e-Power & e-Inverter

Owner’s manual

Revision: 1.1.2
Date: 2025-05-28

For safe and optimum performance, the **e-Power system** must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the **CAUTION** and **WARNING** statements.

PLEASE KEEP THIS MANUAL FOR FUTURE REFERENCE

Disclaimer While every precaution has been taken to ensure the accuracy of the contents of this guide, Modul-System assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice. Important Please be sure to read and save the entire manual before using your e-Power Misuse may result in damage to the box or switch panels and/or cause harm or serious injury.

e-Power version:

28220-03	e-Power 2000
28220-031	e-Power 2000 with Remote Display
28221-03	e-Power 2000 X-treme
28221-031	e-Power 2000 X-treme with Remote Display

Inverters:

28320-03	e-Inverter 2000 with EU plug
28321-03	e-Inverter 2000 with UK plug
28330-03	e-Inverter 3000 with EU plug
28331-03	e-Inverter 3000 with UK plug

Charging:

28500-03	Solar Panel flexible 210W
28501-03	Cables 7m for Solar Panel 210W
28225-03	IEC Power Cable EU 3m Orange cable
28226-03	IEC Power Cable UK 3m Orange cable
28222-03	Inlet Cable to IEC 3m
28223-03	Inlet Cable to IEC 7m
28224-03	Connection Cable EU plug 3m

Accessories:

28202-03	Handle for e-Power
28203-03	Stacking brackets for e-Power 4 pcs
28227-03	Internal Stacking brackets
28228-03	Busbars for stacking e-Power and e-Inverter 3kW

Communication cables:

28201-03	RJ45 Modul-Connect connection cable (2 meters)
28207-03	RJ45 Splitter
28204-03	RJ45 CAN Cable e-Power 0.5m
28205-03	RJ45 CAN Cable e-Power 3m

Service Contact Information

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Phone: +46 31 746 87 00
Web: www.modul-system.com

Contents

1. Introduction

Thank you for purchasing the e-Power and e-inverter system. With our state of the art, easy-to-use design, this product will offer you efficient and reliable battery power.

This manual provides step-by-step instructions for installing the e-Power battery system and e-Inverter in a light commercial vehicle (LCV). It includes guidelines on mounting, wiring, and integrating the system with the vehicle's electrical setup to ensure optimal performance and safety. Detailed diagrams, safety precautions, and troubleshooting tips are included to support a smooth and efficient installation process. Whether you're a professional installer or a fleet technician, this guide will help you set up E-Power correctly and securely.

IMPORTANT SAFETY INFORMATION

This section contains important safety information for the e-Power and e-Inverter system. Before using or installing the system, **READ ALL** instructions and cautionary markings found on the unit, the packaging, and within this manual.

Even though the e-Power system operates at low voltage, it still includes powerful lithium-ion batteries and electrical components that must be handled with care. Failure to follow proper safety practices could result in equipment damage, personal injury, or voiding of the warranty.

Please observe the following:

- Installation must be carried out by trained personnel familiar with low-voltage DC systems and battery safety.
- Do not disassemble or modify any part of the e-Power system. There are no user-serviceable components inside.
- Keep the system dry and well-ventilated. Avoid exposure to water, excessive heat, or confined spaces without airflow.
- Only use manufacturer-approved accessories. Using incompatible equipment may cause malfunction or reduce battery life.
- The lithium-ion battery pack is classified under UN3480 and must be handled and transported in accordance with applicable regulations.
- Avoid short circuits: Do not connect terminals directly or allow metal objects to contact them.
- Inspect regularly for signs of damage, wear, or unusual performance (e.g., swelling, unusual heat, or odor). If any issues are found, stop using the system and consult a qualified technician.
- If the battery is involved in an accident, exposed to water, or dropped from a height, do not use it—have it professionally inspected or replaced.

By following these precautions, you help ensure safe operation and extend the life of your e-Power system.

Installation checklist

After installation, use this checklist to ensure the e-Power system is set up correctly.

Is Modul-Connect powered from the e-Power?

Yes -> Is 12V always ON selected? (Section 6.6 Advanced Settings)

No -> Is 12V in AUTO mode? (Section 6.6 Advanced Settings)

Should both Modul-Connect and e-Power be able to control the e-Heater?

Yes -> Check that the e-Heater is connected with a CAN cable to Modul-Connect and that e-Power is connected to Modul-Connect via Bluetooth (Section 4.2.2)

No -> No actions

Is the e-Power installed in an EV?

Yes -> Is EV Mode turned ON (Section 6.5 Settings) and Ignition +12v input detection wired (Section 3.3.1 DC Charging of e-Power) ?

No -> Is EV Mode turned OFF (Section 6.5 Settings)

Is the termination placed furthest way from the e-Power in the CAN chain?

Yes -> No action

No -> Adjust according to the guidelines (Section 4)

Some vehicles do not support drawing 40A from the chassis battery, such as the Volkswagen ID. Buzz. Is the e-Power installed in a vehicle that supports 40A charging?

Yes -> No action

No -> Adjust charging limit in (Section 6.5 Settings)

2. Product description

2.1 e-Power

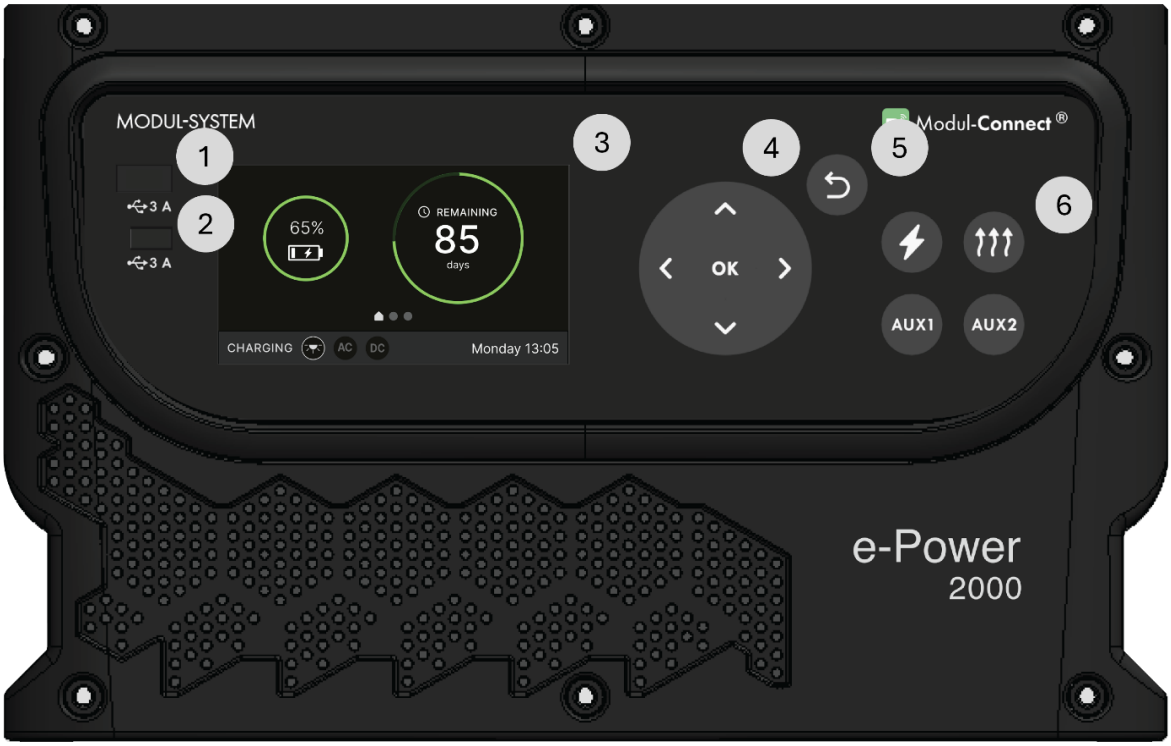
e-Power is a high-performance battery system designed for light commercial vehicles, delivering sustainable and long-lasting power for tools and onboard electronics. Developed by Modul-System, it enhances operational efficiency and integrates seamlessly with your vehicle's electrical system.

