



# Installation Manual

## HeSU 4k4 PRO Battery Module

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In case of product upgrades to the 4k4 PRO Battery Module or for other reasons, this document will be adjusted accordingly. Unless otherwise agreed, this document is intended to be used only as a guide, and all statements, information and advice in the documentation shall not constitute any express or implied action in contradiction to local regulations or standards.

For more information, please contact us.

The official information and the latest datasheet are available on [www.wecobatteries.com](http://www.wecobatteries.com)

It is essential that the battery unit is equipped with the latest firmware version available.

WeCo will release new firmware to improve the functionalities and battery capabilities from time to time

The latest version of the firmware is always available free of charge, the battery firmware can be updated by your local installer.

You can also write an email to [service@weco.uk.com](mailto:service@weco.uk.com) to understand the upgrade procedure.



### ATTENTION

The 4k4 PRO Battery Module is designed to be used indoors.

The STANDARD IP20 degree of protection does not allow installation in outdoor environments even if sheltered from the weather.

The INDOOR definition means literally the internal environment, the room must be closed to unauthorized persons, ventilated and dry.



**ATTENTION:** The battery can explode under heavy impact.

mechanical

**ATTENTION:** The batteries weight exceeds 25kg. Appropriate lifting equipment must be used.

not

**ATTENTION:** This battery can accumulate parasite current. Do not

and must **not** be exposed to open

**ATTENTION:** The battery can explode at flames or other extreme sources of heat

by a professional company

**ATTENTION:** Battery must be recycled to

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## 1 PREFACE

Thank you for choosing our product. We will provide you with a good quality product as well as reliable after service.

To protect against harm to both personnel and the product, please read this manual carefully.

This manual provides detailed information on operation, maintenance and troubleshooting of the product as well as health and safety advice.

### **Special Announcement:**

The manufacturer holds the right of final explanation of any content in this manual.

## 2 INFORMATION IN THIS MANUAL

### 2.1 About this Manual

This manual relates only to the HeSU 4K4 PRO Low Voltage Universal Stackable Model. This manual is intended to be used only by qualified installers who must read carefully and always refer to the manual for guidance on correct operation and maintenance of the product.

### 2.2 Use Range

This installation guidance applies only to the HeSU 4K4 PRO Low Voltage Universal Stackable Model.

### 2.3 Additional Information

Specification of the product can be changed without any notice to customers.

### 2.4 Symbols Used

Symbol meanings:



#### **Caution:**

CAUTION represents hazardous situations which can cause light injuries if not avoided.



#### **Notice:**

NOTICE represents the situations which can cause damage to property if not avoided.



#### **Information:**

INFORMATION provides tips that are valuable for optimum installation and operation of the product.

## 3 SAFETY

### 3.1 Warnings and Notification

Installation environment requirements: -HESU- SERIES is designed for household purposes. For installation, it must be installed in a location complying with IP20. (IP 55 or IP65 are available on request). Installations in locations that do not comply with IP20 may cause failure and/or damage to the product and subsequently the product warranty will be considered void.

### 3.2 Safety Guidelines



#### Caution:

At all times be certain to avoid a short-circuit between the anode terminal and a cathode terminal of the battery. All electrical connections on the -HESU- SERIES must be made only by qualified professional personnel.

When installed and operated in accordance with this manual, the HeSU Series battery will perform as a safe and reliable manner in accordance with the battery operating specifications.

Subjecting the battery to an unsuitable operating environment or to damage, misuse or abuse may result in health and safety risks such as overheating or electrolyte smoke potential. All personnel must comply with the safety precautions and observe all warnings as detailed in this document. If any of the safety precautions or procedures detailed in this manual is not fully understood by the reader, the reader must not perform any operation on the battery, until they have contacted WECO the customer service officer for clarification and confirmation of understanding of the correct procedure.

The safety guidelines included in this document may not include or consider all the regulations in your area of installation/operation. When installing and operating this product the installer must review and consider applicable local laws and regulations in accordance with the industry standards of the product.

Installation personnel shall not wear watches and other metal items when performing installations as a precaution to avoid short circuits and personal injuries.



#### Caution:

The weight of an individual HeSU 4K4 PRO battery is around 50kg, please use original packaging and perform all safety precautions if the battery is to be relocated to another location, to avoid damage to the product and personnel injury.

## 4 PRODUCT OVERVIEW

### 4.1 Product Introduction

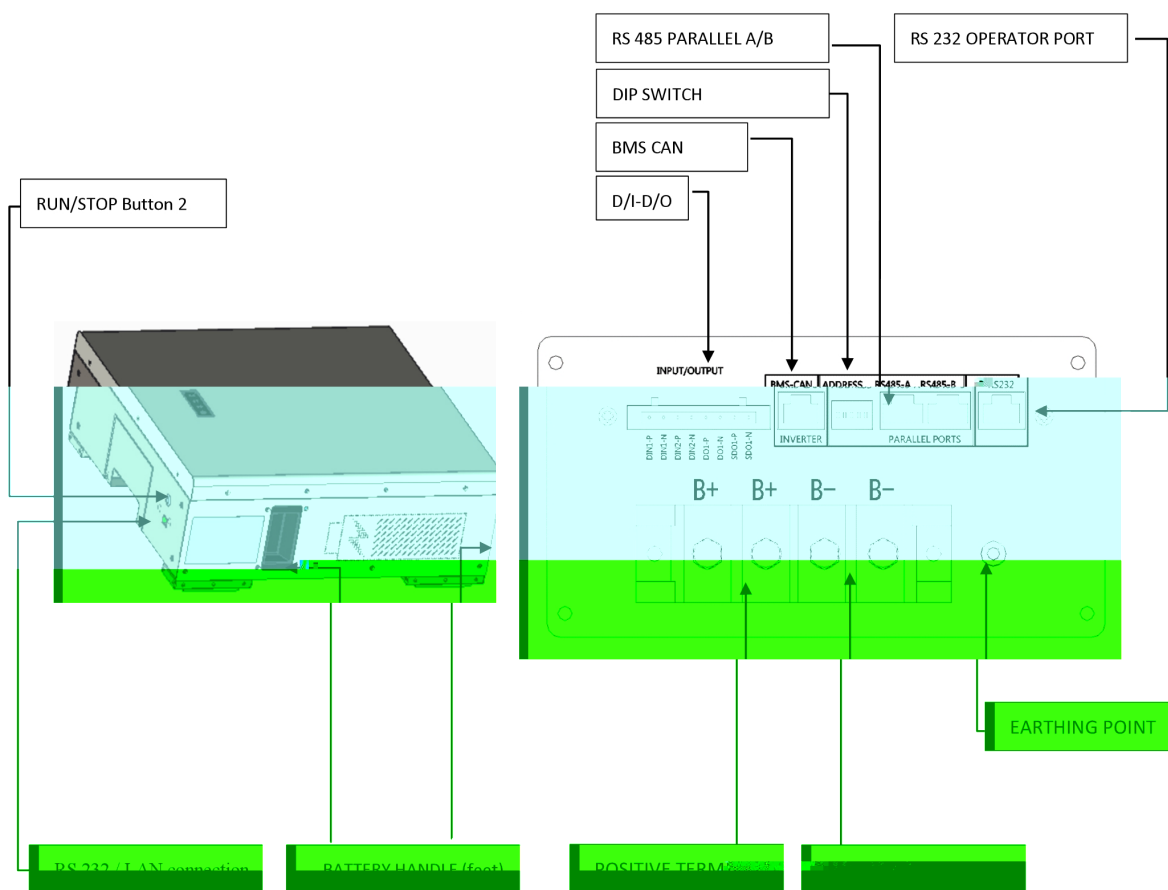
The HeSU Series batteries can be used as an on-grid or off-grid energy storage system. It is recommended not to use this product for any purpose other than the intended purpose as described in this document.

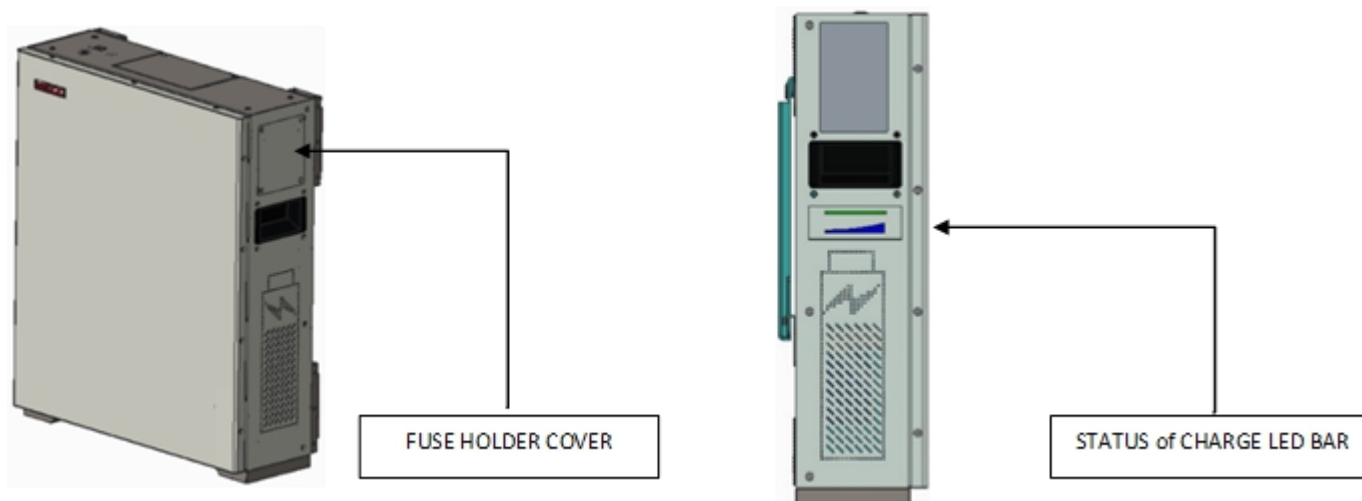
Use of this product other than as described in this document will nullify the product guarantee. The substitution or installation of any components of this battery will nullify the product guarantee.

The use of any components contained within or connected to this battery other than the products sold as part of this product or recommended by the manufacturer will nullify the product guarantee.

Connecting more than five individual HeSU 4K4 PRO battery units in parallel will nullify the product guarantee.

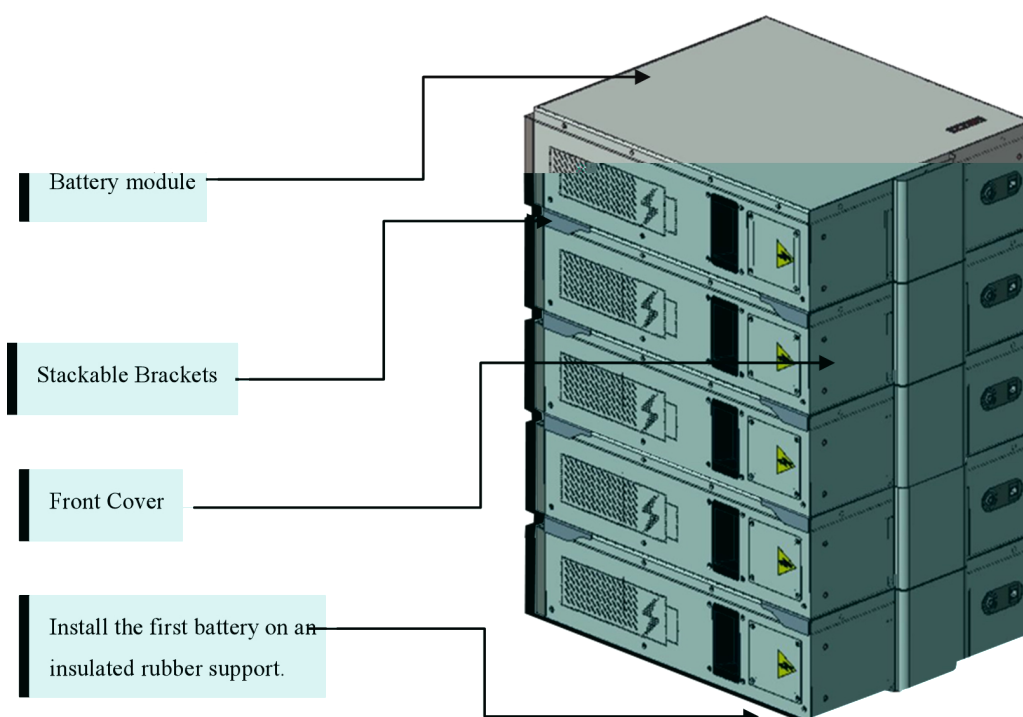
### 4.2 Identifying the Product Components





A Stackable system can be realized by utilizing the Stack Kit (to be purchased separately)

Once installed the system will appear like the picture below.



