LiFePO4 Battery Energy Storage System

User Manual

Version: 1.4

Wall Mounted LiFePO4 battery 51.2v 280Ah / 14.34Kwh

Model No: KB-051280A-B-GBP2

Introduction

With ETL, UL 1973, UL 9540, and UL9540A certifications, the Kedron 48V 280Ah LiFePO4 Wall Mount Battery at the time of this writing is designed to meet or exceed current electrical code requirements for both Canada and USA installations.

With a 15-year warranty, each battery can provide up to 14.34kWh of energy storage, and capable of combining 16 units in parallel for a maximum energy storage potential of 229kWh.

The Kedron 280Ah 48v LiFePO4 battery BMS supports standard communication protocols and is compatible with most popular hybrid 48V system hybrid inverters, stand-alone inverters, and inverter/charger brands available in North America. More inverters are being added to this list regularly as they are tested. For brands that may not support standard communication protocols, the Kedron 280Ah LiFePO4 solution can still be connected and used successfully by adjusting the charging profile as directed in this manual.

Current list of inverters tested and confirmed as compatible:

Inverter Brand		LOGO	Model No	Communication	Application	Installation
1	Sol-Ark		Sol-Ark 5k, 8k, 12k, 15k	CAN	On/off-grid	Wall mounting
2	EG4		6000XP, 12kPV, 18kPV	CAN	On/Off grid	Wall mounting
3	Lux Power Tek		LXP-LB-US 12kW	CAN	On/off-grid	Wall mounting
4	Schneider Electric		SW4048, XW PRO 6848NA	CAN	On/off-grid	Wall mounting
5	SMA		Sunny Island 4548-US/6048-US	CAN	On/off-grid	Wall mounting
6	Victron Energy		Quattro 48V 3000VA, 5000VA, 10000VA,MultiPlus 3000 120V	CAN	off-grid	Wall mounting
7	Outback		GS8048A, GS4048A	CAN	Off grid	Wall mounting
8	Megarevo		R5KLNA, R6KLNA, R8KLNA, R10KLNA	CAN	On/off-grid	Wall mounting
9	Growatt		SPF3500-3500TL LVM-US, SPF3500-5000 US,SPF4000T-12000T DVM-US, SPF6000-12000T DVM-US MPV	CAN	Off grid	Wall mounting
10	Sigineer		M04048 to 12048D, MS6048D	CAN	Off grid	Wall mounting
11	Sac Solar		Sunrino SP series from 4kw to 12kw	CAN	Off grid	Wall mounting
12	SRNE		HF Series 3-5kW, HYP 5Kw, HES 4-6Kw, HES 8-12Kw	RS485	Off grid	Wall mounting
13	Samlex		EVO 4248SP, 4024, 2212/24, 1212/24	/	Off grid	Wall mounting
14	Magnum		4448PAE, 4048PAE, 4024PAE	/	Off grid	Wall mounting

**The above list is current as of the time this manual was printed. Many additional inverter brands have likely been added since publishing.*

**Please note: the supplied RJ45 orange cable is compataible with most inveters via the RS485/CAN connection. Some inverter manufacturers may use a different pinout and require custom RJ45 cabling. Please consult with your inverter manufacturer for compatability and pinout instructions.*

1. Safety Precautions

- **Please read this user manual carefully prior to installing and using this battery.** Failure to follow the instructions and warnings in this document may result in electrical shock, damage to the battery or electrical system, serious injury, or death
- If the battery is stored for a prolonged period, recharging every 3-6 months will be required to maintain a SOC of no less than 80%
- After fully discharging, the battery must be brought to a full 100% SOC within 12 hours
- This battery is not designed for outdoor use and must be protected from the elements
- All battery connections must be disconnected before any maintenance is performed
- Do not use cleaning solvents on battery surfaces. Use a damp cloth to wipe clean if needed while avoiding any exposed electrical connections
- Do not expose the battery to flammable chemicals or vapors
- Do not paint any part of the battery, including any internal or external components
- Always use circuit breakers, fuses, and surge protection as required
- Tampering with internal components without prior written approval will void warranty
- Warranty claims will be denied for installations which do not follow the instructions provided in thie manual
- HIRE A QUALIFIED INSTALLER IF YOU ARE NOT 100% CONFIDENT WITH THE INSTALLATION OR PRGRAMMING OF THIS UNIT

1.1 Before Connecting

- Consulting with a qualified installer is highly recommended
- When unpacking, please inspect the battery carefully and contact your dealer if damage is noted or parts missing
- Ensure the battery main breaker is in the off position prior to installation
- Ensure connections are made correctly before energizing the system
- Reverse polarity of the battery connections may permanently damage the battery and cause harm to the installer
- Please ensure the electrical parameters of this battery are compatible with the connected inverter
- Ensure the battery is installed in a clean, dry location free of dust and insects. For optimal performance, keep the ambient temperature above 0°C (32°F), but do not install the unit near direct heat sources such as space heaters, cook stoves, or fireplaces.
- **NEVER:**
  - **connect battery terminals to AC power directly**
  - **connect this battery in series to other batteries. Only parallel connections are permitted**
  - **connect this battery with other battery brands, sizes, or types. It is only designed to connect in parallel with identical KEDRON 48V 280Ah LiFePO4 batteries**
  - **connect additional batteries in parallel without first ensuring the new battery SOC and Voltage is the same as the master battery**

1.2 Operation

- If the battery must be moved or repaired, all power sources and electrical load circuits must be disconnected, and the battery completely shut down
- Disconnect the battery immediately if the inverter is faulty or system errors continue for extended periods of time
- In case of fire, only use a dry powder fire extinguisher. Never use liquid extinguishers!
- Do not open, attempt to repair, or disassemble the battery

2.Battery Details

2.1 Battery Label

KEDRON
LiFePO4 battery

Solar Lithium Battery Energy Storage System

Battery Type	LiFePO4 Battery
Battery Model	KB-051280A-B-GBP2
Battery Power	14.34KWh
Battery Voltage	51.2V
Capacity of Battery	280Ah
Charge Voltage	56V
Discharge Voltage	46V
Max Charge Current	≤ 150A
Max Discharge Current	≤ 150A
Short Circuit Protection Current	1652A (106ms)
Depth of Discharge	80% DOD
Display	LCD/LED
Communication	CANBUS/RS485
Degree of Protection	IP20

Manufacturing Date: YYYY/MM/DD
Battery Designation:
IFpP/29/176/208/[16S1PJE / -29+50/90

UL9540A TEST REPORT PROVIDED

Intertek
5024301

This battery product meets or exceeds US/CAN code requirements

Battery should be kept away from corrosive, flammable, or explosive materials.

Handle With Care!

2.2 Warning

WARNING AVERTISSEMENT

1. Do not disassemble or alter the battery in any way.
   Ne démontez ni modifiez la batterie en aucune façon.
2. Do not use the battery for purposes not described in its documentation.
   N'utilisez pas la batterie à des fins non décrites dans sa documentation.
3. Do not drop, strike, puncture, or step on the battery.
   Ne laissez pas tomber, ne heurtez pas, ne percez pas et ne marchez pas sur la batterie.
4. In case of electrolyte leakage, keep leaked electrolyte away from contact with eyes or skin, immediately clean with water and seek help from a doctor.
   En cas de fuite d'électrolyte, évitez tout contact de l'électrolyte qui fuit avec les yeux ou la peau, nettoyez immédiatement avec de l'eau et demandez de l'aide à un médecin.
5. Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters,or high temperature sources.
   Ne mettez pas la batterie au feu. Ne l'utilisez pas et ne la laissez pas à proximité de feux, de radiateurs, ou de sources de températures élevées.
6. Do not submerge the battery in water, or expose it to moisture.
   Ne plongez pas la batterie dans l'eau et ne l'exposez pas à l'humidité.
7. Do not allow the terminals to contact exposed wire or metal.
   Ne laissez pas les bornes entrer en contact avec du fil ou du métal exposé.
8. The battery is heavy and can cause injury if not handled safely.
   La batterie est lourde et peut provoquer des blessures si elle n'est pas manipulée en toute sécurité.
9. Keep out of reach of children or animals.Tenir hors de portée des enfants ou des animaux.

2.3 Battery Specifications

Battery Specifications	
Model No	**KB-051280A-B-GBP2**
Nominal Parameters	
Nominal Voltage	51.2V
Rated Capacity	280Ah
Energy	14.34kWh
Dimensions (L x W x D)	900 x 675 x 200mm / 35.4" x 26.6" x 7.8"
Weight	128.5kg / 283lbs

Battery Electrical Parameters (See Page 28 For Charge Profile Settings)	
Maximum Charge Voltage	56 VDC
Discharge Cut-Off Voltage	46 VDC
Recommended & Maximum Charge / Discharge Current	100A Recommended, 150A Maximum
Peak Charge / Discharge Current	200A (2 minutes max @25℃)
Operating Temperature Range	0°C to 45°C @60+/-25% Relative Humidity
Storage Temperature	0℃ to 35℃
Cycle Life (25±2℃,0.5C/0.5C,80%EOL)	≥8500
Certifications	UL1973, UL9540A, CB-IEC62619, CE-EMC, MSDS, UN38.3
Enclosure Protection Rating	IP20

3. Battery Introduction

3.1 Key Features

- LiFePO4 cell chemistry provides exceptional safety and ensures longevity
- Exceptional performance, safe operation, and reliable construction
- Tested to achieve a cycle life of up to 8,500 cycles
- Wall-mounted, with convenient bracket mount for ease of installation
- Integrated state-of-the-art BMS to manage and monitor battery information including: voltage, current, and temperature as well as balancing cell charging & discharging rates
- 15 year limited warranty

3.2 Interface Introduction

No.	Description	Label	Remarks
1	Display Screen		Battery Operational State
2	LED Indicator	SOC	State Of Charge Indication
3	LED Indicator	ALM	Alarm Notification
4	LED Indicator	RUN	Running Status
5	DC Breaker	ON/OFF	200A Breaker
6	Battery Positive	+	Battery POS (+) Connection
7	Battery Negative	-	Battery NEG (-) Connection
8	Ground Connection	⏚	Ground wire connection
9	DIP ADDRESS	ADD	8 Numbered Pins
10	CAN/RS485	CAN/RS485	Battery to Inverter Connection
11	RS485A/485B	RS485A/RS485B	Parallel battery connection or smart BMS software with computer connection
12	RS485A/485B	RS485A/RS485B	Parallel battery connection or smart BMS software with computer connection
13	RESET	RST	Battery / BMS Reset
14	Power Switch	ON/OFF	Press = Inverter On / Off

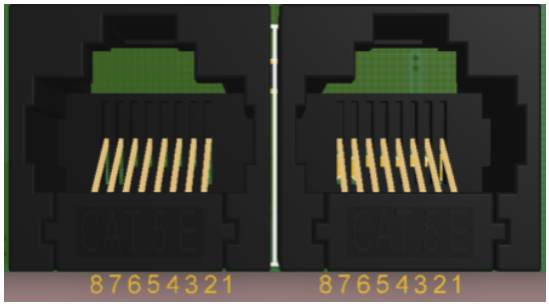
3.2.1 Communication Interface

CAN&RS485

(Above) This connection is used for the battery BMS and inverter communication

CAN - With 8P8C Vertical RJ45 Socket		RS485 - With 8P8C Vertical RJ45 Socket	
RJ45 Pins	Definition Notes	RJ45 Pins	Definition Notes
4,	CANH	1、8,	RS485-B2
5,	CANL	2、7,	RS485-A2
		3、6,	GND