Package Contents:

- RJ45 Terminator
- 5 × M8 Terminal Bolts
- Terminal Protection Caps

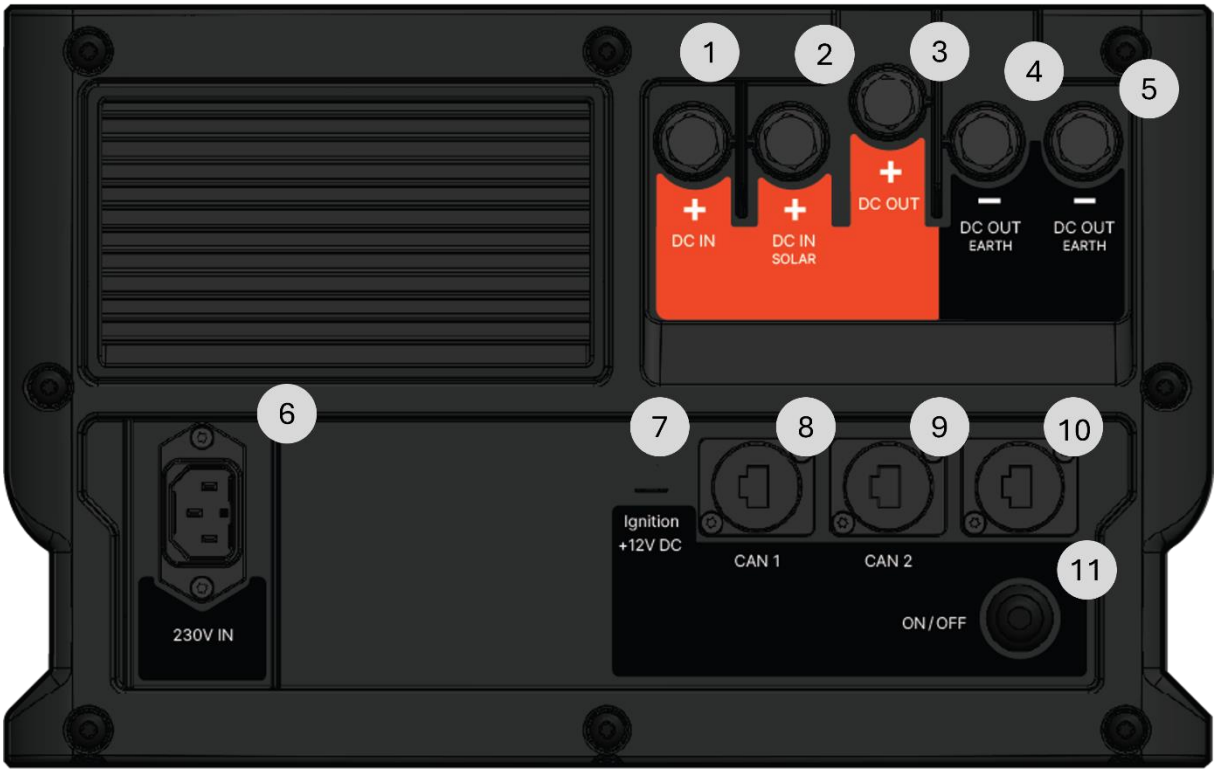
2.1.1 Front of the e-Power

1. USB-A charging port (3A)
2. USB-C charging port (3A)
3. LCD Display
4. Navigation wheel
5. Return button
6. Function buttons
    a. e-Inverter button
    b. e-Heater button
    c. Aux1, configurable button via Modul-Connect
    d. Aux2, configurable button via Modul-Connect



2.1.2 Rear of the e-Power

1. DC IN – M8 terminal
2. DC in Solar – M8 Terminal
3. DC OUT – M8 Terminal
4. DC IN/OUT Earth – M8 Terminal
5. DC IN/OUT Earth – M8 Terminal
6. AC IN – IEC C13 connector
7. Ignition + 12V DC
8. CAN1
9. CAN2
10. Service
11. Main power switch



2.2 e-Inverter

NOTE! The e-inverter cannot be used without e-Power.

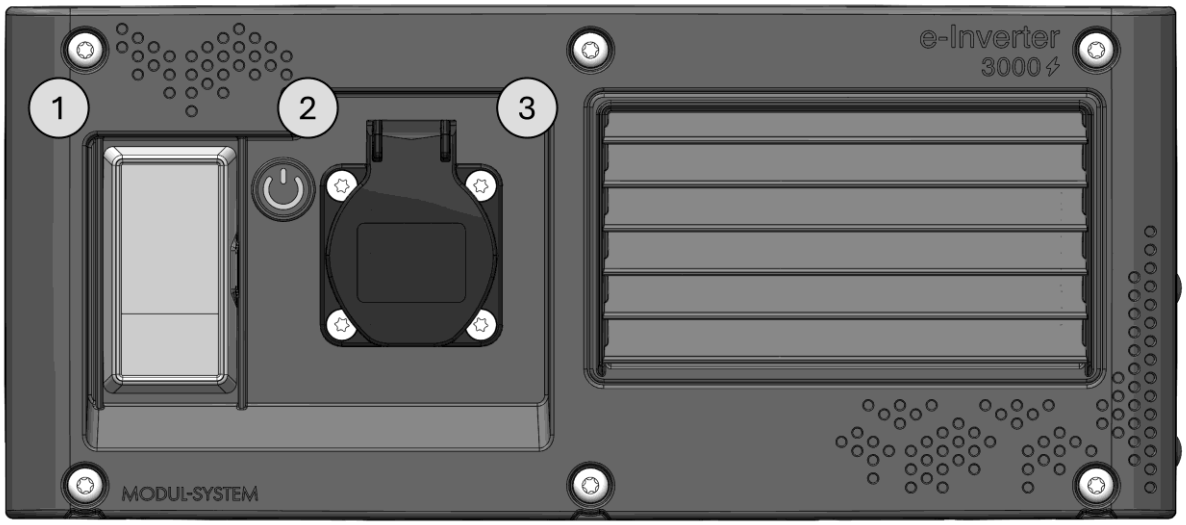
The e-Inverter is a pure sine wave inverter that converts direct current (DC) into alternating current (AC), ensuring stable and reliable power for sensitive electronics and appliances.

Operating within a voltage range of 10.5–15.5 V DC, the e-Inverter provides built-in protection features including a low voltage warning and automatic shutdown to prevent deep battery discharge. It also shuts down automatically in the event of overload or overheating, safeguarding both the inverter and connected equipment. Ideal for automotive, marine, and off-grid applications where reliable AC power is needed from a DC source.

The e-Inverter includes an integrated RCBO, providing protection against both earth leakage and overcurrent. This ensures user safety and safeguards connected devices by automatically disconnecting power in the event of a fault. Read section 4.3 on the requirement for the RCBO to function properly.

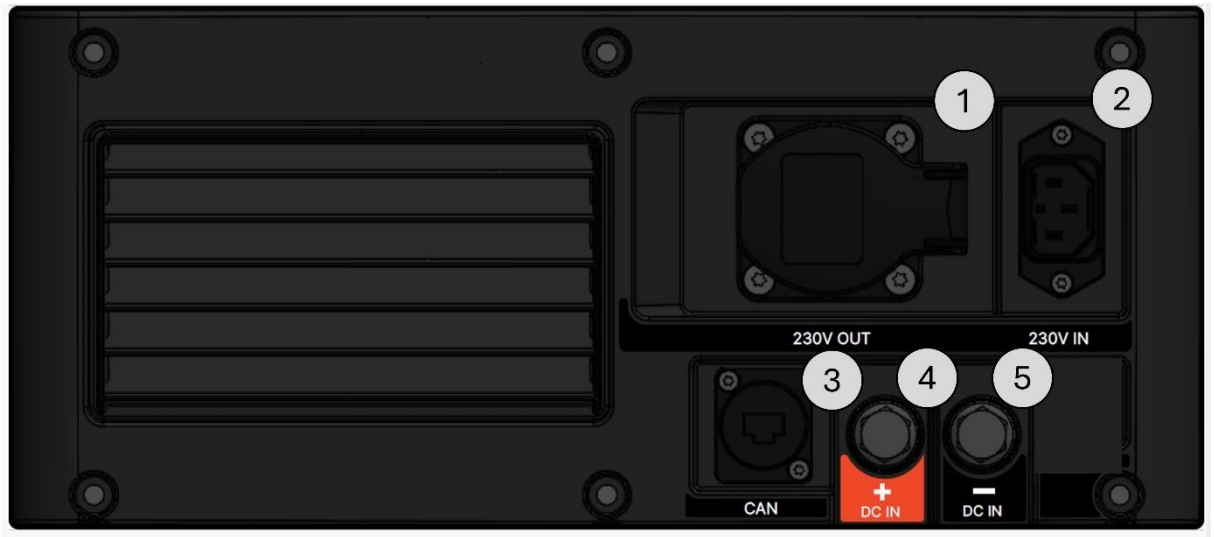
2.2.1 Front of the e-inverter

1. RCBO
2. ON/OFF switch
3. 230V OUT EU/UK plug



2.2.2 Rear of the e-inverter

1. 230V OUT – EU/UK plug
2. 230V IN – IEC plug
3. CAN port – RJ45
3. DC IN - M8 terminal
4. DC IN Earth – M8 terminal



3. Installing e-Power

This section explains how to properly and securely install the e-Power in a vehicle.

