EASUN POWER

Hybrid solar inverter

Inverter EASUN SMT-2KW 12V

Model ISolar-SMT-2K-WiFi

User manual

Installation, operation, settings, troubleshooting



Manufacturer’s original manual, English translation. Structure, tables and illustrations are kept as in the original.

SUPPORT. If you have technical questions not answered in this manual, contact the seller.

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1. About this manual

1.1 Purpose

This manual describes assembly, installation, operation and troubleshooting of this unit. Read it carefully before installation and use. Keep the manual for future reference.

1.2 Scope

The manual contains safety and installation instructions, and information on tools and wiring.



2. Safety instructions

WARNING
This section contains important safety and operating instructions. Read them and keep the manual for future reference.

1. Before using the unit, read all instructions and warning labels on the unit, the batteries and in the relevant sections of this manual.
2. **CAUTION.** To reduce the risk of injury, charge only deep-cycle lead-acid batteries. Other battery types may explode and cause injury and damage.
3. Do not disassemble the unit. For service or repair, go to a qualified service centre. Incorrect reassembly may cause electric shock or fire.
4. To reduce the risk of electric shock, disconnect all wiring before any maintenance or cleaning. Switching the unit off with its switch does not remove this risk.
5. **CAUTION.** Only qualified personnel may install this unit with a battery.
6. **NEVER** charge a frozen battery.
7. For optimal inverter/charger operation, choose cable sizes as required. Correct inverter/charger operation is very important.
8. Be very careful with metal tools on or near batteries. A dropped tool may spark or short the batteries or other electrical parts and cause an explosion.
9. Strictly follow the installation order if you need to disconnect the AC or DC terminals. See the “Installation” section for details.
10. One 150 A fuse is provided as overcurrent protection for the battery supply.
11. **GROUNDING INSTRUCTIONS.** This inverter/charger must be connected to a permanent grounding system. Follow local requirements and codes during installation.
12. NEVER short-circuit the AC output and DC input. Do not connect to the grid when the DC input is shorted.
13. **Warning!** Only qualified service personnel may service this unit. If errors persist after following the troubleshooting table, return the inverter/ charger to the seller or a service centre.

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3. Introduction

This is a multifunction inverter/charger: inverter, solar charge controller and battery charger in one compact case for uninterrupted power. The handy LCD with buttons lets you set battery charge current, grid or solar charge priority and accepted input voltage depending on the application.

3.1 Features

- Pure sine wave inverter
- Input voltage range for appliances or computers is set via the LCD

- Battery charge current is set via the LCD depending on the application
- Grid or solar charge priority is set via the LCD
- Compatible with grid or generator
- Automatic restart after grid recovery
- Overload, overheating and short-circuit protection
- Smart charger for optimal battery performance
- Cold start function
- **This model only switches on with a battery connected.**

3.2 Basic system diagram

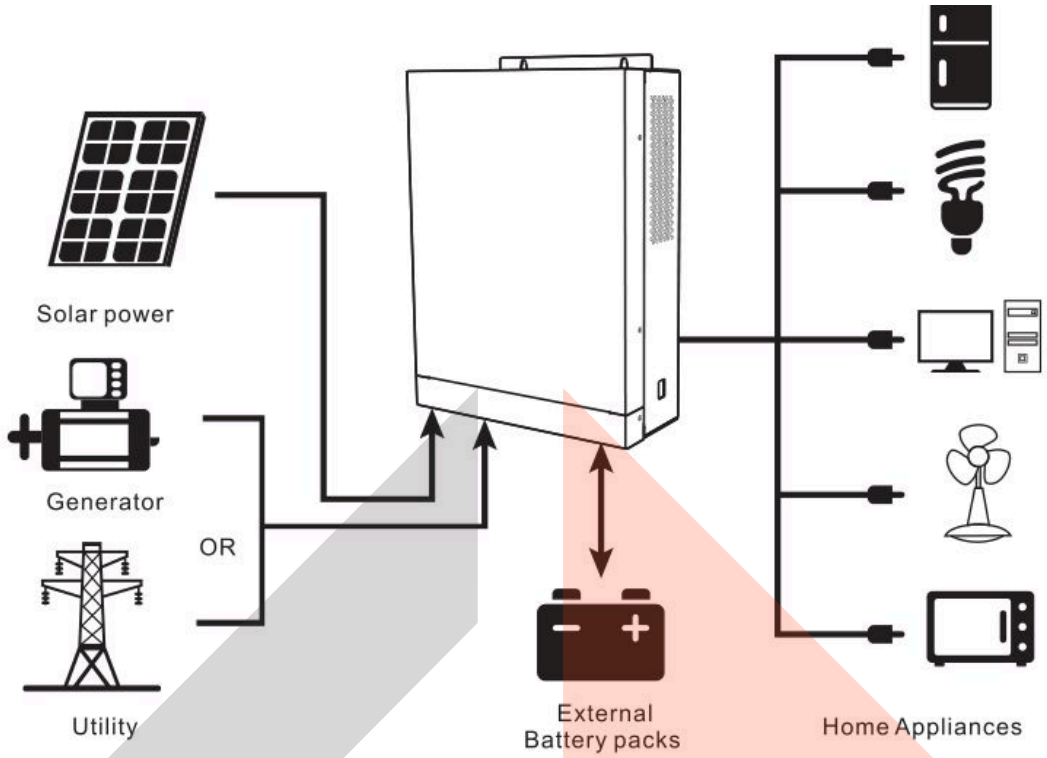
The figure below shows a typical inverter/charger application. A complete system also needs:

- Generator or grid
- PV modules (solar panels)

Discuss other possible system layouts for your needs with your system integrator.

The inverter can power any appliances at home or elsewhere, including motor loads: fluorescent lamps, fans, fridges, air conditioners.

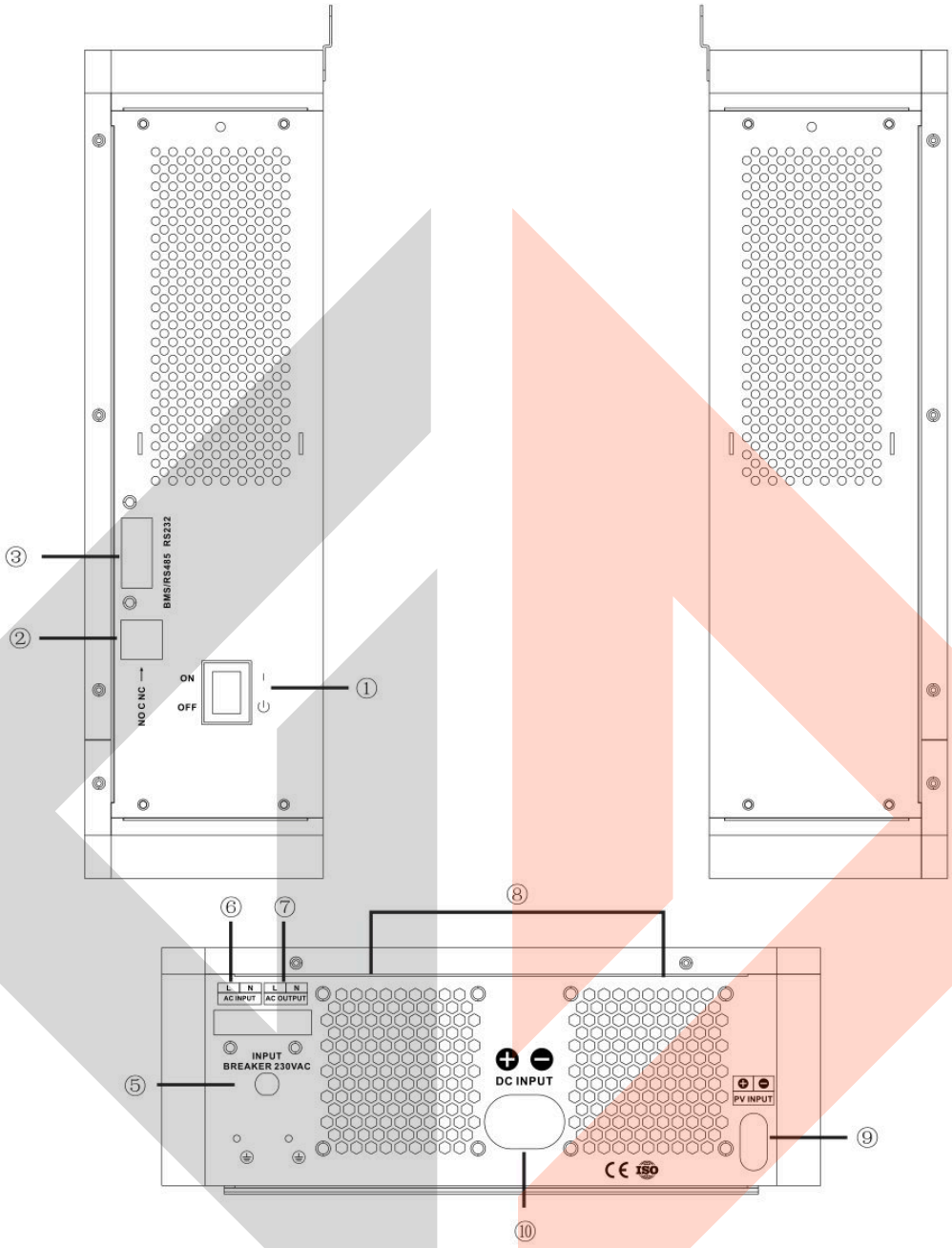
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Solar power — solar panels · Generator — generator · OR — or · Utility — grid · External Battery packs — external batteries · Home Appliances — household appliances

