Communication HUB

LV-HUB Product Manual

With US-C/US5000/UP5000

Information Version: V1.0

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Catalog

1. Introduction

LV-Hub is the CAN communication hub for multiple 48V battery groups in parallel connection.

This manual is specified for connection with US2000C/US3000C/US5000/UP5000 batteries.

2. Specifications

| Item	Parameter
Operating voltage range	48 Vdc
Communication	CAN/RS485
System Consumption	2W
Size	442*190*44mm
Protection degree	IP20
Weight	3.0kg
Operation Life	15 years
Working temperature	-20~60℃
Storage temperature	-40~80℃
CAN (Max 25 groups)	Baud rate: 500K; terminal resistance: 0/120Ω

3. Equipment Interface Instruction

No.	Part	Silk-screen	Function
1	Dry signal		Function reserve
2	Reset Switch Button	RESET	Press 2 seconds and then system will restart.
3	Dip switch	1 - 6	Dip 6: Up：CAN OUT terminal resistance 120Ω Down：0Ω
4	RJ45	CAN OUT	CAN output port (only upper port is for using);
5	RJ45	RS232	Debug
6	RJ45	CAN IN	Connect to port **0** (only for CAN communication);
7	LED	STATUS	Please see LED Indicators Instructions.
8	LED	NUMBER/BIN 1-4	Shows linked in battery group quantity with binary code. Please see LED Indicators Instructions.
9~16	RJ45	0; 1; 2; 3; 4; 5; 6; 7.	Only uses 0~5. Please see LED Indicators Instructions.
17	Switch	ON/OFF	Turns the LV-HUB ON/OFF.
18	48VDC input	48V DC	Power supply: take 48VDC power from outside (from AC/DC adaptor).

Definition of RJ45 Port Pin

No.	CAN OUT	RS232 Pin
1	---	---
2	GND	---
3	---	TX
4	CANH	---
5	CANL	---
6	---	RX
7	---	---
8	---	GND
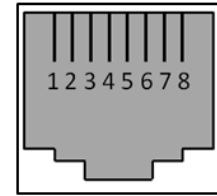
RJ45 Port

RJ45 Plug

LED Indicators Instructions

| Status					
		●	Only the HUB is turned ON, it lights once.		
		● (red)	No battery connected or at least one group is off line. When battery group is reduced it will alarm (in red), but when battery group is added in it will no alarm.		
1	2	3	4	Green flash; connected battery groups number	
●				1 group	
	●			2 groups	
●	●			3 groups	
		●		4 groups	
●		●		5 groups	
	●	●		6 groups	
●	●	●		7 groups	

4. Communication Cable Deployment

Precautions:

1. Each communication HUB connects max 6 battery piles.
2. Each battery pile can configure max 16 US2000C/US3000C/UP5000/US5000.
3. When using US2000C/US3000C/UP5000/US5000, the multiple group connection under RS485 communication **DONOT** require a LV-HUB. The wiring diagram please refer to the corresponding battery model operation manual.

