PBAT Battery Monitoring System Installation Instruction Manual V3.3

1-1 Solution



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1. Precautions

When measuring lines are installed:

 It is recommended to use a torque wrench , please refer to the parameters provided by the battery manufacturer for the torque size.
 It is recommended to use insulating gloves when installing measuring lines.

3. To prevent the measuring wire from touching the positive and negative electrodes of other batteries , and the battery holder.

When battery cell sensor is installed:

 Battery cell sensor breathing light facing outward , ensuring that measuring lines are firmly installed and then plugged directly.
 When pasting 3M glue , it is necessary to clean the surface of the battery ,and make the battery cell sensor clip is clean and dry .
 Pasting 3M glue adhesive on the clip at first , and then pasting the clip on the surface of the battery , pressing for 30-60s, it is recommended to install battery cell sensor after 24 hours.

When battery cell sensor communication lines are installed:

1.It is need to follow the rules of "left in and right out" between battery cell sensors.(For details , refer to the step 2 of Chapter 4) 2.Communication lines should be installed in the slot , or away from the strong cable.

When battery string sensor is installed:

1. The string voltage terminals are connected to the positive and negative poles of the entire battery, it is recommended to connect a fuse in series. (Refer to the installation diagram in Chapter 2) Note :The string voltage can be calculated by the unit accumulation method, for details, refer to the commissioning manual.

2. When battery count in the group is less than or equal to 60,connect Com1 directly to the first battery cell sensor.

When battery count in the group is greater than 60, it is recommended to adopt the connection mode of Com1 and Com2 dividing battery cell sensor.

For example :

① When battery count in the group is 40, connect Com1 directly to the first battery cell sensor.

2 When battery count in the group is 80, connect Com1 to the battery cell sensor from 1 to 40, connect Com2 to the battery cell sensor from 41 to 80.

When Hall sensor is installed:

1. There are some direction requirements ,there is a black arrow above the Hall , the direction of the arrow is consistent with the direction of the current.

2. Try to make the cable through the Hall at a vertical angle.

3. Hall is generally installed in:

 $(1)\mbox{the electrode cable of UPS positive ,that is the positive of the first battery.$

(2) the electrode cable of the last battery negative , that is UPS negative.

When intelligent gateway is installed:

There is RS485A/B/C /D above the intelligent gateway,RS485A represents battery pack 1, RS485B represents battery pack 2, RS485C represents battery pack 3, RS485D represents battery pack 4,connect PBAT600 respectively.

Note : There is a special selection PBAT-GATE 2Z,only two sets of batteries are supported.

2. Product list

Model	Equipment diagram	Diagram
PBAT 61-02 / 61-12 Battery cell sensor		
PBAT 600 Battery string sensor	\bigcirc	
PBAT-Gate Intelligent gateway		
24V DC power supply		
Hall sensor (Measuring string current)		¢
Battery measuring line (6Pin, U type connector, Φ8mm)		
Battery measuring line (6Pin, Ο type connector, Φ8mm)		
Battery cell sensor communication line (DL-BUS communication, RJ11 connector)		
RS485 communication line	\bigcap	
Hall connection line	Se te	[]

3. Wiring diagram(Take a group of batteries as an example)



4. Installation steps

24V DC power supply

Hall connection line



5. System basic commissioning

Step1: Connect the LAN2 port of the intelligent gateway to the computer network port by using a network cable.



Step2: Enter "Control Panel" \rightarrow Open "Network and Sharing Center" \rightarrow Click "Ethernet"



Step3: Click "Properties" \rightarrow "Internet Protocol Version 4 (**TCP/IPv4**)" \rightarrow "Use the following IP address"

Modify IP address : 192.168.16.X

Subnet mask : 255.255.255.0

Default gateway : 192.168.1.1

Note: The modified IP address should not be the same as the network address of the battery gateway, it is not allowed to change the IP address to 192.168.16.2, subnet mask and default gateway address can be modified for local area network.

