



16.1kWh 51.2V

IP65-RATED 314Ah LIFEPO4 BATTERY

TECHNICAL MANUAL

VERSION 1



THIS UNIT IS HEAVY AND EASY TO TIP

This unit tips the scales at a whopping 128.8KG, please ensure you have adequate lifting equipment in place.

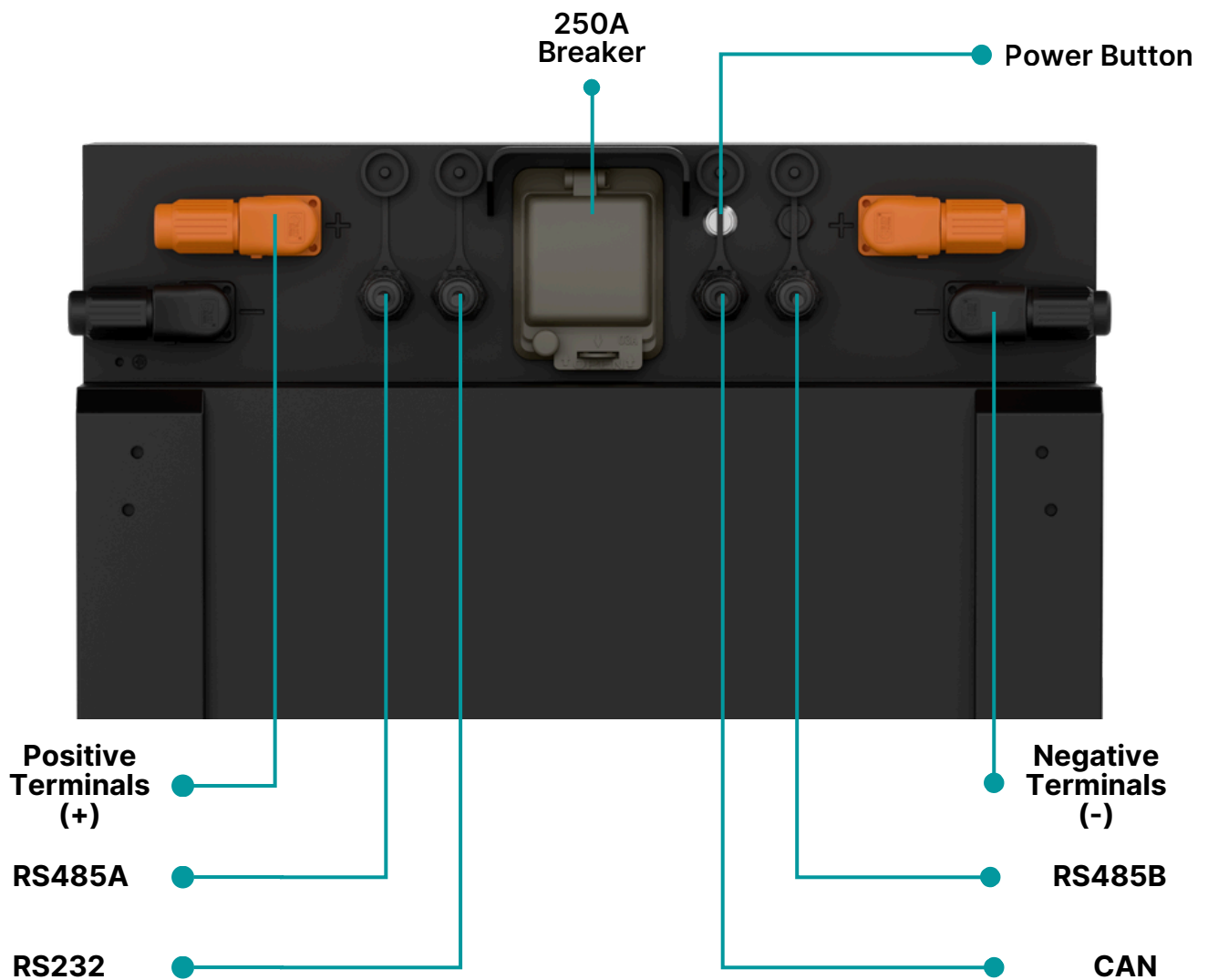


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YOUR BATTERY



PACE

The PACE Battery Management System (BMS) seamlessly integrates with a wide range of popular inverters, including Victron, Pylontech, Growatt, Sofar, Solis, and Goodwe. Changing the inverter protocol doesn't involve any complex software downloads, you can change it simply by navigating the LCD Touchscreen.

