CONNECTING THE BATTERY TO THE INVERTER

# EASUN SMT-6.2KW 48V + 51.2V 100Ah 5.12kWh rack with display




Connecting the 51.2V 100Ah 5.12kWh rack battery with display to the EASUN SMT-6.2KW 48V inverter

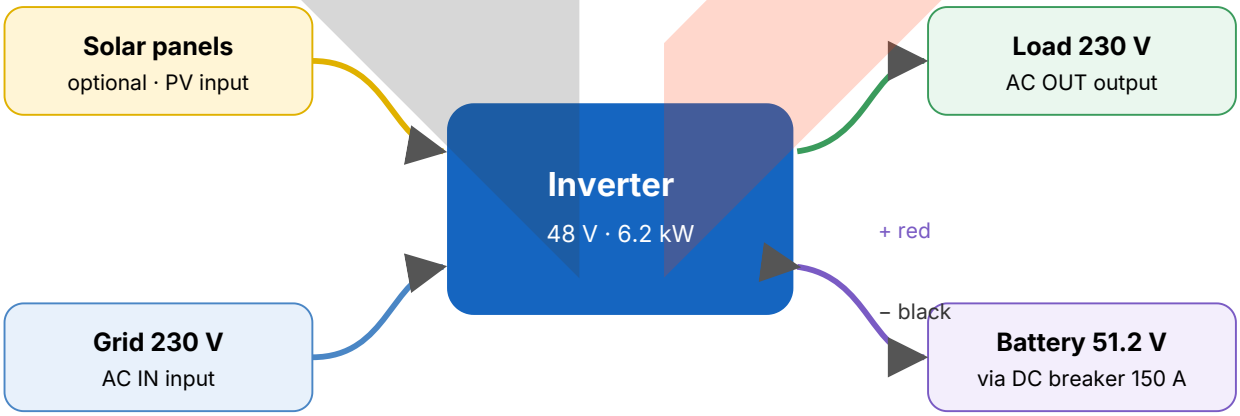
## What is included in the system

- **Inverter EASUN SMT-6.2KW 48V**
- **Battery 51.2V 100Ah 5.12kWh rack with display**

## What else you will need

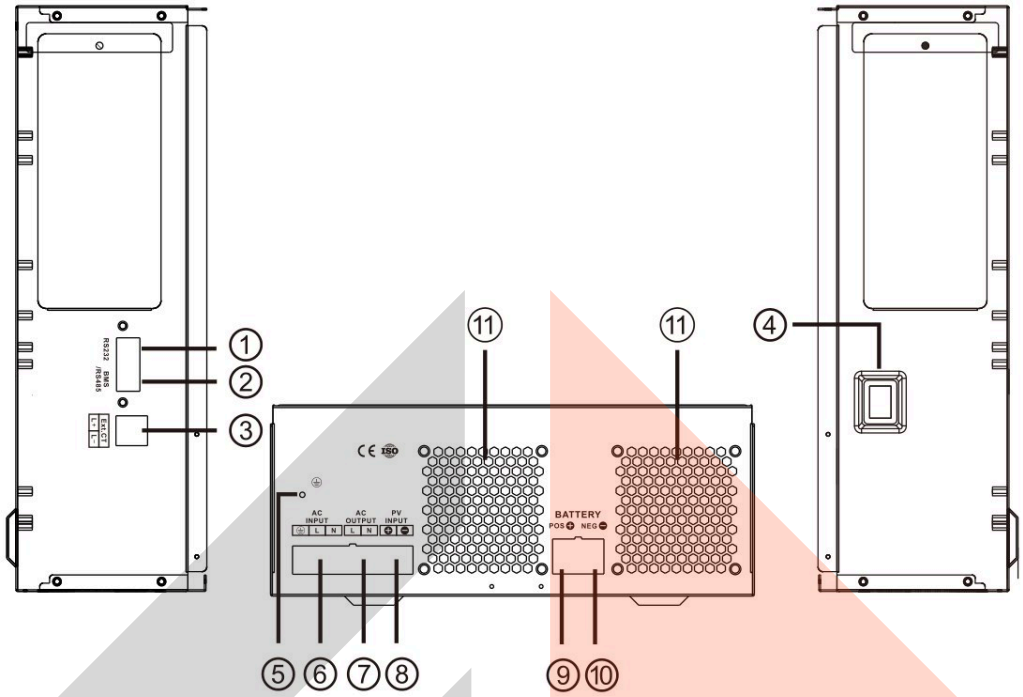
- Battery–inverter power cables 38 mm² (or 2×25 mm²), M8 lugs
- RS485 communication cable (RJ45), e.g. “Communication cable 1.3 m”
- DC breaker / fuse 150 A
- 63 A breaker, 6 mm² cable to the grid input
- Screwdriver, 13 mm wrench, multimeter

