10kWh 51.2V

IP-RATED 200Ah LIFEPO4 BATTERY

TECHNICAL MANUAL

VERSION 1

THIS UNIT IS HEAVY AND EASY TO TIP

This unit tips the scales at a whopping 98KG, please ensure you have adequate lifting equipment in place.

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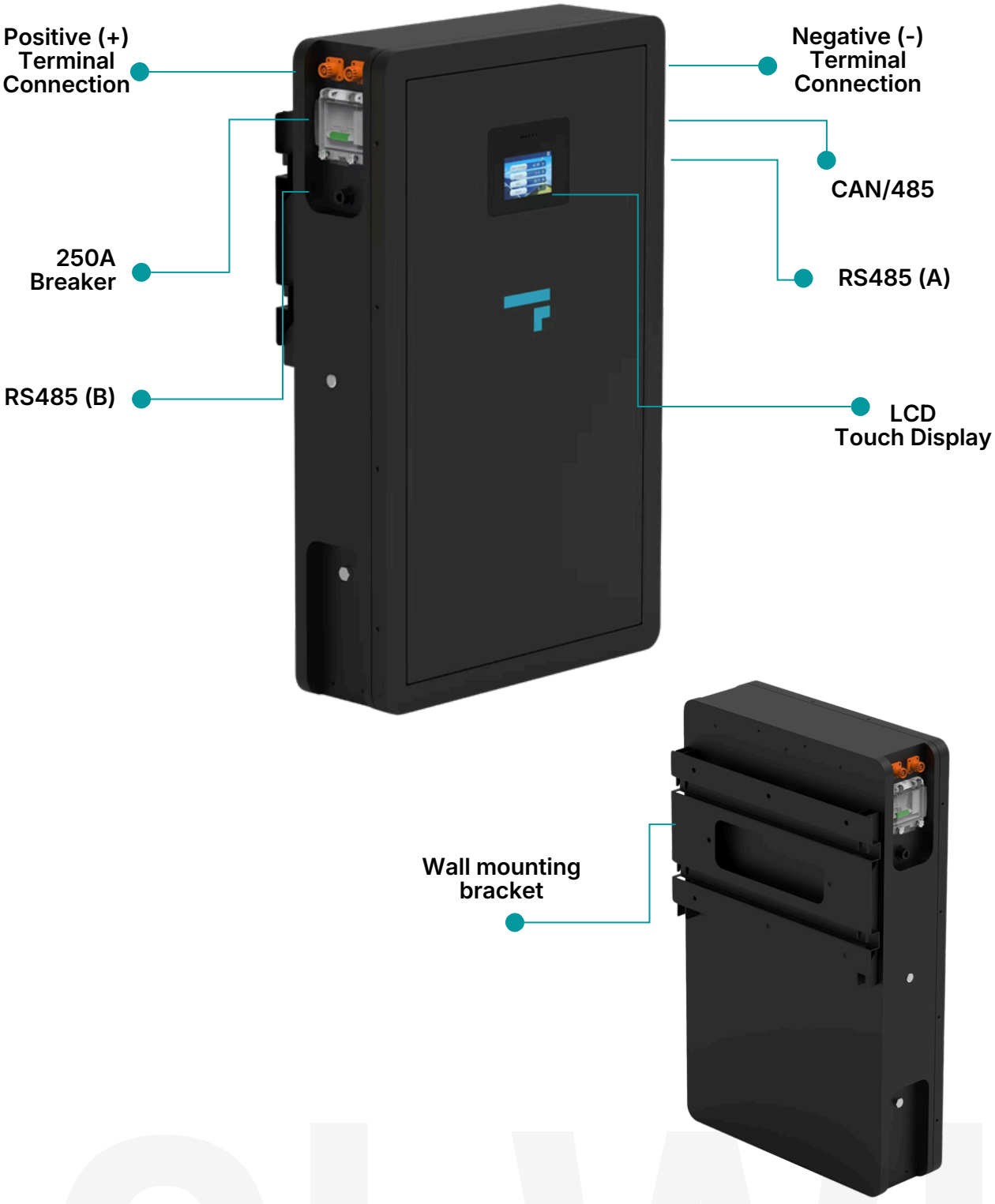
YOUR BATTERY



SAFETY

This unit is heavy

This unit tips the scales at a whopping 98KG, 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 (98kg) - 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.

