

PRODUCT MANUAL

Lithium iron phosphate battery, ferrous lithium or LiFePO4 51.2V100AH







In accordance with Law 1480 of 2011 Consumer Statute and Decree 735 of 2013 of Legal Guarantee:

- To request a guarantee, the customer is obliged to report the damage to the product, make it available to the company at the guarantee service point at AV CL 80 69 70 Unit 1C, and indicate the invoice number to determine its date of purchase.
- The delivery of the repaired product will be delivered to the customer at the warranty service point, unless the customer requests to send it to a different destination, in which case the customer must assume the cost of freight.
- In any case, when a product repair guarantee is denied or approved, the respective written report must be issued supporting the evidence that justifies the decision.
- In no case will Tb Plus Energy proceed with the replacement of the product given under warranty since, if the repair does not proceed, a credit note will be issued which covers the acquisition of another new product or service or the return of the money paid.
- If the failure repeats once the product has been repaired, only the credit note applies, which covers the acquisition of another new product or service or the return of the money paid.
- When the customer opts for a refund of the money, it will be for the amount of the sale price. For this purpose, they must send a communication signed by the legal representative, which indicates the bank details to make the return, the which will be effective within fifteen (15) business days after receipt of the return request.
- The repair of the product will be carried out within 30 business days following the claim, which is carried out by filling out the GP-F-018 Warranty Form, which is completed in the PQRF Guarantees tab on the WEB page www.**tbplusenergy**.com or at the following link:

https://forms.office.com/Pages/ResponsePage.aspx?id=K987JK0Nuke_1n30RF9URwiKWAfZovh DrWEVYGmhK95UOVZYUFBWMUpaQVZBM0hIS0RKUjdLSkdIWS4u:

- Once the guarantee form has been completed, the client has 15 days to make it available at the guarantee service point.
- The product manuals in which proper use, installation instructions and periods covered by the warranty are reported are found in the PQRF Product manuals tab on the website www.**tbplusenergy**.com.

Warranty

• Tb Plus Energy guarantees that each product is free of defects in materials and manufacturing, and offers a guarantee for a period of **60 months** from the purchase of the product.

Note: All our batteries communicate with the main inverter brands that are distributed in Colombia.

LIFEPO4 BATTERY / 51.2V100AH

Tb Plus

INTRODUCTION

Product description

- Ferrous lithium battery (LiFePO4) based on very high quality square cells.
- 51.2V100AH 5120WH -Lifespan@80%DOD greater than 6000 cycles.
- Expected duration greater than 15 years.
- 5 year warranty extendable to 10 years.

Properties

- High energy density.
- High resistance to high temperatures and humidity.
- Good charging efficiency at high temperatures.
- Electronically regulated temperature management by BMS.
- High energy retention.
- Superior useful life.
- Integrated electronics.
- High security: Built-in protection functions.
- Quality certificate.
- Simple installation.
- Greater care for the environment and less pollution.

Advantages

- Easy installation and connection between several batteries (up to 15 modules).
- High charging currents that shorten charging times.
- High discharge currents allowing them to be connected in series.
- High efficiency between charging and discharging, with very little energy loss.
- Greater continuity of current available.
- Easy installation.
- Thanks to the BMS (Battery Monitoring System) there is protection for each of the cells and therefore the battery. It performs individualized monitoring of the voltage of each of the cells, charging and discharging, as well as the system temperature. Based on the information found, adjustments are made to have a perfect balance and guarantee the longest useful life of the system.



IMPORTANT: SAFETY MEASURES AND TIPS

2.1 General rules

- Follow these instructions and keep them safe for future reference. Any work carried out on the Tb Plus Energy[®] battery must be carried out exclusively by qualified personnel.
- Protective clothing and glasses should be worn when working on the battery.
- Avoid contact of the battery with water or any other liquid or gas.
- Avoid high temperatures. Store and install the battery in a cool, dry place.
- Do not attempt to open or disassemble the battery. The electrolyte is very corrosive. Under normal working conditions, it is impossible to come into contact with the electrolyte. If the battery case is damaged, do not touch the electrolyte or the powder it contains as it is corrosive.
- In case of a massive escape, leave the area immediately.
- Splashes of battery materials, such as dust or electrolyte, on the skin or in the eyes should be rinsed immediately with plenty of clean water. Next, medical assistance must be requested. Spills on clothing should be cleaned with water.
- Danger of explosion and fire. The Lithium battery terminals always have current, so no objects or tools should be placed on it. Avoid short circuits, too deep discharges and too high charging currents. Use insulated tools. Do not wear any metal objects, such as watches, bracelets, etc. In the event of a fire, a type D foam or CO2 extinguisher should be used, never water.
- In case of risk of fire, take the battery to a safe place without risk of spreading or harming third parties.
- Ferrous Lithium batteries are very heavy. If present in an accident, they can become a projectile. Make sure it is securely fastened and always use appropriate handling equipment for transport. Handle them with care, as the batteries are sensitive to shock.
- If charged after being discharged below the Discharge Cut-Off Voltage, or if damaged or overcharged, the battery may release a harmful mixture of gases, such as phosphate.
- Failure to follow the instructions for use, repairs carried out with non-original parts or by unauthorized personnel will void the warranty.
- Be especially careful in especially humid environments such as boats or places very close to the sea, lakes or other large bodies of water. In these places it is especially important to be able to ventilate the environment periodically; it is also important to place an anti-humidity component such as silica.

Damaged batteries may leak electrolyte or produce flammable gas.

In case a damaged battery requires recycling, you must follow local recycling regulations (Regulation (EC) No 1013/2006 for the European Union) to process and use the best available techniques to achieve relevant recycling efficiency.

For any product quality or recycling issues, please contact Tb Plus Energy® at www.tbplusenergy.com.

2.2 Transportation warnings

• The Tb Plus Energy[®] battery must be transported in its original packaging or equivalent and in a horizontal position.

If the battery is in its packaging, use padding to prevent damage.



Do not get under a battery while it is being lifted. Never use the terminals to lift the battery, only use the handles.

Batteries are tested according to the UN Manual of Tests and Criteria, part III, subsection 38.3 (ST/SG/AC.10/11/Rev.5).

For transport, batteries belong to category UN3480, Class 9, Packing Group II and must be transported in accordance with this regulation. This means that they must be packaged for land or sea transport (ADR, RID & IMDG) according to packaging instructions P903 and for air transport (IATA) according to instructions P965. The original packaging meets these regulations.

2.3 Disposal of batteries

 Batteries marked with the recycling symbol must be disposed of through an accredited recycling agency. They can also be returned to Tb Plus Energy[®] or its authorized distributor by agreement. Batteries must not be mixed with domestic or industrial waste.

GENERAL INFORMATION ABOUT PHOSPHATE BATTERIES IRON AND LITHIUM

Lithium iron phosphate (LiFePO4) batteries are the safest batteries on the market.

3.1 Resistance

A lead-acid battery will fail prematurely due to sulfation if:

- Operates in deficit mode for long periods of time (that is, if the battery is rarely or never fully charged).
- If it is left partially discharged or, even worse, completely discharged.

A ferrous lithium battery does not need to be fully charged. This is a decisive advantage of these batteries compared to lead-acid ones.

Other advantages are the wide working temperature range, excellent cyclic performance, low internal resistance and high efficiency (see below).

The chemical composition of Tb Plus Energy[®] ferrous lithium batteries are the right choice for very demanding applications.

3.2 High efficiency

In several applications (especially off-grid, solar and/or wind applications), energy efficiency can become of crucial importance.

The full cycle energy efficiency (discharge from 100% to 0% and charge back to 100%) of a normal lead-acid battery is 80%.

