



Rechargeable Li-ion Battery



Model: PBT-LI48108P2F

User Manual
V1.0.0

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1. Preface

Thank you for purchasing POMCube lithium ion phosphate rechargeable battery. In order to use your device safely, efficiently and effectively, please read the User Manual thoroughly and follow the instructions provided before use. Please keep this User Manual for future reference.

POMCube reserves the right to change products information and specifications without notice. Products and specifications discussed herein are for reference purposes only. All information discussed herein may change without notice and without warranties of any kind. This document and all information discussed herein remain the sole and exclusive property of POMCube.

Please visit www.pomcube.com for the latest updates.

2. Legal Compliance

2.1 Disposal and Recycling





This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service, or the shop where you purchased the product.

3. Warning Label









Please pay attention to the warning labels and follow the instruction mentioned.

POMCube disclaims all liability for any accidents or damage caused by using the product in the ways that are not described in this User Manual or using non-genuine parts or accessories.

Table 3.1.1: Warning labels in this manual

 WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in injury or death, or a damage to POMCube li-ion battery.
 CAUTION	CAUTION indicates potentially hazardous situation which, if not avoided, could result in medium/slight injury, or a damage to POMCube lithium ion battery.
NOTE	NOTE indicates an important step or tip that leads to best results, but is not safety or damage related.


3.1 Environmental Conditions

-  **WARNING:** Do not expose battery to direct flame.
-  **WARNING:** Do not install battery near heating equipment.
-  **WARNING:** Do not immerse battery in water or other fluids. Install battery in a location that prevents damage from flooding.
-  **WARNING:** Do not expose battery to ambient temperatures above 60°C (140°F) or below -30°C (-22°F).
-  **CAUTION:** Do not use cleaning solvents to clean the battery, or expose the battery to flammable or harsh chemicals or vapors.
-  **CAUTION:** Do not place battery in a storage condition for more than one (1) month, or permit the electrical feed on the battery to be severed for more than one (1) month, without placing the battery into a storage condition in accordance with POMCube’s storage specifications.
-  **CAUTION:** Ensure that no water sources are above or near the battery, including downspouts, sprinklers, or faucets.
-  **CAUTION:** Ensure that snow does not accumulate around the battery.


3.2

3.2 Emergency Situations


(1) Leaking Batteries

 **WARNING:** If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.


1) Inhalation

 **WARNING:** Evacuate the contaminated area, and seek medical attention.

2) Contact with eyes

 **WARNING:** Rinse eyes with flowing water for 15 minutes, and seek medical attention.


3) Contact with skin

 **WARNING:** Wash the affected area thoroughly with soap and water, and seek medical attention.


4) Ingestion

 **WARNING:** Induce vomiting, and seek medical attention.


(2) Fire


 **WARNING:** NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack to a safe area before it catches fire.

(3) Wet Batteries

 **WARNING:** If the battery pack is wet or submerged in water, do not let people access it, and then contact POMCube or an authorized dealer for technical support.

(4) Damaged Batteries

 **WARNING:** Damaged batteries are dangerous and must be handled with the utmost care. They are not fit for use and may pose a danger to people or property. If the battery pack seems to be damaged, pack it in its original container, and then return it to POMCube or an authorized dealer.

 **WARNING:** Damaged batteries may leak electrolyte or produce flammable gas. If such damage occurs, please contact POMCube.

4. About POMCube Li-ion Battery

4.1 Overview

This is a rechargeable lithium battery with BMS built for energy storage systems and backup power for base stations like repeater, macro site, solar base station. It is integrated with data collecting, system management and communication. With optional EMS module, all system data can be checked on mobile App.

4.2 Features

Quick installation: Firm stack-up modular structure + quick coupler design.

All-round protections for safety, reliability and endurance with built-in BMS: single voltage, overall voltage, charge and discharge current detection, overcharge, over-discharge, overcurrent, short circuit, over temperature.

Functions: Battery cell balance, battery capacity estimation, LED status indications.

Automatic sleep and wakeup modes: NO human intervention required. With optional **EMS (energy management system)**, battery data can be synchronized and checked in real time.

