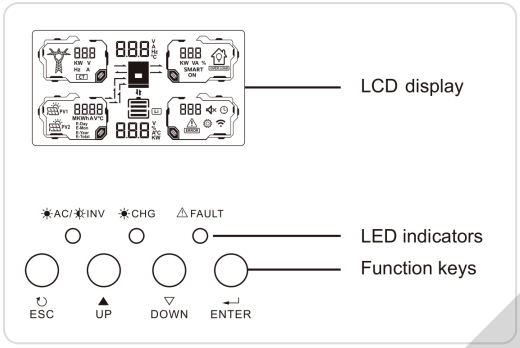
SETUP MANUAL · ENGLISH

Hybrid inverter EASUN SMT 4 kW 24 V

Model per the manual ISolar-SMT-4K-24V-Wifi: connectors, connection, all menu items, lithium battery with BMS, CT sensor, Wi-Fi, codes



Display, AC/INV, CHG, FAULT indicators and ESC, UP, DOWN, ENTER buttons (manual figure).

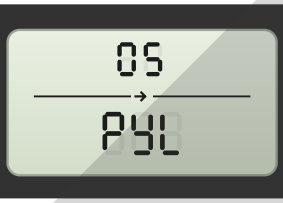
Control panel

ESC exit the	**UP** previous item	**DOWN** next item	**ENTER** enter and confirm

How to change settings

1. Press and hold **ENTER** for 3 seconds: the menu opens.
2. Use **UP / DOWN** to choose the item number.
3. Press **ENTER,** choose the value with **UP / DOWN, ENTER:** save.
4. **ESC:** exit the menu.

Outside the menu, UP / DOWN switch the display screens in turn.



Most important: battery type is item 05.

For a lead-acid battery: AGn or FLd. For a lithium battery compatible with one of the protocols (PYL, GrO, FEL, tqF, LIA, LIb, LIC), choose it in item 05 and enable the BMS link in item 37 = ON. Without a link: USE and manual voltages.

LEDs

Indicator	Steady	Flashing
AC / INV (green)	Output supplied from the grid (grid mode)	Output supplied from battery or sun (battery mode)
CHG (yellow)	Battery fully charged	Battery charging
FAULT (red)	Inverter fault	Warning

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CONNECTORS

Side and bottom panels: what goes where

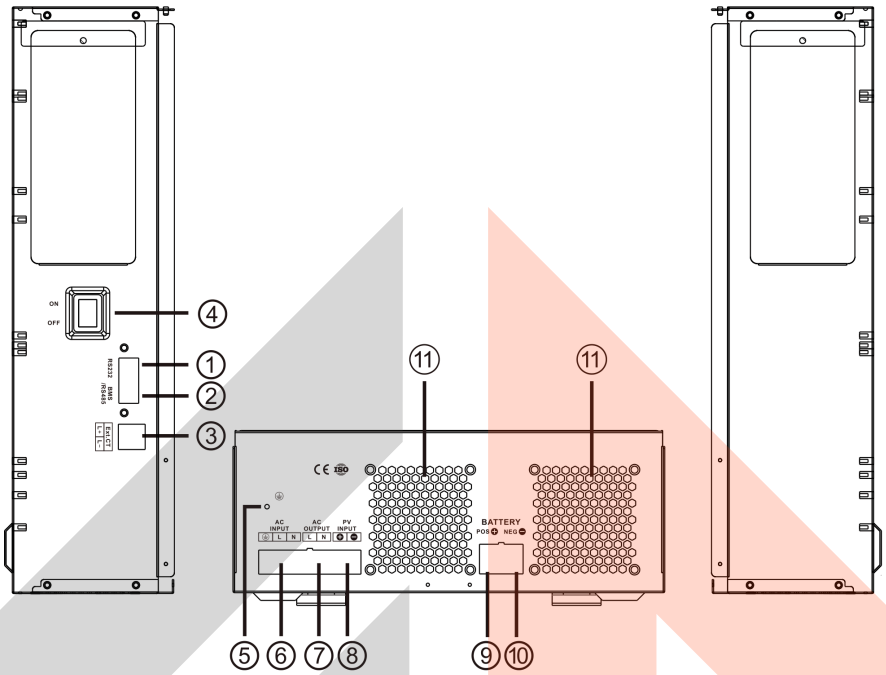

Figure from the manufacturer's manual (sect. 3.3.2): left, the side panel with ports and switch; centre, the view from below. Numbers as in the manual and the table below. There is no real photo of this model's underside.