The full cycle efficiency of a ferrous lithium battery is 92%.

The charging process of lead-acid batteries becomes particularly inefficient when the 80% state of charge is reached, resulting in efficiencies of 50% or even lower in solar systems where reserves for several days are needed (batteries running between 70% and 100% load).

In contrast, a ferrous lithium battery will still achieve 90% efficiency under mild discharge conditions.



3.3 Correlation energy, size and weight.

Thanks to a high degree of energy density, Tb Plus Energy[®] ferrous lithium batteries save up to 70% space and 70% weight.

3.4 Great flexibility

Ferrous lithium batteries are the easiest to charge on the market. They do not need to be fully charged. Therefore, multiple batteries can be connected in parallel and no damage will occur if some batteries are more charged than others.

However, it is very important to connect completely new batteries and not mix batteries that have had different numbers of life cycles used. That is, do not connect new batteries and used batteries, or used batteries with different usage times, together, as it will negatively influence the service life of the product.

3.5 BMS (Battery Monitoring System)

- A ferrous lithium cell will fail if the voltage across it drops below its limit.
- A ferrous lithium cell will fail if the voltage across it increases above its limit.
- The battery cells do not self-balance at the end of the charge cycle.

The cells in a battery are not 100% identical. Therefore, at the end of a cycle, some cells will be fully charged or discharged before others. The differences will increase if the cells are not routinely balanced/equalized.

In other storage technologies, even after one or more cells have been fully charged, a small amount of current will continue to flow (the main effect of this current is the decomposition of water into hydrogen and oxygen). This current helps to fully charge those cells that are not yet fully charged, thus equalizing the state of charge of all cells.

However, the current passing through a ferrous lithium cell when fully charged is almost zero, so lagging cells will not finish fully charging.

Over time, the differences between cells can become so significant that, even when the overall battery voltage is within limits, some cells will fail due to over- or under-voltage. Therefore, cell balancing is highly recommended.

This balancing function is one of the main functions of the BMS, so this system is essential to avoid damage to large battery banks. In addition to this function, the BMS also:

- It will prevent undervoltage in the cells by disconnecting the load when necessary.
- It will prevent overvoltage in the cells by reducing the charging current or stopping the charging process.
- It will shut down the system in case of overheating.
- Short circuit detection.

Important warning

Batteries can be damaged due to excessive discharge or charging. Damage from overdischarge can occur if small loads (e.g. alarm systems, relays, standby current from certain loads, current drain by battery chargers or charge regulators) slowly discharge the battery when the system is not in use.

If there is any doubt about possible residual current draw, isolate the battery by opening the battery switch when the system is not in use and perform checks.

Residual discharge current is especially dangerous if the system has been completely discharged and a low voltage trip has occurred in the cells. After the disconnection caused by the low voltage in the cells, there is still a reserve of 1Ah in the battery per battery of approximately 100Ah capacity. The battery will be damaged if the remaining capacity reserve in the battery is removed. A residual current of 10mA, for example, can damage a 200Ah battery if the system is left in a discharged state for more than 8 days.

4 INSTALLATION

Batteries must always be installed in a horizontal position.

4.1 Connections

- In series: Batteries CANNOT be connected in series.
- In parallel: Up to 15 batteries can be connected in parallel.

4.2 Short circuit protection

When installing a single battery or connected in parallel with devices such as solar inverters, a safety relay must be installed.

4.3 Before using

At the time of shipment, the batteries are charged to approximately 30%.

When charging batteries connected in parallel, the voltage of the batteries or cells with the highest initial state of charge will reach full charge sooner, leaving behind the batteries or cells with a lower initial state of charge. This could result in overvoltage of the batteries or cells plus with the highest initial state of charge, thus causing the BMS to interrupt the charging process.

This is why at Tb Plus Energy[®] we strongly recommend that new batteries be charged to a value of 100% before including them in a parallel configuration.

This can be done by charging the batteries individually at a low rate with a charger or power supply according to the charging values indicated in the data sheet. To completely balance the cells, it is recommended to add an absorption period of several hours at the voltage recommended in the technical sheet.

TECHNICAL VARIABLES

	TECHNICAL DATA SHEET 51.2V100AH
Reference	TB-48100S3
Composition	LiFePO4
Rated voltage	51.2V
Internal resistance	≤30mΩ
Rated capacity	100AH
Rated power	5120Wh
Self discharge rate	≤3.5% monthly
Useful life (@25°C, 80% DOD)	≥6000 cycles
Parallel connected battery function	Max 10 groups in parallel, recommended for less than 6 groups
Recommended charging voltage	56.0 - 57.6V
Recommended charging current	50A
Maximum charging current	100A
Discharge cut-off voltage	44.8V
Recommended discharge current	50A
Max continuous discharge current	100A
Width	440mm
Depth	550mm
Height	133mm
Total width	483mm (19"Rack mounted type)
Weight	Aprox 46kg
Communication interface	R485/CAN
Charging temperature	0°C a 45°C (32°F a 113°F)
Discharge temperature	-20°C a 60°C (-4°F a 140°F)
Storage temperature	0°C a 45°C (32°F a 113°F)
Safety standard	UN38.3 (battery)
Water and dust resistance	IP30

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7 BASIC OPERATION





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ON/OFF

On/off button.

SOC

Indicates the current battery capacity level.

RUN

When lit, it indicates that the battery is in operational mode.

ALM

When the red LED is on, it indicates that the battery is under protection. If the light flashes it indicates an alarm.

LED indicator

STATUS	CONDITION	RUN	ALM		LED IND	ICATOR		
Ctored by	Operational	Flash 1	OFF		Madula	lo conocity		
Stand by	Warning	Flash 1	Flash 3	Module capacity				
	Operational	OFF	OFF		Module ca			
	Warning	OFF	Flash 3	(Flash 2 to Maximum capacity)				
Charge	Overload protection	OFF	OFF	OFF	OFF	OFF	OFF	
	Temperature, overcurrent, protection disabled	OFF	OFF	OFF	OFF	OFF	OFF	
	Operational	Flash 3	OFF		Modulo capacity			
	Warning	Flash 3	Flash 3	module capacity				
Discharge	Low voltage protection	OFF	OFF	OFF	OFF	OFF	OFF	
	Temperature, overcurrent, short circuit connection reverse, protection disabled	OFF	OFF	OFF	OFF	OFF	OFF	
Disabled		OFF	OFF	OFF	OFF	OFF	OFF	
Notes: Abo Flash 3 (lig	out flash type: Flash 1 (light 0.2) ht 0.5sec. / OFF 1.5sec)	5sec / OFF	3.75sec);	Flash 2 (li	ght 0.5sec	/ OFF 0.5	sec);	

ADD

ADD Switch: 4 ADD switches, Dip1 to define different baud rate ("0" is 115200, "1" is 9600). "0" and "1", see the picture on the right. "0XXX" sets the baud rate 115200 and "1XXX" sets the baud rate 9600. The setting will be active only after battery reset.

The address of the secondary batteries will be assigned automatically. 1 "main" battery can monitor up to 15 secondary batteries.





