

Litime L48V-60A-MPPT-BT-US-2

LiTime 60 Amp MPPT 12V/24V/48V Solar Charge Controller User Manual

Model: L48V-60A-MPPT-BT-US-2

1. INTRODUCTION

This manual provides essential information for the safe and efficient operation of your LiTime 60 Amp MPPT Solar Charge Controller. Please read this manual thoroughly before installation and use. This controller is designed to optimize power harvesting from solar panels to charge various battery types, including LiFePO4 and Lead-acid batteries, across 12V, 24V, and 48V systems.

Key features include:

- Advanced Maximum Power Point Tracking (MPPT) technology with 99% tracking efficiency and up to 96% peak conversion efficiency.
- Compatibility with multiple system voltages (12V/24V/48V for LiFePO4 and 12V/24V/36V/48V/Auto for Lead-acid batteries).
- Integrated LCD screen and LED indicators for system monitoring.
- Robust sheet metal shell with dual forced cooling for effective heat dissipation.
- Comprehensive safety protections against overpower, over-voltage, short-circuit, and over-temperature.

2. WHAT'S IN THE BOX

Upon unpacking, please verify that all items listed below are present and undamaged. If any components are missing or damaged, contact customer support immediately.

WHAT'S IN THE BOX



Magic Sticker * 1



Remote Temperature Sensor * 1



Screws * 4



Plastic Anchors * 4



Copper Wire Connectors * 6



Heat Shrink Tubes * 3 pairs

Image: The contents of the product box, including the controller, manual, and accessories.

- LiTime 60 Amp MPPT Solar Charge Controller
- Product Manual
- Magic Sticker (1)
- Remote Temperature Sensor (1)
- Screws (4)
- Plastic Anchors (4)
- Copper Wire Connectors (6)
- Heat Shrink Tubes (3 pairs)

3. PRODUCT OVERVIEW

3.1 Component Identification



Image: A detailed view of the controller's connection ports and mounting points.

1. **Grounding Terminal:** For connecting the system ground.
2. **Remote Temperature Sensor Port:** Connects the external temperature sensor for accurate battery temperature compensation.
3. **Solar Panel Terminals (PV+ / PV-):** Connects to the solar panel array.
4. **Battery Terminals (BAT+ / BAT-):** Connects to the battery bank.
5. **DC Load Terminals (LOAD+ / LOAD-):** Connects to DC loads.
6. **Communication Port (RS485):** For external communication devices.
7. **Mounting Holes:** Used to secure the controller to a surface.

3.2 Display and Operation Keys



Image: A close-up of the controller's LCD screen, charge indicator, fault indicator, and operation keys.

- **LCD Screen:** Displays real-time system operation information.
- **Charge Indicator:** Illuminates to show charging status.
- **Fault Indicator:** Illuminates to indicate system errors or faults.
- **Operation Keys:** Two buttons (S Key and OK Key) for navigating menus and setting parameters.

4. SETUP AND INSTALLATION

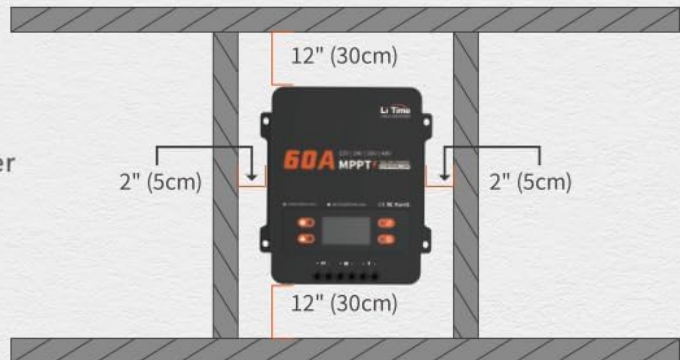
4.1 Choosing a Mounting Location

Select a dry, well-ventilated area away from direct sunlight, high temperatures, and moisture. Ensure adequate clearance around the controller for proper heat dissipation.

