HUBBLE™
ENERGY

AM-5
MANUAL

+ SETTINGS

+ COMMUNICATION

+ TROUBLESHOOTING

INDEX

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.

https://www.hubbleenergy.com/ for the latest version of this manual.

WARNING

Working with high-voltage 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.

PRODUCT DESCRIPTION

SMART - Every Module is equipped with an Independent BMS System

EASY INSTALLATION - Just Plug & Play

SAFE - Safe Lithium Iron Phosphate Battery Cell

CERTIFIED - CE IEC UN38.3 MSDS

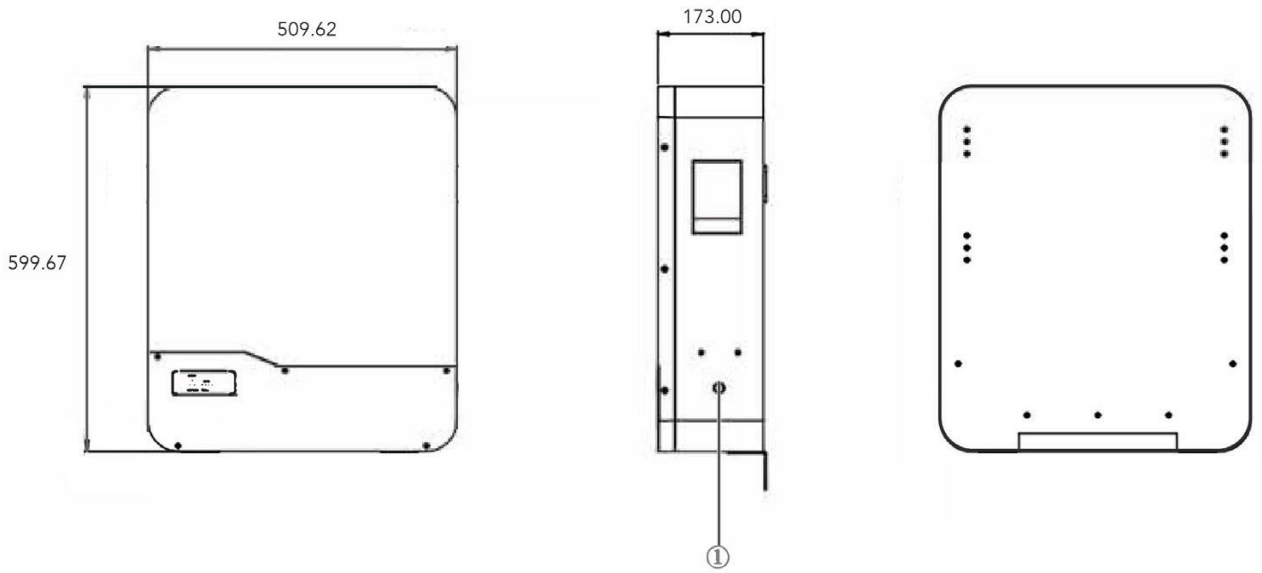
MODULAR - Modular Expansion

LONGER LIFETIME - 6000 Cycles, 15 Years Design Life

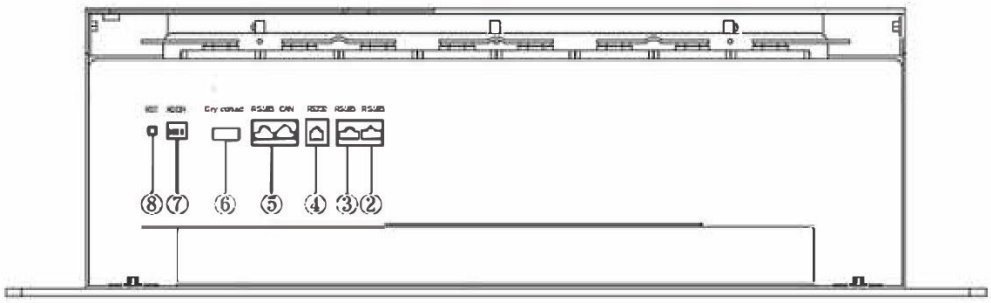
TECHNICAL SPECIFICATIONS	
Model	AM-5
Battery Type	LiFePO4 (LFP)
Nominal Voltage (V)	51.2V
Nominal Energy (KWH)	5.12KWH
Design Capacity	100AH
Design Years	15 Years
PRODUCT SIZE	
Size	600*510*173mm
Weight	51kg
TECHNICAL PARAMETER	
Cycle Life	Unlimited Cycles within the 10-year warranty. T's & C's Apply.
Operating Voltage Range	40V-58.4V
Charging Voltage	DC 55.2V
Charge/Discharge Current (A)	Same Port 100A
Internal Resistance	≥30mΩ
BMS PARAMETERS	
Self-Consumption	≥2W
Rated Voltage	51.2V
Balance Current	30-65(MA)
Communication Method	CAN/RS485/RS232
Intelligent Current Limiter	20A
AMBIENT TEMPERATURE	
Operating Temperature	-10C ~ 50C
Storage Temperature	10C ~ 50C
Humidity	15%-75%

