TBB POWER

Version: A1.0

System of control

USER MANUAL

PCU-HUB

Preface

Thanks for choosing our products and this manual is suitable for control unit PCU-HUB. This manual contains important safety and operation instructions. Read it before any operation/installation and keep it well for future reference.

Product installation and maintenance need to be conducted by a well trained technician or electrician. Please pay more attention to below items:

1. Please use correct voltage to power this product

2. Please insure DC positive and negative are connected correctly. No reversed polarity connection is allowed

3. Please use power cable as short as possible for connection and ensure all connection is well

4. Only TBB engineer or authorized electrician can open the case.

All products has been well inspected before delivery from manufacturer. If there is faulty for example housing swelling is found when open product box, please contact TBB or TBB's re-seller immediately. The environment condition will also has influence to product performance, please make sure product is used in proper environment condition

Remarks: As continuous update on product, this manual might not reflect latest version of product. Please contact TBB or TBB's re-seller if wants to learn most update on product.

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1. General Safety Instruction

1.1 Safety instruction

- Please read this manual and remark, sticker on product before installation or operation
- Please abide by required electrical safety procedure and requirement to prevent any damage or injury. Safety instruction in this manual is not equal to these safety procedure and requirement
- Manufacturer takes no responsibility for any consequence of break above safety procedure or requirement
- A warning mark as below represents potential risk or important information

Warning: The operation is critical to system running, please be careful before operation

1.2 General Precaution

- Do not expose product to dust, rain, snow or liquids of any type，it is designed for indoor use
- To avoid fire and electric shock，make sure all cables selected with right gauge and being connected well. Smaller diameter and broken cable are not allowed to use

2. Production introduction

2.1 General introduction

Control unit PCU-HUB is a system component and acts as a brain of whole system. It decides sequence of power ON/OFF of components in system; coordinates charging or discharging of power products in system; provides low voltage protection to system; collects error information from components in system; upgrades software to components etc. PCU-HUB is always the last one to be powered OFF and the first one to be powered ON. It will enter into low power consumption mode when it's powered off, and be able to be waked up by input dry contract.

2.2 Features

- PCU-HUB comes with normal working mode and low power consumption mode. The power consumption is as low as 12V 5mA when it's in low power consumption mode
- Can be waked up by dry contacts, for example by MPPT charger, inverter charger combi.,IGN signal,system monitor A7 etc.
- PCU-HUB can be powered by auxiliary (12V & 48V) and starter battery (12V) both, the sequence is : Auxiliary battery > Starter battery
- Rated power: 12V 2A or 48V 0.6A
- The power from PCU-HUB to 7'' monitor (Power at 12V 1A)is isolated power, to make sure touching and display on monitor is stable
- PCU-HUB decides power ON/OFF sequence of components in system
- PCU-HUB coordinates charging and discharging of power products in system
- It supports voltage sampling from auxiliary and starter battery
- It supports three CAN communication: Two of them are non-isolated and one of them is isolated
- It supports two RS485 communication: One is for communication of system component from TBB; the other one is for external products
- It supports one LIN communication
- Radio frequency communication compatible
- Cascade communication compatible
- With master Bluetooth connectivity

