PSI-X1P3000-HY
PSI-X1P5000-HY
PSI-X1P6000-HY

EN

SINGLE PHASE HYBRID INVERTER

User Manual

PEIMAR

It is specified that the technical data, information and representations riported in this document mantain a purely indicative value. Peimar reserves the right to modify the data, drawings and information contained in this document at any time and without notice.

PEIMAR

Introduction

This owner's manual outlines step-by-step instructions and procedures for installing, operating, maintaining, and troubleshooting the following grid-connected Peimar inverters:

PSI-X1P3000-HY	PSI-X1P5000-HY	PSI-X1P6000-HY

Please keep this manual available at all times in case you need it.

1. Security measures

1.1. Security tips

The inverter is a device directly connected to a HIGH VOLTAGE power generator. Installation, maintenance, and repair of the inverter may only be carried out by qualified personnel who have carefully read and fully understood all safety regulations contained in this manual.
Keep the user manual properly and read it before use.

1.2. Legend of Safety Symbols

DANGER
Indicates a hazardous situation which, if not avoided, will lead to death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, may lead to death, serious injury, or moderate injury.

ATTENTION
Indicates a hazardous condition that, if not avoided, may lead to minor or moderate injury.

NOTICE
Indicates a situation that can lead to potential harm, if not avoided.

1.3. Safety Instructions

DANGER

1 The user must comply with applicable electrical codes and national and local regulations when installing, operating, and maintaining the inverter, to avoid personal injury or death and damage to the inverter.

2 The work must be carried out by qualified personnel and the equipment must be handled by persons with appropriate experience and knowledge.

3 Do not touch the live parts of the inverter while the device is operating; There is danger of death from electric shock and high voltage.

4 To prevent the risk of electric shock during installation and maintenance, please ensure that all AC and DC terminals are disconnected from the inverter. Never touch the positive and negative poles of the PV strings at the same time.

5 Make sure that the existing wiring is in good condition and that the cables are not undersized. Wiring should be done so that the length of the cables is as short as possible.

6 Do not touch the surface of the inverter while the coating is wet; may result in electric shock.

7 Do not stay near the inverter during adverse weather conditions including storms, lightning, etc.

8 Before touching the cladding, the Peimar inverter must be disconnected from the grid and the photovoltaic generator; You must wait at least five minutes to allow the energy storage capacitors to fully discharge after being disconnected from the power source. Measure the voltage between the positive and negative terminals of the PV connection device to make sure that the device is discharged before carrying out any work on the inverter.

9 The island effect is a particular phenomenon whereby the photovoltaic system continues to feed energy into the grid even when there is a grid loss in the electricity system; This is dangerous for maintenance personnel and the public. The inverters in this series are equipped with built-in protection to avoid the island effect.

10 The inverters of this series are equipped with an internal device certified for residual currents, to protect against possible electrocution and fire risks in the event of a malfunction of the photovoltaic array, cables or inverter. If local regulations require an external residual current, provide for the installation of a residual current circuit breaker downstream of the AC side output, with a residual current of at least type A (a type A or F residual current is recommended) and a tripping threshold Idn=0.3A.

WARNING

1 The installation, maintenance, recycling and disposal of inverters should only be carried out by qualified personnel, in accordance with current national and local laws and regulations and with the use of appropriate equipment. Do not allow the inverter to be used by children or unqualified personnel.

2 The installation site must be away from moisture and corrosive agents.

3 Any unauthorized action, including modification of any type of product functionality, may result in damage to components and a lethal danger to the operator, or to third parties.

4 Do not disassemble inverter parts not mentioned in the installation guide. In the event of improper modifications, Peimar is not responsible for any damage and refrains from any liability relating to the warranty of the aforementioned product.

5 The Peimar inverter must be used exclusively in combination with photovoltaic panels, in compliance with current regulations; do not connect any other power sources to the Peimar inverter.

6 Use only recommended accessories. Failure to do so may result in fire, electric shock, or injury.

7 Make sure that the PV generator and inverter are properly connected to the grounding system; Improper grounding may result in physical injury, death, or equipment malfunction and increase electromagnetic emissions. Ensure that the ground conductor is properly sized as required by safety regulations. Do not connect the unit's ground terminals in series in case of multiple installation.

8 Keep away from flammable and explosive materials to avoid fire.

9 Never touch the positive and negative poles of the PV part together, and never touch each other together at the same time.

10 The unit contains capacitors that remain charged even after the power supply has been disconnected; Allow at least 5 minutes to pass after disconnection. Make sure there is no voltage before operating.

ATTENTION

1 The PV inverter can reach high temperatures during operation. Please do not touch the heat sink or side surface during operation or immediately after shutting down to avoid the risk of burns.

2 To prevent damage and personal injury, hold the inverter firmly when moving, as it is a heavy piece of equipment.

3 Staying at a distance of less than 20 cm from the inverter for a long time could cause damage to your health due to the effect of radiation.

NOTICE

1 The photovoltaic inverter is designed to feed alternating current energy directly into the public electricity grid; Do not connect the inverter's AC output to any device that is not connected to the public distribution power grid.

2 There can be damage to the photovoltaic system both due to direct lightning strikes and due to overvoltages due to nearby discharges. Induced surges are the most likely cause of damage especially in rural areas, where electricity is usually supplied by long power lines. Surges can be induced on both direct current cables and AC cables leading to the building. The designer, on the basis of the risk of lightning strike and what is required by current legislation, will assess the need to install or not any external arresters in addition to the SPs already supplied with the inverter, for the protection of the circuits on the photovoltaic side and on the AC side.

1.4. Key symbols on the label

DANGEROUS ELECTRICAL VOLTAGE

This device is directly connected to the public power grid, therefore any work on the inverter must be carried out by qualified personnel.

DANGER TO LIFE due to high electrical voltage

In the inverter, there may be a residual voltage due to the high capacitance of the capacitors. Wait 5 minutes after disconnecting the appliance before removing the cover.

WARNING, DANGER!

The appliance is directly connected to electric generators and the public power grid.

DANGER OF HOT PARTS

The elements inside the inverter reach high temperatures during operation. Do not touch the metal housing when the inverter is active (risk of burns).

This device MUST NOT be disposed of as waste urban

Please refer to the "Disposal" chapter of this manual for proper management of the inverter disposal.

WITHOUT TRANSFORMER

This inverter has no isolation transformer.

GROUNDING

On the inverter, the connection point of the protective conductor for earthing is indicated.

CE MARK

Devices with the CE mark comply with the basic requirements of the Low Voltage Directive and the Electromagnetic Compatibility Directive.

RoHS **RoHS**

This device complies with the Restriction of Hazardous Substances Directive (ROHS).

INSTRUCTIONS

Refer to this manual for instructions regarding the installation, operation, maintenance, and troubleshooting of the inverter.

2. Product Information

2.1. Field of application

The PSI-X1P series inverters are hybrid inverters that can be connected to the power grid. They are key components in grid-connected photovoltaic systems. The PSI-X1P series inverters receive the electrical energy generated in direct current (DC) from photovoltaic panels and convert it into alternating current (AC), in accordance with the requirements of the utility grid. In the event of a grid failure, thanks to the storage system, it provides a source of energy to support back-up loads, achieving an uninterrupted power supply function.

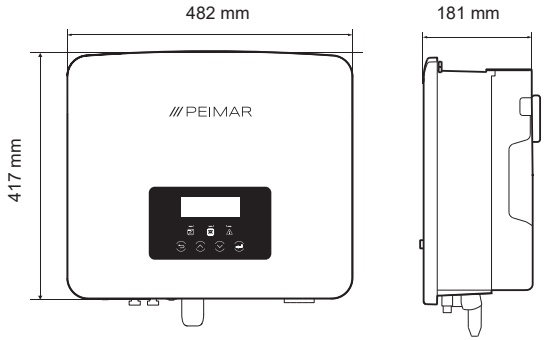
2.2. Product Model Specifications

PSI-X1PXXXX-HY

- PSI-X1P indicates the name of the inverter series
- XXXX indicates the rated power in W of the inverter
- HY indicates that it is a hybrid inverter

2.3. Dimensions of the products

All products in the PSI-X1P series have the same dimensions, as shown in the figure below:



2.4. Packing list

Specific	Quantity
Inverter	1
Support bracket	1
RJ45 port protection cover	1
MC4 connector (male)	2
MC4 connector (female)	2
MC4 Metal Inserts (Male)	2
MC4 Metal Inserts (Female)	2
Terminal 8AWG	1
Ring terminal for ground cable	1
Plugs	3
Grapevines	3
Puck	3
Terminal 10AWG	3
Hex Head Screw M5	1
RJ45 plugs with anti-water cover	3
RJ45 terminals	1
Extend RJ45	1
Module Wi-Fi PSI-X-H -WIFI -3.0	1

Content control

Please refer to the list of accessory components contained in the packaging and check that they are all present before proceeding with the installation; If there are any missing parts, contact your dealer as soon as possible.

3. Installation hypothesis

3.1. Packing check

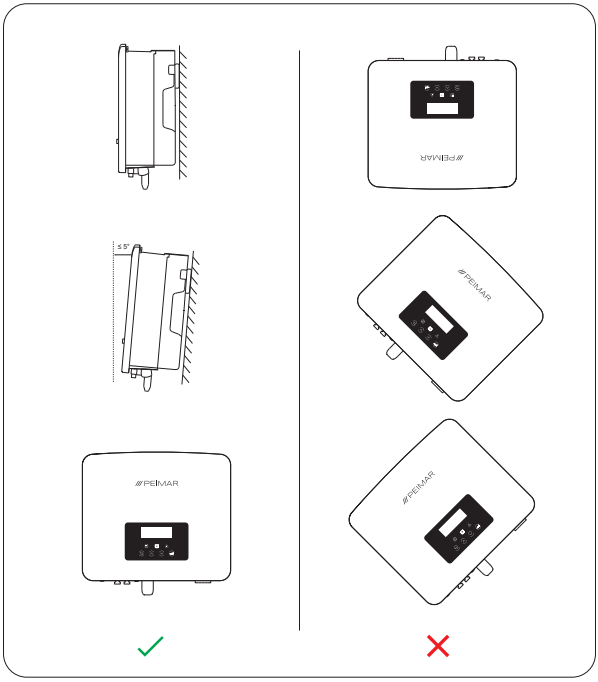
Although Peimar inverters have passed rigorous controls and are tested before they leave the factory, it is not excluded that they may be damaged during transport. Please check that the packaging has not shown any obvious signs of damage; In the event that this is the case, please do not open the box and contact your dealer as soon as possible.

3.2. Methods of installation and placement

Make sure that the inverter installation wall has enough tightness to support its weight.

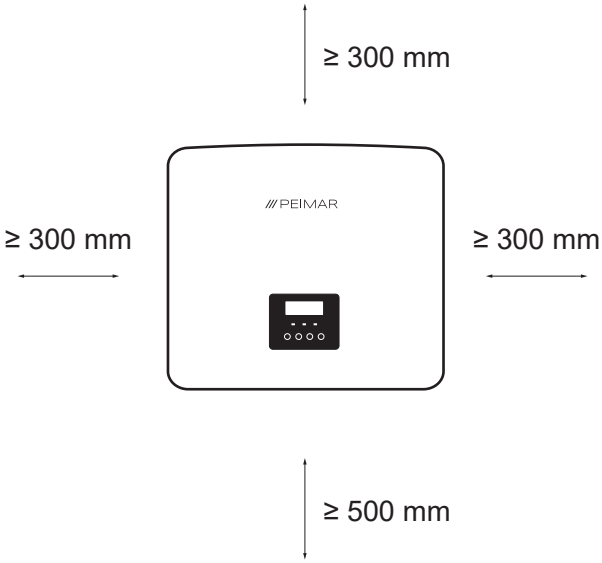
Do not place the inverter with the input/output terminals in contact with other surfaces, as these are not designed to support the weight of the inverter. Always place the inverter horizontally during the installation phases.

1. Please install the device as shown in the figure below. Vertical installation is recommended, or with a maximum inclination of ±5°. Never install the inverter with a side-to-side tilt, horizontal position, or upside down position. Install the inverter out of direct sunlight and avoid any snow accumulation.

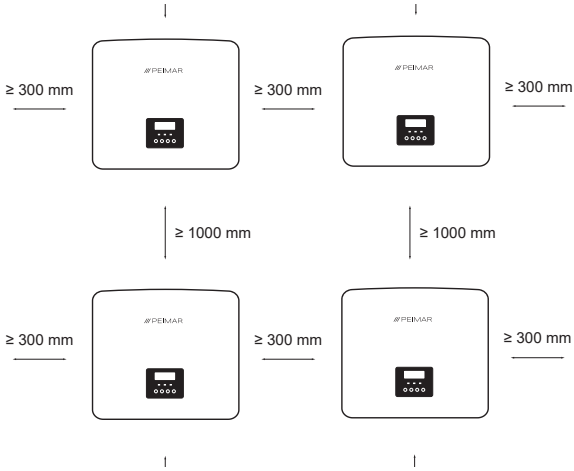


2. Install the inverter at eye level to facilitate the display and possible maintenance activities.

3. Carry out the installation of the inverter with the possibility of disassembly for any maintenance work. Also make sure that there is free space around the device for ventilation to be ensured, as shown in the figure below (see next page):



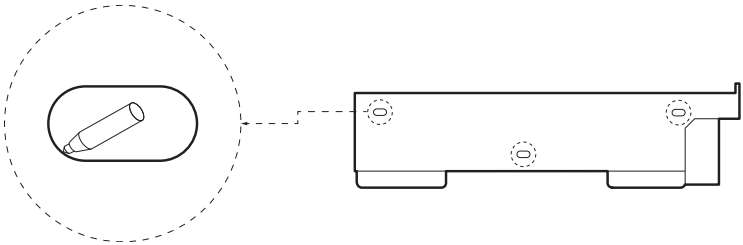
In case of installation of multiple inverters, the in-line installation method is recommended. When space is insufficient and it is necessary to install several inverters on top of each other, please refer to the distances indicated in the figure below:



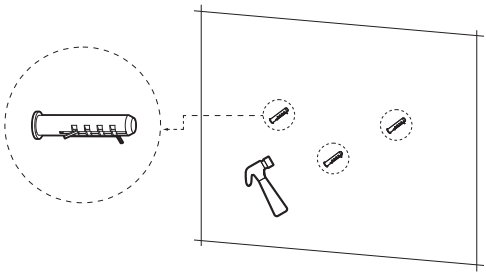
3.4. Assembly Procedure

To proceed with the installation, provide all the tools such as: crimping pliers, screwdrivers, drill, Allen keys, etc.

