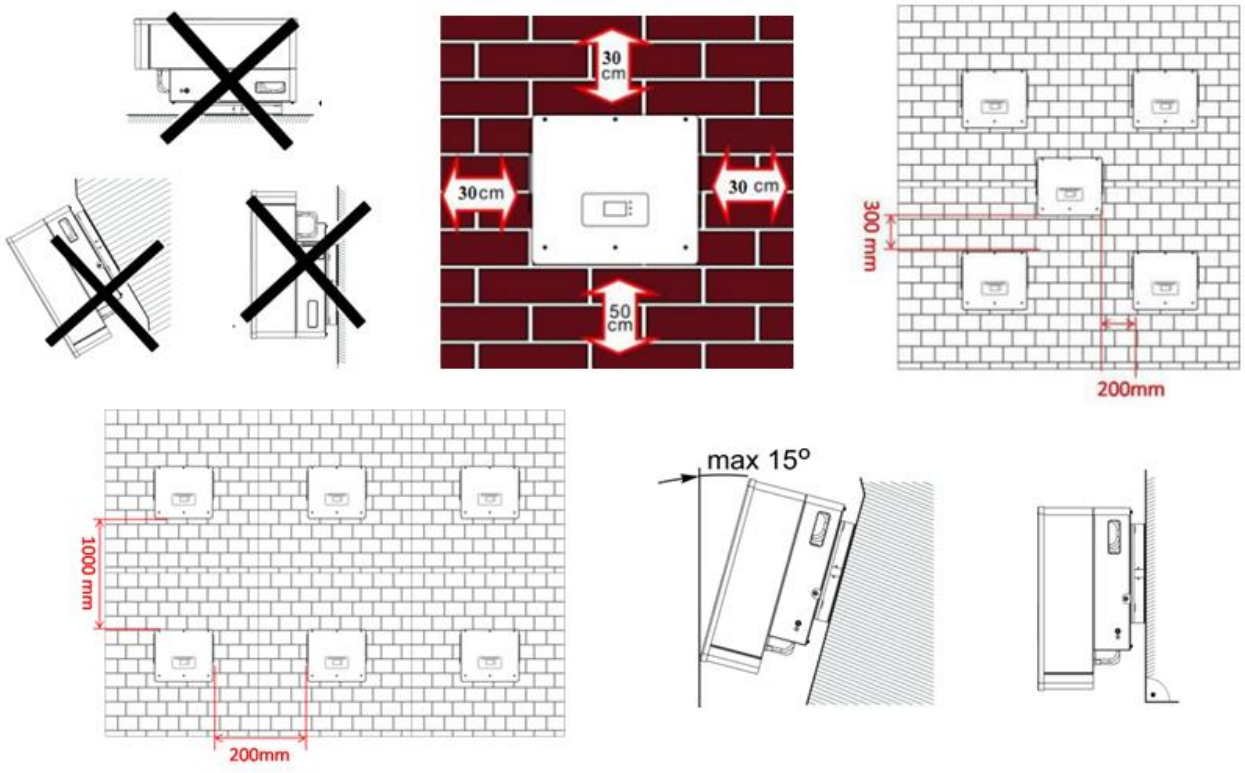


Figure 7 - Correct positioning of the inverter (2)

3.6. Assembly instructions

To remove the inverter, open the packaging, insert your hands into the slots on both sides of the inverter and grasp the handles; lift the inverter out of the packaging and move it to the installation position.

Danger	**The inverter is quite heavy, so make sure to keep your balance while moving it. Two or more people are needed to move the packaging and inverter.**
Attention	**When placing the inverter on the floor, place foam or paper under it to protect the housing.**

1. Determine the position of the holes, make sure the positions of the holes are level, then mark them with a marker pen. Use the drill to make the holes on the wall. The drill must remain perpendicular to the wall. Try not shake it while drilling the holes so as not to damage the wall. If

the holes are not level, they must be repositioned and drilled again.

2. Insert the expansion screws vertically into the hole, making sure that the insertion depth is neither too shallow nor too deep.
3. Align the bracket with the hole, and secure it by tightening the expansion bolts with nuts.
4. Position and fix the inverter to the rear panel.
5. (OPTIONAL) install an anti-theft lock.

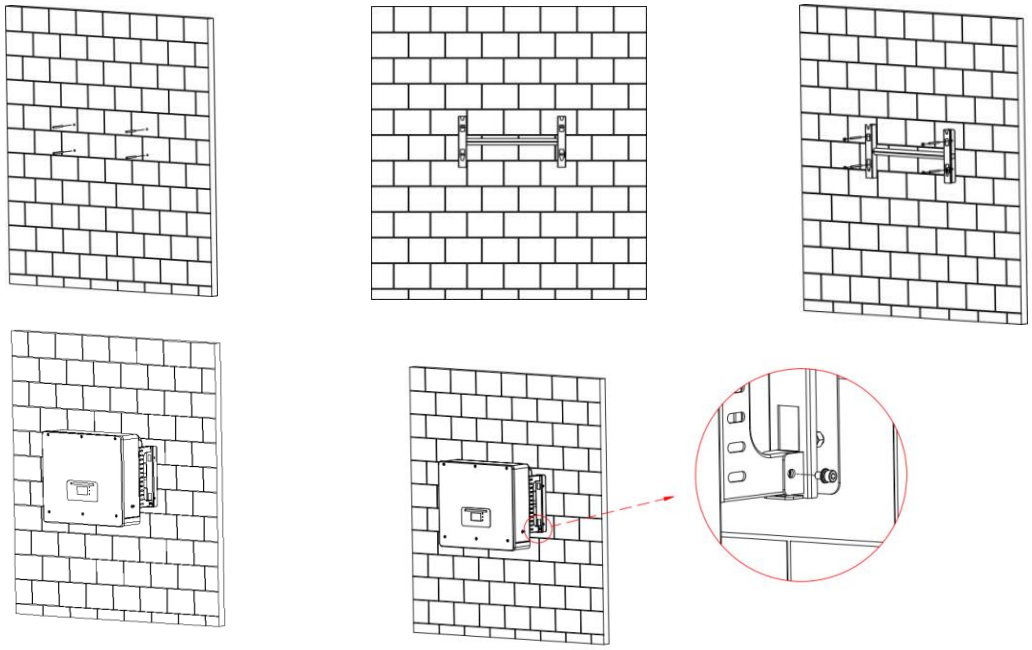


Figure 8 - Positioning of the inverter on the wall

4. Electrical connections

Before making any electrical connections, make sure that the DC circuit breaker is switched off. The stored electrical charge remains in the capacitor after the DC circuit breaker has been switched off, for safety reasons, wait 5 minutes for the capacitor to discharge completely.

Danger	**The PV modules generate electricity when exposed to sunlight, and can create electric shocks. Therefore, before connecting the DC power cord, cover the PV modules with a dark covering.**
Attention	**The inverter must be installed and serviced by a professional electrician. Wear protection equipment when working on high voltage/high current systems such as inverters and battery systems.**
	For the 3PH HYD5000-HYD20000-ZSS inverter, the open-circuit voltage (Voc) of the strings related to the modules connected in series must be ≤ 1000V

Note	

The PV modules must have an IEC 61730 classification of Class A.

Model	Isc PV (absolute maximum)	Maximum output overcurrent protection
3PH HYD5000 ZSS	15A/15A	8A*3
3PH HYD6000 ZSS		10A*3
3PH HYD8000 ZSS		13A*3
3PH HYD10000 ZSS	30A/30A	20A*3
3PH HYD15000 ZSS		25A*3
3PH HYD20000 ZSS		32A*3

Table 5 - Models of three-phase hybrid models

There are two ways to measure the currents exchanged with the grid; refer to the technical notes in the website www.zcsazzurro.com for more details.

1. Direct-insertion current sensors

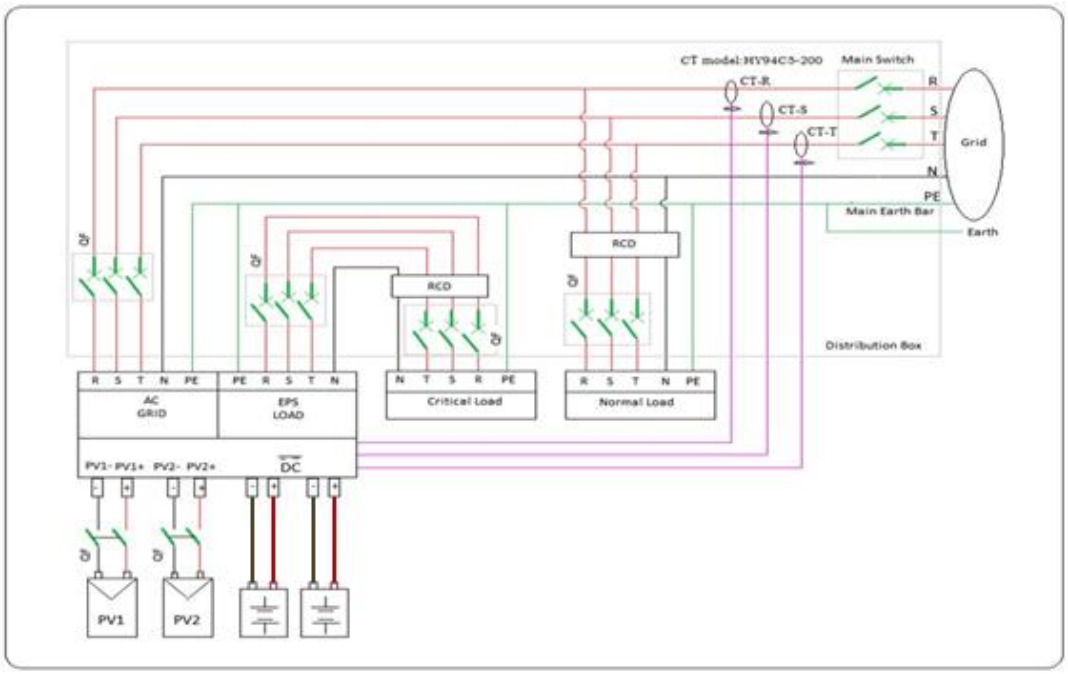


Figure 9 – Configuration with CT current sensor

2. Meter + CT sensor

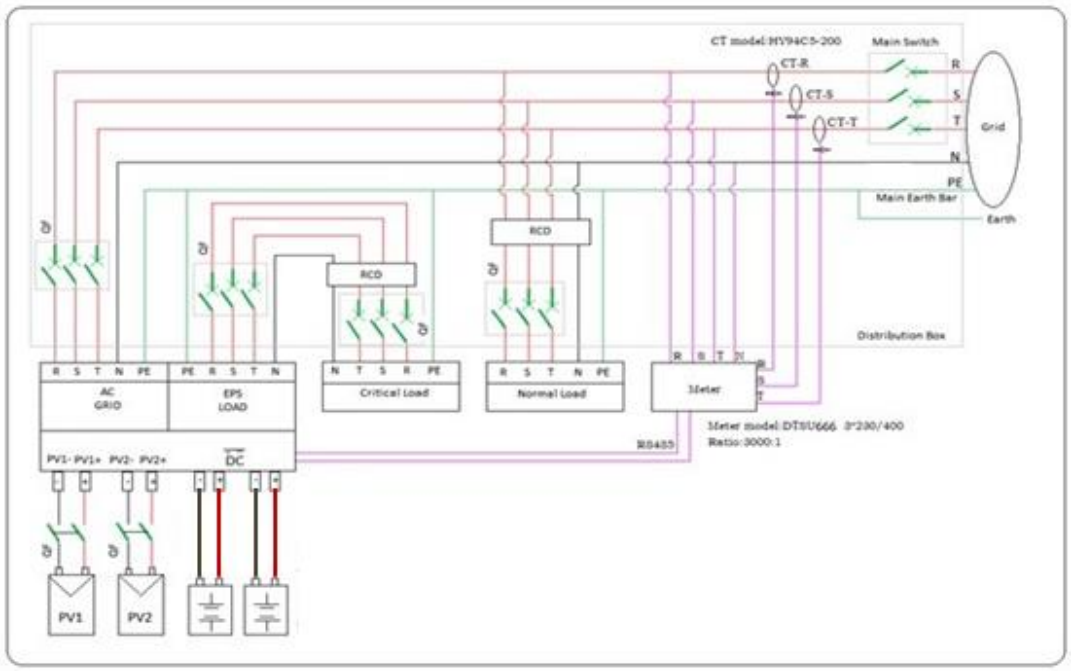
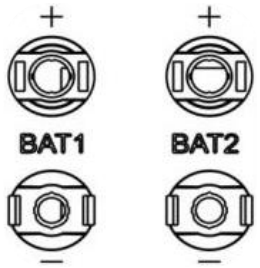
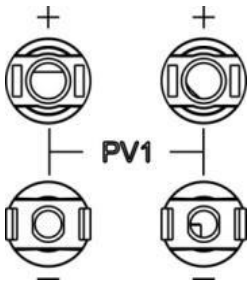
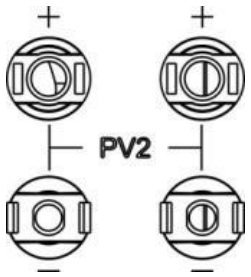
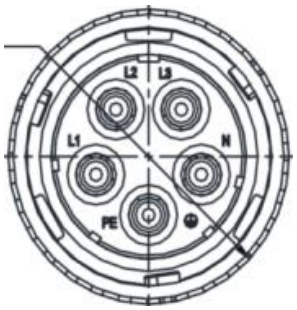
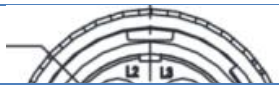


Figure 10 – Configuration with meter + CT sensor

Part	Description		Recommended cable type	Recommended cable specifications
	**+** : connection of the positive electrode to the lithium battery		Multi-core copper cable for outdoor use	Conductor with cross-section: **6mm²**
	- : connection of the negative electrode to the lithium battery			
	**+** : connection of the positive electrode to the photovoltaic system		Outdoor industrial cable for photovoltaic systems	Conductor with cross-section: **6mm²**
	- : connection of the negative electrode to the photovoltaic system			
	**+** : connection of the positive electrode to the photovoltaic system		Outdoor industrial cable for photovoltaic systems	Conductor with cross-section **6mm²**
	- : connection of the negative electrode to the photovoltaic system			
	Load	L1	Multi-core copper cable for outdoor use	Conductor with cross-section: **6mm²～10mm²**
		L2		
		L3		
		N		
		PE		
	AC	L1	Multi-core copper	Conductor with

		L2	cable for outdoor use	cross-section: **10mm²～16mm²**
		L3		
		N		
		PE		

Table 6 - Cable specifications

4.1. Connection of protective ground cables (PGND)

Connect the inverter and the batteries to the grounding electrode using protective ground cables (PGND).

⚠ **Attention**	**The inverter does not have a transformer, therefore the positive and negative polarities of the PV array do NOT have to be grounded.** **All the metal parts in the photovoltaic supply system that do not carry current must be grounded (e.g. PV module frame, PV bracket, dialler housing, inverter housing).**

The PGND cables are pre-set cables (external power supply cables ≥ 4mm² are recommended for grounding purposes), the cable must be a yellow-green colour.

Procedure:

1. Remove a suitable length of the insulating layer using a wire stripper, **NB:** L2 is 3mm longer than L1.

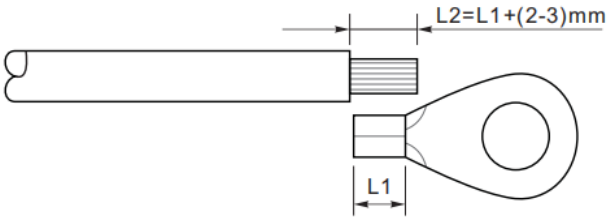


Figure 11 - Removal of insulating layer

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

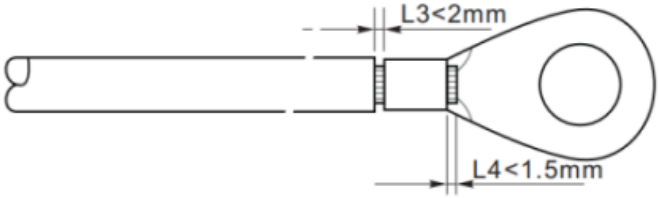
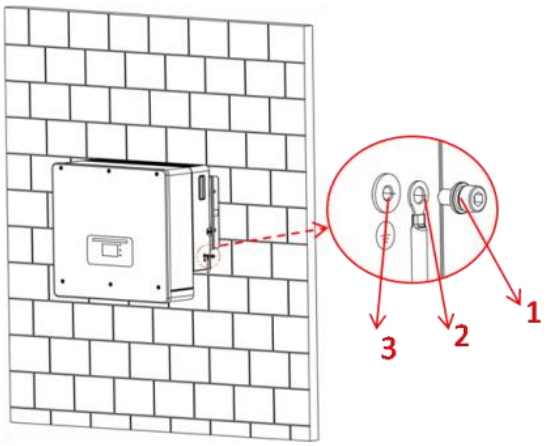


Figure 12 - Crimping of the exposed core

3. Install the crimped OT terminal, insert the M5 screw and tighten the screw at a torque of 3Nm using the hex key.

   NB: L3 is the length between the insulating layer of the ground cable, the L4 curved part and the core wires protruding from the secured part.

   NB: The cavity formed on the conductor just below the crimping strip must completely wrap the core wires, which must be in contact with the terminal.



1) M5 screw
2) OT Terminal
3) Threaded hole

Figure 13 - Installation of crimped terminal

4.2. Connecting the battery

!!!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.

4.2.1.Installing Pylontech batteries

4.2.1.1. Connecting a single battery tower

Figure 14 - Single battery tower

Each tower of battery modules consists of a BMS connected in series to multiple battery modules.
The devices to be used are:

1. The external BMS (ZST-BMS-SC1000-H)

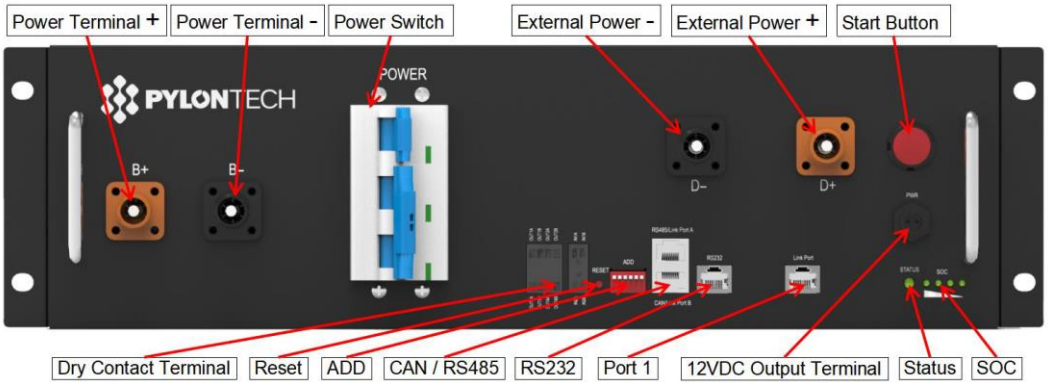


Figure 15 - BMS

2. Battery modules (ZST-BAT-2.4KWH-H)

Figure 16 - Battery module to be connected in series

Power connections

The battery modules must be connected in series via the cables shown in figure.
The connection cables are supplied with the battery.

Figure 17 - Power connector between battery modules

The connector must be connected from the negative input of the first battery module to the positive input of the second one. The negative input of the second battery module must then be connected to the positive input of the third module, continuing the series until the negative input of the second-last module is connected to the positive input of the last module.
In this configuration, the positive input of the first module and the negative input of the last battery module will remain free (follow the colour of the connector as a reference).

Figure 18 - Power cable between battery modules

Subsequently, the external BMS must be connected to the series of battery modules. Therefore the positive of the BMS must be connected to the positive of the first battery, and the negative of the BMS to the negative of the last battery module (the cables for this connection are supplied with the BMS).

Figure 19 - Connection cables between the BMS and battery modules

Figure 20 - Power connection (positive) between the BMS and first battery module

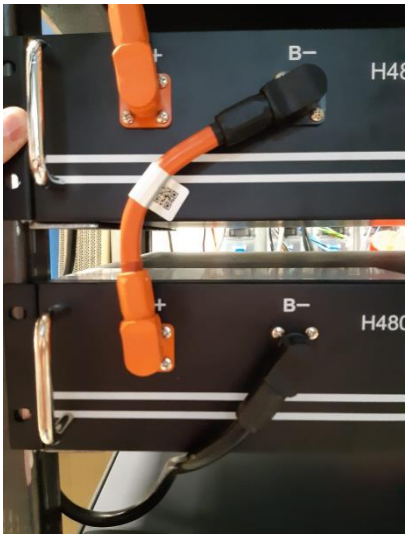


Figure 21 – Power connection (negative) between the BMS and the last battery module

Finally, the BMS must be connected to the inverter via the power cables provided in the kit (ZST-CABLE-KIT-H) as shown in the figure.

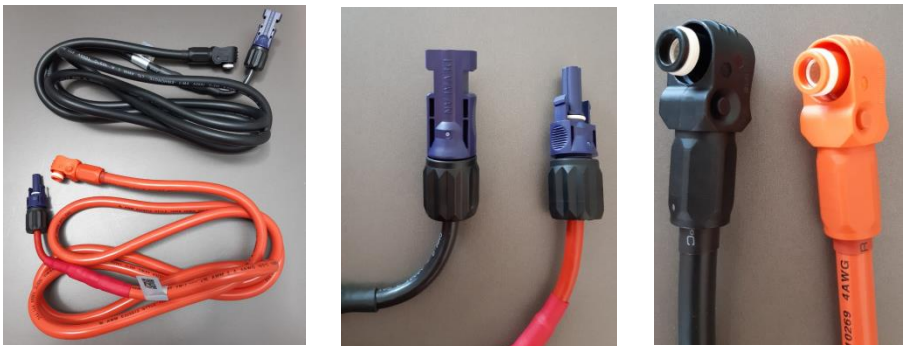


Figure 22 - BMS Inverter power cables (left), inverter-side power terminals (centre), battery-side power terminals (left)

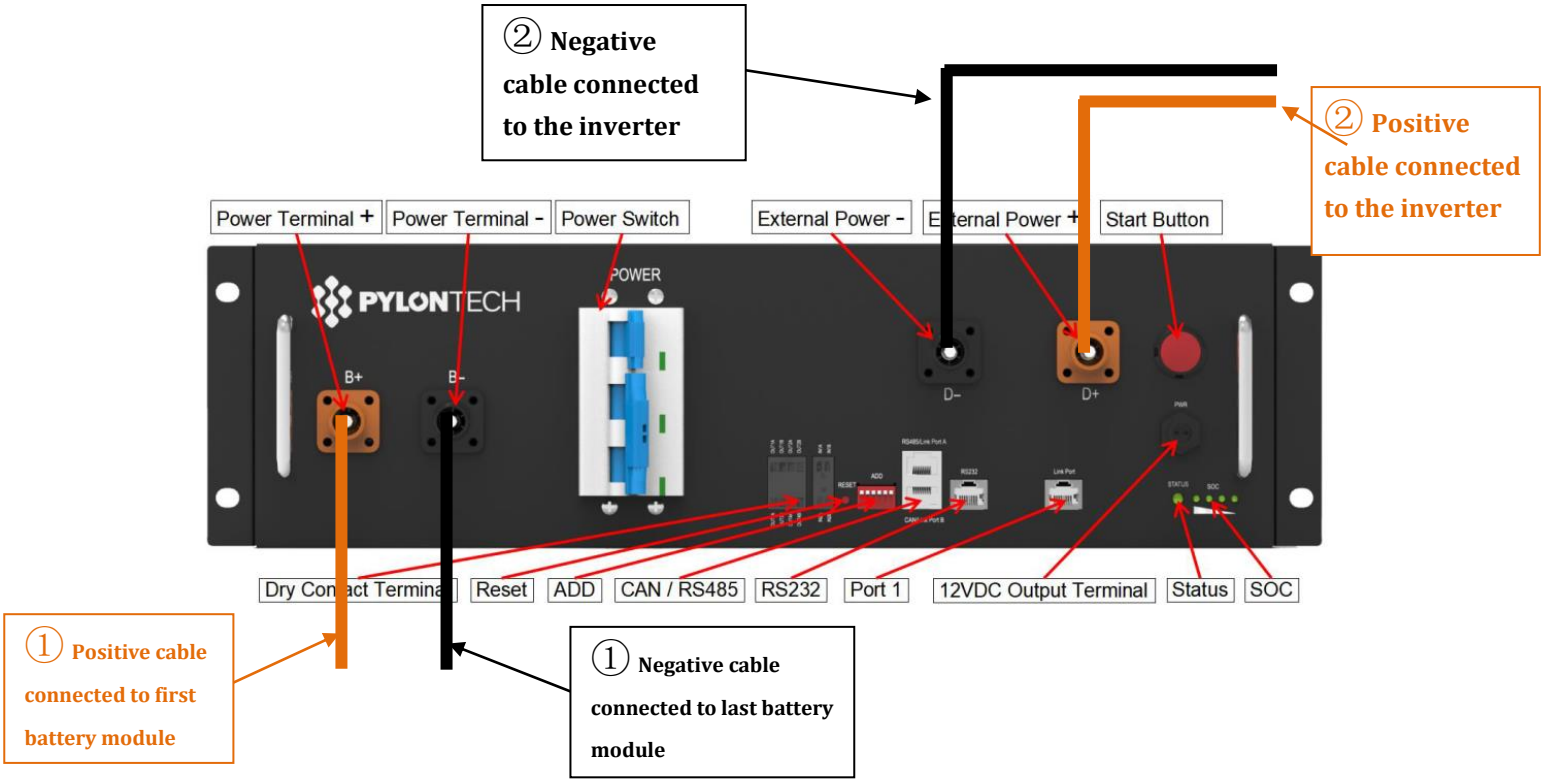


Figure 23 - BMS power connection

Figure 24 - Inverter-side DC power connection with a single battery input populated

Communication between the BMS and Battery Modules

The communication connections must be arranged as follows, using the communication cables between battery modules:

- Link port 1 of the BMS to link port 0 of the first battery
- Link port 1 of the first battery must be connected to link port 0 of the second
  …
- Link port 1 of the second-last battery must be connected to the last battery.

Figure 25 - Communication connections: the BMS and the first battery module (left), connection between the battery modules (centre), connection between the second-last and last battery module in the series (right)

BMS and Inverter communication

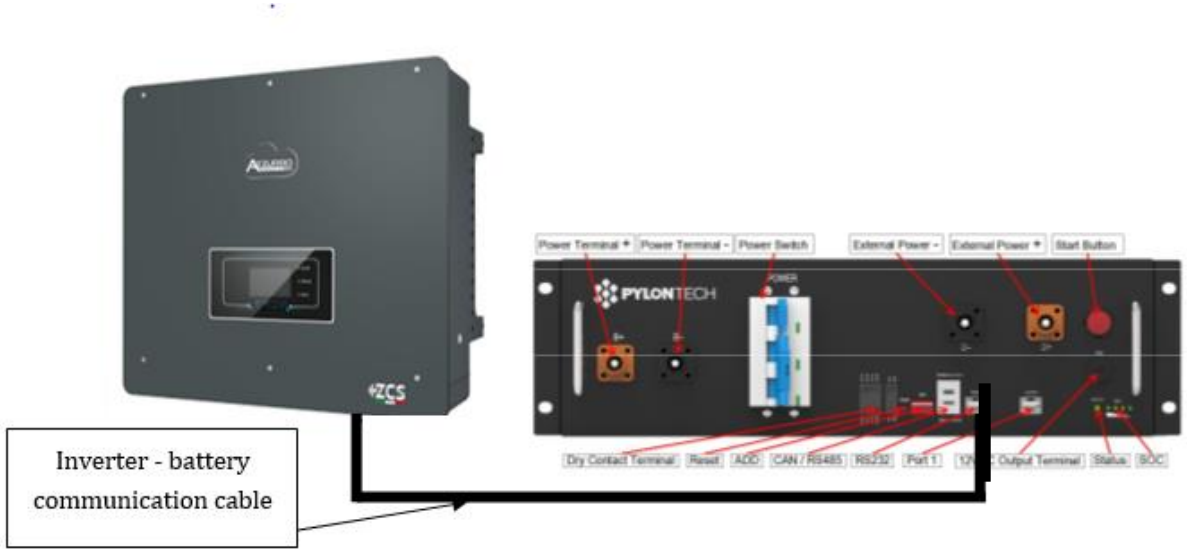


Figure 26 - Hybrid inverter and BMS communication connection

The position of the DIP switches in case of a single tower requires moving all the pins down, this means the address equals 000000.

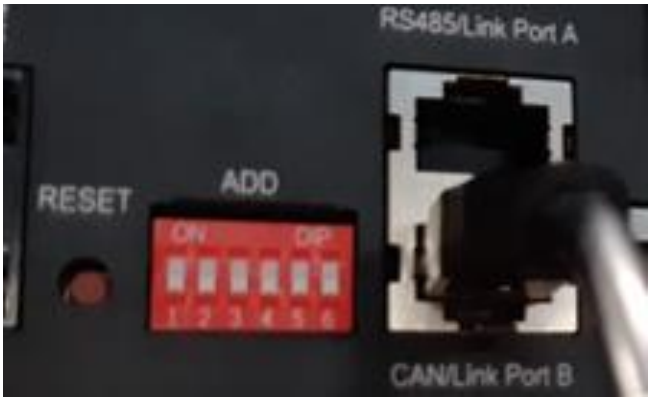


Figure 27 – 000000 battery address

For communication between the battery and inverter, use the black communication cable supplied, which has the BAT and INV labels on the RJ45 end. On the BMS side, insert the end labelled BAT in link port B. The other end, labelled INV, must be cut leaving only the wires connected to pins 2 (orange wire), 4 (blue wire) and 5 (white-blue wire) in the appropriate communication counterpart of the hybrid inverter.

Figure 28 - CAN input of the BMS

Definition of RJ45 Port Pin

No.	CAN	RS485	RS232 Pin
1	---	---	---
2	GND	---	---
3	---	---	TX
4	CANH	---	---
5	CANL	---	---
6	---	GND	RX
7	---	RS485A	---
8	---	RS485B	GND

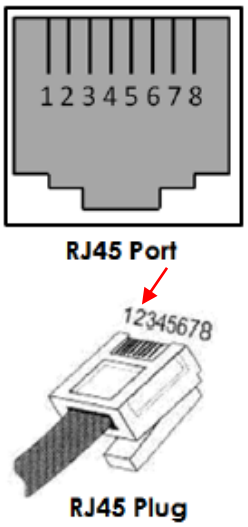


Figure 29 - Pin Out CAN BMS input

4.2.1.2. Installation with double battery tower

Figure 30 - Double battery tower

Power connections

The power cables in each tower between the battery modules and the BMS must be connected as indicated in relative section.
As for the connection between each tower and the inverter, the two power cables (+ and -) coming from the BMS will be connected to the two inputs of the inverter: BAT1 and BAT2.

Figure 31 - Inverter-side DC power connection with two battery inputs populated

Identify the two battery towers by assigning the number 1 to the tower connected to channel 1 and number 2 to the tower connected to channel 2.

Communication between the BMS and Battery Modules

The communication connections must be arranged for each tower as indicated in relative section, using the communication cables between the battery modules:

- Link port 1 of the BMS to link port 0 of the first battery
- Link port 1 of the first battery must be connected to link port 0 of the second
  …
- Link port 1 of the second-last battery must be connected to the last battery.
-

BMS – Inverter communication

The two BMS must be set with a different address by changing the position of the dip switches, as shown below:

- Address 000000 = address 0 (to be assigned to tower 1)
- Address 100001 = address 1 (to be assigned to tower 2)

The RJ45 cable of the BMS with Address=1 (tower 2) will depart from the link port B of the CAN/RS485 input and connect to the link port A of the CAN/RS485 input of the BMS with Address=0 (tower 1); finally, another cable must be inserted in link port B of the same BMS and must be connected to the COM of the inverter, according to the indications in section relative section.

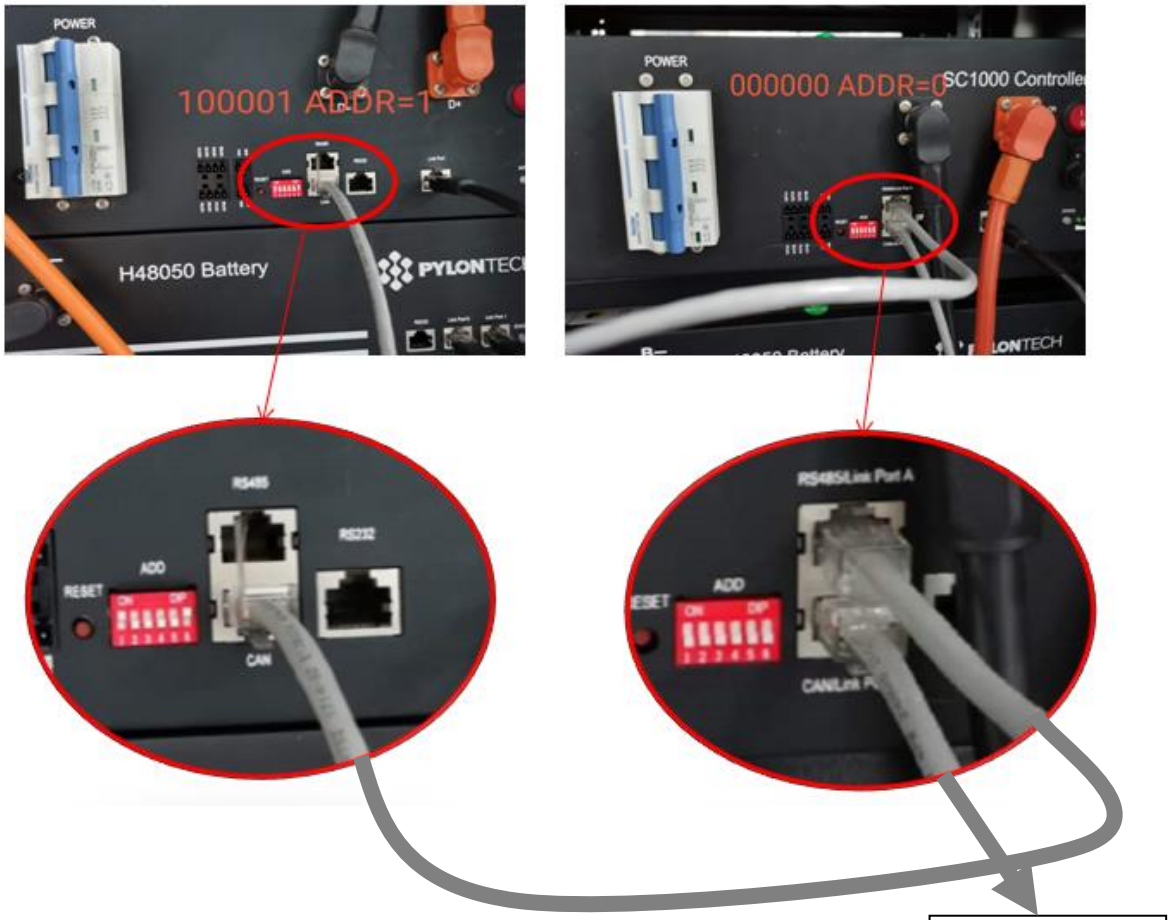


Figure 32 - Communication connections between battery towers

Connect the cable in position 4 (blue wire) to position 7 of the communication connector supplied with the inverter (see figure).
Connect the cable in position 5 (white-blue wire) to position 8 of the communication connector supplied with the inverter (see figure).
Connect the cable in position 2 (orange wire) to position 9 of the communication connector supplied with the inverter (see figure).

