heltec bms HT-10C

Heltec BMS HT-10C Battery Equalizer User Manual

Model: HT-10C

Introduction

The Heltec BMS HT-10C Battery Equalizer is designed to maintain voltage balance between two series-connected 12V batteries, including Gel, Flood, and AGM Lead Acid types. This device ensures optimal battery performance and extends battery lifespan by preventing overcharge and over-discharge conditions between individual batteries in a series bank. It actively transfers energy from higher voltage batteries to lower voltage batteries, ensuring all batteries in the series remain at a balanced voltage level.

Image: Front view of the HT-10C Battery Equalizer, displaying its screen with battery voltage readings and charge status. The screen shows "Bat.1 12.4V" and "Bat.2 00.0V" with a 36% charge indicator, along with "B03" and control buttons labeled "SET" and "DOWN".

Key Features

- **Battery Energy Transfer:** Functions as a practical and multi-functional battery equalizer, providing protection against battery overshoot and over-discharge.
- **Voltage Balancing:** Specifically designed for batteries connected in series to maintain equal voltage levels across them.
- **Automatic Operation:** The equalizer activates when a voltage difference between two batteries exceeds a specified threshold (e.g., 50 millivolts), transferring current from the higher voltage battery to the lower voltage battery.
- **Durable Construction:** Features a robust shell designed for long-serving life.
- **Wide Application:** Compatible with various battery types including Lead-Acid, Gel, Flood, and AGM batteries.