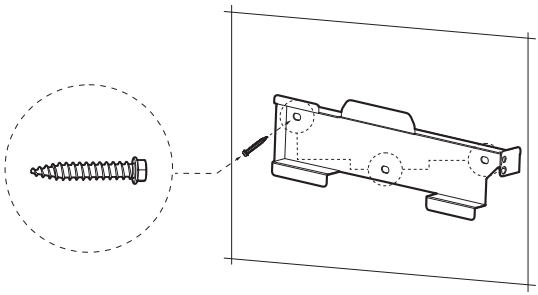
1. Mark the three drilling points for mounting the bracket on the wall;



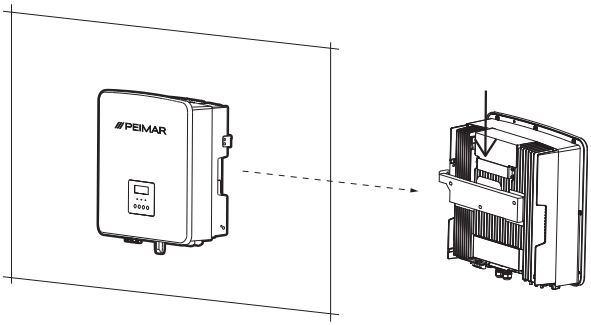
2. Drill the Ø10 mm holes to a depth of 80 mm and insert the expansion anchors into them using a rubber mallet.



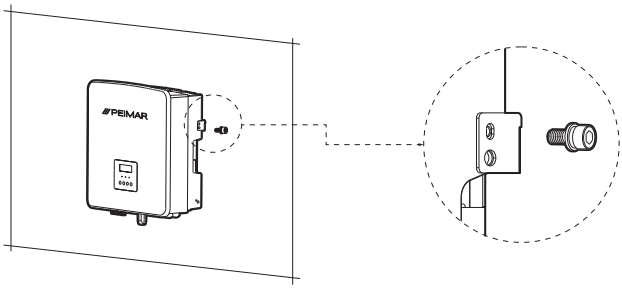
4. Fix the bracket to the wall by screwing the screws into the fixing anchors with the Allen wrench with a tightening torque of 2.5 ± 0.2 Nm



5. Carefully attach the inverter to the bracket.



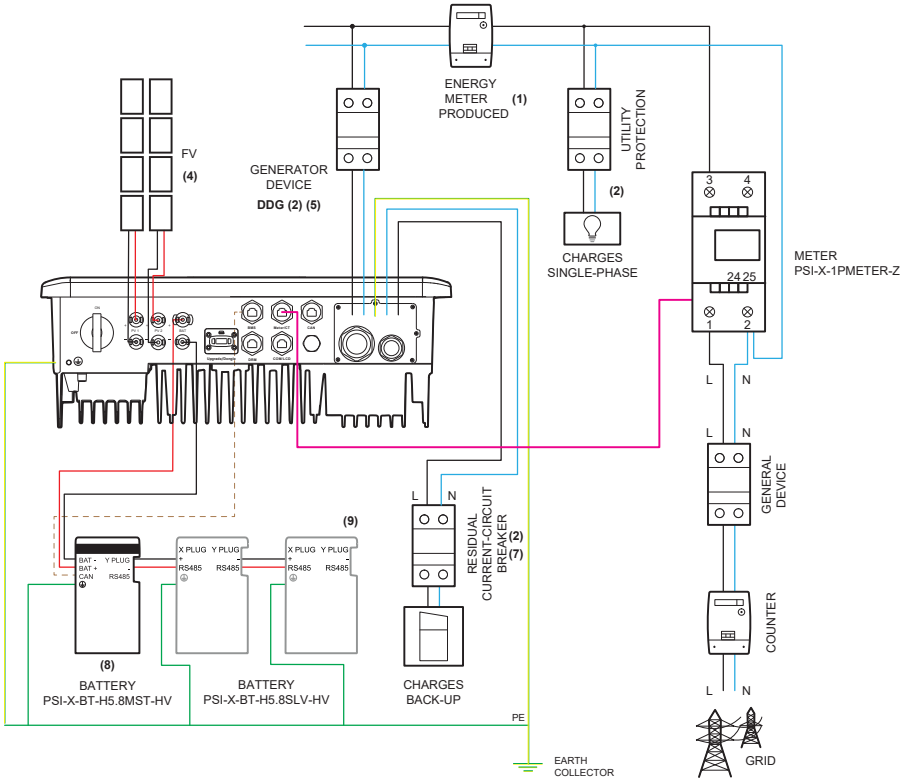
6. Use the TCEI wrench to tighten the internal hex screw on the right side of the inverter with a tightening torque of 1.2±0.1 Nm making sure the back of the device is mounted tightly with the bracket.



4. Installation Hypotheses

4.1. Config. of an X1P series single-phase hybrid inverter

Configuring an X1P Series Single Phase Hybrid Inverter with PSI-X- BT- Master Batteries 5.8MST-HV and PSI-X-BT-5.8SLV-HV slaves in series with back-up line (Off-grid) and PSI-X-1PMETER-ZI meter.



1. The position of the energy meter indicated in the diagram is purely indicative and to be evaluated in agreement with the designer on the basis of the regulations in force at the time of installation and any other existing systems.

2. The protections indicated on the diagram and their position are purely indicative and to be evaluated in agreement with the designer on the basis of the regulations in force at the time of installation and any other existing systems.

PLEASE NOTE

Peimar does not provide the protections described in this document. Contact your distributor for purchase.

3. For the correct operation of the system, it is necessary to install the Peimar meter PSI-X-1PMETER-ZI (For currents up to 80 A) upstream of all network loads and downstream of the exchange meter. For more details, refer to the Meter Connections chapter of this manual.

4. If the configuration chosen for the system requires it, they must be the same as each other. We recommend the use of all MPPTs of the inverter. For more details, please refer to the chapter on PV connections in this section.

5. For safety and in compliance with regulations, provide for the installation of a thermal-residual current circuit breaker downstream of the AC side output and any back-up line, with a differential of at least type A and an tripping threshold Idn=0.3A. Size the AC line according to the distance between the inverter and the exchange meter. For details, refer to the AC Connections chapter of this manual.

6. The designer will evaluate the need to install or not any additional external arresters, with respect to the surge protectors (SPDs) already supplied with the inverter, for the protection of the photovoltaic and AC side circuits. For more details, refer to the PV and AC connections chapter of this manual.

7. The back-up line (OFF-GRID) is supplied only in the event of zero voltage at the GRID output (grid-side blackout). Therefore, in order to be able to continuously power the loads connected to the OFF-GRID output, a switching interlock with the relative automatic protections must be provided, in accordance with current legislation (CEI 0-21, CEI 0-16, etc.).

8. Possible battery configurations:

   a) Peimar PSI-X-SYS-H5.8-HV (Compound of 1 Master PSI-X-BT-5.8MST-HV)

   b) Peimar PSI-X-SYS-H11.5-HV
   (Composite of 1 Master PSI-X-BT-5.8MST-HV + 1 Slave PSI-X-BT-H5.8SLV-HV)

   c) Peimar PSI-X-SYS-H17.3-HV
   (Composite of 1 Master PSI-X-BT-5.8MST-HV + 2 Slave PSI-X-BT-H5.8SLV-HV)

   d) Possible battery configurations with the use of parallel BMS:
   - Peimar PSI-X-SYS-S5.8-H (Compound of the PSI-X-PRL-BMS + 1 Slave PSI-X-BT-H5.8SLV-HV)
   - Peimar PSI-X-SYS-S11.5-HV (Composed of parallel BMS PSI-X-PRL- BMS + 2 Slaves PSI-X-BT-H5.8SLV-HV in series on B1 input)
   - Peimar PSI-X-SYS-S17.3-HV (Composto da BMS di parallelo PSI-X-PRL-BMS + 3 Slave PSI-X-BT-H5.8SLV-HV in serie su ingresso B1)
   - Peimar PSI-X-SYS-P11.5-HV (Composed of parallel BMS PSI-X-PRL- BMS + 1 Slave PSI-X-BT-H5.8SLV-HV on input B1 + 1 Slave PSI-X-BT- H5.8SLV-HV on input B2)
   - Peimar PSI-X-SYS-P23.0-HV (Composed of parallel BMS PSI-X-PRL-BMS + 2 Slaves PSI-X-BT-H5.8SLV-HV on input B1 + 2 Slaves PSI-X-BT-H5.8SLV-HV on input B2)
   - Peimar PSI-X-SYS-P34.6-HV (Composed of parallel BMS PSI-X-PRL-BMS + 3 Slaves PSI-X-BT-H5.8SLV-HV on input B1 + 3 Slaves PSI-X-BT-H5.8SLV-HV on input B2)

NOTICE

Configuration with 5 batteries is not possible.

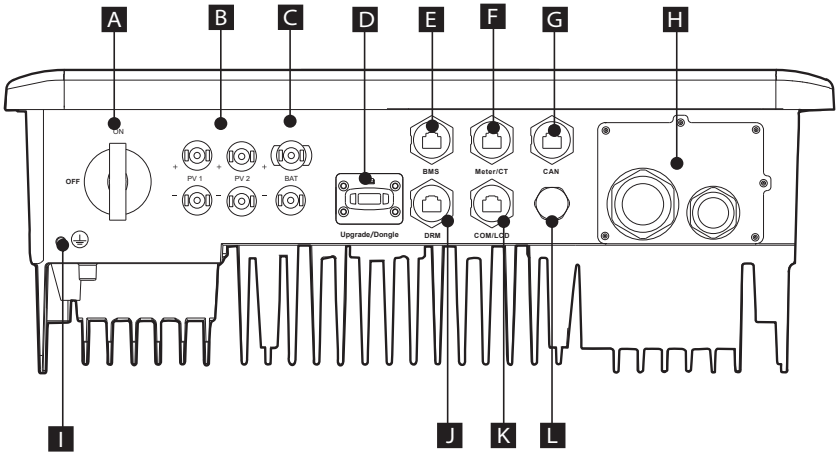
Since the PSI-X-BT-5.8MST-HV battery has a built-in 40A circuit breaker, and the entire storage system is connected in series, no additional circuit breaker is required. For more details, refer to the chapter on connecting the storage system in this manual.

9. Insert the series locking wire between the "-" and "YPLUG" ports on the right side of the last battery module to complete the internal circuitry. The RS485 port on the right side of the last battery will remain unused.

5. Electrical Connection

5.1. Inverter Connection Inputs

Below are the inputs on the underside of the inverter



A	DC disconnect switch
B	Photovoltaic Input
C	Battery Inputs
D	USB port for firmware update/External monitoring connection port
E	BMS port for battery communication
F	METER/CT port for communication with measuring device
G	CAN port for inverter parallel connection
H	Terminal for Loads/Back-up line connection (Off-grid)
I	Screw for ground connection
J	DRM port (Australia only)
K	COM port for communication with external device
L	Waterproof valve

5.2. PV connection

Before proceeding with the connections, it is advisable to pay attention to the following technical specifications:

- It is important to connect only modules with the same electrical characteristics (same panel model) and the same orientation and sun exposure on the same string.
- If you have panels with different electrical characteristics (different models; different number of modules in series; different orientation; etc.) you need to use independent MPPTs that act separately.

For the correct operation of the inverter, make sure that the voltage and current compatibility between the inverter and the photovoltaic strings is respected.

NOTICE

Make sure that the voltage and current of the strings do not exceed the input voltage of the inverter; Incorrect configuration may cause permanent damage to the inverter, which will not be included in the warranty, make sure that:

Voc_Tmin (Open Circuit Voltage at Minimum Temperature) < Vmax_cc (Maximum DC Voltage)

Vmp_Tmin (Voltage at Pmax at minimum temperature) < Vmax_mppt (Maximum MPPT voltage)

Vmp_Tmin (Voltage at Pmax at minimum temperature) < Vmax_sis (Maximum System Voltage of Panel)

Imp_Tmax (Current at Pmax at maximum temperature) < Imax_mppt (Maximum MPPT current)

NOTICE

Make sure that the voltage of the strings is greater than the start-up voltage of the inverter or the system may not turn on or have poor efficiency:

Voc_Tmax (Open Circuit Voltage at Maximum Temperature) > Vstart (Start Voltage)

Vmp_Tmax (Voltage at Pmax at maximum temperature) > Vmin_mppt (minimum MPPT voltage)

PLEASE NOTE

You can't parallel strings.

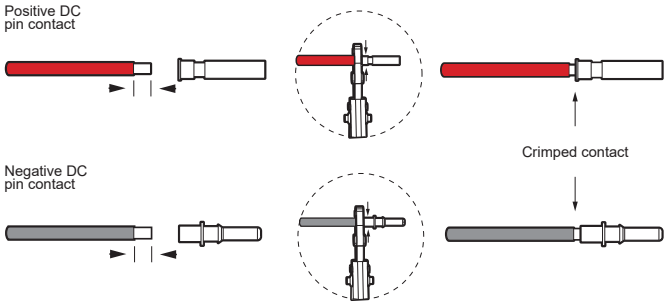
DC Connection Procedure

PLEASE NOTE

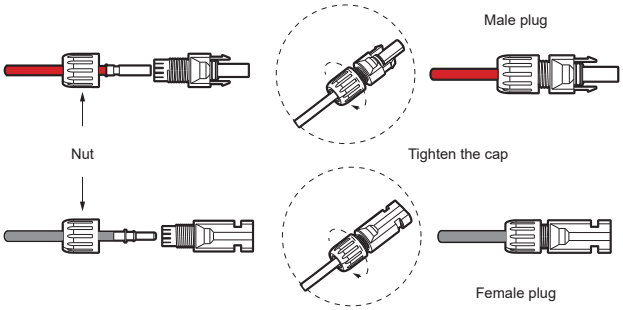
Before connecting the PV strings to the inverter Check that the inverter's DC disconnect switch is turned OFF.

For the DC connection, follow the mounting procedure below:

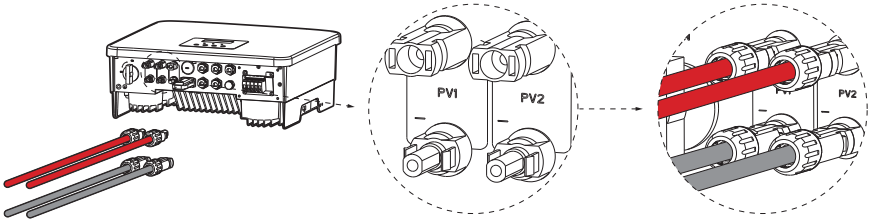
1. Take from the package the 2 pairs of positive and negative MC4 connectors, including waterproof gasket and metal insert, which will be mounted on the terminals of the strings to make the connection with the inverter. Strip the cable ends of the PV string by 8-10 mm and crimp the metal insert of the MC4 connectors with pliers, taking care to respect the polarities.



2. Insert the locking nut and waterproof gasket of each MC4 connector into the PV string cables. Screw the connector onto the locking screw, taking care to observe the polarities.



3. Connect the positive and negative connectors into the respective DC input terminals of the inverter; You should hear a click when the connectors are properly connected.



PLEASE NOTE

It is recommended to use a suitable tool when assembling and disassembling the MC4 connectors so as not to run the risk of damaging them.

