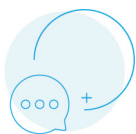




AM2+

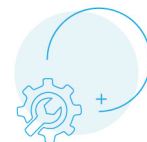
MANUAL



**Settings &
Communication**



Installation



Troubleshooting

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1. IMPORTANT INFORMATION

If the battery voltages vary by more than 1 V, the batteries cannot be paralleled without first charging them individually to the same voltage.

Due to the low impedance of the batteries, connecting them in parallel with different voltages will cause very high magnitude currents to flow between them as they try to equalize.

This will cause the batteries to shut down due to over current protection.

Labels printed on the battery are shown in this manual exactly as they appear on the unit (e.g. WiFi, Coms). Wi-Fi is used when referring to the wireless technology in general.

1.1 Manual Explanation

It is important that you read this manual before attempting the installation of your battery. Please take note of certain steps to ensure correct inverter compatibility.

Please visit <https://www.hubbleenergy.com/> for the latest version of this manual.

1.1.1 Warning

Working with high-current DC systems is dangerous. Do not attempt to modify your inverter and battery setup unless you are certain you understand the risk. Speak to a qualified electrician if you are unsure.

1.1.2 Safety

Please ensure you follow all the safety regulations, standards and codes that apply to the installation and wiring of alternative energy backup systems, whether it is an off grid or grid-connected installation.

The battery should only be installed by a suitably qualified and trained person or under the direct guidance and supervision of such a person, who will be responsible for their safety.

1.1.3 Heavy Equipment Warning

Due to the battery's heavy weight, wear safety shoes when installing and handling the battery. More than one person will be required to unpack the battery safely.

1.1.4 High Currents

There is a risk of electric burns due to the high current if a battery is short circuited. Please use properly insulated tools when connecting the battery.

1.1.5 Inverter Setup

Ensure that the inverter settings are correctly configured for the battery.

1.1.6 3rd Party Interfacing Devices Not Allowed

It is strictly forbidden to access or interfere directly with the battery through third party devices such as monitoring devices or logging devices that are not Hubble Energy products. Third party monitoring and interfacing devices have the potential to change charge voltages and algorithms inadvertently - this can cause a catastrophic fire hazard. Therefore, interfacing to the BMS directly without authorization will void the warranty and Hubble Energy will not be liable for any resulting damages.

2. INTRODUCTION

The Hubble AM2+ is a maintenance-free NMC Lithium-Ion battery designed for residential and commercial backup power systems. It operates at 48V, offers 126Ah capacity, and provides 6.048 kWh of usable energy. A built-in Battery Management System (BMS) protects the cells by managing safety and automatically disconnecting the battery when necessary.

The unit includes an integrated Wi-Fi-enabled Cloudlink system, which allows remote monitoring and management via the Hubble Cloudlink mobile app or web portal. The battery continues to function normally even without a Wi-Fi connection.

The battery enclosure was designed to provide a sleek wall mounted storage solution, with an enclosed internal wiring compartment to prevent accidental access to power and communication cables, thus ensuring a safer and more reliable installation. A LED light bar on the enclosure allows quick observation of battery parameters such as the state of charge and power flow direction

Battery capacity can be expanded by connecting up to 15 batteries in parallel, mainly for extended energy storage. However, when higher power output (higher amperage) is required, fewer parallel units are recommended to avoid practical issues associated with large current-carrying cables.

⚠ Important safety note: AM2+ batteries must never be connected in series; only parallel connection is allowed.

Hubble Energy has been certified with leading inverter manufacturers for compatibility with their products. Please view our website here <https://www.hubbleenergy.com> for the full compatibility list.

3. TYPICAL APPLICATION

The Hubble AM2+ battery plays a key role in maintaining a reliable, efficient, and stable energy storage system. Its main functions include:

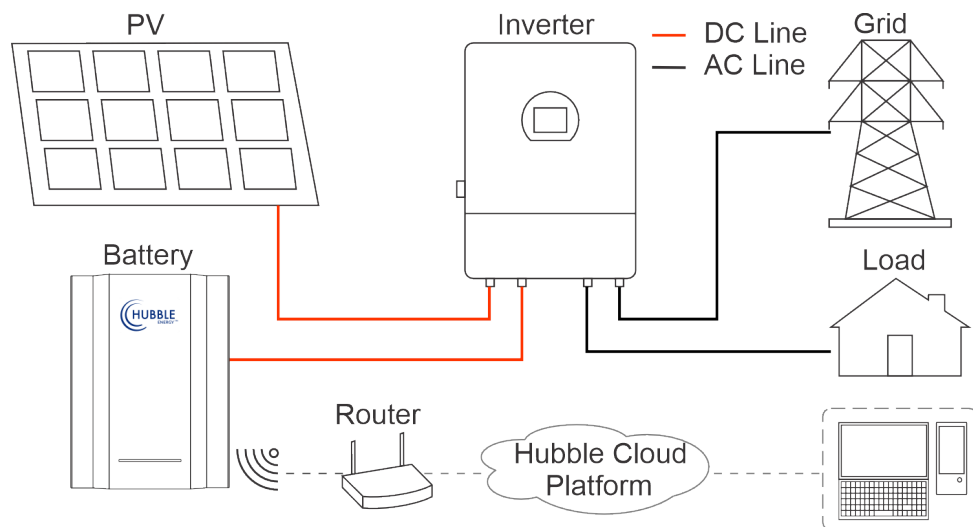
Energy Storage: Captures excess energy from sources like solar PV or during low-demand periods, making it available when production drops or demand increases.

Backup Power: Automatically supplies power during grid failures or instability, ensuring essential devices and systems remain operational.

Load Shifting & Peak Shaving: Helps reduce energy costs by charging during off-peak times and discharging during high-demand periods to minimize expensive grid usage.

Renewable Energy Integration: Smooths fluctuations in renewable generation, providing a steady power output and improving overall system performance and sustainability.

System Monitoring & Control: Includes Cloudlink for remote monitoring, diagnostics, and performance management via the Hubble Cloudlink mobile app or web portal



4. TECHNICAL SPECIFICATIONS

Battery Parameter	Specification
Model	Hubble AM2+
Nominal Energy	6.048 kWh
Design Capacity	126 Ah
Nominal Voltage	48.0 Vdc
Battery Type	NMC 13 Cells per battery
Operating Voltage Range	44 Vdc – 53.6 Vdc
Charging Voltage	53.6 Vdc
Inverter Cut Off Voltage	≥44 V (recommended) / 42 V (minimum)
Charge Current (A)	100 A, Recommended 30 A
Discharge Current (A)	100 A, Recommended 80 A
Cell Service Life	1500 cycles within the Hubble Energy 10-year warranty (Ts & Cs Apply)

Battery Management System (BMS)

Power (Self-Consumption)	≤ 2 W
Cell Balancing (Charging Mode)	Passive - activated once cells are close to full charge voltage
Intelligent Current Limiter	Limits charging current to 20 A if it exceeds 100 A
Protection	Over Charge; Over Discharge; Over Current; Short Circuit; Over and Under Temperature

Cloudlink (Monitoring)

Cloudlink	Built-In
Power (Self-Consumption)	≤ 2 W
Wi-Fi Protocol	802.11 b/g/n/e/i (802.11n up to 150 Mbps)
Communication	CAN / RS485 / RS232

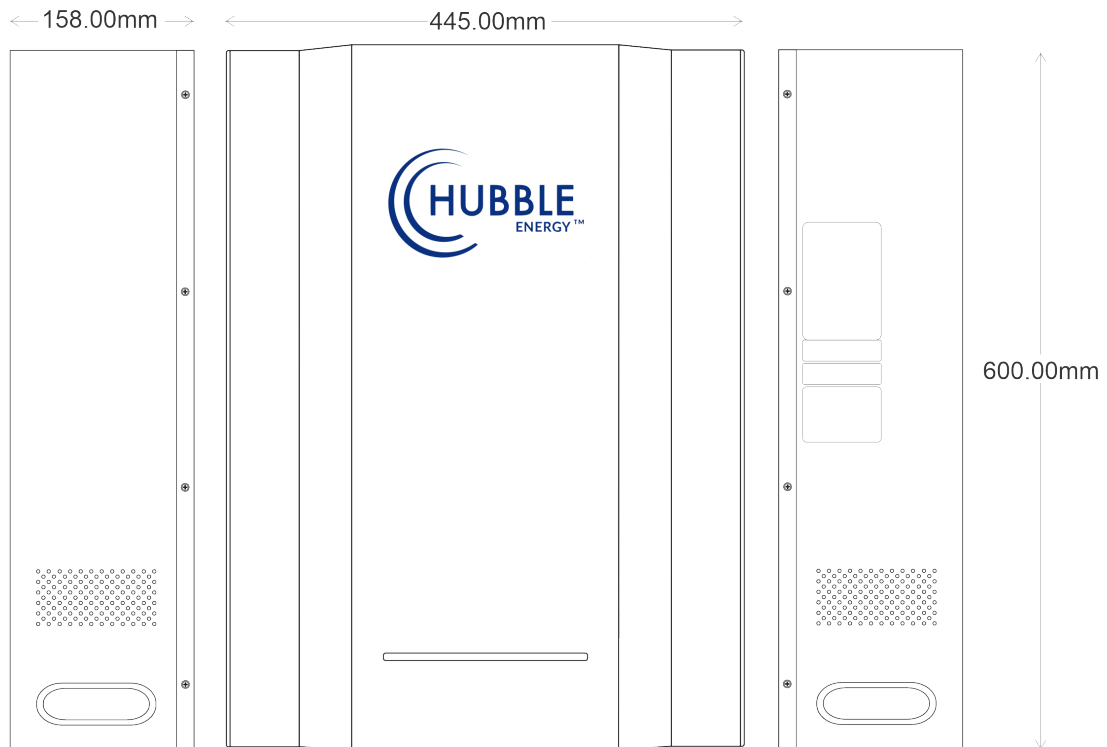
Physical

Dimensions	600 * 445 * 158mm (Height, Width, Depth)
Weight	Approx. 39.1 kg
Installation Mounting	Wall Mounted – Mounting Bracket

Environmental

Operating Temperature	-10 °C to 50 °C
Storage Temperature	10 °C to 50 °C
Humidity	15% to 75%
Certification	CE, UN38.3

5. PRODUCT OVERVIEW



5.1 Packaging Content

TRANSPORT & PACKAGING

No liability can be accepted for damage in transit if the equipment is not transported in its original packaging. Only store the product in a dry environment, within the recommended storage temperature range.

