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› XBERSTAR DIY 12V 4-String 18650 Lithium Battery Management System (BMS) Protection Board User Manual

XBERSTAR 4S30A-LONG

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Model: 4S30A-LONG

1. INTRODUCTION

The XBERSTAR DIY 12V 4-String 18650 Lithium Battery Management System (BMS) Protection Board is designed for assembling 18650 lithium battery packs without the need for welding. This board provides essential protection and management features for 4-series battery configurations, ensuring safe and efficient operation of your DIY battery projects.

2. SAFETY PRECAUTIONS

- Always handle lithium batteries with extreme care. Incorrect handling can lead to fire, explosion, or personal injury.
- Ensure correct polarity when inserting batteries into the holder. Reversing polarity can damage the BMS board and batteries.
- Do not short-circuit the battery pack terminals.
- Use only a compatible 16.8V DC charger for charging the battery pack.
- Avoid exceeding the recommended charging and discharging currents specified for the board and your 18650 cells.
- Keep the board and battery pack away from water, moisture, and extreme temperatures.

3. PACKAGE CONTENTS

Verify that all items are present upon opening the package:

- 1 x XBERSTAR 4S30A-LONG BMS Protection Board
- 1 x Balance Cable (multi-pin connector)

4. SETUP AND ASSEMBLY

This board facilitates easy, no-welding assembly of 4-series 18650 lithium battery packs. The design allows for direct output and use of the assembled battery.

4.1 Battery Configuration

The board supports various parallel configurations within the 4-series setup:

- **4s1p:** 4 batteries in series (total 4 cells)
- **4s2p:** 4 series, 2 parallel (total 8 cells)
- **4s4p:** 4 series, 4 parallel (total 16 cells)

For example, using 3000mAh 18650 cells:

- 4s1p configuration yields approximately 15V 3Ah.
- 4s2p configuration yields approximately 15V 6Ah.
- 4s4p configuration yields approximately 15V 12Ah.

You can stack the number of battery packs according to your specific capacity requirements.

4.2 Assembly Steps

1. **Insert 18650 Cells:** Carefully insert your 18650 lithium cells into the designated slots on the board, ensuring correct positive (+) and negative (-) polarity for each cell. The board is designed for a secure, welding-free connection.
2. **Connect Balance Cable:** Plug the included balance cable into the multi-pin connector on the smaller BMS module attached to the main board. Ensure it is fully seated. This cable is crucial for voltage equalization and balanced charging.
3. **Output Connections:** Connect your load or charging input to the appropriate terminals on the board. The board features screw terminals for secure connections.



Figure 1: Top view of the XBERSTAR 4S30A-LONG BMS Protection Board, showing the main circuit, BMS module, and connection terminals.