3.3 Product overview

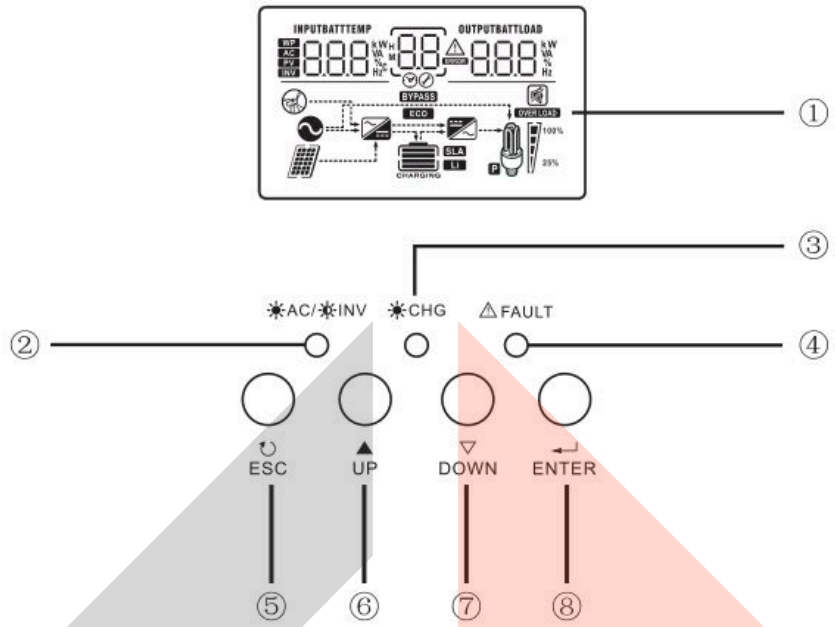
3.3.1 Rear panel



1. ON/OFF power switch
2. Dry contact
3. BMS/RS485 comms port
4. RS232 comms port
5. Input breaker
6. AC input
7. AC output
8. Fan
9. PV input
10. Battery input

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3.3.2 LCD display



1. LCD display
2. Status indicator
3. Charge indicator
4. Fault indicator
5. ESC
6. UP
7. DOWN
8. ENTER

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4. Installation

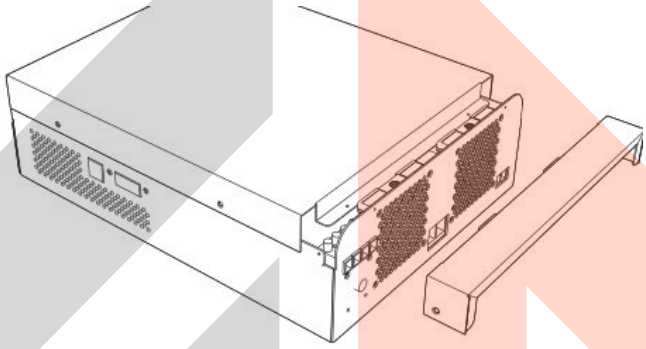
4.1 Unpacking and inspection

Inspect the unit before installation and make sure the box contents are not damaged. The box should contain:

- Unit — 1 pc
- User manual — 1 pc

4.2 Preparation

Before wiring, remove the bottom cover by undoing two screws as shown below.



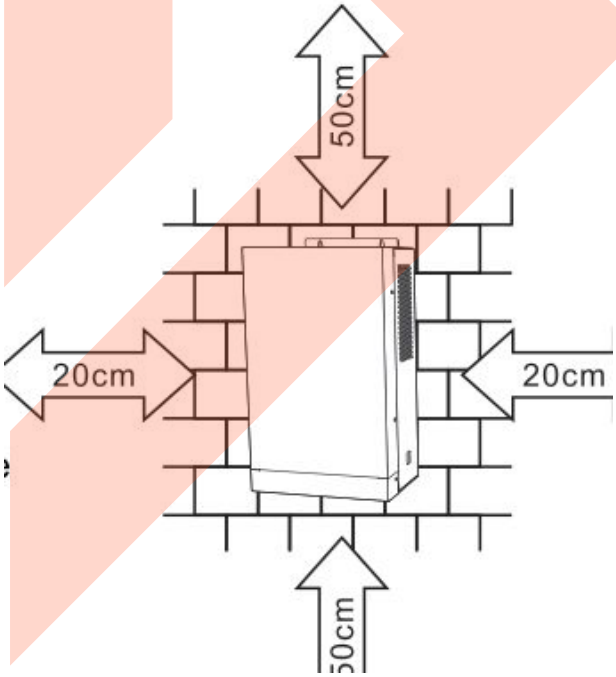
4.3 Mounting the unit

Before choosing where to install, consider:

- Do not mount the inverter on flammable building materials.
- Mount on a solid surface.
- Install the inverter at eye level so the LCD is always easy to read.
- For heat removal, leave about 20 cm free at the side and about 50 cm above and below the unit.

- For optimal operation, ambient temperature should be 20–35 °C.
- The recommended position is vertical on a wall.

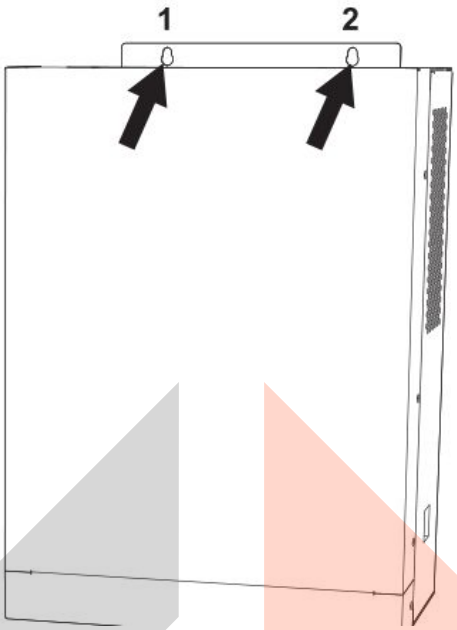
- Keep other objects and surfaces at the distances shown in the diagram: this ensures adequate heat removal and room to disconnect wires.



WARNING
SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Fix the unit with two screws:

- 1, 2 — M6×80 mm expansion bolts.

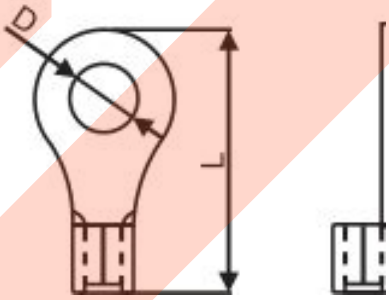


4.4 Battery connection

CAUTION
For safe operation and compliance, install a separate DC overcurrent protector or disconnect between the battery and inverter. In some cases a disconnect may not be required, but overcurrent protection is still needed. Size the fuse or breaker by the typical current in the table below.

WARNING
All connections must be made by qualified personnel.
For system safety and efficient operation, using a suitable battery cable is very important. To reduce the risk of injury, use the recommended cable and lug below.

Ring lug:



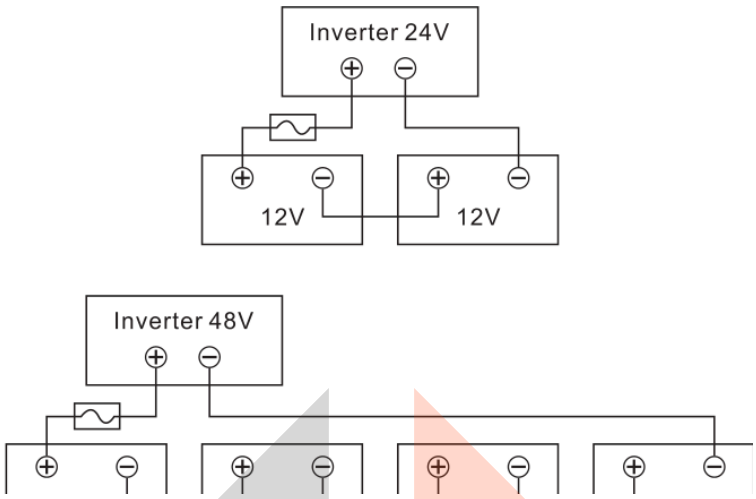
Recommended battery cable and lug:

Rated power	Typical current	Battery capacity	Wire size	Cable, mm²	Lug D, mm	Lug L, mm	Torque
2 kVA	165 A	200 Ah	2×4 AWG	25	8.4	33.2	5 N·m

Battery connection procedure:

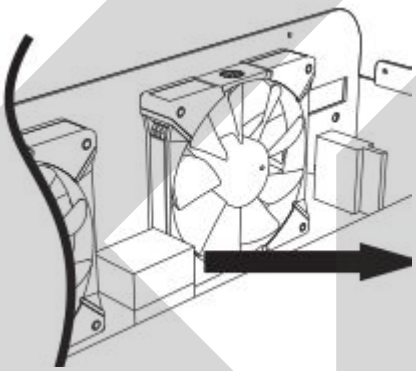
1. Crimp ring lugs on the battery cables to match the recommended cable and lug.

