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Bolisila ML2430/ML2440

Bolisila ML2430/ML2440 MPPT Solar Charge Controller

USER MANUAL

Model: ML2430/ML2440 | Brand: Bolisila

INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your Bolisila ML2430/ML2440 MPPT Solar Charge Controller. This advanced Maximum Power Point Tracking (MPPT) controller is designed to efficiently manage power flow from your solar panels to your battery bank, ensuring optimal charging and system performance.

Key features include a multi-function LCD with backlight display, dynamic operational data display, easy installation with automatic battery voltage determination, and multiple protection mechanisms against overcharge, over discharge, overload, short circuit, reverse polarity, overheating, and battery undervoltage.

PRODUCT OVERVIEW

The Bolisila ML2430/ML2440 MPPT Solar Charge Controller is a robust device designed for reliable solar power management. Below are images illustrating the controller's various aspects and components.



Figure 1: Front view of the ML2430/ML2440 controller, showing the LCD display, control buttons, and model specifications.



Figure 2: Rear view of the controller, highlighting the integrated heat sink fins for efficient thermal management.

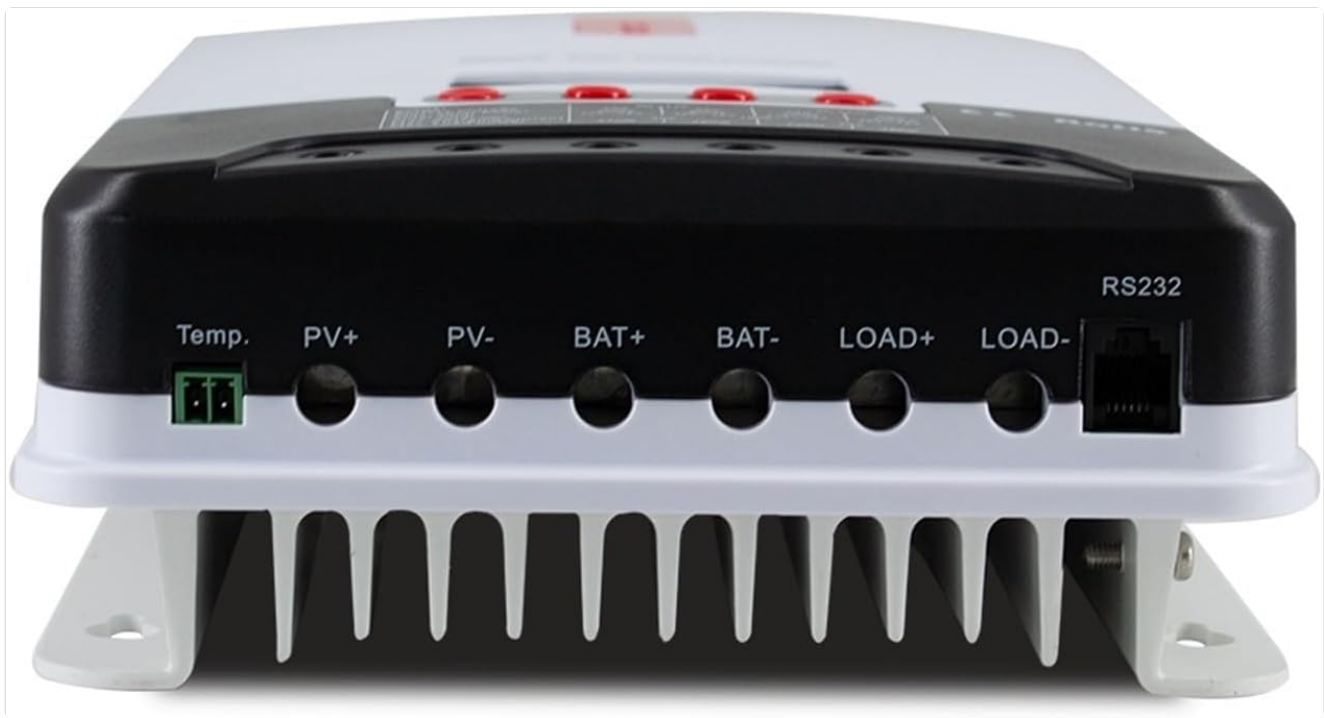


Figure 3: Bottom view of the controller, displaying the various connection terminals for temperature sensor, PV input, battery, and load, along with the RS232 communication port.

SETUP AND INSTALLATION

Follow these steps carefully to ensure proper and safe installation of your MPPT solar charge controller. It is crucial to connect components in the specified order to prevent damage.

