TURBO ENERGY
SOLAR INNOVATION

SUNBOX

Instruction
manual

SunBox Series 5.0

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Editor: **Turbo Energy S.L.**

Important note: The satisfaction of the end user will depend heavily on having made an adequate estimate of the demand, power, and energy, present and future, to which the equipment will be subjected. Improper calculation may not provide adequate and sufficient service.

Safety recommendations:

Please read the following information carefully before installing and implementing the product. The installation and commissioning of the system must comply with the Electrotechnical Low Voltage Regulation (REBT), and its complementary technical instructions, specifically, the ITC_BT 03, 04, 05 and 40, and the rest of the current regulations, either locally or regionally. Non-compliant use, use of the product in applications and/or configurations not in accordance with this manual, and/or modifications during assembly will result in warranty cancellation and all liability will be disclaimed.

Solar energy systems must be grounded (lightning protection).

Electrical connections must be made exclusively by a specialist technician.

This manual is intended to be a document that facilitates the correct installation of the SunBox equipment. However, once installed it is important to pay attention to the monitoring of maintenance instructions in order to maintain over time the functional and aesthetic characteristics inherent in the installation.

The correct use and the compliance with the maintenance requirements to be performed will depend heavily on the inevitable rate of aging of the installation. Similarly, the manufacturer will only assume responsibility if the equipment has defects of origin and will recline it if equipment contained in this manual is not maintained, or does not use manufacturer-approved spare parts.

Please read this manual carefully before starting the installation.

Content

1. Scope

This manual refers to the installation, operation, and maintenance of hybrid photovoltaic solar equipment SunBox.

Proper installation, as well as proper maintenance, are essential to ensure optimal performance and make the most of system capabilities.

This manual is complementary and is presented indivisibly with the following additional documents:

- o Instruction Manual and Datasheet for Hybrid Inverter (Hybrid Series 48V 5.0)
- o Instruction Manual and Datasheet for Batteries (Lithium Series 48V 5.1kWh)

For any other questions about the inverter or the battery, consult the corresponding manuals that can be found on the Turbo Energy website.

2. Safety instructions

To ensure correct installation it is recommended:

i.   Use safe mounting tools and install safety devices. Use ladders in good condition and check that they are securely fixed (~ 70 °) on firm support points.
ii.   Use the appropriate PPE for assembly: approved protective glasses, safety shoes, gloves and helmet.

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3. Description and operation

Description:

The SunBox consists of a mounted and wired cabinet prepared to include up to 2 Turbo Energy Lithium Batteries (Lithium Series 48V 5.1kWh) and a Turbo Energy Single Phase Hybrid Series 48V 5.0.
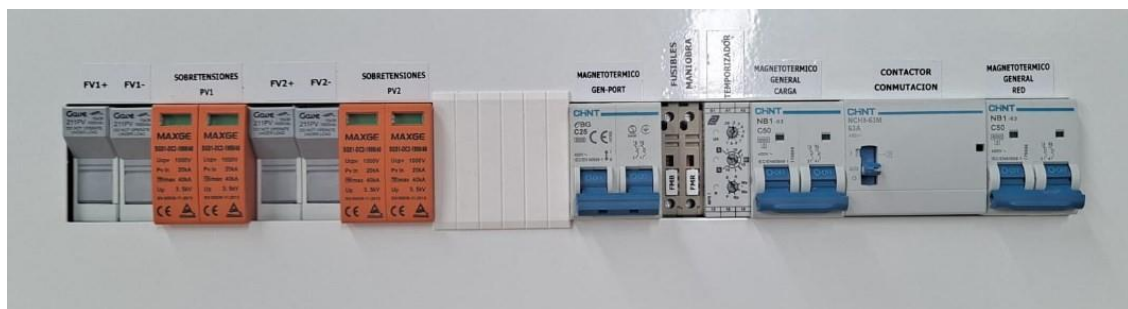
The system includes several protections for both DC and AC:

Continuous current (DC)

- Four 16A fuses

AC (Protections)

- A magnetothermal switch

The machine has fast MC4 links that facilitate the connection of each string.

In terms of support and handling, the system includes four wheels that can support a load of 280 Kg.

Operation mode:

The SunBox can work in Self-consumption mode and in Off-Grid mode, and for this, the SunBox has a switch to toggle between both modes.

1. Off-grid mode

It is a mode to be completely independent from the grid, working only with photovoltaic generation and batteries.
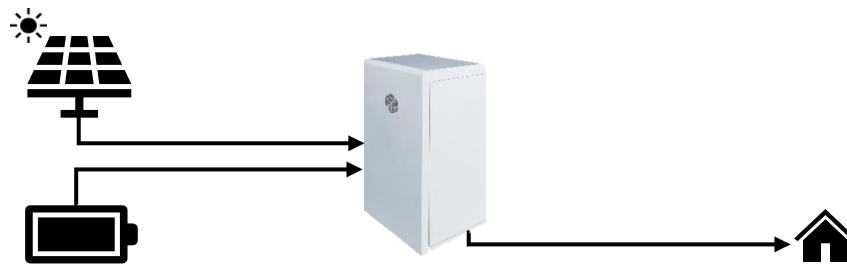
2. Self-consumption mode

For the general mode of operation and depending on the energy coming from the photovoltaic panels, there are two different situations:

a)   When the demand for electricity consumption is lower than the energy produced by photovoltaic panels, the Inverter transforms the DC into AC to meet the demand for electricity, while charging the batteries with excess power. In this way energy is accumulated for later use at times when energy production is not sufficient.

b)   When the demand for electricity consumption exceeds the energy produced by photovoltaic panels, the Inverter transforms the DC into AC and takes the missing power from the batteries or the grid, depending on whether the batteries are charged or not, to meet the demand for electricity.

i.   When the batteries are sufficiently charged, the inverter transforms the energy stored in DC to AC to 220V to supply the load. When the batteries are left with the minimum charge level that allows them to ensure a proper operation, they are automatically disconnected to protect the system.
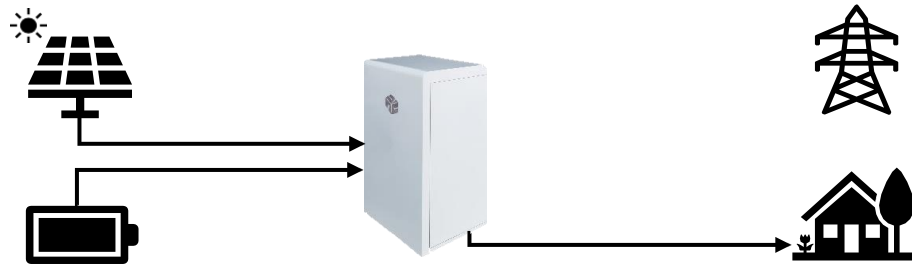
ii. When the batteries do not have enough charge level to ensure proper operation, the inverter takes the missing power to meet the demand from the grid. In this way the system works in parallel with the grid and with photovoltaic panels.
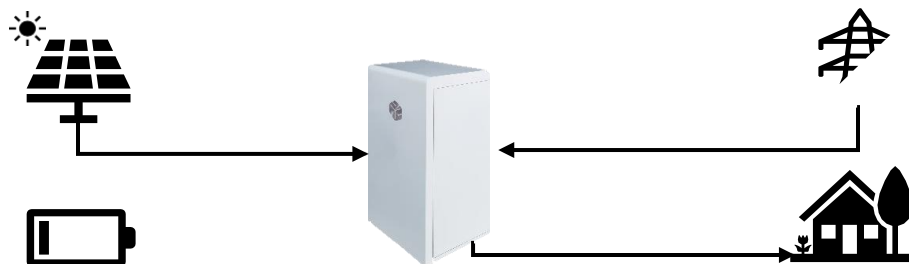
Furthermore, in this mode, in the event of a network failure, the switch automatically switches to off-grid mode to continue its correct operation and comply with anti-island regulations.

In short, the Inverter performs the functions of energy balancing and ensures the operation of the system.

4. Specifications

Batteries

- Manufacturer: Turbo Energy SL

- Model: Lithium Series 48V 5.1kWh

- Attached data sheet and instruction manual.