PACE BMS Data	48V 200A
Maximum Discharge	200A
Max Charging Current	200A
Temperature Protection	YES
OverCurrent Protection	YES
OverDischarge Protection	YES



SAFETY



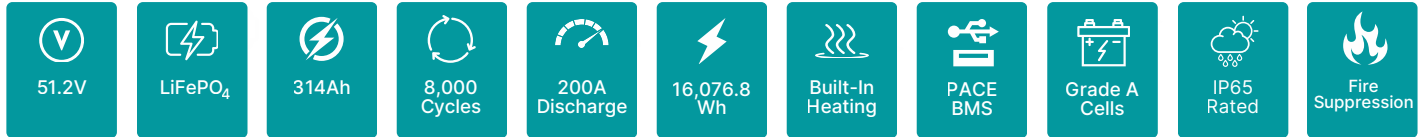
This unit is heavy

This unit tips the scales at a whopping 128.8KG, please ensure you have adequate lifting / manoeuvring equipment in place. Before setting it up, make sure children and furry friends are not nearby.

- Wear proper safety gear such as gloves and eye protection
- These batteries are HEAVY (128.8KG) - always get help to lift them
- Do not reverse polarity
- Do not connect with any batteries in series
- Ensure the system is properly grounded
- Always use insulated tools
- Do not work on battery with it turned on or with the grid turned on
- Do not connect battery to solar wiring directly
- Make sure all fasteners are properly torqued
- Ensure your chargers/inverters are appropriately programmed
- Use only on 48v nominal systems, do not connect with other batteries (such as 15S)
- Ensure the installation follows applicable local, national and all legal electric stipulations
- Installation should be done by a qualified and knowledgeable person
- Make sure proper cable sizes and overcurrent protection are utilised
- Ensure the system is installed in a location suitable for electronics
- Keep the battery within safe operational temperatures
- Do not put the battery in a hazardous, hot or flammable environment
- Install your equipment in a location where children and pets are not present
- Do not paint, or spray paint the battery
- If there are any electrical smells or excessive heat, use your breaker switch and contact your local fire station
- Only clean the battery with a dry cloth - do not use any liquids, spray cleaners, aerosols or any type of solvents.



SPECIFICATIONS



Specifications	
Rated Voltage (V)	51.2V
Maximum Charge (V)	57.6V
BMS	PACE 200A
Nominal Capacity (Ah)	314Ah
Minimum Capacity (Ah)	314Ah
Maximum Charge Current (A)	200A
Total Wh	16,076.8
Maximum Discharge	200A
Discharge Cut-off Voltage	43.2V
Discharge Temperature	-20°C to 60°C
Charging Temperature	-20°C to 45°C (heater enabled)
Storage Temperature	1 Month: -20°C ~ 60°C 1 Year: 0°C ~ 35°C
Relative Humidity	45% ~ 85%
Cell Configuration	16S1P
Cycle Life	8,000 @ 80% DOD
Communication Ports	CAN, RS485, RS232
Design Life	15 years
Weight	128.8kg
Active Balancer	2A
Preloaded Inverter Protocols	Compatible with multiple LV inverters, including Sunsynk, Solis, Victron and more.



Built-In Fire Suppression Unit

Our ultra-thin, built-in aerosol unit stops fires the moment they start. When temperatures spike to 170°C, the system releases a fast-acting potassium aerosol that instantly disrupts the fire's chemical reaction. Result: rapid suppression, zero maintenance, and reliable protection for enclosed electrical spaces.





