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GCSOAR TD2107

GCSOAR 15A MPPT Solar Charge Controller TD2107 User Manual

Model: TD2107

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of your GCSOAR 15A MPPT Solar Charge Controller, model TD2107. This controller is designed to efficiently manage power from your solar panels to charge various battery types in 12V or 24V systems, featuring advanced MPPT technology and built-in WiFi for remote monitoring.

2. Key Features

- **Advanced MPPT Technology:** Achieves tracking efficiency up to 99.5% and charging conversion efficiency up to 98%, with a wide Maximum Power Point (MPP) working voltage range.
- **Automatic System Voltage Recognition:** Automatically detects 12V or 24V DC system voltage.
- **High PV Input Capability:** Supports a maximum PV voltage of 75V. Maximum PV input power is 200W for 12V battery systems and 400W for 24V battery systems.
- **Built-in WiFi:** Enables remote monitoring and settings adjustment via a dedicated mobile application.
- **Versatile Battery Compatibility:** Compatible with sealed, gel, flooded, AGM, and Li-Ion batteries. User-definable charging parameters are available for customized battery types.
- **Multiple Load Control Modes:** Offers 24-hour working mode, light control mode, and light + time control mode.
- **Comprehensive Protection:** Includes short circuit, over current, and reverse polarity protection.
- **User-Friendly Interface:** Features a detailed LCD display and two buttons for easy operation and parameter viewing.

3. Safety Instructions

- Ensure all wiring is correctly connected and securely fastened to prevent loose connections and overheating.
- Install the controller in a well-ventilated area to ensure proper heat dissipation.
- Always connect the battery first, then the solar panel, and finally the load. Disconnect in the reverse order.
- Use appropriate circuit breakers or fuses for the battery, solar panel, and load circuits.
- Avoid touching live terminals.
- Do not attempt to repair or modify the controller yourself. Contact qualified personnel for service.

4. Product Overview

The GCSOAR TD2107 MPPT Solar Charge Controller features a compact design with a bright LCD display and intuitive control buttons. It is equipped with terminals for solar panel input, battery connection, and DC load output, along with USB ports for charging small devices.



Figure 4.1: Front view of the GCSOAR 15A MPPT Solar Charge Controller TD2107, showing the LCD display, control buttons, and connection terminals.



Figure 4.2: Dimensions of the GCSOAR TD2107 controller. The unit measures approximately 165mm (length) x 123mm (width) x 46mm (height).

5. Technical Specifications

Feature	Specification
Rated Charge Current	15A
System Voltage	12V/24V Auto Work
Max PV Voltage	75V
Max PV Input Power (12V System)	200W
Max PV Input Power (24V System)	400W
Battery Type Support	Lead-Acid (Sealed, Gel, Flooded), Lithium (LiFePO4, Li-NiCoMn)
Charging Mode	MPPT 4-Stage (Bulk, Boost, Float, Equalize)
Communication	Built-in WiFi
Dimensions	6.6 x 4.5 x 1.9 inches (165mm x 123mm x 46mm)
Item Weight	1.43 pounds
Material	Plastic

6. Installation and Wiring

Proper installation is crucial for the safe and efficient operation of your solar charge controller. Follow these steps carefully.