Lithium battery systems are widely used in residential energy storage systems, such as solar energy storage systems and UPS. The power wall LiFeP04 battery pack adopts the international advanced lithium iron phosphate battery application technology and BMS control technology.

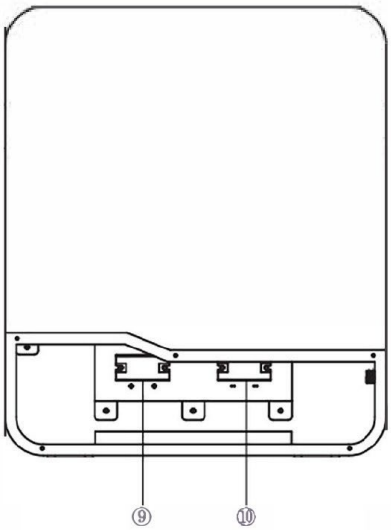
INTERFACE & SIZE

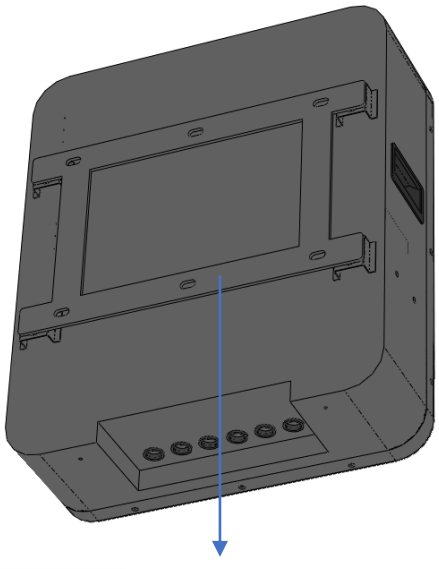


1. POWER SWITCH
2. BATTERY LINK
3. BATTERY LINK
4. RS232



5. CAN/RS485
   -External Communication
6. DRY CONTACT
7. ADD
8. RST
9. BATTERY +
10. BATTERY -





BRACKET PLACEMENT

PARALLEL CONECTION OF BATTERIES

Connect the positive pole and positive pole in parallel, and the negative pole and negative pole in parallel, as shown in the figure below:

CORRECT METHODS OF BATTERY LINKING

NOTE: DIAGRAM 1

Maximum of 4 batteries in parallel or maximum inverter current not exceeding 250Amps.

NOTE: DIAGRAM 2

The preferred method for battery paralleling is to connect each parallel battery to a busbar. Ensure all cables are the same length from each battery and ensure the cable thickness are all the same to ensure even distribution of current and load.