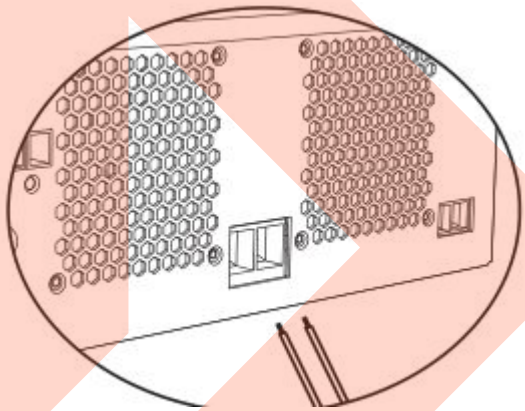
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Examples of connecting 12 V batteries for 24 V and 48 V inverters. For this model the 12 V battery connects directly, via a fuse in “+”.

2. Insert the battery wires flat into the inverter’s battery connectors and tighten the bolts clockwise to 2 N·m. Make sure polarity is correct on both the battery and the inverter/ charger and the conductors are firmly held in the battery terminals. Recommended tool: Pozi No. 2 screwdriver.





WARNING
Electric shock hazard. Work carefully: series-connected batteries carry high voltage.

CAUTION
Before the final DC connection or closing the DC breaker or disconnect, make sure positive (+) goes to positive (+) and negative (–) to negative (–).

4.5 AC input and output connection

CAUTION
Before connecting to the AC supply, install a separate AC breaker between the inverter and the supply. This lets you safely disconnect the inverter for service and fully protects the AC input from overcurrent. Recommended breaker: 25 A for 12 V systems and 32 A for 24 V systems.

CAUTION
There are two terminal blocks marked “IN” and “OUT”. Do NOT mix up the input and output connectors.

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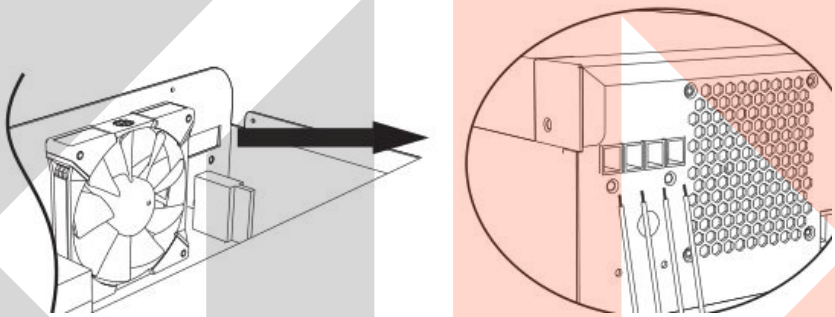
WARNING
All connections must be made by qualified personnel. For system safety and efficient operation, using a suitable AC input cable is very important. To reduce the risk of injury, use the recommended cable size below.

Recommended AC cables:

Rated power	Section	Torque
2 kVA	14 AWG	0.8–1.0 N·m

AC input and output connection procedure:

1. Before connecting AC input and output, be sure to open the DC protector or disconnect.
2. Strip 10 mm of insulation from the six conductors; shorten line L and neutral N by 3 mm.
3. Insert the AC input wires per the polarity on the terminal block and tighten the screws. Connect the PE protective conductor (⏚) first.
   ⏚ → ground (yellow-green)
   L → line (brown or black)
   N → neutral (blue)



WARNING
Before connecting to the unit, make sure the AC supply is disconnected.

4. Make sure the wires are secure.

CAUTION
Appliances such as air conditioners need at least 2–3 minutes to restart: this lets refrigerant pressure equalise in the circuits. If power drops and returns quickly, connected appliances may be damaged. To avoid this, check with the air conditioner maker before installation whether it has a start delay function. Otherwise the inverter/charger will trip on an overload error and cut the output to protect the appliance, but this can still cause internal damage to the air conditioner.

4.6 PV connection

PV connection (solar controller model only)

CAUTION
Before connecting PV modules, install a **separate** DC breaker between the inverter and the PV modules.

WARNING
All connections must be made by qualified personnel. For system safety and efficient operation, using a suitable PV module cable is very important. To reduce the risk of injury, use the recommended cable size below.

Typical current	Section	Torque
10 A	12 AWG	1.4–1.6 N·m

Choosing PV modules. When choosing PV modules, first consider these requirements:

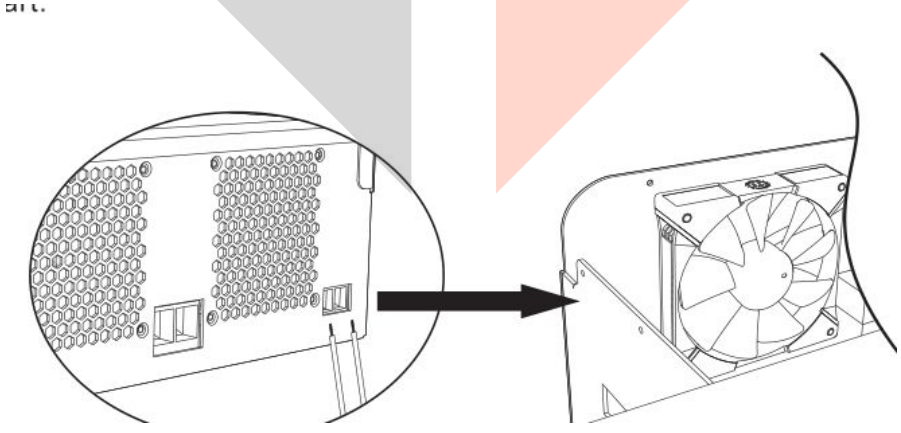
The open-circuit voltage (Voc) of the PV modules must not exceed the inverter's maximum PV array open-circuit voltage. The maximum operating voltage of the PV modules should be close to the inverter's optimal PV voltage range for the highest efficiency. If one PV module is not enough for this, connect several modules in series.

Model	ISolar-SMT-2K-WiFi
PV charge mode	MPPT
Max. PV power	2000 W
MPPT range	30–500 V DC
Optimal voltage	300–400 V DC
Max. PV input voltage	500 V DC
Max. PV charge current	100 A
Max. AC charge current	60 A
Max. charge current	100 A

Wiring PV modules. Procedure:

1. Strip 10 mm of insulation from the positive and negative conductors.
2. We recommend crimping ferrules on the ends of the positive and negative wires with a suitable tool.
3. Fix the wire cover on the inverter with the supplied screws as shown below.



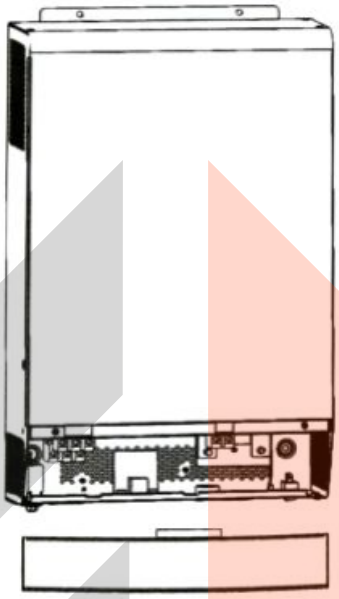


4. Check the polarity of the wires from the PV modules and the PV input connectors. Then connect the cable's positive (+) to the PV input connector's positive (+), and negative (–) to negative (–). Tighten both wires

clockwise. Recommended tool: 4 mm flat screwdriver.

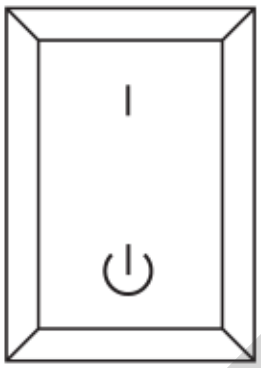
4.7 Final assembly

After connecting all wires, refit the bottom cover with two screws as shown below.



5. Operation

5.1 Power on and off



Once the unit is properly installed and the batteries are securely connected, simply press the On/Off switch (on the bottom of the case) to switch the unit on.

5.1.1 Power-on procedure

Connect a battery that meets the requirements (battery voltage must be above 23 V) or the AC grid (AC input voltage must be within the allowed range for the output mode); the inverter can then be switched on.

➤ **Start from grid.** Connect a normal AC grid and press the switch — the system starts automatically. If grid output priority is set, the panel shows AC mode after a while: the unit has started successfully and then enters AC mode.

➤ **Start from battery.** Connect the battery and press the power button to create a working power source. The system starts automatically; after a while the panel shows battery mode: the unit has started successfully and then enters battery mode.