Inverter/Charger

- Manufacturer: Turbo Energy SL

- Model: Single Phase Hybrid Series 48V 5.0 (HIS5000/48)

- Attached data sheet and instruction manual.

Model — SunBox Series 5.0

Photovoltaic panels data

Max. photovoltaic field power	6500 Wp
PV voltage range	100-500 V
MPPT working range	125-425V
Starting voltage	150V
Independent MPPT	2
Maximum current per MPPT	13A
Category DC surges	II

AC Output (Self-consumption with grid)

Maximum power	11500W
Rated output voltage	230V
Rated output frequency	50/60Hz

AC Output (Self-consumption with grid / Off-grid)

Nominal power	5000W
Maximum power	5500W
Rated output voltage	230V
Rated output frequency	50/60Hz

Batteries data

Capacity	5,1kWh / 10,2kWh
Usable capacity	4,60kWh / 9,20kWh
DoD	90%
Cycles at 90% DoD	>6000
Cells	Metal Can
Type of technology	LiFePO4
Nominal battery voltage	51,2V
Max. Charge/discharge current	50A
BMS communication	CAN

DC protections (by MPPT)

4 x Fuse holder and fuse 1000Vdc/15A	Integrated

AC protections

Magnetothermic Grid	Integrated
Magnetothermic Load	Integrated

General data

Communication with the Portal	Wi-Fi
IP rating	IP20
User interface	APP
Weight (Kg)	95Kg
Switch Self-consumption to Grid	Automatic
Dimensions (width*height*depth)	600*1400*600mm

Certificates and Regulations

Network connection regulations	RD1699
Safety regulations	IEC/EN62109-1 & -2
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-16, EN61000-4-18, EN61000-4-29

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5. Installation and assembly

Recommendations for setting up strings

Voc < 41V

Panel 1660x1004mm

MPPT 1	MPPT 2
Mínimo 6 paneles	Mínimo 6 paneles
Máximo 12 paneles	Máximo 12 paneles

Voc < 50,9V

Panel 2024x1004mm

MPPT 1	MPPT 2
Mínimo 5 paneles	Mínimo 5 paneles
Máximo 10 paneles	Máximo 10 paneles

Preliminary recommendations for installation

The installation of the SunBox should be carried out in a place protected from inclement weather, and it is especially relevant that its location is kept dry and avoid potentially flooded areas. The operating temperature range should be considered, which must not exceed 50ºC or be less than 0ºC. Take appropriate measures to ensure the operating temperature range.

Recommendations for system connection:

Below is a simplified scheme of the interior of the SunBox Series 5.0:
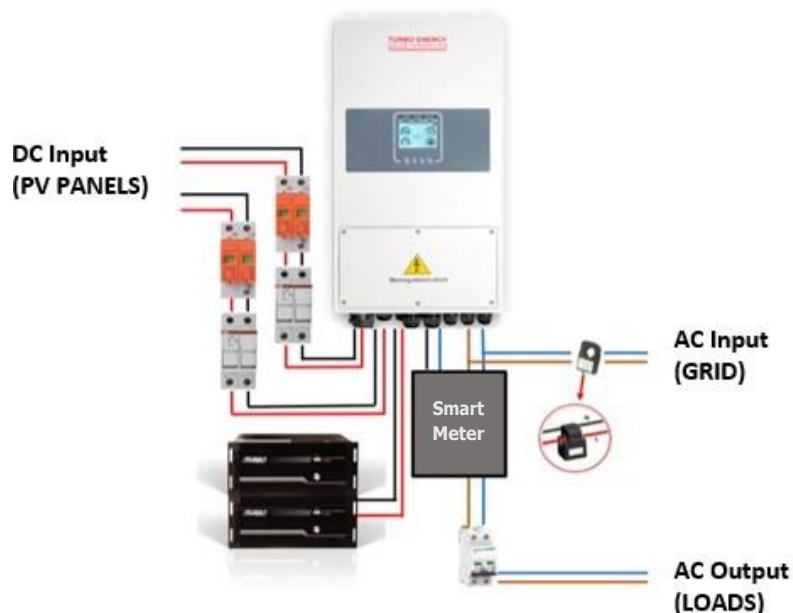
The equipment is prepared so that the installer simply has to connect the input of panels, grid, loads and batteries, if applicable, to the place indicated below. All protections specified in the schematic are included and pre-assembled, thus facilitating the function of the installer.

- Photovoltaic panels must be connected in series to the input specified below. Internally connects to its corresponding fuses.
- The inverter's grid output is protected with its differential and automatic switches. It must be connected after the magnetothermal of the general housing frame and to the specified internal terminals of the SunBox by a 6 mm^2 hose.
- The CT-meter comes pre-assembled and connected inside the SunBox.
- In case batteries need to be installed, the SunBox Series 5.0 comes ready to store up to 2 Turbo Energy Lithium Series 48V 5.1kWh batteries. Its installation is explained below.

*The Grid and Load outputs in normal grid operation will be the same as they are internally connected, however, in case of grid failure, if the system stays running in off-grid, the inverter opens the contact that joins the grid and load and leaves the load output running in off-grid. This is because the inverter cannot operate in island mode, therefore the automatic must be separated from the frame so that it can operate in off-grid. The operation in off-grid will depend on whether the corresponding batteries have been installed and will operate by solar energy and batteries only for the duration of renewable energy. It should be noted that the power will be limited to 5 kW, therefore it is not possible to include loads that require a lot of power.

5.1 Installation options

Option 1

For load powers lower than 11 kW (5kW if in off-grid mode), the general connection of the SunBox will be as shown in the following diagram:
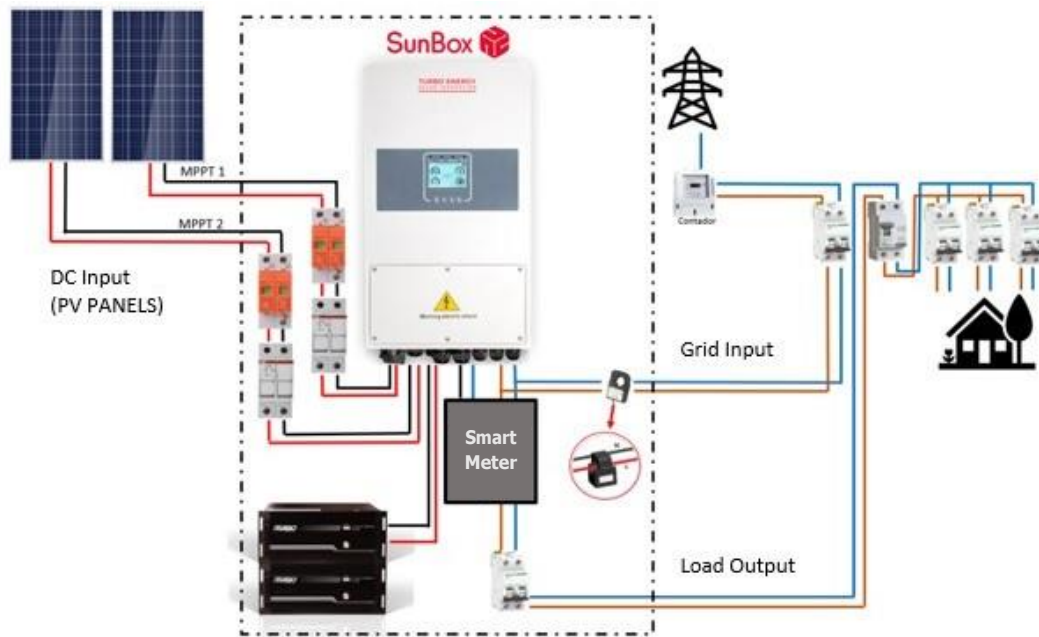
It is the simplest configuration and avoids manipulation of the load connections. As all the power from the network passes through the equipment (Load output) and it distributes the energy, it implies that the maximum power of the loads is 11kW in self-consumption mode and 5kW in off-grid mode.