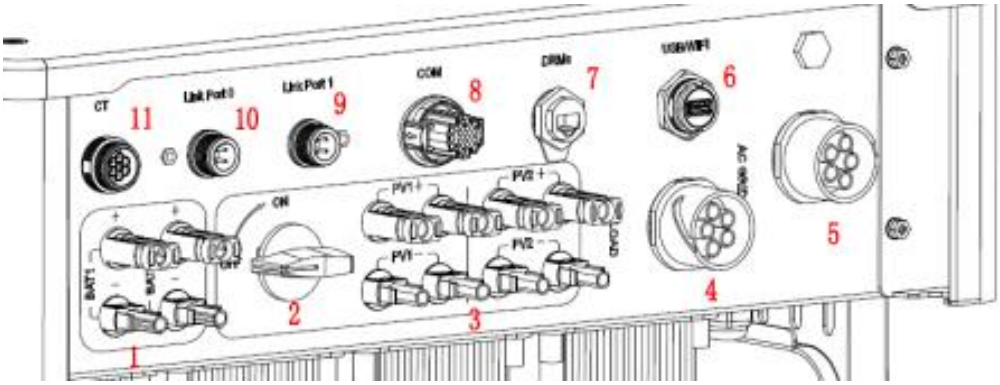


Figure 33 - Section of inverter connections

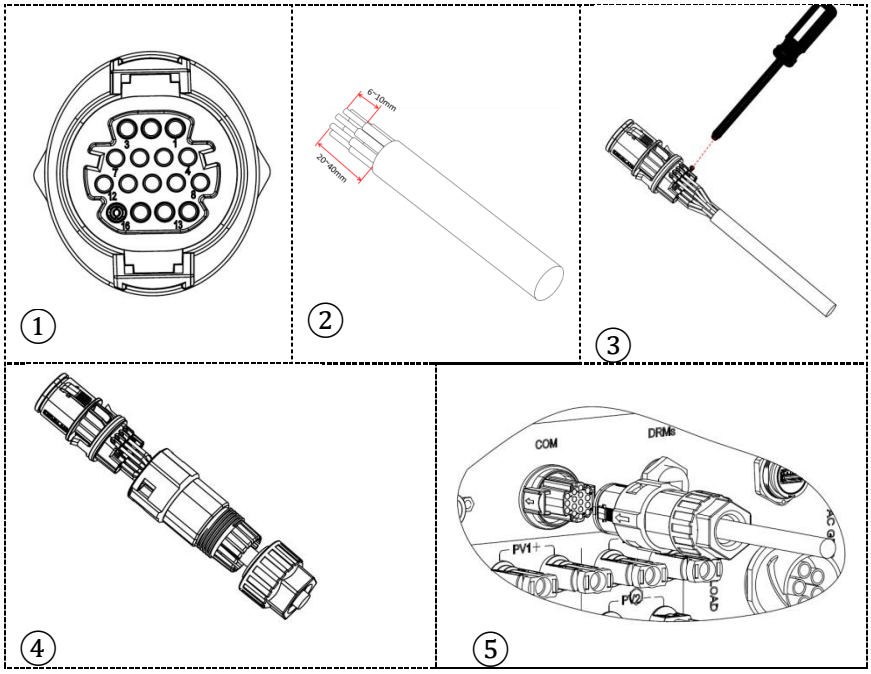


Figure 34a - COM port connection

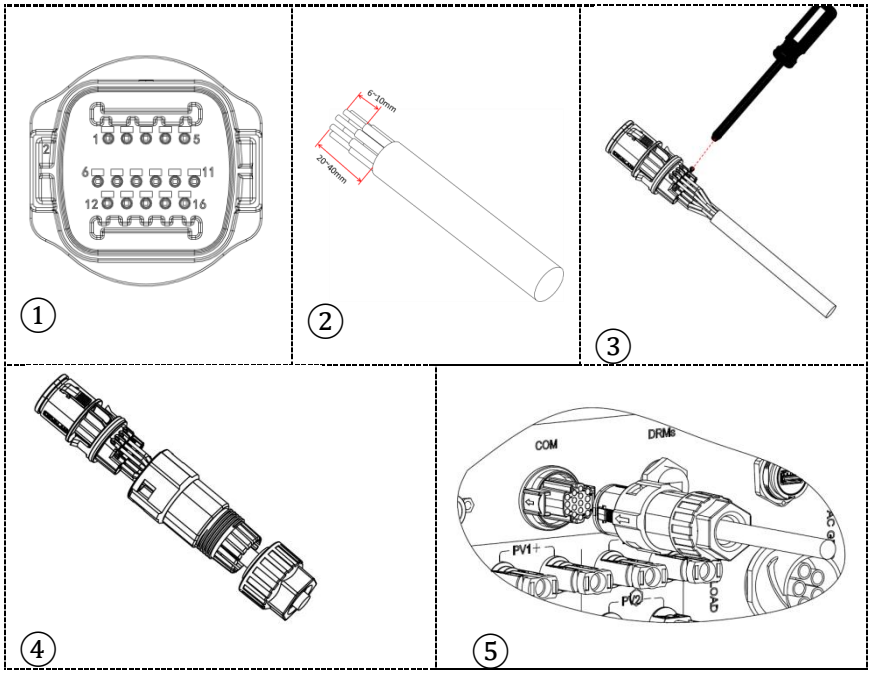


Figure 34b - COM port connection

PIN Inverter	Battery communication	Notes
7	CAN H (blue wire)	Communication with the BMS of the lithium battery, the CAN of the inverter adapts to the BMS of the lithium battery.
8	CAN L (white-blue wire)	
9	GND.S (orange wire)	

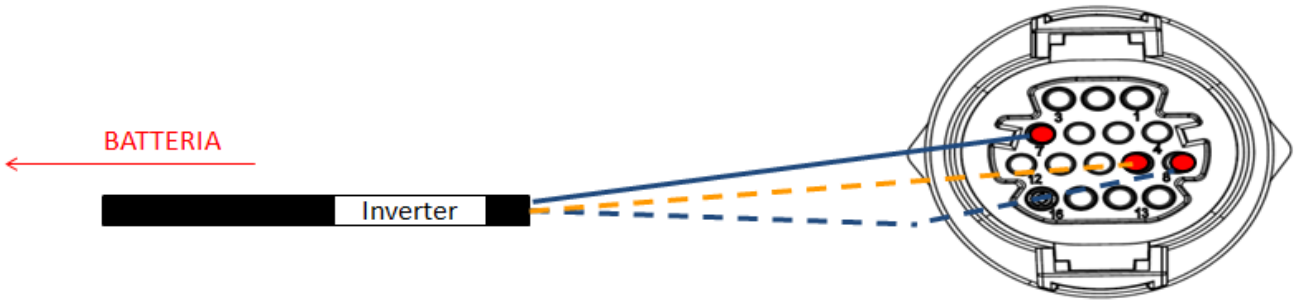


Figure 35a - COM connection diagram

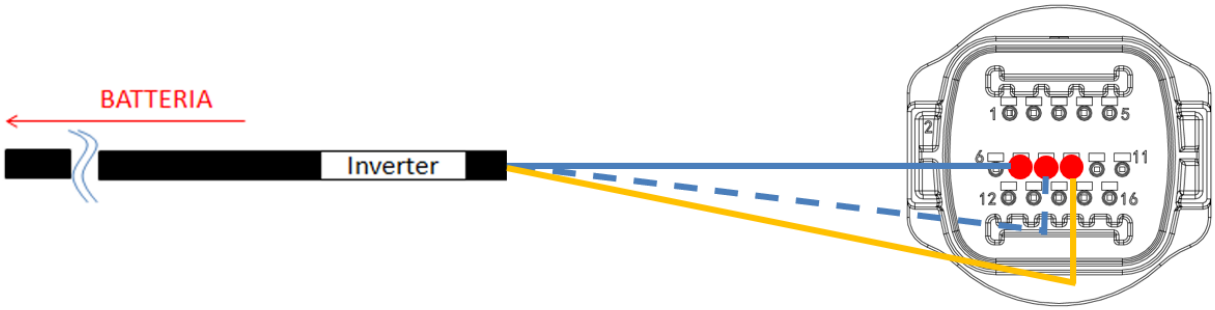


Figure 35a - COM connection diagram

4.2.2.Installing WeCo batteries

4.2.2.1. Only one battery tower connected

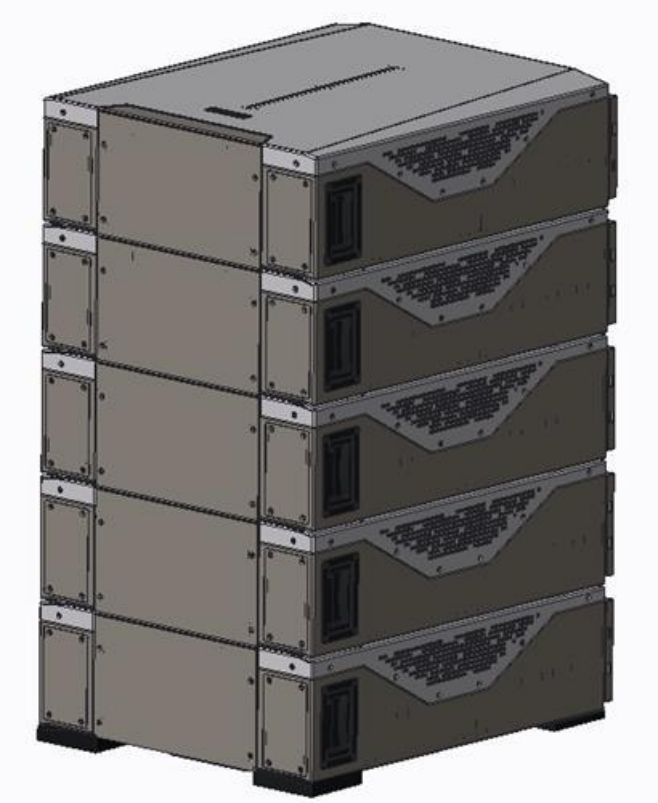


Figure 36 - Single battery tower

Each tower consists of a HV-BOX connected in series to multiple battery modules.
The devices to be used are:

1. external HV BOX

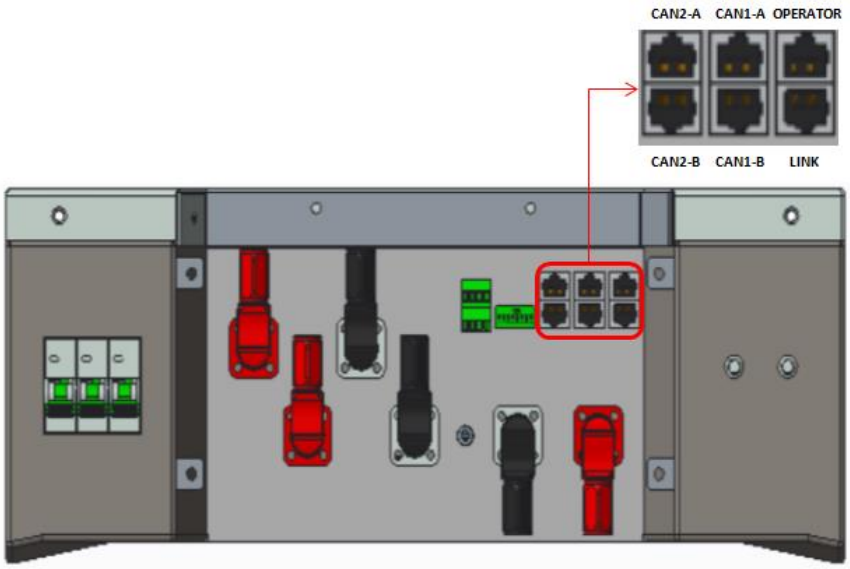


Figure 37 - HV BOX

2. Battery module

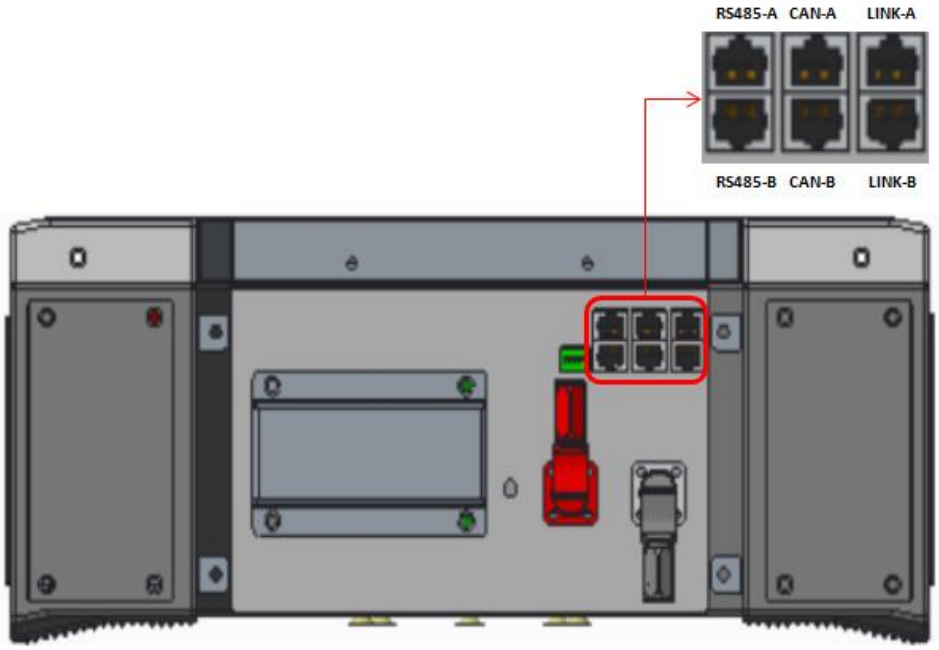


Figure 38 - Battery module to be connected in series

Power connections

The battery modules must be connected in series via the cables supplied.
The connector must be connected from the negative input of the first battery to the positive input of the second one. From here, the negative input must be connected to the positive input of the third module, continuing the series until the negative input of the second-last module is connected to the positive input of the last module.

In this configuration, the positive input of the first module and the negative input of the last battery will remain free (follow the colour of the connector as a reference).

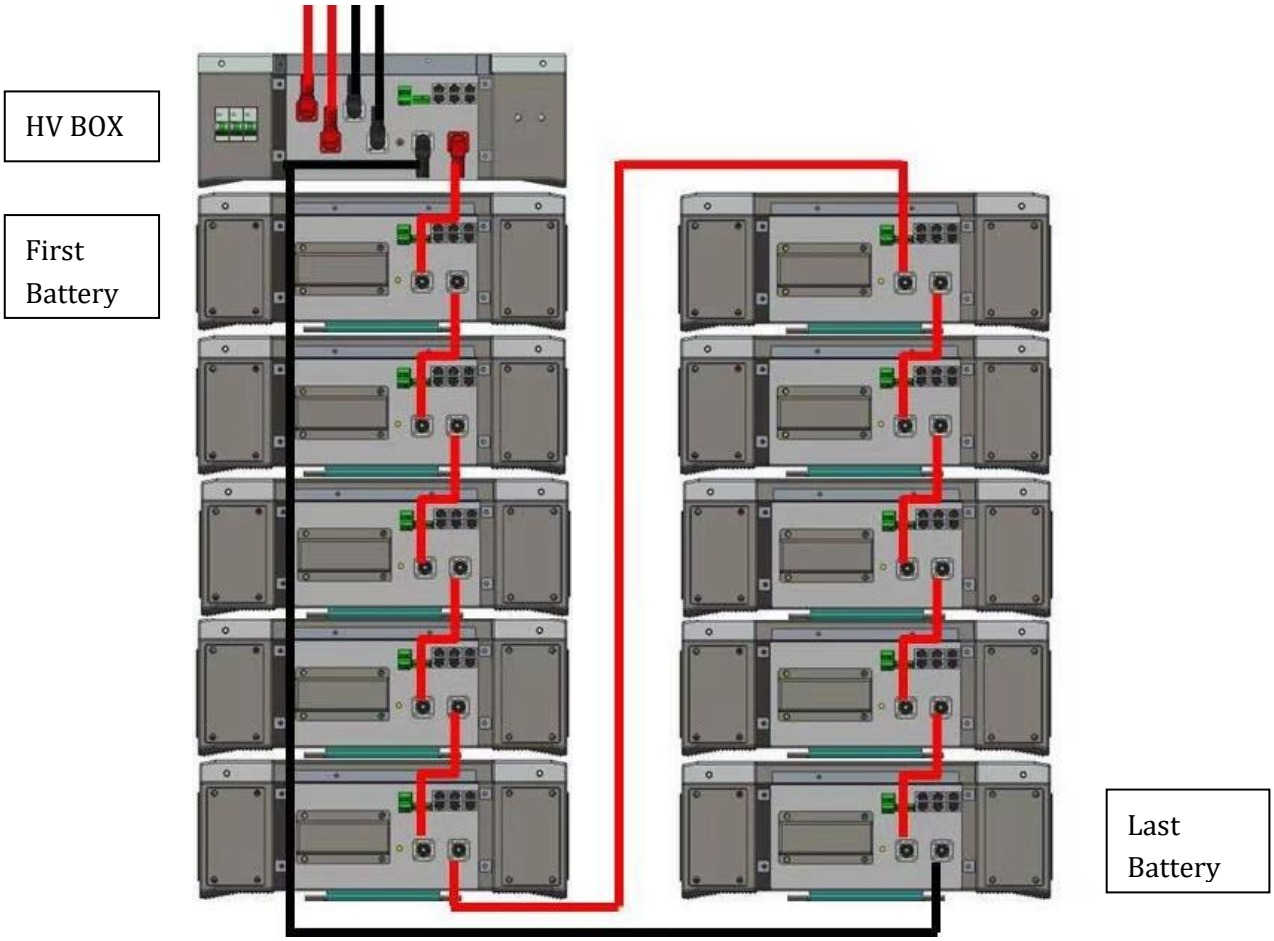


Figure 39 - Wiring between battery modules in series

Subsequently, the HV BOX must be connected respecting the + and – polarity as it is powered by the batteries themselves. Therefore, the positive of the HV BOX must be connected to the positive of the first battery, and the negative of the HV BOX to the negative of the last battery module.
The HV BOX must be grounded using the M5 screw terminals supplied.

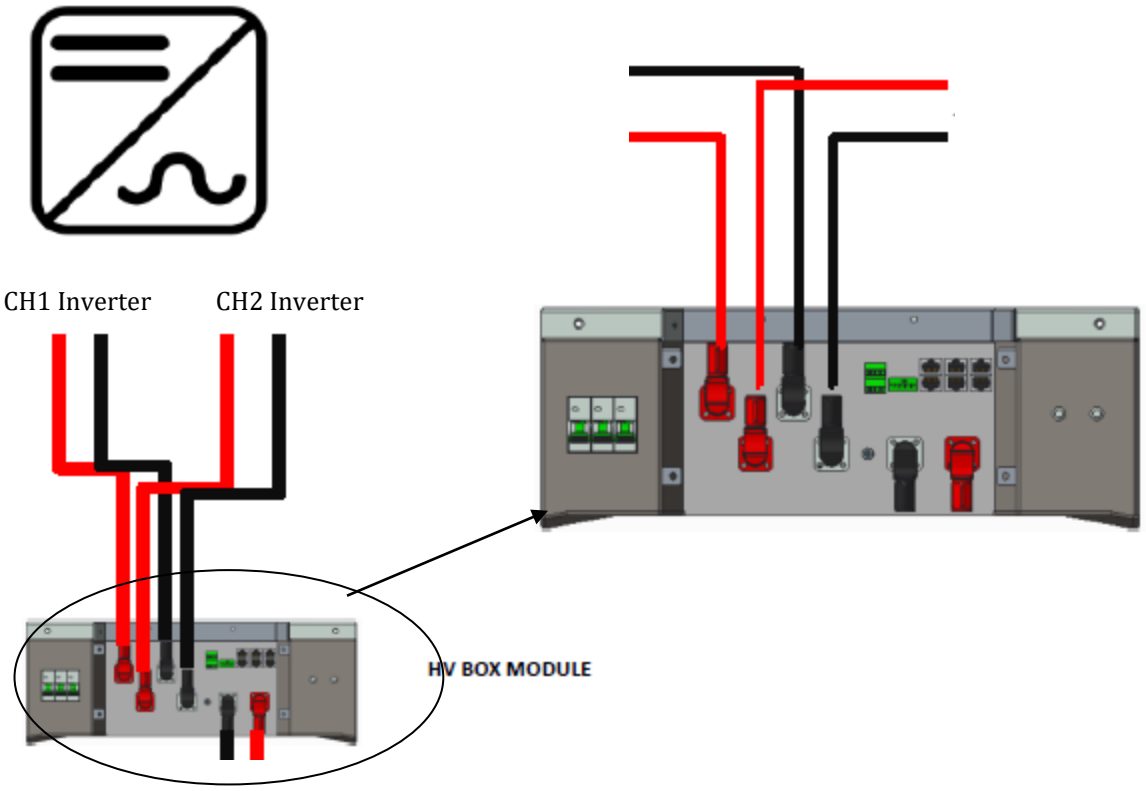


Figure 40 - HV BOX power connection

As for the power connections between the HV BOX and the inverter, the HV BOX module allows the connection of both channels coming from the inverter (if properly set from the inverter LCD, the battery column will be able to manage the maximum power of the inverter, both when charging and discharging).

Figure 41 - Inverter-side DC power connection with two battery inputs populated

Communication of HV BOX and Battery Modules

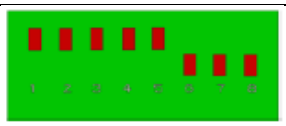
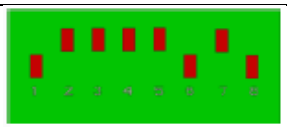
The communication connections must be arranged as follows, using the communication cables between the battery modules:

- CAN1-B of the HV BOX to CAN-A of the first battery
- LINK of the HV BOX to LINK-A of the first battery
- CAN-B of the first battery to CAN-A of the second battery
- LINK-B of the first battery to LINK-A of the second battery

  …
- CAN-B of the second-last battery to CAN-A of the last battery
- LINK-B of the second-last battery to LINK-A of the last battery.

As regards the positioning of the dip switches of the battery tower, it is necessary to first check the serial number of the HV BOX module and select the address according to the following indications:

- The DIP switches of all the battery modules except for the last one must be set so that the addresses from 1 to 5 are in the ON position, while those from 6 to 8 are in the OFF position (ADD=111111000).
- The last module in the series must have all pins set to ON, except for pins 1, 6, and 8 which must be set to OFF (ADD=01111010)

Battery modules from first to second-last battery	
Last battery in the series	

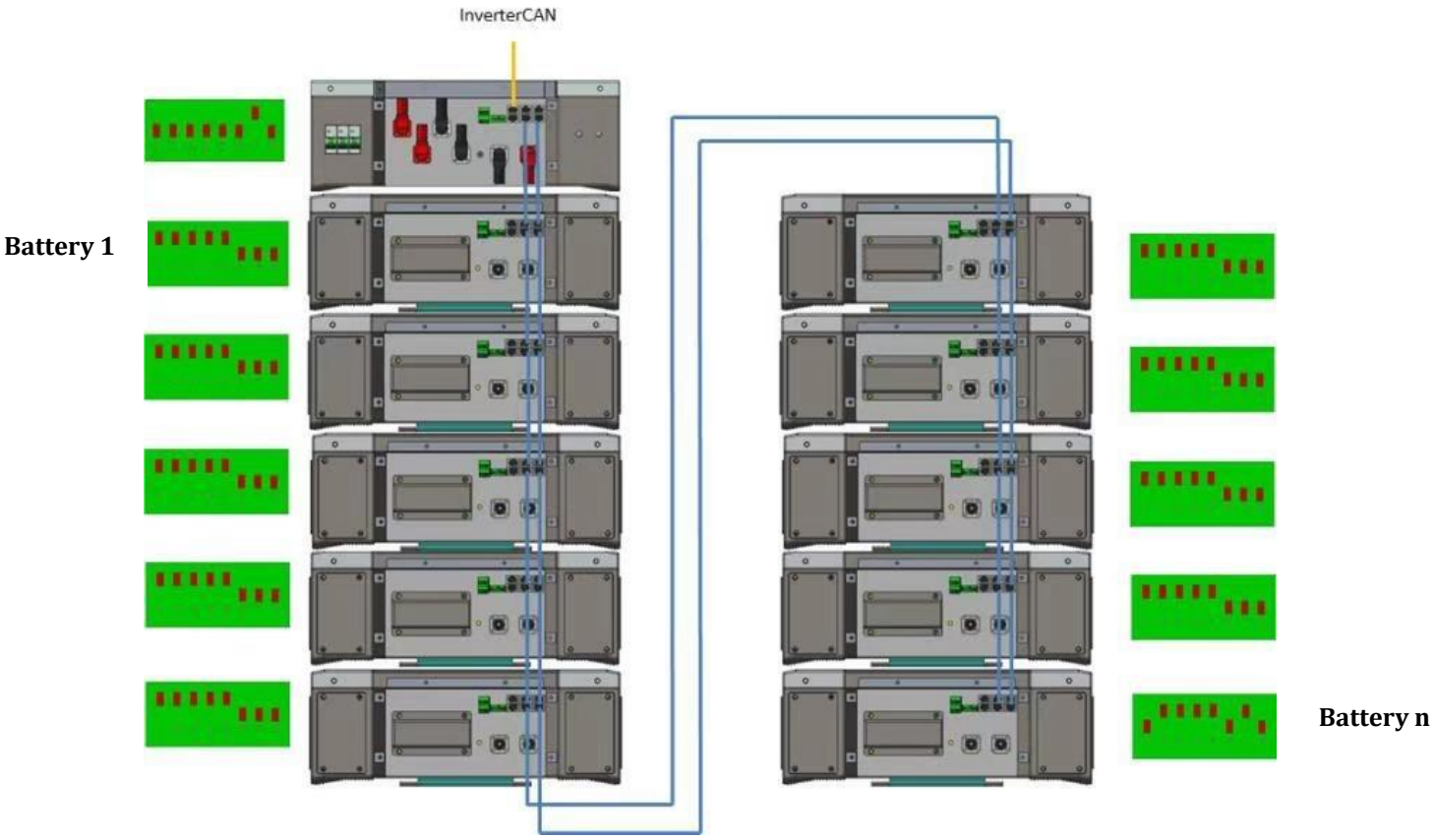


Figure 42 - Communication connections: HV BOX and first battery module, connection between battery modules, connection between second-last and last battery module in the series

HV BOX and Inverter communication

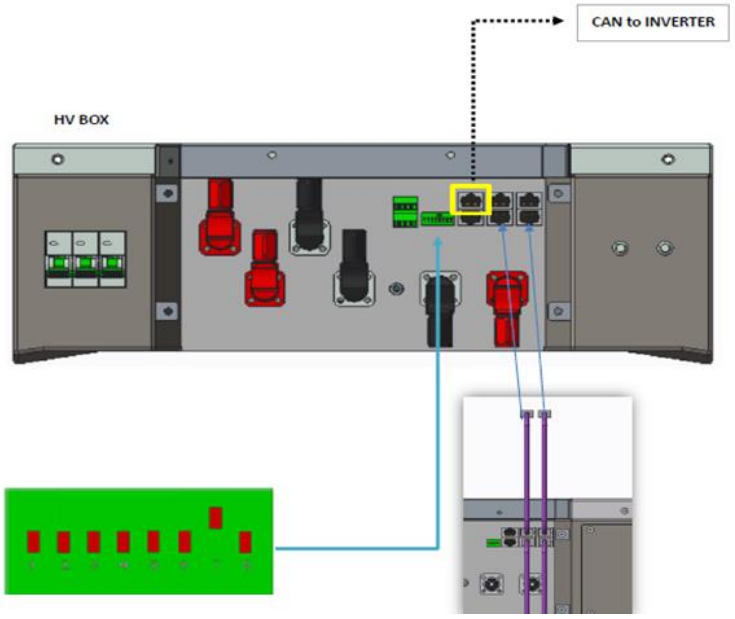


Figure 43 - HV BOX configuration

In the case of a single battery tower, the address must be set with all pins in the OFF position, except for pin 7, which must be in the ON position.

4.2.2.2. Installation with two battery towers

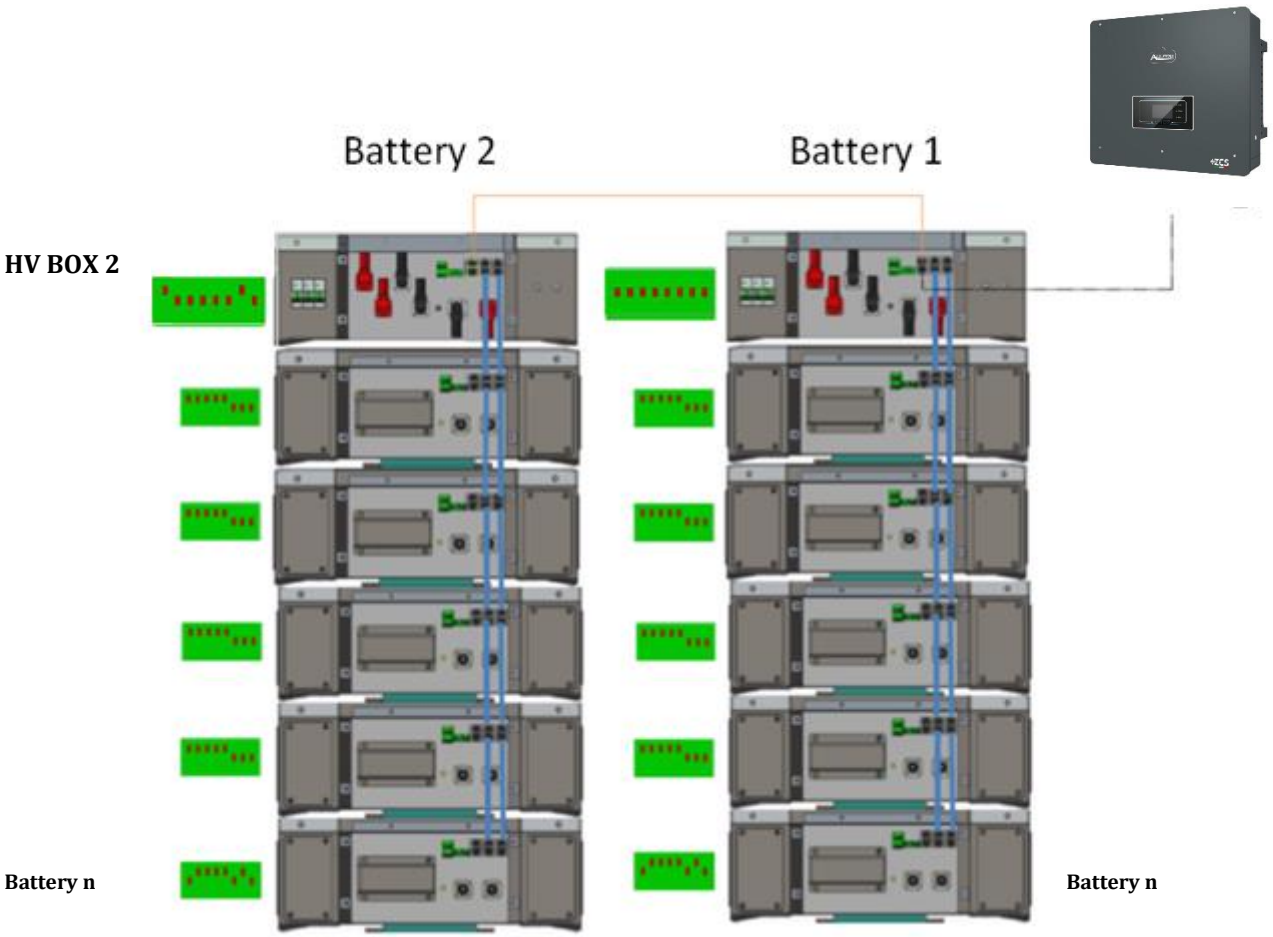


Figure 44 - Double battery tower

Power connections

The power cables in each tower between the battery modules and HV BOX must be connected as indicated in relative section.
As for the connection between each tower and the inverter, the two power cables (+ and -) coming from the HV BOX will be connected to the two inputs of the inverter: BAT1 and BAT2.

Battery 1 **Battery 1**

Figure 45 - Inverter-side DC power connection with two battery inputs populated

Identify the two battery towers by assigning the number 1 to the tower connected to channel 1 and number 2 to the tower connected to channel 2.

Communication between the HV BOX and Battery Modules

The communication connections must be arranged for each tower as indicated in relative section, using communication cables between the battery modules:

- CAN1-B of the HV BOX to CAN-A of the first battery
- LINK of the HV BOX to LINK-A of the first battery
- CAN-B of the first battery to CAN-A of the second battery
- LINK-B of the first battery to LINK-A of the second battery

  …
- CAN-B of the second-last battery to CAN-A of the last battery
- LINK-B of the second-last battery to LINK-A of the last battery.

HV BOX – Inverter communication

In the case of two battery towers:

1. Battery Tower 1

   Set address to ADD=00000000
2. Battery Tower 2
   a. All pins in the OFF position, except for pin 1 and pin 7, which must be in the ON position (ADD=10000010).

A cable from the CAN2-A input of the HV BOX of tower 2 must be connected to the CAN2-A input of the HV BOX of tower 1; finally, the Inverter/HV BOX communication cable must be inserted in the CAN2-B port of the HV BOX.

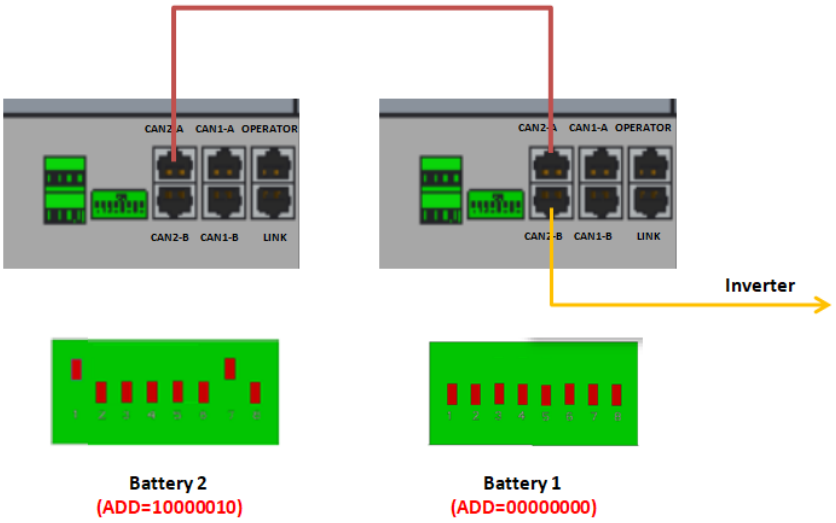


Figure 46 - Communication connections between battery towers

The inverter and the HV BOX must be connected by populating the CAN2-A input with the Inverter-HV BOX communication cable. The other end, in which only the "orange" and "white-orange" wires are present, must be wired to the quick-connect COM connector of the hybrid inverter, as shown in the figures below.
The HV BOX must be grounded using the M5 screw terminals supplied.

