



# Communication HUB

## LV-HUB Product Manual

Information Version: 2.2

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This manual introduces LV-Hub from Pylontech. LV-Hub is a communication hub for US2000/US3000 Lithium-Ion Phosphate Battery storage system. Please read this manual before you install the battery and follow the instruction carefully during the installation process.

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## 1. Introduction

LV-Hub is the CAN/RS485 communication hub for multiple 48V battery groups in parallel connection.

**Fit Description:** US2000 / US3000 / US2000C / US3000C / UP5000 / US5000.

## 2. LV-Hub-A



| No. | Item                    | Parameter                                    |
|-----|-------------------------|----------------------------------------------|
| 1   | Operating voltage range | 48 Vdc                                       |
| 2   | Communication           | CAN/RS485                                    |
| 3   | System Consumption      | 2W                                           |
| 4   | Size                    | 442*190*44mm                                 |
| 5   | Protection degree       | IP20                                         |
| 6   | Weight                  | 3.0kg                                        |
| 7   | Operation Life          | 15 years                                     |
| 8   | Working temperature     | -20~60℃                                      |
| 9   | Storage temperature     | -40~80℃                                      |
| 10  | CAN (Max 25 groups)     | Baud rate: 500K; terminal resistance: 0/120Ω |
| 11  | RS485 (Max 5 groups)    | Baud rate:9600/115200                        |

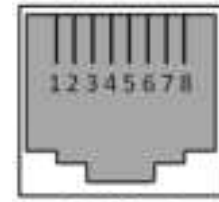
## 2.1 Ports:



| 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:<br>Up: CAN OUT terminal resistance 120Ω<br>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 2.3.                                                                                                                                           |
| 8    | LED                 | NUMBER/BIN 1-4          | Shows linked in battery group quantity with binary code. Please see 2.3.                                                                                  |
| 9~16 | RJ45                | 0; 1; 2; 3; 4; 5; 6; 7. | Only uses 0~5. Please see 3.2.                                                                                                                            |
| 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).<br> |

## 2.2 Definition of RJ45 Port Pin

| No. | CAN OUT | RS485  | RS232 Pin |
|-----|---------|--------|-----------|
| 1   | ---     | ---    | ---       |
| 2   | GND     | ---    | ---       |
| 3   | ---     | ---    | TX        |
| 4   | CANH    | ---    | ---       |
| 5   | CANL    | ---    | ---       |
| 6   | ---     | GND    | RX        |
| 7   | ---     | RS485A | ---       |
| 8   | ---     | RS485B | GND       |



RJ45 Port



RJ45 Plug

## 2.3 LED Indicators Instructions

| Status |   |   |   |                                                                                                                                                                         |
|--------|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |   |   |   |                                                                                                                                                                         |
|        |   |   |   | ● Only the HUB is turned ON, it lights once.                                                                                                                            |
|        |   |   |   | ● No battery connected or at least one group is off line.<br>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                                                                                                                                                                |