3.1 Choose the Mounting Location

- Select a secure, ventilated area inside the van, such as under the seat, in the load area, or near the bulkhead.
- Ensure the surface is flat and can support the weight of the battery system.
- Keep it away from heat sources, sharp objects, and moving parts.
- The mounting orientation of the e-Power will not significantly affect its performance, but for optimal performance of the LiFePo4 batteries the e-Power must be mounted horizontally as shown in the diagrams. Never mount up-side down.

3.2 Secure the e-Power Unit

- Position the unit in the chosen location.
- Use the T-tracks on the unit to secure it in the vehicle.
- Fasten the unit using bolts, ensuring it is firmly in place and does not shift while driving.

3.3 Connect the Wiring

- Route the cables safely along the van's existing wiring channels to prevent damage.
- Connect the fused main power cables to the vehicle's electrical system according to the wiring diagram in later section.
- Ensure all connections are tightened with 8Nm torque and insulated to avoid short circuits.
- If not used in conjunction with the e-Power, e-Heater or Modul-Connect, the terminator needs to be placed in the CAN1 or CAN2 port in the rear of the e-Power.

3.3.1 DC Charging of the e-Power

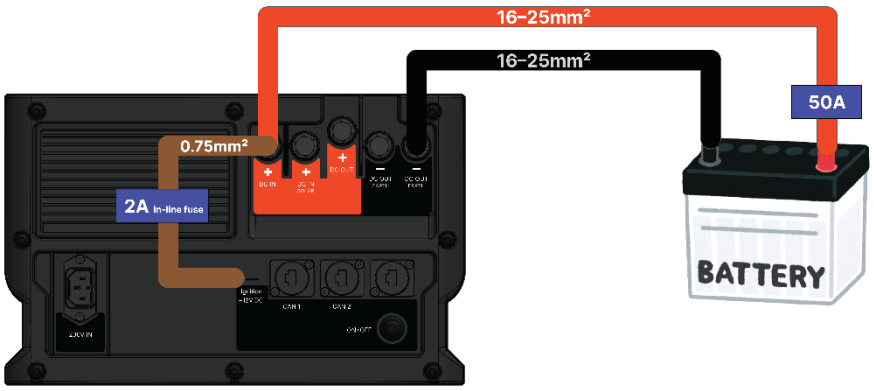


Figure 1 DC Charging for electrical vehicles

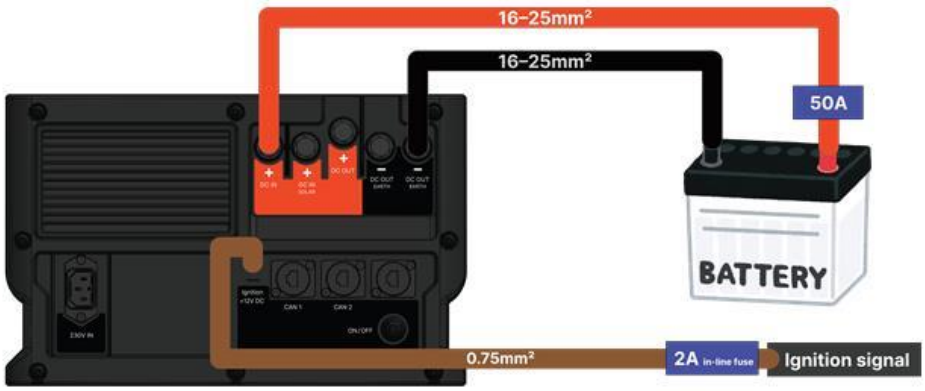


Figure 2 DC Charging for non-electrical vehicles

Required Components

- 12V Battery
- Appropriate cables (16–25mm^2 gauge depending on cable length)
- 50A fuse
- M8 Ring terminals
- Brown 0.75 mm^2 cable with a 2A fuse

Wiring Procedure

Step 1: Prepare the Battery and System

1. Ensure the e-Power is powered off in the rear before making any connections.
2. Confirm the battery voltage and polarity to prevent incorrect wiring.
3. Use appropriately rated cables (16–25mm^2) for both positive and negative connections.

Step 2: Connect the Positive Cable

1. Attach one end of the positive (red) cable to the DC-IN+ terminal of the e-Powe with an 8Nm torque.
2. Route the cable securely to the battery's positive terminal.
3. Install a 50A fuse in-line with the positive cable near the supplying battery terminal for protection.
4. Connect the other end of the positive cable to the battery's positive terminal with an 8Nm torque.

Step 3: Connect the Negative Cable

1. Attach one end of the negative (black) cable to the DC-IN- terminal of the e-Power with an 8Nm torque.
2. Route the cable securely to the battery's negative terminal.
3. Firmly connect the other end of the negative cable to the battery's negative terminal with an 8Nm torque.

Step 4: Connect the ignition cable

For electric vehicle

1. Attach one end of the brown 0.75 mm^2 cable with a 2A fuse to the Ignition + 12V DC pin in the rear.
2. Attach the other end to the DC-IN+ terminal with an 8Nm torque.

For non-electric vehicles

1. Attach one end of the brown 0.75 mm^2 cable with a 2A fuse to the Ignition + 12V DC pin in the rear.
   Attach the other end to a +12v ignition supply from the vehicle's fuse box.

Step 5: Verify Connections

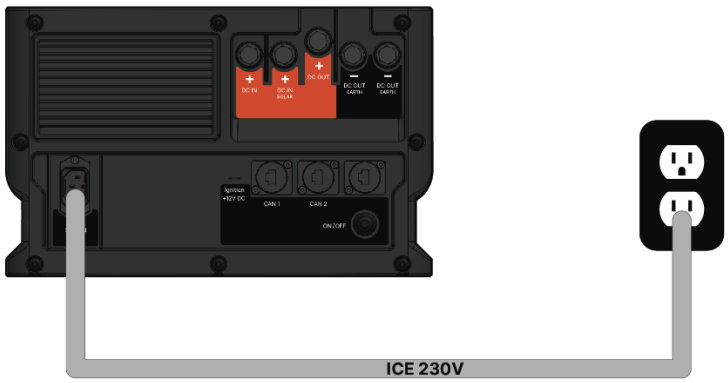
1. Double-check all connections to ensure proper polarity.
2. Make sure all terminal connections are tight and secure to avoid resistance or sparking.
3. Inspect the wiring for any damage or potential short circuits.

Step 6: Power On and Test

1. Turn on the system, turn on the vehicle ignition and check for proper operation.

2. Ensure that the battery is charging and supplying power correctly when +12V ignition is active.
3. Monitor the system for any irregularities such as excessive heat or voltage drops.

3.3.2 AC Charging



Required Components

- 28225-03 IEC Power Cable EU 3m Orange cable

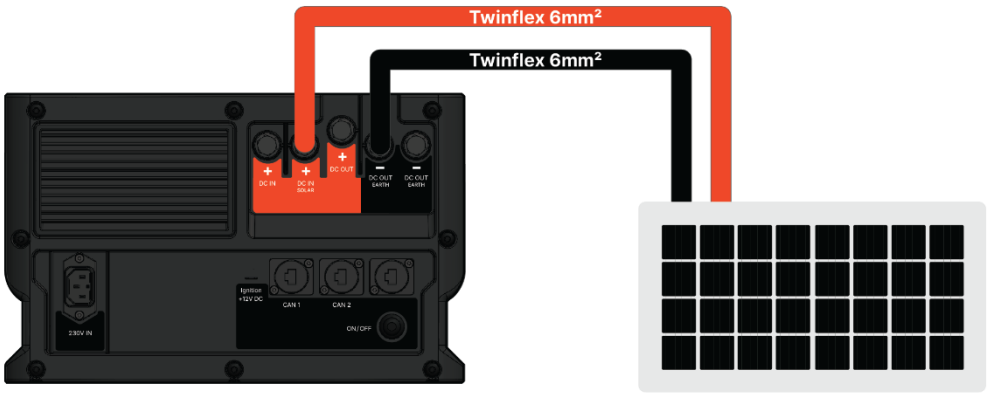
Or

- 28226-03 IEC Power Cable UK 3m Orange cable

Wiring Steps

1. Ensure AC power is off.
2. Plug AC cable into the 230V input socket on the power unit.
3. Connect the other end to the AC wall outlet.
4. Verify secure connections.
5. Power on and check system operation in the menu.