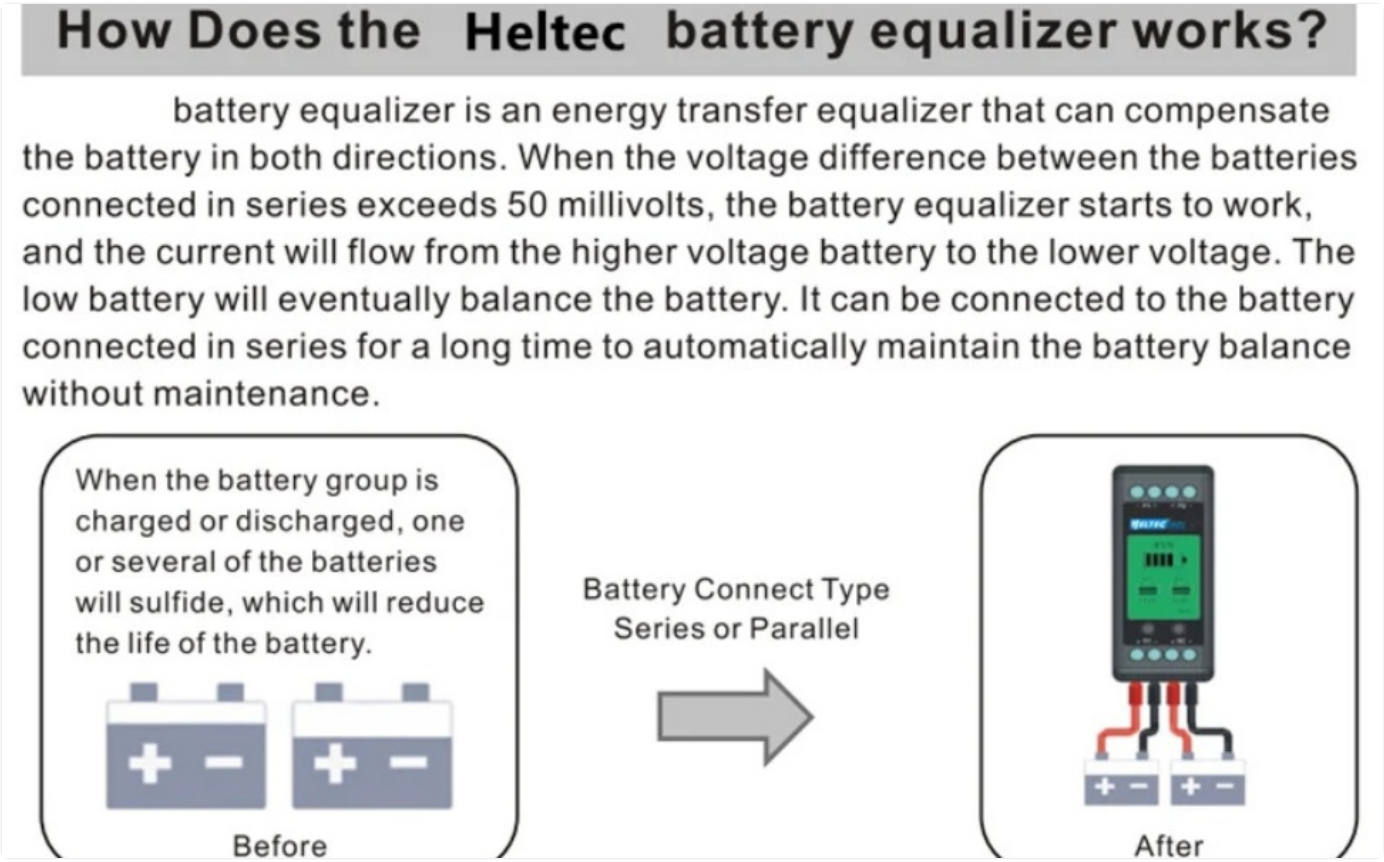


Image: Diagram illustrating the working principle of the Heltec battery equalizer. It shows that the equalizer is an energy transfer device that compensates for voltage differences. When the voltage difference exceeds 50 millivolts, current flows from the higher voltage battery to the lower voltage battery, automatically maintaining balance. It also depicts how sulfation can occur in unbalanced batteries ("Before") and how the equalizer helps maintain balance ("After") for series or parallel connections.

Specifications

Attribute	Value
Model No.	HT-10C
LCD Display	Yes
Rated Voltage Scope	7-18V

Attribute	Value
Optimizing Current	0-10A
Quiescent Current	10mA
Connection Method	Parallel Connect or Series Connect
Multi-module Parallel Connection	Support
Product Size	85*75*30mm
Product Weight	160g
Item Weight (from product data)	5.3 ounces (0.15 Kilograms)
Output Voltage (from product data)	24 Volts (DC)
Input Voltage (from product data)	24 Volts

Note: Some specifications are derived from the product data and may represent system-level parameters rather than the equalizer's direct input/output for balancing.

