

EN

PSI-X1P-TL PSI-X1P-TLM

SINGLE PHASE ON GRID INVERTER

User manual



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It should be noted that the technical data, information and representations contained in this document have 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.

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Introduction

This user manual defines detailed instructions and procedures for the installation, operation, maintenance and troubleshooting of the following Peimar inverters connected to the electrical grid:

PSI-X1P1100-TL	PSI-X1P1500-TL	PSI-X1P2000-TL	PSI-X1P2500-TL
PSI-X1P3000-TL	PSI-X1P3000-TLM		PSI-X1P4200-TLM
PSI-X1P5000-TLM		PSI-X1P6000-TLM	

Please always keep this manual available in case you need it.

1. Security measures

1.1. Safety tips

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

1.2. Legend of safety symbols



DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



WARNING

Indicates a hazardous situation that, if not avoided, could result in death, serious injury, or moderate injury.



ATTENTION

Indicates a hazardous condition that could result in minor or moderate injury if not avoided.



NOTICE

Indicates a situation that could lead to potential damage if not avoided.

1.3. Safety instructions



DANGER

1. The user must comply with the applicable electrical codes, national and local regulations during the installation, operation and maintenance of the inverter, to avoid incurring 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 people with adequate experience and knowledge.
3. Do not touch the parts of the inverter while the device is running; There is danger to death from electric shock and high voltage.
4. To prevent the risk of an electric shock during installation and maintenance, please make sure that all AC and DC terminals are disconnected from the inverter, and never touch the positive and negative pole of the PV connection device simultaneously.
5. Make sure that the existing wiring is in good condition and that the cables are not undersized. The wiring must be carried out in a way so that the length of the cables is as short as possible.
6. Do not touch the inverter surface while the coating is wet; could cause an electric shock.
7. Do not stay close to the inverter during bad weather conditions including storm, lightning, etc.
8. Before touching the coating, the inverter must be disconnected from the grid and from the photovoltaic generator; it is necessary to wait at least five minutes to allow the energy storage capacitors to fully discharge after being disconnected from the energy source. It is needed to measure the voltage between the positive and negative poles of the PV connecting device to ensure that the device is discharged before carrying out any work on the inverter.
9. The island effect is a particular phenomenon where the photovoltaic system continues to feed energy into the grid even when there is a grid loss in the electricity system; this is a dangerous phenomenon for maintenance personnel and the public. The inverters of this series are equipped with an integrated protection to avoid the islanding effect.

10. The inverters of this series are equipped with a certified internal residual current device to protect against possible electric shock and fire hazards in the event of a malfunction of the PV array, cables or inverter. If the local regulations require an external differential switch, install a magneto-thermal differential switch downstream of the AC side output, with a differential of at least type A (a type A or F differential is recommended) and a tripping threshold $I_{dn}=0.3A$ differential switch.



WARNING

1. The installation, maintenance, recycling and disposal of the inverters must be carried out only by qualified personnel, in compliance with the national and local laws and regulations in force with the use of suitable equipment. Prevent the inverter from being used by children or unqualified personnel.
2. The installation location must be away from humidity and corrosive agents.
3. Any unauthorized action, including the modification of any type of product functionality, may result in damage to the components and a lethal danger to the operator, or to third parties.
4. Do not disassemble the inverter parts not mentioned in the installation guide. In an event of improper modifications Peimar is not responsible for any damage and abstains from any liability relating to the guarantee of the mentioned product.
5. The Peimar inverter must only be used in combination with photovoltaic panels only, in compliance with current regulations; do not connect other energy sources to the Peimar inverter.
6. Use only the recommended accessories, otherwise there is a risk of fire, electric shock, or injury.
7. Make sure that the photovoltaic generator and the inverter are correctly connected to the earth system; Improper grounding can cause personal injury, death, or equipment malfunction and increase electromagnetic emissions. Make sure that the ground conductor is adequately sized as required by the safety standards. Do not connect the earth terminals of the unit 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 at the same time.
10. The unit contains capacitors that remain charged even after the power supply has been removed; allow at least 5 minutes to pass after disconnection. Make sure there is no voltage before operating

**ATTENTION**

- 1 The photovoltaic inverter can reach high temperatures during operation. Please do not touch the heat sink or side surface during operation or immediately after turning off the power to avoid the risk of burns.
- 2 To prevent damage and personal injury, hold the inverter firmly when moving it, as it is a heavy piece of equipment.
- 3 Staying within 20cm of the inverter for a long time may cause harm to health due to radiation.

**NOTICE**

- 1 The photovoltaic inverter is designed to feed alternating current energy directly into the public electricity grid; do not connect the AC output of the inverter to any device that is not connected to the electricity grid.
- 2 There may 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. Surge voltages can be induced on both DC cables and AC cables leading to the building. The designer, based on the risk of lightning and what is required by current legislation, will evaluate whether or not to install any additional external arresters compared to the SPs already supplied with the inverter, for the protection of the circuits on the photovoltaic side and AC side.

1.4. Legend of symbols on the label



DANGEROUS ELECTRIC VOLTAGE

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



DANGER TO LIFE due to high voltage!

There may be residual voltage in the inverter due to the high capacity of the condenser. Wait 5 MINUTES after disconnecting the appliance before touching the coating or carrying out maintenance on the system.



WARNING, DANGER!

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



DANGER HOT PARTS

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



This device MUST NOT be disposed as a municipal waste.

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



WITHOUT TRANSFORMER

This inverter does not have an isolation transformer.

**EARTHING**

The connection point of the protective conductor for earthing is indicated on the inverter.

**CE MARK**

Devices with the CE mark meet the essential requirements of the Low Voltage Directive and the Electromagnetic Compatibility Directive.

RoHS RoHS

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

**INSTRUCTIONS**

Refer to the present manual for inverter installation, operation, maintenance, and troubleshooting instructions.

2. Product information

2.1. Field of use

The network inverters of the PSI-X1P-TL/TLM series are single-phase network inverters, to be connected to the electricity grid; they receive the electricity generated in direct current (DC) by the photovoltaic panels and convert it into alternating current (AC), in compliance with the requirements of the public grid.

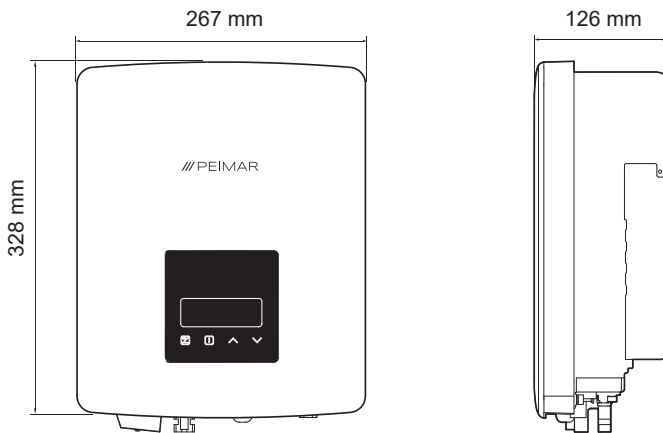
2.2. Product Model Specifications

PSI-X1PXXXX-TL / PSI-X1PXXXX-TLM

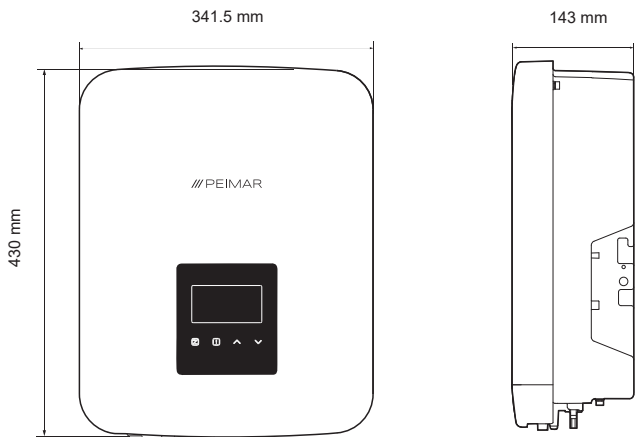
- PSI-X1P indicates the series name of the inverter.
- XXXX indicates the nominal power in W of the inverter.
- TL indicates that it is a transformerless inverter with single MPPT.
- TLM indicates that it is a transformerless inverter with dual MPPT.

