

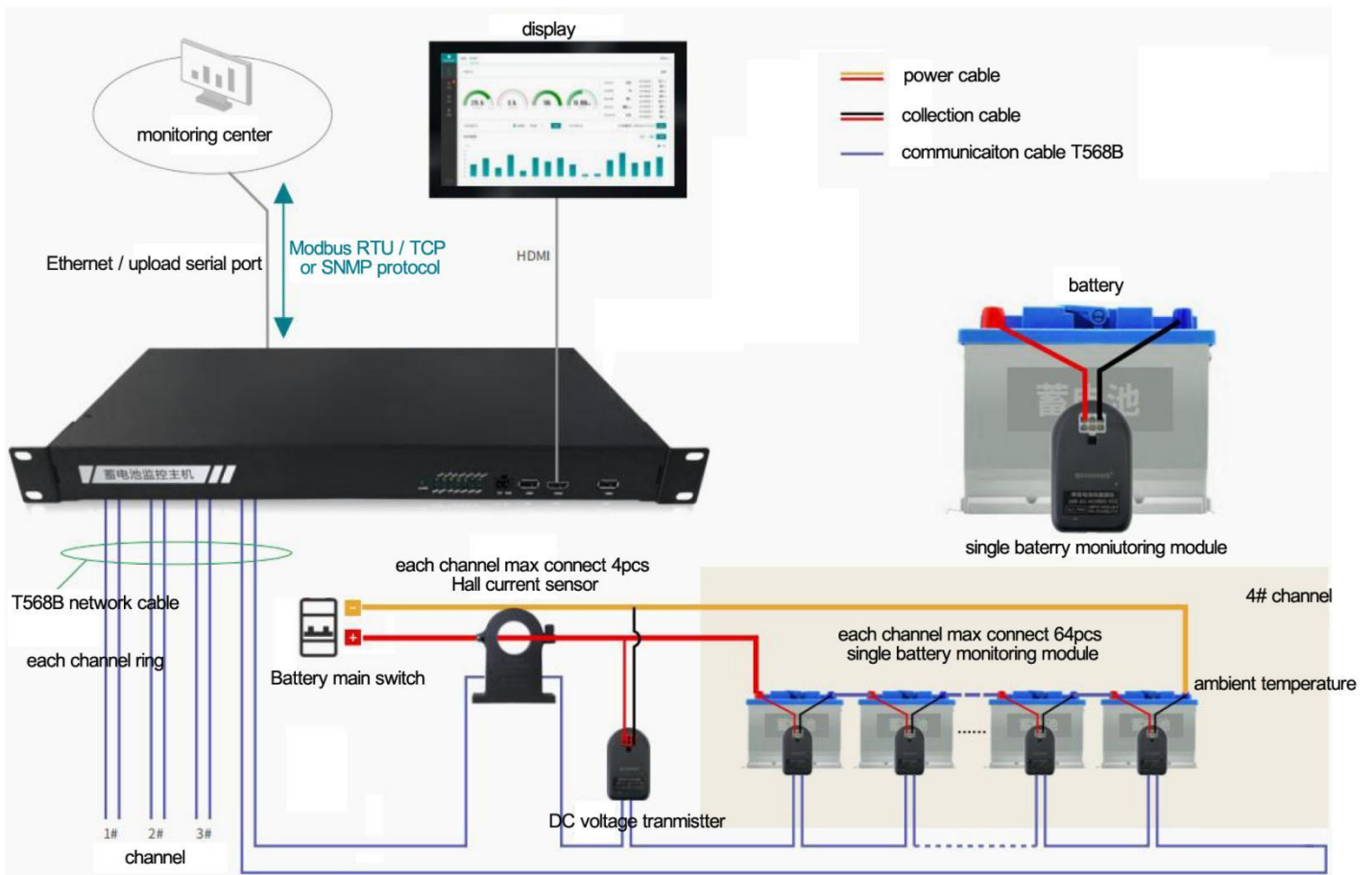
SPD-A3-CBAH01-B11

**Battery Monitoring Host
Manual**

1. Safety and installation precautions

- Please be sure to comply with the following regulations, otherwise it may endanger personal safety or cause the equipment to become unusable!
- Before installation, please carefully read the installation instructions of each product in the battery pack monitoring system to confirm whether the product fully meets the usage requirements. If you have any questions, please contact the product supplier.
- Check whether the product model is consistent with the corresponding model in the installation instructions.
- Before installing or disassembling the equipment, ensure that all external power supplies are disconnected. Operation with power on is strictly prohibited!
- The installer is required to strictly follow the wiring method in the instruction manual, strictly follow the wiring sequence, and be well marked!
- Tools such as screwdrivers, adjustable wrenches, and fixed wrenches used during installation must be insulated and protected to prevent short circuits between the positive and negative terminals of the battery.
- After checking and verifying that the connection between the module and the battery is correct, insert the module terminal socket. Pay special attention to the positive and negative wiring of the battery. Wrong wiring may cause equipment burnout and personal injury.