INSTALLATION METHODS

CHOOSE THE MOUNTING LOCATION

Check the ventilation clearance at least 12"(30cm) above and below the controller and 2"(5cm) on both sides.



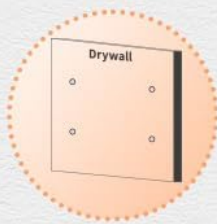
INSTALLATION METHOD

On Wood Wall (Optional)

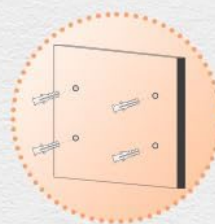


Align and Fix the Controller

On Drywall (Optional)



1. Drill the Holes



2. Fix the Plastic Anchors



3. Align and Fix the Screws

Image: A diagram showing the required ventilation clearances for mounting the controller, with at least 12 inches (30cm) above and below, and 2 inches (5cm) on both sides.

- Maintain at least 12 inches (30cm) of clearance above and below the controller.
- Maintain at least 2 inches (5cm) of clearance on both sides.

4.2 Mounting the Controller

The controller can be mounted on a wood wall or drywall using the provided screws and plastic anchors.

1. **On Wood Wall:** Align the controller and fix it directly with screws.
2. **On Drywall:** Drill holes, insert plastic anchors, then align and fix the controller with screws.

4.3 Wiring Connections

WARNING: Ensure all power sources are disconnected before making any connections. Incorrect wiring can damage the controller, batteries, or solar panels.

Follow the connection sequence below to prevent damage:

1. Connect the **battery bank** to the Battery Terminals (BAT+ / BAT-).

2. Connect the **DC loads** to the DC Load Terminals (LOAD+ / LOAD-).
3. Connect the **solar panel array** to the Solar Panel Terminals (PV+ / PV-).
4. Connect the **Remote Temperature Sensor** to its dedicated port.
5. Connect the **Grounding Terminal** to the system ground.

HOW TO CONNECT



Image: An illustration of a complete solar power system setup, showing the connections between solar panels, the charge controller, battery, and an inverter/load.

4.4 Recommended Cable Size and Fuse

Proper cable sizing and fusing are critical for safety and performance.



Image: A table detailing recommended wire gauge and fuse sizes for solar panel/battery and load connections.

Recommended Wire Gauge and Fuse

Connection	Wire Gauge Recommendation	Fuse Recommendation (1.2 to 1.5 times max continuous current)
Solar Panel/Battery	6 AWG	72A to 90A
Load	10 AWG	36A to 45A

5. OPERATING INSTRUCTIONS

5.1 LCD Display and Indicators

The LCD screen provides real-time data, while LED indicators offer quick status updates.

- **LCD Screen:** Displays battery voltage, charging current, load current, system status, and error codes.
- **Charge Indicator:** Solid green when charging, flashing green during float charge, off when not charging.
- **Fault Indicator:** Solid red indicates a fault; refer to the troubleshooting section for details.

5.2 Operation Keys (S Key & OK Key)

The two buttons allow you to view system data and configure settings.



In View Mode

Key	Operation	Function
 (S Key)	Short Press	View Real-time Data
	Press and Hold	/
 (OK Key)	Short Press	View Set Parameters
	Press and Hold	Enter Set Mode

In Set Mode

Key	Operation	Function
 (S Key)	Short Press	View Previous Page
	Press and Hold	Exit Set Mode without Saving
 (OK Key)	Short Press	View Next Page
	Press and Hold	Save Data & Exit Set Mode

Image: A table detailing the functions of the 'S Key' and 'OK Key' for navigating and setting parameters on the controller's display.

Key Operations in View Mode

Key	Operation	Function
S Key	Short Press	View Real-time Data
S Key	Press and Hold	Not applicable
OK Key	Short Press	View Set Parameters
OK Key	Press and Hold	Enter Set Mode

Key Operations in Set Mode

Key	Operation	Function
S Key	Short Press	View Previous Page
S Key	Press and Hold	Exit Set Mode without Saving
OK Key	Short Press	View Next Page
OK Key	Press and Hold	Save Data & Exit Set Mode

5.3 Battery Type and System Voltage Configuration

The controller supports LiFePO4 and Lead-acid batteries. Parameters can be adjusted via the LCD screen in Set Mode.