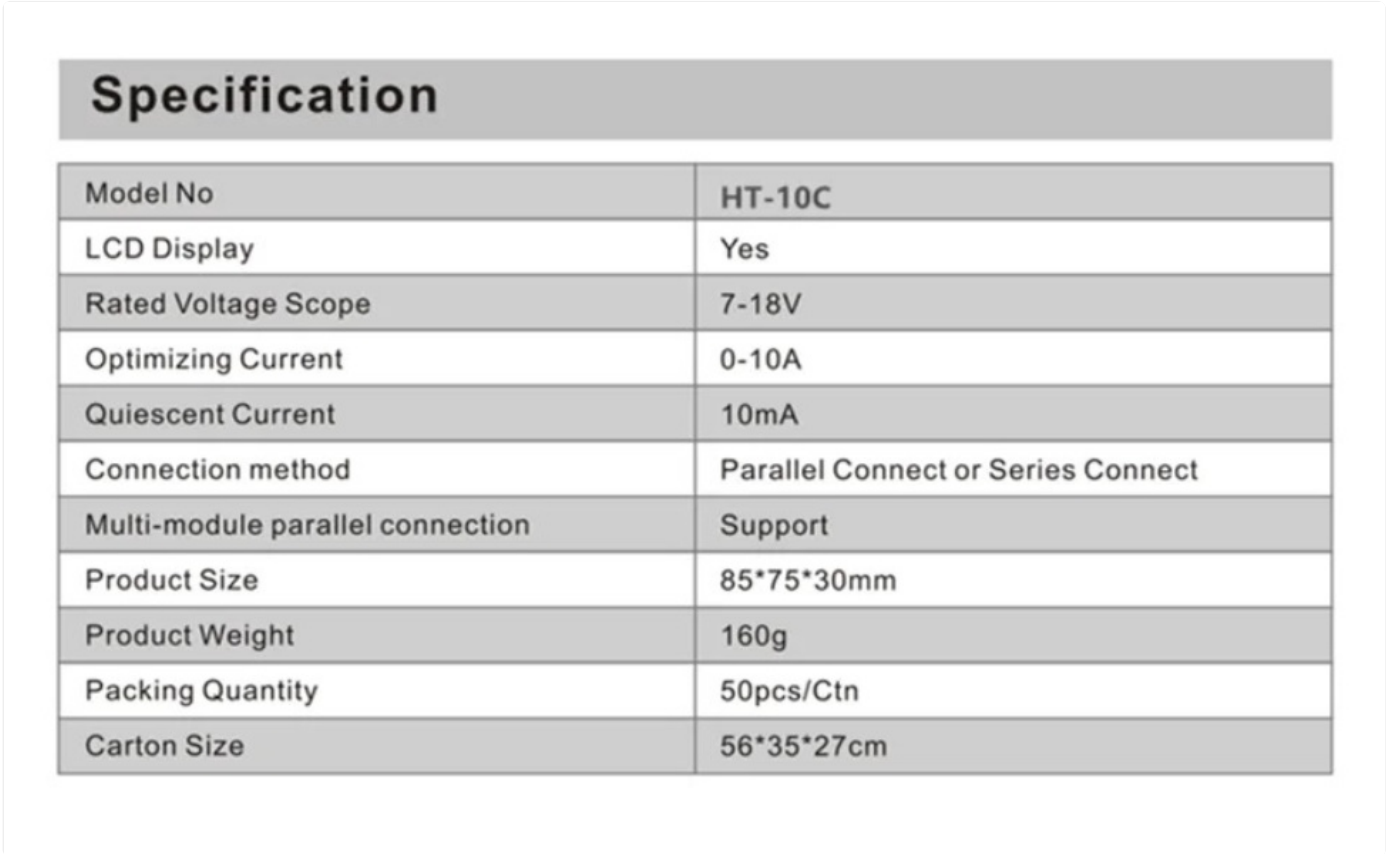


Image: A table detailing the specifications of the HT-10C, including Model No., LCD Display presence, Rated Voltage Scope, Optimizing Current, Quiescent Current, Connection method, Multi-module parallel connection support, Product Size, Product Weight, Packing Quantity, and Carton Size.

Setup and Installation

The HT-10C Battery Equalizer is designed for easy integration into battery systems. Follow these steps for proper setup:

1. **Identify Battery Terminals:** Ensure you correctly identify the positive (+) and negative (-) terminals of each 12V battery in your series connection.
2. **Connect Equalizer to Batteries:**
    - Connect the equalizer's B1+ terminal to the positive terminal of the first battery (Bat.1).
    - Connect the equalizer's B1- terminal to the negative terminal of the first battery (Bat.1).
    - Connect the equalizer's B2+ terminal to the positive terminal of the second battery (Bat.2).
    - Connect the equalizer's B2- terminal to the negative terminal of the second battery (Bat.2).
3. **Series Connection:** Ensure your two 12V batteries are connected in series to achieve a 24V system. The equalizer will balance these two batteries.
4. **Multi-Module Connection (Optional):** For systems with more than two batteries in series (e.g., 48V systems with four 12V batteries), multiple HT-10C equalizers can be connected in parallel to balance each pair of batteries. Refer to the connection diagrams for guidance.