№	What it is	Why	What to connect
1	**RS232**	PC comms port (2400 baud). The manual advises connecting a PC with the supplied comms cable and installing monitoring software on the computer.	PC comms cable
2	**BMS / RS485**	RJ45 port for the lithium battery BMS link: **pin 1: 485B, 2: 485A,** 3–8 unused. Enable with item 37.	comms cable from the battery BMS
3	**CT**	Spring terminal block for an external current sensor (CT): **L+:** red wire, **L–:** black. Needed for PEC mode (item 01).	CT current sensor wire
4	**ON / OFF**	Inverter power switch (on the side panel).	—
5	**Output earth**	Earth screw (⏚ mark) on the bottom panel.	PE wire
6	**AC INPUT**	Terminals ⏚ · **L** · **N** of the grid or generator input.	cable from the grid via a separate 32 A breaker
7	**AC OUTPUT**	Terminals **L** · **N** of the load output. Do not confuse with the input (6).	cable to the load panel
8	**PV INPUT**	+ · – terminals of the solar panels.	cables from the panels via a separate DC breaker
9	**BATTERY POS (+)**	Battery positive terminal 24 V.	battery "plus" via DC protection
10	**BATTERY NEG (–)**	Battery negative terminal.	battery "minus"
11	**Fans**	Fan grilles: do not cover them.	—

Earthing: the PE wire (yellow-green) is connected **first.** Do not mix up the **IN** (6) and **OUT** (7) terminal blocks.

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TECHNICAL DATA

Specifications per the manual table

AC input (grid)		AC output	
Connection	**L + N + PE**	Rated power	**3600 W** (from battery and from PV)
Rated voltage	**220 / 230 / 240 V**	Peak power	**7200 VA**
Voltage range	**90–280 V** (APL), **170–280 V** (UPS), ±3 V	Voltage / frequency	**220 / 230 / 240 V ±5 %, 50 / 60 Hz ±0.1 %,** pure sine
Frequency	**50 / 60 Hz** (auto-detect)	Transfer time	**10 ms** (UPS), **20 ms** (APL)
Battery		Overload (on battery)	105–150 %: 11 s; 150–200 %: 2 s; above 200 %: 400 ms
Rated voltage	**24 V**	**Grid-tie (export)**	
CV / float voltage	**28.2 V / 27 V** (adjustable)	Grid export voltage	**100–280 V,** 47–53 / 57–62 Hz (±1 Hz)
Max. grid charge current	**100 A**	Rated current / cos φ	**15.7 A / > 0.99**
Max. PV / total charge current	**120 A / 120 A**	Max. efficiency (DC/AC)	**98 %**
Solar panels (PV), MPPT		**Interfaces and conditions**	
Max. PV power	**5000 W**	RS232	**2400 baud**
MPPT range / optimum	**60–500 V / 300–400 V**	Expansion	lithium battery BMS comms card, Wi-Fi card
Max. PV voltage	**500 V**	Operating / storage	**–10…50 °C / –15…60 °C,** humidity 20–95 % non-condensing
Max. PV input current	**15 A**	Altitude / noise	up to 1000 m without derating, max. 4000 m / ≤ **50 dB**
Standards: EN-IEC 60335-1, EN IEC 60335-2-29, IEC 62109-1		Model per the manual: **ISolar-SMT-4K-24V-Wifi**	

For the **4K** model the manual gives a rated power of **3600 W** (from both battery and PV). The manual gives no dimensions or weight.

Safety (from the manual)

- Before use, read all instructions and warning labels on the inverter, battery and in the manual.
- Do not disassemble the inverter: repairs only at a service centre. Before servicing or cleaning disconnect all cables: switching off with the switch does not remove the shock risk.
- Battery connection and installation by a qualified specialist only. Never charge a frozen battery.
- Take care with metal tools near the battery: an accidental short can cause a spark or explosion.
- To protect the battery circuit the manual specifies a 150 A fuse.
- The inverter must be connected to a permanent earth. Do not short the AC output and DC input; do not connect the grid if the DC input is shorted.
- Air conditioners need 2–3 min to restart. If the grid drops and returns quickly, check that the air conditioner has a start delay, otherwise damage is possible.