To configure the batteries, the ADD switch must be configured according to the following

		ADD BUTTC	ON POSITION		CORRESPONDING BATTERY
	#1	#2	#3	#4	Configuration for independent battery use
0	OFF	OFF	OFF	OFF	Settings for Main Battery
1	ON	OFF	OFF	OFF	Configuration for secondary battery (N1)
2	OFF	ON	OFF	OFF	Configuration for secondary battery (N2)
3	ON	ON	OFF	OFF	Configuration for secondary battery (N3)
4	OFF	OFF	ON	OFF	Configuration for secondary battery (N4)
5	ON	OFF	ON	OFF	Configuration for secondary battery (N5)
6	OFF	ON	ON	OFF	Configuration for secondary battery (N6)
7	ON	ON	ON	OFF	Configuration for secondary battery (N7)
8	OFF	OFF	OFF	ON	Configuration for secondary battery (N8)
9	ON	OFF	OFF	ON	Configuration for secondary battery (N9)
10	OFF	ON	OFF	ON	Configuration for secondary battery (N10)
11	ON	ON	OFF	ON	Configuration for secondary battery (N11)
12	OFF	OFF	ON	ON	Configuration for secondary battery (N12)
13	ON	OFF	ON	ON	Configuration for secondary battery (N13)
14	OFF	ON	ON	ON	Configuration for secondary battery (N14)
15	ON	ON	ON	ON	Configuration for secondary battery (N15)

RS232

RS232 communication terminal (RJ11 Port) to export battery information.

CAN

CAN communication terminal (RJ45 port) to export battery information.

RS485

RS485 communication terminal (RJ45 port) for communication between batteries.

RJ11 port

NO	RJ11 PIN
1, 2, 6	NC
3	TX (single face)
4	RX (single face)
5	GND



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RJ45 port

NO	RJ45 PIN
1, 8	RS485-B
2,7	RS485-A
3, 6	GND
4	CAN-H
5	CAN-L



RESET

Press for more than 3 seconds to reset the battery.

DRY CONTACT

"Dry contact" input and output terminal.

POWER TERMINAL

Power cable terminal. There are two pairs of terminals with the same function, one that connects to the equipment and the other to another battery to expand the capacity.

For each battery module, each terminal can have charge and discharge function.

Power cables use waterproof Amphenol connectors. The anchor button must be pressed to disconnect it.



BASIC INSTALLATION DIAGRAM



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Connection to rack bars





10 INSTALLATION

- (1) Install the battery modules, preferably in a cabin. (If you need a cabin please contact Tb Plus Energy®).
- (2) Tighten the four corresponding screws per module.
- (3) Connect the cables according to the diagram.
- (4) Connect the cables to the inverter.
- (5) Make sure all cables are properly routed.
- (6) Turn on all modules (ON/OFF button).

(7) Configure ADD according to the table (see point 7 "Basic operation", "ADD" section). Module number 1 will be the "Primary" and the others will be the "secondary".



Cabin battery module wiring diagram



11.1 Discharge curve at different speeds @25°C



11.2 Charging characteristics @0.2C, 25°C





11.3 Capacity under different temperature



11.4 Life cycle under different DOD @0.5C, 25°C



TROUBLESHOOTING

12.1 Determination of the problem based on:

The battery can be turned on or not.

If the battery is on, check that the red light is off, flashing or on;

If the red light is off, please check whether the battery can be charged/discharged or not.

12.2 Preliminary steps of determination:

1. The battery cannot turn on, the lights do not turn on or flash.

If the external battery switch is on, the RUN light is flashing, and the external power supply voltage is different from the battery voltage, the battery still cannot power on, please contact Tb Plus Energy[®] or your authorized dealer.

2. The battery can be turned on, but a red light comes on and cannot be charged or discharged. If the red light is on, that means the system is abnormal, please check the values as follows:

a) Temperature: above 50°C or below -10°C, the battery cannot work.

Solution: Move the battery to the normal operating temperature range between -10°C and 50°C.

b) Current: if the current is higher than the maximum current value indicated on the technical sheet, battery protection will be activated.

Solution: Check whether the current is too big or not, if so, to change the setting on the power supply side.

c) High voltage: if the charging voltage is higher than that indicated on the technical sheet, battery protection will be activated.

Solution: Check whether the voltage is too high or not, if yes, to change the setting on the power supply side.

d) Low voltage: when the battery is discharged to values other than those indicated on the data sheet, battery protection will be activated.

Solution: Charge the battery for a while, the red light goes out.

Excluding the above four points, if the fault still cannot be located, please turn off the battery power switch and repair.

12.3 The battery cannot be charged or discharged

1. Cannot load:

Solution: Disconnect the power cables, measure the voltage on the power side and make sure it is within the load levels. After this, restart the battery, connect the power cable and try again, if it still does not work, turn off the battery and contact Tb Plus Energy[®] or your authorized dealer.

2. Can not be downloaded:

Solution: Disconnect the power cables, measure the voltage on the battery side and make sure it is within discharge levels. After this try again and if it still cannot discharge, turn off the battery and contact Tb Plus Energy[®] or your authorized dealer.

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13.1 Unzip the file from the host computer

BatteryMonitor V2.1.9.zip

13.2 Open the monitor software

- Open the folder.
- Select the top computer software.
- Double click to open the top computer.

Tagreement	2022/6/13 16:27	文件夹		
🚞 de	2022/6/13 16:27	文件夹		
as es	2022/6/13 16:27	文件夹		
💼 ja	2022/6/13 16:27	文件夹		
Tanguages	2022/6/13 16:27	文件夹		
and the second s	2022/6/13 16:27	文件夹		
RealTimeRecord	2022/6/13 16:27	文件夹		
🚞 ru	2022/6/13 16:27	文件夹		
Battary Monitor V2.1.9操作说明.pdf	2022/5/17 19:46	WPS PDF 文档	3,378 KB	
G BatteryMonitor.exe	2022/4/21 9:19	应用程序	1,884 KB	
BatteryMonitor.exe.config	2021/10/20 19:52	XML Configurati	3 KB	
BatteryMonitor.pdb	2021/10/20 20:10	PDB 文件	522 KB	
B DevExpress.Data.v15.2.dll	2017/11/17 21:43	应用程序扩展	5,082 KB	
DevExpress.Data.v15.2.xml	2017/11/17 21:43	XML 文档	1,098 KB	
DevExpress.Images.v15.2.dll	2017/11/17 21:43	应用程序扩展	3,221 KB	
DevEverage Marm v15.2 dll	0017/1 <mark>1/17</mark> 01.40	な田伯の子団	AGA VD	

13.3 Load protocol file

Select import protocol.

See figure 3-1.

• Open the folder (select the **agreement** in the top folder on your computer).

See figure 3-1.

 Select the EN protocol suffix in the Agreement folder that corresponds to the English protocol (for example, 16s_V20_ADDR_EN)

See figure 3-2.

Click OK.

See figure 3-3.

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0000 1	BMS information						
Cell15 Cell16	Manufacturers CANIViction	Part model:	1103-VQ01				Pa
0.000 V 0.000 V	Software Ver: 16.4	Protocol version:	2.0				0.0

Figure 3-1

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· 個祝 · 新建文件夹					
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> DESKTOP-E74	145_V20_ADDR_EN.xml	2022/6/15 16:14	XML 文档	68 KB	
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Figure 3-2



				PT
ell voltage(V)		Battery voltage	Battery infomation	Pr
Max voltage: Min voltage:	40 50 60	0.001/	Remaining capacity 0.00 Ah	
0.000 V 0.000 V	30	70 0.000	Total capacity 0.00 Ah	
	20.	,80		
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Call07Call08	Warn		operature infomation	
0.000 V 0.000 V			Battery temp1 0.0 °C	
C-840 C-840			Rattery temp2 0.0 %	
0.000 V 0.000 V			(Ruture 1 and 2 and 5	
			eattery temps 0.0 C	
0.000 V 0.000 V			Battery temp4 0.0 °C	
			Ambient temp 0.0 °C	
Cell13 0.000 V D Cell14 0.000 V D			Power temp 0.0 °C	
	BMS information			
and the second s				

Figure 3-3

13.4 Communication port configuration

- Port number (upper computer will automatically identify the USB serial port number to 485)
 Transmission speed: 19200
- See figure 4-1.