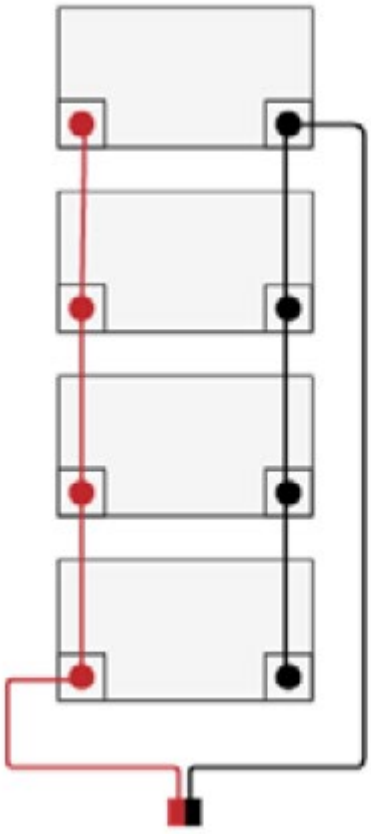


DIAGRAM 1

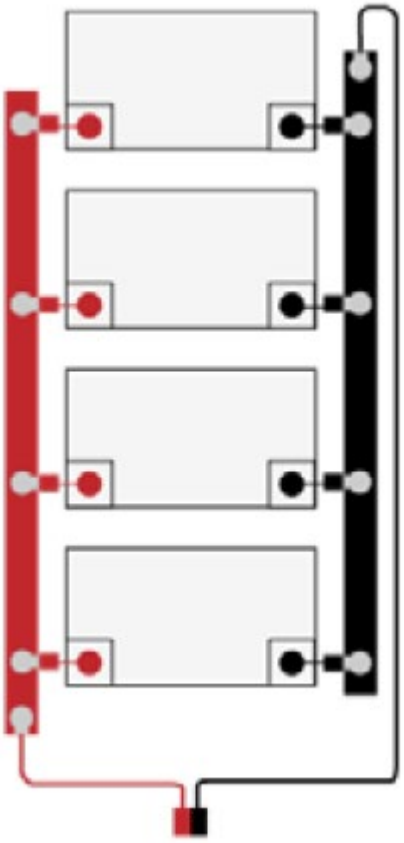
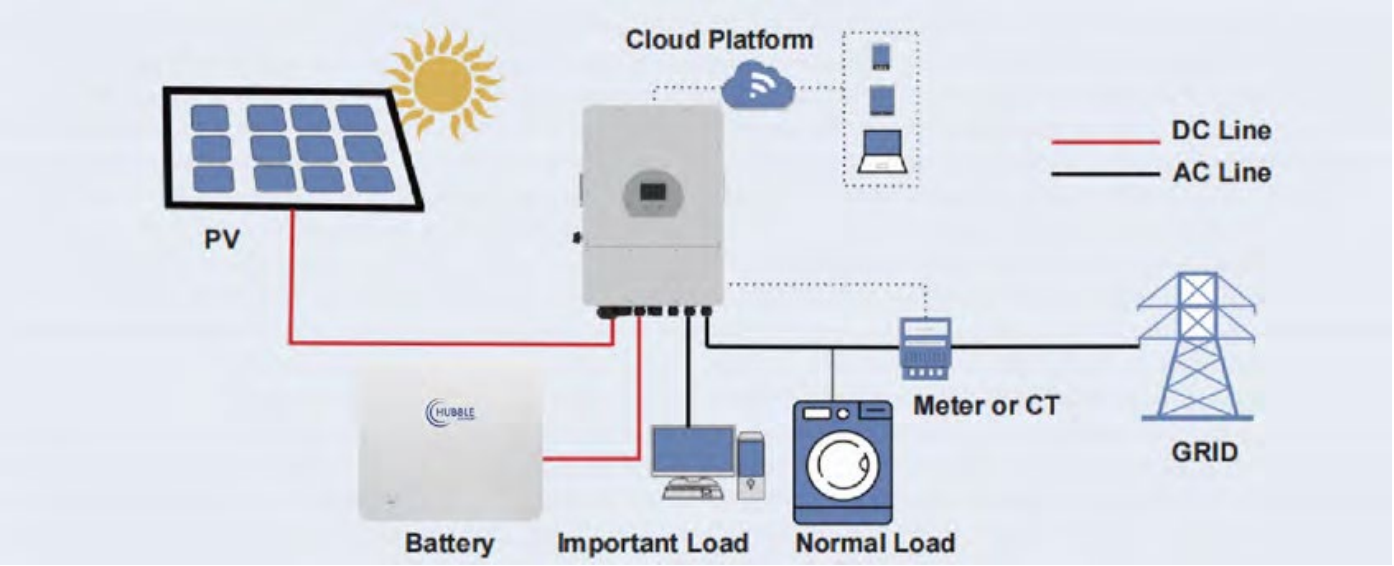