2.3 Outlook and dimension

Fig. 2-1 Outlook of PCU-HUB

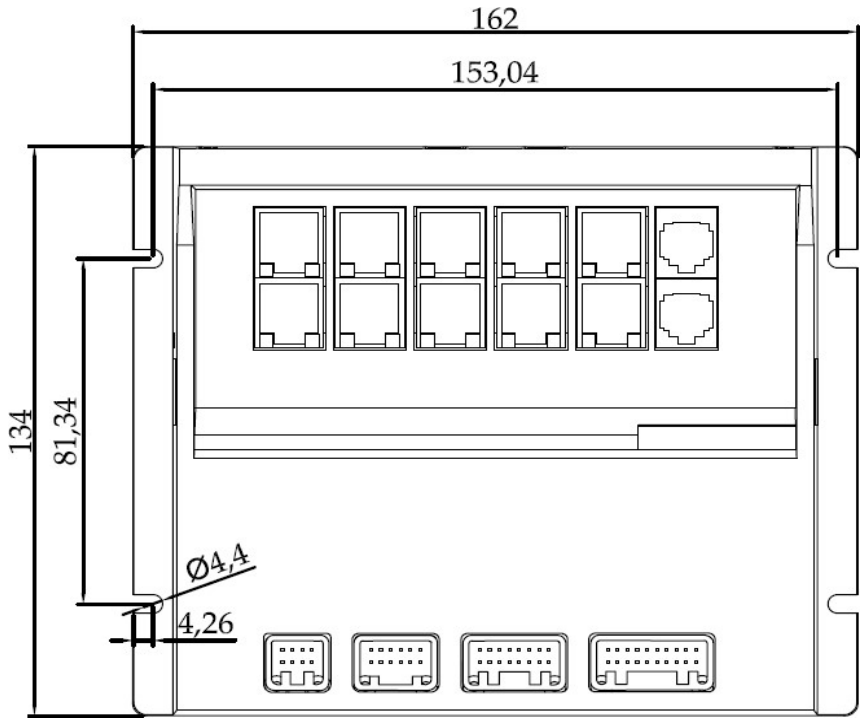


Fig.2-2 PCU dimension (Unit:mm)

2.4 Ports and terminals

Table 2-1 Ports and terminals of PCU-HUB

No.	Description	Definition	Remarks
1	Monitor	For system monitor like 7'' LCD	To provide power to system monitor, as well as with CAN/RS485 communication, wake-up signal etc.
2	Sensor	For sampling from sensors	Temperature sensor for example
3	AUX in	An input port	Dry contact input, cascade communication etc.
4	AUX out	An output port	Dry contact output
5	ISO CAN/485	Communication port	Isolated CAN/RS485 communication
6	Chassis CAN	Communication port	Non-isolated CAN communication
7	COM1-5, COM7-9	Communication port	CAN/RS485 communication for system components from TB
8	Xensor	For communication from sensors	For example, Level sensor, Tire sensor, Data Stick etc.
9	COM6, COM12	Communication port	For LIN communication

2.4.1 Port Monitor

Table 2-2 Definition of port Monitor

PIN NO	PIN Definitions	Polarity	Remarks
1	GND	12VDC Negative	
2	ISO_RS485_A+	RS485 A	ISO_RS485
3	ISO_RS485_B+	RS485 B	ISO_RS485
4	VCC_12V	12VDC Positive	
5	CAN1_L	CAN L	ISO_CAN
6	0V	12VDC Negative	ON_OFF_IN
7	ON_OFF_OUT	Wake-up signal	
8	CAN1_H	CAN H	ISO_CAN

2.4.2 Port Sensor

Table 2-3 Definition of Port Sensor

PIN NO	PIN Definitions	Polarity	Remarks
1	Ins.TEMP	Input of indoor temperature sampling	
2	Outs.TEMP	Input of outdoor temperature sampling	
3	Res1.TEMP	Liquid level sampling	
4	Res2.TEMP	Liquid level sampling	
5	Res3.TEMP	Liquid level sampling	
6	Res4.TEMP	Voltage sampling (0-12V)	
7	Res5.TEMP	Voltage sampling (0-12V)	
8	Res6.TEMP	Voltage sampling (0-12V)	
9	0V	12VDC Negative	
10	0V	12VDC Negative	
11	+SB_12V	12VDC Positive	From starter battery
12	+48V	12VDC Positive	From auxiliary battery

