



USER'S MANUAL



THREE-PHASE STRING INVERTERS

3PH 80KTL-110KTL-LV / 100KTL-136KTL-HV



ZUCCHETTI
Centro Sistemi



Grid-connected inverter 3PH 80KTL-136KTL User Manual



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General instructions

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

Please keep these instructions!

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

Copyright statement

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Technical support

ZCS offers a support and technical consultancy service accessible by sending a request directly from the website <https://www.zcsazzurro.com/it/support>.

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

Preface

General information

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

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

- **Scope**

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the following inverters:

3PH 80KTL-LV / 3PH 100KTL-LV / 3PH 110KTL-LV /

3PH 100KTL-HV / 3PH 125KTL-HV / 3PH 136KTL-HV






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 the inverter in the photovoltaic system and for operators of the photovoltaic system.

- **Symbols used**

This manual provides information for safe operation and uses certain symbols to ensure the safety of personnel and materials, and for efficient use of the equipment during normal operation. It is important to understand this information to avoid accidents and damage to property. Please take note of the following symbols used in this manual.

	Danger: indicates a hazardous situation which, if not resolved or avoided, could result in serious personal injury or death.
Danger	
	Warning: indicates a hazardous situation which, if not resolved or avoided, could result in serious personal injury or death.
Warning	
	Caution: indicates a hazardous situation which, if not resolved or avoided, could result in minor or moderate personal injury.
Caution	
	Attention: indicates a potentially hazardous situation which, if not resolved or avoided, could result in damage to the system or other property.
Attention	
	Note: provides important tips on the correct and optimal operation of the product.

1. Preliminary safety instructions



Note

If you have problems or questions regarding the reading and understanding of the following information, please contact Zucchetti Centro Sistemi S.p.A. through the appropriate channels.

General information in this chapter

Safety instructions

It mainly highlights the safety instructions to be followed during installation and use of the equipment.

Symbols and icons

Introduces the main safety symbols on the inverter.

1.1. Safety instructions

Before installing and using the equipment, make sure you read and understand the instructions in this manual and familiarise yourself with the relative safety symbols shown in this chapter.

Depending on national and local requirements, permission must be obtained from your local provider before connecting to the electrical grid, making sure that the connections are carried out by a qualified electrician.

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

Before installing and operating the equipment, the electrical circuit of the strings must be disconnected by opening the string circuit breaker to interrupt the high-voltage DC of the photovoltaic system. Failure to do so could result in serious injury.

Qualified personnel

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

Installation requirements

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

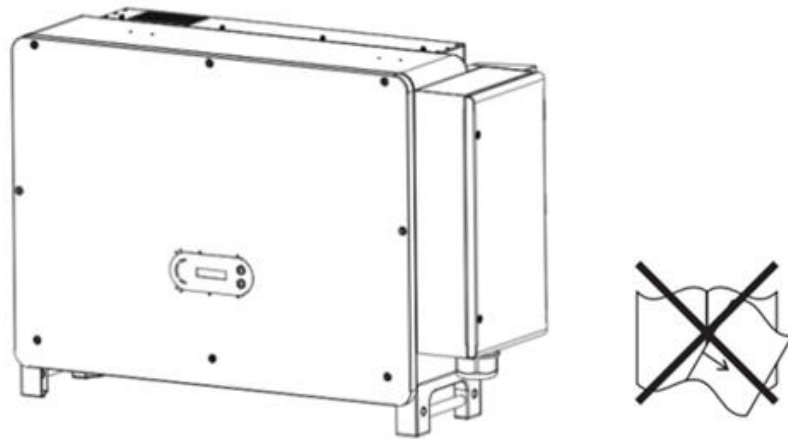






Figure 1 - Do not lose or damage this manual

Transport requirements



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

Electrical connections



Please pay attention to the electrical regulations on accident prevention when dealing with photovoltaic inverters.

	<p>Before connecting the mains power, be sure to disconnect the photovoltaic modules by disconnecting all the DC switches of the generator. When exposed to the sun, the photovoltaic panels produce a voltage that can be dangerous!</p>
Danger	
	<p>All installation operations must be carried out by a professional electrician, who must:</p> <ul style="list-style-type: none"> • Be prepared. • Carefully read this manual and understand its contents.
Warning	
	<p>Before connecting the inverter to the grid, make sure that all the necessary permits have been obtained from the local grid operator and that all the electrical connections are made by a professional electrician.</p>
Attention	
	<p>Do not remove the information label or open the inverter. Otherwise, ZCS will not provide any warranty or maintenance.</p>
Note	

Operation

	<p>Contact with the electrical grid or the terminal of the equipment may cause electrocution or fire!</p> <ul style="list-style-type: none"> • Do not touch the terminal or the conductor connected to the electrical grid. • Follow all the instructions and safety requirements relating to the mains connection.
Danger	
	<p>Some internal components reach very high temperatures when the inverter is in operation. Wear protective gloves!</p>
Attention	


Maintenance and repair

	<ul style="list-style-type: none"> • Before carrying out any repairs, disconnect the inverter from the mains network (AC side) and from the photovoltaic system (DC side). • After switching off the AC and DC switches, wait 5 minutes before carrying out any repairs or maintenance on the inverter!
Danger	
	<ul style="list-style-type: none"> • The inverter should start working again after any faults have been fixed. For any repairs, contact your local authorised service centre; • Do not disassemble the internal components of the inverter without permission. This will void the warranty. Zucchetti Centro Sistemi S.p.A. shall not be responsible for any damage or loss caused by these actions.
Attention	

EMC/Noise Level





Electromagnetic compatibility (EMC) refers to that on electrical equipment functions in a given electromagnetic environment without any trouble or error, and impose no unacceptable effect upon the environment. Therefore, EMC represents the quality characters of an electrical equipment.

- The inherent noise-immune character: immunity to internal electrical noise
- External noise immunity: immunity to electromagnetic noise of external system
- Noise emission level: influence of electromagnetic emission upon environment

	<p>Electromagnetic radiation from inverter may be harmful to health! Please do not continue to stay away from the inverter in less than 20cm when inverter is working</p>
Danger	





1.2. Symbols and icons



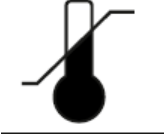


Safety signals

	<p>High voltage of inverter may be harmful to health! Only qualified personnel can operate the product. Keep this product out of the reach of children.</p>
Danger	
	<p>Pay attention to possible burns due to hot parts. Only touch the screen or press the keys while the inverter is in operation.</p>
Caution	
	<p>The PV strings should be connected to the ground in accordance with the local regulations! To ensure the safety of the system and people, the inverter and photovoltaic strings must be securely connected to the ground.</p>
Attention	
	<p>Ensure the correct DC input voltage; which must be below the maximum allowable DC voltage. Overvoltage can cause permanent damage to the inverter or other faults which are not covered by the warranty!</p>
Warning	

Symbols on the inverter

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

	<p>Residual voltage may be present on the inverter! Before opening the inverter, wait 5 minutes to ensure that the capacitors are completely discharged.</p>
	<p>Beware of high voltage</p>
	<p>Beware of high temperatures</p>
	<p>Complies with the European Standards (CE)</p>

	<p>Ground connection point</p>
	<p>Read this manual before installing the inverter.</p>
	<p>Indication of the allowable temperature range</p>
	<p>Positive and negative polarities of the input voltage (DC).</p>
	<p>RCM (Regulatory Compliance Mark). The product complies with the requirements of the applicable Australian standards.</p>



2. Product features

General information in this chapter

Product overview

The field of use and overall dimensions of the 3PH 80KTL-136KTL inverters are indicated in this section.

Description of functions

It describes how the 3PH 80KTL-136KTL inverters and their internal operating modules work.

Efficiency curve

Describes the efficiency curves of the inverter.

2.1. Product presentation

Field of use

The 3PH 80KTL-136KTL inverters are grid-connected photovoltaic inverters equipped with 8-12 MPPT, capable of converting the direct current generated by the photovoltaic strings into three-phase sine wave alternating current and feeding the energy to the public electricity grid. An AC circuit breaker must be used as a disconnecting device and must always be easily accessible.

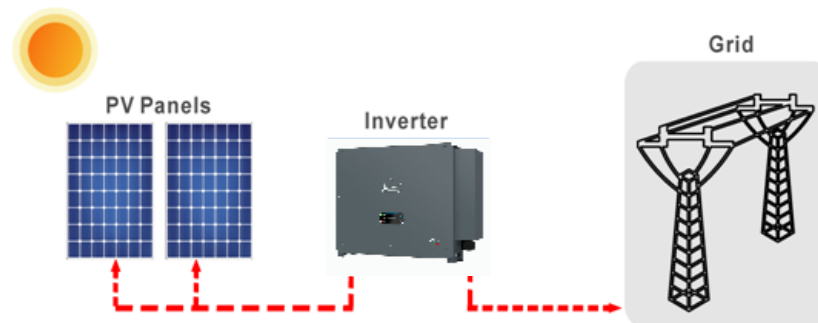


Figure 2 – Grid-connected photovoltaic system

The 3PH 80KTL-136KTL inverters can only be used with photovoltaic modules that do not require one of the polarities to be grounded. The operating current and voltage during normal operation must not exceed the limits indicated in the technical specifications. Only photovoltaic modules can be connected to the input of the inverter (do not connect batteries or other power supply sources).

Dimensions description

- Overall dimensions: H x W x D = 693.5 mm x 995.5 mm x 368 mm

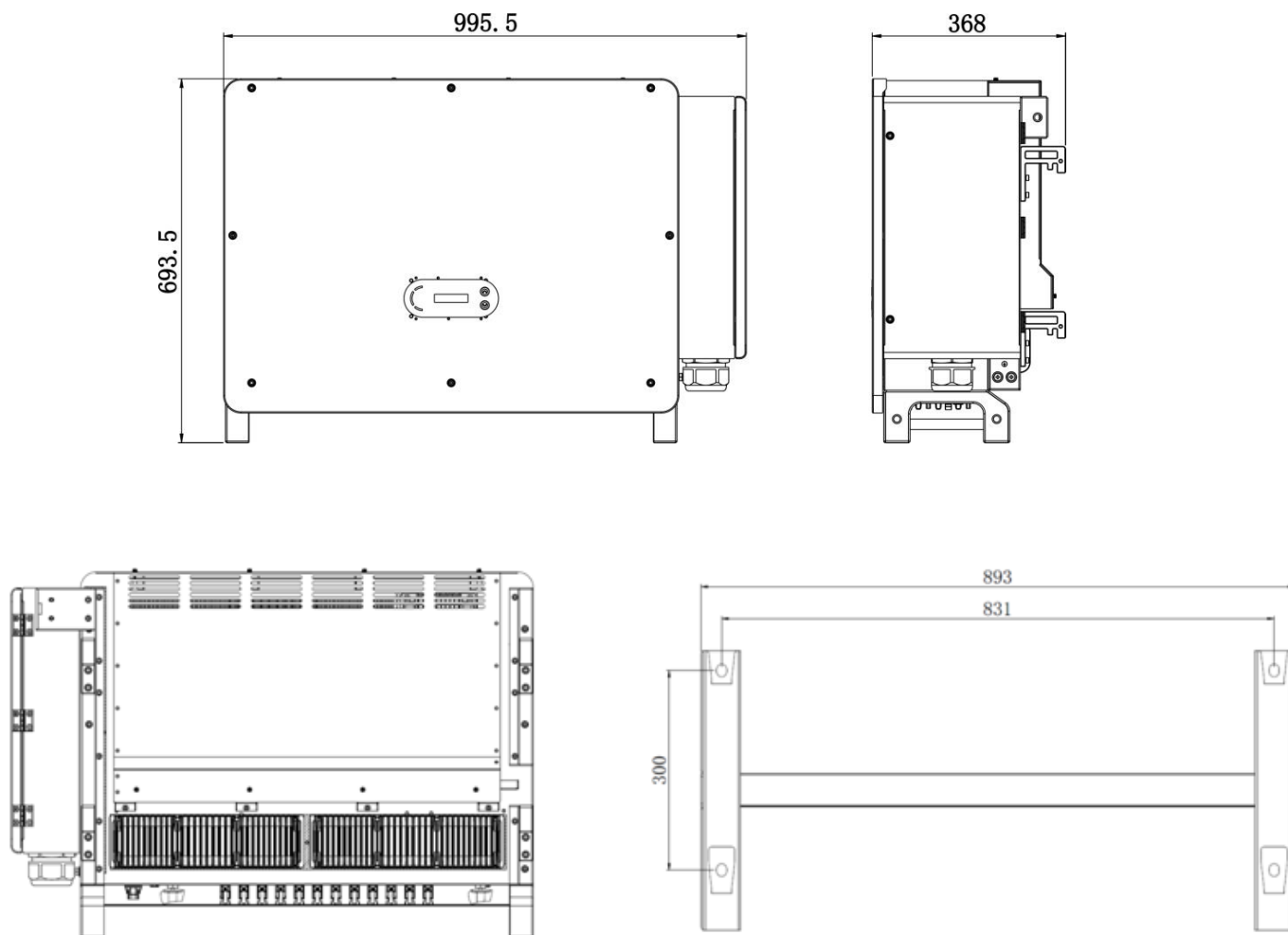


Figure 3 – Front, side and back view of the inverter and bracket

- Labels on the inverter

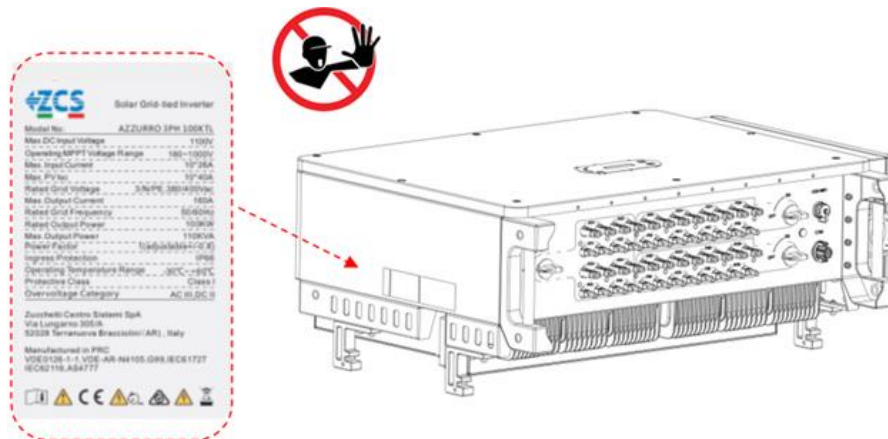


Figure 4 - Do not remove the label on the side of the inverter

2.2. Description of functions

The DC voltage generated by the PV modules is filtered through the input board before entering the power board. The input board also has the function of detecting the insulation impedance and the DC input voltage/current. The power board converts the DC power into AC power. The current converted into AC is filtered through the output board and is then fed into the grid. The output board also has the function of measuring the grid and GFCI voltage/current and acts as an output insulation relay. The control board provides the auxiliary power supply, controls the operating status of the inverter and shows it on the display. The display also shows the error codes when the inverter is not functioning properly. At the same time, the control board can activate the protection relay in order to protect the internal components.

Electrical block diagram

AZZURRO 3PH 80KTL-136KTL has 16-24 DC input strings. 8-12 MPPT trackers that converts the direct current of PV array to grid-compliant, three phase current and feeds in into the utility grid. Both DC and AC side has Surge Protection Device (SPD).

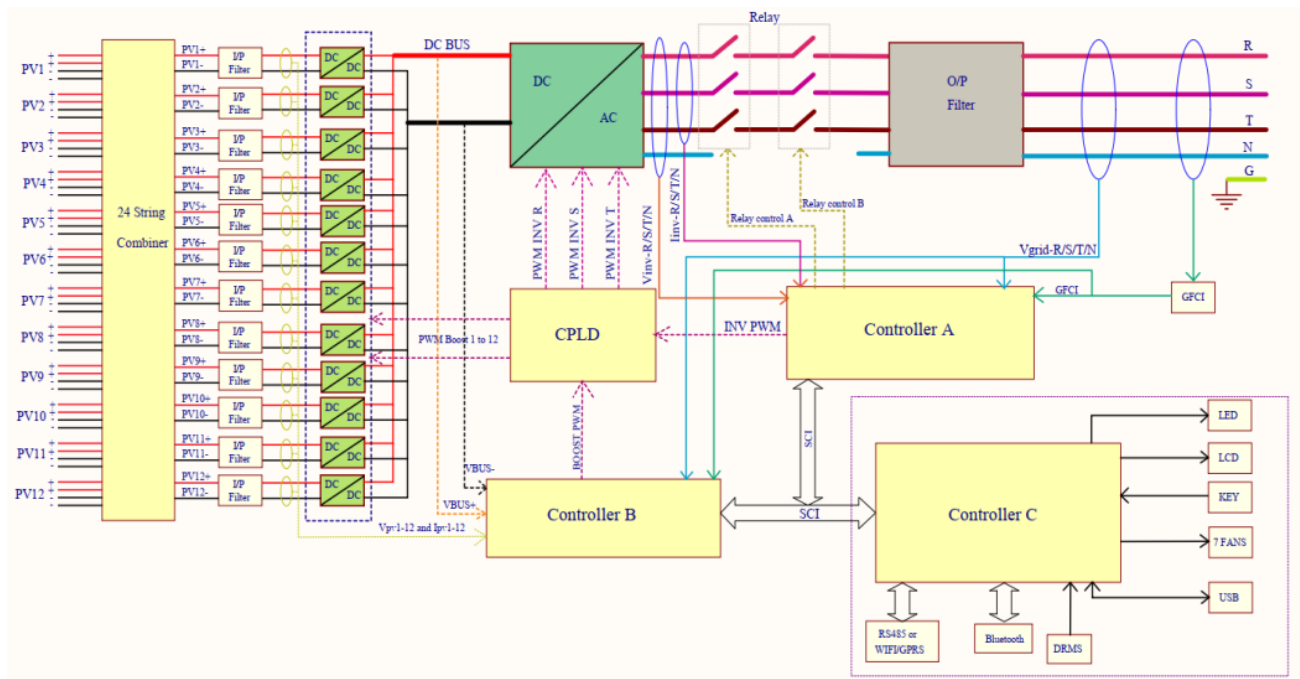
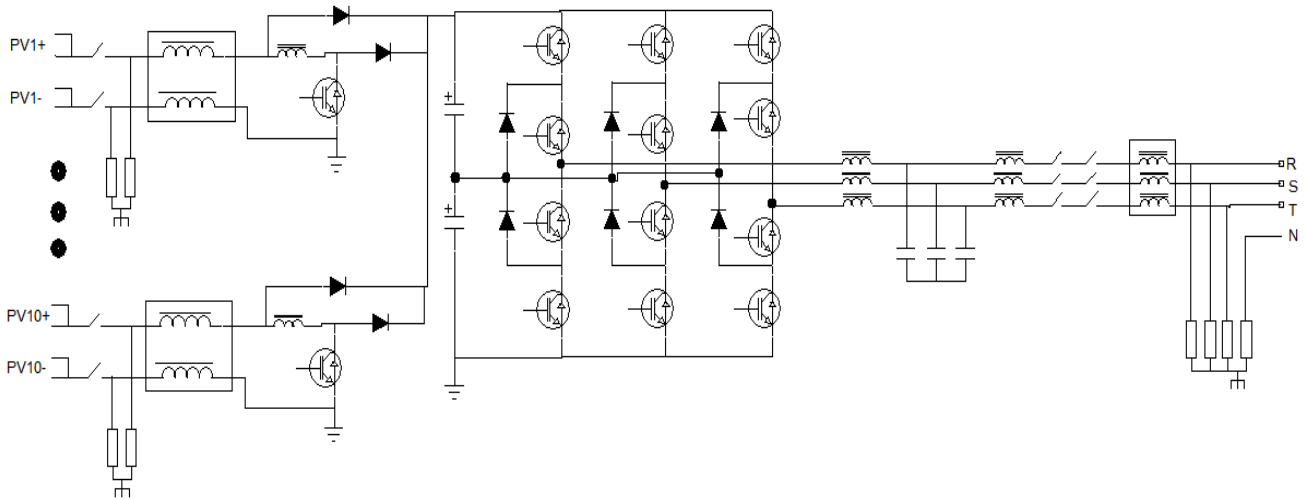


Figure 5 – Block diagram of the 3PH 80KTL-136KTL inverters

Inverter functions

A. Energy management unit

Remote control to start/ shunt down inverter through an external control.

B. Feeding reactive power into the grid

The inverter is able to produce reactive power thus to feed it into the grid through the setting of the phase shift factor. Feed-in management can be controlled directly by the grid company through a RS485 interface.

C. Limited the active power fed into the grid

If enable the limited of active power function, inverter can limit the amount of active power fed into the grid to the desired value (expressed as percentage).

D. Self-power reduction when grid is over frequency

When the grid frequency exceeds the limit set, the inverter reduces the power in order to ensure the stability of the grid.

E. Data transmission

The inverter (or a group of inverters) can be monitored remotely via an advanced communication system based on RS485 interface, via external data loggers, via Wi-Fi, GPRS or Ethernet.

F. Software update

USB interface for uploading the firmware, remotely uploading is available.

2.3. Module protection

A. Anti-islanding

The inverter is equipped with a protection system that automatically shuts down the system during power outages. This is called an “anti-islanding” system. This protects electrical workers when they are trying to repair lines on the grid, in compliance with the applicable national laws and regulations.

B. RCMU

The inverters are equipped with a redundancy on the reading of the ground leakage current, on both the direct and alternating current sides. The ground leakage current is measured simultaneously and independently by two different processors: it is sufficient for one of the two to detect a fault in order to trigger the protection, resulting in separation from the grid and shutdown of the operation.

C. Grid monitoring

Continuous monitoring of the grid voltage to ensure that the voltage and frequency values stay within the operating limits.

D. Internal protection of the inverter device

The inverter has all kinds of internal protections to protect the device and internal components when abnormal situations occur on the grid or DC input line.

E. Ground fault protection

The inverter must be used with photovoltaic modules connected with “floating” connections, i.e. with positive and negative terminals that are not grounded. An advanced ground fault protection circuit

continuously monitors the ground connection and disconnects the inverter when a ground fault is detected. The ground fault condition is indicated by a red LED on the front panel.

2.4. Efficiency and derating curves

Efficiency curve of ZCS Azzurro for the 3PH 80KTL-136KTL family

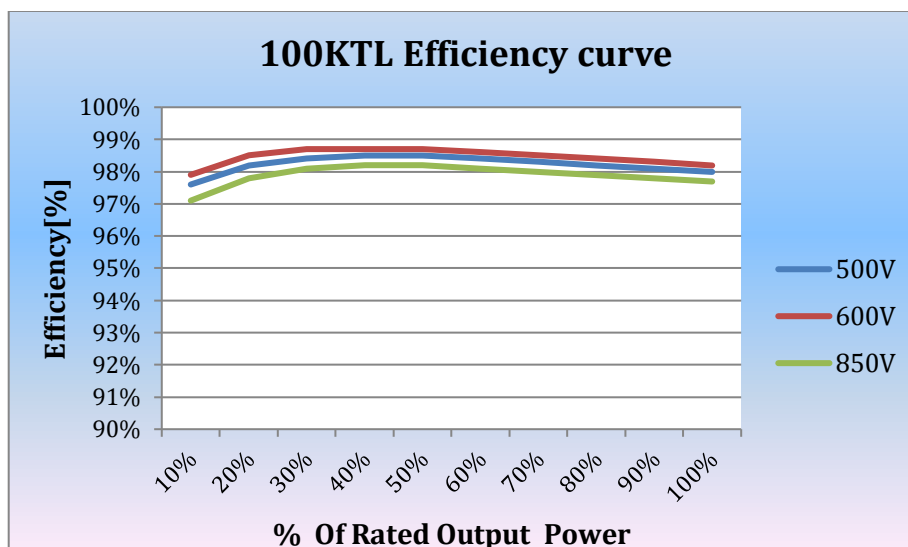


Figure 6 - Efficiency curve for ZCS Azzurro 3PH 80KTL-136KTL inverters

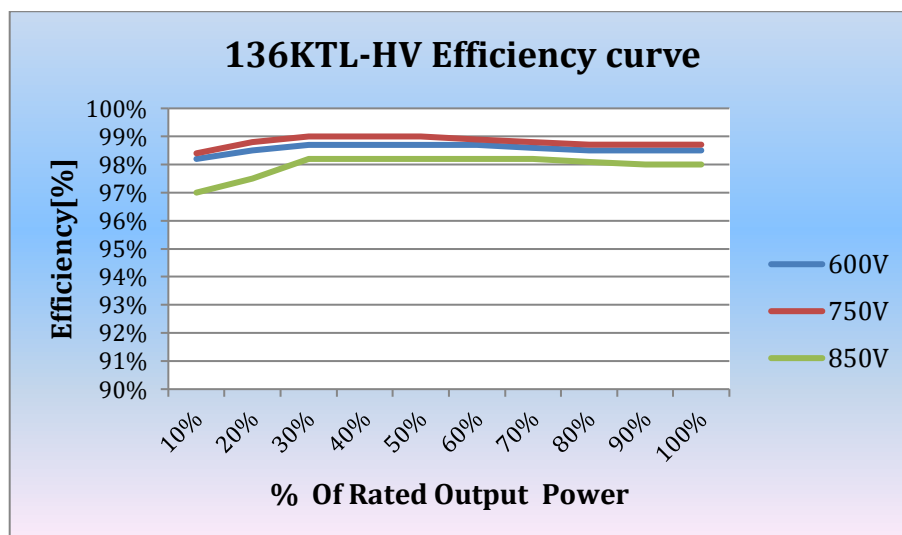





Figure 7 - Efficiency curve for ZCS Azzurro 3PH 80KTL-136KTL inverters

3. Installation

General information in this chapter

This chapter describes how to install the 3PH 80KTL-136KTL inverter.