Location

- Only on concrete or another **non-combustible** solid surface, vertically on a wall, at eye level.
- Clearances: **20 cm** at the sides, **50 cm** above and below. Optimal room temperature 20–35 °C.
- Mounting: **three M4 × 30 screws** (two at the top, one at the bottom).
- Contents per the manual: inverter and manual.

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WIRING

Cables, protection and step-by-step connection

Cables and protection (manual tables for 4 kVA)

Section	Cable	Protection	Torque
Battery (200 Ah battery)	2 × 25 mm², ring lug D 8.4 mm, L 33.2 mm	separate DC protection / disconnector for a typical current of **138 A**	5 N·m (in the table)
AC input / output	4 mm²	separate breaker **32 A** (for a 24 V system)	1.2–1.6 N·m
Solar panels (PV)	4 mm², typical current 30 A	separate DC breaker (rating not given in manual)	1.4–1.6 N·m

Manual inconsistencies: for battery terminals the table gives 5 N·m and the step text 2 N·m; for PV the cable table gives a typical current of 30 A and the specification table a max. PV input current of 15 A. **Check against the label and terminals.**

Step 1 Preparation

Remove the bottom cover (two screws). Before connecting AC make sure the battery DC protection / disconnector is off.

Step 2 Battery (No. 9 “+”, No. 10 “–”)

- Crimp ring lugs on the cables per the table above.
- Insert the cables straight into the battery terminals and tighten the bolts clockwise (Pozi No. 2 screwdriver).
- **Plus to plus, minus to minus:** check before the last connection or before switching on the DC breaker. For 24 V: two 12 V batteries **in series,** fuse in the “plus” circuit (manual diagram).

Step 3 Grid and loads (AC INPUT No. 6, AC OUTPUT No. 7)

- Between grid and inverter: a separate 32 A breaker. De-energise the grid before connecting.
- Strip 10 mm of insulation on six conductors; shorten L and N by 3 mm.
- First **PE** (yellow-green), then **L** (brown or black) and **N** (blue). Connect the output the same way. Check that the wires are held firmly.

Step 4 Solar panels (PV INPUT, No. 8)

- Between panels and inverter: a separate DC breaker.
- String open-circuit voltage (Voc) must not exceed **500 V;** operating voltage ideally around **300– 400 V.** If one panel is not enough, connect several in series.
- Strip 10 mm, crimp ferrules, check polarity and connect + to +, – to – (4 mm flat screwdriver). Fix the cable cover with the supplied screws.

Step 5 Close up and switch on

- Refit the bottom cover (two screws).
- Starting needs a battery above **23 V** or a grid within range. Press the switch (No. 4): with grid the inverter enters grid mode, from battery it enters battery mode.
- Switching off: press the switch again.

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SETTINGS MENU

All display menu items

The display image shows default values for a 24 V system (or values from the manual figure if no factory value is given). Numbers missing here do not exist in the manual's menu.

Output and operating modes



00 Exit menu

Exit settings mode.



01 Load supply source priority

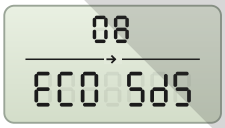
- **SUb:** solar first. If solar is not enough for the whole load, the grid is added.
- **SbU:** solar first; if solar is not enough, the battery is added. The grid feeds the loads only when battery voltage falls to the warning level or the item 12 value, or solar and battery are not enough.
- **SUF:** if solar is enough for the whole load and battery charging, the surplus can be exported to the grid (sold). If solar is not enough, the grid feeds the load as well.
- **PEC:** the inverter feeds its own load and the house network; if solar and battery are not enough, it adds grid energy, but does **not export** to the grid. Used with a CT current sensor (connector No. 3): the CT sees current towards the grid and the inverter reduces power to own consumption.

The manual gives no factory value for item 01.



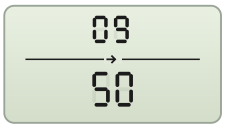
03 Grid input voltage range

- **APL:** household appliances (default): 90–280 V.
- **UPS:** computers: 170–280 V.



08 ECO mode (power saving)

SdS: off (default). **SEn:** on: in battery mode at low load the system temporarily stops the output.