DIAGRAM 2

SOLUTION DIAGRAM

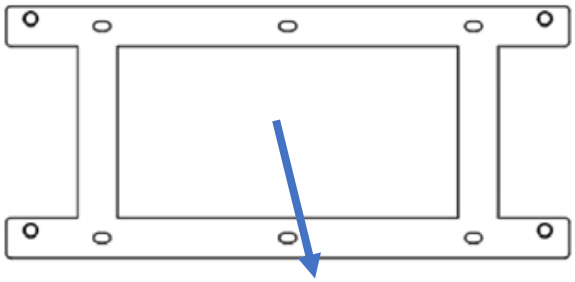


INVERTER LIST

SOLIS	SOFAR SOLAR
VICTRON	LUXPOWER
GROWATT	HAUWEI
DEYE	EPEVER
SUNSYNK	SUNGROW
SOLAR EDGE	ANERN
MUST	SCHNEIDER
KSTAR	SOL ARK
INVT	VOLTRONIC POWER
SOLAX	MPP SOLAR
STUDER	OUTBACK POWER
TBB	ENPHASE

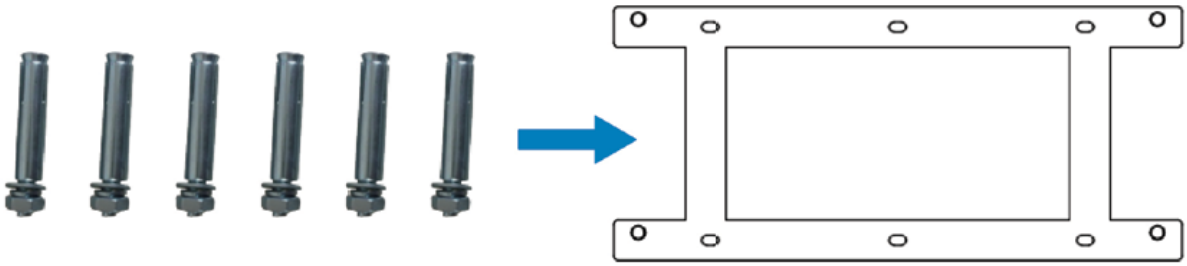
INSTALLATION NOTES

1. As shown in the figure below, press the mounting structure on the wall surface, use a marker to draw the installation positioning hole of the fixed pendant, remove from wall and drill the holes.

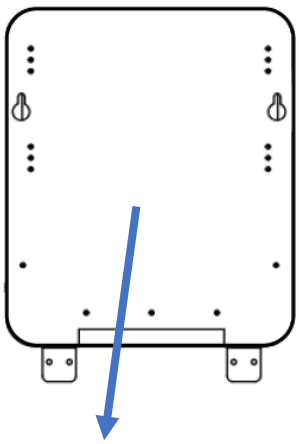


WALL POSITION PUNCHING *6PCS

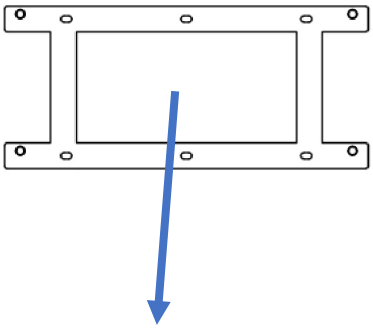
2. As shown in the figure below, fix the attached six expansion bolts in the opening of the mounting structure and tighten the nuts on the bolts.



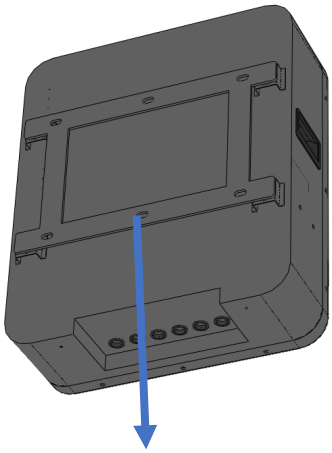
3. Lift the AM-10 battery carefully and hook it into position securely onto the wall mount bracket.