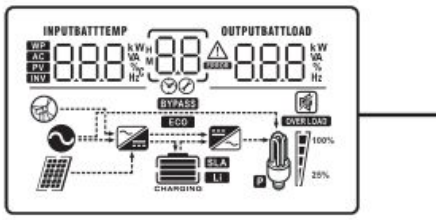
5.1.2 Shutdown procedure

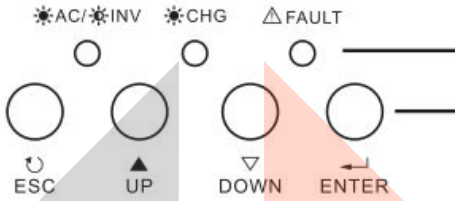
When the system runs in battery mode or grid output mode, press the switch again — the system shuts down.

5.2 Control and display panel

The control and display panel shown below is on the front of the inverter. It has three indicators, four function keys and an LCD showing the operating status and input/output power data.

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Top: LCD display; below: LED indicators and function keys

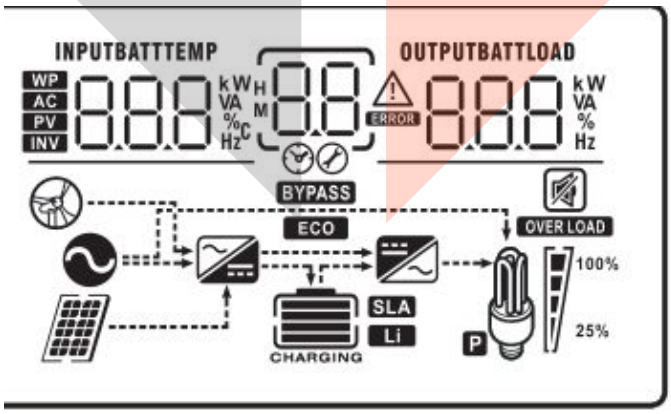
LED indicators

Indicator	Colour	State	Value
☀AC / ☀INV	Green	Steady	Output fed from the grid (grid mode).
		Flashing	Output fed from battery or PV (battery mode).
☀CHG	Yellow	Steady	Battery fully charged.
		Flashing	Battery charging.
⚠FAULT	Red	Steady	Inverter fault.
		Flashing	Inverter in warning state.

Function keys

Button	Purpose
ESC	Exit settings mode
UP	Go to previous item
DOWN	Go to next item
ENTER	Confirm a selection in settings mode or enter settings mode

LCD icons



Icon	Description
Input sources	

Icon	Description
AC	Indicates AC input.
PV	Indicates PV input.
INPUTBATT 888 kW VA % C Hz	Shows input voltage, input frequency, PV voltage, charge current, charge power, battery voltage.
Setting programs and faults	
88	Indicates setting programs.
88 ERROR	Shows warning and fault codes. Warning: 88 flashes with the warning code. Fault: 88 ERROR lit with the fault code.
Output	
OUTPUTBATTLOAD 888 kW VA % Hz	Shows output voltage, output frequency, load in percent, load in VA, load in W and discharge current.
Battery	
CHARGING	Shows battery level 0–24 %, 25–49 %, 50–74 % and 75–100 % in battery mode, and charge status in grid mode.

In AC mode, battery charge status is shown.

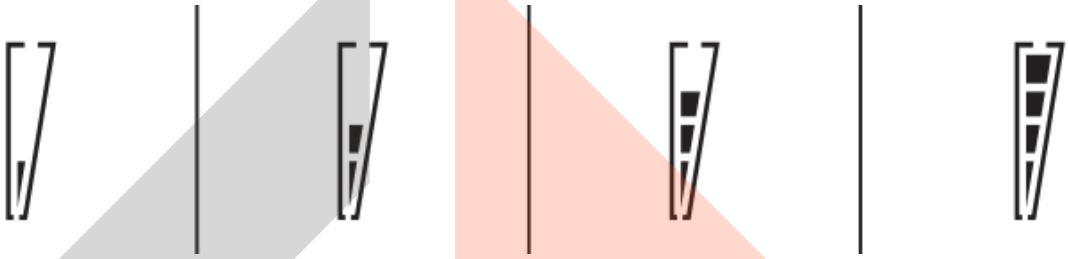
State	Battery voltage	Display
Constant current / constant voltage	< 2 V/cell	4 segments flash in turn.
	2–2.083 V/cell	Bottom segment on, the other three flash in turn.
	2.083–2.167 V/ cell	Two bottom segments on, the other two flash in turn.
	> 2.167 V/cell	Three bottom segments on, the top one flashes.
Float charge. Batteries fully charged.		4 segments on.

In battery mode, remaining capacity is shown.

Load	Battery voltage	Display
Load > 50 %	< 1.85 V/cell	
	1.85–1.933 V/cell	
	1.933–2.017 V/cell	
	> 2.017 V/cell	
Load < 50 %	< 1.892 V/cell	

Load	Battery voltage	Display
	1.892–1.975 V/cell	
	1.975–2.058 V/cell	
	> 2.058 V/cell	

Load

OVER LOAD	Indicates overload.
	Shows load level 0–24 %, 25–49 %, 50–74 % and 75–100 %. 

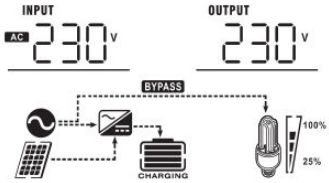
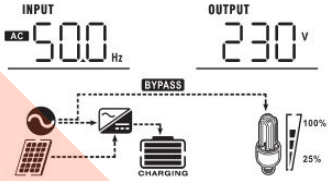
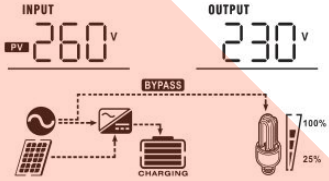
Operating modes

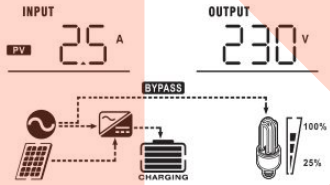
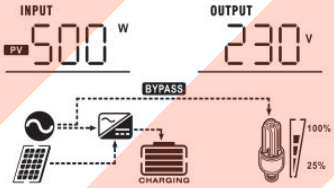
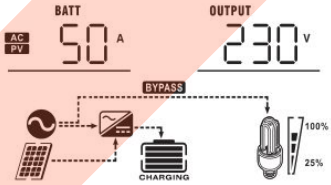
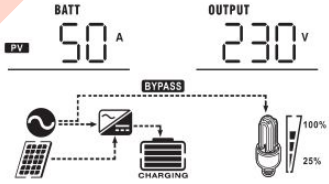
	Unit connected to the grid.
	Unit connected to PV panels.
BYPASS	Load powered from the grid.
	Grid charging circuit working.
	DC/AC inverter working.
	Unit buzzer muted.

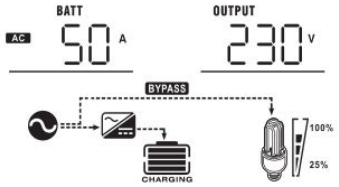
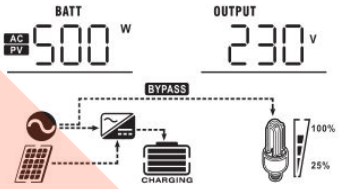
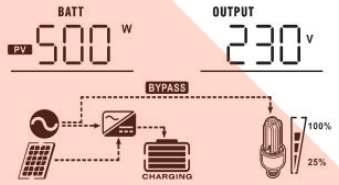
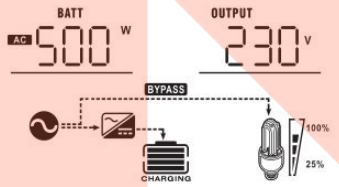
Choosing display information

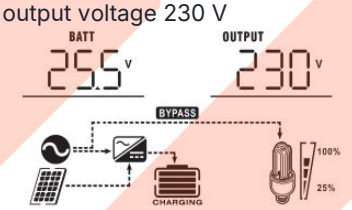
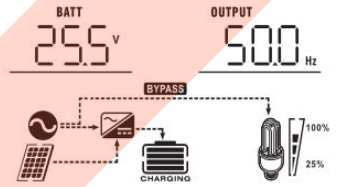
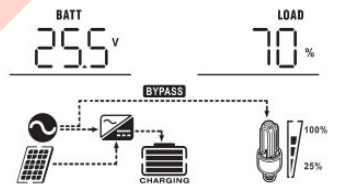
Information on the LCD cycles with “UP” or “DOWN” in this order: input voltage, input frequency, PV voltage, charge current, charge power, battery voltage, output voltage, output frequency, load in percent, load in W, load in VA, DC discharge current, main CPU version.