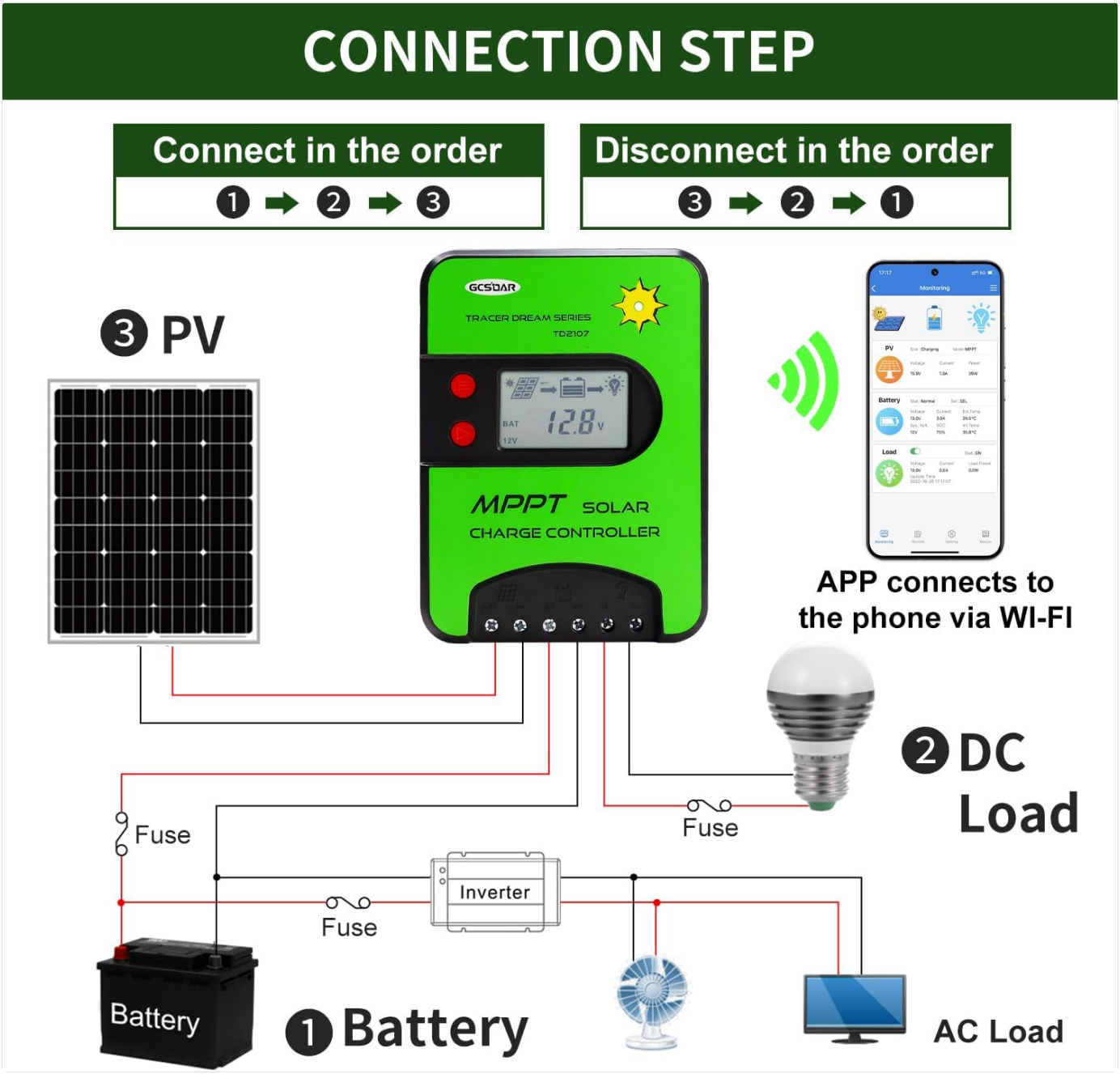


Figure 6.1: Visual guide for connecting and disconnecting the solar charge controller components.

Connection Order:

1. **Connect Battery:** Connect the battery to the controller's battery terminals (marked with a battery symbol). Ensure correct polarity.
2. **Connect DC Load (Optional):** Connect your DC loads to the controller's load terminals (marked with a light bulb symbol). Ensure correct polarity.
3. **Connect Solar Panel:** Connect the solar panel to the controller's PV terminals (marked with a solar panel symbol). Ensure correct polarity.