09 Output frequency

50 Hz default or 60 Hz.



10 Output voltage

230 V default. 220 or 240 V can be selected.



23 Bypass on overload

byd: off (default). **byE:** on: on overload in battery mode the inverter switches to grid.



06 Auto restart after overload

Off (default) or on. In the manual figures: **ttd:** off, **LtE:** on.



07 Auto restart after overheating

ttd: off (default). **ttE:** on.

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Charge current and charge source



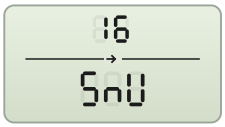
02 Maximum total charge current (sun + grid)

60 A by default. Range from 10 A to the maximum charge current (per the manual table 120 A), step 10 A.



11 Maximum grid charging current

30 A by default. 2 A, then from 10 A to the maximum grid charge current (per the table 100 A), step 10 A. If item 02 is less than item 11, the grid charges at the item 02 current.



16 Charging source priority

When the inverter is in grid, standby or fault mode:

- **CSO:** sun first; the grid charges only without sun.
- **SnU:** sun and grid charge together (default).
- **OSO:** sun only, even with grid present.
- **Sot:** solar surplus: solar feeds the load first, surplus charges the battery.

In battery mode only solar can charge, if there is enough.



46 Grid charging start time

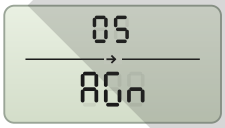
00:00 by default. From 00:00 to 23:00, step 1 hour.



47 Grid charging end time

00:00 by default. From 00:00 to 23:00, step 1 hour.

Battery



05 Battery type

- **AGn:** AGM (default); **FLd:** flooded.
- **USE:** user: charge voltage, cut-off and double cut-off are set in items 24, 26, 27, 29 and 61.
- **LIA:** battery with the LIA protocol; **PYL:** Pylontech; **tqF:** Techfine; **GrO:** Growatt; **FEL:** Felicity: items 24, 26, 27, 29 are set automatically.
- **LIb:** lithium battery with the LIb protocol; **LIC:** lithium battery from another manufacturer: items 26, 27, 29 are set automatically. For LIC check the connection order with the maker of the battery.

Item 61 is mentioned in the USE description but is not in the manual's menu table.



12 Battery voltage to switch to grid (SbU mode)

23.0 V by default, range 22–25.5 V, step 0.5 V.



13 Battery voltage to return to battery (SbU mode)

27 V by default, range 24–29 V, step 0.5 V. **FUL:** return to battery only after full charge.



17 Restart voltage from battery

In SOC mode: after shutdown due to low battery charge, the inverter restarts when solar charging brings the battery to this value. The manual figure shows **53.5 V** (the manual gives no range; the value looks like a 48 V system: **check on the display).**



24 Warning: low battery voltage

When the load runs only from the battery, the inverter gives an alarm. Range for 24 V: **20.0–27.0 V.** The manual gives no factory value for 24 V (the figure shows 44.0 V for a 48 V system).

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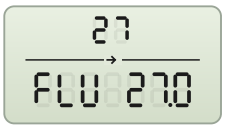
26 CV (bulk) charge voltage

28.2 V by default. Adjustable only with type USE (item 05): 24.0–30.0 V, step 0.1 V.



27 Float voltage

27.0 V by default.



29 Battery discharge cut-off (Low DC cut-off)

21.0 V by default. With battery only, the inverter shuts down; with solar and battery, it charges the battery without AC output. With type USE: 20.0–26.0 V, step 0.1 V; the threshold does not depend on load.



59 Maximum battery discharge current

200 by default, range 20–200. If discharge current is higher, the inverter gives a warning (code A27).

Equalising charge (FLd and USE only)



30 Equalization charge

EdS: off (default). **EEn:** on. Available if FLd or USE is selected in item 05.



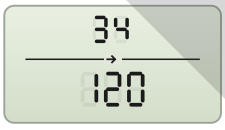
31 Equalising voltage

29.2 V default, 24.0–30.0 V, step 0.1 V.



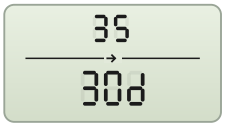
33 Equalising duration

60 min default, 5–900 min, step 5 min.



34 Equalising timeout

120 min default, 5–900 min, step 5 min.