Installation notes:

	<ul style="list-style-type: none"> • DO NOT install 3PH 80KTL-136KTL inverters near flammable materials. • DO NOT install 3PH 80KTL-136KTL inverters in an area where flammable or explosive materials are stored.
Danger	
	<p>The housing and heat sink may become very hot while the inverter is running, DO NOT install the inverter in places where they may be touched inadvertently.</p>
Warning	
	<ul style="list-style-type: none"> • Consider the weight of the inverter when handling and transporting the inverter. • Choose an appropriate mounting position and surface. • Assign at least two people to install the inverter.
Attention	

A. Installation process

This section describes the process for installing the 3PH 80KTL-136KTL inverter

B. Checks before installation

This section describes the checks to carry out on the outer packaging, on the inverter and its components.

C. Installation tools

This section describes the tools needed to install the inverter and to make the electrical connections.

D. Installation position

This section describes the characteristics of the installation site of the inverter.

E. Moving the inverter

This section describes how to move the inverter to the installation site.

F. Installing the inverter

This section describes the steps for mounting the inverter on the wall.

3.1. Installation process

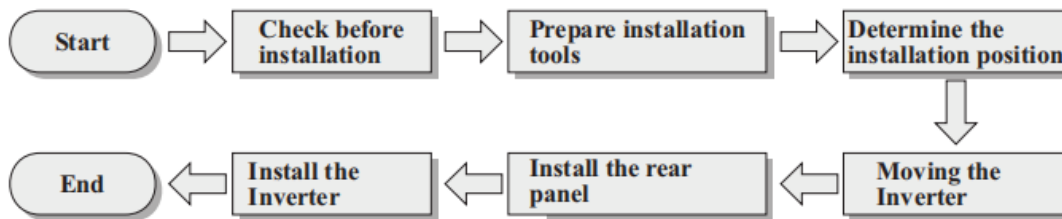


Figure 8 - Installation steps

3.2. Checks before installation

Checking the outer packaging

Packaging materials and components may be damaged during transport. Therefore, please check the materials of the outer packaging before installing the inverter. Check the surface of the box for external damage such as holes or tears. If any kind of damage is found, do not open the box containing the inverter and contact the supplier and transport company as soon as possible.

It is recommended to remove the packaged materials from the box 24 hours before installing the inverter.

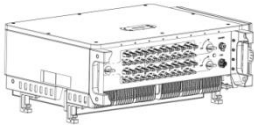

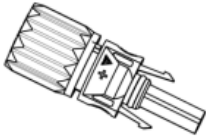
Checking the product

After removing the inverter from its packaging, check that the product is intact and complete. If any damage is found or components are missing, contact the supplier and transport company.

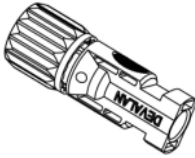


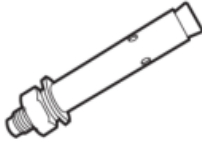
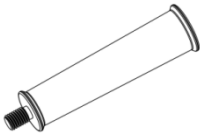
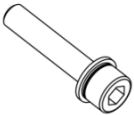


Contents of the packaging

Carefully check the contents of the packaging before installation, making sure that no element inside the packaging is missing or damaged.


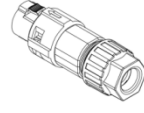
The package should contain the following components:

No.	Pictures	Description	Quantity
1		AZZURRO 3PH 80KTL-136KTL	1 PCS
2		Rear Panel	1 PCS
3		PV+ input connector	80KTL-LV 16PCS 100KTL-LV 20PCS 110KTL-LV 20PCS 100KTL-HV 20PCS 125KTL-HV 20PCS 136KTL-HV 24PCS




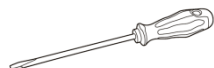
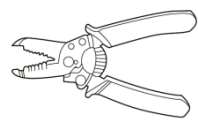
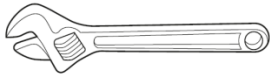

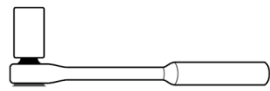
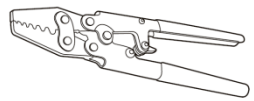
4		PV- input connector	80KTL-LV 16PCS 100KTL-LV 20PCS 110KTL-LV 20PCS 100KTL-HV 20PCS 125KTL-HV 20PCS 136KTL-HV 24PCS
5		PV+ metal pin	80KTL-LV 16PCS 100KTL-LV 20PCS 110KTL-LV 20PCS 100KTL-HV 20PCS 125KTL-HV 20PCS 136KTL-HV 24PCS
6		PV- metal pin	80KTL-LV 16PCS 100KTL-LV 20PCS 110KTL-LV 20PCS 100KTL-HV 20PCS 125KTL-HV 20PCS 136KTL-HV 24PCS
7		M10*90Hexagon screws	4 PCS
8		Auxiliary Handle	4 PCS
9		M6*30 Hexagon screws	2 PCS
10		Manual	1PCS
11		Warranty Card	1PCS






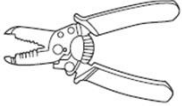
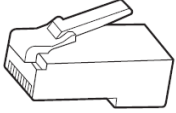
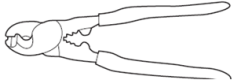
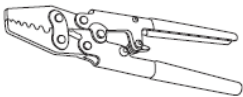
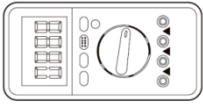

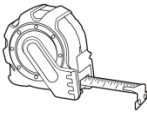
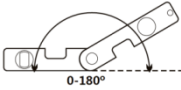
12	 <p>GENTILE CLIENTE, TI RICORDIAMO DI ACCEDERE ALLA SEZIONE ESTENSIONE GARANZIA DEL SITO www.zcsazzurro.com PER ESTENDERE LA GARANZIA DEL TUO INVERTER COME INDICATO NEI T&C</p> <p>DEAR CUSTOMER, WE REMIND YOU TO ACCESS THE WARRANTY EXTENSION SECTION OF THE SITE www.zcsazzurro.com TO EXTEND THE WARRANTY OF YOUR INVERTER AS WROTE ON THE T&C</p>	Quality Certificate	1PCS
13		COM 16pin connector	1PCS

3.3. Installation tools

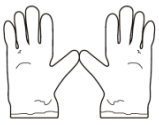


The following tools are required for installation of the inverter and electrical connections; therefore, they must be prepared before installation.

No.	Tool	Function
1	 <p>Drill Recommended drill bit: 10mm</p>	To drill holes in the wall for fixing the bracket
2	 <p>Screwdriver</p>	To screw and unscrew screws for the various connections
3	 <p>Wire stripper</p>	To prepare the cables for wiring
5	 <p>Adjustable spanner (opening greater than 32 mm)</p>	To tighten the bolts
6	 <p>4 mm Allen key 6 mm Allen key</p>	To screw the inverter to the wall-mounting bracket and to open the front cover of the inverter
7	 <p>M5 socket wrench</p>	To tighten the bolts
8	 <p>RJ45 crimping tool</p>	To crimp the RJ45 connectors for the communication cables



9		Rubber hammer	To insert the expansion plugs into the wall holes
10		MC4 removal tool	To remove the DC connectors from the inverter
11		Diagonal pliers	To cut and tighten the cable ends
12		Wire stripping tool	To remove the outer sheath of the cables
13		RJ45	2 pieces
14		Cable cutter	To cut the power cables
15		Crimping tool	To crimp the power cables
16		Multi-meter	To check the voltage and current values
17		Marker pen	To mark the wall for better fixing precision
18		Measuring tape	To measure distances
19		Level	To make sure the bracket is level

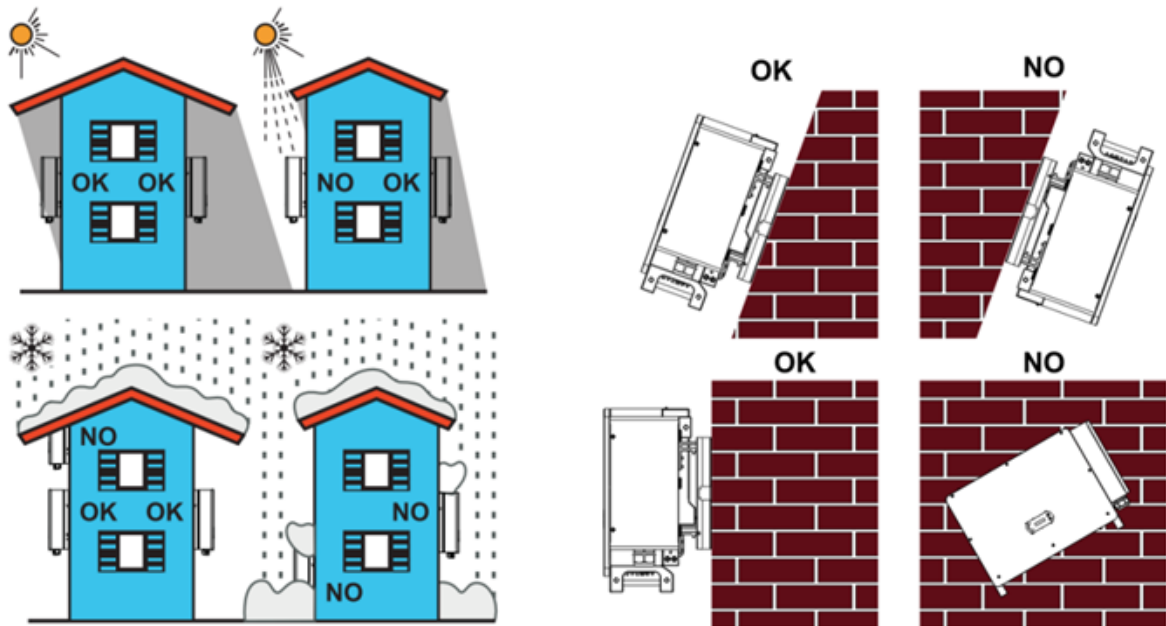


20		ESD gloves	Protective clothing
21		Safety goggles	Protective clothing
22		Protection mask	Protective clothing

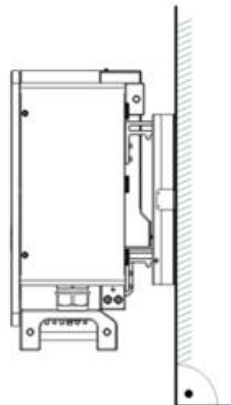
3.4. Installation position

Choose an appropriate installation location for the inverter.

Follow the requirements below to determine the installation position.



Vertical installation



Tilt back installation

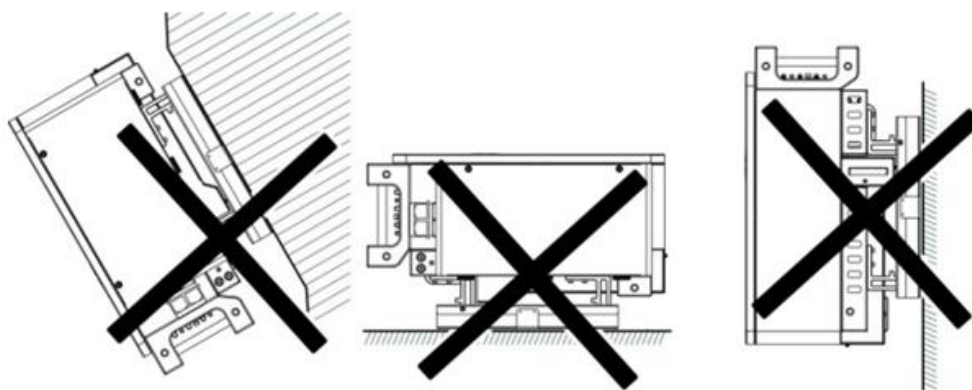
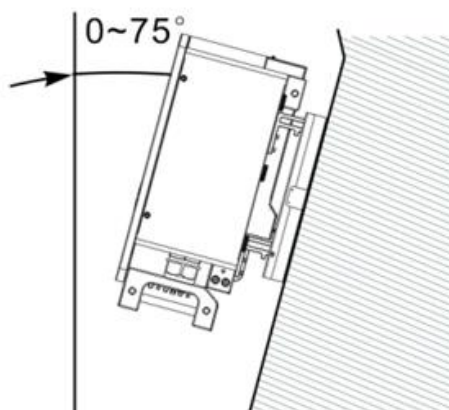
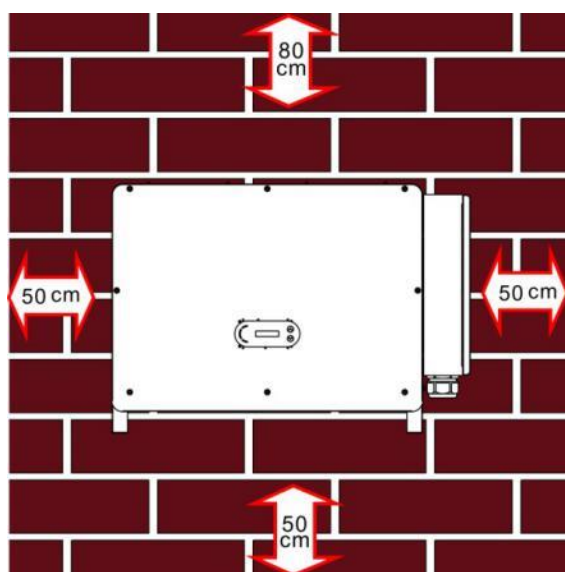


Figure 9 – Requirements for installing a single inverter



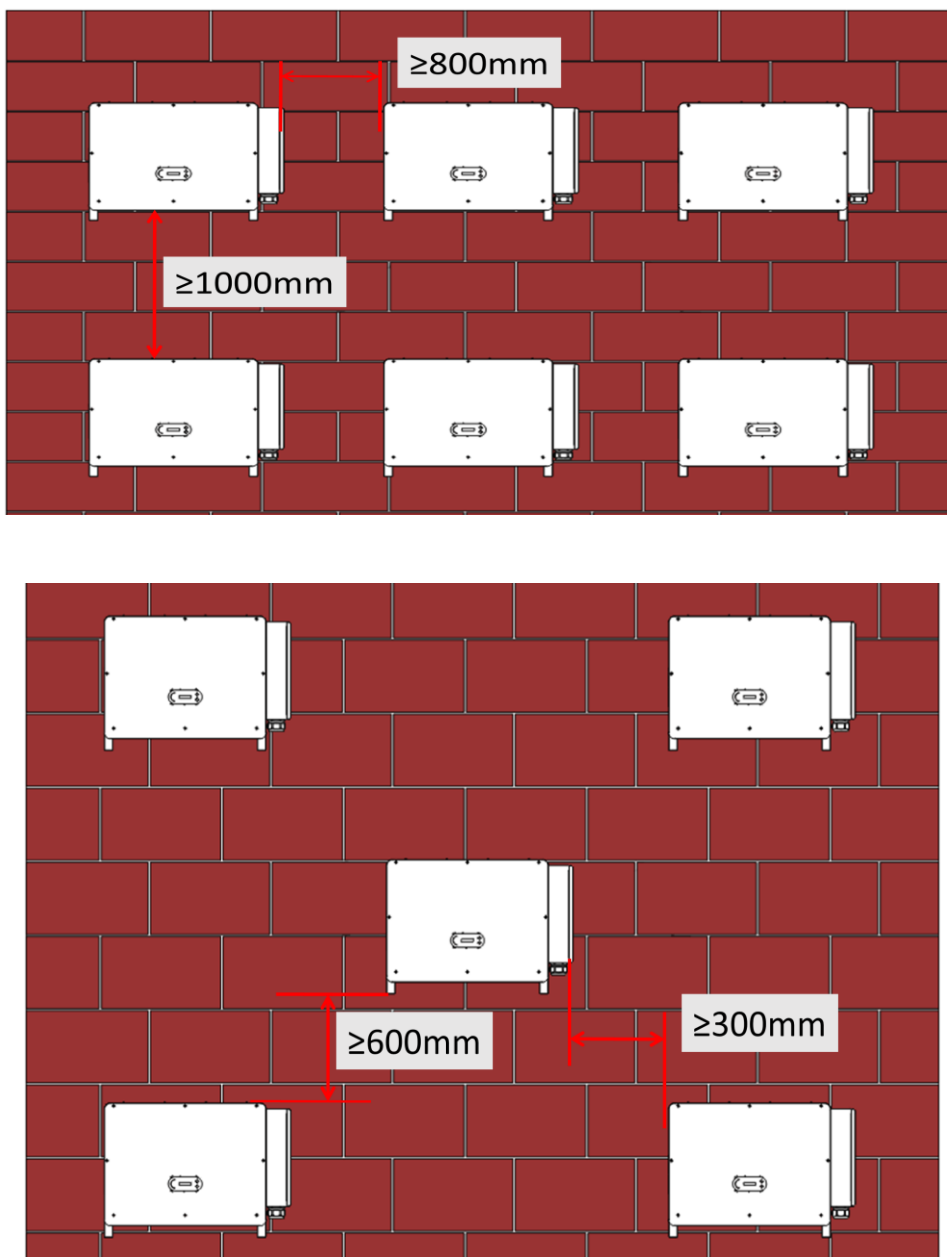


Figure 10 - Requirements for installing multiple inverters

Note: For safety reasons, ZCS S.p.A. and/or its partners may not carry out any technical repairs or maintenance work, or move the inverter from and to the ground if it is installed at a height of more than 180 cm from the ground.

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

3.5. Moving the 3PH 80KTL-136KTL inverter

This section describes how to move the inverter correctly

- 1) When opening the packaging, insert your hands into the slots on both sides of the inverter and take a hold of it as shown in Figure below. Two people are needed to carry out this operation in order to ensure the safety of people and the correct handling of the inverter.

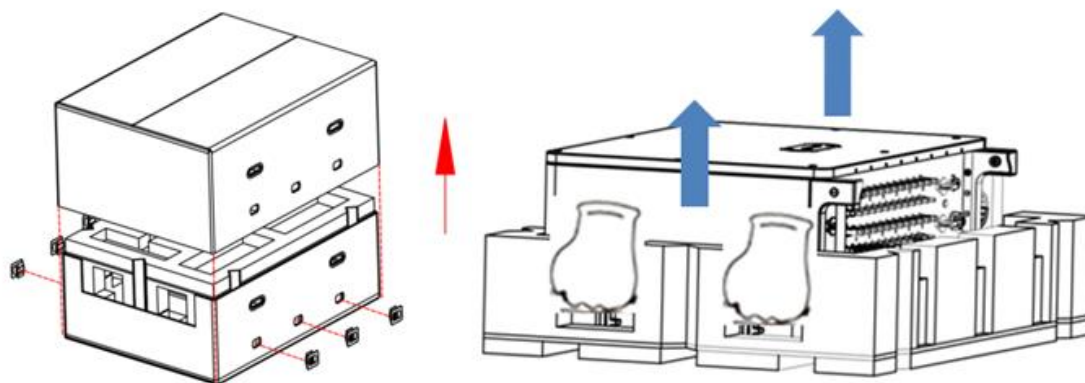



Figure 11 – Removing the inverter from its packaging

- 2) Lift the inverter from its packing box and move it to the installation position.

	<ul style="list-style-type: none"> • To prevent damage and personal injury, hold the inverter firmly when moving, as it is a heavy piece of equipment. • Do not position the inverter with the input/output terminals in contact with other surfaces, as these are not designed to support the weight of the inverter. Always position the inverter horizontally. • When placing the inverter on the floor, make sure to place a support under the unit to protect its front door. • Use auxiliary handle inside the package for moving the inverter. After use, keep it well for future usage.
Attention	

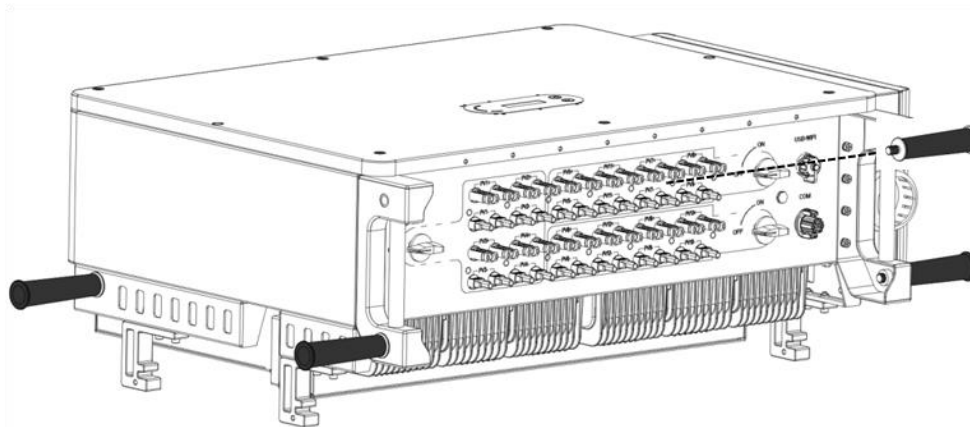


Figure 12 - Auxiliary handle position

3) Lifting equipment.

Tighten the screws of two M12 rings into the inverter sides according to the instruction diagram below (Note: M12 rings need self-preparation).

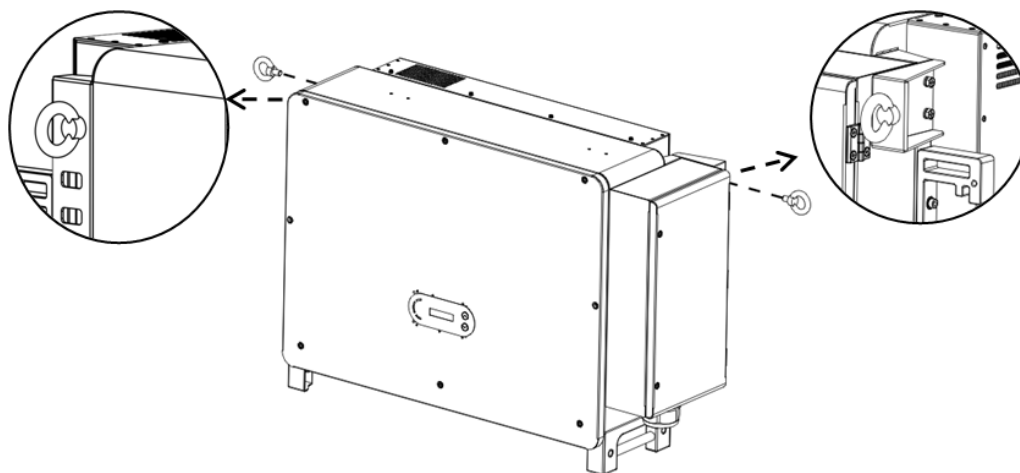
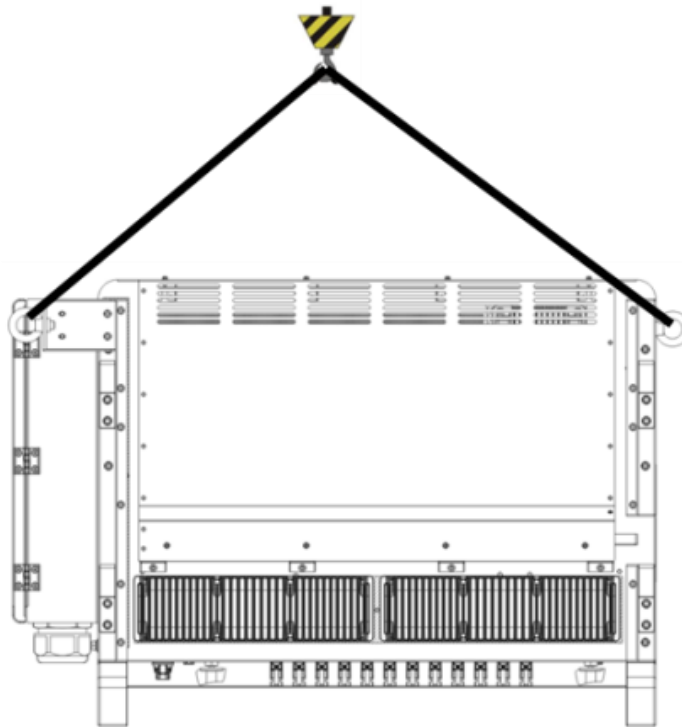


Figure 13 - Installation of rings

Fastened and tied the rope through two rings. Lifting inverter 50 mm above ground by using lifting equipment, check the tightening device of the hoisting ring and rope. After confirming that the binding connection is secure, lift the inverter to the destination.