(Below) These connections are used to connect batteries in parallel, or smart BMS connection via computer USB + software



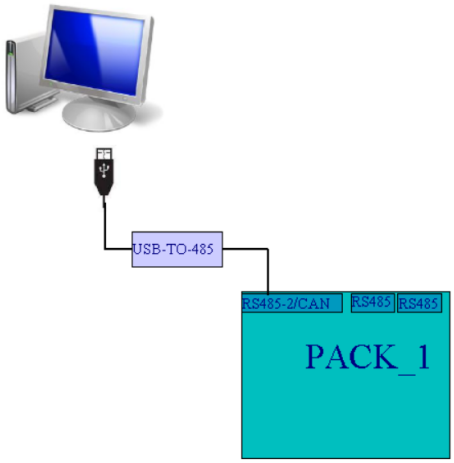
RS485-A/RS485-B

3.2.2 BMS Internal Grid Connection & Monitoring

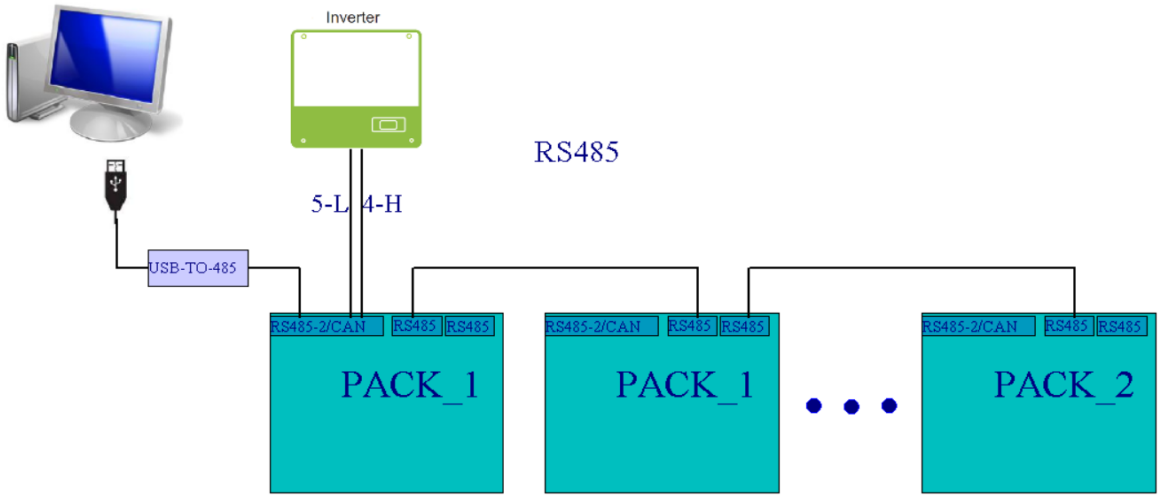
RS485-A/B - With 8P8C Vertical RJ45 Socket		RS485-A/B - With 8P8C Vertical RJ45 Socket	
RJ45 Pins	Definition Notes	RJ45 Pins	Definition Notes
1、8、	RS485-B1	1、8、	RS485-B1
2、7、	RS485-A1	2、7、	RS485-A1
3、6、	GND	3、6、	GND
4、5、	NC	4、5、	NC

3.2.3 Communication applications

- RS485 Stand-alone mode connection



- RS485-A/B as Master, CAN with Inverter, 485-A/B as Slave mode parallel communication



Note: Monitoring of battery system performance is achieved via inverter monitoring portal / app

3.3 SOC Indicator & Status Indicator Guides

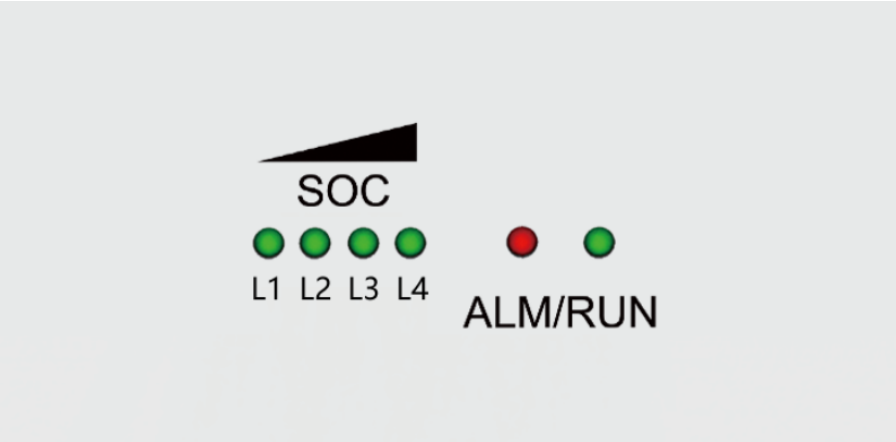


Chart 1: Battery Status

Chart 2: Battery Capacity

Capacity / LED Indicator		L1	L2	L3	L4
SOC	0~25%	Flash	OFF	OFF	OFF
	25~50%	ON	Flash	OFF	OFF
	50~75%	ON	ON	Flash	OFF
	75~100%	ON	ON	ON	Flash
RUN Status		ON			

Chart 3: Battery Status

Status	Normal Warning Protection	RUN	ALM	Capacity LED				Description
		●	●	●	●	●	●	
Shut Down	Shut Down	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	Flash	OFF	OFF	OFF	OFF	OFF	Standby
Charge	Normal	Flash	OFF	Charge				
	Warning	ON	Flash					
	Protection	OFF	ON					
Discharge	Normal	Flash	OFF	Charge				
	Warning	ON	Flash					
	Protection	OFF	ON	OFF	OFF	OFF	OFF	UVP,OCP...
Fault		OFF	ON	OFF	OFF	OFF	OFF	Stop Charging or Discharing

3.4 Connectors

- Battery Connections: used to connect the positive pole (+) and negative pole (-) from the battery to the inverter
- ADD: Reserved Address portal for multiple parallel battery connections
- Canbus / RS485: used for active communication between battery and inverter (via supplied RJ45 orange cable)
- RS485A / RS485B: Used for parallel battery communication cable connection (via supplied blue RJ45 cable), or using a computer for USB to RS485 for dynamic monitoring data of the battery

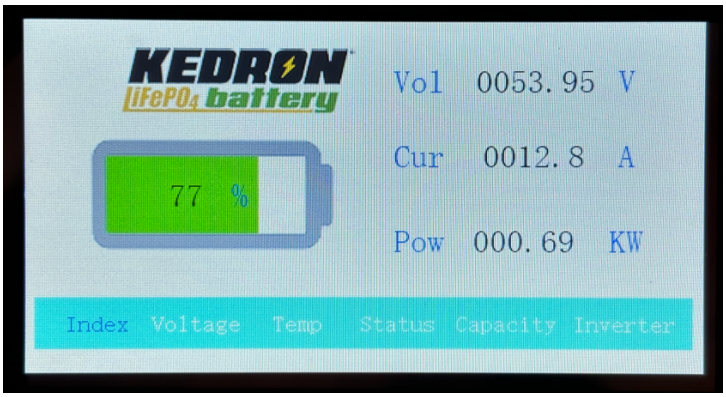
3.5 Reset

- If the operating system screen is unrespoinsive or an unknown error occurs, press and hold this RST button for 3 seconds. The LED lights will flicker between RUN and the lowest capacity indicator, or from the lowest capacity indicator to RUN light to indicate a successful reset.

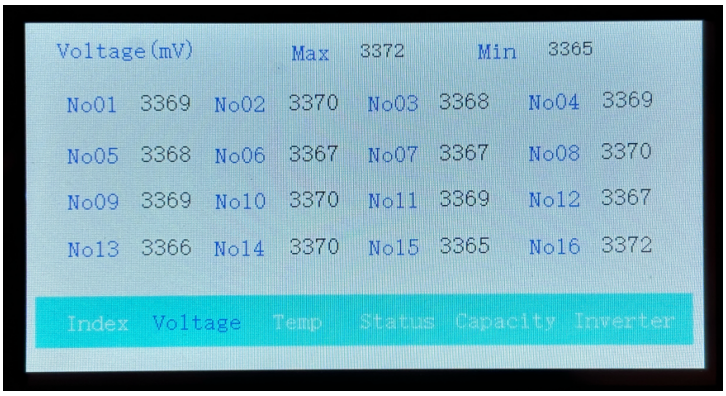
3.6 Touch Screen Display

The Kedron LiFePO4 Battery Touch Screen has 6 pages of information to display system KPI's or for user programming: Index, Volage, Temp, Status, Capacity, and Inverter

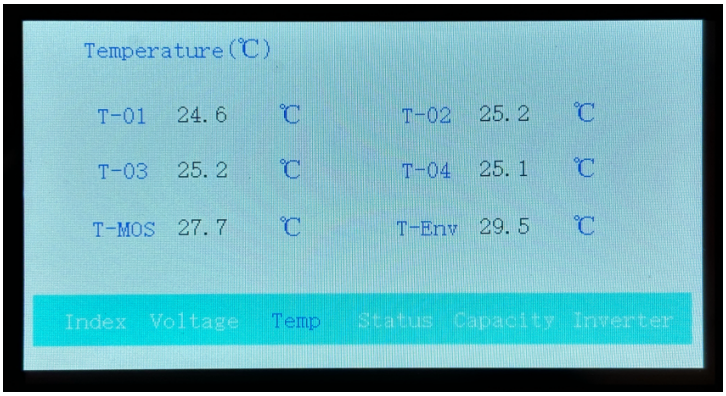
This screen is the system startup screen which will show while the system is initializing



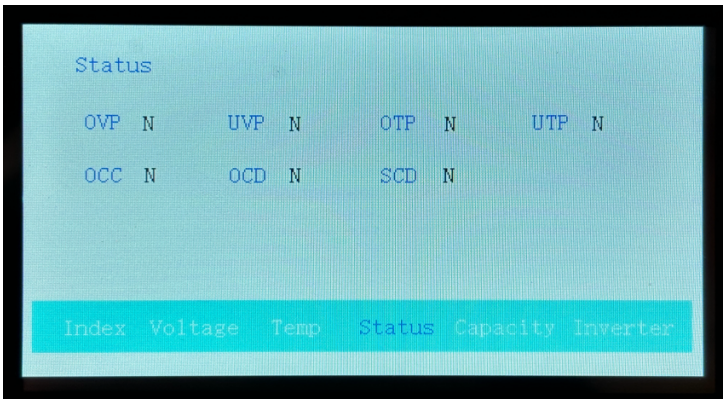
Index: This screen shows the battery State of Charge on the left via the battery icon. On the right side you can monitor real time Voltage (V), Current (A), and Power usage (KW)



Voltage: This screen shows the invivdual battery cell voltage readings in millivolts, including a live summary of the Maximum and Minimum values identified at the top of the screen

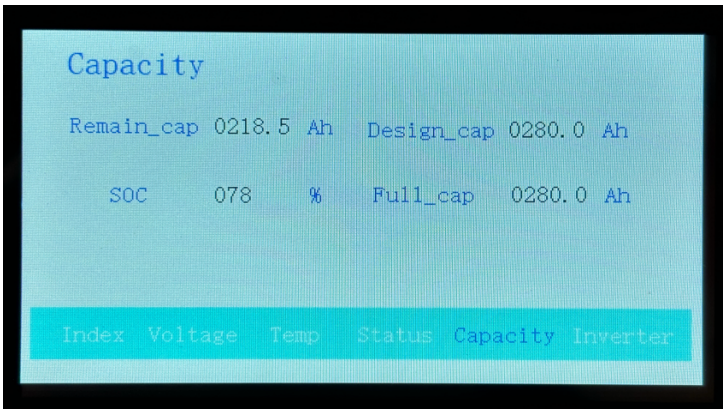


Temperature: This screen shows the temperature of the 4 internal battery packs, BMS System MOS, and Environment