35 Equalising interval

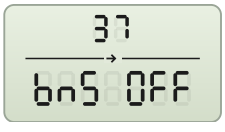
30 days default, 0–90 days, step 1 day.



36 Start equalising now

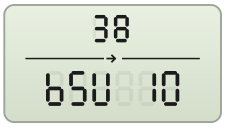
AdS: no (default). **AEn:** start immediately; **E9** appears on the main screen. Available if item 30 is on.

Lithium battery: BMS and state of charge (SOC)



37 BMS communication

OFF: disabled (default). **ON:** enable the BMS link.



38 Lock-out at low SOC

If SOC from the BMS is below the setting, the inverter shuts down to protect the battery. The manual figure shows **10 %.** Works with any lithium type in item 05.

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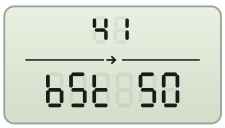
39 **SOC for switching to grid**

In battery-priority mode the inverter is forced to grid charging when SOC is below the setting. The figure shows **20 %.**



40 **SOC to return to battery**

In battery-priority mode the inverter returns to battery when SOC is above the setting. The figure shows **95 %.**



41 **SOC for restart**

After switching on, the inverter works normally only when SOC is above the setting. The figure shows **50 %.**

Grid: export, CT, schedule



50 **Grid code (country)**

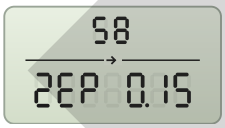
Grid voltage and frequency limits for export:

- **IND** (mode 1): 195.5–253 V, 49–51 Hz.
- **GEn** (mode 2): 184–264.5 V, 47.5–51.5 Hz.
- **SAd** (mode 3): 184–264.5 V, 57–62 Hz.
- **PAt** (mode 4): 170–264.5 V, 47.5–53.5 Hz.
- **U2b** (mode 5, default): 100–280 V, 47.5–53.5 Hz.



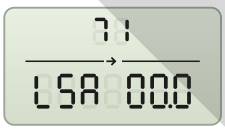
56 **Grid export power**

Step 200 W. The manual figure shows **6.2 kW,** more than this model's rated 3600 W: **check on the display.**



58 **Power drawn from the grid**

0.15 kW by default, 0.01–0.5 kW, step 0.01 kW.



71 **Peak shaving start**

00:00 by default, 00:00–23:00, step 1 hour. In PEC mode: the time from which the battery supplies energy.



72 **Peak shaving end**

00:00 by default, 00:00–23:00, step 1 hour.



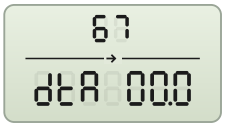
48 **Scheduled AC output on time**

00:00 by default, 00:00–23:00, step 1 hour.



49 **Scheduled AC output off time**

00:00 by default, 00:00–23:00, step 1 hour.



67 **Output open time**

Value 0–23 (hour).



68 **Output stop time**

Value 0–23 (hour).

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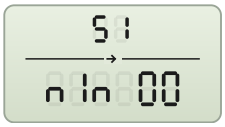
Clock



51 Minutes

00–59.



52 Hours

00–23.



53 Day

00–31.



54 Month

1–12.



55 Year

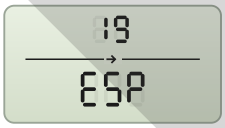
16–99.

Display, sound, service



18 Beeper

bON: on (default). **bOF:** off.



19 Return to main screen

ESP (default): after 1 min without key presses the display returns to the main screen (input / output voltage). **tEP:** the last selected screen stays.



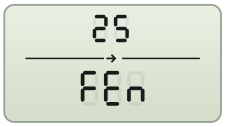
20 Backlight

LON: on (default). **LOF:** off.



22 Alarm when the main source is lost

AON: on (default). **AOF:** off.



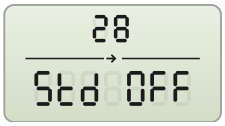
25 Fault code logging

FEn: record (default). Do not record: **FbS** in the manual figure.



45 PV energy counter reset

nrt: do not reset (default). **rSt:** reset.



28 Reset to factory settings

OFF by default. **ON:** restore factory settings.