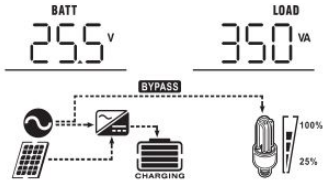
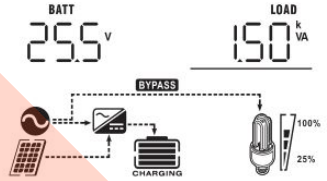
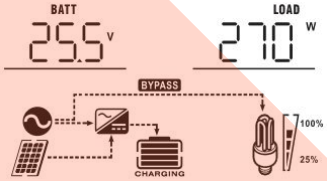
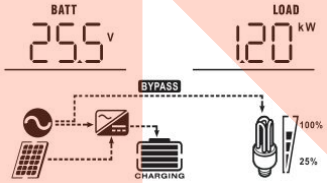
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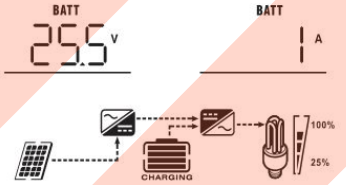
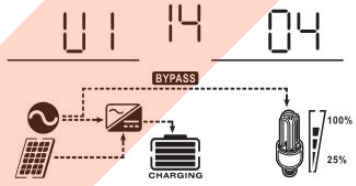
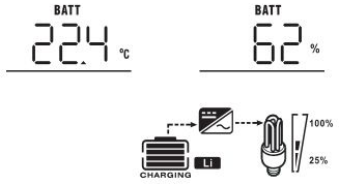
Information	Display
Input / output voltage (main screen)	Input voltage 230 V, output voltage 230 V 
Input frequency	Input frequency 50 Hz 
PV voltage	PV voltage 260 V 

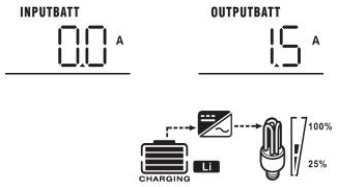
Information	Display
PV input current	PV current 2.5 A 
PV power	PV power 500 W 
Charging current	AC and PV charge current 50 A 
	PV charge current 50 A 

Information	Display
	AC charge current 50 A 
Charge power	AC and PV charge power 500 W 
	PV charge power 500 W 
	AC charge power 500 W 

Information	Display
Battery voltage and output voltage	Battery voltage 25.5 V, output voltage 230 V 
Output frequency	Output frequency 50 Hz 
Load in percent	Load 70 % 

Information	Display
Load in VA	Load below 1 kVA is shown as xxx VA 
	Load from 1 kVA is shown as x.xx kVA 
Load in W	Load below 1 kW is shown as xxx W 
	Load from 1 kW is shown as x.xx kW 

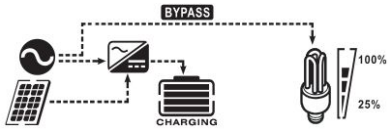
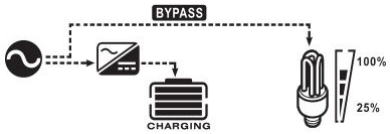
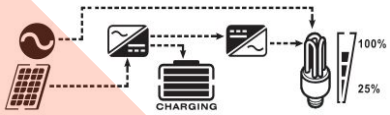
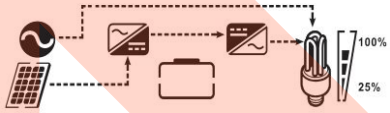
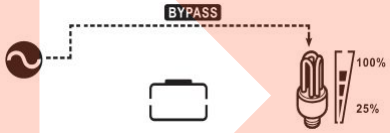
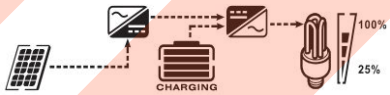
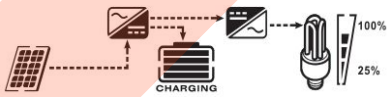
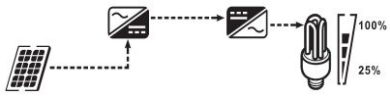
Information	Display
Battery voltage / DC discharge current	Battery voltage 25.5 V, discharge current 1 A 
Main CPU version	Main CPU version 00014.04 
BMS comms OK	Left: lithium battery temperature, right: its charge (SOC) 

Information	Display
	Left: lithium battery input current, right: its output current 

Operating modes

Mode	Description	Display
Standby mode	No output, but the unit can charge the batteries. Standby: the inverter is not yet on but can charge the battery without AC output.	Charging from grid and PV.  Charging from grid.  Charging from PV.  No charging. 
Fault mode	PV and grid can charge the batteries. Fault mode: errors from an internal circuit fault or external causes — overheating, output short circuit, etc.	Charging from grid and PV.  Charging from grid.  Charging from PV.  No charging. 

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Mode	Description	Display
Grid mode	The unit feeds the output from the grid and charges the battery.	Charging from grid and PV.  Charging from grid.  If “solar first” priority is selected and solar is not enough for the load, solar and grid together power the load and charge the battery.  If output priority “solar first” is selected and no battery is connected, solar and grid power the load.  Powered from the grid. 
Battery mode	The unit feeds the output from the battery and PV.	Powered from battery and PV.  PV powers the load and charges the battery at the same time.  Powered from battery only. 
No-battery mode	The unit feeds the output from PV.	

5.3 LCD settings

Hold ENTER for 3 seconds to enter settings mode. Use “UP” or “DOWN” to choose a program, “ENTER” to confirm, ESC to exit.

On-screen codes are shown as the seven-segment display shows them.

Program	Description	Options
00	Exit settings mode	**ESC —** exit
01	Output source priority	**SUb —** solar first: solar powers the load first; if it is not enough for all loads, the grid also powers the load at the same time. **SbU —** solar first: solar powers the load first; if it is not enough, the battery also supplies at the same time. The grid powers the load only when battery voltage drops to the low-voltage warning level or to the value of program 12, or when solar and battery are not enough.
02	Max. charge current: total charge current from solar and grid (max. charge current = grid charge current + solar charge current)	**60A** default. Range from 10 A to the max. charge current, step 10 A.
03	AC input voltage range	**APL** appliances (default): accepted AC input voltage 90–280 V. **UPS:** accepted AC input voltage 170– 280 V.
05	Battery type	**AGn** AGM (default) · **FLd** flooded **USE** user-defined: charge voltage, low DC cut-off voltage and dual cut-off voltage can be set in programs 24, 26, 27, 29 and 61. **LIA** LIA-protocol battery · **PYL** Pylontech battery · **tqF** Techfine battery · **GrO** Growatt battery · **FEL** Felicity battery: programs 24, 26, 27 and 29 are set automatically, no extra setup needed. **LIb** LIB-protocol battery: choose if the lithium battery is LIB-protocol compatible; programs 26, 27 and 29 are set automatically, no extra setup needed. **LIC** lithium battery from another maker: programs 26, 27 and 29 are set automatically, no extra setup needed. Check the setup procedure with the battery maker.
06	Auto restart after overload	**LtD** off (default) · **LtE** on
07	Auto restart after overheating	**ttD** off (default) · **ttE** on

Program	Description	Options
08	ECO function: on battery with low load, the system pauses temporarily	**SdS** off (default) · **SEN** on
09	Output frequency	**50** Hz (default) · **60** Hz
10	Output voltage	**220** V · **230** V (default) · **240** V
11	Max. grid charge current. Note: if the value in program 02 is lower than in program 11, the inverter uses the current from program 02 for grid charging.	**30A** default. Range: 2 A, then from 10 A to the max. AC charge current, step 10 A.
12	Back-to-grid voltage when “SBU” is selected in program 01	12 V system: **11.5** V default, range 11–12.5 V, step 0.5 V. 24 V system: **23.0** V default, range 22–25.5 V, step 0.5 V.
13	Back-to-battery voltage when “SBU” is selected in program 01	12 V system: **FUL** battery fully charged or **13.5** V (default); range 12–14.5 V, step 0.5 V. 24 V system: **FUL** or **27.0** V (default); range 24–29 V, step 0.5 V.
16	Charging source priority	If the inverter/charger is in grid, standby or fault mode, the charge source can be set as follows: **CUt** grid first: the grid charges the battery first; solar charges only when there is no grid. **CSO** solar first: solar charges the battery first; the grid charges only when there is no solar. **SNU** solar and grid (default): solar and grid charge the battery at the same time. **OSO** solar only: solar is the only charge source, whether or not the grid is present. If the inverter/charger is in battery mode, only solar can charge the battery, if there is enough solar.
18	Beeper	**bON** on (default) · **bOF** off

Program	Description	Options
19	Auto return to main screen	**ESP** return to main screen (default): whatever screen is selected, if no key is pressed for 1 minute, the display returns to the main screen (input/output voltage). **HEP** stay on the last screen the user selected.
20	Backlight	**LON** on (default) · **LOF** off