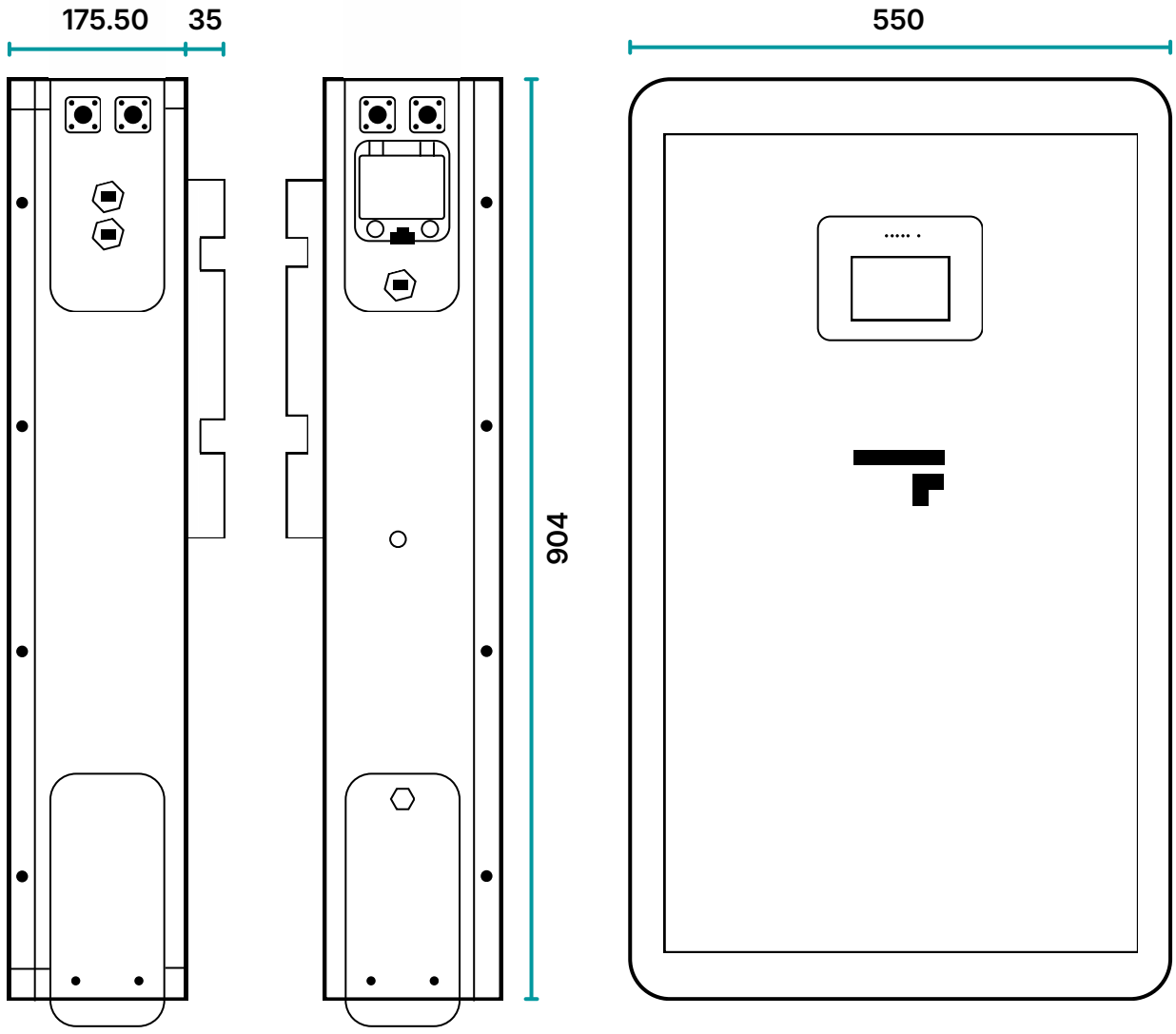
SPECIFICATIONS

51.2V | $LiFePO_4$ | 200 Ah | 6,000 Cycles | 200A Discharge | 10 kWh | Fire Suppression | Comms | Seplos BMS

Specifications	
Rated Voltage (V)	51.2V
Maximum Charge (V)	57.6V
BMS	SEPLOS 200A
Nominal Capacity (Ah)	200Ah
Minimum Capacity (Ah)	200A
Maximum Charge Current (A)	200A
Total Wh	10,240
Maximum Discharge	200A
Discharge Cut-off Voltage	43.2V
Discharge Temperature	-20°C to 40°C
Charging Temperature	-10°C to 40°C
Storage Temperature	1 Month: -10°C ~ 35°C 3 Months: 25 ±2 °C
Relative Humidity	65% ±10%
Cell Configuration	2P16S
Cycle Life	6,000 @ 91% DOD
Communication Ports	CAN, RS485
Design Life	15 years
Weight	98kg
IP Rating	IP65
Preloaded Inverter Protocols	Compatible with multiple LV inverters, including but not limited to LuxPower, Sunsynk, Solis, Victron and more.

