

daier 5S 15A 18.5V Li-ion 18650 BMS Protection Board User Manual

Model: E1080

1. Introduction

This manual provides essential instructions for the proper installation, operation, and maintenance of the daier 5S 15A 18.5V Lithium Li-ion 18650 Battery Packs BMS Protection PCB Board (Model E1080). This board is designed to protect 5-series lithium-ion battery packs, ensuring their longevity and safe operation.

2. Product Overview

The daier 5S BMS (Battery Management System) is a high-current protection board specifically designed for 5-string 3.7V/4.2V lithium battery packs. It integrates multiple protection features to safeguard your battery pack from common electrical issues, thereby extending its lifespan and ensuring user safety.

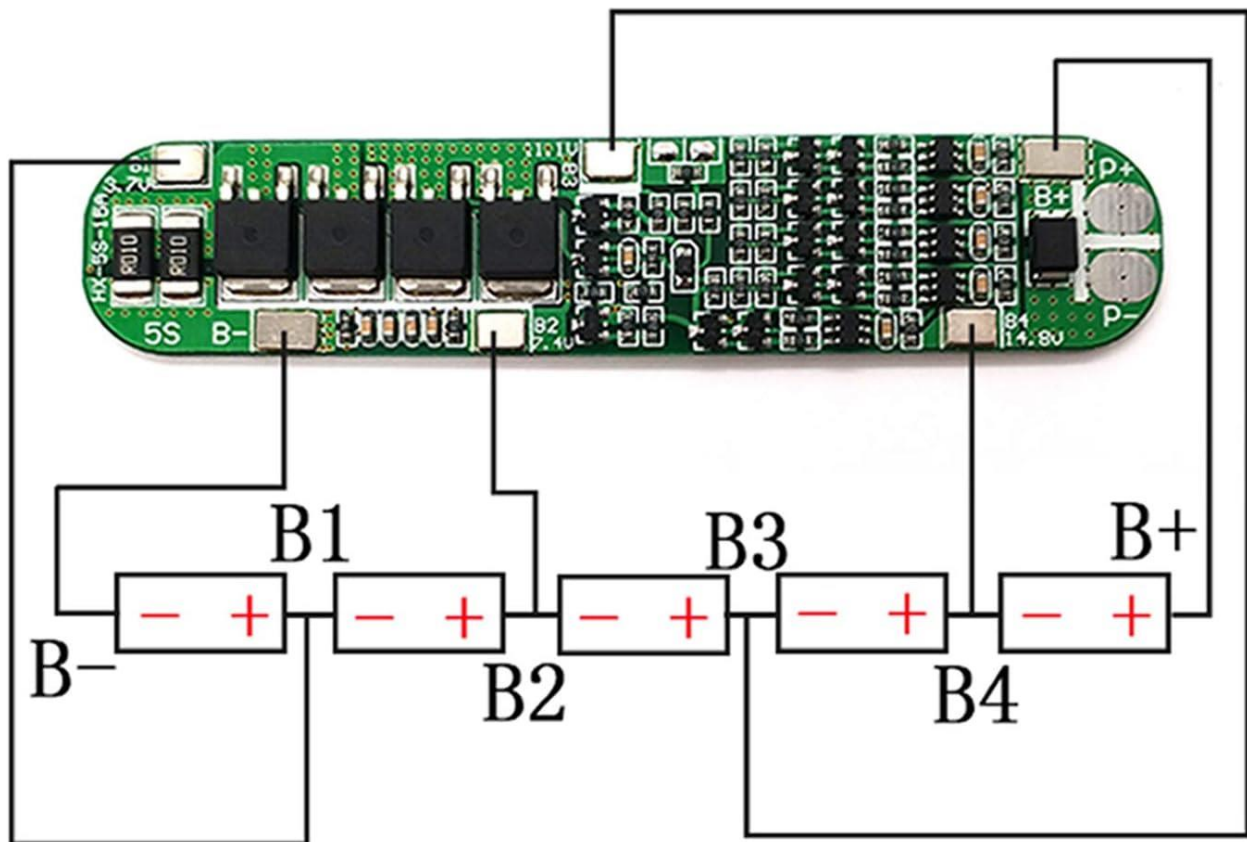


Figure 1: Top-down view of the daier 5S 15A BMS Protection PCB Board, showing components and solder pads.