Attention

- Keep balance when lifting the inverter, avoid to crash on wall or other objective .
- Stop working in bad weather condition such as raining, heavy fog, winding.

3.6. Installing the 3PH 80KTL-136KTL inverter

- 1) Placed the rear panel on the mounting wall, determine the mounting height of the bracket and mark the mounting poles accordingly. Drilling holes by using Hammer Drill, keep the hammer drill perpendicular to the wall and make sure the position of the holes should be suitable for the expansion bolts.

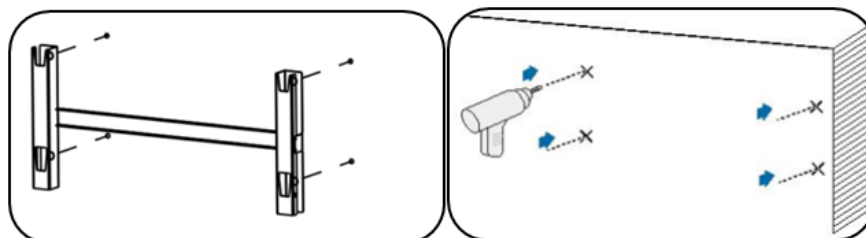


Figure 14 - Drilling holes on the mounting wall

2) Insert the expansion bolt vertically into the hole.

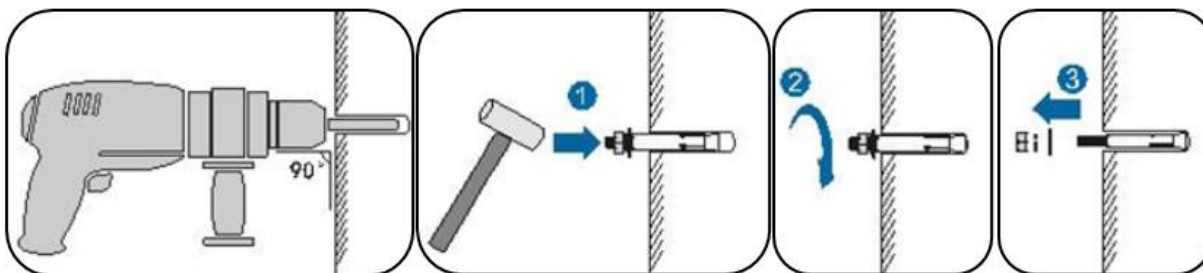


Figure 15 - Screws into the holes

3) Align the rear panel with the hole positions, fix the rear panels on the wall by tightening the expansion bolt with the nuts.

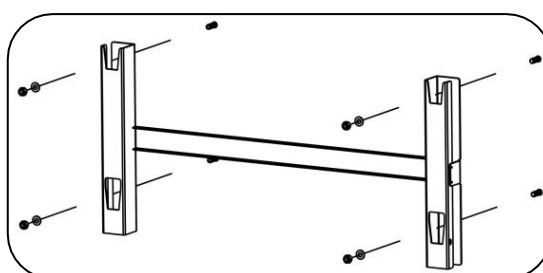
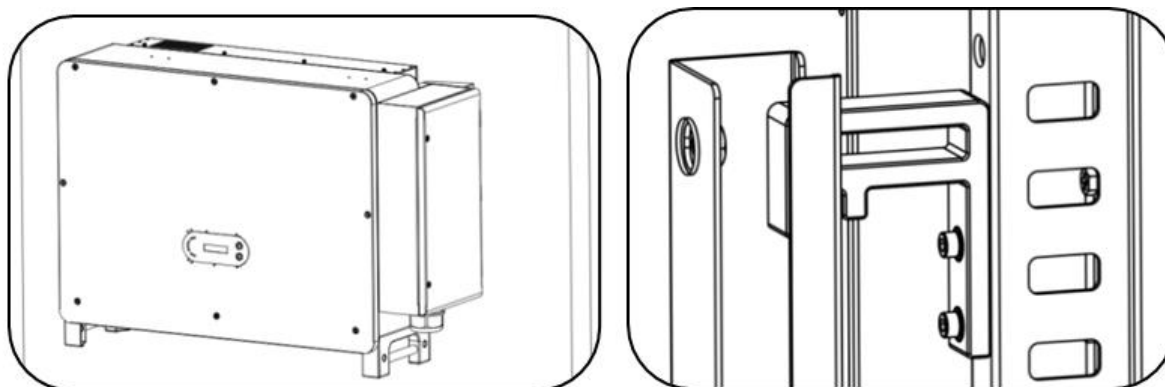


Figure 16 - Install rear panel

4) Lift the inverter and hang it on the rear panel, and fixing both side of inverter with M6 screw (accessories).



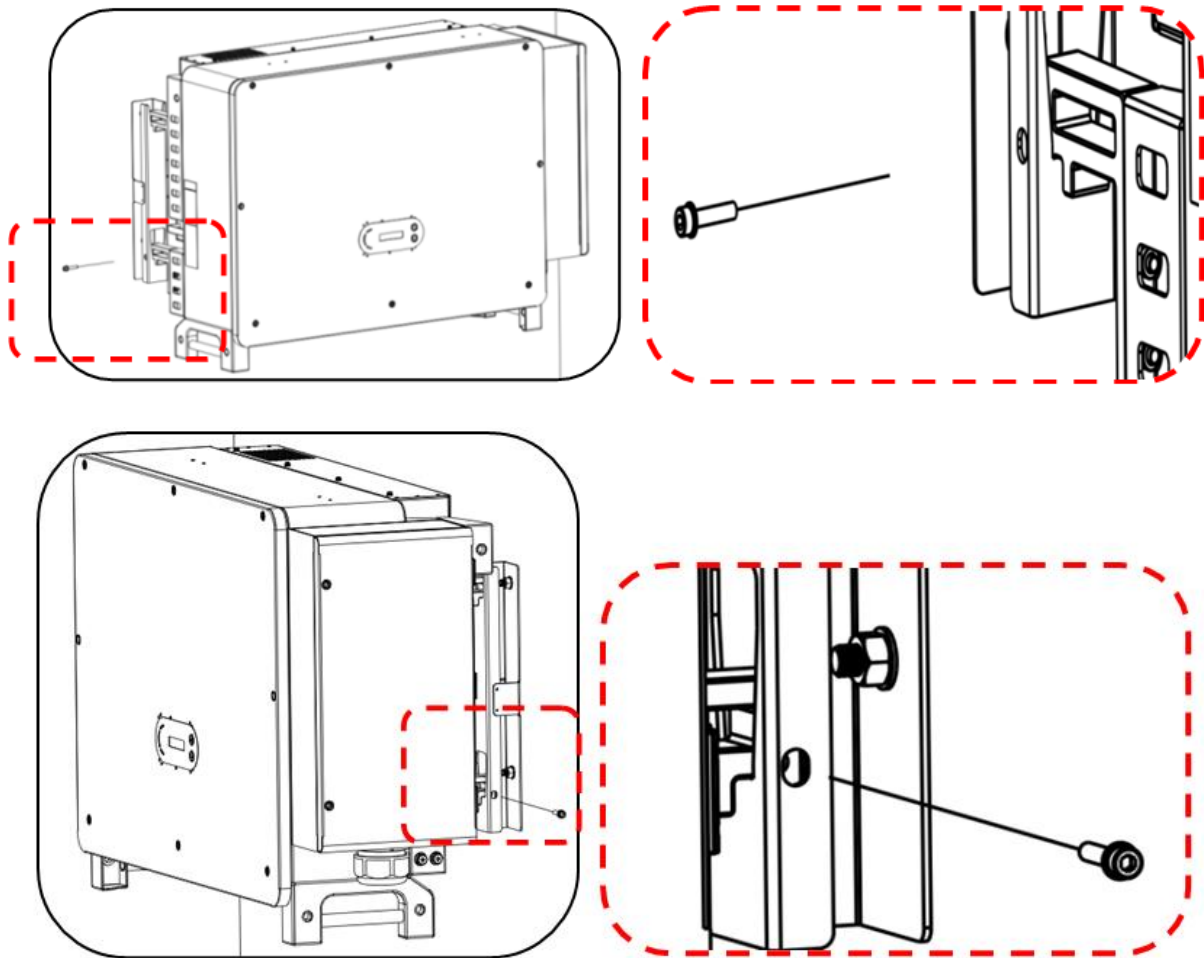


Figure 17 - Fix inverter

- 5) Use wall mount bracket, ensure the pole position are in same level by using level rule and take a mark with maker.

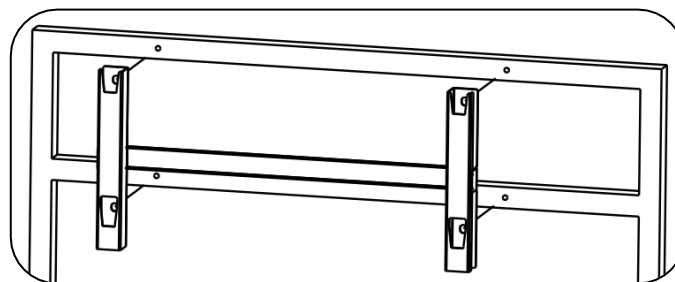


Figure 18 - Ensure hole position

- 6) Drilling hole by using Hammer Drill, recommend to do a stain proofing.

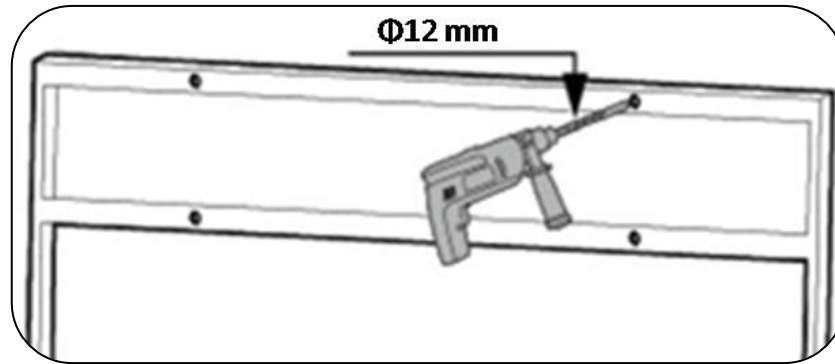


Figure 19 - Drilling holes

- 7) Use M10 screw and M10 flat washer to secure the wall bracket (Note : M10*50 screw and M10 flat washer need self-preparation).

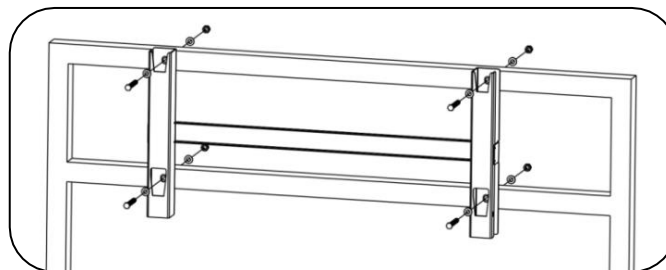
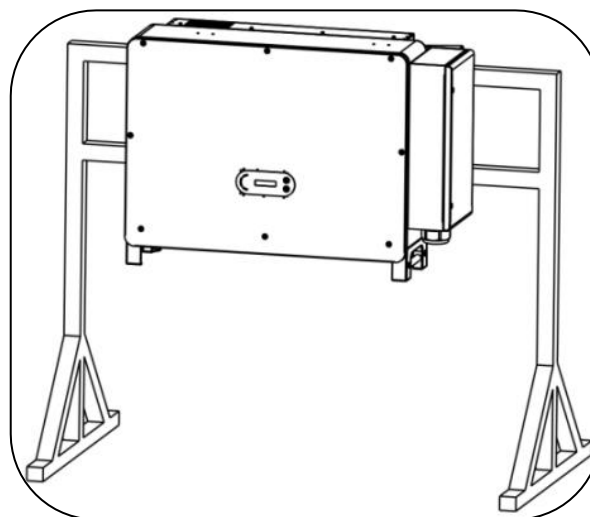


Figure 20 - Fix wall bracket

- 8) Repeat step 4).



Note: if height between ground and bracket is less than 1.3m, use auxiliary handle for installation. Otherwise, use lifting equipment.

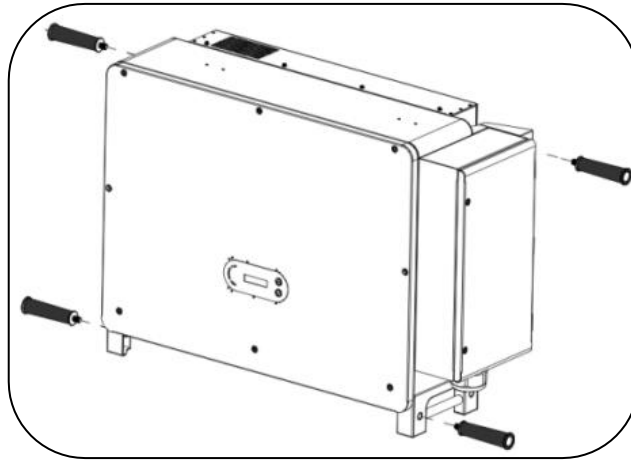


Figure 21 - Installation position of auxiliary handle






4. Electrical connections

General information in this chapter

This chapter describes the electrical connections of the 3PH 80KTL-136KTL inverter. Carefully read this section before connecting the cables.

NOTE: Before making any electrical connections, ensure that the DC and AC circuit breakers are open. Remember that the accumulated electrical charge remains in the inverter capacitor after the DC and AC circuit breakers have been switched off. Therefore, it is necessary to wait at least 5 minutes to allow the capacitor to discharge completely.

	The inverter must be installed and serviced by professional technicians or electricians.
Attention	
	The PV modules generate electricity when exposed to sunlight, which can pose a risk of electric shock. Before connecting the DC input power cord, be sure to disconnect the strings via the appropriate circuit breakers.
Danger	
	The maximum open-circuit voltage of the photovoltaic string must be less than 1100 V. The 3PH 80KTL-136KTL has 8-12 independent input channels (MPPT); all the photovoltaic modules connected to them must be of the same model and brand, and must be positioned with the same orientation (solar azimuth and inclination angle).
Note	

4.1. Electrical connections

Describes the process for making the electrical connections.

4.2. Terminal connector

Introduce inverter terminal port layout.

4.3. Connecting the PNGD cable (grounding)

Describes the connection of the ground cable (PGND) for the ground of the inverter.

4.4. Connecting the AC output power cables

Describes the connection of the inverter to the AC grid using the AC power cables (following the granting of the grid connection by the distributor).

4.5. Connecting the DC input power cables

Describes the connection of the photovoltaic strings to the inverter using the DC power cables.

4.6. Connecting the communication cables

Introduce the propose WIFI/USB, COM and how to connect WIFI/USB port.

4.7. Safety check

Before operate inverter, check the PV array, inverter DC side safety connection and AC side safety connection.

4.1. Electrical connections

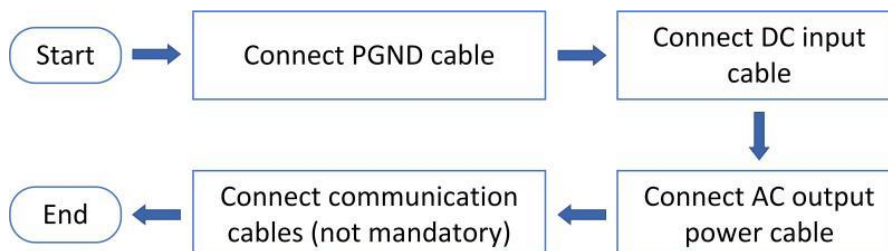
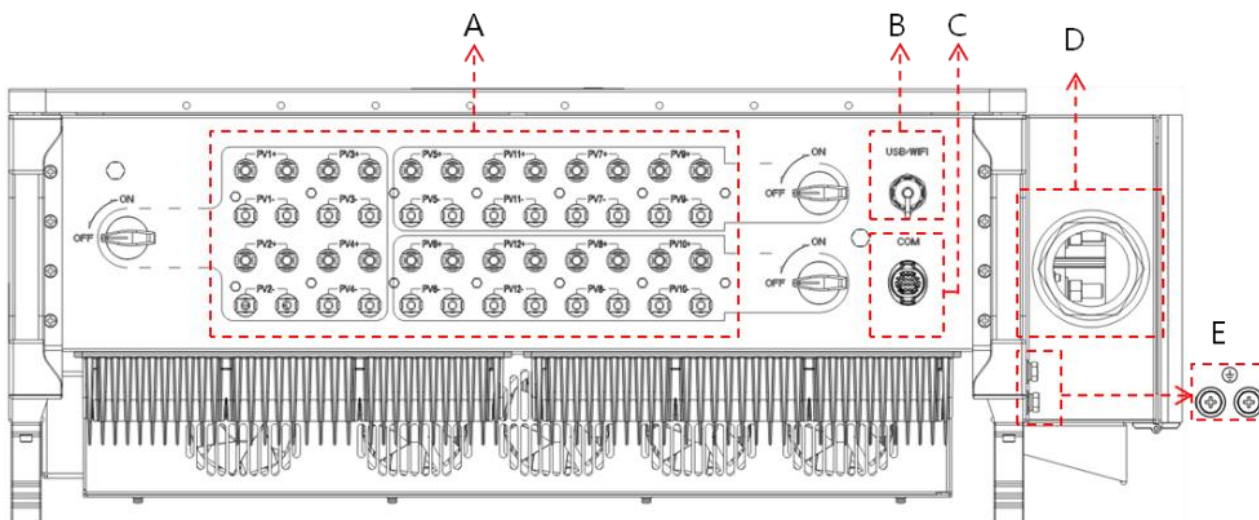



Figure 22 - Flowchart for connecting cables to the inverter

4.2. Terminal connector

Connector description as below:




*take picture as reference

No	Name	Connection	Description
A	DC input terminals	PVX+ / PVX-	PV connector
B	USB/WIFI port	USB/WIFI/GPRS/ETHERNET	For WIFI,GPRS, Ethernet Communication
C	RS485 Modbus/DRMs	RS485/DRMs	RS485 Communication port/ DRMs port
D	AC output terminals		AC output terminal
E	Grounding		Connecting terminal of the ground , choose at least one for grounding connection

4.3. Connecting PNGD cables (grounding)

Connect the 3PH 80KTL-136KTL inverter to the ground electrode using ground protection cables (PGND).

	<p>The inverter does not have a transformer, therefore the positive and negative polarities of the photovoltaic string do NOT need to be grounded. Otherwise, the inverter may fail. All non-current-carrying metal parts (such as the PV module frame, PV rack, housing of the combiner box, and housing of the inverter) in the PV power system must be connected to the ground.</p>
Attention	

Prerequisites:

Prepare the grounding cable (recommend 16mm² yellow-green outdoor cable and M8 OT Terminal).

Procedure:

- 1) Remove the insulation layer with an appropriate length using a wire stripper shown in figure below.

Note: L2 is approximately 2-3 mm longer than L1.

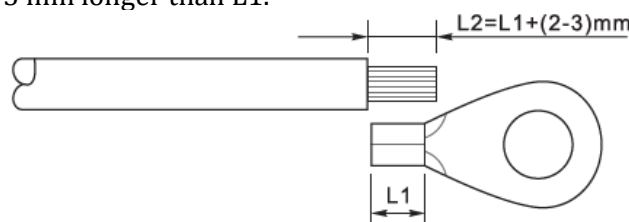


Figure 23 - Preparing the ground cable (1)

- 2) Insert the exposed core wires in the OT terminal and crimp them using a crimping tool, as shown in figure below. Recommend using OT terminal: OTM6, Cable: $\geq 6\text{mm}^2$.

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

Note 2: The cavity formed after the conductor has been crimped must completely wrap the conductor wires. The core of the wire must be in close contact with the terminal.

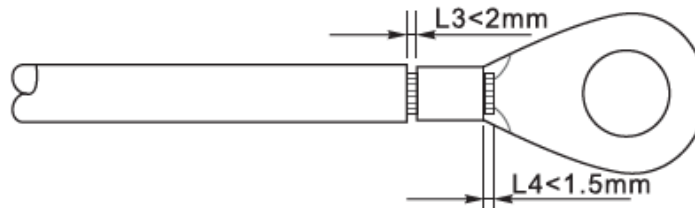
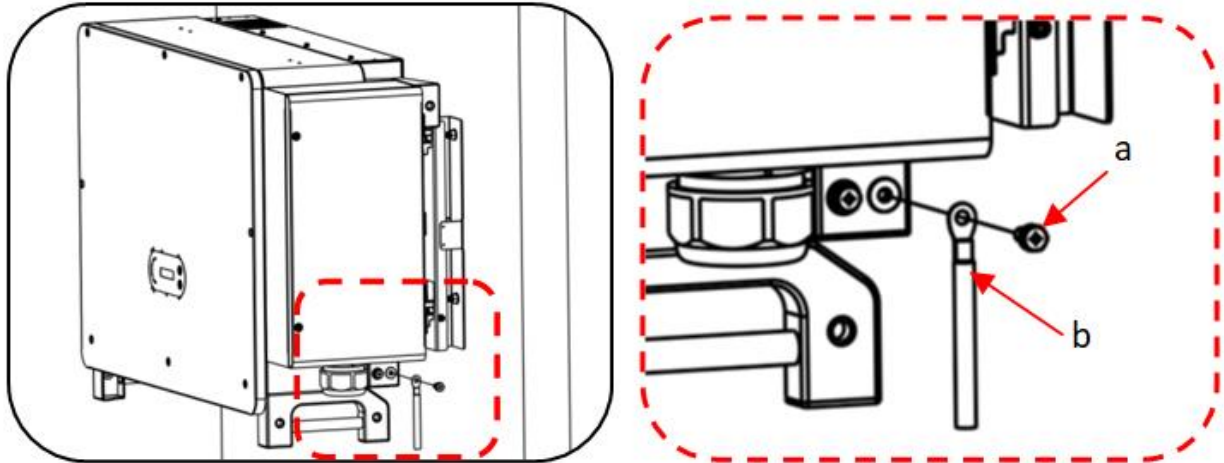


Figure 24 - Preparing the ground cable (2)

- 3) Remove the screw from the bottom side of inverter (Shown as figure), connect the grounding cable to the grounding point and tighten the grouping screw. Torque is 6-7Nm.

Note: To ensure the anti-corrosion performances of the ground terminals, apply silica gel on them after connecting the ground cable.



a.M8hexagon screw b. grounding cable

Figure 25 - Inverter external grounding instruction diagram

4.4. Connecting the AC output power cables

Inverter has a standard and integrated residual current monitoring unit (RCMU), when inverter detected leakage current excess 300mA, it will cut off with utility grid for protection. For external Residual Current Device (RCD), the rated residual current shall be 300mA or higher.

Precondition:

Inverter AC side should connect a three phase circuit current to ensure inverter can be cut off with utility grid for abnormal condition.

The AC cable need to meet the requirement of local grid operator.

Cable connection procedure

Open the wiring box.

- Use M6 driver to unscrew the two screws on the wiring box.
- Open wiring box cover.

Note:

- Forbid to open then main board cover of inverter.
- Before open the wiring box, please ensure there is not DC and AC connection.
- If open the wiring box on snowing or raining day, please take protective measures to avoid the snow and rain enter wiring box. Otherwise, should not open the wiring box.
- Please do not unused screw in the wiring box.