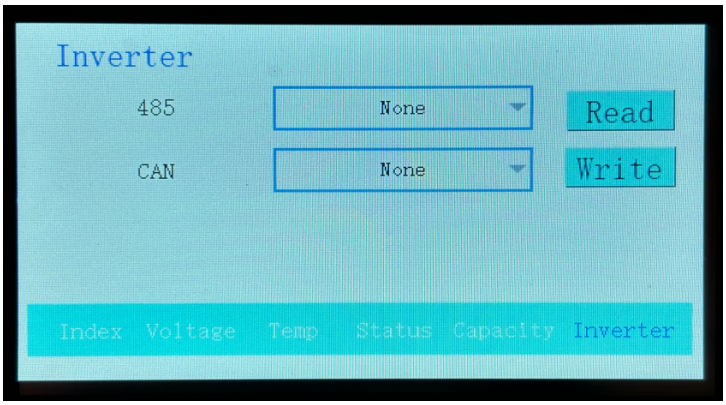


Status: This screen shows the various protections being monittord by the BMS and their status, with 'N' being Normal:

OVP = Over Voltage Protection
UVP = Under Voltage Protection
OTP = Over Temperature Protection
UTP = Under Temperature Protection
OCC = Over Current during Charge
OCD = Over Current during Discharge
SCD = Short Circuit Discharge



Capacity: This screen shows the remaining Ah Capacity, SOC %, Design Capacity from the factory, and Full Capacity at present operating conditions



Inverter: This screen is used to interact between the Inverter and Kedron LiFePO4 Battery BMS. When the inverter is connected and powered on, select 'Read' to automatically detect the inverter software recognized, and 'Write' to confirm

3.7 Heating Function

LiFePO4 batteries are designed to prevent operation at freezing temperatures to protect the cells. Consequently, the BMS is programmed to stop accepting a charge and to shut down the discharging circuit completely at 0°C (32°F).
To facilitate charging when the battery is at the freezing threshold, this Kedron LiFePO4 280Ah battery utilizes a specialized internal heating film.

1. Description of the heating function:
   - The heating film consumes approximately 100 watts (~48V @ 2A) when activated.
   - The heating function activates only when the internal temperature is at 0°C (32°F) and an external charging source is detected (PV input, AC grid, or generator).
   - The heating function draws energy exclusively from the external charging source. It will not activate when the battery is in discharge or standby mode to prevent draining stored power.

How does the heating system work?

When the internal battery temperature sits at 0°C (32°F) and a charge source is present, the heating circuit activates. The BMS prohibits the cells from accepting charge during this phase to prevent damage. The heating film warms the internal components until the temperature reaches +5°C (41°F). Once this safe temperature is reached, the heating circuit disengages, and the BMS allows charging to proceed. Important: the heating function only activates when an outside charge source is present. Therefore, it will not consume internal battery power as that can lead to dangerously low SOC and potential damage. Make sure your system has an adequate outside charge source connected during the colder winter months if this battery is installed in a non-heated space.

Important:
This function is strictly designed to bridge the safe-charging temperature gap using incoming power. It requires an active external charge source to operate and does not maintain the battery temperature independently.

4. Safe Handling

4.1 Tools

- Use properly insulated tools to prevent accidental electric shock or short circuits
- If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape

4.2 Safety Gear

- The use of insulated gloves and safety glasses are recommended during installation. Steel-toed shoes or boots are also recommended

Insulated gloves

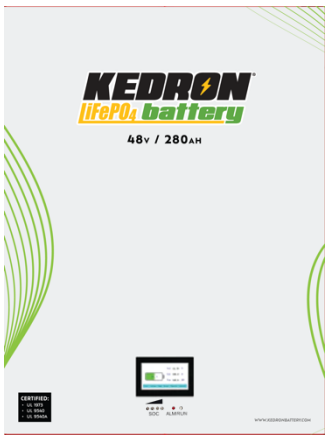
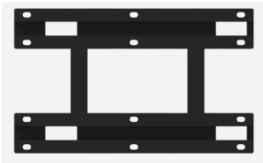
Safety goggles

Safety shoes

5.Installation

5.1 Crate Contents

Thoroughly inspect all components upon receipt. If you notice any damage to the battery or parts are missing, immediately notify your dealer.

NO.	Item	Quantity	Specification
1	Battery Pack 	1 PC	14.34KWH Kedron 280Ah LiFePO4 Battery
2	Wall mounted Bracket and Screws  	1 SET	One Wall Mount Bracket and 8 wall mount anchors
3	Inverter Power Cable 	1 SET	1 pair of 2M (6.5FT) x 35mm2 (2AWG) inverter connection cables with push-in style 200A M10 connectors for battery connection

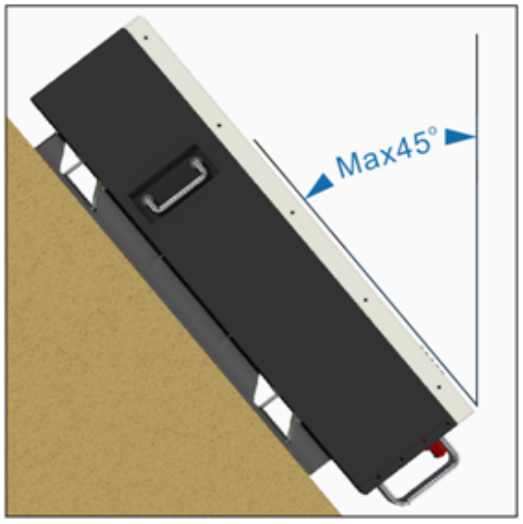
4	Communication Cable 	1 PC	1.5M (5FT) Ethernet cable to connect battery port to inverter comm port via **CAN/RS485**
5	Parallel Battery Com Cable 	1 PC	1M (3.25FT) Ethernet cable to connect additional batteries in parallel (up to 16 max) via **RS485-A or RS485-B**
6	Ground Wire 	1PC	Ground wire for connection between additional parallel batteries

5.2 Installation Location

Note: Each battery weighs 128.5KG / 283Lbs

Ensure you are using a mechanical or hydraulic lift, or a minimum of 2 strong individuals for installation, and that the installation location meets the following criteria:

- Location must meet local and national building & electrical code requirements
- Must be suitable for the size and weight of the battery
- Must be installed on a firm surface with adequate substrate to sustain the weight of the battery
- Ensure the battery is installed in a dry space free of dust or insects.
- There are no flammable or explosive materials within this space
- Maintain an ambient temperature between 0°C and 45°C (32°F to 113°F) for best performance, and do not install close to heat sources such as space heaters, cook stoves, or fireplaces.
- Installation should be vertical, but a backwards tilt of up to 45° is permitted if required. Avoid any sideways tilt angle. See below image for example:



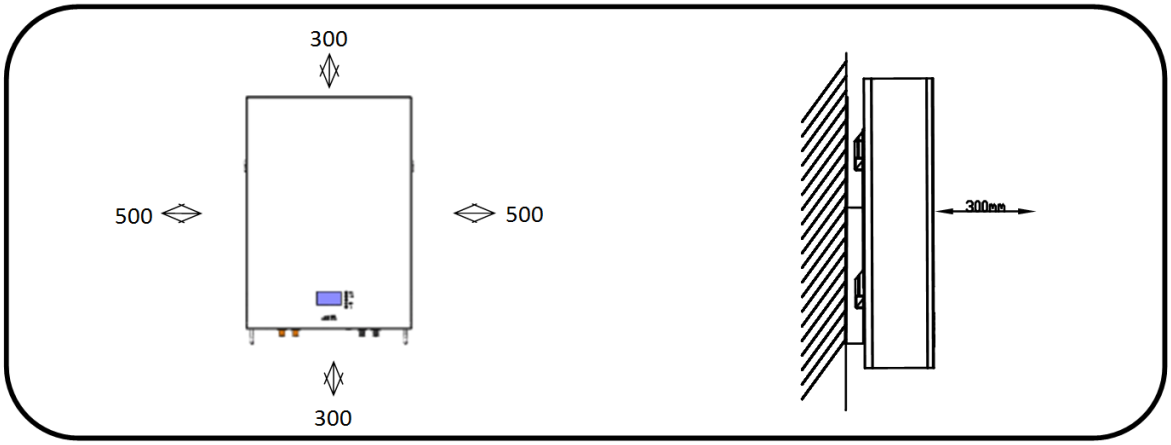
CAUTION

If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. The optimal temperature range for the battery pack to operate is 0°C to 45°C. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

5.2.1 Minimum Clearances

Observe the minimum clearances to walls, other batteries, or objects as shown in the diagram and picture below in order to guarantee sufficient heat dissipation

Direction	Minimum clearance (mm / inches)
Above	300mm / 12”
Below	300mm / 12”
Sides	500mm / 20”
Front	300mm / 12”

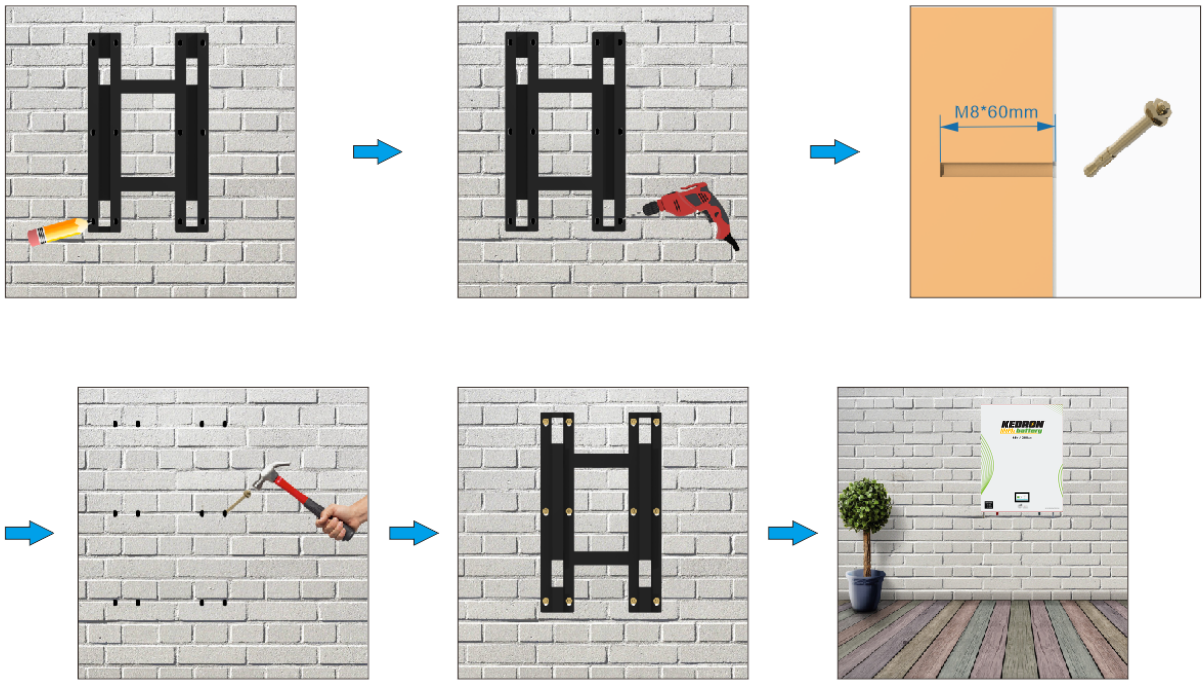


5.3 Installing the Battery Pack

5.3.1 Wall Mounting

> **⚠ WARNING**
>
> In order to avoid electrical shock or personal injury, inspect existing electronic or plumbing installations that may be installed behind this wall space before drilling holes. At 128.5KG / 283Lbs the battery is very heavy. Handle with care to avoid damage to the product or injury to the installer.