- There are many cells connected in series in the battery pack. Taking 20 cells of 12V cells as an example, the voltage between the positive and negative cells is about 240VDC. High voltage is extremely dangerous and needs to be handled with caution. It is strictly prohibited to touch the battery without any protective measures. Touch the battery posts and equipment terminals. Operators are required to hold a senior electrician certificate to work!
- Before powering on the device, make sure that the power supply voltage meets the voltage range required by the device.
- Ensure that the ambient temperature in the area where the equipment is installed is within the range of -40°C to 85°C, and the relative humidity is maintained between 5% and 95% (non-condensation).

2. System architecture and overall wiring diagram



This battery monitoring system includes 4 categories of products: battery monitoring host, Hall current sensor, DC voltage transmitter, single battery monitoring module. Hall current sensor, DC voltage transmitter, single battery monitoring module transmit data to the battery monitoring host through wired communication through the SNS bus port. Realize online monitoring of battery voltage, temperature, internal resistance, and battery bank current and voltage.

The battery monitoring host can be connected to up to 4 monitoring loops. Each loop can be connected to up to 64 single battery monitoring modules, 4 hall current sensors and 1 DC voltage transmitter. Loop connection can ensure that if any circuit break occurs in the loop, other modules can still communicate normally.

3. Installation

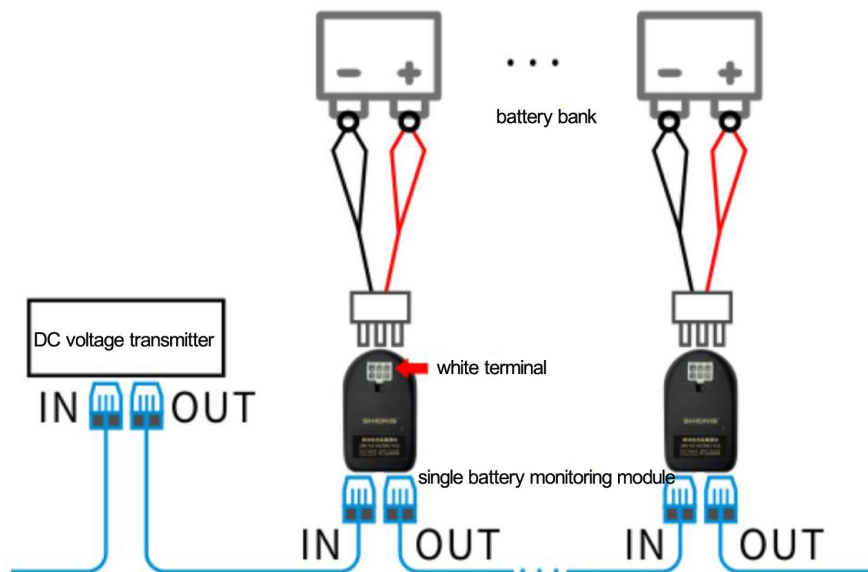
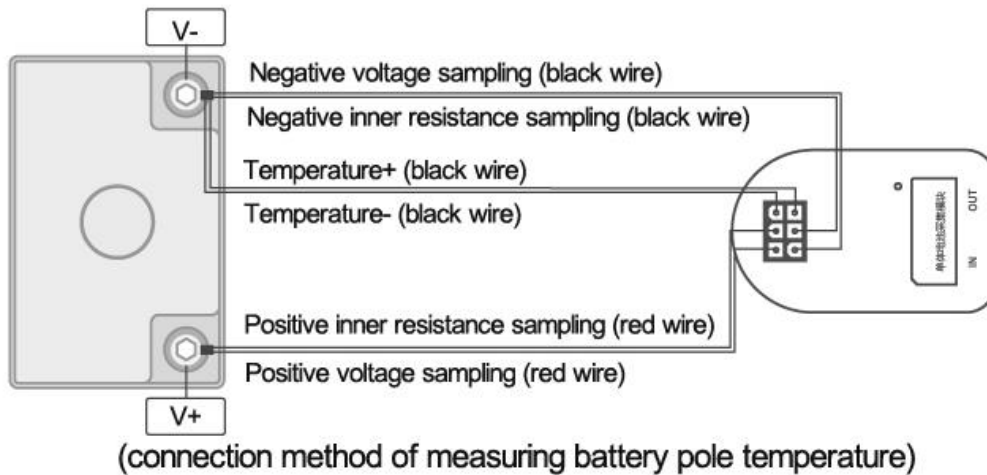
3.1 Check before installation

