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› [Taidacent HP24SA 16S Lifepo4 40A Battery Protection Board User Manual](#)

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Taidacent HP24SA 16S LiFePO4 40A Battery Protection Board User Manual

Model: HP24SA 16S LiFePO4 40A

1. INTRODUCTION

The Taidacent HP24SA Battery Protection Board is a sophisticated Battery Management System (BMS) designed to safeguard LiFePO4 battery packs. This board provides essential protection functions including over-charge, over-discharge, over-current, short-circuit, and temperature control, ensuring the longevity and safe operation of your battery system. It also features cell balancing to maintain optimal battery performance.

This manual provides detailed instructions for the installation, operation, and maintenance of the HP24SA 16S LiFePO4 40A model.

2. SAFETY INFORMATION

Please read and understand all safety instructions before installing or operating this device. Failure to follow these instructions may result in electric shock, fire, or serious injury.

- **Professional Installation:** Installation should only be performed by qualified personnel with experience in battery systems and electronics.
- **Battery Handling:** Always handle batteries with care. Avoid short-circuiting battery terminals.
- **Voltage Precautions:** High voltages can be present. Ensure all power sources are disconnected before making any connections.
- **Environmental Conditions:** Do not expose the board to moisture, extreme temperatures, or corrosive environments.
- **Correct Wiring:** Verify all wiring connections are correct and secure before applying power. Incorrect wiring can damage the board and battery.

3. PRODUCT OVERVIEW

The Taidacent HP24SA series protection board is designed for various lithium battery chemistries and cell configurations. This specific model, the 16S LiFePO4 40A, is configured for 16 series LiFePO4 cells with a continuous discharge current limit of 40A.

Key features include:

- Over-charge protection
- Over-discharge protection
- Over-current protection
- Short-circuit protection
- Temperature control protection
- Cell balancing function



Figure 1: Taidacent HP24SA Battery Protection Board with included wiring harness.

4. SPECIFICATIONS

Parameter	Value (16S LiFePO4 40A)
Applicable Battery Type	LiFePO4 (Lithium Iron Phosphate)
Nominal Battery Voltage (LiFePO4)	3.2V per cell
Protection Parameter Range (LiFePO4)	2.5V-3.65V (typical), 2.1V-3.75V (extended)
Number of Series Cells	16S
Continuous Discharge Current Limit	40A

Parameter	Value (16S LiFePO4 40A)
Applicable Models	Two-wheeler (e.g., electric bikes, scooters)
Motor Power (corresponding to 40A)	Within 1200W
Controller Current Limit (corresponding to 40A)	Within 35A
Dimensions	87 × 95 × 10mm
Short Circuit Protection Trigger	External load short circuit
Short Circuit Detection Delay	200uS
Short Circuit Release Condition	Load disconnection / Charge activation
Discharge Over-temperature Protection	75 ± 5 °C
Discharge High Temperature Release	53 ± 14C
Working Power Consumption	<50uA
Operating Temperature Range	-20C to +80C

5. SETUP AND INSTALLATION

Careful wiring is critical for the correct operation and safety of the BMS. Follow these steps precisely.