Key features include:

- Overcharge protection
- Over-discharge protection
- Over-current protection
- Short circuit protection

3. Specifications

Parameter	Value
PCB Board Size (approx.)	88 x 17 x 3 mm
Battery Type	5-string 3.7V/4.2V Lithium Li-ion (e.g., 18650)
Continuous Discharge Current	15A (max)
Instantaneous Discharge Current	25A
Charge Voltage	21V
Charging Current	15A (max)
Over-charge Detect Voltage	4.28 ± 0.05 V
Over-charge Release Voltage	4.28 ± 0.05 V
Over-charge Protect Delay	0.5 S
Over-discharge Detect Voltage	2.55 ± 0.08 V
Over-discharge Detect Delay	250 μ S
Current Detect Voltage	150 mV
Current Detect Delay	9 mS
Current Detect Threshold	30 ± 3 A

4. Setup and Installation

Careful wiring is crucial for the correct and safe operation of the BMS board. Please follow the diagram below precisely. Ensure all connections are secure and properly insulated to prevent short circuits.

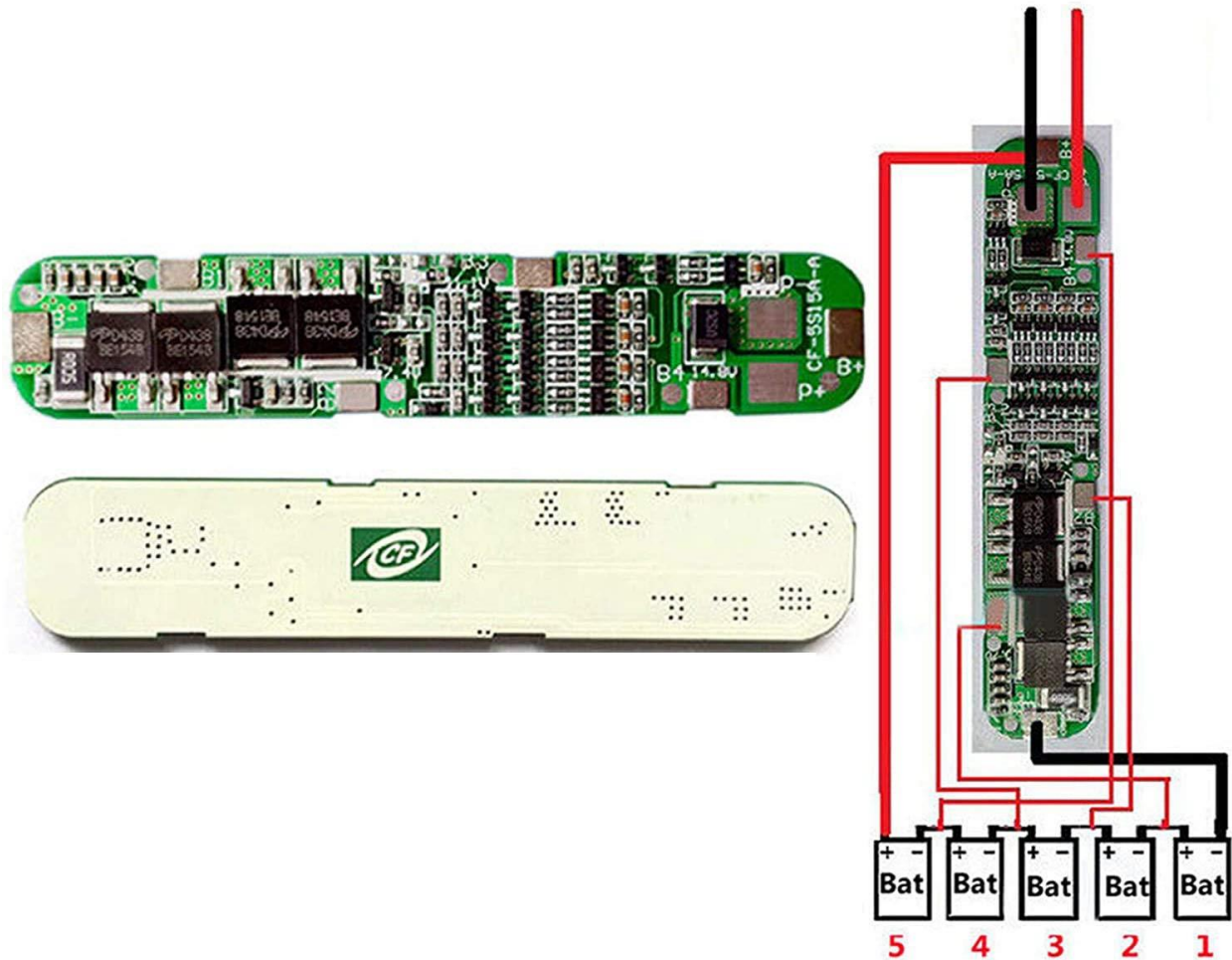


Figure 2: Wiring diagram illustrating the connection of the 5S BMS board to five 18650 lithium-ion cells in series.