2.3. Product dimensions

The network inverters of the PSI-X1Pxxxx-TL series have the dimensions indicated in the following figure:



The PSI-X1Pxxxx-TLM series grid inverters have the dimensions indicated in the following figure:



2.4. List of components

Specifications	Quantity
Inverter	1
Support bracket already screwed to the inverter	1
Positive DC connectors	1,2 ⁽¹⁾
Negative DC connectors	1,2 ⁽¹⁾
Positive DC pin connectors	1,2 ⁽¹⁾
Negative DC pin connectors	1,2 ⁽¹⁾
Ring terminal for earthing	1
Screw anchors	2,3 ⁽¹⁾
Screw washers	-,3 ⁽¹⁾
Expansion screws	2,3 ⁽¹⁾
AC connector	1
Installation manual	1
Wi-Fi module	1 ⁽²⁾

⁽¹⁾ For the PSI-X1Pxxxx-TLM model, which differs in some cases.

⁽²⁾ Not included for PSI-X1P1100-TL and PSI-X1P1500-TL models.



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 components, contact your dealer as soon as possible. Keep the original packaging in case you need to send the product back for any repairs or replacements.

3. Installation instructions

3.1. Warnings



DANGER

- Danger to life due to risk of fire or electric shock.
- Do not install the inverter near flammable or explosive objects.
- This inverter will be directly connected to a HIGH VOLTAGE electric generator; installation must be carried out exclusively by qualified personnel.



NOTICE

- This device is compliant with environmental pollution degree II for outdoor environments.
- An inappropriate or non-compliant installation environment can compromise the life of the inverter.
- Installing the inverter with direct exposure to sunlight is not recommended.
- The installation site must be well ventilated.

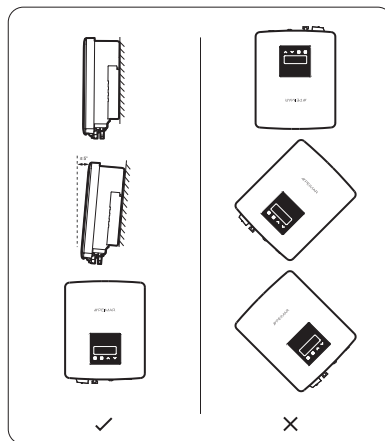
3.2. Packaging control

Although Peimar inverters have passed rigorous checks and are tested before they leave the factory, it is not excluded that they may suffer damage during transport. Please check that the packaging has not shown obvious signs of damage; If this occurs, please do not open the box and contact your retailer as soon as possible.

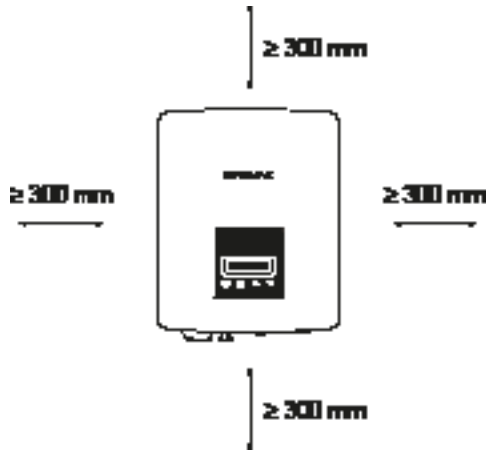
3.3 Installation and positioning methods

The device is cooled by natural convection and can be installed indoors or outdoors. Do not expose the inverter to direct sunlight as this could cause power derating due to overheating. Do not expose the inverter to rain or snow, as this could compromise the life of the inverter.

1. Please install the device as shown in the figure below. Vertical installation is recommended, or with a maximum inclination of 5° backwards. Never install the inverter with a forward or lateral inclination, in a horizontal position or in an upside down position.

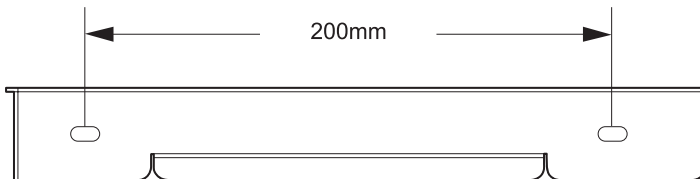


2. Install the inverter at eye level to facilitate viewing of the display and possible maintenance activities.
3. Carry out the installation of the inverter allowing for the possibility of disassembly for maintenance work. Make sure there is the minimum free space around the device, to ensure ventilation, as indicated in the figure below.

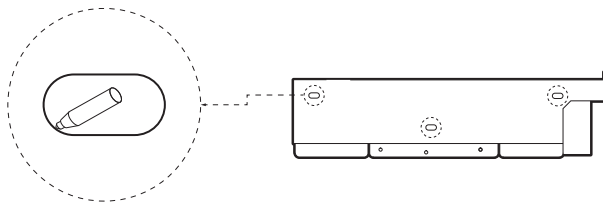


3.4. Assembly procedure

1. Mark the position of the drilling points for mounting the anchoring bracket (the bracket in the package is already screwed to the heat sink).



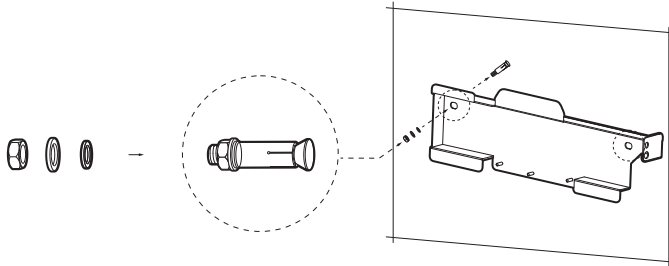
Inverter PSI-X1Pxxxx-TL



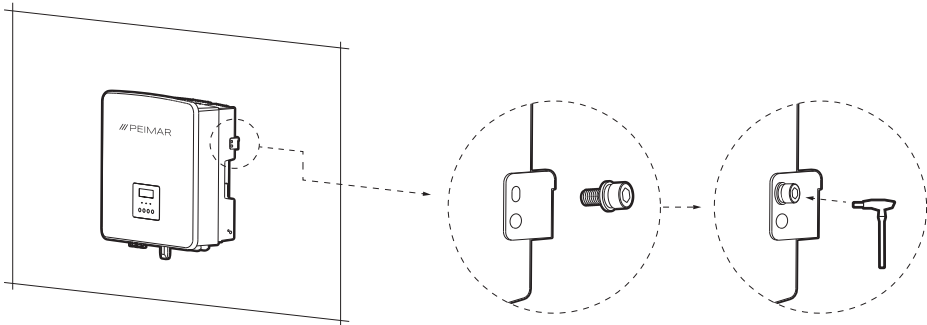
Inverter PSI-X1Pxxxx-TLM

2. Drill the necessary holes in the wall ($\Phi 6$ for PSI-X1Pxxxx-TL inverter and $\Phi 10$ for PSI-X1Pxxxx-TLM inverter) in correspondence with the marked points and insert the plugs using a rubber hammer