9	以太网 Status ×		以太网 Properties	Internet Protocol Version 4 (TCP/IPv4) Properties
General			Networking Authentication Sharing	General
Connection IPv4 Connectivity:	Internet		Connect using 愛 Reatek PCIe GBE 系列控制器	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Media State:	No Internet access Enabled		Configure	Obtain an IP address automatically
Duration:	00:10:21		Region Packet Scheduler	Use the following IP address:
Speed: Details Activity — Bytes:	100.0 Mbps Sent — Received 406,822 1,589,653	•	Microsoft Netenok Adapter Mulpipear Protocol Microsoft LDP Protocol Diver Link Layer Topology Discovery Rappar (10 Driver Link Layer Topology Discovery Rappar (10 Driver Link Layer Topology Discovery Responder Layer Topology Discovery Disco	IP address: 192 . 168 . 8 . 13 Subnet mask: 255 . 255 . 240 . 0 Default gateway: 192 . 168 . 1 . 1 Obtain DNS server address automatically Image: Use the following DNS server addresses Preferred DNS server: 202 . 96 . 128 . 166 Alternate DNS server:
Sector Properties	😚 Disable Diagnose			Validate settings upon exit Advanced
	Close		OK Cancel	OK Cancel

Step4:Download Google Chrome , enter the address "192.168.16.2" after opening ,enter the login screen . Default username: admin , password: admin , choose a language : Chinese/English , click "Login".



Step5:Select the left menu "Setting" \rightarrow "Configuration" \rightarrow "Address Map" Make communication setting.

The COM1 to COM4 of the Map Setting is corresponding to the four interfaces "RS485A/B/C/D" of intelligent gateway, and corresponding to battery1 to battery4. Note: There are only two RS485A/B interfaces for PBAT-GATE-2Z selection. Click "Add" to enter the next step.



Step6: Add device name: PBAT600,then click "OK", waiting for PBAT-600 Status: **Connected**, show that connected completed.

/ICE		×						
Name:	PBAT-600	Ŧ						
vice Address:	1			Add	Select All	Unselect All	Delete Sele	ected
lumber:	1						_	
iber:	0			PBAT-6	00 Status:	Connected		
	1			No.	Name			String
			(1	PBAT-600			1



Click "OK", return to real-time data interface

India d	1 898				Temperature: 012 Humony: 0%/84	wage V2.3-20100524 (# Log out
	Real-Time Data					
activity.commistration						
Real Time Data						
😹 Historical Data	String Coll Digital	Input				
🛃 Discharge Data	String Voltage 425.92V	String Current 2.43A	SOC: 100%	Status Floating Charge	Balance Deviation 98 92%	
🖾 Reports						
▲ Fault Statistics	String1	• Ø Vol	age () Temperature () Resistance ()	500 <u>5</u> 50H	Max 13.481 V ID #14 Min: 13.252	V ID #29 Avg 13.398 V
A Real-Time Alarm						
I Historical Alarm	15 V		tie	mer Limit 16.6 . Linear Limit 10.8		String1—Voltage
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6. Battery information setting

Step1: Select the left menu "Setting" \rightarrow "Project Setting" \rightarrow "Battery Information" ; **Step2:** Click "Modify" in the lower right corner;



Step3: Fill in the information on the surface of the battery , and click "Confirm" ;

Step4: After the gateway is restarted , pop-up connection completed and click "Confirm" Note: 1.Battery information is for reference only , please contact the battery manufacturer for details.

2.If using the recommended value , please select the correct capacity , voltage , the remaining information will have a recommended value.

3.String voltage measuring mode : select battery cell sensor accumulation , we can calculation string voltage by battery cell sensor without wiring.

Select measuring value, PBAT600 connects the positive and negative polse of the entire battery pack for measurement.

4.Internal resistance correction : Select the type of wire used , it will correct the internal resistance data automatically , it will more accurate.

STRING INFORMATION	3	message	
Battery Manufacturer:	AAA		
Model:	BBB	Save successfully	
Capacity(AH):	400 🔻		ОК
Voltage(V):	12 🔻		U IT
Internal Resistance(mΩ):	20		
Production Date:	2017-01-01		
Running Date:	2017-01-01	Message	
Cut off Voltage(V):	10.08		
Recovery Voltage(V):	12.68	Are you sure you want to write	e config files to PBA
Float Upper Current(A):	3	600? It will take a few minutes	0
Float Voltage(V):	13.38		Cancel
Lower Float Voltage(%):	0.5		Cancel
Upper Float Voltage(%):	0.5		
Available Time(h):	0.1		
Show Available Time:	No 🔻	Message	>
Group Battery Type:	Measured Value 🔹	-	
Internal Res Correction:	0.4 🔻	Completed Connect	~ ~
	One drag One PliersLine One drag One wasnerLine	Completed Connect	on
	Une drag Iwo PliersLine		

7. Hall sensor setup

Step1: Select the left menu "Setting" \rightarrow "Project Setting" \rightarrow "Hall Sensor Setup"; **Step2:** Select string NO., select Hall sensor specifications:50/100/200/300/400/500A,and then click "Write"; You can click "Load" to confirm whether the setting is successful. Note: 1.The adjust function is only used when the group current data error is very large, use with caution.