5.3. AC Connection

For safety and in compliance with regulations, provide for the installation of a thermal-differential circuit breaker downstream of the AC and back-up outputs; we recommend a residual current circuit breaker of at least type A and a tripping threshold Idn=0.3A. Size the AC line according to the distance between the inverter and the exchange meter. For limits and recommended values, refer to the table below. (Values shown are standard. Please check the cross-section of the cables according to the actual length of the line and the resulting voltage drop).

	PSI-X1P3000-HY	PSI-X1P5000-HY	PSI-X1P6000-HY
Cellar (oar)	4-6 mm^2	8-10 mm^2	8-10 mm^2
Microswitch	32 A	50 A	50 A

	PSI-X1P3000-HY	PSI-X1P5000-HY	PSI-X1P6000-HY
Cellar (oar)	3-4 mm^2	4-6 mm^2	4-6 mm^2
Microswitch	25 A	32 A	32 A

Size the back-up line (OFF-GRID) according to the distance between the inverter and the exchange meter. For limits and recommended values, refer to the table below. (Values shown are standard. Please check the cross-section of the cables according to the actual length of the line and the resulting voltage drop).

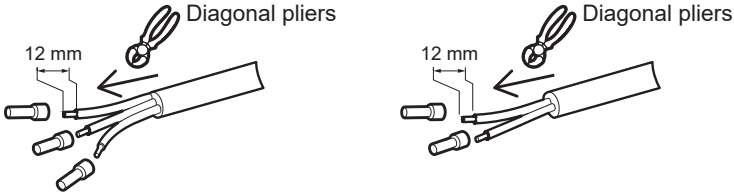
	PSI-X1P3000-HY	PSI-X1P5000-HY	PSI-X1P6000-HY
Cellar (oar)	3-4 mm^2	4-6 mm^2	4-6 mm^2
Microswitch	25 A	32 A	32 A

Since the PSI-X-BT-5.8MST-HV battery has a built-in 40A circuit breaker and the entire storage system is connected in series, no additional circuit breaker is required.

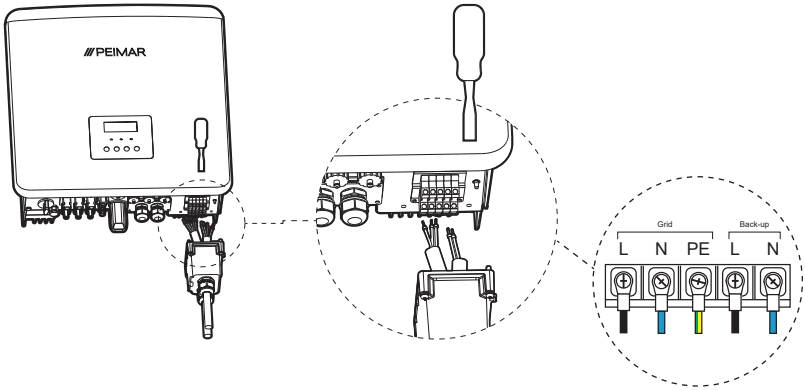
AC Connection Procedure

Before connecting the AC line to the inverter, make sure that you have cut off the power to the AC side.

1. Prepare a three-core cable and a two-core cable by stripping the ends by 12 mm.



2. After that, locate the European terminals and the waterproof cover in the package.



3. The AC line and back-up cables run through their respective Grid ports and back-up of the waterproof cover.

The back-up line (OFF-GRID) of the PSI-X1Pxxxx-HY inverter is continuously supplied both in the event of zero voltage at the GRID output (grid-side blackout), and in the case of normal connection to the grid as a privileged load, net of a short intervention time.

If the inverter is switched off or disconnected (e.g. in the event of maintenance on the device), the back-up output (OFF-GRID) is not powered. In this case, it is advisable to provide an external switch (automatic or manual), in order to supply the privileged loads directly from the grid during maintenance operations.

Provide for any external protections in compliance with the current CEI regulations and the indications of the network operator.

5.4. Connecting the storage system

Make sure that the installation site meets the following conditions:

- The building is designed with anti-seismic features
- The seat is away from the sea, to prevent brackish water and humidity from damaging the batteries
- The floor is flat
- There are no flammable or explosive materials in the vicinity
- The environment is cool and shaded, avoid direct sunlight and keep away from heat sources
- Temperature and humidity remain at constant levels
- There is a minimum amount of dust and dirt in the area
- There is no presence of corrosive gases, including ammonia and acid vapour
- The ambient temperature is between 0 °C and 55 °C, and the optimal ambient temperature is between 15 °C and 35 °C

Storage conditions

Batteries must be stored in accordance with the above storage requirements and must be installed and switched on for a first charge within 3 months of leaving the Peimar factory. The installer must agree with his supplier for the delivery, installation and switching on of the storage system for recharging in good time. At the end of the 3 months of non-use, the storage system must be charged to at least 50% SOC.

PLEASE NOTE

When the system is put on stand-by or is switched off for a prolonged period (more than 3 months) for various needs, proceed with the forced charging of the storage system in order to maintain a SOC level of at least 50%.

Adding or replacing batteries to an existing storage system

If a battery is replaced or added to the storage system, the new battery must have a SOC percentage charge that is as close as possible to the entire system, otherwise the difference in cell voltage could create malfunctions in the storage system. A maximum difference of ±5 % is permitted.

Since the batteries at the exit from the factory should have between 40% and 50% SOC, before installing the new battery make sure that the SOC of the existing storage system is about 40%. Also check with technical support to make sure that the inverters and batteries are updated to the latest firmware version

5.4.1. PSI-X-BT-5.8MST-HV master and PSI-X-BT-5.8SLV-HV slave battery connection

NOTICE

Since the PSI-X-BT-5.8MST-HV battery has a built-in 40A circuit breaker and the entire storage system is connected in series, no additional circuit breaker is required.

Included in the package of each PSI-X-BT-5.8MST-HV master and PSI-X-BT-5.8SLV-HV slave battery are the BMS power and communication cables necessary for connection and are already crimped on both ends.

Possible battery configurations:

a) 5.8 kWh = 1 Master PSI-X-BT-5.8MST-HV

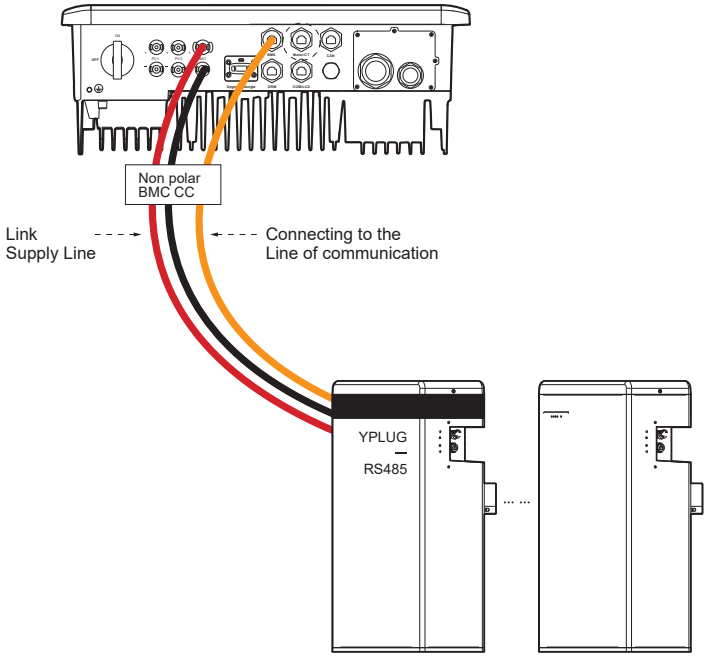
b) 11.5 kWh = 1 Master PSI-X-BT-5.8MST-HV + 1 Slave PSI-X-BT-H5.8SLV-HV

c) 17.3 kWh = 1 Master PSI-X-BT-5.8MST-HV + 2 Slave PSI-X-BT-H5.8SLV-HV

PSI-X-BT-5.8MST-HV battery connection to the inverter

1. Connect the BAT+ and BAT- ports of the inverter with the BAT+ and BAT- ports of the PSI-X-BT-5.8MST-HV battery via the power cables.

2. Connect the BMS port of the inverter with the CAN port of the PSI-X-BT- battery 5.8MST-HV through communication cable. Secure the connection to the battery's CAN port by tightening the grommet.



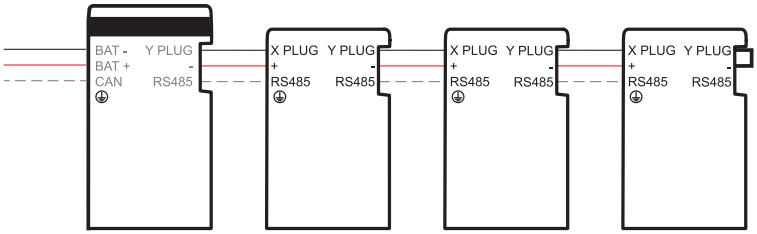
Connecting the PSI-X-BT-5.8SLV-HV Batteries

1. Connect the positive (red) cable from the port on the right side of the PSI-X-BT-H5.8MST-HV / PSI-X-BT-H5.8SLV-HV to the "+" on the left side of the next battery.

2. Connect the negative (black) cable from the "YPLUG" port on the right side of the PSI- X-BT-H5.8MST-HV / PSI-X-BT-H5.8SLVHV to "XPLUG" on the left side of the next battery

3. Connect the communication cable from the RS485 port on the right side of the first battery module to the RS485 port on the left side of the next battery.

4. Connect the remaining batteries in the same way.



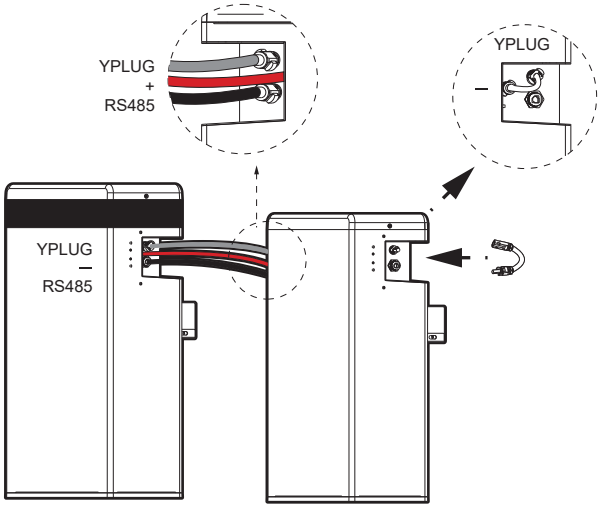
BATTERY
PSI-X-BT-H5.8MST-HV

BATTERIES
PSI-X-BT-H5.8SLV-HV

5. Insert the series locking wire in "-" and "YPLUG" on the right side of the last slave battery to complete the internal circuitry.

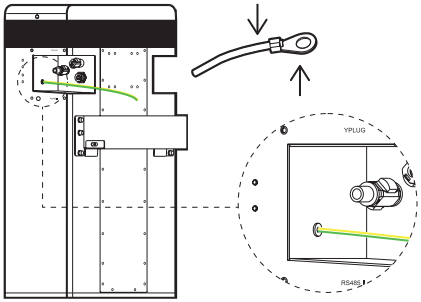
PLEASE NOTE

The latest battery in the series does not have the communication cable connected at the output, and the port is not used.



PLEASE NOTE

For the safety of the system, it is mandatory to earth the entire storage system: Crimp the terminal of the earth cable included in the box to the appropriate line and fix the earth cable in the appropriate outlet.



Commissioning

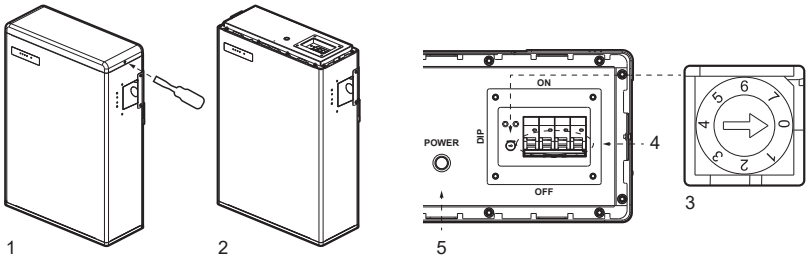
After installing the storage system, follow these steps for commissioning:

1. Remove the top cover of the Master battery.
2. Remove the cover plate.
3. Rotate the DIP switch to the corresponding number of PSI-X-BT- H5.8SLV-HV Slave batteries installed:

   1 Master + 1 Slave: DIP SWITCH SU 1

   1 Master + 2 Slave: DIP SWITCH SU 2

   1 Master + 3 Slave: DIP SWITCH SU 3
4. Flip up the switch next to the DIP switch.
5. Press the POWER button to turn on the storage system.
6. Replace the cover plate.
7. Re-screw the top cover of the Master PSI-X-BT-H5.8MST-HV battery.



Start the battery only after turning on the inverter.

For further details, refer to the quick installation guide for the PSI-X-BT-5.8MST-HV and PSI-X-BT-5.8SLV-HV batteries, available in the download section on the www.peimar.com website.

5.4.2. PSI-X-PRL-BMS parallel BMS and PSI-X-BT-5.8SLV-HV slave connection

The connection with PSI-X-PRL-BMS parallel BMS and PSI-X-BT-5.8SLV-HV slave batteries, as an alternative to the connection with PSI-X-BT-5.8MST-HV master battery and PSI-X-BT-5.8SLV-HV slave batteries, allows for a higher total storage capacity.

NOTICE

The PSI-X-PRL-BMS parallel BMS has integrated a 40 A switch; Therefore, no additional circuit breaker is required.
Included in the package of each PSI-X-BT-5.8SLV-HV slave battery and PSI-X-PRL-BMS parallel BMS are the power and BMS cables required for connection, but some of them must be crimped on one end.