3. Fix the anchor bracket to the wall, screwing the screws into the plugs.

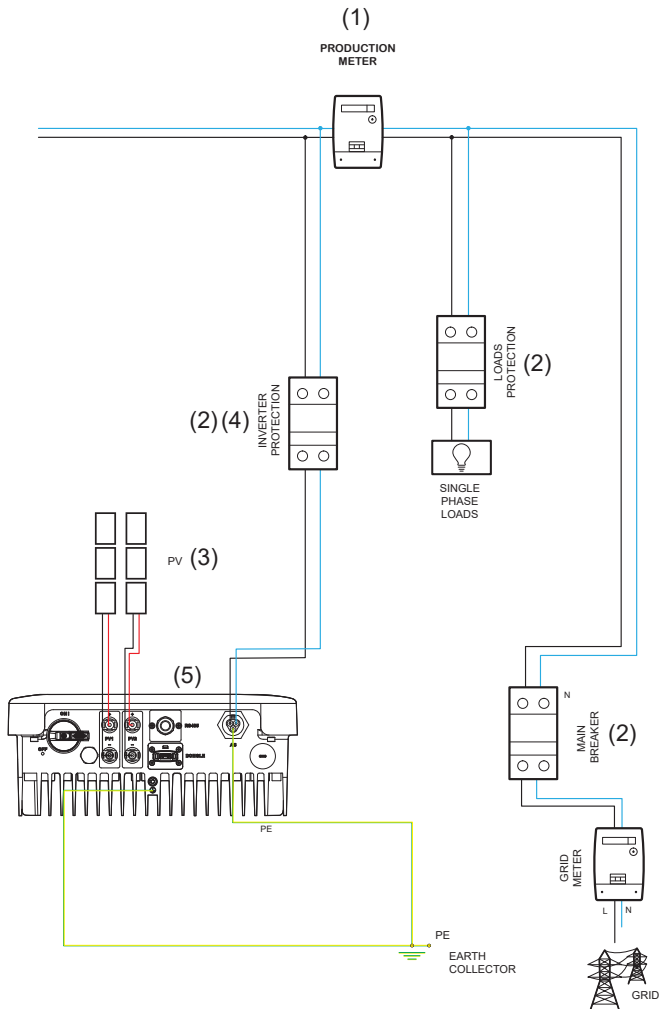


4. Carefully attach the inverter to the bracket, ensuring that the back of the device is mounted snugly against the bracket.
5. Tighten the screw on the side of the inverter to ensure correct fixing (in the case of the PSI-X1Pxxxx-TL inverter there is a screw on each side).



4. Installation hypothesis

Configuration of a PSI-X1P-TL/TLM series single-phase grid inverter.



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

- The protections indicated on the diagram and their position are purely indicative and to be evaluated in agreement with the project planner 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 to purchase.

- For correct operation of the inverter, make sure that voltage and current compatibility between the inverter and photovoltaic strings are respected. For PSI-X1Pxxxx-TLM inverters, the use of both MPPTs (PV1 and PV2) are recommended. For the possible configurations of the photovoltaic line, refer to the "PV Connection" paragraph of this manual.
- With respect with the protections already present, for safety and in compliance with regulations, provide for the installation of a circuit breaker downstream of the AC side output, with at least a type A differential and an intervention threshold $I_{dn}=0.3$ A. Dimension the AC line based on the distance between the inverter and the exchange meter. For further details, consult the chapter relating to AC connections in this manual. For limits and recommended values, refer to the table below.

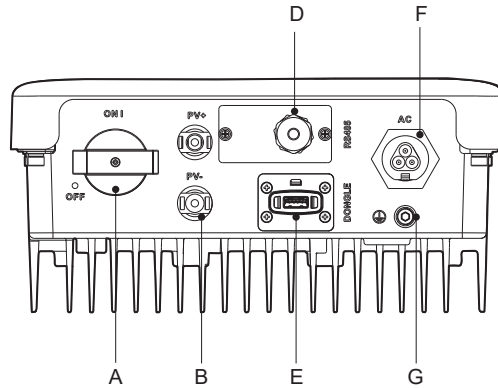
	Nominal power (kW)	Recommended switch size (A)	Cable section (mm ²)
PSI-X1P1100-TL	1.1	10 A	2.5 - 6
PSI-X1P1500-TL	1.5	10 A	2.5 - 6
PSI-X1P2000-TL	2.0	16 A	2.5 - 6
PSI-X1P2500-TL	2.5	20 A	2.5 - 6
PSI-X1P3000-TL	3.0	20 A	2.5 - 6
PSI-X1P3000-TLM	3.0	20 A	4 - 6
PSI-X1P4200-TLM	4.2	25 A	5 - 6
PSI-X1P5000-TLM	5.0	32 A	5 - 6
PSI-X1P6000-TLM	6.0	32 A	5 - 6

- The project planner will evaluate the need to install any additional external arresters or not, compared to the overvoltage protections (SPD) already supplied with the inverter, for the protection of the photovoltaic side and AC side circuits. For further details, consult the chapter on PV and AC connections in this manual.

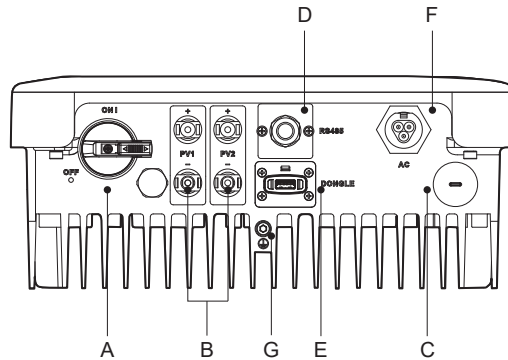
5. Electrical connection

5.1. Inverter connection inputs

PSI-X1Pxxxx-TL



PSI-X1Pxxxx-TLM



A	DC disconnect switch
B	Photovoltaic input
C	USB port for firmware update
D	RS485 port for communication with external device
E	DONGLE port for Wi-Fi/Ethernet module connection
F	Terminal for AC connection
G	Hole for earth connection

5.2. PV CONNECTION

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

- It is important to connect on the same string only modules with the same electrical characteristics (same panel model) and the same orientation and exposure to the sun.
- If you have panels with different electrical characteristics (different models; different number of modules in series; different orientation; etc.) it is necessary to use independent MPPTs that act separately.
- For correct operation of the inverter, ensure that voltage and current compatibility between the inverter and photovoltaic strings are respected.



NOTICE

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

V_{oc_Tmin} (Open circuit voltage at minimum temperature) < V_{max_cc} (maximum DC voltage)

V_{mp_Tmin} (Voltage at P_{max} at minimum temperature) < V_{max_mppt} (maximum MPPT voltage)

V_{mp_Tmin} (Voltage at P_{max} at minimum temperature) < V_{max_sis} (maximum panel system voltage)

I_{mp_Tmax} (Current at P_{max} at maximum temperature) < I_{max_mppt} (maximum MPPT current)



NOTICE

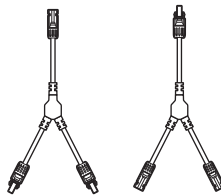
Make sure the string voltage is higher than the inverter start voltage or the system may not turn on or have poor efficiency:

V_{oc_Tmax} (Open circuit voltage at maximum temperature) > V_{start} (starting voltage)

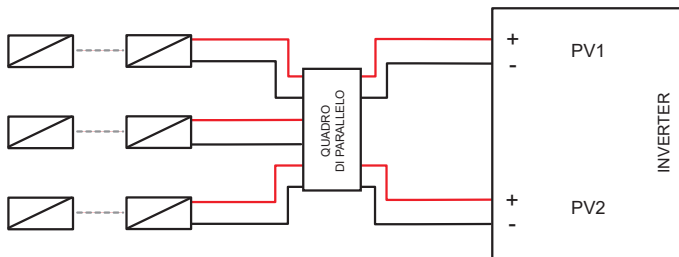
V_{mp_Tmax} (Voltage at P_{max} at maximum temperature) > V_{min_mppt} (minimum MPPT voltage)

For inverters of the PSI-X1Pxxxx-TLM series, if the electrical parameters require it, it is possible to make the following string connections on the two MPPTs:

1. In the case of a string with a current greater than 14A, assume the use of Y connectors as in the figure.



2. In the case of more than two strings connected in parallel, but with a maximum current lower than 28A, assume the use of a parallel panel as in the figure.

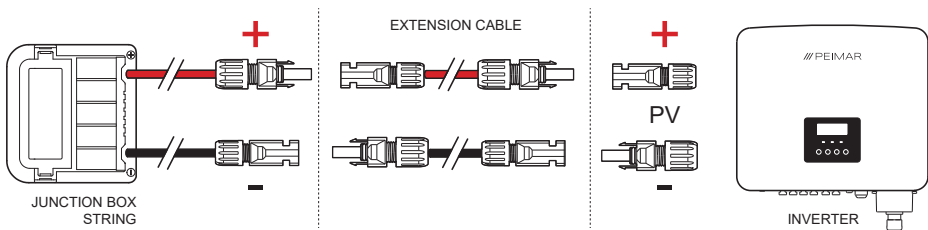


If a photovoltaic configuration with strings in parallel is envisaged, it is necessary to set the parallel MPPT function using the following procedure:

MENU > OPTIONS (Password 2014) > PV MODE > PARALLEL.