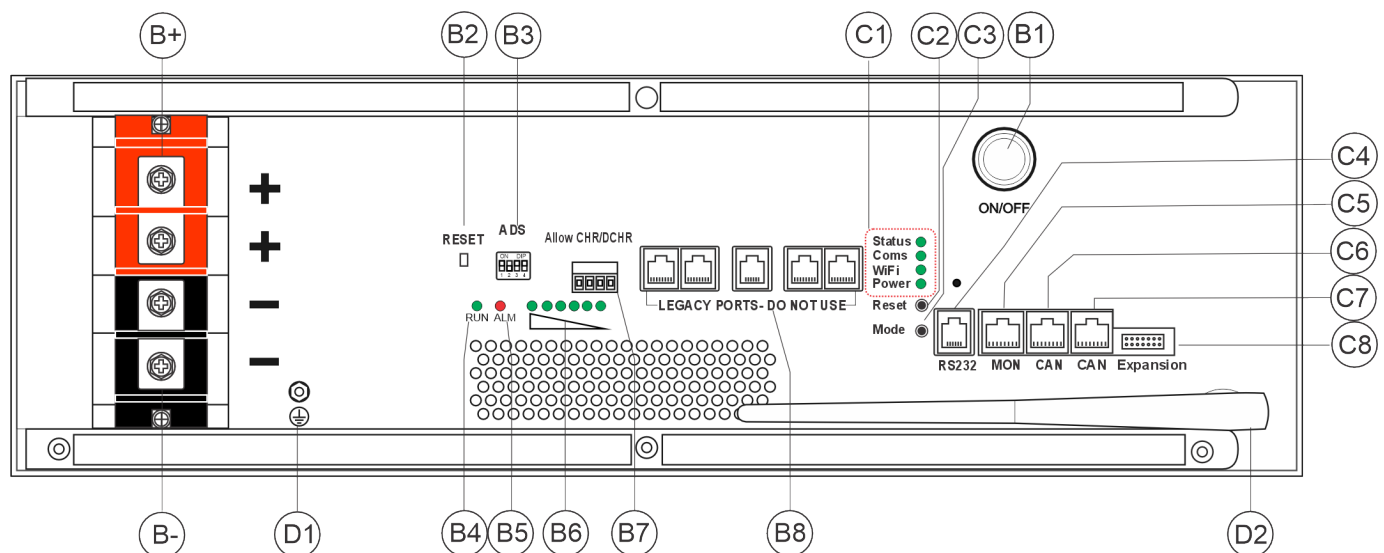
The following is contained in the packaging.

- 1x AM2+ battery.
- 1x Wall mounting bracket.
- 6x M8X60 anchor bolts.
- 1x 1,5m Grey Battery link cable (for paralleling batteries).
- 1x 1,5m CAN/485 Cable
- 1x 1m Red 25mm² battery cable.
- 1x 1m Black 25mm² battery cable.
- 1x CAN terminator (fitted in one of the CAN ports)

Optional Communications Cable.

- 1x AM2+ to AM-2 Transition Cable - to be ordered when paralleling AM2+ with AM-2 batteries.

5.2 Wiring Interface



5.2.1 Legends

Legend	Description
B+	Battery POS terminals
B-	Battery NEG terminal
B1	ON/OFF switch
B2	Reset Button
B3	Dip Switches
B4	Run LED
B5	Alarm LED
B6	SOC Indicator
B7	Allow Charge/Discharge Dry Contacts
B8	Legacy Ports – "Do Not Use"

Legend	Description
C1	Cloudlink LED's
C2	Cloudlink Reset Button
C3	Cloudlink Mode Button
C4	RS232 Port
C5	MON Port
C6	CAN Port
C7	CAN Port
C8	Expansion Connector "Not in Use"
D1	Earth Connection
D2	Antenna

5.3 Wiring Interface Description

A brief description of the function of each interface is provided below.

Note that the BMS indicators, DIP switch settings and Cloudlink indicators will be discussed in more detail in later sections of the manual.

5.3.1 Battery Terminals

ID	Interface	Function
B+	Battery POS terminal	Allows the positive output of the battery to be connected to the system.
B-	Battery NEG terminal	Allows the negative output of the battery to be connected to the system.

5.3.2 BMS Interface

B1	ON/OFF switch 	Powers the BMS ON/OFF. The BMS connects the battery cells to the battery terminals through an electronic switch unless a protection condition is detected.
B2	Reset 	The reset button is located to the left of the dip switches and the button can be used to wake up the battery from the low power sleep state, put it in the sleep state, or to reset the BMS protection board. Wake up: Press and hold the reset button for more than 1 second. Enter sleep mode: Press and hold for 3 to 6 seconds. Reset protection board: Press and hold for more than 6 seconds.
B3	Dip Switches 	The DIP switches are used to set a unique communication address for each battery.
B4	Run indicator 	If the run LED is lit or flashing, the battery terminals are connected to the battery cells. <ul style="list-style-type: none"> • A flashing run indicator signals that the battery is discharging. • A lit indicator signals that the battery is charging.
B5	Alarm Indicator 	The red alarm indicator flashes when an alarm condition is detected and is solid on when a protection is detected. In case of an alarm the battery will continue to operate as indicated by the run indicator. In case of a protection condition the run indicator will turn off and the battery terminals will be disconnected from the cells to either disconnect the charging, discharging or both current paths.
B6	Battery SOC indicator 	Six green indicators light up linearly to indicate the current state of charge of the battery Each indicator represents a 16.7 % change in SOC. While the battery is charging, the highest active SoC indicator will be flashing to indicate the battery is being charged. (Do not confuse this with the run indicator which flashes when the battery is being discharged.)
B7	Allow Charge/Discharge 	The dry contacts are potential free normally open contacts, that can be used to signal when the BMS experiences an alarm or protection condition. Two dry contacts are available on the four-pin connector: <ul style="list-style-type: none"> • Pins 1 and 2 will close when there is a low battery alarm. • Pins 3 and 4 will close when there is a protection or fault condition.
B8	Legacy Ports	Do Not Use

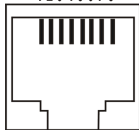
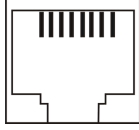
5.3.3 Cloudlink Interface

C1	LED Indicators	Description
	Status 	<p>Four green LED's provide information on the status and operating mode of the Cloudlink.</p> <p>Status Led After the Cloudlink reboots the status Led flashes rapidly for about 5 times. Thereafter it flashes once every 15 seconds to indicate that the Cloudlink is operational.</p>
	Coms 	<p>Coms Led Indicates if a communication connection exists to the battery, inverter and/or other 3rd party equipment such as energy meters.</p> <p>OFF: No serial or CAN communication to devices present (e.g., no battery or inverter connected).</p> <ul style="list-style-type: none"> FLASHING: The Cloudlink has serial or CAN communications with one device. LIT: if the Cloudlink has serial or CAN communications to more than one device.
	WiFi 	<p>Wi-Fi Led Status of Wi-Fi connection</p> <ul style="list-style-type: none"> OFF: No Wi-Fi networks could be found. FLASHING: Connected to a Wi-Fi network. LIT: Connected to a Wi-Fi network with internet access.
	Power 	<p>Power Led</p> <ul style="list-style-type: none"> LIT: The Cloudlink is powered.

5.3.4 Cloudlink Buttons

C2	Reset 	Reset Button - Reboots the Cloudlink.
C3	Mode 	Mode Button - Sets the Cloudlink into different configuration modes.

5.3.5 Cloudlink Communication Ports

C4	RS232 Port	This RS232 port is unused.																		
C5	MON Port 	<p>This RJ45 MON port contains three communication interfaces.</p> <ul style="list-style-type: none">• RS232 (Pin 1 & 2)• RS485 (Pin 3 & 5)• CAN (Pin 6 & 7) <table><tr><th>Pin</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr><tr><td>Function</td><td>RS232-RX</td><td>RS232-TX</td><td>RS485-B</td><td></td><td>RS485-A</td><td>CAN-H</td><td>CAN-L</td><td>GND</td></tr></table>	Pin	1	2	3	4	5	6	7	8	Function	RS232-RX	RS232-TX	RS485-B		RS485-A	CAN-H	CAN-L	GND
Pin	1	2	3	4	5	6	7	8												
Function	RS232-RX	RS232-TX	RS485-B		RS485-A	CAN-H	CAN-L	GND												
C6 & C7	CAN Port 	<ul style="list-style-type: none">• RS485 BMS Battery Link (Pin 1 & 2) Each slave battery communicates over the RS485 BMS link to transmit its battery information to the master battery.• CAN (Pin 4 & 5) The master battery sends the combined battery information to the inverter• RS485 (Pin 7 & 8) <table><tr><th>Pin</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr><tr><td>Function</td><td>RS485 BMS Link-B</td><td>RS485 BMS Link-A</td><td></td><td>CAN-H</td><td>CAN-L</td><td>GND</td><td>RS485-A</td><td>RS485-B</td></tr></table>	Pin	1	2	3	4	5	6	7	8	Function	RS485 BMS Link-B	RS485 BMS Link-A		CAN-H	CAN-L	GND	RS485-A	RS485-B
Pin	1	2	3	4	5	6	7	8												
Function	RS485 BMS Link-B	RS485 BMS Link-A		CAN-H	CAN-L	GND	RS485-A	RS485-B												
C8	Expansion Port	The expansion port is reserved for future use.																		

6. AM2+ DIP SWITCH SETTINGS

For parallel connected batteries, each battery must be assigned a role as either a MASTER or a SLAVE, and all batteries must be interconnected using the battery link cables via the CAN ports.

In a parallel battery system, only one battery can function as the MASTER, and up to 14 additional batteries may be configured as SLAVES, each with a unique address.

Sometimes, if communication settings are changed while the inverter/battery is powered on and operating, the BMS data may not refresh correctly. For this reason, any adjustments to the communication cabling or battery DIP-switch settings should be made only when the entire system is powered down and fully isolated.

It may also be necessary to perform a Cloudlink reset after making these configuration changes to ensure proper communication and data updates

If the system uses only a single battery, it must be configured as the MASTER

To accomplish this, the DIP switches  must be set for each battery.

BATTERY NUMBER	ASSIGNMENT	ADDRESS	DIP SWITCH	DIP SWITCH: ADDRESS			
			POSITION	#1	#2	#3	#4
1	Master	1		ON	OFF	OFF	OFF
2	Slave 1	2		OFF	ON	OFF	OFF
3	Slave 2	3		ON	ON	OFF	OFF
4	Slave 3	4		OFF	OFF	ON	OFF
5	Slave 4	5		ON	OFF	ON	OFF
6	Slave 5	6		OFF	ON	ON	OFF
7	Slave 6	7		ON	ON	ON	OFF
8	Slave 7	8		OFF	OFF	OFF	ON
9	Slave 8	9		ON	OFF	OFF	ON
10	Slave 9	10		OFF	ON	OFF	ON
11	Slave 10	11		ON	ON	OFF	ON
12	Slave 11	12		OFF	OFF	ON	ON
13	Slave 12	13		ON	OFF	ON	ON
14	Slave 13	14		OFF	ON	ON	ON
15	Slave 14	15		ON	ON	ON	ON

7. PARALLELING BATTERIES GENERAL INFORMATION

Multiple batteries can be connected in parallel when a longer backup time is required (higher energy storage capacity) or when more power (higher amperage) is required or a combination of both.

If the main purpose is to increase the output power, it is recommended not to connect more than two to eight paralleled batteries to a single inverter due to the high amperage large diameter cables that will be required, which will make the installation impractical.