4.1 Wiring diagram
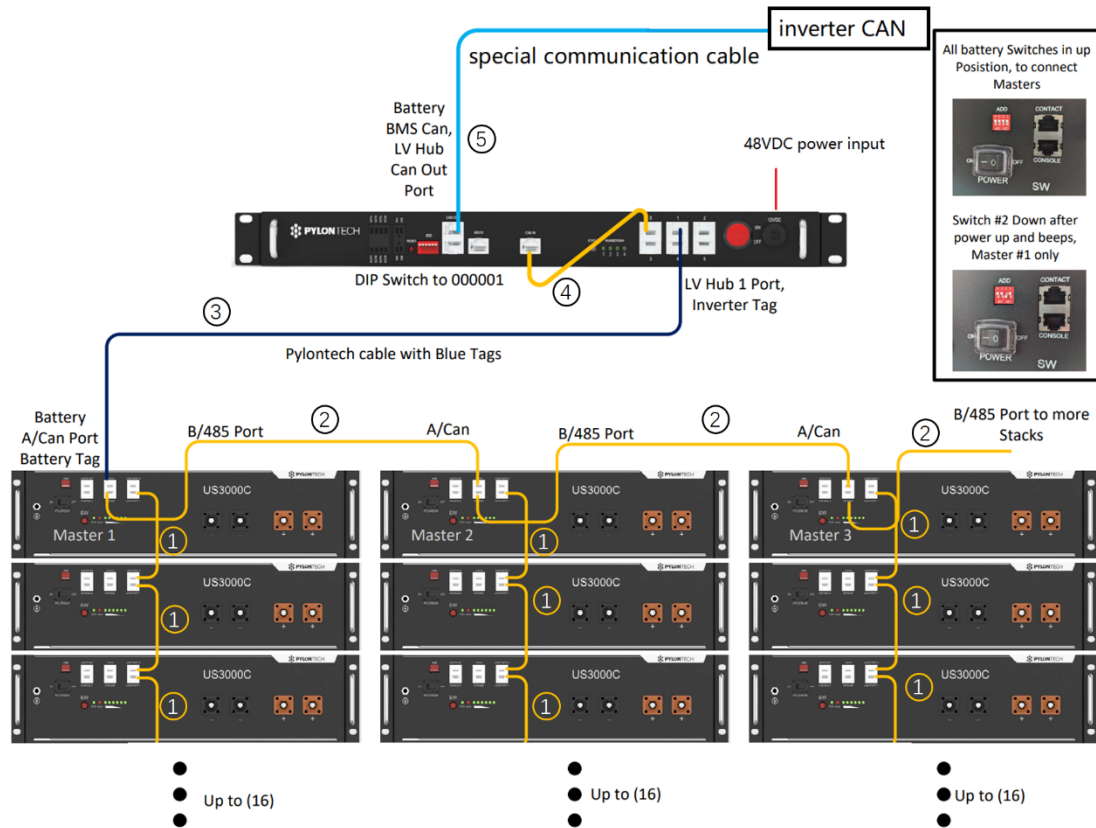
4.2 Communication Cable definition

Communication Cable types:

1. Cable ①/②/④ are standard Ethernet cable (8 pin direct-pin cable).

2. Cable ③ is to connect LV-HUB and first master battery, the first 3 pins on the port of battery side should be NULL, or use WI0SCAN30RJ1 cable inside external cable kits.

3. Cable ⑤ is to connect LV-HUB and the inverter, the first 3 pins on the port of battery side should be NULL, and the pinout is 4H5L on battery side. The pinout on inverter side shall varying depends on the inverter instructions.

Communication Cables connection:

Cable ①: Port 1 of first battery connect to port 0 of next battery

Cable ②: The B/485 port of first master battery connect to A/CAN port of next group' master battery; the B/RS485 of last group master battery is empty.

Cable ③: The A/CAN of first master battery connects to LV-HUB port 1-7 freely.

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Cable ④: On the LV-HUB, the CAN IN connects to port 0.

Cable ⑤: LV-HUB CAN OUT port connect to inverter CAN port.

4.3 Communication Cable wiring sequence

1) After finish the communication cable connection, follow the product manual of the battery to connect the battery power cable in parallel: each pair of cable hold max 100A constant current. Connect enough pairs of cable based on calculation of system current.
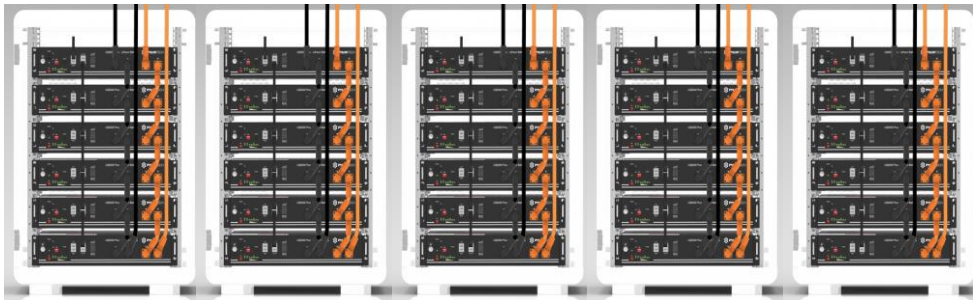
2) Suitable protection breaker between battery system and inverter is required.
3) connect power cable of LV-HUB.
4) The address of the LV HUB must be: 000001. All ADD Dip switches of the batteries as default (all UP).

5) Boot up every single battery, with the SW button in sequence1st string master battery - 2nd string master battery - … 6th string master battery. After all batteries waked up and buzzer of master battery in group1 rings 3 times. Means all groups are online.
6) Change the dip switch of **ONLY** the **master battery in group1** to 0100.

7) Then connect communication cable between LV-HUB and master battery in group 1(using proprietary RJ cable with PIN 1-3 null). Use that specific cable, otherwise, communication won't work.

8) Then turn ON LV-HUB. You will hear the LV HUB Beep. Then all the groups connected shall be shown on the LED.

9) Then connect the LV-HUB to the inverter with the correct pinout at both battery side and inverter side. Battery side always use pin4 as CAN-H and pin5 as CAN-L.

5. Trouble shooting

Communication related problem

Appearance: unable to communicate with inverter

Solution: check pinout, communication cables connection and battery status

Address related problem

Appearance: The number of address assignments does not match the actual rack number

Solution:

1) Check communication cable connection and restart the whole system
2) Upgrade LV-HUB

Functional related problem

Appearance: unable to be turned on

Solution: check if the DC output is 48V and if power cable is in good condition.

Connection related problem

Appearance: mixing using USB series with USC series batteries

Solution: for example, mix using 8 US2000 and 2 US2000C. LV-HUB should be used and 2 US2000C batteries become master battery separately.

Excluding the points above, if the faulty still cannot be located, turn off battery and LV-HUB then contact your local distributor.