SPECIFICATIONS

Dimensions

500(L) × 232(W) × 915(H)mm

Safety Precautions



Due to its significant weight (128.8kg), it's crucial to use suitable lifting equipment and sufficient personnel in accordance with local manual handling regulations.

Never work on these batteries while powered or connected to the grid. Install only in suitable, safe environments by a qualified person, following all electrical codes. Ensure correct grounding, polarity, programming, cabling, and torque. Use only with compatible 51.2V systems. Never in series or with other chemistries. Keep away from heat, hazards, pets, and children. If overheating or burning smells occur, trip the breaker and call emergency services. Clean only with a dry cloth.

Battery Warranty

The Fogstar Energy IP-Rated 16.1kWh battery comes with a 10-year warranty covering BMS failure, cell failure, temperature sensors, charging/discharging faults, and internal corrosion.

To submit a claim, contact Fogstar Customer Support:

 customerservice@fogstar.co.uk

 01527 757980

Please include your proof of purchase and a clear description of the issue.

Parallel Connectivity

Up to 16 units can be connected in parallel. These batteries **cannot** be connected in series.

Charging Parameters

Bulk: 57.6V

Float: 55.2V

Low DC cut off: 43.2V

Battery Connections

We supply a pair of 1.5m battery cables with Amphenol to M8 connectors, designed for reliable battery communication and power linking via a busbar in parallel installations. For correct installation, always connect all negative conductors before connecting the positive conductors.

A 1.5m communication cable is included for RS485/CAN data exchange, along with a 1.8m PC cable for direct computer connection, system setup, and diagnostics.

These accessories allow for easy integration into both single-unit and multi-unit battery configurations.

Updating the Inverter Protocol

The PACE Battery Management System (BMS) seamlessly integrates with a wide range of popular inverters, containing pre-loaded protocols for Victron, Luxpower, Sofar, Solis, and many more. Changing the inverter protocol doesn't involve any complex software downloads; you can change it simply by navigating the LCD Touchscreen.

Battery Heating

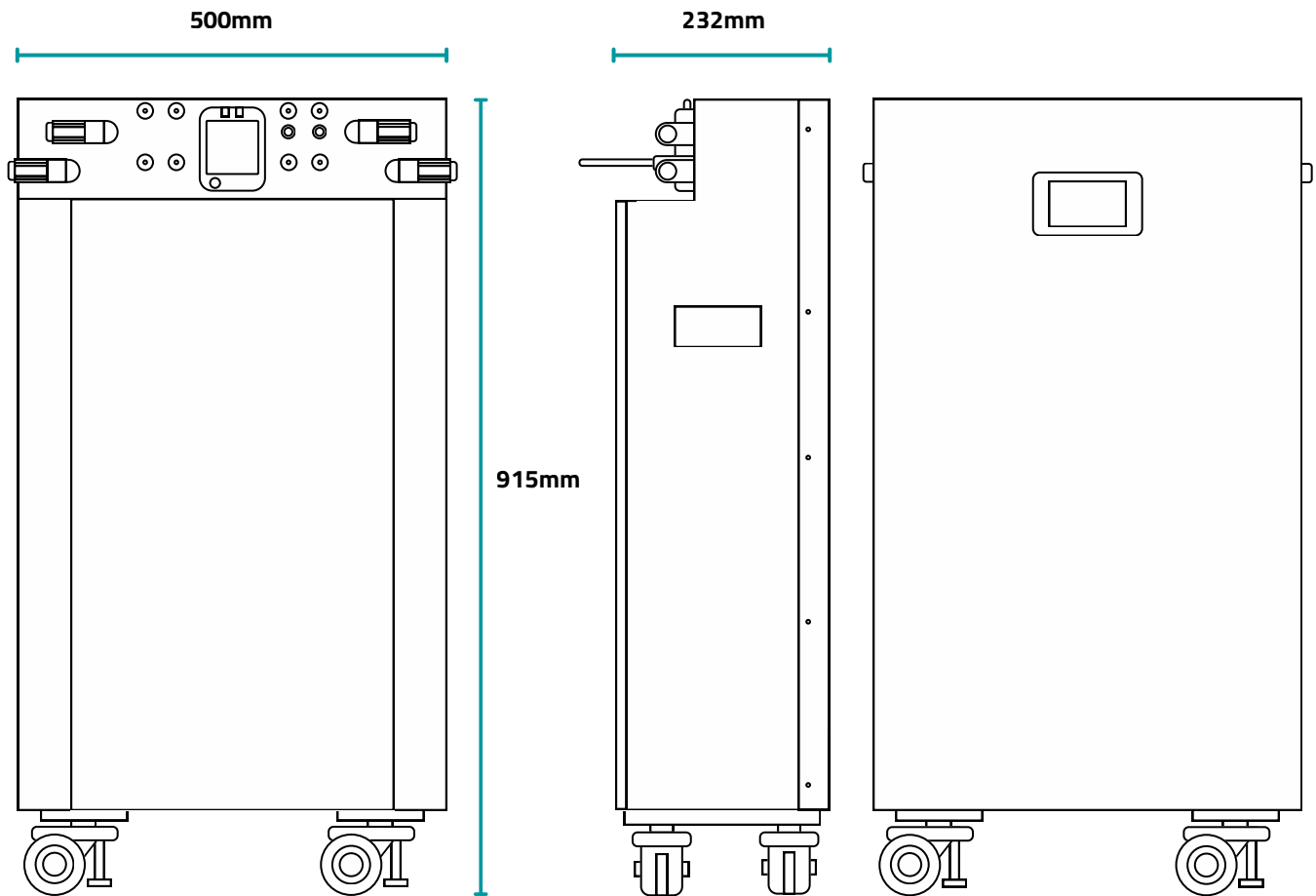
The integrated heating system activates below 5 °C, enabling safe charging at 0 °C and reliable operation in ambient temperatures down to -20 °C.