## 3. Operation

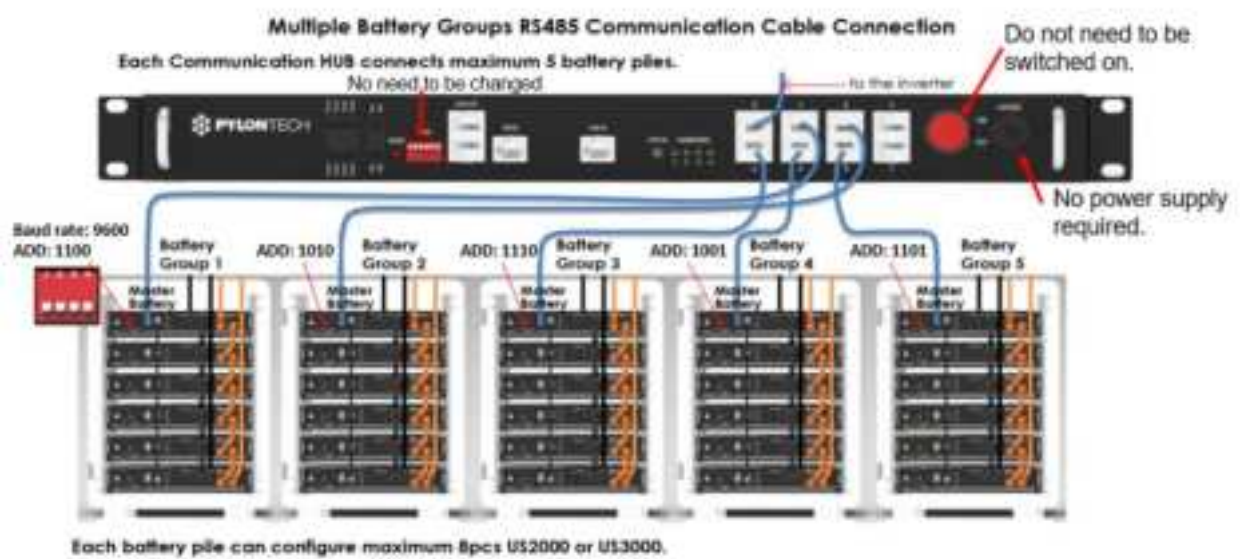
### 3.1 Protocol

**CAN:** CAN-Bus-protocol-PYLON-low-voltage-V1.2-20180408 or above.

**RS485:** RS485-protocol-pylon-low-voltage-V3.1-20180408 or above.

### 3.2 Cables Connection for US2000/US3000 under RS485 or CANBUS.

#### 3.2.1 Cables Connection for RS485



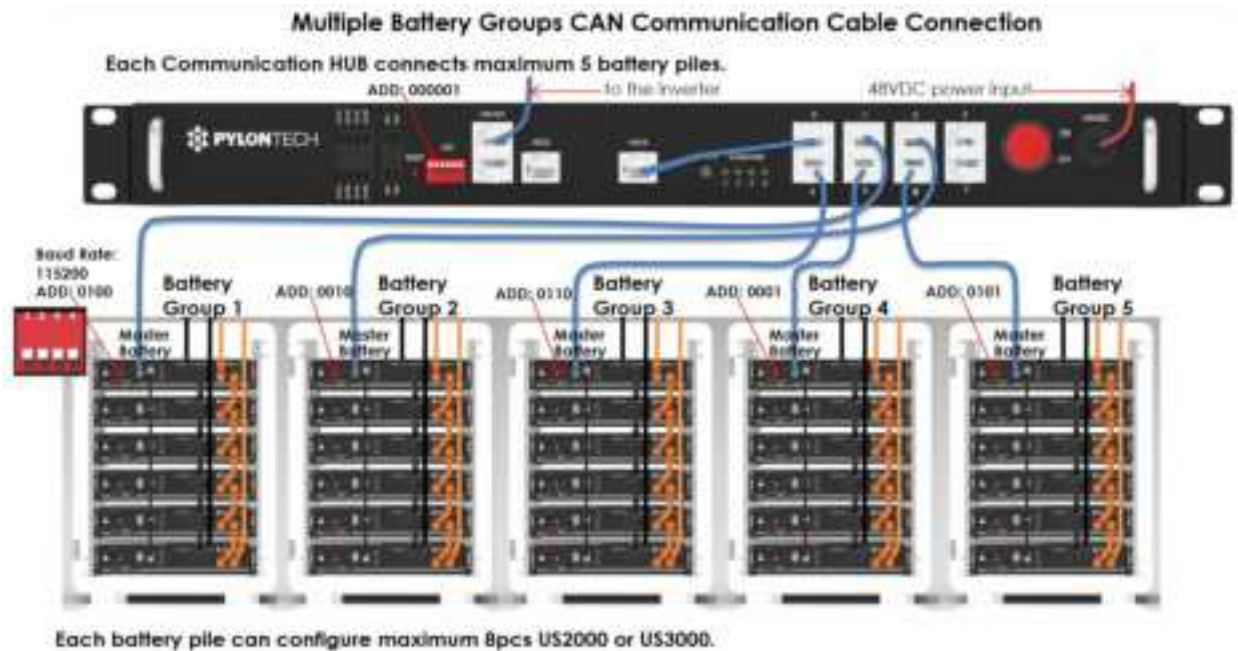
- Each battery group can configure maximum 8pcs US2000B Plus or 8pcs US3000.
- LV-Hub-A configures maximum 5 group batteries.
- RS485 communication needn't additional cable and power just a simple hub is enough.