Option 2

In the case of connecting load powers greater than 11kW in self-consumption mode, the configuration to be carried out is as follows:
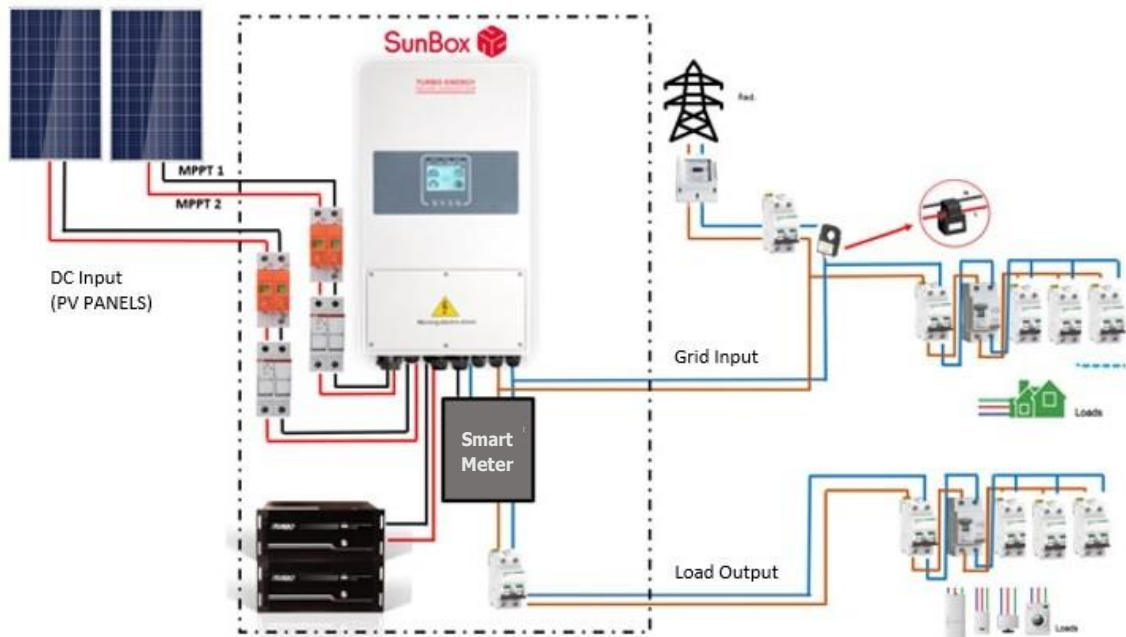
In this way, we have a series of critical loads connected to the Load output (up to a maximum of 5 kW) that will allow the panels and / or batteries to supply them with energy despite a grid failure. The rest of the loads above 11kW must be connected on the grid side.

In the case of not needing to connect critical loads and wanting to simplify the installation, all the loads can be put on the grid side as follows (but in the event of a grid failure, the loads are left without supply even though there is generation photovoltaic and / or battery):
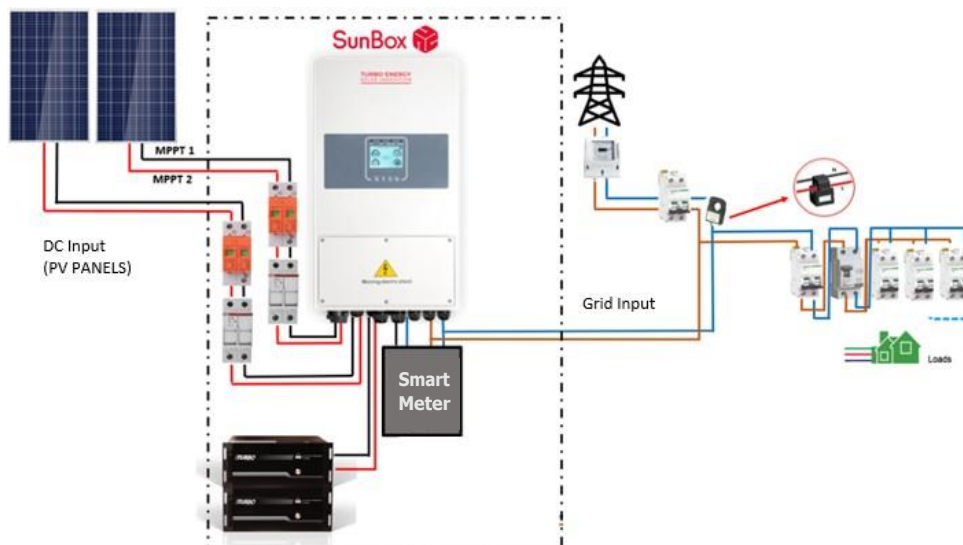
5.2 Gen-Port

The SunBox has an intelligent input / output that can provide the equipment with different functionalities.

Generator input

The output of a generator can be connected to this input, so that the off-grid installation can rely on this source for power supply. The maximum power value is 5000 W.

Microinverter or inverter input

The output of microinverters or inverters can be connected to this input, with a total power of up to 5000W. This is a great advantage, since the number of photovoltaic panels in the installation can be increased.

For example, if 3 microinverters of 1600 W are installed in series, we will have a total of 4800 W (<5000W). If we connect 4 400W photovoltaic panels per microinverter, we will have a total of 12 extra panels in our installation.

Smart Load

This mode uses this input as an output and receives power only when the battery SOC and PV power are above a user-programmable threshold.

For example, if you have an auxiliary electric water heater connected to this output, with this functionality you can program that, if the SOC of the battery is above 95% and the solar production is more than 500W, the water heater will heat up with that surplus energy.

To connect inputs or outputs to this port, remove the screws and open the front cover of the inverter.
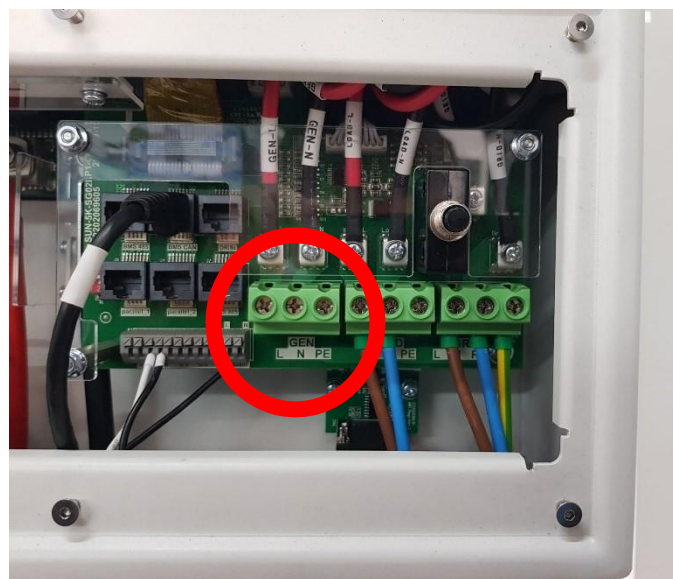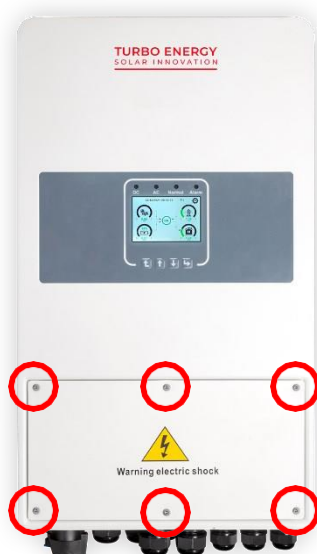
5.3 DC wiring

The series of photovoltaic panels shall be carried out as indicated in section 4.1.

The cabinet already has the right protections installed for continuous sockets.

To access the connections, open the back door of the SunBox cabinet. It is very important to note that each positive must be connected to its negative in the cabinet, for this it is recommended to mark the cables or make connections one at a time until the installation is complete.