Confirm that the product accessories all are ready and the product appearance is not deformed or damaged.

- Battery monitoring host: power cord*2, terminal block 5P*1, 2P*1.

- Hall current sensor: Communication cable*1.
- DC voltage transmitter: communication cable*1, sampling cable*1.
- Single battery monitoring module: communication cable*1, sampling cable*1.

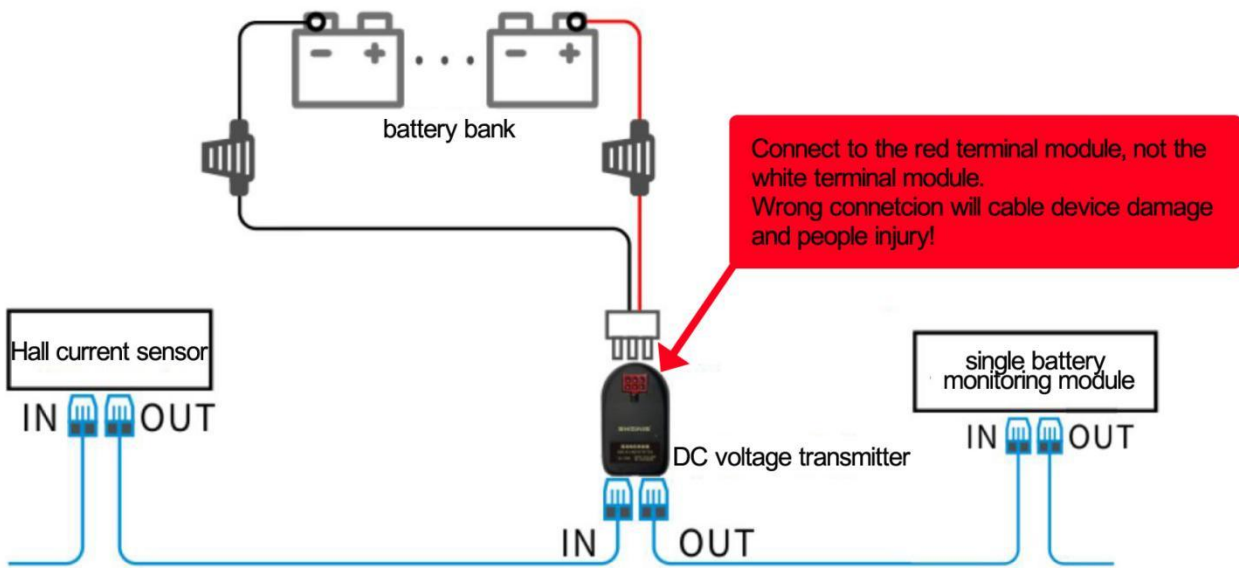
3.2 Single battery monitoring module wiring



Single battery monitoring module connection method: the red line of the sampling cable is connected to the positive electrode of the battery, and the black line of the sampling cable is connected to the negative electrode of the battery.