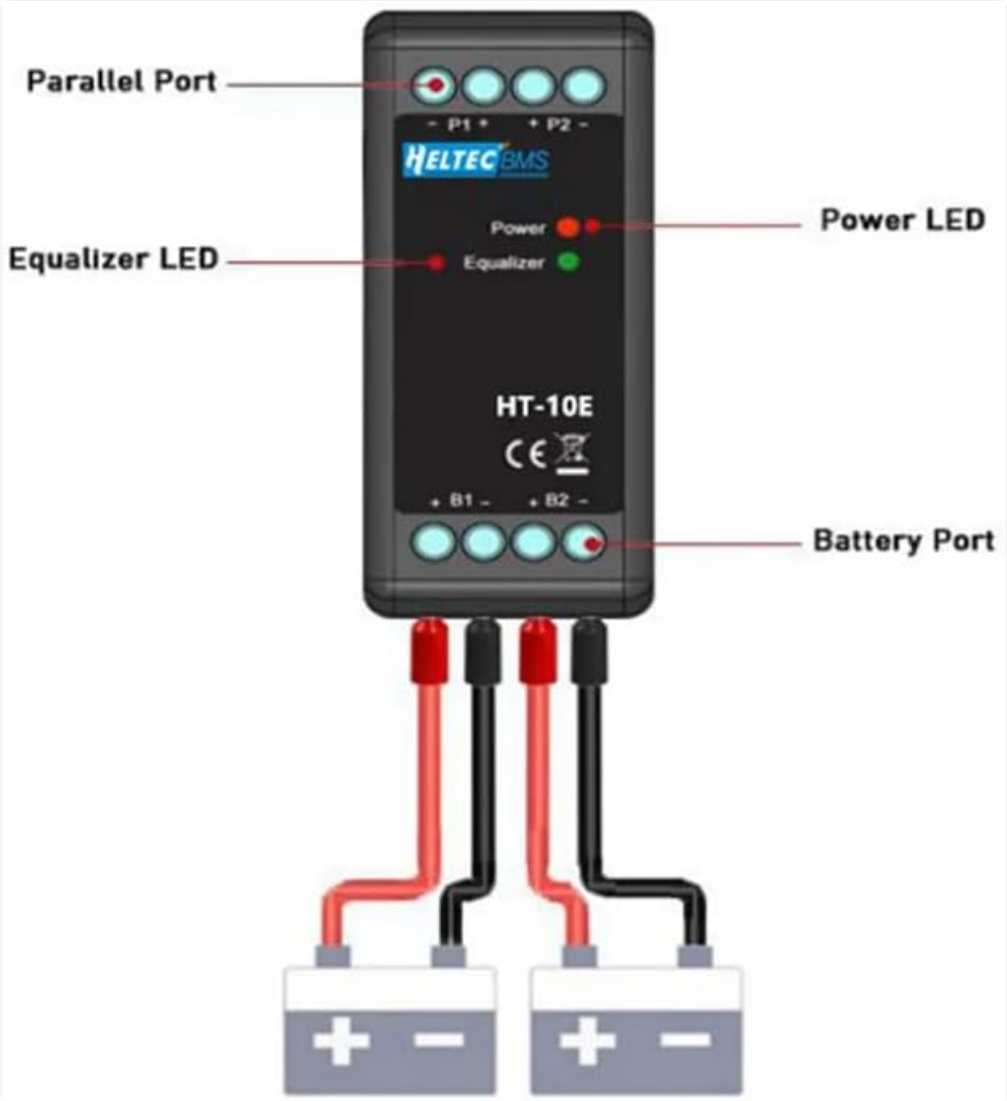


Image: A detailed diagram showing the connection points on the HT-10C (labeled as HT-10E, but functionally similar) and how to connect it to two 12V batteries in series. It highlights the Parallel Port, Equalizer LED, Power LED, and Battery Port connections (B1+, B1-, B2+, B2-).