1. Choose suitable wall structure capable of supporting this weight with a thickness greater than 80mm / 3.15”. Concrete or brick is recommended. Note: for wood frame walls, locate the studs and substitute the included wall anchors with suitable galvanized Lag Screws designed to support the weight of the battery. All screws must drill directly into the vertical wall studs. Before starting, check local codes to ensure this installation method is permitted
2. Use the mounting frame as a template, and mark the hole positions for drilling
3. Drill 8 holes according to the hole pattern: 10mm (.40”) and depth of 60mm (2.36”)
4. Hammer the M8 screw anchors into the above holes, and tighten down the screw. Note: Do not position screws flush to the wall, leave 10 to 20 mm (.40” to .80”) exposed.
5. Fix the mounting frame to the 8 screws.
6. Raise the battery a little higher than the mounting frame while maintaining the balance of the battery. Hang the battery on the frame through the hooks.



WARNING

Failure to ensure the wall structure can support the weight of the battery can cause serious injury or death: never attempt to mount the inverter on the wall bracket unless you are absolutely sure that the mounting frame is firmly mounted on the wall.

IF YOU ARE NOT 100% SURE THE WALL BRACKET IS SECURE, DO NOT ATTEMPT TO HANG!

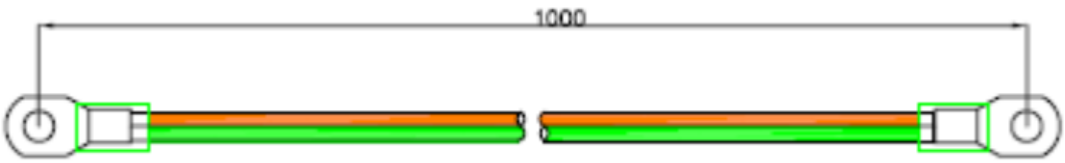
5.3.2 Electrical Installation

- Before connecting the power cables, use a multi-meter to measure cable continuity, identify possible short circuits, and confirm positive and negative polarity is correct. Then clearly mark or label the cables.

5.3.3 Connecting the battery to the ground cable

- Install a grounding cable to the grounding point on each module. Recommended torque setting is 6Nm

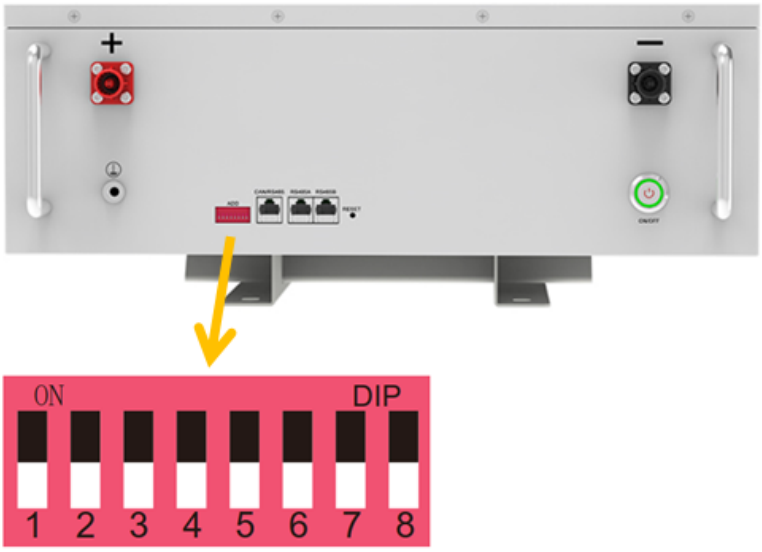
Grounding cable:



5.3.4 Inverter Setup

DIP SWITCH ADDRESS SETUP (For single battery installation): The factory default DIP switch setting for the master battery module is DIP Switch **mode 1 (ADDRESS: 00000000).**

Note: Before installation, please ensure the battery DIP Switch setting is correct according to the specific inverter communication specification. Consult with the inverter owners manual if required.



5.3.5 Inverter Connection

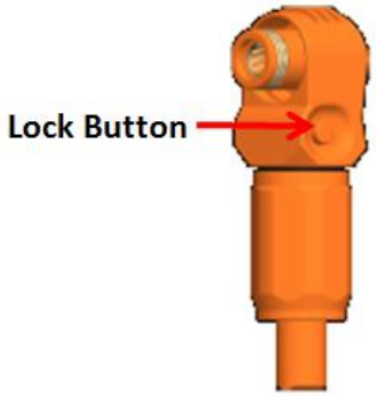
The battery power cables supplied with your Kedron battery include 1 x red POS (+) and 1 x black NEG (-) 35mm (2AWG) with M10 (3/8) standard ring terminals on one end which connect to the inverter, and push-on locable quick connectors for the battery connection.

Connect the battery to the inverter using the supplied power cables and orange RJ45 communication cable. If the inverter being used is not compatable with a standard RJ45 cable, verify the correct PIN sequence with the inverter manufacturer. If the inverter does not support standard communication protocols, the charge source must be programmed manually to match the approved charge profile shown on Page 28 of this manual.

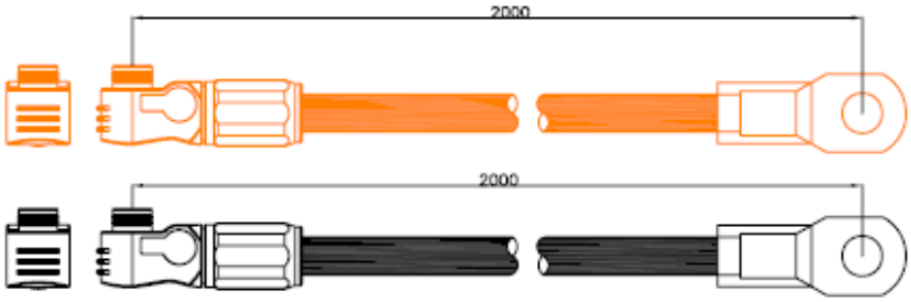
1. Connect the (+) and (-) power cables to the inverter via the M10 (3/8) ring terminal end of the cable. Recommended torque setting is 18.6Nm (165 in. lbs.)

2. The battery output socket utilizes push-on quick connectors. The supplied (+) and (-) power cables should be pushed into the battery socket until they lock in place. In the event that the installation requires custom cabling, the correct cross section size is 35mm2 (1.38”) or 2/0 AWG. Note this wire size is dependant on the total distance from the battery to inverter or busbar. Consult with a professional installer if the length of custom cables exceeds the supplied cable length of 2M (6.5FT).

Battery Power Cables

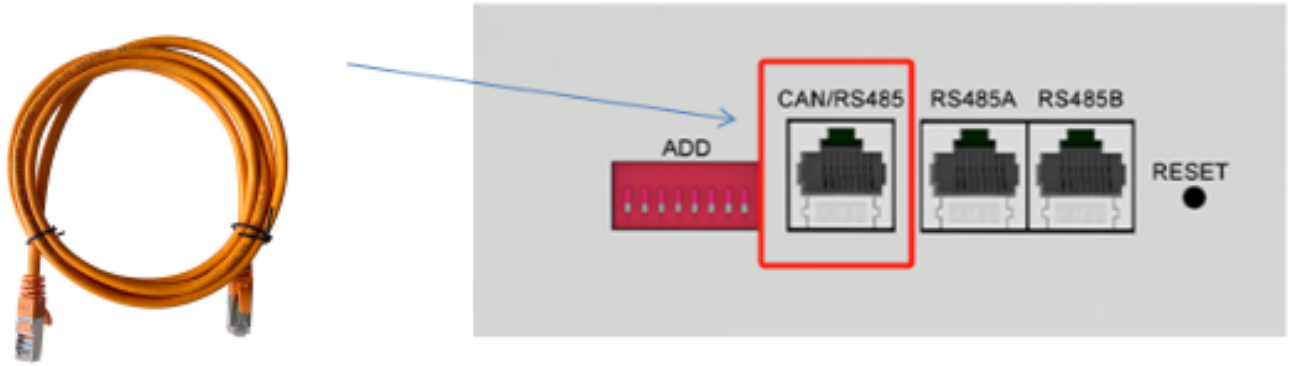


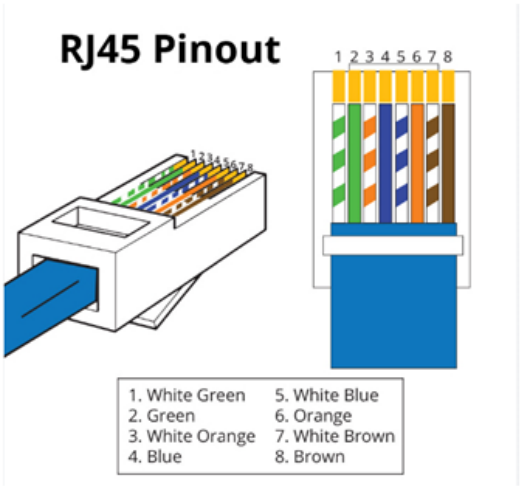
Power cables sets :



5.3.6 Connection of Communication Interface

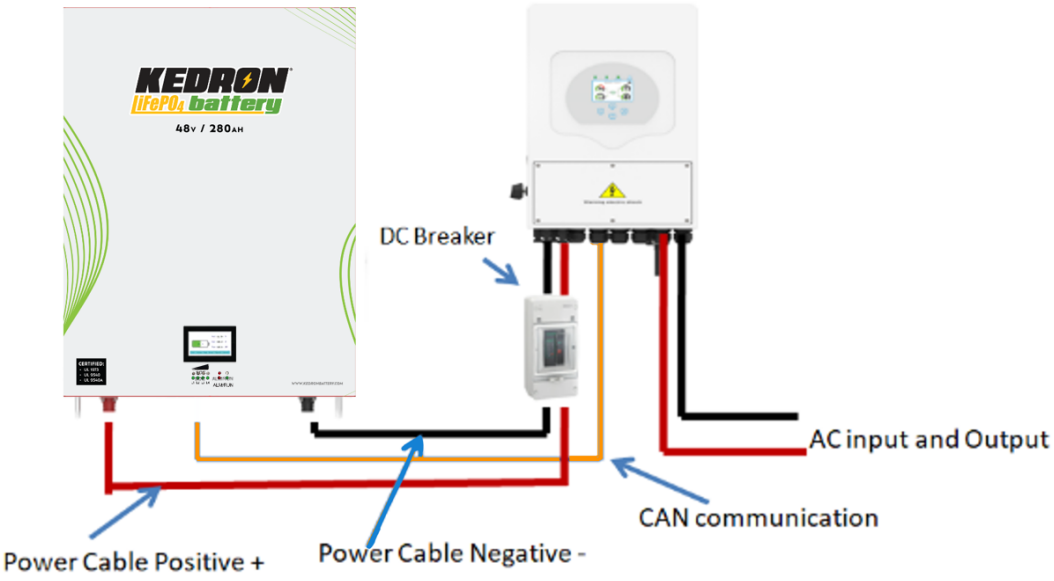
Connect the primary CAN IN port of the battery shown below to the CAN or RS485 communication interface of the inverter using the supplied orange RJ45 Ethernet cable.