Tear off the 3M adhesive protective film of the single battery monitoring module, and stick the module on the battery surface or other suitable location. Before using 3M adhesive, please wipe the pasting surface clean to avoid dust, moisture, oil stains, etc. that affect the viscosity. The suitable operating temperature of 3M adhesive is 20°C (±5°C). If the temperature is too low, it will not be easy to stick.

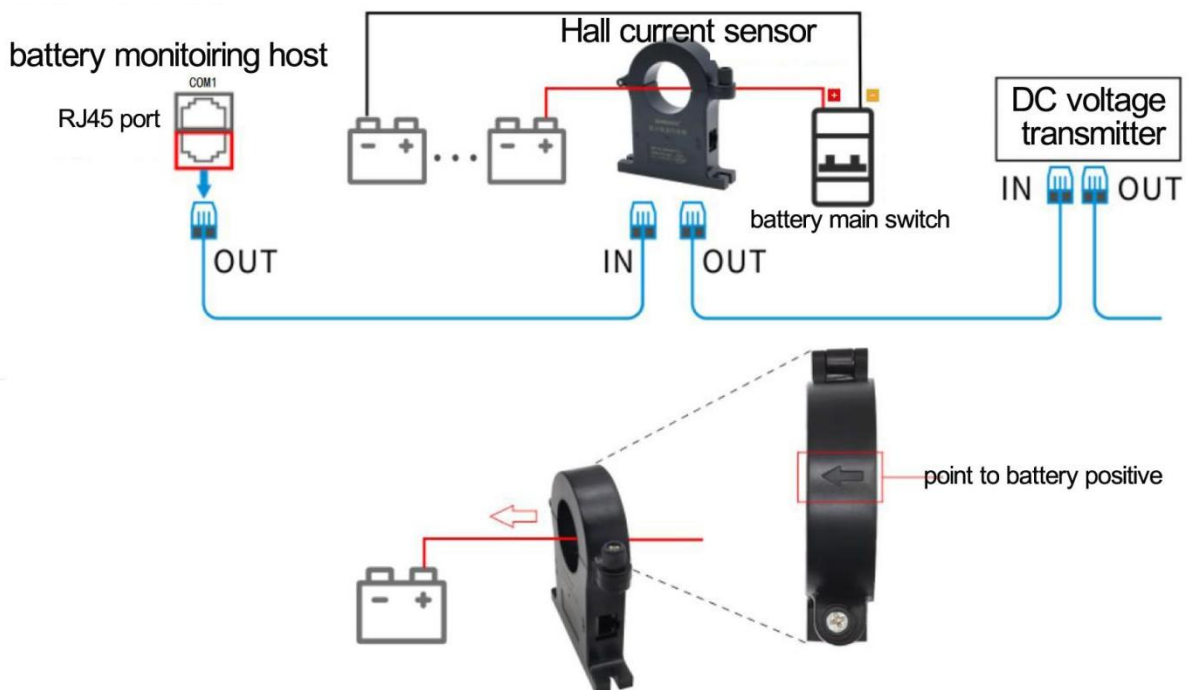
3.3 DC voltage transmitter wiring



The red line of the DC voltage transmitter is connected to the positive terminal of the battery bank, and the black line is connected to the negative terminal of the battery bank. Tear off the 3M adhesive protective film and stick it to the appropriate position.

Special note: The terminal of DC voltage transmitter is red, and the terminal of single battery monitoring module is white. Do not mistake a single battery monitoring module for a DC voltage transmitter. High voltage at both ends of the battery pack may cause device and personal injury.