The multi option is to be selected if the MPPTs are used independently, The comm option is to be selected if the MPPTs are placed in parallel with each other.

To connect a photovoltaic string to the inverter, two solar cables are required which in turn must be connected to the positive and negative DC inputs of the inverter. On the cables on the inverter side, use the connectors present in the package. On the cables on the panel side, obtain the appropriate MC4 or compatible connectors (as per the diagram below).



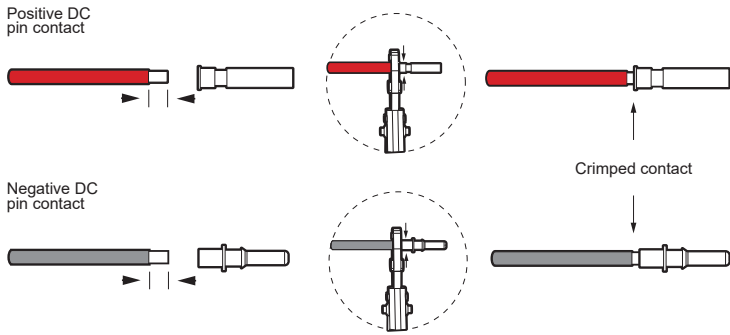
PLEASE NOTE

Peimar does not supply the solar cables and panel-side MC4 connectors described above in this document. Contact your distributor to purchase.

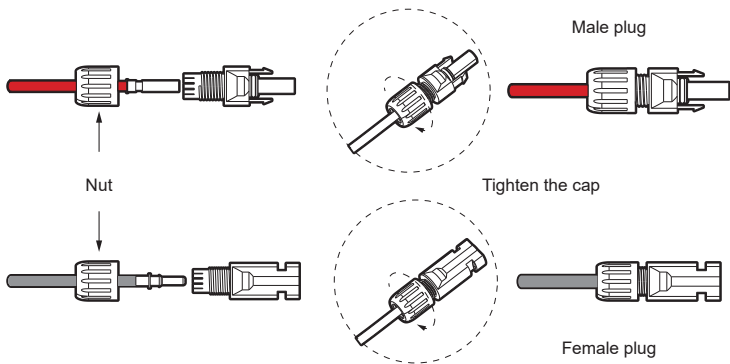
DC connection procedure

Verify that the inverter's DC switch is turned OFF. On the underside of the inverter there are positive and negative photovoltaic inputs. For inverters of the PSI-X1Pxxx-TLM series, it is recommended to use the connectors of both inputs (PV1 and PV2) to exploit both MPPTs of the inverter.

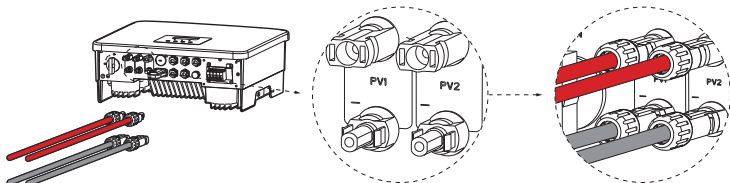
1. For the DC connection, observe the following assembly procedure: Take the positive and negative MC4 connectors from the package, including the waterproof gasket and metal insert, which will be mounted on the string terminals to make the connection with the inverter. Strip the ends of the photovoltaic string cables by 8-10 mm and crimp the metal insert of the MC4 connectors with pliers, taking care to respect the polarities. The recommended section of the photovoltaic cable is 4-6mm².



2. Insert the locking screw and waterproof gasket of each MC4 connector into the PV string cables. Screw the connector to the locking screw, taking care to respect 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 connected correctly.

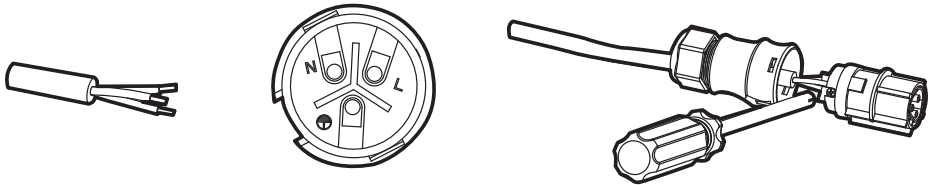




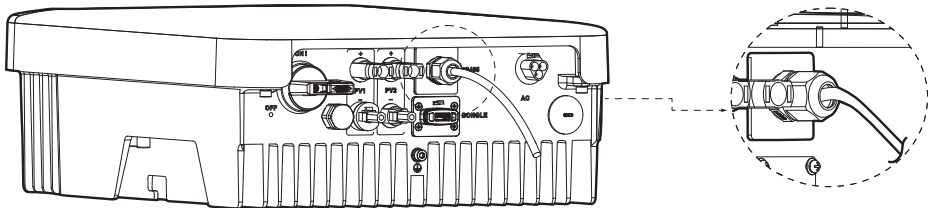
PLEASE NOTE

Evaluate the installation of protection devices on the line as indicated in the "Installation hypothesis" chapter of this manual.

5.3. AC CONNECTION



Prepare a three-core cable and insert it into the waterproof cable gland of the AC connector included in the package. Connect the L N and PE ends of the cable according to the connection symbols. Securely fasten all parts of the connector and connect the connector to the inverter.



PLEASE NOTE

Evaluate the installation of protection devices on the line as indicated in the "Installation hypothesis" chapter of this manual.

6. Meter Connection

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 single-phase inverters of the PSI-X1P(TP-TPM-HY) series and for currents up to 80 A is the direct insertion PSI-X-1PMETER-ZI.

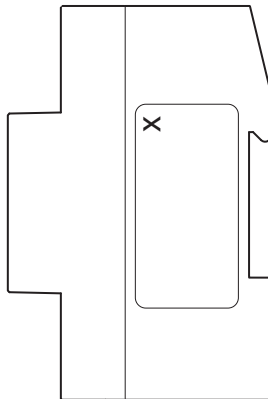
The installation of the PSI-X-1PMETER-ZI meter therefore allows you to:

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



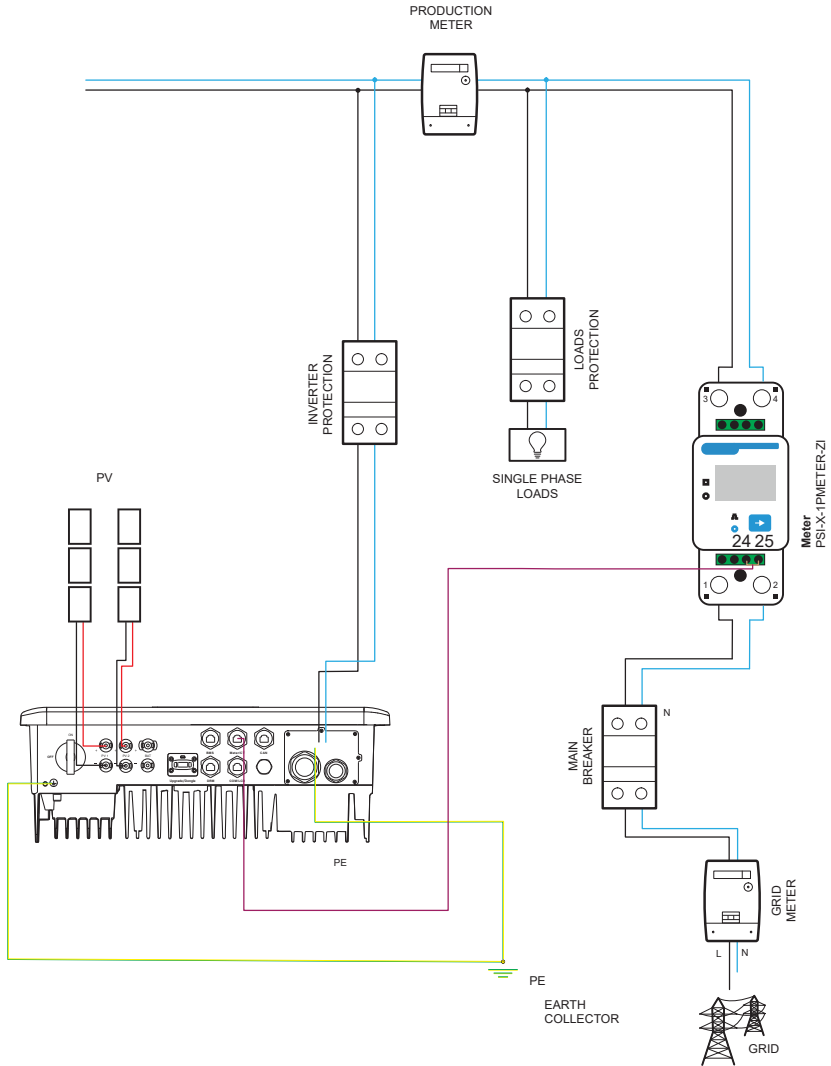
PLEASE NOTE

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



PLEASE NOTE

The PSI-X-1PMETER-ZI must be installed upstream of the network loads, downstream of the exchange meter; refer to the diagram below for the exact installation point (see generic diagram below).