Click **Connect**.

See figure 4-2.



k00				Protocol name:	BMS-165
di vohageN) Maxvoltager daxvoltager daxvoltager din vohager din vo	20 50 60 70 20 50c: 202 80 10 50c: 202 90 0 0 0 0 0 0 0 0 0	Current	Battery information (Remain_capacity 0.00 Ah) (Total_capacity 0.00 Ah) (SOC 0.0 %) (Nominal capacity 0.00 Ah)	Protocol version: 2 Part config Port num Baud rate Connect Target config	LO COV/12 19200 Break
Cellos Cellos Cellos Cellos Cellos Cellos Cellos Cellos Cellos Cellos	System status Otocharge switch Ocharge switch Ocharge for Of emperature control switch	it suitch	(Battoy, Cycles 0 times) (SCH 0.0 %) (Tus voltage 0.00 V) a • • • • • • • • • • • • •		Pact Park
Cellos Cellos Color V 0.000 V Cellos 0.000 V			(Bettoy, Tmp1 00%) (Bettoy, Tmp2 00%) (Bettoy, Tmp3 00%) (Bettoy, Tmp3 00%)		Pack Pack
Cell13 C.000 V Cell15 C.000 V Cell15 Cell16 C.000 V	BMS informations Manufacturer: Part model		(Anbiert, Tmp 00°C) (Power, Tmp 00°C)	Fact total	٥

Figure 4-1

err reaces (1) core personales (1)	1 Classical 1	I Statistical State		and the second	T source observe C and	a ajeas
00					Protocol name: 8	BMS-165
ll voltage(V) Max voltage(C - Max voltage) C	1	Battery voltage	Battery information	-	Protocol version: 2 Part canfin	10
vlax voltager	30 50 60 70	0.00V	Remain_capacity	0.00 Ah	Port num	COV12
G000V	20, 80		(Total_capacity 0	dA 00	Connect	19200 Break
loitage difference 30.000mV	10- SOC: MIZE - 90	Current	(soc	0.0 %		
Cell01 Cell02	0 -10	0.004	Nominal capacity	0.00 Ah	Target config	Pack addr
C000 V P 0.000 V P		0.004	Battery Cycles 0	times	Fact 1	Pack 9
Cell03 G.000 V 0.000 V	System status		But unbane	00.4	Fack 2	Pack 10
Call05 Call06	ODischarge switch OCharge switch OCurrent lin	it switch	i (con variabe		(held)	Dark 11
0.000 V 0.000 V	Of emperature control switch		•			-
Cell07 Cell08	Warn and Protect		Temperature infomat	ion	Fact &	Pack 13
0.000 V P 0.000 V P			Battory_Tmp1	0.0 °C	Fack 5	Pack 1
Cell00 Cell10			Battery_Tmp2	00%		
6000 V P [0.000 V P			(Battery,Tmp3	00%	Fack 6	Pack 14
Cell11 Ccell12 Ccell12 Ccell12			Rattery_Tmp4	005	Fact 7	Pack 11
Cell13 Cell14			Ambient, Tmp	0.0 °C	Fact B	
0.000 V - 0.000 V			Power_Tmp	000		
Cell15 Cell16	Manufacturer: CaNProtocol/Growalt Rart model	BM511011CC			Fack total	o
0.000 V 0.000 V	Software Veri 2.6 Protocol ve	rsion: 2.0			Cycle refresh	Multipl
	1					

Figure 4-2





After successful connection, the upper computer displays the battery data.

See figure 4-3.



Figure 4-3

13.5 Access

Account: administrator

Password: administrator

00				Protocol name:	BMS-165
A voltage(N) Max voltaget C Max volt	20, soc: 50, 60, 70, 80 10, soc: 50, 60, 70, 80 10, soc: 50, 50, 70, 80 10, soc: 50, 50, 70, 80 10, soc: 50, 60, 70, 80 10, soc: 50, 50, 60, 70, 80 10, soc: 50, 50, 70, 80 10, soc: 50, 50, 70, 70, 70, 70, 70, 70, 70, 70, 70, 7	Bailery volkge 53.10V	Rattery information (Remain, capacity 24.82 Ah) (Total, capacity 50.00 Ah) (SCC 40.6 %) (Nominal capacity 50.00 Ah)	Protocol version : - Part quelling Port num Baud rate Consett - Target config	20 COW12 16000 Break Pack edd
Cell03 Cell04 3317 V 3317 V Cell05 Cell06 3.116 V 3.218 V	System status ODischarge switch OCharge switch OCharger CTemperature control switch	Gergi	X Sycles 0 times 100.0 % 0e 53.111 V		Pack 9 Pack 10 Pack 11
Cel07 Cel08 3.316 V 3.317 V Cel00 Cel00 3.318 V 3.318 V	Warn and Protect	edmin	information imp1 190 % imp2 192 %	fact fact	Park 12 Park 12 Park 14
Cel11 3318V Cel12 3318V Cel13 2317V Cel14 3318V			(Renew, Tenpel 10.11) (Ambient, Tenpel 22.21) (Power, Tenpel 20.51)		Park 15
Cel15 Cel16 3.317 V 3.317 V	Manufacturer: CaNProtocol/Growalt Part mod	W: BMS11011CC		Fack total	0



13.6 Loading parameters

Load Parameter: Download parameter to BMS from upper computer.

Upload Parameter: Upload parameter to upper computer from BMS.

13.6.1 Upload parameters

When you use the top computer for the first time, it is not allowed to download parameters directly without checking; you need to load the parameters first and then close them.



13.6.2 Modify parameters

- Click "Upload parameters" here to upload parameters from BMS.
- Change the internal parameters of the BMS and function switches.
- Click Set all to enable the modification.
 Note: The red numbers in the following figure indicate the operation sequence.

k00	Protecti name :	BM5-105
ell voltage(V) Max voltage: C Max voltag	Battery voltage - Rattery inforvation - Port config	20
Max unband	40 50 CO CO CONI/ Remaining Capacity 47.08 Ah Bust num	COVI2
3.301 V 3.297 V	C Parameter Manage	16200
	De laver as of Sec al Close	Break
Voltage difference 4.000e		Park add
Cell01 Cell02	Num Name Value Unit Operate Voltage sensing fullure DN	
3.301 V 3.300 V	0 Single high volu 5.500 V Download Temperature service failure	Pack 0
6.000		
3.297 V 3.300 V	1 Single high pred 1.400 V Devenices Current sensor failure	Pack 10
	2 Conta have man 2 600 V Download	-
Cel05 Cel06		Pack 11
	3 Monomerilow pr 1.100 V Download Cell pressure failure	
Cell07 Cell06	Charge switch failure	Part In
3'300 A 3'301 A	4 Monomer owner 2.650 V Download	Pack 12
Cell00Cell10	Chars parameter	-
3.300 V 3.300 V	5 Cvervotage ingrisecu V Loanoas	Pack 14
Transfer Inc.	6 Monomer under 2700 V Download Download	-
JJOT V JJOO V		Pack 15
Cel13 Cel14	Power Trop 25512	
2000 C	8MS information rg	
Cel15 Cel16	Manufactuser: CANProtocol/Pylon Rat model:	0
3.300 V 3.300 V	Software Ver. 2.7 Protectal vaniant 2.0	1

13.6.3 Load parameter

- Click Load parameters (step 1 below)
- Choose the target parameter document (step 2 below) and click open (step 3 below).
 Click Set all (step 4 below).
- Click **Close** (step 5 below) after indicating success.
- The parameters have been set correctly.