The nameplate label attached to the product describes the product parameters, including model type and serial number. Installers must always check that the specifications displayed on the nameplate of the battery module relates to the installation manual that is being referred to for guidance.

Only qualified personnel, with a comprehensive understanding of this manual are permitted to install this product.

## 4.3 LED Bar definitions

During startup: LED1-LED5: GREEN for 5 Seconds

After startup: LED1-LED5 changes to BLUE color and the SOC of the battery will be displayed.

### SOC STATUS

●	SOC	90-100%
●	SOC	55-89%
●	SOC	32-54%
●	SOC	6-31%
●	SOC	5% * (Yellow when SOC is below 4,9%)

### ERRORS

Low temperature	High temperature	Low temperature	High temperature	High temperature	Slave lost	
contactor open	contactor open	contactor open	contactor open	contactor open	communication	BMS Fault
LED1 on RED	LED5 on RED	LED2 on RED	LED4 on RED	LED3 on RED	LED1-LED2 on RED	LED1-LED5 on RED

### Information:

During the normal status the LED bar always displays SOC value.

During a Fault or Error the LED bar displays the SOC value for 5 seconds, and then displays the battery fault status for 5 seconds, alternately



## 5 SYSTEM INSTALLATION

*The battery is packed in a carton box. The total weight exceeds 55Kg and as such it is mandatory that the opening, unpacking and preliminary checking of the battery is conducted by carried out by a minimum of two people.*

### 5.1 Installation Notice


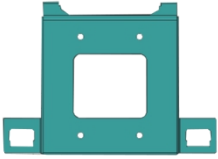


- a) Before installation, check the battery open circuit voltage.
- b) Battery installation location should be at least 20m away from sources of heat, sparks or other source of potential danger.
- c) Battery connecting cables should be as short as possible to prevent excessive voltage drops.
- d) Batteries with different capacity, different P/N or from different manufactures must never be connected together.
- e) Before connecting the battery, the battery positive and negative poles need to be carefully checked to ensure correct installation.
- f) The battery should be installed on a horizontal plane.



### 5.2 Package Information and Parts List

The battery is packed in a carton together with standard accessories. When unpacking the battery, be sure to check that the battery and accessories are free from damage and that the correct quantities of each component are included within the carton.





The following list of components can be used as a check list when unpacking the individual battery and battery kits.

#### 5.2.1 Parts list \* Included Accessories

Number	Name	Quantity	Description	Image
1	Battery	1	Lithium battery module	
2	Wall mounting plate	1	Support Plate	
3	Wall screws	4	Wall Plate Fixing Screws+Plug	
4	CAN cable RJ45 ( RJ 45/RJ9 ZCS/SOFAR)	1	1.5m	









5	RJ45 parallel cable	1	1.5m	
6	Power cable	1	Length 2.5m 25mm diameter	
7	User manual	1		<a href="https://wecobatteries.com/download-area/">https://wecobatteries.com/download-area/</a>

## 5.2.2 Stack Kit (To be purchased separately)

Number	Name	Quantity	Description	Image
1	Stack Feet with rubber	2	Left Side + 2 Screws	
2	Stack Feet with rubber	2	Right Side+ 2 Screws	
3	Front Cover	1	Front Cover + 4 Screws	
4	Parallel Bus Bar	1+1	1 Red Bus Bar 1 Black Bus Bar	

## 5.2.3 Recommended Installation Tools

To remove the terminal cover it is required an Allan Key 2.5mm

 <p>Multimeter + Current clamp</p>	 <p>Screw Driver Set</p>	 <p>Allen Key Set</p>	 <p>Drill + Hammer</p>
 <p>Electrician Scissors</p>	 <p>Wrench set</p>	 <p>Lifting strap + mechanical lifter</p>	 <p>RS 232/USB+screw terminal (insulated)</p>

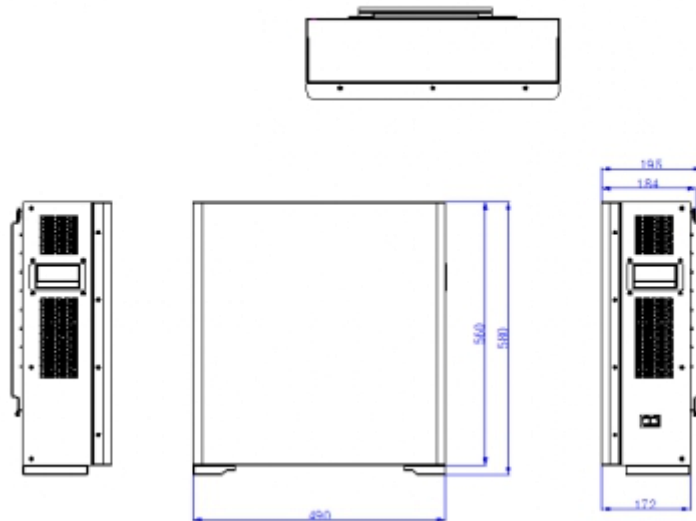
## 5.2.3 Personal Protective Equipment



## 5.3.1 Installation Procedure (Wall Mount)

Preparing the installation area by considering the battery dimension and weight.

The battery weight is 56kg. The wall or the floor must be capable of supporting the battery weight.



### Wall Installation Procedure

**Step 1:** Install the fixing screws on the appropriate height of the wall. The scheme is as following:



#### Information:

When installing the screws, please check the wall plug size, WeCo provides 4x  $\phi 10 \times 60$ mm, but it may be that a different size or type will be required depending on the actual installation surface.

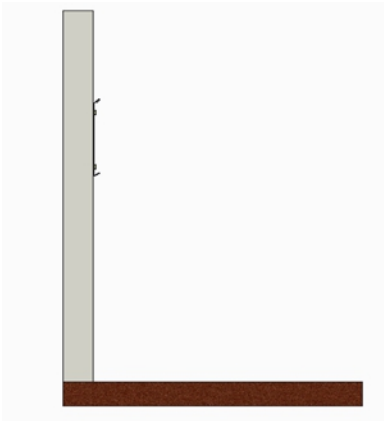


**Step 2:** Make sure that the mounting screws are firmly and securely attached to the wall.

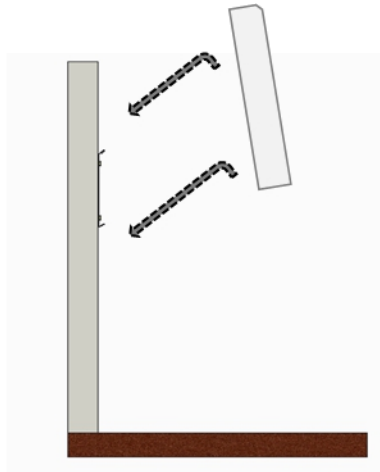


#### Information:

When the battery bracket is fixed, please work with a partner to avoid damage to the product or personal injury and install the battery on the wall bracket.



Step 3: Fix the support plate on the wall



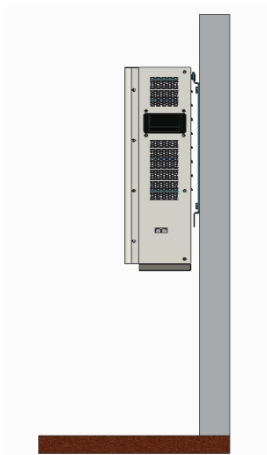
Step 4: Interlock the battery module with the wall bracket



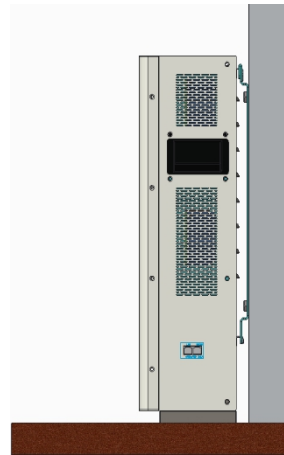
### Information:

For wall and floor installation it is always required to secure the battery module with the vertical structure by using the provided bracket

Free standing installations are strictly forbidden



Wall Mounted



Floor Mounted



### Information:

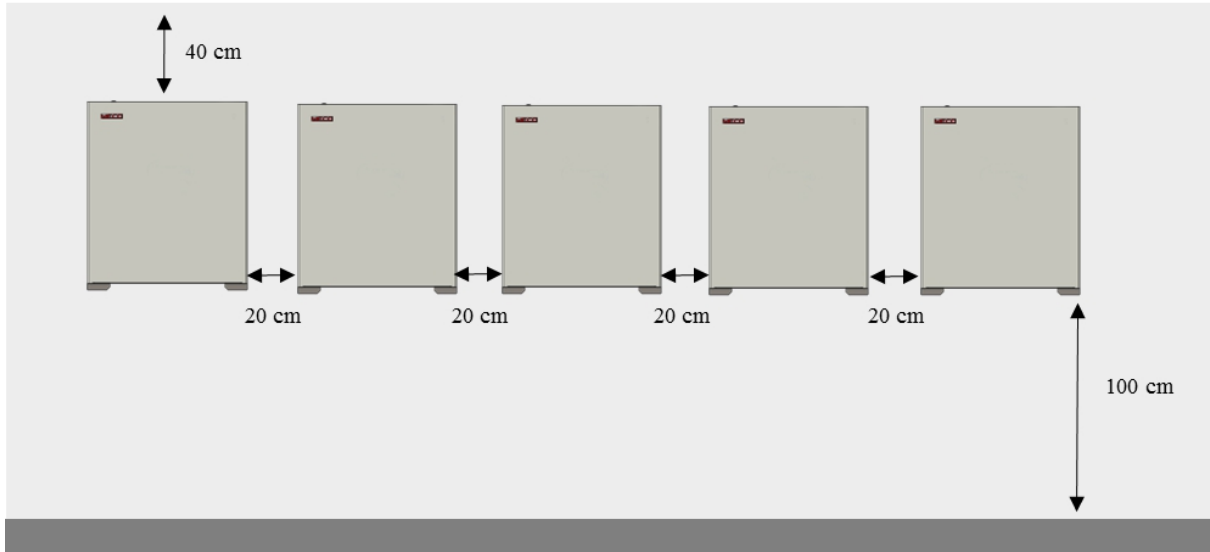
When installing the battery, please work with appropriate lifting devices managed by at least two people to avoid product damage or personal injury. The battery module exceeds 55Kg.

## Wall Mounted Installation of Multiple Batteries

Keep 20 cm between the batteries and or between walls and other objects on the left and right side.

Maintain at least 40 cm from the ceiling.