If the main purpose is to increase the backup time with a low-power inverter and load matching the power delivery of one or two batteries, more batteries may be connected in parallel.

7.1 Parallel Battery Requirements

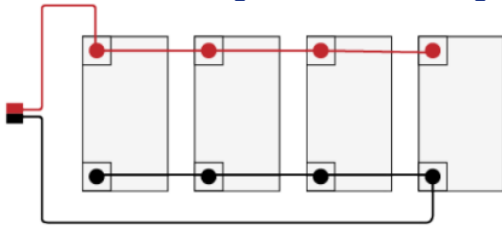
Batteries can be connected in parallel, provided that the following requirements are met:

- Only identical battery models of the same capacity may be connected in parallel.
- The voltage of each battery must be identical, otherwise large currents will flow between the batteries when they are turned on. This can cause the battery's protection to disable the battery.
- The power cabling must be done in such a way that the impedance from the inverter to each battery is identical, to ensure current sharing.
- DIP switches must be configured on the battery to set a unique address for each battery.
- Communication cables must be connected between the batteries and from the master battery to the inverter. Connection or splitter boxes are not permitted to be used.

7.2 Power Cables

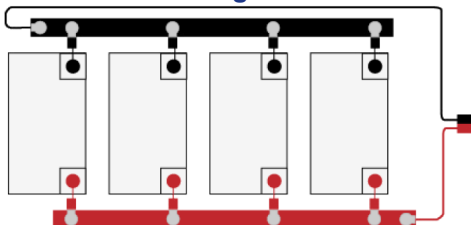
Due to the low impedance of the batteries, it is very important that the power cable lengths from each battery to the inverter are identical, otherwise, the battery connected with the shortest cable will provide most of the current.

7.2.1 Paralleling Of Batteries Using Cables



- All positive poles are connected together.
- All negative poles are connected together.
- Due to paralleling the cables must be rated at a multiple of the rated battery current.
- If the aim of paralleling is to increase output power, this becomes impractical when many batteries must be connected in parallel, due to the large cable diameters involved.
- These cables will also be too big to connect to the terminals on the batteries.
- To ensure that the impedance to each battery is the same, connect the positive load cable to the positive terminal of the first battery, and connect the negative load cable to the negative terminal on the last battery.

7.2.2 Paralleling Of Batteries Using Busbars



- All positive poles are connected together using short cables to a central copper busbar.
- All negative poles are connected together using short cables to a central copper busbar.
- The cables between the batteries and busbars are rated for the rated battery current.
- To ensure that the impedance to each battery is the same, connect the positive load cable to one end of the positive busbar closest to the first battery, and connect the negative load cable to the opposite end of the negative busbar closest to the last battery.
- These cables must be rated at a multiple of the rated battery current.

8. INSTALLATION



WARNING - HEAVY PART

The HUBBLE AM2+ weighs 39.1kg and requires at least TWO people to lift it safely. The handles on the sides are not suitable for lifting the battery and are used for positioning.

This section provides information on how to install the battery, how to parallel batteries and describe the communication cable pinouts.

The battery should be installed using the guidelines contained in this manual and should only be used for its designated application.

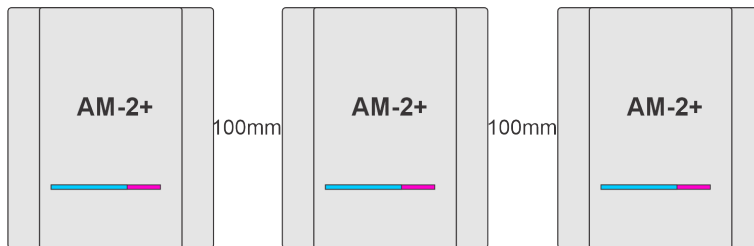
- Never install the Hubble AM2+ where there is corrosive or explosive gas.
- Do not install the battery outdoors or in direct sunlight or damp environments.
- Only qualified personnel should perform electrical connections.

8.1.1 Unpack the battery and check the condition

- Carefully remove packaging without using sharp objects near the enclosure.
- Check the battery for any damage.
- If the battery is damaged, do not proceed and contact your supplier.
- When no damages are visible, please proceed.

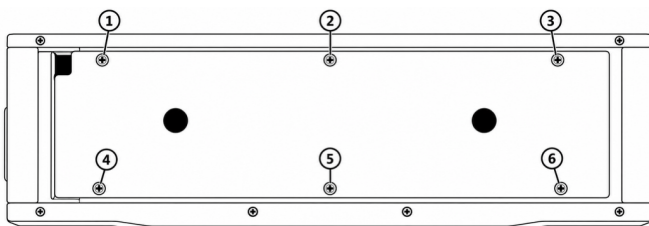
8.1.2 Positioning

- Ensure the mounting surface is flat, level, and strong enough to support the unit's weight.
- Ventilation openings are unobstructed
- There is clear access to the bottom wiring cover.
- Power and communication ports are reachable.



8.1.3 Removing the wiring compartment lid

The wiring compartment is enclosed by a removable lid, secured with six screws. Magnetic strips on the lid hold it in position against the enclosure, so it does not fall while the screws are being removed or fitted. Once the lid is removed, the terminals, controls, indicators, and communication ports become accessible, allowing the installer to connect power and communication cables and to turn on and configure the battery.



1. Using a suitable Phillips screwdriver, remove the six lid screws marked 1–6. The magnetic strips will keep the lid in place while the screws are removed.
2. Pull the lid straight away from the compartment to release the magnets and place the lid and screws aside safely for refitting.
 - Refitting: Position the lid on the compartment; the magnetic strips will hold it in place. Fit and tighten all six screws, ensuring no cables are trapped beneath it.

8.1.4 First Power Up Check

Recommended practice: Check each battery individually before mounting or connecting any DC or communication cables. This check is not compulsory but helps identify startup or firmware issues before installation. Software Version V5.0.8 or later is required.



1. With no cables connected to the battery, turn the ON/OFF switch ON. Verify that the battery, Cloudlink and light bar power up.
2. Using a suitable DC voltmeter, measure the voltage across the battery's positive (+) and negative (-) terminals. Confirm that the voltage is within the specified range. Record the reading.
3. Press and hold the Cloudlink Mode button (M). Continue holding after the first beep, then release after two consecutive beeps. Confirm that the light bar displays a green sweeping pattern, followed by solid green, indicating Configuration Mode.
4. Open Wi-Fi settings on your phone or computer and connect to RIOT CL-xxxx, as illustrated. No password is required.
5. If prompted, select Connect anyway or Keep connection. "Connected without internet" is normal.
6. Open your browser and enter <http://192.168.4.1>.
7. On the Information page, scroll down and check the Software Version, as indicated in the screenshot. It must be V5.0.8 or later.
8. If an earlier version is installed, contact Hubble Technical Support with the battery and Cloudlink serial numbers to arrange the required update before installation.
9. Tap Menu (≡), select Exit, then select Yes when prompted to exit Configuration Mode.
10. Confirm that the light bar sweeps through different colors and returns to the pink and blue SOC display.
11. Turn the battery OFF and repeat the check for each remaining battery.

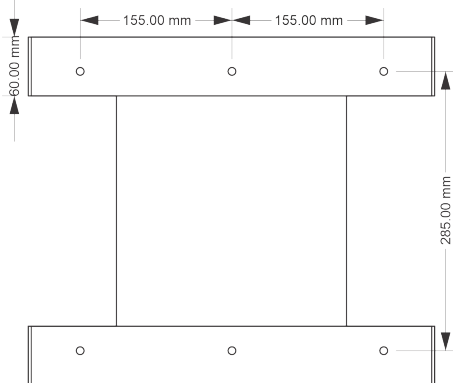
SOFTWARE VER Hubble CL 8m Main v5.08

Note:

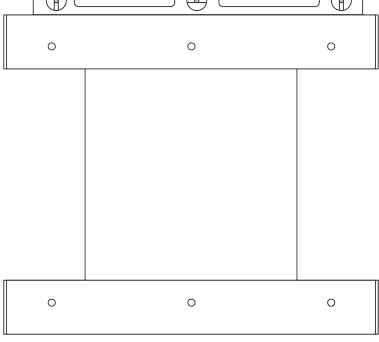
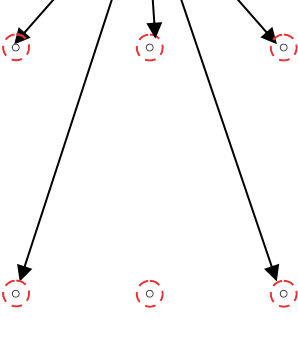
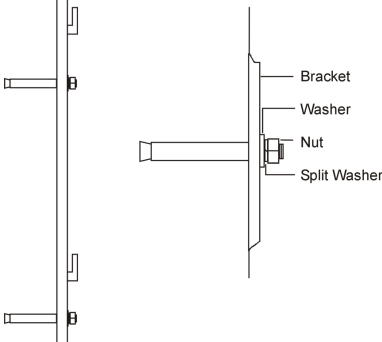
If the RIOT CL network does not appear or the session times out, re-enter Configuration Mode and try again.

8.2 Mounting the Bracket

Mounting Bracket dimensions

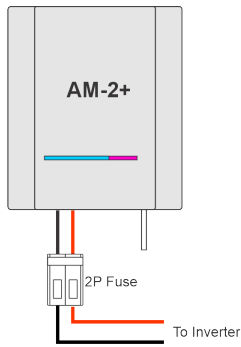


1. Install the mounting bracket as shown below:

Press the mounting bracket against the wall surface, level the bracket with a spirit level. Mark the 6 x positioning holes against the mounting surface.	Remove the mounting bracket and drill the marked holes into the wall.	Insert the 6 x anchor bolts into the drilled holes. Secure the mounting bracket and tighten the nuts.
		

2. Lift the AM2+ battery and hook it into position securely onto the wall mount bracket

8.3 Single Battery Installation



8.4 Parallel Connected Batteries

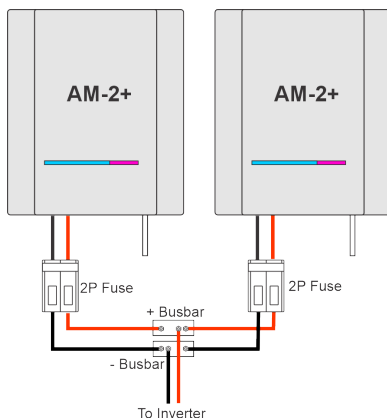
If the system requires parallel connected batteries, measure and note the voltage of each battery, to check if the batteries are unbalanced.

If the voltages vary by more than 1V, the batteries cannot be paralleled without first charging them individually to the same voltage. (Due to the low impedance of the batteries, connecting them in parallel with different voltages will cause very high magnitude currents to flow between them as they try to equalize.

This will cause the batteries to shut down due to over current protection.)

8.4.1 Batteries connected in parallel using a busbar system.

If more than two batteries are paralleled, the preferred method to parallel them is to use a busbar system, to ensure the batteries share current equally.