Possible battery configurations:

5.8 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 1 Slave PSI-X-BT-H5.8SLV-HV

11.5 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 2 Slave PSI-X-BT-H5.8SLV-HV in series on input B1

17.3 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 3 Slave PSI-X-BT-H5.8SLV-HV in series on input B1

Inoltre:

11.5 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 1 Slave PSI-X-BT-H5.8SLV-HV on B1 input + 1 Slave PSI-X-BT-H5.8SLV-HV on B2 input

23.0 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 2 Slaves PSI-X-BT-H5.8SLV-HV on B1 input + 2 Slaves PSI-X-BT-H5.8SLV-HV on B2 input

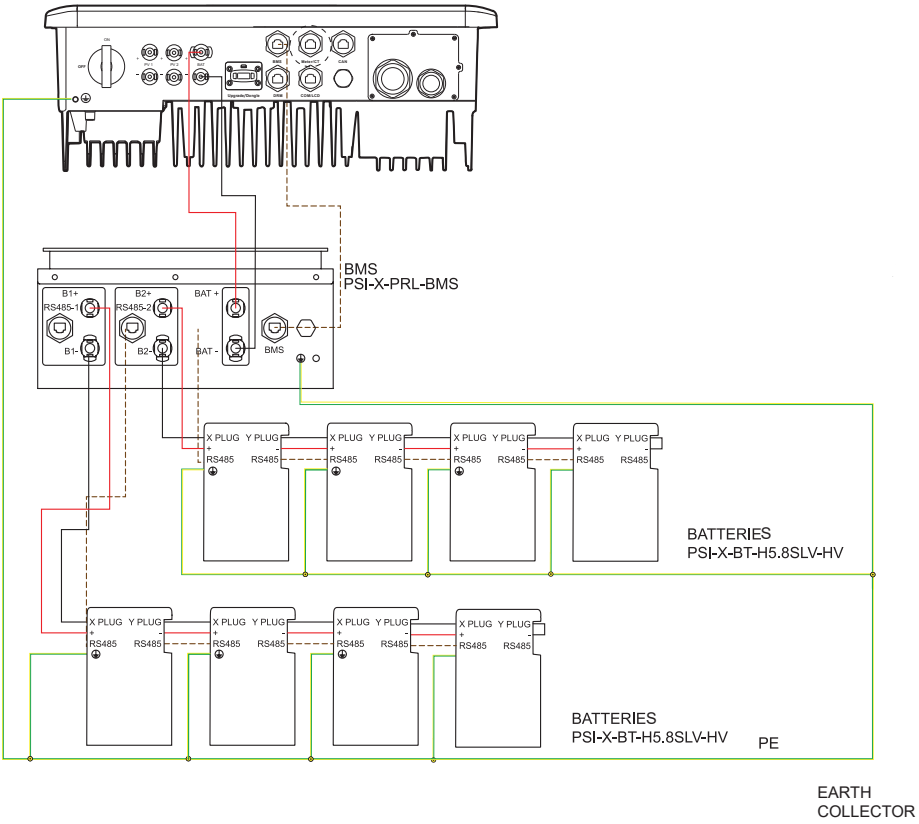
34.6 kWh = 1 BMS of parallel PSI-X-PRL-BMS + 3 Slaves PSI-X-BT-H5.8SLV-HV on B1 input + 3 Slaves PSI-X-BT-H5.8SLV-HV on B2 input

NOTICE

Configuration with 5 batteries is not possible.

PLEASE NOTE

It is not possible to connect PSI-X-BT-5.8MST-HV master batteries to the parallel BMS. It is not possible to connect a single PSI-X-BT-H5.8SLV-HV slave battery to the parallel BMS. If you connect two battery strings to the parallel BMS, they must be the same length (2+2, 3+3 or 4+4).



PSI-X-PRL-BMS Parallel BMS Connection to Inverter

Below is the connection diagram between the PSI-X-BMS-PRL and the inverter (see table below):

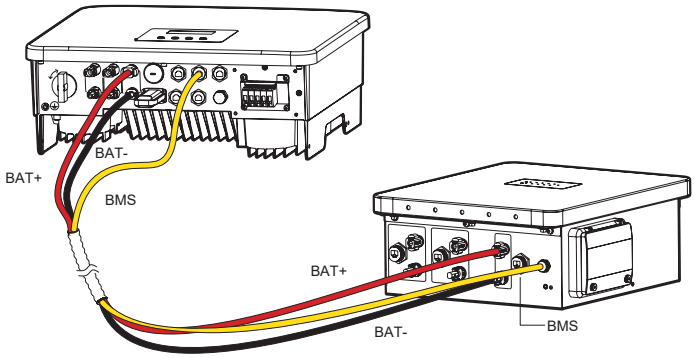
1. Connect the BAT+ and BAT- ports of the inverter with the BAT+ and BAT- ports of the parallel PSI-X-PRL-BMS BMS via the power cables.

2. Connect the BMS port of the inverter with the BMS port of the parallel PSI-X-PRL-BMS via the communication cable.

PLEASE NOTE

To ensure a proper connection, make sure you have tightened the grommet.

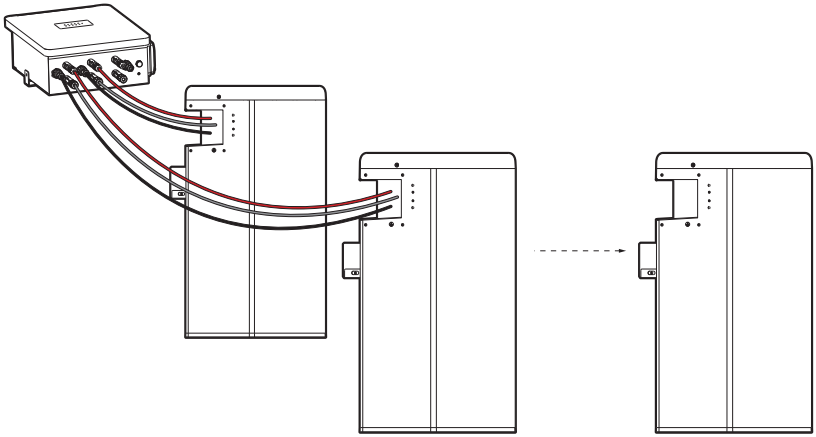
PSI-X-BMS-PRL		PSI-X1Pxxxx-HY
BAT+ Holder	>	BAT+ Holder
BAT- Door	>	BAT- Door
BMS Port	>	BMS Port



PSI-X-PRL-BMS Parallel BMS Connection to PSI-X-BT- H5.8SLV-HV Batteries

1. Connect the positive (red) cable from the "B1+" or "B2+" port of the parallel BMS to the "+" port on the left side of the slave battery.
2. Connect the negative (black) cable from the "B1-" or "B2-" port of the parallel BMS to the "XPLUG" port on the left side of the slave battery.
3. Connect the communication cable from the "RS485-1" or "RS485-2" port of the parallel BMS to the "RS485" port on the left side of the slave battery.

To connect the PSI-X-3PMETER-HY meter, follow the mounting procedure:



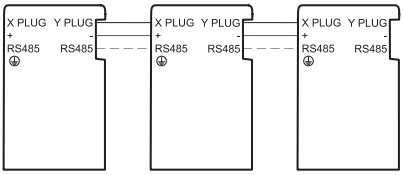
Connecting the PSI-X-BT-5.8SLV-HV Batteries

1. Connect the positive (red) cable from the "-" port on the right side of the PSI-X-BT- H5.8SLV-HV to the "+" on the left side of the next battery.

2. Connect the negative (black) cable from the "YPLUG" port on the right side of the PSI-X- BT-H5.8SLVHV to the "XPLUG" on the left side of the next battery.

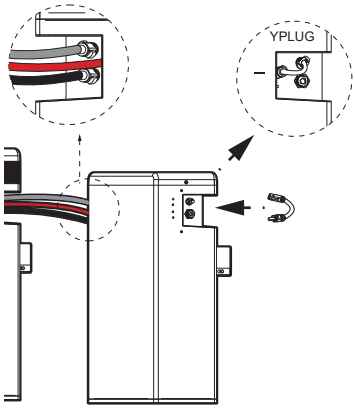
3. Connect the communication cable from the RS485 port on the right side of the first battery module to the RS485 port on the left side of the next battery.

4. Connect the remaining batteries in the same way.



BATTERIES
PSI-X-BT-H5.8SLV-HV

5. Insert the series locking wire in "-" and "YPLUG" on the right side of the last slave battery to complete the internal circuitry.



PLEASE NOTE

For the safety of the system, it is mandatory to earth the entire storage system: Crimp the terminal of the earth cable included in the box to the appropriate line and fix the earth cable in the appropriate outlet.

Commissioning

After installing the storage system, follow these steps for commissioning:

1. Lift the waterproof cover.
2. Configure the DIP switch according to how the batteries are installed: Select 0 when connecting a single battery branch (in input 1 or input 2); Select 1 when connecting 2 battery branches in parallel (the number of batteries in each branch must be the same).
3. Flip the switch and press the POWER button to turn on the PSI-X- PRL-BMS.
4. Lower the waterproof cover.

PLEASE NOTE

Start the battery only after turning on the inverter.

5.5. Meter/CT Connection

5.5.1 Single-Phase Meter PSI-X-1P-METER-ZI

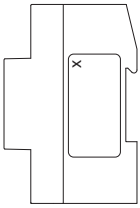
The meter is a device that allows you to analyze the energy flow of the system to manage it in the most appropriate way; The meter compatible with the single-phase inverters of the PSI-1XP (TP-TPM-HY) series and for currents up to 80 A is the PSI-X-1PMETER-ZI with direct insertion.

The installation of the PSI-X-1PMETER-ZI meter therefore allows you to:

- Monitor self-consumption during daylight hours on the inverter display or on the monitoring portal;
- Read consumption in real time on the meter display;
- Set the power "Export Limit" function which, if enabled, allows the system to block the feeding of excess energy into the grid; if, on the other hand, the "Export Limit" function is disabled (Default value), the energy not self-consumed by the users will be fed into the grid.

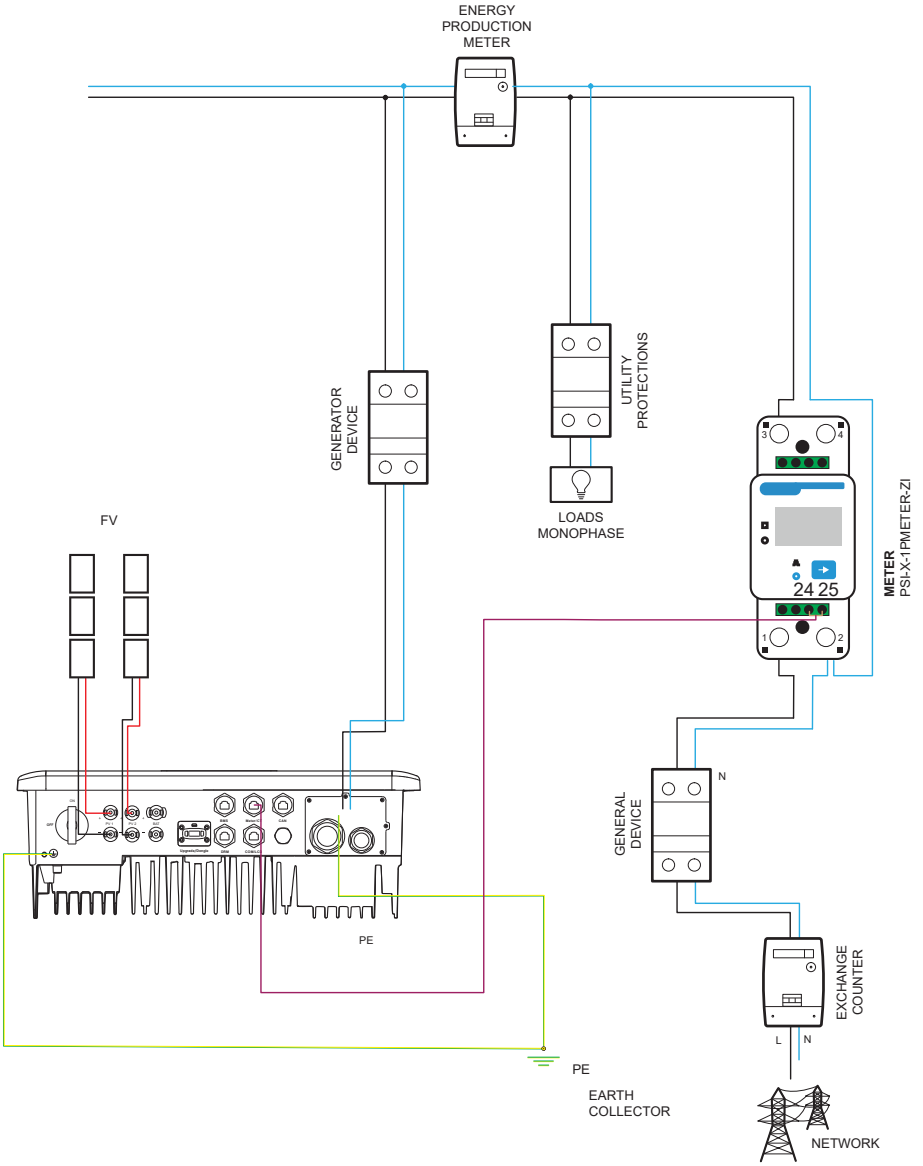
PLEASE NOTE

Check that an "X" is indicated next to the product label.



PLEASE NOTE

The PSI-X-X1PMETER-ZI must be installed upstream of the mains loads, downstream of the exchange meter; Refer to the diagram below for the exact installation point (see generic diagram below).


ENERGY
PRODUCTION
METER
GENERATOR
DEVICE
UTILITY
PROTECTIONS
LOADS
MONOPHASE
FV
METER
PSI-X-1PMETER-ZI
24 25
GENERAL
DEVICE
N
PE
EXCHANGE
COUNTER
L
N
PE
EARTH
COLLECTOR
NETWORK

PLEASE NOTE

The position of the energy meter and the protections indicated in the diagram are purely indicative and to be evaluated in agreement with the designer on the basis of the regulations in force at the time of installation and any other existing systems.

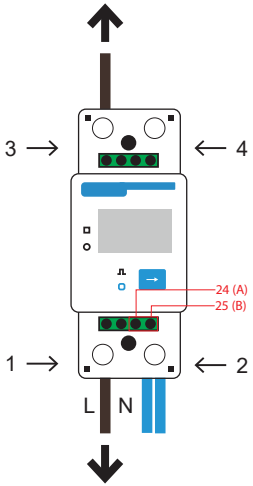
Installation Meter PSI-X-1PMETER-ZI

To connect the PSI-X-3PMETER-HY meter, follow the mounting procedure:

WARNING

Make sure you have cut off the AC side power on the system line.

INVERTER SIDE



NETWORK SIDE

- 1 - 3 are the pins of the Line.
- 2 pins of the Neutral.
- 24 - 25 are the pins of the communication cable.
- 4 is unused.

1. Strip the phase (L) coming from the exchange counter (mains side) by 8-10mm and fix it to input 1 of the meter by tightening the clamp;
2. Strip the phase (L) coming from the system (inverter side) by 8-10mm and fix it at input 3 of the meter;
3. Strip the neutral coming from the exchange counter and the system by 8-10mm and fix them to the input 2 of the meter by tightening the clamp. It is also possible to connect the neutral incoming from the system (inverter side) to output 4 of the meter.

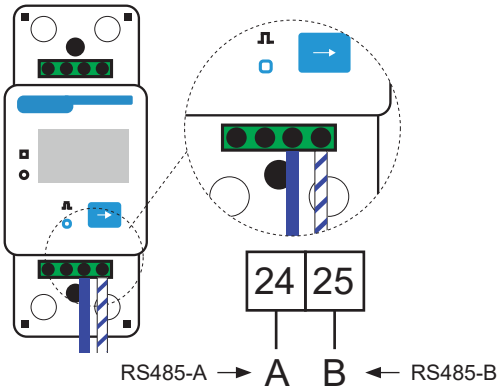
PLEASE NOTE

The size of the network cables for the meter connection must have a cross-section < 16,00 mm^2.