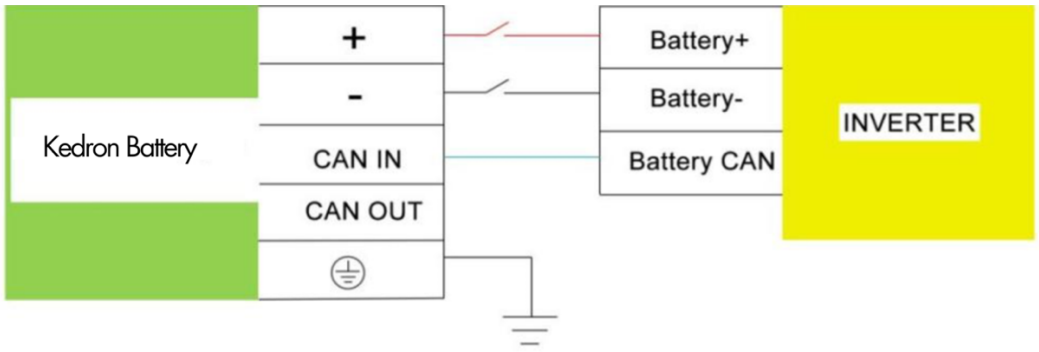




PIN Definition

Position	Colour	Definition
PIN 1	White Green	485B
PIN 2	Green	485A
PIN 3	White Orange	X GND
PIN 4	Blue	CAN-H
PIN 5	White Blue	CAN-L
PIN 6	Orange	Reserved
PIN 7	White Brown	XIN
PIN 8	Brown	Reserved



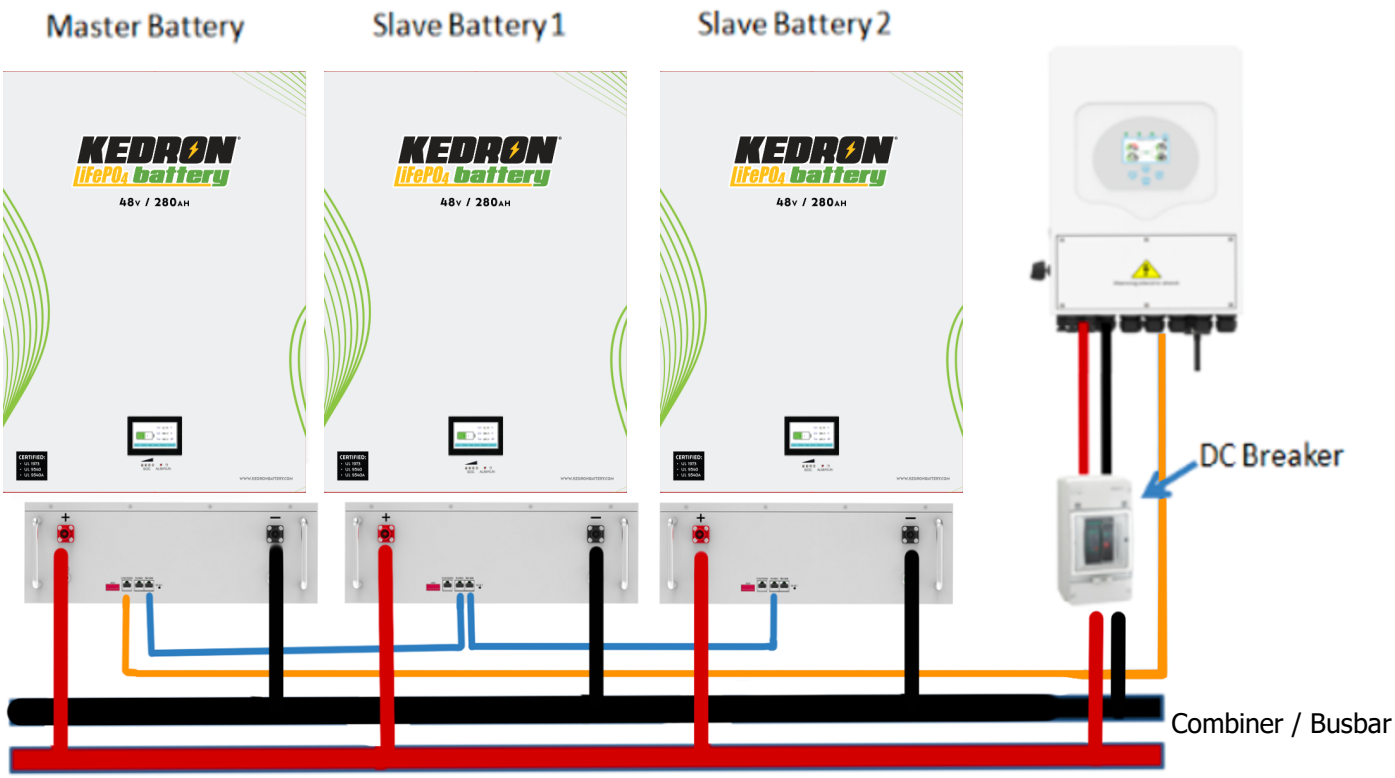


5.3.7 Parallel Battery Connections

The Kedron 280Ah LiFePO4 supports up to 16 batteries in parallel. Each Slave battery added in parallel will require 1 set of power cables, and 1 x blue RJ45 ethernet cable. These cables are supplied with the battery.

A distribution box containing busbars will be required, with the busbar over-current capacity being higher than the maximum nominal current value when the load is running. Please refer to your installer to ensure code compliance.

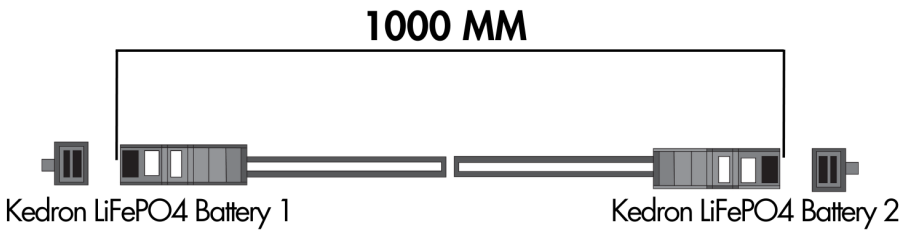
For the example shown below: a total of 3 batteries connected in parallel will require 3 pairs of power cables, 1 x Battery <> Inverter communication cable (orange), and 2 x Battery <> Battery communication cables (blue).

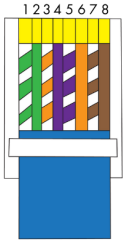


NOTE: The battery communication cables shown above in blue are connected by using the RS485B (CAN OUT) on the Master Battery connected to the RS485A (CAN IN) on Slave Battery 1. This connection sequence is repeated and then again for each subsequent battery connected in parallel.

PINOUT for Communications Cables

PINOUT for Parallel Battery Connections

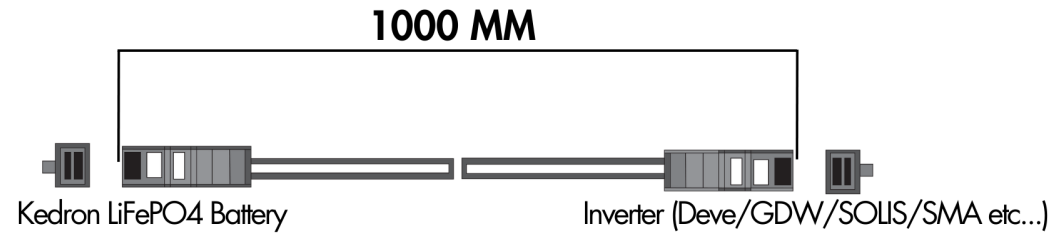


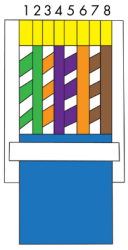


Foot Position	Color	Definition
PIN 1	White Green	485B
PIN 2	Green	485A
PIN 3	White Orange	X GND
PIN 4	Blue	CAN-H
PIN 5	White Blue	CAN-L
PIN 6	Orange	Reserved
PIN 7	White Brown	XIN
PIN 8	Brown	Reserved

Foot Position	Color	Definition
PIN 1	White Green	485B
PIN 2	Green	485A
PIN 3	White Orange	X GND
PIN 4	Blue	CAN-H
PIN 5	White Blue	CAN-L
PIN 6	Orange	Reserved
PIN 7	White Brown	XIN
PIN 8	Brown	Reserved

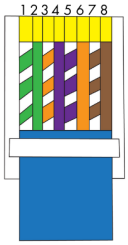
PINOUT for Battery to Inverter Connection

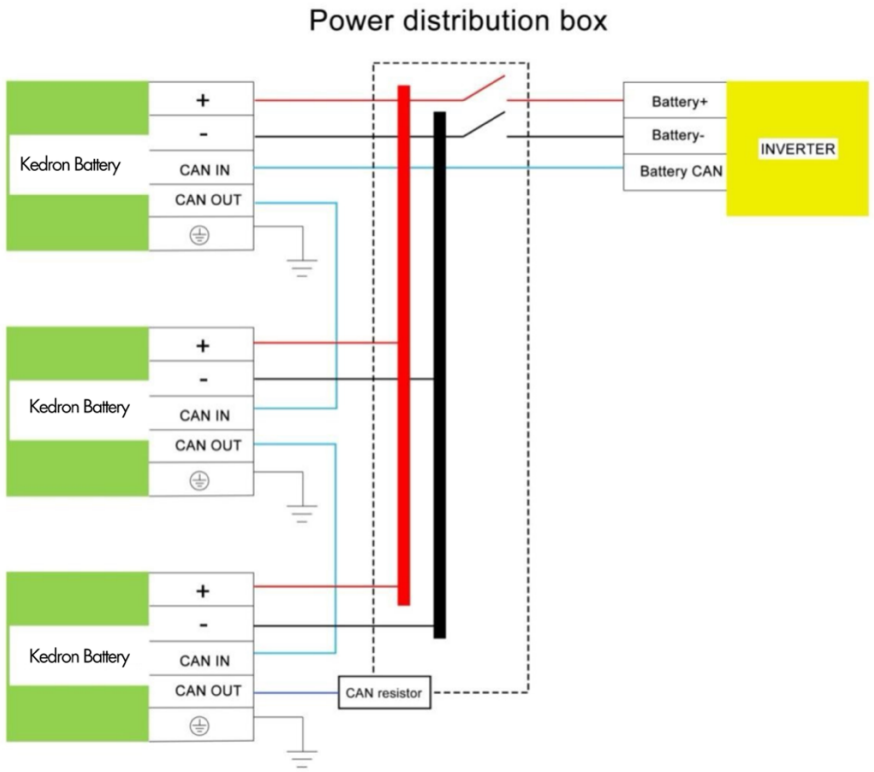




Foot Position	Color	Definition
PIN 1	White Green	485B
PIN 2	Green	485A
PIN 3	White Orange	X GND
PIN 4	Blue	CAN-H
PIN 5	White Blue	CAN-L
PIN 6	Orange	Reserved
PIN 7	White Brown	XIN
PIN 8	Brown	Reserved

Foot Position	Color	Definition
PIN 1	White Green	485B
PIN 2	Green	485A
PIN 3	White Orange	X GND
PIN 4	Blue	CAN-H
PIN 5	White Blue	CAN-L
PIN 6	Orange	NC
PIN 7	White Brown	NC
PIN 8	Brown	NC





An over-current protection and isolation switch that operates both positive and negative conductors simultaneously is required between parallel batteries, and between the inverter and battery system. Modifying the power cables to insert the over-current protection and isolation switch between parallel batteries will not void product warranty, but should be made by a qualified installer to ensure code compliance.