8.4.2 Mount the DC Isolating Device

Mount the DC isolation device/s. Either use a properly rated DC circuit breaker or fuse disconnect switch, to allow the battery / batteries to be connected to a single or multiple inverters.

- The isolation device must provide overload protection and isolate both the positive and negative battery poles.

8.4.3 Mount/Install the Rest of the Power System Components

Mount the rest of the power system components e.g., inverter, distribution boards etc.

8.4.4 Connect the Battery Cables

DC Battery wiring must comply with local installation standards.

- Ensure that the battery ON/OFF switch is turned off.
- Identify the labelled terminals/ports:
Battery positive (+).
Battery negative (-).
- Route cables through the provided cable entry glands.
- Ensure the battery terminals are connected securely and with correct DC polarity.

Single battery installation:

- Connect the battery terminals to the DC isolation device using correctly rated cables.

Parallel battery installation:

- If a busbar system is used, connect the battery terminals to the busbar system and then to the DC isolation device, using correctly rated cables.
 - If no busbar system is used, connect the batteries in parallel using the main battery terminals.
 - Please note that the current flowing between the batteries will now be a multiple of the rated current of a single battery.
 - Ensure that correctly rated cables are used.
-

8.4.5 Configure the Battery DIP Switches

Configure the DIP switches to set the address for each battery used. In a single battery installation ensure the DIP switch is set to the master battery. In a parallel connected installation, each battery must have a unique address.

Refer to the **Section 6 “DIP Switch Settings”** for more details on configuring the DIP switches.

8.5 Communication Cable Connection

8.5.1 Inverter to Battery CAN Communications Cable

DO NOT USE A FULLY POPULATED COMMS CABLE BETWEEN THE INVERTER AND THE BATTERY

Depending on the type and model of inverter used, the pins onto which the CAN bus signals terminate on the inverter side will differ.

The battery contains CAN and RS485 signals on both the battery CAN ports.

The CAN-H and CAN-L wires carry all the real-time data from the battery to the inverter. Without these two lines connected correctly, the inverter cannot read the battery's status, including: State of Charge (SOC), Voltage, Current limits, Temperature, Charge/discharge permissions.

Battery CAN Port								
Pin	1	2	3	4	5	6	7	8
Function	Do not use this pin when connecting to the inverter	Do not use this pin when connecting to the inverter	Do not use this pin when connecting to the inverter	CAN-H	CAN-L	GND	RS485-A	RS485-B

Connect the inverter communications cable to the **left CAN port (C6)** of the master battery.

Before wiring:

Before connecting the communications cable between Inverter and the battery one must establish the following because Incorrect pin alignment may prevent communication or damage equipment.

- Check if the inverter has one combined port or two separate ports.
- Always confirm the inverter's BMS/CAN RJ45 pin layout in the inverter's installation manual before connecting the cable.
- Inverter manufacturers do not all follow the same pin numbering; therefore, the installer must verify CAN pin and RS485 positions every time.

Inverters With a Single Combined Communication Port:

- Some models use ONE RJ45 port that carries both CAN and RS485 signals. Labelled BMS 485/CAN, CAN/485 etc, please check your inverter manual for the correct pin layout.

Inverters With Two Separate Communication Ports:

- Some inverters provide one port for CAN and another for RS485.

8.5.2 AM2+ Battery Parallel Link Cable:

In a parallel battery installation, link the batteries together using the supplied battery link cable in a daisy chain configuration, using the two ports labelled as CAN.

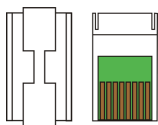
- Connect the supplied battery link cable from the right CAN port (C7) of the master battery to the left CAN port (C6) of the first slave battery.
- Then connect the next battery link cable from the right CAN port (C7) of the first slave to the left CAN port (C6) of the next slave battery.
- Repeat this pattern for all remaining slave batteries.

Battery Link Cable Mapping:

Pin 1 → Pin 1	Pin 2 → Pin 2	Pin 3 → Pin 3	Pin 4 → Pin 4
Pin 5 → Pin 5	Pin 6 → Pin 6	Pin 7 → Pin 7	Pin 8 → Pin 8

8.5.3 AM2+ Can Terminator:

Each battery is supplied with a CAN terminator, already fitted in one of the two CAN ports. Check which port it is in before connecting any communication cables. The terminator must always end up in the right CAN port (C7) of the last battery.

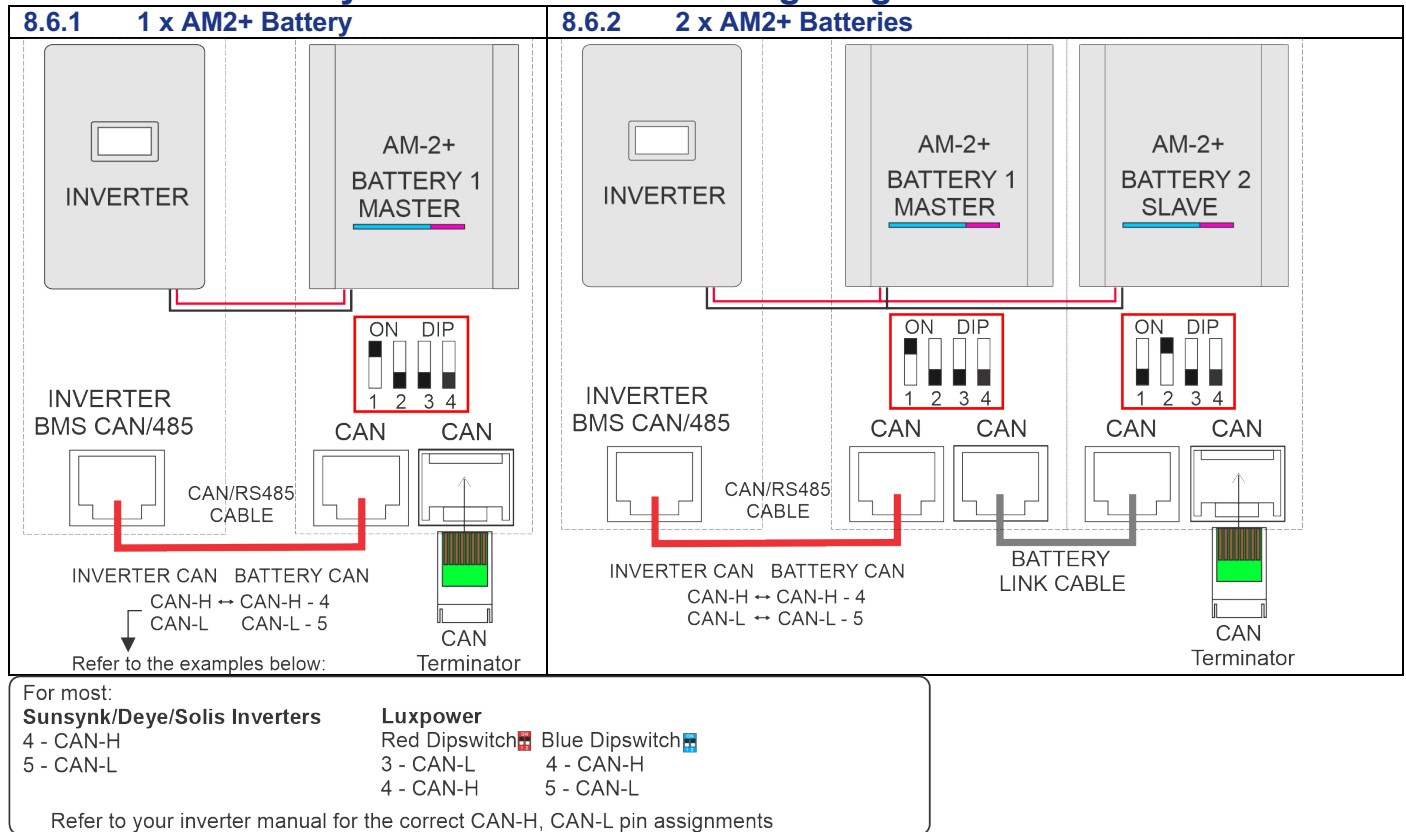


- Single battery: Make sure the CAN terminator is in the right CAN port (C7). If it is fitted in the left CAN port (C6), move it to C7.
- Parallel batteries: Remove the CAN terminator from the master battery and from every slave battery except the last one. The terminator must remain only in the right CAN port (C7) of the final slave battery.
- Keep the removed terminators in case the system is reconfigured later.

Please Note:

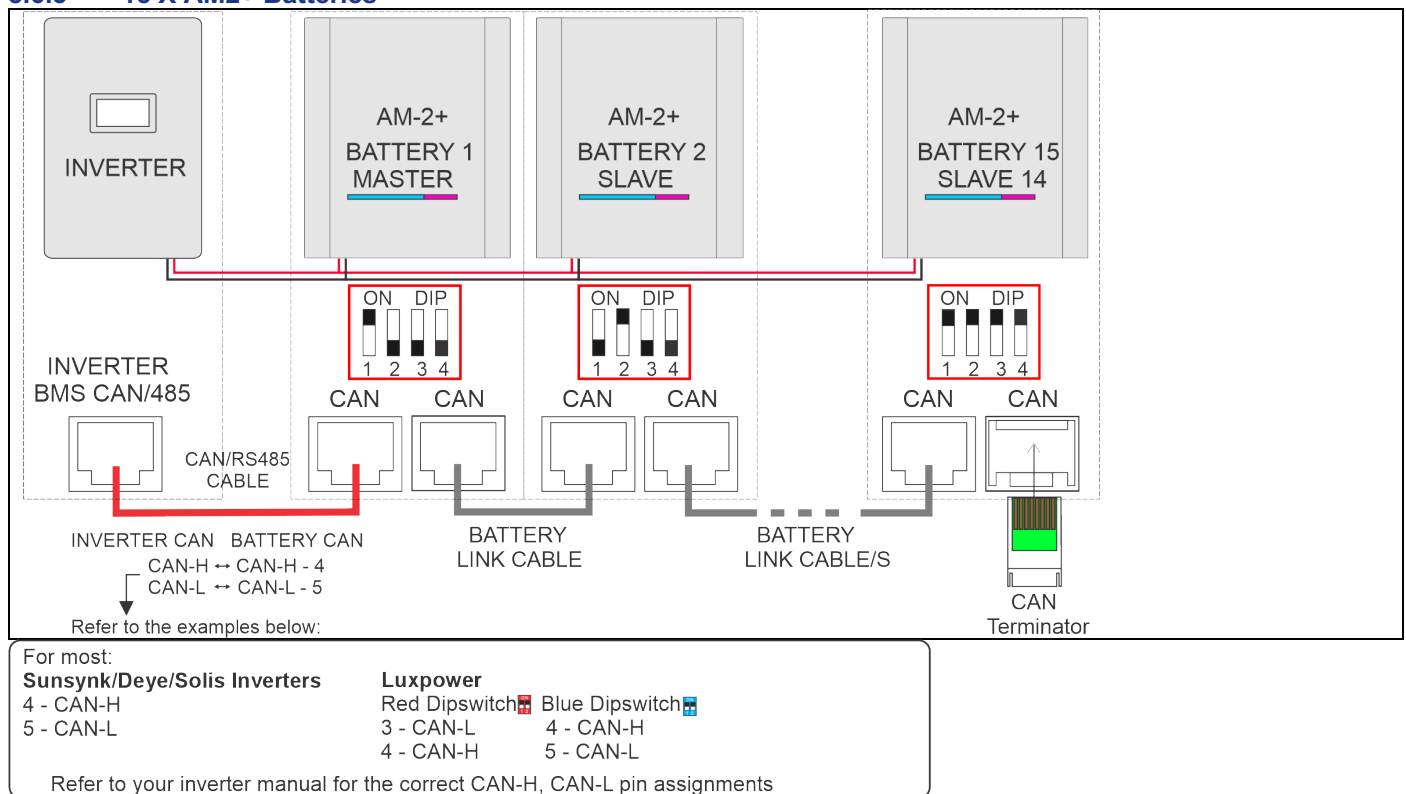
Refer to the reference diagrams on the next page for CAN enabled Inverters connected to Hubble batteries.