5.4 AC wiring

To connect Grid and Load open the back door of the SunBox cabinet and connect to the pointed and identified terminals with colors, phase gray, neutral blue, yellow and earth green.
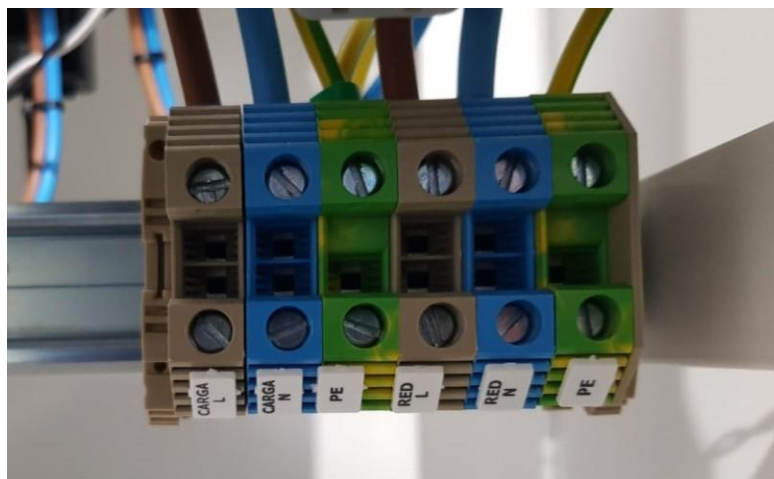
5.5 Configuration of Lithium Series Slim 48V 5.1 kWh

Each module has 4 DIP (Dual Inline Package) switches that will be configured differently depending on the number of batteries to be connected

1=ON
0=OFF
1 2 3 4
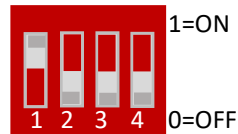
Address	Dial switch position				Explain
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Pack1/Master
2	OFF	ON	OFF	OFF	Pack2
3	ON	ON	OFF	OFF	Pack3
4	OFF	OFF	ON	OFF	Pack4
......					

Wiring configuration

The cable needed to make the connection is the **RJ45.** It is a special cable that is composed of 8 smaller cables each with a different color configuration.

It's needed to use a standard pin-to-pin cable with RJ45 connector
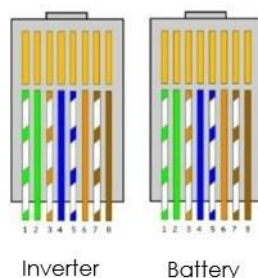
Inverter   Battery

For the connection between the inverter and battery, the RJ45 cable will be connected to the CAN-1 port in the battery

5.7 Wheels mounting

The SunBox has 4 wheels that must be mounted using the included screws and washers.
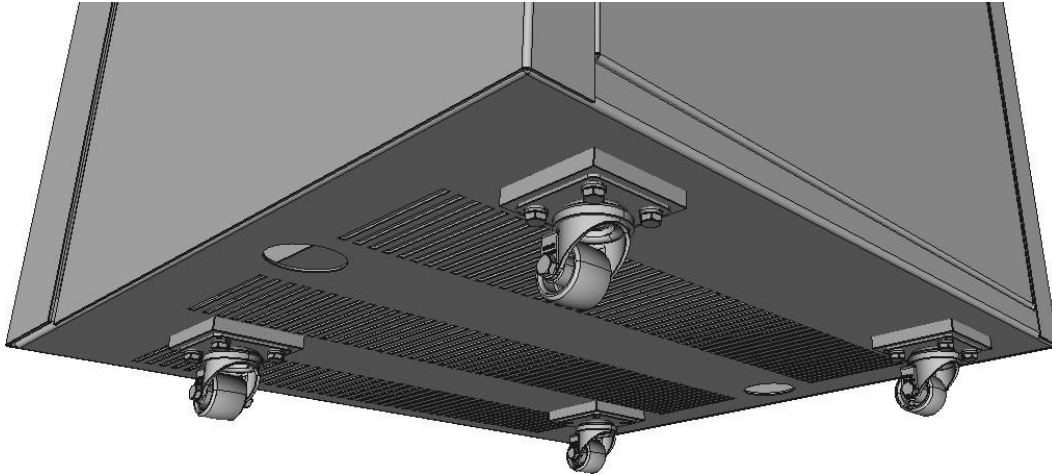
The order of placement of the elements is Grower washer, DIN 125 washer and screw.
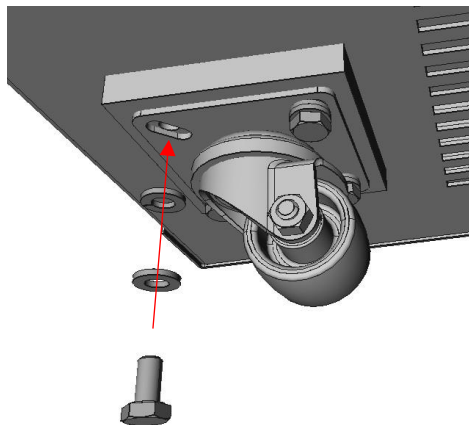
5.8 Start-up

Once you are finished with all connections, the machine is ready to start working. It will proceed as follows:

1. Reset the DC and AC protections at the back of the cabinet.
2. Start the Batteries. To do this, press the Power button (On/Off) for 2-4 seconds. The BMS will start, and both the LCD screen and the power button will light up.
3. Connect the loads as specified in the previous scheme, and ready for service.
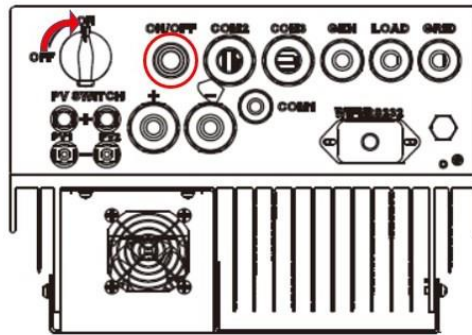
6. Inverter/Charger Configuration

The LCD is touchscreen, and the main screen shows the overall information of the inverter.
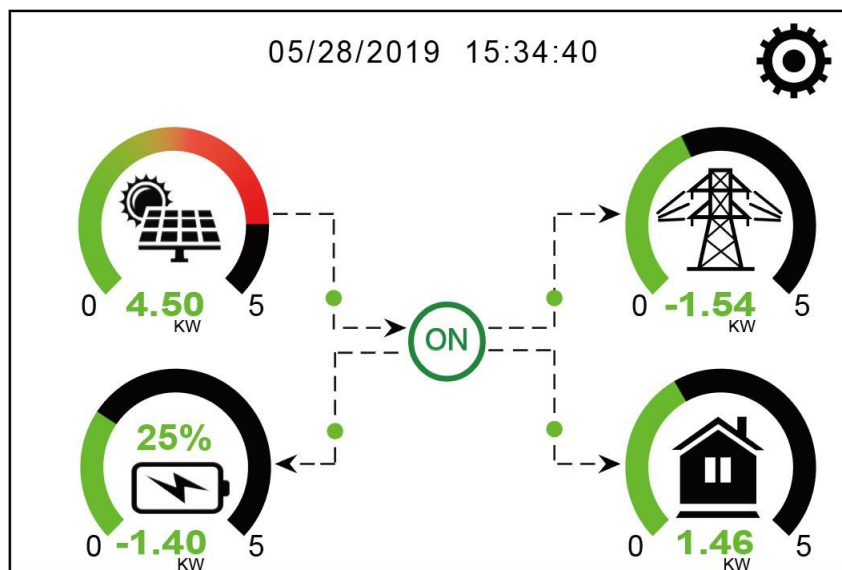
1. The icon in the center of the home screen indicates that the system is operating normally. If it turns into "comm./F01~F64", it means the inverter has communication error or other errors. The error message will display under this icon (F01-F64 errors, detail error info can be viewed in the System Alarms menu).
2. At the top of the screen is the time.
3. Pressing System Setup Icon, it is possible to enter in the system setup screen which includes Basic Setup, Battery Setup, Grid Setup, System Work Mode, Generator port use, Advanced function, and Li-Batt info.
4. The main screen shows the system information, including Solar, Grid, Load and Battery. It also displays the energy flow direction by arrows. When the power is high, the color on the panels will change from green to red.

- PV power and Load power always keep positive.
- Grid power negative means sell to grid, positive means get from grid.
- Battery power negative means charge, positive means discharge.