3.3.3 Solar Charging



Required Components

- 28500-03 Solar Panel flexible 210W
- 28501-03 Cables 7m for Solar Panel 210W

Wiring Steps

1. Ensure the e-Power is tuned off.
2. Connect the positive red cable on the DC IN SOLAR terminal.
3. Connect the negative black cable to one of the DC OUT/IN terminals.
4. Plug the other end of the red cable to the cable on the panel marked with “+”.
5. Plug the other end of the black cable to the cable on the panel marked with “-”.
6. Verify secure connections.
7. Power on and check system operation in the menu.

3.4 Test the System

- Turn on the system and check that the power output is functioning correctly.
- Verify all connections and ensure there are no loose cables.

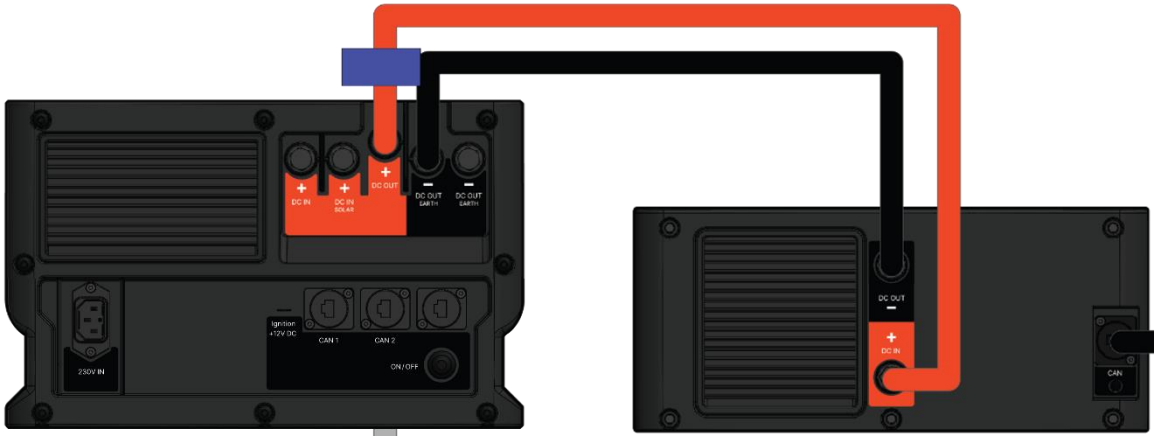
3.5 Final Checks & Safety Measures

- Secure and tidy up all cables using cable ties and conduit.
- Ensure that all safety features, such as fuses and circuit breakers, are correctly installed.
- Perform a final inspection to confirm everything is securely mounted and operating as expected

4. Installing and connecting e-Inverter and e-Heater

This chapter explains how to supply power to the e-Inverter and e-Heater from the e-Power unit, how to connect the communication cables and instructions regarding the RCBO of the e-Inverter.

4.1 Powering the e-Inverter and e-Heater



The e-Inverter and e-Heater should be wired to the positive and negative DC IN on the rear of the e-Power.

4.1.1 e-Heater power cables

Fuse Requirements for e-Heater

e-Heater 1000

- Must be fitted with one in-line 100 A DC-rated fuse on the positive +12 V supply at the main battery connection.

e-Heater 2000

- Must be fitted with one in-line 200 A DC-rated fuse on the positive +12 V supply at the main battery connection.

Note:
The 100 A / 200 A DC-rated fuse and holder must be installed at the DC positive source to protect the cable run.

Cable Requirements for e-Heater

e-Heater 1000

- Cable length up to 1 meter: **16 mm²**
- Cable length up to 3 meters: **25 mm²**

e-Heater 2000

- Cable length up to 2 meters: **35 mm²**
- Cable length up to 3 meters: **50 mm²**

Cables are available at below part numbers:

28415-03 Battery cables 0.8m for e-Heater 1000
28416-03 Battery cables 2m for e-Heater 1000
28422-03 Battery cables 0.8m for e-Heater 2000
28423-03 Battery cables 2m for e-Heater 2000

4.1.2 e-Inverter power cables

Fuse Requirements for e-Inverter

e-Inverter 2000

- Must be fitted with one **in-line 200 A DC-rated fuse** on the positive +12 V supply at the main battery connection.

e-Inverter 3000

- When connected to e-Power, it does not require a fuse due to the internal 300A fuse of the e-Power.

Cable Requirements for e-Inverter

e-Inverter 2000

- Cable length up to 2 meter: **35 mm²**
- Cable length up to 3 meters: **50 mm²**

e-Inverter 3000

- Cable length up to 1 meter: **35 mm²**
- Cable length up to 2 meter: **70 mm²**
- Cable length up to 3 meters: **95 mm²**

Cables are available at below part numbers:

28423-03 Battery cables 2m for e-Heater 2000
28324-03 Angled Battery Cables 2m for e-Inverter 2000

4.2 Communication cables and Bluetooth

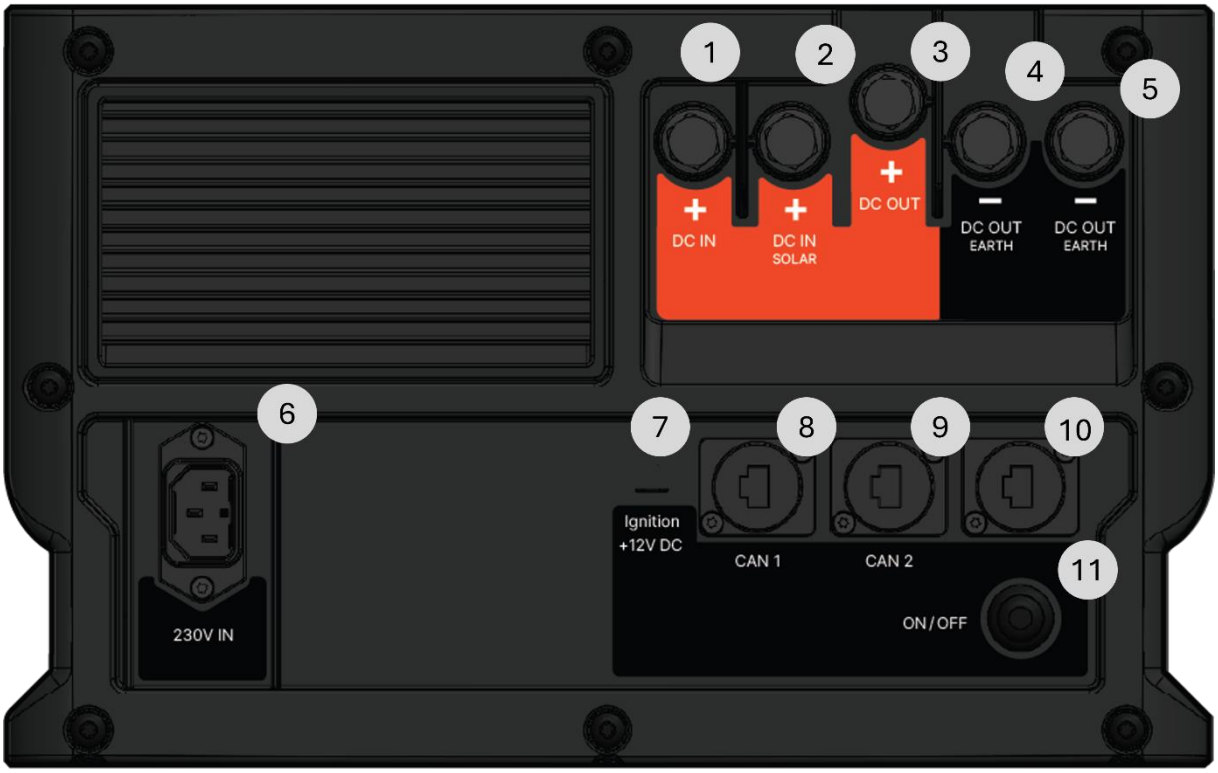
To control the e-Inverter and/or e-Heater from the e-Power system, the units must be:

- Connected on CANbus via the RJ45 ports in the rear, and
- CANbus must be terminated

CANbus must be terminated with a 120-ohm resistor at both ends to keep the signal clear and stable. Inside the e-Power, there is already a built-in resistor but there needs to be another resistor at the end of the CAN chain.

Parts need:

- Terminator (included with the e-Power)
- RJ45 cable (28204-03 or 28205-03)
- RJ45 Splitter (28207-03)



The CAN ports (number 8 and 9) in the rear of the units are for connecting the units.