8.6 AM2+ Battery Communications Wiring Diagrams



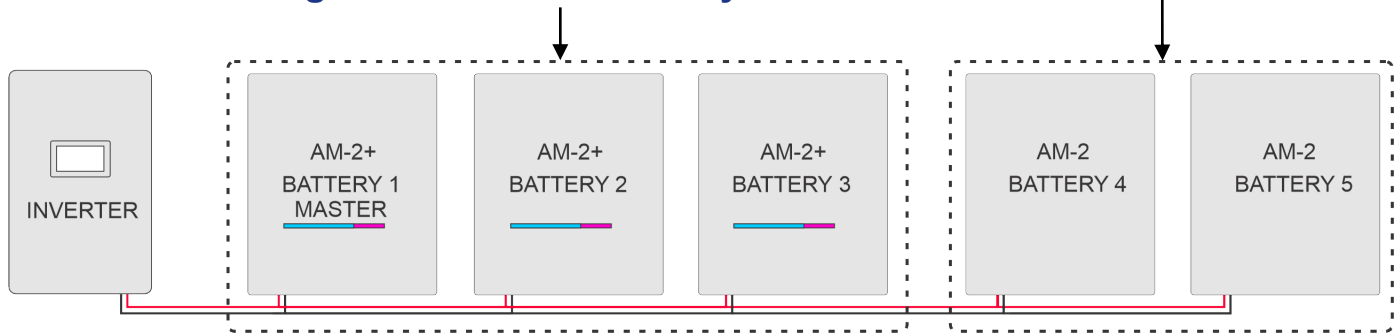
If the inverter has a CAN port, its CAN-H and CAN-L must be connected to the battery's CAN-H and CAN-L.
Please Note: Communications cabling color in this diagram is for illustration purposes only.

8.6.3 15 X AM2+ Batteries



If the inverter has a CAN port, its CAN-H and CAN-L must be connected to the battery's CAN-H and CAN-L.
Please Note: Communications cabling color in this diagram is for illustration purposes only.

8.7 Connecting The New AM2+ Battery with AM-2 Batteries



WARNING — Do not connect an 8-conductor straight patch cable between the AM2+ CAN Port and the AM-2 battery link port.

The two ports have different pin assignments.

When transitioning from **AM2+ to AM-2**, use only the specified **2-Wire Transition Link Cable**, with:

- Pin 1 ↔ Pin 1.
- Pin 2 ↔ Pin 2.
- Pins 3,4,5,6,7,8 must remain disconnected.

Cable Types:

- AM2+ CAN → AM2+ CAN uses the 8-core straight battery link cable.
- AM2+ CAN → AM-2 Battery Link Port uses the special 2-wire transition link cable.
- AM-2 Battery Link Port → AM-2 Battery Link Port uses the 8-core straight battery link cable.

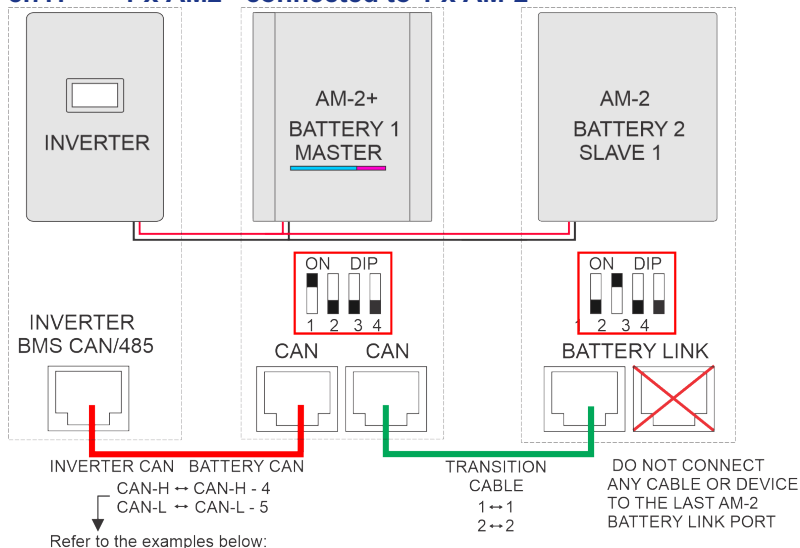
Cloudlink Firmware:

- All the AM2+'s internal Cloudlinks must be running Cloudlink Firmware v5.0.8 or later.

Example diagrams Sections:

- 8.7.1 - 1 x AM2+ connected to 1 x AM-2
- 8.7.2 - 1 x AM2+ connected to 3 x AM-2
- 8.7.3 - 2 x AM2+ connected to 3 x AM-2

8.7.1 1 x AM2+ connected to 1 x AM-2



For most:

Sunsynk/Deye/Solis Inverters

4 - CAN-H

5 - CAN-L

Luxpower

Red Dipswitch Blue Dipswitch

3 - CAN-L

4 - CAN-H

4 - CAN-H

5 - CAN-L

Refer to your inverter manual for the correct CAN-H, CAN-L pin assignments

Please Note: Communications cabling color in this diagram is for illustration purposes only.

9. OPERATING AND SYSTEM STARTUP

The operating section contains the startup and shutdown procedure, and descriptions of the battery indicators, Cloudlink indicators and battery light bar that can be used to determine the operational status of the battery.

9.1 Before Startup

Confirm that:

- Every battery passed the individual checks as described in section 8.1.4.
- Complete the individual power-up and firmware checks.
- Batteries and inverter are OFF; isolation devices are open.
- DC polarity, earth connections, terminal torque and battery voltage matching have been checked.
- Addresses, communication cables and termination are correct.

9.2 Start the System

1. Follow the inverter manufacturer's sequence where it differs.
2. Close the battery DC isolation devices between the batteries and inverter in the approved sequence.
3. Switch ON the master battery and check its BMS indicators and pink-and-blue SOC display.
4. Switch ON every slave battery individually and check its indicators.
5. Stop if an alarm or protection indication appears.
6. Switch ON the inverter.

Switching ON the master does not switch ON the slaves. Slaves still OFF may display a multicolour animation followed by a partial orange bar. Light-bar activity alone does not confirm that a battery is operating.

10. Verify Operation

- Open the inverter's BMS information page and confirm that battery communication is established as in section 10.1.
- Select the battery type and communication protocol for the inverter model as in section 10.2.
- Apply the approved charging, discharging, voltage and SOC settings.
- Keep equalisation disabled.
- Using Cloudlink monitoring, confirm that the detected battery count matches the installed bank.
- Verify that the reported charge and discharge limits are appropriate for the connected batteries and do not exceed the ratings of the inverter, cables or protection devices.
- Check for battery or communication alarms.
- Perform controlled charging and discharging checks, confirming that every battery participates and remains within its permitted limits.
- Record the settings, detected pack count and commissioning results.

10.1 Access the Inverter BMS CAN Information page.

- Confirm that the CAN comms is working as in the next section.
When CAN comms between the "Master" and "Inverter" are working as expected you should see the following:
- On the inverter's BMS CAN information page, the maximum charge and discharge currents should reflect the total allowed for the entire battery bank (and not simply for the AM2+ "master").

1 x AM2+	
1 x Battery	
Battery Voltage: 53.00V	
Battery Current: 0A	Battery Charge Voltage: 53.6V
Battery Temp: 23.5C	Charge Current Limit: 100A
SOC: 86% SOH: 100%	Discharge Current Limit: 100A

2 x AM2+	
2 x Batteries = 1 x Master and 1 x Slave	
Battery Voltage: 53.00V	
Battery Current: 0A	Battery Charge Voltage: 53.6V
Battery Temp: 23.5C	Charge Current Limit: 200A
SOC: 86% SOH: 100%	Discharge Current Limit: 200A

- On our monitoring portal, the master Cloudlink will report the total number of batteries as the sum of the packs.

10.2 Configure The Inverter Battery Settings

The intention of the steps below is only to power the inverter from the battery, to allow configuration of the battery settings - not to commission the entire system.

- Configure battery related settings on the inverter

Settings that should be configured typically include the battery type, maximum charge and discharge current, maximum charge voltage, cut off voltage.

Inverters using CAN communication with the battery also require setting of the shutdown, low battery and restart SoC percentages.

- If a CAN communication cable is used between the inverter and the battery, it is recommended to still configure the settings should the CAN communication fail.
- If no CAN communication cable is used, the battery will be operated according to the applicable battery settings on the inverter, which must be set manually to the correct values.

Please consult the Hubble website at <https://www.hubbleenergy.com/> for the latest recommended settings. It is very important to use the correct setting values - incorrect values can damage the battery.

As an example, set the following parameters for an Inverter not utilizing CAN to allow safe usage of the battery.

Battery parameters - Axpert:

Battery type:	Customer setting
Bulk / Equalize voltage:	53.6 V
Float voltage:	53.6 V
Cut-off voltage:	44 V
Charge current (recommended):	30A per battery
Discharge current (max):	100A per battery
Battery equalisation:	DO NOT ACTIVATE THIS FUNCTION

Equalisation is only applicable to lead acid type batteries and could damage your Lithium battery.

CAN enabled inverter examples:

Sunsynk:

Battery Type	Battery Charge	Shutdown
Select Lithium, Can and Protocol "0"	Do not activate equalisation	Shutdown settings under your discretion
Batt Type ☒ Lithium Battery Capacity <input type="text" value="100Ah"/> CAN ☒ ☐ AGM V Charge Amps <input type="text" value="30A"/> RS485 ☐ ☐ AGM % Discharge Amps <input type="text" value="100A"/> Protocol <input type="text" value="0"/> ☐ No Bat ☒ Activate	Batt Charge Float V <input type="text" value="53.6V"/> Absorption <input type="text" value="53.6V"/> Equalization <input type="text" value="53.6V"/> <input type="text" value="90 Days"/> <input type="text" value="0.0 hours"/>	Shut Down Shut Down <input type="text" value="20%"/> Low Batt <input type="text" value="25%"/> Restart <input type="text" value="30%"/>

Proceed to section 11: Cloudlink Setup.