Placement & Clearance

Although the battery is designed for outdoor use, we recommend installing it in a sheltered location where possible, such as beneath an eave, canopy, or purpose-built enclosure. Providing additional protection from prolonged exposure to direct sunlight, heavy rainfall, snow, and other extreme weather conditions can help maximise long-term performance and service life.



DIMENSIONS



PACKING LIST



We supply a pair of 1.5m battery cables with Amphenol to M8 connectors, designed for reliable battery communication and power linking via a busbar in parallel installations. For correct installation, always connect all negative conductors before connecting the positive conductors.

A 1.5m communication cable is included for RS485/CAN data exchange, along with a 1.8m PC cable for direct computer connection, system setup, and diagnostics.

These accessories allow for easy integration into both single-unit and multi-unit battery configurations.



CLASSIC UI

Updating the Inverter Protocol via the Touchscreen

You can update your Inverter protocol via the Touchscreen on the battery, this negates the need for downloading the Pbms Tools BMS Software.

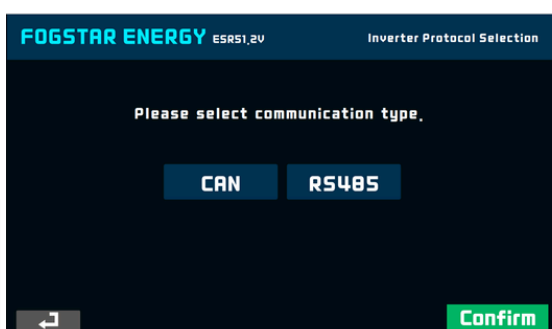
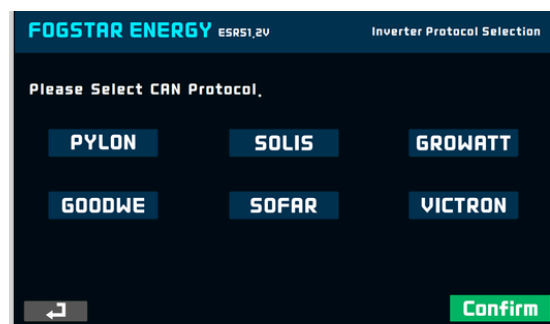
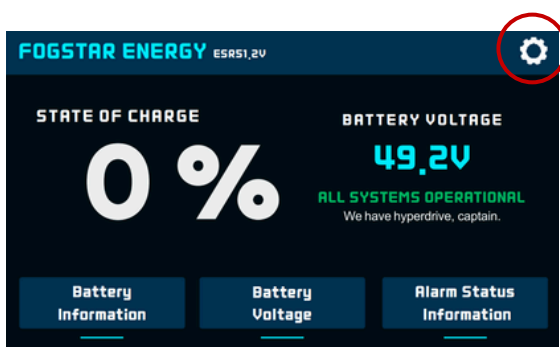
1. Hit the 'Settings' button in the top right hand corner
2. Select CAN or RS485 communication type
3. Select the correct protocol
4. Click 'Confirm' and use the back arrow to navigate back to the main screen.