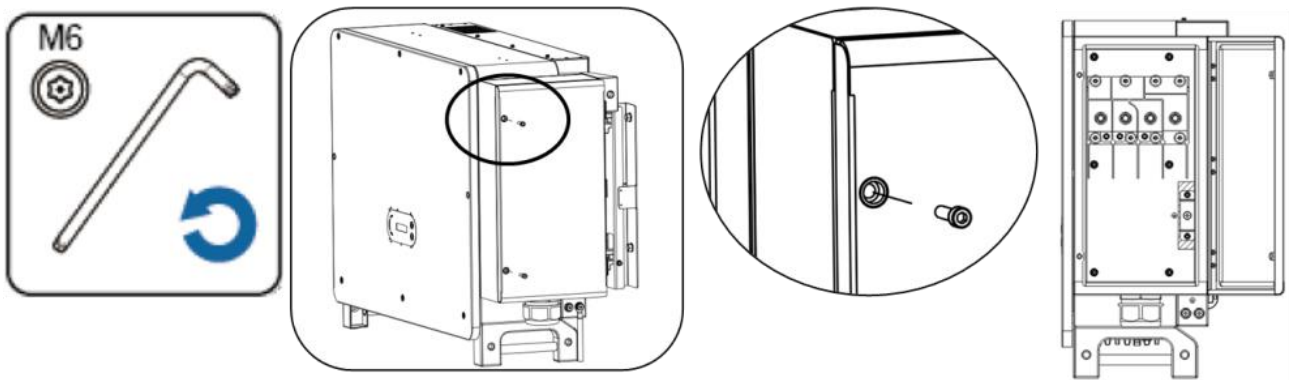


Figure 26- Open wiring box

Wiring Terminal and Precautions

Note:

- Before connect to grid, please ensure the grid voltage and frequency of local grid meet the requirement of inverter , any question please seek local grid company for help.
- Inverter can only connect to grid after get the permission from local grid company
- Should not connect any loads between inverter and AC circuit breaker
- OT/DT Requirement :
- When use copper core cable, please use copper terminal connector
- When use copper clad aluminum cable, please use copper terminal connector
- When use aluminum core cable, please use Copper and aluminum transition terminal connector or aluminum terminal connector

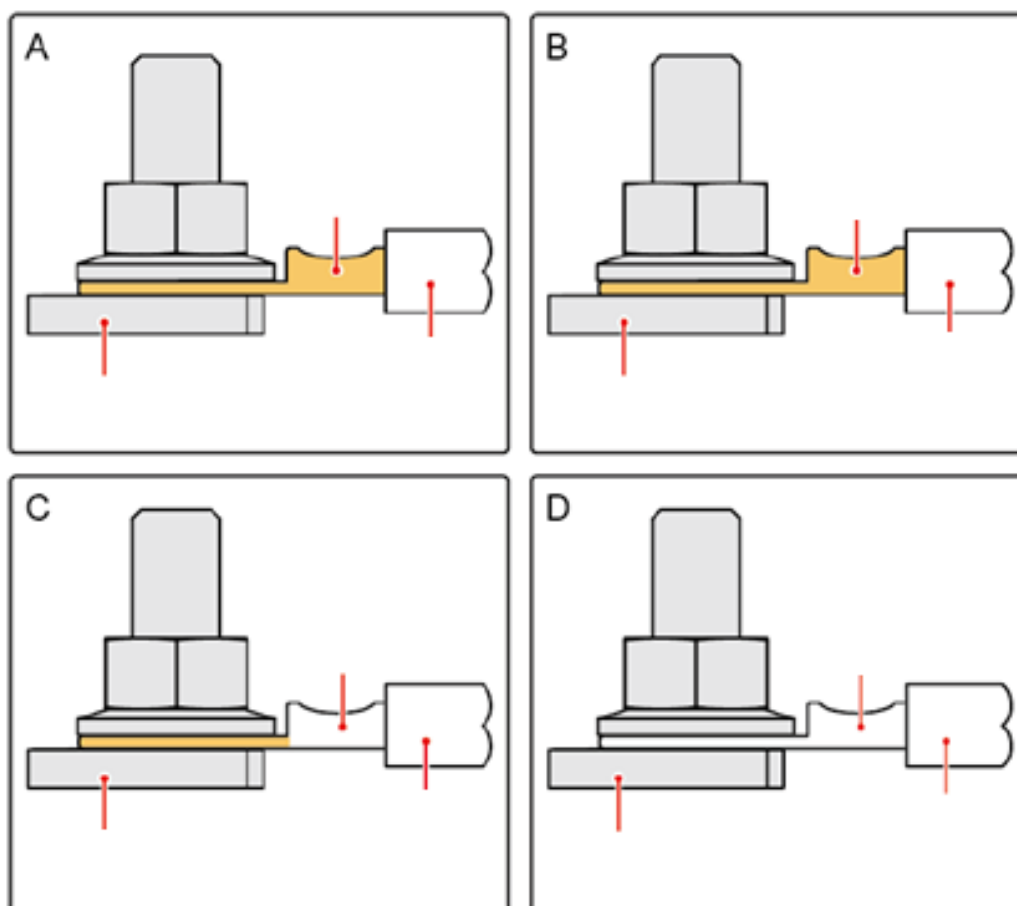


Figure 27- OT/DT Requirement for terminal connection

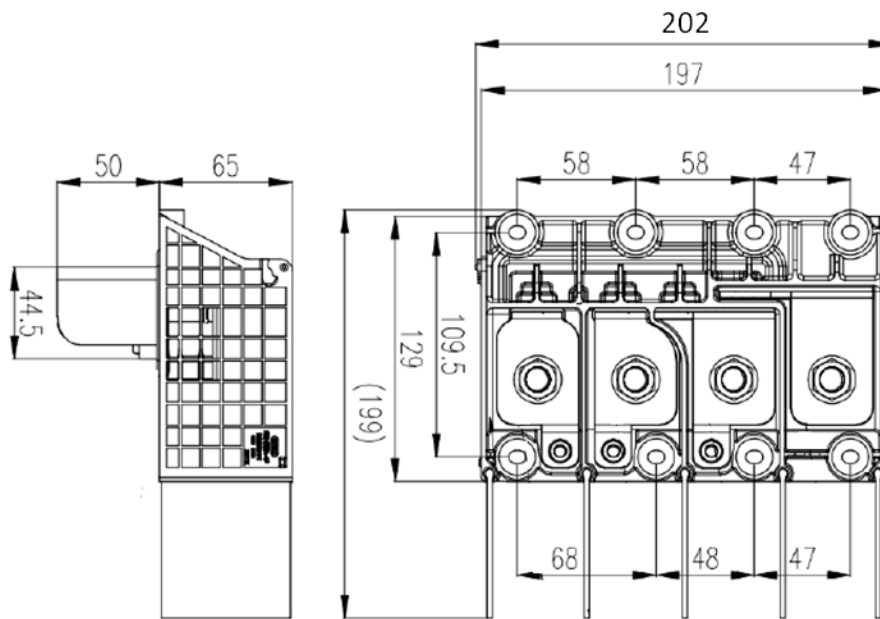


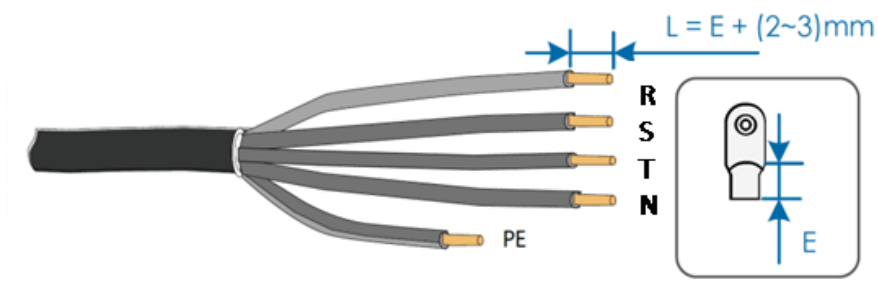
Figure 28 - AC Terminal size

Wring Procedure

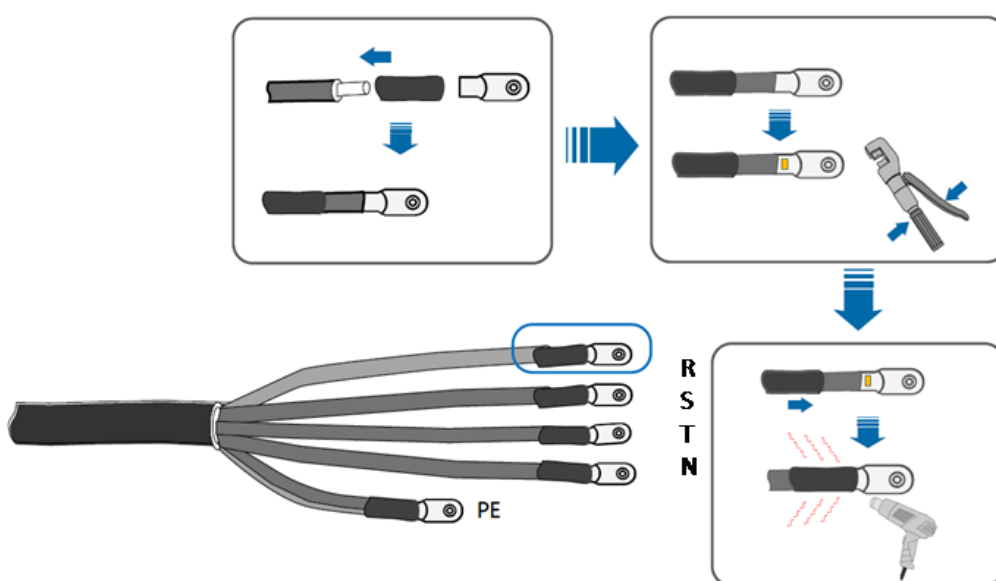
The section will use a five core wire as a sample, four core wire has same connection process. The table below presents recommend AC cable size.

Name	Type	Area(mm ²)
AC Cables	Recommended: Outdoor four-core/five-core copper or aluminum wire	Copper Wire: 95~185; Aluminum Wire: 120~240; PE Wire: reference 5.3

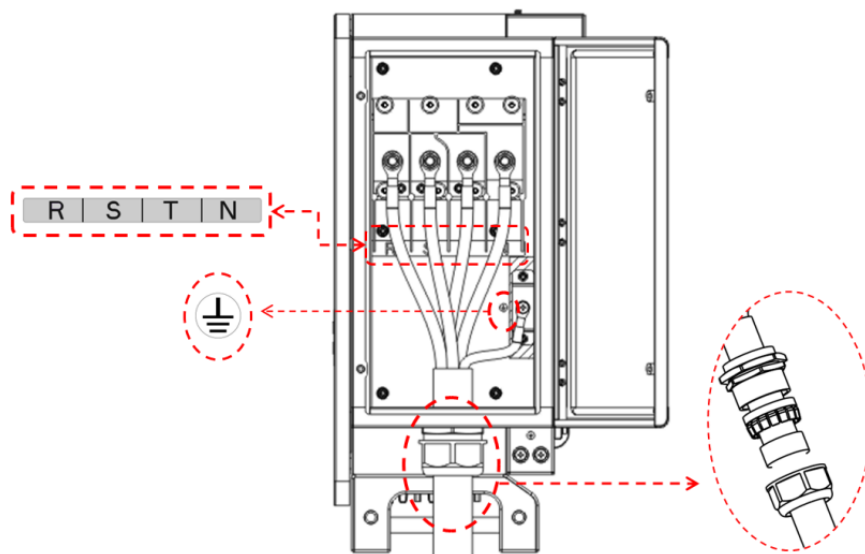
- 1) Open the cover.
- 2) Turn OFF the AC circuit breaker and secure against reconnection.
- 3) Unscrew the nut of the AC terminal block and select the sealing ring according to the outer diameter of the cable. Insert the nut, sealing ring into the cable in sequence.
- 4) Remove the insulation layer of an appropriate length according to figure below.



5) Crimp the Terminal.

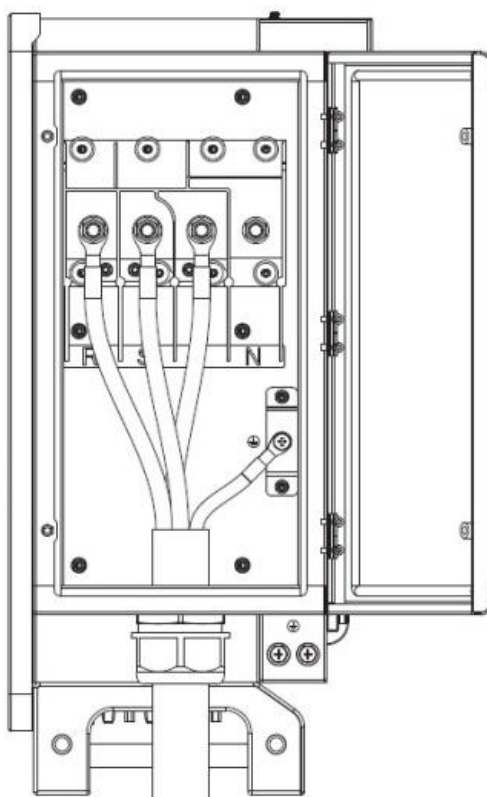


6) Depending on the grid configuration, connect L1, L2, L3 and N to the terminals according to the label and tighten the screw on the terminal using a screwdriver.



Note:

- Phase lines use M12 terminal connector, PE line use M8 terminal connector. The position of "PE" Line and "N" Line should not be opposite. Opposite position may cause inverter permanently faulty.
- As shown in the figure below ,for HV model ,the N-wire does not need to be connected. (HV model:100KTL-HV,125KTL-HV,136KTL-HV).



7) Closed wiring box cover, and tighten the screw.

4.5. Connecting the DC input power cables

Connect the 3PH 80KTL-136KTL inverter to the photovoltaic strings using DC input power cables. Select the input mode: the 3PH 80KTL-136KTL inverter has 8-12 MPPTs, which can be set independently or in parallel, depending on how the system was designed. The user can choose the appropriate MPPT operating mode.

Independent mode (default):

If the strings are independent (e.g. installed on two separate flaps), the input model must be set to “independent mode.”

Parallel mode:

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

Note:

- Connecting PV strings into inverter must following the below procedure. Otherwise, any faulty cause by inappropriate operation will be including in the warranty case.
- Ensure the maximum short circuit current of PV strings should less than the maximum inverter DC current input. And three “DC switch” is in OFF position. Otherwise, it may cause high voltage and electric shock.
- Ensure PV array have good insulation condition in any time.
- Ensure same PV string should have the same structure, including: same model, same number of panels, same direction, same azimuth.
- Ensure PV positive connector connect to inverter positive pole, negative conenctor connect to inverter negative pole
- Please use the connectors in the accessories bag. The damage cause by incorrect is not including in the warranty.

Context

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

Figure 29 - Recommend DC cable size

- 1) Find the metal contact pins in the accessories bag, connect the cable according below figure (1.Positive cable, 2. negative cable).

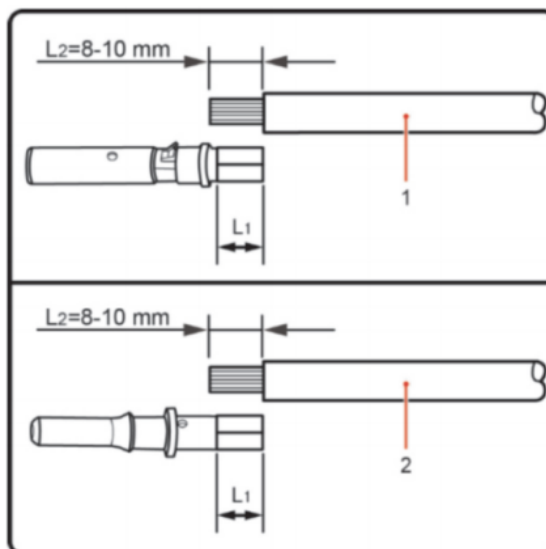
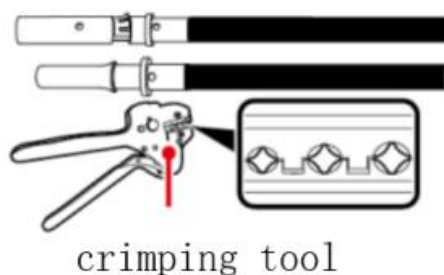
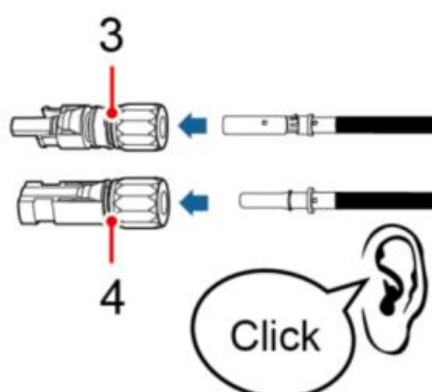


Figure 30 - DC cable connection

- 2) Crimp the PV metal contact pin to the striped cable using a proper crimping pliers.



- 3) Insert wire into the connector cap nut and assemble into the back of male or female plug, When you heard a “click”, the pin tact assembly is seated correctly. (3. Positive Connector, 4. negative connector).



- 4) Measure PV voltage of DC input with multimeter, verify DC input cable polar and connect DC connector with inverter until hearing a slight sound indicated connection succeed.

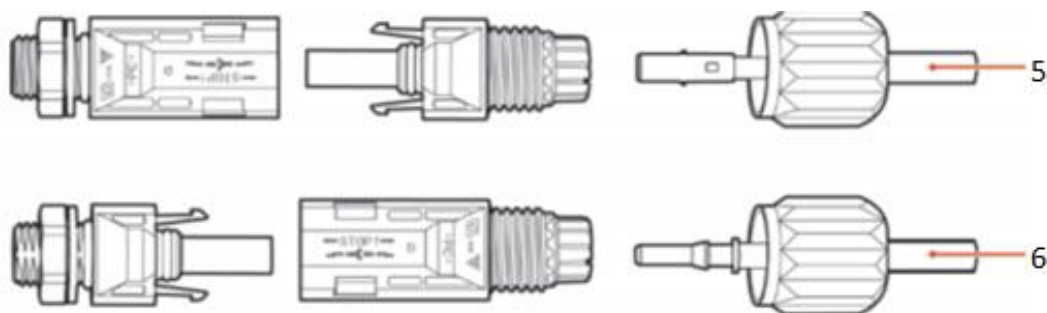
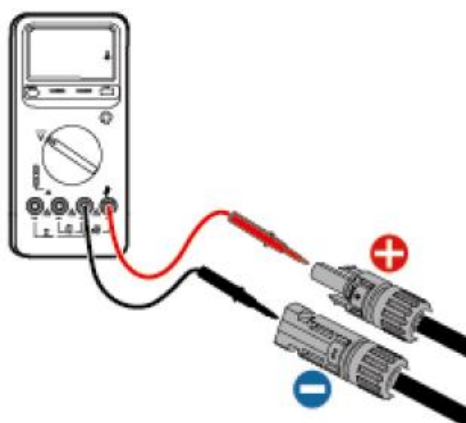


Figure 31 - DC cable connection




Note: Please use multimeter to make sure the PV array positive pole and negative pole!

Dealing : If need to remove the PV connector from inverter side, please use the Removal Tool as below diagram, move the connector gently.

Removal procedure

To remove the positive and negative connectors from the inverter, insert a removal tool in the bayonet coupling and press the tool with adequate force, as shown in the figure below.

	<p>Before removing the positive and negative connectors, make sure that the inverter's circuit breaker is switched off. If not, the direct current may cause an electric arc that could result in a fire</p>
<p>Warning</p>	

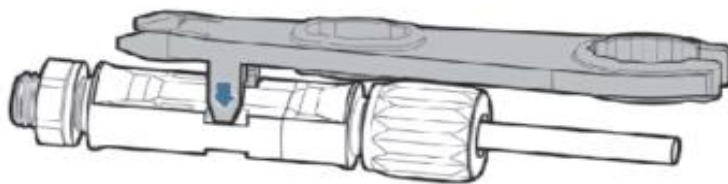


Figure 32 – Removing the DC connector

4.6. Connecting the communication cables

Note:

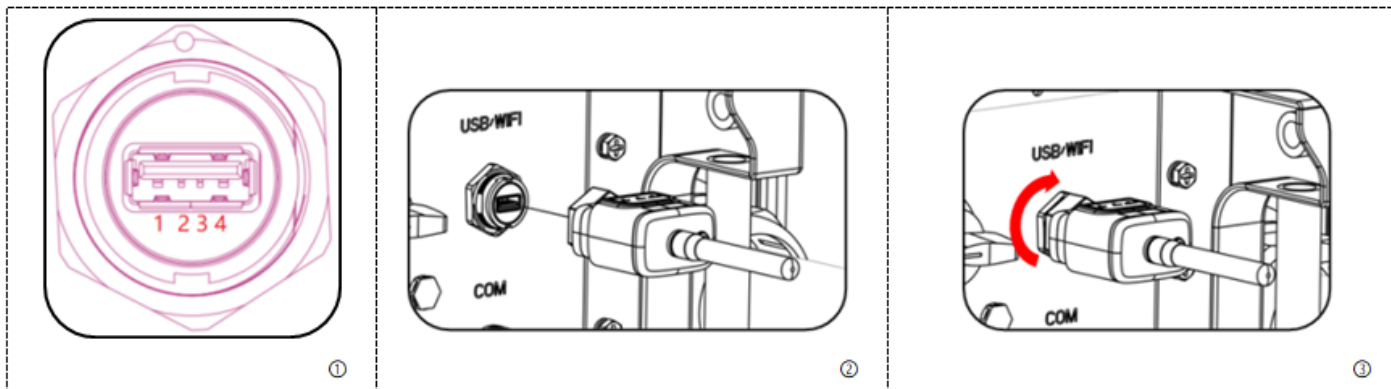
When layout the wiring diagram, please separate the communication wiring and power wiring in case the signal be affected.

USB/Wifi Port

Port Description :

USB/WIFI port	USB: USB PORT	Use for updating the software
	WIFI: WIFI/GPRS/ETHERNET PORT	Use for connect WiFi/GPRS/Ethernet for data transmission

Procedure:



COM-Multi function communication port

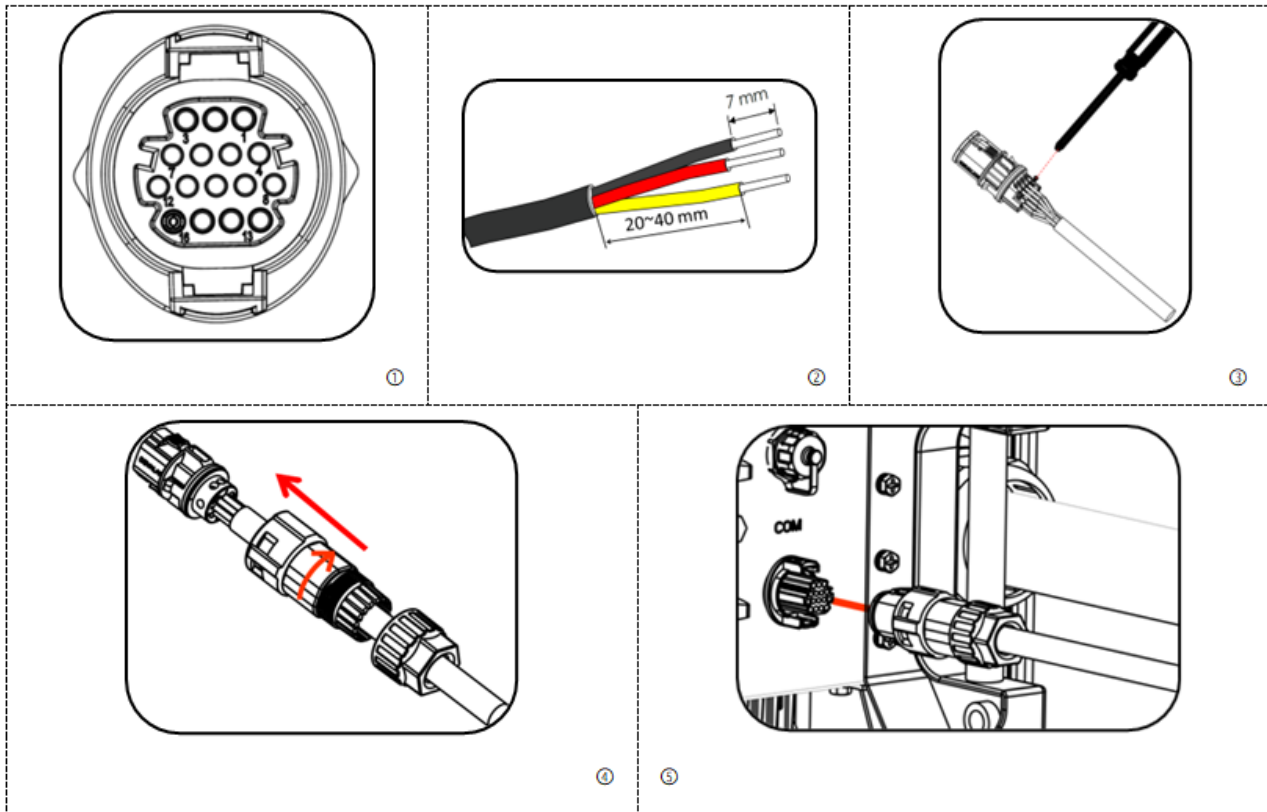
The table below presents recommend com cable size.