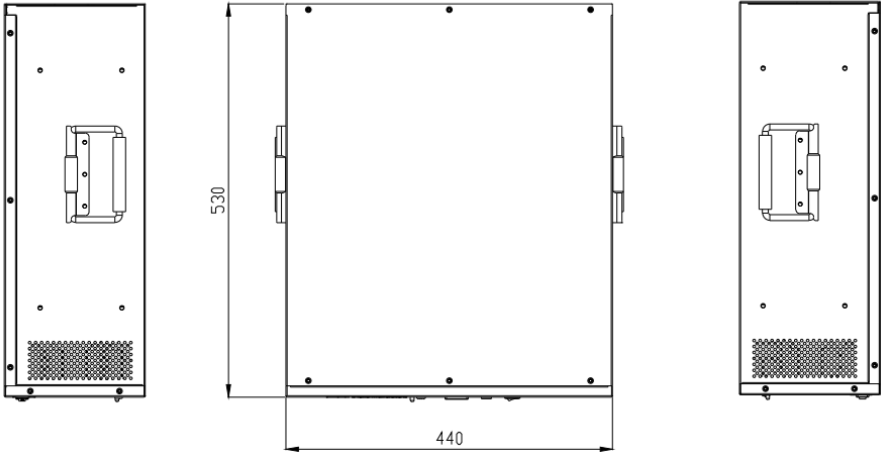
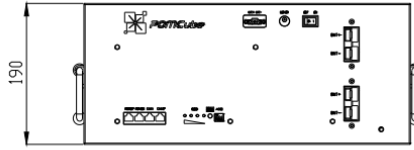
Powered by high safety and long-life **lithium iron phosphate cell**.

Flexible capacity expansion: parallel connection of multiple battery modules supported.

Fan-free self-cooling and maintenance free design.

4.3

4.3 Specifications



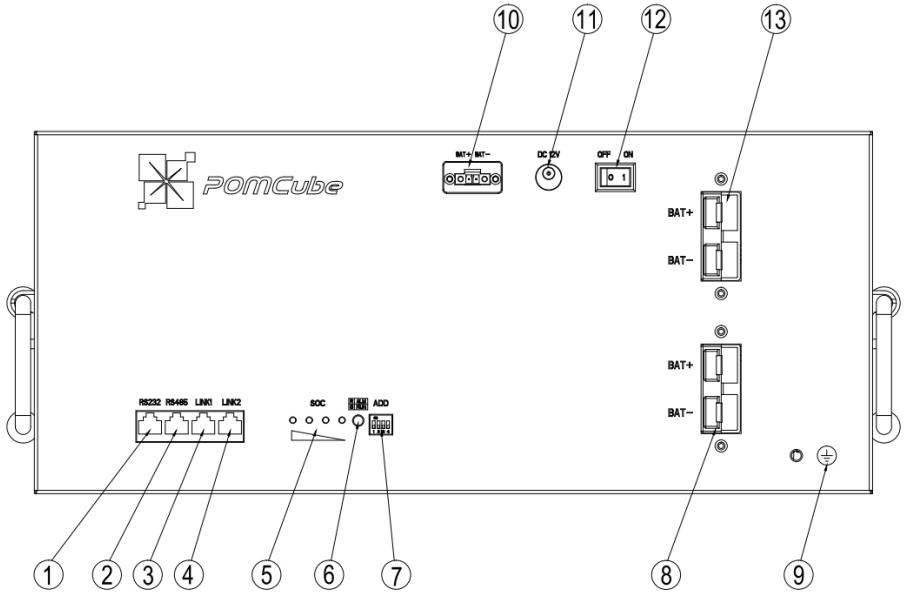
Model	PBT-LI48108P2F
Nominal Voltage	51.2V
Nominal Capacity	108AH
Nominal Energy	5530Wh
Internal Resistance	$\leq 200\text{m}\Omega$
Life Cycle	>5000 cycles@0.5C 80%DOD
Monthly Self Discharge	<3%
Efficiency of Charge	99% @0.5C

Efficiency of Discharge	96~99% @1C
Charge Voltage	56.8V
Charge Current	54A
Max. Charge Current	100A
Charge Cut-Off Voltage	57.6V(Configurable)
Discharge Current	54A
Max. Discharge Current	100A
Discharge Cut-Off Voltage	48V(Configurable)
Charge Temperature	0°C to 45°C @60±25% Relative Humidity
Discharge Temperature	-20°C to 60°C @60±25% Relative Humidity
IP Rate	IP20
Weight	58kg
Dimension (L*W*H)	530mm*430mm*190mm
Terminal	ANDERSON-120A Gray
Communication	RS485 and CAN
Parallel	Up to Ten
Protection	Over Current / Over Temperature / Over Voltage / Under Voltage
Wakeup	Automatic Voltage Wakeup External 12Vdc Power Source Can be Used to Wakeup BMS after Severe Overdischarge.

NOTE: Slight weight deviation for each device.