All of our units are configured to CAN > Pylon when shipped - in most instances, you won't even need to change the protocol.

Connecting battery to PC and using the Pbms Tools software

For this, you will require a USB to RS232 cable - if you need one sent out, please get in touch with a member of our team. This requires a Windows PC (this process has been tested on Windows 7 and above).

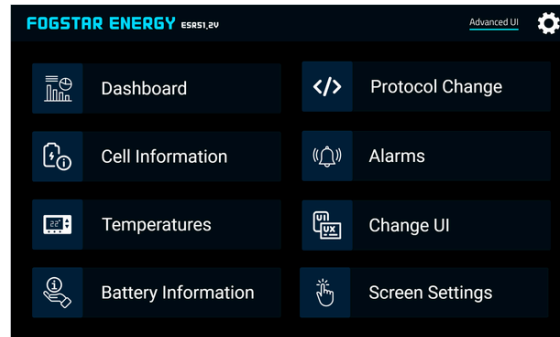
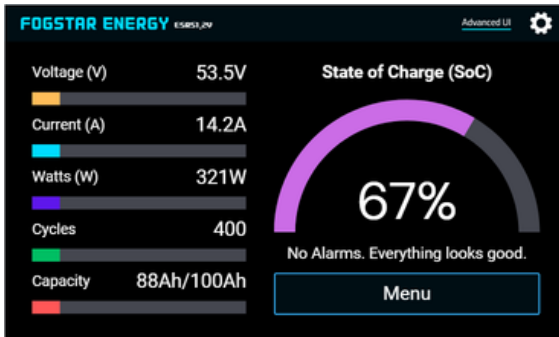
1. On the initial connection to the USB port, Windows will automatically download drivers for the USB to RS232.
2. Download the PBMS BMS monitoring program from our Knowledge Hub.
3. You may be asked to install or update Microsoft .Net Framework, please proceed with this.
4. Open the PBMS Monitoring Tool.



Changing the inverter protocol via the screen.



ADVANCED UI



Advanced UI Overview

The Advanced UI provides detailed, real-time information about the battery system. It is intended for users who require more in-depth data than the Classic UI.

Dashboard

Shows key operating data including voltage, current, power, State of Charge (SoC), cycle count, and remaining capacity.

Cell Information

Shows individual cell voltages, along with the highest and lowest cell values, voltage differential, and cell balancing status. This screen is used to monitor cell consistency and balance.

Temperatures

Shows cell, BMS, and environmental temperature readings. BMS temperature may change during charging and discharging.

Battery Information

Provides system configuration and status details such as communication protocols, number of connected batteries, battery position, design and actual capacity, MOS status, and current limiting state.

Alarms

Displays active warnings or faults. If none are present, the screen confirms normal operation.

Protocol Change

Allows selection of the CAN or RS485 BMS communication protocol.



INSTALLATION

Parallel Configuration and BMS Addressing

The Fogstar Energy IP-65 16.1kWh utilises a BMS with automatic address allocation. No DIP switch configuration is required.