10kWh

DIMENSIONS



10kWh

PACKING LIST

We supply a pair of 1.5m positive and negative power cables with Amphenol connectors. Always connect negative conductors before attaching the positive.

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 the battery to integrate easily into both single-unit and multi-unit configurations.

1.5m Power Cable Harness	2PCS	
1.8m Host PC Cable	1PCS	
1.5m Communication	1PCS	

INSTALLATION

Power Cable Specification and Connection Requirements

The supplied 1.5m Positive and Negative power cables use Amphenol connectors and are designed for stable, reliable inter-battery power linking.
When installing:

1. Connect all Negative conductors first.
2. Connect Positive conductors only after all Negative connections are secure.

Communication Cables

- A 1.5m communication cable is provided for RS485/CAN data exchange between battery units and system components.
- A 1.8m PC cable enables direct connection to a computer for system configuration, monitoring, and diagnostics.

These allow the battery to be integrated in both standalone systems and parallel banks, without additional communication accessories.

INSTALLATION

Parallel Configuration and BMS Addressing

The Fogstar Energy 10kWh 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 10°C and 30°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.

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°C ± 10°C
- Operating temperature range: –20°C to +70°C
- Relative humidity tolerance: ≤95%
- Discharge duration: ≤3 seconds
- Dimensions: 117 × 68 × 8 mm (including bracket)
- Agent mass: 11 g ± 1 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.

OPERATING MODES

Charging mode

When the BMS detects a connected charger and the external charge voltage exceeds the internal battery voltage by more than 0.5 V, the charging MOSFET is enabled. Once the charging current rises above the minimum effective threshold, the system enters Charging Mode. In Charging Mode, both the charge and discharge MOSFETs remain closed.

Discharging mode

The BMS enters Discharge Mode when a load is detected and the discharge current exceeds the effective discharge threshold.

Standby mode

If neither charging nor discharging conditions are met, the BMS switches to Standby Mode.

Shutdown mode

The BMS enters Shutdown Mode after 48 hours in normal standby, or when undervoltage protection, key shutdown, or an external switch shutdown is triggered.

Wake-up conditions for Shutdown mode

Charging activation / 48V Voltage activation / Power button Activation

LED Indicator Sequence

The BMS uses four (4) SOC LEDs, one (1) ALARM LED, and one (1) RUN LED to indicate system status. The SOC LEDs display battery capacity during charging and discharging. The ALARM LED signals protection events or abnormal conditions, and the RUN LED indicates normal operation. LED states such as solid, flashing, or off are used to represent operating status and fault conditions.

OPERATING MODES

Capacity Indicator

Status		Charge				Discharge			
Capacity Indicator		L4 ●	L3 ●	L2 ●	L1 ●	L4 ●	L3 ●	L2 ●	L1 ●
	0～25%	OFF	OFF	OFF	BLINK	OFF	OFF	OFF	GREEN
	25～50%	OFF	OFF	BLINK	GREEN	OFF	OFF	GREEN	GREEN
	50～75%	OFF	BLINK	GREEN	GREEN	OFF	GREEN	GREEN	GREEN
	≥75%	BLINK	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
Running indicator light ●		Green				Flash			

LED Flashing Modes

Flashing Mode	On Time	Off Time
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