A general rule for the termination is that it needs to go furthest away form the e-Power, to terminate both ends of the CAN chain. However, in the case of the e-Inverter being stacked on top of the e-Power, with short RJ45 cable, alternative 2 can be used.

Alternative 1

1. Connect the RJ45 cable into CAN1 or CAN2 in the rear of the e-Power.
2. Connect the other end of the cable to the RJ45 splitter and connect the splitter to the CAN port on the e-Inverter/e-Heater.
3. Plug in the terminator in the other port on the splitter.

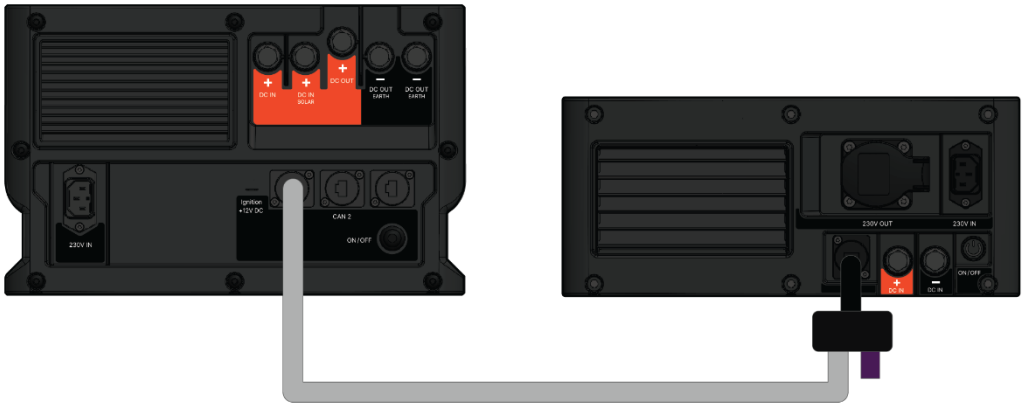


Figure 3 RJ45 cable between the e-Power and e-Inverter with termination at the end

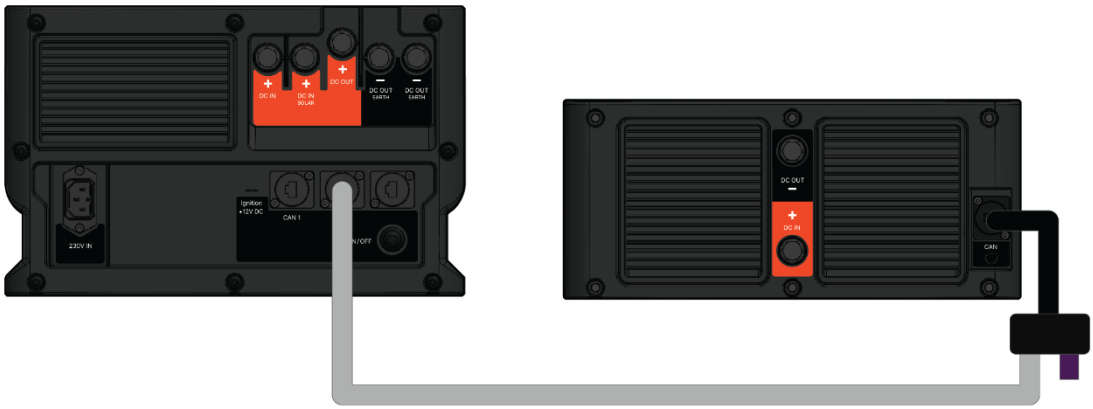
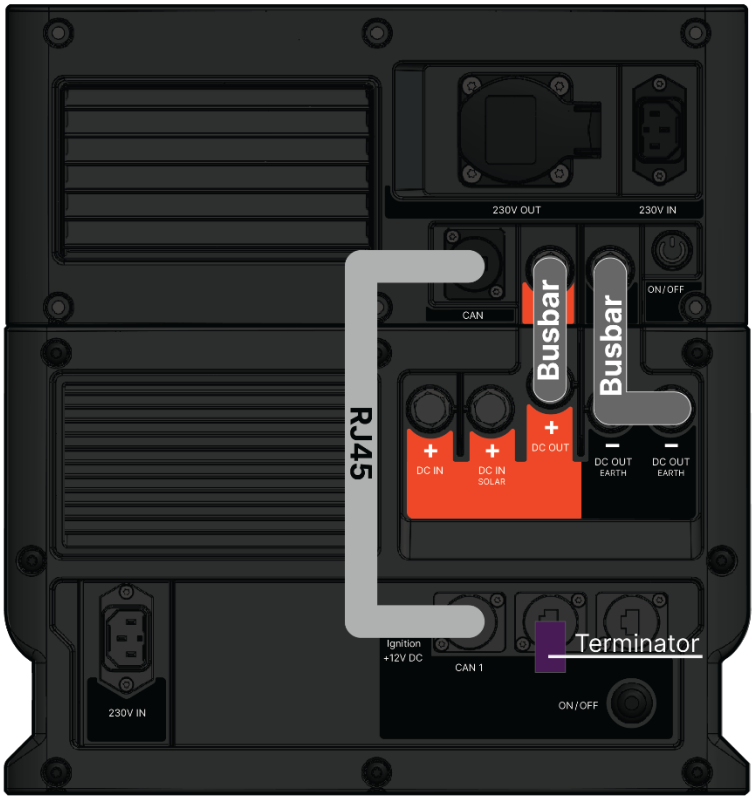


Figure 4 RJ45 cable between the e-Power and e-Heater with termination at the end

Alternative 2

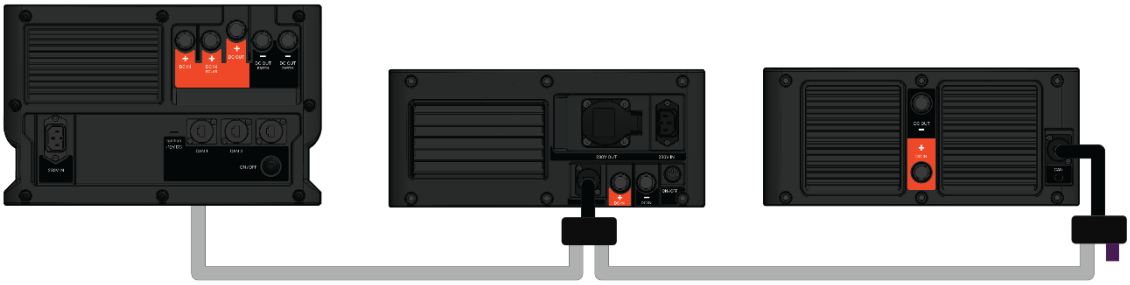
1. Connect the RJ45 cable into CAN1 in the rear of the e-Power.
2. Connect the other end of the cable to the CAN port on the e-Inverter.
3. Connect the terminator in CAN2.



4.2.1 Connecting multiple units to e-Power

When multiple units are connected to the e-Power, all need to be connected in the same CAN chain.

1. Connect the first unit, e.g., the e-Inverter, with an RJ45 cable from the CAN1 on the e-Power to the RJ45 splitter. The splitter then goes into the CAN port on the e-Inverter.
2. Connect another RJ45 cable into the free port in the splitter and connect the other end to another splitter.
3. The second splitter then goes into the e-Heater's CAN port.
4. Lastly, as that termination must be in the end of the CAN chain, the termination must go into the splitter connected to the heater, as that is furthest away from the e-Power.



4.2.2 Connecting Modul-Connect, e-Heater and e-Power

If both e-Power and Modul-Connect are used to control the e-Heater, the e-Heater must be connected to Modul-Connect, which should then be paired with e-Power via Bluetooth. The e-Heater should not be wired to the e-Power via CAN in this scenario.