When connecting multiple batteries in parallel:

- Use a standard network cable between units.
- Follow this wiring sequence:
 - The first unit's RS485B connects to the second unit's RS485A.
 - The second unit's RS485B connects to the third unit's RS485A.
 - Continue this pattern for any additional units.
 - The first unit acts as the host, with its CAN/485 communication line connecting to the inverter.

All subsequent units operate as slaves within the communication chain.

Placement and Environmental Requirements

For safe installation and optimal performance, the following conditions must be met:

- Install the battery on a level, non-flammable surface, such as concrete.
- Do not place the unit on flammable building materials.
- Maintain an operational ambient temperature between -20°C and 60°C.
- Ensure a minimum clearance of 30cm around the battery for ventilation and service access.
- Avoid environments with **excessive** moisture, dust, vibration, or direct sunlight.
- Although the battery is designed for outdoor use, **we recommend installing it in a sheltered location** where possible, such as beneath an eave, canopy, or purpose-built enclosure.

Providing additional protection from prolonged exposure to direct sunlight, heavy rainfall, snow, and other extreme weather conditions can help maximise long-term performance and service life.

Installation Time

Additional system integration, including inverter connection, protection devices, and grid-related work, will vary according to installation design and site conditions.

Electrical Installation Responsibility

Fogstar is a battery manufacturer and supplier. Specific installation procedures, regulatory compliance, and any electrical work must be carried out by a qualified electrician.

The installer must ensure that all wiring, protection devices, terminations, and commissioning steps meet local electrical regulations and safety standards.



FIRE SUPPRESSION

Overview

This device is a compact, heat-activated aerosol fire suppression unit designed for small enclosed spaces such as electrical cabinets. When the surrounding temperature reaches its trigger point, the internal agent rapidly converts into an extinguishing aerosol that disrupts combustion and suppresses the fire.

How it works

Once the temperature-sensitive element activates, the suppression compound breaks down and releases fine aerosol particles. These particles absorb flame radicals and interrupt the combustion process, quickly stopping the spread of fire.

When the device activates, the suppression compound breaks down and produces a fine aerosol made up of potassium-based particles, including potassium carbonate (K_2CO_3), potassium hydroxide (KOH), and potassium bicarbonate ($KHCO_3$). These particles disrupt the combustion process by absorbing flame radicals. This halts the chemical chain reaction and quickly extinguishes the fire.

Technical Specifications

- Activation temperature: $170^{\circ}\text{C} \pm 10^{\circ}\text{C}$
- Operating temperature range: -20°C to $+70^{\circ}\text{C}$
- Relative humidity tolerance: $\leq 95\%$
- Discharge duration: ≤ 3 seconds
- Dimensions: $117 \times 68 \times 8$ mm (including bracket)
- Agent mass: $11 \text{ g} \pm 1 \text{ g}$

Operation

The unit is fully automatic. If a fire occurs and temperatures rise to the activation point, the device will release its aerosol agent and suppress the fire. No manual action is required.

Safety Information

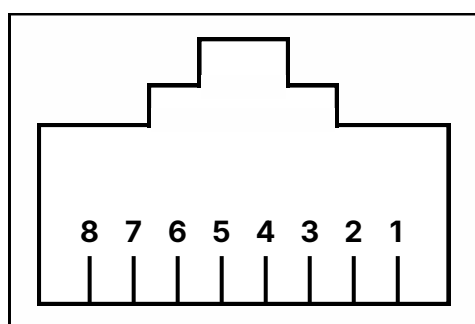
- Do not dismantle or modify the unit.
- Keep it away from heat sources before installation.
- Do not expose the device to impact or strong vibration.
- Keep out of reach of children.
- If accidental discharge occurs, ventilate the area.
- For fires involving re-ignition risks, follow up with additional suppression measures.
- Replace the device if the casing is damaged.
- Do not cover or obstruct the activation surface.



COMMUNICATION

The BMS communication interface is defined according to the communication requirements of the connected inverter. Different inverter brands may use communication ports with pin definitions that do not match the standard BMS layout. In these cases, a custom communication cable is required. Incorrect cable wiring can cause communication errors or unexpected system behaviour. In most applications, a standard network cable can be used, provided the wiring matches the required pinout.