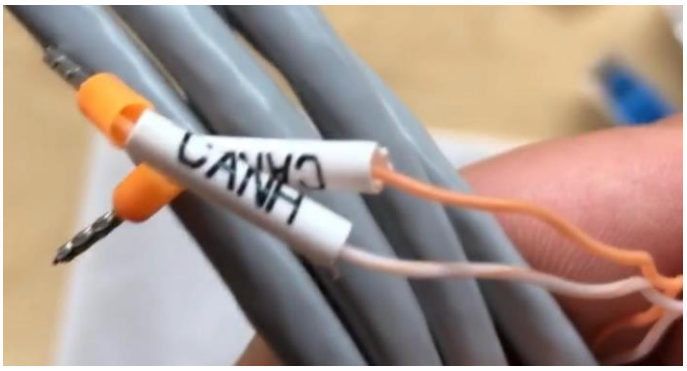


Figure 47 - Inverter/HV BOX communication cable

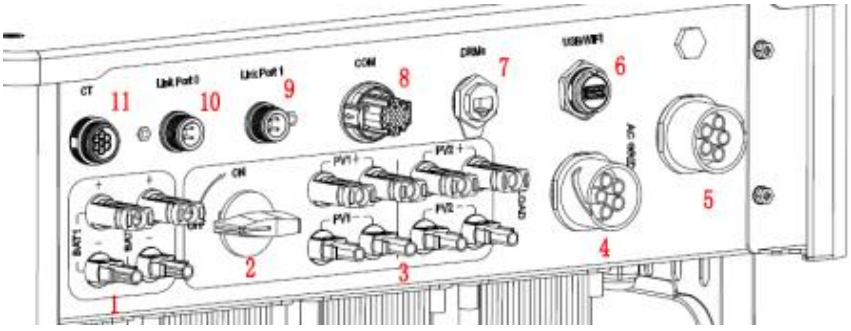


Figure 48 - Section of inverter connections

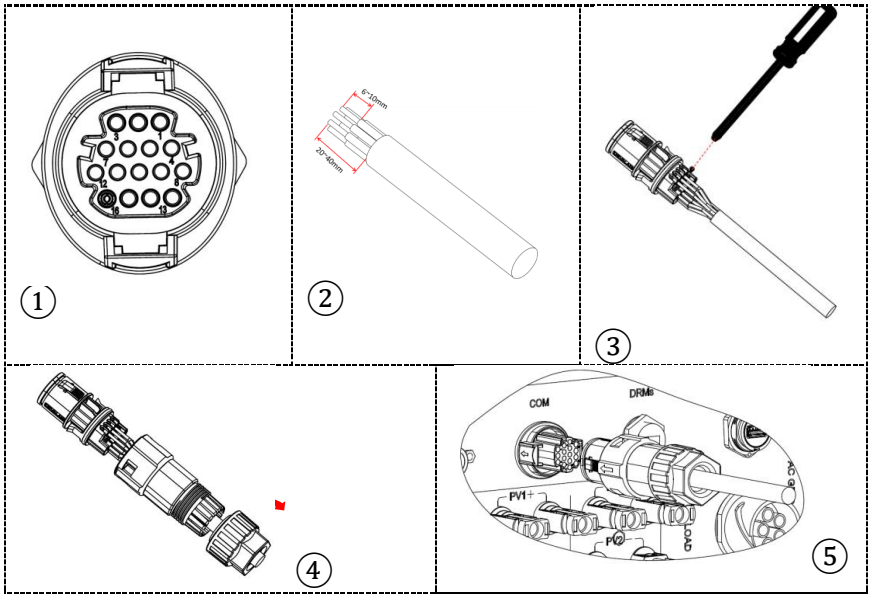


Figure 49a - COM port connection

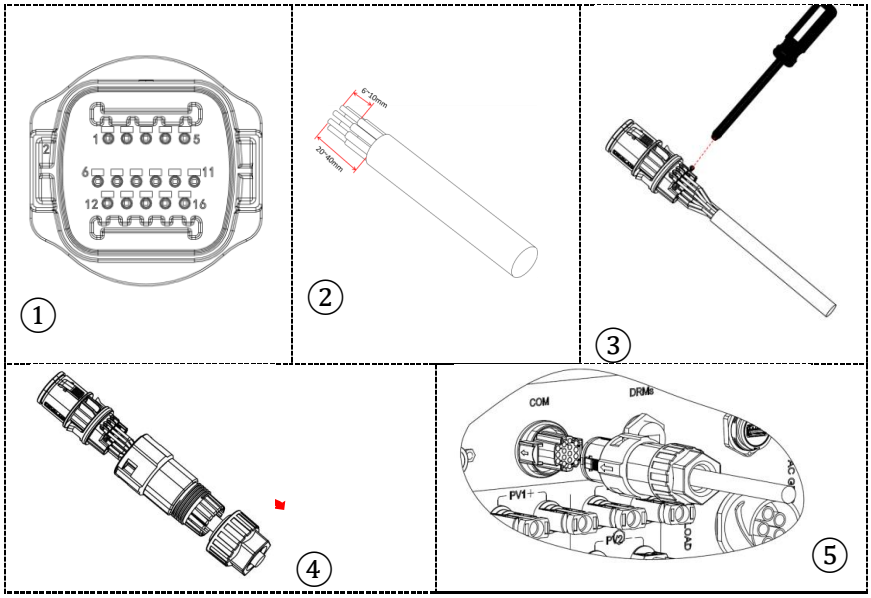


Figure 49b - COM port connection

PIN Inverter	Battery communication	Notes
7	CAN H (white-orange wire)	Communication with thee HV BOX of the lithium battery, the CAN of the inverter adapts to the HV BOX of the lithium battery.
8	CAN L (orange wire)	

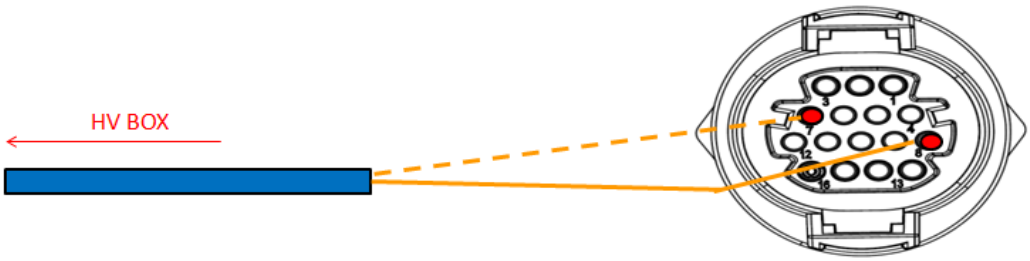


Figure 50a - Description of COM interface

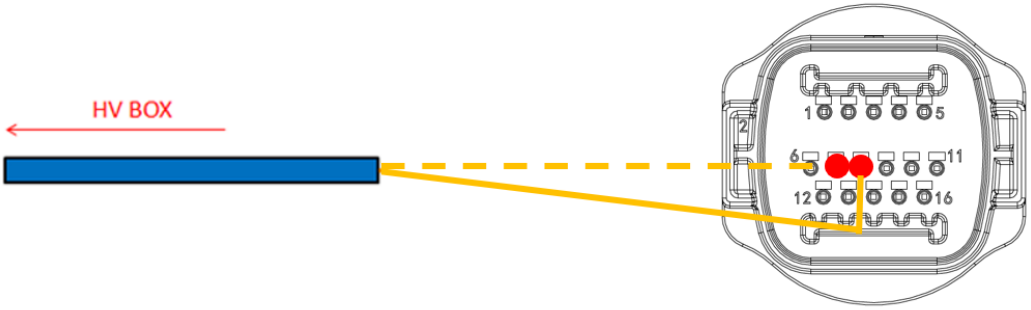


Figure 50b - Description of COM interface

4.2.3.Installing WeCo 5K3XP batteries

4.2.3.1. Only one battery tower connected

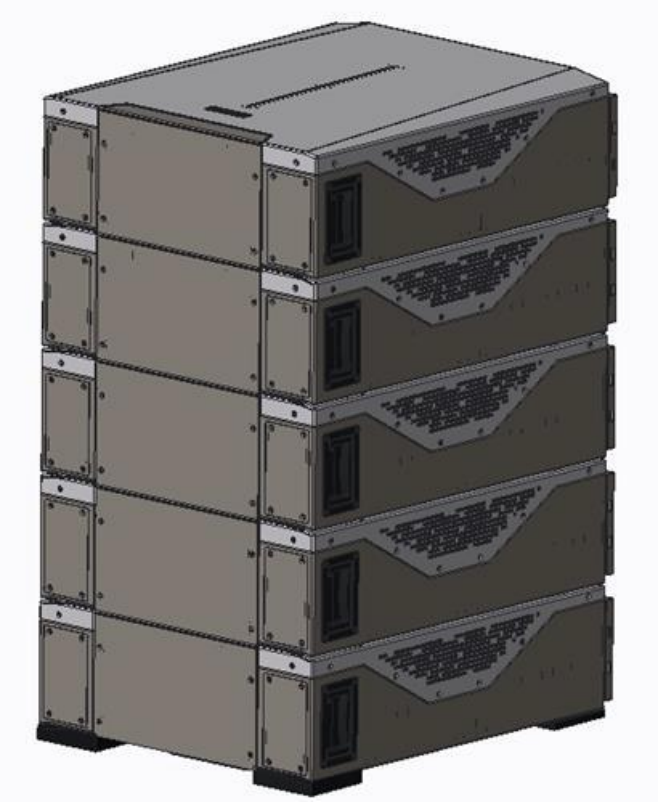


Figure 51 - Single battery tower

Each tower consists of a HV-BOX connected in series to multiple battery modules.
The devices to be used are:

3. external HV BOX

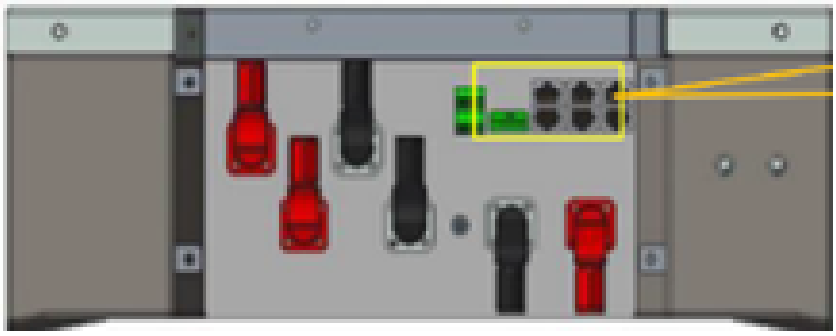


Figure 52 - HV BOX

4. Battery module

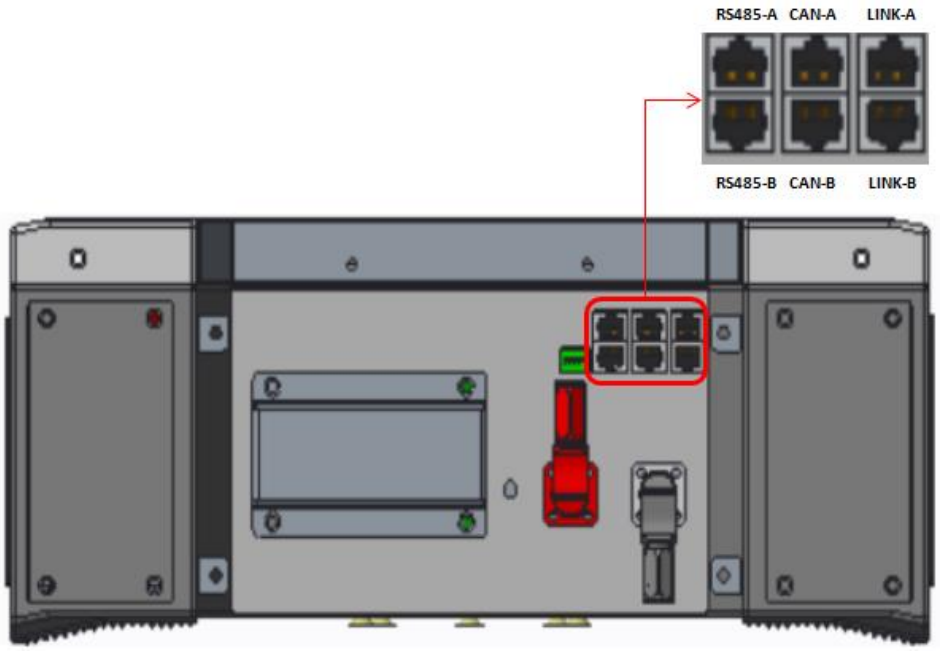


Figure 53 - Battery module to be connected in series

Power connections

The battery modules must be connected in series via the cables supplied.
The connector must be connected from the negative input of the first battery to the positive input of the second one. From here, the negative input must be connected to the positive input of the third module, continuing the series until the negative input of the second-last module is connected to the positive input of the last module.
In this configuration, the positive input of the first module and the negative input of the last battery will remain free (follow the colour of the connector as a reference).

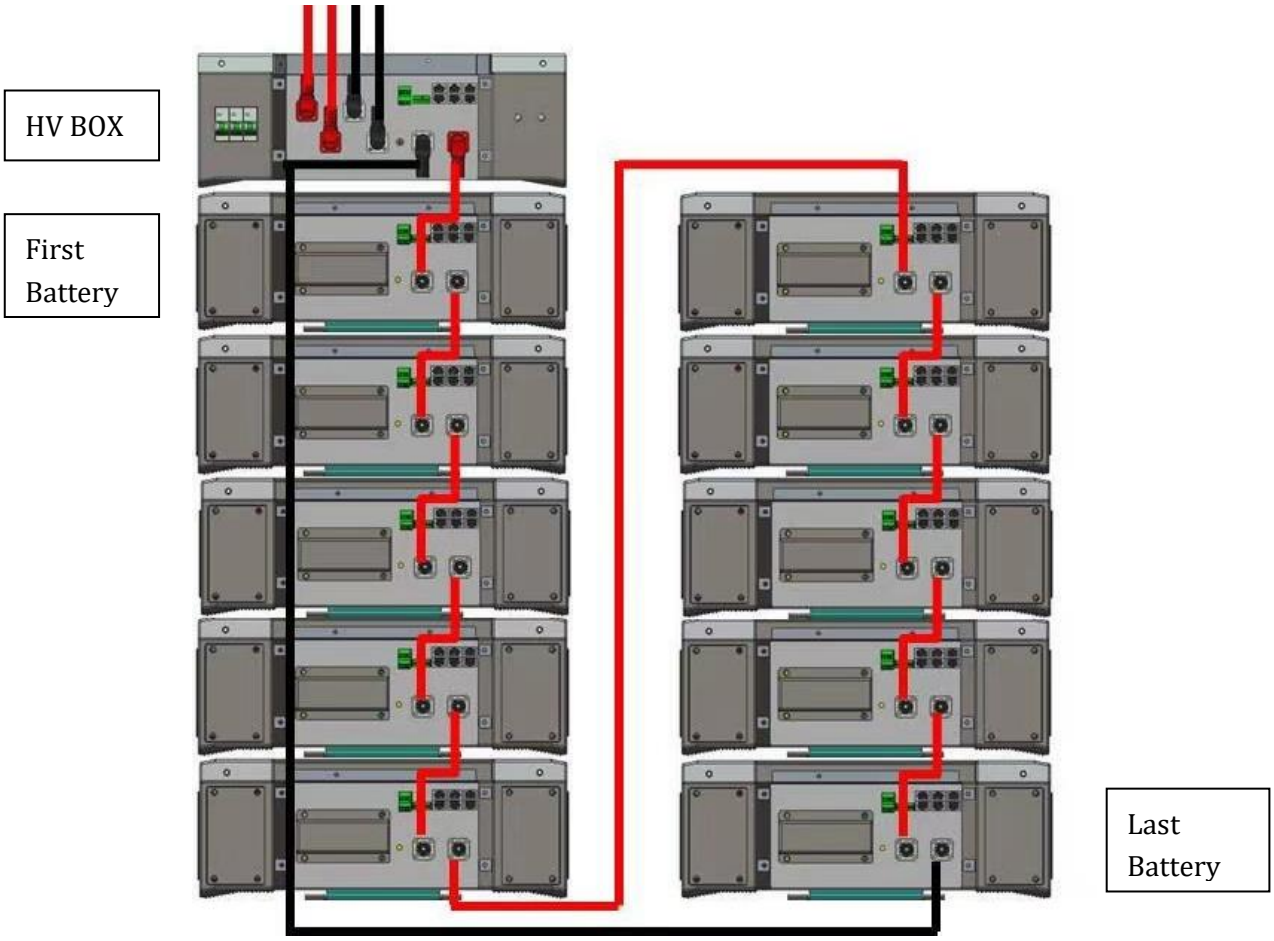


Figure 54 - Wiring between battery modules in series

Subsequently, the HV BOX must be connected respecting the + and – polarity as it is powered by the batteries themselves. Therefore, the positive of the HV BOX must be connected to the positive of the first battery, and the negative of the HV BOX to the negative of the last battery module.
The HV BOX must be grounded using the M5 screw terminals supplied.

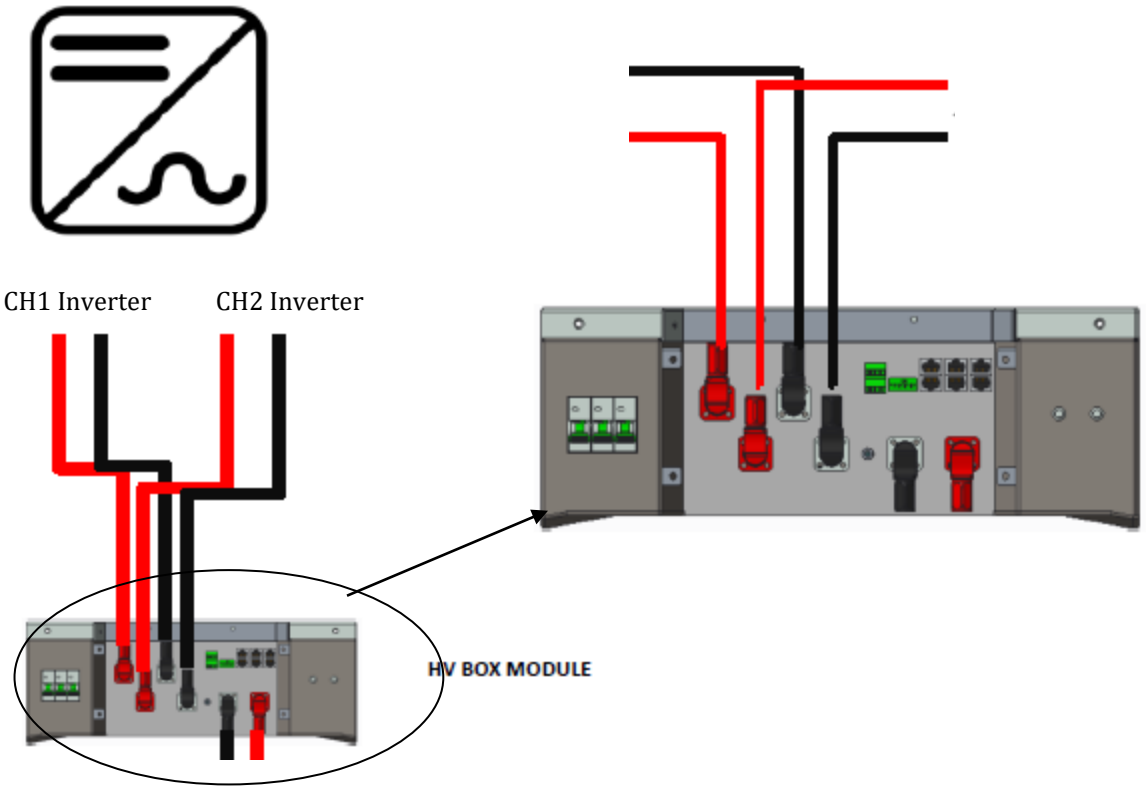


Figure 55 - HV BOX power connection

As for the power connections between the HV BOX and the inverter, the HV BOX module allows the connection of both channels coming from the inverter (if properly set from the inverter LCD, the battery column will be able to manage the maximum power of the inverter, both when charging and discharging).

Figure 56 - Inverter-side DC power connection with two battery inputs populated

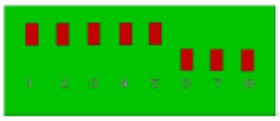
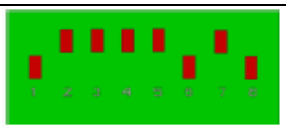
Communication of HV BOX and Battery Modules

The communication connections must be arranged as follows, using the communication cables between the battery modules:

- CAN1-B of the HV BOX to CAN-A of the first battery
- CAN-B of the first battery to CAN-A of the second battery
  …
- CAN-B of the second-last battery to CAN-A of the last battery.

As regards the positioning of the dip switches of the battery tower, it is necessary to first check the serial number of the HV BOX module and select the address according to the following indications:

- The DIP switches of all the battery modules except for the last one must be set so that the addresses from 1 to 5 are in the ON position, while those from 6 to 8 are in the OFF position (ADD=111111000).
- The last module in the series must have all pins set to ON, except for pins 1, 6, and 8 which must be set to OFF (ADD=01111010)

Battery modules from first to second-last battery	
Last battery in the series	

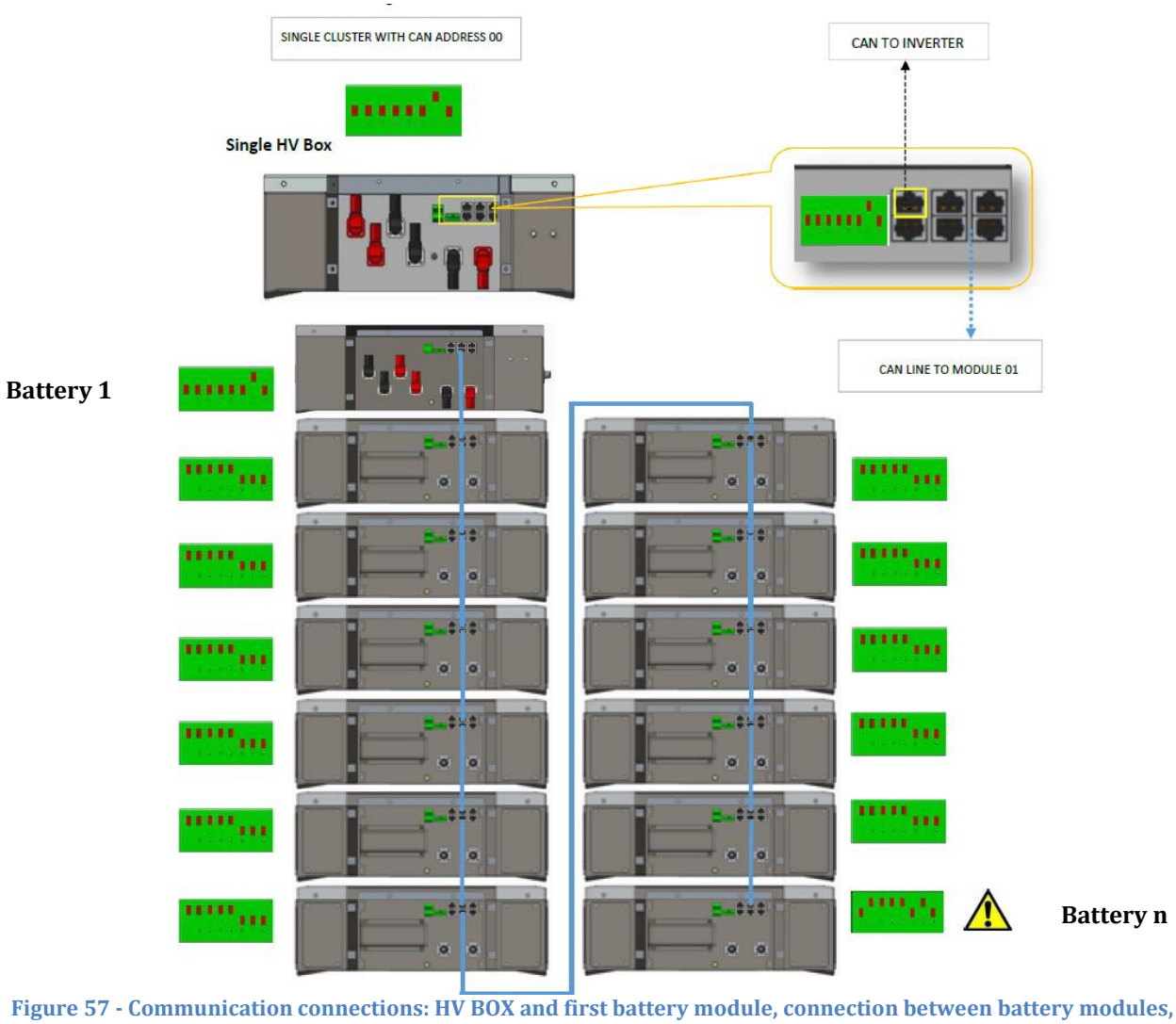


Figure 57 - Communication connections: HV BOX and first battery module, connection between battery modules, connection between second-last and last battery module in the series

HV BOX and Inverter communication

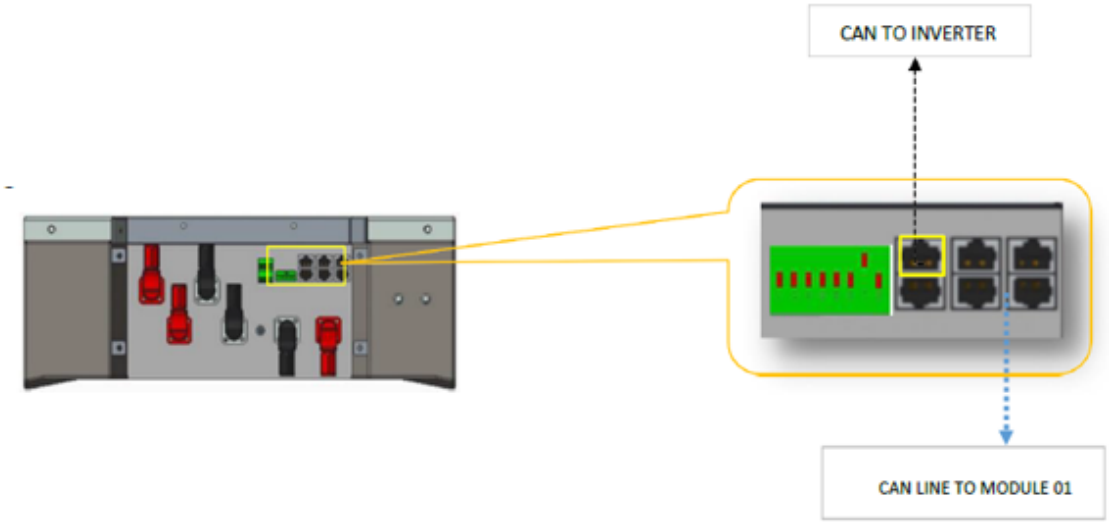


Figure 58 - HV BOX configuration

In the case of a single battery tower, the address must be set with all pins in the OFF position, except for pin 7, which must be in the ON position.

4.2.3.2. Installation with two battery towers

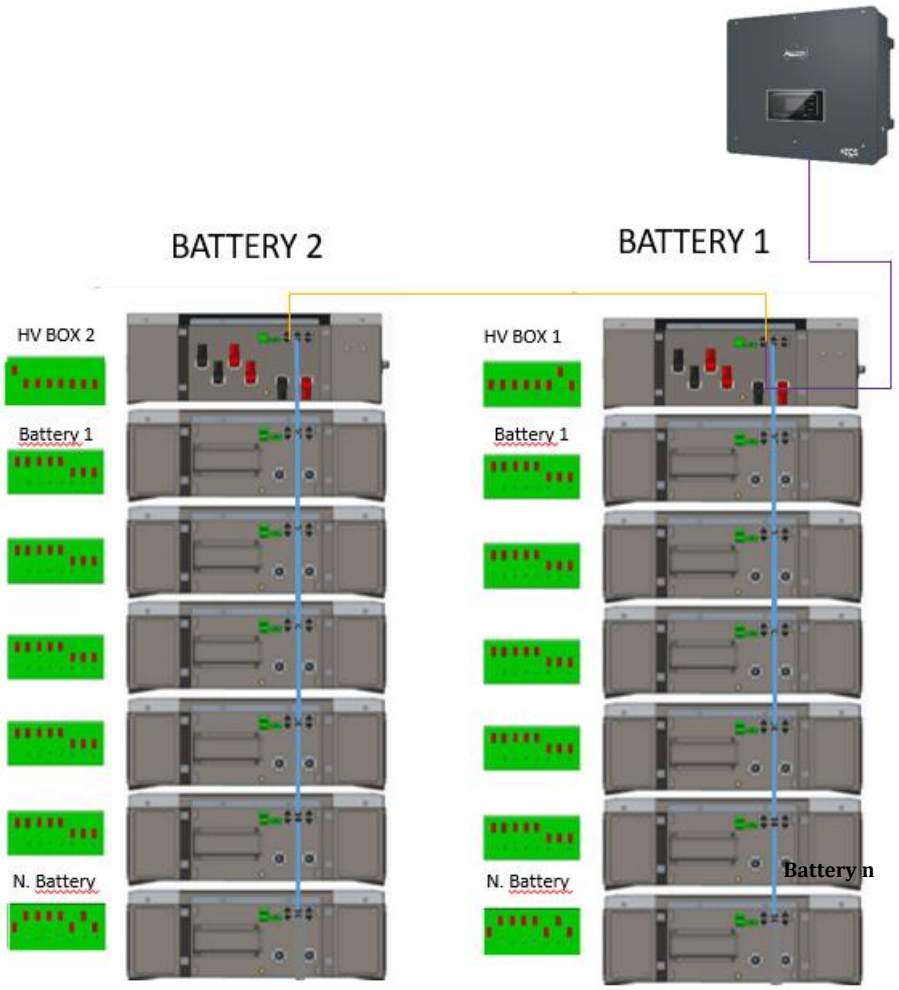


Figure 59 - Double battery tower

4.2.3.3. Power connections

The power cables in each tower between the battery modules and HV BOX must be connected as indicated in relative section.
As for the connection between each tower and the inverter, the two power cables (+ and -) coming from the HV BOX will be connected to the two inputs of the inverter: BAT1 and BAT2.

Figure 60 - Inverter-side DC power connection with two battery inputs populated

Identify the two battery towers by assigning the number 1 to the tower connected to channel 1 and number 2 to the tower connected to channel 2.

4.2.3.4. Communication between the HV BOX and Battery Modules

The communication connections must be arranged for each tower as indicated in relative section, using communication cables between the battery modules:

- CAN1-B of the HV BOX to CAN-A of the first battery
- CAN-B of the first battery to CAN-A of the second battery
  …
- CAN-B of the second-last battery to CAN-A of the last battery.

4.2.3.5. HV BOX – Inverter communication

In the case of two battery towers:

3. Battery Tower 1
   Set address to ADD=00000010
4. Battery Tower 2
   a. All pins in the OFF position, except for pin 1, which must be in the ON position (ADD=10000000).

A cable from the CAN2-A input of the HV BOX of tower 2 must be connected to the CAN2-A input of the HV BOX of tower 1; finally, the Inverter/HV BOX communication cable must be inserted in the CAN2-B port of the HV BOX.

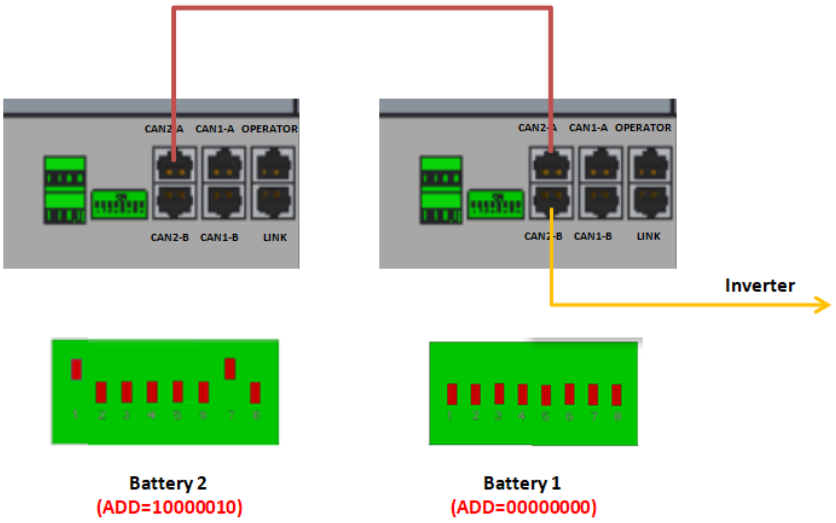


Figure 61 - Communication connections between battery towers

The inverter and the HV BOX must be connected by populating the CAN2-A input with the Inverter-HV BOX communication cable. The other end, in which only the "orange" and "white-orange" wires are present, must be wired to the quick-connect COM connector of the hybrid inverter, as shown in the figures below.
The HV BOX must be grounded using the M5 screw terminals supplied.

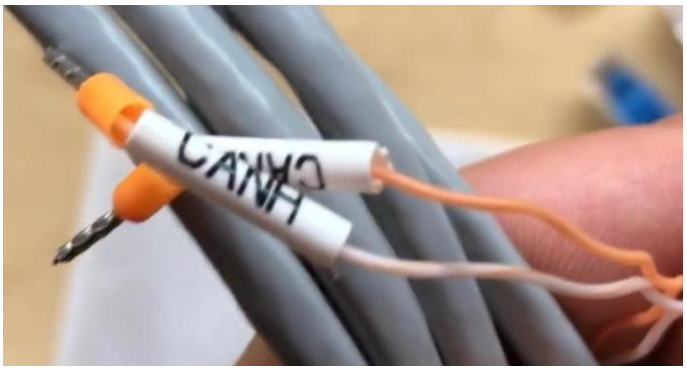


Figure 62 - Inverter/HV BOX communication cable

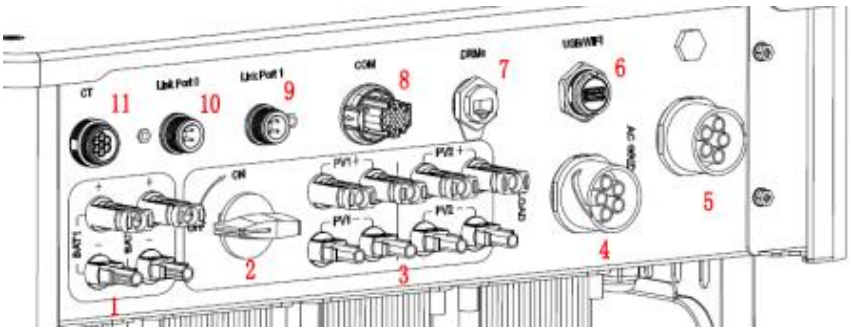


Figure 63 - Section of inverter connections

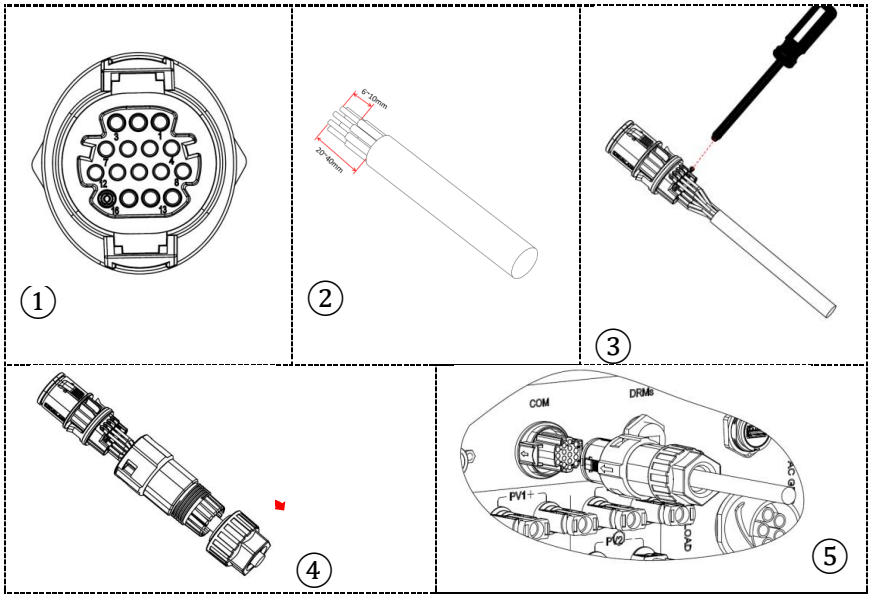


Figure 64a - COM port connection

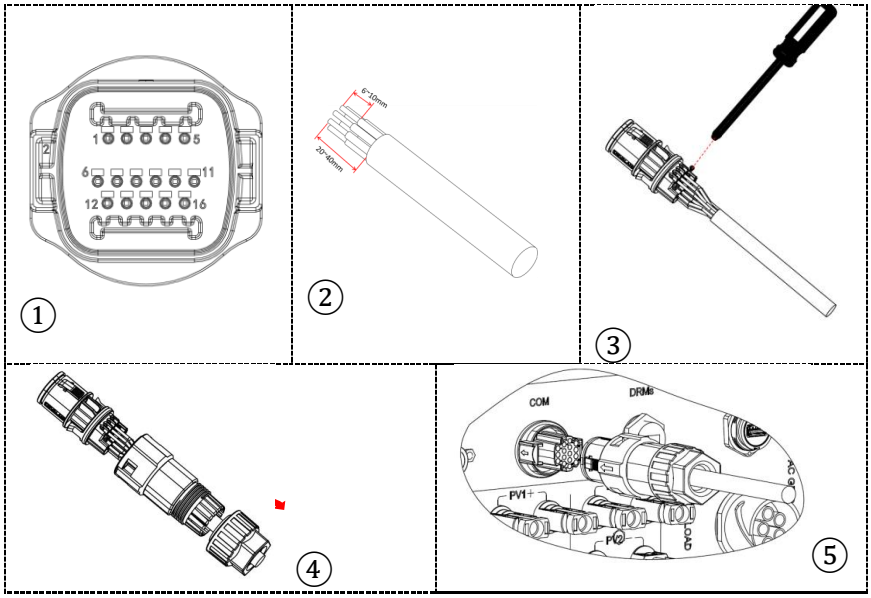


Figure 64b - COM port connection

PIN Inverter	Battery communication	Notes
7	CAN H (white-orange wire)	Communication with thee HV BOX of the lithium battery, the CAN of the inverter adapts to the HV BOX of the lithium battery.
8	CAN L (orange wire)	

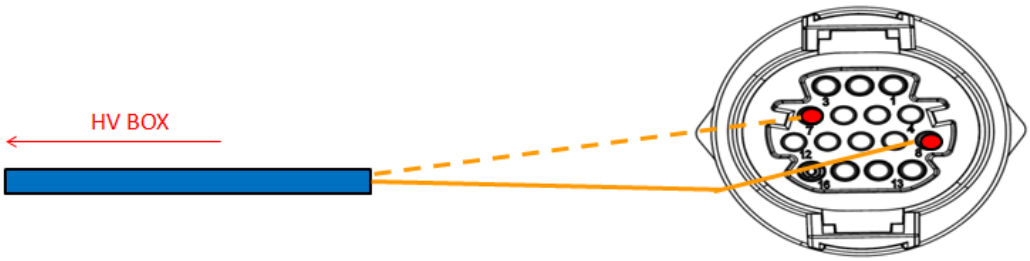


Figure 65a - Description of COM interface

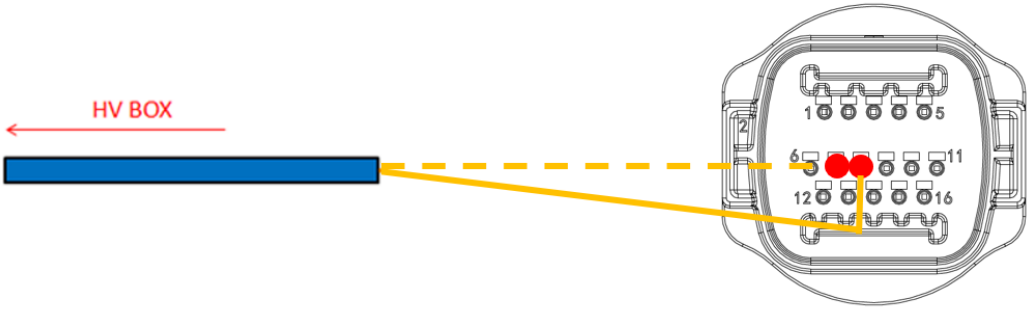


Figure 65b - Description of COM interface

4.3. Photovoltaic connection

The photovoltaic connection method is the same as that of the battery connection, only the terminal specifications are different, refer to
Table 6. The steps are the same as for the battery.