BOX PENDANT OPENING POSITION



FIXED PENDANT



AFTER COMPLETION AS SHOWN IN THE FIGURE

LED WORKING STATUS INDICATION

Status	Normal Alarm Protection	RUN	ALM	SOC Indication LED				Remarks
Power Off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	All Off
Standby	Normal	Flash 1	OFF	Indication by SOC				Standby State
	Alarm	Flash 1	Flash 3					Cell Low Voltage
Charge	Normal	ON	OFF	Indication by SOC (The Top SOC LED Flash 2)				ALM LED OFF when Cell Over-Charge Voltage Alarm
	Alarm	ON	Flash 3					
	Over Charge Protection	ON	OFF	ON	ON	ON	ON	If no Mains Supply, LED as Standby
	Temperature/Over-Current Fault Protection	OFF	ON	OFF	OFF	OFF	OFF	-
Discharge	Normal	Flash 3	OFF	Indication by SOC				-
	Alarm	Flash 3	Flash 3					-
	Under Discharge Protection	OFF	OFF	OFF	OFF	OFF	OFF	-
	Temperature Alarm or Over-Current Alarm or Short Circuit Protection	OFF	ON	OFF	OFF	OFF	OFF	-
	Fault	OFF	ON	OFF	OFF	OFF	OFF	-

CAPACITY INDICATION INSTRUCTIONS

Discharge				Charge				State	
L1	L2	L3	L4	L1	L2	L3	L4	Capacity Indicator Light	
Lighting	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	0 ~ 25%	Battery Power (%)
Lighting	Lighting	OFF	OFF	Lighting	Flash 2	OFF	OFF	25 ~ 50%	
Lighting	Lighting	Lighting	OFF	Lighting	Lighting	Flash 2	OFF	50 ~ 75%	
Lighting	Lighting	Lighting	Lighting	Lighting	Lighting	Lighting	Flash 2	75 ~ 100%	

LED FLASH INSTRUCTIONS

Flash Mode	On	Off
Flash 1	0.25 S	3.75 S
Flash 2	0.5 S	0.5 S
Flash 3	0.5 S	1.5 S

PLEASE NOTE

Can enable or prohibit LED indicator light alarm through the upper machine, the factory default is enabled.

DUAL SWITCH POSITION

Address	Switch Positions				Remark
	#1	#2	#3	#4	
1	ON	OFF	OFF	OFF	Master
2	OFF	ON	OFF	OFF	Battery 2
3	ON	ON	OFF	OFF	Battery 3
4	OFF	OFF	ON	OFF	Battery 4
5	ON	OFF	ON	OFF	Battery 5
6	OFF	ON	ON	OFF	Battery 6
7	ON	ON	ON	OFF	Battery 7
8	OFF	OFF	OFF	OFF	Battery 8
9	ON	OFF	OFF	ON	Battery 9
10	OFF	ON	OFF	ON	Battery 10
11	ON	ON	OFF	ON	Battery 11
12	OFF	OFF	ON	ON	Battery 12
13	ON	OFF	ON	ON	Battery 13
14	OFF	ON	ON	ON	Battery 14
15	ON	ON	ON	ON	Battery 15