PLEASE NOTE

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

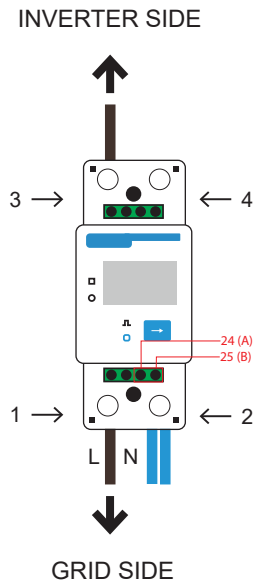
PSI-X-1PMETER-ZI METER installation

To connect the PSI-X-1PMETER-ZI meter, observe the following assembly procedure:



WARNING

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



- 1 - 3 they are the Line pins.
 - 2 - 4 they are the Neutral pins.
 - 24 - 25 they are the pins of the communication cable.
1. Strip the phase (L) arriving from the exchange meter (network side) by 8-10mm and fix it to input 1 of the meter by tightening the clamp.
 2. Strip the phase (L) arriving from the system (inverter side) by 8-10mm and fix it to input 3 of the meter.
 3. Strip the neutral arriving from the exchange meter and from the system by 8-10mm and fix them to input 2 of the meter by tightening the clamp. It is also possible to connect the neutral arriving from the system (inverter side) to output 4 of the meter.



PLEASE NOTE

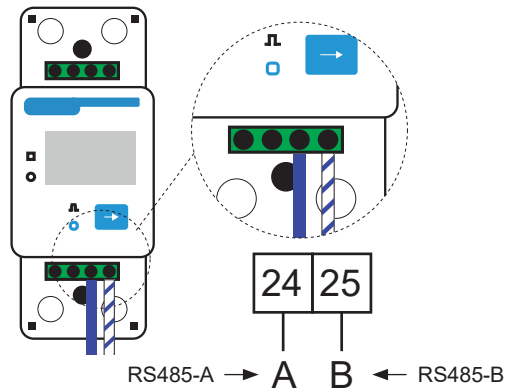
The size of the network cables for connecting the meter must have a section of $\leq 16,00 \text{ mm}^2$.

4. Arrange a twisted pair cable of sufficient length to cover the distance between the inverter and the meter, otherwise provide 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 terminal.



PLEASE NOTE

The size of the meter's communication cable must have at least a section between $0,25$ e $1,00 \text{ mm}^2$.

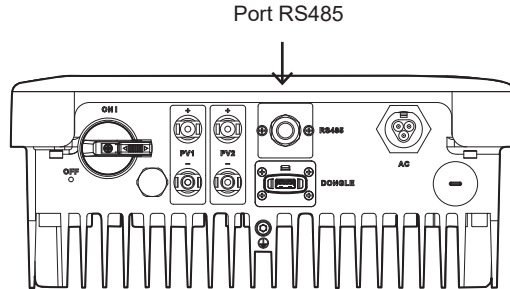


5. For connection on the inverter side, refer to the relevant inverter manual and the paragraphs below.
6. Once the electrical connection phase has been completed, fix the PSI-X-1PMETER-ZI meter on DIN rails (height 35 mm). Since the meter is neither waterproof nor dustproof, it is recommended to install it inside the electrical panel.
7. The display of the PSI-X-1PMETER-ZI meter lights up when the system is powered. The meter is already automatically set with the correct network parameters; by briefly pressing the “arrow” button it is possible to scroll and check the different set parameters; the meter is already preset with the correct operating parameters, which therefore do not need to be modified.

PSI-X1P series single-phase mains inverter connection (TL-TLM)

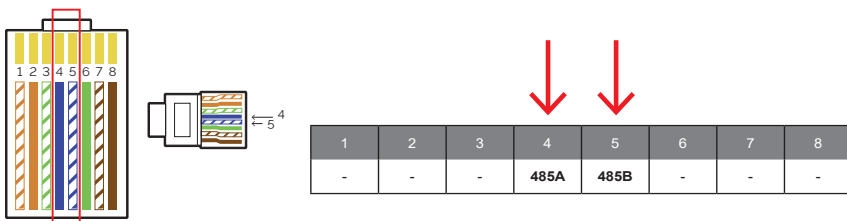
The following installation procedure applies to single-phase mains inverters of the PSI-X1P-TL and PSI-X1P-TLM series.

To connect the meter to the inverter you must use the communication port called RS485 located on the lower part of the inverter.

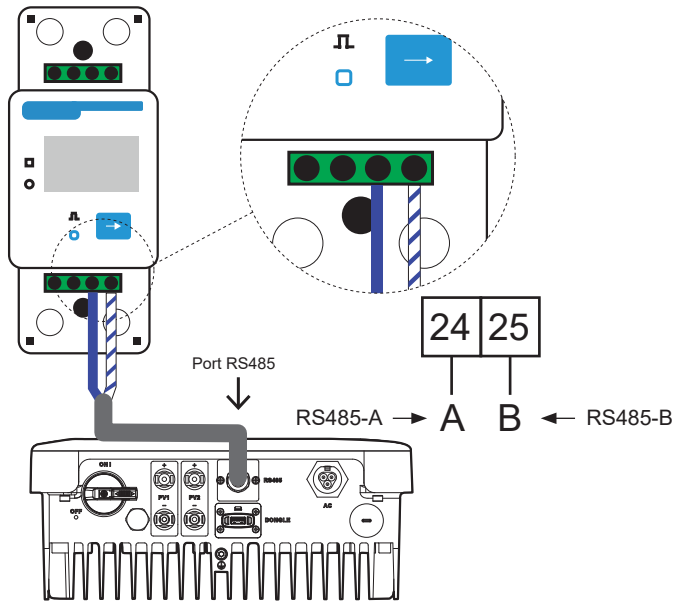


1. Take the connection cable and after connecting the two ends to the meter in the respective ports (24 and 25, see previous chapter) proceed to crimp the two wires of the other end of the cable to an RJ45 plug so that there is continuity Between:
 - Terminal 24 (A) of the meter and Pin 4 of the plug.
 - Terminal 25 (B) of the meter and Pin 5 of the plug.

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



2. Connect the RJ45 plug to the RS485 port of the inverter.



3. For the PSI-X-1PMETER-ZI meter to work correctly it is necessary to select the correct setting on the PSI-1XP network inverter. From the display go to the menu and select Meter:

MENU > OPTIONS > Password "2014" > Export Control > Select Mode > Meter > Enable.

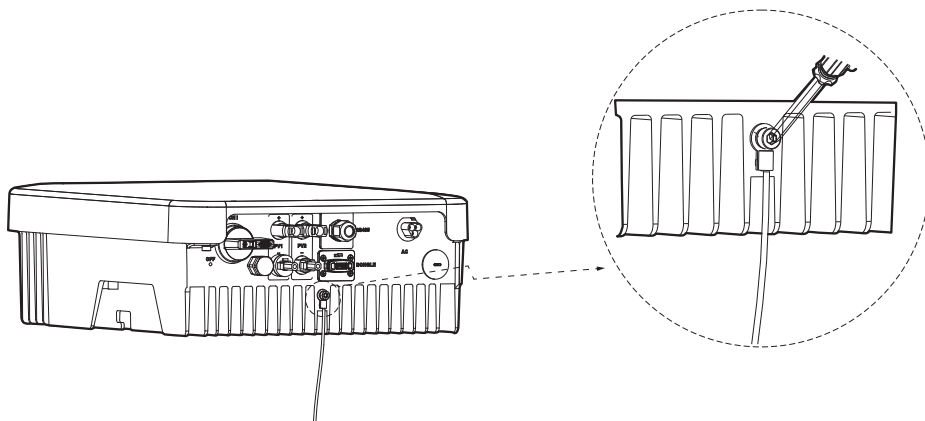
To activate the export limit function and ensure that energy is not exported to the grid, activate the appropriate option in the advanced settings of the inverter; from the display go to the menu:

MENU > OPTIONS > Password "2014" > Export Control > Select Mode > Meter > 0W.