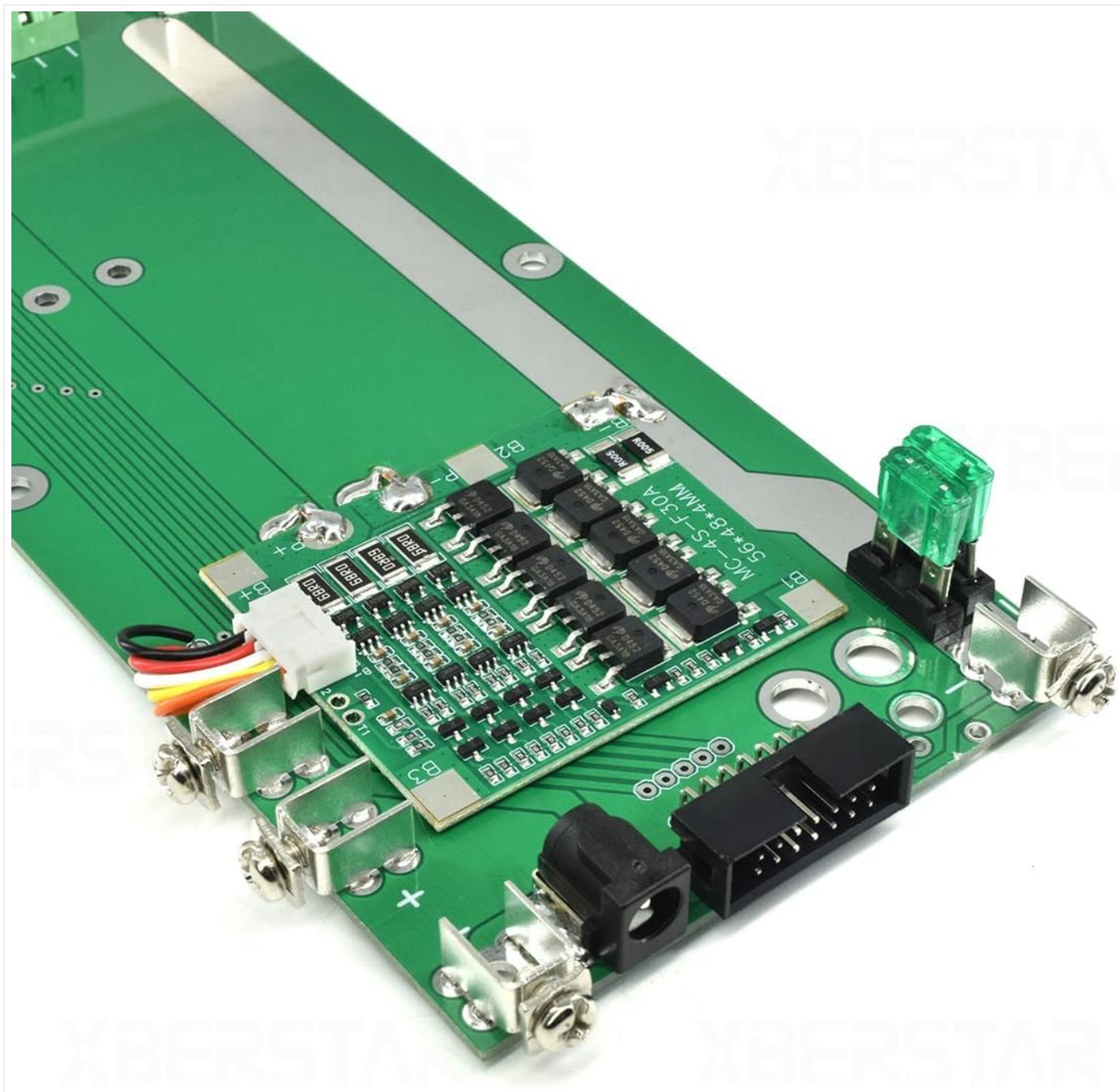


Figure 2: Close-up of the BMS module, highlighting the balance cable connector and individual cell monitoring points.