- When each battery group's current is  $>120A$ , this battery group must configure 2 pair external power cables like the diagram.

- The details of ADD Switch setting also can see the menu of battery.

### 3.2.2 Cables Connection for CAN (single HUB)



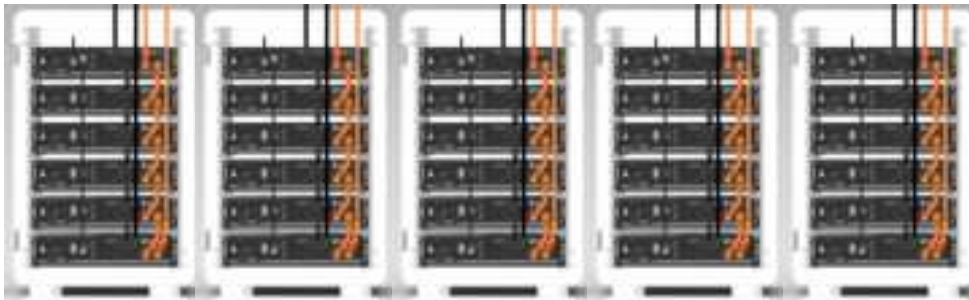
- Each battery group can configure maximum 8pcs US2000B Plus or 8pcs US3000.
- LV-Hub-A configures maximum 5 group batteries.
- When each battery group's current is  $>120A$ , this battery group must configure 2 pair external power cables like the diagram.
- The details of ADD Switch setting also can see the menu of battery.
- When using with SMA SUNNY ISLAND, the ADD on HUB(or master HUB if there are multiple HUBs) must be 000011 (for B14V0105 presenting on product label) or 000101 (for B14V0106 presenting on product label).

## 3.3 Cables Connection for US2000C/US3000C/UP5000 under CANBUS

Note: **The cable connection for RS485 do not require a LV-HUB.** The specific cable connection way please refer to the related battery operation manual.

Connect power cable first:

- 1) 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) Make sure all dipswitch is X0XX, then turn ON batteries.
- 5) After all batteries running and buzzer of master battery in group1 rings 3 times. Means all groups are online.
- 6) Change the dip switch of **master battery in group1** to X1XX. Then connect communication cable between LV-HUB and master battery in group 1.
- 7) Then turn ON LV-HUB.

\*Below communication cable shall be 8 pin direct-pin cable:

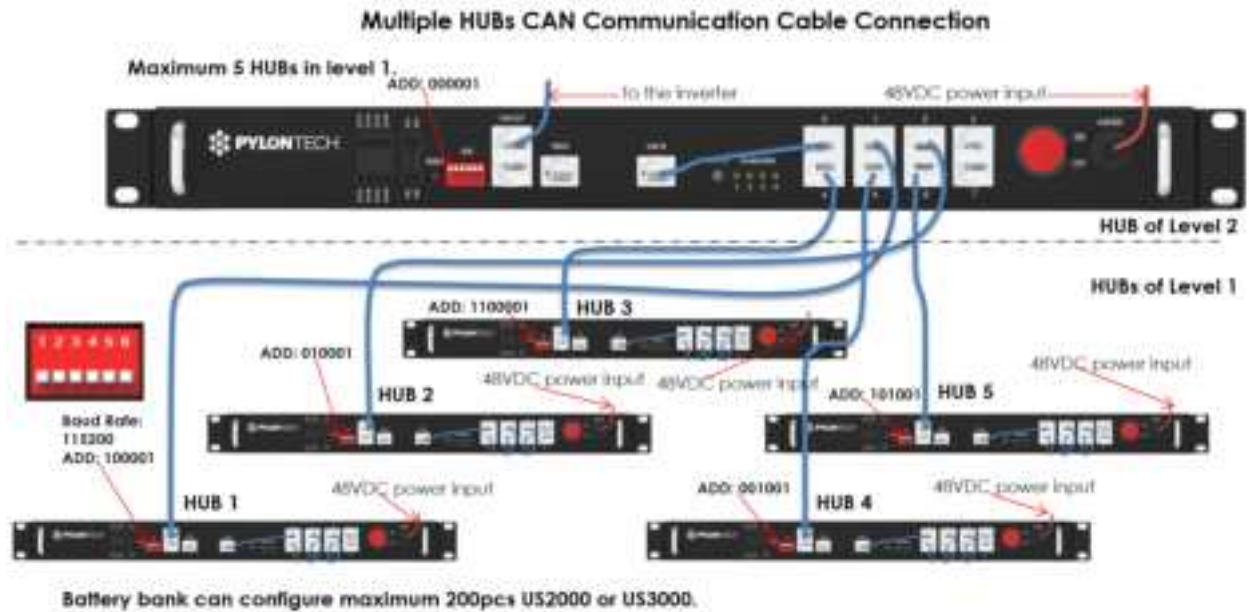
- a. Between battery modules
- b. Between LV-HUB **Port 0** to LV-HUB **CAN IN**