CAN/RS485

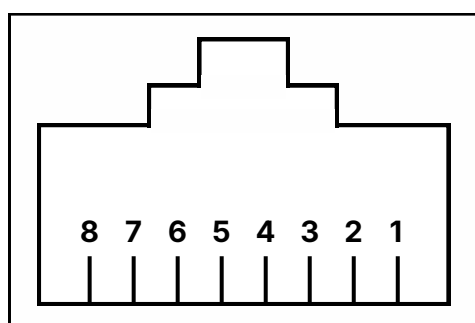


CAN/RS485

Pin	Description
1, 8	RS485-B
2, 7	RS485-A
4	CAN-H
5	CAN-L
3, 6	GND

Internal Communications: Select the appropriate RS485 port for BMS internal communication. The internal communication link operates at a baud rate of 19200, meaning data is transmitted at 19,200 bits per second. Both communicating devices must use the same baud rate for stable communication.

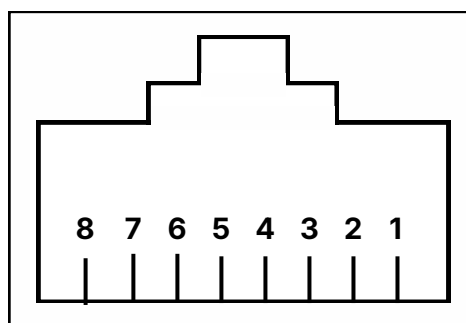
RS485A



RS485A

Pin	Description
1, 8	RS485-B
2, 7	RS485-A
3	Master Enable Pin
4	Auto Address Pin 2
5	GND
6	GND

RS485B



RS485B

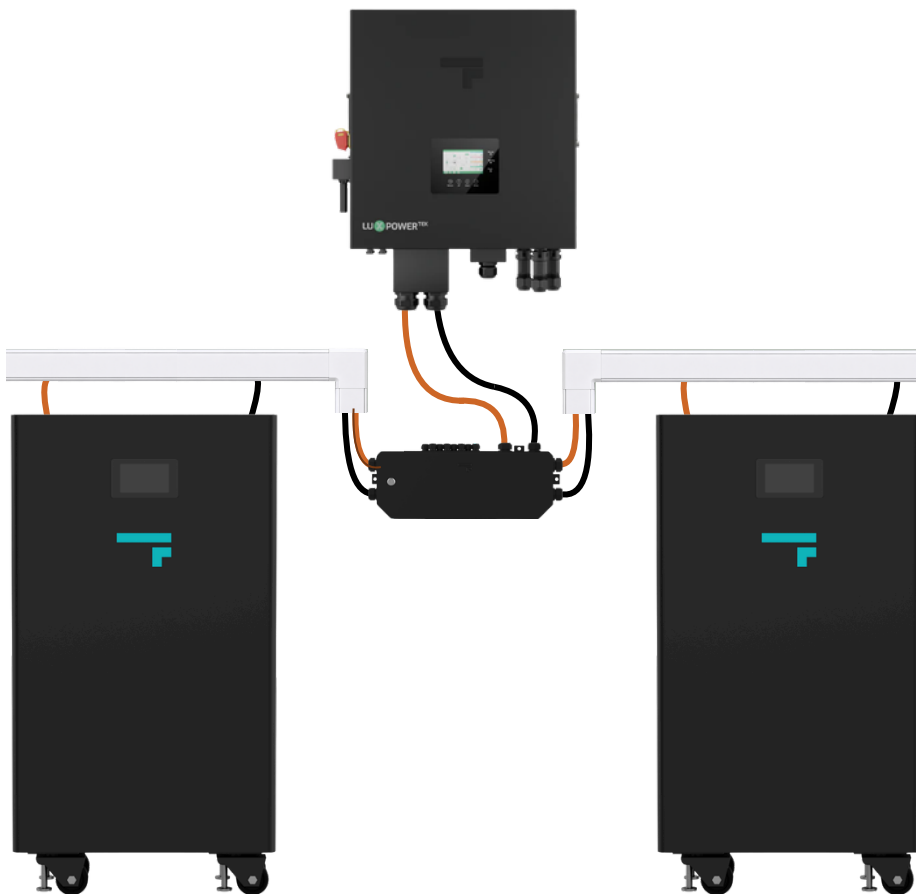
Pin	Description
1, 8	RS485-B
2, 7	RS485-A
3	GND
4	Auto Address Pin 1
5	GND
6	Slave Enabled Pin