The bottom side of the battery should be at least at 100 cm from the floor.



## 5.3.2 Stack Installation

### 5.3.2.1 Installation of accessories and preparatory phases

Phase 1: Choose the support surface carefully, the batteries have a weight of over 55 kg each and can reach 270 kg including the accessories, in a stack of five batteries.

Make sure the support surface is adequate to support the overall battery load.



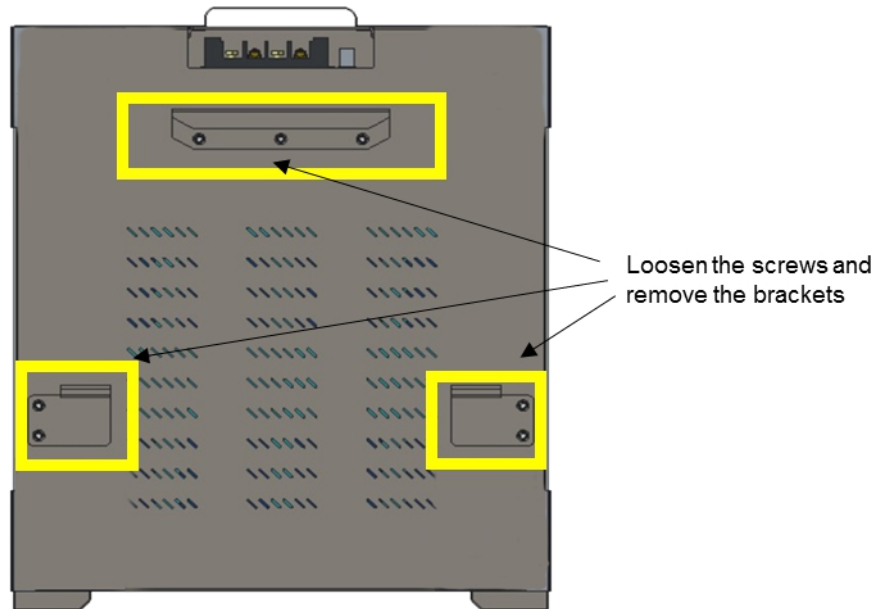
#### Information:

##### Preparation of the modules

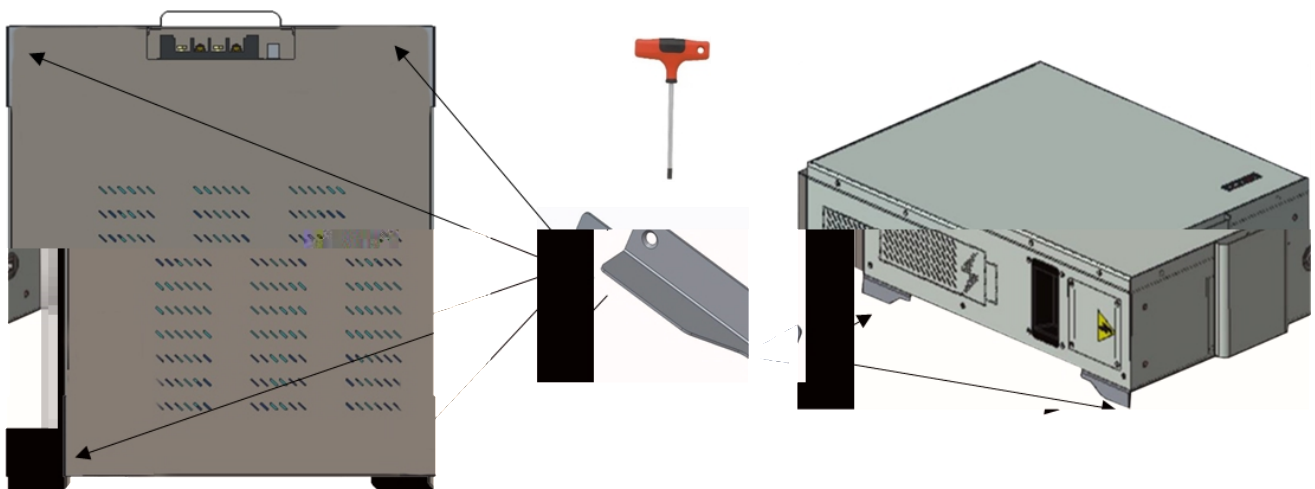
The battery is delivered as standard in a **WALL MOUNTED CONFIGURATION** and it is therefore necessary that the installer make simple external changes to install into a **STACKABLE CONFIGURATION**

## STACK MOUNT INSTALLATION PROCEDURE

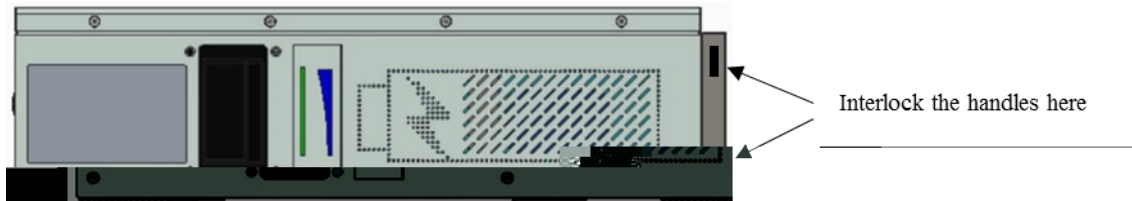
Step 1: When the batteries will be stacked you must remove the three brackets from the back side of the battery as shown below



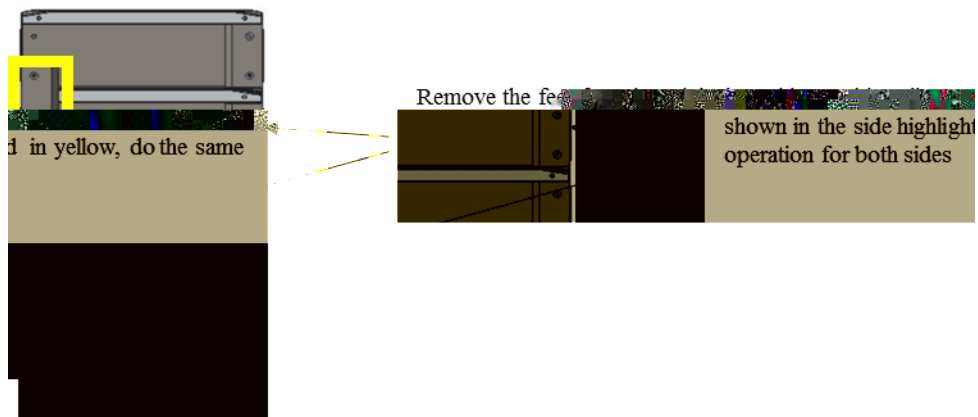
Step 2: Next, install the pads on all four corners of the bottom of the second battery in the stack using the screws provided as shown in the picture below.



Step 3: To lift and position the battery on top of the first one, use the temporary handles provided with the stack kit and align the second battery with the first and lay down the second module.



Step 4: Once each battery has been installed in the horizontal position, the feet which shipped with the battery in standard configuration can be removed and installed across the modules to interlock the modules with each other.



Step 5: Continue installation of the modules up to a maximum of five modules in total





## ⚠ Caution:

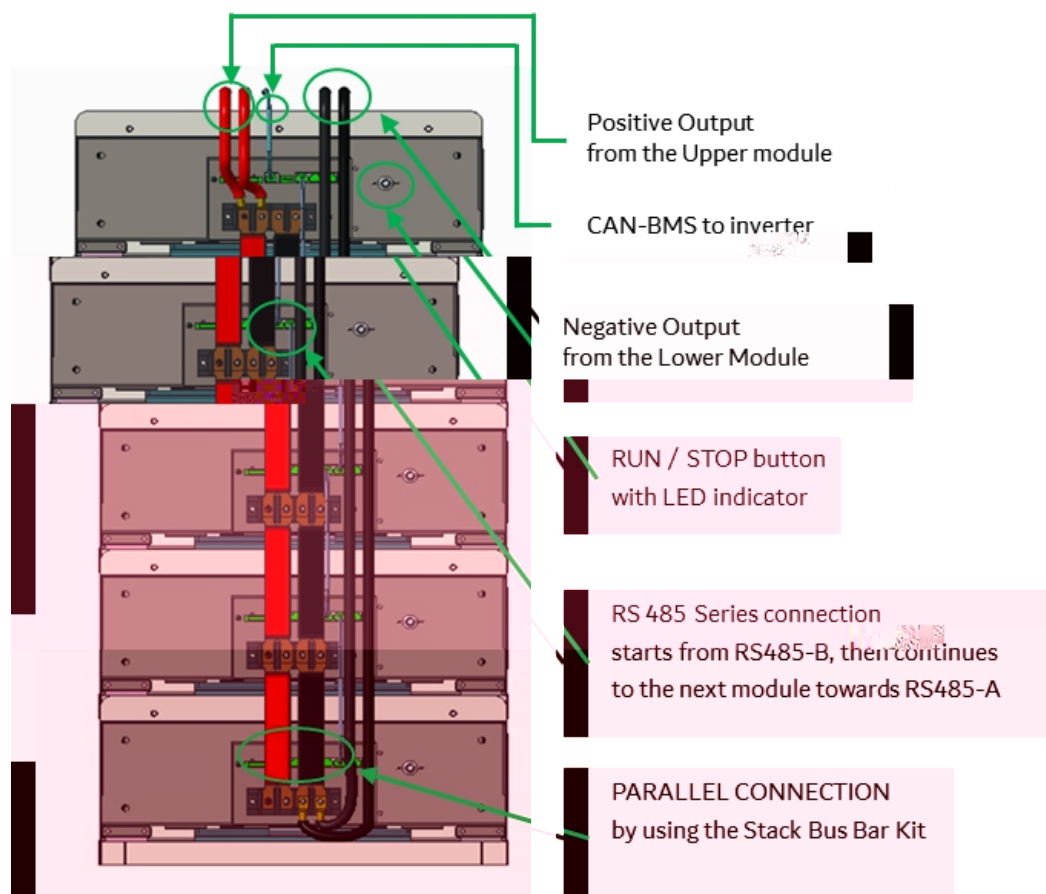
Each battery weights more than 55kg and must be installed with the help of a mechanical lift, and / or with at least two people equipped with suitable suction cups for lifting or with lifting straps

## ⚠ Caution:

MAKE SURE THAT THERE IS **ZERO VOLTAGE ON THE BATTERY TERMINALS**. CHECK THE LED BUTTON ON THE BOTTOM AND ALWAYS MEASURE THE B+ AND B- TERMINALS WITH A MULTIMETER.

Once it has been verified that there are ZERO volts present ON ALL BATTERIES, proceed with the installation of the cables as shown in the diagram below.