\*Below communication cable shall has **first 3 pin NULL** or use **WI0SCAN30RJ1** cable inside external cable kits:

- a. Between Group 1 Master Battery **A/CAN** to LV-HUB **Port 1**.



## 3.4 Cables Connection for Multiple HUBs under CANBUS.

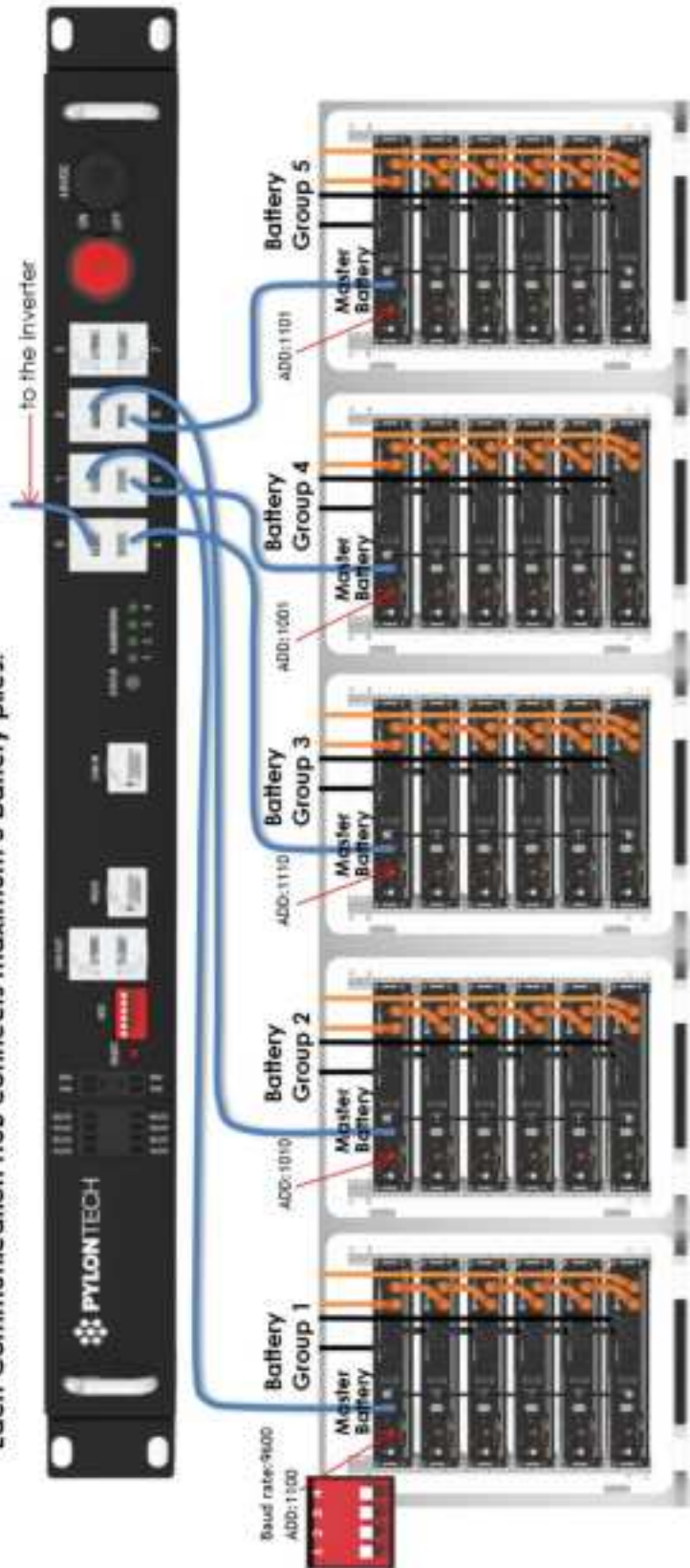