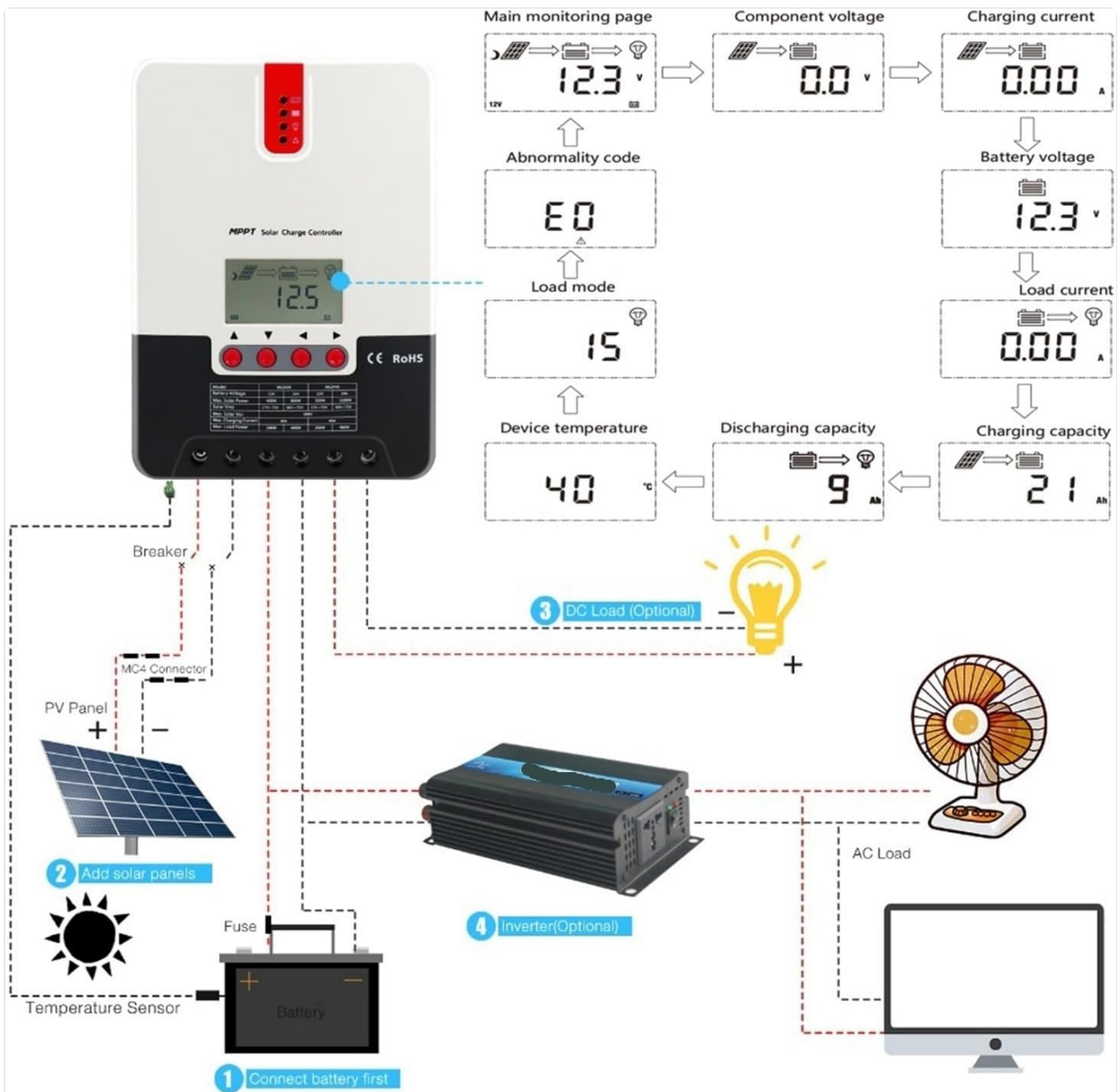


Figure 4: System connection diagram illustrating the proper wiring sequence for the solar charge controller, battery, PV panels, and optional loads/inverter.

1. **Connect Battery First:** Ensure the battery is connected to the controller's battery terminals (BAT+ and BAT-) before connecting any other components. The controller will automatically detect the battery voltage (12V or 24V). Observe correct polarity.
2. **Connect Solar Panels:** After the battery is connected, connect your solar PV panels to the PV input terminals (PV+ and PV-). Ensure the total open-circuit voltage of your solar array does not exceed the controller's maximum input voltage (100VDC). Observe correct polarity.
3. **Connect DC Load (Optional):** If you have DC loads, connect them to the load terminals (LOAD+ and LOAD-). The controller provides protection for the load.
4. **Connect Inverter (Optional):** If using an inverter, connect it to the battery terminals or a dedicated inverter output, ensuring it is properly sized for your system.
5. **Temperature Sensor:** Connect the external temperature sensor to the designated port. This allows the controller to perform accurate temperature compensation for battery charging.
6. **Power On:** Once all connections are secure and verified, the controller will power on and begin operation.