Name	Type	Outer diameter (mm)	Area (mm ²)
RS485 Communication Wire	Outdoor shielded twisted pair meets local standards	3 core: 4~8	0.25~1

Port Description :


PIN	Define	Function	Note
1	RS485A	RS485 signal+	Wire connection monitoring or multiple inverter monitoring
2	RS485A	RS485 signal+	
3	RS485B	RS485 signal-	
4	RS485B	RS485 signal-	
5	Electric meter RS485A	Electric meter RS485 signal+	Wire connection Electric meter
6	Electric meter RS485B	Electric meter RS485 signal-	
7	GND.S	RS485 signal ground	
8	DRM0	Remote shunt down	DRMS port
9	DRM1/5		
10	DRM2/6		
11	DRM3/7		
12	DRM4/8		
13	GND.S	Communication Ground	
14-16	Blank PIN	N/A	N/A

Procedure:



5. Commissioning the inverter

5.1. Safety inspection before commissioning

	<p>Make sure that the DC and AC voltages fall within the range permitted by the inverter.</p>
<p>Attention</p>	

- **Photovoltaic strings**

Before turning on the inverter, it is necessary to examine the photovoltaic string. Check the open-circuit voltage of each photovoltaic panel and compare it with the data in the technical datasheet.

- Make sure that the open-circuit voltage of each PV string corresponds to the technical data;
- Make sure that the positive and negative polarities are correct.

- **DC Connection**

Make sure that the DC switch of the inverter is off. Use the multi-meter to check the voltage and current on the DC side; check the DC cable, make sure that the positive and negative poles are not inverted, and are consistent with the positive and negative poles of the photovoltaic string; otherwise, the inverter may suffer irreparable damage. Compare the voltage of each string connected to the same MPPT; if the difference is more than 3%, the PV string may be damaged. The maximum DC voltage (if the minimum operating temperature allowable is reached) should be less than 1100 V. Make sure that all the photovoltaic strings are securely connected to the input of the inverter.

- **AC Connection**

Make sure that the AC switch of the inverter is off. Check that the phases of the inverter are correctly connected to the grid (R, S, T, N, PE). Check that the type of AC grid in which the inverter is installed is correct (TN-C, TN-S, TT). Check that the voltage of each phase is within the correct range. If possible, measure the THD; if there is too much distortion, the inverter may not operate properly.

- **Installing the front cover and the clamping screws**

5.2. Starting the inverter

- 1) Turn ON the DC switch both on the field panel and on the photovoltaic inverter (if present); wait for the screen to turn on.
- 2) Turn ON the AC switch installed on the wall.
When the photovoltaic string generates enough direct current, the inverter will start automatically. The word "normal" shown on the screen indicates the correct functioning of the inverter.
- 3) Set the correct country code.

Note: Different grid operators in different countries require different specifications regarding the grid connections of PV inverters. Therefore, it is very important to select the correct country code according to the requirements of the local authorities.

If in doubt, consult the system engineer or a qualified electrician.

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

If the inverter indicates the presence of any faults, refer to related chapter of this manual or contact the Zucchetti Centro Sistemi S.p.A. technical support.

6. Operating interface

General information in this chapter

This section describes the display and its operation, as well as the buttons and LED indicators of the 3PH 80KTL-136KTL inverters.

6.1. Operating panel and display

Buttons and LED indicators

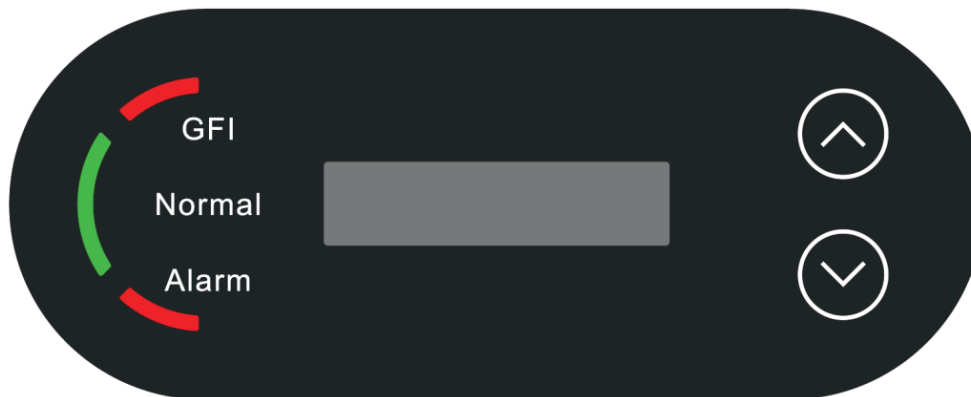


Figure 33 - LCD display with buttons and LED indicators

Main buttons:

- “^” Short press UP button = go up
- “^” Long press UP button = exit current interface
- “v” Short press DOWN button = go down
- “v” Long press DOWN button = enter current interface

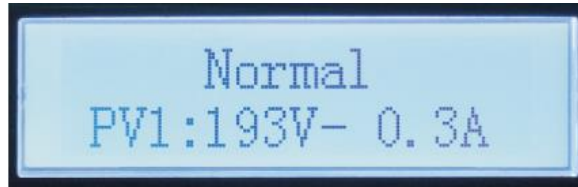
Indicator lights:

- “GFI” Red light ON = GFCI faulty.
- “Normal” Green light flashing = counting down or checking.
- “Normal” Green light ON = Normal.
- “Alarm” Red light ON= recoverable or unrecoverable faulty.

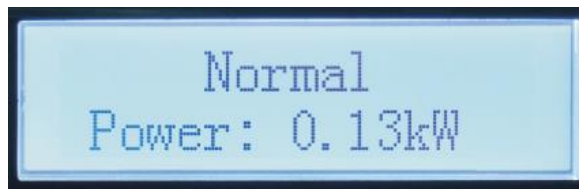
6.2. Main interface

LCD interface indicated inverter status, alarm information, communication connection, PV input current and voltage, grid voltage, current and frequency, today generation, total generation.

Inverter working status, PV 1 -12 PV input voltage and current.



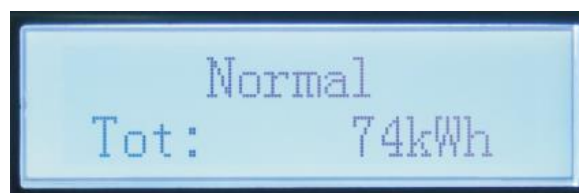
Inverter working status, PV generated power.



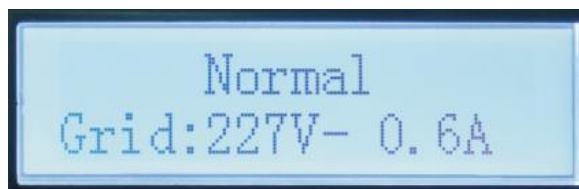
Inverter working status, today generated electricity.



Inverter working status, total generated electricity.

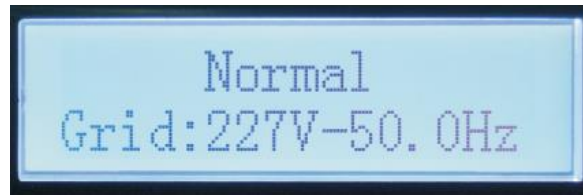


Inverter working status, grid voltage and current.

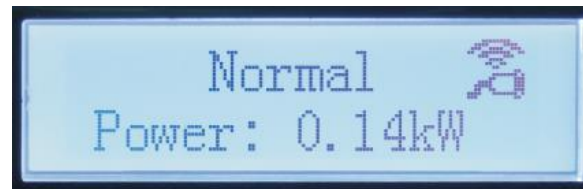


Inverter working status, grid voltage and frequency.

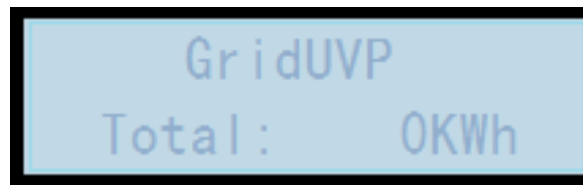




Inverter working status, Wi-Fi/ RS485 status.



Inverter faulty alarm.

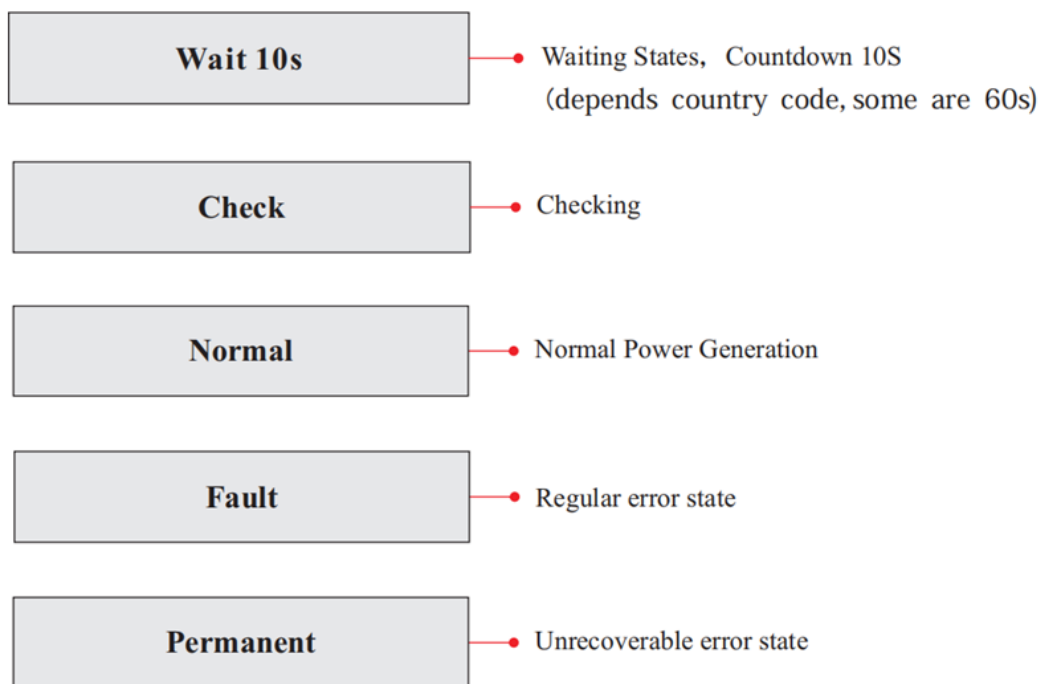


When power turn on, LCD interface displays INITIALIZING, refer below picture.



When control board successfully connected with communication board, the LCD display the current state of the inverter, display as shown in the figure below.





Inverter states includes: wait, check, normal, fault and permanent

Wait: Inverter is waiting to Check State when reconnect the system. In this state, grid voltage value is between the max and min limits and so on; If not, inverter will go to Fault State or Permanent State.

Check: Inverter is checking isolation resistor, relays, and other safety requirements. It also does self-test to ensure inverter software and hardware are well functional. Inverter will go to Fault State or Permanent State if any error or fault occurs.

Normal: Inverter enter to Normal State, it is feeding power to the grid; inverter will go to Fault State or Permanent state if any error or fault occurs.

Fault: Fault State: Inverter has encountered recoverable error. It should recover if the errors disappear. If Fault State continues; please check the inverter according error code.

Permanent: Inverter has encountered unrecoverable error, we need maintainer debug this kind of error according to error code.

When the control board and communication board connection fails, the LCD display interface as shown in the figure below.



6.3. Main menu

Long press the down button under standard interface to enter into main interface, Main interface including below information:

Normal	-----Long press DOWN button
	1.Enter Setting
	2.Event List
	3.SystemInfo
	4.Display Time
	5.Software Update

(A) Enter setting Interface as below

The "Settings" menu contains the following sub-menu:

1.Enter Setting	-----Long press DOWN button	
	1.Set time	11.Logic Interface
	2.Clear Energy	12.Set Power Ratio
	3.Clear Events	
	4.Country Code	
	5.On-Off Control	
	6.Set Energy	
	7.Set Address	
	8.Set Input mode	
	9.Set Language	
	10.MPPT Scan	

Long press the button to Enter the main interface of "1.Enter Setting" and long press to enter the setting menu. You can select the content you want to set by short pressing the button.

Note1: Some settings need to enter the password (the default password is 0001), when entering the password, short press to change the number, long press to confirm the current number, and long press after entering the correct password. If "password error, try again" appears, you will need to re-enter the correct password.

- **Set Time**

Set the system time for the inverter.

- **Clear Energy**

Clean the inverter of the total power generation.

- **Clear Events**

Clean up the historical events recorded in the inverter.

- **Country Code**

Long press button, enter interface, save the specific file into USB and insert USB into inverter communication port.

- **On-Off Control**

Inverter on-off local control.

- **Set Energy**

Set the total power generation. You can modify the total power generation through this option.

- **Set address**

Set the address (when you need to monitor multiple inverters simultaneously), Default 01.

- **Set Input mode**

Azzurro 3PH 80KTL-136KTL has 8-12 MPPT, these MPPTs can work interdependently, or divided into parallel mode. User can change the setting according to the configuration.

- **Set Language**

Set the inverter display language.

- **MPPT Scan**

Shadow scanning, when the component is blocked or abnormal, causing multiple power peaks, by enabling this function, the peak point of maximum power can be tracked.

- **Logic interface**

Enable or disable logical interfaces. It is use for below standard Australia (AS4777), Europe General (50549), German(4105)

- **Set Power Ratio (The country is set at 10)**

Set generation ratio.

(B) Event list

Event List is used to display the real-time event records, including the total number of events and each specific ID No. and happening time. User can enter Event List interface through main interface to check details of real-time event records, Event will be listed by the happening time, and recent events will be listed in the front. Please refer to below picture. Long press the button and short press the button to turn the page in standard interface, then enter into “2.Event List” interface.

2. Event List	
1. Current event	2. History event
Fault information	001 ID04 06150825 (Display the event sequence number, event ID number, and event occurrence time)

(C) “SystemInfo” Interface as below

3.SystemInfo	-----Long press DOWN button	
1.Inverter Type		
2.Serial Number		
3.Soft Version		
4.Hard Version		
5.Country		
6.Modbus Address		
7.Input Mode		

The user enters the main menu by long pressing the DOWN button, short press and turns the page to select menu contents, then long press the button to enter "3. SystemInfo". Turning the page down can select the system information to view.

(D) Display Time

Long press the button and short press the button to turn the page in the standard user interface to enter into "4.Display Time", then long press the button to display the current system time.

(E) Software Update

User can update software by USB flash drive, Zucchetti Centro Sistemi S.p.A. will provide the new update software called firmware for user if it is necessary, The user needs to copy the upgrade file to the USB flash drive.

6.4. Updating Inverter Software

AZZURRO 3PH 80KTL-136KTL inverter offer software upgrade via USB flash drive to maximize inverter performance and avoid inverter operation error caused by software bugs.

- 1) Turn off AC circuit breaker and DC switch, remove the communication board cover as below figure. If the RS485 line has been connected, please release the waterproof nut first and make sure the communication line is no longer the force. Then remove the waterproof cover.

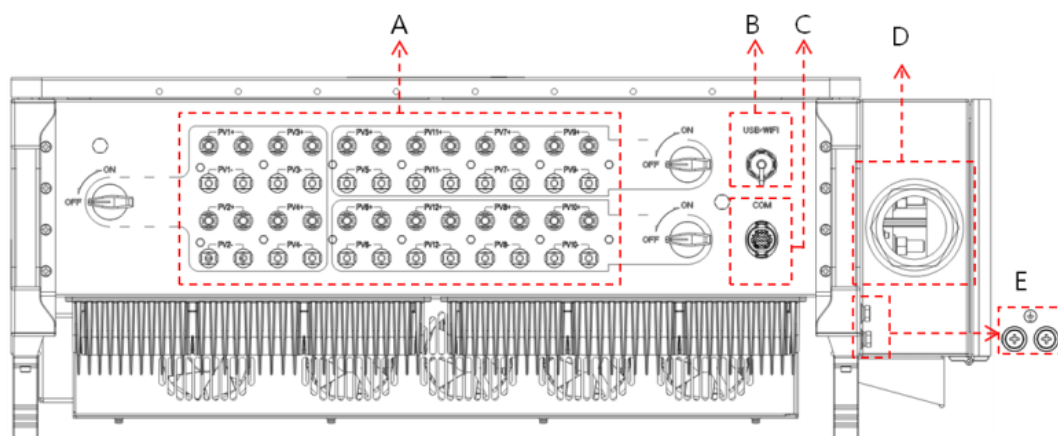


Figure 34 - Remove communication board cover

- 2) Insert USB into computer.
- 3) Zucchetti Centro Sistemi S.p.A. service team will send the software code to user, After user receive the file, please decompressing file and cover the original file in USB flash drive.

- 4) Insert USB drive into the USB port of inverter.
- 5) Then turn on DC switch and enter into the online upgrade to the main menu "5.Software Update" in the LCD display program. The method to enter the menu can refer to operation interface of LCD.
- 6) Input the password 0715 and then begin the update process.
- 7) System update main DSP, slave DSP and ARM in turns. If main DSP update success, the LCD will display "Update DSP1 Success", otherwise display "Update DSP1 Fail". If slave DSP update success, the LCD will display "Update DSP2 Success", otherwise display "UpdateDSP2 Fail".
- 8) If Fail, please turn off the DC switch, wait for the LCD screen turn off, then turn on the DC switch again, then continue to update from step 5.
- 9) After the update is completed, turn off the DC breaker, wait for the LCD screen extinguish, then recover the communication waterproof and then turn on the DC breaker and AC breaker again, the inverter will enters the running state. User can check the current software version in SystemInfo→3.SoftVersion.

7. Troubleshooting and maintenance

7.1. Troubleshooting

This section describes the potential errors for this product. Please read carefully for the following tips when doing the troubleshooting:

- 1) Check the warning message or faulty codes on the inverter information panel.
- 2) If not any error code display on the panel, please check the following lists:
 - Is inverter be installed in a clean, dry, ventilated environment?
 - Is the DC switch turn off?
 - Are the cable cross section area and length meet the requirement?
 - Are the input and output connection and wiring in good condition?
 - Are the configuration settings correctly for the particular installation?

This section contains the potential errors, resolution steps, and provide users with troubleshooting methods and tips.

The process to check the event list can refers to Manual.

Even List ID	Event List Name	Even List Description	Solution
ID01	GridOVP	The power grid voltage is too high	<p>If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. inverter automatically returns to normal operating status when the electric grid's back to normal.</p> <p>If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If no, contact technical support. If yes, check the AC circuit breaker and AC wiring of the inverter.</p>
ID02	GridUVP	The power grid voltage is too low	
ID03	GridOFP	The power grid frequency is too high	
ID04	GridUFP	The power grid frequency is too low	<p>If the grid voltage/frequency is within the acceptable range and AC wiring is correct, while the alarm occurs repeatedly, contact technical support to change the grid over-voltage, under-voltage, over frequency, under-frequency protection points after obtaining approval from the local electrical grid operator.</p>

ID05	GFCIFault	GFCI Fault	If the fault occurs occasionally, the possible cause is that the external circuits are abnormal occasionally. inverter automatically returns to normal operating status after the fault is rectified.If the fault occurs frequently and lasts a long time,check whether the insulation resistance between the PV array and earth(ground) is too low, then check the insulation conditions of PV cable.
ID06	OVRT	OVRT faulty	
ID07	LVRT	LVRT faulty	
ID08	IslandFault	Islanding faulty	
ID09	GridOVPIstant1	Grid instantaneous voltage too high 1	
ID10	GridOVPIstant2	Grid instantaneous voltage too high 2	
ID11	VGridLineFault	Grid Line voltage Faulty	
ID12	InvOVP	Inverter overvolatge	
ID17	HwADFaultIGrid	The grid current sampling error	ID17-ID24 are internal faults of inverter, turn OFF the “DC switch”, wait for 5 minutes, then turn ON the “DC switch”. Check whether the fault is rectified. If no, please contact technical support.
ID18	HwADFaultDCI	The DCI sampling error	
ID19	HwADFaultVGrid(DC)	Grid voltage sampling faulty (DC side)	
ID20	HwADFaultVGrid(AC)	Grid voltage sampling faulty (AC side)	
ID21	GFCIDeviceFault(DC)	Current leakage sampling (DC side)	
ID22	GFCIDeviceFault(AC)	Current leakage sampling (AC side)	
ID23	HwADFaultIdcBranch	Current Branch sampling faulty	
ID24	HwADFaultIdc	DC input current sampling faulty	
ID29	ConsistentFault_GFCI	The GFCI sampling value between the master DSP and salve DSP is not consistent	ID17-ID24 are internal faults of inverter, turn OFF the “DC switch”, wait for 5 minutes, then turn ON the “DC switch”.