Disconnection Order:

1. Disconnect Solar Panel.

2. Disconnect DC Load.
3. Disconnect Battery.

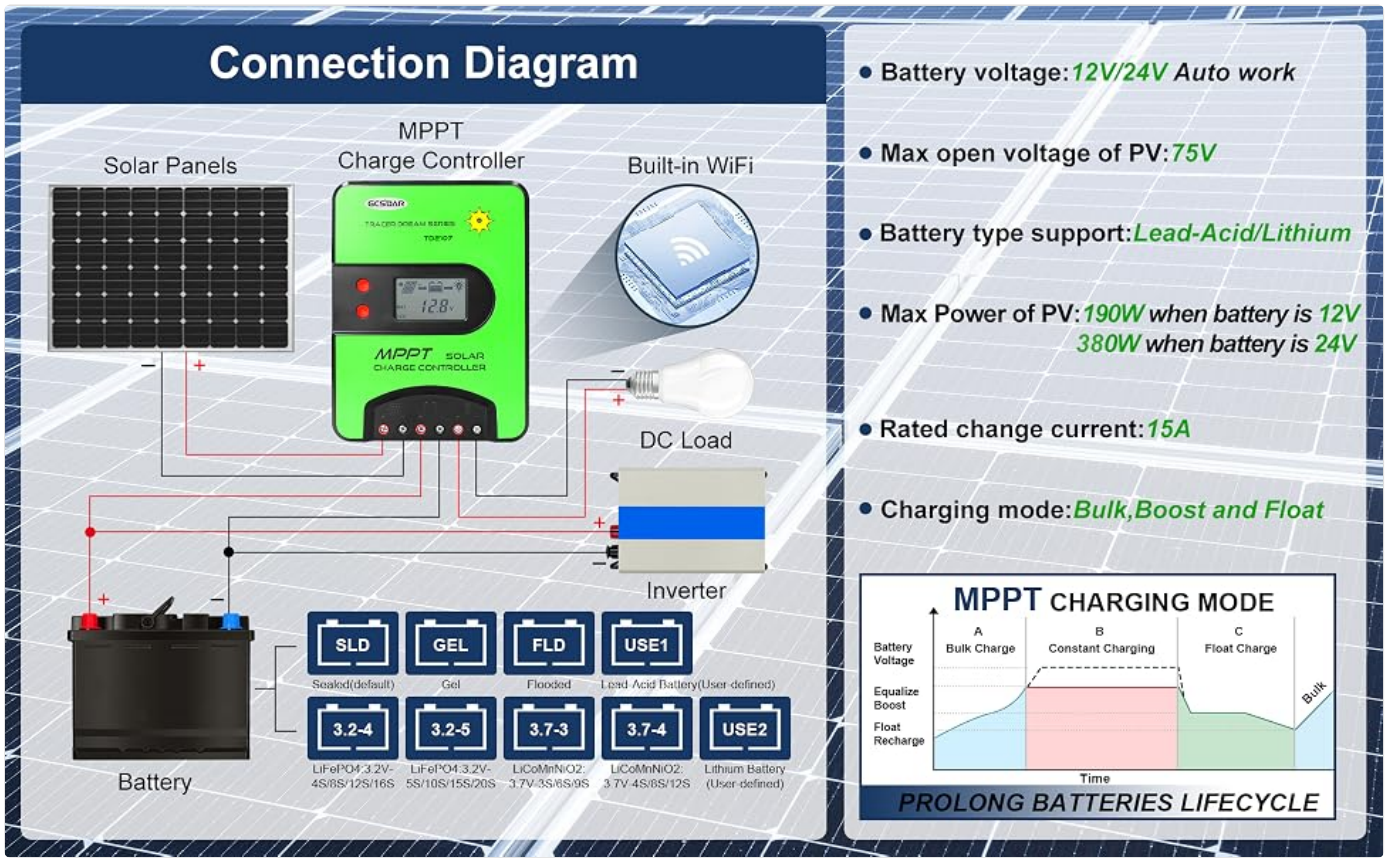


Figure 6.2: Comprehensive wiring diagram illustrating the connection of solar panels, battery, inverter, and DC load to the MPPT charge controller.