In above picture, all communication cable connect in between shall be 8 pin direct-pin cable.

## Annex 1: Cables Connection for US2000/US3000 under RS485

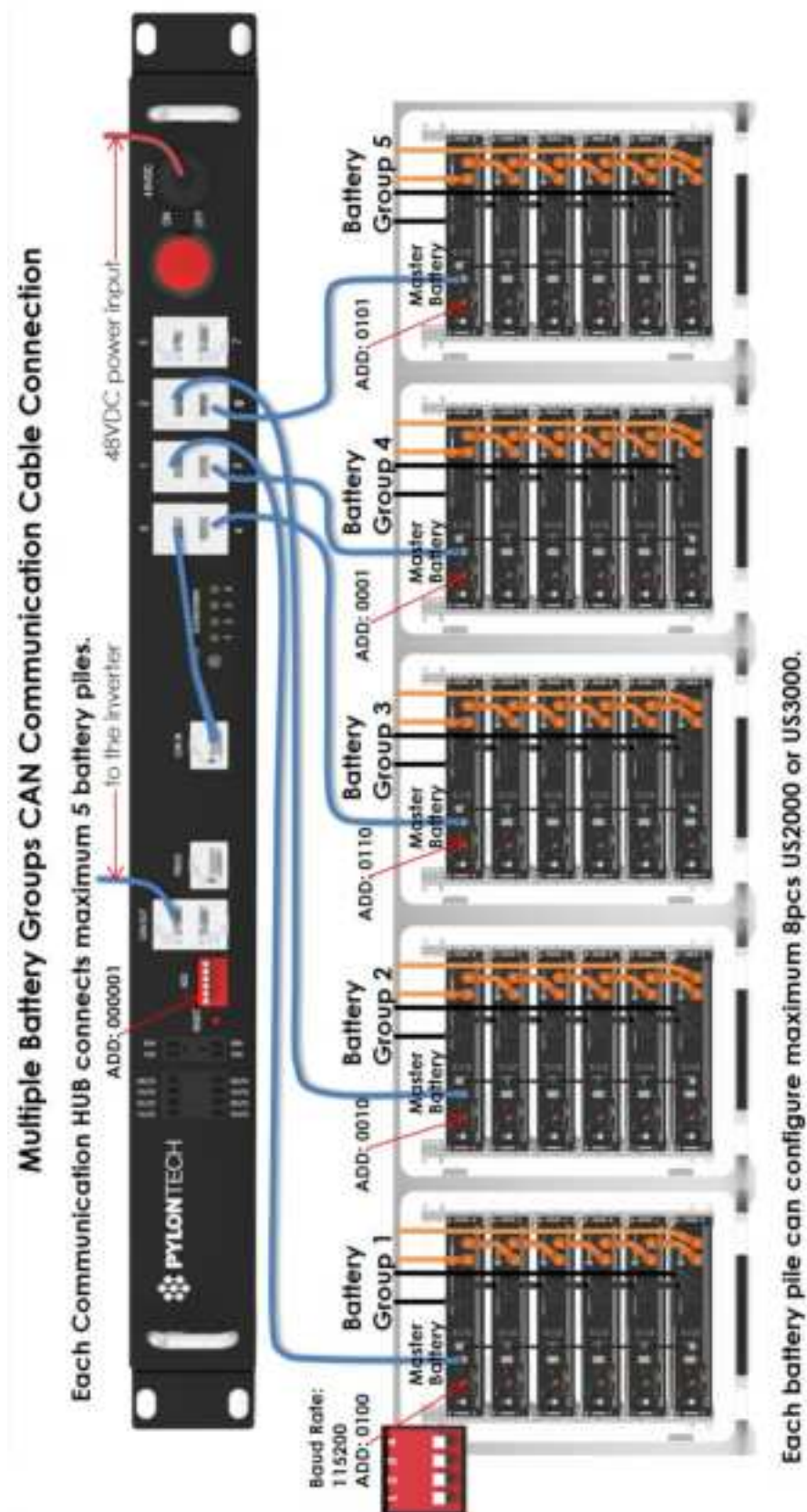
### Multiple Battery Groups RS485 Communication Cable Connection