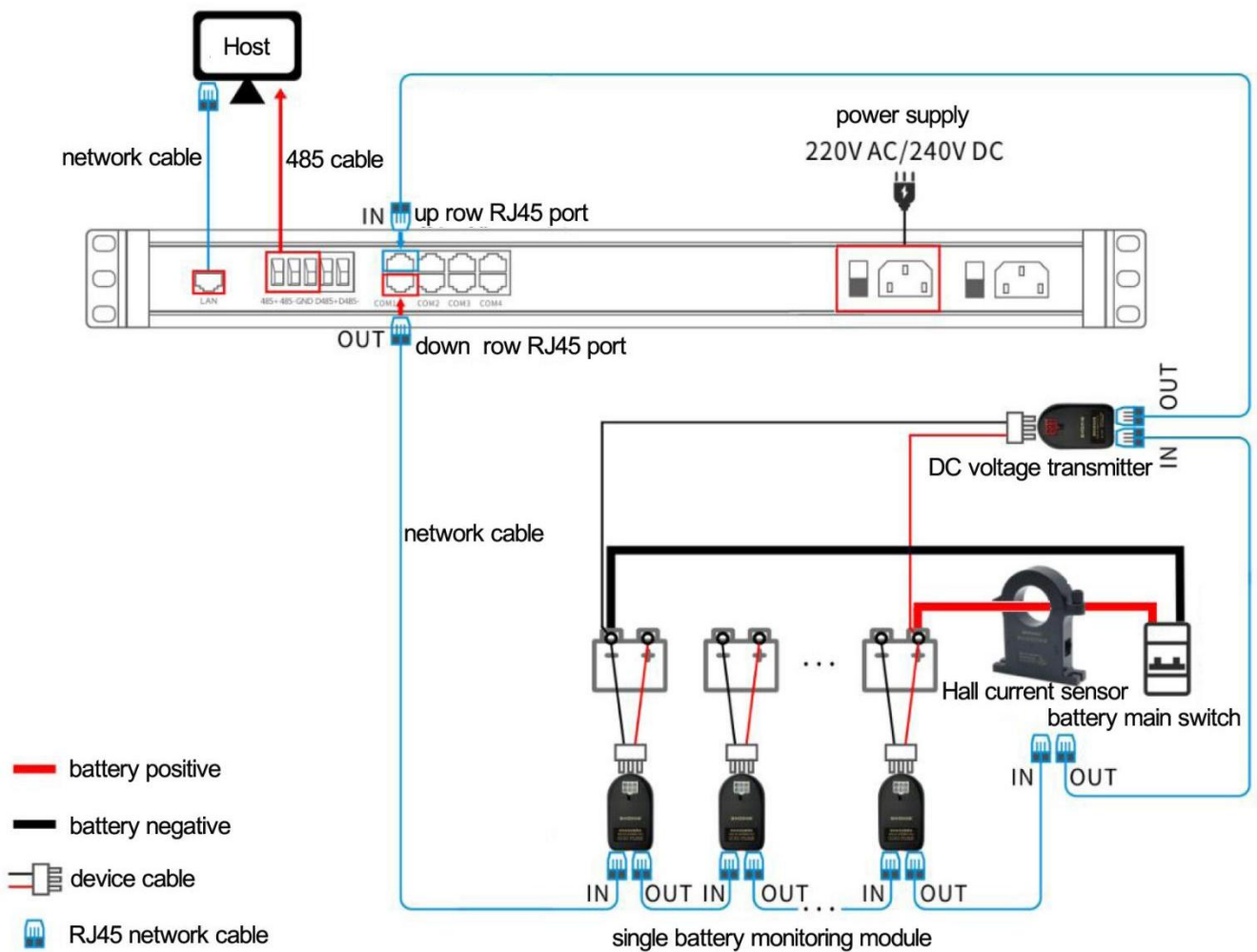
3.4 Hall current sensor wiring



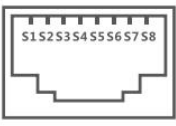
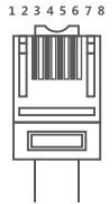
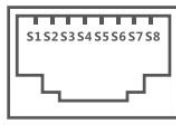
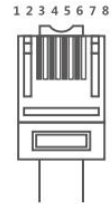
Unscrew the Hall coil fixing screw of Hall current sensor, insert the positive or negative wire of the battery pack into the coil, fix the Hall coil with the screw, and tie it to keep the relative position of the line and the Hall coil fixed.