2.4.3 Port AUX in

Table 2-4 Definition of Port AUX in

PIN NO	PIN Definitions	Polarity	Remarks
1	Input_1	Dry contact input 1	
2	Input_2	Dry contact input 2	
3	Input_3	Dry contact input 3	
4	Input_4	Dry contact input 4	
5	Input_5	Dry contact input 5	
6	Input_6	Dry contact input 6	
7	Input_7	Dry contact input 7	
8	Input_8	Dry contact input 8	
9	0V	12VDC Negative	Negative for cascade connection
10	vout_14V	12VDC Positive	
11	Data	For cascade connection	
12	Clock	For cascade connection	
13	+5V	+5VDC Output	
14	+5V	+5VDC Output	
15	+5V	+5VDC Output	
16	IGN	Ignition signal input	

2.4.4 Port AUX out

Table 2-5 Definition of Port AUX out

PIN NO	PIN Definitions	Polarity	Remarks
1	RY_1_NO	Dry contact output 1, default disengaged	Relay capacity 30VDC 2A
2	RY_1_COM		
3	RY_2_NO	Dry contact output 2, default disengaged	Relay capacity 30VDC 2A
4	RY_2_COM		
5	RY_3_NO	Dry contact output 3, default disengaged	Relay capacity 30VDC 2A
6	RY_3_COM		
7	RY_4_NO	Dry contact output 4, default disengaged	Relay capacity 30VDC 2A
8	RY_4_COM		
9	RY_5_NO	Dry contact 5	Relay capacity 30VDC 2A
10	RY_5_COM		
11	RY_5_NC		
12	RY_6_NO	Dry contact 6	Relay capacity 30VDC 2A
13	RY_6_COM		
14	RY_6_NC		
15	RY_7_NO	Dry contact 7	Relay capacity 60VDC 2A
16	RY_7_COM		
17	RY_7_NC		
18	RY_8_NO	Dry contact 8	Relay capacity 60VDC 2A
19	RY_8_COM		
20	RY_8_NC		

2.4.5 Port ISO CAN/485

Table 2-6 Definition of Port ISO CAN/485

PIN NO	PIN Definitions	Polarity	Remarks
1	GND	Dry contact input	For wake-up purpose
2	ON_OFF_OUT		
3	ISO_RS485_A+	RS485	Isolated
4	CAN1_H	ISO_CAN	Isolated
5	CAN1_L	ISO_CAN	Isolated
6	ISO_RS485_B-	RS485	Isolated
7	RES_12V_CTR	IOT 12V DC	
8	GND		

2.4.6 Port Chassis CAN

Table 2-7 Definition of Port Chassis CAN

PIN NO	PIN Definitions	Polarity	Remarks
1			
2			
3			
4	CAN2_H	CAN H	Non-isolated
5	CAN2_L	CAN L	
6			
7			
8			

2.4.7 Port CAN/RS485 (COM1-5,COM7-9)

Table 2-8 Definition of port CAN/RS485

PIN NO	PIN Definitions	Polarity	Remarks
1			
2			
3	RS485_1_A+	RS485 A	
4	CAN0_H	CAN H	Non-isolated
5	CAN0_L	CAN L	
6	RS485_1_B-	RS485 B	
7			
8			

2.4.8 Port Xensor

Table 2-9 Definition of port Xensor

PIN NO	PIN Definitions	Polarity	Remarks
1	GND	Dry contact input	For wake-up
2	ON_OFF_OUT_2		
3	RS485_1_A+	RS485 A	
4	CAN0_H	CAN H	Non-isolated
5	CAN0_L	CAN L	
6	RS485_1_B-	RS485 B	
7	RES_12V_CTR	12VDC Positive	Power to sensor
8	GND		

2.4.9 Port LIN (COM6, 12)

Table 2-10 Definition of port LIN

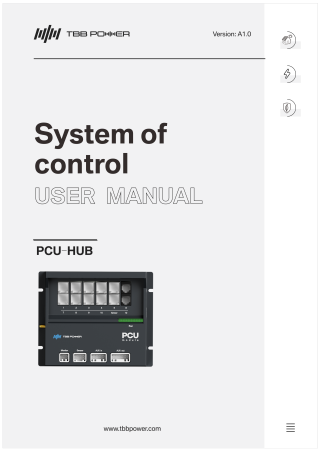
PIN NO	PIN Definitions	Polarity	Remarks
1	+12V_CTRL_ALL	12VDC Positive	
2			
3	LIN1	LIN	
4			
5	0V	12VDC Negative	
6			