ID30	ConsistentFault_Vgrid	The Grid voltage sampling value between the master and slave is not consistent	Check whether the fault is rectified. If no, please contact technical support.
ID31	ConsistentFault_DCI		
ID33	SpiCommFault (DC)	SPI Communication Faulty (DC side)	
ID34	SpiCommFault(AC)	SPI Communication Faulty (AC side)	
ID35	SChip_Fault	Chip Faulty (DC side)	
ID36	MChip_Fault	Chip Faulty (AC side)	
ID41	RelayFail	Relay faulty	
ID42	IsoFault	Low isolation faulty	
ID43	PEConnectFault	Ground faulty	
ID44	PvConfigError	Input mode incorrect	
ID45	Reserved		
ID47	Reserved		
ID49	Reserved		<p>Ensure the installation position and installation method meet the requirements of related chapter of this user manual.</p> <p>Check whether the ambient temperature of the installation position exceeds the upper limit. If yes, improve ventilation to decrease the temperature.</p>
ID50	TempFault_HeatSink1	Heat sink1 over-temperature protection	
ID51	TempFault_HeatSink2	Heat sink2 over-temperature protection	
ID52	TempFault_HeatSink3	Heat sink3 over-temperature protection	
ID53	TempFault_HeatSink4	Heat sink4 over-temperature protection	
ID54	TempFault_HeatSink5	Heat sink5 over-temperature protection	
ID55	TempFault_HeatSink6	Heat sink6 over-temperature protection	
ID57	TempFault_Env1	environment temperature1 protection	
ID59	TempFault_Inv1	Model1 over-temperature protection	

ID60	TempFault_Inv2	Model2 over-temperature protection	
ID61	TempFault_Inv3	Model3 over-temperature protection	
ID65	VbusRmsUnbalance	Unbalanced RMS value of bus voltage	
ID66	VbusInstantUnbalance	Unbalanced instantaneous value of bus voltage	
ID67	BusUVP	Bus undervoltage during grid connection	If the configuration of the PV array is correct, could be the sun irradiation is too low. Once sun irradiation back to normal, inverter will work back normal
ID69	PVOVP	PV overvoltage	
ID70	Reserved		
ID71	BusOVP	BUS overvoltage	
ID72	SwBusRmsOVP	Inverter bus voltage overvoltage software	
ID73	SwBusInstantOVP	Inverter bus voltage instantaneous value overvoltage software	
ID81	Reserved		
ID82	DciOCP	Dci overcurrent faulty	
ID83	SwOCPInstant	Output instantaneous current protection	ID83 are internal faults of inverter, turn OFF the “DC switch”, wait for 5 minutes, then turn ON the “DC switch”. Check whether the fault is rectified. If no, please contact technical support.
ID84	Reserved		
ID85	SwAcRmsOCP	Output RMS current protection	
ID86	SwPvOCPInstant	PV overcurrent software protection	
ID88	IacUnbalance	Output current unbalance	
ID97	Reserved		
ID98	HwBusOVP	Inverter bus hardware overvoltage	
ID99	Reserved		

ID100	Reserved		
ID102	HwPVOCP	PV hardware overcurrent	
ID103	HwACOCP	AC output hardware overcurrent	
ID113	OverTempDerating	Overttemperature derating	This faulty only cause alarm, It will not directly cause the system to enter a fault state.
ID114	FreqDerating	Frequency derating	
ID115	FreqLoading	Frequency loading	
ID116	VoltDerating	Voltage derating	
ID117	VoltLoading	Volatge loading	
ID124	Reserved		
ID125	Reserved		
ID129	unrecoverHwAcOCP	Output overcurrent hardware permanent fault	ID129-ID141 are internal faults of inverter, turn OFF the "DC switch", wait for 5 minutes, then turn ON the "DC switch". Check whether the fault is rectified. If no, please contact technical support.
ID130	unrecoverBusOVP	Bus overvoltage permanent fault	
ID131	unrecoverHwBusOVP	Bus overvoltage hardware permanent fault	
ID133	Reserved		
ID134	unrecoverAcOCPInstant	Output transient overcurrent permanent fault	
ID135	unrecoverIacUnbalance	Output current imbalance permanent fault	
ID138	unrecoverPVOCPInstant	Input overcurrent permanent fault	
ID139	unrecoverHwPVOCP	Input hardware overcurrent permanent fault	
ID140	unrecoverRelayFail	Relay permanent fault	ID145-ID158 are internal faults of inverter, turn OFF the "DC switch", wait for 5 minutes, then turn ON the "DC switch". Check whether the fault is rectified. If no, please contact technical support.
ID141	unrecoverVbusUnbalance	Bus Unbalanced permanent fault	
ID145		USB Failure	
ID146		WIFI failure	
ID147		Bluetooth failure	
ID148		RTC Clock failure	

ID149		Communication BOARD EEPROM error	
ID150		Communication BOARD FLASH error	
ID153		SCI communication (DC side)	
ID154		SCI communication (AC side)	
ID155			
ID156		Inconsistent software version	
ID157			
ID158			
ID161	ForceShutdown	ForceShutdown	
ID162	RemoteShutdown	RemoteShutdown	
ID163	Drms0Shutdown	Drms0 shunt down	
ID165	RemoteDerating	RemoteDerating	Inverter shows ID83 when remote derating. If no one operate this function, please check the connection (I/O) according to related chapter
ID166	LogicInterfaceDerating	Logical interface derating	
ID167	AlarmAntiRefluxing	Anti Refluxing derating	
ID169	FanFault1	Fan 1 Alarm	
ID170	FanFault2	Fan 2 Alarm	
ID171	FanFault3	Fan 3 Alarm	
ID172	FanFault4	Fan 4 Alarm	
ID173	FanFault5	Fan 5 Alarm	
ID174	FanFault6	Fan 6 Alarm	
ID177	Reserved		
ID178	Reserved		
ID179	Reserved		
ID180	Reserved		
ID181	Reserved		
ID182	Reserved		
ID193- ID224	StringFuse_Fault0-31	String fuse open circuit alarm	
ID225- ID240	Reserved		

7.2. Maintenance

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

Cleaning the inverter

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

Cleaning the heatsink

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

8. Uninstalling

8.1. Uninstallation steps

- Disconnect the inverter from the AC grid by opening the AC circuit breaker.
- Disconnect the inverter from the photovoltaic strings by opening the DC circuit breaker.
- Wait 5 minutes.
- Remove the DC connectors.
- Remove the AC terminals.
- Unscrew the fixing bolt of the bracket and remove the inverter from the wall.

8.2. Packaging

If possible, pack the product in its original packaging.

8.3. Storage

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

8.4. 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.

9. Technical data

9.1. Technical data 80KTL-110KTL-LV

TECHNICAL DATA	3PH 80KTL-LV	3PH 100KTL-LV	3PH 110KTL-LV
DC input			
Typical DC power *	96000W	120000W	132000W
Maximum DC power on each MPPT	13000W		
Independent MPPTs/Strings each MPPT	8/2	10/2	
Maximum DC voltage	1100V		
Start-up voltage	200V		
Nominal DC voltage	600V		
MPPT range in DC	180V-1000V		
Full power range in DC	500V-850V		
Maximum DC input current each MPPT	26A		
Maximum absolute DC input current each MPPT	40A		
AC output			
Nominal AC Power	80kW	100kW	110kW
Maximum AC Power	88kVA	110kVA	121kVA
Maximum AC current each phase	128A	160A	175A
Type of connection/Nominal AC grid voltage	Three phase 3PH/N/PE 220V/230V/240V (PH-N); 380V/400V/415V (PH-PH) or Three phase 3PH/PE 380V/400V/415V (PH-PH)		
AC voltage range	184V~276V (PH-N); 320V~480V (PH-PH) (according to local standards)		
Nominal AC frequency	50Hz/60Hz		
AC frequency range	45Hz~55Hz / 54Hz~66Hz (according to local standards)		
Total Harmonic Distortion (THD)	<3%		
Power factor	1 (set +/-0.8)		
Active power adjustability range	0-100%		
Active power grid injection	Possible to adjust from 0 to nominal AC power **		
Efficiency			
Maximum Efficiency	98.6%	98.7%	98.75%
Euro efficiency	98.2%	98.3%	98.4%
Efficiency MPPT	>99.9%		
Night time consumption	<1W		
Protections			
Internal interface protection	No		
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Overheating protection	Yes		
Overvoltage category/Protection class	Overvoltage Category III / Protective class I		
Integrated dischargers	AC/DC: Type 2 standard		
Standards			
EMC	EN 61000-6-2/4, EN 61000-3-1/12		
Safety standards	IEC 62109-1/2, IEC62116, IEC61727, IEC61683, IEC60068(1,2,14,30)		
Grid standards	Grid standards and certificates available on www.zcsazzurro.com		
Communication			
Interfaces	Wi-Fi/4G/Ethernet (optionals), RS485 (proprietary protocol), USB		
Additional I/O	I/O inputs for Antireverse power controller device		
Environmental data			
Temperature working range	-30°C...+60°C (power derating over 45°C)		
Topology	Transformerless		
Environmental protection degree	IP66		
Humidity range	0%.....100%		
Maximum operative altitude	4000m		
Acoustic noise	< 60dB @ 1mt		
Weight	72kg	84kg	85kg
Cooling system	FANs cooled		
Dimensions (H*L*P)	1051mm*660mm*340 mm		
Display	LED indicators, bluetooth + 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

** Possible using Antireverse Power Controller (ZSM-ZEROINJ)

9.2. Technical data 100KTL-136KTL-HV

TECHNICAL DATA	3PH 100KTL-HV	3PH 125KTL-HV	3PH 136KTL-HV
DC input			
Typical DC power *	120000W	150000W	163200W
Maximum DC power on each MPPT	20000W		
Independent MPPTs/Strings each MPPT	10/2		12/2
Maximum DC voltage	1100V		
Start-up voltage	200V		
Nominal DC voltage	680V		
MPPT range in DC	180V-1000V		
Full power range in DC	550V-850V		
Maximum DC input current each MPPT	26A		
Maximum absolute DC input current each MPPT	40A		
AC output			
AC output	100kW	125kW	136kW
Nominal AC Power	110kVA	137kVA	150kVA
Maximum AC Power	128A	160A	160A
Maximum AC current each phase	Three phase 3PH/PE 288 (PH-N); 500V (PH-PH)		Three phase 3PH/PE 311 (PH-N); 540V (PH-PH)
Type of connection/Nominal AC grid voltage	230V~332V (PH-N); 400V~575V (PH-PH) (according to local standards)		250V~358V (PH-N); 432V~621V (PH-PH) (according to local standards)
AC voltage range	50Hz/60Hz		
Nominal AC frequency	45Hz~55Hz / 54Hz~66Hz (according to local standards)		
AC frequency reange	<3%		
Total Harmonic Distortion (THD)	1 (set +/-0.8)		
Power factor	0~100%		
Active power adjustability range	Possible to adjust from 0 to nominal AC power **		
Efficiency			
Maximum Efficiency	98.8%	99%	99%
Euro efficiency	98.5%	98.5%	98.51%
Efficiency MPPT	>99.9%		
Night time consumption	<1W		
Protections			
Internal interface protection	No		
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Overheating protection	Yes		
Overvoltage category/Protection class	Overvoltage Category III / Protective class I		
Integrated dischargers	AC/DC: Type 2 standard		
Standards			
EMC	EN 61000-6-2/4, EN 61000-3-1/12		
Safety standards	IEC 62109-1/2, IEC62116, IEC61727, IEC61683, IEC60068(1,2,14,30)		
Grid standards	Grid standards and certificates available on www.zcsazzurro.com		
Communication			
Interfaces	Wi-Fi/4G/Ethernet (optionals), RS485 (proprietary protocol), USB		
Additional I/O	I/O inputs for Antireverse power controller device		
Environmental data			
Temperature working range	-30°C...+60°C (power derating over 45°C)		
Topology	Transformerless		
Environmental protection degree	IP66		
Humidity range	0%.....100%		
Maximum operative altitude	4000m		
Acoustic noise	< 60dB @ 1mt		
Weight	72kg	84kg	85kg
Cooling system	FANs cooled		
Dimensions (H*L*P)	1051mm*660mm*340mm		
Display	LED indicators, bluetooth + 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

** Possible using Antireverse Power Controller (ZSM-ZEROINJ)

10. Monitoring systems

10.1. External Wi-Fi adapter

10.1.1. Installation

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

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

Installation tools:

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



Figure 35 – Port for external Wi-Fi adapter

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

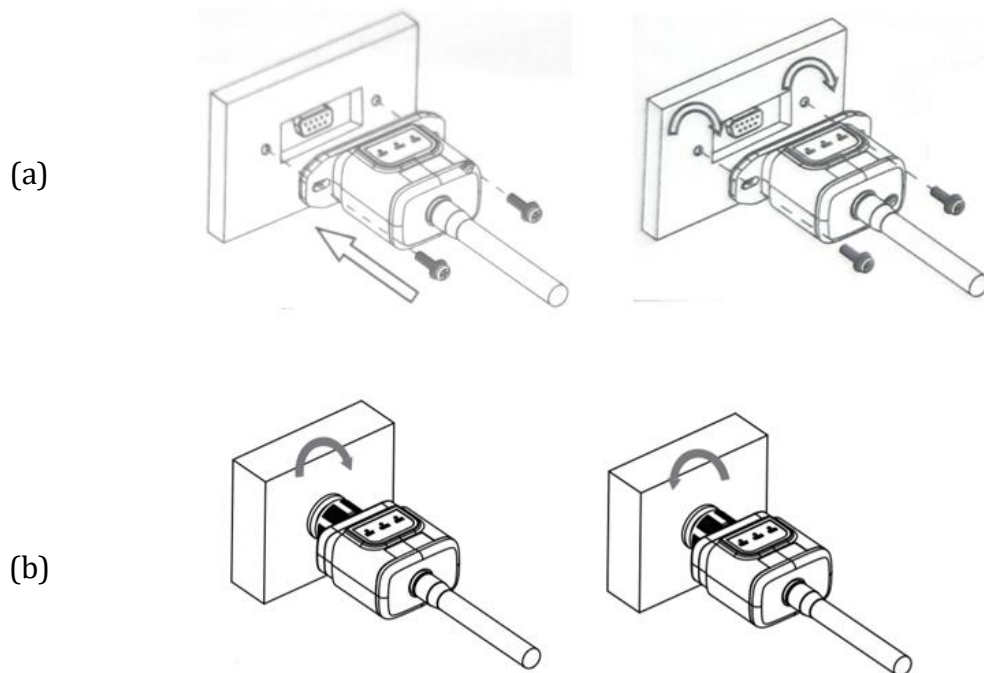


Figure 36 - Inserting and securing the external Wi-Fi adapter

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

10.1.2. 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 37 - 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 38 - 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.

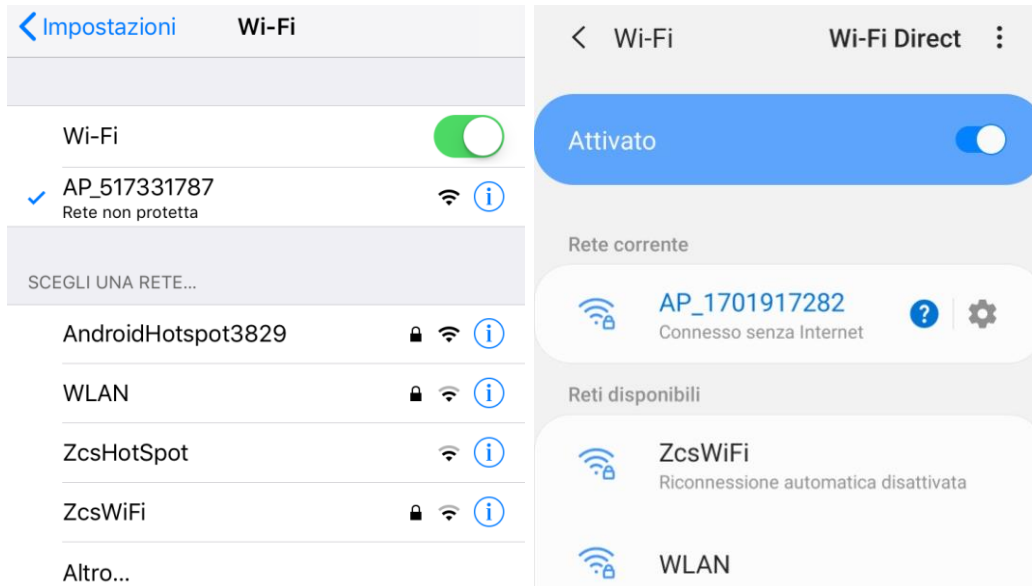


Figure 39 - Connection to Access Point for Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

- 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 40 - 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.

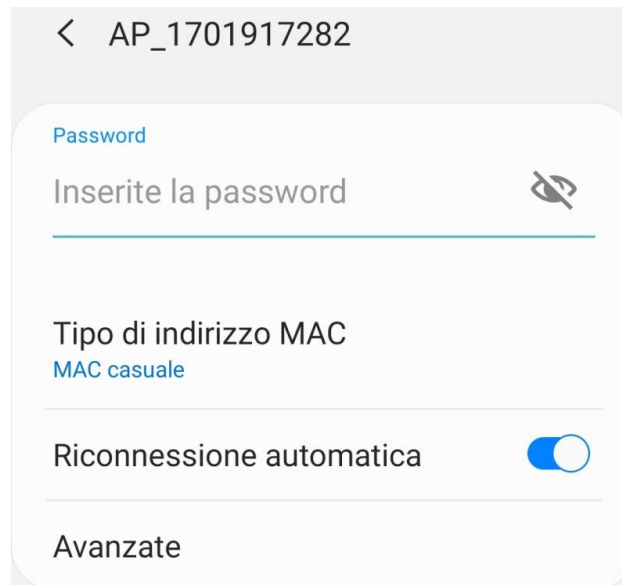


Figure 41 – Password entry prompt

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

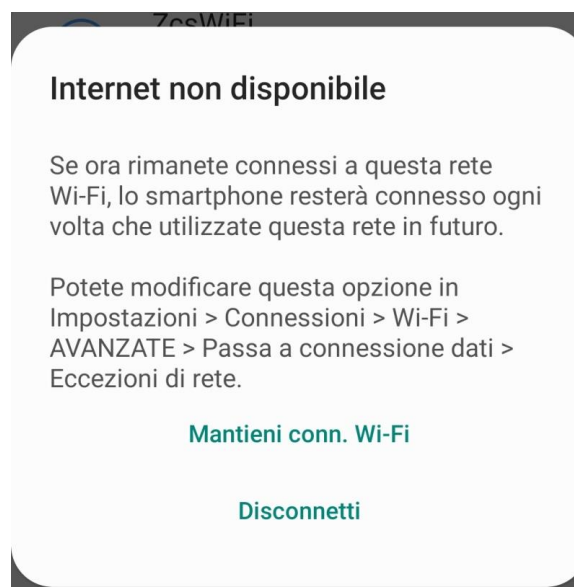


Figure 42 – Screen indicating that the Internet cannot be accessed

- 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.

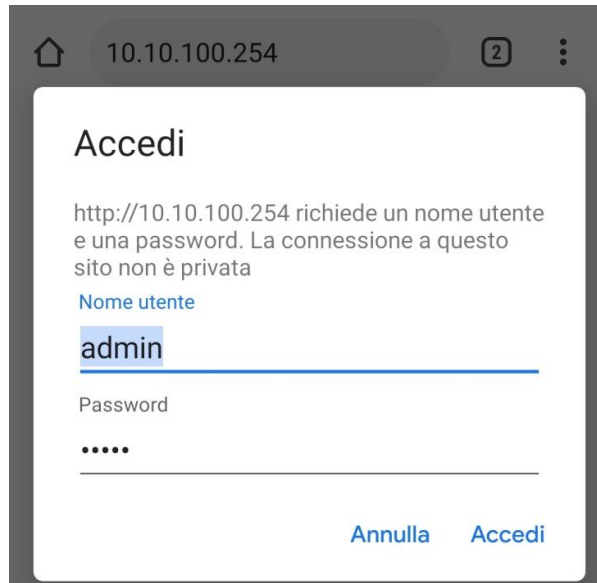


Figure 43 – Screen for accessing the web server to configure the Wi-Fi adapter

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

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

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

中文 | English

Status	<div style="border: 2px solid red; padding: 5px; margin-bottom: 10px;"> <p>- Inverter information</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 70%;">Inverter serial number</td><td>ZH1ES160J3E488</td></tr> <tr><td>Firmware version (main)</td><td>V210</td></tr> <tr><td>Firmware version (slave)</td><td>---</td></tr> </table> </div> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Inverter model</td><td>ZH1ES160</td></tr> <tr><td>Rated power</td><td>--- W</td></tr> <tr><td>Current power</td><td>--- W</td></tr> <tr><td>Yield today</td><td>11.2 kWh</td></tr> <tr><td>Total yield</td><td>9696.0 kWh</td></tr> <tr><td>Alerts</td><td>F12F14</td></tr> <tr><td>Last updated</td><td>0</td></tr> </table> <p>- Device information</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Device serial number</td><td>1701917282</td></tr> <tr><td>Firmware version</td><td>LSW3_14_FFFF_1.0.00</td></tr> <tr><td>Wireless AP mode</td><td>Enable</td></tr> <tr><td> SSID</td><td>AP_1701917282</td></tr> <tr><td> IP address</td><td>10.10.100.254</td></tr> <tr><td> MAC address</td><td>98:d8:63:54:0a:87</td></tr> <tr><td>Wireless STA mode</td><td>Enable</td></tr> <tr><td> Router SSID</td><td>AP_SOLAR_PORTAL_M2M_20120615</td></tr> <tr><td> Signal Quality</td><td>0%</td></tr> <tr><td> IP address</td><td>0.0.0.0</td></tr> <tr><td> MAC address</td><td>98:d8:63:54:0a:86</td></tr> </table> <p>- Remote server information</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Remote server A</td><td>Not connected</td></tr> <tr><td>Remote server B</td><td>Not connected</td></tr> </table>	Inverter serial number	ZH1ES160J3E488	Firmware version (main)	V210	Firmware version (slave)	---	Inverter model	ZH1ES160	Rated power	--- W	Current power	--- W	Yield today	11.2 kWh	Total yield	9696.0 kWh	Alerts	F12F14	Last updated	0	Device serial number	1701917282	Firmware version	LSW3_14_FFFF_1.0.00	Wireless AP mode	Enable	SSID	AP_1701917282	IP address	10.10.100.254	MAC address	98:d8:63:54:0a:87	Wireless STA mode	Enable	Router SSID	AP_SOLAR_PORTAL_M2M_20120615	Signal Quality	0%	IP address	0.0.0.0	MAC address	98:d8:63:54:0a:86	Remote server A	Not connected	Remote server B	Not connected	Help
Inverter serial number	ZH1ES160J3E488																																															
Firmware version (main)	V210																																															
Firmware version (slave)	---																																															
Inverter model	ZH1ES160																																															
Rated power	--- W																																															
Current power	--- W																																															
Yield today	11.2 kWh																																															
Total yield	9696.0 kWh																																															
Alerts	F12F14																																															
Last updated	0																																															
Device serial number	1701917282																																															
Firmware version	LSW3_14_FFFF_1.0.00																																															
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IP address	10.10.100.254																																															
MAC address	98:d8:63:54:0a:87																																															
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Signal Quality	0%																																															
IP address	0.0.0.0																																															
MAC address	98:d8:63:54:0a:86																																															
Remote server A	Not connected																																															
Remote server B	Not connected																																															

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

Status of remote server

◆ Not connected: Connection to server failed last time.
If under such status, please check the issues as follows:
(1) check the device information to see whether IP address is obtained or not;
(2) check if the router is connected to internet or not;
(3) check if a firewall is set on the router or not;

◆ Connected: Connection to server successful last time;

◆ Unknown: No connection to server. Please check again in 5 minutes.

Figure 44 – Status screen

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

Please select your current wireless network:

Site Survey

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

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

Refresh

Add wireless network manually:

Network name (SSID)
(Note: case sensitive)

Encryption method

Encryption algorithm

Next

1 2 3 4

Figure 45 – Screen for selecting the available wireless network (1)

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

Please fill in the following information:

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

Obtain an IP address automatically

IP address

Subnet mask

Gateway address

DNS server address

1 2 3 4

Figure 46 – Screen for entering the password of the wireless network (2)

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

Enhance Security

You can enhance your system security by choosing the following methods

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

1 2 3 4

Figure 47 - Screen for setting the security options (3)

10) Click “OK”.

Setting complete!

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

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



Figure 48 - 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.

Setting complete! Please close this page manually!

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

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

Web Ver:1.0.24

Figure 49 - Successful configuration screen



10.1.3. Verification

Wait two minutes after configuring the adapter and then go back to the Wi-Fi network selection screen to verify that the AP_***** network is no longer present. The absence of the Wi-Fi network in the list will confirm the successful configuration of the Wi-Fi adapter.



Figure 50 – Wi-Fi network search on Smartphone (iOS and Android); Access point of the Wi-Fi adapter is no longer visible

If the Wi-Fi network is still present in the list, connect to it again and enter the status page. Check the following information:

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

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

Figure 51 – 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 52 - Initial status of LEDs

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



Figure 53 - 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 54 – Reset button on the Wi-Fi adapter

10.1.4. 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 55 - 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 56 – 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 57 - 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.