2. When calibrating, please make sure the current across the Hall's cable is zero.

🕫 Setting	~	Hall Sensor Setting			
Parameter	Setting	String No.:	String1		Ŧ
Project Set	tting Ý	Hall Sensor Specifications:	50	• A	Load Write
Project D	t Details	Adjust:	Adjust		
Battery Informati	on				
Hall Sens Setup	or	PBAT600 Version Information			
		PBAT600 Software Version:	1.13		
		PBAT600 Test Vsersion:	1.00		
		PBAT600 Hardware Vsersion:	1.00		
		Physical Address:	1		

8. Rapid alarm setting

Step1: Select the left menu "Setting" \rightarrow "Parameter Setting" \rightarrow "Alarm Setting"; **Step2:** Select "Apply Alert Template";

Setting	Field Co	Appy Alam 1								
	40.	Monitoring Parameter	Tolggen Type	Themshold	Recovery	Action Delay(s)	Recovery Delay(s)	Trigger Action	Enable	Graphic Reports
	2	String Cumint(A)	Over High Limit	50	50	0	0	Write Record	Yee	LP Hodfy
Parameter Setting	2	String Current(A)	Under Law Limit	-60	60	0.	0	Write Record	Yes	Let Hodey
~	3	String Voltage(V)	Ovei High Limit	460.10	460.0	0	0	Wats Record	Yes	Lef Modify
Network Setting	4	String Votage(V)	Under Law Limit	345.5	345.6	0	0	Write Record	Yes	Let Hold h
C .	4	String SOC(%)	Under Low Link	0	0	0	0	Wirte Record	No	of Bodh
Serial Port		Cell Voltage(V)	Ovei High Limit	14.4	14.4	0	0	Witte Record	Yes	GP Modely
Setting	1	Cell Voltage(V)	Under Low Limit	10.0	10,0	0	0	Write Record	Yes	Let Rodfy
Setting	1	Cell Internal Resistance($\pi\Omega$)	Over High Limit	20	20	٥	0	Write Record	Yes	Lef Wodly
Input Sotting	9	Cel SOC(%)	Under Low Linit	0	0	0	0	Write Record	No	Lif Hodly
input setting	10	CHE DOH(%)	Under Low Limit	0	0	0.	0	Write Record	tia	Lif Rodly
	78	Cell Temperature(10)	Over High Limit	50	50	0	0	Write Record	Yea	Lif Bodty
Alarm Setting										Contin
CommDobug										and the second second
Commbebug										

Step3:Voltage type :select the correct voltage type,2V or 12V ;

Battery count : enter the battery count in the current set of batteries ;

Enter Hall sensor specifications and internal resistance reference(It will obtain battery information automatically and the Hall setting of Hall sensor) ; Click "OK"

Step4:Pop-up alarm parameter list , confirm that the set threshold and recovery are correct or not ; Click "OK" in the lower right corner.

Step5:Finally, in the lower right corner of the alarm settings ,click the red "Confirm Configuration" to complete the simple alarm setting.

Note: If you have some knowledge of the battery alarm parameters , please refer to the alarm setting in Chapter 9.

arr 32 tati Sensor 50 tati Sensor 50 tations(A): 20 ance(mQ): Carlei totemal 20 ance(mQ): 20 totemal 20 totemal		Voltag	e.	12\	,		*	×
11 Sensor Sting Current(A) Under Low Limit 50 1 1 20 3 Sting Voltage(V) Over High Limit 460.8 1 20 5 Sting SOC(%) Under Low Limit 345.6 5 Sting SOC(%) Under Low Limit 0 0 6 Cell Voltage(V) Under Low Limit 10.8 6 Cell Voltage(V) Under Low Limit 10.8 7 Cell Voltage(V) Under Low Limit 10.8 8 Cell Internal Resistance(mQ) Over High Limit 10.8 9 Cell SOC(%) Under Low Limit 0 9 Cell SOC(%) Under Low Limit 0 10 Cell SOC(%) Under Low Limit 0 11 Cell SOH(%) Under Low Limit 50 11 Cell SOH(%) Under Low Limit 50 11 Cell SOH(%) Under Low Limit 50 12 13 10 Cell SOH(%) Under Low Limit 50 13 14 10 Cell SOH(%) Under Low Limit 50 </td <td></td> <td>erv Cour</td> <td>nt</td> <td>32</td> <td></td> <td></td> <td>_</td> <td></td>		erv Cour	nt	32			_	
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9. Alarm setting