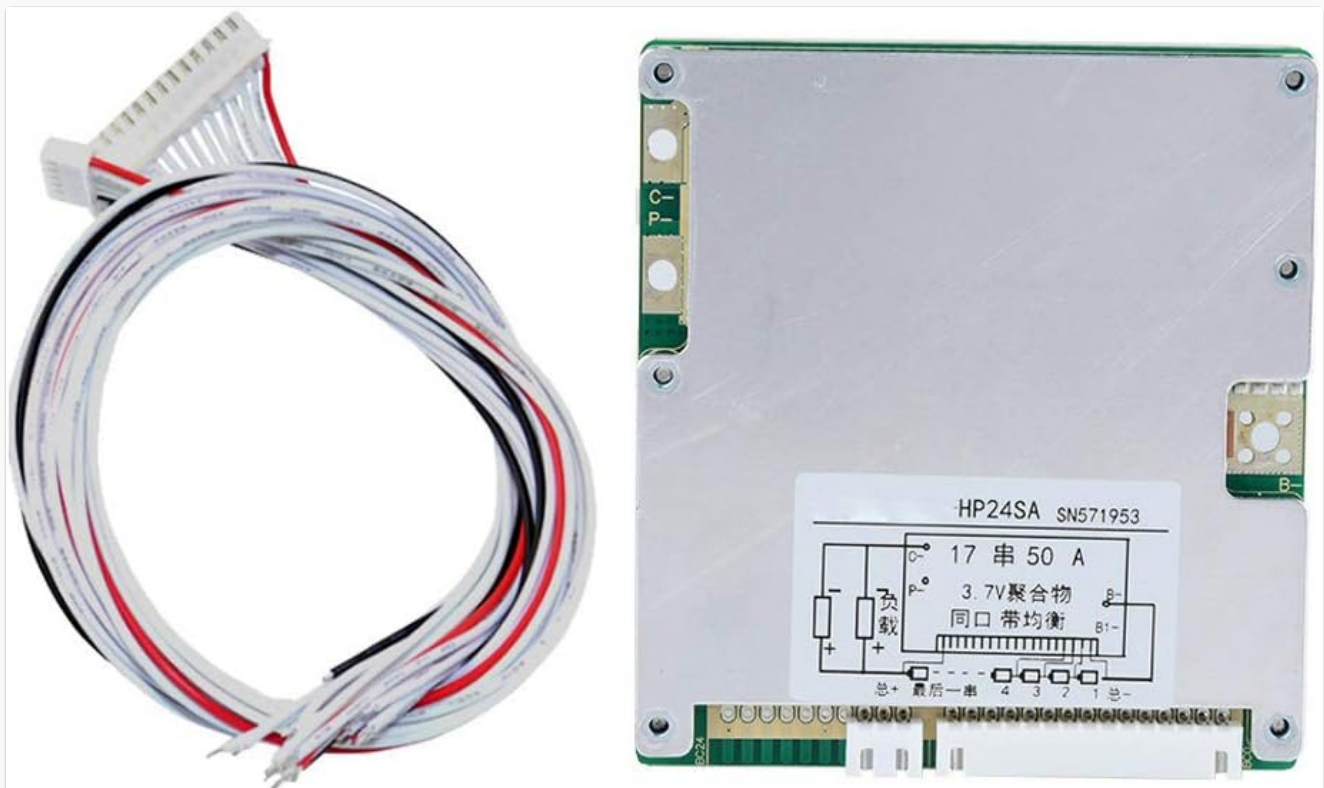


Figure 2: Top view of the Taidacent HP24SA board, highlighting connection terminals.

Wiring Procedure:

- 1. Prepare Battery Pack:** Ensure your 16S LiFePO4 battery pack is fully assembled and each cell's voltage is within a healthy range.

2. **Connect B- Terminal:** Connect the thick negative wire from the battery pack (the overall negative terminal) to the **B-** terminal on the protection board. This is typically the largest negative pad.
3. **Connect Balance Wires:** Starting from the lowest cell (B1), connect the balance wires from your battery pack to the corresponding balance port on the BMS. Ensure the order is correct (B1, B2, B3... up to B16). The last balance wire connects to the positive terminal of the 16th cell (the overall positive terminal of the battery pack). *Double-check each balance wire connection for correct voltage and polarity.*
4. **Connect P- Terminal (Load/Discharge):** Connect the negative terminal of your load (e.g., motor controller) to the **P-** terminal on the protection board. This is the discharge output.
5. **Connect C- Terminal (Charge):** If using a separate charging port, connect the negative terminal of your charger to the **C-** terminal on the protection board. If using a common charge/discharge port, P- and C- might be combined or share the same connection point. Refer to the specific board's silkscreen for clarification.
6. **Connect Battery Pack Positive:** The positive terminal of the battery pack (the positive of the 16th cell) connects directly to the positive terminal of your load and charger. The BMS typically only manages the negative side of the circuit.

Important: Always connect the B- first, then the balance wires, and finally the P- and C- terminals. Disconnect in the reverse order.

6. OPERATING INSTRUCTIONS

Once correctly installed, the Taidacent HP24SA BMS operates automatically to manage and protect your battery pack.

- **Charging:** Connect your charger to the battery pack (via the C- terminal on the BMS if applicable, and directly to the pack's positive). The BMS will monitor cell voltages and terminate charging if any cell reaches its over-charge protection voltage.
- **Discharging:** Connect your load to the battery pack (via the P- terminal on the BMS and directly to the pack's positive). The BMS will monitor cell voltages and current, terminating discharge if any cell reaches its over-discharge protection voltage or if the current exceeds the limit.
- **Balancing:** The integrated balancing function works to equalize the voltage across all cells in the pack, typically during charging or when the battery is at rest, to maximize pack capacity and lifespan.
- **Protection Activation:** If any protection threshold is exceeded (e.g., over-current, short-circuit, over-temperature), the BMS will temporarily cut off the output to protect the battery.

7. MAINTENANCE

Minimal maintenance is required for the HP24SA protection board. Adhere to the following guidelines:

- **Keep Clean and Dry:** Ensure the board remains free from dust, dirt, and moisture.
- **Inspect Connections:** Periodically check all wiring connections for tightness and signs of corrosion or damage.
- **Avoid Physical Damage:** Protect the board from impacts or excessive vibration.
- **Temperature Control:** Operate the battery system within the specified temperature range (-20C to +80C) to prevent thermal stress on the BMS.

8. TROUBLESHOOTING

If you encounter issues with your Taidacent HP24SA BMS, consider the following troubleshooting steps:

- **No Output Power:**

- Check all wiring connections for looseness or incorrect polarity.
 - Measure the voltage of each cell in the battery pack. If any cell is below the over-discharge protection threshold, the BMS will cut off output. Recharge the battery pack.
 - Check for a short circuit on the output (P-). The BMS will activate short-circuit protection. Disconnect the load and reconnect after a few seconds.
 - Verify the overall battery pack voltage is within the operational range.
- **Charging Stops Prematurely:**
 - One or more cells may have reached the over-charge protection voltage. The BMS will stop charging to prevent damage.
 - Check the charger's output voltage and current.
- **BMS Overheating:**
 - Ensure adequate ventilation around the BMS.
 - Reduce the load current if it consistently approaches the maximum limit.
 - The BMS may have activated over-temperature protection. Allow it to cool down.
- **Unbalanced Cell Voltages:**
 - Ensure balance wires are correctly connected and not damaged.
 - Allow the battery pack to rest or charge for an extended period to allow the balancing function to work.

9. WARRANTY AND SUPPORT

Specific warranty information for the Taidacent HP24SA Battery Protection Board is not provided in the product details. For warranty claims, technical support, or further inquiries, please contact your retailer or the manufacturer directly.

Manufacturer: Taida

For additional support, please visit the [Taidacent Store on Amazon](#).