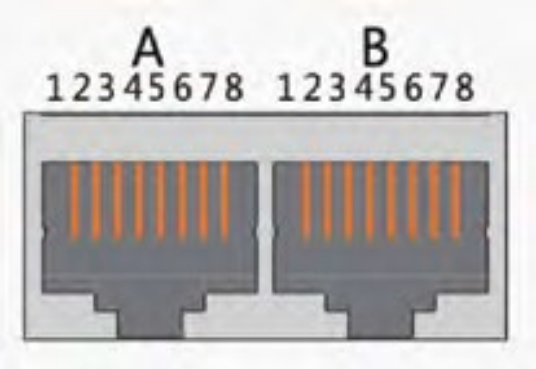
INTERFACE DEFINITION

DIAGRAM OF THE COMMUNICATION INTERFACE

RS232 COMMUNICATION PORT DEFINITION

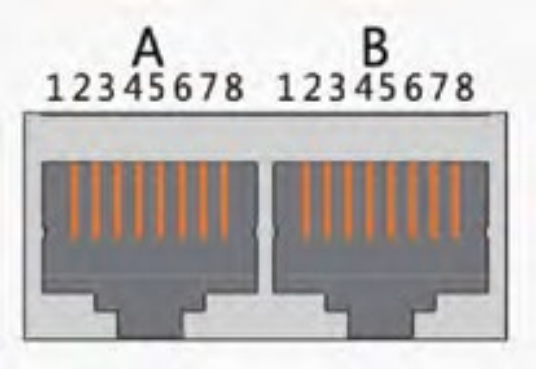
Interface	Defined Declaration	
RJ12, RS232 Pin Layout	PIN 1	NC (Empty)
	PIN 2	NC (Empty)
	PIN 3	TX Protection board sends data (Computer receiving data foot)
	PIN 4	RX Protection board receives data (Computer sends data)
	PIN 5	Ground signal ground
	PIN 6	NC (Empty)

RS 485-1 / CAN COMMUNICATION INTERFACE DEFINITON



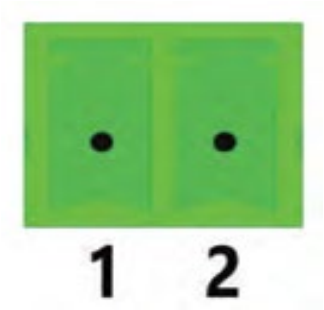
Interface	Defined Declaration			Defined Declaration		
X1 Communication Port Definition	RJ45 CAN Pin Layout	PIN 1	CANL	RJ45, RS485 Pin Layout	PIN 1	RS485-B1
		PIN 2	CGND		PIN 2	RS485-A1
		PIN 3	NC (empty)		PIN 3	RS485-GND
		PIN 4	CANH		PIN 4	RS485-B1
		PIN 5	CANL		PIN 5	RS485-A1
		PIN 6	NC (empty)		PIN 6	RS485-GND
		PIN 7	CGND		PIN 7	NC (empty)
		PIN 8	CANH		PIN 8	NC (empty)

RS485-2 COMMUNICATION INTERFACE DEFINITION



Interface	Defined Declaration			Defined Declaration		
Battery Link Ports	A Part RS-485-2 Interface	PIN 1	RS485-B2	B Part RS-485-2 Interface	PIN 1	RS485-B2
		PIN 2	RS485-A2		PIN 2	RS485-A2
		PIN 3	RS485-GND		PIN 3	RS485-GND
		PIN 4	NC (Empty)		PIN 4	NC (Empty)
		PIN 5	NC (Empty)		PIN 5	NC (Empty)
		PIN 6	RS485-GND		PIN 6	RS485-GND
		PIN 7	RS485-A2		PIN 7	RS485-A2
		PIN 8	RS485-B2		PIN 8	RS485-B2

DRY CONTACT DESCRIPTION



This BMS can provide one channel of dry contact signal, all dry contact signals are passive switches, regardless of polarity.

KRY 1 (2P Terminal)

BMS State	Description	Remark
Normal Operation	1/2 pin is disconnected	-
BMS Alarm	1/2 pin is connected	Output when SOC alarm, under voltage and over voltage alarm and BMS protection state, such as under voltage protection, over voltage protection or short circuit protection;

BUTTON OPERATION INSTRUCTIONS

When the BMS is in sleep state, press the button for more than 1 seconds, the protection board is activated. When the BMS is in operating state, pressing the button more than 3 seconds and less than 6 Seconds, then the BMS will enter sleep state. When the BMS is in working state, the protection board will reset when the button is pressed for more than 6 seconds.

BUZZER ACTION DESCRIPTION

In the case of short-circuit protection, the buzzer beeps every 2 seconds. If a short circuit is detected 3 times in a row, then he short-circuits protection is locked, the buzzer will no longer beep. Disconnect the battery and wait a few minutes to switch it back on. It might take up to 5 minutes to redetect a clear condition and then the BMS will re-enable.

INTERFACE FUNCTIONS

WARNING

Interfacing or plugging in any 3rd party or non-approved Hubble products or peripherals into the RS232 (serial) or RS485 (Battery Link) ports, can cause damage to the BMS and cause the BMS to malfunction. This may also result in damaging the internal cells. Plugging in non-approved Hubble products into these ports can immediately void your warranty.