6.1.1. LCD operation flow chart
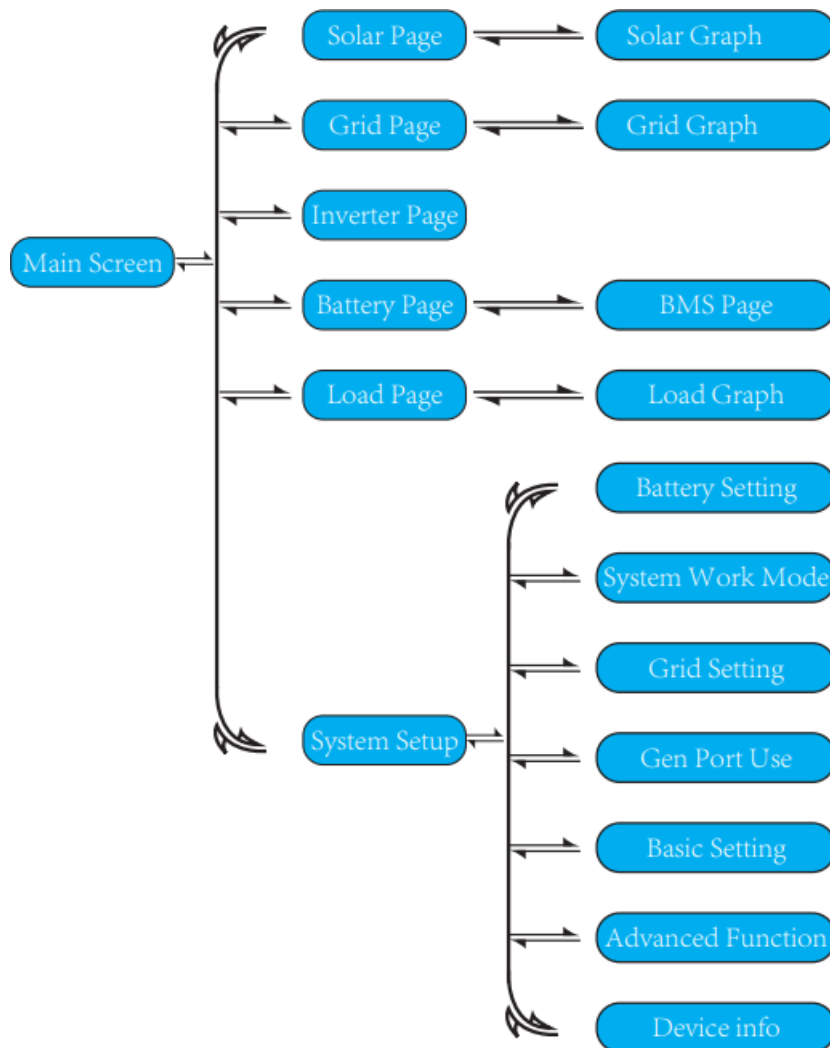
5.2. Information from Main Menu

Solar

Power: 1560W ①	Today=8.0 KWH ③
PV1-V: 286V PV2-V: 45V	Total =12.00 KWH
PV1-I: 5.5A PV2-I: 0.0A ②	
P1: 1569W P2: 1W	
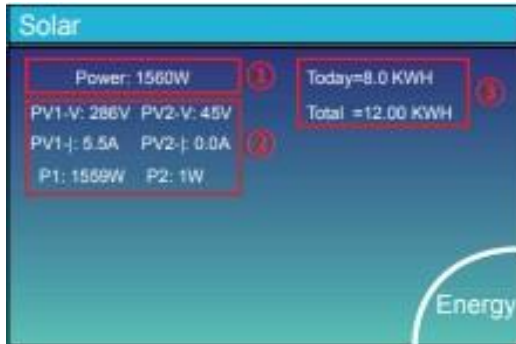
Energy

This is Solar Panel detail page.
① Solar Panel Generation.
② Voltage,Current,Power for each MPPT.
③ Solar Panel energy for Day and Total.

Press the "Energy" button will enter into the power curve page.

Inverter

Power: 44W ①	DC-T:52.6C ③
L1: 240V L2: 0V ②	AC-T:41.0C
I1:0.6A I2:0.0A	
Power1: 0W	
Power2: 0W	

This is Inverter detail page.
① Inverter Generation.
② Voltage,Current,Power for each Phase.
③ DC-T:mean DC-DC temperature,
   AC-T:mean Heat-sink temperature.

Load

Power: 42W ①	Today=0.0 KWH ③
L1: 240V L2: 0V ②	Total =0.80 KWH
P1: 0W P2: 0W	
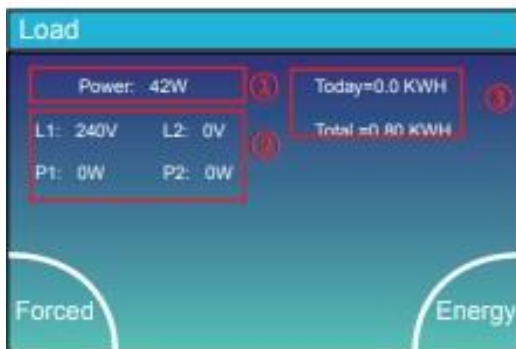
Forced   Energy

This is Back-up Load detail page.
① Back-up Power.
② Voltage,Power for each Phase.
③ Back-up consumption for Day and Total.

Press the "Energy" button will enter into the power curve page.

Press the "Forced" button will forced open the smart-load(While GEN PORT utilized as Smart-load output).

Grid

Stand-by ①	BUY ③
Power: 0W	Today=2.2KWH
0.0Hz	Total =11.60 KWH
L1: 0V L2: 0V ②	SELL
CT1: 0W CT2: 0W	Today=0.0KWH
LD1: 0W LD2: 0W	Total =8.60 KWH

Energy

This is Grid detail page.
① Status,Power,Frequency.
② L1&L2:Voltage for each Phase
   CT1&CT2:External Current Sensor Power
   LD1&LD2:Internal Current Sensor Power.
③ BUY:Energy from Grid to Inverter,
   SELL:Energy from Inverter to Load.

Press the "Energy" button will enter into the power curve page.

Batt

Stand-by

SOC: 36%

U:50.50V

I:-58.02A

Power: -2930W

Temp:30.0C

Li-BMS

This is Battery detail page.

if you use Lithium Battery,you can enter BMS page.

Li-BMS

Mean Voltage:50.34V	Charging Voltage :53.2V	Sum Data
Total Current:55.00A	Discharging Voltage :47.0V	
Mean Temp :23.5C	Charging current :50A	
Total SOC :38%	Discharging current :25A	Details Data
Dump Energy:57Ah		

Li-BMS

	Volt	Curr	Temp	SOC	Energy	Charge Volt	Charge Curr	Fault	
1	50.38V	19.70A	30.6C	52.0%	26.0Ah	0.0V	0.0A	0|0|0	Sum Data
2	50.33V	19.10A	31.0C	51.0%	25.5Ah	53.2V	25.0A	0|0|0	
3	50.30V	16.90A	30.2C	12.0%	6.0Ah	53.2V	25.0A	0|0|0	
4	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
5	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
6	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
7	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
8	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	Details Data
9	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
10	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
11	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
12	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
13	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
14	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	
15	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0|0|0	

5.3. Curve page - Solar, Load and Grid

Solar Power Production:Day — 3000W — 2019-5-28

CANCEL | Day | Month | Year | Total

System Solar Power:Month — 2000Wh — 5-2019

CANCEL | Day | Month | Year | Total

System Solar Power:Year — KWh — 2019

CANCEL | Day | Month | Year | Total

System Grid Power:Total — 2000KWh — TOTAL

CANCEL | Day | Month | Year | Total
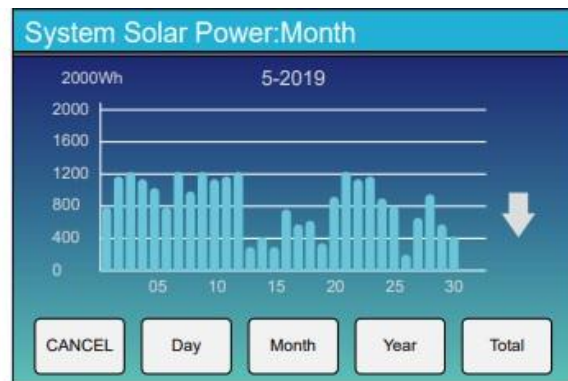
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD. For more accuracy in power generation, please check on the monitoring system. Click the up and down arrow to check power curve of different period.