- **LiFePO4 Battery Charging Mode:** Supports 12V, 24V, and 48V systems.
- **Lead-acid Battery Charging Mode:** Supports 12V, 24V, 36V, 48V, and Auto-detection systems.



Image: A table outlining the compatibility of the controller with LiFePO4 and Lead Acid batteries across different system voltages, along with maximum solar input power, PV input voltage, rated charging current, and rated load current.

6. MAINTENANCE

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

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- **Connections:** Periodically check all wiring connections to ensure they are tight and free from corrosion.
- **Ventilation:** Ensure the ventilation openings are not blocked to allow for proper airflow. The dual forced cooling system relies on clear airflow for effective heat dissipation.
- **Temperature Sensor:** Ensure the remote temperature sensor is securely attached to the battery for accurate temperature readings.

7. TROUBLESHOOTING

The controller is equipped with multiple protection features to ensure safe operation. If the Fault Indicator

illuminates, refer to the list below for potential issues.

9 SAFETY PROTECTIONS



Image: An illustration highlighting the nine safety protection features integrated into the solar charge controller.

7.1 Safety Protections

The LiTime MPPT controller includes the following safety protections:

- PV Over-voltage Protection
- PV Reverse Polarity Protection
- PV Short-circuit Protection
- Battery Over-voltage Protection
- Battery Under-voltage Protection
- Battery Reverse Connection Protection
- Load Over Current Protection
- Controller Over-temp Protection
- Low-temp Charging Protection (LTCP) for lithium batteries (stops charging below 0°C/32°F, resumes at ≥5°C/41°F).



Image: A visual explanation of the Low-Temperature Charging Protection (LTCP) feature, showing the temperature thresholds for stopping and resuming charging.

7.2 Common Issues and Solutions

- **No Power/Display:** Check battery connections and ensure the battery voltage is within the controller's operating range.
- **No Charging:** Verify solar panel connections, ensure sufficient sunlight, and check for PV over-voltage or short-circuit faults.
- **Load Not Working:** Check load connections, ensure the load current does not exceed the rated capacity, and verify battery voltage is above the low voltage disconnect setting.
- **Over-temperature Fault:** Ensure adequate ventilation around the controller. Reduce load or solar input if operating in extreme ambient temperatures.

For persistent issues, please contact LiTime customer support.

8. SPECIFICATIONS

Detailed technical specifications for the LiTime 60 Amp MPPT Solar Charge Controller.

General Specifications

Parameter	Value
Brand	Litime
Model Number	L48V-60A-MPPT-BT-US-2
Rated Charging Current	60A
Rated Load Current	30A
System Voltage	12V/24V/48V (LiFePO4), 12V/24V/36V/48V/Auto (Lead Acid)
Max. PV Input Voltage	150V
Max. Solar Panel System Input Power (12V)	870W
Max. Solar Panel System Input Power (24V)	1740W
Max. Solar Panel System Input Power (36V)	2610W

Parameter	Value
Max. Solar Panel System Input Power (48V)	3480W
Tracking Efficiency	≥99%
Peak Conversion Efficiency	Up to 96%
Display Type	LCD
Operating Temperature	Up to 50°C
Product Dimensions (L x W x H)	6.57 x 2.76 x 8.66 inches (167 x 70 x 220 mm)
Item Weight	3.75 pounds (1.7 kg)
Material	Steel
Color	Black

9. WARRANTY AND SUPPORT

LiTime provides professional technical support and customer service. If you have any questions or require assistance, please do not hesitate to contact us.

- **Technical Support:** Available via phone or online services.
- **Response Time:** Quick feedback within 24 hours.
- **Contact Email:** service@litime.com

For warranty details, please refer to the warranty card included with your product or visit the official LiTime website.