4. Arrange a twisted pair cable of sufficient length to cover the distance between the inverter and the meter, otherwise use an RS485 cable of suitable length. Insert the two wires of a terminal, stripping them beforehand, into outputs 24 (A) and 25 (B) of the meter and then secure them by tightening the clamp.

PLEASE NOTE

The size of the meter's communication cable must have at least a cross-section between 0.25 and 1.00 mm^2.



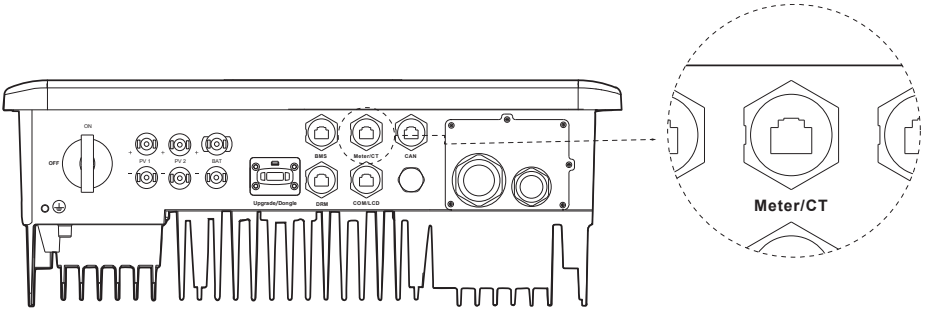
5. For connection on the inverter side, please refer to the relevant inverter manual and the paragraphs below;

6. Once the electrical connection phase has been completed, fix the PSI-X-1PMETER-ZI meter on DIN rails (height 35 mm). Since the meter is neither waterproof nor dustproof, it is recommended to install it inside the electrical panel;

7. The display of the PSI-X-1PMETER-ZI meter lights up when the system is energized. The meter is already automatically set with the correct network parameters; By briefly pressing the "arrow" key, you can scroll through and check the different parameters set; The meter is already pre-set with the correct operating parameters, which therefore do not need to be modified.

PSI-X1P Series Hybrid Single Phase Inverter Connection (HY)

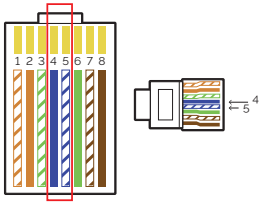
The following installation procedure applies to the PSI-X1P-HY series hybrid single-phase inverters. To connect the meter to the inverter, you must use the communication port called Meter/CT located on the underside of the hybrid inverter.



1. Take the connection cable and after connecting the two ends to the meter in the respective ports (24 and 25, see previous chapter) proceed to crimp the two wires of the other end of the cable to an RJ45 plug so that there is continuity between:

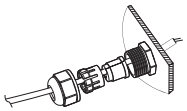
- Meter terminal 24 (A) and plug pin 4
- Meter Terminal 25 (B) and Plug Pin 5

If a standard RS485 communication cable (not included in the package) is used, connect the blue wire to terminal 24 and the white-blue wire to terminal 25 of the meter; from the inverter side, crimp the blue wire to Pin 4 of the plug and the white-blue wire to Pin 5 of the plug.

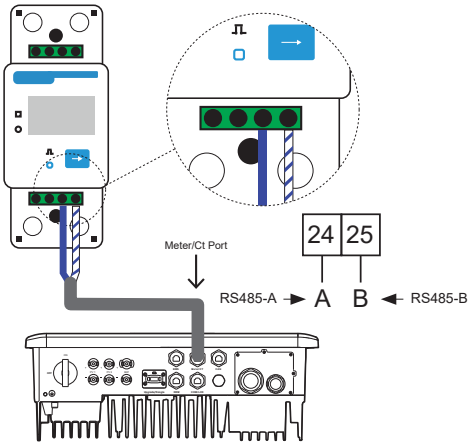


1	2	3	4	5	6	7	8
-	-	-	485A	485B	-	-	-

2. Insert the other end of the cable into the inverter's meter port by unscrewing the grommet and inserting it through the waterproof gasket.



3. Finally, connect the RJ45 plug into the RS485 port of the inverter:



4. In order for the PSI-X-1PMETER-ZI meter to work correctly, it is necessary to select the correct setting on the hybrid inverter;

From the display, go to the menu and select Meter:

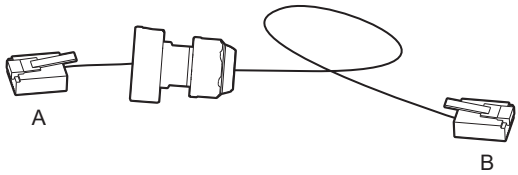
Menu → Settings → Advanced Settings [2] → Conf. Meter / CT

[2] Password “2014”

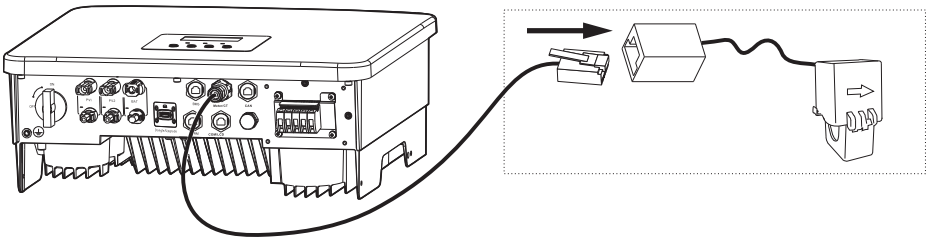
5.5.2. CT Connection

The current transformer (CT) must be mounted on the phase of the alternating line upstream of all network loads, downstream of the exchange meter; Refer to the connection diagrams in Chapter 4 for the exact installation point.

Create a communication line with Category 5e or higher data cable wired in Mode B. Insert the waterproof cover in the package at one end.



Connect the end of the cable with water cover to the METER/CT port and the other end to the RJ45 extender, which serves as the connection between the communication line and the CT cable, as shown in the diagram below:

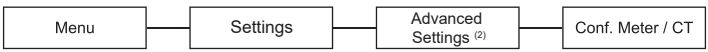


NOTICE

The arrow on the CT must be pointing towards the public network.

Check that the length of the entire line is sufficient to cover the distance between the inverter and the CT considering the length of the CT cable of 0.5 meters.

By default, the measuring device set on the inverter display is CT (TA). However, check the setting by going to:

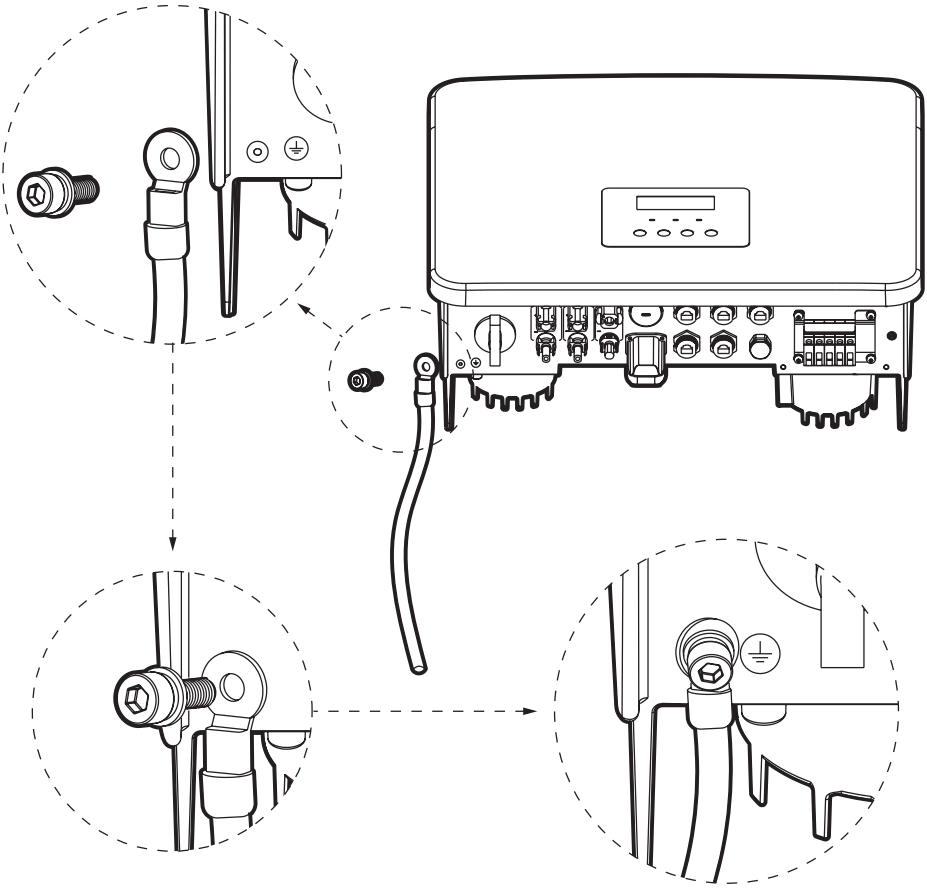


(2) Password “2014”

6. Earthing

For the safety of the system, it is mandatory to ground the inverter:

- Crimp the terminal of the ground wire included in the box to the appropriate line.
- Fix the ground cable in the hole provided, identified by the grounding symbol, by tightening the hex head screw included in the package.



7. Parallel connection of multiple PSI-X1P series inverters

The hybrid inverters of the PSI-X1P series have the function of parallel connection of up to 2 inverters in a single single-phase system.

In this system, one inverter will be set as the Master, and will control the management and power delivery of the other connected inverter. In this system, only one CT needs to be connected that will communicate with the Master inverter.

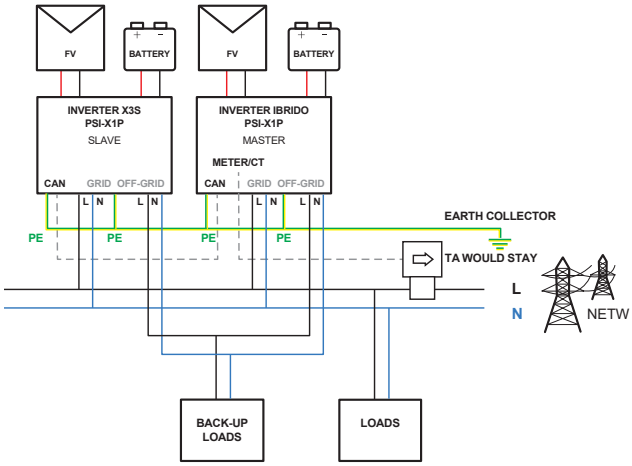
The Slave inverter will be connected to the Master via communication cables.

NOTICE

Before installation, make sure the inverters meet the following three conditions:

1. The firmware version of both inverters must be the same;
2. The model of both inverters must be the same;
3. The model and quantity of batteries connected to each inverter must be the same; Otherwise, the parallel function cannot be used.
4. In order to be able to add it to the system and monitoring system, each inverter must have a wifi module inserted even if connected in parallel mode.

System diagram



7.1. Operation Mode in parallel

There are three operating modes in the system in parallel, and knowing all three will help you understand the system better, so we recommend that you read them carefully before putting the system into operation.

1. **Free-Independent Mode**

   By default all inverters are set to Free – Independent mode, as long as no inverter is set as Master.

2. **Master Mode**

   Once an inverter is set as the Master, it will control the management and power delivery of the second connected inverter. You can change the mode again via the display settings.

3. **Slave Mode**

   Once one inverter is set as the Master, the second inverter will automatically enter Slave mode. Slave mode cannot be changed from the display settings.

7.2. Electrical connections of communication and display

Step 1: Connect the phase, neutral, and ground of the inverters to the same single-phase line. Follow the connection methods described in chapter 5 of the PSI-X1Pxxxx-HY Inverter Installation Manual.

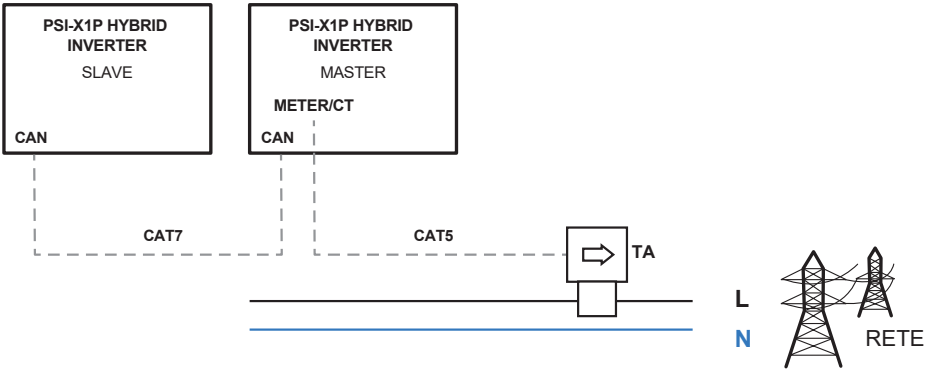
PLEASE NOTE

For the safety of the system, it is mandatory to carry out the grounding of each inverter.

Step 2:

- The inverters communicate with each other via data cables. The installer must independently equip himself with a Category 7 data cable for each parallel and a Category 5 or higher data cable for the connection of the master inverter with the CT.
- Connect the two ends of the CAT7 cable into one of the CAN ports on each inverter.
- Connect the end of the CAT5 cable to the METER/CT port on the master inverter and the other end to the RJ45 extender that serves as a connection to the CT cable.

- Place the CT on the AC line phase upstream of all mains loads, downstream of the changeover meter. Printed on the CT is an arrow that must be oriented towards the net.
- For further clarification on the connection of the CT, please refer to the relevant chapter of the PSI-X1Pxxxx-HY Inverter Installation Manual.



Step 3: Once the meter is connected to the master inverter, you need to activate the master mode from the display:

MENU > ADVANCED > OPTIONS ("2014" PASSWORD) > PARALLEL OPTION > MASTER MODE.

7.3. How to exit the system in parallel

If you want to disable the parallel option on inverters, follow these steps:

Step 1: Disconnect all network cables from the CAN ports.

Step 2: For each inverter, turn off the master mode from the display:

MENU > ADVANCED > OPTIONS (Password "2014") > PARALLEL OPTION > FREE

MODE.

PLEASE NOTE

If a Slave inverter is set as "Free" but the mains cables are not disconnected from the CAN ports, it will automatically return to "Slave" mode.

If a Slave inverter is disconnected from the other inverters but not set to "Free" mode, it will stop working and remain in the standby state.