OPERATING MODES

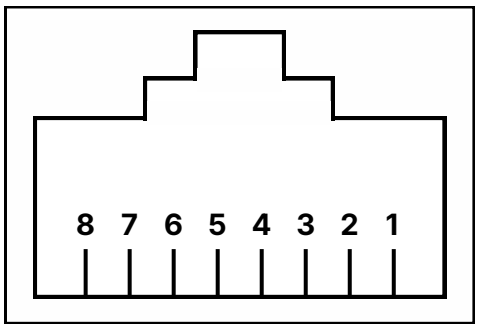
Status Indicator

System Status	Running Status	RUN	ALM	SOC				Description
		●	●	●	●	●	●	
Power Off	Sleep	Off	OFF	OFF	OFF	OFF	OFF	All Indicators Off
Standby	Normal	Flashing	OFF	OFF	OFF	OFF	OFF	Standby Mode
Charging	Normal	Solid On	OFF	According to the Capacity Indicator				Normal charging state
	Over Current Alarm	Solid On	Flash Mode 2	According to the Capacity Indicator				Overcurrent protection active
	Overvoltage Protection	Flash Mode 1	OFF	OFF	OFF	OFF	OFF	Overvoltage protection active
	Temperature or overcurrent protection	Flash Mode 1	OFF	OFF	OFF	OFF	OFF	Temperature or overcurrent protection active
Discharging	Normal	Flash Mode 3	OFF	According to the capacity indicator				Normal discharging state
	Alarm	Flash Mode 3	Flash Mode 3					Alarm active
	Temperature, overcurrent, or short circuit protection	OFF	Solid on	OFF	OFF	OFF	OFF	Protection active. Forced sleep after 48 hours without activity.
	Undervoltage protection	OFF	OFF	OFF	OFF	OFF	OFF	Undervoltage protection active. Discharge disabled.

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.

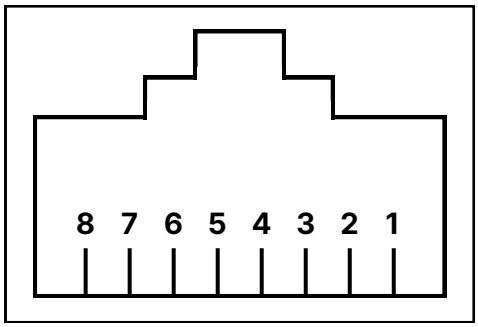
CAN/RS485



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

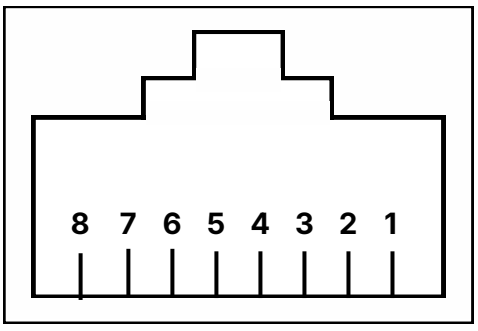
Internal Communications: Select the appropriate RS485 port for BMS internal communication. The internal communication link operates at a baud rate of 19200, meaning data is transmitted at 19,200 bits per second. Both communicating devices must use the same baud rate for stable communication.