5. Interfaces

5.1 Battery Interfaces



No.	Item	Name	Function
①	RS232	RS232 communication terminal	Reserved port
②	RS485	RS485 communication terminal	Communicate with external devices, e.g. EMS
③	LINK1	Parallel communication terminal 1	In paralleling multiple battery packs, connect to the LINK2 of the last battery pack (lower address)

④	LINK2	Parallel communication terminal 2	In paralleling multiple battery packs, connect to the LINK1 of the next battery pack (higher address)
⑤	SOC	Battery power indication	Indicate electric capacity and charge/discharge status
⑥	RUN/ALM	System running or alarm	Indicate system running or malfunction alarm
⑦	ADD	Code switch	In paralleling multiple battery packs, d set addresses for battery packs
⑧	BAT+/BAT-	Positive/negative electrode terminal 1	Connect to inverter, controller or load; or parallel to the next battery pack
⑨	PE	Grounding terminal	Connect to ground
⑩	BAT+/BAT-	Positive/negative electrode terminal 3	Connect to mini watt devices, such as an EMS with a proper input voltage, a maximum output current of 5A is accepted
⑪	DC 12V	12V power supply input	Activate BMS from deep sleep mode, a 12V/1A adapter is required
⑫	ON/OFF	On-off key	Turn on/off the system
⑬	BAT+/BAT-	Positive/negative electrode terminal 2	Connect to inverter, controller or load; or parallel to the last battery pack

5.2

5.2 Battery Interfaces Description

(1) RS232 communication

Reserved for communication with upper computer. Battery information, e.g. voltage, current, temperature, status, SOC, SOH and manufacturing data, can be checked on the upper computer.

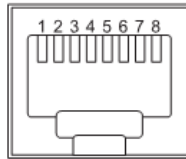
(2) **RS485 communication**

To be connected to external devices such as EMS (Energy Management System). All electric parameters can be updated to EMS. In this way, RS485 can be used for parameter setting and online upgrade.

(3) **LINK1/LINK2 communication**

LINK1/LINK2 communication, or CAN communication, is for the communication between master and slave battery packs. In this way, master battery pack will detect data and device status of slave packs and send parallel control strategies.








(4) **Communication pins definition**



RS232—with 8P8C vertical RJ45 socket		RS485—with 8P8C vertical RJ45 socket		CAN—with 8P8C vertical RJ45 socket	
RJ45 pin	Definition	RJ45 pin	Definition	CAN pin	Definition
3	RS232-TX	8	RS485-B	4	CAN-H
6	RS232-RX	7	RS485-A	5	CAN-L
8	GT	6	GT	2	GT
Others	NC	Others	NC	Others	NC
GT: GND of RS232, RS485 and CAN					

(5) **LED Indicators Description**

Table 4.3.1: BMS Indicators description

Battery module Status	Status Indications (RGB)			SOC Indication LEDs			
	 Green	 Red	 Blue	 Green	 Green	 Green	 Green
Sleep	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Normal	Blinking	OFF	OFF	Indication by SOC
Alarm ¹	Blinking Yellow		OFF	
Protection ²	OFF	Blinking	OFF	
Error ³	OFF	ON	OFF	
Parallel failure	OFF	OFF	ON	

1. Alarm/Blinking Yellow: alarming of battery overcharge, over-discharge, over-current or over-temperature
2. Protection/Blinking Red: battery output off, battery under protection mode for overcharge, over-discharge, over-current or over-temperature
3. Error/Solid Red: battery short-circuit or hardware failure
4. If LED indicates differently from the Table 4.3.1, contact POMCube for program updates.

Table 4.3.2: SOC Indicators description

Status		Solid			
SOC LEDs		L4 ●	L3 ●	L2 ●	L1 ●
SOC (%)	0 ~ 25%	OFF	OFF	OFF	ON
	25 ~ 50%	OFF	OFF	ON	ON
	50 ~ 75%	OFF	ON	ON	ON
	75 ~ 100%	ON	ON	ON	ON



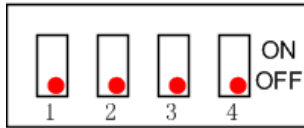
Charging indication if SOC=50%



Discharging indication if SOC=50%

(6) Code switch setting

When more than one battery pack are installed in parallel, they can be distinguished by the unique hardware addresses set for each pack. Hardware address can be set from the code switch as follows:



Address	Code switch #				description
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	Set as Pack 1 (Address of the master pack must be started from address 0)
1	ON	OFF	OFF	OFF	Set as Pack 2
2	OFF	ON	OFF	OFF	Set as Pack 3
3	ON	ON	OFF	OFF	Set as Pack 4
4	OFF	OFF	ON	OFF	Set as Pack 5
5	ON	OFF	ON	OFF	Set as Pack 6
6	OFF	ON	ON	OFF	Set as Pack 7
7	ON	ON	ON	OFF	Set as Pack 8
8	OFF	OFF	OFF	ON	Set as Pack 9
9	ON	OFF	OFF	ON	Set as Pack 10
10	OFF	ON	OFF	ON	Set as Pack 11
11	ON	ON	OFF	ON	Set as Pack 12