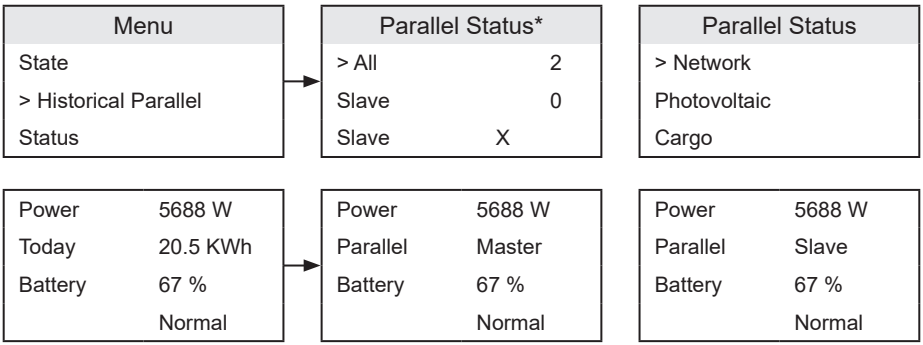
7.4. Display LCD

Main Screen:

Once an inverter enters the parallel system, the daily production "Today" will be replaced by the inverter mode "Parallel" and the word Master or Slave will appear next to it depending on the status. Parallel faults will take precedence over other faults and will be shown first on the main display.

Display Status:

The user can see all status data from the Master inverter. The overall power of the system and the power of each Slave inverter can be seen from the display of the Master inverter.



*O: Connected, X: Disconnected

Whenever the master inverter fails and stops operation, all slave inverters will be shut down at the same time. However, the master inverter has independent operation and will not be affected by any slave inverter failures.

The system will operate according to the parameters set in the Master inverter, and all parameters set in the Slave inverters will not be taken into account. When a Slave inverter exits the system and operates as a stand-alone unit, all of its settings will be reset.

PLEASE NOTE

The settings for off mode, grid standard, self-consumption, power factor and remote control selected on the master inverter apply to the entire system; the corresponding settings of the Slave inverters will not be taken into account.

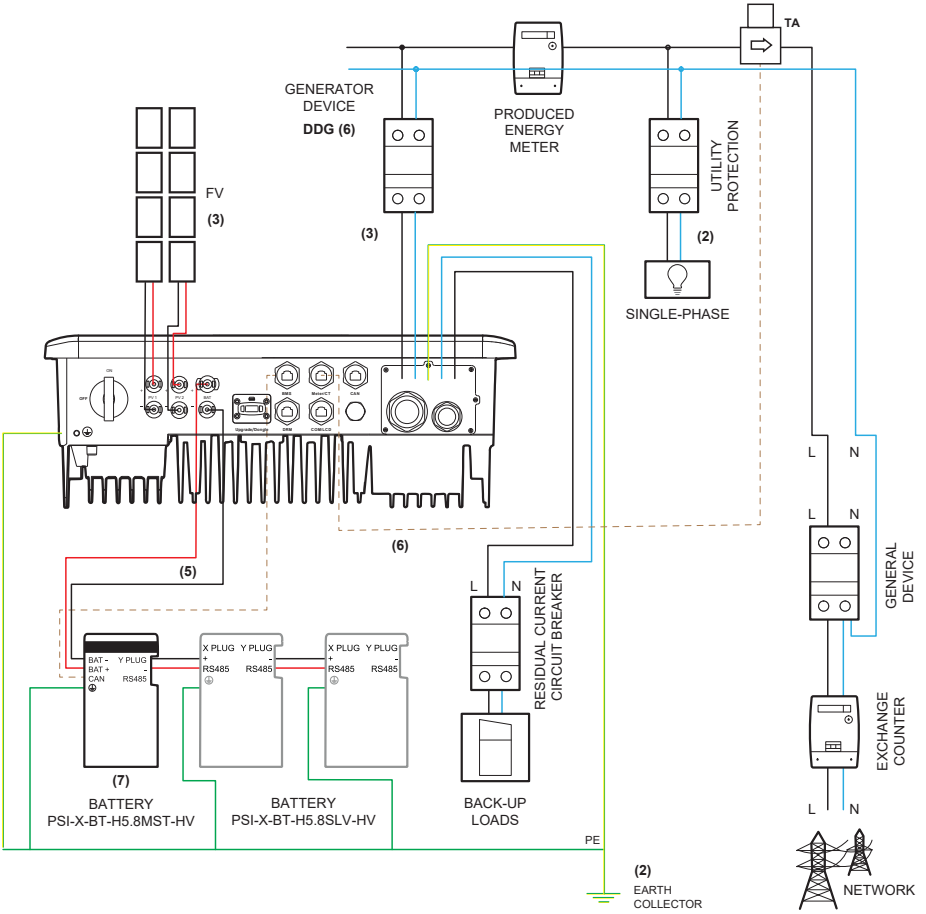
PLEASE NOTE

In order to monitor the entire system on the web portal, it is necessary to configure all the

inverters present via wi-fi or ethernet module (optional). Follow the configuration steps described in the configuration chapter of the following manual.

8. Mode of Operation

8.1. Inverter Start



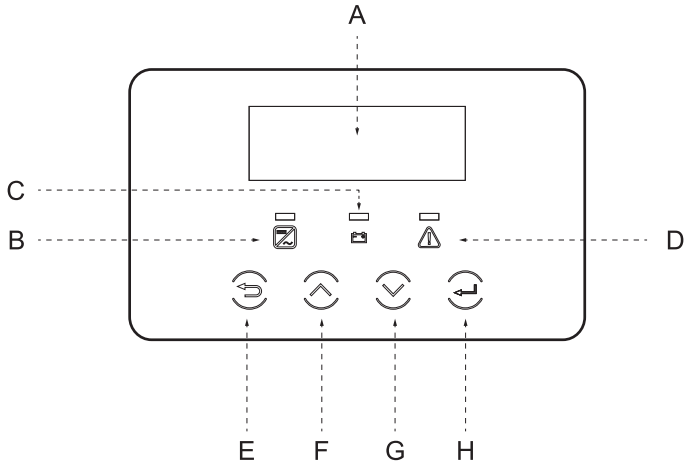
Before switching on the inverter, pay attention to the following:

1. Make sure the inverter is fixed to the wall.
2. Make sure all ground wires are grounded.
3. Check that all DC and AC lines are connected.
4. Make sure the CT is plugged in.
5. Make sure the battery is well connected.
6. Turn the disconnect switch to DC line On and close the grid line switch.
7. Close the switch on the battery. Press and hold the power button on the battery for 5 seconds to exit the "Off" mode (factory setting: "Off").

WARNING

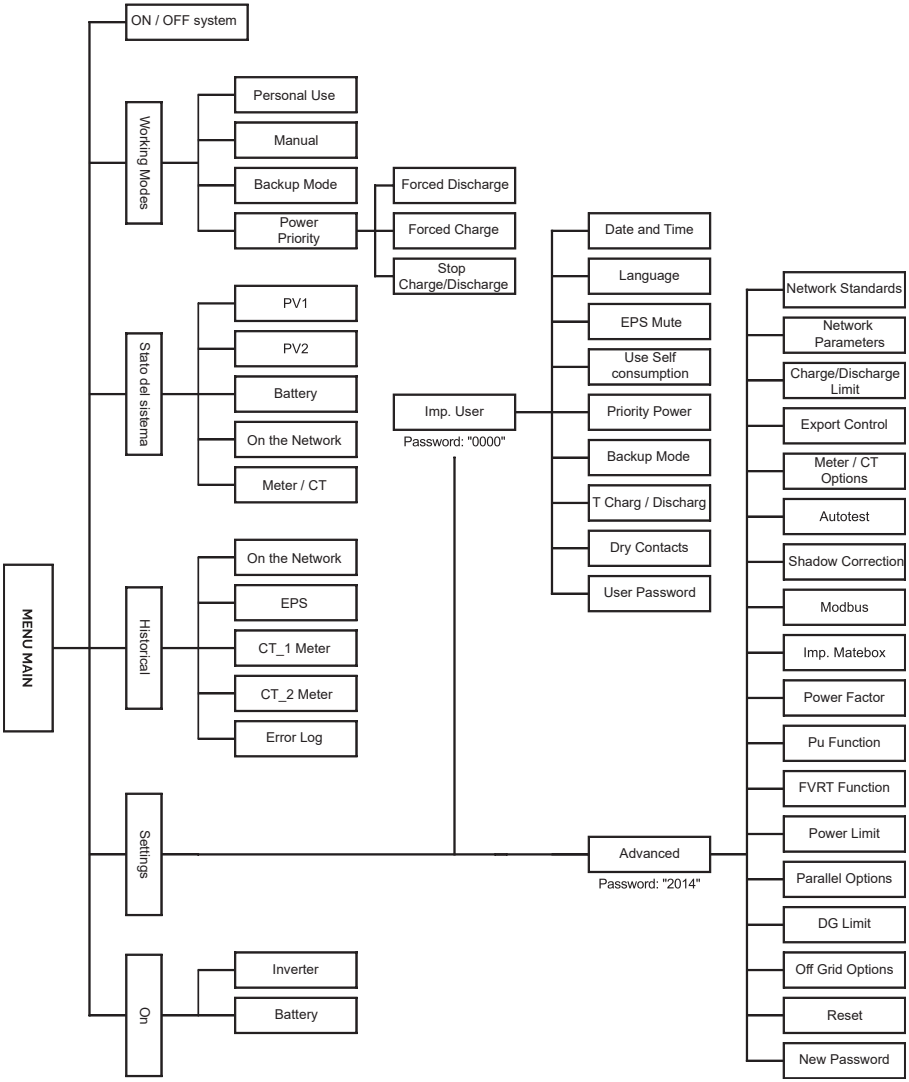
Before performing the inverter power-up procedure, make sure that you have completed all electrical connections correctly.

8.2. Setting and visualisation interface



A	Display	The display allows the display of the inverter's production data and the setting of the operating parameters
B	LED indicators	Solid blue light: the inverter is in normal state or in OFF-GRID mode Flashing blue light: The inverter is in standby, control state, or the DC line disconnect switch is in the OFF position Off: The inverter is in a faulty state
C		Solid green light: battery communication works normally Flashing green light: Battery communication is normal in idle mode Off: The battery does not communicate with the inverter or is absent
D		Red light on: The inverter is in error state Off: The inverter has no error
E	Keys	ESC key: Exit from the current interface or function
F		Up key: Scroll Up/Left or increment selected value
G		Down key: Scroll Down/Right or decrement selected value
H		Enter button: Confirm your selection

8.3. Block diagram of the inverter screen



8.4. Main display functions

When the inverter is started, the screen that appears on the display is the main one showing the following information:

- Power/Power = indicates the instantaneous output power
- P-Grid/P-grid = indicates the energy sent to the grid or absorbed by the grid (if the value is positive the energy is fed into the grid, if negative the energy is taken from the grid)
- Today = indicates the energy produced throughout the day

(scroll with the up and down arrows to read the information on the display)

Power	0 W
Today	0.0 kWh
Battery	80%
Normal	

Menu

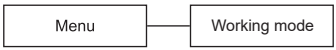
This screen is for the user to view information about the inverter and change its settings To enter this screen press "OK" on the main screen. Choose the desired settings by scrolling with the UP and DOWN arrows and press "OK" to confirm.

ON/OFF System

By entering this screen you can choose between:

- ON: This status indicates that the inverter is working (usually the default state)
- OFF: This status indicates that the inverter has stopped working and only the LCD screen is on.

Working Modes



There are 4 modes to select:

- Personal use (self-consumption)
- Back-up mode
- Power Priority (Network Injection)
- Manual and EPS

When connected to the grid, all working modes work normally when the battery SOC >5%. When the battery charge rate is less than 5%, the PV or grid will charge the battery until SOC ≥11% and then automatically return to the user-selected working mode.

- **Self-consumption (default)**

  The Self-Consumption mode is the one set by default, the operation is described below.

  1. In case of photovoltaic power greater than loads

     With active charging or discharging period, the PV will power the loads first, and the excess energy will charge the battery. If the battery is fully charged, excess energy will be fed into the grid.

     (The inverter will limit feed-in to the grid if export control has been set). (PV > loads: PV > loads > battery > grid)

  2. In case of higher load power than photovoltaic

     With the charging period active, the PV will first power the loads and the remaining power will be drawn from the grid. The battery will remain on standby.

     (PV < Loads: PV + Grid > Loads)

     With active discharge period, the PV and battery will power the loads. If the power is still not sufficient, the remaining power will be taken from the grid.

     (PV < Loads: PV + Battery + Grid > Loads)

  3. No photovoltaic power

     With active charging period, the grid powers the loads and charges the battery

     (PV =0, Grid > Loads + Battery)

     Active Discharge Period: The battery will power the loads. If the battery power is not sufficient, the rest of the energy will be drawn from the grid and the inverter will enter standby mode

(PV=0, Battery+ Mains > Loads)

The minimum battery charge "SOC MIN" and the maximum charge "batt charge up to" can be set via the display in the range of 10-100%.

- **Power Priority (Feed-in)**

The Power Priority or Feed-in mode is suitable for areas with a high energy selling price but limits on the power input. With this mode, in addition to the minimum charge, it is also possible to set the maximum battery charge; Once the set charge percentage is reached, the remaining energy will be fed into the grid.

1. In case of photovoltaic power greater than loads

   With the charging period active, the PV will power the loads first, then charge the battery to the set percentage capacity, and finally export the remaining energy to the grid.

   If the grid operator limits the feed-in power of the inverter, the surplus energy continues to charge the battery.

   (PV > Loads: PV > Loads > Battery > Grid > Battery)

   With active discharge period: the PV will feed the loads first and export the excess energy to the grid.

   (PV > Loads: PV > Loads > Grid)

2. In case of higher load power than photovoltaic

   With the charging period active, the PV will first power the loads and the remaining power will be drawn from the grid. The battery will remain on standby.

   (PV < Loads: PV + Grid > Loads)

   With active discharge period, the PV and battery will power the loads. If there is still not enough power, it will be taken from the grid.

   (PV < Loads, PV + Battery + Grid > Loads)

3. No photovoltaic power

   With active charging period, the grid will power the loads and charge the battery.

   (PV=0, Mains > Loads + Battery)

   With active discharge period, the battery will power the loads first. If the battery power is not sufficient, the remaining power will be drawn from the grid and the inverter will enter standby mode.

(PV= 0, Battery + Mains > Loads)

The minimum battery charge "SOC MIN" and the maximum charge "batt charge up to" can be set via the display in the range of 10-100%.

- **Back-up mode**

The backup mode is suitable for areas with frequent network blackouts. This mode will keep the battery charge level at a relatively high percentage to ensure that back-up (Off-grid) loads are powered for longer when the grid is down.

The minimum battery charge "SOC MIN" and the maximum charge "batt charge up to" can be set via the display in the range of 30-100%:

- **Manual**

In this mode it is possible to manage the operation of the battery and choose between 3 submenus: forced discharge, forced charge, stop charge/discharge.