COMMUNICATION

Parallel Communication Wiring

The BMS supports automatic address assignment, so no DIP switch configuration is required. Use standard network cables for parallel communication. Connect RS485-B of the first unit to RS485-A of the second unit, RS485-B of the second unit to RS485-A of the third unit, and so on. The first unit acts as the host and connects to the inverter CAN/RS485 port. All other units operate as slave units. Refer to page 3 for the battery layout and port location diagram.



Before connecting it should be completely disconnected and powered-down.

Battery Placement Requirements

Maintain a minimum spacing of 30cm between batteries when installing. Ensure all battery modules are placed securely and remain in the shutdown state before connecting communication cables.

PC Communication Connection

For monitoring or configuration, the BMS can be connected to a computer using a USB-to-RS485 adapter. Connect RS485-B to T/R+ and RS485-A to T/R-. Recommended adapter models include UT-890 and UT-891A.



WARRANTY

The Fogstar Energy IP-65 16.1kWh battery comes with a 10-year warranty, covering BMS failure, cell failure, temperature sensors, charging/discharging faults, and internal corrosion. Excludes misuse, tampering, incompatible systems, or accidental damage.

Please see the Fogstar Energy IP-65 16.1kWh Warranty Booklet for further warranty information.

Reporting an Issue

Should you encounter a problem with your Fogstar unit it is important you contact our Customer Services team first and foremost. This gives us an opportunity to help you resolve the issue before any problems arise. By coming directly to us, before posting on forums or groups, we can help you resolve any issues or concerns quickly and efficiently.

Please send any images or screenshots, along with a description of your issue to customerservice@fogstar.co.uk.

If your issue is urgent and you need to talk with a member of the tech team immediately, please call 01527 757980.



FAQ'S

How many batteries can I connect together?

You can connect up to 15 units in parallel.

What are the dimensions of the IP-65 16.1kWh Battery?

500 (L) x 232 (W) x 915 (H) mm

Do I need to configure DIP switches?

The Fogstar Energy IP-65 16.1kWh utilises a BMS with automatic address allocation. No DIP switch configuration is required.

Does the battery need to be powered off before connecting?

Yes. All batteries must remain in the shutdown state before connecting communication or power cables.

Can these batteries work with other inverter brands?

Yes. The BMS seamlessly integrates with a wide range of popular inverters, containing pre-loaded protocols for popular LV inverter brands including but not limited to Luxpower, Sunsynk, Solis, Victron and more.

Can I mix different battery capacities or models in the same system?

No. Only identical battery models with the same capacity and BMS configuration should be connected in parallel.

Can my battery be mounted on the side?

Yes, you can mount the batteries on their side as part of your installation. However, this approach may make it a bit awkward when reading the battery vitals on the touchscreen, also, the weight of battery can cause some issues in this instance.

What fixtures and fittings do I use to mount the unit to the wall?

Whilst we provide a robust mount for your unit if required, we have left the mounting fixtures firmly in your hands. It goes without saying that different wall types require different fixtures.

- Type of Wall: Understand if it's drywall, concrete, brick, or wood stud. This determines the appropriate types and sizes of anchors/screws/fasteners.
- Strength of Wall: Ensure the wall itself can support the combined weight of the battery and mounting bracket. Doubling up studs or adding reinforcement might be necessary.
- If you are unsure about the fixing requirement for your unit, please contact a structural engineer who will be able to advise on the best solution for mounting your battery.

What is the warranty period?

This battery includes a 10-year warranty. For full warranty terms and conditions, please refer to the Fogstar website.

FOGSTARENERGY