Wiring Instructions:

1. **B- (Battery Negative):** Connect the main negative terminal of the entire 5-cell battery pack to the B- pad on the BMS board.
2. **B1:** Connect the positive terminal of the first cell (Cell 1) and the negative terminal of the second cell (Cell 2) to the B1 pad. This is the balance wire for the first series connection.

3. **B2:** Connect the positive terminal of the second cell (Cell 2) and the negative terminal of the third cell (Cell 3) to the B2 pad. This is the balance wire for the second series connection.
4. **B3:** Connect the positive terminal of the third cell (Cell 3) and the negative terminal of the fourth cell (Cell 4) to the B3 pad. This is the balance wire for the third series connection.
5. **B4:** Connect the positive terminal of the fourth cell (Cell 4) and the negative terminal of the fifth cell (Cell 5) to the B4 pad. This is the balance wire for the fourth series connection.
6. **B+ (Battery Positive):** Connect the main positive terminal of the entire 5-cell battery pack (which is the positive terminal of Cell 5) to the B+ pad on the BMS board.
7. **P- (Output Negative):** This is the negative terminal for both charging and discharging. Connect your load's negative terminal and charger's negative terminal here.
8. **P+ (Output Positive):** This is the positive terminal for both charging and discharging. Connect your load's positive terminal and charger's positive terminal here. Note that P+ is typically directly connected to B+ on many BMS designs, but always verify with the specific board and diagram. In this diagram, P+ is shown connected to B+.

Important: Always connect the balance wires (B1-B4) before connecting the main B- and B+ terminals. Incorrect wiring can damage the BMS board and/or the battery pack.

5. Operating Principles

The BMS board continuously monitors the voltage of each cell in the battery pack, as well as the overall current flowing through the pack. When any of the following conditions are detected, the BMS will activate its protection mechanisms:

- **Overcharge Protection:** If any cell voltage exceeds the over-charge detect voltage ($4.28V \pm 0.05V$), the BMS will stop charging to prevent cell damage.
- **Over-discharge Protection:** If any cell voltage drops below the over-discharge detect voltage ($2.55V \pm 0.08V$), the BMS will stop discharging to prevent irreversible cell damage.
- **Over-current Protection:** If the discharge current exceeds the instantaneous discharge current (25A) or continuous discharge current (15A), the BMS will cut off the output to protect the cells and the board itself.

- **Short Circuit Protection:** In the event of a short circuit at the output terminals, the BMS will immediately cut off the power to prevent damage and potential hazards.

Once a protection event occurs, the BMS will typically resume normal operation once the fault condition is removed (e.g., charger disconnected, load reduced, short circuit cleared).

6. Maintenance

The daier 5S BMS board is designed for reliable operation with minimal maintenance. However, adhering to the following guidelines can help ensure its longevity:

- **Keep Dry:** Avoid exposing the board to moisture or liquids.
- **Cleanliness:** Keep the board free from dust and debris. Use a soft, dry brush if cleaning is necessary.
- **Temperature:** Operate the board within its specified temperature range. Avoid extreme heat or cold.
- **Insulation:** Ensure all connections are properly insulated to prevent accidental short circuits.
- **Regular Inspection:** Periodically inspect the board and connections for any signs of damage, corrosion, or loose wiring.

7. Troubleshooting

If you encounter issues with your daier 5S BMS board, consider the following common troubleshooting steps:

Problem	Possible Cause	Solution
No output voltage (P+ / P-)	○ Over-discharge protection activated ○ Short circuit activated ○ Incorrect wiring ○ Damaged BMS board	○ Charge the battery pack to above the over-discharge release voltage. ○ Check for short circuits in the load or wiring. ○ Verify all wiring connections against the diagram (Figure 2). ○ Inspect the board for visible damage.
Battery not charging	○ Overcharge protection activated ○ Charger issue ○ Incorrect wiring	○ Check individual cell voltages; if any are too high, the BMS will prevent further charging. ○ Ensure the charger is functioning correctly and provides the correct voltage (21V). ○ Verify wiring, especially to B+ and P+.
BMS board gets hot	○ Excessive current draw ○ Internal fault	○ Reduce the load to stay within the continuous discharge current limit (15A). ○ Disconnect power and inspect the board for damage. If heating persists at low loads, the board may be faulty.

If the problem persists after attempting these solutions, please contact customer support.

8. Warranty and Support

For warranty information and technical support regarding your daier 5S 15A 18.5V Li-ion 18650 BMS Protection Board, please refer to the purchase documentation or contact your retailer. You may also visit the official daier website for further assistance and contact details.

Contact Information:

- **Brand:** daier
- **Manufacturer:** daier
- For specific support, please refer to the contact details provided at the point of purchase or on the official daier website.