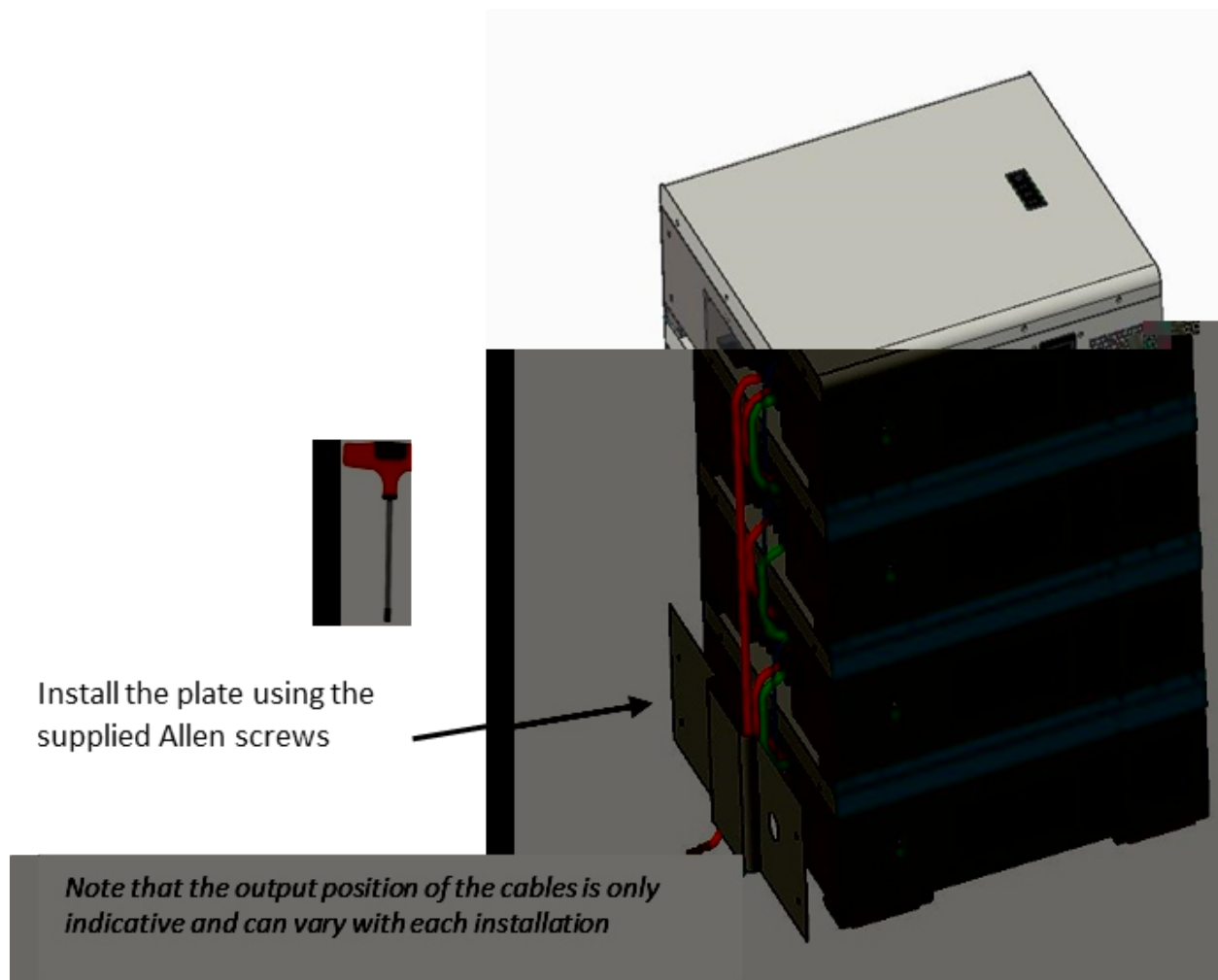
Power Connection by using the STACKABLE KIT BUS BAR



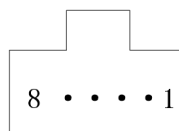
After all cables and bus bars have been connected, and the inverter is correctly set up, try to start up the system by turning ON the master module and proceed toward the last module installed. If the installation is properly set up all the modules will turn on in sequence, install the protective front plate

If the inverters have properly identified the battery BMS model and Capacity, Turn OFF the system your connection is properly set up.

Always install cables in accordance with installation guidelines and avoid long cable runs to prevent excessive voltage drops







Pin	8	7	6	5	4	3	2	1
Definition						GND	CAN_L	CAN_H

## 5.5 DIP Switch Settings



### Caution:

Always configure the DIP switch settings BEFORE connecting any power cables to the battery terminals B+ and B-.



### Caution:

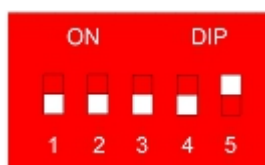
The battery module must be restarted for DIP switch settings to take effect



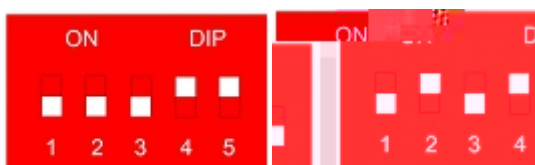
### Caution:

When connecting to an inverter which has BMS-CAN communication, switch #5 on the Master battery module must always be set to "ON".

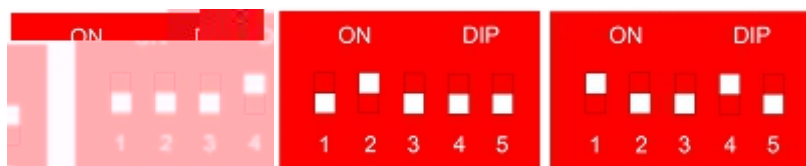
### 5.5.1 Stand Alone Battery



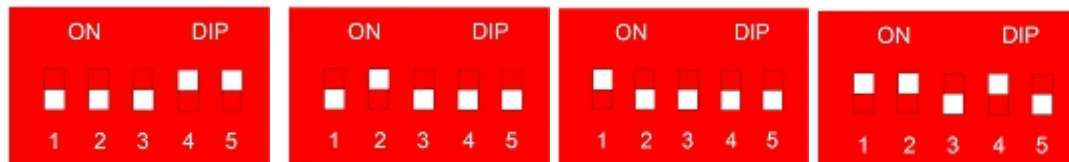
### 5.5.2 (Master + Slave#1)



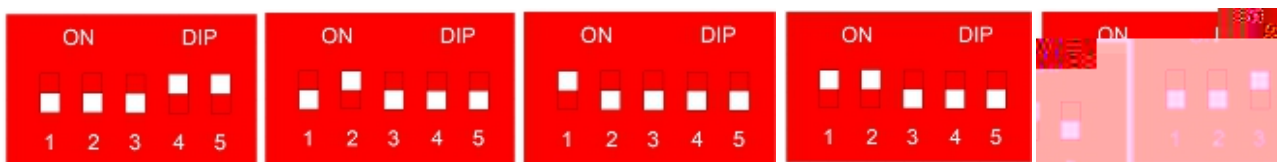
### 5.5.3 (Master + Slave#1 + Slave#2)



### 5.5.4 (Master + Slave#1 + Slave#2 + Slave#3)



### 5.5.4 (Master + Slave#1 + Slave#2 + Slave#3 + Slave#4)





**Caution:**

Always configure the DIP switch settings BEFORE connecting any power cables to the battery terminals B+ and B-.

## 5.6 Parallel Battery Wiring Convention



**Caution:**

Parallel battery installation must follow the wiring conventions shown in the illustrations of this section

- 5.6.1 Master Plus Slave#1
- 5.6.2 Master Plus Slave#1 & Slave#2
- 5.6.3 Master Plus Slave#1 & Slave#2 & Slave#3
- 5.6.4 Master Plus Slave#1 & Slave#2 & Slave#3 & Slave#4
- 5.6.5 Master Plus Slave#1 & Slave#2 & Slave#3 & Slave#4 & Slave#5



**Caution:**

Failure to follow these wiring conventions can result in damage to the battery and potentially cause personal injuries.



**Caution:**

For parallel battery connections follow the instructions provided in Section 9 and Section 10 of this manual. These sections give instructions on the diameter of cables to be used in parallel installations. Failure to do so can result in damage to the battery and potentially cause personal injuries.



**Caution:**

For maximum charge and discharge current refer to the tables given in Section 9, Section 10, Section 11, Section 12 and Section 13 of this manual.



**Caution:**



All Power Cable Connectors should be tightened to 40 Nm and checked every three months



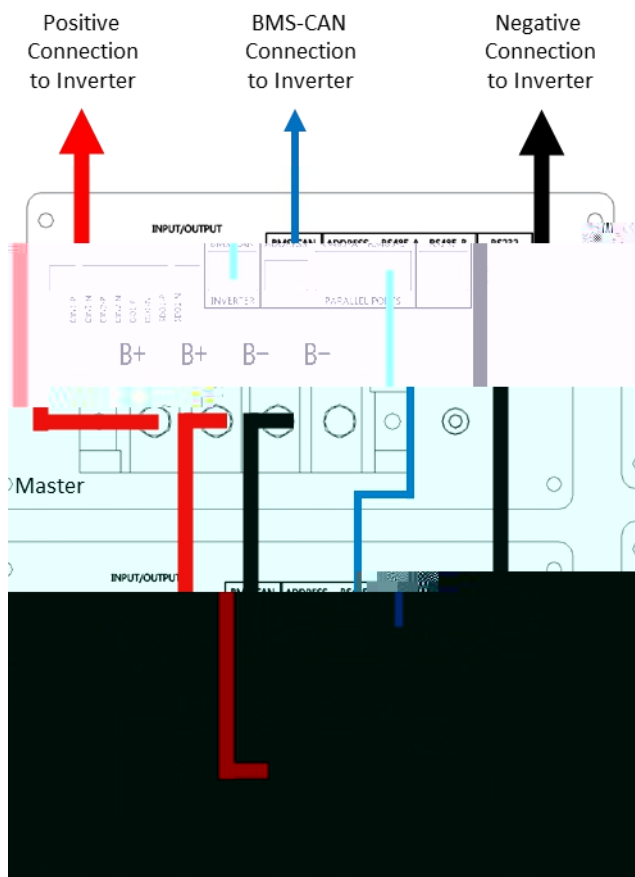
## Caution:

The drawings in this manual are for reference only. If the drawings in this manual do not match the actual product that is being installed, **DO NOT PROCEED**. Ensure that the battery is isolated and that all connections are removed. Store the battery in a safe place and call WeCo product assistance for support [service@weco.co.uk](mailto:service@weco.co.uk).

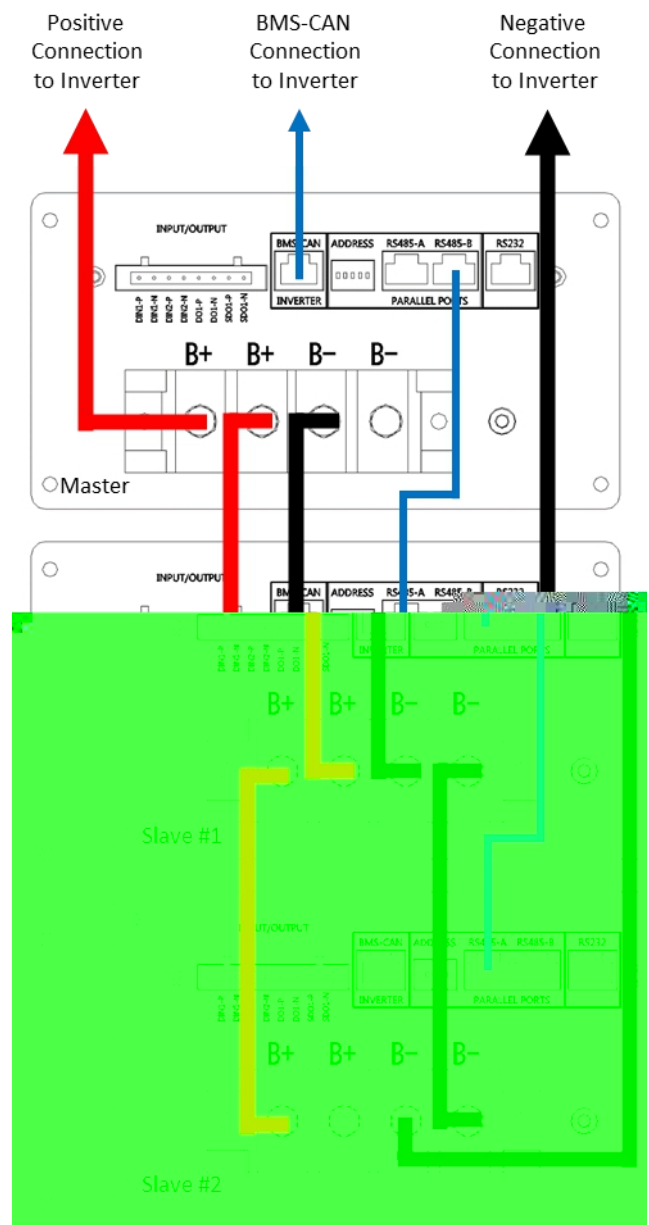
The batteries in each stack communicate with each other via the RS485 ports. The master battery always connects to the RS485-B port and from there connects to the RS485-A port on the Slave#1 module. The RS485-B port on the Slave#1 module then connects to the RS485-A port on the Slave#2 module and so on depending on the number of batteries you have in a stack.