ck00	1							Protocol name:	DM5-165
Cell voltage(V)	-	© 17.99				×		Protocol version:	2.0
Max voltage: C	Max volta;	+ · · · + = · #	134 > 153 >	~ 0	P (RR'44)			Port config	
Anvoltage	utin volta	-			р		2	Port num Read rate	COM21
7332A	3.333 W		1.1	使改日期	200	200		ease race	19200
	-	- EH	- Char	2022.0.02.00.00.0				Consert	Break
Voltage difference	0.000r	11 文明	The second secon	2022/14/0 19:56	1.49.K				
Trans.	C. BALL	+ TS	1 22	2022/3/22 14:41	2 HE M			Target contig	Pack addr
3.833 V	6.383 V	2 85	1 后来会教型水	2022/3/16 9:30	空标曲				-
		- 48	1 動建文件夫	2022/3/20 16:56	文件夫			Pack 1	PART
Cell03	Cell04	E- Windows (C)	# 48100-1101-10C-SD16E3-155	2022/2/24 12:06	2041.交易	11 K			-
3.333 V	3.333 V	- P(R)	26 期北部(192.168.1.10)- 保護方式	2022/2/21 17:32	标准方式	2.6	6	Tack 2	Pack 10
		1011 (21)	💂 原始間谷 (192,168,1.10) - 特徴方式	2022/2/21 17:32	快速方式	2.10			
Cel05 3.333 V	Cr806 3.333 V	- Bate (F)	● 動物機(A) - 快速方式	2022/2/22 9:22	快速方式	1 K		Pack 5	Pack 11
		Network							-
Cel07	Cell00	*	¢				3	Contra Co	Conce in
3.333 V	5.00 V	文件	B(N): 48100-1101-10C-5D16E3-155	~	parameter file(*.eml)	÷		Pack 5	Pack 13
Ce809	Cell10				(D)#(D)	10215			
3.333 V	3.383 V				Dattery temp3	25.0 %		Pack G	Pack 14
Celli	Cell12								
3.333 V	3,333 V				Battery temp4	210.0		Pack 7	Pack 15
Cell13	Cell14				Ambient temp	22.8 %		Pack B	
3.333 V	1.00 V				Power temp	242 %			

LIFEPO4 BATTERY / 51.2V100AH



k00						Protocol name: BMS-165 Protocol version: 2.0
Max un	hane: C	Max soltane: C	_		Eattery information	Port config
44.	Parameter	Manage)	Port num
2	Seve as	Close				Baud rate 15200 +
in the second		4			Fuction switch	Cornect Break
	Num	Name Value	Unit	Operate	Voltage sensor involidation	Target config Rack addr
23	0	Monomer high v 3.500	v	Download	Temperature sensor invalidation	
	1	Monomer high p 3.400	v	Download	Current sensor invalidation	
3.3	2	Monomer low or 2.900	v	Download	Button witch invalidation	Park 2 Park 10
Ce		Monomer low or 1.000		Downlow	Cell differential pressure invalidation	Park 3 Park 11
Ce		Monamer overvc 1.850	v	Download	Charge saitch invalidation	Park 4 Park 12
-	5	Monomer overvc 3.400	v	Download	Chars parameter	Park 3 Park 10
IJ	6	Monomer under 2500	v	Download	Model: 1101SD16E3 Download	Pack 5 Pack 16
Ce Ll	-					Park 7 Park 15



13.7 Communication protocol configuration

 ${\sf Click} \ {\bf CAN}, {\sf select} \ {\sf the \ corresponding \ {\sf CAN} \ protocol \ according \ {\sf to \ the \ type \ of \ inverter}}$

• 6 options: PN-GDLT / GRWT / VCTR / SMA-SF / GINL / Studer.

Protocol Type	Supported Inverted Brands
PN-GDLT	Pylon/Goodway/TBB/Luxpower/Deye
GRWT	Growatt SPF/SPH
VCTR	Victron
SMA-SF	SMA/Sofar
GINL	Solis
Studer	Studer

See figure 7-1.



• After changing the protocol, confirm whether the protocol was changed successfully, update the protection board information

See figure 7-2.

• The corresponding manufacturer information will be displayed in the **"BMS Information"** box.

See figure 7-3.

k00				Protocol name:	BMS-105
ell voltage (V) Max voltage: C Min voltage: C Rax voltage 1332 V. 1200 V. 1200 V. Voltage difference 84.000mV	43 59 60 30 1 7 70 20 soc: 20 0	tenery voltage 52.88V	Bettery Information (Remaining capacity 51.30.4.h.) (Total capacity 52.00.0.h.) (50C 98.8 %)	Protocol version: Port config Port num Baud rate Correct	2.0 CCAVS 19200 Break
Cell01 3.382 v 3.269 v Cell03 3.300 v 2.259 v Cell04 5.259 v Cell05 Cell05 Cell06	System status Oflicitarge switch @Charging switch Compensative control switch	0.00A	Rated capacity 5200 Ah Rattery cycles 0 times 50H 100.0 % Bus voltage 48:57 V	Target config	Pack addr Dack D Fack 10 Fack 11
Cell07 Cell08 3258.V 3256.V Cell09 Cell10 3259.V 3259.V	Warn and Protect	done	Temperature information Bettery temp1 24.5 % Bettery temp2 25.2 % Bettery temp3 25.4 %	Tack Tack Tack	Fact 12
Cell11 5303 V Cell13 5301 V Cell13 5286 V Cell14 5300 V	EMS information		Eattery temp4 25.6 °C Annihiert temp 28.7 °C Power temp 27.6 °C	Pack B Pack total	Fact 13
3.301 V 3.302 V	Software Ver: 16.4 Protocol ve	nion: 20			

Figure 7-1

00				Protocol name:	8MS-165
Voltage(V) Lax voltage: C Min voltage: C Aav voltage: C Min voltage: C Min	Successful execution ofset CAN p	Correct Coore	Battery information Remaining capacity 51.38 Ah Total capacity 52.00 Ah SOC 96.8 % Rated capacity 52.00 Ah Battery cycles 0 times SOH 106.0 % Bus voltage 49.57 V III + Temperature information Battery temp1 246 % Battery temp1 246 %	Protocol venion: Post config Pert num Baud rate Connect Target config Pack Pack Pack Pack	2.3 COMP C
1299 V 3299 V Cell11 Cell12 3303 V 3301 V Cell13 Cell4 3299 V 3300 V	8MS information		Rattery temp3 25.5 % Rattery temp4 25.8 % Ambient temp 28.7 % Rower temp 27.0 %		Pack I
Cell15 Cell16 3.301 V 3.302 V	Manufacturer: CANtGrowatt SPF SPH Part mode	H: 1103-VQ01		Pack of the	-

Figure 7-2





100			Protocol name: BMS-165
ell voltage(V) Max voltage: C – Min voltage: C	Battery voltage	Battery information	Protocol version: 2.0 Port config
Var voltage 3.382 V 3.258 V	52.88	Total capacity 52.00 Ah	Baud rate 19200
Voltage difference 84.000mV	10 Social Stands	SOC 98.8 N	
Cell01 Cell02		Rated capacity 52.00 Ah	- Target config Pack addr
3.382 V 3.250 V	0.007	Battery cycles 0 times	Pack 1 Pack
Cell03 Cell04 5.500 V 3.259 V	System status ODischarge switch OCharging switch OCurrent limit switch	SOH 100.0 % Bus vohage 49.57 V	Pak2 Pak
Cell05 3.296 V 3.300 V	Ot emperature control switch	*	Pack J Pack
CH07 CH08	Warn and Protect	Temperature information	Pack 4 Pack
5.248 V 5.299 V	Current calibration not done	Bactery temp1 24.7 1C	Pack 5 Pack 7
Cell09 Cell10 3-299 V 3-299 V		Battery temp3 25.4 °C	Park Park
Cel11 Cel12		Battery temp4 25.9 °C	Pack7 Pack
Cel13 3.299 V 3.300 V		Power temp 25.9 °C	Pack®
Cell15 Cell16	Manufacturer CANsGrowatt_SPF_SPH Part model: 1103-V001		Pack total 0