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Lithium battery with BMS, CT current sensor

Only what the EASUN manual describes

Lithium battery with BMS

1. Connect the **BMS/RS485 port (No.** 2) to the battery's BMS port with an RJ45 cable: **pin 1: 485B, pin 2: 485A,** 3– 8 unused. The manual has no CAN port.
2. Item **05:** choose your battery protocol: **PYL** (Pylontech), **GrO** (Growatt), **FEL** (Felicity), **tqF** (Techfine), **LIA, LIb** or **LIC** (third-party lithium). The inverter sets voltages 24/26/27/29 (for LIb and LIC 26/27/29) itself.
3. Item **37: ON:** enable the BMS link.
4. Items **38–41:** state of charge (SOC) thresholds: 38 lock-out (figure 10 %), 39 switch to grid (20 %), 40 return to battery (95 %), 41 minimum SOC to start (50 %). Item **59:** max. discharge current (200).
5. Check the display: code **61** means there is no BMS link.

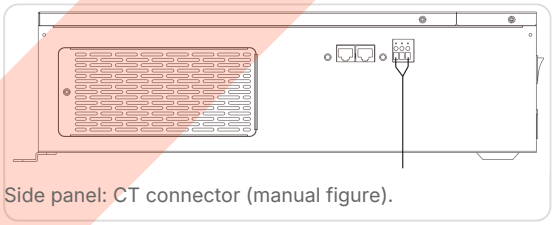
> Equalising charge (items 30–36) is available only for types **FLd** and **USE:** do not enable it for lithium types. If the battery supports none of the protocols, the manual provides type **USE:** set CV (26), float (27) and cut-off (29) voltages manually per the battery data sheet.

Lithium battery (BMS) link codes

Code	Meaning
60	BMS blocks both charge and discharge: the inverter stops battery charge and discharge.
61	BMS link lost: after connecting the battery no signal found within 1 min (buzzer sounds) or the link dropped after a successful connection (buzzer at once).
69	BMS blocks charging: the inverter stops charging.
70	BMS requests charging: the inverter charges the battery.
71	BMS blocks discharging: the inverter stops discharging.

CT current sensor (connector No. 3)

1. Switch off the inverter and connect the external CT to the spring terminal block with the supplied tool: **L+:** red wire, **L–:** black. The current direction arrow on the CT must point **to the inverter.**
2. Switch on the inverter.
3. In the menu choose item **01 = PEC.**



Side panel: CT connector (manual figure).

With a CT the inverter covers the house's own consumption and does not sell energy to the grid. The time when the battery supplies energy in PEC mode is set by items 71–72.

Equalising charge (lead-acid batteries)

Equalising reduces electrolyte stratification and plate sulphation. First enable item **30,** then either set the interval in item **35,** or start it at once with item **36.** If the equalising voltage is not reached within the item 33 time, charging is extended up to the item 34 timeout, then returns to float.

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WI-FI

Wi-Fi and the Solar of Things app

Per the Wi-Fi section of the manual (Wi-Fi data collector)

iPhone · App Store

Android · Google Play

1. Install the app

- Method 1: scan the QR on the left: the official page of the **Solar of Things** (developer Shanghai Siseli) app in the App Store or Google Play.
- Method 2: scan the QR code on the collector's film.
- Method 3: search the app store for **"Solar of Things".**

2. Register

On the app home screen tap **Sign Up,** fill in the details as prompted and complete registration.

3. Connect the collector to the router

1. Wait until the **PWR** indicator lights on the collector. Turn on Bluetooth on the phone, in the app tap **Wi-Fi Configuration:** a search page with nearby collectors opens.
2. Choose your collector, on the setup page tap the search icon and choose your Wi-Fi network name.

4. Add the device

- Method 1: on the home page tap "+" in the top right corner and hold the phone near the inverter: the app finds the device itself. Choose the ID matching the ID on the collector label and tap **Add.**
- Method 2: **Manually Add:** enter the collector ID, name and other details as prompted.
- Method 3: **Scan Add:** scan the ID QR code on the collector's film.

Before scanning check the collector ID: it is on the case and on the setup page. If setup fails, tap **Diagnose** in the top right corner.

Collector indicators

Collector indicator	State
PWR (power)	Lit: power supply normal; off: power supply problem.
COM (inverter link)	Off: no data exchange; off 0.3 s / on 0.9 s: sending; off 0.3 s / on 0.3 s: receiving; steady on: two-way exchange.
NET (Wi-Fi network)	Off 0.3 s / on 3 s: connected to the router; off 0.3 s / on 0.3 s: not connected to the router.
SRV (server)	On: server link present; off: no server link.