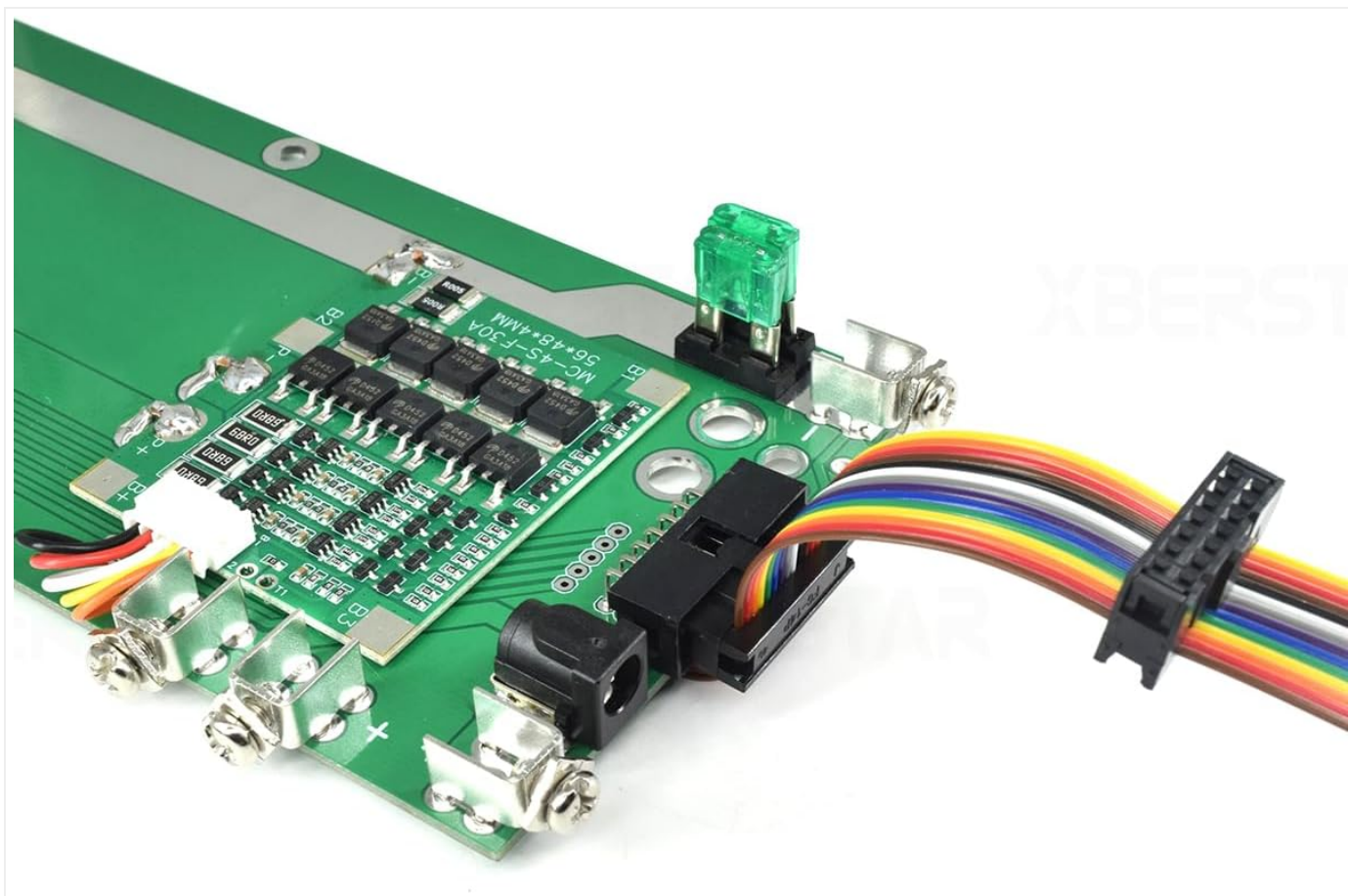


Figure 3: The balance cable properly connected to the BMS module, essential for balanced charging and discharge.

5. OPERATING INSTRUCTIONS

Once assembled, the battery pack with the BMS board is ready for use.

5.1 Charging

- Connect a **16.8V DC charger** to the designated charging input port (e.g., DC power plug or Micro-USB, if applicable).
- It is recommended that the charging current for each layer (parallel group) should not exceed 1A to ensure optimal battery health and longevity.
- The BMS board includes balance charging functionality to ensure all cells in the series are charged to a similar voltage level.

5.2 Discharging

- Connect your load to the output terminals of the battery pack.
- The BMS board provides discharge protection, including over-discharge current protection, to prevent damage to the batteries.

6. MAINTENANCE

- **Regular Inspection:** Periodically check all battery connections and terminal screws to ensure they are secure.
- **Cleanliness:** Keep the board clean and free from dust, dirt, and debris. Use a soft, dry cloth for cleaning.
- **Storage:** When not in use for extended periods, store the battery pack in a cool, dry environment, ideally at a partial charge (around 50%).
- **Fuse Check:** Each board has a 15A fuse. If a battery issue occurs, check the fuse for continuity. Replace with an

identical fuse if blown.

7. TROUBLESHOOTING

Problem	Possible Cause	Solution
No output from battery pack	• Incorrect battery insertion/polarity • Blown fuse • Over-discharge protection activated • Loose connections	• Verify all battery polarities are correct. • Check the 15A fuse on the board and replace if blown. • Charge the battery pack to reset over-discharge protection. • Ensure all terminal connections are tight.
Battery pack not charging	• Incorrect charger voltage • Loose charging cable connection • Balance cable not connected • Over-charge protection activated	• Confirm charger is 16.8V DC. • Ensure charging cable is securely connected. • Verify the balance cable is properly plugged into the BMS module. • Allow the battery to discharge slightly if over-charge protection is active.
One or more cells unbalanced	• Balance cable not connected or faulty • Significant cell voltage difference	• Ensure balance cable is correctly connected. • Allow the BMS to balance cells during charging. This may take time if cells are significantly unbalanced.

8. SPECIFICATIONS

- **Brand:** XBERSTAR
- **Model Number:** 4S30A-LONG
- **Input Voltage (Nominal):** 15 Volts (for the 4-series battery system)
- **Output Voltage (Nominal):** 12 Volts (for the 4-series battery system)
- **Item Weight:** 0.14 Kilograms
- **Plug Type:** DC power plug, Micro-USB (for charging/auxiliary connections)
- **Dimensions:** Approximately 18.7 cm x 8.5 cm (Length x Width)
- **Individual Cell Fuse:** 15A per battery slot
- **Protection Features:** Charge/discharge protection, discharge current protection, temperature protection, voltage equalization, balance charging.