10.3 Turning The System Off

WARNING: Please follow the turn off steps as described in the inverter's manual if they differ from the steps below.

- Remove or reduce the load and disconnect the AC load supply.
- Shut down the inverter and isolate the charging sources in the prescribed order.
- Confirm that charging and discharging current have stopped.
- Switch OFF every battery individually, including the master and all slaves.
- Open the required DC isolation devices.

11. CLOUDLINK SETUP

Each AM2+ has an integrated Cloudlink which is intended to manage and monitor the battery system. The battery must be connected to the internet for remote monitoring, notifications, and automatic firmware updates.

By connecting the battery to the internet, you consent to us doing remote firmware updates and monitoring the battery. It is required that the battery is connected to the internet within three months after installation and remains online.

If the battery has not been connected to the internet within three months from first installation, then the warranty for the battery will be reduced to 3 years.

The master AM2+ battery Cloudlink communicates with the slave battery/s.

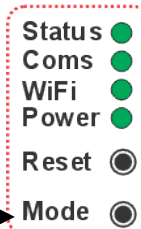
Only the master Cloudlink requires to be configured and is described in more detail in the following section.

11.1 Connecting Using Your Mobile Device

Step 1: Ensure that your mobile data is disabled. This will prevent your mobile device from disconnecting from the Cloudlink during the configuration procedure.

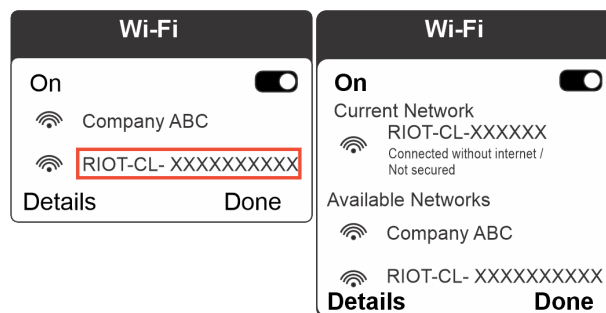
Step 2: Configuration Mode

1. Press and hold the **Mode** button marked “M” at the bottom wiring panel.
2. Continue holding the button after you hear the first beep.
3. **Release** the button after you hear **two consecutive beeps**.
4. The Cloudlink is now in **Configuration Mode**.
5. Wait until the Status, Coms and WiFi LEDs are flashing simultaneously.
6. LED bar on the front lid changes to Green.



Step 3: Connect to “RIOT CL-#” hotspot

1. Open the Wi-Fi settings on your mobile/desktop device.
2. Scan for available Wi-Fi networks.
3. Select the Cloudlink access point named **RIOT CL-xxxx**.
4. No password is required.



If the network does not appear:

- Refresh the Wi-Fi network list & wait up to **10 seconds**.
- Confirm that the Status, Coms and WiFi LEDs are still flashing simultaneously.
- If the LEDs are no longer flashing simultaneously, repeat **Step 2** to re-enter Configuration Mode.

Step 4: Navigating the URL

1. Open a browser on your mobile device or computer.
Google Chrome is recommended.
2. Enter the following address in the browser address bar: <http://192.168.4.1>



Samsung users can also tap the **gear icon** next to the **RIOT CL-xxxx** network name, then select **Manage Router** to open the configuration page directly.

Alternatively:



Scan the QR code to open the Cloudlink configuration page automatically.

PLEASE NOTE

The **Wi-Fi access point** named **RIOT CL-xxxx** is only available while the device is in Configuration Mode. The Cloudlink automatically exits Configuration Mode after **2 minutes of inactivity** or after a maximum of **5 minutes**. If the configuration is not completed within this time, you must restart the configuration process. This is a built-in security feature.

If your mobile device indicates whether you want to disconnect from the **RIOT CL-xxxx** network, select **Connect** or **Keep Connection** to continue.

The network name includes part of the device's unique serial number. Use this number to identify the correct Cloudlink.

For **iOS devices**, type the full address into the browser address bar: <http://192.168.4.1>

If the configuration page does not open, check if:

- The Cloudlink is still in **Configuration Mode**, indicated by the LED sequence/ Green LED bar.
- Your mobile device is still connected to the **RIOT CL-xxxx** Wi-Fi network. If either of these are not true, return to:
- **Step 2: Configuration Mode** and repeat the process.

Step 5: Enter Owner Information

Once the configuration page has loaded, the INFORMATION screen is displayed.

Enter the following information:

- First name & Surname
- Mobile number, including the Int'l dialling code (e.g. **+27 83 555 5555**)
- Email address

This information is stored on the Cloudlink and is used to link and secure the device to your Cloudlink Portal account.

REMINDER

The Cloudlink remains in Configuration Mode for a maximum of **5 minutes**. If the setup process is interrupted or times out, return to **Step 2** and restart the configuration process.

Step 6: Open Device Settings

To access the Device Settings page:

1. Tap the **Menu** (≡) button.
2. Select **Device Settings** from the menu.

Enable Buzzer:

- Enable or disable the buzzer.

ENABLE OTA UPD: **Warning!!!**

- Disable – This device will not receive automatic software updates via the internet.
- Enable - This device will automatically and periodically check for and then download new versions of software if available.
- Once the software has been updated the device will need to reboot and will go offline for a few seconds, this may cause other systems connected to this device to momentarily go into an alarm state.

CAN Speed:

- Must be the same for all devices on the CAN Bus (typically 500k)

CAN Mode:

- As per the inverter requirements, e.g. for a Victron system select Victron, for a Deye, Sunsynk system select Universal. For Solis select Solis LV.

RS485 Conn. To:

- As per the site requirements, if the inverter information is to be displayed on the Cloudlink Monitoring site, and the RS485 wires are connected, then select "Inverter".

SERIAL Conn To:

- Connect to battery for most instances.
- Connect to Axpert/Voltronic when connected to Axpert/Voltronic inverter.

Reset BMS Par:

- Do not change this setting.

Adaptive Cell Limits:

- Do not change this setting.

Override Bat Chr Voltage:

- Do not change this setting.

1. Tap **Save** to store the settings.
2. Tap OK.
3. Your settings are saved.

Step 7: Open Site Settings

To access the Site Settings page:

1. Tap the **Menu** (≡) button.
2. Select **Site Settings** from the menu.

Inverter Specifications:

- Inverter Brand - Select the Inverter from the dropdown list.
- Inverter Model - Select the inverter wattage.
- Nr of Inverters - Number of inverters installed.

Battery Specifications:

Note that the Cloudlink auto should detect the Brand, Model and Nr of Packs.

- Battery Brand.
- Battery Model.
- Nr of Packs.

Multiple Cloudlink Setup:

These settings are only changed when more than one battery bank (of up to 15 batteries each) is installed. For a single bank, leave the defaults: This Unit's Address **0** and Nr of Cloudlink Slaves **0**.

- This Unit's Address: 0 identifies the Cloudlink as the system master (Bank 1). The master Cloudlink of each additional bank acts as a slave and must have a unique address: 1 for Bank 2, 2 for Bank 3, and so on.
- Nr of Cloudlink Slaves: Set only on the Bank 1 master Cloudlink, to the number of additional banks. Set to 0 on all other Cloudlinks.

Bank	Cloudlink (master battery of the bank)	This Unit's Address	Nr of Cloudlink Slaves
Bank 1	System master	0	2 (number of additional banks)
Bank 2	Acts as slave	1	0
Bank 3	Acts as slave	2	0

Example shown for three banks. For two banks, set Nr of Cloudlink Slaves on Bank 1 to 1 and omit the Bank 3 row.

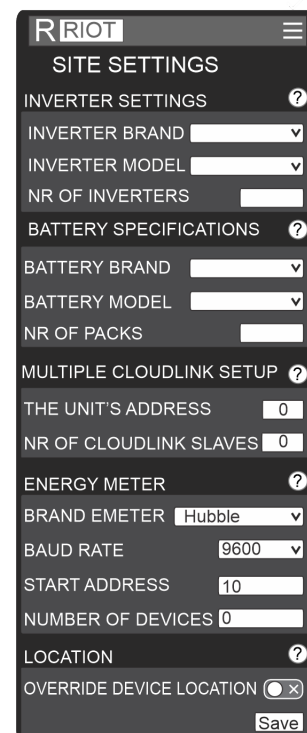
A maximum of 15 banks is recommended (up to 225 batteries). This gives This Unit's Address values from 0 to 14, and Nr of Cloudlink Slaves on the Bank 1 master up to 14.

Note: Cloudlink unit addresses are separate from the battery DIP switch addresses in Section 6.

Energy Meters:

- Brand E-Meter – Brand of meter in use.
- Baud Rate - Energy Meter Baud Rate if installed.
- Start Address - Energy meter address.
- Number Of Devices - Number of energy meters installed.

3. Tap **Save** to store the settings.
4. Tap OK.
5. Your settings are saved.



Step 8: Open Wi-Fi Settings

To access the Wi-Fi configuration page:

1. Tap the **Menu** (≡) button.
2. Select **Wi-Fi Settings** from the menu.



Step 9: Wi-Fi Configuration

1. From the **Wi-Fi Settings** page, tap **Refresh** (circular arrow icon) to scan for available Wi-Fi networks.
2. Select the Wi-Fi network that the Cloudlink should connect to.
 - **Do not select RIOT CL-xxxx**, as this is the temporary Cloudlink setup network.
3. Enter your Wi-Fi password.



4. Tap **Save** to store the settings.
5. Tap OK.
6. Your settings are saved.

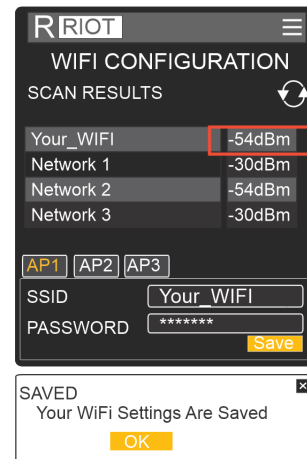
IMPORTANT

For the most reliable operation, select the Wi-Fi network with the strongest signal:

- Networks with stronger signals generally appear higher in the list.
- The recommended signal strength is between **0 dBm and -60 dBm**.
- Weak signals may affect CloudLink performance and connectivity.

If signal strength is poor:

- Contact Hubble regarding an external antenna option.
- Install a Wi-Fi extender or booster closer to the CloudLink device.
- The recommended signal strength is between **0 dBm and -60 dBm**.



Step 10: Complete the Setup

1. Tap the **Menu** (≡) button - Select **Exit**.

The Cloudlink will save the settings, reboot and return to normal operation.

- After a few seconds, the **Status LED** turns off, indicating that Configuration Mode has ended. Thereafter it blinks once every 15 seconds.

If the WiFi LED remains off for 1-5 minutes after this process, then it means that the device is unable to connect to the network and you may have typed the incorrect password for the selected AP.