Danger	**Before removing the positive and negative connectors, make sure that the DC circuit breaker is open.**

4.4. Load connection

Procedure:

1. Select the type of cable and the appropriate specifications according to
2. Table 6.
3. Pass the wire through the terminal.

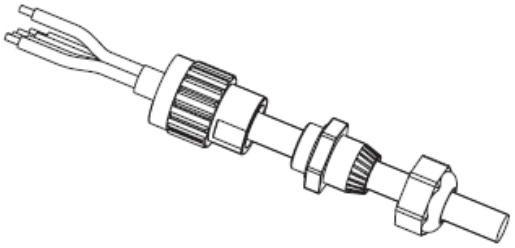


Figure 66 - Passing of the wire through the terminal

4. Connect the cable to the terminal, according to the identification on the terminal.

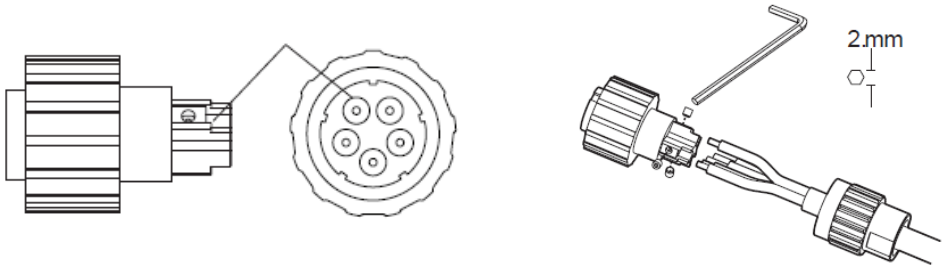


Figure 67 - Connecting the cable to the terminal

5. Connect the terminal to the machine port and turn the clamp in a clockwise direction.

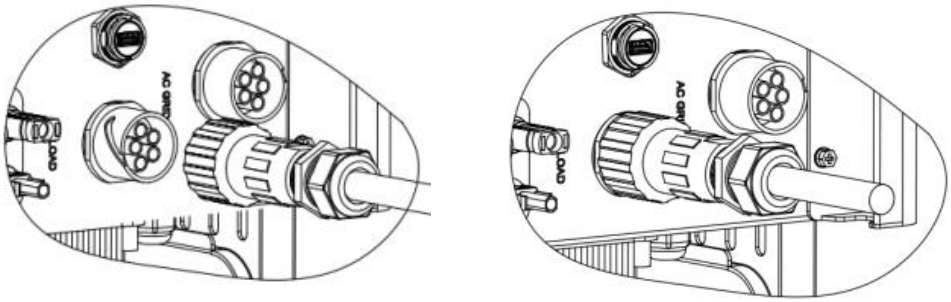


Figure 68 - Terminal clamping

4.5. Grid connection

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

Procedure:

1. Select the type of cable and the appropriate specifications according to
2. Table 6.
3. Pass the wire through the terminal.

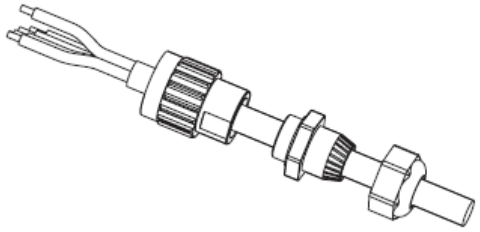


Figure 69 - Passing of the wire through the terminal

4. Connect the wire to the terminal, according to the identification on the terminal.

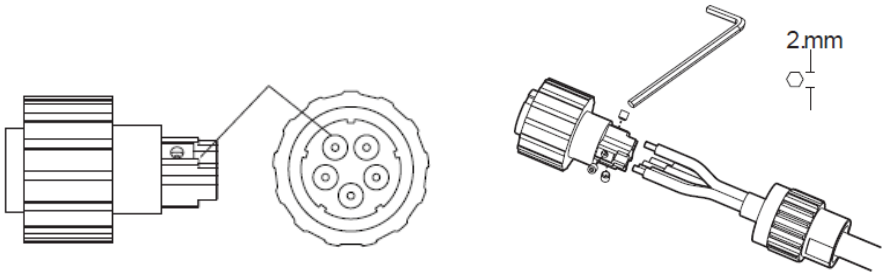


Figure 70 - Connecting the wire to the terminal

5. Connect the terminal to the machine port and turn the clamp in a clockwise direction.

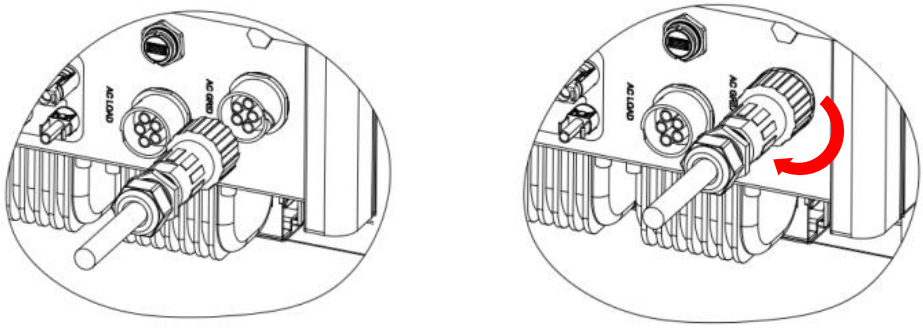


Figure 71 - Connecting the terminal to the machine

5. External communication

5.1. USB/Wi-Fi

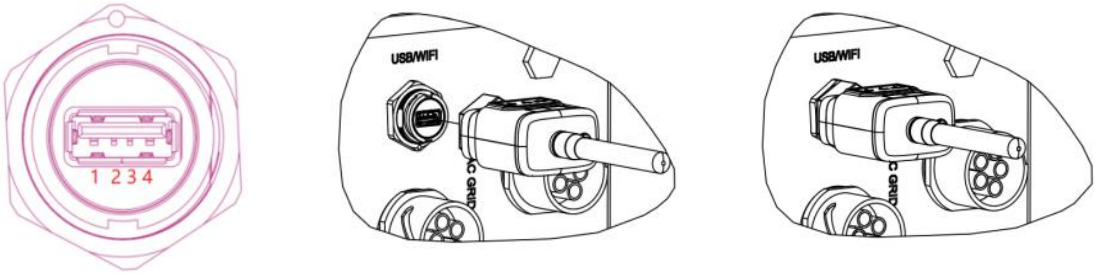


Figure 72 - External Wi-Fi connection

PIN	Definition	Function	Notes
1	GND.S	Power Supply - USB	The USB power supply is 5V/1A; It cannot be used to charge external devices
2	DP	Data + USB	
3	DM	Data - USB	
4	VBUS	Power Supply - USB	

Table 58 – Interface description

5.2. DRMs Interface - Logical Interface

Procedure:

1) Position the wire terminals according to the colour sequence shown in Figure below.

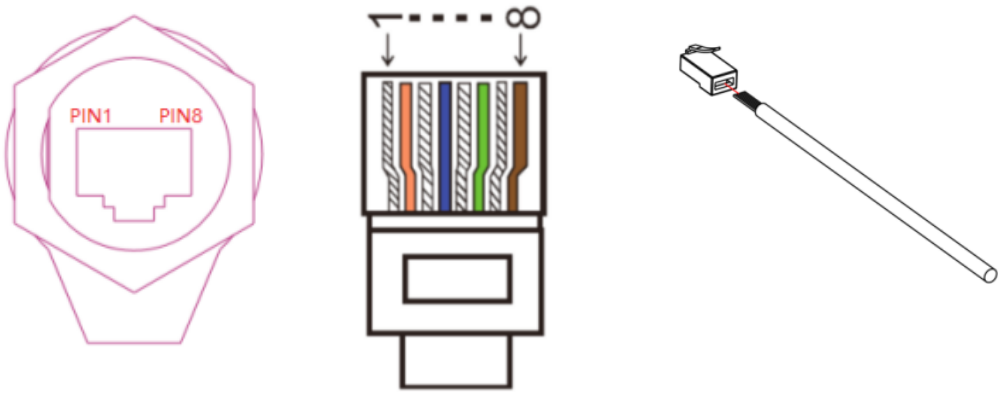


Figure 73 – Connecting the DRMs interface (1)

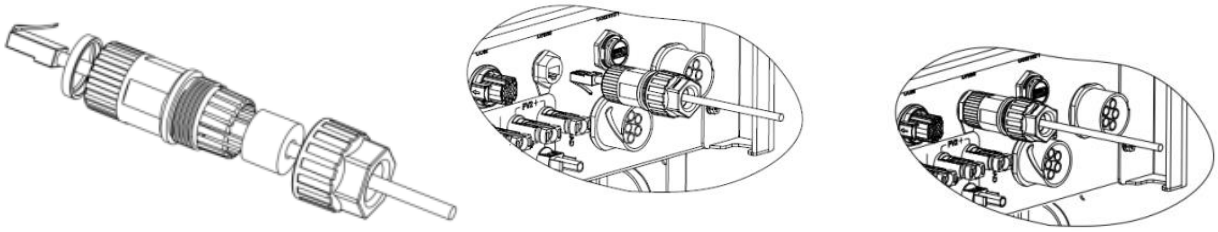


Figure 74 – Connecting the DRMs interface (2)

2) Pass the cable terminal through the cable gland, insert the communication cable into the RJ45 connector. The pins of the logical interface are defined according to the different standard requirements:

   a) Logical interface according to the VDE-AR-N 4105 standard: 2018-11, necessary for controlling and/or limiting the output power of the inverter. The inverter can be connected to a RRCR (Radio Control Receiver), together with all the other inverters in the installation, so as to dynamically limit the output power.

   b) Logical interface in accordance with the EN50549-1:2019 standard, necessary for interrupting the output power supply within 5 seconds following an instruction received from the interface.

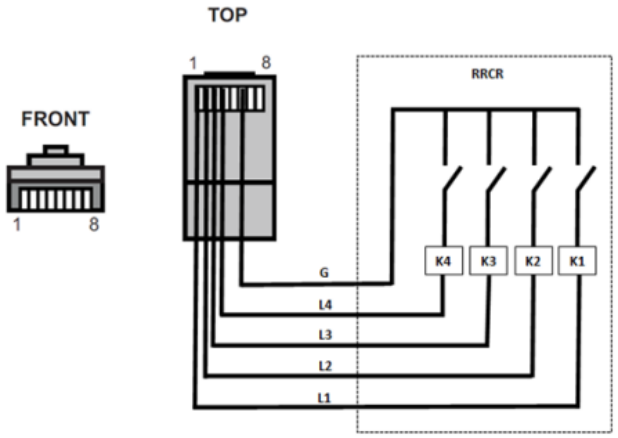


Figure 75 - RRCR connection

PIN	Name	Description	Connected to (RRCR)
1	L1	Input contact relay 1	K1 – Output relay 1
2	L2	Input contact relay 2	K2 – Output relay 2
3	L3	Input contact relay 3	K3 – Output relay 3
4	L4	Input contact relay 4	K4 – Output relay 4
5	NC	Not connected	Not connected
6	G	GND	Relay common node
7	NC	Not connected	Not connected
8	NC	Not connected	Not connected

Table 7 – Terminal description

L1	L2	L3	L4	Active power	Cos(φ)
1	0	0	0	0%	1
0	1	0	0	30%	1
0	0	1	0	60%	1
0	0	0	1	100%	1

Table 8 – Inverter preconfigured for the RRCR power levels (1 closed, 0 open)

No.	PIN name	Description	Connected to (RRCR)
1	L1	Input contact relay 1	K1 – Output relay 1
2	NC	Not connected	Not connected
3	NC	Not connected	Not connected
4	NC	Not connected	Not connected
5	NC	Not connected	Not connected
6	G	GND	K1 – Output relay 1
7	NC	Not connected	Not connected
8	NC	Not connected	Not connected

Table 9- Terminal description

L1	Active Power	Power drop rate	Cos(φ)
1	0%	< 5 seconds	1
0	100%	/	1

Table 10 - Inverter preconfigured for the RRCR power levels (1 closed, 0 open)

5.3. COM Communication - Multifunction

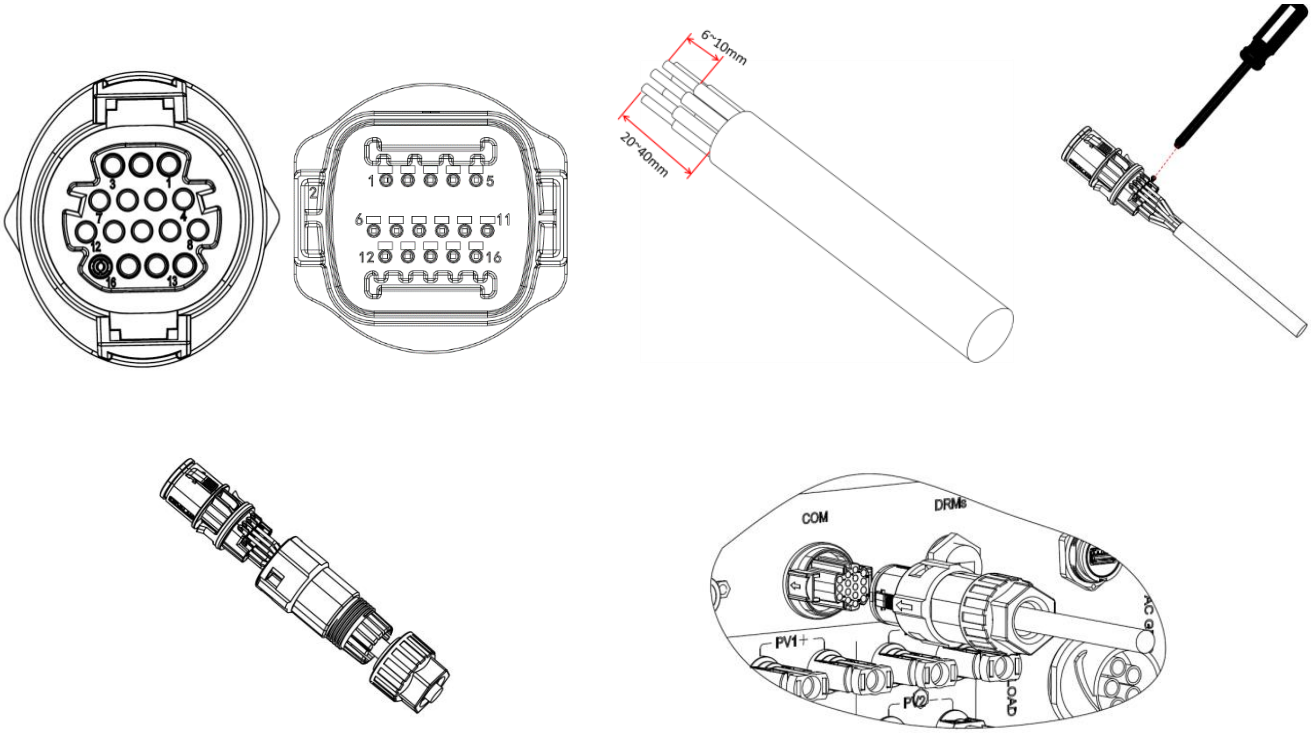


Figure 76 – COM interface

Refer to

Figure below for the RS485 connection if you want “cascade” monitoring of the inverters.

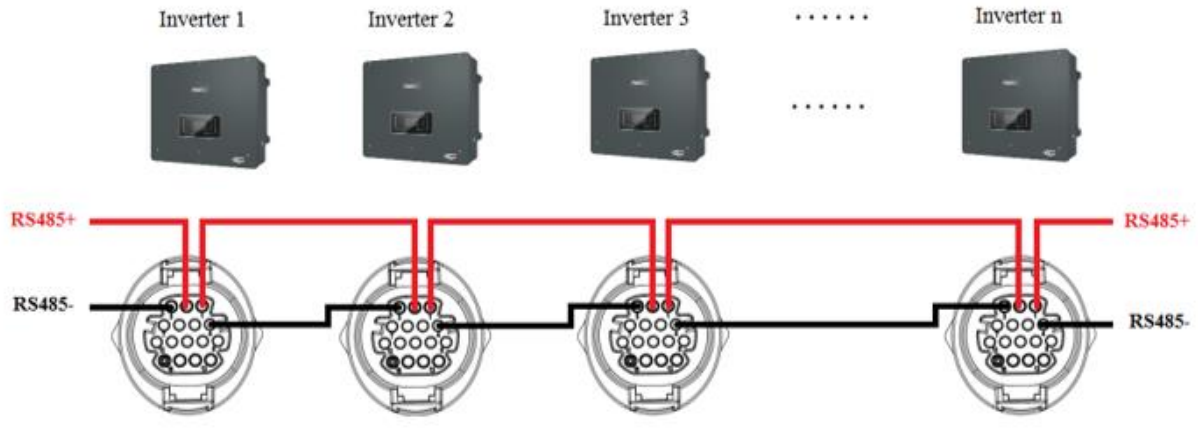


Figure 77 - RS485 connection (monitoring between inverters)

PIN	Definition	Function	Notes
1	RS485A1-1	RS485 differential signal +	Wired or cascade monitoring of the inverter
2	RS485A1-2	RS485 differential signal +	
3	RS485B1-1	RS485 differential signal –	
4	RS485B1-2	RS485 differential signal –	
5	RS485A2	RS485 differential signal +	Communication with three-phase meters
6	RS485B2	RS485 differential signal –	
7	CAN0_H	CAN positive polarity	Communication with BMS of the lithium battery
8	CAN0_L	CAN negative polarity	
9	GND.S	BMS communication GND	
10	485TX0+	RS485 differential signal +	
11	485TX0-	RS485 differential signal -	
12	GND.S	GND signal	Lead-acid battery temperature measurement
13	BAT_Temp	Lead-acid battery temperature probe	
14	DCT1	Dry Contact1	Option of the electric switch function
15	DCT2	Dry Contact2	
16	VCC	VCC communication	12V power supply

Table 11 - Interface description

5.4. Measurement of currents exchanged with the grid

Measurement of the currents exchanged with the grid is fundamental for the correct functioning of the energy storage in the battery.
There are two ways to take this measurement correctly:

1. Direct use of CT sensors (ZST-ACC-TA model).

2. Use of metre and CT sensors. In this case, both the current probes offered by ZCS and other types of probes can be connected to the metre, which must be correctly set on the metre.

The first method can be applied in all cases where the distance between the hybrid inverter and the sensor insertion point is less than 50 meters. To extend the + and – cables of the CT sensor, it is recommended to use STP category 6 8-pole, or a 2x0.5 mm^2 bipolar shielded alarm cable.
If the distance is greater, then the second method must be used.
The correct insertion point of the sensors or the Meter + CT sensors for measuring the currents exchanged with the grid is shown in the figure below.

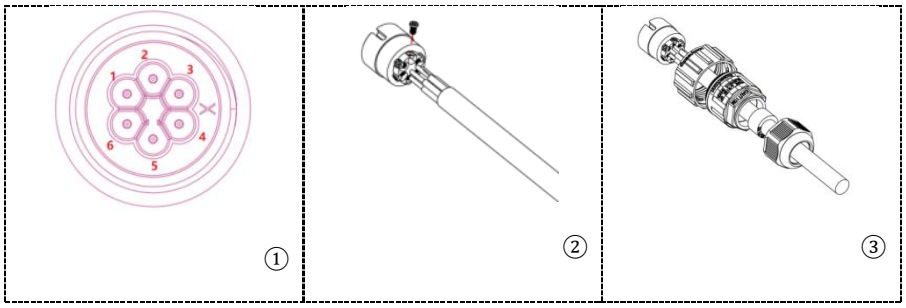
5.4.1.Direct connection of CT sensors

In the case of direct connection of the CT sensors, use the dedicated connections supplied with the inverter as shown in the figure.
These sensors must be connected directly to the CT input of the inverter shown in the figure, according to the indications in the table.

Figure 78 - Numbered connections of the CT connector

PIN	Definition	Function	Notes
1	Ict_R-	Negative R-phase sensor (L1)	Used to connect the R-phase current sensor (L1)
2	Ict_R+	Positive R-phase sensor (L1)	
3	Ict_S-	Negative S-phase sensor (L2)	Used to connect the S-phase current sensor (L2)
4	Ict_S+	Positive S-phase sensor (L2)	
5	Ict_T-	Negative T-phase sensor (L3)	Used to connect the T-phase current sensor (L3)
6	Ict_T+	Positive T-phase sensor (L3)	

Table 12 - Interface Description



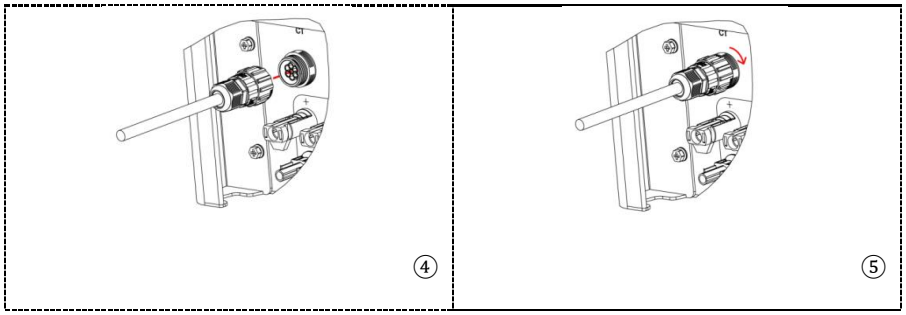


Figure 79 - CT interface

Take care to correctly identify the three phases as they are connected to the inverter on the grid connector. The sensors of each phase must match.
Position the sensors according to the direction on the sensor (arrow).

Figure 80 - Reference to sensor direction

If it is necessary to extend the sensor connection cables, use STP network cables.
This cable can be extended only up to a maximum of 50 metres.
Make sure to properly insulate the extension connections so as to prevent any low insulation problems.

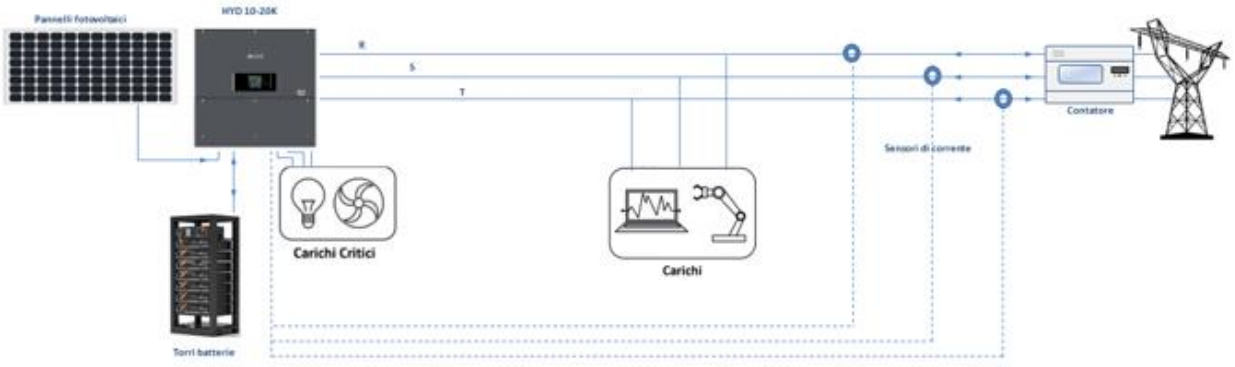


Figure 81 - Installation diagram of hybrid three-phase inverter with CT

5.4.2. Connecting the Meter

Due to the stability of the RS485 signal, for distances greater than 50 metres between the inverter and measuring point, it is necessary to use the Meter in addition to the sensors, as shown in the figure.
Make sure to position the probes so that each toroid reads only the current flows relating to the exchange. To do this, it is recommended to position them at the output of the exchange meter.

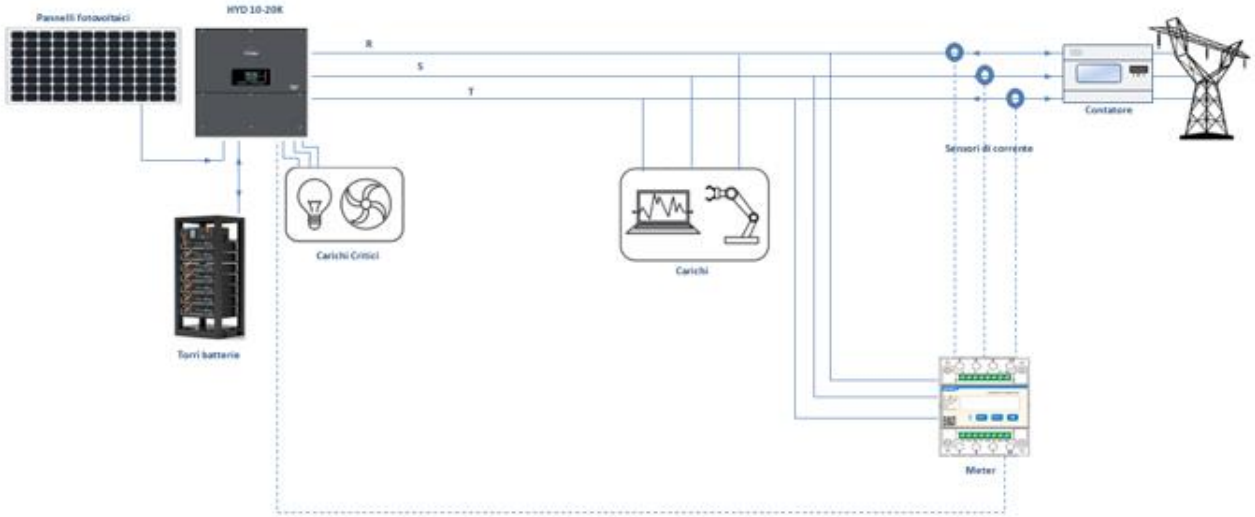


Figure 82 - Installation diagram of hybrid inverter with Meter on the exchange

This involves connecting the sensors to the Meter, and then connecting the Meter to the inverter via a serial port.

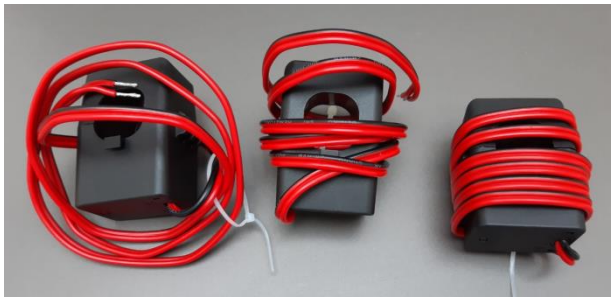


Figure 83 - Meter (top), CT sensors (low)

Connect the Meter and sensors according to the diagram shown in the figure below.
Connect PIN 10 of the Meter to the neutral cable (N), connect PINs 2, 5 and 8 to phases R, S and T respectively.
As regards the connections with the CT sensors, the terminals of the R-phase sensor must be connected to PIN 1 (red wire) and PIN 3 (black wire).
The terminals of the S-phase sensor must be connected to PIN 4 (red wire) and PIN 6 (black wire).
The terminals of the T-phase sensor must be connected to PIN 7 (red wire) and PIN 9 (black wire).
Position the sensors according to the direction on the sensor (arrow).

ATTENTION: hook the CT sensors to the phases only after they have been connected to the Meter.

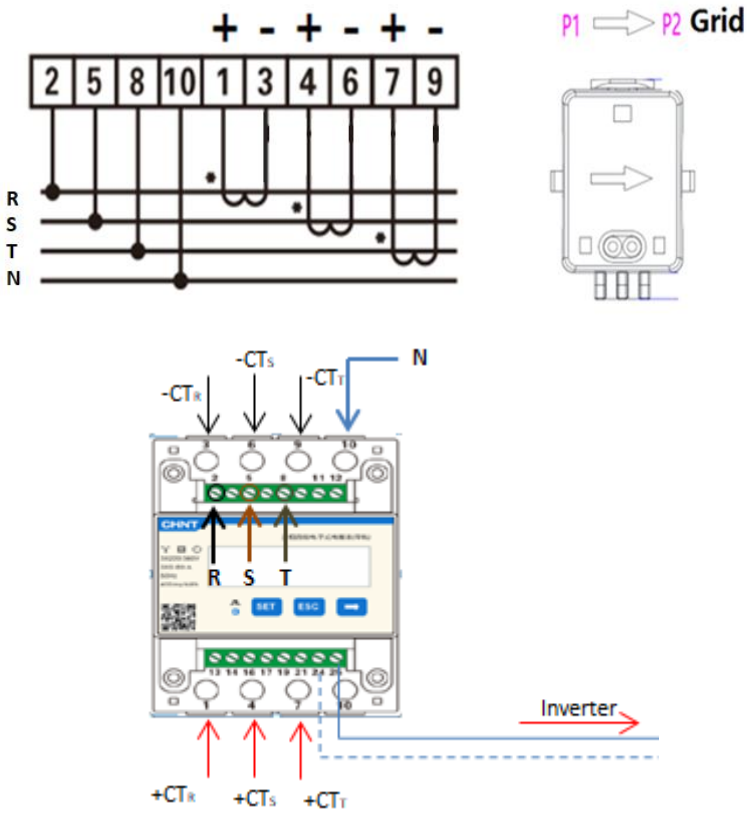


Figure 84 - Meter and sensors connections

The connection between the Meter and inverter is made through the RS485 serial port.
On the Meter side, this port is identified by PINs 24 and 25.
On the inverter side, use the connection port identified as “COM” by connecting PINs 5 and 6 as shown in the figures and tables below.

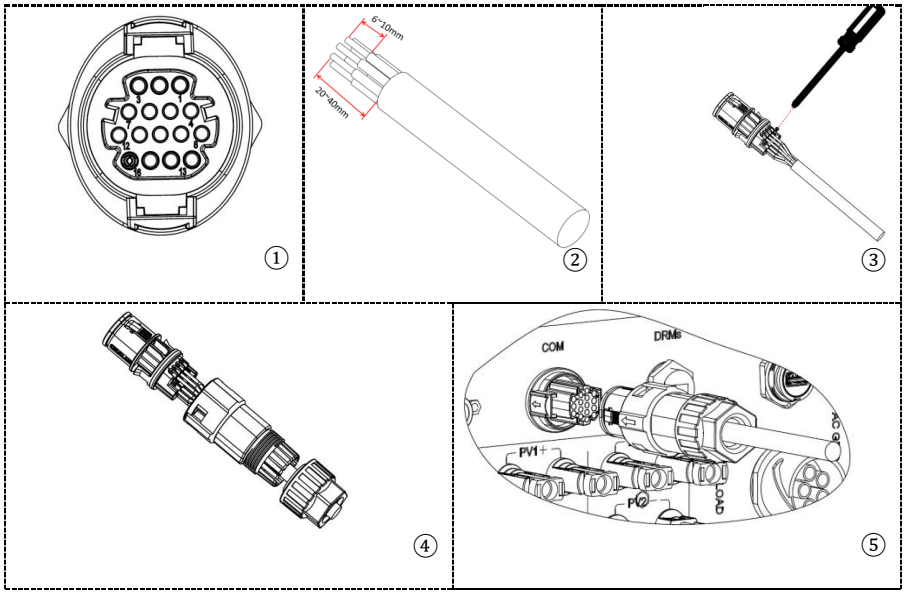


Figure 85a – COM interface

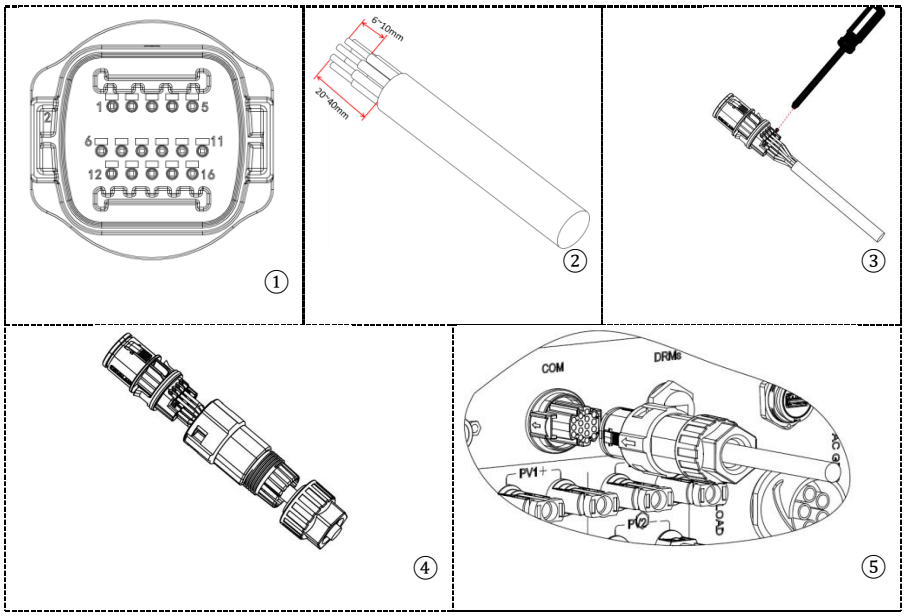


Figure 85b – COM interface

PIN Inverter	Definition	PIN Meter	Notes
5	RS485 differential signal +	24	Communication with Meters
6	RS485 differential signal –	25	

Table 13 - Interface description

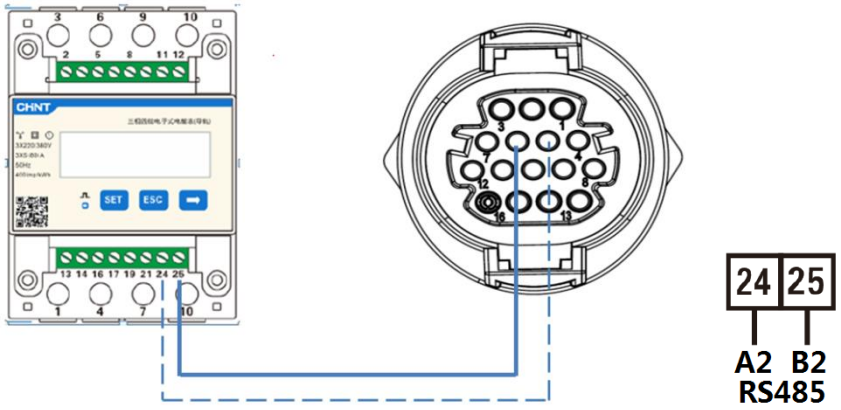


Figure 86a - Connection of Meter serial port

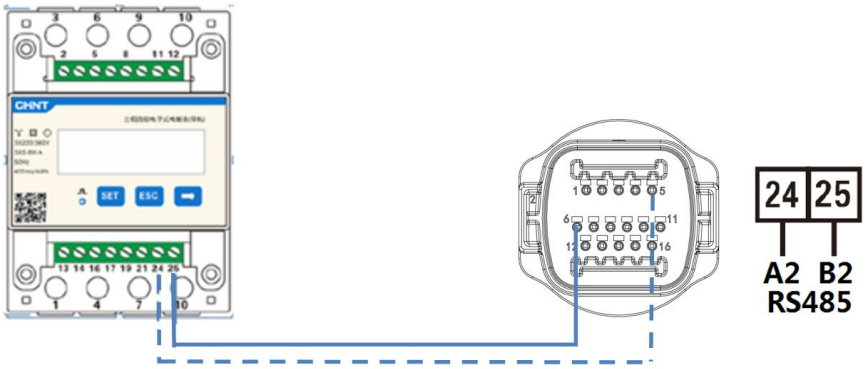


Figure 86b - Connection of Meter serial port

NOTE: For distances greater than 100 metres between the Meter and hybrid inverter it is recommended to connect two 120 Ohm resistors along the 485 daisy chain: the first to the inverter (between PINs 5 and 6 of the interface), and the second directly to the Meter (PINs 24 and 25).