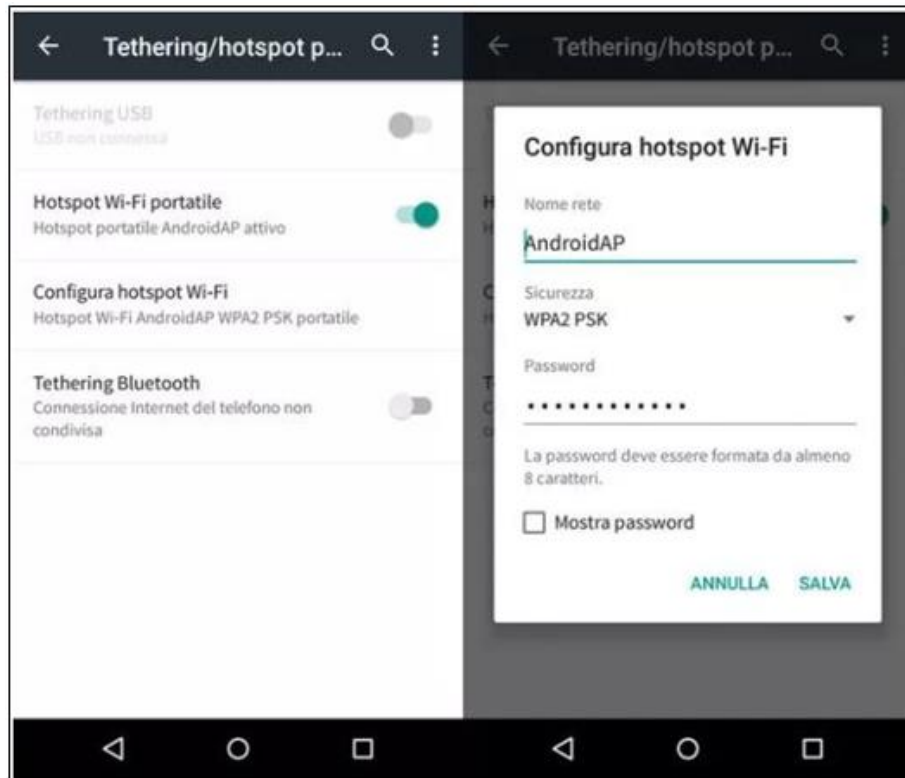


Figure 58 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

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

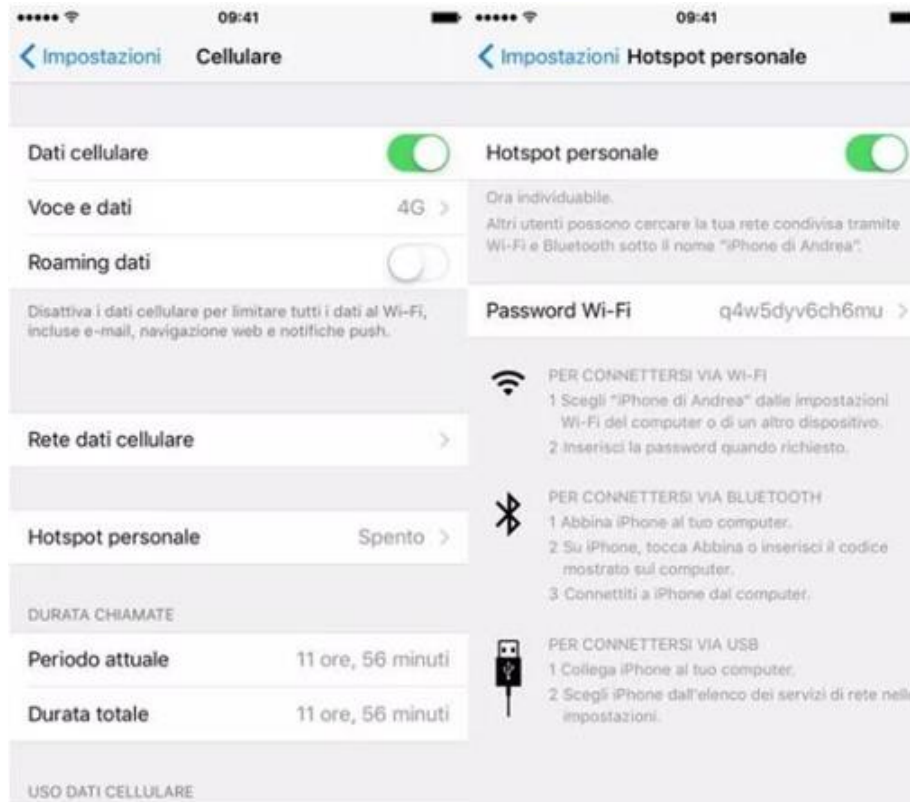


Figure 59 - Configuration of an iOS smartphone as a hotspot router

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).

10.2. Ethernet adapter

10.2.1. Installation

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

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

Installation tools:

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

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



Figure 60 – 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.

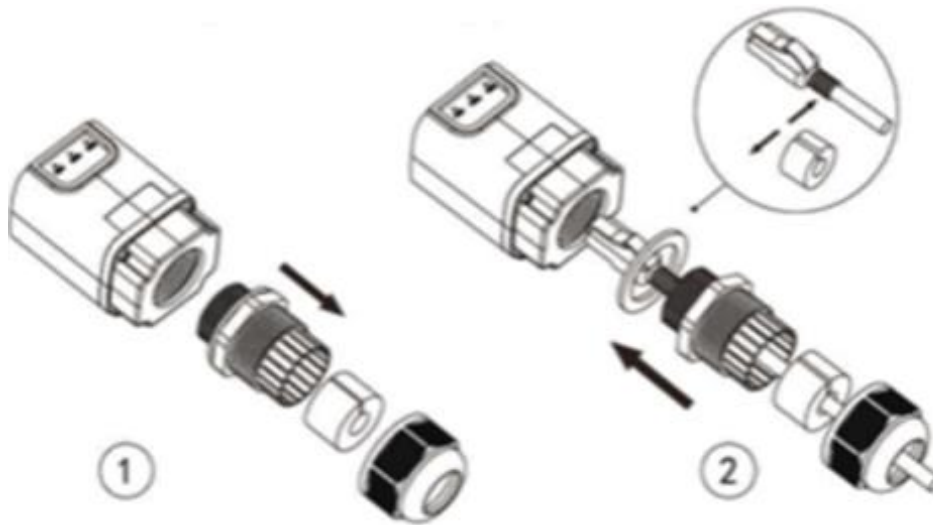


Figure 61 – Inserting the network cable inside the device

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

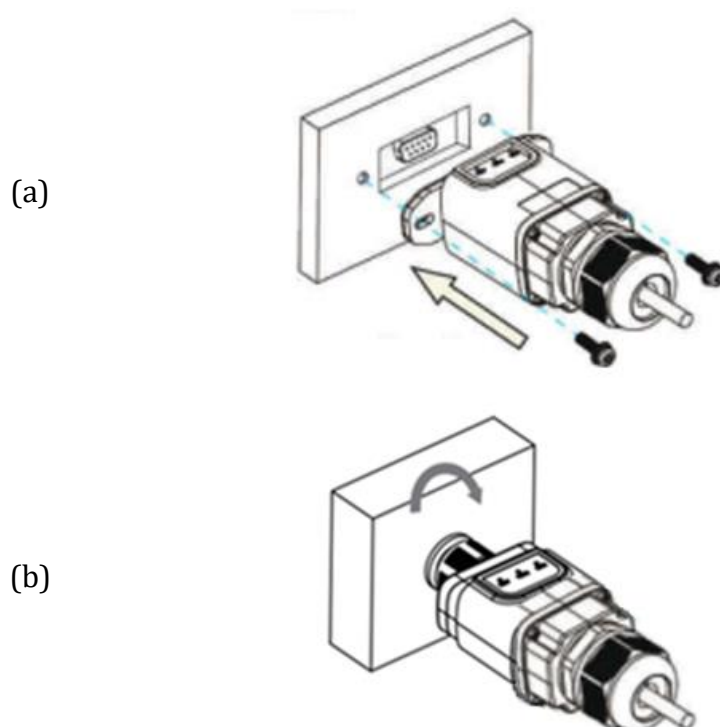


Figure 62 – Inserting and securing the ethernet adapter

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

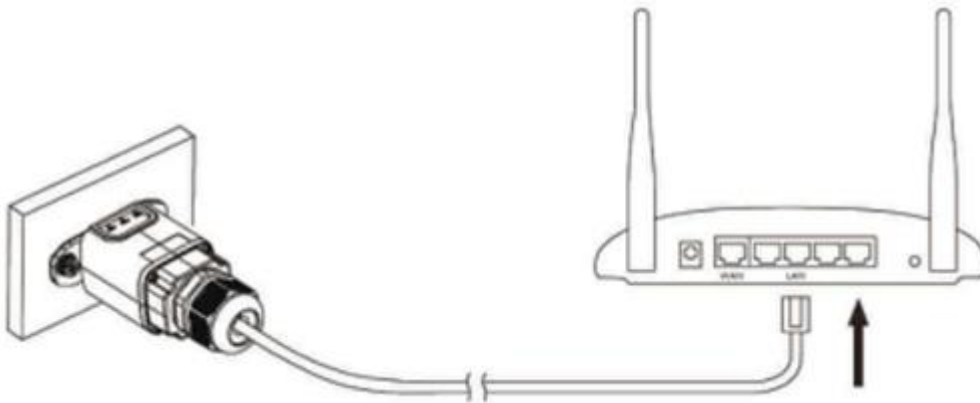


Figure 63 – Connecting the network cable to the modem

- 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.

10.2.2. 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 64 - Initial status of LEDs

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



Figure 65 - Final status of LEDs

10.2.3. 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 66 - 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 67 - 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).

10.3. 4G adapter

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

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

10.3.1. Installation

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

Installation tools:

- Cross screwdriver
- 4G adapter

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



Figure 68 – Port of the 4G adapter



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

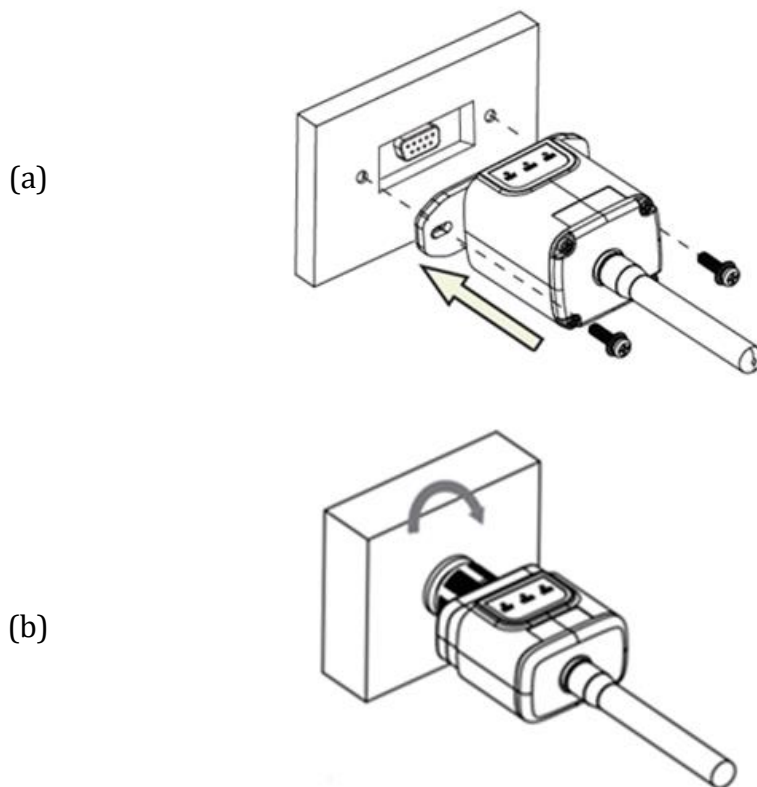


Figure 69 - Inserting and securing the 4G adapter

- 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.

10.3.2. 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 70 - 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 71 - 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 72 - 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 73 - 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.

10.4. Datalogger

10.4.1. 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 74 – Diagram for connecting the ZSM-DATALOG-04 / ZSM-DATALOG-10 datalogger

- Datalogger up to 31 inverters (code ZSM-RMS001/M200): allows to monitor up to 31 inverters or a system with a maximum installed power of 200kW.

It can be connected to the network via an Ethernet cable.

- Datalogger up to 31 inverters (code ZSM-RMS001/M1000): allows to monitor a maximum of 31 inverters or a system with a maximum installed power of 1000kW.

It can be connected to the network via an Ethernet cable.



Figure 75 - 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”](http://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.

10.4.2. Electrical connections and configuration

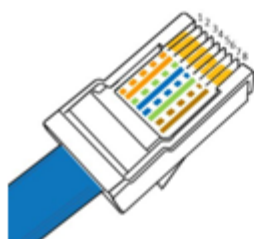
All the Azzurro ZCS inverters have at least one RS485 connection point.

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

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

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

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



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

Figure 76 - Pin out for connecting the RJ45 connector

2) Daisy chain

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

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

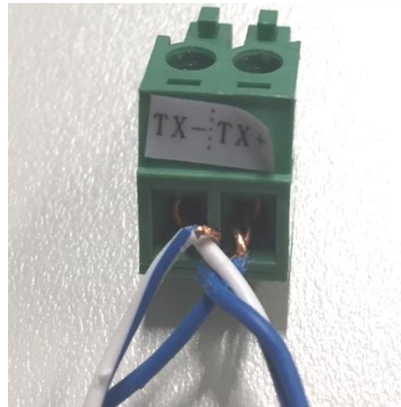


Figure 77 - Tightening the network cable to the RS485 terminal block

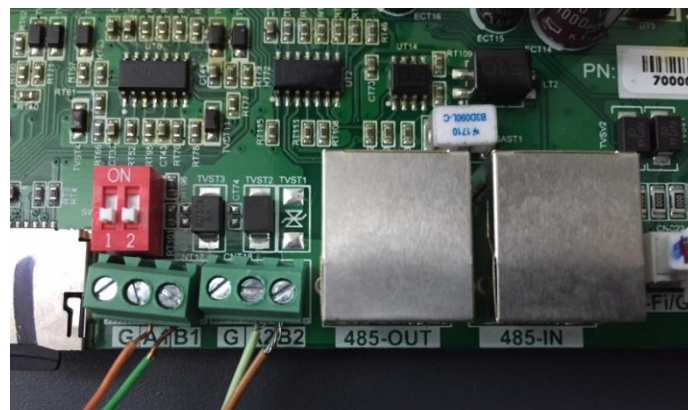
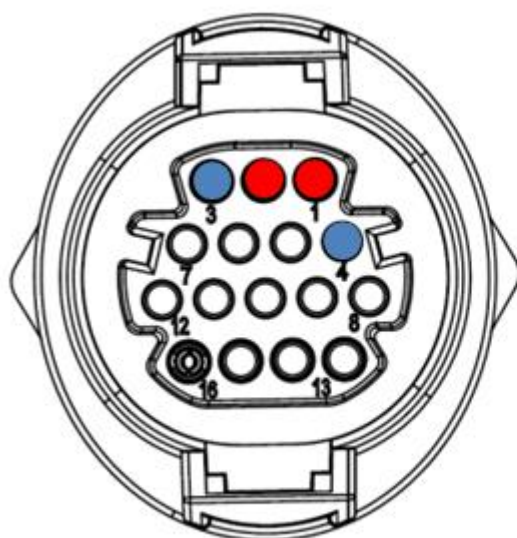


Figure 78 - Connecting the serial line via the RS485 terminal block and via the RJ45 plug

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





- Pin 1 - 2 / RS485 +
- Pin 3 - 4 / RS485 -

Figure 79 - Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS

- 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.

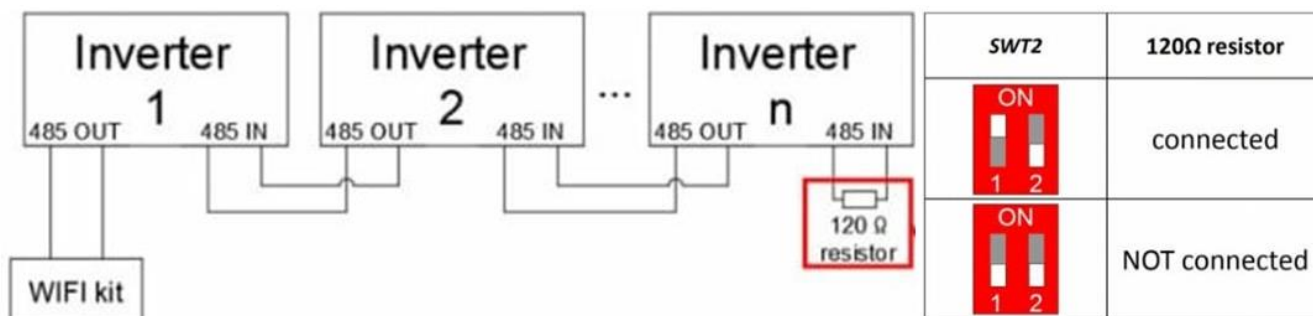


Figure 80 - Positioning of dip switches to connect the isolation resistor

- 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.

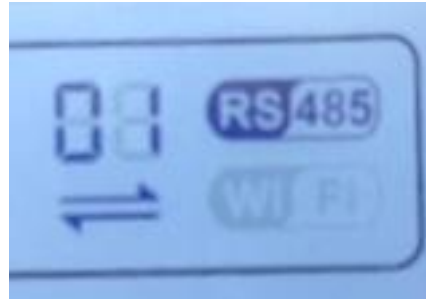


Figure 81 - RS485 symbol on the display of the inverter

- 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.

10.4.3. 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

10.4.4. 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.

10.4.5. Ethernet configuration

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



Figure 82 - 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.

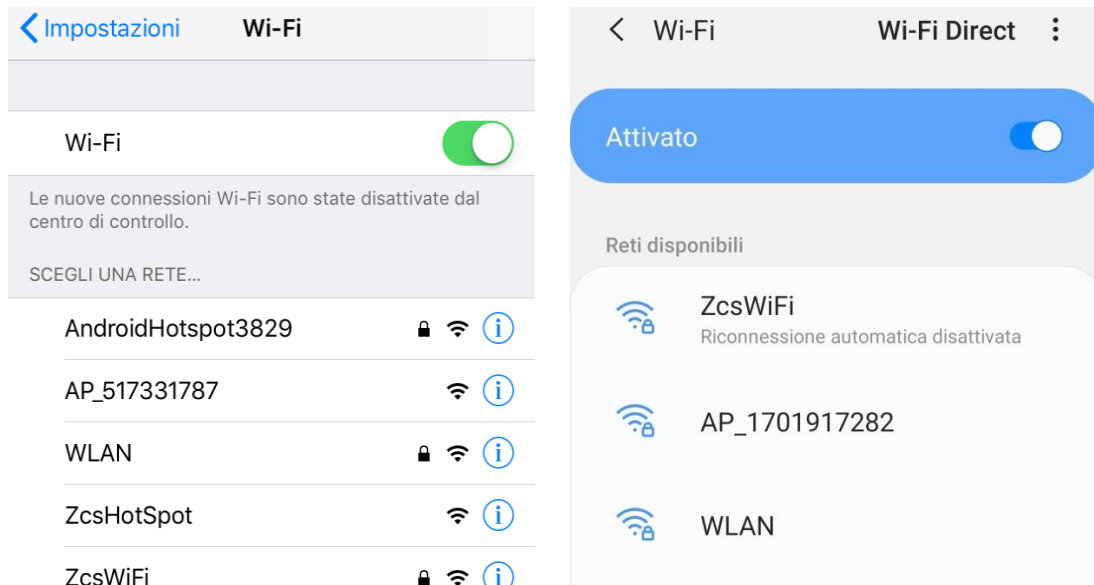


Figure 83 - Wi-Fi network search on iOS smartphone (left) and Android (right)

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



Figure 84 - 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.

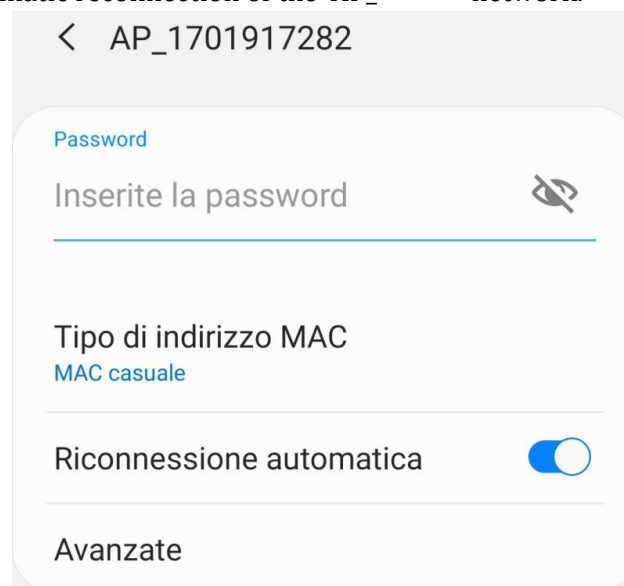


Figure 85 - Password entry prompt

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

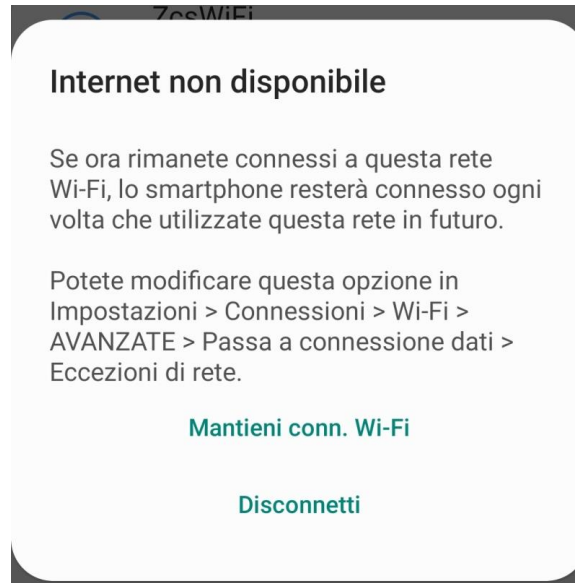


Figure 86 - Screen showing that the Internet cannot be accessed

- 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.

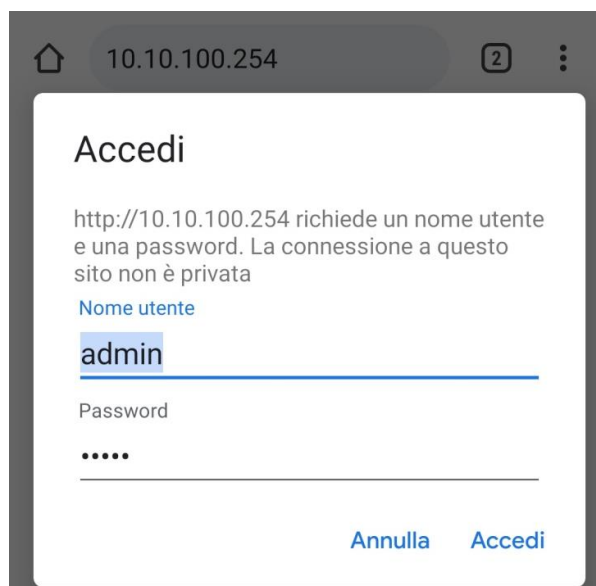
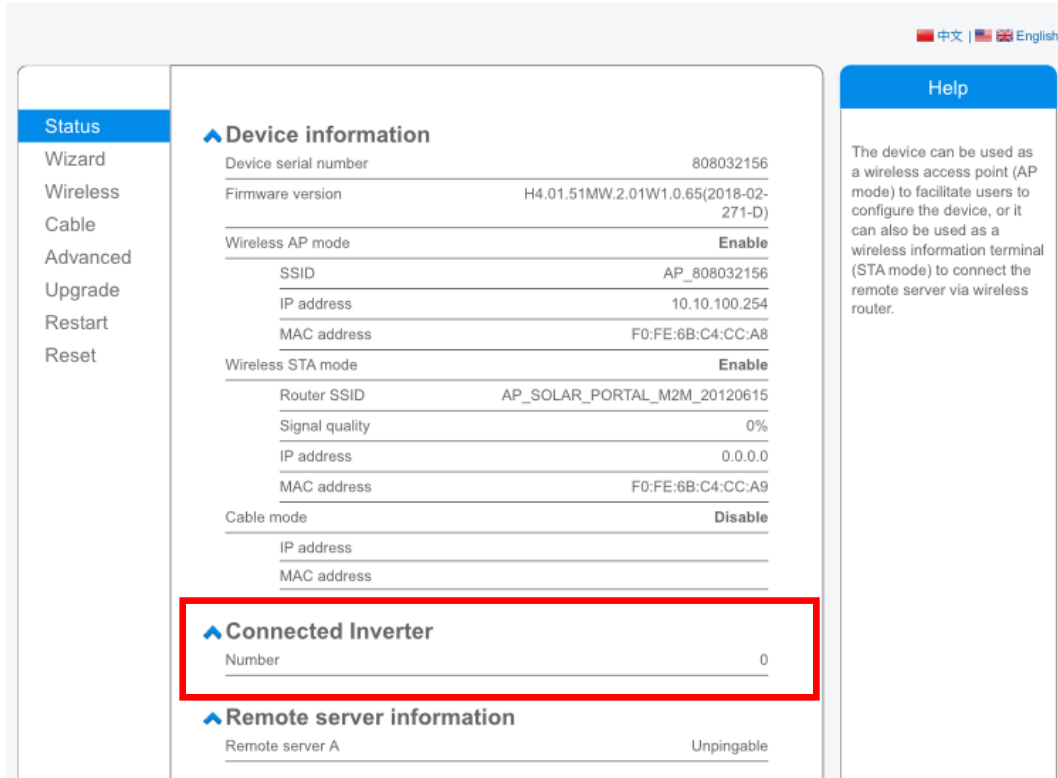


Figure 87 - Screen for logging into the web server to configure the datalogger

- 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.