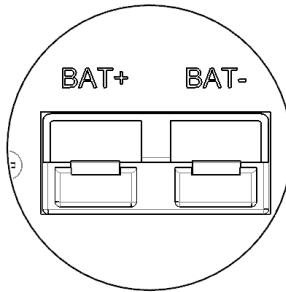
12	OFF	OFF	ON	ON	Set as Pack 13
13	ON	OFF	ON	ON	Set as Pack 14
14	OFF	ON	ON	ON	Set as Pack 15
15	ON	ON	ON	ON	Set as Pack 16

(7) **BAT+/BAT- Terminals 1/2/3**

120V gray Anderson terminal is used charge/discharge. A wire with Anderson terminals no both sides is optional. Properly connect the BAT wire according to the wire sequence and terminal position shown in the figure below.

BAT+: Battery positive electrode

BAT-: Battery negative electrode



BAT+/BAT- terminals 3 are for connecting mini watt loads/devices, such as an EMS. The maximum output current accepted is 5A.

⚠ WARNING: Terminals must be connected in the right electrode, or it may bring a damage to the system.

(8) **ON/OFF Switch**

Switch on/off the Rocker Switch to start or shut off BMS, thus controlling the input and output loop power of battery packs. BMS must be turned OFF if the battery packs are not to be used for a long period of time. When BMS is switched ON, right after BMS's self-inspection, the charge/discharge MOS tube will be switched on, and output voltage can be detected in BAT+/BAT-.



(9) 12V Input Power Terminal

A 12V input power terminal can be used for activating BMS from deep sleep mode. When the power of the battery is extremely low and auxiliary power supply of BMS fails, an external 12V power supply is needed to activate BMS, thus activating charge/discharge MOS tube and having the battery recharged.

6. Sleep Mode and Activation

6.1 Sleep Mode

The battery system will enter low power mode in one of the following situations:

(1) Over-discharge protection of a single battery unit or battery pack lasts over 3 minutes;

⚠ WARNING: Ensure there is no external voltage input before entering sleep mode, or sleep mode will not occur.

6.2 Activation

(1) Activation from low power mode

Battery system will switch from low power mode to normal working mode in one of the following situations:

- a. Charger with an output voltage higher than battery voltage connected;
- b. Recharge ON/OFF Rocker Switch.





BMS will hourly try activating itself from low power mode and activating charge MOS tube. If charging continues and the charging current is greater than 2Amp,

BMS will switch to normal charging from low power mode. Once BMS is charged and activated, the battery charger input detection will start after BMS is self-inspected. If a battery charger input is detected, the charge MOS tube will start working and battery charging starts; if no charging is detected, system will re-enter low power mode in 3 minutes.

(2) Activation from deep sleep mode

When single battery voltage decreases to the over-discharge limit voltage as specified for the battery cell, and auxiliary power supply of BMS stops working, battery pack will enter deep sleep mode from low power mode. To reactivate the battery pack, connect a 12V power supply to DC 12V terminal to activate the BMS and charge/discharge MOS tube before battery charging resumes.

7. Other Instructions

-  **WARNING:** When battery pack is connected to external loads or devices, operate in the following sequence: turn on load and any other possible switches between device and battery packs, then turn on ON/OFF Rocker Switch.
-  **WARNING:** Always use a proper battery charger. **NEVER** reverse the polarities when connecting to battery charger.
-  **CAUTION:** If indicators turn solid red when connecting to load or devices, try to restart it by turning ON the rocker switch of battery pack.
-  **CAUTION:** Battery power is low if all SOC indicators on the battery pack are off. Charge it as soon as possible.

7.1 Getting Started with the APP (Optional)

If you also have POMCube EMS or iCAN Mini hybrid inverter, you may check your battery information on our APP.

(1) Download the APP

You can search “Eloncity” in Apple App Store or Google Play, or scan the QR

code below or on the packing box to download the app from Apple App Store or Google Play.



Apple App Store



Google Play

(2) Add New Devices

Start the app and click the add device button, then scan the device QR code or input the device code to add your devices. You can find the QR code and the device code on the label pasted on the device.

(3) Detailed device data, e.g. running status, history, alerts, can be checked on the APP. Set the working modes, grid type, utility rate plan, generator information following the guidance on the APP.

8. Service

If you have any questions, please contact us at service@pomcube.com, if it becomes necessary to return the device for repair, contact your local distributor for more information.



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