5.4. System Setup Menu
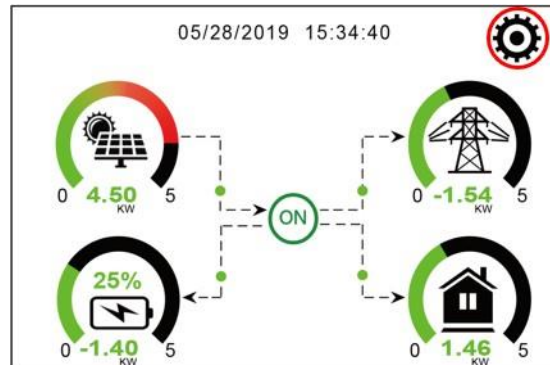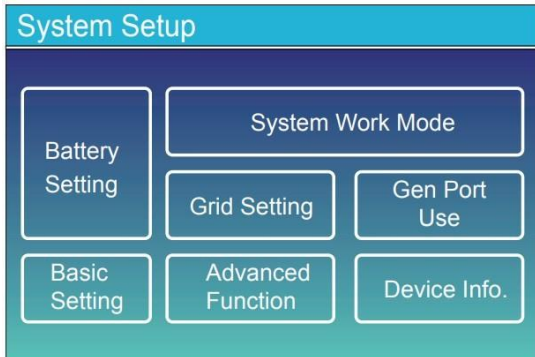
5.5. Basic Setup Menu
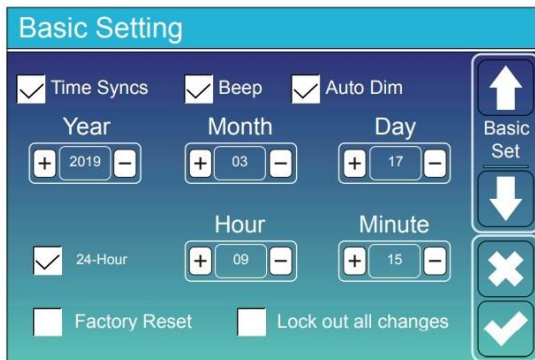
This is the basic system setup

Beep: activate/desactivate alarm noise

5.6. Battery Setup Menu

Lithium: Use of the battery with communication
Use Batt V: Use of the battery without commmunication (charge information on volts)
Use Batt %: Use of the battery without commmunication (charge information on percentage %)
No Batt: Battery disconnection
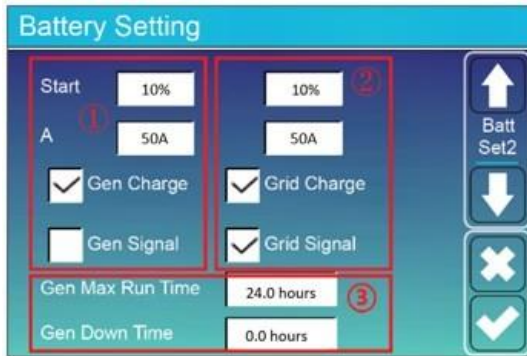
Menu 1: Generator
Menu 2: Grid
Start Indicates the charge level of the
Indicates the amperage de the charge from
the battery *(recomended 40A)*
Gen Max Run Time: *Configurate on 24.0 hous*
Gen Down Time: *Configurate on 0.0 hours*
battery to start charging
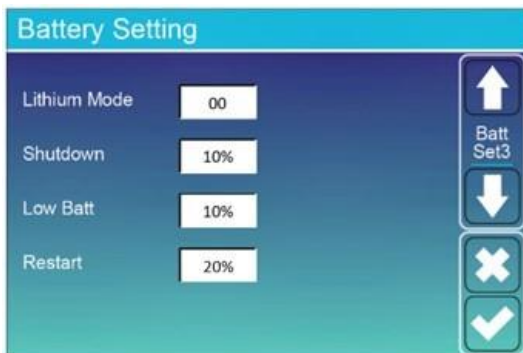
Lithium Mode: Select according to the BMS
protocol of the battery
Shutdown: The inverter will shut down if the SOC
goes below 10%
Low Batt: The inverter will alarm when the
inverter goes below 10%
Restart: The inverter will turn on back when the
battery reaches this level of charge
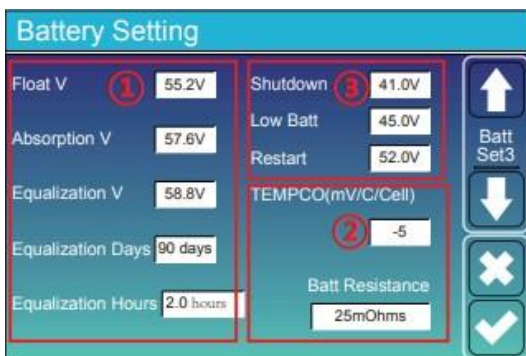
On this screen the configuration by tension for
batteries is made. We can stablish the floating
level, absortion, equalization, etc.

Consult on the battery manual

5.7. System Work Mode Setup Menu

Zero Export to Load: Select this one
when the installation is off grid
Zero Export to CT: Select this one when
the installation is on grid (we want to
read the CTs)
(*Select Solar Sell to be able to sell to
grid*)
Max Sell Power: Maximum energy
available to be sold to grid (set on the
maximum value)
Zero Export Power: *Seleted on 020*
Grid Peak Shaving: Maximum power to
take from the grid

Enable: Enables the system to work for time periods

GPS: Grid Peak Shaving. Sets the power limit to be taken from the grid per period.

SOC2: Configure slightly below SOC1.

SOC1: Minimum battery reserve. *Do not set below 10%*

Start/End: Start and End hour of each period.

GM(General Mode: System tries to cover consumption with Bat+Sol.

BU(Back-Up Mode): Battery is not discharged to cover demand.

CH(Charge Mode): Battery charge mode.

As an example, following the table above, different schedules can be established in different time periods:

- 00:00 - 08:00: Charge mode activated. Since the energy is cheaper at night it compensates to charge the battery with the grid and store it for use in more expensive periods.

- 08:00 - 10:00: BackUP mode activated. Battery does not discharge.

- 10:00 - 14:00: GM mode activated. The user has a lower contracted power (2500 W) for this period since it is more expensive. A 30% battery is reserved to supply power peaks that exceed 2500 W.

- 14:00 - 18:00: BackUP mode activated. The battery is not discharged since these are the hours of greatest sun production.

- 18:00 - 22:00: GM mode activated. The user has a lower contracted power (2500 W) for this period since it is more expensive. 45% battery is reserved to supply power peaks that exceed 2500 W.

- 22:00 - 00:00: GM mode activated. No reserve to supply the peaks.

5.8. System work mode Menu 2

Time of Use: Enables the system to work for time periods

Gen: Select to enable the entry of energy from the generator

Time: Limits of the timetable

Power: Amximum power to receive from the generator (configure at 5000W)

Batt: When the battery is above this level os charge, the generator will turn off

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The system will not use system work mode 1 and 2 at the same time, depending on our installation
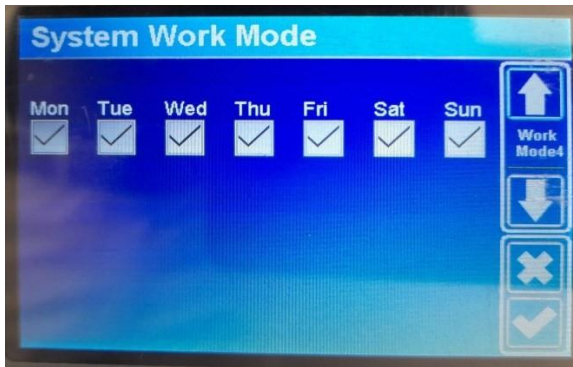
In the last page of the system work mode, you can set the days of the week that the configuration of the system work operates