Work Select
> Manual
Forced Charge

Work Select
> Manual
Forced Discharge

Work Select
> Manual
Stop Cha&Discha

- **EPS (off-grid) mode**

EPS mode is used when there is no mains power. The system provides emergency power via photovoltaics and batteries to provide power to the loads connected to the back-up line (Off-grid). (Battery is required).

The EPS line is powered only in the event of zero voltage at the GRID output (grid blackout). Therefore, in order to be able to continuously power the loads connected to the EPS output, a switching interlock and the related automatic protections must be provided, in accordance with the current CEI 0-21 standard.

1. When the PV power is sufficient, the PV will power the loads first, and the excess power will go to charge the battery

   (PV > Back-up Loads: PV > Back-up Loads > Battery)

2. When the power of the photovoltaic system is insufficient, energy will be drawn from the battery.

   (PV > Back-up Loads (Off-grid): PV + Battery > Back-up Loads - Off-grid)

3. Without PV power the battery will power the emergency loads until the set maximum depth of discharge is reached, min SOC, then the inverter will enter standby mode.

   (PV=0, Battery > Back-up Loads - Off-grid)

   The minimum battery charge "SOC MIN" for EPS mode can be set via the display in the range 10% - 25.

System Status

Included are: PV1, PV2, Battery, On the grid (energy fed into or taken from the grid), EPS (off-grid), Meter/CT. Press up and down to select and press "Enter" to confirm and press Exit to return to the menu.

a/b. **PV1 and PV2**

Here you can view the voltage, current and power of the PV1 and PV2 of the PV panels.

c. **Battery**

This status shows the battery condition of the system.
Battery voltage and current, battery power, battery capacity, battery temperature, BMS connection status are included.
battery capacity, battery temperature, BMS connection status. The meaning of the sign of the current and power of the battery indicates: "+" means charge; "-" means download

d. **On the network**

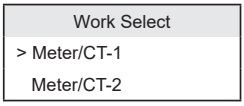
The voltage, current, frequency and power of the grid is displayed here.

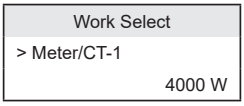
e. **EPS (off-grid)**

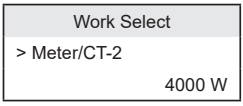
The voltage, current, frequency, and power of the inverter when it is disconnected from the grid is displayed here.

f. **Meter/CT**

Here you can view the meter or CT data.







Historical data

The historical data includes data on the grid power of the inverter, the power generation of the EPS, the power of the Meter/CT 1-2 and the errors of the logs. Press up and down to select and press "Enter" to confirm and press Exit to return to the menu.

1. On the network

   Here you will find the data on the power of the inverter when it is connected to the grid, both for the day and the Total.

2. EPS (Off-grid)

   Here you will find the data on the output of the EPS inverter both for the day and the Total.

3. Meter/CT 1

   Here you can view the data of the energy sold by the inverter, the total energy sold, the electricity bought from the grid, and the total electricity sold on a certain day.

4. Meter/CT 2

   Here you can view the total power output from the inverter for the day.

5. Error Logs

   Here you can view the 6 most recent errors.

User Setting

Here you can set the inverter time, language, working modes, charging and discharging period, and user password.

1. Date & Time

   This interface is for users who want to set the date and time.

2. Language

   The inverter is equipped with several languages to choose from.

3. EPS Muto

   Here you can choose whether or not the Buzzer lights up when the inverter is operating in EPS (Off-grid) mode. If you select Yes, the Buzzer will mute, while if you select NO, in EPS (Off-grid) mode, it will sound once every 4s

when the battery is fully charged. The closer the battery is to the low state, the louder the buzzer will sound, reminding users that the battery is getting damaged

4. Self-consumption

   In this mode, you can set the minimum percentage of battery power, set whether power can be drawn from the grid to charge the battery, and set the amount of power to charge the battery.

   For example: set the minimum SOC of the battery capacity to "10%", means that when the battery has been discharged to 10% capacity, the battery cannot continue to discharge; When mains charging is set to Enabled, mains power charges the battery; if it is set to Disable, the mains power supply does not charge the battery; If the battery charge has been set to 90%, it indicates that the network is allowed to charge the battery to 90%.

5. Power Priority

   In this mode, you can set the minimum percentage of battery power, set whether power can be drawn from the grid to charge the battery, and set the amount of power to charge the battery.

   For example: set the minimum SOC of the battery capacity to "10%", means that when the battery has been discharged to 10% capacity, the battery cannot continue to discharge.

   If the battery charge has been set to 90%, it indicates that the network is allowed to charge the battery to 90%.

6. BackUp Mode

   In this mode, you can set the minimum percentage of battery power, set whether power can be drawn from the grid to charge the battery, and set the amount of power to charge the battery.

   For example: set the minimum SOC of the battery capacity to"10%", means that when the battery has been discharged to 10% capacity, the battery cannot continue to discharge.

   If the battery charge has been set to 90%, it indicates that the network is allowed to charge the battery to 90%.

7. Charging & Discharging Time

   Here you can set the charging and discharging period. If 2 charging and discharge times are required, activate the second Period from the menu and then set it.

8. Dry contact

   When the user uses the function of the inverter's external communication control device, the parameters of the external response control can be selected here.

   Refer to the manual for external device settings.

   If the user uses the inverter's dry contact to control the external device (such as a heat pump) through an Adapter Box, refer to the installation manual.

9. User Password

   The default password for the end user is "0000", but you can set a new password by choosing the words by pressing the up and down keys and press enter to confirm the value. Once you have chosen your password, press on "Ok" to save your new password.

Advanced Settings

All advanced settings can be set here, such as battery, mains, EPS, etc... Advanced Settings is typically used to customize and reset the battery and network. The password to log in is "2014".

a. Network Standards

   Normally it is not necessary to change these parameters, as they are set automatically by setting the correct network standard. If it is necessary to make changes, they must be in accordance with current legislation.

PLEASE NOTE

For inverters installed in Italy, the CEI 0_21 entry is available in the list of standards with the parameters required by the current CEI 0-21 standard; only if the inverter is installed under the Areti - ACEA Group grid, please select the ACEA standard. The above information must be verified and confirmed by the grid operator and the technician connecting to the grid.

b. Network Parameters

   Here you can set the frequency and voltage values for the mains protection.

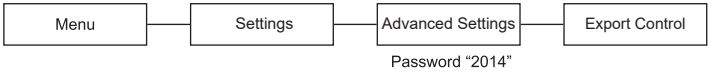
   The default value is the one specified by the current security regulations and cannot be changed and the user cannot change it.

   The content of the display is displayed according to the requirements of local laws and regulations, which are constantly increasing. Please refer to the contents displayed on the inverter screen.

c. Charge/Discharge Limit

Here the user can set the parameters of the charger; The inverter is compatible with both lithium batteries. The user can set the charging and discharging parameters.

d. Export Control

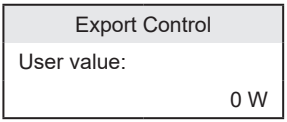


Here the user can set the parameters of the charger; The inverter is compatible with both lithium batteries. The user can set the charging and discharging parameters.

This feature allows the inverter to control the energy transferred to the grid. There are two values, the user value and the factory value. The factory value can be changed by the user.

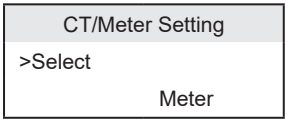
The user value set by the installer must be lower than the factory value and indicates the maximum output power from the system upstream of the measuring device (CT/meter). If the user does not want to transfer power to the mains, set the value to 0 W.

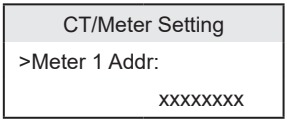
MENU > OPTIONS > SETTINGS ADVANCED (Password "2014") > EXPORT CONTROL > USER VALUE > 0W.



e. Meter/TA(CT) Options

The user must select the CT or meter to connect the inverter to. Select the address for the meter. For CTs, you don't need to select the address.

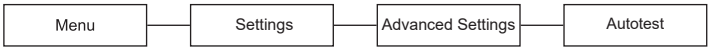




f. Self-test

In cases where the grid standard set is CEI 0 21 or ACEA and the system has a nominal power of less than 11.08kWp, it is necessary to perform the Self-Test function directly from the inverter.

To start the full self-test function, proceed as follows:



Password “2014”

Una volta completato l’autotest, che richiede alcuni minuti, appariranno le schermate coi risultati. È possibile visualizzare il test report anche in un secondo momento accedendo all’apposita schermata oppure avviare singolarmente ciascun test.

NOTICE

Make sure that the inverter is connected to the grid and that it receives the minimum voltage from the PV generator throughout the self-test procedure.

g. Shadow Correction

Here you can set up shadow tracking with four options, which are off, low, medium, and high.

h. Modbus

Here you select the baud rate of the external communication protocol. The values are addresses 19200 and 485.

i. Matebox Setup

If you want to use a Matebox, set it up here.

j. Power Factor

Applicable only for specific countries, so please refer to the local public network.

There are 5 modes: Off, Under-Excited, Over-Excited, Curve, Q(u). (May be changed or added without notice).

Press the up and down key to select, press the Enter key to confirm.

k. PU Function

The PU function is a volt-watt response mode required by some national standards such as AS4777.2. This function can control the active power of the inverter as a function of the grid voltage. Selecting "Enable" means that this feature is enabled and is the default value. Select "Disable" to turn off the feature.

l. FVRT Function

Here you can set Enable or Disable.

m. Power Limit

Power limit function with which you can set the maximum power of the AC output as a percentage.

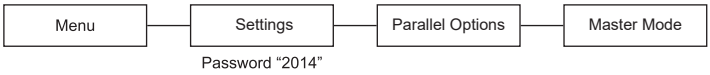
n. Parallel Options

The user can set the frequency selection in EPS (Off-grid) mode here and set the minimum capacity reserved for battery discharge.

EPS (Off-grid) Setting	EPS (Off-grid) Setting	EPS (Off-grid) Setting
> Frequency	> Frequency	> Min SoC
50 Hz	60 Hz	10%

o. DG Limit

To activate and deactivate the parallel mode of the inverters, follow:



p. Off Grid Options

Here you can set a minimum opening current.

q. Reset

Reset log errors, meter power, inverter power, and restore default settings.

r. New Password

Set a new password.

On

Here you can see some basic information about the inverter and battery. such as the Serial number, the software version number, and the running time of the system.

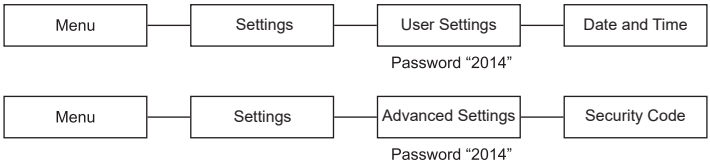
PLEASE NOTE

It is possible to check the firmware version of the inverter by following the respective paths below:

MENU > INFO > MASTER (ARM: 2.03)
MENU > INFO > MANAGER (ARM: 2.03)

8.5. First time configuration

Default date, language, and network standards are already set on the device. It is therefore necessary to verify its correctness:



NOTICE

In the case of Italy, if the grid distributor is Enel, select CEI021; if the distributor is ARETI – ACEA GROUP, select ACEA.

9. Configuring the PSI-X Inverter Monitoring System

9.1. Installer Account Creation

PLEASE NOTE

For each system, the account of the end user (owner of the system) must always be created and then, if desired, the created system can be added to the installer account. Not the other way around.

To get an installer account please send an email to assistenza@peimar. com, by entering the following data:

- Company Name
- Reference email address
- Username (Characters other than letters, numbers, "@", "_", "." are not allowed, there must be no spaces)
- Inverter SN
- Monitoring SN printed on the Wi-Fi module
- Password

As soon as you have received your credentials from Peimar technical assistance, you will be able to log in from the link https:// www. peimar-psix-portal.com/#/login and change your password if necessary.

To monitor the customer's system, it will be necessary to go to:

Device Management > New Devices > + Add and enter the monitoring SN of the Wi-Fi module, then press "Consent". If the entire procedure has been followed correctly, it will be possible, after a few minutes, to observe the production data of the customer's photovoltaic system.

9.2. Configuration via Wi-Fi module

A Wi-Fi module (PSI-X-TL/TLM ≥ 2kW single-phase grid inverter, PSI-X3P-TP three-phase grid inverter, PSI-X1P-HY, PSI-X3P-HY and PSI-X3S-HY hybrid inverters) is included in many models of the PSI-X series (PSI-X-H-WIFI or PSI-X-H-WIFI-3.0)

that allows, When properly configured, remote monitoring of operational status and production data.

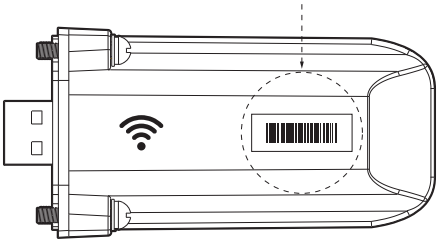
PLEASE NOTE

- **If the SN of the module starts with SWxxxxxxxx, you can perform theconnection procedure via browser only**
- **If the SN of the module starts with SXxxxxxxxx or SVxxxxxxxx, it is possible to carry out the connection procedure both via browser and via App.**
- **It is recommended to connect to the main Wi-Fi line as connecting to repeaters/Wi-Fi does not guarantee that data will be sent to the server.**

9.2.1. Configuration via browser Wi-Fi module

Connection Procedure

1. Insert the Wi-Fi module into the appropriate USB port on the bottom of the inverter (WIFI for PSI-X3P-HY series inverters, Upgrade/Dongle for PSI-X1P-HY and PSI-X3S-HY SERIES inverters, dongle for PSI-X1P-TL/TLM and PSI-X3P-TP/TPM series inverters); the LED on the back will start flashing (LED not present in the PSI-X-H-WIFI-3.0 model).
2. Use a laptop or smartphone and look for the device's Wi-Fi hotspot which is generally called Wifi_Sxxxxxxxxx (Sxxxxxxxxx=code printed on the Wi-Fi module itself).



3. Permanently connect to the hotspot, click on "connect" and wait for confirmation (it is normal for the warning of no internet connection to come out).

4. Open your browser and type in the Address bar http://192.168.10.10/.

PLEASE NOTE

For older inverter models, which have a PSI-X-H-WIFI dongle (or for PSI-X-H-WIFI-3.0 dongles with SN starting with SX) use the http://5.8.8.8/ address (Normally you just need to type on the address bar 5.8.8.8) Be careful not to connect to the https://5.8.8.8/ address.

5. Enter "admin" as username.
6. Enter as password:

- "admin" if the SN of the module starts with SWxxxxxxxx
- Code printed on the form itself if the SN of the module begins with SXxxxxxxxx or SVxxxxxxxx.

7. Enter the "Setting Page" and click on the "Find AP" button to scan the available Wi-Fi networks.
8. Select your home Wi-Fi network, enter your password in the "Key" box and click "Save".

PLEASE NOTE

Network name and password must contain only numbers or letters, no special characters are accepted.