5.4.3.Measuring the photovoltaic production

If there is already one or more photovoltaic inverters in the system, it is possible to have the hybrid system display not only the photovoltaic contribution of the panels connected to its inputs but also the power produced by external photovoltaic panels.
This is achieved by connecting a second Meter in a suitable position that allows reading the entire production of the photovoltaic system (excluding that of the hybrid three-phase inverter).
As for the RS485 communication (Meter - HYD), all the meters present must be connected to the COM port of the inverter in inputs 5 and 6 of the interface).

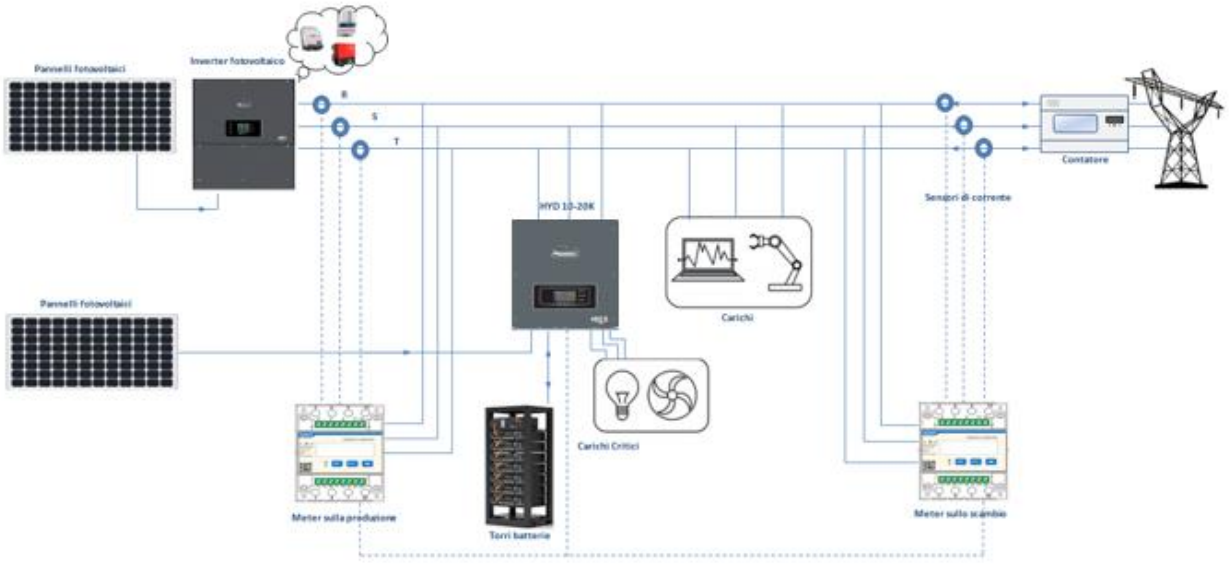


Figure 87 - Installation diagram of Hybrid with Meter on exchange and production

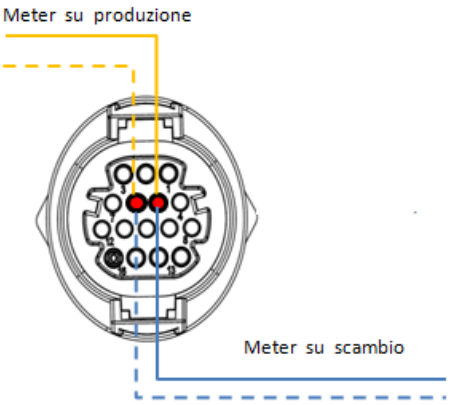


Figure 88a - Connection of serial port with more than one meter

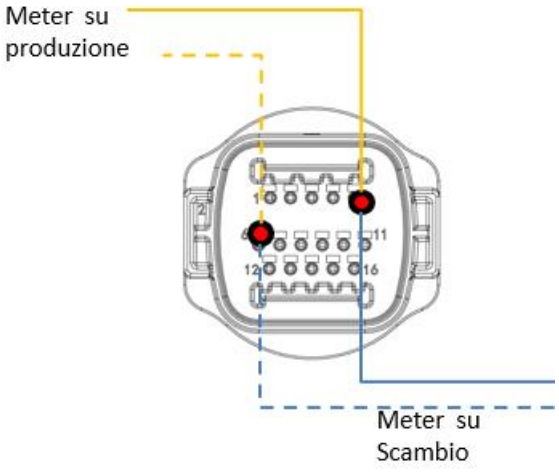


Figura 88b - Connection of serial port with more than one meter

5.4.3.1. Configuring the Meter parameters

After connecting the cables correctly, it is necessary to set the correct parameters from the Meter display.

1. Press to:
   - "Confirm"
   - Move cursor

   (to enter digit)
2. Press to "go back"
3. Press to "add"

Figure 89 - Meter Legend

Exchange Meter configuration

To configure the device in read mode on **exchange**, enter the settings menu as shown below:

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

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

3. Enter the number "701":
   a. From the first screen where the number "60<u>0</u>" appears, press the "→" key once to write the number "60<u>1</u>".
   b. Press "**SET**" twice to move the cursor left, highlighting "<u>6</u>01";
   c. Press the "→" key once more to write the number "<u>7</u>01"

Note: In case of error, press "ESC" and then "SET" again to reset the required code.

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

         Note: In case of error, press "SET" until the number relating to thousands is highlighted and then press "→" until only the number "1" appears;
         at this point repeat the above procedure.

      iii. Press "ESC" to confirm and "→" to scroll to the next setting.
   b. **ADDRESS:**
      i. Leave address 01 (default setting) so that the inverter assigns the data sent by the meter as the power relating to the exchange.

Configuring Meter on exchange and production

To configure the device in read mode on the **exchange**, refer to the instructions in relative section (Configuring Meter on exchange).

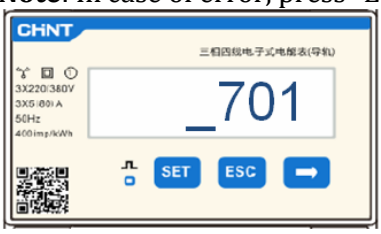
To configure the device in read mode on **production**, enter the settings menu as shown below:

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

2. Press **SET** again and "600" will appear:

3. Enter the number “701”:
    a. From the first screen where the number “600” appears, press the “→” key once to write the number “601”.
    b. Press “**SET**” twice to move the cursor left, highlighting “601”;
    c. Press the “→” key once more to write the number “701”

Note: In case of error, press “ESC” and then “SET” again to reset the required code.

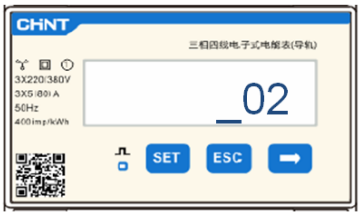


4. Confirm by pressing **SET** and to enter the settings menu.
5. Enter the following menus and set the parameters indicated:
    a. **CT**:
        i. Press **SET** to enter the menu
        ii. Write “40”:
            1. From the first screen where the number “1” appears, press the ”→” key several times to write the number “10”.
            2. Press “**SET**” once to move the cursor left, highlighting “10”
            3. Press the “→” key several times to write the number “40”

            Note: In case of error, press “SET” until the number relating to thousands is highlighted and then press “→” until only the number “1” appears;
            at this point repeat the above procedure.

        iii. Press “ESC” to confirm and “→” to scroll to the next setting.

    b. **ADDRESS**:
        i. Press **SET** to enter the menu:
        ii. Write “02” (pressing “→” once from screen “01”). With address 02, the inverter assigns the data sent by the meter as production power. A maximum of 3 meters can be set for the production (Addresses 02 03 04).



iii. Press “ESC” to confirm.

iv.

5.4.3.2. Checking the correct installation of the Meter

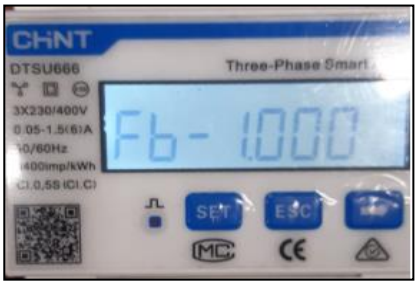
Check the Meter on Exchange

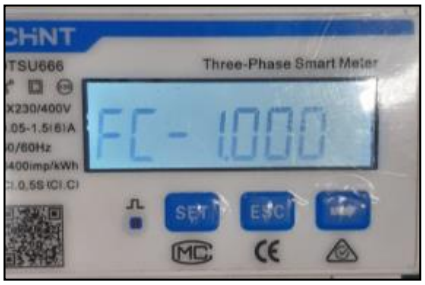
To carry out this check, it is necessary to:

- Switch off the hybrid inverter and any other source of photovoltaic production,
- Switch on loads of more than 1 kW for each of the three phases of the system.

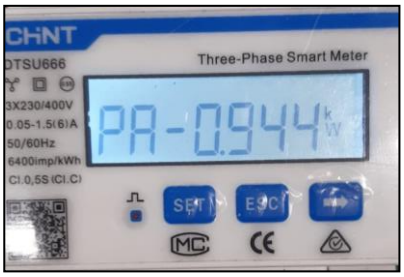
Stand in front of the meter and use the “→” keys to scroll through the items, and “ESC” to go back, checking that:

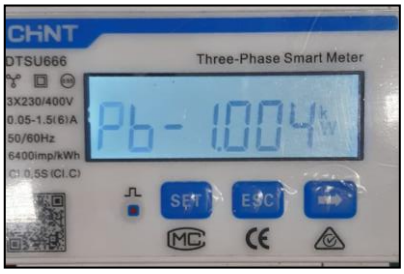
1. The Power Factor values for each phase Fa, Fb and Fc (phase shift between voltage and current) are between 0.8-1.0. If the value is lower, move the sensor to one of the other two phases until the value is between 0.8-1.0.



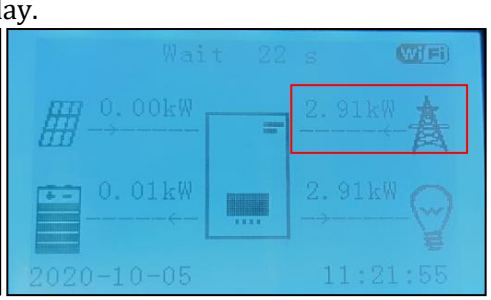


2. The Pa, Pb and Pc Powers are:
    - Greater than 1 kW.
    - In line with the home consumption.
    - The sign in front of each negative value (–).





3. Switch on the Inverter and Battery and check that the total power value (Pt) is in line with the value shown on the inverter's display.



Checking the Meter on Production

In case of **meter on production**, repeat the above steps:

1. Check the Power Factor as described in the previous case.
2. The sign of the Pa, Pb, and Pc powers must match
3. Switch on the Inverter Hybrid and check that the total power value (Pt) is in line with the value shown on the inverter's display.

5.5. Parallel Inverter mode

This mode allows to synchronise the charging and discharging power of multiple interconnected hybrid inverters in order to maximise self-consumption.

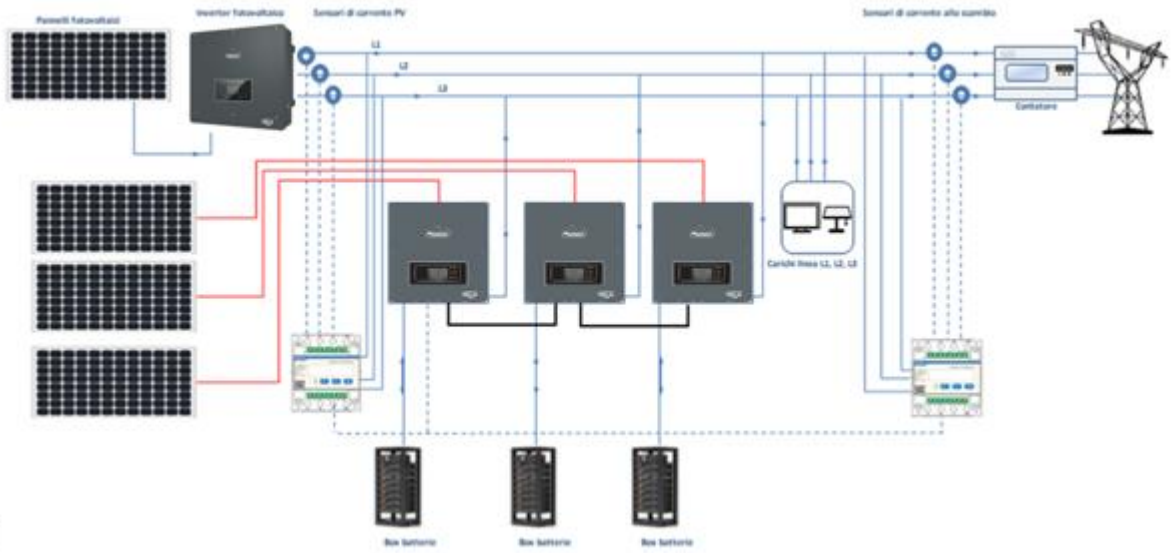


Figure 90 - Single-line diagram of parallel inverter connection

5.5.1. Connections between inverters

1. The inverters must be interconnected using the cable supplied, making sure to popular the inputs as follows:
   - Link port 1 of Master Inverter → Link port 0 of Slave 1 Inverter
   - Link port 2 of Slave 1 Inverter → Link port 0 of Slave 2 Inverter
   - Link port 3 of Slave 2 Inverter → Link port 0 of Slave 3 Inverter
   - ...
   - Link port 1 of Slave n-1 Inverter → Link port 0 of Slave n Inverter

   NOTE: the inverter parallel cable supplied has a length of 3 meters which cannot be extended.

2. If the inverters connected are of the same size, it is possible to connect in parallel the LOAD outputs in order to supply power to the same group of priority loads. To do this, a parallel switchboard must be used. Make sure that the connections between each inverter and parallel switchboard have the same length and cross-section, and have the lowest possible impedance. It is advisable to install suitable protection on each connection line between the inverter and the switchboard.

3. The total load connected to the LOAD outputs must be less than the total sum of the power outputs of the inverters in EPS mode.

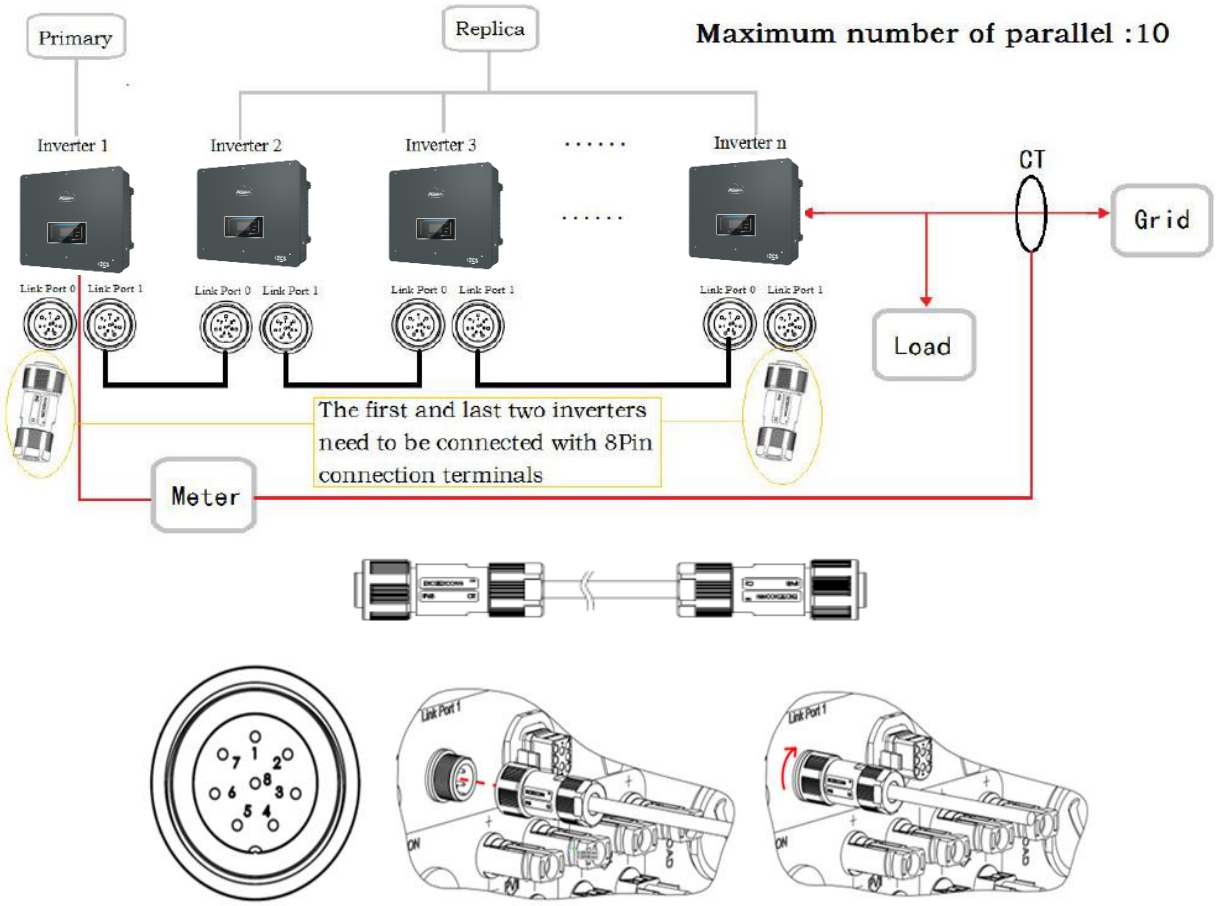


Figure 91 - Parallel connections between inverters

PIN	Definition	Function	Notes
1	IN_SYN0	Signal synchronisation 0	The high signal level is 12 V
2	CANL	CAN negative polarity	
3	SYN_GND0	Signal synchronisation GND0	
4	CANH	CAN positive polarity	
5	IN_SYN1	Signal synchronisation 1	
6	SYN_GND1	Signal synchronisation GND1	
7	SYN_GND2	Signal synchronisation GND2	
8	IN_SYN2	Signal synchronisation 2	

Table 14 - Interface description

6. Buttons and indicator lights

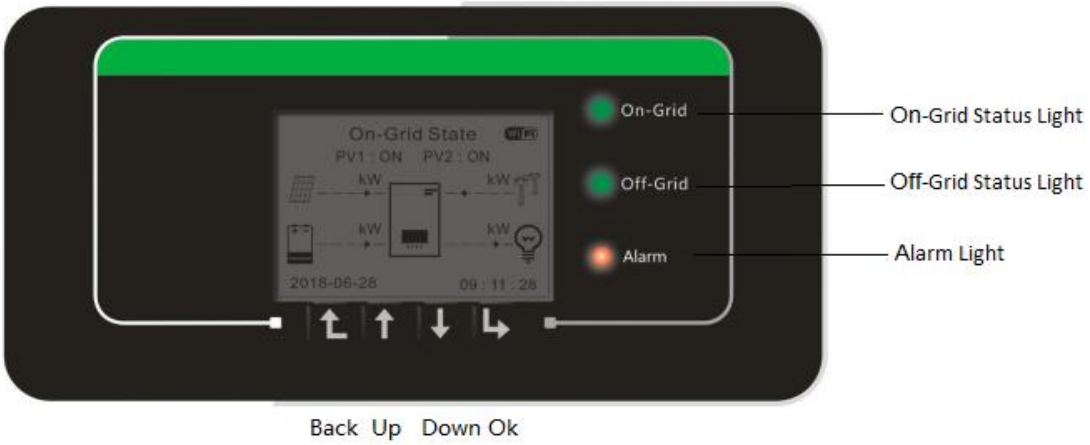


Figure 92 – Screen

The buttons on the screen have the following functions:

- "Back" - to go back to the previous screen or enter the main page;
- "Up" - to move up the menu or for the +1 function;
- "Down" - to move down the menu or for the -1 function;
- "OK" - to select the current option of the menu, or to move.

Status	Connected to the grid Green light	Off-Grid Green light	Alarm Red light
Connected to the grid	ON		
Standby (connected to the grid)	Flashing		
Off-Grid		ON	
Standby (Off-Grid)		Flashing	
Alarm			ON

Table 15 - Meaning of lights

7. Operation

Check the following points and make sure the connections have been made before starting the inverter:

1. The inverter must be securely fixed to the wall bracket.
2. The PV+/PV- wires are securely connected with the correct polarity and voltage.
3. The BAT+/BAT- wires are securely connected with the correct polarity and voltage.
4. The GRID/LOAD cables are connected securely/correctly.
5. The AC switch is correctly connected between the inverter's GRID port and the GRID, with the automatic switch: OFF.
6. The AC switch is correctly connected between the inverter's LOAD port and the critical load, with the automatic switch: OFF.
7. The communication cable of the lithium battery must be correctly connected.

7.1. Before configuration (follow carefully)

IMPORTANT: Carefully follow this procedure to activate the inverter

1. Ensure that there is no power generation on the phases of the inverter
2. Set the DC switch to ON
3. Switch on the batteries:
    a. Pylontech Battery
        i. Set the Power Switch (DC disconnect switch) on the front of the BMS to ON
        ii. Press the red START button of the BMS for one second

    b. WeCo batteries
        i. Arm the GENERAL BREAKER present on the front of HV BOX.
4. Set the AC differential switch between the inverter's GRID input and the grid to ON
5. Set the AC differential switch between the inverter's LOAD input and the critical load to ON
6. The inverter should turn on and start running (if all steps have been performed correctly)

7.2. Commissioning

Before starting the actual operation of the inverter, some parameters will need to be set, as shown in the table below.

Parameters	Notes
1. OSD language options	Default English
2. Setting of date and time, confirmation	If the inverter is connected to a PC or mobile app, the time should be set to the local time
*3. Importing of safety parameters	Find the file with the safety parameters (renamed according to the country selected) on the website, download them to a USB stick and import them
4. Setting of input channel	Default order: BAT1, BAT2, PV1, PV2
*5. Setting of battery parameters	The default values are shown according to the input channel configured
6. The set-up is completed	

Table 16 - Parameters to be set for first start-up

⚠ **Caution**	**It is very important to make sure that the right country code has been selected in accordance with the requirements of the local energy authorities.** **Consult with qualified and authorised personnel to ensure the correct choice.**

NB: Zucchetti Centro Sistemi S.p.A. shall not be held responsible for any harmful consequences resulting from the incorrect setting of the country code.

7.2.1. OSD language options

1.中文	
2.English	
3.Italian	OK
4.	
.....	

7.2.2. Setting of date and time, confirmation

Time YYYY-MM-DD hh:mm:ss

7.2.3. Importing of safety parameters

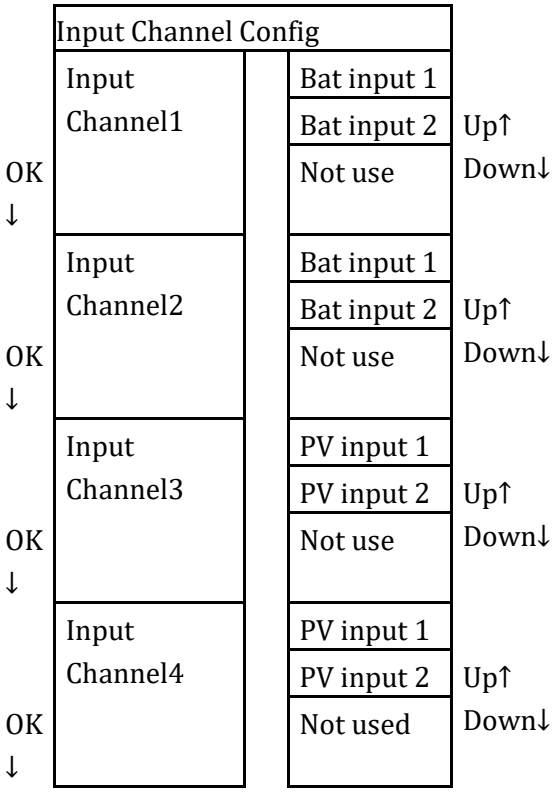
The user can modify the safety parameters of the machine via a USB stick, and must copy and modify the values on the USB stick beforehand. To enable this option, contact Zucchetti Centro Sistemi S.p.A.

Code		Region		Code		Region	
00	00	Germany	VDE4105	18	00	EU	EN50438
	01		BDEW		01		EN50549
	02		VDE0126	19	00	IEC EN61727	
01	00	Italy	CEI-021 Internal	20	00	Korea	
	01		CEI-016 Italy	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	
	04		AU-QLD		01		LV
	05		AU-VAR		02		230
	06		AUSGRID		03		254
	07		Horizon	29	00	Slovakia	VSD
03	00	Spain	RD1699		01		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	Netherlands		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	

Table 17 - List of country codes

7.2.4. Setting of input channel



In the case of a **single Pylontech battery tower**, set the inputs according to the channel populated:

- Input channel 1 → BAT input 1 (if the channel populated is no. 1)
- Input channel 2 → Not Used

In the case of a **single WeCo battery tower**, set the inputs by populating both channels:

- Input channel 1 → BAT input 1
- Input channel 2 → BAT input 1

In case of **double battery tower (Pylontech, WeCo)** set the inputs:

- Input channel 1 → BAT input 1
- Input channel 2 → BAT input 2

For independent strings, set:

- Input channel 3 → PV input 1
- Input channel 4 → PV input 2

For parallel strings, set:

- Input channel 3 → PV input 1
- Input channel 4 → PV input 1

7.2.5. Setting of battery parameters

	Single Pylontech battery tower	Single WeCo battery tower	Double PYLON/WECO battery tower	
Battery identification	Battery 1	Battery 1	Battery 1	Battery 2
1.Battery Type	PYLON	WECO	PYLON/WECO	PYLON/WECO
2.Battery Address	00	00	00	01
3.Max Charge (A)	25.00	50.00	25.00	25.00
4.Max Discharge (A)	25.00	50.00	25.00	25.00
5.Discharge Depth	max 90%	max 90%	max 90%	max 90%
6.Save	ok	ok	ok	ok

Item	Default state
Energy Storage Mode	Self-use mode
EPS Mode	Disable
Anti Reflux	Disable
IV Curve Scan	Disable
Logic interface	Disable

Table 18 - Default values for other settings

7.3. Main menu

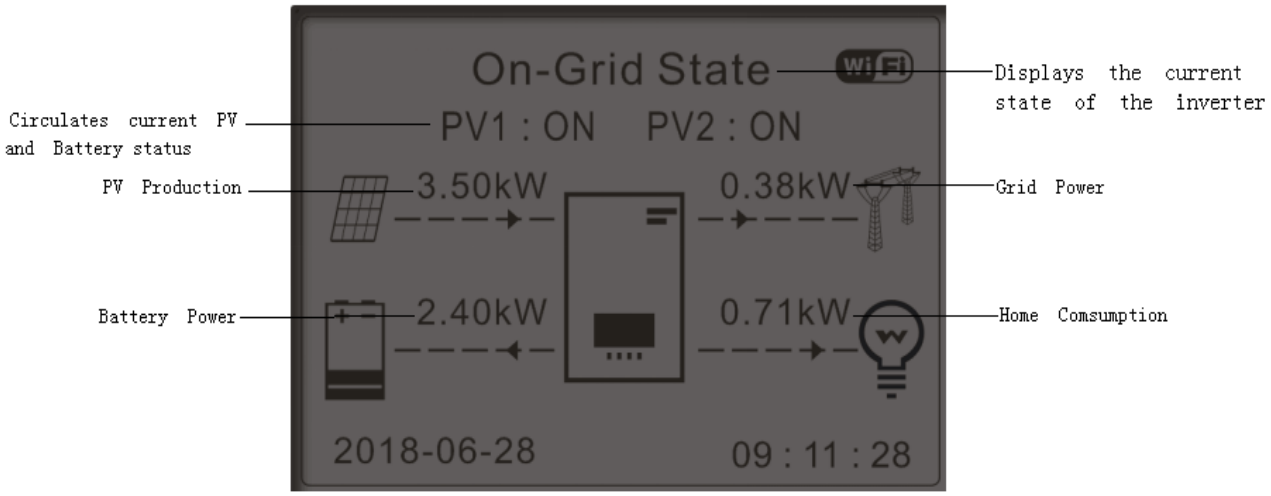


Figure 93 - Main menu interface

From the main interface, press the "Down" key to enter the page with the grid/battery settings.

Main interface		Grid Output Information
	Down↓	Grid(V) R.....***.*V
		Grid(V) S.....***.*V
		Grid(V) T.....***.*V
		AC Current R.....**.**A
		AC Current S..... **.**A
		AC Current T.....**.**A
	Down ↓	Frequency.....**.**Hz
		Battery Information (1)
		Batt1 (V).....****.*V
		Batt1 Curr.....**.**A

Batt1 Power.....**.*KW
Batt1 Temp.....*°C
Batt1 SOC.....**%
Batt1 SOH.....**%
Batt1 Cycles.....*T

Down↓

Battery Information (2)
Batt2 (V).....****.*V
Batt2 Curr.....**.**A
Batt2 Power.....**.*KW
Batt2 Temp.....*°C
Batt2 SOC.....**%
Batt2 SOH.....**%
Batt2 Cycles.....*T

From the main interface, press the “Up” key to enter the page with the photovoltaic settings.

Main interface

Up↑

PV Information
PV1 Voltage.....****.*V
PV1 Current.....**.**A
PV1 Power.....**.**KW
PV2 Voltage.....****.*V

PV2 Current.....**.**A
PV2 Power.....**.**KW
Inverter Temp.....*°C

From the main interface, press the “Back” key to enter the main menu, which has the following 5 options.

Main interface		1.System Settings
	Back	2.Advanced Settings
		3.Energy Statistics
		4.System Information
		5.Event List
		6.Software Update

7.3.1. Basic settings

1. System Settings		1.Language Settings
	OK	2.Time
		3.Safety Param.
		4.Energy Storage Mode

5.Self-test
6.Input Channel Config
7.EPS Mode
8.Communication Addr.
9.Set ForceChargeTime

1. Language settings

1.Language Settings	OK	1.中文	
		2.English	
		3.Italian	OK
		4.	
		.....	

2. Time

Set the system time for the inverter

2.Time	OK	Time YYYY-MM-DD hh:mm:ss

3. Safety parameters

The user can modify the safety parameters of the machine via a USB stick, and must copy and modify the values on the USB stick beforehand.

To enable this option, contact Zucchetti Centro Sistemi S.p.A.

4. Storage mode

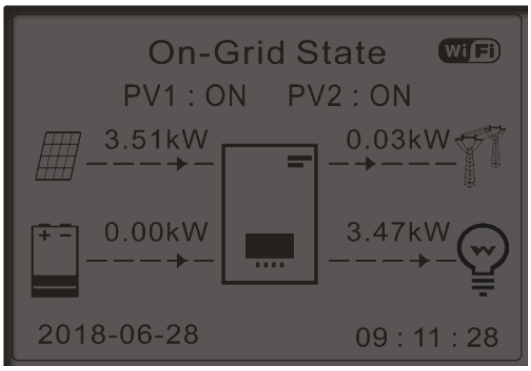
4.Energy Storage Mode	OK	1.Self-use Mode	OK
		2.Time-of-use Mode	
		3.Timing Mode	
		4.Passive Mode	OK

Self-consumption mode

The inverter automatically charges and discharges the battery.

If the PV generation (kW) = consumption (kW), with ΔP < 100W, the inverter does not charge or discharge the battery (Figurea).

If the PV generation (kW) > consumption (kW), the power surplus is stored in the battery (Figure b).

a) 

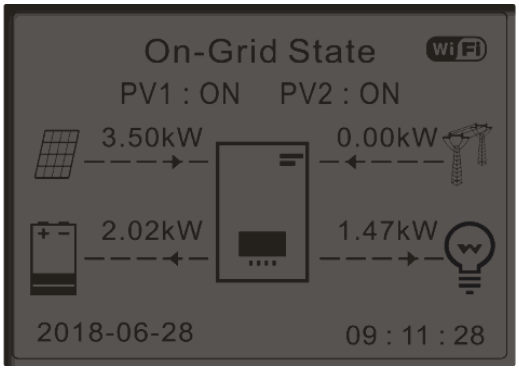
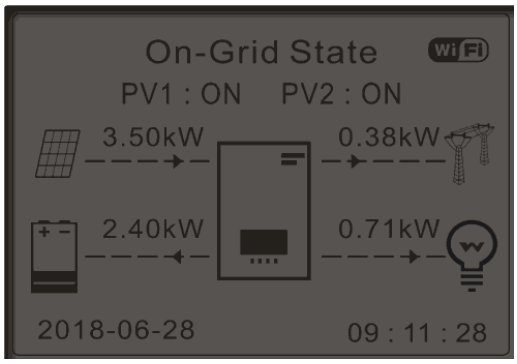
b) 

Figure 94 - Inverter display in self-consumption mode (1)

If the PV generation (kW) < consumption (kW), the battery is discharged to provide the necessary power, until it is completely discharged (Figure a).

If the battery is fully charged (or at maximum charging power), the surplus power is transferred to the grid (Figure b).

a) 

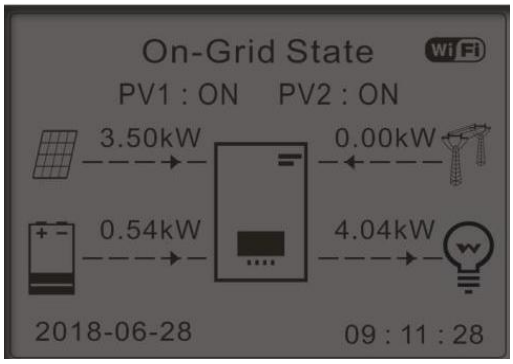
b) 

Figure 95 - Inverter display in self-consumption mode (2)

If the PV generation + battery (kW) < consumption (kW), the inverter draws power from the grid.

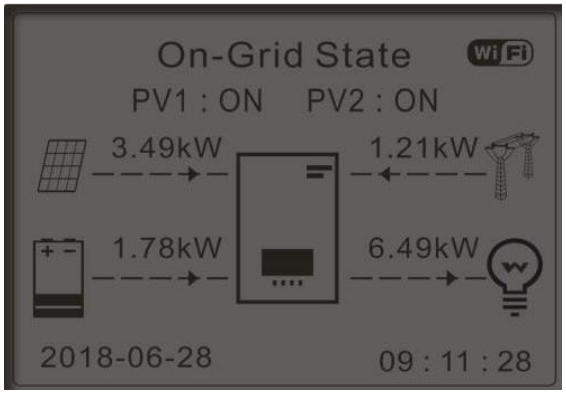


Figure 96 - Inverter display in self-consumption mode (3)

Times of use

For a more rational management of the energy (especially in winter, where the photovoltaic system cannot effectively charge the battery), it may be necessary to set a date range for recharging the battery from the grid; once this range has been set, the inverter will operate in automatic mode for the remaining time.

Various settings can be made to manage the most complex requests.

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

Timed Use

The time range in which to charge and discharge the battery can be set manually.

3.Timed Mode	OK	Timed 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 00 m Discharge End 16 h 00 m Discharge Power 02500 W

Passive Use

For more detailed information on passive operation, please contact Zucchetti Centro Sistemi S.p.A.

5. Self-test

5.Autotest	OK	1.Fast Self-test
		2.STD Self-test

The fast self-test gives the same results as the STD (standard) self-test, but takes less time.