3. Installation

3.1 Open box

- Only open product box before installation, and please check if box is in good condition before it is opened
- Take product out of box in a careful manner
- Check if everything in below Box List is in the box; contact TBB or TBB's re-seller if anything is missed or damaged
- Keep user manual properly for future reference

Table 3-1 Box List

Item	Spec.	Q'ty	Picture
Control unit PCU-HUB	162 mm x 134 mm x 43 mm	1	
User manual	In paper	1	

3.2 Installation

Please install product on a solid ans flat surface.

Drill installation holes as below drawing, and then fix product by M4 screw.

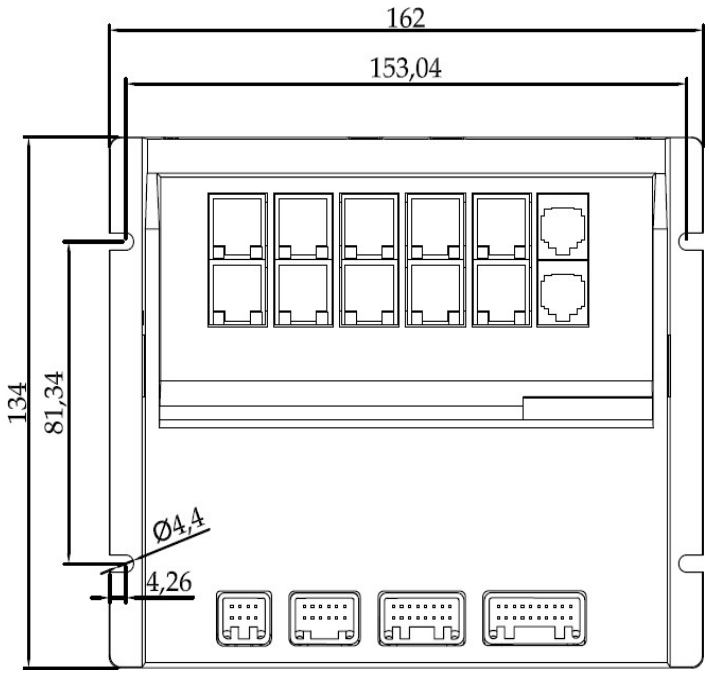


Fig.3-1 Installation holes of PCU-HUB

4. Operation

4.1 Check item before operation

1) Check if input voltage meets product request; or it will cause damage to product. Please contact TBB or TBB's re-seller if any question to voltage

2) Check if cables are connected correctly before product get power

3) Check if cables are fixed well. Please make sure no short circuit risk

4) Check if product is installed on a flat and solid surface

5) Get product powered if all above items is checked

4.2 LED indicators (Only works when in a system)

○:Solid ON ●: OFF ◑ : Flashing

Table 4-1 LED indicators

No.	Indicator	Status
1	○ RUN	Working normally
2	● RUN	Power OFF
3	◑ RUN	1) 0.5 seconds ON and 0.5 seconds OFF: Error 2) 0.1 seconds ON and 4.9 seconds OFF: Low power mode

5. Specification

Model No.	PCU-HUB
Rated Power	Starter battery: 12V/2A (Voltage range: 10.5-16VDC)
	Auxiliary battery: 12V/2A or48V/0.6A
Communication	Cascade
	RS485
	CAN
	LIN
	Bluetooth
	RF
Idle Power	≈5mA (12vdc)
Protection	Short circuit, Polarity reversed connection
Dimension	162 mm x 134mm x 43 mm
Weight	0.5Kg
IP Rating	IP20
Cooling	Nature cooling
Certificate	EN61000-6-1, EN61000-6-3ETSI, EN 300328 V2.2.2: 2019
Working Environment	Altitude≤2000m
	Temperature: -20℃~65℃

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