7. Grounding

For the safety of the system it is mandatory to earth the inverter:

- 1 Crimp the terminal of the ground wire included in the box to the appropriate line.
- 2 Fix the earth cable in the appropriate hole, identified by the earth symbol, by tightening the hexagonal head screw already screwed to the heat sink.



8. Parallel connection of multiple PSI-X1P-TLM series inverters

This chapter describes the parallel connection of multiple inverters of the PSI-X1P-TLM series, respectively with a power of 3 kW, 4.2 kW, 5 kW and 6 kW, through the use of an energy management meter.



PLEASE NOTE

Parallel connection, through the use of a network meter in the system, is allowed up to a maximum of 5 inverters.

If it is not necessary to reduce the power fed into the grid or read self-consumption, it is also possible to connect a greater number of inverters to the same line, without using the meter for energy management; it is however necessary to evaluate its feasibility with the project planner in compliance with current regulations.

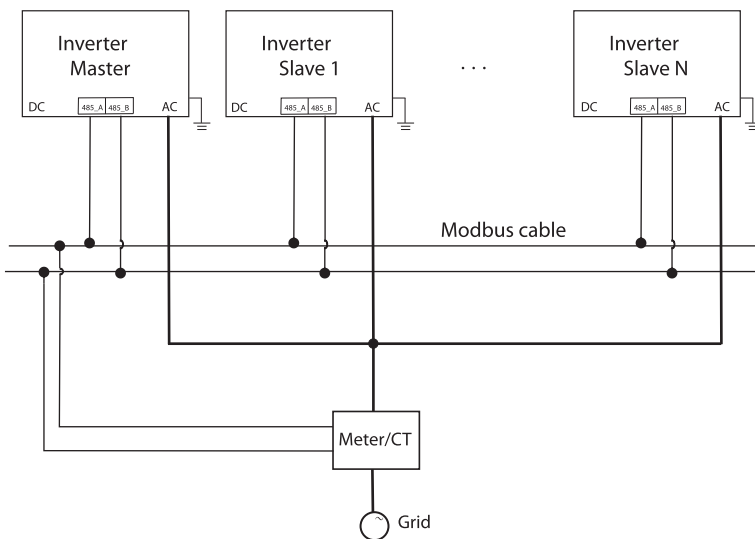
For systems with a total nominal power greater than 11.08 kW, the installation of an external interface protection system must be envisaged, as required by law. Before proceeding, also check that the inverters are from the same PSI-X1P-TLM series.

It is not possible to parallel using inverter meters other than those mentioned above.

8.1. Electrical connections, communication and display settings

With the parallel connection mode, one inverter will be set as Master and will control the management and energy supply of all the other connected inverters, which will become Slave inverters.

In this system it is necessary to connect only one Meter which will communicate only with the Master inverter, while the slave inverters will be connected in cascade to the Master via communication cables (see diagram below).



Phase 1: Connect the phase, neutral and earth of the inverters to the same line. Follow the connection methods described in the AC Connection chapter of this manual.

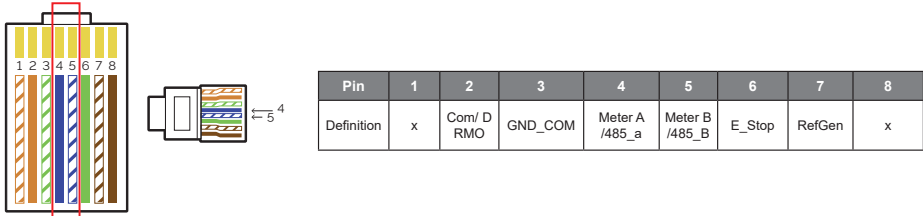


PLEASE NOTE

For the safety of the system it is mandatory to earth each inverter.

Phase 2: The installer must independently equip himself with an RS485 data cable to connect the inverters to each other so as to put them in communication.

The data cable must be connected by connecting an RJ45 plug to the RS485 port of the inverter; The PIN definitions of the RS485/Meter interface are shown below:



To make the parallel connection between the inverters, connect the communication cables as follows:

- Connect all the inverters of the system in parallel with each other using the RS485 cables.
- Connect the communication cable to the master inverter.

Phase 3: Connect the meter to the master inverter by connecting a communication cable so that there is continuity between:

- Terminal 24 (A) of the meter and Pin 4 of the plug
- Terminal 25 (B) of the meter and Pin 5 of the plug

For further details, proceed as described in the relevant chapter of this manual for connecting the Meter.

Phase 4: Once the meter has been connected to the master inverter, it is necessary to activate it on the display and set the "Parallel power" value on the master inverter. This will be the limit value of the operating power of the parallel system. The output power from each Slave inverter will be distributed respectively according to the rated output power of each. The value can be set between a range from 0 kW to 30 kW. The "Parallel power" function is activated when the inverter operates as master and the parallel function is active. This function replaces "Power Limit" in normal operation, which is used to set the power limit on a single inverter. To set it:

MENU > OPTIONS > Password "2014" > EXPORT CONTROL > MODE > METER > PARALLEL POWER=> 30000 W.

Phase 5: Finally, you need to activate the master or slave mode on the display:

MENU > OPTIONS > Password "2014" > PARALLEL SETTINGS > ENABLE > MASTER MODE/SLAVE MODE.



PLEASE NOTE

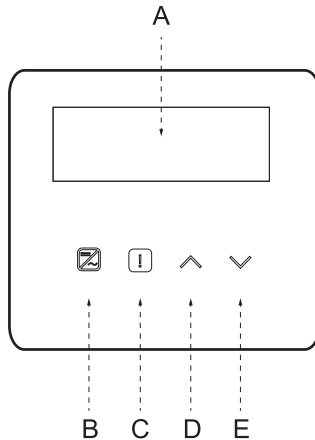
Only the inverter connected to the meter must be set as Master, the others must be set as Slave.

9. Turning on the inverter

- 1 Make sure the inverter is fixed to the wall.
- 2 Make sure the inverter is properly grounded.
- 3 Check that the DC and AC lines are correctly connected.
- 4 Make sure that any meter is well connected, in the right position (upstream of all loads).
- 5 Turn the inverter's DC switch to On.
- 6 Turn on the AC line switch and any DC line switches.

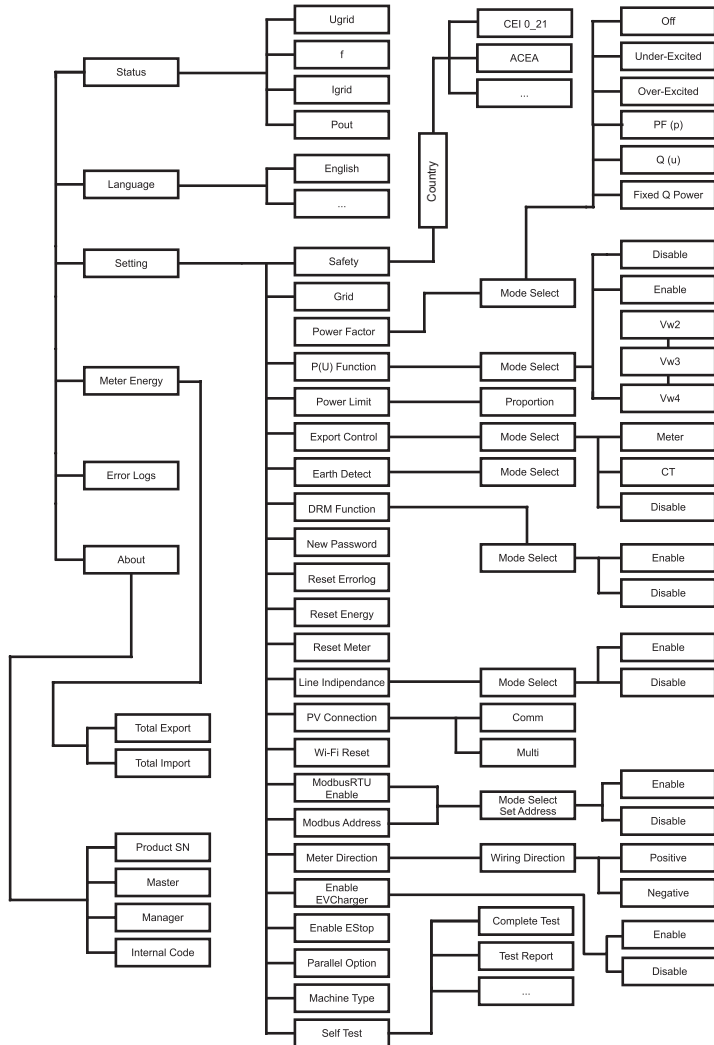
If the electrical connections have been correctly carried out, the inverter display will light up when the system is powered. After a few seconds in which the inverter is in the control state, the system will start to work normally and produce electricity.