Program	Description	Options
22	Beep when the primary source is interrupted	**AON** on (default) · **AOF** off
23	Overload bypass: if enabled, on overload in battery mode the unit switches to grid mode	**byd** off (default) · **byE** on
24	Low battery voltage: if the battery is the only available source, the inverter sounds an alarm	**LOU 10.0** V (battery low voltage 10.0 V). Range 10.0–13.5 V for 12 V systems and 20.0–27.0 V for 24 V systems.
25	Fault code logging	**FEN** recording on (default) · **FdS** off
26	Bulk charge voltage (CV voltage)	12 V system: default **14.1** V. 24 V system: default **28.2** V. Adjustable if user-defined type is selected in program 5. Range 12.0–15.0 V for 12 V systems and 24.0–30.0 V for 24 V systems, step 0.1 V.
27	Float charge voltage	12 V system: default **13.5** V. 24 V system: default **27.0** V.
28	Reset to factory settings	**OFF** (default) · **ON**
29	Low DC cut-off voltage: if the battery is the only available source, the inverter shuts down; if PV and battery are available, the inverter charges the battery without AC output	12 V system: default **10.5** V. 24 V system: default **21.0** V. Adjustable if user-defined type is selected in program 5. Range 10.0–13.0 V for 12 V systems and 20.0–26.0 V for 24 V systems, step 0.1 V. The cut-off voltage is fixed at the set value regardless of load.
30	Battery equalisation charge	**EEN** on · **EdS** off (default). Available if flooded (FLd) or user-defined (USE) type is selected in program 05.
31	Equalization charge voltage	12 V system: default **14.6** V. 24 V system: default **29.2** V. Range 12.0–15.0 V for 12 V systems and 24.0–30.0 V for 24 V systems, step 0.1 V.
33	Equalisation time	**60** min (default). Range 5–900 min, step 5 min.

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Program	Description	Options
34	Equalisation timeout	**120** min (default). Range 5–900 min, step 5 min.
35	Equalising interval	**30d** 30 days (default). Range 0–90 days, step 1 day.
36	Start equalisation now	**AEN** on · **AdS** off (default). Available if equalisation is enabled in program 30. If “on” is selected, equalisation starts immediately and **E9.** appears on the main screen. If “off” is selected, equalisation is cancelled until the next scheduled time per program 35; then **E9** is not shown on the main screen.
37	Enable BMS comms	**bnS OFF** off (default) · **bnS ON** on. Whether to use BMS comms.
38	Battery lockout SOC	**bSU 10%.** If any lithium battery type is selected in program 5: if the SOC reported by the BMS is below the set value, the inverter shuts down to protect the battery.
39	SOC for switching to grid	**StG 20%.** If any lithium battery type is selected in program 5: when running with battery priority, the inverter forces grid charging if the BMS SOC is below the set value.
40	Back-to-battery SOC	**Stb 95%.** If any lithium battery type is selected in program 5: when running with battery priority, the inverter returns to DC operation if the BMS SOC is above the set value.
41	SOC for restart	**bSt 50%.** If any lithium battery type is selected in program 5: at inverter start-up, SOC must be above the set value for normal operation.

If a BMS/485 comms interface is connected externally, the RJ45 pinout is:

RJ45 pin	Signal
1	RS485-B
2	RS485-A
3, 4, 5, 6, 7, 8	not used (NC)

Comms connection

Use the supplied comms cable to connect the inverter to a PC. Install the monitoring software on the computer.

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Dry contact signal

The rear panel has one dry contact (3 A / 250 V AC). It can send a signal to an external device when battery voltage reaches the warning level.

Unit state	Mode	Condition	NC & C	NO & C
Off	Unit off, no output.		Closed	Open
On, output fed from battery or solar	Normal mode	Battery voltage below the low DC warning voltage	Open	Closed
		Battery voltage above float voltage	Closed	Open
	“Solar first” mode	Battery voltage below the switch-to-grid voltage	Open	Closed
		Battery voltage above the back-to-DC voltage	Closed	Open

5.4 Battery equalisation charge

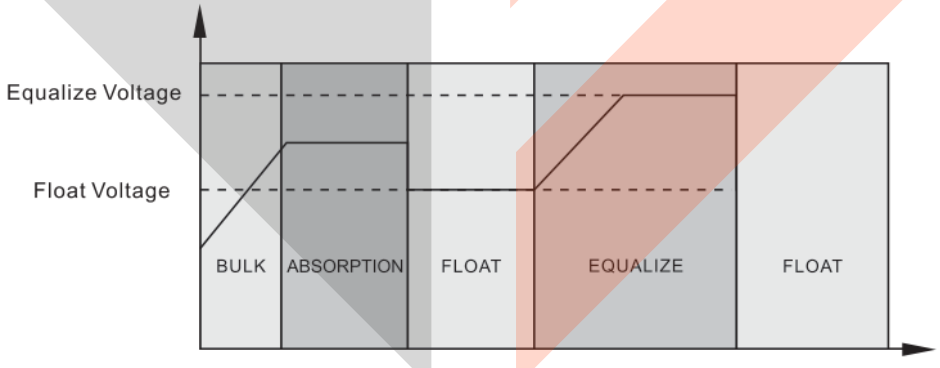
An equalisation function has been added to the charge controller. It reverses the build-up of negative chemical effects such as stratification, where acid concentration is higher at the bottom of the battery than at the top. Equalisation also helps remove sulphate crystals that may have formed on the plates. Left unchecked, sulphation will reduce the overall battery capacity. Periodic equalisation is therefore recommended.

How to use equalisation. First enable equalisation charge in program 30 of the LCD settings. Then apply it in one of these ways:

1. Set the equalisation interval in program 35.
2. Start equalisation now in program 36.

> **NOTE**
> Equalisation is not used for lithium batteries: program 30 is available only for flooded or user-defined type.

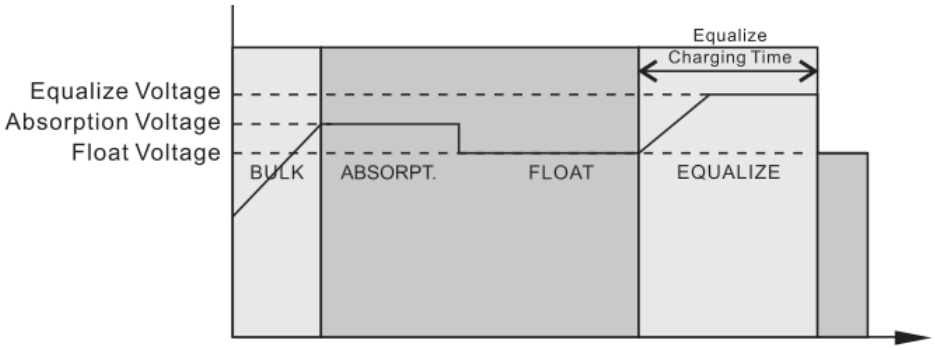
When equalisation runs. When the set equalisation interval (battery equalisation cycle) arrives or equalisation is started immediately, the controller enters the equalisation stage.



Equalize Voltage — equalisation voltage · Float Voltage — float charge voltage · BULK — bulk charge · ABSORPTION — constant voltage charge · FLOAT — float charge · EQUALIZE — equalisation

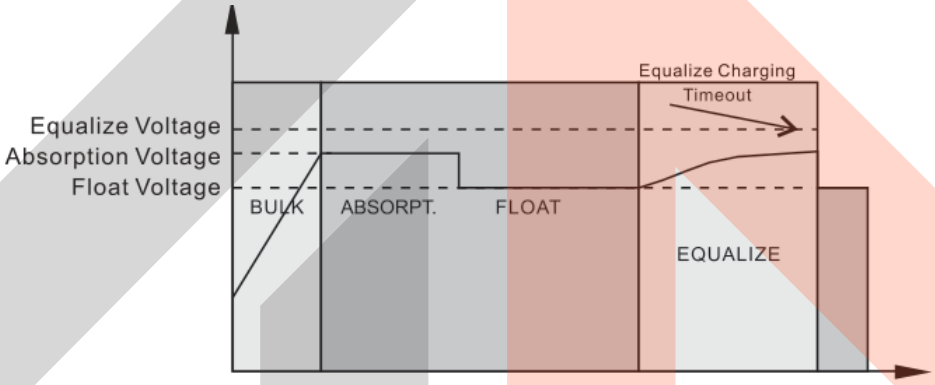
Equalisation time and timeout. In the equalisation stage, the controller charges the battery at the highest possible current until voltage rises to the equalisation voltage. Voltage is then held constant at that level. The battery stays in equalisation until the set equalisation time ends.

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Absorption Voltage — constant voltage charge voltage · Equalize Charging Time — equalisation time

However, if the equalisation time has passed and the battery has not reached the equalisation voltage, the controller extends equalisation until it does. If after the equalisation timeout the battery voltage is still below the equalisation voltage, the controller stops equalisation and returns to float charge.



Equalize Charging Timeout — equalisation timeout

5.5 Faults and warnings

5.5.1 Faults

➤ **Fault:** the inverter enters fault mode, the red indicator is steady on, and the LCD shows the fault code (ERROR icon).

Fault code	Event
01	Fan locked while the inverter is off.
02	Overheating or poorly connected NTC temperature sensor.
03	Battery voltage too high.
04	Battery voltage too low.
05	Output short circuit or overheating detected by internal converter components.
06	Output voltage too high.
07	Overload timeout.
08	Bus voltage too high.
09	Bus soft start failed.
51	Overcurrent or surge.
52	Bus voltage too low.
53	Inverter soft start failed.
55	DC offset in AC output voltage too high.
57	Current sensor fault.
58	Output voltage too low.
59	PV voltage exceeds the limit.