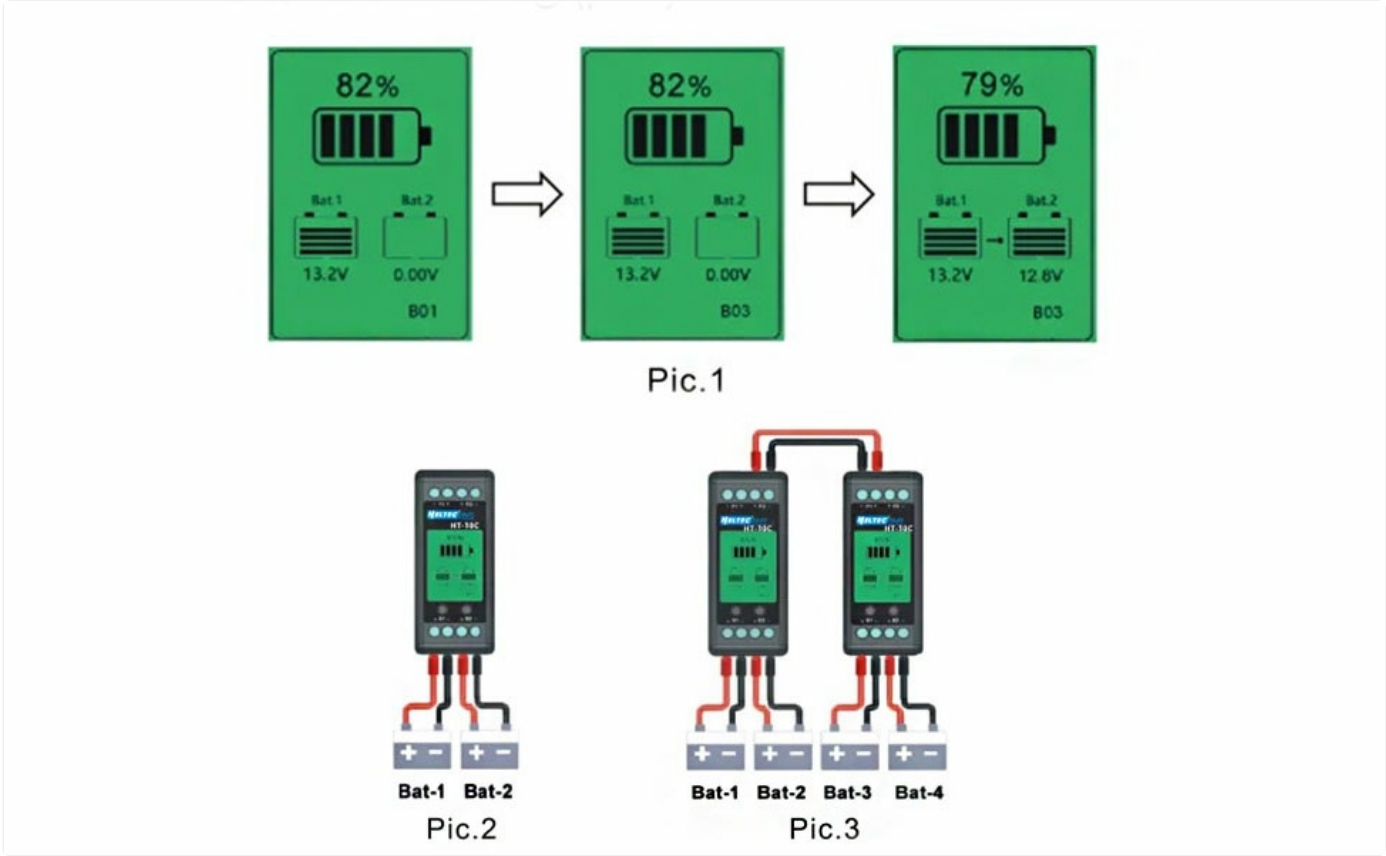


Image: This image includes "Pic.1" demonstrating the balancing process where voltage is transferred from a higher voltage battery to a lower one until balanced. "Pic.2" shows the connection for two batteries (one equalizer) and "Pic.3" shows how to connect two equalizers for four batteries in series, illustrating multi-module parallel connection.

Operating Instructions

Once correctly installed, the HT-10C Battery Equalizer operates automatically. The LCD display provides real-time information about your battery system.

- **Automatic Balancing:** The equalizer continuously monitors the voltage of the connected batteries. When a voltage difference of 50mV or more is detected, it automatically initiates current transfer to balance the voltages.
- **LCD Display:** The integrated LCD screen shows the voltage of each connected battery (Bat.1 and Bat.2) and the overall charge percentage. This allows for quick visual inspection of battery health and balance status.
- **Indicator LEDs:**
  - **Power LED:** Indicates that the equalizer is powered on and receiving voltage from the battery system.
  - **Equalizer LED:** Illuminates when the balancing process is active, indicating that current is being transferred between batteries.
- **Control Buttons (SET/DOWN):** These buttons are typically used for initial setup or to cycle through display modes, if applicable. Refer to the on-screen prompts for specific functions.

Maintenance

The Heltec BMS HT-10C Battery Equalizer is designed for minimal maintenance. However, periodic checks can ensure its continued optimal performance:

- **Visual Inspection:** Periodically inspect the equalizer and its connections for any signs of damage, corrosion, or loose wiring. Ensure all terminals are securely fastened.
- **Cleanliness:** Keep the equalizer clean and free from dust, dirt, and moisture. Use a dry, soft cloth for cleaning. Do not

use abrasive cleaners or solvents.