5.3.8 Battery Module DIP Switch Definition and Description

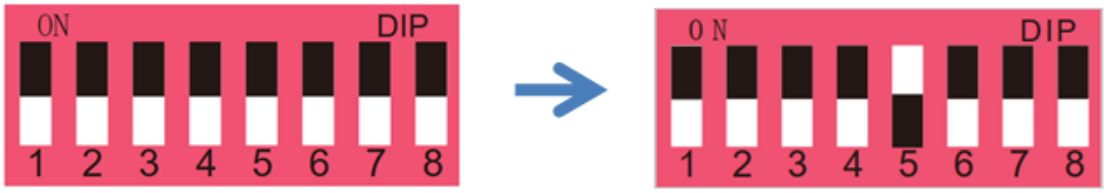
DIP switch position (master communication protocol and baud rate selection)

<table>
<tr><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 colspan="4" rowspan="3">Distinguishes between master and slave</td><td>Baud rate selection</td><td rowspan="3">No definition</td><td rowspan="3">No definition</td><td rowspan="3">No definition</td></tr>
<tr><td>OFF: CAN:500K, 485: 9600</td></tr>
<tr><td>ON: CAN 250K, 485:115200</td></tr>
</table>

When multiple batteries are connected in parallel, the Master Battery communicates with the Slave Batteries through the RS485 interface. The Master summarizes the information of the entire battery system and communicates with the inverter through CAN or 485.

For all different inverter models based on CAN or 485 protocols, you need to set the #5 DIP position to match the inverter baud rate:

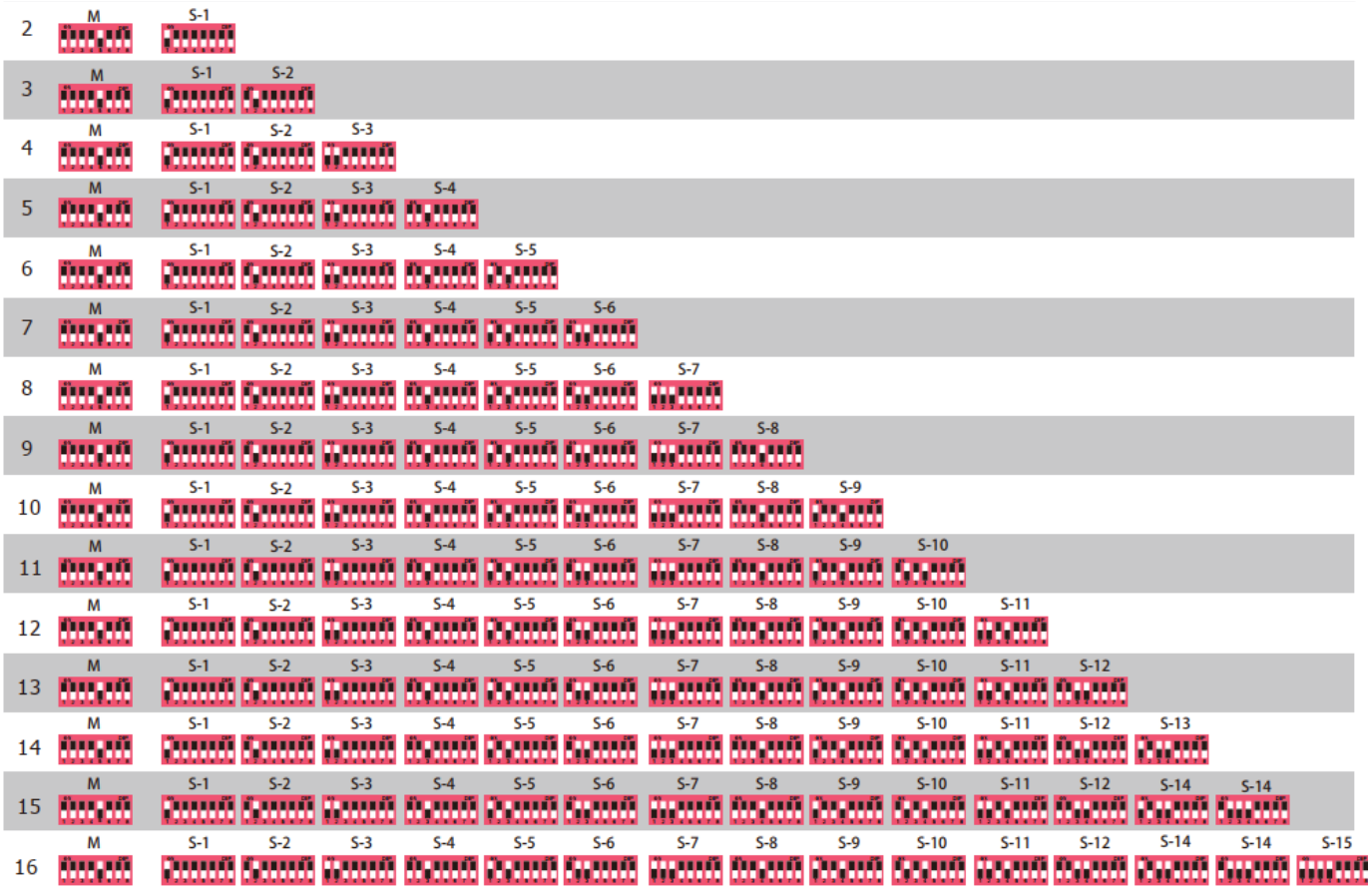
1) When the battery is connected to inverter systems manufactured by EG4, GOODWE, SOLIS, LUX POWER, SOFAR, DEYE, VICTRON, GROWATT SPF, and the SCHNEIDER Conext series, the DIP switch mode of the Master battery should be set to 000010000 ("Switch #5" to "ON") before powering on. For all other manufacturers, please confirm the Baud rate required and adjust Switch #5 to ON or OFF as necessary.



If you are connecting an inverter and are unable to determine the correct #5 switch position, and find the inverter is not communicating: power off system, change the switch position, and power back on. If the inverter is still not communicating, verify the cable PINOUT is correct. Consult with a qualified installer if needed.

2) Slave Battery DIP settings for 2 thru 16 batteries in parallel:

M = Master Battery S = Slave Battery



Inverter Initilization

Caution

The positive (+) and negative (-) pole of the inverter input interface and the battery output interface should be confirmed prior to connection to avoid accidental reverse poliarity.

- The red power cable is connected to the positive (+) pole and the black power cable is connected to the negative (-) pole
- Confirm and adjust the charge and discharge parameters of the inverter interface as required

How to determine if the communication between the battery and inverter is normal:

A. If the inverter display matches the Kedron LiFePO4 battery capacity and charge/discharge voltage parameters, it means communication between the Kedron® LiFePO4 battery is functioning properly.

B. If the display shows three different colors flashing alternately, this indicates a communication problem between the battery and inverter. Power down the inverter, then the battery. Verify ethernet cable connections are correct, DIP settings are correct, and ethernet cable PINOUT updated if necessary. Power the system back on. If you experience the same problem, consult with a qualified installer.

Table 3-5: Battery Charging & Discharging

Equipment Status	**Charging** a) The maximum continuous charging current should be ≤0.5C (50% of battery capacity) b) If the battery remaining capacity is below 15% State of Charge (SOC), please bring to a full charge within 48 hours
	Discharging c) The maximum continuous discharge current of the battery should be ≤0.5C (50% of battery capacity) d) The recommend maximum regular Depth of Discharge (DOD) of the battery is 85%

5.3.9 Battery Charging & Inverter Parameter Settings

- Charging (Bulk) Voltage: 57.6V
- Absorption Voltage: 56.5V
- Float Voltage: 56V
- Shut Down (cut-off) Voltage / SOC: 48V / 10%
- Restart (Rebulk) Voltage: 52V
- Max Charge Current: 150A
- Max Discharge Current: 150A

Please note: For MPPT charge controllers without an adjustable LFP charge profile or designed for flooded acid batteries: Turn off Equilization, and do not use Temperature Compensation. If using an inverter/charger and separate MPPT charge controller, remember to adjust charge profile settings in both.

5.3.10 Warranty Registration

After your Kedron LiFePO4 Battery Energy Storage System installation is complete, please register your new battery to activate the battery warranty. Please scan the QR Code below and follow the instructions:

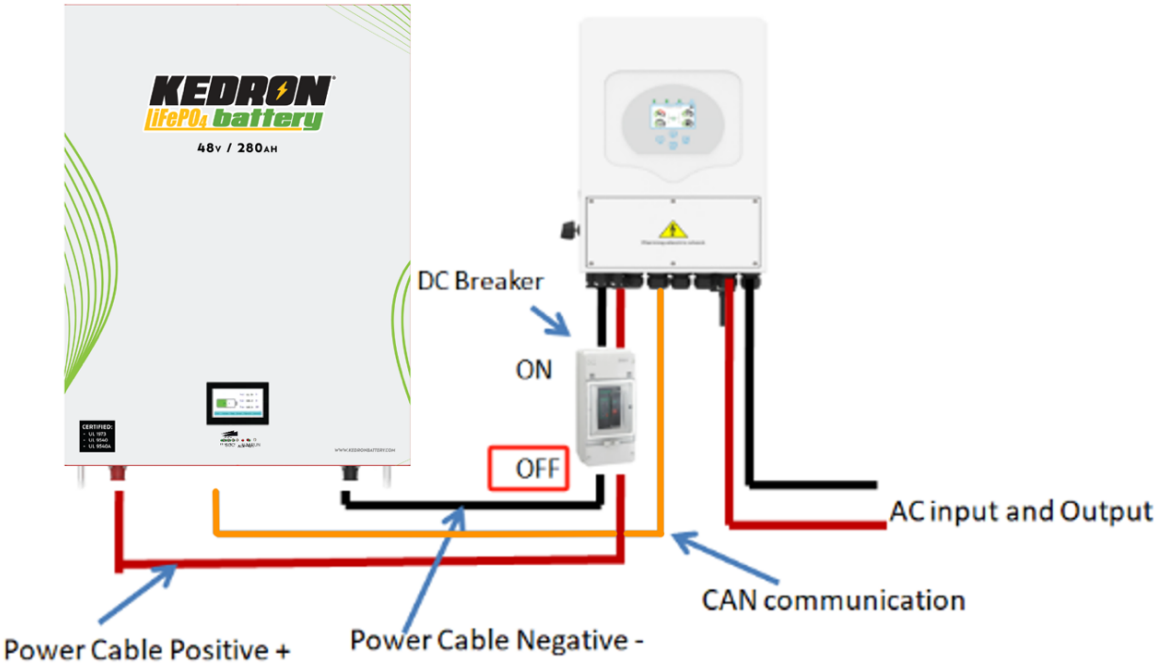
Warranty Registration

6. Use, Maintenance and Troubleshooting

6.1 Battery System Usage and Operation Instructions

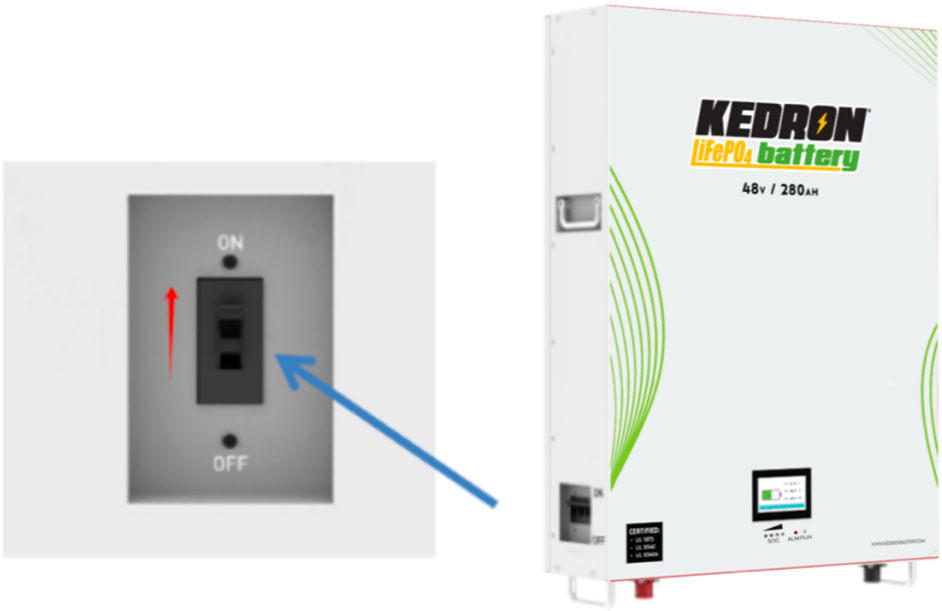
1) Initialization / Power On

Step 1: Before initializing the battery, please ensure the DC breaker between the battery and inverter is in the ”OFF” position.

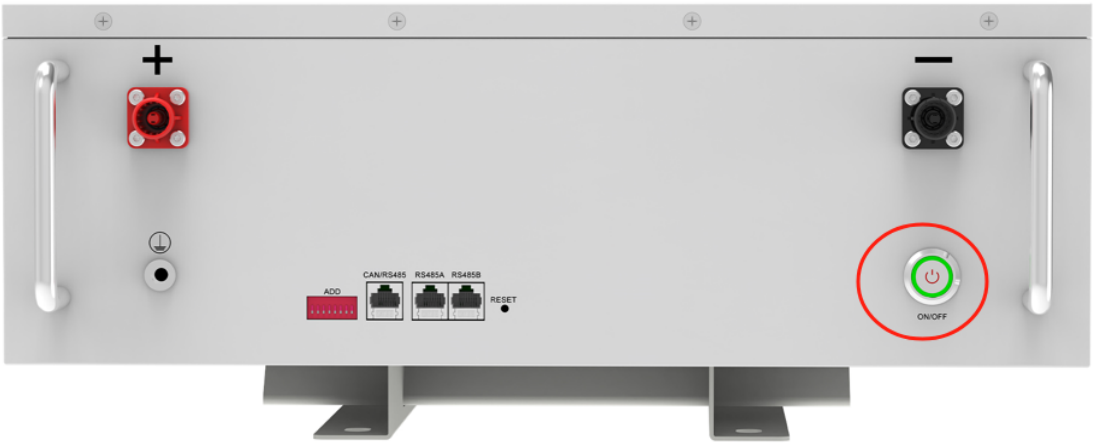


- Ensure battery cables are installed correctly: Red for Positive (+) and Black for Negative (-)
- Ensure the communication cable is connected to the battery & inverter CAN port correctly

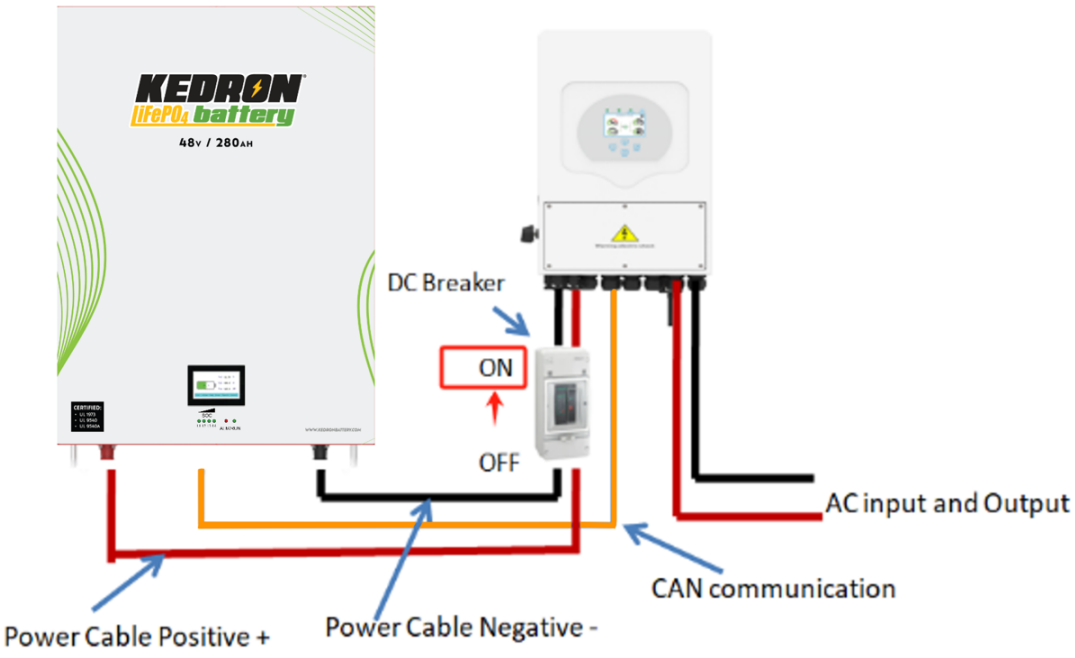
Step 2: Pull Battery DC breaker up to the “ON” position.



Step 3: Turn on the battery by pressing the On/Off button on the bottom of the battery. The LCD and all LED’s will flash briefly at the same time. At this point, the BMS is activated and the boot-up sequence begins. The Kedron LiFePO4 Battery logo will be displayed for a few seconds, and then default to the Index screen.

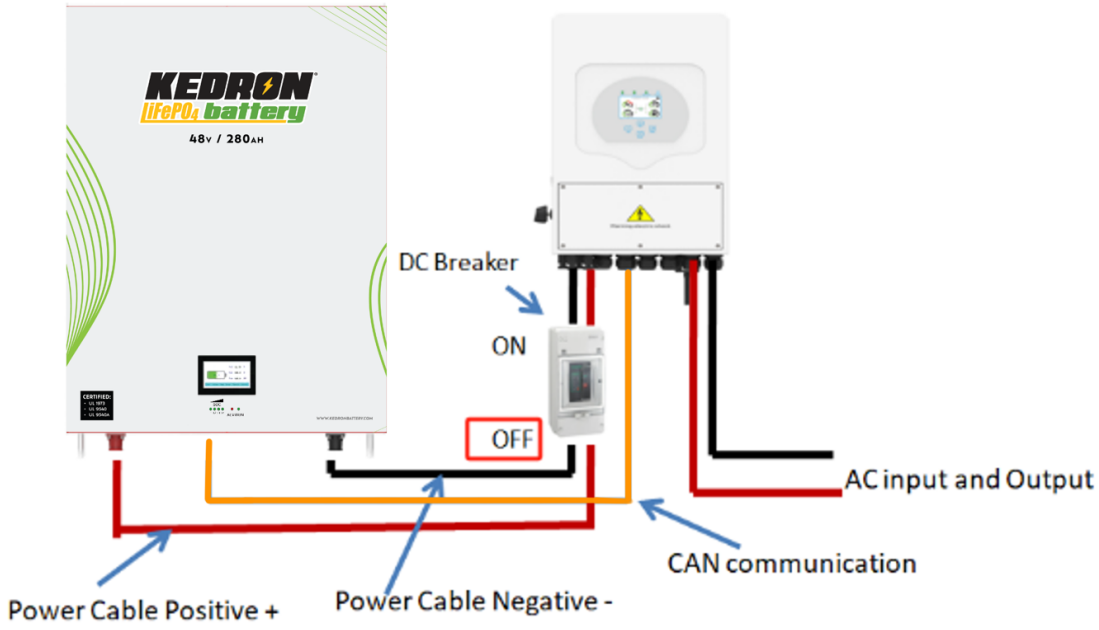


Step 4: Pull the DC breaker between the battery and inverter to the “ON” position. The connected inverter will now be energized. Follow the operating instructions provided by your inverter manufacturer.

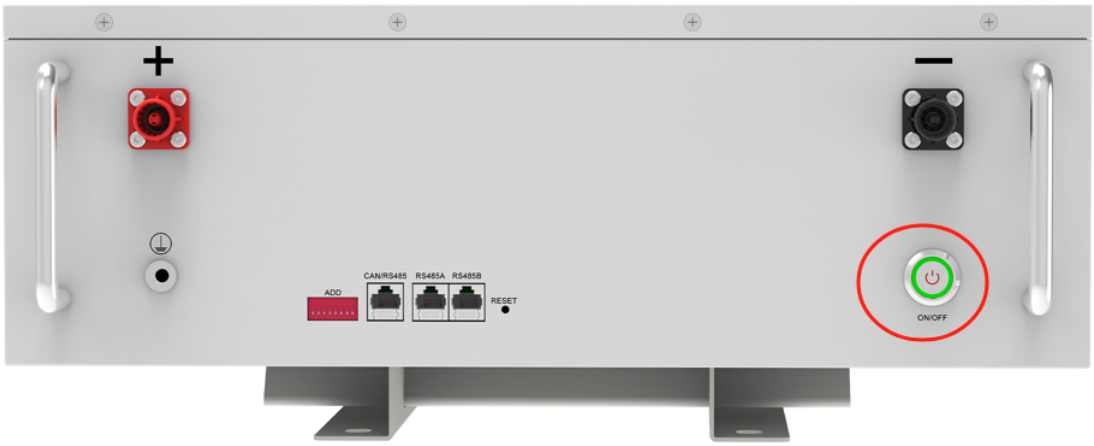


2) Power Off

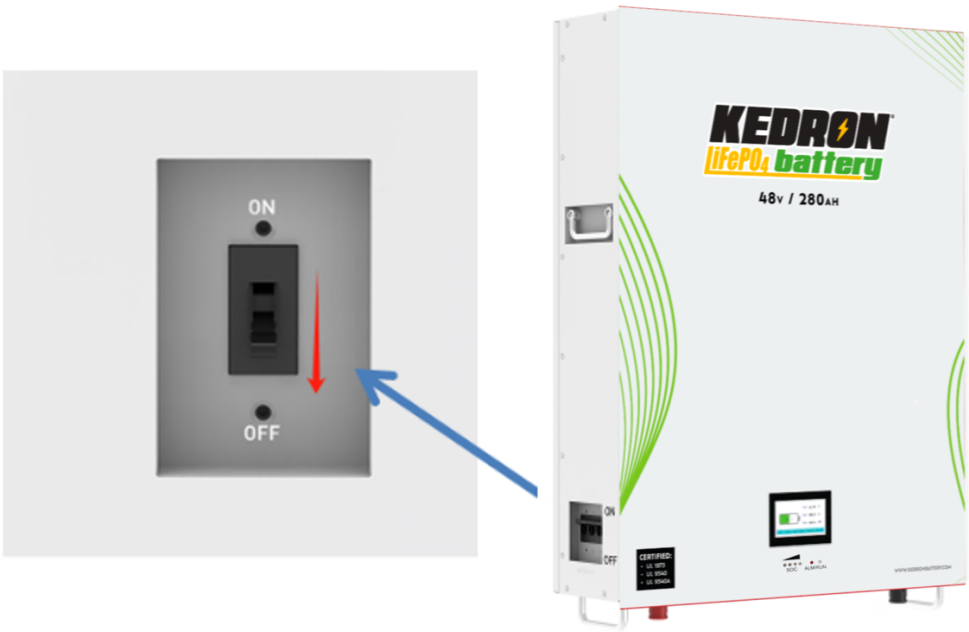
Step 1: Turn off your inverter (if applicable). Pull down the DC breaker between the battery and inverter to the “OFF” position



Step 2: Press the On/Off button on the bottom of the battery.