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5.5.2 Warnings

➤ **Warning:** the red indicator flashes, the LCD shows the warning code (⚠ icon flashes), and the inverter does not enter fault mode.

Warning code	Event	Beeper
01	Fan locked while the inverter is on.	Three beeps per second
02	Overheating	None
03	Battery overcharged	One beep per second
04	Battery low	One beep per second
07	Overload	One beep every 0.5 s
10	Output power derating	Two beeps every 3 s
15	Low PV energy	Two beeps every 3 s
16	High AC input voltage (> 280 V) during bus soft start	None
E9	Battery equalisation charge	None
bP	Battery not connected	None

5.5.3 Information codes

The relevant information code is shown on the LCD with the ⚠ icon. Check the inverter screen.

Code	Description
60	If, after comms between inverter and battery are established, the battery state allows neither charging nor discharging, code 60 appears and charging and discharging stop.
61	Comms lost. • If no comms signal is detected within 1 minute after connecting the battery, a beep sounds. • If comms are lost after the inverter and battery have connected, the beep sounds immediately.
69	If, after comms are established, the battery state does not allow charging, code 69 appears and charging stops.
70	If, after comms are established, the battery needs charging, code 70 appears and the battery charges.
71	If, after comms are established, the battery state does not allow discharging, code 71 appears and discharging stops.

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6. Troubleshooting

Problem	Display / LEDs / beep	Explanation / possible cause	What to do
Unit shuts down automatically during power-on	LCD, LEDs and beep active for 3 seconds, then everything goes off	Battery voltage too low (< 1.91 V/cell)	1. Charge the battery. 2. Replace the battery.
No response after power-on	No display	1. Battery voltage very low (< 1.4 V/cell). 2. Internal fuse has blown.	1. Contact a service centre to replace the fuse. 2. Charge the battery. 3. Replace the battery.
Grid present but unit runs on battery	LCD input voltage 0, green LED flashes	Input protection tripped	Check whether the AC breaker has tripped and the AC wiring is correct.
	Green LED flashes	Poor AC power quality (grid or generator)	1. Check whether the AC wires are too thin or too long. 2. Check that the generator (if any) works properly and the input voltage range is set correctly (UPS → appliances).
	Green LED flashes	Output source priority set to “solar first”	Change output source priority to “grid first”.
After power-on the internal relay keeps switching on and off	LCD and LEDs flash	Battery disconnected	Check that the battery wires are securely connected.
Continuous beep, red LED on	Fault code 07	Overload error: inverter overloaded by 105 % and time has run out.	Reduce the load by switching off some equipment.
		If PV input voltage is above the limit, output power is derated. If the connected load is then above the derated power, an overload occurs.	Reduce the number of PV modules in series or the connected load.
	Fault code 05	Output short circuit.	Check the wiring and disconnect the faulty load.
		Internal converter temperature above 120 °C.	Check that airflow is not blocked and ambient temperature is not too high.
	Fault code 02	Inverter internal component temperature above 100 °C.	(as above)
	Fault code 03	Battery overcharged.	Return to a service centre.
		Battery voltage too high.	Check that the battery specs and number meet the requirements.
	Fault code 01	Fan fault.	Replace the fan.
	Fault code 06/58	Abnormal output (inverter voltage below 190 V AC or above 260 V AC).	1. Reduce the load. 2. Return to a service centre.
	Fault code 08/09/53/57	Internal component fault.	Return to a service centre.
	Fault code 51	Overcurrent or surge.	Restart the unit; if the error repeats, return it to a service centre.

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Problem	Display / LEDs / beep	Explanation / possible cause	What to do
	Fault code 52	Bus voltage too low.	(as above)
	Fault code 55	Unbalanced output voltage.	(as above)
	Fault code 59	PV input voltage above the limit.	Reduce the number of PV modules in series.

7. Technical specifications

	Parameter	ISolar-SMT-2K-WiFi
Input	Input lines	L + N + PE
	Rated input voltage	220 / 230 / 240 V AC
	Voltage range	90–280 V AC ±3 V (APL mode), 170–280 V AC ±3 V (UPS mode)
	Frequency	50 / 60 Hz (auto-detect)
Output	Rated power	1600 W
	Output voltage	220 / 230 / 240 V AC ±5 %
	Output frequency	50 / 60 Hz ±0.1 %
	Waveform	Pure sine wave
	Transfer time (adjustable)	computers (UPS mode) 10 ms, appliances (APL mode) 20 ms
	Peak power	3200 VA
	Peak efficiency (on battery)	> 94 %
Battery	Battery voltage	12 V DC
	Constant voltage charge voltage (adjustable)	14.1 V DC
	Float charge voltage (adjustable)	13.5 V DC
Chargers	PV charge mode	MPPT
	Max. PV input power	2000 W
	MPPT range	30–500 V DC
	Optimal voltage	300–400 V DC
	Max. PV input voltage	500 V DC
	Max. PV charge current	100 A
	Max. AC charge current	60 A
	Max. charge current	100 A
Display	LCD display	Shows operating mode, load, input, output, etc.
Interfaces	RS232	2400 baud
	Comm. ports	Lithium battery BMS comms board, Wi-Fi board, dry contact
	Parallel connection	Not supported
Environment	Operating temperature	−10...+50 °C
	Humidity	20–95 % (non-condensing)
	Storage temperature	−15...+60 °C
	Altitude	Up to 1000 m without derating, above 1000 m derated, max. 4000 m (per IEC 62040)
	Noise	≤ 50 dB

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Appendix. Wi-Fi connection via the app

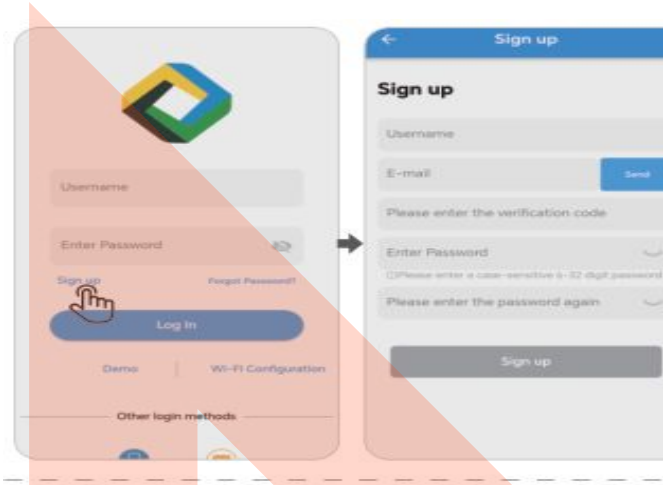
1. Wi-Fi wireless network setup

1.1 Downloading the app

- Method 1: scan the QR code on the film of the data logger (collector).
- Method 2: search the app store for “Solar of Things” and install it.

1.2 Account registration

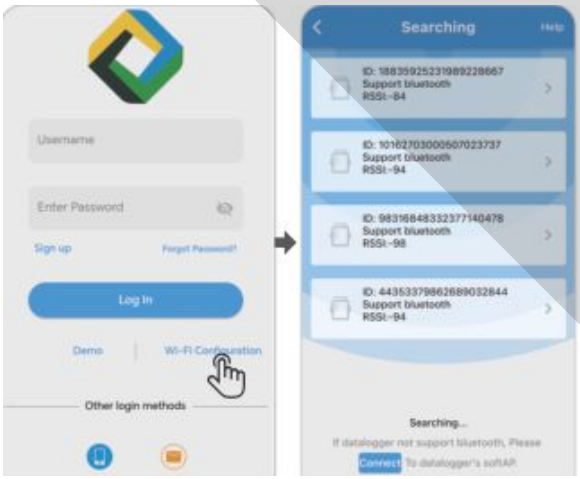
On the app home page tap “Sign Up”, fill in the required details as prompted and complete registration.

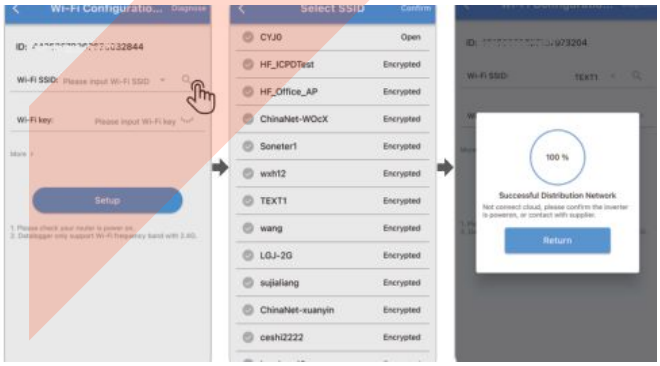


2. Network connection and adding a device

2.1 Connecting the Wi-Fi collector to the router

1. When the PWR LED on the collector lights up, turn on Bluetooth on the phone, open Solar of Things and tap “Wi-Fi Configuration” to go to the “Searching” page. The app shows nearby Bluetooth devices automatically.
2. Choose the collector to connect, open the connection page and tap the search icon. Choose your Wi-Fi network name and enter the password. The collector supports only 2.4 GHz Wi-Fi; the router must be on.