## Wiring diagram




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## Inverter connectors: bottom and side panels




| № | Connector | What it is | What connects where |
|---|---|---|---|
| 1 | **RS232** | RS232 communication port (side panel) | For service; not connected in normal operation |
| 2 | **BMS / RS485** | RJ45 port for communication with the lithium battery BMS | Battery communication cable; pinout: 1 — RS485- B, 2 — RS485-A, 3–8 not connected. Then program 05 = battery protocol, 37 = ON |
| 3 | **Ext. CT (L+ · L–)** | Current sensor (current transformer) input | Only for limiting export to the grid: red wire — L+, black wire — L– |
| 4 | **ON / OFF** | Power switch (side panel) | Switch on after the battery is connected and the polarity checked |
| 5 | **Grounding** | Case earthing screw | Protective PE wire (yellow-green) |
| 6 | **AC INPUT (⏚ · L · N)** | Grid or generator input | Via a 63 A breaker, 6 mm² cable, torque 1.4–1.6 N·m. PE first, then L and N |
| 7 | **AC OUTPUT (L · N)** | Output to loads (load panel) | Same cable as on the input. Do not confuse with AC INPUT |
| 8 | **PV INPUT (+ · –)** | Solar panel input | Via a separate DC breaker, 4 mm² cable. String Voc up to 500 V, operating 360–430 V |
| 9 | **BATTERY POS (+)** | Battery positive terminal | 38 mm² or 2×25 mm² cable , 8.4 mm ring lug, torque 5 N·m; a fuse or DC breaker in the “+” |
| 10 | **BATTERY NEG (–)** | Battery negative terminal | Same cable; check the polarity before connecting |

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| № | Connector | What it is | What connects where |
|---|---|---|---|
| 11 | **Fans** | Cooling vents | Do not cover; 20 cm of free space at the sides, 50 cm above and below |

Figure and numbers from the manufacturer's manual (section "Connector panels").

## Key values for this pair

| | | |
|---|---|---|
| **56.8 V**<br>charge voltage (26) | **54.4 V**<br>float voltage (27) | **48.0 V**<br>cut-off (29) |
| **PYL**<br>BMS protocol (05) | **50 A**<br>max. charge current (02) | **30 A**<br>grid charging (11) |

## Connection procedure

1. Mount the inverter vertically on a non-combustible wall in a dry place. Leave at least 20 cm of free space above and below for cooling.
2. Make sure everything is switched off: inverter button OFF, battery switch/button OFF, DC breaker off, 230 V grid not connected.
3. Install a **150 A** DC breaker or fuse between the battery and the inverter in the positive (red) wire.
4. Connect the power cables (cross-section at least **38 mm² (or 2×25 mm²),** M8 lugs): **red** from the battery "+" to the inverter "+ BAT", **black** from the battery "−" to "− BAT". Check the polarity twice: swapped "+" and "−" will damage the inverter.
5. Tighten the terminal bolts firmly (without stripping the thread) and fit the protective caps. A loose contact heats up and melts the terminals.
6. Connect the battery and the inverter with the **communication cable** (RJ45): **RS485** port on the battery → **BMS / RS485** port on the inverter. Do not plug the cable into the CAN or WiFi port. For protocol settings, see "Battery communication".
7. Switch on the battery (button or switch on the case, if any), then the DC breaker.
8. Switch on the inverter with the ON button. The battery voltage should appear on the display. Enter the settings from the table below.
9. Switch off the inverter and connect the 230 V grid to the **AC IN** terminals (L, N, PE) through a separate 63 A breaker.
10. Connect the load (your socket/distribution board) to the **AC OUT** terminals (L, N, PE). Never mix up AC IN and AC OUT: feeding grid power into the output damages the inverter.
11. If you have solar panels, connect them to the **PV** input last, observing polarity. The open-circuit voltage of the panels (Voc) rises in frosty weather: do not exceed the PV maximum on the inverter label.
12. Switch on the inverter and check: 230 V at the output, the battery charges from the grid (charging icon on the display), the lights stay on when the grid is off.

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## Battery communication: Pylontech protocol (RS485)

This battery has an RS485 port and “talks” to the inverter: the inverter sees the state of charge in percent (SOC) and takes the correct charge voltages and currents from the BMS by itself.

**On the battery:**

1. On this battery the protocol is selected on its touchscreen: open the protocol settings in the screen menu ( **PROTOCOL)** and check that **PYLON (** Pylontech) is selected for communication with the inverter. If a different protocol is set, select PYLON and confirm.
2. Plug the communication cable to the inverter into the battery’s **RS485 CAN** port. The pair of **RS485** ports on the right is only for linking batteries together.
3. For a single battery, do not change the address or the other BMS settings.

**On the inverter:**

1. Program **05** (battery type) = **PYL,** program **37 (**BMS communication) = **ON.**
2. Cable from the inverter **BMS / RS485** port to the battery **RS485** port.
3. Switch the inverter off and on. After 10–30 seconds the battery charge should appear on the display in **%.** If only the voltage or a communication error (warning 61 (BMS communication)) appears instead of percent, check the cable, port and protocol.
4. Once communication is established, the inverter takes the charge (26, 27) and cut-off (29) voltages from the battery. The values in the table below are a fallback if communication is lost.
5. The thresholds for switching to the grid and back (12, 13) are set in percent with BMS communication: recommended **20%** switch to grid, **80%** return to battery.