1. Fast self-test	OK	Start Self-test	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”
OK self-test!	
↓	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 400ms	
↓	Press “Down”
27.S1: 228V 408ms	
↓	Press “Down”
27.S2 threshold 92V 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	

6. Configuration of input channel

6.Input Channel Config	OK	Input Channel Config			
		Input Channel1		Battery input 1	Down OK
				Battery input 1	
				Disable	
		Input Channel2		Battery input 2	Down
				Battery input 2	
				Disable	

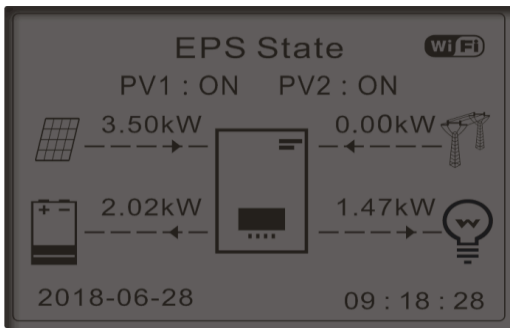
Input Channel3	PV input 1	Down
	PV input 1	
	Disable	
Input Channel4	PV input 2	Down
	PV input 2	
	Disable	

7. EPS Mode

7.EPS Mode	OK	1. EPS Mode Control	OK	1.Enable EPS Mode	OK
				2. Disable EPS Mode	

If the PV generation (kW) > consumption (kW), with ΔP < 100W, the inverter charges the battery (Figure a).
If the PV generation (kW) = consumption (kW), the inverter does not charge or discharge the battery (Figure b).

a)



b)

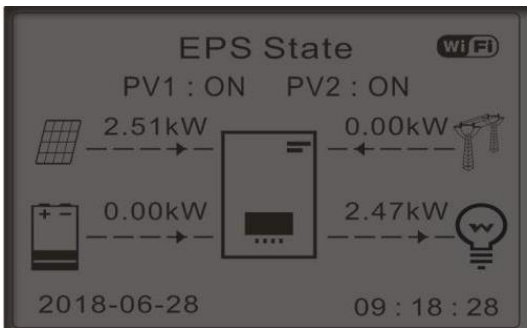
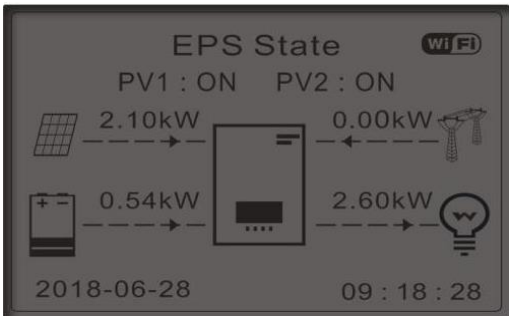


Figure 97 - Display with EPS in operation (1)

If the PV generation (kW) < consumption (kW), with ΔP < 100W, the inverter discharges the battery (Figure a).
If the PV generation (kW) is normal, but consumption (kW) is lower or zero, the power surplus is stored in the battery (Figure b).

a) 

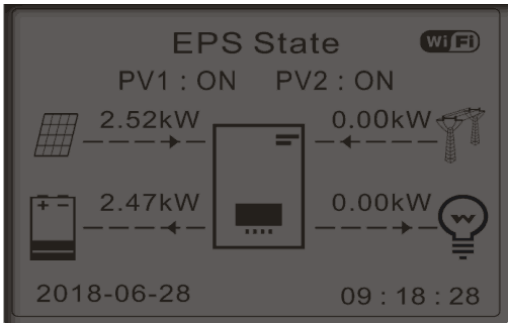
b) 

Figure 98 - Display with EPS in operation (2)

8. Communication address

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

9. Setting of forced charge time

9.Set ForceChargeTime	OK	Charge Start	OK
		Charge End	OK

7.3.2. Advanced settings

2.Advanced settings	OK	**Input 0001**

1.Battery Parameters
2.Battery Active
3.Anti Reflux
4.IV Curve Scan
5.DRM0 Control
6.Factory Reset
7.Parallel settings
8.Bluetooth Reset
9.CT Calibration

1. Battery parameters

A. Internal BMS

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

B. Pylon/Azzurro/WeCo/External BMS

1.Battery Parameters	OK	1.Battery Type	4.Max Discharge (A)	
		2.Battery Address	5.Discharge Depth	
		3.Max Charge (A)	6.Save	OK

Depth of Discharge (DOD)

e.g. DOD = 50% and EPS = 80%

While the grid is connected, the inverter will not discharge the battery as long as the SOC is less than 50%.

In the event of a blackout, the inverter operates in EPS mode (if EPS is enabled) and continues to discharge the battery until it reaches a battery SOC of 20%.

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

2. Battery active

Function to be implemented.

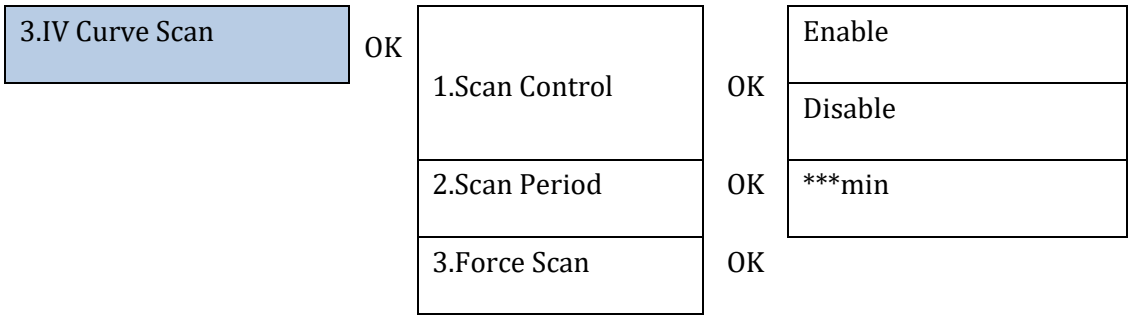
3. Anti Reflux

The "Anti Reflux Control" mode can be enabled to limit the maximum power exported to the grid. The power set is the maximum power to be fed into the grid.

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

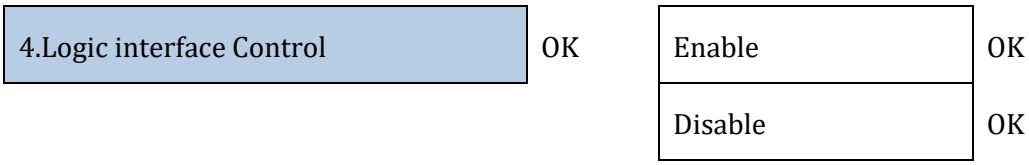
4. IV Curve Scan

The IV curve scan (MPP scan) can be enabled to find the maximum overall power by adjusting the value during operation to obtain the maximum output from the panels even in suboptimal conditions.
A scan period can be set or an instant scan can be performed.

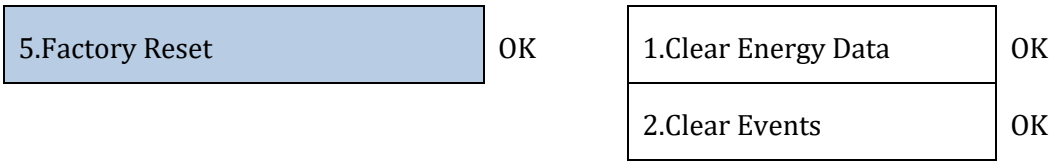


5. Logic Interface Control

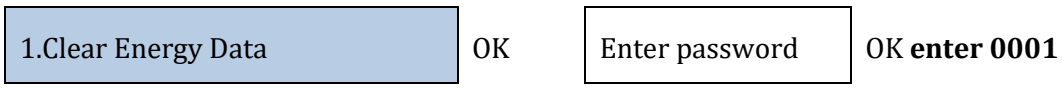
Enable or disable logic interfaces. Refer to the chapter on the connections between logic interfaces (relative section).



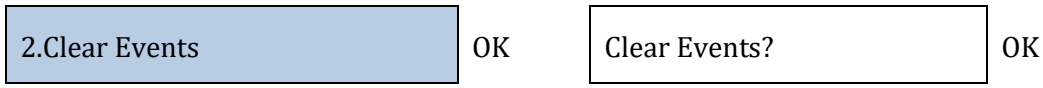
6. Reset factory settings



Delete the history of total power generated by the inverter.



Delete history of errors recorded on the inverter.



7. Parallel inverter settings

6.Parallel settings	OK

1.Parallel Control	Enable / disable
2.Parallel Master-Slave	Primary / Replica
3.Parallel Address	00 (Primary) 01 (replica 1) … 0n (Replica n)
4.Save	ok

8. Reset Bluetooth

Function to be implemented.

9. CT Calibration

Once the sensors have been connected, the “CT Calibration” function in the advanced settings of the device can be used to allow the system to correctly read the current flows.
In order for the inverter to perform this operation, it is necessary that:

- The system is connected to the grid
- The batteries are present and switched on
- The loads in the system are off
- Photovoltaic production is off

In this way, the system will automatically set the position of each sensor in the correct phase and the direction in line with the system's current flows.

For more details, please visit www.zcsazzurro.com.

7.3.3. Event list

The event list shows the events in real time, and with a progressive number, date and time and type of error. The list of errors can be checked through the main menu to monitor the details of the event history in real.

3.Event List	OK	1.Current Event List	OK	ID042 IsoFault
		2.History Event List		

2.History Event List	OK	1.ID001 2020-4-3 14:11:45	OK	1.ID001 GridOVP
		2.ID005 2020-4-3 11:26:38		2.ID005 GFCI

7.3.4. System interface information

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

1.Inverter Info	OK	Inverter Info (1)
		Product SN
		ARM Software Version
		Main DSP Software Version
		Slave DSP Software Version
		Power Level

Down↓	Inverter Info (2)
	Hardware Version
	Power Level
	Country
	Energy Storage Mode
Down↓	Inverter Info (3)
	Input Channel1
	Input Channel2
	Input Channel3
	Input Channel4
Down↓	Inverter Info (4)
	RS485 Address
	EPS Mode
	IV Curve Scan
	Anti Reflux
Down↓	Inverter Info (5)
	Logic interface Control
	PF Time Setting
	QV Time Setting
	Power Factor
Down↓	Inverter Info (6)
	Insulation resistance

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

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

7.3.5. Energy statistics

3.Energy Statistics	OK	Today
		PV .....***KWH
		Load .....***KWH
		Export .....***KWH
		Import.....***KWH
		Charge.....***KWH
		Discharge.....***KWH
	Down ↓	Month
		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

7.3.6. Software Update

The 3PH HYD5000-HYD20000-ZSS inverters offer the possibility to update the system via a USB stick for maximising the inverter's performance and preventing any operating errors caused by software bugs.

Procedure:

1. Insert the USB stick into the inverter (the files necessary for the update are already inside it)
2. Open the DC switch
3.

6.Software Update	OK	Enter password	OK **Enter 0715**
			Start Update
			Updating DSP1...
			Updating DSP2...

Updating ARM…

4. If any of the errors listed below appear, repeat the operation. If this happens several times, contact the support service.

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

Table 19 - Software update errors

5. After completing the update, close the DC switch, wait for the LCD screen to turn off; then restore the Wi-Fi connection and open both the DC and AC switches, wait a few seconds for the inverter to turn on again. To check the current version of the system update, go to System Info > Software Version.

8. Technical specifications

8.1. Technical data 3PH HYD5000-HYD8000-ZSS

TECHNICAL DATA	3PH HYD5000 ZSS	3PH HYD6000 ZSS	3PH HYD8000 ZSS
DC photovoltaic input			
Typical DC power *	7500W	9000W	12000W
Maximum DC power on each MPPT	6000W (480V-850V)	6600W (530V-850V)	6600W (530V-850V)
Independent MPPTs/Strings each MPPT	2/1		
Maximum DC voltage	1000V		
Start-up voltage	250V		
Nominal DC voltage	600V		
MPPT range in DC	180V-960V		
Full power range in DC	250V-850V	320V-850V	360V-850V
Maximum DC input current each MPPT	12.5A/12.5A		
Maximum absolute DC input current each MPPT	15A/15A		
Battery input data			
Type of batteries	Lithium Ion (supplied by Zucchetti)		
Voltage range	180V-750V		
Number of battery channels	1		
Maximum charge/discharge power	5000W	6000W	8000W
Allowed temperature range**	-10°C/+50°C		
Maximum charge current	25A (40A peak for 60s)		
Maximum discharge current	25A (40A peak for 60s)		
Charge curve	Managed by integrated BMS		
Depth of Discharge (DoD)	0%-90% (set)		
AC output			
Nominal AC Power	5000W	6000W	8000W
Maximum AC Power	5500VA	6600VA	8800VA
Maximum AC current each phase	8A	10A	13A
Type of connection/Nominal AC grid voltage	Three Phase 3/N/PE, 220/380, 230/400		
AC voltage range	180V~276V (according to local standards)		
Nominal AC frequency	50Hz/60Hz		
AC frequency reange	45Hz~55Hz / 54Hz~64Hz (according to local standards)		
Total Harmonic Distortion (THD)	< 3%		
Power Factor	1 default (set +/- 0.8)		
Active power grid injection	Set by display		
EPS (Emergency Power Supply) output			
Maximum Power in EPS***	5000W	6000W	8000W
Peak apparnet power in EPS***	10000VA for 60s	12000VA for 60s	16000VA for 60s
Voltage and frequency in EPS	Three Phase 230V/400V 50Hz		
Maximum current in EPS	8A (15A for 60s)	10A (18A for 60s)	13A (24A for 60s)
Total Harmonic Distortion (THD)	3%		
Switch time	<20ms		
Efficiency			
Maximum Efficiency	98.0%		
Euro efficiency	97.5%		
Efficiency MPPT	99.9%		
Maximum charge/discharge efficiency	97.6%		
Standby consumption	<15W		
Protections			
Internal interface protection	Yes		
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Overheating protection	Yes		
Overvoltage catergory/Protection class	Overvoltage Category III / Protective class I		
Integrated dischargers	AC/DC MOV: Type 2 standard		
AC output overcurrent protection	Yes		
Battery Soft start	Yes		
Standard			
EMC	EN61000-1, EN61000-3		
Safety standards	IEC62109-1, IEC62109-2, NB-T32004/IEC62040-1		
Grid standards	Grid standards and certificates available on www.zcsazzurro.com		
Communication			
Interfaces	Wi-Fi/4G/Ethernet (optional), (proprietary protocol), USB , CAN 2.0 (Battery data connection), Bluetooth		
Additional I/O	RS485 bus for external meters (up to 4 meter connectable), 6 digital inputs (5V TTL), CT direct connections		
Environmental data			
Temperature working range	-30°C...+60°C (power derating over 45°C)		
Topology	Transformerless		
Environmental protection degree	IP65		
Humidity range	0~100%		
Maximum operative altitude	4000m		
Acustic noise	<45 dB @ 1m		
Weight	33Kg		
Cooling system	Natural cooled		
Dimensions (H*W*L)	515mm*571mm*264mm		
Display	LED display and APP		
Warranty	10 years		

* Typical Dc power is not an absolute maximum rating. Online configurator available on www.zcsazzurro.com will guide the user on valid and possible configurations
** Standard value for lithium-ion batteries; maximum operativity in the range +10°C/+40°C
*** Power in EPS depends on battery type and on status of the storage system (residual capacity, temperature)

8.2. Technical data 3PH HYD10000-HYD20000-ZSS

TECHNICAL DATA	3PH HYD10000 ZSS	3PH HYD15000 ZSS	3PH HYD20000 ZSS
DC photovoltaic input			
Typical DC power *	15000W	22500W	30000W
Maximum DC power on each MPPT	7500W (300V-850V)	11250W (450V-850V)	15000W (600V-850V)
Independent MPPTs/Strings each MPPT	2/2		
Maximum DC voltage	1000V		
Start-up voltage	250V		
Nominal DC voltage	600V		
MPPT range in DC	180V-960V		
Full power range in DC	220V-850V	350V-850V	450V-850V
Maximum DC input current each MPPT	25A/25A		
Maximum absolute DC input current each MPPT	30A/30A		
Battery input data			
Type of batteries	Lithium Ion (supplied by Zucchetti)		
Voltage range	180V-750V		
Number of battery channels	2 (set as independent or parallel)		
Maximum charge/discharge power	10000W	15000W	20000W
Allowed temperature range**	-10°C/+50°C		
Maximum charge current	25A (35A for 60s)		
Maximum discharge current	25A (35A for 60s)		
Charge curve	Managed by integrated BMS		
Depth of Discharge (DoD)	0%-90% (set)		
AC output			
Nominal AC Power	10000W	15000W	20000W
Maximum AC Power	11000VA	16500VA	22000VA
Maximum AC current each phase	16A	24A	32A
Type of connection/Nominal AC grid voltage	Three Phase 3/N/PE, 220/380, 230/400		
AC voltage range	180V~276V (according to local standards)		
Nominal AC frequency	50Hz/60Hz		
AC frequency reange	45Hz~55Hz / 54Hz~64Hz (according to local standards)		
Total Harmonic Distortion (THD)	< 3%		
Power Factor	1 default (set +/- 0.8)		
Active power grid injection	Set by display		
EPS (Emergency Power Supply) output			
Maximum Power in EPS***	10000W	15000W	20000W
Peak apparnet power in EPS***	20000VA for 60s	22000VA for 60s	22000VA for 60s
Voltage and frequency in EPS	Three Phase 230V/400V 50Hz		
Maximum current in EPS	16A (30A for 60s)	24A (32A for 60s)	32A (33A for 60s)
Total Harmonic Distortion (THD)	3%		
Switch time	<20ms		
Efficiency			
Maximum Efficiency	98.2%		
Euro efficiency	97.7%		
Efficiency MPPT	99.9%		
Maximum charge/discharge efficiency	97.8%		
Standby consumption	<15W		
Protections			
Internal interface protection	Yes	No	
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Overheating protection	Yes		
Overvoltage catergory/Protection class	Overvoltage Category III / Protective class I		
Integrated dischargers	AC/DC MOV: Type 2 standard		
AC output overcurrent protection	Yes		
Battery Soft start	Yes		
Standard			
EMC	EN61000-1, EN61000-3		
Safety standards	IEC62109-1, IEC62109-2, NB-T32004/IEC62040-1		
Grid standards	Grid standards and certificates available on www.zcsazzurro.com		
Communication			
Interfaces	Wi-Fi/4G/Ethernet (optional), (proprietary protocol), USB , CAN 2.0 (Battery data connection), Bluetooth		
Additional I/O	RS485 bus for external meters (up to 4 meter connectable), 6 digital inputs (5V TTL), CT direct connections		
Environmental data			
Temperature working range	-30°C...+60°C (limitazione di potenza sopra i 45°C)		
Topology	Transformerless		
Environmental protection degree	IP65		
Humidity range	0~100%		
Maximum operative altitude	4000m		
Acustic noise	<45 dB @ 1m		
Weight	37Kg		
Cooling system	FANs cooled		
Dimensions (H*W*L)	515mm*571mm*264mm		
Display	LED display and APP		
Warranty	10 years		

* Typical Dc power is not an absolute maximum rating. Online configurator available on www.zcsazzurro.com will guide the user on valid and possible configurations
** Standard value for lithium-ion batteries; maximum operativity in the range +10°C/+40°C
*** Power in EPS depends on battery type and on status of the storage system (residual capacity, temperature)

9. Troubleshooting

This section contains information and procedures for troubleshooting any problems and errors signalled by the inverter.

 **Attention**	**Read the following section carefully. Check the warnings, messages and error codes shown on the screen.**

If no errors are found, check that certain basic conditions are met before proceeding. **Any type of check must be carried out safely according to the specific procedure.**

- Is the inverter located in a clean, dry place with good ventilation?
- Is the DC circuit breaker ON?
- Do the cables have the appropriate cross-section and length?
- Are the input and output connections in good condition?
- Are the configuration and settings correct for this type of installation?
- Are the communication system and display free of damage?

If all these requirements are met, proceed with the steps for viewing any errors.

Ground connection error

The 3PH HYD5000-HYD20000-ZSS inverters comply with the IEC 62109-2 standard for earth alarm fault monitoring.

If the ground connection error appears, it will be displayed on the LCD screen, the red light will turn on and the error will appear in the event list. For devices fitted with Wi-Fi/GPS, the alarm can also be displayed on the monitoring site and also notified on the mobile app.

Code	Name	Description	Solution
ID001	GridOVP	The grid voltage is too high.	If the error occurs occasionally, there may be abnormal fluctuations in the grid, the inverter returns to normal operation as soon as the grid returns to normal conditions. If the alarm occurs frequently, check whether the grid voltage and frequency are within acceptable ranges. If so, check the AC switch and the AC connection to the inverter. If the grid voltage and frequency are within acceptable ranges and the AC connection is correct, but the alarm persists, contact technical support to change the values of overvoltage, undervoltage, maximum frequency, minimum frequency, after obtaining the approval of the local grid operator.
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	Loss of charge	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support.
ID006	OVRT fault	OVRT function error	
ID007	LVRT fault	LVRT function in error	
ID008	IslandFault	Isolation error	
ID009	GridOVPInstant1	Transient overvoltage of grid 1	
ID010	GridOVPInstant2	Transient overvoltage of grid 2	
ID011	VGridLineFault	Grid voltage error	
ID012	InvOVP	Inverter overvoltage	
ID017	HwADFaultIGrid	Error in the measurement of the grid current	

ID018	HwADFaultDCI	Measurement error of the DC component of the grid current	
ID019	HwADFaultVGrid(DC)	Grid voltage (DC) measurement error	
ID020	HwADFaultVGrid(AC)	Grid voltage (AC) measurement error	
ID021	GFCIDeviceFault(DC)	Current (DC) leakage measurement error	
ID022	GFCIDeviceFault(AC)	Current (AC) leakage measurement error	
ID023	HwADFaultDCV	Measurement error of the DCI component of the charge voltage	
ID024	HwADFaultIdc	Input current measurement error	
ID029	ConsistentFault_GFCI	Leakage current reading error	
ID030	ConsistentFault_Vgrid	Grid voltage reading 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 error	
ID042	IsoFault	Low impedance isolation	Check the isolation resistance between the photovoltaic panels and the ground, if there is a short circuit, the error can be fixed immediately.
ID043	PEConnectFault	Ground fault	Check the Ac-side of the PE output for grounding.
ID044	PvConfigError	Error in input mode setting.	Check the mode of the PV input (parallel/independent); if they are not

			correct, change them.
ID045	CTDisconnect	CT error	Check whether the CT connection is correct.
ID049	TempFault_Bat	Battery temperature protection	Make sure that the inverter is installed in a cool, well-ventilated place, below the temperature limits and away from direct sunlight. Check that the inverter has been installed according to the instructions in the manual.
ID050	TempFault_HeatSink1	Radiator temperature protection 1	
ID051	TempFault_HeatSink2	Radiator temperature protection 2	
ID052	TempFault_HeatSin3	Radiator temperature protection 3	
ID053	TempFault_HeatSink4	Radiator temperature protection 4	
ID054	TempFault_HeatSin5	Radiator temperature protection 5	
ID055	TempFault_HeatSin6	Radiator temperature protection 6	
ID057	TempFault_Env1	Ambient temperature protection 1	
ID058	TempFault_Env2	Ambient temperature protection 2	
ID059	TempFault_Inv1	Module 1 temperature protection	
ID060	TempFault_Inv2	Module 2 temperature protection	
ID061	TempFault_Inv3	Module 3 temperature protection	
ID065	VbusRmsUnbalance	RMS bus voltage is not balanced	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support.
ID066	VbusInstantUnbalance	Transient voltage value of the BUS is not balanced	
ID067	BusUVP	Busbar undervoltage during grid connection	
ID068	BusZVP	Low BUS voltage	
ID069	PVOVP	PV overvoltage	Check whether the voltage of the PV modules in series (Voc) is higher than the maximum input voltage. If so, adjust the number of PV modules in series to reduce the voltage of the PV modules in series, adapting them to the input

			voltage range of the inverter. After changing the voltage, the inverter returns to normal operation on its own.
ID070	BatOVP	Batter overvoltage	Check that the battery overvoltage settings are compatible with the battery specifications.
ID071	LLCBusOVP	LLC Bus overvoltage protection	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support.
ID072	SwBusRmsOVP	Software RMS overvoltage protection of the DC bus	
ID073	SwBusInstantOVP	Software instantaneous overvoltage protection of the DC bus	
ID081	SwBatOCP	Battery software overcurrent protection	
ID082	DciOCP	Dci overcurrent protection	
ID083	SwOCPInstant	Instantaneous output current protection	
ID084	SwBuckBoostOCP	BuckBoost software flow	
ID085	SwAcRmsOCP	Current actual value protection	
ID086	SwPvOCPInstant	Software PV overcurrent protection	
ID087	IpvUnbalance	Parallel PV flows not balanced	
ID088	IacUnbalance	Output current not balanced	

ID097	HwLLCBusOVP	LLC bus hardware overvoltage	
ID098	HwBusOVP	Bus hardware overvoltage	
ID099	HwBuckBoostOCP	Excessive BuckBoost hardware flows	
ID100	HwBatOCP	Excessive battery hardware flows	
ID102	HwPVOCP	Excessive PV hardware flows	
ID103	HwACOCP	Excessive AC hardware output flows	
ID110	Overload1	Overload protection 1	Check whether the inverter is running in overload
ID111	Overload2	Overload protection 2	
ID112	Overload3	Overload protection 3	
ID113	OverTempDerating	Internal temperature too high.	Make sure that the inverter is installed in a cool, well-ventilated place, below the temperature limits and away from direct sunlight. Check that the inverter has been installed according to the instructions in the manual.
ID114	FreqDerating	AC frequency is too high.	Make sure that the grid frequency and voltage are 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	Low battery voltage protection	Check that the battery voltage on the inverter side is not too low
ID125	BatLowVoltageShut	Battery shutdown due to low voltage	
ID129	unrecoverHwAcOCP	Permanent hardware error due to output overcurrent	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support.
ID130	unrecoverBusOVP	Fixed bus overvoltage error	
ID131	unrecoverHwBus	Bus hardware	

	OVP	overvoltage error	
ID132	unrecoverIpvUnbalance	Permanent unbalanced PV flow error	
ID133	unrecoverEPSBatOCP	Permanent battery overcurrent error in EPS mode	
ID134	unrecoverAcOCPInstant	Transient battery output overcurrent error	
ID135	unrecoverIacUnbalance	Permanent unbalanced output current error	
ID137	unrecoverPvConfigError	Permanent error in input mode settings	Check the mode of the PV input (parallel/independent); if they are not correct, change them.
ID138	unrecoverPVOCPInstant	Permanent input overcurrent error	
ID139	unrecoverHwPVOCP	Permanent hardware overcurrent error	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support
ID140	unrecoverRelayFail	Permanent relay error	
ID141	unrecoverVbusUnbalance	Permanent unbalanced bus voltage error	
ID145	USBFault	USB error	Check the USB input of the inverter
ID146	WifiFault	WiFi error	Check the Wi-Fi input of the inverter
ID147	BluetoothFault	Bluetooth error	Check the Bluetooth connection of the inverter
ID148	RTCFault	RTC clock error	Internal inverter errors. Switch it off, wait 5 minutes and switch it on again. If the errors still occur, contact technical support
ID149	CommEEPROMFault	EEPROM communication board error	
ID150	FlashFault	FLASH communication board error	
ID153	SciCommLose(DC)	SCI communication error (DC)	
ID154	SciCommLose(AC)	SCI communication error (AC)	
ID155	SciCommLose(Fuse)	SCI communication error (fuse)	
ID156	SoftVerError	Incorrect software version	Contact technical support and update the software
ID157	BMSCommunicatonFault	Lithium-battery communication error	Make sure that the battery is compatible with the inverter. A CAN

			connection is recommended. Check the communication port/line of the battery and inverter for any errors.
ID161	ForceShutdown	Forced shutdown	The inverter has undergone a forced shutdown
ID162	RemoteShutdown	Remote shutdown	The inverter has undergone a forced remote shutdown
ID163	Drms0Shutdown	DRMs0 shutdown	The inverter has undergone a forced DRMs0 shutdown
ID165	RemoteDerating	Remote derating	The inverter has undergone a remote load derating
ID166	LogicInterfaceDerating	Logic interface derating	The inverter is loaded by running the logic interface.
ID167	AlarmAntiRefluxing	Anti-reflux derating	The inverter is programmed to prevent counter-current load sagging.
ID169	FanFault1	Fan1 error	Check whether fan 1 of the inverter is working properly
ID170	FanFault2	Fan2 error	Check whether fan 2 of the inverter is working properly
ID171	FanFault3	Fan3 error	Check whether fan 3 of the inverter is working properly
ID172	FanFault4	Fan4 error	Check whether fan 4 of the inverter is working properly
ID173	FanFault5	Fan5 error	Check whether fan 5 of the inverter is working properly
ID174	FanFault6	Fan6 error	Check whether fan 6 of the inverter is working properly
ID177	BMS OVP	BMS overvoltage alarm	Internal lithium battery error; turn off the inverter and battery, wait 5 minutes and then turn them on again. If the errors still occur, contact technical support
ID178	BMS UVP	BMS undervoltage alarm	
ID179	BMS OTP	BMS high temperature alarm	
ID180	BMS UTP	BMS low temperature alarm	
ID181	BMS OCP	BMS overload warning when charging and discharging	
ID182	BMS Short	BMS short-circuit alarm	

10. Uninstalling

10.1. 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.
- Remove the DC connectors from the inverter.
- Remove the connectors for communication with the batteries and current sensors.
- Remove the AC terminals.
- Unscrew the fixing bolt of the bracket and remove the inverter from the wall.

10.2. Packaging

If possible, pack the product in its original packaging.

10.3. Storage

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

10.4. 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.

11. Monitoring systems

11.1. External Wi-Fi adapter

11.1.1. 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.

(a)

(b)

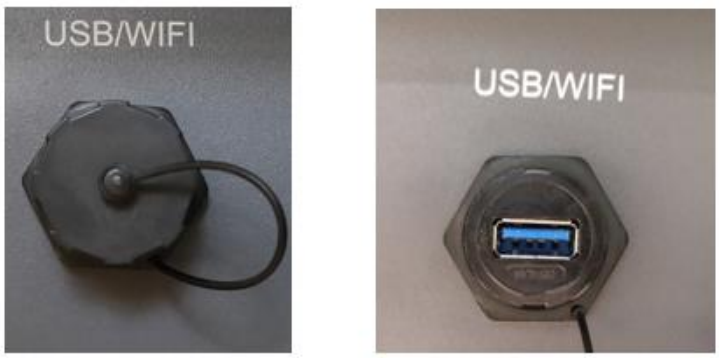


Figure 99 – Port for external Wi-Fi adapter

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.

(a)

(b)

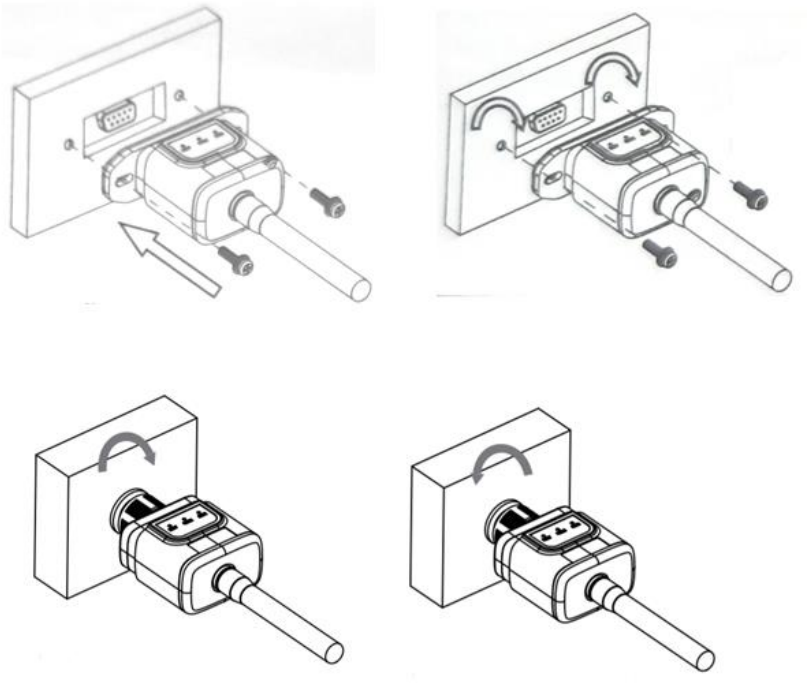


Figure 100 – Inserting and securing the external Wi-Fi adapter

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

11.1.2. 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 101 - 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 102 – 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.

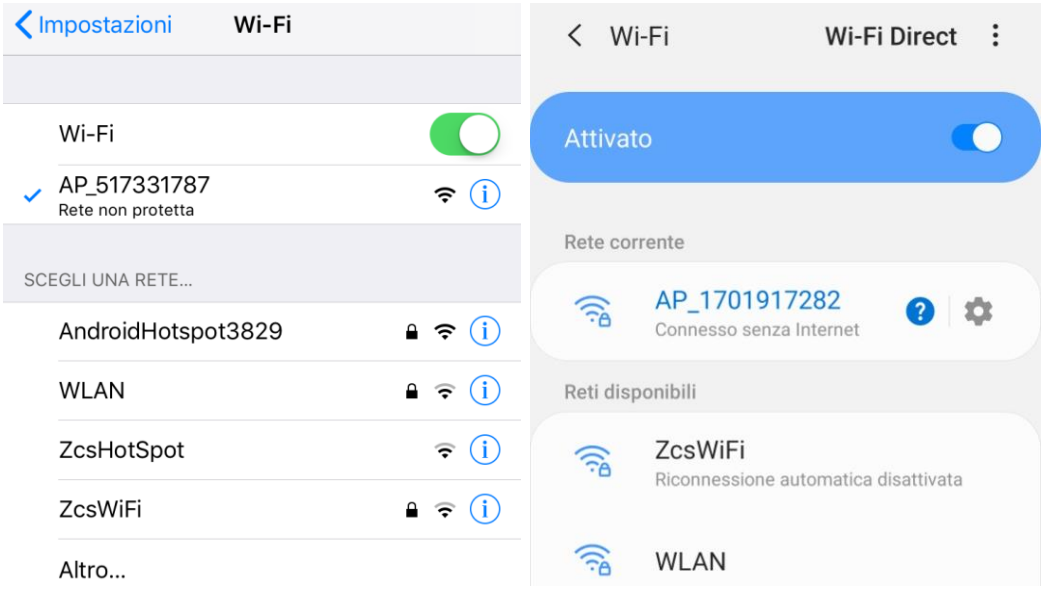


Figure 103 - Connection to Access Point for Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

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 104 – 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.

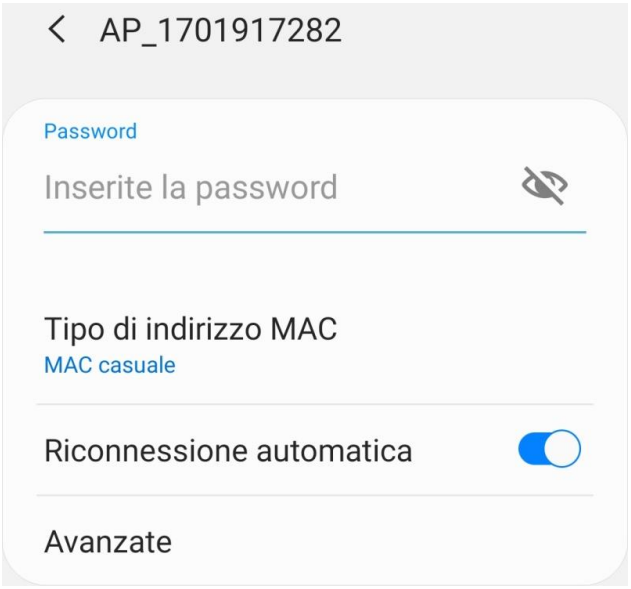


Figure 105 – Password entry prompt

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 106 – 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.

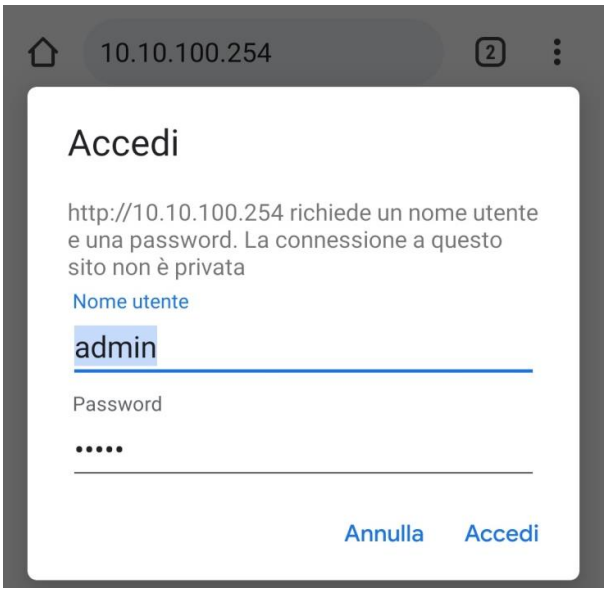


Figure 107 – Screen for accessing the web server to configure the Wi-Fi adapter

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.

