LiTime 20Amp PWM Solar Charge Controller

LiTime 20Amp PWM 12V/24V Solar Charge Controller User Manual

Model: 20Amp PWM Solar Charge Controller

1. INTRODUCTION

This manual provides detailed instructions for the installation, operation, and maintenance of your LiTime 20Amp PWM 12V/24V Solar Charge Controller. Please read this manual thoroughly before using the product to ensure proper function and safety.

Image 1.1: LiTime 20Amp PWM Solar Charge Controller and its packaging.

2. KEY FEATURES

- **Wide Compatibility:** Supports 12V/24V lithium (LiFePO4) and lead-acid batteries (FLA, GEL, SEL).

- **High Solar Input:** Handles up to 340W for 12V systems and 680W for 24V systems.

- **LCD Display:** Provides real-time monitoring of solar, battery, and load status.

- **USB Output:** Integrated 5V/1A USB port for charging small devices.

- **Direct DC Load Control:** Connect DC devices directly with real-time or timer modes.

- **Compact Design:** Small footprint (5.12 × 3.54 × 1.36 inches) and lightweight (0.46 lb) for easy installation.

3. SAFETY INSTRUCTIONS

Please observe the following safety precautions during installation and operation:

- Ensure all connections are correct and secure before powering on the system.

- Do not expose the controller to water or high humidity. This product is not waterproof.

- Install the controller in a well-ventilated area, protected from direct sunlight and high temperatures.

- The controller includes multiple protections:

    - PV over-voltage protection

    - PV over-current protection

    - PWM over-temperature protection

    - Battery over-voltage protection

    - Battery reverse polarity protection

    - Battery over-discharge protection

    - Short circuit protection

    - Overload protection

- Always connect the battery first, then the solar panel, and finally the load. Disconnect in reverse order.

- Consult a qualified professional if you are unsure about any installation steps.

Image 3.1: The controller features multiple built-in protections for safe operation.

4. WHAT'S IN THE BOX

Upon opening the package, verify that all components are present:

- 1x LiTime 20Amp PWM Solar Charge Controller
- 1x Controller Bracket
- 1x Product Manual
- 2x Nuts M3
- 2x Screws 3*15mm
- 2x Plastic Anchors 4*20mm
- 2x Screws PM3*6mm (for support backplate)
- 2x Screws PM3*12mm (for fixed bracket)

Image 4.1: All items included in the product package.

5. PARTS IDENTIFICATION

Familiarize yourself with the components of the solar charge controller:
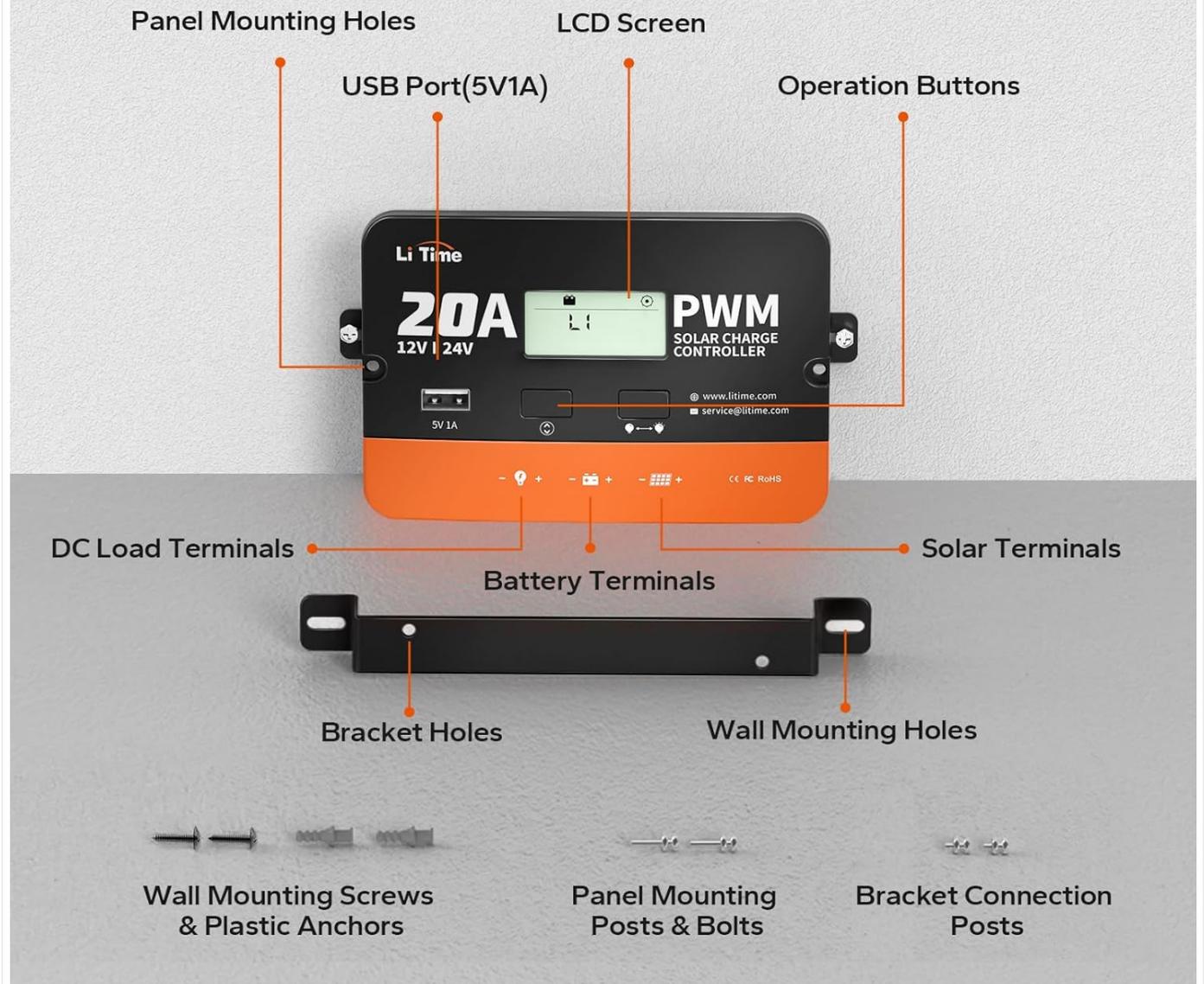
IDENTIFICATION OF PARTS