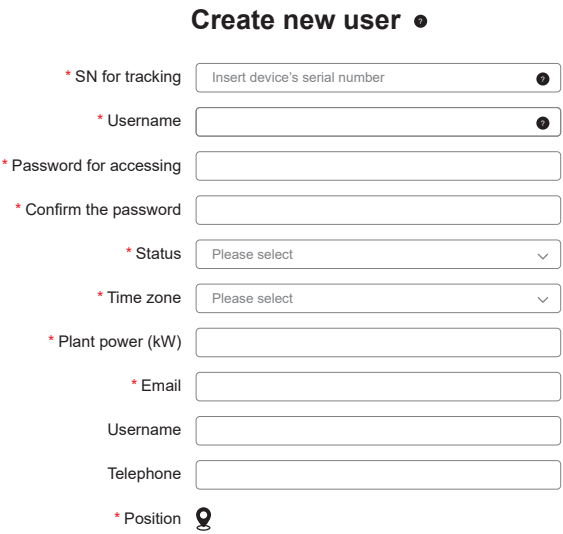
9. The module's LED, if present, will start flashing quickly; when after about 20 seconds it will become permanently on, it means that the Wi-Fi module has connected to the router.
10. Connect to the dongle again.
11. Reconnect to the http address mentioned above to check that the data entered is stored correctly and that the IP address is present in order to make sure that the connection was successful.

End-User Account Creation

PLEASE NOTE

For each system, the account of the end user (owner of the system) must always be created and then, if desired, the created system can be added to the installer account. Not the other way around.

Once you have successfully configured the monitoring system, to view the production data on the portal, type the address https://peimar-psix-portal. com/#/login and create a new end-user account by pressing the "Sign Up" button.



In the "Tracking SN" field, enter the code printed on the form itself and on the label attached to the box. Once you have filled in all the required fields (time zone Italy UTC +01:00), press the "Subscribe" button to complete the registration.

Press the "Return" button and log in with the credentials you just created.

If the entire procedure has been followed correctly, it will be possible, after a few minutes, to observe the production data of the photovoltaic system.

9.2.2. Configuration via Wi-Fi module from app

End-user account creation.

PLEASE NOTE

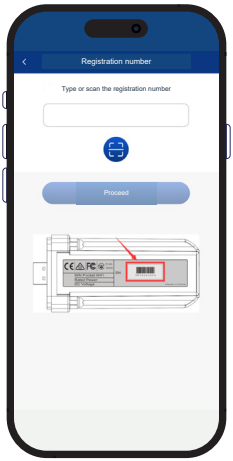
For each system, the account of the end user (owner of the system) must always be created and then, if desired, the created system can be added to the installer account. Not the other way around.

1. Download the Peimar X Portal App from the store

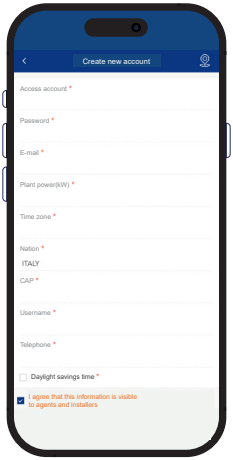
App Store

Google Play Store

2. Choose your language by pressing the 3 dots at the top left.
3. Press the "Create New Account" button, type or scan the monitoring SN printed on the Wi-Fi module itself, and press the "Next" key.

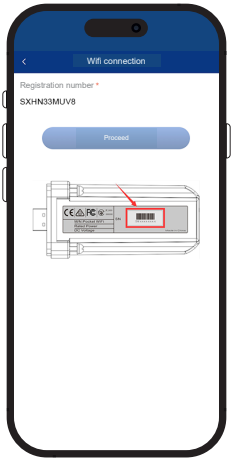


4 To create a new account, enter the required data (Italy time zone UTC +01:00) and press "Ok".



Connection Procedure

1. Log in to the App with the credentials you just created.
2. Enter the User section > Wi-Fi Connection, type or scan the monitoring SN printed on the Wi-Fi module itself, and press "Next".



3. At the alert "Peimar X portal wants to access the Wi-Fi network" press the "Sign in" option.

4. Enter your home Wi-Fi network name (SSID) and password.

PLEASE NOTE

Network name and password must contain only numbers or letters, no special characters are accepted.

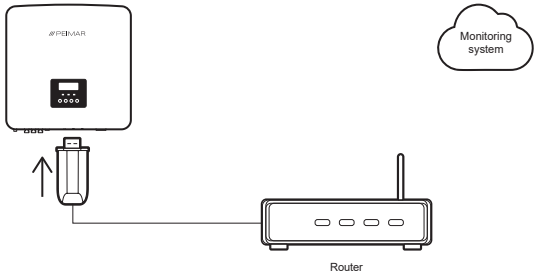
5 If the whole procedure has been followed correctly, the module LED, if present, will become permanently lit and after a few minutes the app will start receiving the production data from the inverter and it will be possible to view it remotely.

9.3. Configuration via Ethernet cable (LAN) with PSI-X-H-ETH-3.0

If the Wi-Fi signal is too weak, you can also connect to the server via Ethernet cable. You will need to purchase the PSI-X-H-ETH-3.0 module equipped with an ethernet port, which allows the inverter to be connected via data cable to your home router (PSI-X3P-TPM three-phase grid inverter inverters already have the Ethernet module included).

Insert the Ethernet module into the Ethernet module USB port on the bottom of the inverter (WIFI for PSI-X3P-HY series inverters, Upgrade/Dongle for PSI-X1P-HY and PSI-X3S-HY SERIES inverters, dongle for PSI-X1P-TL/TLM and PSI-X3P-TP/TPM series inverters);

The installer will need to procure a category 5e or higher data cable himself.



PLEASE NOTE

To complete the configuration of the monitoring system, follow the same procedure described in the paragraphs "Creation of an end-user account" for configuration via Wi-Fi module from browser or App;

the procedure described in the paragraph "Connection procedure" is not necessary as the connection is made directly via cable.

When prompted to enter the "monitoring SN", enter the code on the label of the ethernet module in place of the code on the label of the Wi-Fi module.

10. Error codes and troubleshooting

ERROR CODE	ERROR TYPE	RESOLUTION
IE 001	TZ Protect Fault	Overcurrent Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings.
IE 002	Grid Lost Fault	Lost mains voltage: Measure the mains voltage at the inverter terminal block. Check the correct connection of the AC cable on the inverter terminal block.
IE 003	Grid Volt Fault	Mains voltage overload: Measure the mains voltage at the inverter terminal block. Check the correct connection of the AC cable on the inverter terminal block. Wait a few minutes for it to return to the operating range
IE 004	Grid Freq Fault	Mains frequency out of range: Wait a few minutes for it to return to the operating range
IE 005	PV Volt Fault	PV Surge Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings.
IE 006	Bus Volt Fault	PV Surge Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings.
IE 007	Bat Volt Fault	Battery Overvoltage Error: Check the compatibility between the inverter and the storage system.
IE 008	AC10M Volt Fault	Mains Overvoltage Error: Verify that you have selected the correct security code (network standard). Check the voltage drop across the entire AC line to the changeover meter.
IE 009	DCI OCP Fault	DCI Overcurrent Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings.
IE 010	DCV OVP Fault	EPS (Off-grid) Overvoltage Error: Verify that you have selected the correct security code (network standard). Check the voltage drop on the entire off-grid line up to the load.

IE 011	SW OCP Fault	Software Overcurrent Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings.
IE 012	RC OCP Fault	Overcurrent Error: Check the compatibility between PV generator and inverter via designer. Verify the integrity of the MC4 connectors of the PV strings
IE 013	Isolation Fault	Isolation Error: Check AC and DC line insulation
IE 014	Temp Over Fault	Over-temperature error: Check the installation location of the devices
IE 015	Bat Con Dir Fault	EPS(Off-grid) Current Error: Verify that the maximum AC power at the Off-grid output is within the limits. Check for any non-linear load connections on the EPS (Off-grid)
IE 016	EPS(Off-grid) Overload Fault	EPS Load Error(Off-grid): Verify that the maximum AC power at the Off-grid output is within the limits
IE 017	OverLoad Fault	Network Load Overload Error: Turn off high-power devices and restart the inverter.
IE 018	BatPowerLow	Low Battery Power Error: Turn off high-powered devices. Charge the battery to a higher level than the protection values.
IE 019	BMS Lost	Lost communication with battery: Check the integrity of the BMS cable. Check that you have securely connected the cables to the correct communication ports
IE 020	Fan Fault	Fan Error: Check that foreign material has not caused damage to the fan
IE 021	Low Temp	Under-temperature error: Check the installation location of the devices
IE 022	ARM Unmatched	ARM firmware version not compatible. Update the ARM firmware version and restart the inverter.
IE 023	Other Device Fault	Inverter ARM EEPROM Error: Restart the entire system Disconnect and reconnect PV connectors
IE 024	InterComms Error	Generic Communication Error: Restart the entire system.

IE 025	InterComms Error	Generic Communication Error: Restart the entire system
IE 026	Inv EEPROM Fault	Inverter EEPROM error: Restart the entire system.
IE 027	RCD Fault	RCD Error: Restart the entire system
IE 028	Grid Relay Fault	Network Relay Error: Restart the entire system.
IE 029	EPS(Off-grid) Relay Fault	EPS Relay Error: Restart the entire system.
IE 030	PV ConnDirFault	PV String Polarity Error: Check the correct polarity of the MC4 connector with the PV strings
IE 031	ChargerRelayFault	Charging Relay Error: Restart the entire system.
IE 032	EarthRaleyFault	Ground EPS Relay Error: Restart the entire system.
IE 101	PowerTypeFault	Power Failure: Check for firmware updates.
IE 102	Port OC Warning	EPS Overcurrent Error: Verify that the maximum AC power at the Off-grid output is within the limits.
IE 103	Mgr EEPROM Fault	EEPROM Manager Error: Reboot the entire system
IE 104	DSPunmatched	DSP Version Error: Check that the DSP versions of the inverters are the same
IE 105	NTC Sample Invalid	NTC Error: Restart the entire system. Check the installation location of the devices.
IE 106	Bat Temp Low	Battery Undertemperature Error: Check the installation location of the storage system.
IE 107	Bat Temp High	Battery Overtemperature Error: Check the installation location of the storage system.
IE 109	Meter Fault	Errore Meter: Check the correct installation of the meter/CT
IE 110	BypassRaleyFault	Bypass Relay Error: Restart the entire system.

BE 001	BMS_External_Err	External Battery Error: Check the electrical and data connections between the battery and inverter and between batteries.
BE 002	BMS_Internal_Err	Internal Battery Error: Check the electrical and data connections between the battery and inverter and between batteries. Check that the dipswitch is set correctly. Incorrect communication cable. Batteries.
BE 003	BMS_OverVoltage	Battery Surge Error: Check the compatibility between storage system capacity and inverter.
BE 004	BMS_LowerVoltage	Battery undervoltage error: Charge the battery via the Battery Charger function in the advanced settings.
BE 005	BMS_ChargeOCP	Battery Overcharge Error: Check the electrical and data connections between the battery and inverter and between batteries. Restart the storage system.
BE 006	BMS_ DischargeOCP	Errore sovraccarica batteria: Verificare le connessioni elettriche e dati tra batteria e inverter e tra batterie. Riavviare il sistema di accumulo.
BE 007	BMS_TemHigh	Battery Overcharge Error: Check the electrical and data connections between the battery and inverter and between batteries. Restart the storage system
BE 008	BMS_TempSensor Fault	Temperature Sensor Error: Restart the Storage System
BE 009	BMS_CellImblance	Cell Charge Error: Check that the batteries have the same SOC.
BE 010	BMS_Hardware Protect	Errore hardware BMS: Restart the storage system.
BE 011	BMS_Circuit_Fault	Errore circuito BMS: Restart the storage system
BE 012	BMS_ISO_Fault	Battery Isolation Error: Check that the battery is properly grounded
BE 013	BMS_VolSen_Fault	BMS Voltage Sensor Error: Restart the Storage System
BE 014	BMS_TemppSen_ Fault	Temperature Sensor Error: Restart the Storage System

BE 015	BMS_CurSensor Fault	Current Sensor Error: Restart the Storage System
BE 016	BMS_Relay Fault	Errore relè BMS: Restart the storage system
BE 017	BMS_Type_ Unmatch	BMS Software Error: Check for BMS updates.
BE 018	BMS_Ver_ Unmatch	BMS Version Error: Check the firmware alignment of the batteries.
BE 019	BMS_MFR_ Unmatch	Battery Communication Error: Check battery models and firmware versions
BE 020	BMS_SW_ Unmatch	Errore software BMS: Check the firmware alignment of the batteries.
BE 021	BMS_M&S_ Unmatch	Errore mismatch firmware batterie: Check the firmware alignment of the batteries.
BE 022	BMS_CR_ NORespond	Battery Charge Error: Check BMS firmware versions
BE 023	BMS_SW_ Protect	Slave Battery Software Error: Check BMS Firmware Versions
BE 024	BMS_536_Fault	Battery discharge overcurrent error: Restart the storage system.
BE 025	BMS_SelfcheckErr	Storage system over-temperature error: Restart the entire system.
BE 026	BMS_TempdiffErr	Temperature Sensor Error: Restart the Storage System
BE 027	BMS_BreakFault	Battery SOC Error: Restart the storage system.
BE 028	BMS_Flash_Fault	Errore hardware BMS: Restart the storage system.
BE 029	BMS_Precharge_ Fault	Battery Charge Error: Restart the storage system.
BE 030	BMS_AirSwitch_ Fault	Errore switch batteria: Restart the storage system.

11. Periodic maintenance

In most cases, inverters do not need any maintenance or correction, but if the inverter often loses power due to overheating, the problem can be due to the following reasons:

- The heatsink on the back of the inverter is dirty. If necessary, clean it with a soft, dry cloth or brush (repeat this operation approximately every 6 months for proper maintenance of the inverter). Only trained and authorized professional personnel, who are familiar with the safety requirements, may perform maintenance.
- That the input and output cables are in good condition and not deteriorated (do this check at least every 6 months).

12. Disposal

This device MUST NOT be disposed of as urban waste.

The crossed-out wheelie bin symbol on the device label indicates that the product at the end of its useful life must be collected separately from other waste to allow it to be properly treated and recycled. The user must, therefore, deliver the end-of-life equipment free of charge to the appropriate municipal centres for the separate collection of electrical and electronic waste, or return it to the retailer in the 1-on-1 manner when purchasing a new equivalent product. Adequate separate collection for the subsequent recycling, treatment and environmentally compatible disposal of discarded equipment helps to avoid possible negative effects on the environment and health and promotes the reuse and/or recycling of the materials of which the equipment is made. Any improper disposal of the product by the user will result in the application of the penalties provided for by current legislation.

13. Warranty Conditions

For warranty conditions, refer to the relative document which can be downloaded from the website www.peimar.com.

PEIMAR

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