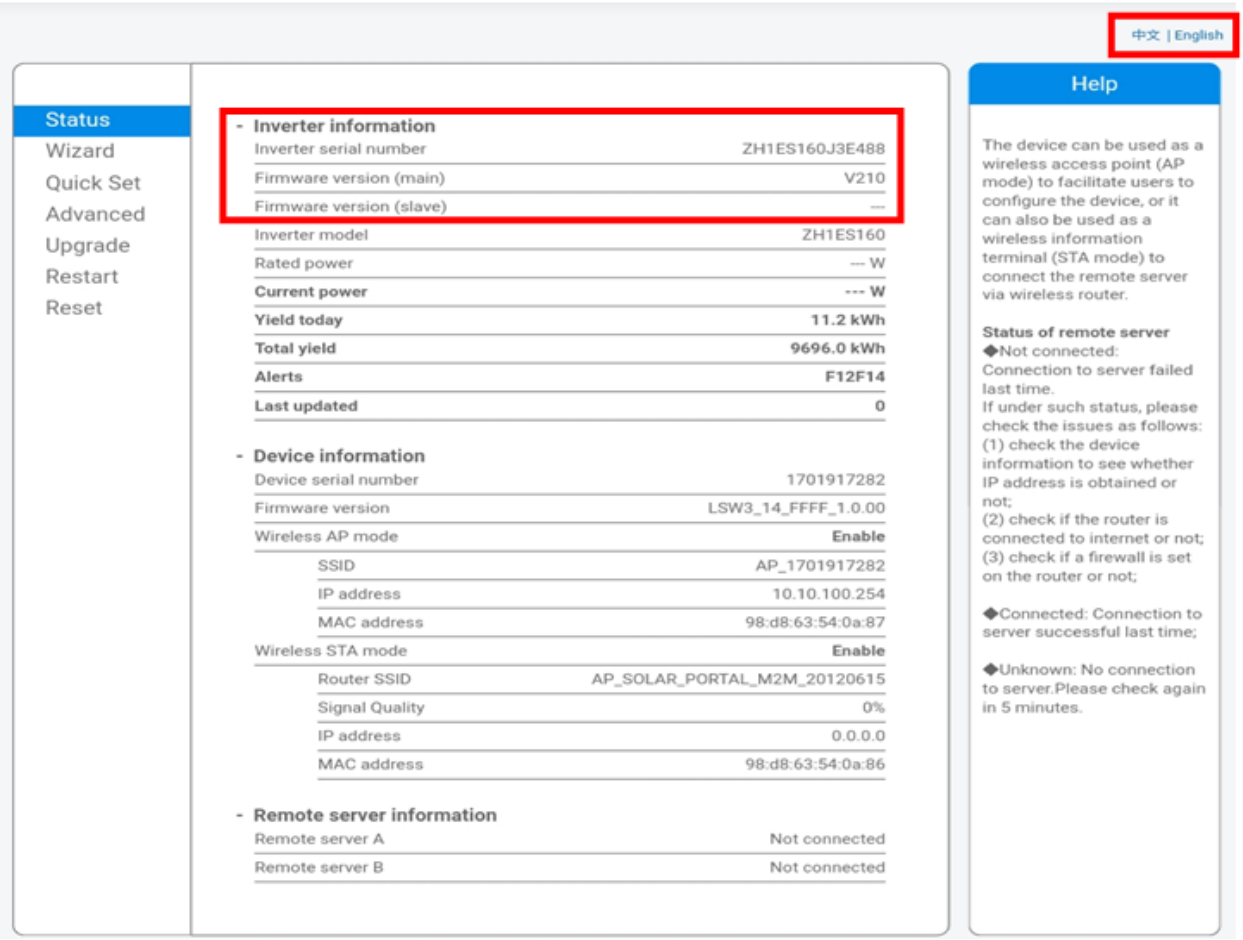


Figure 108 – Status screen

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.

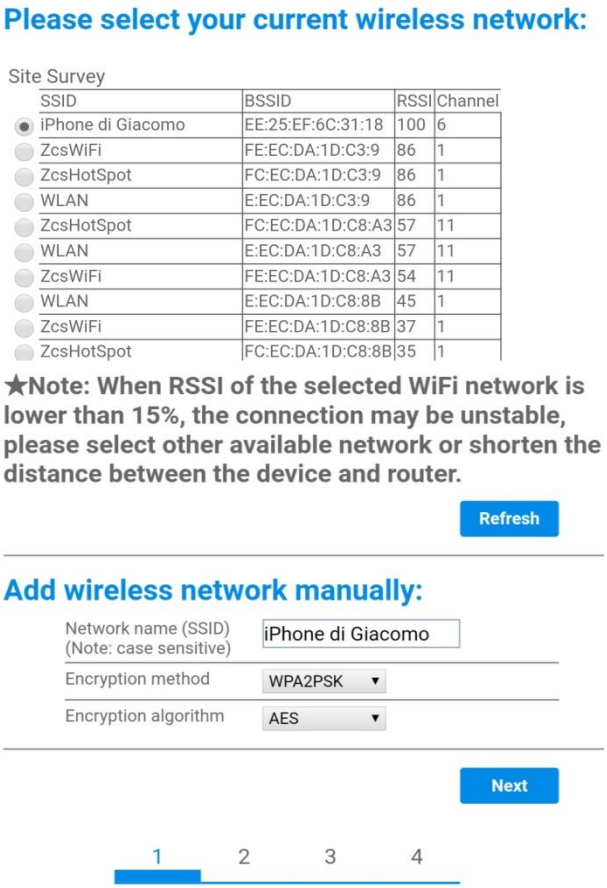


Figure 109 – Screen for selecting the available wireless network (1)

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.

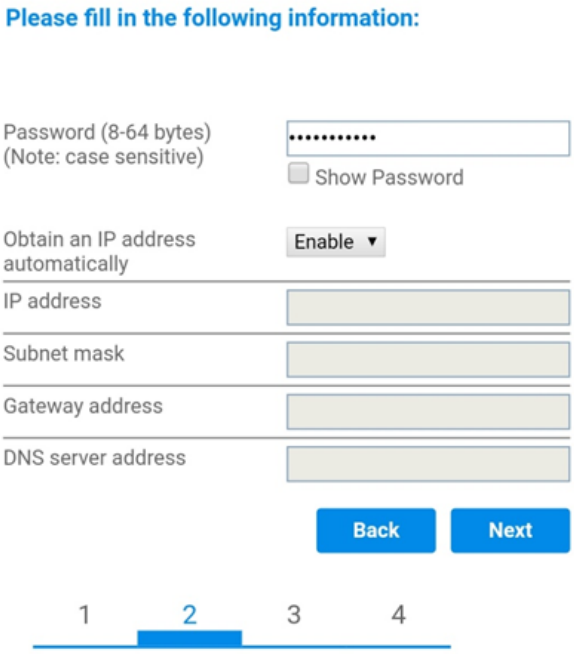


Figure 110 – Screen for entering the password of the wireless network (2)

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

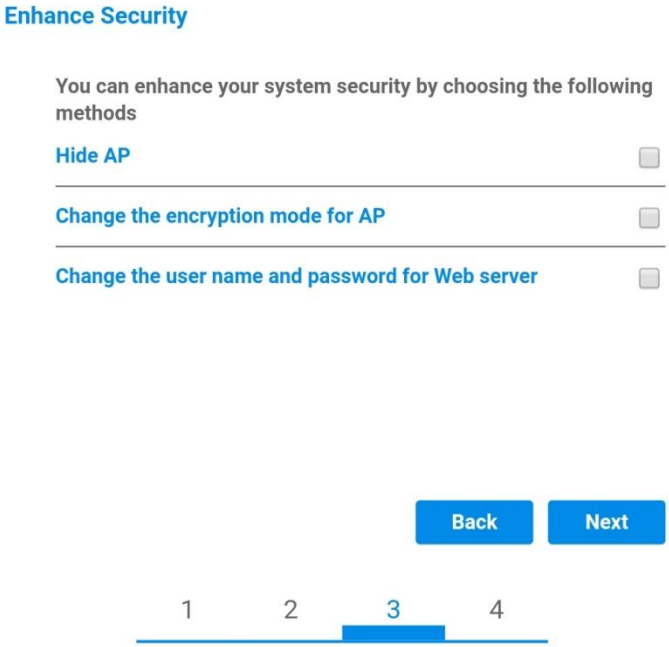


Figure 111 - Screen for setting the security options (3)

10) Click “OK”.

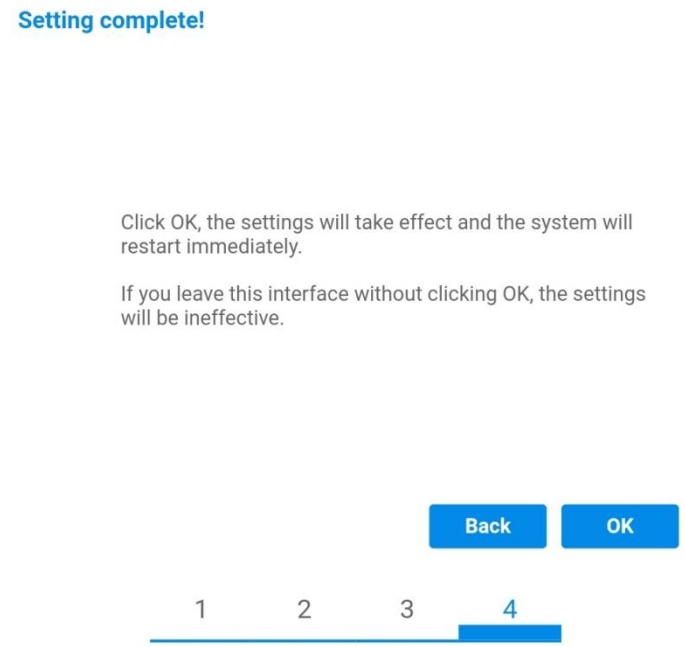


Figure 112 – Final configuration screen (4)

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 por remove it from the background of the telephone.

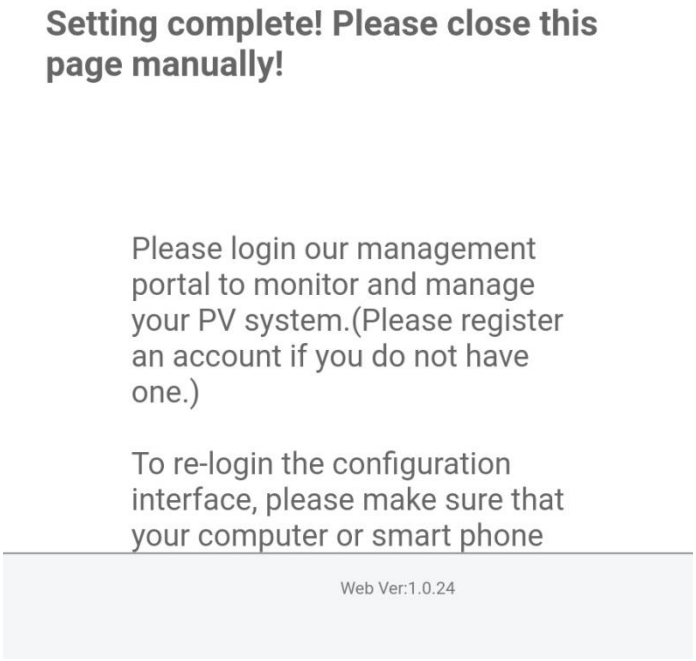


Figure 113 - Successful configuration screen

11.1.3. Verification

To verify the correct configuration, connect to it again and access the status page. Here 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

Figure 114 – 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 115 - Initial status of LEDs

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

Figure 116 - 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 117 – Reset button on the Wi-Fi adapter

11.1.4. 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 118 - 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 119 – 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 120 - 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**

a) 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.

b) 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.

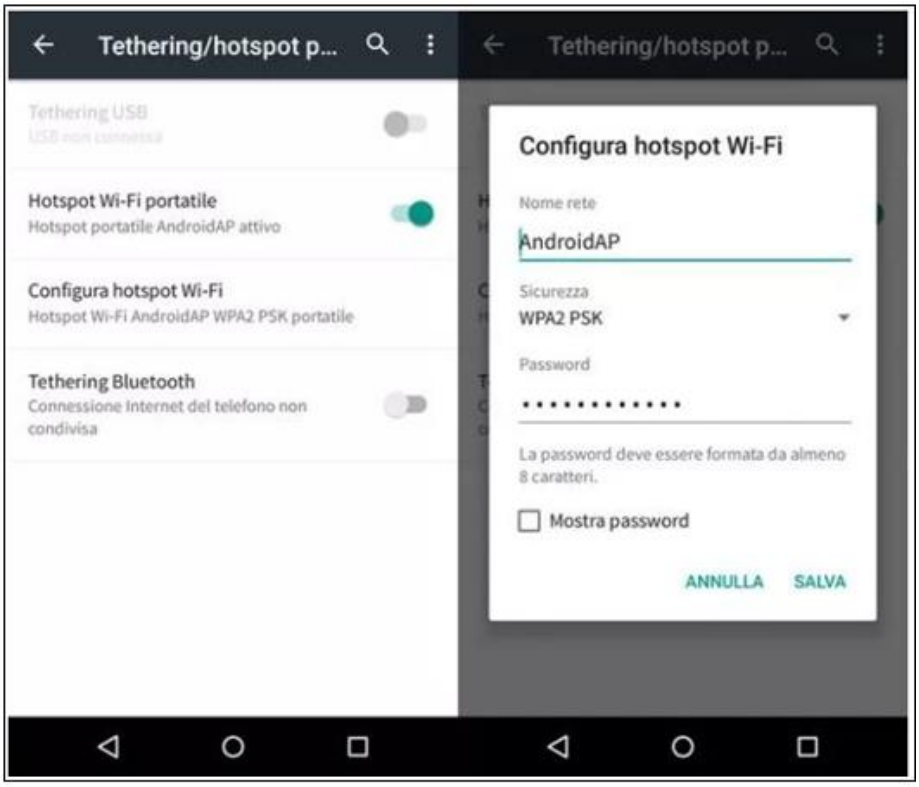


Figure 121 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

a) 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.

b) 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.

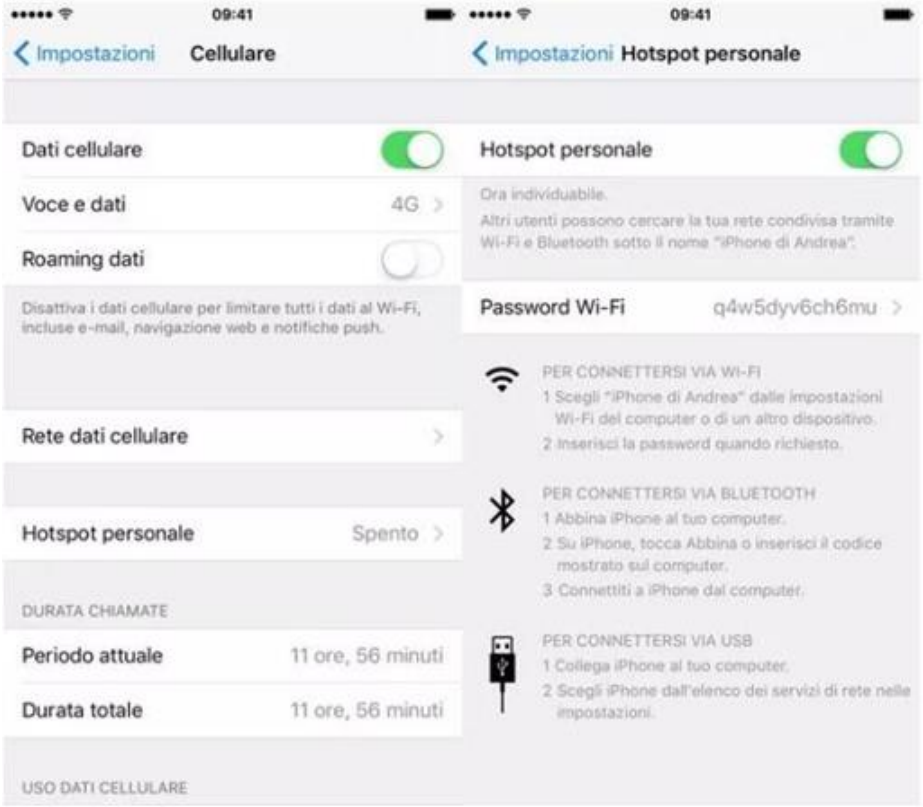


Figure 122 - Configuration of an iOS smartphone as a hotspot router

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).

11.2. Ethernet adapter

11.2.1. 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.

(a)

(b)

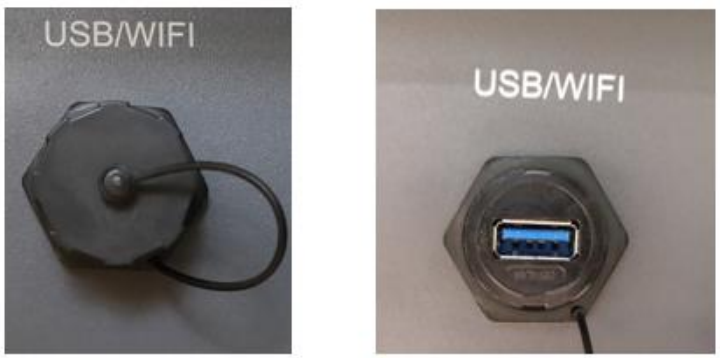


Figure 123 – Port of the Ethernet adapter

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.

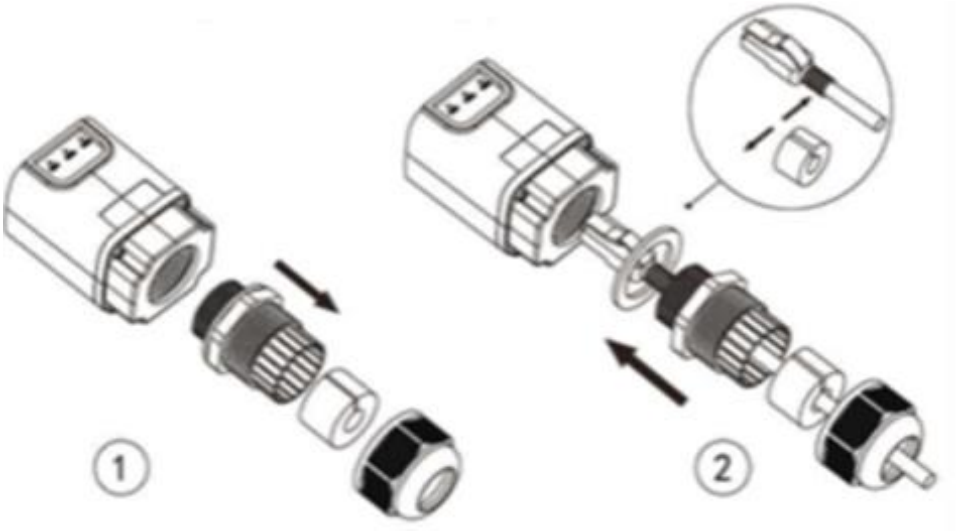


Figure 124 – Inserting the network cable inside the device

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.

(a)

(b)

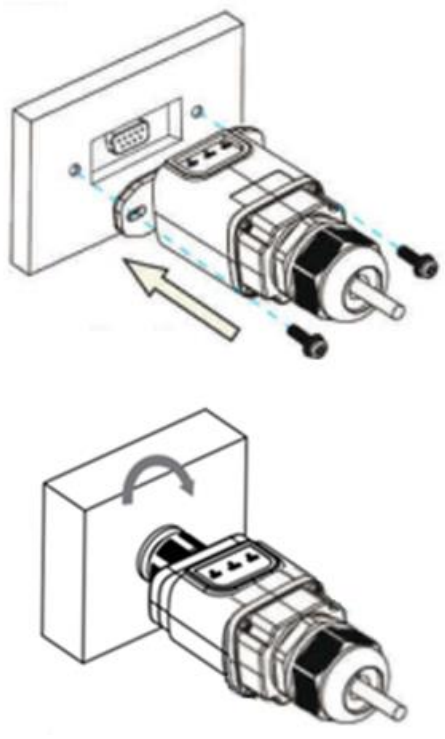


Figure 125 – Inserting and securing the ethernet adapter

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

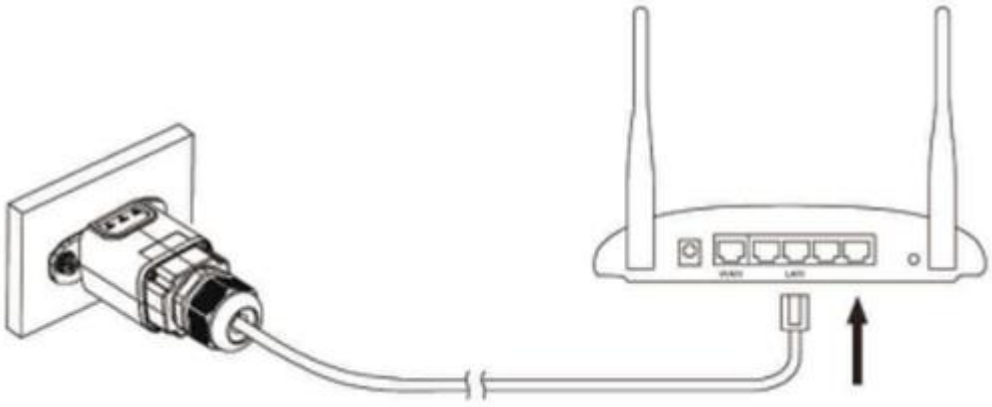


Figure 126 – Connecting the network cable to the modem

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.

11.2.2. 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 127 - Initial status of LEDs

2) Final status:
   NET (left LED): steady on

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

Figure 128 - Final status of LEDs

11.2.3. 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 129 - 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 130 - 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).

11.3. 4G adapter

The ZCS 4G adapters are sold with a virtual SIM integrated into the device with data traffic fee included for10 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.

11.3.1. 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.

(a)

(b)

Figure 131 – 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.

(a)

(b)

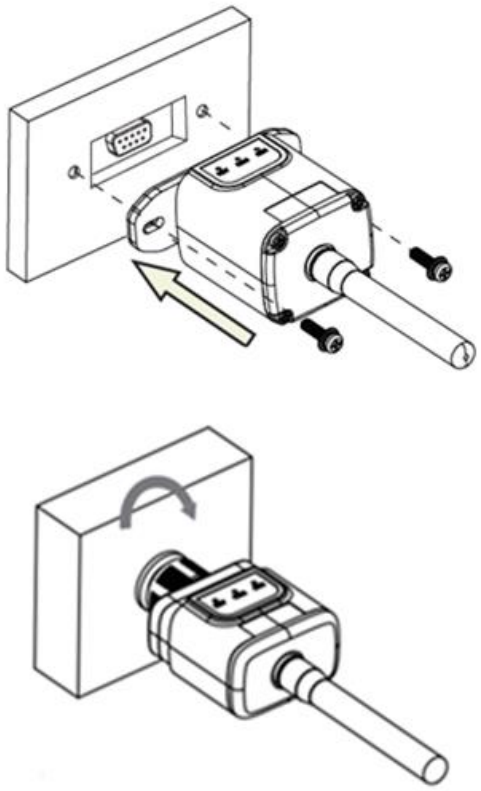


Figure 132 – Inserting and securing the 4G adapter

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.

11.3.2. 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 133 - 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 134 - 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 135 - 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 136 - 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.

11.4. Datalogger

11.4.1. Preliminary notes on how to configure the datalogger

The AzzurroZCS 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 137 – 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.

Figure138– 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.

11.4.2. Electrical connections and configuration

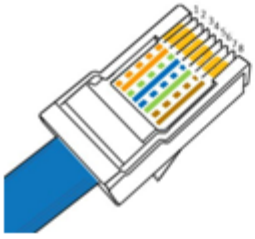
All the Azzurro ZCS inverters have at least one RS485 connection point.
The connections can be made via the green terminal block or via the RJ45 plug inside the inverter.
Use positive and negative conductors. There is no need to use a conductor for the GND. This applies to both the terminal block and 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

Figure126– 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.

Figure139– Tightening the network cable to the RS485 terminal block

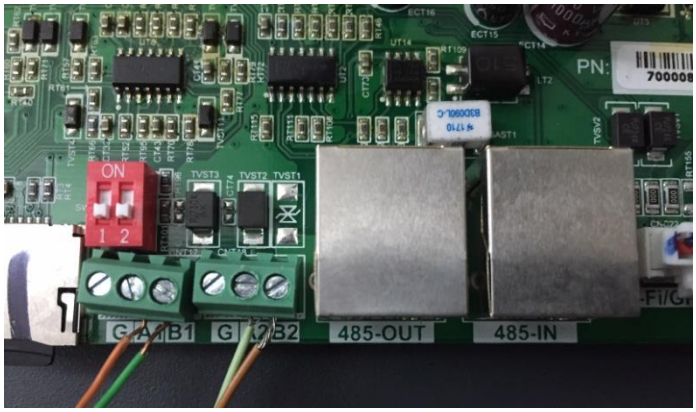


Figure140– Connecting the serial line via the RS485 terminal block and via the RJ45 plug

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

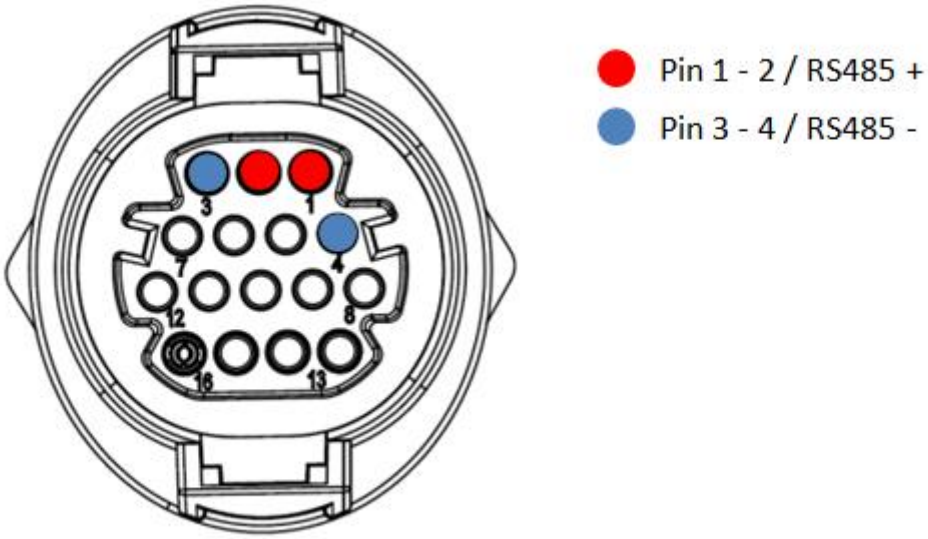


Figure 141a – Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS

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.

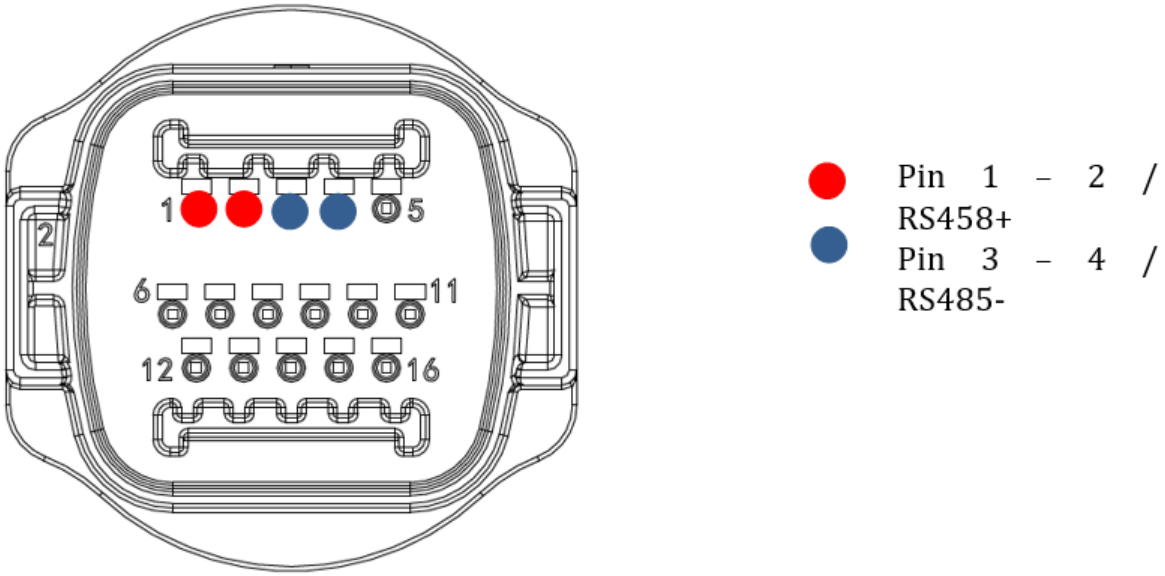


Figure 141b – Connecting the serial line via the communication connector for 1PH 3000-6000 TLM-V3, 3PH HYD5000-HYD20000-ZSS

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.

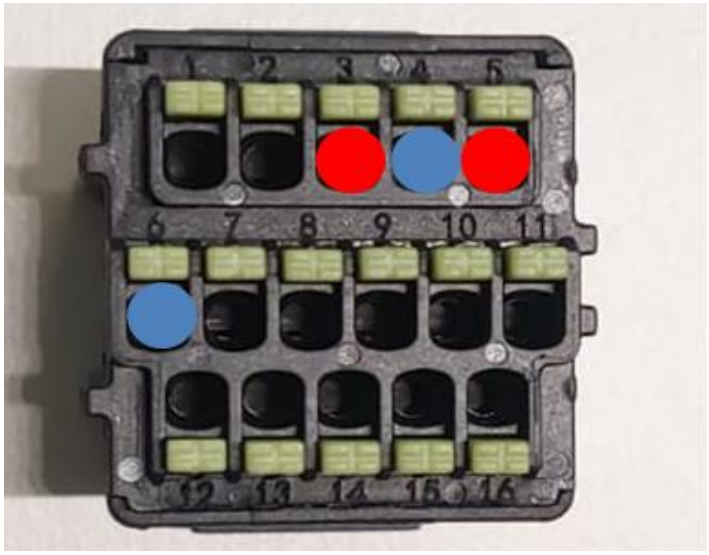


Figure 141c – Connecting the serial line via the communication connector for 1PH HYD3000-HYD6000-HP

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.

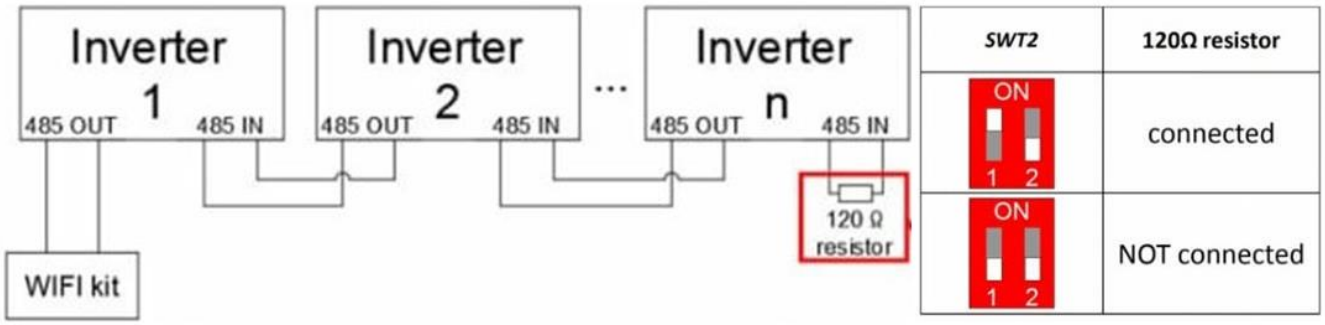


Figure 142 – Positioning of dip switches to connect the isolation resistor

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 143 – 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.

11.4.3. 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

11.4.4. 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.

11.4.5. Ethernet configuration

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

Figure 144 – 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.

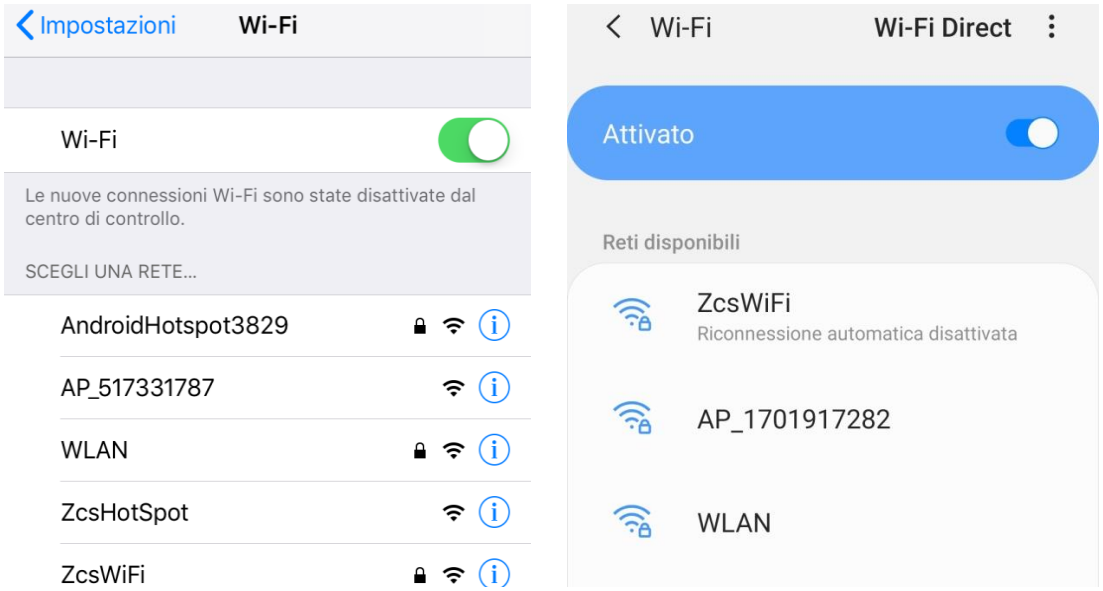


Figure 145 - Wi-Fi network search on iOS smartphone (left) and Android (right)

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

Figure 146 - 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.

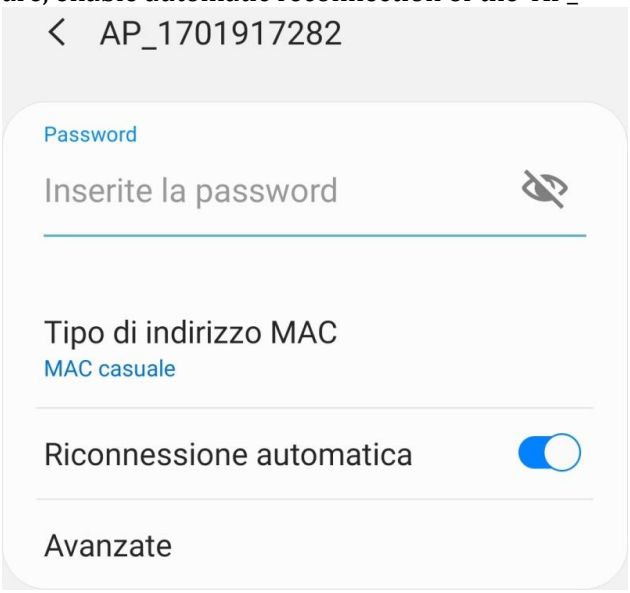


Figure 147 - Password entry prompt

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 148 - 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 149 - 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.

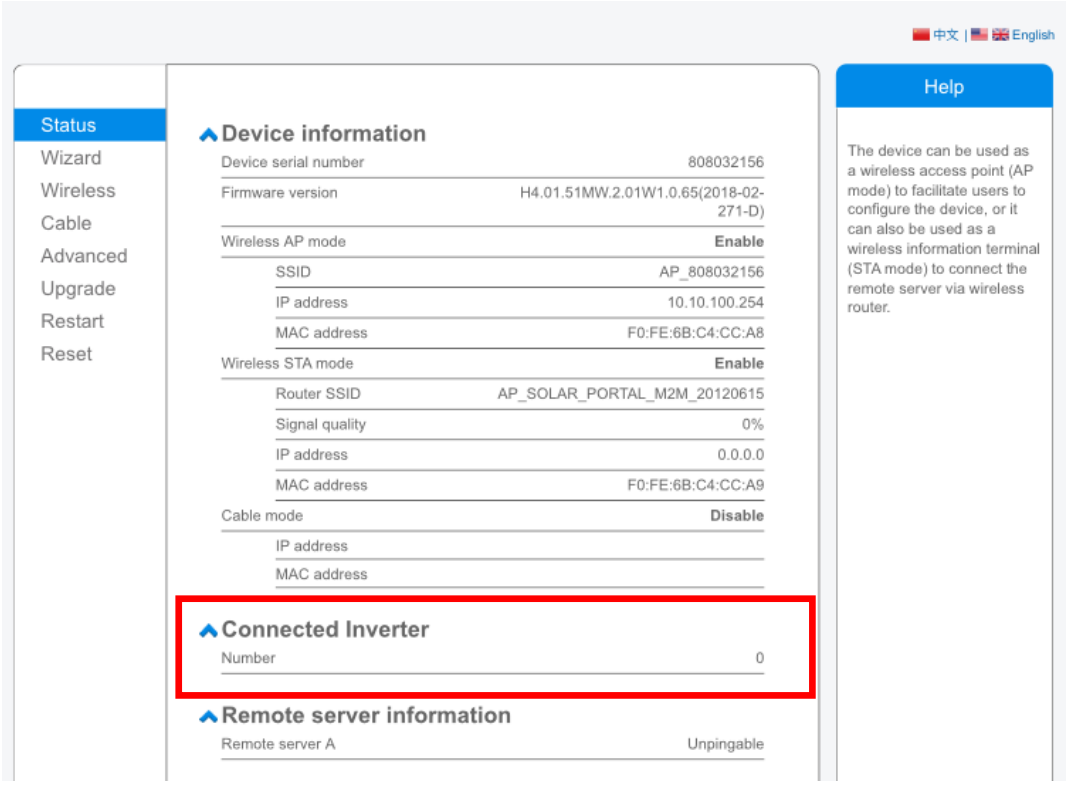


Figure 150 – Status Screen

8) Click on the Wizard setup button in the left-hand column.