Important: Always connect the battery first to allow the controller to recognize the system voltage. Incorrect wiring can damage the controller or other components.

7. Battery Compatibility and Charging

The controller supports various battery types and employs a 4-stage charging process to optimize battery health and lifespan.



Figure 7.1: Illustration of supported battery types (Sealed, Gel, Flooded, AGM, Lithium, User-defined) and the 4-stage charging process.

Supported Battery Types:

- Sealed Lead-Acid Batteries
- Gel Batteries
- Flooded Lead-Acid Batteries
- AGM Batteries
- Lithium Batteries (LiFePO4, Li-NiCoMn)
- User-defined battery parameters for custom configurations.

4-Stage Charging Process:

1. **Bulk Charging:** Delivers maximum current to rapidly charge the battery.
2. **Boost Charging:** Charges the battery to a higher voltage to ensure a full charge.
3. **Float Charging:** Maintains the battery at a constant voltage, compensating for self-discharge.

4. **Equalize Charging (for certain lead-acid types):** Periodically overcharges the battery to balance cell voltages and prevent sulfation.

8. Operating the Controller

The controller's LCD display provides real-time information about your solar system, and the two buttons allow for navigation and parameter adjustments.

LCD Display Information:

- PV Voltage and Current
- Battery Voltage and State of Charge (SOC)
- Load Status and Current
- System Status (Charging, Discharging, etc.)

Load Control Modes:

The controller offers flexible load management options:

- **24-Hour Working Mode:** The DC load remains continuously on.
- **Light Control Mode:** The DC load turns on automatically at dusk and off at dawn.
- **Light + Time Control Mode:** The DC load turns on at dusk and remains on for a preset duration.

Refer to the controller's on-screen menu or the mobile app for detailed instructions on how to select and configure these modes.

9. WiFi Connectivity and Mobile App

The built-in WiFi module allows for convenient remote monitoring and control of your solar system via a smartphone application.



Figure 9.1: The GCSOAR TD2107 controller supports WiFi connectivity for remote monitoring via a mobile application.

App Download and Connection:

1. **For Android:** Scan the QR code provided in the physical manual or browse the manual website to download the 'iConnect' app.
2. **For iOS:** Search for the keyword "LD iConnect" in the App Store to download the application.
3. Follow the in-app instructions to connect your controller to your local WiFi network and register it for remote access.



Figure 9.2: Screenshot of the mobile application's monitoring interface, displaying real-time PV, battery, and load data.