Special attention: When wiring, pay special attention to the current direction of the positive or negative wire. The current direction should be consistent with the direction indicated by the arrow on the film on the upper surface of the device.

3.5 Wiring between each module and battery monitoring host



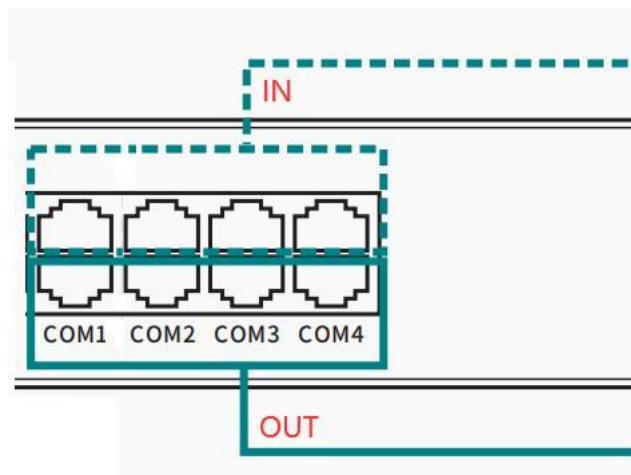
RJ45 port line sequence description of battery monitoring host COM1 to COM4 ports, Hall current sensor , DC voltage transmitter and single battery monitoring module:

IN	Line sequence	PIN	OUT	Line sequence	PIN
  RJ45 connector	S1(orange white)	TXD	  RJ45 connector	S1(orange white)	TXD
	S2(orange)	RXD		S2(orange)	RXD
	S3(green white)	DIN		S3(green white)	DOOUT
	S4(blue)	GND		S4(blue)	GND
	S5(blue white)	12V+		S5(blue white)	12V+
	S6(green)	GND		S6(green)	GND
	S7(brown white)	12V+		S7(brown white)	12V+
	S8(brown)	GND		S8(brown)	GND

The battery monitoring host has a total of 4 sets of COM ports (as shown in the figure below).

COM1 to COM4 are SNS bus ports. Each group of COM ports has two RJ45 interfaces, corresponding to a group of monitoring loops. The lower row (near the lower surface of the host) is the OUT port, and the upper row is the IN port.

When using loop connection, each group of monitoring loops must be connected to the IN/OUT port of the same group of COMs. Each group of monitoring loops can connect up to 64 single battery modules, 4 Hall current sensor, 1 DC voltage transmitter. There is no requirement for the order in which different modules are connected, but it is recommended that the Hall current sensor and DC voltage transmitter is connected to the front of the loop to facilitate confirmation of its address in the loop and debugging.



Wiring steps:

- (1). The battery monitoring host network port is connected to Ethernet, and the power port is connected to 220V AC or 240V DC through the power cord.
- (2). The battery monitoring host, Hall current sensor, DC voltage transmitter and single battery monitoring module are connected in a loop through the SNS bus port communication line.
- (3). Loop connection: The OUT port of the battery monitoring host and the IN port of the first module are connected through the SNS bus port communication line, and the OUT interface of the previous module and the IN port of the subsequent module are connected through the SNS bus port communication line. The OUT port of the last module is then connected to the IN port of the battery monitoring host to form a loop.
- (4). It is generally recommended to use loop connection. Users can also use single-line connection, that is, the OUT port of the last module is not connected to the IN port of the battery monitoring host. However, when using this connection method, a failure in the communication part of a certain module will cause all subsequent modules to be offline.

Special attention:

- (1) When using loop connection, each group of loops must be connected to the same group of COM IN/OUT ports of the battery monitoring host;
- (2) When using the single-wire connection method, the IN port of the first module must be connected to the OUT port of the battery monitoring host instead of the IN port;
- (3) The IN and OUT of each device cannot be reversely connected, otherwise it will cause errors in device address allocation and cause communication failures. When there is a communication failure between the single battery module and the group voltage transmitter, the device indicator light stays on without flashing.