9) Now click on the Start button to start the configuration wizard.

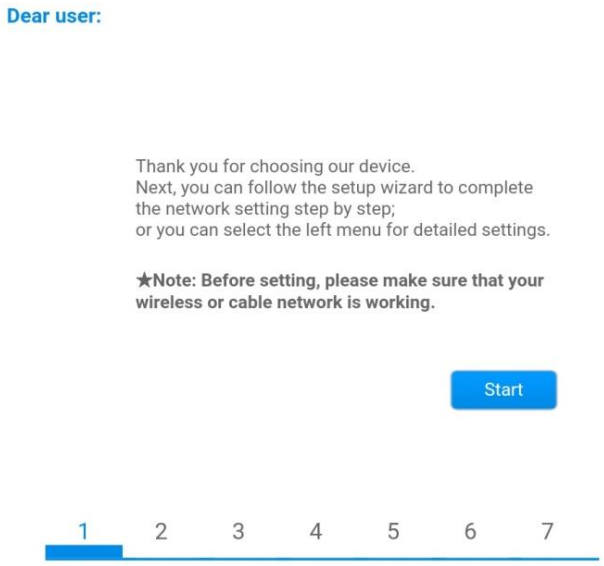


Figure 139 – Screen for starting (1) the Setup Wizard

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

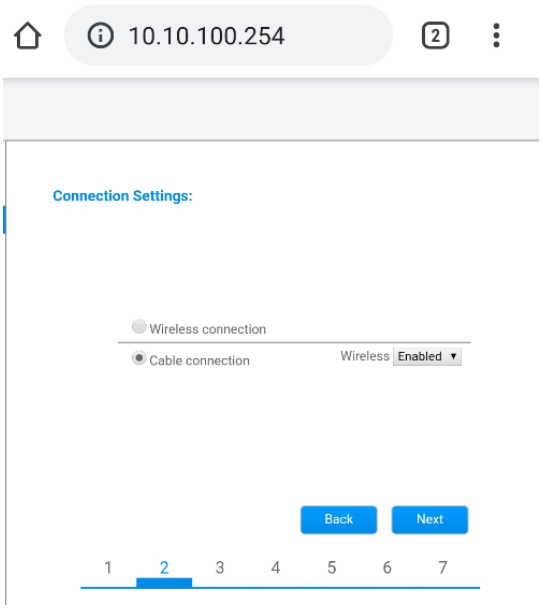


Figure 151 - Network cable connection selection screen

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

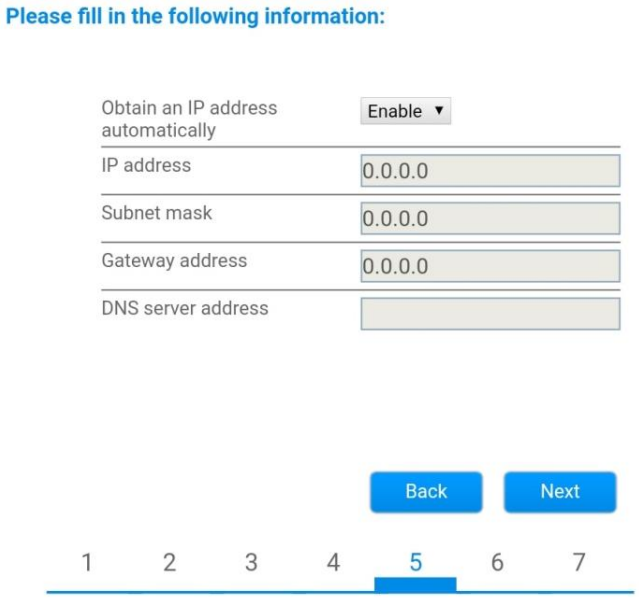


Figure 152 – Screen for automatically obtaining the IP address (5)

12) Click on Next without making any changes.

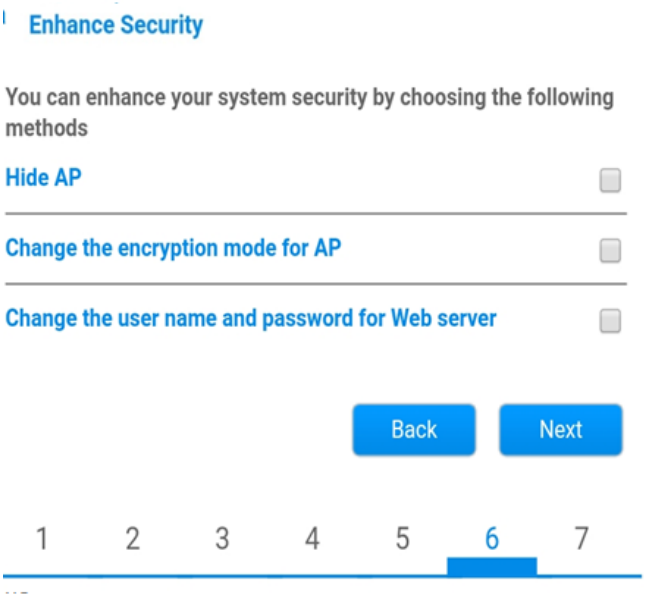


Figure 153 - Screen for setting the security options (6)

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

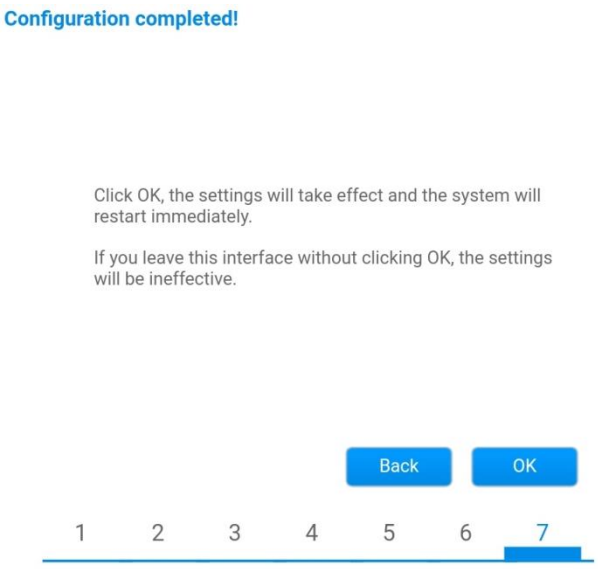


Figure 154 – Final configuration screen (7)

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.

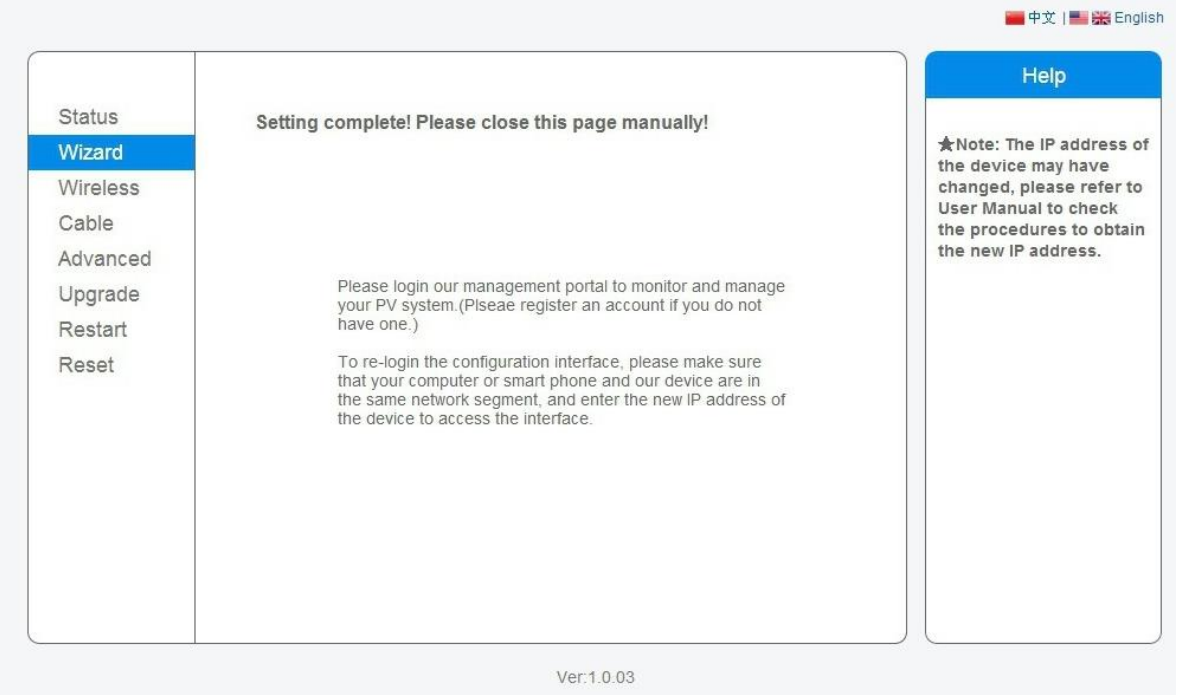


Figure 155 – Successful configuration screen

11.4.6. 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 156 – 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

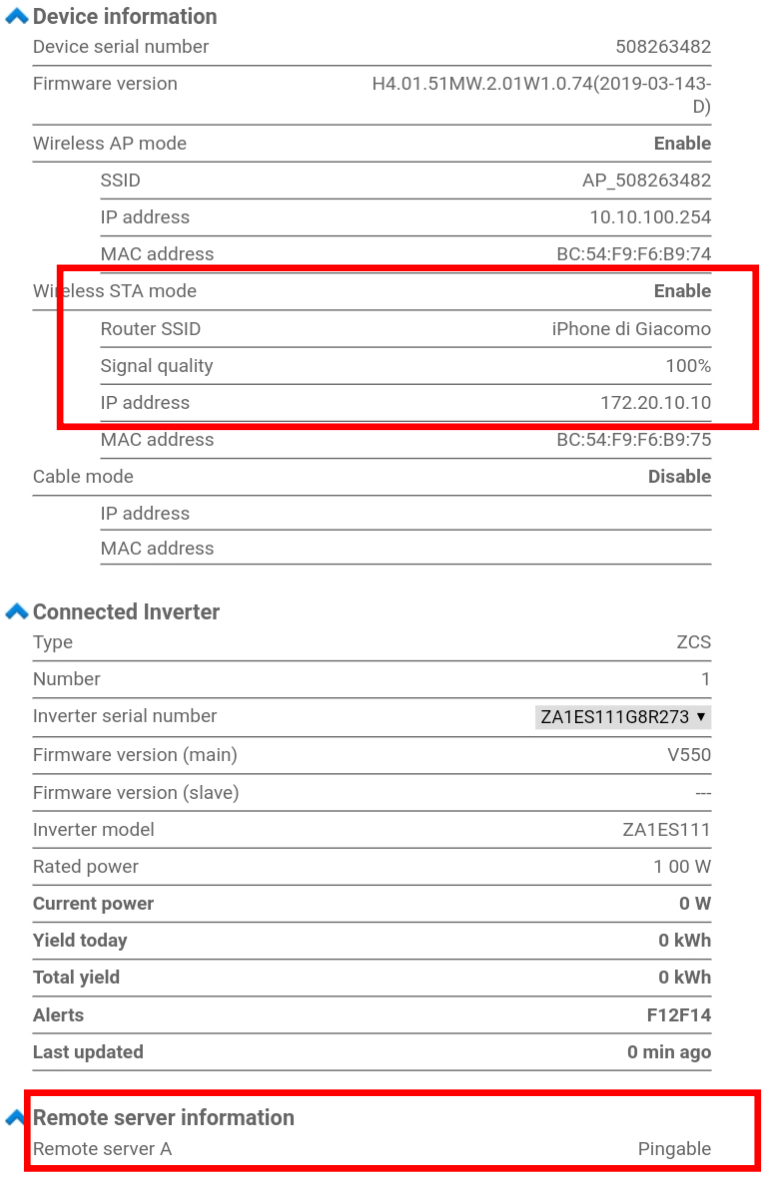


Figure 157 – Main status screen and checking of correct configuration

Figure 158 - 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.

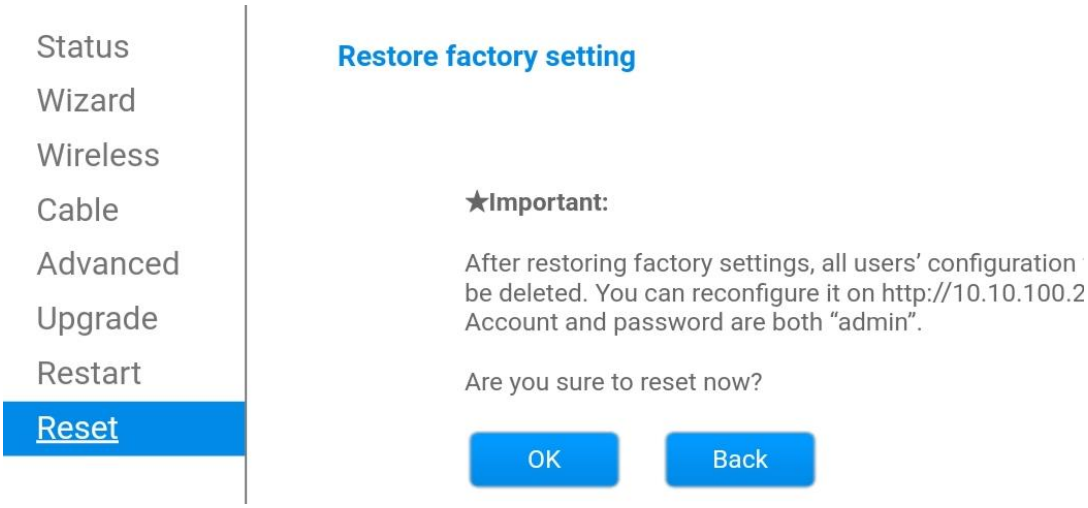


Figure 159 – Reset Screen

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

11.4.7.1. Mechanical description and Datalogger interface

Mechanical Dimensions: 127mm x 134 x 52 mm
Protection rating: IP20

The usable ports are indicated below.

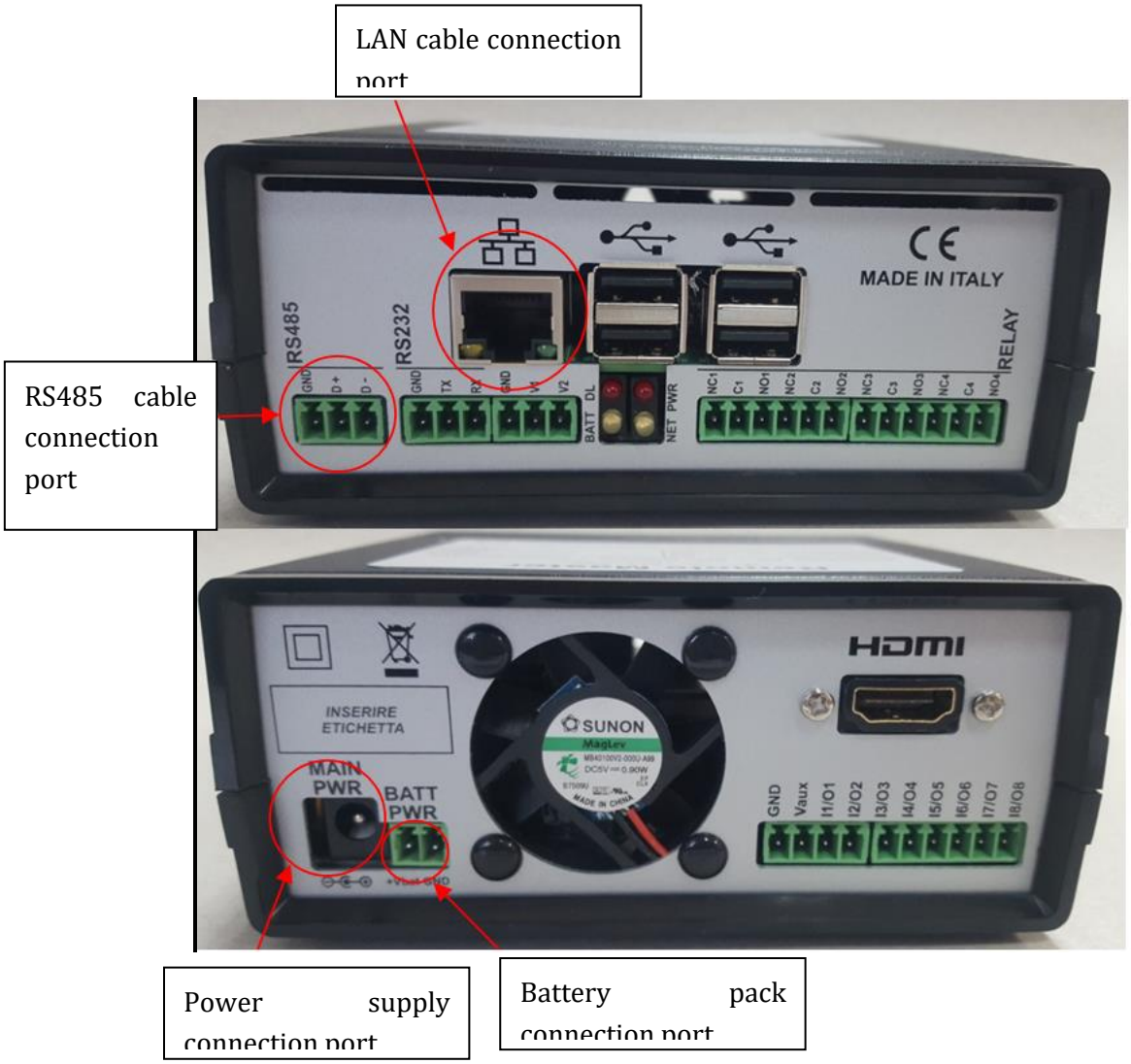


Figure 160: Datalogger rear panel

11.4.7.2. 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

11.4.7.3. 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.

11.4.7.4. 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.

11.4.7.5. 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.

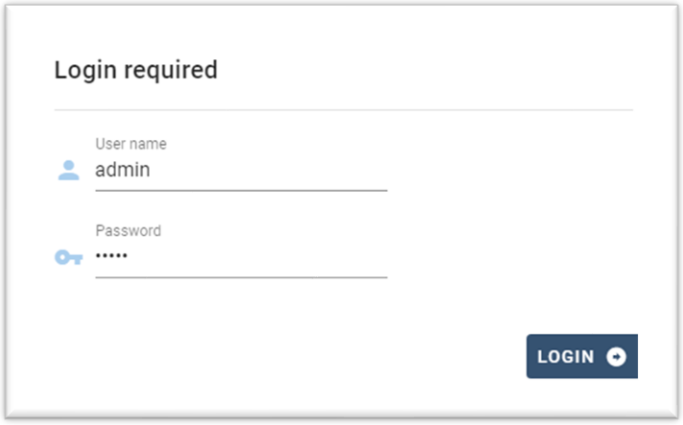
Datalogger SIDE	SENSOR SIDE
V1 terminal (12Vdc output voltage)	**RED +12V** Terminal
GND terminal (GND/RTN)	**BLACK 0V** Terminal
V2 terminal (12Vdc driveable voltage)	

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

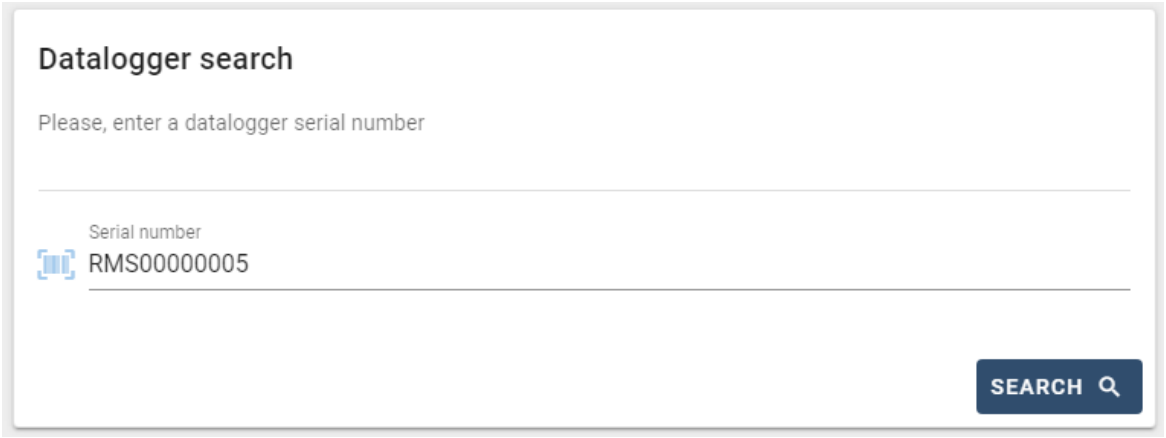
A stable communication in terms of signal and power supply, up to 200m, is guaranteed by using the RS485 cable, type Te.Co. 15166 (2x2x0,22+1x0,22)st/pu.
For longer distances, a connection to the signal side of the datalogger is recommended, and a connection to the +12V power supply via an external power supply unit.

11.4.8. Configuring the Datalogger

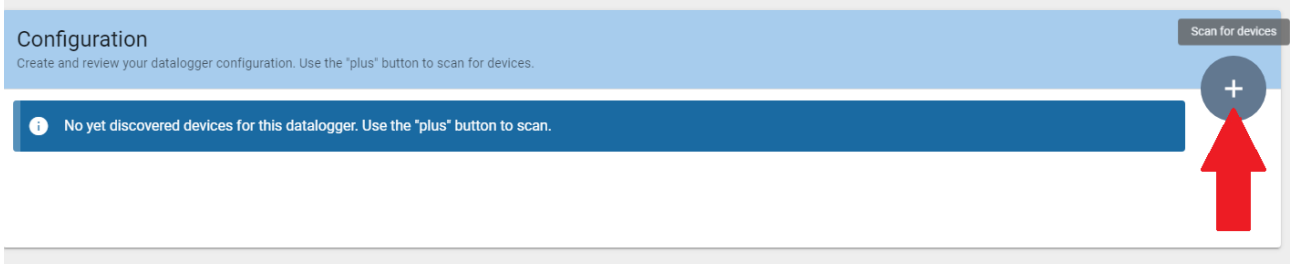
Connect to the website dlconfig.it and login by entering the temporary credentials: Username = admin and Password = admin.



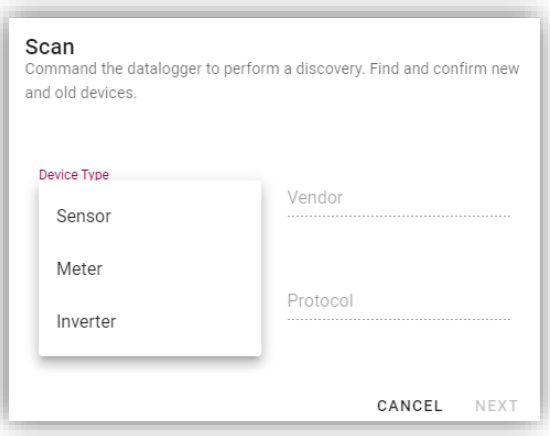
In the screen that opens, enter the serial number(S/N) of the datalogger to be configured and click "SEARCH".



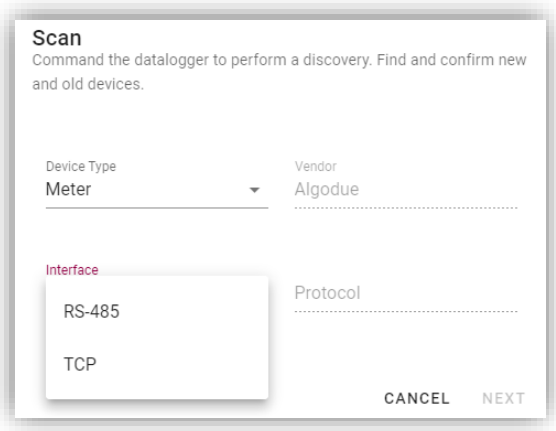
In the configuration page, you can search for any devices connected to the datalogger (inverter, meter or sensors) by clicking the + button, as shown in the figure.

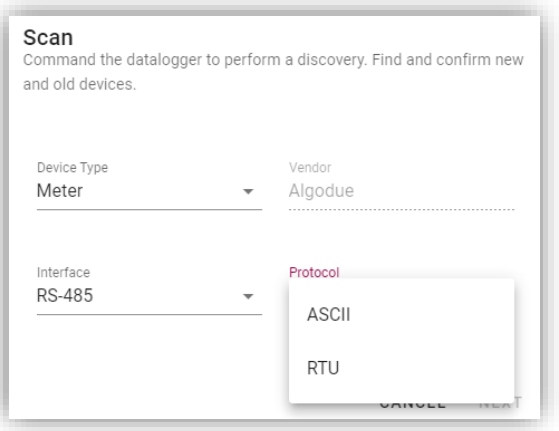


A window will open where you can search for each type of device connected to the Datalogger, after indicating the range of addresses associated with the relative devices.

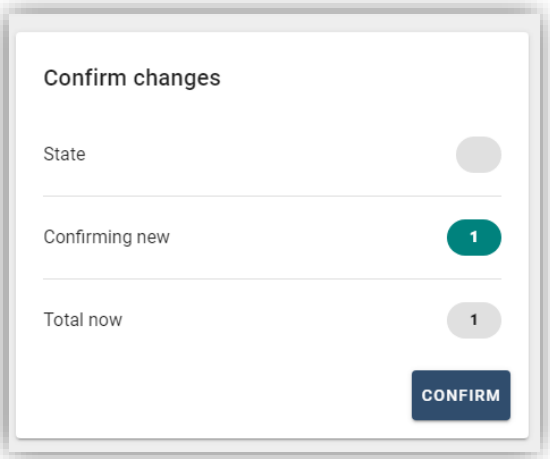


If a meter is one of the devices connected to the Datalogger, select the type of Meter/Datalogger communication interface and the relative communication protocol.

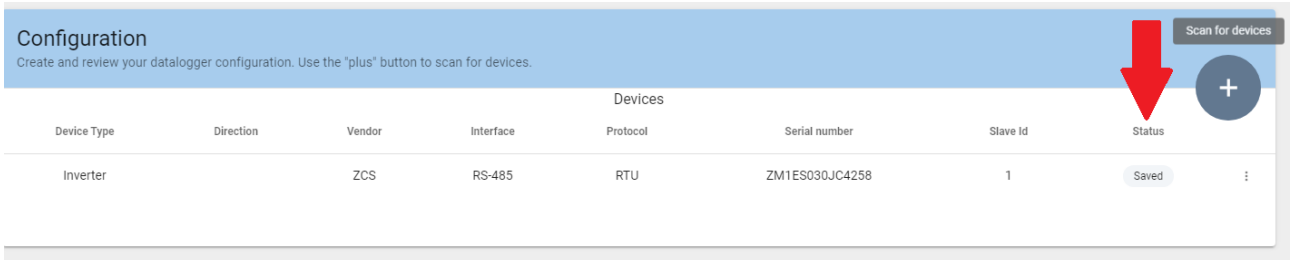




Once this operation has been completed, update the new configuration by clicking “Confirm,” which will allow you to register the devices associated with the datalogger.

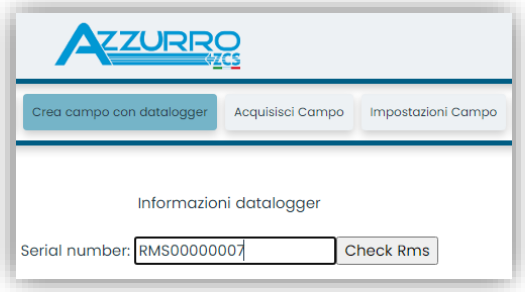


From this moment, the datalogger is correctly configured (all devices must be in the "saved" status) and therefore a new installation can be created on the ZCS Azzurro portal for associating the datalogger and the devices connected to it.

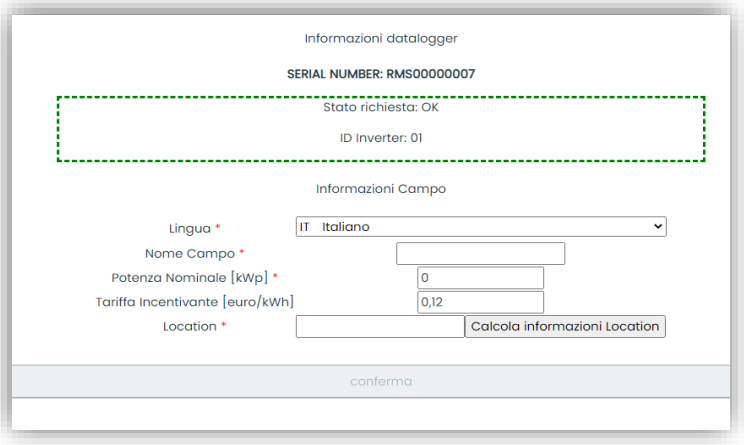


11.4.8.1. Configuring the Datalogger on the ZCS Azzurro portal

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).



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.



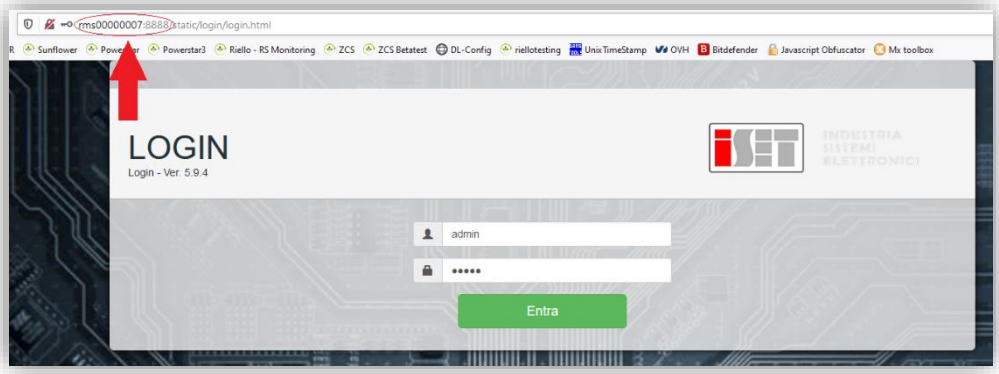
Once the "location" of the field has been entered, click "Calculate Location Information" to allow the system to obtain the latitude, longitude and time zone of the installation. Click "Confirm" to complete

the configuration of the field. You only need to wait a few minutes to view the data flow on the ZCS Azzurro portal.

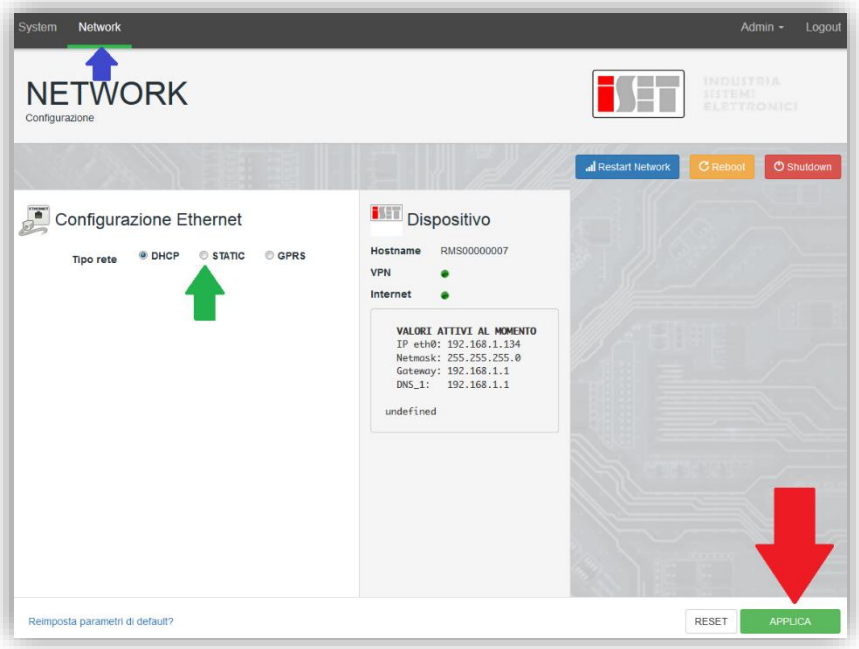
ATTENTION: The location data is essential for the correct operation of the datalogger in the ZCS system. It is important to define it very carefully.

11.4.8.2. 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 RMSxxxxxxxx: 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).

11.4.9. 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.

11.4.9.1. 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.

11.4.9.2. 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, CO_2 gains and savings.
Below is an example of a local monitoring page.

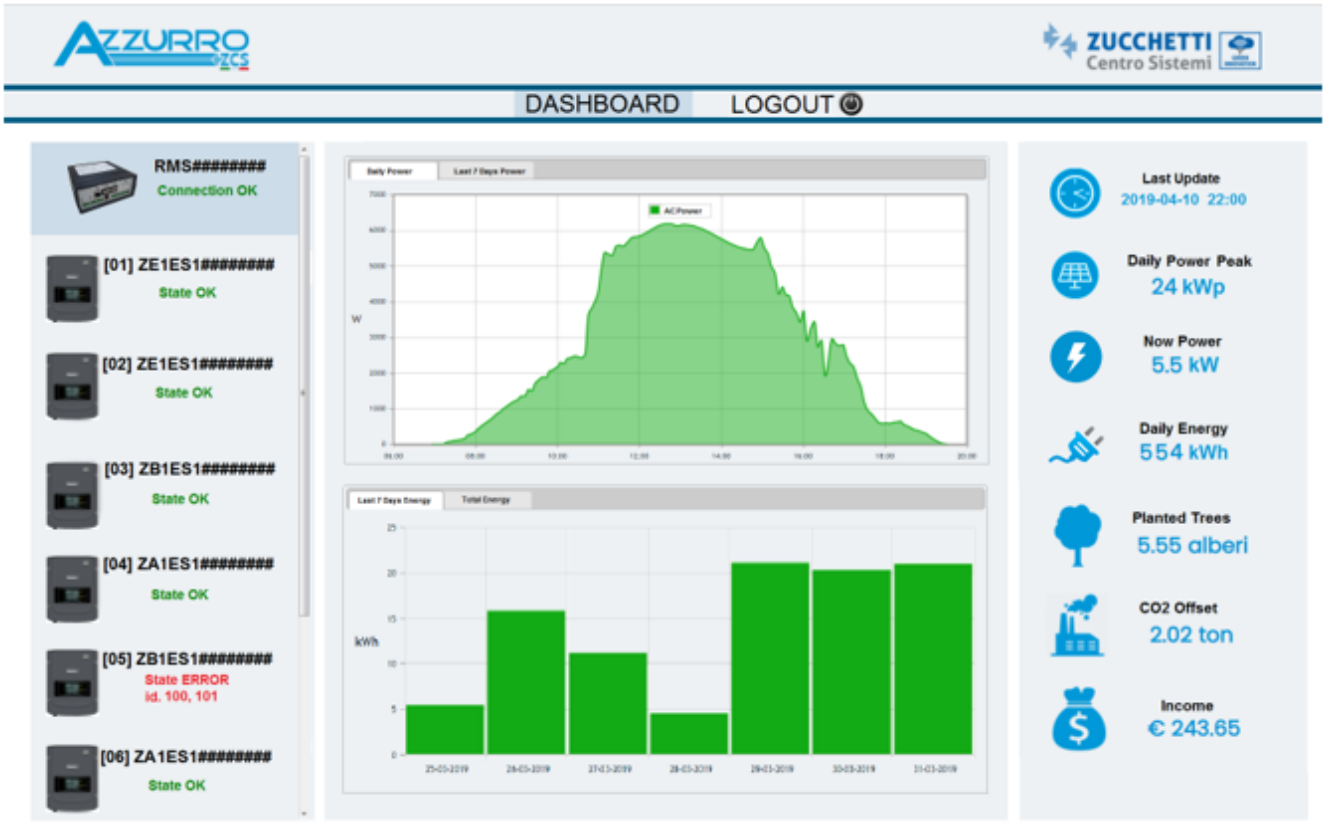


Figure 161: Example of local monitoring page

12. 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.

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