DESCRIPTION OF SLEEP FUNCTION

To reduce the power consumption of the whole system, the system has a sleep function.

When the following conditions are met, the system will enter the sleep mode:

1. The over-discharge protection of the BMS has not been released for 5 minutes.
2. The duration of the standby state has reached 24 hours (no communication, no charge and discharge, no charger connected).

DESCRIPTION OF WAKE-UP FUNCTION

Please note that the battery enters sleep mode due to single or overall over-discharge and cannot be activated or switched on by serial port or the comm ports.

The BMS will activate and wake from sleep when the following is detected:

1. If a charge current is applied to the battery from the Inverter/UPS.
2. If the power button is pressed.
3. Through communication from the RS232 or CAN Bus in certain circumstances.

CURRENT LIMITING FUNCTION

The BMS has an advanced current limiting function built in. The charge current limiter is designed to activate if charging current has reached the maximum battery design charge limit. This ensures the battery does not disconnect from the circuit and the current limiter takes over and reduces the charge to 20Amps per battery.

The default start-up condition of the charging current limit is to start when the charging current is greater than 100A. After entering the current limit, the test will be performed again every 10 minutes. When the current is less than the current limit start value, the current limit function will be turned off. When the current is bigger than the current limit start value, then the current limiting mode with stay enabled.

COMMUNICATION DESCRIPTION

1. The RS232 port is only for use with Hubble specific peripherals or technicians or at a service centre to interface with the BMS. Attempting to use this port for anything else or 3rd party products can cause damage.

2. The CAN Port is specifically to be used to any interfacing 3rd party equipment like inverters etc. This port is dedicated to inverters and other CAN bus ports for communication to get battery information.

3. The RS485 communication port can be interfaced with 3rd party inverters that does not have a CAN port and is supported by Hubble.

4. The Battery link ports are only for connecting more batteries of the same model to increase capacity and to enable multiple battery communications.

OPTIONAL CLOUDLINK DEVICE

The Hubble Cloudlink is an optional add-on to the Hubble X and AM range of products. If the device is connected to Wi-Fi it will cloud, all battery and inverter data to our cloud-server, enabling users to remotely monitor their power system.

LEARN MORE ABOUT THE HUBBLE CLOUDLINK HERE

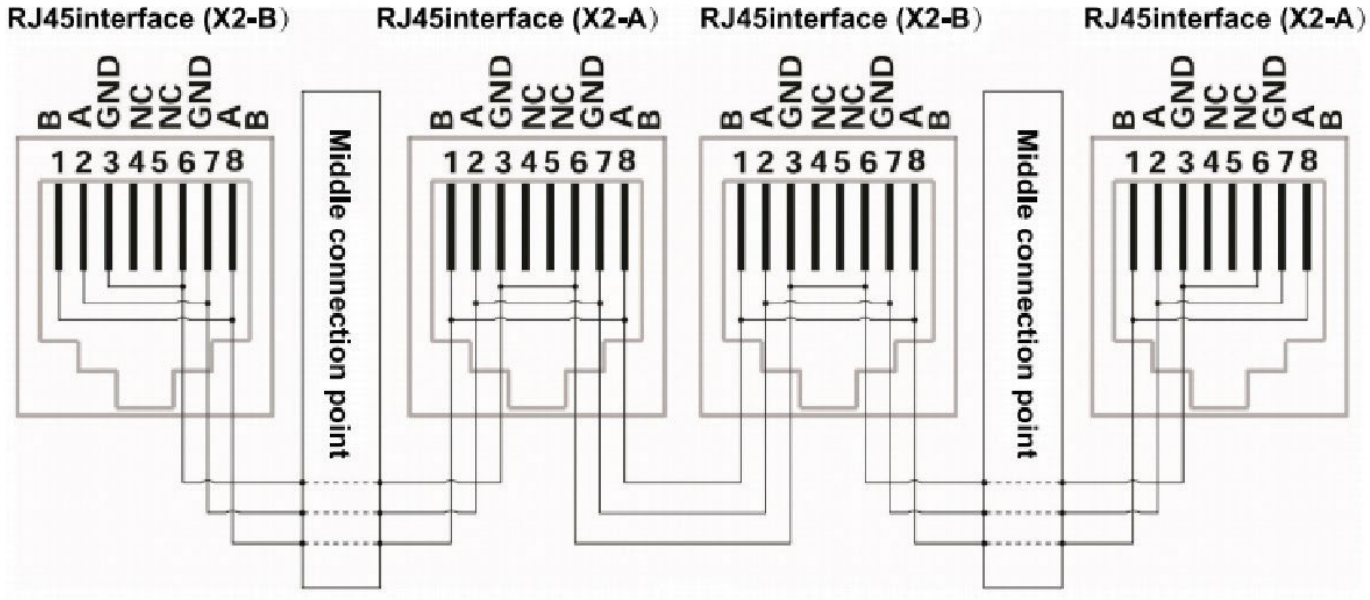
https://www.hubbleenergy.com/about-the-cloudlink