App setup e-power control

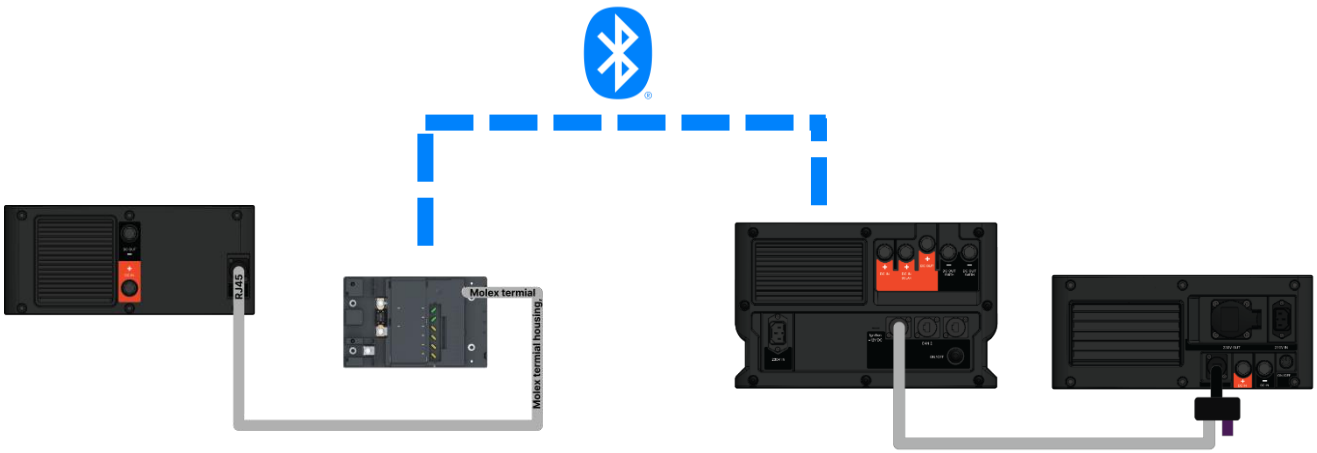
To control from both Modul-Connect and e-Power, the e-Power must be connected to Modul-Connect via Bluetooth.

1. Go to ‘Manage Vehicle’, scroll down to devices and press on ‘+Add device’.

2. Turn on Bluetooth on the e-Power (in the advanced settings menu).

3. Select to add e-Power in the app and select the e-Power to connect to.

4. On the configuration page, the Aux1 and Aux2 buttons on the e-Power can be configured to control accessories from Modul-Connect. These does not have to be configured for the heater to function and they can be left with ‘None’.



4.3 e-Inverter and RCBO

The e-Inverter includes a built-in RCBO (Residual Current Circuit Breaker with Overcurrent Protection). It protects the user and connected equipment by automatically cutting AC power in the event of:

- Earth leakage faults
- Overloads
- Short circuits

Grounding via DC Negative

- The inverter is grounded internally through the DC negative input.
- No separate chassis ground is needed — as long as the battery's negative terminal is securely bonded to the vehicle chassis or system ground.
- This connection forms the inverter's earth reference, enabling the RCBO to work properly.

Important: The RCBO relies on this battery-to-chassis bond. Without it, the safety system will not function correctly.

4.3.1 Using power outside the vehicle

When powering equipment outside the vehicle, you must ensure the RCBO can still detect and stop faults.

Requirement:

1. The battery negative must be grounded to the vehicle chassis.
2. External equipment must have a return path (ground connection) so fault current can flow back to the inverter.

There are two recommended options:

Earth Rod

An earth rod is a metal rod (usually copper or galvanized steel) driven into the ground to provide a direct electrical connection to the earth. It ensures that any fault current has a safe path to ground, helping protective devices like RCDs operate effectively.

How to use:

- Hammer a copper or galvanized rod (min. 1.5 m) into the soil
- Connect it to the inverter chassis or AC socket earth terminal
- Use a 10–16 mm^2 copper cable

Insulation Guard

An insulation guard is a safety device that monitors the electrical insulation between live conductors and earth in an isolated power system. It detects any drop in insulation resistance, indicating a potential fault, and alerts the user before it becomes dangerous.

What it does:

- Monitors insulation between live wires and the inverter frame
- Detects earth faults and can shut off the power

5. Operating the unit

5.1 Starting up the unit

Main Power switch

ON – Activates the system, enabling all functions.

- Once the switch is ON, the unit will start automatically.
- If 12V is not set to Always ON, see section 6.6 Advanced settings, there will not be any power coming out of the outputs until it is activated by charging or turning on any of the integrated product's, the e-Inverter and e-Heater.

OFF – Completely shuts down the unit; recommended for long-term storage (e.g., vacations) to conserve battery.

- When the rear switch is set to OFF, the unit is completely shut down and consumes minimal power.
- All outputs are disabled, and the unit cannot receive a charge.
- Since the system is fully powered down, it does not keep track of the date and time, requiring them to be re-entered upon startup.

5.2 Navigation and Control

Navigation & Menu Control Buttons

Located on the right side of the display, these buttons allow users to interact with the system.

- Directional Pad (Up, Down, Left, Right, OK)
    - Up/Down/Left/Right Arrows – Navigate through menu options.
    - OK Button (Centre of the pad) – Confirms selections and open the menu from the start screen.
- Back Button (↩)
    - Returns to the previous page

Function Buttons

These buttons activate specific features of the system:

- e-Inverter Button (Lightning Icon)
    - Turns the connected e-Inverter on or off, allowing AC power output when needed.
- e-Heater Button (Wavy Lines Icon)
    - Activates the heating function if a heater is connected.
- AUX1 & AUX2 Buttons
    - Toggle auxiliary outputs via Modul-Connect. If not used with Modul-Connect, these buttons will not control anything.

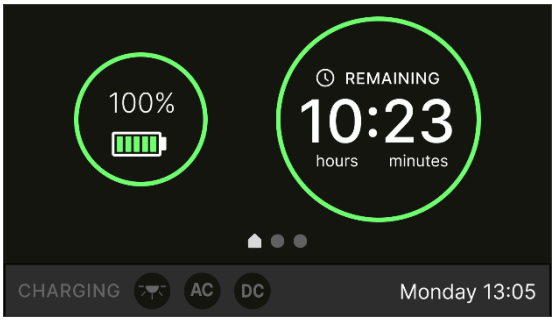
These buttons provide easy control over power distribution, auxiliary devices, and navigation within the system's menu.

5.3 Home Screen

This screen provides an overview of the battery's charge level and remaining runtime based on current consumption.

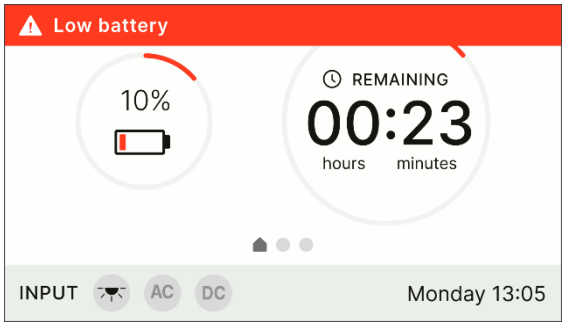
Remaining Runtime (Right Circle)

- Shows the estimated remaining operating time based on the current power consumption.
- Here, the system can run for 10 hours and 23 minutes before depletion.
- This value dynamically adjusts based on real-time energy consumption.



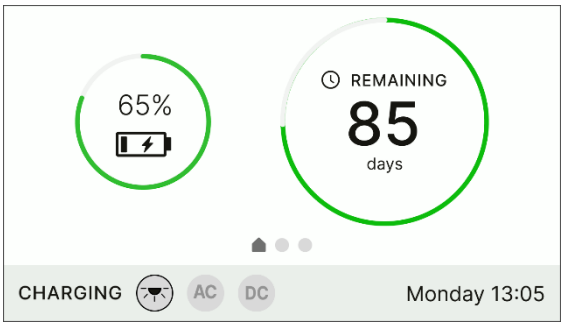
Battery Charge Level (Left Circle)

- Displays the current state of charge (SOC) in percentage.
- In this case, the battery is charged at 10%.
- The battery icon visually represents its charge state.



Bottom Menu Bar

- The bottom bar shows the current **charging status**, with icons for **solar, AC, and DC** power sources (solar is active).
- Current Time – Displays the system time (Monday 13:05).

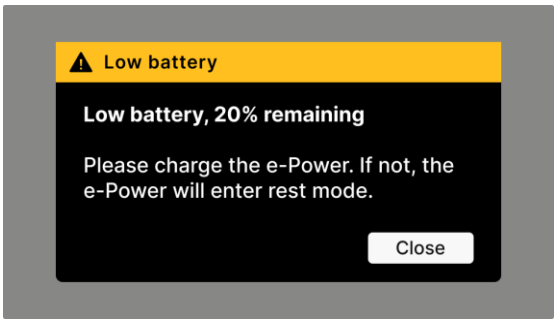


5.4 Low Battery Warnings

This section describes the **low battery warning system** and the corresponding **power-saving measures** taken by the unit as the battery level decreases.