Figure 7-3

BMS information	
Manufacturer: CAN:PNG_DYE_L	uxp_TBPart model: 1103-YQ01
Software Ver: 16.4	Protocol version: 2.0
BMS information	
Manufacturer: CAN:Growatt_S	PF_SPH Part model: 1103-YQ01
Software Ver: 16.4	Protocol version: 2.0
BMS information	Pat model: 1102 VO01
Manufacturer: CAN:Victron	Part model: 1105-4Q01
Software Ver: 16.4	Protocol version: 2.0
BMS information	
G	
Manufacturer: CAN:SMA_SO	FAR Part model: 1103-YQ01



Manufacturer: CAN:GINLONG	Part model:	1103-YQ01
Software Ver: 16.4	Protocol version	on: 2.0
BMS information		
BMS information	Part model:	1103-YQ01

Figure 7-4 (other manufacturer information)

13.8 Introduction to screen interface

After successful connection, the red box below is the interface Introduction screen.

See figure 8-1.

Detailed introduction see Table 8-1.

00				Protocol name:	EN/5-165
VolkagetV) AzzvolkagetV) AzzvolkagetV) AzzvolkagetV) J.259 V Otkevelkaget J.259 V Otkevelkaget J.259 V Otkevelkaget J.259 V Otkevelkaget J.259 V OtkevelkagetV S.259 V OtkevelkagetV S.259 V OtkevelkagetV S.259 V S.261 V <	System status O'System status O'Sischarge suitat Ocharging suitat Ocharging suitat O'rengerature consul suitat Warn and Protect Current calibration not do	Eattery voltage 52.89V	Battery information Bermaining capacity 134.96 Ab) (Total capacity 150.00 Ab) (SOC 49.9 %) (Rated capacity 150.00 Ab) (Rated capacity 150.00 Ab) (Ratery cycles 0 times) (SOH 1000.0%) (But voltage 48.37 V) (IIII) (IIII) (Ratery tempol 27.5%) (Ratery tempol 27.6%) (Ratery tempol 27.6%)	Protocol version: Post config Pert num Baud rate Connect Target config Gast Gast Gast Gast Gast Gast Gast	20 COMAC 19205 Break Pack addr Gall Gall Gall Gall Gall
Cel13 Cel14 3.300 V 3.300 V Cel15 Cel16 3.301 V 3.301 V	8M5 information Manufacturer: CAN:Studer Part model: Software Ver: 15.4 Protocol versio	1101-L001	Powertemp 28.8 °C	Pack total	0

Figure 8-1

LIFEPO4 BATTERY / 51.2V100AH



Name	Description	Notes	Figure
Maximum voltage	Higher voltage cell		Max voltage 3.302 V −
Minimum voltage	Lowest voltage cell		Vin voltage 3.297 V
Voltage difference	Voltage difference between maximum voltage and the minimum voltage		Voltage difference 5.000mV
Battery voltage	Total battery voltage		52.79V
Current	Charging current or discharge current (negative value)		0.00A
Remain capacity	Current battery capacity	Upload parameter-Num59 can set current capacity	(Remain_capacity 48.87 Ah.)
Total capacity	Actual capacity after full battery		(Total_capacity 100.00 Ah)
SOC	State of charge	Remain_capacity/Tota I_capacity*100%	(SOC 49.8 %)
Nominal capacity	Rate capacity	Remain_capacity/Tota l_capacity*100%	(Nominal capacity 50.00 Ah.)
Battery_cycles	Cycle number	The number of cycles will be increased by one when the cumulative discharge capacity reaches 80% of the full capacity	Battery_Cycles 4 times
SOH	State of health		(SOH 100.0 %)
Bus voltage	Port voltage. Detection of external voltage	When there is no external connection, the bus voltage is equal to the total battery voltage	(Bus voltage 52.79 V)
Discharge switch	Discharge switch indicator	Green: switch connected Gray: switch disconnected	ODischarge switch
Charge switch	Charge switch indicator	Green: switch connected Gray: switch disconnected	Charge switch

LIFEPO4 BATTERY / 51.2V100AH

Name	Description	Notes	Figure
Current limit switch	Current limit switch indicator	Green:switch connected Gray:switch disconnected	OCurrent limit switch
Temperature control switch	Temperature control switch indicator	Green:switch connected Gray:switch disconnected	OTemperature control switch
Warn and Protect	BMS warning and protect display area		Warn and Protect
Battery Temp1	Cell temperature1 value		(Battery_Tmp1 19.5 °C)
Battery Temp2	Cell temperature2 value		(Battary_Tmp2 10.0 °C)
Battery Temp3	Cell temperature3 value		Battery_Tmp3 20.0 ℃)
Battery Temp4	Cell temperature4 value		Battery_Tmp4 29.1 °C
Ambient Temp	Ambient temperature value		Ambient_Tmp 22.7 °C
Power Temp	Power temperature value		Power_Tmp 20.8 %

Table 8-1

13.9 Parallel mode

Selection of parallel packages

 When multiple batteries are combined (maximum to 16), make sure the corresponding address marked by the BMS is consistent with the address set (pack x, pack x) by the upper computer (click the pack number to brighten or dim the icon).

See figure 9-1.

 When confirming the number of parallel machines, click connect to top computer (Cycle Refresh) and select Cycle Refresh. The upper computer can see the number of parallel machines and update the packet data.
 See figure 9-2.

On the top interface of the computer, you can click **Multiple** to view each group of data in the PACKAGE.

See figure 9-3.



k00				Protocol name:	BMS-165
I voitage(V)	1	Battery voltage	Battery information	Protocol version:	2.0
Max voltage: C Min voltage: C Max voltage 3.381 V 2.299 V	40 50 60 30 70 70	52.88V	(Remaining capacity 134.90 Ah (Total capacity 150.00 Ah)	Port config Port num Raud rate	COM4 12200
(oltana differenza 82.000ml/)	soc: 90.099	Current	(SOC 89.9%)	Connect	Break
	10- tode: Standt		(Rated capacity 150.00 Ah	Target config 🔝	Pack addr
Cell01 Cell02 3.381 V 3.501 V	0	0.00A	(Battery cycles 🛛 times)		Park
C.101			(SOH 100.0 %)		
3.301 V 3.301 V	System status		(Bus voltage 48.57 V		Pack 1
Cellos Cellos	Of emperature control seltch	nt switch		Pack 3	Fack
3300 V	Ware and Protect		Tennent midentics		-
Cel07 Cel08	Wall and Protect	<u></u>	temperature internation	- ALA	(race)
1244.4	Current calibration not o	ione	Battery temp1 27.5 ℃	Pack S	Pack
Cell09 Cell10			Battery temp2 27.6 ℃		
3300 Y			Rattery temp1 25.0 °C	Pack 6	Pack
Cell1 Cell2			Battery temp4 27.5 %	Dack 7	Fack 1
POWER POWER			Ambiert temp 10.5 °C		-
Cell13 Cell14			Power temp 28.8 *C	Pack II	
and a	BMS information			Rack testal	
Cell15 Cell15	Manufacturer: CANScuder Rart model:	1101-6X01		- 200 00 UM	
22001	Software Ver: 16.4 Protocol ver	sion: 20		Cucle refresh	Multip