- You have to restart the configuration.
- If the WiFi LED continues flashing it indicates that it was able to connect to the local AP (so the password is correct), but unable to make a connection to the Internet.
- This may be due to a firewall blocking Internet access or that the network may have reached its data cap. This may be the case when the device is installed at the guesthouse, office building or similar environment.
- Please consult with the business IT department to allow internet traffic to and from the Cloudlink device. If the LED light is solid on but not flashing, you are connected and ready to go! Will beep once to confirm connection.

Firmware Update vs Configuration Mode

The Cloudlink may automatically download and install firmware updates during setup.

- **Firmware Update** - The Status, Coms, and Wi-Fi LEDs flash one at a time in sequence.
- **Configuration Mode** - The Status, Coms, and Wi-Fi LEDs flash together simultaneously.

These LED patterns indicate different operating states and should not be confused.

12. TROUBLESHOOTING WI-FI CONNECTION

12.1 Wi-Fi LED Remains Off

If the **Wi-Fi LED** stays off for **1–5 minutes** after setup:

- The device could not connect to the selected Wi-Fi network.
- The Wi-Fi password may be incorrect.

Repeat the configuration process and verify the password.

12.2 Wi-Fi LED Flashes Continuously

If the **Wi-Fi LED** continues flashing:

- Cloudlink is connected to the local Wi-Fi network.
- However, it cannot reach the internet.

Possible causes include:

- Firewall restrictions
- Network security policies
- Internet connectivity issues
- Reached data limits or bandwidth restrictions

In business, office, hotel, or guest-house environments, consult the network administrator to allow internet traffic to and from the Cloudlink device.

12.3 Wi-Fi LED Is Solid On

If the **Wi-Fi LED** remains solid on without flashing:

- Cloudlink is successfully connected and operating normally.
- The device emits a single beep to confirm a successful connection.

13. CLOUDLINK PORTAL SETUP GUIDE

To access and monitor your Cloudlink device online, create a Cloudlink Portal account.

Step 1: Create or Access Your Account

Using a web browser on your mobile device or computer, navigate to:

<https://portal.hubblelithium.com/signup>

Alternatively, scan the provided QR code to open the registration page directly.



Already have an account?

Sign in using your existing username and password, then proceed to **Step 4: Log In**.

Step 2: Register Your Account

Complete the registration form with the following information:

- First Name
- Last Name
- Email Address (this will be your username)
- Password

For security, use a strong password containing:

- At least 8 characters
- Uppercase and lowercase letters
- Numbers
- Special characters

Once completed:

- Complete the reCAPTCHA verification.
- Review the Privacy Policy.
- Select the Privacy Policy acceptance checkbox.
- Click **Sign Up**.

Self registration	
First Name*	<small>First name required</small>
Last Name*	
Email*	
Create password*	
Repeat your password	
☐ I'm not a robot	
☐ Accept Privacy Policy	
Sign Up	
<small>Already have an account? Sign in</small>	

Step 3: Activate Your Account

An activation email will be sent to the email address you provided during registration:

- Open the email.
- Click **Activate Your Account** to complete the registration process.

Note: If you do not receive the activation email within 10 minutes:

- Check that you entered the correct email address.
- Check your Spam or Junk folder.

Step 4: Log In

After activating your account, log in to the Cloudlink Portal.

Navigate to: <https://portal.hubblelithium.com/login>

Enter the email address and password used during registration, then click **Log In**.

Once logged in, you can begin managing and monitoring your Cloudlink devices through the Cloudlink Portal.



14. CLAIMING YOUR DEVICE

After creating and logging in to your Cloudlink Portal account, you must claim your Cloudlink device before you can access its remote monitoring features.

To claim a device, find the Device Name and Secret Key on the label on the right-hand side of the battery.

A screenshot of a 'Claim Device' form. At the top, there are four hexagonal icons. Below them, the text 'Hubble_Cloudlink-12345' is highlighted with a red box, and 'A1552BFF44' is highlighted with a green box. To the right of these is a 'Claim' button. Below this, the text 'Claim your first device here' is followed by two input fields: 'Device name*' and 'Secret Key*'. At the bottom right is a 'Claim Device' button. Red and green arrows from the battery label point to the 'Device name*' and 'Secret Key*' fields respectively.

1. **Device Name.**
2. **Secret Key.**
3. Enter these details in the corresponding fields.
4. Tap **Claim Device**.

Once the claim process is complete, the device will be linked to your Cloudlink Portal account.

14.1 Adding Additional Devices

Mobile App

To claim additional Cloudlink devices:

- Open the **Menu** (≡) - Select **All Devices**.
- Tap the **+** icon.
- Find the **Device Name** and **Secret Key** on the label on the right-hand side of the battery you wish to add.
- Enter the details in the appropriate fields.
- Tap **Claim Device**.

Devices		
Device	Alias	↑
Hubble_Cloudlink-123456	Joe Soap	⋮

Desktop

- Open the **Menu** (≡) - Select **All Devices**.
- Scroll down to the **Device Claiming** section.
- Find the **Device Name** and **Secret Key** on the label on the right-hand side of the battery you wish to add.
- Enter the details in the appropriate fields.
- Click **Claim Device**.

PLEASE NOTE

Each Cloudlink device has a unique **Device Name** and **Secret Key**. Ensure you enter the correct details to successfully link the device to your account.

Once claimed, the device will appear in your Cloudlink Portal and be available for remote monitoring and management.

15. DASHBOARD OVERVIEW

The dashboard provides quick access to your system's performance and information.

On the Powerflow dashboard, tap the relevant icon to view detailed information.

15.1 Dashboard Icons

1. **Solar Panel Icon** – View your **Energy Savings**.
2. **Grid/House Icon** – View **Power Usage** and **Generation Graphs**.
3. **Inverter Icon** – View all connected inverters and photovoltaic (PV) production data.
4. **Battery Icon** – View battery information for all connected batteries.
5. **System Information** – Access detailed system information through the menu.

15.2 Changing Your Details

To update your contact details:

1. Open the **Menu (≡)** -Select **Site Manager**.
2. Scroll down to the **Devices** section.
3. Tap the  icon.
4. Select  **Edit Device**
5. Scroll to the **Owner Contact** section.
6. Tap the  **Edit** icon.
7. Update your details and select **Save**.

Your profile information will be updated immediately.

15.3 Changing Your Device Details

To modify your Cloudlink device information:

1. Open the **Menu (≡)** -Select **Site Manager**.
2. Scroll down to the **Devices** section.
3. Tap the  icon.
4. Select  **Edit Device**
5. Scroll to the **Device Details** section.
6. Tap the  **Edit** icon.

Update your device details and select **Save**

The changes will be applied to the selected device.

15.4 Changing Your Default Dashboards

You can choose which device and dashboard are displayed when you log in.

1. Open the **Menu (≡)**.
2. Select **Account**.
3. Scroll to User Defaults.
4. Configure:
 - Mobile Default Dashboard – The dashboard shown on mobile devices.
 - Desktop Default Dashboard – The dashboard shown on desktop devices.
 - Default Powerflow Widget – The widget displayed on the Powerflow dashboard (e.g. Power Graph).
 - Default Device – The device that opens automatically after login.
4. Save your preferences.

USER DEFAULTS

Mobile default dashboard
 v

Desktop default dashboard
 v

Default Powerflow widget
 v

Default Device

15.5 Changing Cloudlink Configuration Settings

Cloudlink settings can be updated remotely from the portal.

1. Open the **Menu** (≡).
2. Select **Remote Console**.
3. Open the menu in the top-Left Info (≡).
4. Select **Device Settings**.
5. Make the required changes.
6. Click **Save**.

Wait for the portal to confirm that the settings have been successfully sent to the Cloudlink device.

15.6 Changing Inverter Settings

Where supported, inverter settings can be adjusted remotely.

1. Open the **Menu** (≡).
2. Select **Inverter Settings**.
3. Update the required inverter settings.
4. Click **Save**.

Wait for confirmation that the changes have been successfully applied to the inverter.

Note: Some inverter settings may be restricted depending on the inverter model and firmware version.

15.7 Sharing Your Site with an Installer

To provide an installer with access to your site:

1. Open the **Menu** (≡).
2. Select **Account**.
3. Click **Copy Secret Key**.
4. Send the copied key to your installer via email, message, or another secure method.



The installer can use this key to access your system remotely.

15.8 Adding a Customer (For Installers)

Installers can add customer devices to their accounts using the customer's Secret Key.

- Open the **Menu** (≡).
- Select **All Devices**.
- Tap the **+** button in the top-right corner.
- Enter:
 1. The customer's **Secret Key**
 2. The customer's **Email Address**
- Click **Add Customer** or **Claim Device**.

Once verified, the customer's site will be linked to your installer account for monitoring and support.

PLEASE NOTE

Installers should never claim a customer's device from the start.
It is important that customers claim their own devices.
When an installer claims a customer, the device will automatically be added for monitoring.

16. BATTERY LIGHT BAR DISPLAY

The battery contains a light bar that is controlled by the Cloudlink, which communicates with the battery BMS to obtain battery parameters that can be displayed.

The light bar displays battery parameters such as state of charge (SoC) and power flow direction (charging / discharging) using various colours and animations.

When the battery is turned on or the Cloudlink is rebooting, a moving rainbow pattern will be displayed while the Cloudlink establishes communication with the BMS.

- If communication with the BMS is established, it will display the battery SoC and power flow direction, using colour and animation.
- If no communication could be established a partial orange bar will be displayed.

LIGHT BAR DISPLAY (NORMAL MODES)			
CLOUDLINK MODE	REASON FOR THIS STATE	INFO DISPLAYED	DISPLAY DESCRIPTION
Boot	Battery turned on. Cloudlink rebooted.	Cloudlink booting, trying to establish communication with BMS.	An animated moving rainbow pattern is displayed, one color at a time. 
Normal	BMS communication established.	Battery SoC and power flow	The SoC percentage is indicated by the portion of the light bar displayed in blue, with the remainder in pink.
	BMS communication failure.	Warning (BMS communication failed)	The left 40% portion of the bar will be orange. 
Configuration	Configuration Mode		An animated sweeping green from left to right.

17. BATTERY INDICATORS AND BUZZER

The battery on, run and alarm indicators together with the SoC indicators (located inside the wiring compartment) can be used to determine the status of the battery, using the tables below.

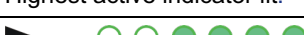
The SoC indicators turn on linearly as the battery state of charge increases. Six states of charge indicators are used on the AM2+ battery, each representing a 16.7 % capacity span. The first indicator will be on if the SoC is between 0 to 16.67 %, the second from 16.67 to 33.3% etc. While the battery is charging, the highest active SoC indicator will flash.

17.1 BMS Battery Indicators

For explanation:

	Led is OFF		Led is ON
	Led is OFF		LED is ON

	Blinks every second		Blinks every 3 seconds
	Blinks every 5 seconds		Blinks every 15 seconds

BATTERY STATUS AND MODE	RUN	ALARM	SOC CAPACITY						NOTES
			#1	#2	#3	#4	#5	#6	
Battery power off									
Battery turned off / Sleep mode									All indicators off.
Standby									
Normal									Standby mode. The current SoC is displayed.
Alarm Low cell voltage									Standby mode with low voltage condition present.
Charging									
Normal			 Highest active SoC indicator flashing.						
Alarm			 Highest active SoC indicator flashing.						Alarm indicator is off for an over voltage alarm.
Protect Over Current									BMS disable further charging.
Discharging									
Normal			 Highest active indicator lit.						
Alarm			 Highest active indicator lit.						
Protect Over current Short circuit Temperature Reverse polarity									BMS disable further charging and discharging.