Language: 中文 | English

Status

- Wizard
- Wireless
- Cable
- Advanced
- Upgrade
- Restart
- Reset

Device information

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

Connected Inverter

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

Remote server information

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

Help

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

Figure 88 – Status Screen

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

Dear user:

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

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

Start

1 2 3 4 5 6 7

Figure 89 – Screen for starting (1) the Setup Wizard

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

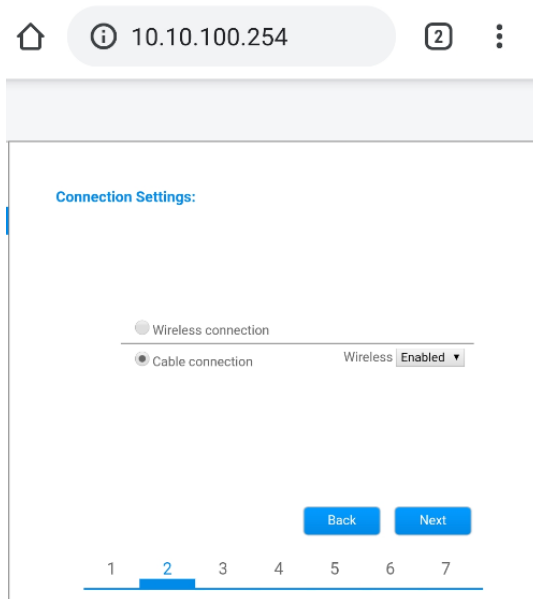


Figure 90 - Network cable connection selection screen

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

Please fill in the following information:

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

Back Next

1 2 3 4 **5** 6 7

Figure 91 - Screen for automatically obtaining the IP address (5)

12) Click on Next without making any changes.

Enhance Security

You can enhance your system security by choosing the following methods

Hide AP

Change the encryption mode for AP

Change the user name and password for Web server

Back

Next

1 2 3 4 5 **6** 7

Figure 92 - Screen for setting the security options (6)

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

Configuration completed!

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

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

Back

OK

1 2 3 4 5 6 **7**

Figure 93 - 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.

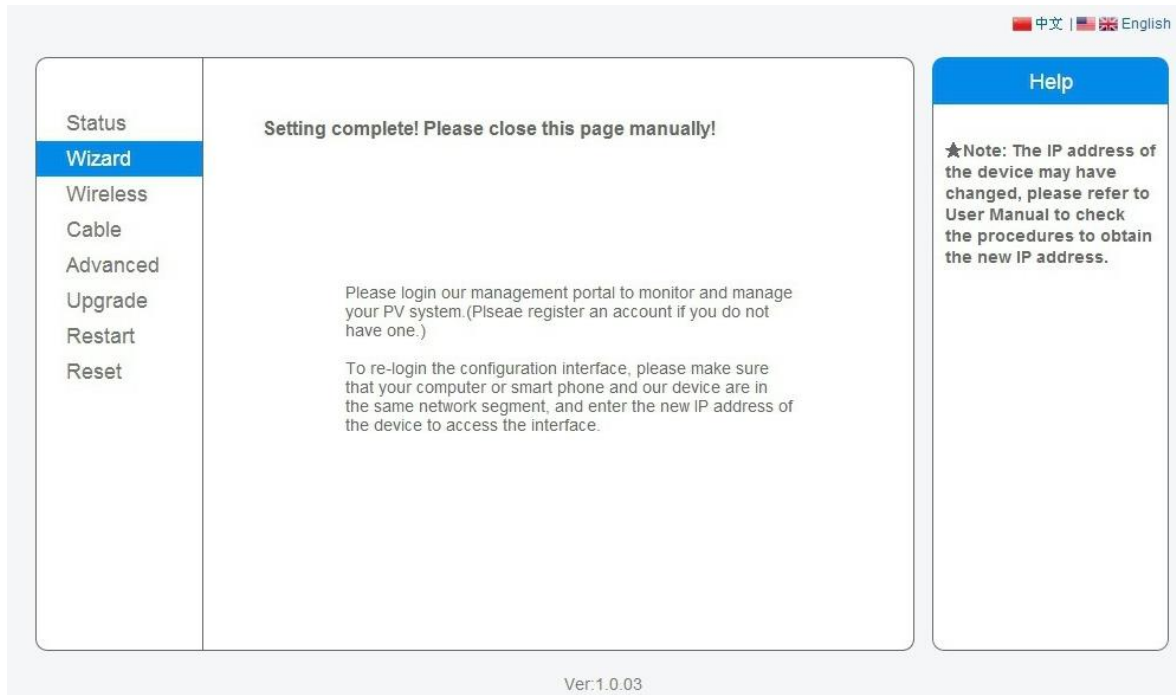


Figure 94 – Successful configuration screen

10.4.6. 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 95 – LED indicating the correct configuration of the datalogger

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

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

Device information

Device serial number	508263482
Firmware version	H4.01.51MW.2.01W1.0.74(2019-03-143-D)
Wireless AP mode	Enable
SSID	AP_508263482
IP address	10.10.100.254
MAC address	BC:54:F9:F6:B9:74
Wireless STA mode	Enable
Router SSID	iPhone di Giacomo
Signal quality	100%
IP address	172.20.10.10
MAC address	BC:54:F9:F6:B9:75
Cable mode	Disable
IP address	
MAC address	

Connected Inverter

Type	ZCS
Number	1
Inverter serial number	ZA1ES111G8R273 ▼
Firmware version (main)	V550
Firmware version (slave)	---
Inverter model	ZA1ES111
Rated power	1 00 W
Current power	0 W
Yield today	0 kWh
Total yield	0 kWh
Alerts	F12F14
Last updated	0 min ago

Remote server information

Remote server A	Pingable
-----------------	----------

Figure 96 – Main status screen and checking of correct configuration

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

Figure 97 - 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.

- Status
- Wizard
- Wireless
- Cable
- Advanced
- Upgrade
- Restart
- Reset**

Restore factory setting

★Important:

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

Are you sure to reset now?

OK

Back

Figure 98 – Reset Screen



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

10.4.7.1. Mechanical description and Datalogger interface

Mechanical Dimensions: 127mm x 134 x 52 mm

Protection rating: IP20

The usable ports are indicated below.

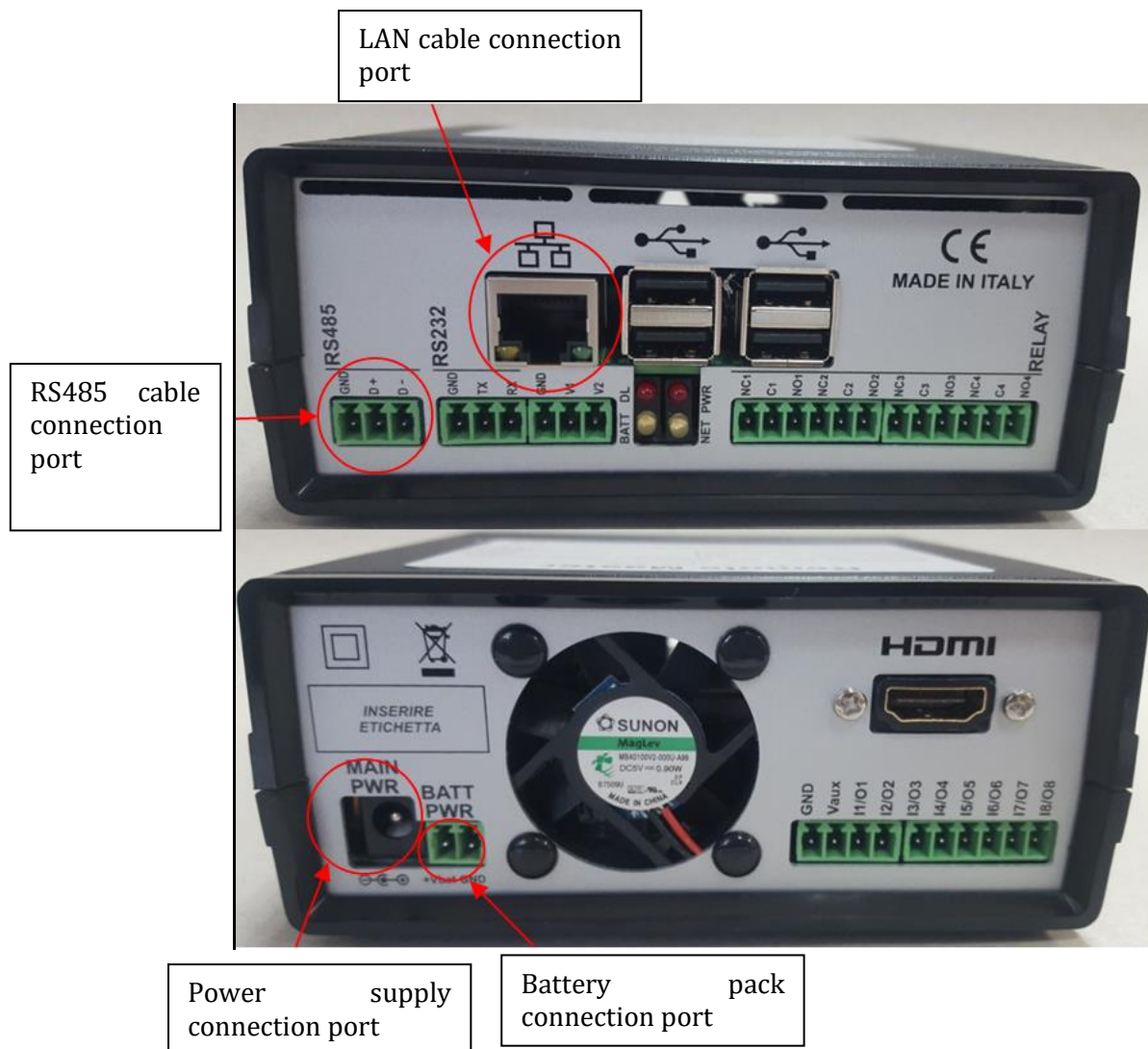


Figure 99: Datalogger rear panel

10.4.7.2. 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

10.4.7.3. 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.

10.4.7.4. 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.

10.4.7.5. 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)	

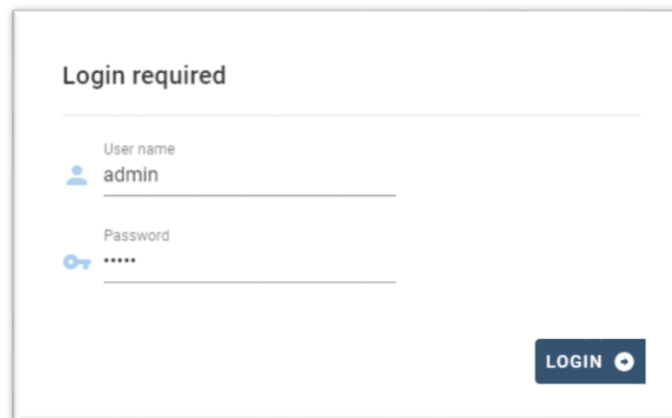
Table 4: Electrical connection of the sensor to the datalogger (power supply)

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.

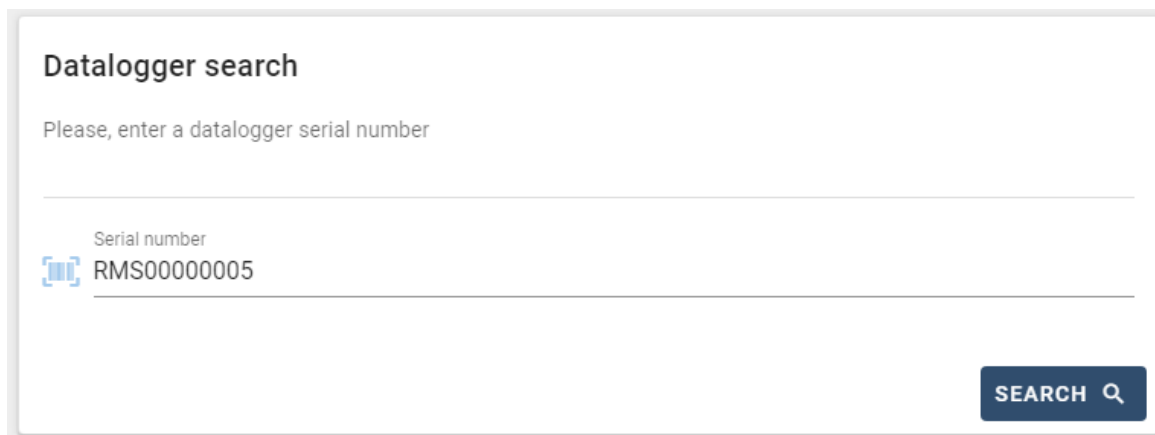
For longer distances, a connection to the signal side of the datalogger is recommended, and a connection to the +12V power supply via an external power supply unit.

10.4.8. Configuring the Datalogger

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

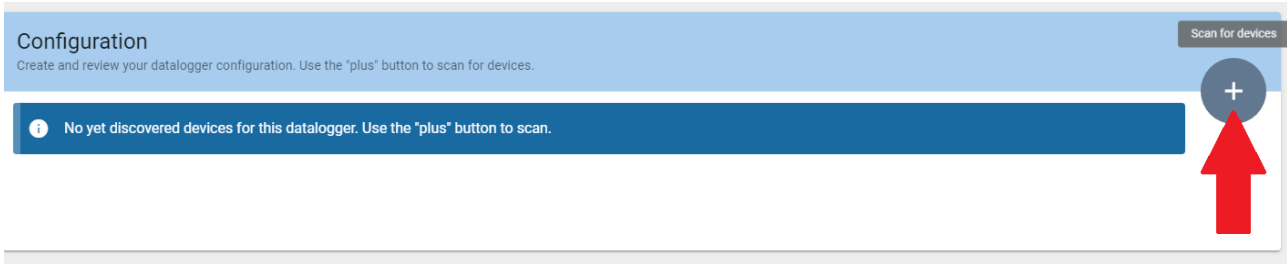


In the screen that opens, enter the serial number(S/N) of the datalogger to be configured and click "SEARCH".

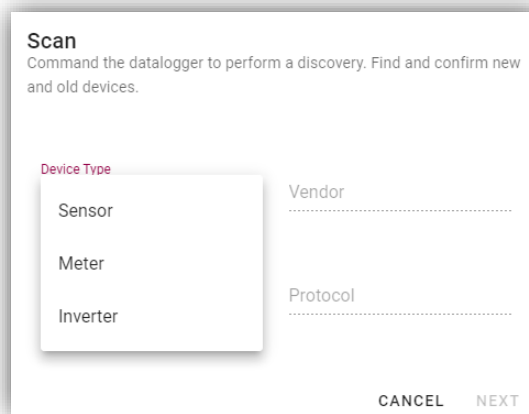


In the configuration page, you can search for any devices connected to the datalogger (inverter, meter or sensors) by clicking the + button, as shown in the figure.

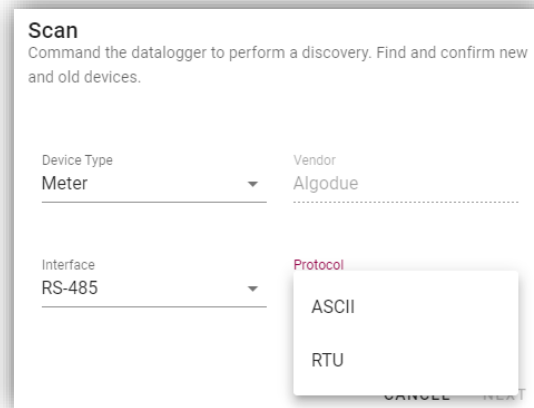
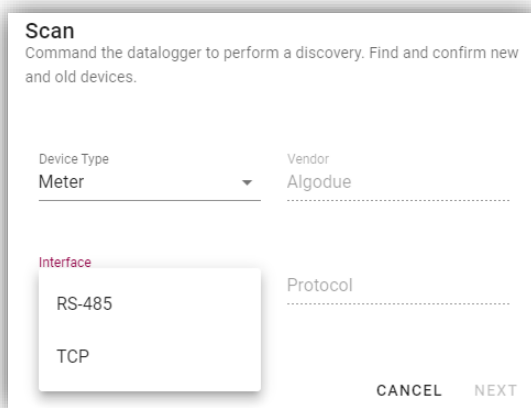




A window will open where you can search for each type of device connected to the Datalogger, after indicating the range of addresses associated with the relative devices.



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.

Confirm changes

State

Confirming new 1

Total now 1

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

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

+

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

10.4.8.1. Configuring the Datalogger on the ZCS Azzurro portal

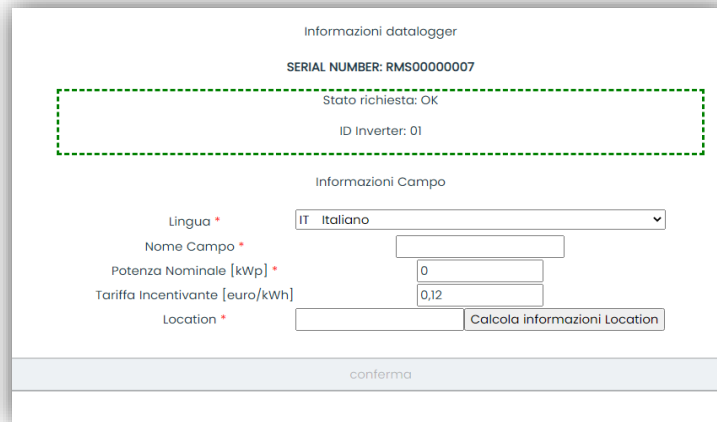
Access the ZCS Azzurro portal (<https://www.zcsazzurroportal.com>). For new users, click “Sign up now” to register on the portal by entering your email, username and password. After logging into the portal, click “Configuration Panel”, and then select the option “Create field with Datalogger.” The “Create 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).

AZZURRO
ZCS

Informazioni datalogger

Serial number:

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.

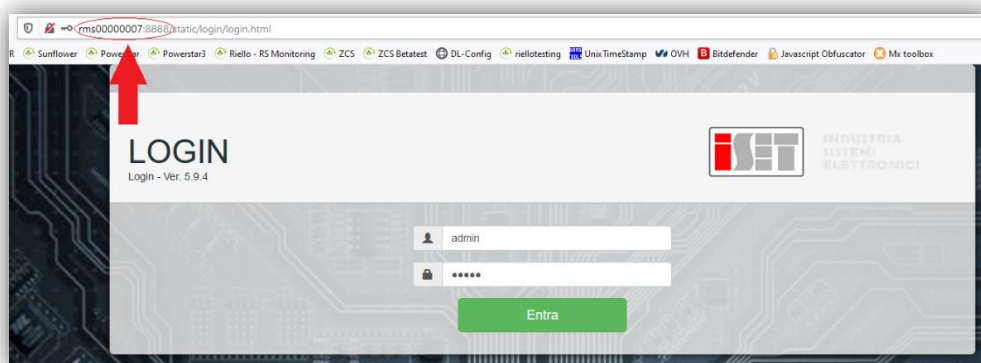


Once the “location” of the field has been entered, click “Calculate Location Information” to allow the system to obtain the latitude, longitude and time zone of the installation. Click “Confirm” to complete the configuration of the field. You only need to wait a few minutes to view the data flow on the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

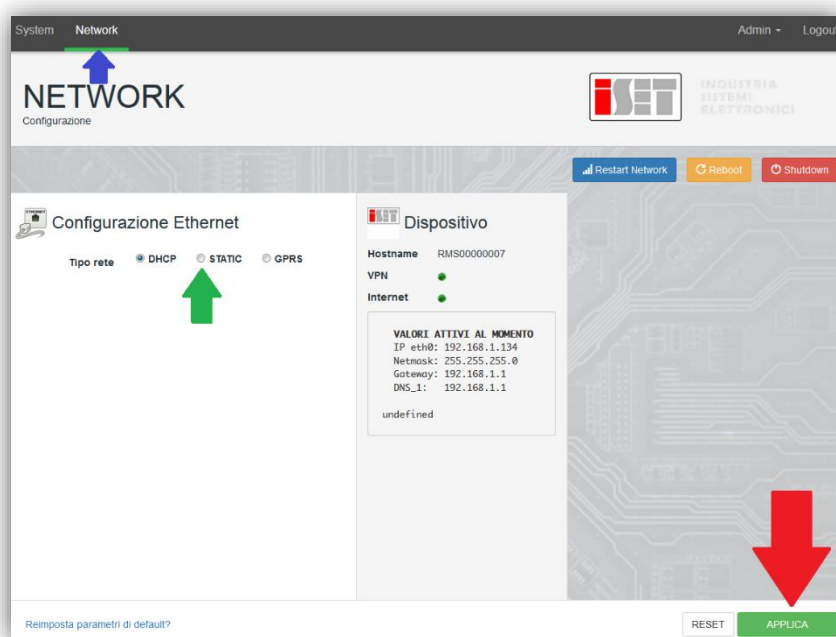
ATTENTION: The location data is essential for the correct operation of the datalogger in the ZCS system. It is important to define it very carefully.

10.4.8.2. Network configuration

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



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



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

10.4.9. 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.

10.4.9.1. 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.

10.4.9.2. Features of local monitoring

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

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

Below is an example of a local monitoring page.

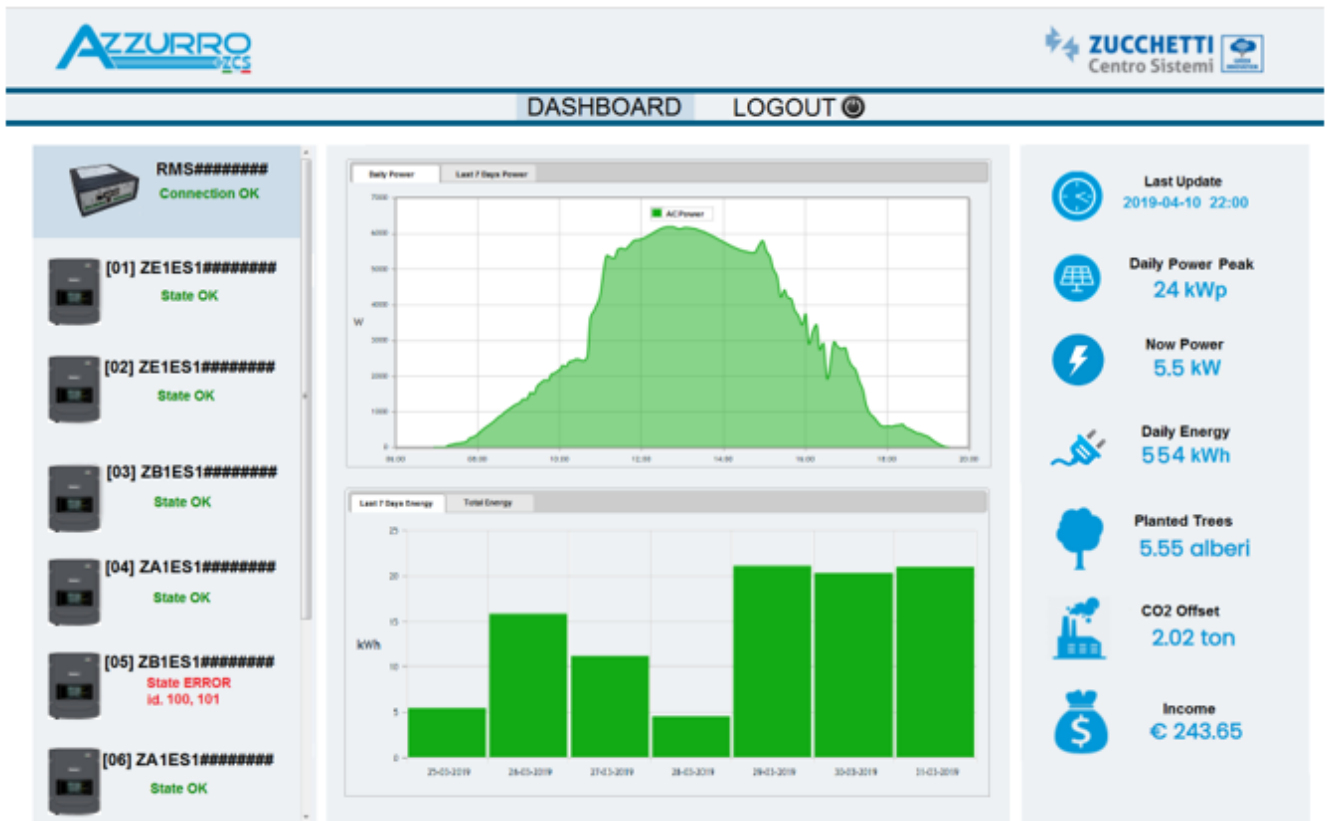


Figure 100: Example of local monitoring page

11. 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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