Figure 9-1

In Figure 9-1, 2 package icons are shown in the package frame, this means there are 3 packages in parallel status. Only the slave package can be displayed in the package frame.

port Pretocal (19 Intel partnershar)	in the second of the line is the communication log 😵 RealTime Record 👳	Calibrate 🕹 Login 🕅 🕬	2 France States 🗃 Sava layout (11)
:k02			Protocol name: BMS-165
el voltage/V) Max voltage: C 3305 V Voltage difference 15.000rV Cel01 3296 V Cel02 3297 V Cel02 3297 V Cel02 3297 V Cel02 3297 V Cel02 3297 V	20 20 30 50 50 52.76V 52.76V Current Curent Cure	Bettery information Remaining capacity 49.98 Ah (Total capacity 190.00 Ah (500 Al 9 K) (Rated capacity 100.00 Ah) (Ratted capacity 100.00 Ah) (Rattery cycles 2 Kines) (504 100.0 K)	Protocol venion: 2.0 Post config Post rum Bad rate Connect Brack Terget config Pack add DOI DEC DOC DEC
Cell05 Cell06 3297 V 3297 V Cell07 Cell08 3297 V 3299 V	Obiodarge switch Ochanging switch Ochange Einit switch Otemperature central witch Warn and Protect None warn	Bun voltage 52.62 V	
Celto 3.250 V 3.301 V Celto 3.259 V 3.305 V		Battery temp2 22.3 °C Battery temp3 22.4 °C Battery temp4 22.9 °C Amblem temp 24.1 °C	
3296 V 3299 V Cell 5 Cell 6 3296 V 3298 V	BMS information Manufacturer: CANProtocol/Pylon Part model: 11015D17G1 Software Vers 2.7 Protocol version: 2.0	Power temp 24.1 %	Pack total 2 (2 Cycle refresh) Multiple

Figure 9-2



BatteryVolt: 0.00 V Current: 0.00 A	BetteryVolt: \$2,77 V	BatteryVolts 0,00 V	Better, Volu 0.00 V	Rotten Mills (SALV
Residual capacity: 0.0 Ah Total capacity: 0.0 Ah Kenega voltage: 0.000 V Max voltage: 0.000 V #00 Min voltage: 0.000 V #00	Current C.00 A Residual capacity: 50.0 Ah Total capacity: 100.0 Ah Average voltager 8.206 V Max voltager 8.206 V #12 Min voltager 8.209 V #09	Currenti, 0.00 A Residual capacitys 0.0 Ah Total capacity 0.0 Ah Average voltager 0.000 V Max voltage 0.000 V #00 Min voltage 0.000 V #00	Currents 0.00 A Residual capacitys 0.05 Ah Tatal capacitys 0.05 Ah Average voltages 0.000 V Max voltages 0.000 V #00 Min voltages 0.000 V #00	Current, 300 A Rosidual copacity: 300 Ah Total copacity: 300 Ah Average voltages: 6000 V Mini voltages: 6000 V #00 Mini voltages: 6000 V #00
ACK 05	PACK 06	PACK 07	PACK 00	PACK 05
Butteryl/Lit 0.00 V Current: 0.00 A Enricklini 0.00 A Total expensive 0.0 A Nerrego roltspace: 0.000 V Max voltspace: 0.000 V Max voltspace: 0.000 V	RutteryVidi 0.00 V Currence 0.00 A Residual capacity 0.0 A Total capacity 0.0 A Average voltages 0.00 V Max voltages 0.00 V Min voltages 0.00 V	Bartneyskulli 0.00 V Currence: 0.00 A Breidsel queschy 0.0 A Terela queschy 0.0 A Average voltaget: 0.000 V Max-verlaget: 0.000 V Min-verlaget: 0.000 V	RatheryVvNc 0.00 V Commit 6,00 A Revided accessible 6,00 A Total coperity 6,0 Ah Average vallage: 0,00 V Ibda vallage: 0,00 V 900 Min vallage: 0,00 V 900	Rumovytvált 6.00 V Connecci 0.00 A Rendual overly 0.01 A Total operity 0.00 V Avresgo vittage: 0.000 V Main voltage: 0.000 V
MCK 10	PACK 11	PACK 12	PACE 11	PACK 14
BatteryVahi 0.00 V Connect 0.00 A Residual capacity: 0.0 Ah Total capacity: 0.0 Ah Man vahage: 0.000 V Min vahage: 0.000 V #00	Buttery Vubit 0.00 V Current 0.00 A Breinkhar (negotiv) 0.0 A Total capacity 0.0 A Asmage withinget 0.000 V Max withinget 0.000 V Max withinget 0.000 V Max withinget 0.000 V	BarteyVelli 0.00 V Curvere: 0.00 A Bardshal reporting Total opporty 0.0 Ab Amergia voltage: 0.000 V Max veltage: 0.000 V Min voltage: 0.000 V 900	BatteryVe/te 0.00 V Comment 6.00 A Residual agent/the 0.00 A Total capacity 6.00 AV Amenge voltage: 0.000 V Max voltage: 0.000 V	BarmeryViah 0.00 V Currence: 0.00 A Revisited requestly 0.00 A Total capacity 0.0 A Ammago villinge: 0.000 V Max voltage: 0.000 V Min voltage: 0.000 V

Figure 9-3

13.10 Firmware update

10.1 Open Firmware Update (BMS Boot State)

k00						Probacol names	BMS-165
ell voltage(V) Max voltage 0.000 V 0.000 V	•	30, 40	0 60 70 70 80	0.00V	Remaining Capacity 0.00 Ah (Total Capacity 0.00 Ah	Protocol version: Port config Port num Baud rate	COM12 18200
Voltage difference 2.00	WWW 10	a construction	-		 • • • • • • • 		
C+801C+802		Set			Ah	Target config	Pack addr
0.000 V 0.000 V	P	Port:	COMI ~	Pack Num: Pa	ck0 ~ 🔊	Park 1	(Park 1
Cell03 Cell04 0.000 V 0.000 V	a	BaudRate:	19200 ~		P	Task 2	Park
	00	Parity:	None ~				
0.000 V 0.000 V		DataBits:	8 ~				Cance a
Cell07 0.000 V Cell08 0.000 V	o M	StopBits:	One v	O Open	D Reset	Patt	Pack 1
		Program Up	date		5	Park 5	(Pack 1
Cell10 0.000 V	2	Please sele			Download	Part D	Pack 1
Cell11 0.000 V Cell12 0.000 V		1		0.0%		Park?	Park
Cell13 0.000 V Cell14 0.000 V			2		Power Timp 0.0 °C	Part	
C-015	BMS	information				Pack total	0
0.000 V 0.000 V	Man	utacturer: CANProt	ocot.Pylon Fart model:	1101501761			

10.2 Use the USB communication line at 485, select the corresponding **port**, select the **baud rate** of 19200, and click **open**.

10.3 Select folder——Skip from the corresponding box——choose the destination program (This program. ehex format).

Port:	COM3	~	1 Pack Num: Pack0 ~
BaudRate:	19200	~	2
Parity:	None	~	
DataBits:	8	~	3
StopBits:	One	~	ර් Open ්ට Reset
Program Up	date		
lease sele			🕞 🖡 Downlo

ort:	COM3	~	Pack Num: Pack	ck0 ~
BaudRate:	19200	~		
Parity:	None	~		
DataBits:	8	~		
stopBits:	One	~	ප Close	C Reset
rogram Up	date			

10.4 Click **download** and the progress bar will appear (When it reports an error, please try to press the reset button or download it several times.)