Important: Always disconnect solar panels and loads before disconnecting the battery. Disconnect in

reverse order of connection for safety.

OPERATING INSTRUCTIONS

The ML2430/ML2440 controller features a multi-function LCD display that provides real-time operational data and status. Use the buttons below the display to navigate through different screens.

LCD Display Information:

- **Main Monitoring Page:** Displays current battery voltage and charging status.
- **Component Voltage:** Shows the voltage from the solar panels.
- **Charging Current:** Indicates the current flowing from the solar panels to the battery.
- **Load Current:** Displays the current drawn by connected DC loads.
- **Device Temperature:** Shows the internal temperature of the controller.
- **Discharging Capacity:** Tracks the total energy discharged from the battery.
- **Charging Capacity:** Tracks the total energy charged into the battery.
- **Abnormality Code (Error Codes):** Displays specific codes (e.g., E0) if an error or abnormal condition is detected. Refer to the Troubleshooting section for details on these codes.

The controller automatically manages the charging process using MPPT technology to maximize power harvest from your solar array. It also provides intelligent load control and various battery protection functions.

MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your solar charge controller.

- **Visual Inspection:** Periodically inspect the controller and all wiring connections for any signs of damage, corrosion, or loose connections. Ensure all terminals are securely tightened.
- **Cleaning:** Keep the controller clean and free from dust and debris. Use a dry, soft cloth to wipe the casing and display. Do not use liquid cleaners.
- **Ventilation:** Ensure the area around the controller is well-ventilated to allow for proper heat dissipation, especially around the heat sink fins on the back.
- **Environmental Conditions:** Verify that the operating environment remains within the specified temperature range (-35°C to +45°C) and that the controller is protected from direct sunlight, rain, and excessive humidity.
- **Firmware Updates:** Check the manufacturer's website (Bolisila) periodically for any available firmware updates that may improve performance or add features.

TROUBLESHOOTING

This section provides solutions to common issues you might encounter with your solar charge controller.

Problem/Error Code	Possible Cause	Solution
Controller not powering on	Battery not connected or reverse polarity; Battery voltage too low.	Ensure battery is connected correctly with proper polarity. Check battery voltage; it must be within 9V to 35V.

Problem/Error Code	Possible Cause	Solution
No charging current	Solar panels not connected or reverse polarity; Insufficient sunlight; PV voltage too low/high.	Verify PV panel connections and polarity. Check sunlight conditions. Ensure PV input voltage is within specifications (Max 100V).
Load not working	Load disconnected or reverse polarity; Overload protection activated; Battery voltage too low.	Check load connections and polarity. Reduce load to within rated current. Charge battery.
Error Code E0 (or similar)	Indicates an abnormality. Specific meaning depends on the exact code (refer to detailed manual if available).	Check all connections. Power cycle the controller (disconnect PV, then battery, wait 1 minute, reconnect battery, then PV). If persistent, contact support.
Overcharge/Over-discharge protection	Battery voltage reached protection threshold.	This is normal operation. The controller protects the battery. Ensure battery is correctly sized for your system.

For issues not covered here, or if problems persist, please contact Bolisila customer support.

SPECIFICATIONS

The following table outlines the technical specifications for the Bolisila ML2430 and ML2440 MPPT Solar Charge Controllers.

Parameter	ML2430	ML2440
Systems Voltage	12V/24V Auto	
No-load Loss	0.7W to 1.2W	
Battery Voltage Range	9V to 35V	
Max. Solar Input Voltage	100V (25°C), 90V (-25°C)	
Max. Power Point Voltage Range	Battery voltage +2V to 75V	
Rated Charging Current	30A	40A
Rated Load Current	20A	20A
Max. PV System Input Power (12V)	400W	550W
Max. PV System Input Power (24V)	800W	1100W
Conversion Efficiency	98%	
MPPT Tracking Efficiency	> 99%	
Temperature Compensation Factor	-3.0mv/°C/2V (default)	
Operating Temperature	-35°C to +45°C	
Protection Degree	IP32	

Parameter	ML2430	ML2440
Communication Method	RS232	
Altitude	3000m	
Product Dimensions (ML2430)	210*151*59.5mm	N/A
Product Dimensions (ML2440)	N/A	238*173*72.5mm

WARRANTY AND SUPPORT

Bolisila products are manufactured to high-quality standards. For specific warranty terms and conditions, please refer to the warranty card included with your product or visit the official Bolisila website. Keep your purchase receipt as proof of purchase.

If you encounter any issues or require technical assistance, please contact Bolisila customer support. Provide your product model number (ML2430/ML2440) and a detailed description of the problem to facilitate faster service.

Manufacturer: Bolisila