Image 5.1: Labeled diagram of the solar charge controller's components.

1. **Panel Mounting Holes:** For securing the controller.

2. **LCD Screen:** Displays system status and settings.

3. **USB Port (5V/1A):** For charging mobile devices.

4. **Operation Buttons:** For navigating menus and adjusting settings.

5. **DC Load Terminals:** Connect DC loads (e.g., lights, fans).

6. **Battery Terminals:** Connect to the battery bank.

7. **Solar Terminals:** Connect to the solar panel array.

8. **Bracket Holes:** For attaching the mounting bracket.

9. **Wall Mounting Holes:** For direct wall mounting.

10. **Bracket Connection Posts:** For securing the bracket.

11. **Panel Mounting Posts & Bolts:** Hardware for panel mounting.

12. **Wall Mounting Screws & Plastic Anchors:** Hardware for wall mounting.

6. INSTALLATION AND SETUP

6.1 Mounting the Controller

Choose a vertical surface protected from direct sunlight, high temperatures, and water. Ensure good ventilation around the controller.

Image 6.1: Optional panel mount and wall mount installation methods.

6.2 Wiring Connections

Follow the connection order carefully to prevent damage:

1. **Connect the Battery:** Connect the battery to the battery terminals (positive to positive, negative to negative). The LCD will light up.

2. **Connect the Solar Panel:** Connect the solar panel to the solar terminals (positive to positive, negative to negative).

3. **Connect the DC Load:** Connect the DC load to the load terminals (positive to positive, negative to negative).

Important: Disconnect in the reverse order: load, then solar panel, then battery.

Max Solar Input Voltage	Max Solar Input Power	Recommended Solar Open Circuit Voltage	Rated Solar Charge Current	Max Load Output Current
<55V	340W/12V, 680W/24V	18V for 12V system, 36V for 24V system	20A	20A

Image 6.2: Example wiring diagram for a solar power system.

6.3 Battery Type Selection

It is crucial to select the correct battery type for optimal charging and battery longevity. The controller supports LiFePO4 (Lithium), FLA (Flooded), GEL, and SEL (Sealed) batteries.

1. **Enter Set Mode:** Press and hold the first button (usually the 'Menu' or 'Set' button) for a few seconds to enter the settings menu.

2. **Choose Parameters:** Short press the second button (usually 'Up' or 'Select') to cycle through the available battery types (LI, FLD, GEL, SEL).

3. **Save Setting:** Once the desired battery type is displayed, press and hold the first button again to save the setting and exit.

Note: For 12V lithium batteries, the default setting is often suitable. For other battery types or 24V systems, ensure you manually select the correct type. Only FLD, GEL, and SEL battery types support automatic recognition of 12V/24V system voltage.

Image 6.3: Steps for adjusting the battery type setting.

7. OPERATION

7.1 LCD Display Information

The LCD screen cycles through various parameters, providing real-time system status:

- Incoming Solar Voltage
- Battery Voltage
- Battery Charging Amperage
- Load Output Amperage
- Battery State of Charge (SOC)
- Controller Temperature

7.2 USB Output

The 5V/1A USB port can be used to charge small electronic devices such as smartphones or tablets. This output is controlled by the load switch.

7.3 DC Load Control Modes

The controller offers various modes for controlling the DC load output:

- **Mode 15 (Manual):** The load output is manually actuated. Press the load button to turn it on or off.
- **Mode 17 (Always On):** The load output remains continuously on.
- **Mode 0 (Daylight Off):** The load turns on only when no daylight is detected (i.e., when no power is coming from the solar panel).
- **Modes 1-14 (Timer Off):** The load turns on when no daylight is detected and remains on for the set number of hours (1 to 14 hours) before turning off.
- **Mode 16 (Testing Mode):** The load turns on and off in quick succession for testing purposes.