5.9. Grid Setup Menu
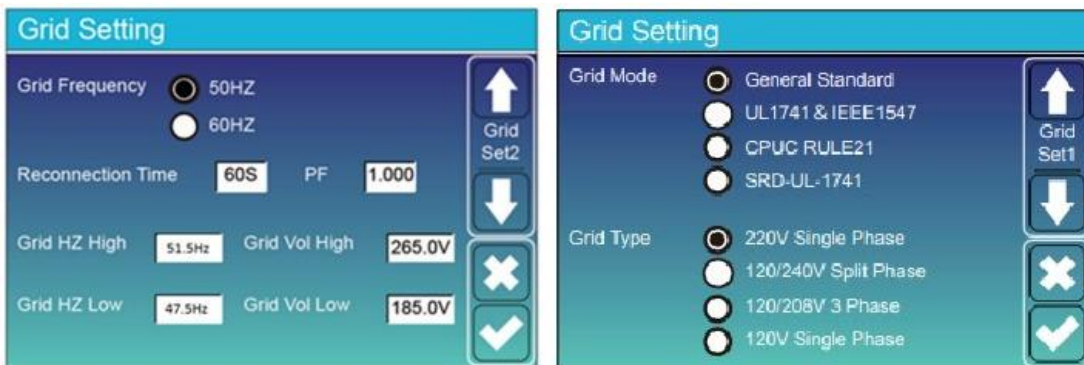
In case of being in Spain, set up the variables as on the previous images

5.10. GEN PORT use Setup Menu
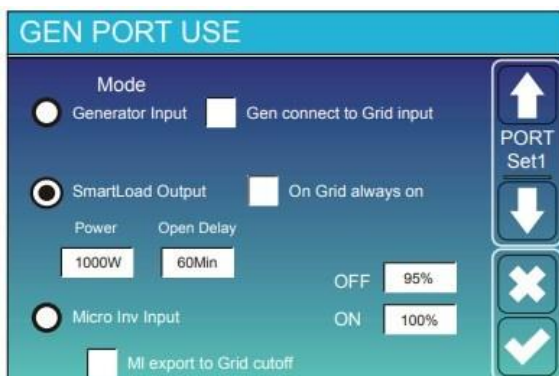
Generator input rated power: Max power received by the inverter
 (Configurate on 5000W as maximum)
In case of putting inverters in parallel, divide the maximum power of the generator between the number of devices connected in parallel. Set to this value X. 5000W maximum
GEN connect to grid input: Generator connected to Grid
Smart Load Output: The Gen Port is used as output load when the SOC of the battery and solar production are above a programmed value: e.g. Power=500W, ON: 100%, OFF=95% When the production exceeds 500W and the SOC reach 100%, it

Smart Load OFF Batt: SOC of the battery when load will turn off

Smart Load ON Batt: SOC of the battery when load will turn on. The condition of solar production being above the value of ''Power'' must happen simultaneously.

On Grid always on: The load connected to Gen Port will always be fed if there is Grid

Micro Inv Input: Use of the as micro-inverter entry or on-grid inverter.

Micro Inv Input OFF: When the SOC of the battery exceeds this value, the inverter or microinverter will stop working.

Micro Inv Input ON: When the SOC of the battery reaches this level, the inverter or microinverter will start working.

AC Couple Fre High: With this option selected, when SOC is reachong the OFF value, the microinverter power goes down lineally. When the SOC reaches the OFF value, the frequency of the system goes equal to the selected value and the microinverter stops working.

5.11. Advanced Function Setup Menu

Solar Arc Fault On: USA market.

System Selfchec: Disabled

Gen Peak Shaving: If selected, when the power demanded to the inverter exceeds a determened value, the inverter gives the energy difference to not go above that

5.12. Inverters on Parallel
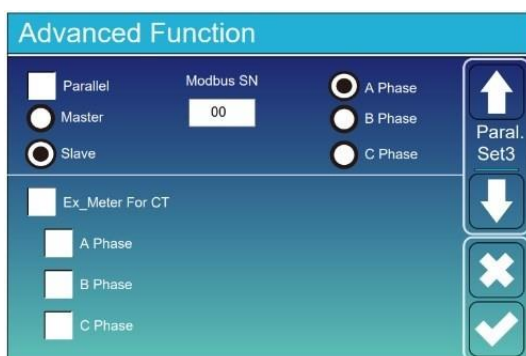
1. Select Parallel
2. Choose a master inverter, and the slaves.
3. Choose a Modbus number to each inverter to be on parallel (they must be different)
4. Configurate all the inverters to the same phase
5. In case of including Meters, must select Ex_Meter For CT. Choose the same phase to all the inverters.

5.13. Threephase installation with three monophase inverters
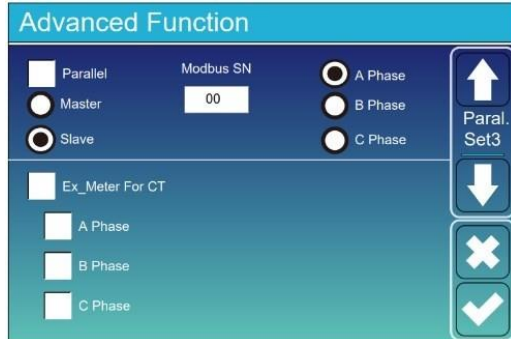
1. Select all three inverters as master
2. Do not select ''Parallel''
3. Choose a Modbus number for each one (they must be different)
4. Choose a diferent phase for each inverter
5. In case of including Meters, select the option Ex_Meter For CT. The phase of each Meter must be the same of the one of the inverter connected to.

5.14. Device Info Setup Menu
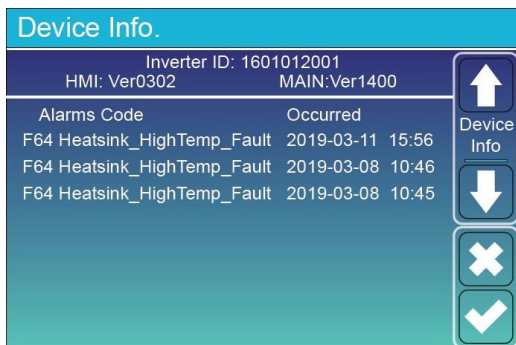
7. Wi-Fi connection setup

In order to upload the SunBox to the cloud and be able to see the monitoring of the system, it is essential to connect the equipment to the internet. To do this, the following steps must be followed:

<u>Step 0:</u> Locate the serial number of the logger

At the bottom of the inverter there is a plate with a QR code, the serial number of your logger and the logger's wifi access password.

The logger creates a Wifi network whose name is "AP_" followed by the serial number of the logger.

<u>Step 1</u>: Connect to the Wifi network

With an electronic device with Wi-Fi (PC, Tablet, Smartphone…) the connection with the logger's Wi-Fi is established:

Open the wireless network connection of PC, Tablet or Smartphone

Click on view available wireless networks

Select the one corresponding to the device with which you want to connect (identified by "AP_" and the serial number of the logger)
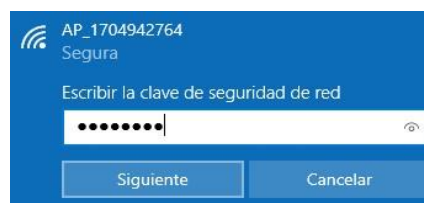
Enter the password that appears on the logger's plate together with the serial number.
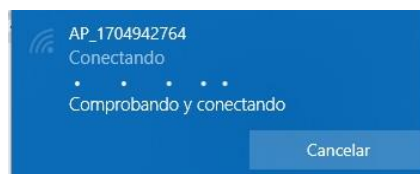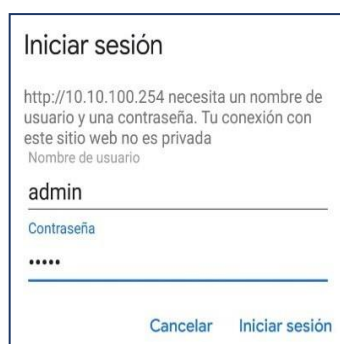
Step 2: Connect to the web portal

Once connected to the Wi-Fi network with your PC, Tablet or smartphone, you must access the logger's web portal.

To do this, open a web browser on the PC, tablet or smartphone that has been connected to the logger's Wi-Fi.