**Important: power from the battery.** The battery BMS is usually rated for 100 A continuous current (the exact value is on the battery label). That is ≈ **4.6 kW** of continuous load from the battery. The inverter delivers its full 6.2 kW when grid or solar power is available. If the battery “trips” during a power cut, reduce the number of powerful appliances switched on at the same time.

## Inverter settings

Entering the menu: hold the **ENTER** (or **SET**) button for 3 seconds. Use ▲/▼ to select the program number, press ENTER, change the value, press ENTER to save. Exit: **ESC**.

| № | Parameter | Value | Why |
|---|---|---|---|
| 01 | Output source priority | **SUb** (no panels) or **SBU** (with panels) | SUb: solar, with the grid making up any shortfall; the battery is kept full in case of a power cut. SBU: solar first, then battery, then grid. |
| 02 | Maximum charging current (total) | **50 A** | Safe for LiFePO4 100Ah (≈0.5C). Do not set higher: it shortens the battery’s life. |
| 03 | AC input voltage range | **UPS** (from the grid) / **APL** (from a generator) | UPS: fast switchover, computers do not restart. APL: if you run on a generator. |
| 05 | Battery type / BMS protocol | **PYL** | PYL = Pylontech protocol. |

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| | | | |
|---|---|---|---|
| **37** | BMS communication | **ON** | Without this the inverter does not read the BMS data even with the correct type in item 05. |
| **06** | Auto restart after overload | **LTE** (enabled) | The inverter resumes operation by itself. |
| **07** | Auto restart after overheating | **TTE** (enabled) | The inverter resumes operation by itself. |
| **09** | Output frequency | **50 Hz** | Standard for Ukraine and Europe. |
| **11** | Maximum grid charging current | **30 A** | Moderate grid charging so as not to overload the wiring and the battery. |
| **12** | Back-to-grid voltage (SBU mode) | **50.0 V** | When the battery discharges to this voltage, the load switches to the grid (if available). |
| **13** | Back-to-battery voltage (SBU mode) | **54.0 V** | After recharging to this voltage, the inverter runs from the battery again. |
| **16** | Charging source priority | **SNU** (solar + grid) | The battery charges from both solar and grid. Without panels, it charges from the grid. |
| **26** | Charge voltage (Bulk / CV) | **56.8 V** | Standard for LiFePO4 16S (51.2 V). |
| **27** | Float voltage | **54.4 V** | The battery is not overcharged when it stays on the grid for a long time. |
| **29** | Cut-off voltage (Low DC cut-off) | **48.0 V** | The inverter switches off its output so as not to drain the battery to zero and trip the BMS. |

Program numbers follow this inverter manufacturer's manual. After entering the settings, switch the inverter off and on again.

## Which mode to choose

- **Backup during power cuts only (no panels):** 01 = SUb, 16 = SNU. The inverter runs from the grid and the battery is always full; when the power goes out it switches to the battery automatically.
- **You have solar panels and want to save:** 01 = SBU, 16 = SNU (or CSO). Solar power by day, battery at night, the grid only when the battery has dropped to 50.0 V.
- **Running on a generator:** 03 = APL, 11 = 30 A or less, so as not to overload the generator.

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## How long it runs on battery

| Load | Example | Runtime |
|---|---|---|
| 100 W | router, lights, chargers | **≈ 41.5 h** |
| 200 W | fridge + lights | **≈ 20.7 h** |
| 300 W | fridge + lights + TV | **≈ 13.8 h** |
| 500 W | fridge, laptop, pump | **≈ 8.3 h** |
| 1000 W | boiler, kettle briefly, several appliances | **≈ 4.1 h** |
| 2000 W | air conditioner, water heater, electric stove | **≈ 2.1 h** |
| 4000 W | whole house, pump, power tools | **≈ 1.0 h** |

Approximate: 90% of battery capacity and inverter efficiency ≈90%. A fridge runs in cycles, so the real runtime is longer.

## Check after start-up

- Battery voltage on the display: ≈ 54.4–56.8 V when full, ≈ 50.0 V when discharged.
- Switch off the grid breaker: the load must keep running without interruption.
- After 10–15 min of operation, touch the terminals and cables: they must not be hot. If they heat up, a connection is loose or the cable is too thin.
- A battery below 46.4 V may have gone into BMS protection: charge it from the grid through the inverter.

**Safety.** Make all connections only with the battery, inverter and grid switched off. Do not short-circuit the battery terminals: the short-circuit current of LiFePO4 is very high. Do not install the inverter in a bathroom, outdoors in the rain or near flammable materials. If in doubt, contact an electrician.

## Shutdown and maintenance

- Switch off in reverse order: load → grid → panels → inverter → DC breaker → battery.

- Every 3 months, check that the terminals are tight and the ventilation openings are clean.
- If you do not use the kit for a long time, charge the battery to 50–70% and switch it off.

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