Port:	COM3	~	Pack Num:	Pack0		~
BaudRate:	19200	~				
Parity:	None	~				
DataBits:	8	~				
StopBits:	One	~	ර Close		'D Rese	t
rogram Up	date					

Port:	COM3	~	Pack Num:	Pack0	~
BaudRate:	19200	~			
Parity:	None	~			
DataBits:	8	~			
StopBits:	One	~	ථ Close		"O Reset
Program Up	date				

10.5 After the program update is successful **(OK)**, request the successful download as proof that the program update is successful.

Set	(cotto				-
POIL.	Info				
BaudRa	Guarante				
Parity:	Success				
DataBit					
StopBit					et
Program		0	K		
		0	N.	 	ownlo

Note: This update software can also be updated according to the corresponding address. If the BMS address matches the package number address, it can be updated.

Port:	COM3	~	Pack Num:	Pack1 🗸 🗸
BaudRate:	19200	~		
Parity:	None	~		
DataBits:	8	~		
StopBits:	One	~	ပံ Open	🕤 Reset
StopBits: Program Up	One		0 Open	Dev C

13.11 Real time registration

Real-time logging will record all real-time information of the battery. The function can be used to automatically monitor the operating status of the battery.

Click **Real time** to enable real-time logging.

See figure 11-1.

Click Real time record to edit detailed information.

See figure 11-1/11-2/11-3.

00			Protocol name: BMS-15S
voltage(V) ax voltage: C – Min voltage: C Aax voltage: Viin voltage 3.300 V – 3.299 V	40 50 60 70 52.79V	Battery infomation Remaining capacity 74.81 Ah (Total capacity 150.00 Ah)	Protocol version: 2.0 Port config Port num Baud rate 19200 Protected Protect
Atage difference 1.000mV	10- 10- 10- 10- 10- 10- 10- 10-	(SOC 49.8 %) (Rated capacity 150.00 Ah)	-Target config 🛛 Pack addr
Cell03 Cell04 3.300 V 3.300 V	System status Discharge switch Charging switch Current first switch	SOH 100.0 % Bus voltage 52.79 V	Pack 2 Pack
Cell05 Cell06 3.299 V 3.299 V	OTemperature control witch	× × ×	Pack 3 Pack
Cell07 Cell08 3.299 V 3.300 V	None warn	Battery temp1 18.8 °C	Park 5 Park
Cell09 Cell10 3.299 V 3.299 V		Battery temp3 18.8 °C	Pack 6 Pack
Cell11 Cell12 3.300 V 3.300 V		Battery temp4 19.7 ℃	Pack 7 Pack
Cell15	BMS information	Power temp 18.4 °C	Pack total 0
3.299 V	Software Ver: 2.8 Protocol version: 2.0		Curle refresh Multi

Figure 11-1





Figure 11-2

Click **STOP** to stop recording.

1200 1200 1200 1200 1200 1200 1200 1200	1.00 1.00	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	1300 1300 3.000 1300 1300 3.0000 3.00000 3.00000 3.0000 3.00000000	L199 5.209 5.209 5.209 5.209 5.209 5.200 5.200 5.209 5.209 5.209 5.209 5.209	1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299	1209 1200 1200 1200 1200 1200 1200 1200	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	L/W 1.300 6.799 1.290 1.290 1.290 1.200 1.200 1.200 1.200
1200 1200 1200 1200 1200 1200 1200 1200	1.00 1.00 1.29 1	1.00 5.00 5.20 1.20 1.20 0 WE have	1300 5.500 5.300 1300 3.300 8 ******* 8 *******	1.399 1.799 1.299 1.299 1.299 1.299 1.300 1.399 1.299 1.299 1.299	1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299	1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299	3.300 3.300 3.300 3.300 3.300 3.300 3.300 3.300 3.300	1289 1299 1299 1290 1290 1290 1290 1290 129
1279 1270 1270 2210 × Agreement × 4000000000000000000000000000000000000	1.299 1.299 1.299 1.299 2.299 2.299 2.299 2.299 2.299 2.299	1.00 1.24 1.39 P 838 hpm	1300 1301 1300 X max ² B • 0	L299 L299 L299 L299 L300 L300 L300 L300 L309 L299 L299 L299 L299 L299	1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.299 1.200	1.29 1.29 1.29 1.29 1.29 1.29 1.29 1.29	1.00 1.05 1.00 1.00 1.00 1.00 1.00 1.00	1/299 1/299 1/299 1/299 1/299 1/299 1/299 1/299
1299 1299 1213 > Agreement > #IRADIR 2002/1118 642 2002/1118 642	1299 1299 × 0 10 10 10 10 10 10 10 10 10 10 10 10 10	129 1399 	130 1300 8 8 • 0	1299 1299 1299 1299 1300 1300 1399 1299 1299 1299	1,299 1,299 1,299 1,299 1,299 1,299 1,299 1,299 1,290 1,200	1.29 1.39 1.39 1.39 1.39 1.39 1.39 1.39 1.3	1.09 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1299 1299 1299 1390 1499 1299 1299
1299 GTL3 > Agreement > Section = 12 Section = 12 Sect	1286 × 0 1286 × 0 2886 × 2848	2.99	1300 ×	1399 1399 1300 1300 1398 1398 1399 1399	1299 1299 1299 1299 1299 1299 1299 1299	1.200 1.200 1.200 1.200 1.200 1.200 5.200	1.100 3.300 3.300 3.300 5.300 3.300	1299 1299 1399 1399 1299 1299
CTA + Agreement +	< 0 #8 / 294 294	0 884e		1299 5300 1300 5299 1398 1399 1399	1.299 1.299 1.299 1.298 1.298 1.298 1.200	1.200 1.200 1.200 1.200 3.200	1.300 1.800 1.800 1.800 3.800	1200 1200 1200 1200
CELE > Agreement > ManDB assurance was approved was approved was approved was	~ 0 MB / XNR XNR	P SRips	** •	5.100 1.300 5.210 1.200 1.200	1,299 1,299 1,296 1,296 1,299 1,100	5.299 5.299 5.299 5.299	8.800 8.800 8.800 3.800	5.900 5.299 5.290
1214 > Aprenet > #WER Associate #12 Associate #12 Associate #12 Associate #12 Associate #12	~ 0 HB / XNR XNR	P BRAyer	** •	1.300 1.349 5.249 1.279 1.299	1,299 1,298 1,298 1,299 1,200	1,299 1,299 5,299	3.800 3.800 3.901	1,299
900 000 500 000 000 500 000 000 500 000 0	HS 7	+	** •	1.348 5.249 1.299 1.299	1.298	5,299	3.300	1,290
HUKER 2002/3/16 9/12 2002/3/16 9/12 2002/3/16 9/12	#2 7 234 248	•		5,219 1,299 1,299	1,299	5.299	3.999	4.546
HWER 2002/018-942 2002/018-942 2002/018-942	NB 2 232 242	*		1,399	1.300	the internet		10.77
4562/3/14 9452 2552/3/14 9452 2552/3/14 9452	294 294			1,290		1.09	8.800	\$1299
8682/9/18 842 8682/9/18 842 8682/9/18 643	294 2942				1,298	1.000	3,300	1,290
2020/8/18 9/12 2020/8/18 6/12	248			3.299	1.298	1,000	3.000	8,299
2020/674 643	2042			1,399	1.299	3.299	3.309	3,299
2020/6/16 642				1,299	1.290	1.299	3,300	3,299
	319.0			3,299	1,296	3,299	3.300	3,299
30503/818 815	2944							
		680						
			(6 90) -	(850) Ex.	ilino ka		dato ku	dato ta

Figure 11-3

Click **RUN** to save again.

Click **Clear** to clear the log frame.

Click **Save** to export the registration document.

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