The BMS-CAN port on the Master battery connects to the Inverter.

### 5.6.1 Master Plus S1



### 5.6.2 Master Plus S1-S2

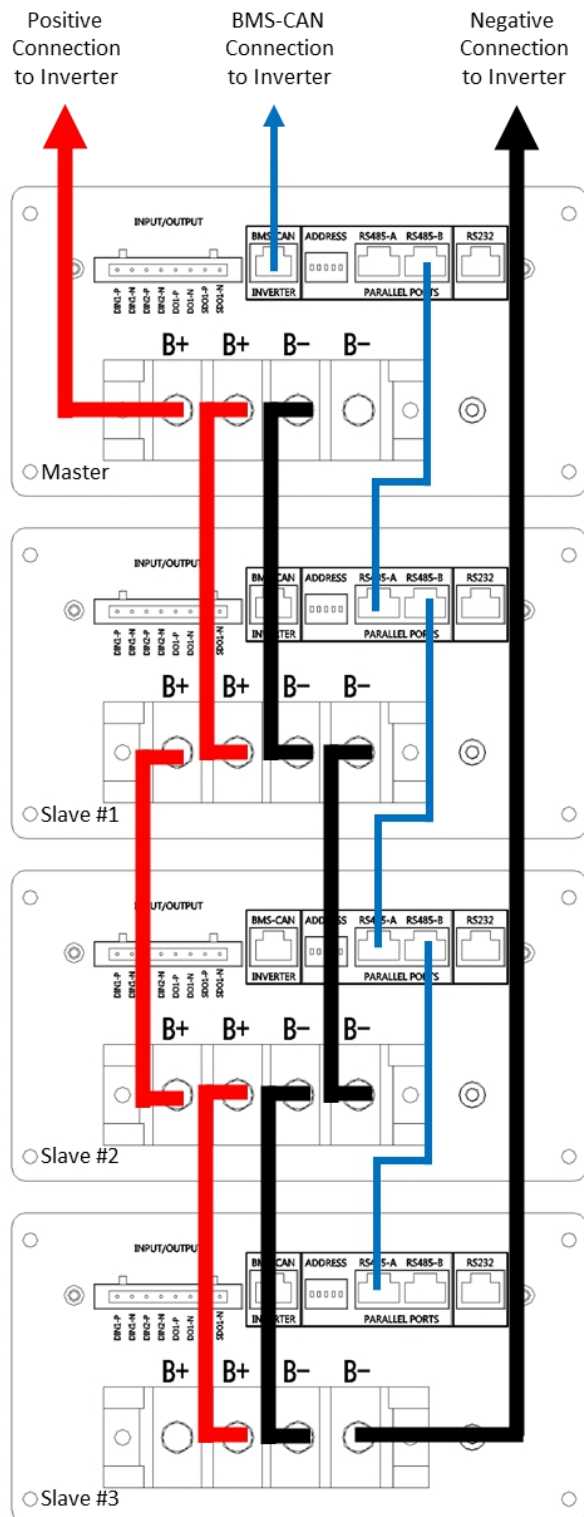




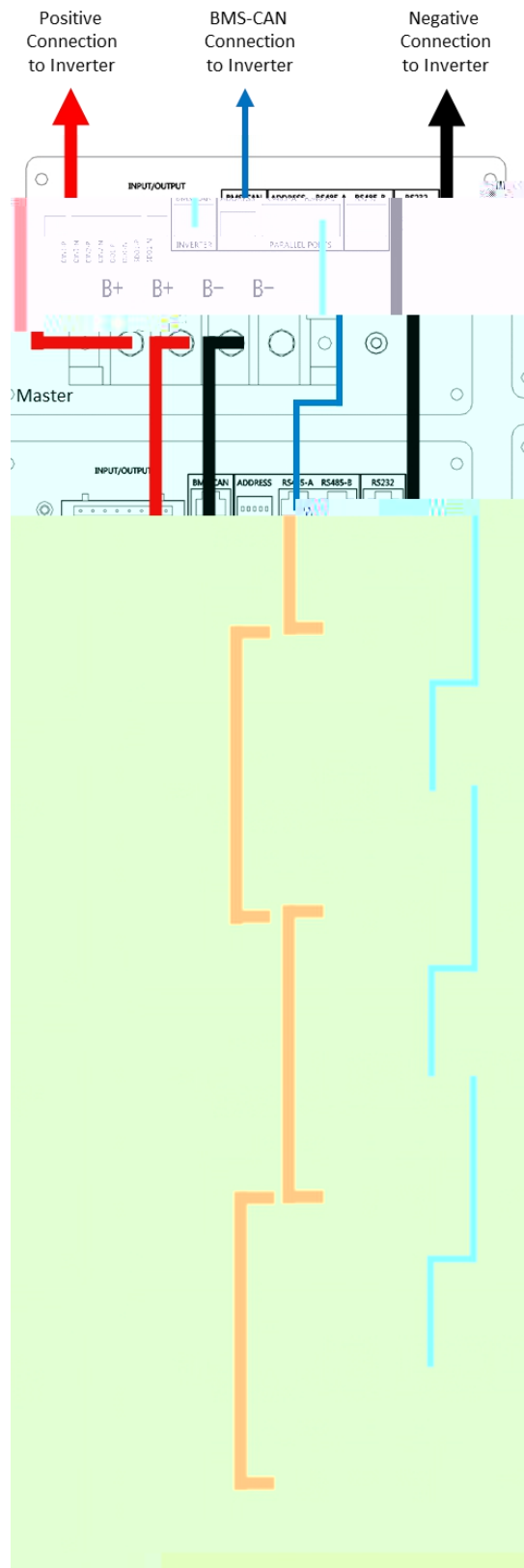
## Caution:

For parallel battery connections follow the instructions provided in Section 9 and Section 10 of this manual. These sections give instructions on the diameter of cables to be used in parallel installations. Failure to do so can result in damage to the battery and potentially cause personal injuries.

### 5.6.3 Master S1-S2-S3



### 5.6.4 Master Plus S1-S2-S3-S4



## 6 BATTERY ACTIVATION AND SHUTDOWN

### 6.1 Panel buttons and LEDs Explanation

Attention: The drawings in this manual are for reference only. If the actual battery has a different configuration stop all installation activity, ensure that the battery is disconnected and in a safe condition and contact WECO support center



Name	Meaning	Function or indication status
POWER	On/Off button	Switches the module on or off
START	Blinks Green when the battery module is starting up	When the battery box is starting up normally, it blinks for 5 seconds
RUN	Steady Green when the battery module is running normally	When the battery box is running normally, it the power button will remain a steady green

### 6.2 Stand Alone Battery Front Panel Control

#### 6.2.1 Start Battery

Short press the power button for one second. The GREEN RUN light should come on blinking.

The battery has been activated normally.

#### 6.2.2 Shut Down Battery

Long press the power button for five seconds. The GREEN RUN light should go off. The battery has been shut down normally.

#### 6.2.3 Low Battery – Force Charge

**Prerequisite:** The **VOLTAGE** between the battery B + and B- terminals is **ZERO** and the **PANEL LIGHTS ARE OFF**. Battery is in “Shutdown State”.

**Preparation condition before forced charging:** Connect the charger or the inverter with charging capability to the B+ and B- of the battery box to ensure charging capacity.

**Forced charging approach:** Short press the battery power button, the battery RUN light will flash green, which means that the battery is entering the compulsory charging mode. If the battery receives an adequate charging power (above 10 Amps/58V) within 90 seconds from pressing the button, the battery will continue to charge normally until a stable state is reached.

If the battery does not receive adequate charging power within 90 seconds after pressing the button, the battery will enter the shutdown mode once again.



## 6.3 Parallel Battery Configuration

1. The voltage difference between any of the batteries in the stack must not be greater than 2V. Otherwise, the BMS will not allow the batteries to be activated in a parallel connection.
2. SOC of each battery in the stack must be the same (check SOC as individual battery before parallel connection)
3. The power cabling between the batteries is in accordance with section 5.6 of this manual.
4. All DIP switches are configured in accordance with section 5.5 of this manual.
5. The RS 485 inter battery data connections are properly connected as per section 5.6 of this manual. The data connection “daisy chain” must start from port-B of the master battery (do not install the RS485 on the port-A of the master battery, it will occur in a fault)
6. Connect the CAN port of the master battery with the CAN port of the inverter and make sure that the communication is working properly by checking the inverter display
7. Before activating the system, the operator should check the cable connection carefully and make sure that all safety procedures are respected. Check the inverter settings and connection before turning on. In case of an inverter without communication make sure to set the voltage and current value as per the charge/discharge parameters provided in this manual.

### 6.3.1 Activation of Parallel Batteries (From Master to Slave#4)

Short press the Master power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#1 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#2 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#3 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#4 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Now all parallel batteries are activated normally and the parallel system is properly powered on.

### 6.3.2 Shutdown of Parallel Batteries

Long press the Master Power button for five seconds. The GREEN RUN light should go off immediately.

The GREEN RUN lights on the slave batteries will not be extinguished immediately.

The RED FAULT lights on the slave batteries will start flashing after ten seconds and the GREEN RUN lights will remain on.

After one minute the RED Fault lights and the GREEN RUN lights on all slave batteries will go off.




The parallel battery system has shutdown properly.



#### Notice:

In a parallel battery system, we strongly advise not to switch off individual slave batteries. If there is a reason to switch off a slave battery, we recommend that the procedure described in 6.3.2 of this manual is followed.

Switching off an individual slave battery in a parallel system is possible in an adverse situation, but only as a last resort.

## 7 TROUBLESHOOTING \* (WeCo Monitor via RS 232)

No.	ALARM	SYMPTOM	SOLUTION	PC Software
				GREEN (NORMAL) RED (FAULT)
1	OVER CURRENT ALARM	The battery relay is disconnected during charging or discharging, and the battery fault light is flashing.	Reduce charge or discharge current	Disch_Ov_Cur warn:  Ch_Ov_Cur warn: 
2	OVER TEMPERATURE ALARM	The battery relay is disconnected during charging or discharging, and the battery fault light is flashing.	Stop charging or discharging, wait until the battery temperature drops and then reuse	Ch_Ov_Temp alarm:  Disch_Ov_Temp alarm: 
3	LOW TEMPERATURE ALARM	The battery is unable to charge or discharge normally	Waiting for the temperature of the battery to rise to a suitable temperature before charging or discharging	Ch_Low_Temp alarm:  Disch_Low_Temp alarm: 
4	OVER VOLTAGE ALARM	The battery relay is disconnected when charging, and the battery fault light is flashing.	Stop charging and review and reset properly the inverter settings ( WeCo suggests to use Closed Loop CAN-BMS inverters)	Over Vol alarm: 
5	LOW VOLTAGE ALARM	The battery relay is disconnected when discharging, and the battery fault light is flashing.	Stop discharging from battery. Charge the battery in accordance with the correct charging procedure.	Low Vol alarm: 
6	RELAY DAMAGE	The battery is switched on, there is no alarm, but no voltage is present. The battery is switched off, there is no alarm, but voltage is present (always check for with voltage with a meter at all times)	Please contact the after-sales service, replace relay	When this sign is disconnected and green, the relay is disconnected; When this sign is connected and red, the relay is connected; Main Relay(Magnetic retention): 
7	PROTECTION BOARD DAMAGE	The PC and the batteries RS232 connection is reliable, but the monitoring software cannot read the battery information and status.	Please contact the after-sales service, replace protection board.	