10. Setting and visualisation interface



A	Display	The display allows you to view the inverter's production data and set the operating parameters
B	LED indicators	Steady blue light: The inverter is in normal state. Flashing blue light: The inverter is in waiting or checking state.
C		Red light on: the inverter is in error state. Red light Off: the inverter has no error.
D	Buttons	UP/ESC key: if pressed quickly, scrolls Up/Left or increases the selected value. If pressed for a long time it works as an ESC button and allows you to exit the interface or the current function.
E		DOWN / ENTER key: if pressed quickly, scrolls Down/Right or decreases the selected value. If pressed for a long time it works as an ENTER button and confirms the selection.

11. Inverter Screen Block Diagram



*Options available only for PSI-X1P-TLM inverters.

11.1. Main functions on the display

When the inverter starts, the screen that appears on the display is the main one which shows the following information:

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

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

Menu:

This screen is used by the user to view information relating to the inverter and change its settings. To enter this screen, press the "DOWN/ENTER" key of the inverter for a certain time on the main startup screen. Choose the desired settings by scrolling with the up and down arrows and press "DOWN/ENTER" to confirm.

Status:

Two types of parameters are displayed:

- Grid

The current AC parameters of the inverter such as voltage, current, output power and grid power are shown. With "Pout" it measures the inverter output, "Pgrid" measures the energy exported or imported from the grid. When the value is positive it indicates that the energy is injected into the grid, while when the value is negative it indicates that the energy is withdrawn from the grid.

- Solar

This status shows the condition of the PV system in real-time, showing the parameters of: input voltage, current and power status of each PV input.

Language:

The Italian language is already set by default on the device. Check that the desired options are set or, if necessary, change them by following the relevant path:

MENU > LANGUAGE > Italian.

Settings:

Use this screen to access and modify the operating parameters of the inverter.



PLEASE NOTE

The default password is "2014", which only allows the installer to review and change the necessary settings in accordance with local rules and regulations.

- Standard

Default network standard values are already set on the device. Check that the desired options are set or change them if necessary by following the relevant path:

MENU > OPTIONS > password "2014" > STANDARD.



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 regulation; only if the inverter is installed under the Areti - ACEA Group network, please select the ACEA standard. The previous indications must be verified and confirmed by the network manager and the technician who connects to the network.

- Network Options

Normally it is not necessary to modify these parameters, since 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.

- Power factor

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

There are 6 modes: Off, Under-Excited, Over-Excited, PF(p), Q(u) and Fixed Q Power.

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

- Function P(u)

The P(u) function is a volt-watt response mode required by some national standards such as the Australian one. This function can control the active power of the inverter according to the grid voltage. Selecting "Enable" means that this feature is enabled and is the default value. Select "Disable" to disable the feature.

- Power limit

MENU > OPTIONS (password "2014") > NETWORK OPTIONS > POWER LIMIT.

This function allows you to set the percentage of power at the AC output of the inverter. The default value is 100% (1.00).



PLEASE NOTE

This option does not allow you to enable the power export limit function, which allows the system to block the feeding of the surplus energy produced into the grid; for this procedure, consult the Meter connection paragraph in this manual.

- Export control

With this function the inverter can control the energy fed into the grid by installing an external meter. There are two values: "User value" and "Factory value": the factory value is predefined and cannot be modified by the user; the user value is set by the installer and must be lower than the factory value and within the range of 0 kW to 30 kW. Choose "Disable" the function will be deactivated. For further details, read the meter connection chapter of this manual.

- Earth detect

The default setting is "Disabled".

- DRM function

With this function the installer can decide whether to Enable/Disable the switch of the inverter via an external communication device.

- New password

Using this option you can set a new password: set the new 4 digits and long press the down key to confirm.

- Reset Energy / meter / error log

With these functions the user can reset the relevant information saved by the inverter.

- Line impedance:

The user can choose whether or not to use the Line Impedance function;

- PV Connection

With this function you can select the type of connection of the photovoltaic strings. Select MULTI if the MPPTs are independent and COMM if they are connected in parallel. For further details, read the "PV Connection" chapter of this manual.

- Wi-Fi Reset

With this function the user can reset the Wi-Fi.

- Modbus

The installer can decide whether to Enable/Disable this function to communicate with other devices via the Modbus protocol.



PLEASE NOTE

To make this connection, please contact the manufacturer, in order to obtain specific technical information.

- Modbus Address

User can set modbus address by this function.

- Meter direction

With this setting it is possible to invert the direction of the meter's data reading.

- Model

On this page you can view the inverter model.

- Enable EV Charger

The installer can decide whether to Enable/Disable this function for using the charging station. This option is only available for PSI-X1P-TLM inverters.

- Enable EStop

Using this function, the installer can enable an emergency switch; This option is only available for PSI-X1P-TLM inverters.

- Parallel option

Activating this setting allows multiple inverters of the PSI-X1P-TLM series to be connected in parallel, through the use of an energy management meter. For further details, read the chapter "Connecting multiple inverters of the PSI-X1P-TLM series in parallel" of this manual. This option is only available for PSI-X1P-TLM inverters.

- Self test

In cases where the option CEI 0-21 or ACEA is set under the "country" section and the system has a nominal power lower than 11.08 kWp, it is necessary to perform the Autotest function directly from the inverter.



PLEASE NOTE

If the correct network standard is selected, the correct values for performing the self-test will automatically be set.

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

MENU > OPTIONS > PASSWORD "2014" > SELF TEST > COMPLETE TEST.

Once the self-test is completed, which takes a few minutes, the results screens will appear. It is also possible to view the test report at a later time by accessing the appropriate screen.

MENU > OPTIONS > PASSWORD "2014" > SELF TEST > TEST REPORT.

You can also start each test individually.



PLEASE NOTE

Make sure that the inverter is connected to the grid, that it is in Normal state and that it receives the minimum voltage from the photovoltaic generator throughout the self-test procedure.

Energy Meter

Through this setting the user can control the input or withdrawal of energy from the grid.

Error Log

The error log contains information about the latest errors that occurred.

Info

This interface displays inverter information, including the serial number and firmware versions (master and manager).

You can check the inverter firmware version by following the respective paths below:

MENU > INFO > MASTER (1.08 AND SUBSEQUENT).

MENU > INFO > MANAGER (1.07 AND SUBSEQUENT).

12. System monitoring configuration PSI-X inverter

12.1. Creation of installer account



PLEASE NOTE

For each system, the end user account (owner of the system) must always be created and subsequently, if desired, it is possible to add the created system to the installer account. Not vice versa.

To obtain an installer account please send an email to assistance@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)
- SN of the inverter
- Tracking SN printed on the Wi-Fi module
- Password

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

To monitor the customer's system you will need to go to:

Device Management > New Devices > + Add and enter the monitoring SN of the Wi-Fi module, then press "Allow". 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.

12.2. Configuration via Wi-Fi module

In numerous models of the PSI-X series (single-phase grid inverters PSI-X1P-TL/TLM \geq 2kW, three-phase grid inverters PSI-X3P-TP, hybrid inverters PSI-X1P-HY PSI- HY) a Wi-Fi module (PSI-X-H-WIFI or PSI-X-H-WIFI-3.0) is included which allows, if configured correctly, remote monitoring of operational status and production data.