To change the load control mode, enter the set mode (as described in Section 6.3) and navigate to the load mode setting.

8. MAINTENANCE

To ensure optimal performance and longevity of your solar charge controller, perform the following maintenance checks periodically:

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- **Connections:** Periodically check all wiring connections for tightness and corrosion. Loose connections can cause overheating and system malfunction.
- **Ventilation:** Ensure that the ventilation openings are not blocked to prevent overheating.
- **Environmental Conditions:** Verify that the controller remains in a dry, well-ventilated area, protected from extreme temperatures and moisture.

9. TROUBLESHOOTING

This section addresses common issues you might encounter with your solar charge controller.

Problem	Possible Cause	Solution
LCD screen is off.	No battery connected or battery voltage is too low.	Ensure the battery is properly connected and has sufficient charge.
Battery not charging.	Solar panel not connected or insufficient sunlight. Reverse polarity connection of solar panel. Battery type setting is incorrect.	Check solar panel connections and ensure adequate sunlight. Verify solar panel polarity. Adjust battery type setting (refer to Section 6.3).

Problem	Possible Cause	Solution
Load not working.	Load connection is loose or incorrect. Load control mode is set incorrectly. Battery voltage is too low (under-voltage protection). Load is overloaded.	Check load wiring. Adjust load control mode (refer to Section 7.3). Charge the battery. Reduce the load or check for short circuits.
Controller overheating.	Poor ventilation or excessive load/solar input.	Ensure proper ventilation. Reduce load or check solar input limits.

10. SPECIFICATIONS

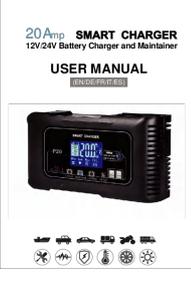| Parameter	Value
Model	20Amp PWM Solar Charge Controller
System Voltage	12V/24V Auto-recognition (for FLD/GEL/SEL)
Rated Charge Current	20A
Rated Load Current	20A
Max Solar Input Voltage	<55V
Max Solar Input Power	340W (12V system) / 680W (24V system)
Recommended Solar Open Circuit Voltage	18V for 12V system, 36V for 24V system
USB Output	5V/1A
Display Type	LCD
Operating Temperature	-20°C to +55°C (approximate, based on typical ranges)
Product Dimensions (L x W x H)	5.12 x 3.54 x 1.36 inches (130 x 90 x 34.6 mm)
Item Weight	0.46 lbs (5.3 ounces / 0.21 kg)
Material	Acrylonitrile Butadiene Styrene (ABS)
Certifications	RoHS, CE

Image 10.1: Physical dimensions and weight of the controller.

11. Warranty and Support

The LiTime 20Amp PWM Solar Charge Controller is backed by a 3-year warranty. For technical assistance or warranty claims, please contact LiTime customer support.

- **Website:** www.litime.com
- **Email Support:** service@litime.com
- **Technical Support:** technicalsupport@litime.com

Related Documents - 20Amp PWM Solar Charge Controller

	[LiTime 24V 50Ah TM Bluetooth Lithium Iron Phosphate Ion Battery User Manual](#) Comprehensive user manual for the LiTime 24V 50Ah TM Bluetooth Lithium Iron Phosphate Ion Battery, covering specifications, features, operation, and safety instructions.
	[LiTime 12.8V 100Ah Mini LiFePO4 Battery User Manual](#) User manual for the LiTime 12.8V 100Ah Mini LiFePO4 battery, detailing specifications, safety precautions, installation, operation, and maintenance for deep cycle applications.
	[BougeRV HC24 Series Solar Charge Controller User Manual](#) User manual for the BougeRV HC24 Series solar charge controller, detailing recommendations for safe use, features, system wiring, button functions, display interface settings, error codes, and specifications for 10A, 20A, and 30A models.
	[20Amp Smart Battery Charger & Maintainer User Manual - P20/20AMP/N20](#) Comprehensive user manual for the 20Amp Smart Battery Charger and Maintainer (Model P20/20AMP/N20). Covers technical specifications, features, charging instructions, repair mode, estimated charging times, and safety warnings for 12V/24V Lithium, LiFePO4, and Lead-acid batteries.
	[20Amp Smart Charger User Manual: 12V/24V Battery Charger and Maintainer](#) Comprehensive user manual for the 20Amp Smart Charger, detailing technical specifications, interface description, charging procedures, features, screen icons, error codes, and essential safety warnings for 12V and 24V batteries.
	[HOST Voyager 20A PWM Waterproof Solar Charge Controller Manual](#) User manual for the HOST Voyager 20A PWM waterproof solar charge controller, covering installation, operation, safety, technical specifications, and troubleshooting. Features include 4-stage PWM charging, multiple battery type support, and electronic protections.