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

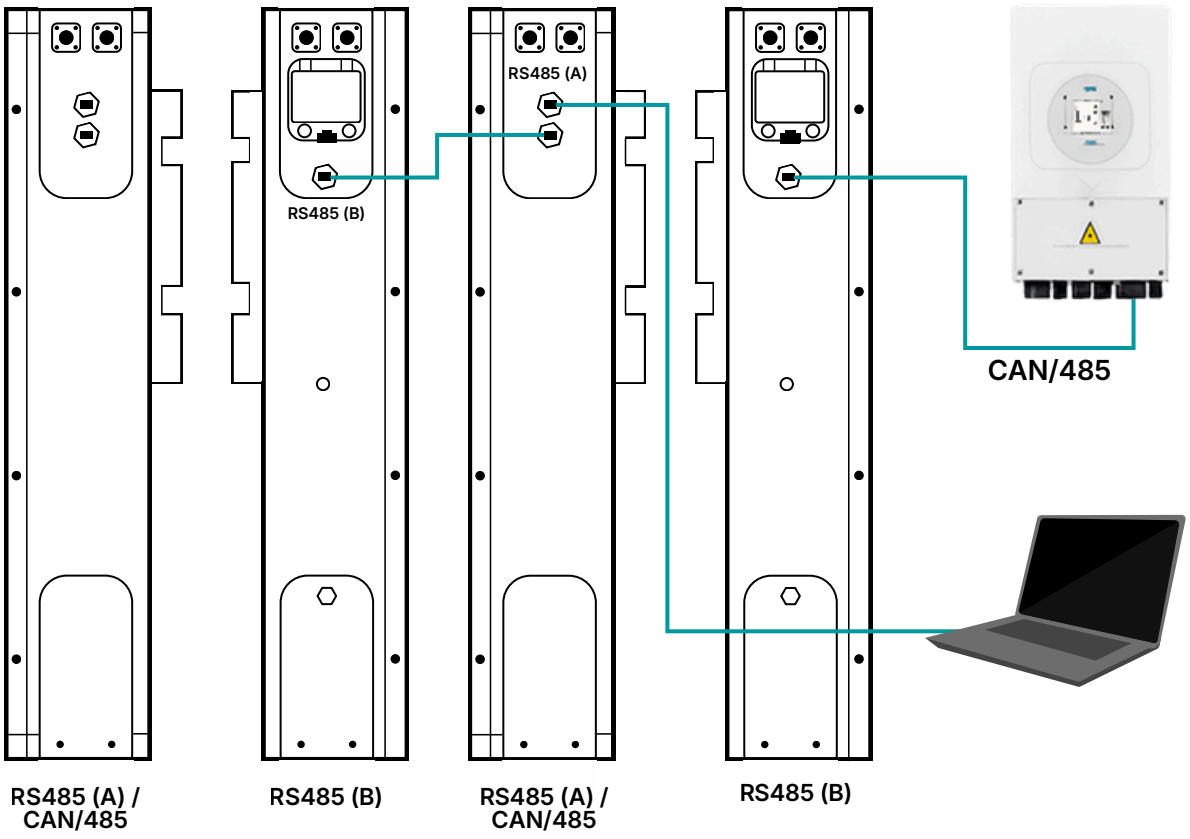


RS485B	
Pin	**Description**
1, 8	RS485-B
2, 7	RS485-A
3	GND
4	Auto Address Pin 1
5	GND
6	Slave Enabled Pin

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.

FUNCTION DESCRIPTION

ON/OFF Function

ON/OFF: To power on the BMS, press the ON/OFF key for more than 1 second. The LED capacity indicators will illuminate in sequence. Release the key and the BMS will enter the power-on state.
OFF/Dormant: To shut down the BMS, press the ON/OFF key for more than 3 seconds. The running indicator LED will illuminate in sequence. Release the key and the BMS will enter the shutdown state.

Voltage Detection and Protection

Total Voltage Over-Voltage Protection: When the total battery voltage reaches the over-voltage protection threshold, the BMS disables the charging MOSFET and stops charging. Protection is released once the voltage drops to the recovery level or when the discharge current exceeds 3A.

Individual Cell Under-Voltage Protection: If any cell reaches the single-cell under-voltage protection value, the BMS will disable the discharge MOSFET for up to 60 seconds and enter shutdown mode. Recovery occurs once charging is applied or the power button is pressed after protection has been triggered.

Total Voltage Under-Voltage Protection: When the pack voltage reaches the total under-voltage protection threshold, the BMS turns off the discharge MOSFET for 60 seconds and enters Shutdown Mode. As with individual cell protection, recovery is initiated by applying charge or by pressing the power button.

Current Detection and Protection

Voltage Detection: The BMS monitors cell voltage with an accuracy of ±10 mV between 0 and 45 °C, and ±30 mV between -20 and 70 °C.

Individual Cell Over-Voltage Protection: If any cell reaches its individual over-voltage protection threshold, the BMS disables the charging MOSFET and stops charging. Protection is cleared once the voltage falls to the recovery level or the discharge current rises sufficiently to release the over-voltage condition.

Temperature Detection and Protection

Temperature Detection: The BMS monitors temperature using sensors for four cells, one environmental point, and one MOS tube. Temperature sampling accuracy is ±2 °C under normal conditions. The core temperature sensor is a 10K/3435 NTC thermistor.

FUNCTION DESCRIPTION

Charging Over-Temperature Protection: During charging or discharging, if the temperature reaches the charging over-temperature protection threshold, the BMS disables the charging MOSFET and stops charging. Charging automatically resumes once the temperature falls below the over-temperature recovery value.

Charging Under-Temperature Protection: Under all operating conditions, if the temperature reaches the charging under-temperature protection threshold, the BMS disables the charging MOSFET and stops charging. Charging resumes when temperature rises above the under-temperature recovery value.

Discharge Over-Temperature Protection: If the temperature reaches the discharge over-temperature protection threshold during charging or discharging, the BMS disables the discharge MOSFET and stops discharging. Discharging resumes once the temperature falls below the over-temperature recovery value. Charging temperature protection is also applied after general discharge over-temperature protection, and the charging temperature limit is set lower than the discharge temperature limit.

Discharge Under-Temperature Protection: If the temperature reaches the discharge under-temperature protection threshold during charging or discharging, the BMS disables the discharge MOSFET and stops discharging. Discharging resumes once temperature rises above the recovery value. Charging temperature protection also applies after general discharge under-temperature protection, and the charging temperature limit is set higher than the discharge temperature limit.