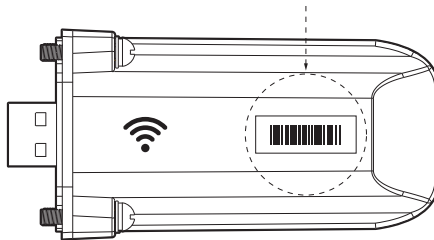
PLEASE NOTE

- If the SN of the module begins with SWxxxxxxx it is possible to carry out the connection procedure only via browser;
- If the SN of the module begins with SXxxxxxxx or SVxxxxxxx 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 since connecting to repeaters/Wi-Fi does not guarantee the sending of data to the server.

12.2.1. Configuration via Wi-Fi module from browser

Connection procedure

1. Insert the Wi-Fi module into the relevant USB port at 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 inverters of the PSI-X1P-TL/TLM and PSI-X3P-TP/TPM series); 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 search for the Wi-Fi hotspot of the device which is generally called Wifi_Sxxxxxxx (Sxxxxxxx=code printed on the Wi-Fi module itself).



3. Connect permanently to the hotspot, click on "connect" and wait for confirmation (it is normal for the failure to connect to the internet warning to appear).
4. Open the browser and type <http://192.168.10.10/> in the address bar.



PLEASE NOTE

For old inverter models, which have a PSI-X-H-WIFI stick (or for PSI-X-H-WIFI-3.0 sticks with SN starting with SX) use the address <http://5.8.8.8/> (Normally it is sufficient type 5.8.8.8 in the address bar) Be careful not to connect to the address <https://5.8.8.8/>.

5. Enter "admin" as the username.
6. Enter as password:
 - "admin" if the module's SN begins with SWxxxxxxx
 - Code printed on the module itself if the module's SN begins with SXxxxxxxx or SVxxxxxxx.
7. Enter the "Setting Page" click on the "Find AP" button to scan the available Wi-Fi networks.
8. Select your home Wi-Fi network, enter the relevant password in the "Key" box and click on "Save ".



PLEASE NOTE

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

9. The module LED, if present, will start flashing quickly; when it becomes permanently lit after about 20 seconds, it means that the Wi-Fi module has connected to the router.
10. Connect to the dongle again.
11. Reconnect to the http address indicated previously to check that the data entered have been stored correctly and that the IP address is present in order to ensure that the connection was successful.

End user account creation



PLEASE NOTE

For each system, the end user account (owner of the system) must always be created and subsequently, if desired, it is possible to add the created system to the installer account. Not vice versa.

Once the monitoring system has been configured correctly, 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.

Create new user ●

* SN for tracking

* Username

* Password for accessing

* Confirm the password

* Status


* Time zone

* Plant power (kW)

* Email

Username

Telephone

* Position 

In the "Monitoring SN" field, enter the code printed on the form itself and on the label applied to the box. Once you have filled in all the mandatory fields (Italian time zone UTC +01:00), press the "Register" 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.

12.2.2. Configuration via Wi-Fi module from the app

End user account creation



PLEASE NOTE

For each system, the end user account (owner of the system) must always be created and subsequently, if desired, it is possible to add the created system to the installer account. Not vice versa.

1. Download the Peimar X Portal App from the store.



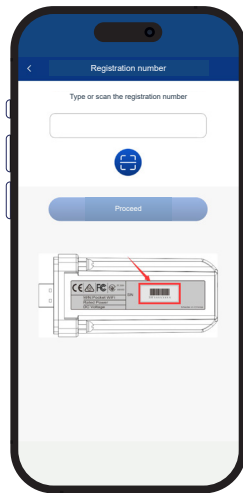
App Store



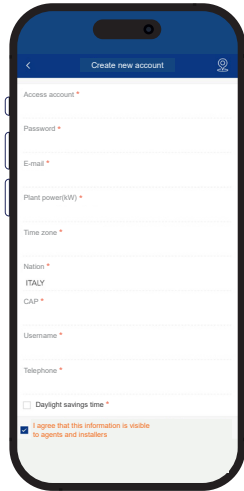
Google

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 tracking SN printed on the Wi-Fi module itself, and press the "Next" button.

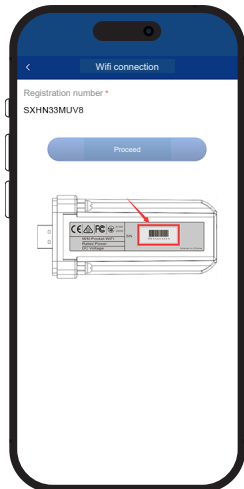


4. To create a new account, enter the required data (Italian time zone UTC +01:00) and press "Ok".



Connection procedure

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



3. At the message "Peimar X portal wants to access the Wi-Fi network" press the "Log in" option.
4. Enter the name of your home Wi-Fi network (SSID) and its password.



PLEASE NOTE

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

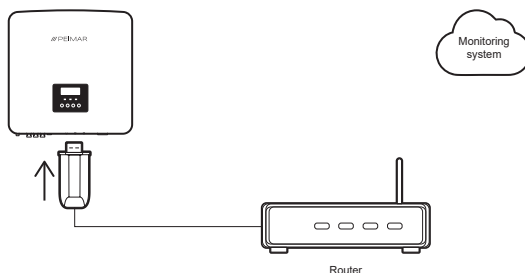
- 5 If the entire procedure has been followed correctly, the module LED, where present, will become permanently lit and after a few minutes the app will begin to receive the production data from the inverter and it will be possible to view it remotely.

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

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

Insert the Ethernet module into the relevant USB port at 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 inverters of the PSI-X1P-TL/TLM and PSI-X3P-TP/TPM series).

The installer will have to independently procure a category 5e or higher data cable.



**PLEASE NOTE**

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

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

When you are asked to enter the "monitoring SN", enter the code on the label of the ethernet module instead of the code on the label of the Wi-Fi module.

13. Error codes and troubleshooting

TYPE OF ERROR	RESOLUTION
AC HCT fault	Check the integrity of the photovoltaic strings and restart the inverter.
SPI fault	
SCI fault	
EEPROMInv fault	
Faulty relay	
Sample error	
RCD fault	Check the impedance between each DC input and the ground screw and between the AC output and the ground screw.
ConfigPV Error	Check the photovoltaic mode entered on the display.
Lost network	Check the mains voltage at the AC connector of the inverter.
AC10M volt fault	Check supply voltage and alternating line voltage drop.
Voltage lost	
Lost frequency	
PLL loss	Check mains voltage.
Bus volt fault	Check that voltages and currents of the photovoltaic strings comply with the inverter nameplate data.
Inv. OCP fault	
DCI OCP fault	
PV volt fault	
RC fault	
OCP SW failure	
TZ protection	Check the integrity of the cables and connections.
Another failure	Check the integrity of the inverter's DC and AC lines.
MgrEEPROM error	
Isolation fault	
High temperature	Check that you have ensured correct ventilation of the inverter.
Meter error	Check the functioning of the communication cable between the meter and the inverter.
Earth fault	Check the correct installation of the earth line. Check that the TER Detection function has not been activated by mistake (MENU > OPTIONS (password 2014) > TER DETECTION).

14. Disposal



This device MUST NOT be disposed off as waste urban.

The crossed-out wheelee bin symbol on the device label indicates that the product must be collected separately from other waste at the end of its useful life to allow for adequate treatment and recycling. The user must, therefore, give the equipment that has reached the end of its life free of charge to the appropriate municipal centers for the separate collection of electrical and electronic waste, or return it to the retailer according to the 1 for 1 method when purchasing a new equivalent product. Adequate separate collection for the subsequent sending of the decommissioned equipment for recycling, treatment and environmentally compatible disposal contributes to avoiding possible negative effects on the environment and health and promotes the re-use and/or recycling of the materials it is made of the equipment. Illegal disposal of the product by the user entails the application of the sanctions referred to in current legislation.

15. Warranty Conditions

For the warranty conditions, refer to the relevant document downloadable from the website www.peimar.com

/// PEIMAR



info@peimar.com | www.peimar.com