PARALLEL FUNCTIONS

PARALLEL (CASCADE) FUNCTION OF BATTERY PACKS

When the battery packs are cascaded, the one with the communication address of 0001 is called the master battery pack, and the other ones with the communication address are called the slave battery packs. The slave battery pack can communicate with the master battery pack through the RS485 communication interface, and the master battery pack centrally packs and manages the data of each battery pack in this cascaded system.

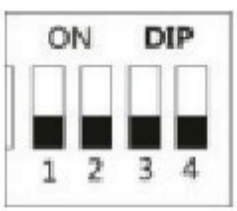
When the battery packs are cascaded, only the main battery pack can communicate with the host computer, upload the data, status and information of all battery packs in the cascaded system, integrate monitoring and management and realize remote monitoring.



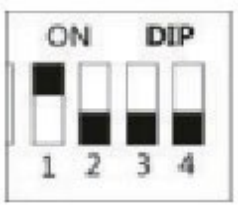
RS485 PARALLEL WIRING DIAGRAM

When performing multi-machine parallel communication operation, it is necessary to configure the DIP address of each PACK first. The dialling code adopts BCD code format, the definition is:

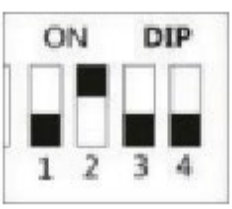
ADDRESS 1



ADDRESS 2



ADDRESS 3



AND SO ON FOR THE FOLLOWING. (BLACK IS OFF. BLANK IS ON)

WARNING

To ensure proper use of the battery please read the manual carefully before using it.

HANDLING

Do not expose the battery to fire.

Do not place the battery in a charger or equipment with wrong terminals connected.

Avoid shorting circuiting the battery.

Avoid excessive physical shock or vibration.

Do not disassemble or deform the battery.

Do not immerse in water.

Do not mix the battery with other different makes, type, or model batteries.

Keep out of the reach of children.

CHARGE AND DISCHARGE

The Battery must be charged with an appropriate Charger/Inverter only.

Never use a modified or damaged charger.

STORAGE

Store the battery in a cool, dry and well-ventilated area.

DISPOSAL

Regulations vary for different countries. Dispose of in accordance with local regulations.

BATTERY OPERATION INSTRUCTION

CHARGING

Charging Current: Do not surpass the specified charging current.

Charging Voltage: Do not surpass the specified charging voltage.

Ensure correct DC polarity before connecting the terminals.

DISCHARGING CURRENT

The discharging current must not surpass this maximum battery specification.

BATTERY STORAGE

The battery should store in the product specification book stipulation temperature range. If it has surpassed six months with long-time storage, it is suggested you charge the battery.

COMPLETING SETUP

CONGRATULATIONS!

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 https://www.hubbleenergy.com/. Be sure to include the following information in your initial email so that we can provide you with timely assistance:

1. Inverter make & model.
2. Model & number of connected batteries.
3. Are your batteries in Series or Parallel?
4. A brief description of your system and any issues you may be having.
5. If possible; images of your power system.
6. Contact details if we should need to contact you.

VIEW OUR WEBSITE FOR MORE INFORMATION

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/