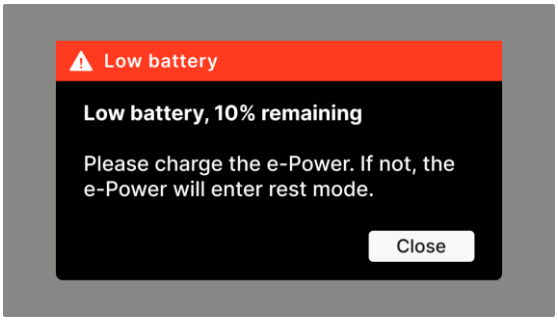
At 20% State of Charge (SOC)

- The first warning message appears on the screen, notifying the user that the battery has reached 20%.
- Screen brightness is automatically reduced to conserve power.
- The user is advised to charge the unit to avoid further power depletion.



At 10% State of Charge (SOC)

- A second warning message is displayed, highlighting that the battery level has dropped to 10%.
- Screen brightness is further reduced to minimize power consumption.
- A sound warning will trigger every minute until the battery reaches 0%.



- Users should immediately connect the unit to a power source to charge it, thus preventing it shutting down.

At 0% State of Charge (SOC) – Deep Sleep Mode

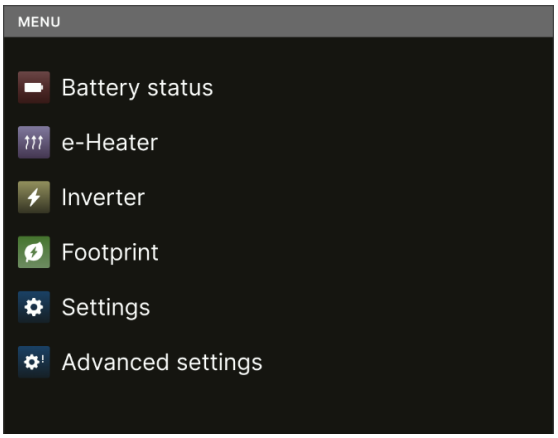
- When the battery reaches 0%, the system will enter Deep Sleep Mode.

- In Deep Sleep Mode, the unit cannot be used until it receives an external charge.
- Users must connect the unit to an external power source to reactivate the system.

When the state of charge becomes low, the system will warn and go into battery saving mode. The clock and calendar of the e-Power till be kept.

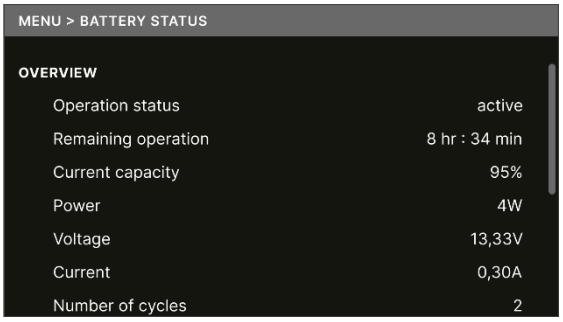
6.Menu

The menu provides access to the operating status and key settings for the e-Power system.



6.1 Battery Status Menu

This menu provides real-time information about the battery's performance and operational status.



Operation Status – Indicates whether the battery is currently active or inactive.

Remaining Operation – Displays the estimated time the battery can continue operating under the current load. In this case, it shows 8 hours and 34 minutes remaining.

Current Capacity – Represents the battery's charge level as a percentage. Here, it is **at 95%.**

Power – Shows the power consumption or output of the battery in watts. The displayed value is 4W.

Voltage – Indicates the current voltage level of the battery. In this case, it is 13.33V.

Current – Displays the current flowing from the battery in amperes. The value shown i**s 0.30A.**

Number of Cycles – Represents how many complete charge-discharge cycles the battery has gone through. This battery has undergone 2 cycles

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This section provides individual voltage readings for each battery cell. Monitoring cell voltage ensures balanced performance and prolongs battery life.

Cell 1: 3.330V

Cell 2: 3.330V

Cell 3: 3.330V

Cell 4: 3.330V

Each cell is operating at the same voltage, which indicates uniform charge distribution, an important factor for battery health.

This menu displays temperature readings for different points within the battery system, helping to monitor thermal stability.

- Between Cell 1 and 2: 25.6°C
- Between Cell 2 and 3: 25.6°C
- Between Cell 3 and 4: 25.6°C

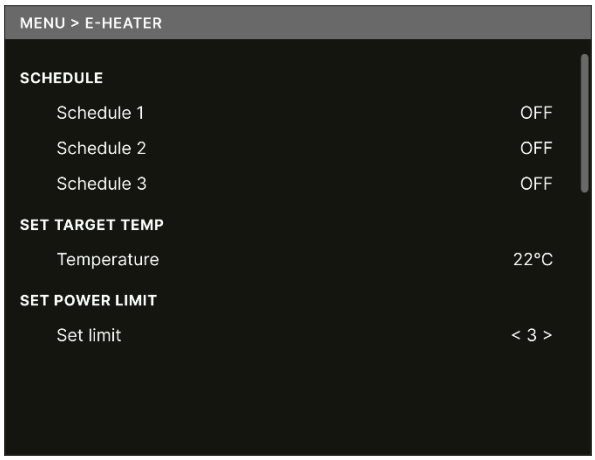
These values indicate that the battery is operating within a stable temperature range.

6.2 Heater

This menu allows users to control the electric heater's scheduling, temperature settings, and power limits.

Schedule

The system provides three schedule slots that can be set to automatically turn the heater on or off at specific times. In this case, all schedules are currently deactivated:



- **Schedule 1**: OFF
- **Schedule 2**: OFF
- **Schedule 3**: OFF

Users can enable and configure these schedules as needed to automate heating cycles.

Set Target Temperature

- **Temperature**: 22°C

This setting determines the target temperature for the heater. Once activated, the heater will work to maintain this set temperature.

Set Power limit

This setting determines the maximum power level at which the heater operates. The number represents a fraction of the heater's total power capacity:

- 1 → Heater operates at 1/3 of its maximum power
- 2 → Heater operates at 2/3 of its maximum power
- 3 → Heater operates at full power (3/3)

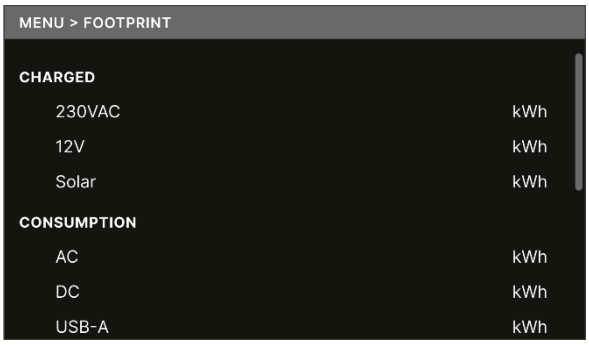
The < 3 setting indicates that the heater is currently operating at less than full power. Lowering this value can help manage energy consumption, reduce electrical load, and optimize efficiency, especially in situations where full power is unnecessary, or energy-saving is a priority.

6.3 Footprint

This menu provides an overview of the energy balance, showing the sources of energy charged into the system and the total power consumption.

Charged

This section displays the total amount of energy charged into the system from various power sources, measured in kilowatt-hours (kWh):



- 230VAC – The energy received from an external AC power source (e.g., grid or generator).
- 12V – Energy charged through a 12V power input, such as a vehicle alternator.
- Solar – Energy harvested from a solar panel system.

Consumption

This section shows the total power consumed by different system outputs, also measured in kWh:

- AC – Total power consumption from AC-powered devices connected to the system.
- DC – Power consumed by DC-powered appliances running directly from the battery system.
- USB-A – Power used by devices connected via USB-A ports.

By monitoring this menu, users can track energy input versus consumption, optimise power usage, and ensure efficient energy management.

6.4 Inverter

This menu provides settings for the inverter operation, specifically focusing on its runtime.