Write the text "10.10.100.254" in the address bar of the web browser.
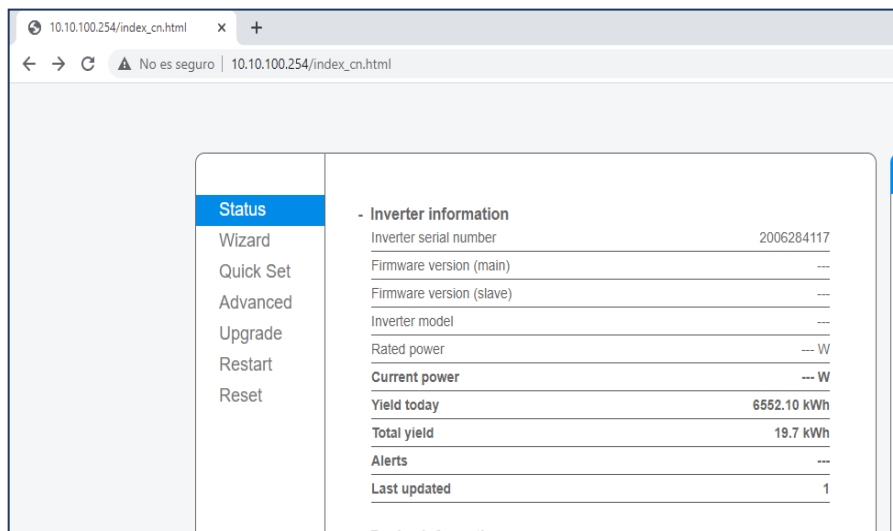
A pop-up window will appear to login with a username and password. The default user is "admin" and the password is "admin", and then press the "Login" button.

Once the logger's web portal has been accessed, the "Status" page with general information about the registrar can be seen.

Click on the "Wizard" link under the "Status" link to connect the logger to the Wi-Fi (the Wi-Fi of your house or your plant).

Step 3: Setup logger access to the Wi-Fi

Step 3.1: select the Wi-Fi

When we run the connection wizard, the list of Wi-Fi networks to which the logger has access appears. Among them should appear our Wi-Fi. We must select it and press the "Next" button at the bottom of the screen:

Step 3.2: enter the Wi-Fi password: in the "Password" field, enter your Wi-Fi password and press the "Next" button.

Step 3.3: In this step it is **NOT** necessary to select any option and then press the "Next" button. It is used to configure the security of the connection to the Wi-Fi. By selecting Hide AP, the Wi-Fi network will appear as a hidden network.

Step 3.4 If the adjustment has been made correctly, press the "OK" button to restart the connection.

If the restart is successful, a message will appear indicating that it was successful, if it does not appear then refresh the browser page:

Step 4: Verify the logger connection to the Wi-Fi

After restarting the web page, log back in to the "Status" page and check the status of the recorder's network connection:

Once we have verified that the logger is connected to the Wi-Fi, it is possible to add the plant to the cloud platform.

	We recommend not to change the password of the access portal or the password of the inverter's Wi-Fi through the portal 10.10.100.254. If you forget the password, you will not be able to access the portal again to configure the WiFi.
	We recommend to use a 2.4 Gh wifi network to assure a sucessful connection.

8. Maintenance recommendations

To keep the system in good condition, achieve optimal operation and extend its service life, it is recommended to perform the following maintenance tasks:

    i.   Reviewing connections, and wiring status, replace damaged cables and refix connections if necessary.

    ii.   Review and check the status of DC fuses. It is suggested, as a simple method of verification, to sequentially disconnect the DC lines one by one to verify the energy input of each panel group. To do this, it is mandatory to disconnect the DC disconnector prior to each disconnection of continuous lines.

    iii.   **Important:** each continuous line has two fuses, one for the positive and one for the negative. If applicable, replace damaged fuses. If once replaced the line remains current in the presence of solar radiation and verified that the rest of the lines do have, contact technical service.

9. Troubleshooting

9.1 Inverter most common mistakes

The following table recollects most common technical errors from the inverter and how to solve them quickly.

If any of the fault messages listed in Table 7-1 appear on your inverter and the fault has not been removed after restarting, please contact your local dealer or service center. You need to have the following information ready.

1. Inverter serial number;

2. On-grid power generation date;

3. The problem description (including the fault code and indicator status displayed on the LCD) is as detailed as possible.

Error code	Description	Solutions
F07	DC/DC_Softsart_Fault	Check battery fuse. Reset inverter.
F08	GFDI _Relay_Failure	1. When inverter is in Split phase(120/240Vac) or three-phasesystem (120/208Vac) system, the backup load port N line needs to connect ground. 2. If the fault still exists, please contact us for help.
F10	AuxPowerBoard_Failure	Wait a couple minutes. Disconnect Wifi or any other communication type.
F13	Working mode change	1. When the grid type and frequency changed it will report F13. 2. When the battery mode was changed to "No battery" mode,it will report F13. 3. For some old FW version, it will report F13 when the systemwork mode changed. 4. Generally, it will disappear automatically when shows F13. 5. If still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch.
F18	AC over current fault of hardware	1. Please check whether the backup load power and commonload power are within the range. 2. Restart and check whether it is in normal.
F20	DC over current fault of the hardware	1.Check PV module connect and battery connect. 2.When in the off-grid mode, the inverter startup with big powerload, it may report F20. Please reduce the load power connected. 3.Turn off the DC switch and AC switch and then wait oneminute,then turn on the DC/AC switch again.
F22	Tz EmergStop Fault	1.Indicates the inverter is remotely controlled and power off. 2.It will remain in "OFF" state until the unlock command comes. 3.When the number of inverters in parallel is less than 5 pieces, all inverter DIP switches (1 and 2) must be in the ON position. If the number of inverters in parallel is greater than 7, the DIP switch of the main inverter (1 and 2) must be in the ON position and the DIP switches of the rest (1 and 2) must be in the OFF position.
F23	AC leakage current is transient over current	Check PV side cable ground connection. Restart the system 2~3 times.
F24	DC insulation impedance failure	1.Check the connection of PV panels and inverter is firmly andcorrectly. 2.Check whether the PE cable of inverter is connected to ground.
F26	The DC busbar is unbalanced	1.Please wait for a while and check whether it is normal. 2.When the hybrid in split phase mode, and the load of L1 andload of L2 is big different, it will report the F26. 3.Restart the system 2~3 times.

F29	Parallel CAN Bus fault	1.When in parallel mode, check the parallel communication cableconnection and hybrid inverter communication address setting. 1.During the parallel system startup period, inverters will report F29. when all inverters are in ON status, it will disappear automatically.
F32	PV to DC over current	1. Check the PV panels charge to see if there are too many panels connected to one string. If the MPPT is overloaded, disconnect the necessary panels from the inverter or rebuild the connection of the panels to adjust the MPPT correctly. 2. Check if there is any other possibility of being any overcurrent to the MPPT
F34	AC Overcurrent fault	1. Check the backup load connected, make sure it is in allowed power range.
F35	No AC grid	Please confirm grid is lost or not. Check the grid connection is good or not. Check the switch between inverter and grid is on or not.
F41	Parallel system stop	1. Check the hybrid inverter working status. If there's 1 pcs hybrid inverter is in OFF status, the other hybrid inverters may report F41 fault in parallel system.
F42	AC line low voltage	1. Check the AC voltage is in the range of standard voltage inspecification. 2. Check whether grid AC cables are firmly and correctlyconnected.
F47	AC over frequenc	Check the frequency is in the range of specification or not. Check whether AC cables are firmly and correctly connected.
F48	AC lower frequency	1. Check the frequency is in the range of specification or not. 2. Check whether AC cables are firmly and correctly connected.
F56	DC busbar voltage is too low	1. Check whether battery voltage is too low. 2. If the battery voltage is too low, using PV or grid to charge thebattery.
F58	BMS communication fault	1. it tells the communication between hybrid inverter and batteryBMS disconnected when"BMS_Err-Stop" is active. 2. if don't want to see this happen, you can disable"BMS_Err-Stop" item on the LCD.
F59	AC Grid overcurrent	1. Chech AC current. 2. If there is no grid check the discharge battery current.
F63	ARC fault	1. ARC fault detection is only for US market. 2. Check PV module cable connection and clear the fault.
F64	Heat sink high temperature failure	1. Check whether the work environment temperature is too high. 2. Turn off the inverter for 10mins and restart.

9.2 Battery errors

If the error appearing is related to batteries, please check the Battery Manual.