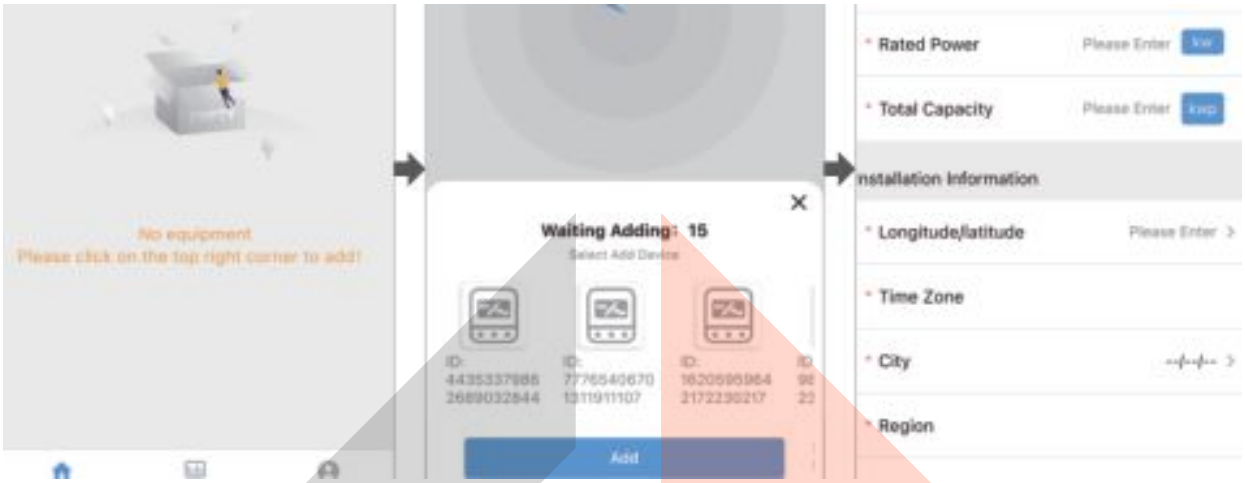


2.2 Adding a device

Method 1. On the app home page tap “+” in the top right corner to open the add device page; hold the phone near the device and the app will find it

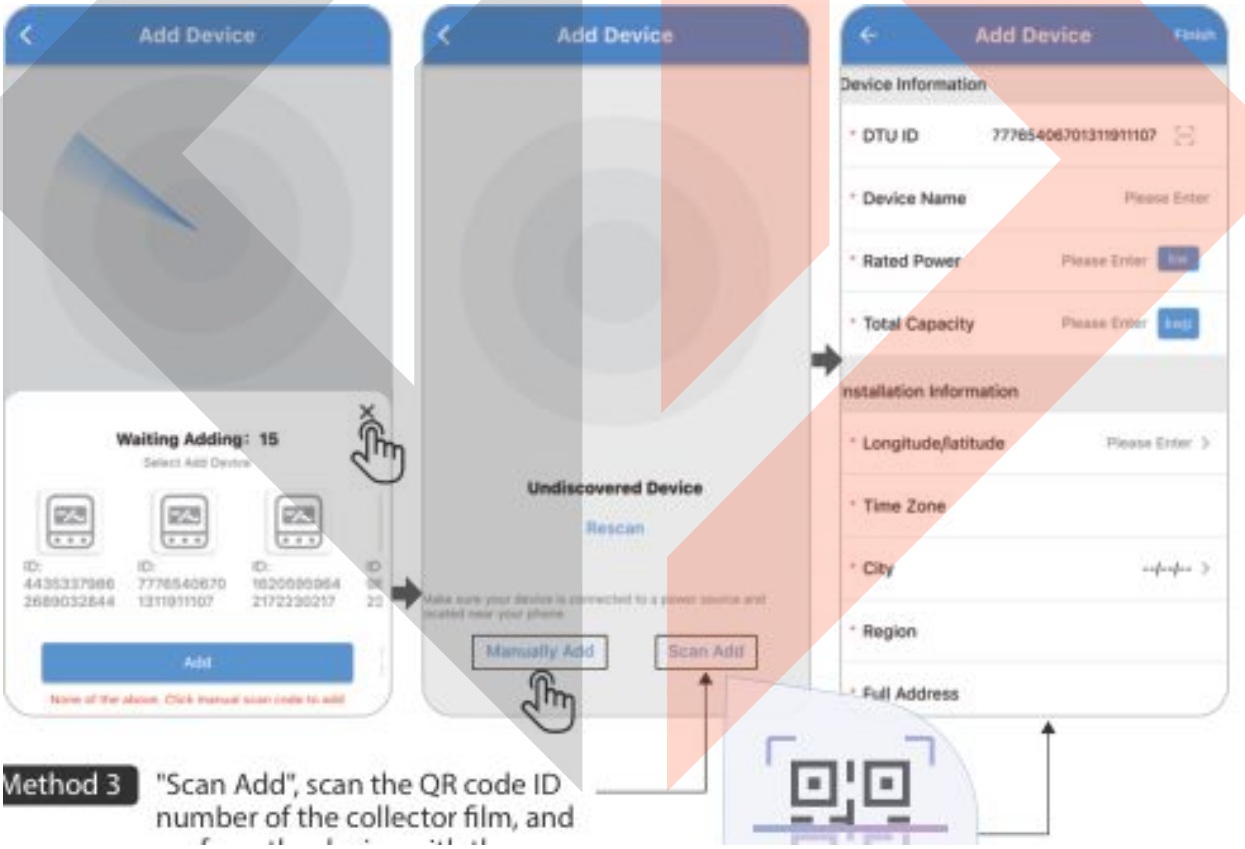
automatically. After the scan, choose the ID that matches the ID on the collector label and tap “Add”.

Note: check the collector ID before scanning. If the ID cannot be found on the case, see it on the connection page.



Method 2. “Manually Add”: enter the collector ID, name and other details as prompted on screen.

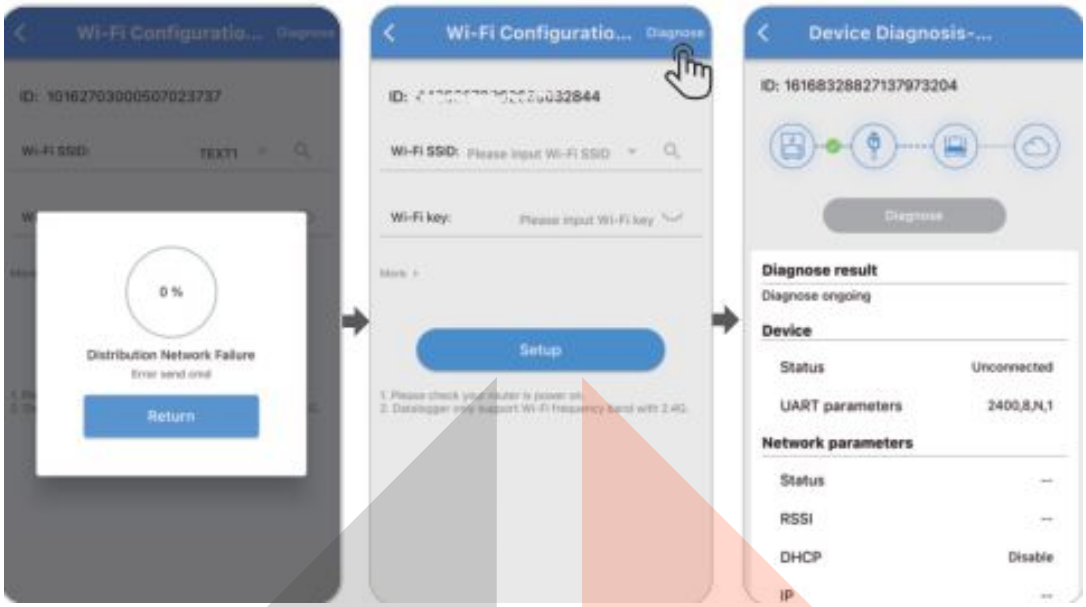
Method 3. “Scan Add”: scan the ID QR code on the collector film and add the matching collector.



3. Collector diagnostics and LED meanings

3.1 Diagnostics

After the network connection succeeds or fails, you can run diagnostics by tapping “Diagnose” in the top right corner.



3.2 Collector LEDs

Indicator	State
PWR (power)	Lit: power supply normal; off: power supply problem.
COM (serial port data exchange)	Off — no data exchange; off 0.3 s and on 0.9 s — sending data; off 0.3 s and on 0.3 s — receiving data; on — two-way exchange.
NET (network)	Off 0.3 s and on 3 s — collector connected to the router (STA mode); off 0.3 s and on 0.3 s — collector not connected to the router.
SRV (server)	On — connected to the server; off — no server connection.

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