Step 3: Pull down the battery DC breaker to the “OFF” position.



6.2 Alarm Description and Solution

The Kedron 280Ah LiFePO4 Energy Storage System utilizes the latest in BMS technology to provide a wide range of protections which meet or exeed national electrical code requirements. Using a combination of LED lights and system buzzer, users are able to identify the reason for the alarm and the corresponding solution. While most alarm faults can be cleared easily, users experiencing frequent alarms for the same errors should contact with their local qualified installer to conduct a full system inspection.

6.2.1 Alarms Affecting Power Output

When the battery protection mode is activated or a system failure has occurred, the LED indicator on the front panel will alarm and notify the user. See Table 6-1 below:

Table 6-1 Main Alarm and Protection

State	Alarm category	Alarm indication	Solution
Charging	Over-current when charging	RED LED flashing Buzzer start	Reduce the charging current to below the rated allowable value
	High temperature protection	RED LED flashing	Stop charging, inspect system, and allow time for the battery to cool
Discharging	Over-current protection when discharging	RED LED flashing Buzzer start	Stop discharging, and reduce the discharge current to below rated allowable value
	High temperature protection when discharging	RED LED flashing	Stop discharging, inspect system, and allow time for the battery to cool
	Over-discharge protection	RED LED flashing Buzzer start	Charge the battery as soon as possible
	Low voltage alarm	Yellow LED on	Charge the battery as soon as possible

6.2.2 Alarms Not Affecting Power Output

If a low SOC alarm occurs, the battery system also issues a corresponding alarm signal. The user should check the equipment, determine the type and location of the fault, and take corrective action to ensure that the system is in the best working condition to avoid affecting the system output. The alarm details and solutions are shown in Table 6-2 below:

Table 6-2 Minor alarm

Alarm category	Alarm indication	Solution
SOC 0-10%	System working status: RED LED stays on	Stop discharging, and charge the battery system immediately

6.2.3 Analysis and treatment of common faults

Table 6-3

Item	Fault description	Cause	Solution
1	LED and/or touchscreen non-responsive after powering up the system	Possible software issue	Press and hold the Reset button for 3 seconds
2	No DC output after the system has initialized	System breaker has tripped	Check the status of the DC circuit breaker on the side of cabinet
3	No DC output, red LED is ON, buzzer active	Battery voltage (SOC) is too low	Charge the battery immediately
4	The battery stops accepting a charge and doesn't indicate 100% SOC	Charging voltage is too low	Ensure charging parameters are correct (Page 28) and/or inverter communication active
5	The Master battery SOC LED #1 is yellow and flashing	Communication fault between battery and inverter, or between other batteries in parallel	Check to ensure the inverter cable is connected properly. Then check the cables connecting additional parallel batteries
6	Battery LED #1 and #2 are flashing alternately	Communication issue between batteries	Check the external communication cable connection, and verify the slave module DIP setting is correct

Please contact your local Kedron® LiFePO4 Battery dealer or qualified installer if you require additional technical assistance

7.1 Limited Warranty

KEDRON® LiFePO4 Battery Energy Storage System

Wall Mounted LiFePO4 battery 51.2v 280Ah / 14.34Kwh

Model No: KB-051280A-B-GBP2

I. WARRANTY TERMS

1. Products

The following limited warranty terms and conditions (collectively, the "Factory Warranty") apply exclusively to the KEDRON® LiFePO4 Battery wall-mounted model **KB-051280A-B-GBP2** LiFePO4 which:

- were manufactured by and bear the original manufacturing label of KEDRON® LiFePO4 Battery
- were sold by KEDRON® LiFePO4 Battery directly or through a certified KEDRON® LiFePO4 Battery dealer ("Authorized Dealer") as new products
- were installed and commissioned by an Authorized Dealer or Qualified Installer

2. Product Warranty

For Covered Products, KEDRON® LiFePO4 Battery covers all defects in workmanship and materials during the Warranty Period under normal application, installation, use and service conditions as specified in KEDRON® LiFePO4 Battery's standard product documentation, and subject to the conditions listed below ("Product Warranty"). The Product Warranty is not intended to be a durability warranty, as end-user conditions and usage is variable. KEDRON® LiFePO4 Battery specifically disclaims any warranty to include specific components in any product or service.

3. Performance Warranty

KEDRON® LiFePO4 Battery guarantees that the actual storage capacity of the Covered Product models LFP Battery Pack will be not less than 80% of the labeled storing capacity during whole warranty time period.

4. Warranty Obligations

(a) During the Warranty Period, KEDRON® LiFePO4 Battery will, at its option, analyse the defective reason according to warranty issue material like pictures, videos and description, and provide online support. If issue is resulted from a quality problem, KEDRON® LiFePO4 Battery will replace defective parts free of charge for the distributor or installer to repair the product.

(b) KEDRON® LiFePO4 Battery will, at its option, use new and/or reconditioned parts in building replacement parts. KEDRON® LiFePO4 Battery reserves the right to use parts or products of original or improved design in the repair or replacement of your product. If KEDRON® LiFePO4 Battery replaces a product part, its warranty continues for the remaining portion of the Warranty Period or 90 days from the date of the repair or replacement, whichever is greater.

(c) The distributor or installer has an obligation to contact the end user to verify and report relative issues of the Warranty Product. **This Factory Warranty does NOT cover costs of installation, cost to diagnose problems or repair, cost of removal, or any costs related to shipping parts or replacement products of the Covered Product or parts thereof.**

(d) In the event of a defect of products or services supplied by KEDRON® LiFePO4 Battery, Customer's sole remedy shall be, at KEDRON® LiFePO4 Battery's cost and expense valued at no more than 100% of the original cost of the equipment, (a) repair or replacement of defective product at KEDRON® LiFePO4 Battery's discretion, or (b) re-performance of defective services.

(e) Except for visible defects of products and services for which Customer shall provide notice to KEDRON® LiFePO4 Battery immediately, Customer shall provide written notice of any defect to KEDRON® LiFePO4 Battery within 10 days after discovery of such defect.

(f) KEDRON® LiFePO4 Battery's liability with respect to any product, including without limitation KEDRON® LiFePO4 Battery's obligation to repair or replace defective products or to re-perform defective services, shall be excluded if (a) Customer fails to inspect products or services, (b) Customer fails to inform KEDRON® LiFePO4 Battery about defects, (c) Customer fails to observe product operating and maintenance instructions provided by KEDRON® LiFePO4 Battery, (d) Any product or product part has been opened, modified, repaired, processed, replaced or installed, or any other work has been performed in relation to or that affects any product, by a non-certified or otherwise unauthorized person, (e) Any other act or omission has occurred that otherwise has resulted in a loss of product warranty.

(g) The installer or person performing the initial system commissioning must hold a compliant electrician certificate, KEDRON® LiFePO4 Battery will not liable for product(s) damaged through installer error or installation error. Determination of warranty coverage is as set out in this Warranty document, and at the discretion of the KEDRON® LiFePO4 Battery Service team.

5. Product Suitability

KEDRON® LIFEPO4 BATTERY – PRODUCT FACTORY WARRANTY

KEDRON® LiFePO4 Battery products are designed to meet stated international safety standards and regulations. Because local safety standards and regulations vary significantly, KEDRON® LiFePO4 Battery cannot guarantee that products meet all applicable requirements in each locality. Customer assumes responsibility for compliance with such safety standards and regulations in the localities in which a product will be shipped, sold or used. Before purchase and use of any product, Customer shall review the product application, and national and local codes and regulations, and must verify that the use and installation of the product will be in compliance therewith.

6. Warranty Term

(a) The warranty period ("Warranty Period") for the Covered Product commences upon the initial purchase from KEDRON® LiFePO4 Battery or from an Authorized Dealer (as evidences by the purchase invoice date).

(b) The Warranty Period for the **KB-051280A-B-GBP2** Model terminates **180 months** after purchase of the Covered Product by an Authorized Dealer.

7. Persons Entitled to Make Warranty Claims

Warranty claims may only be made by the original purchaser of a Covered Product, if the Covered Product has been registered through KEDRON® LiFePO4 Battery product registration website during the installation process by the Authorized Dealer. The Covered Product must remain in its original location and configuration.

8. Claim Notice

(a) If a customer who purchased via an authorized distributor/installer believes that he/she has a justified claim covered by this Factory Warranty, you must submit the claim in writing ("Claim Notice") to KEDRON® LiFePO4 Battery within the applicable Warranty Period to KEDRON® LiFePO4 Battery. Any Claim Notice must include the following information:

- The serial number of the Covered Product for which a Claim Notice is being sent;
- A copy of the dated purchase receipt for the Covered Product;
- A copy of the installation protocol for the Covered Protocol signed by an Authorized Dealer;
- Information about the use of the Covered Product in reasonable detail;
- Information about the defect in reasonable detail.

(b) Upon receipt of your Claim Notice, KEDRON® LiFePO4 Battery may ask for further information or claim verification from you, receipt of which will be required prior to processing the claim.

(c) Upon acceptance of your warranty claim, KEDRON® LiFePO4 Battery may require that you send the Covered Product at your own costs to a KEDRON® LiFePO4 Battery warranty claim center.

II. WARRANTY LIMITATIONS

1. Excluded Warranty Claims

(a) KEDRON® LiFePO4 Battery makes no warranties, either expressed or implied, orally, or in writing, with respect to any other warranty coverage except those expressly stated in this limited Factory Warranty

(b) The Factory Warranty does not cover damages that occur due to:

- Transport damage;
- Installation or commissioning through any person which is not an Authorized, Certified Dealer;
- Failure to observe the user manual, maintenance regulations and intervals;
- Modifications, changes, or attempted repairs, except as conducted by an Authorized Dealer;
- Incorrect use or inappropriate operation;
- Insufficient ventilation of the Covered Product;
- Failure to observe the applicable safety regulations;
- Force majeure.

(c) This factory warranty does not cover cosmetic defects which do not directly influence energy production, or degrade form, fit, and function.

(d) Claims that go beyond the scope of this limited Factory Warranty, in particular claims for compensation for direct or indirect damages arising from the defective device, for compensation for costs arising from disassembly and installation, or loss of profits, are expressly NOT covered by this Factory Warranty.

(e) In no event will KEDRON® LiFePO4 Battery be held responsible or liable for any personal injuries resulting from the use of the system, or for any other damages, whether direct, indirect, incidental, or consequential; even if KEDRON® LiFePO4 Battery has been advised of such damages.

III. GENERAL

This limited Factory Warranty and the terms contained herein supersede all statements contained in any and all user manuals, installation manuals, other equipment literature or catalogs, or orally with respect to any product or performance warranty for Covered Products.