8	CELL DAMAGE	Battery box in the state of no charge and no discharge, a cell voltage and most of the other cells voltage difference greater than 200mV.	Please contact the after-sales service.	The real-time display of the cell voltage on the monitoring software is as follows: <div><div>Voltage</div><table><tr><th>Cell Vol(V)</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr><tr><td>1-5</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6-10</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11-15</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>16-20</td><td></td><td></td><td></td><td></td><td></td></tr></table></div>	Cell Vol(V)	1	2	3	4	5	1-5						6-10						11-15						16-20					
Cell Vol(V)	1	2	3	4	5																													
1-5																																		
6-10																																		
11-15																																		
16-20																																		
9	FIRST PARALLEL CONNECTION FAILURE OF BATTERIES	When the batteries are first paralleled, start the system, slave battery fault light flashing. No sound from the slave battery relay action, no voltage output.	Measure the positive and negative voltage of each battery, if the voltage difference between the batteries is greater than 2V, please reduce the voltage difference to less than 2V to try parallel connection	Pack Vol Imbalance: 																														
10	MASTER-SLAVE MACHINE COMMUNICATION EXCEPTIONS	Slave battery fault light flashes, the master machine cannot control slave battery	Check that the communication cables between the master battery and the slave batteries are securely connected	slave1 online 																														
11	BATTERY OR PARALLEL BATTERY SYSTEM SHUTDOWN CANNOT START	There is no alarm information in the battery, but the batteries are not working properly	Please contact the after-sales service																															
12	OTHER EXCEPTIONS	Humidity, cell expansion, frost-Defrost, unbalances etc.	Please contact the after-sales service	FAULT RED																														



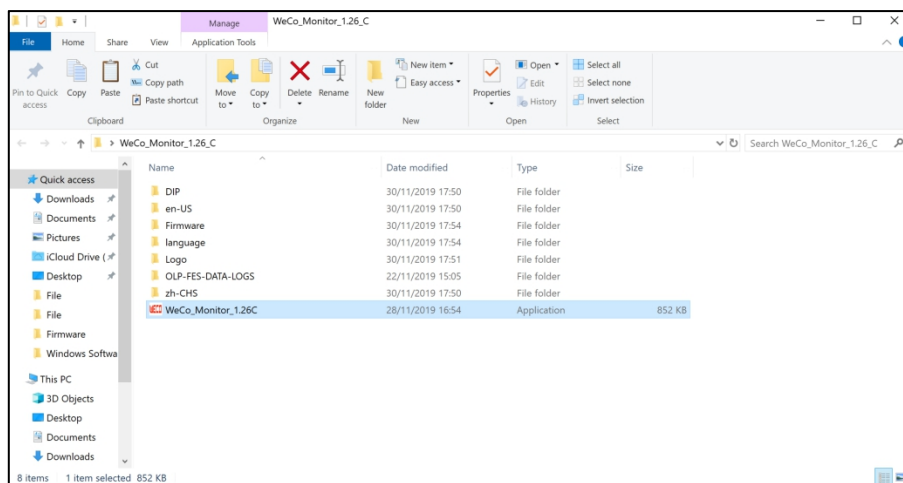
## FOR AUTHORIZED TECHNICIANS ONLY

### 8 SOFTWARE GUIDE

**WECO OLP RS232 (USB / RS232 converter is necessary to communicate with the battery)**

*\*PC -Battery communication and set up for 232-USB device is available for auth. Installers.*

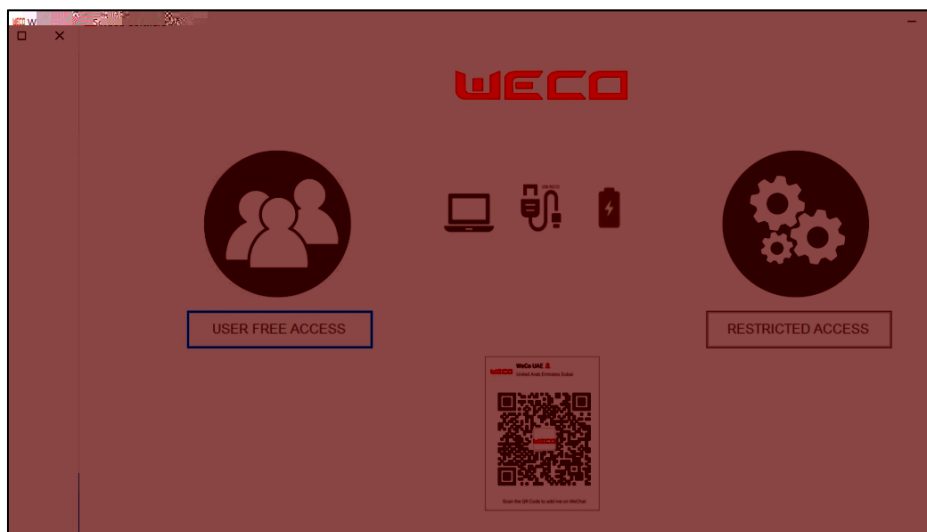
- 8.1 Launch the EXE file “WeCo Monitor” and wait for the self-installation to complete



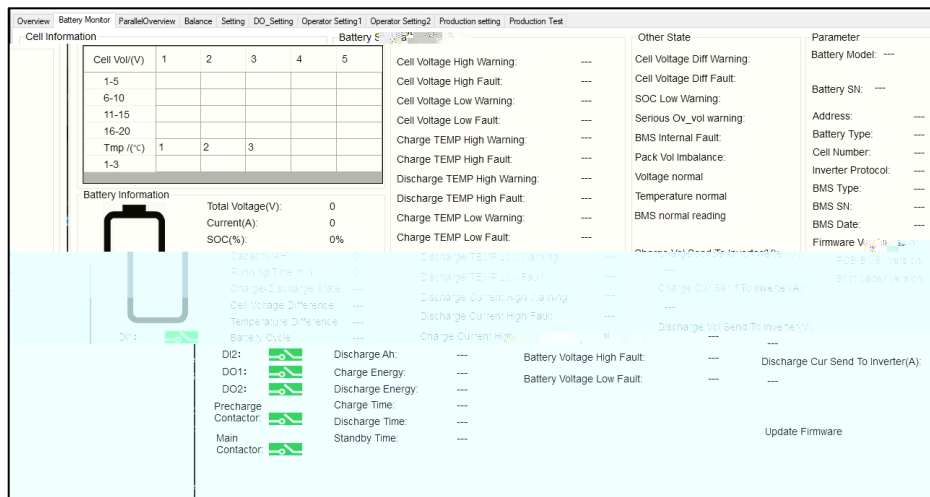
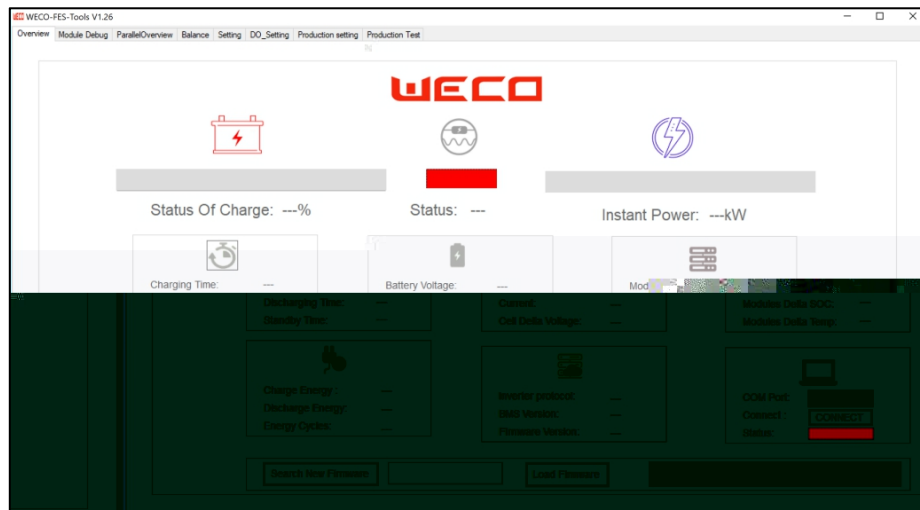
- 8.2 From the main page select “USER FREE ACCESS” if you are not an authorized installer.

If you are an authorized installer and you have a 1<sup>st</sup> level password click on the RESTRICTED ACCESS windows and follow the ‘Authorized Installer Guide’

*If in possession of a valid password the authorized installer will be able to access more detailed windows within the software.*



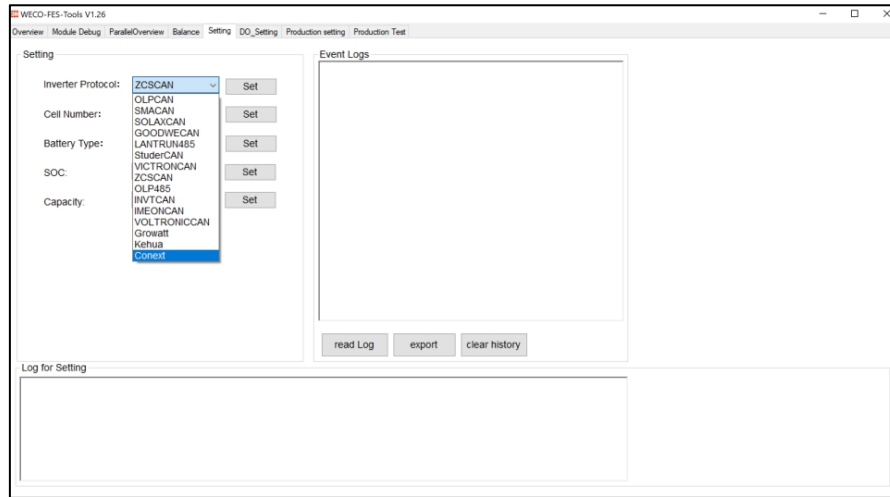
- 8.3 Connect the RS232 converter between the battery and the PC and search the relative com on the PC settings (device manager of Windows). Select the COM port from the Main page of the WeCo Monitor, then press CONNECT. Follow the instructions and wait for the data to appear on the screen.



- 8.4 If more than one module is connected, select Parallel Overview and check the single unit data.