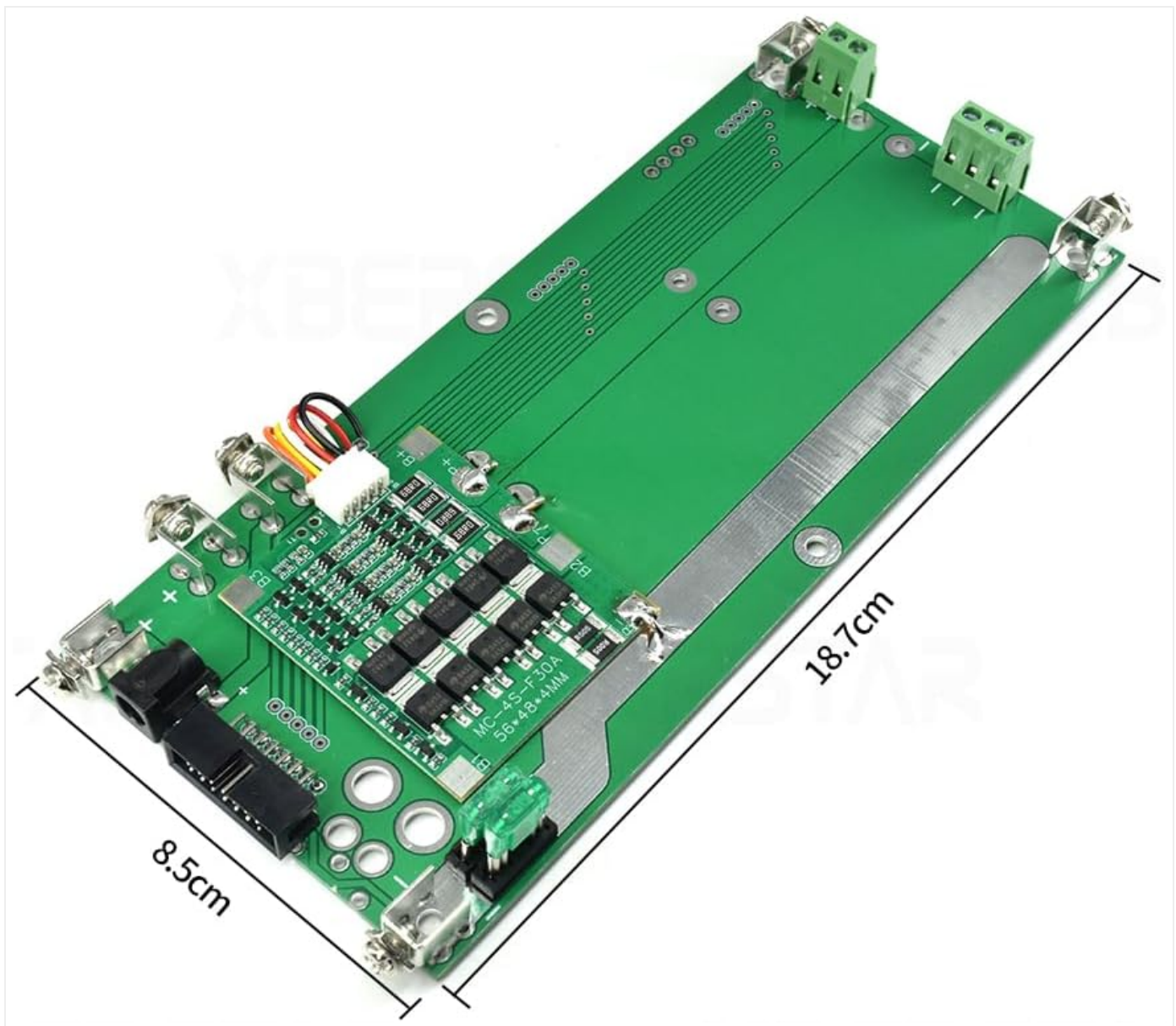


Figure 4: Dimensions of the XBERSTAR 4S30A-LONG BMS Protection Board.

9. WARRANTY AND SUPPORT

For warranty information, technical assistance, or product support, please contact XBERSTAR customer service through your original retailer or visit the official XBERSTAR website. Please have your product model number (4S30A-LONG) and purchase details available when seeking support.