18. CLOUDLINK INDICATORS

The Cloudlink indicators indicate whether the Cloudlink is powered, the status of the Wi-Fi connection, if any devices are connected to any of the communication buses and if the Cloudlink itself is still operating.

When the Cloudlink is in a special mode, the Wi-Fi, Coms and Status indicator will all flash.

18.1 CLOUDLINK INDICATORS

INDICATOR	FUNCTION	OFF	FLASH	ON	DESCRIPTION
Power	Indicate if the Cloudlink is powered.				The Cloudlink is unpowered. The Cloudlink is powered.
Wi-Fi	Indicate the status of the Wi-Fi connection.				No Wi-Fi networks could be found. Connected to a Wi-Fi network, but the internet is not accessible. Connected to a Wi-Fi network with internet access available.
Coms	Indicate if a communication connection exists to the battery, inverter and/or other 3rd party equipment such as energy meters.				No serial or CAN communication to devices present (e.g., no battery or inverter connected). Serial or CAN communications with one device established. Serial or CAN communications with more than one device established.
Status	Indicate if the Cloudlink is still functioning.		 		After a Cloudlink reboot the light flashes very quickly for about 5 times. Thereafter it flashes once every 15 seconds to indicate the Cloudlink is operational / alive. In Configuration Mode it blinks every second.

19. DETAILED BMS FUNCTIONS

The primary function of the Battery Management System (BMS) is to calculate the battery's State of Charge (SoC) and State of Health (SoH) and to protect the battery cells from damage by disconnecting the charging path, discharging path, or both during abnormal operating conditions.

Additional functions performed by the BMS include:

- Charge current limiting – Regulates and limits the charging current to safe levels.
- Passive cell voltage balancing – Ensures all cells reach the same voltage to maintain balanced performance and extend battery life.
- Dry contact outputs – Provides alarm or protection signals that can be used to trigger an external device or system response.
- Sleep and wake-up functionality – Prevents deep discharge by placing the battery into low-power mode when required and restoring it when safe to do so.

19.1 Buzzer

In the event of a short-circuit protection event, the buzzer will emit a beep every 2 seconds.

If a short-circuit condition is detected three consecutive times, the short-circuit protection will become locked, and the buzzer will stop beeping. When this occurs, disconnect the battery and wait a few minutes before switching it back on.

After clearing the fault, it may take up to 5 minutes for the BMS to confirm that conditions are safe and resume normal operation.

19.2 Charge Current Limiter

The BMS has an advanced current limiting function that allows the charging current to be limited to 20 A if the charging current exceeds 100 A.

The default start-up condition of the charge current limiter is to activate when the charge current exceeds the rated battery charge current limit (100 A).

After 10 minutes the charge current limiter will be turned off and the charge current level re-evaluated.

If the current still exceeds the threshold level, the current limiter will be turned on again, otherwise it will stay turned off.

19.3 Cloudlink

The battery contains an integrated Wi-Fi enabled monitoring system, called Cloudlink, which performs the following functions:

- Remote monitoring and management.
- Ensures the latest Cloudlink firmware is obtained automatically, using over-the-air (OTA) firmware updates.
- Control the light bar mounted on the battery enclosure.
- Provides the connection access ports for all the communication interfaces/buses.
- Communicates with the BMS to allow monitoring and control.

19.4 Communication Interface Ports

The Cloudlink has four communication interface ports.

- 1x RJ45 port labelled MON, containing CAN bus, RS485 bus and RS232 interface.
- 2x RJ45 ports labelled CAN, containing CAN bus, RS485 bus and RS485 BMS LINK bus.
- 1x port labelled RS232, which is not used.

Their usage is as follows:

- The RS485 bus signals can be interfaced with 3rd party inverters that do not have a CAN bus and are supported by Hubble.
- The RS485 BMS Link bus signals are used when paralleling of batteries is required, to allow communication between the batteries.
- The CAN bus signals are specifically to be used to interface with 3rd party equipment like inverters, which require battery parameters to automatically configure charge and discharge settings to allow safe charging and discharging of the battery.
The MON port RS232 signals can be used to connect with an inverter if supported.

19.5 Dry Contact

The dry contacts are potential free normally open contacts, that can be used to signal when the BMS experiences an alarm or protection condition. Under normal conditions the contacts are open.

When an alarm or protection event occurs, the contacts close.

Two dry contacts are available on a four-pin connector:

- Pins 1 and 2 will close when there is a low battery alarm.
 - Pins 3 and 4 will close when there is a protection or fault condition.
-

19.6 Protection

The battery incorporates an integrated electronic circuit breaker within the BMS. This electronic protection device can disconnect the charging path, the discharging path, or both, whenever abnormal operating conditions are detected.

The electronic circuit breaker activates to protect the battery and its internal cells against conditions such as:

- Overcharge
- Over-discharge
- Overload
- Short circuit
- Over-temperature
- Under-temperature
- Other abnormal or unsafe states

However, despite having this internal protection, an external circuit breaker or fused disconnect must still be installed to provide proper system-level protection and to comply with standard installation safety practices.

19.7 Passive Cell Voltage Balancer

Due to normal manufacturing tolerances, individual battery cells can vary slightly in capacity, self-discharge rate, and internal impedance.

When these cells are connected in series to form a battery, such differences can lead to cell voltage imbalances, especially during charging. Cells that reach higher voltages than others may experience accelerated degradation over time.

To prevent this, the BMS incorporates a passive cell voltage balancer, which ensures that the voltage across all cells remains closely matched.

The balancer activates when the battery is near its full-charge voltage and the voltage difference between cells exceeds a predefined threshold.

19.8 Sleep And Wake-Up Function

To protect the battery from becoming fully discharged, the BMS will place the battery into a low-power sleep mode, reducing internal consumption to the minimum. The battery will enter sleep mode if any of the following conditions occur:

- Over-discharge protection timeout:
 - The battery has remained in over-discharge (under-voltage) protection for more than 5 minutes.
 - (To avoid this, the battery must be recharged above the under-voltage release level within the 5-minute period.)
- Extended standby condition:
 - The battery has been in standby for more than 24 hours, defined as no charging current, no discharging current, and no communication activity.

Wake-Up Conditions:

The BMS will automatically wake the battery from sleep mode when any of the following are detected:

- A charging current is applied to the battery.
- The reset button is pressed and held for more than 1 second.
- Communication activity is detected on the RS232 or CAN bus (under certain supported conditions).

19.9 Reset Button

When the BMS is in the sleep state, pressing the reset button for more than 1 second will reactivate the BMS protection board.

When the BMS is operating normally, pressing and holding the button for 3 to 6 seconds will place the BMS into the sleep state.

Pressing and holding the button for longer than 6 seconds will perform a full reset of the protection board.

19.10 Remote Monitoring and Management

When connected to a Wi-Fi network, Cloudlink can collect data directly from the battery and inverter to allow remote monitoring and management of the power system through the Hubble Cloudlink application on a phone or by using the Hubble Cloudlink Portal website on a phone or computer.

19.11 Light Bar Control

The light bar displays battery-related parameters such as the State of Charge (SoC) and the power flow direction (charging or discharging). In addition, it can also display special Cloudlink modes that are used when configuring the Cloudlink.

These special modes are shown only when the Cloudlink enters a configuration mode—either through the Mode button on the Cloudlink interface or when an unsolicited over-the-air (OTA) update is in progress.

Once the special mode is exited—whether manually, automatically, or by timeout—the light bar will return to displaying the standard battery-related parameters.

20. BATTERY CARE

To take care of your battery and prolong its life please take note of the following:

20.1 Battery storage and disposal

- Store the battery in a dry and well-ventilated area within the allowed storage temperature range, preferably at a cool 25°C temperature.
- Provide a refresh charge if the battery has been stored for longer than 5 to 6 months, prior to installation.
- Dispose of in accordance with local regulations.

20.2 Cell Balancing

Ensure that the batteries are fully charged at least once every 7 days to enable the BMS cell balancer to activate and perform cell balancing, this will prolong and protect the cell life.

The cell balancer only activates on 100 % charge. If the balancer does not activate for an extended period, the cells could eventually become unbalanced.

This can cause the performance of undercharged cells to degrade and could eventually result in greatly reduced cell cycle life.

This is especially important in complete off-grid installations without any utility power, where battery charging is reliant on limited alternative energy sources of power, that might not be sufficient to fully charge the battery every day.

20.3 Charging And Discharging

- Ensure the battery terminals are connected securely and with correct DC polarity.
- The battery must only be charged using an appropriate charger / inverter.
- Never use a modified or damaged charger / inverter.
- Do not exceed the rated battery charging voltage.
- Do not exceed the rated charging current.
- Do not exceed the rated discharging current.
- Do not use the battery in freezing conditions.

20.4 Connecting Third-Party devices

It is strictly forbidden to access or interfere directly with the battery BMS or Cloudlink through third-party devices such as monitoring devices or logging devices that are not Hubble Energy products.

20.5 Handling

- Do not expose the battery to direct fire.
- Do not short circuit the battery.
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse the battery in water.
- Do not use the battery with other battery models, types, or brands.
- Keep out of the reach of children.

20.6 Installation Environment

- Do not install the battery in damp or wet environments.
- Never install the battery where there is corrosive or explosive gas present.
- Do not install the battery outdoors or in direct sunlight – only indoor installations are allowed

20.7 Maintenance and Repairs

All repairs are only to be done by Hubble Energy or an authorised repair centre. The AM2+ battery is maintenance-free, but you should carry out the following routine checks.

- Check the enclosure and wiring compartment for dust or debris.
- Inspect cables for signs of strain or bending.
- Confirm monitoring system connectivity (if used).

Information published on this manual is correct as of the date published on this manual.

Please ensure you have the latest manual which can be obtained from our website at <https://www.hubbleenergy.com>

21. COMPLETION

Once all the above steps have been completed you can proceed to follow the start-up instructions given by your inverter manufacturer. If you have any difficulties with setting up your system, please contact our Technical Support Department via support@hubbleenergy.com

Be sure to include the following information in your initial email so that we can provide you with timely assistance:

Inverter make & model.

Model & number of connected batteries.

A brief description of your system and any issues you may be having.

If possible, images of your power system.

Your contact details.

21.1 Hubble Energy Apps

The following apps can be downloaded from:

Android Users:

Hubble Installer App

[Hubble Installer - Apps on Google Play](#)



Hubble Cloudlink Monitoring App

[Hubble Cloudlink - Apps on Google Play](#)



iPhone Users:

Hubble Installer App

[Hubble Installer v3 App - App Store](#)



Hubble Cloudlink Monitoring App

[Hubble Cloudlink App - App Store](#)



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