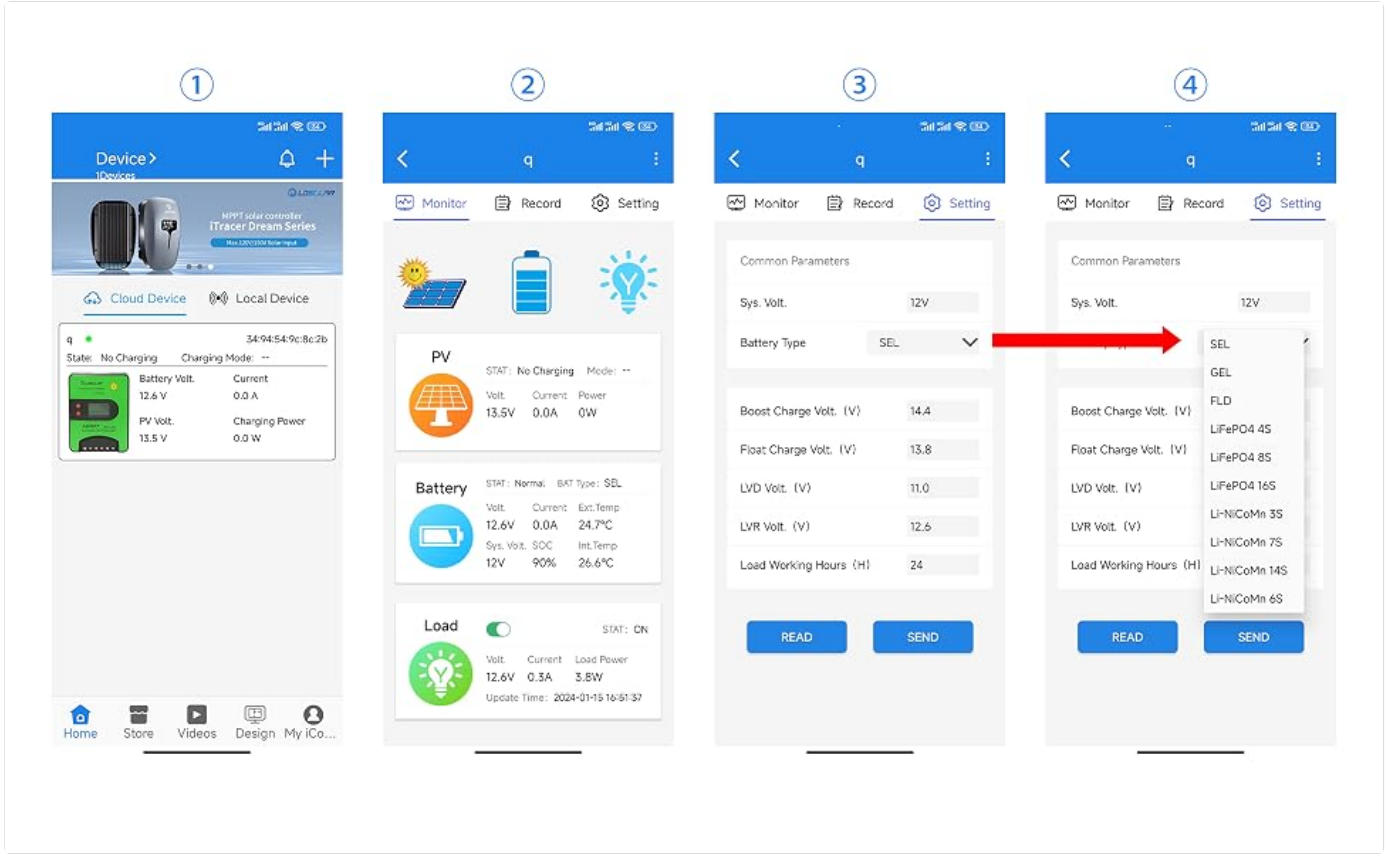


Figure 9.3: Screenshot of the mobile application's settings interface, demonstrating how to select battery types and adjust charging parameters.

The app allows you to view energy flow, monitor system performance, and adjust various parameters, including battery type and load control settings.

10. Maintenance

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

- Periodically inspect all wiring connections for tightness and corrosion.
- Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- Ensure adequate ventilation around the controller to prevent overheating.
- Check the battery terminals for corrosion and clean if necessary.
- Monitor the system performance via the LCD display or mobile app for any unusual readings.

11. Troubleshooting

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

Problem	Possible Cause	Solution
No display on controller	Battery not connected or low voltage; reverse polarity.	Check battery connections and voltage. Ensure correct polarity. Charge battery if voltage is too low.
Battery not charging	Solar panel not connected; low PV voltage; faulty panel or wiring.	Verify solar panel connections and polarity. Check PV voltage. Inspect solar panel and wiring for damage.
Load not working	Load disconnected; overcurrent protection; incorrect load control mode.	Check load connections. Reduce load if overcurrent. Verify load control mode settings.
WiFi connection issues	Incorrect app settings; weak WiFi signal; controller not in pairing mode.	Ensure correct app settings. Move controller closer to router. Refer to app instructions for pairing mode.

12. Warranty and Support

GCSOAR products are designed for reliability and performance. For warranty information, technical support, or service inquiries, please refer to the contact details provided with your purchase or visit the official GCSOAR website. Please have your model number (TD2107) and purchase date available when contacting support.

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