Ambient Over/Under-Temperature Protection: An NTC sensor on the PCB monitors the internal ambient temperature of the case. When ambient temperature reaches the over-temperature or under-temperature protection threshold, the BMS stops both charging and discharging. Operation resumes only when ambient temperature returns to the defined recovery range.

Power Over-Temperature Protection: The NTC sensor monitoring the MOS power tube temperature on the PCB triggers protection when the MOSFET temperature reaches its over-temperature threshold. The BMS stops charging and discharging until the MOS tube temperature falls back to the recovery value, at which point normal operation can resume.

Balancing Function

Standby Balance: The BMS uses an energy-consumption equalisation circuit. Balancing begins when both the equalisation start voltage and the differential-pressure threshold are met. The default start voltage is 3.4 V, the equalising current is ≥ 50 mA, and the equalising resistor temperature must remain below 50 °C.

FUNCTION DESCRIPTION

Charge Balance: During charging, the BMS initiates balancing once the equalisation start voltage and differential-pressure conditions are satisfied. As with standby balancing, the default start voltage is 3.4 V, the equalising current is ≥ 50 mA, and the equalising resistor temperature must not exceed 50 °C.

High-Temperature Balance Inhibit: Balancing is disabled automatically if the equalising resistor temperature reaches the high-temperature limit.

Balance Timeout: The BMS terminates balancing once the configured maximum balance duration has been reached.

Temperature Rise

Main Heating Components: The BMS temperature rise must not exceed 70 °C when the battery pack is discharged horizontally at the rated discharge current under ambient conditions of 25 °C. When tested in an environment at 55 °C, the battery pack is placed flat and discharged at 0.1 C. In this test condition, the BMS MOSFET is not thermally protected.

Consumption: In normal standby operation, when the **time-limit flow module is not active**, BMS consumption is ≤ 40 mA. When the **standby time-limit flow module is enabled**, consumption is ≤ 60 mA. In **shutdown or hibernation**, BMS consumption falls to ≤ 0 uA. The **individual LCD screen** consumes ≤ 5 mA.

Storage

Historical Data Storage: The BMS records historical operating data, including state transitions, individual cell voltages, total pack voltage, charge and discharge currents, temperature, and other parameters. Data is logged with timestamps in year/month/day/hour/minute/second format, with a storage capacity of at least 500 records. A first-in, first-out system is used, and stored data can be viewed through the monitoring interface.

Pre-charge

Pre-Charge on Power-On: When the BMS is turned off, pressing the power key initiates startup. The pre-charge function activates immediately to prevent short-circuit protection from being triggered by a capacitive load.

Pre-Charge in Standby Mode: If the BMS is suddenly connected to a capacitive load while in standby, it identifies the load as capacitive and activates the pre-charge function to avoid triggering short-circuit protection.

FUNCTION DESCRIPTION

Automatic Dialling

Automatic Address Assignment: For automatic address assignment in parallel systems, the parallel units must be connected to the internal communication line using the specified parallel communication wiring method. If wiring is not completed correctly, the address cannot be assigned automatically. Users should confirm that the correct parallel communication method has been followed.

One-Button Switch

One-Button Off: When the host unit is instructed to shut down, it sends a shutdown command to the slave unit. The correct shutdown sequence requires the host to be turned off manually first; the host then issues the shutdown command to the slave. The host will complete its shutdown only after the slave has powered down in sequence. Manually shutting down the slave alone will not trigger the one-button shutdown process.

One-Button On: When any one BMS unit in the system is powered on, all other connected BMS units will activate gradually.

WARRANTY

The Fogstar Energy 10kWh battery comes with a 6-year warranty and 10-year customer support, covering BMS failure, cell failure, temperature sensors, charging/discharging faults, and internal corrosion. Excludes misuse, tampering, incompatible systems, or accidental damage.

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 16 units in parallel.

What are the dimensions of the 10kWh Battery?
550 (L) x 175 (W) x 904 (H) mm

Do I need to configure DIP switches?
The Fogstar Energy 10kWh 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.

What does each LED mean on the battery?
The BMS uses four SOC LEDs, one ALARM LED, and one RUN LED to display operating status, capacity, and protection events. LED behaviour (solid, off, or flashing) indicates charging, discharging, standby, or fault conditions. Please refer to pages 11 and 12 for the full LED indicator guide.

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.

What is the warranty period?
This battery includes a 6-year warranty, along with 10 years of ongoing support. For full warranty terms and conditions, please refer to the Fogstar website.

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