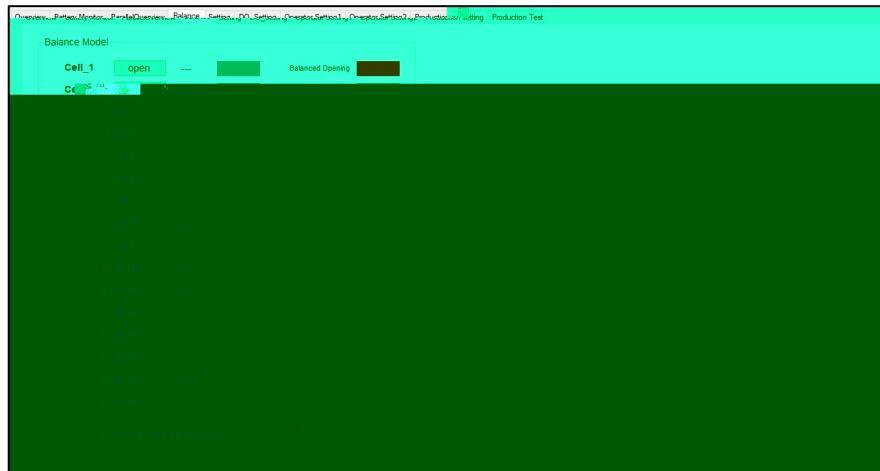
- 8.5 To set the CAN protocol to match the inverters communication protocol, select the inverter that you are connecting to from the list and press SET, wait for the positive feedback after the first communication with the inverter



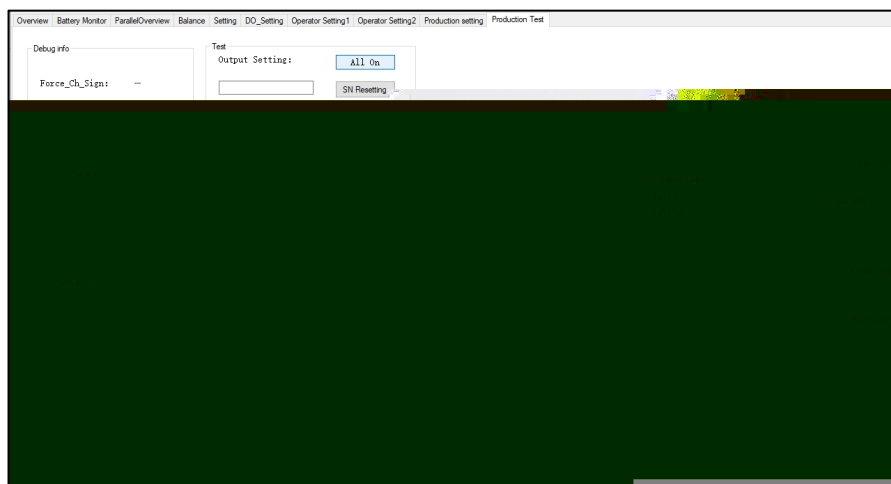
- 8.6 To manually adjust the battery parameters, select the “Operator Setting 1” tab which will allow you to make changes within permitted limits. This operation is possible only with batteries connected to the WeCo Server (Wifi or LAN)

Setting		Setting Value	Current Value	Setting Value	Current Value
Battery Voltage High Cutoff	---	---	---	Charge TEMP High Cutoff	---
Battery Voltage High Cutoff Time	---	Set	---	Charge TEMP High Recovery	---
Battery Voltage High Recovery	---	---	---	Charge TEMP High Cutoff Time	---
Battery Voltage High Recovery Time	---	---	---	Charge TEMP Low Cutoff	---
Battery Voltage Low Cutoff	---	---	---	Charge TEMP Low Recovery	---
Battery Voltage Low Cutoff Time	---	Set	---	Charge TEMP Low Cutoff Time	---
Cell Voltage High Cutoff	---	---	---	Discharge Current High Limit Level1	---
Cell Voltage High Cutoff Time	---	---	---	Discharge Current High Time Level1	---
Cell Voltage High Recovery	---	Set	---	Discharge Current High Recovery Time Level1	---
Cell Voltage High Recovery Time	---	---	---	Discharge Current High Limit Level2	---
Cell Voltage Low Cutoff	---	---	---	Discharge Current High Time Level2	---
Cell Voltage Low Cutoff Time	---	Set	---	Discharge Current Low Cutoff	---
Discharge Current High Limit	---	---	---	Discharge TEMP High Cutoff	---
Discharge Current High Time	---	Set	---	Discharge TEMP High Recovery	---
Discharge Current High Recovery Time	---	---	---	Discharge TEMP High Cutoff Time	---
				Discharge TEMP Low Cutoff	---
				Discharge TEMP Low Recovery	---
				Discharge TEMP Low Cutoff Time	---




























- 8.7 The normal mode for equalization is Auto mode, however in the unlikely event of a failure it is possible to perform a manual equalization. If it is necessary to perform a manual equalization, please contact WeCo support for further advice. Reference to the CELL EQUALIZATION MANUAL (not public) will be necessary to activate the manual procedure. **IMPORTANT** After the first Manual/Forced Equalization the single cell equalizer will return to Auto mode within 24h.



- 8.8 Factory reset. (This must be authorized from the WECO Tech Department) follow the instruction of the FACTORY RESET PROCEDURE



## 9 PRODUCT COMPATIBILITY LIST (See Also Section 8.5)

No.	INVERTER BRAND		MODEL	WITHOUT WeHUB	WITH WeHUB
1		SoFar / ZCS Azzurro	SP3000/HYD	modules	
2		Deye	All		
3		Phocos*	CAN Version		
4		Schneider	XWPRO (CAN) (XW+open loop)		
5		Solis	RHI LV		
6		Growatt	SPH LV		
7		SMA	Sunny Island		
8		Goodwe	LV Hybrid		
9		Studer Innotec	Extender		
10		Sofar Solar	All		
11		Victron Energy	Victron Energy	modules	
		TBE	ALL		
		INVT-MEGA	LV All		
		Imeon Energy	All		
		Voltronic Power	HYBRID (CAN)		
		Morningstar	Open Loop		
		Kehua Tech	Hybrid LV All		
		Must Solar	PH / PV		
		Lux Power Tek	LV Hybrid All		
		Solax Power	SK11 LV All		
		Sungrow	SH3K6/SH4K6	21	
		Steca	Open Loop	22	
		OutBack (No BMS/ Alpha CAN)	Open Loop	23	
		TSUN	LV Hybrid All	24	

\*





# NO CANBUS CONNECTION AVAILABLE (INVERTER SETTINGS)

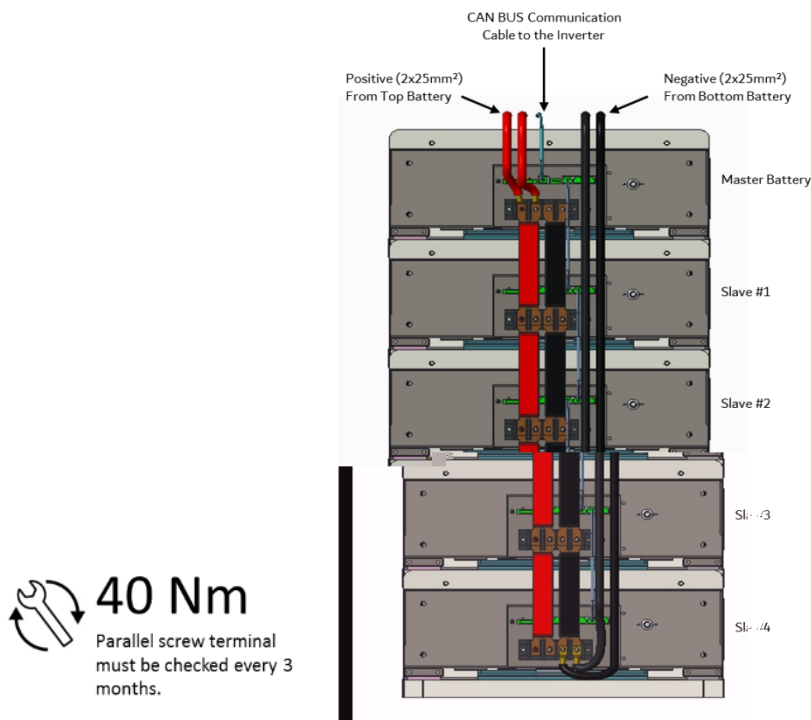
Any inverter can be used with WeCo Batteries by setting the voltage and Current Value as per Battery datasheet.

Description	Inverter Low Voltage CUT OFF	Inverter High Voltage CUT OFF	STD Charging Current (Max 86A -110A)	STD Discharging current (Max 86A-110A)
Single Battery	49.5 =SOC 0%  Suggested 50.5= SOC 5% if ON grid  Suggested 51.0 =SOC 10% if OFF GRID	55.4	50A max 110A	86A max 110A
Master + Slave1				
Master+SL1+SL2				
Master+SL1+SL2+SL3				
Master+SL1+SL2+SL3+SL4				

TEMPERATURE/ C-RATE	1C + Overload	0.5C
CHARGE	-8°C +55°C	-9°C – 15°C
DISCHARGE	-20°C +55°C	+56°C +65°C

## 10. SINGLE CLUSTER CONFIGURATION 100A

*No HUB is required for a single cluster*

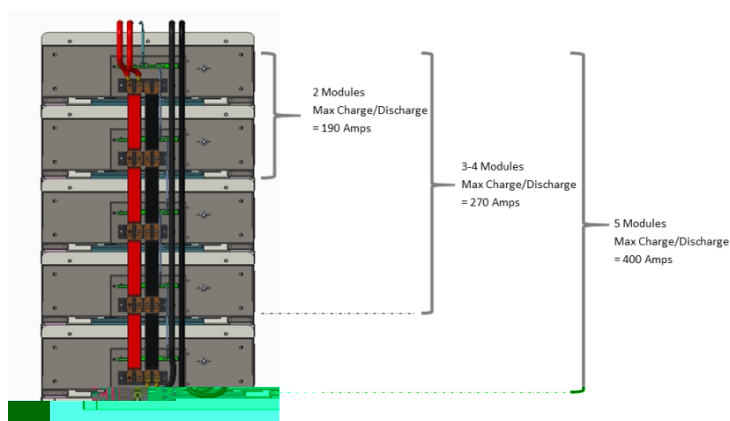


### ATTENTION

Connect two 25 mm<sup>2</sup> AWG Wire of the same length on each terminal as shown above

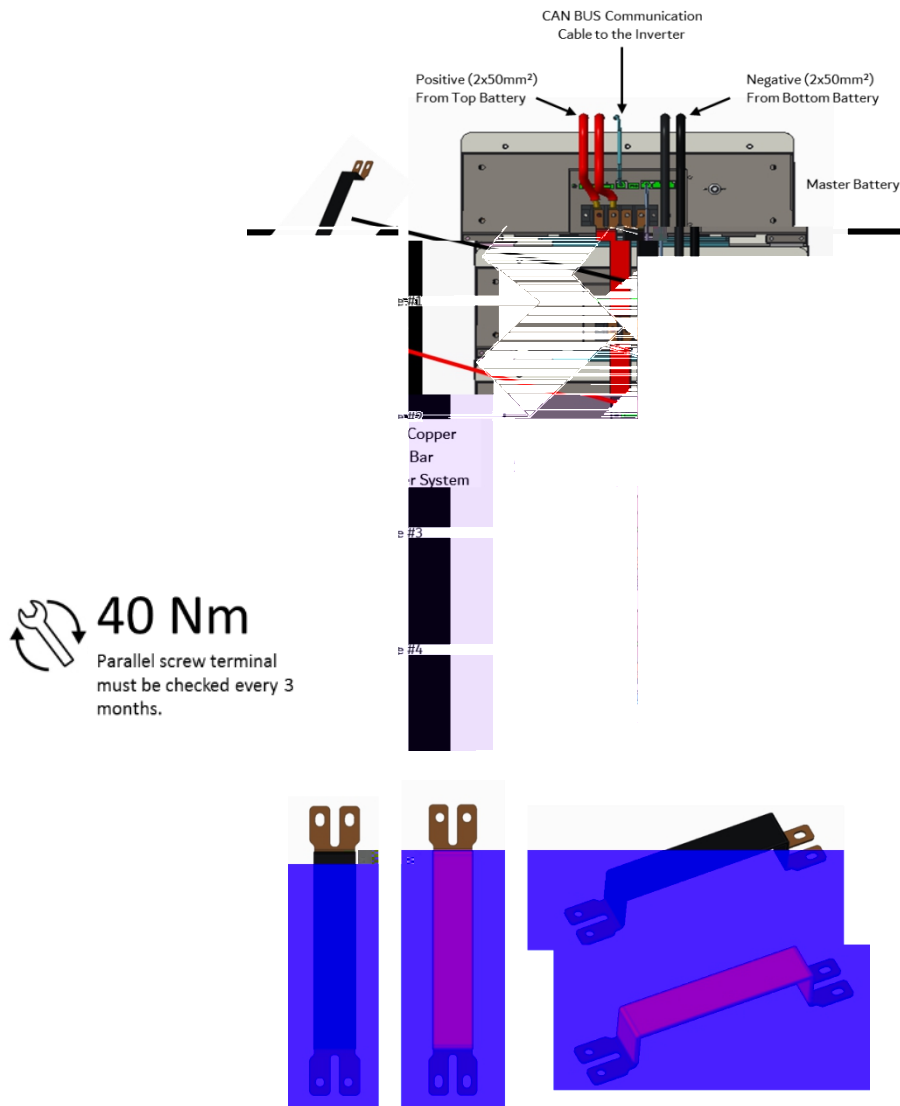
For the Single Cluster configuration with standard 25 mm<sup>2</sup> AWG cables do not exceed the current ratings listed in the chart below.