The manual does not say which inverter port the collector connects to (the specification table lists a "Wi-Fi card" among expansion interfaces).

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Faults and warnings

Faults: red LED lit

The inverter enters fault mode, the display shows a code marked ERROR.

Code	Meaning	What to do (per the manual table)
F01	Fan blocked while the inverter is off	Replace the fan (service).
F02	Overheating or poorly connected temperature sensor (NTC)	Internal temperature above 100 °C: check that the airflow is not blocked and the room is not too hot.
F03	Battery voltage too high	Battery overcharged: to service; or check that battery type and number meet the requirements.
F04	Battery voltage too low	Charge or replace the battery.
F05	Output short circuit or overheating of internal components	Short: check wiring, disconnect the faulty load. Overheating (above 120 °C): check airflow and temperature.
F06	Output voltage too high	Output out of range (below 190 or above 260 V): reduce the load; if that fails, to service.
F07	Overload (time-out)	Overload 105 %: switch some appliances off. If PV voltage is above the limit, output is derated: use fewer panels in series or reduce the load.
F08	Bus voltage too high	Internal fault: to service.
F09	Bus soft-start failure	Internal fault: to service.
F51	Overcurrent or surge	Restart the inverter; if it recurs, to service.
F52	Bus voltage too low	Restart the inverter; if it recurs, to service.
F53	Inverter soft-start failure	Internal fault: to service.
F55	DC component in AC output voltage	Restart the inverter; if it recurs, to service.
F57	Current sensor faulty	Internal fault: to service.
F58	Output voltage too low	Reduce the load; if that fails, to service.
F59	PV voltage exceeds the limit	Use fewer panels in series.

Warnings (Alarm): the red indicator flashes

The inverter keeps working, the display flashes a code with the ⚠ sign.

Code	Meaning	Beeper
A01	Fan blocked while the inverter is on	3 beeps every second
A02	Overheating	none
A03	Battery overcharged	1 beep every second
A04	Low battery voltage	1 beep every second
A07	Overload	1 beep every 0.5 s
A10	Output power derating	2 beeps every 3 s
A15	Low solar energy	2 beeps every 3 s
A16	High grid voltage (above 280 V) during bus start	none
A27	Maximum discharge current exceeded (item 59)	none
E9	Equalising charge in progress	none
bP	Battery not connected	none

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Screens, modes, problems and sources

Problem	What you see	Cause	What to do
The inverter switches itself off during start	Display, indicators and buzzer work for 3 s and go off	Battery voltage too low (< 1.91 V per cell)	Charge or replace the battery
Nothing happens after switching on	No indication at all	Battery voltage very low (< 1.4 V per cell) or internal fuse blown	Charge or replace the battery; the fuse at a service centre
Grid is on, but the inverter runs on battery	Input voltage on display 0, green flashes	Input protection tripped	Check the AC input breaker and AC wiring
	Green flashes	Poor grid or generator quality	Check that AC cables are not thin or too long, the generator is sound and item 03 is correct (UPS → APL)
	Green flashes	“Solar first” priority	Change the priority in item 01
Relay keeps clicking	Display and indicators flash	Battery disconnected	Check the battery cable connections

Display screens (UP / DOWN)

Screen	What the display zones show (1 input, 2 output, 3 load, 4 PV1 / PV2, 5 battery, 6 code)
Voltage	Input and output voltage, load in %, PV voltage, battery voltage: main screen.
Frequency / current	Input and output frequency, load in VA, PV current, battery current.
Power	Input, load and PV power in W, battery power. With a CT sensor: power through the CT (“–” sign if the CT is fitted the wrong way).
Temperature	Inverter, PV and battery temperature.
Energy	PV yield per day, month, year and total; battery charge level in %.
Version and date	Firmware version (CPU), then clock and date.

Operating modes

Mode	What happens
Standby	The inverter is not yet switched on by the switch: no output, but the battery can charge from grid or solar.
Grid	Loads run from the grid, charging available. In PEC solar and battery help the grid; in SUF solar surplus goes to the grid.
Battery	Loads run from battery and / or solar; solar surplus charges the battery.
PV only	Loads run from solar, the display shows **bP** (battery not connected).

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