- **Environmental Conditions:** Ensure the equalizer is operating within its specified temperature and humidity ranges to prevent damage.
- **Battery Health:** While the equalizer helps maintain balance, it is important to regularly check the overall health of your batteries. An equalizer cannot fix a fundamentally faulty or degraded battery.

Troubleshooting

If you encounter issues with your HT-10C Battery Equalizer, refer to the following common troubleshooting steps:

Problem	Possible Cause	Solution
Equalizer not powering on (No LCD display, no Power LED)	No power supply; Incorrect wiring; Blown fuse (if applicable).	Check all wiring connections to ensure they are secure and correct. Verify battery voltage is within the equalizer's rated voltage scope (7-18V per battery). Inspect for any external fuse in the system.
Equalizer LED not illuminating when batteries are unbalanced	Voltage difference too small; Equalizer malfunction.	Ensure the voltage difference between batteries is at least 50mV. If the difference is significant and the LED still doesn't light, contact support.
Batteries remain unbalanced after extended operation	Severely degraded battery; Incorrect connection; Equalizer capacity exceeded.	Test individual battery health. A severely degraded battery may not be able to hold a charge. Re-verify all connections. Ensure the equalizer's optimizing current (0-10A) is sufficient for the imbalance.
LCD display shows erratic readings	Loose connection; Electrical interference; Faulty unit.	Check and secure all wiring. Ensure the installation environment is free from strong electromagnetic interference. If the issue persists, the unit may be faulty.

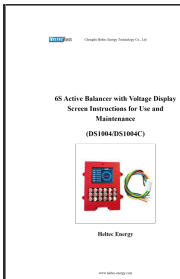
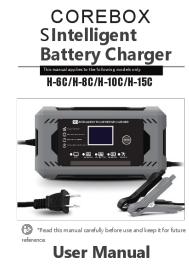
If these steps do not resolve the issue, please contact Heltec BMS customer support for further assistance.

Warranty and Support

For warranty information and technical support, please refer to the official Heltec BMS website or contact their customer service directly. Keep your purchase receipt as proof of purchase for any warranty claims.
Heltec BMS is committed to advancing battery technology and providing reliable power solutions. For more information about their products and services, visit their official store:

Visit the Heltec BMS Store on Amazon

Related Documents - HT-10C

	[6S Active Balancer with Voltage Display Screen: Instructions for Use and Maintenance] Detailed instructions for the Heltec BMS 6S Active Balancer (DS1004/DS1004C), covering product overview, technical specifications, installation, connection diagrams, and safety precautions for ternary lithium and LiFePO4 batteries.
	[Heltec Smart Active BMS for Lithium Battery: Operation and Maintenance Manual] Comprehensive operation and maintenance manual for Heltec Energy's Smart Active BMS for lithium battery packs. Covers technical specifications, connection diagrams, usage instructions, app operation, parameter settings, safety precautions, and warranty information for models 8~17S/8~20S/8~24S with current ratings from 40A to 200A.
	[Watts IS-FS-BMS Flood Sensor Connection Kit Installation Guide] Comprehensive installation guide for the Watts BMS Flood Sensor Connection Kit (Model IS-FS-BMS). Learn step-by-step instructions for setup, wiring, and requirements for integrating flood detection into your building management system.
	[COREBOX S Intelligent Battery Charger User Manual - Models H-6C, H-8C, H-10C, H-15C] Comprehensive user manual for the COREBOX S Intelligent Battery Charger, covering models H-6C, H-8C, H-10C, and H-15C. Includes charger components, usage instructions, charging modes, specifications, troubleshooting, and safety warnings.
	[Masach 2023 Online Catalog: NextGen RF Shields & EMI/RFI Solutions] Explore Masach's 2023 online catalog of NextGen RF Shields, including 5G-enabled EMI/RFI shields. Discover a vast selection of hermetically sealed, two-piece, and seamless designs in Tin-plated Steel and Nickel-Silver alloys, optimized for high performance, flexibility, and cost-effectiveness in board-level shielding applications. Find detailed specifications, material information, and handling guidelines for various models.
	[MeshPocket: Wireless Power Bank with LoRa Connectivity] Explore the MeshPocket, an intelligent wireless power bank by Heltec Automation, featuring Bluetooth, LoRa communication, and an e-ink display. Ideal for Meshtastic users and outdoor adventures.