Step1: Select the left menu "Setting" \rightarrow "Parameter Setting" \rightarrow "Alarm Setting"; **Step2:** Select the alarm parameters you want to set , then click "Modify" on the right side of the system;

		a franker fatte	CA. Adversion Moderal Back to Adversion								
Setting	~	No.	Monitoring Parameter	Tripper Type	Threshold	Receivery	Action Delay(s)	Recovery Delay(s)	Tripper Action	Inable	Graphic Repo
Jeung		1	Stang Carvet(A)	Over High Limit	56	58	D	0	Write Record	Yes	l#licdh
	- 1999 (10 C	2	Stang Carrent(A)	Under Low Circl.	60	-50	D	6	Wittin Record	Yes	Le Made
Parameter Se	etting	3	Steeg Voltage(V)	Over High Limit	460.8	460.8	D	8	Time Record	Yes	of North
	~	4	Stang Voltage(V)	Under Law Land	345.6	345.6	0	0	Write Record	Yes	Le Modify
Network Set	tting	5	Storg SOC(%)	Under Low Lind		0	0	0	Write Record	785	W Modify
			Cell Votage(V)	Over High Limit	14.4	34.4	0	0	Write Record	Yes	(#Modify
Serial Port		r	Cell Voltage(V)	Under Law Limit	11.0	38.8	D	0	Winter Record	Yes	W Medity
Setting			Call Internal Resetance(mC)	Over High Limit	30	30	0	0	Write Record	Yes	L# Medity
		.9	Cell SOC(%)	Under Law Limit		#C	0	0	Write Record	145	W Medly
Input Settin	a	10	Cell SOH(%)	Uncler Low Loret	4	1	0	8	Verse Record	Nan	ur ticate
inpat obtain	9	.11	Cell Temperature(C)	Over High Liest	54	58	0	0	Write Record	Vies	W Nedly

Step3:Select "Yes" in enable ,enter the alarm threshold and recovery , and then click "OK"

Step4:Pop-up " Save successfully", click "OK";

Step5:After confirming that all alarm configurations are correct, click the red "Confirm Configuration" in the lower right corner of the alarm settings page.

Note: When the trigger type is upper-limit ,the threshold value is greater than the hysteresis value; When the trigger type is lower-limit ,the threshold value is less than the hysteresis value

Threshold and hysteresis value please refer to the attached page : Alarm setting recommendation table.

ALARM SETTING		×			Messa	age				×		
Enable:	©Yes ○No				Save	succe	essfully	ý				
Monitoring Parameter:	String Current(A)									OK		
Trigger Type:	Over High Limit								1			
Threshold:	50							4	Ļ			
Recovery:	50											
Action Delay(s):	0		мо. 1 2	Monitoring Parameter (Mong Current(A) Stong Current(A)	Under Low Long	00 -50	Recovery 00 -50	Action Delays	 Recovery Detr 0 0 	(N) Thyper Action Write Record Write Record	Enable Nos Vos	Graphic Reports (21 Modily (21 Modily
Recovery Delay(s):	0		5	Strig Volge(r) Strig Volge(r) Strig SOC(%) Ort selection	Under Low Low	37.6 0	97.5 10	0	0	White Record White Record	10 10	CP Netly CP Netly CP Netly
Trigger Action:	DO/Write Record		7	Cell Inferge(V) Cell Inferge(V) Cell Inferge(Residence(RE)) Cell SOC(%)	Under Cox Linel Over High Linet Under Cox Linet	12 20	11 30 0	0	0	Write Record Write Record Write Record	Nos Nes No	(2 Heally (2 Heally (2 Heally (2 Heally
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recomm	Attachm
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able	setting

	2V	12V	2 nd Upper limit	1 st Upper limit	2 nd lower limit	1 st Lower limit
Float Voltage	2.23~2.27	13.38 ~ 13.62	2.40	2.56	1.95	1.80
Charge Voltage	2.35 ~ 2.39	14.10~14.40	2.45	2.60	1.95	1.80
Open Circuit Voltage	2.10~2.12	12.60 ~ 12.72				
Cut-off voltage	1.75 ~ 1.80	10.50 ~ 10.80			1.95	1.80
Reset voltage	$2.08 \sim 2.10$	12.48 ~ 12.60				
Internal Resistance			Standard*1.3	Standard*1.5		
Ambient Temperature			30	40	10	0
Negative Temperature (Float)			TEMP+5	TEMP+10		
Negative Temperature (Equal)			TEMP+10	TEMP+20		
Negative Temperature (Discharge)			TEMP+15	TEMP+30		

Note: The above parameters are for reference only, all based on the parameters provided by the battery manufacturer.





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