Each Communication HUB connects maximum 5 battery piles.

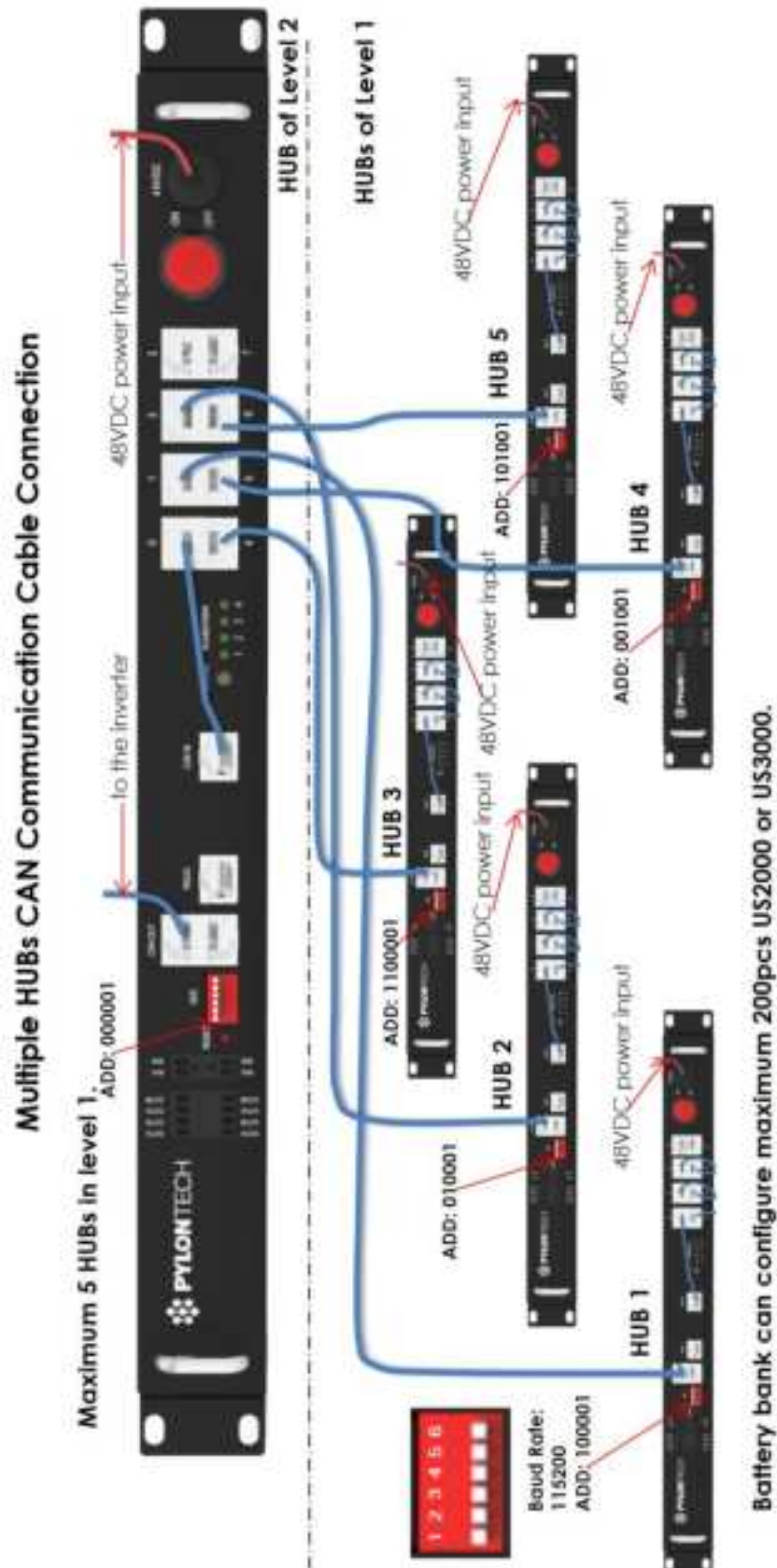


Each battery pile can configure maximum 8pcs US2000 or US3000.

## Annex 2: Cables Connection for US2000/US3000 under CAN



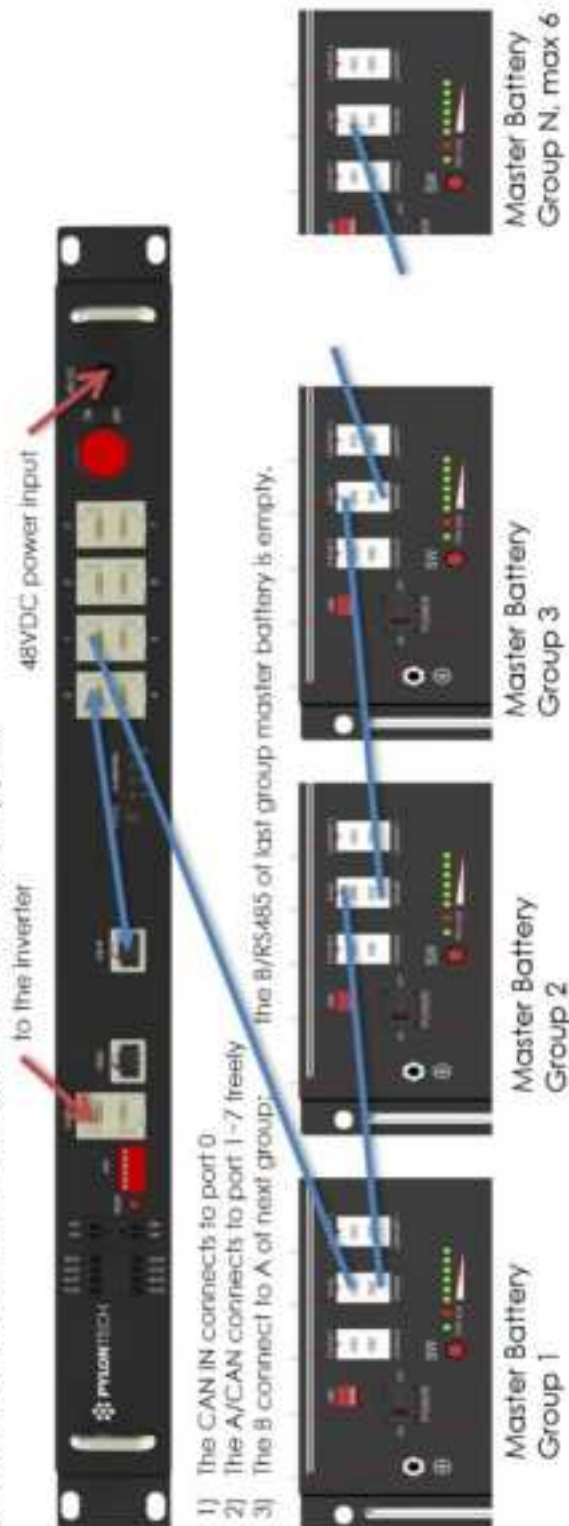
## Annex 3: Cables Connection for CAN (multi HUB)



## Annex 4: Cables Connection for US2000C/US3000C/UP5000 under CANBUS

### Multiple Battery Groups CAN Communication Cable Connection

Each Communication HUB connects maximum 6 battery piles.



- 1) The CAN IN connects to port 0
- 2) The A/CAN connects to port 1~7 freely
- 3) The B connect to A of next group;

the B/RS485 of last group master battery is empty.

Each battery pile can configure maximum 16pcs US2000C/US3000C/UP5000.



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