Single Cluster Number of batteries in parallel with 25mm parallel connection cable	Maximum Charge/ Discharge Amps
2	190A-(210Peak)
3	270A-(290Peak)
4	270A-(310Peak)
5	400A-(420Peak)



## 11. SINGLE CLUSTER CONFIGURATION 300A

No HUB is required for a single cluster



SPECIAL BUS BAR FOR PARALLEL CONNECTION UP TO MAX 400A



### ATTENTION

Bus Bar is mandatory for systems above 100A

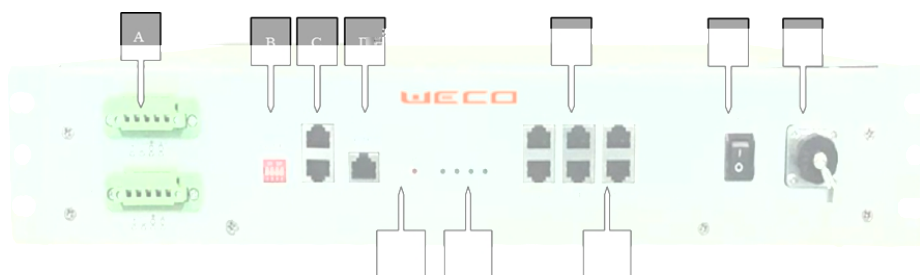
Connect two 50 mm² AWG Wire of the same length on each terminal as shown above

DO NOT USE DIFFERENT BUS BAR TYPES OR CABLES

## 12. MULTI CLUSTER HUB CONTROLLER (We-HUB)

Multi Cluster CAN Hub for High Capacity and High Current Configuration

Required for Systems with more than one Cluster



BMU BMS COMBINER (We-HUB)

The BMS BMU Multi Cluster Hub Controller (We-HUB) is mandatory when more than one cluster is connected on a common bus bar. The We-HUB can manage a maximum of 5 clusters with a maximum of 5 batteries in each cluster.

### ⚠ Caution:

Each battery module and each cluster must have the same SOC %

### ⚠ Caution:

Each Cluster must have the same number of battery modules

### ⚠ Caution:

For systems above 100A, the modules must be connected in accordance with Section-11 of this manual. The Bus Bar kit reference STK 4K4 PRO-300 must be used.

Interface Description		
A	I/O CONTACT 2X	Programmable closure/ contact
B	DIP SWITCH	Baud Rate Selection
C	CAN BUS PORTS 2X	CAN Bus port for external solar – grid charger
D	RS 485 port	RS 485 communication port (MODBUS)
E	CLUSTER CAN PORTS 5X	Master Cluster CAN port
F	ON OFF SWITCH	Internal Power supply switch
G	INLET 48Vdc	Connector for power input to connect to the bus bar (1A fuse protected)
H	RS232 PORT	External Port for programming and Debug
I	LED LIGHTS 4X	25% SOC status each LED
L	POWER INDICATOR	Power Supply LED Status

To order the We-HUB, use the kit code “Master HUB 300 LV-5”

1 x WeHUB Parallel Controller		<b>⚠ Notice:</b>  <b>Both Items Ship in One Box</b>
1 x WeHUB Cable Power Supply		

## 13. MULTI CLUSTER CURRENT LIMITATIONS



### Caution:

The current limit is set by the WeHUB (BMU-BMS Master Combiner) according with the quantity of clusters and modules connected as per the tables below. The inverter, if has the functions, must be set with the below restrictions in addition to the BMS We-HUB control logic settings.

CURRENT SETTING / BMS CURRENT LIMIT					
Batteries \ Clusters	1	2	3	4	5
1	-	155	206	275	344
2	155	279	372	495	557
3	206	372	446	528	660
4	241	433	462	616	700
5	301	488	578	700	700
INVERTER LIMITS CURRENT: as per this chart		HIGH VOLTAGE 56,7 Vdc LOW VOLTAGE 48,5 Vdc			

1. The charge current will be limited to 0A when the single module voltage has reached 56.8V.
2. The discharge current will be limited to 0A when the single module voltage has been discharged to 46.7V.
3. The battery system will communicate with the inverter to limit the current (If Inverter is Compatible).
4. Each battery will be protected by the same logic separately as per single module protection concept.
5. If some batteries individually will reach any fault status the single battery will protect and disconnect from the system in less than 3 seconds.
6. The current limit of the system must be adjusted according to the active batteries in system in order to restore normal function.
7. If the cluster is not balanced, the current limitation set from the We-HUB to the inverter will be sent in order to manage the rest of active modules and clusters, in the same time the imbalanced modules or cluster will equalize in standby mode and will reconnect once in the normal range.
8. If more than 2 batteries in one cluster are in protection mode the entire cluster will protect by shutting down.
9. If there is more than 2 cluster in protection mode, the full system will protect by shutting down.
10. The batteries will send information to the inverter to limit the charge/discharge current to zero Amps if the battery is detecting an over current. (If Inverter is Compatible)
11. Current limit protection cycle allows an automatic reconnection for three times. If the issue is not resolved within three reconnection attempts, it is necessary to perform a full manual restart. Precautionary checks in accordance with this manual must be carried out.
12. If the current of one cluster is larger than the current limit, the battery system send a warning according with the single module BMS logic
13. If the warning state does not clear within 5 minutes, the cluster will shut down and a manual reconnection is required. Precautionary checks in accordance with this manual must be carried out.

**Maximum Power Charge and Discharge (kW)**

Clusters Batteries	1	2	3	4	5
1	4.8	8.7	11.6	15.4	19.3
2	8.7	15.6	20.8	27.7	31.2
3	11.6	20.8	25.0	29.6	37.0
4	13.5	24.3	25.9	34.5	39.2
5	16.9	27.3	32.4	39.2	39.2



**Caution:**

Inverter charging and discharging current must be limited as per the tables contained in Section-13 of this manual.

## 14. MULTI CLUSTER CONNECTION

**⚠ Caution:**

We-HUB is mandatory when connecting multiple clusters in parallel

**⚠ Caution:**

Each cluster can have a maximum of five (5) 4K4 modules

**⚠ Caution:**

Each cluster must have the same number of 4K4 modules

**⚠ Caution:**

Each battery module and cluster must have the same SOC % and Voltage

**⚠ Caution:**

All battery modules must have the same firmware

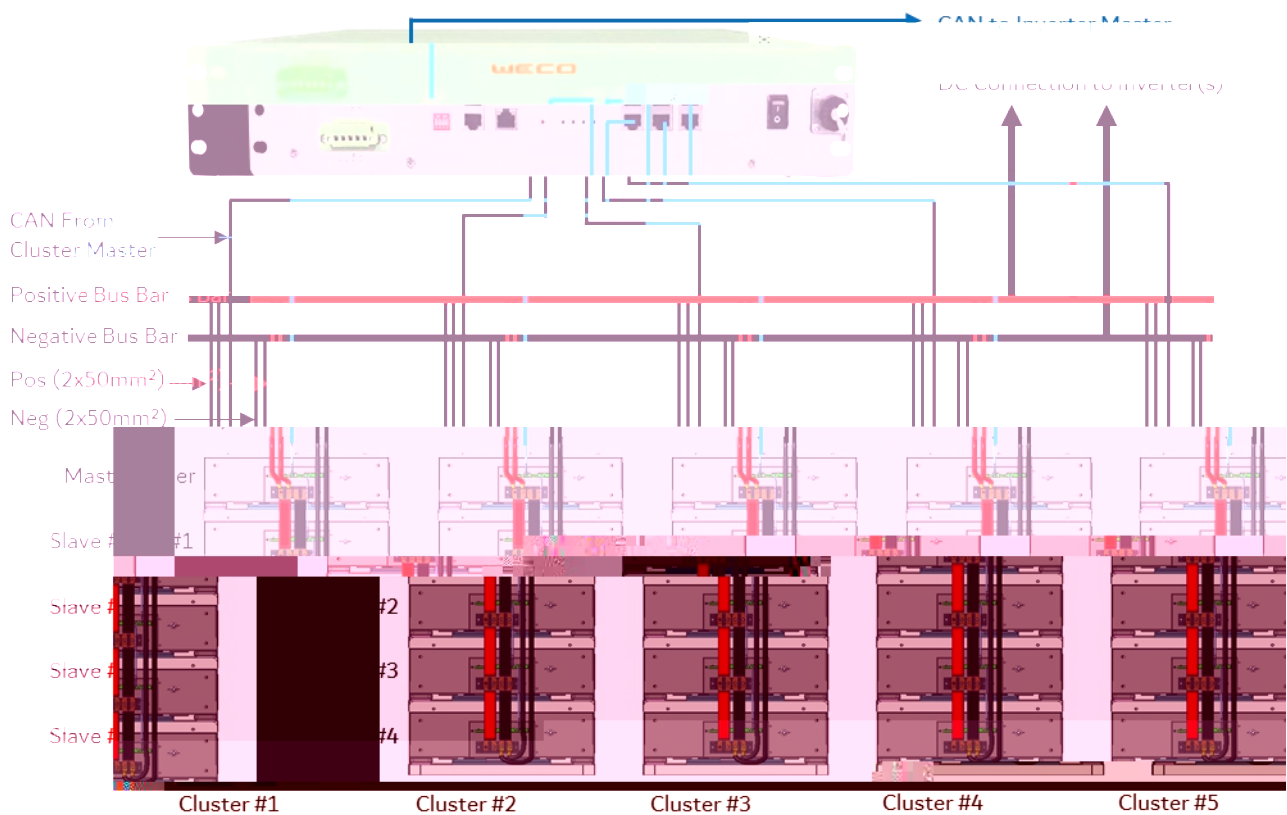
**⚠ Caution:**

The maximum currents and power stipulated in Section-13 of this manual must not be exceeded

**⚠ Caution:**

The correct sizing of cable and bus bar kits should be installed in accordance with this manual

The following illustration depicts a maximum configuration with five (5) clusters each having five (5) battery modules.



**⚠ Caution:**

All connections external to the battery modules must be in compliance with local regulations.