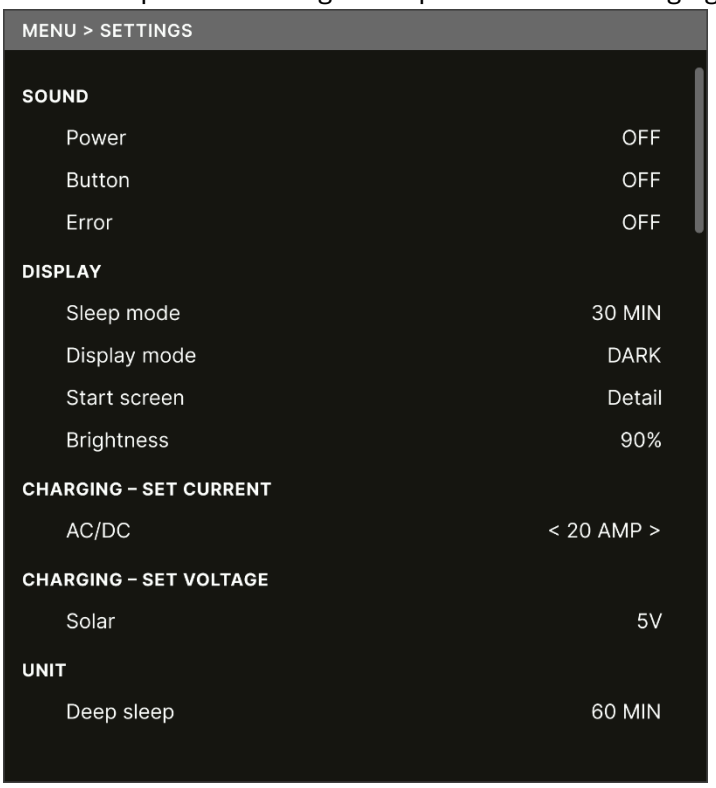
Settings

- Run Time: 30 MIN

This setting defines how long the inverter will remain active before automatically shutting down. In this case, the inverter is set to operate for 30 minutes before turning off.

6.5 Settings

This menu provides configurable parameters for charging, sound, display, and unit behaviour.



Charging – Set Current

- AC/DC Charging Limit: < 20 AMP >

The built-in charger allows users to set a lower current limit for charging. The total charging current is shared between AC and DC chargers, with each capable of up to 40A individually. If both charging types are active, the total available current is split accordingly.

Maximum Current Settings Table:

Maximum Current Setting	Only AC Available	Only DC Available	Both AC & DC Available
80A	40A	40A	80A total (40A from AC, 40A from DC)
60A	40A	40A	60A total (shared between AC & DC)
40A	40A	40A	40A total
20A	20A	20A	20A total

If only one charging type is active, the system will not reduce the charging current unless the limit is set to 20A.

DC Charging

- **EV Mode: ON**
  This setting controls whether the system operates in EV mode, which optimizes DC charging to support electric vehicle charging needs.

Sound Settings

Users can toggle sound alerts for different events:

- **Power Sound:** OFF
- **Button Sound:** OFF
- **Error Sound:** OFF

These options allow customization of **audible feedback** for power status, button presses, and error notifications.

Display Settings

- **Sleep Mode: 30 MIN**
  - The display will enter sleep mode after **30 minutes of inactivity** to save energy.
- **Display Mode: DARK**
  - The display is set to **dark mode** for improved visibility in low-light conditions.

- **Start Screen: Detail**
    - The device starts with the **detailed view** when powered on.
- **Brightness: 90%**
    - The screen brightness is set to **90%,** ensuring a balance between visibility and power efficiency.

Unit Settings

- **Deep Sleep: 60 MIN**
    - The device will enter **deep sleep mode** after **60 minutes of inactivity**, further reducing power consumption.

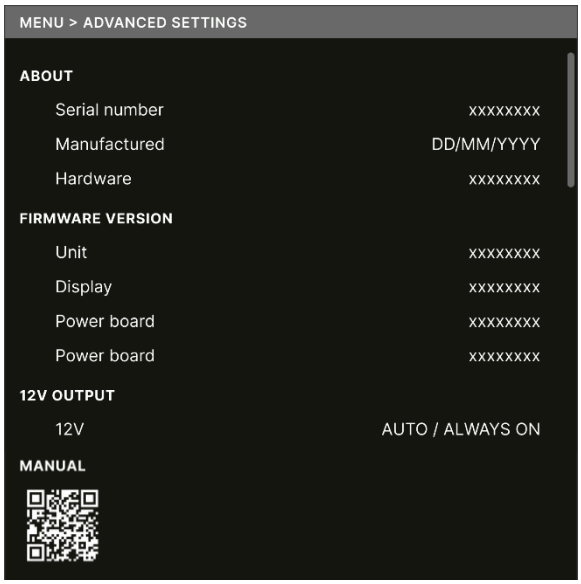
Date The date of the unit can be changed here. If schedules are set, they are based on the date and time selected in this section.

Time The time of the unit can be changed here. If schedules are set, they are based on the date and time selected in this section.

Sound When the sound for button is on, the buttons on the e-Power will feedback with a sound for every press. When sound for error is on, error and low battery warnings will come with a sound.

6.6 Advanced settings

This menu provides detailed system information, firmware version details, error codes, and the option for a factory reset.



About

This section contains essential device identification and manufacturing details:

- Serial Number – A unique identifier for the device (XXXXXXXX).
- Manufactured Date – The production date of the unit (DD/MM/YYYY).
- Hardware Version – Identifies the specific hardware version installed (XXXXXXXX).

These details are useful for technical support, warranty claims, or firmware updates.

Firmware Version

Displays the current firmware versions of different components of the system:

- Unit – Firmware version of the main control unit.
- Display – Firmware version of the display module.
- Power Board – Firmware version(s) for the power board(s).

Having the correct and up-to-date firmware ensures system stability, compatibility, and performance improvements.

12V Output

12V Auto Setting

- When set to *Auto*, the 12V output automatically activates when the e-Heater or e-Inverter is turned on via the e-Power system, or when charging is detected. To conserve power, the 12V output will deactivate after a specified period of inactivity.

12V Always-On Mode

- For accessories that require continuous power—such as Modul-Connect systems or lighting—the 12V output can be set to *Always On*, ensuring uninterrupted power regardless of system load or charging status.

Manual

A QR code is provided for quick access to the product manual. Scanning it with a smartphone or tablet opens the digital version of the manual for detailed reference.

7.Understanding the error codes

Category	Code	Description	Suggested Action
Charger DC Errors	1	Battery input high voltage protection (CH3)	Verify charger and battery compatibility; check for regulator issues
	2	Battery input low voltage protection (CH3)	Inspect battery charge level and condition
	3	Battery input high voltage protection (CH2)	Same as above (CH2-specific)
	4	Battery input low voltage protection (CH2)	Same as above (CH2-specific)
	5	Battery input high voltage protection (CH1)	Same as above (CH1-specific)
	6	Charger high temperature protection Battery	Let unit cool; inspect for dust buildup and cooling performance
	7	High temperature protection (CH1 / CH2)	Check temperature sensors and environmental conditions
	8	Offline	Verify communication or power connections to charger
	9	Battery low temperature protection (CH1)	Warm battery to operating temperature range
	10	CH3 offline	Check cable connections and charger power
	11	Output short circuit protection	Disconnect all outputs and test individually; inspect for shorts
	12	No battery detected	Check battery connections; confirm battery is functional and properly seated
	13	Lithium battery low temperature protection	Warm battery; ensure temperature is above safety threshold before charging
Charger AC Errors	1	AC input low voltage / AC input high	Measure AC input; verify with grid or generator supply

Category	Code	Description	Suggested Action
	2	Voltage output reverse protection	Check wiring polarity and ensure correct connections
	3	Charger high temperature protection	Improve cooling; inspect for fan failures or restricted airflow
	6	Battery high temperature protection (CH1)	Allow battery to cool; ensure proper ventilation
	7	Battery low temperature protection (CH1)	Warm battery before charging
	9	Battery high voltage protection (CH1)	Check battery charging circuit; investigate faulty charge controller
BMS Module Errors	0	Battery not seen	Confirm communication with BMS; inspect connectors and cabling
	4	Over voltage battery	Stop charging; inspect charge controller and verify max voltage
	5	Under voltage battery	Recharge battery; check for deep discharge
	6	Over voltage cell	Inspect individual cell voltages; replace faulty cell if needed
	7	Under voltage cell	Same as above; recharge or replace low-voltage cells
	8	Over temperature battery	Let battery cool; avoid excessive loads or hot environments
	9	Under temperature battery	Warm battery to safe operating range
	10	Over current limit	Check for current spikes; reduce load or review charging/discharging rates
BMS Errors	6	BMS precharge error	Inspect precharge circuit; check resistor and relay operation
	8	BMS start error	Restart system; review BMS initialization routine and wiring

8. Technical Specification

	e-Power 2000
Battery Size	178ah (2 294Wh)
DC Charger	40A
AC Charger	40A
PV Charging	Yes
AC Charging connection	IEC
Charging temperature	0-55°C, -30 - 55° (X-treme)
DC Output voltage	10-14.5V
Max Current Continuously	250A
Max Current (2S)	295A
Battery Type	LiFePo4
Certifications	ECE R10, CE UKCA
IP Rating	IP23C
Dimensions	320mm x 477mm x 202mm
Weight	25kg
Warranty	3 years