4. Debugging

4.1 Confirmation before power-on and debugging

Before powering on and debugging, please be sure to confirm that the product wiring is normal:

- Confirm that the DC voltage transmitter is not mistakenly connected to the single battery monitoring module;
- Confirm that the wiring between each single battery monitoring module and the battery is normal, the black wire is connected to the negative pole, and the red wire is connected to the positive pole;
- Confirm that the wiring between the DC voltage transmitter and the battery pack is normal, with the black wire connected to the negative pole and the red wire connected to the positive pole;
- Confirm that the current direction of the battery pack wire under test passing through the Hall current sensor is consistent with the direction of the film mark.

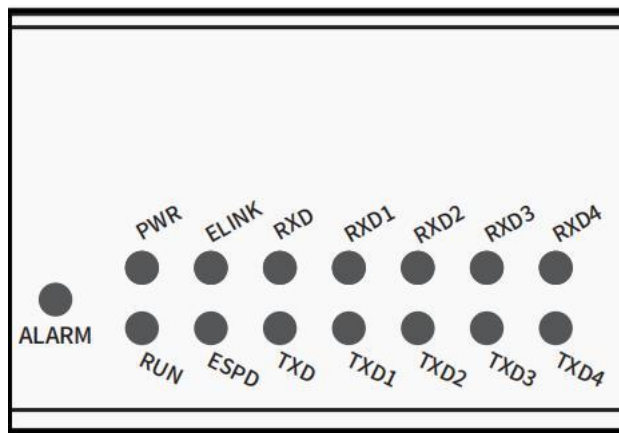
- Confirm that the communication cables between modules are wired correctly. The OUT interface of the upper-level module is connected to the IN interface of the lower-level acquisition module. Do not connect IN to IN or OUT to OUT.

6. Confirm that the LAN port of the battery monitoring host is connected to the network.

4.2 System power on

After powering on, check the status of the indicator lights of each device in turn to confirm that each device is working properly.

4.2.1 Battery monitoring host



ITEM	Explanation	ITEM	Explanation
PWR	Power indicator lighter	RUN	Running lights
ELINK	When the light is on, it means the network is connected; when it flashes, it means there is data in the network port.	ESPD	The light on means 100M, the light off means 10M or the network cable is not connected.
RXD	Upload RS485 data receiving indicator light	TXD	Upload RS485 data sending indicator light
RXD1~RXD4	COM1~COM4 Download data receiving indicator lights	TXD1~TXD4	COM1~COM4 Download data sending indicator light
ALARM	Alarm indicator light	/	/

4.2. 2 Hall current sensor, DC voltage transmitter, single battery monitoring module

Item	Explanation
Indicator light is on	Device is powered.
Indicator light flash slowly	Device communication is normal.
Indicator light flash quickly	Device is collecting battery inner resistance (single battery monitoring module).

Note: The indicator light of DC voltage transmitter does not have the status of quick flashing.

After powering on, if the communication wiring is abnormal, the device indicator light will stay on.

Please carefully check whether the communication cable connection method is correct.

Communication is normal. The indicator light flashes slowly (communication status) at a frequency close to once per second. After flashing ten times, it will stay on for a few seconds (non-communication status) and continue to flash slowly for the next set of ten times.

5. Common problems and solutions

5.1 Hall current sensor, DC voltage transmitter, single battery monitoring module

Issue	Reason	Method
Device light is not on	Power fault	Check the device is powered normally or not
Device light is always on	Communication cable fault	Check the device communication cable is connect well or not

5.2 Battery monitoring host

Issue	Reason	Method
PWR light is not on	Power fault	Check the device is powered normally or not
RXD/TXD light stays on and does not flash during the communication process.	RS485/SNS bus port line failure	Check the device RS485/SNS communication cable is connect well or not
RUN light is not on	Power fault	Check the device is powered normally or not