

[Manuals.plus](#) /

› [RICH SOLAR](#) /

› RICH SOLAR 20A MPPT Solar Charge Controller User Manual

RICH SOLAR RS-MPPT20

RICH SOLAR 20A MPPT Solar Charge Controller User Manual

Model: RS-MPPT20

1. INTRODUCTION

The RICH SOLAR 20 Amp MPPT Solar Charge Controller is an advanced, efficient device designed to manage power flow from your solar panels to your battery bank. Utilizing Maximum Power Point Tracking (MPPT) technology, it optimizes energy harvest from your solar array, ensuring maximum charging efficiency for various battery types. This controller automatically detects 12V or 24V DC system voltages and offers robust electronic protections for safe and reliable operation.



Figure 1.1: Front view of the RICH SOLAR 20A MPPT Solar Charge Controller, showing the LCD display and control buttons.

Key Features:

- **Battery Compatibility:** Supports Sealed, Gel, Flooded, and Lithium deep cycle battery options.
- **Automatic Voltage Detection:** Automatically detects 12V or 24V DC system voltages.
- **High Efficiency MPPT:** Innovative MPPT technology with up to 99% tracking efficiency and 98% peak conversion efficiency.
- **Comprehensive Protection:** Includes electronic protection against overcharging, over-discharging, overload, short circuit, and reverse polarity.
- **Durable Design:** Die-cast aluminum housing for effective heat dissipation and enhanced durability.
- **Temperature Sensor:** Capable of measuring battery temperature for optimized charging.
- **Communication Port:** RS232 port for communication with the BT-1 Bluetooth module, enabling smartphone app connectivity.

2. SETUP AND INSTALLATION

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

2.1 Safety Precautions

- Ensure all power sources are disconnected before installation.
- Wear appropriate personal protective equipment (PPE), including safety glasses and insulated gloves.
- Install the controller in a well-ventilated area, away from flammable materials and direct sunlight.
- Ensure proper grounding of the system.

2.2 Mounting the Controller

Mount the controller vertically on a flat, non-flammable surface to allow for adequate airflow and heat dissipation. Ensure there is sufficient space around the unit for wiring and ventilation.

Dimensions



Figure 2.1: Product dimensions for mounting, showing approximate measurements of 8.27 inches length, 5.94 inches width, and 2.34 inches height.

2.3 Wiring Connections

Follow the connection order below to prevent damage to the controller or other components. Always connect the battery first, then the solar panel, and finally the DC load.

1. **Connect the Battery:** Connect the positive and negative terminals of your battery bank to the corresponding "BAT+" and "BAT-" terminals on the charge controller. Ensure correct polarity. The controller will automatically detect the 12V or 24V system voltage.
2. **Connect the Solar Panel:** Connect the positive and negative terminals of your solar panel array to the "PV+" and "PV-" terminals on the charge controller. Ensure correct polarity.
3. **Connect the DC Load (Optional):** If using, connect your DC load to the "LOAD+" and "LOAD-" terminals.

Reliable MPPT Power

 **98%**

Smart Temp Sensor Control

 **99%**

High Tracking Efficiency



Figure 2.2: Illustration of the solar charge controller connected to a solar panel and a battery, demonstrating the wiring setup for reliable MPPT power.

Smart Temp Sensor Control



Figure 2.3: A user interacting with the controller, highlighting the ease of connection and setup.

3. OPERATING INSTRUCTIONS

Once installed, the RICH SOLAR MPPT charge controller operates largely automatically. This section details its key operational aspects.

3.1 LCD Display and Buttons

The integrated LCD display provides real-time information about your solar system, including battery voltage, charging current, and system status. The buttons below the display allow for navigation through menus and adjustment of settings.

3.2 Charging Stages

The controller employs a 4-stage charging algorithm to optimize battery health and longevity:

- **Bulk Charging:** Delivers maximum current to rapidly charge the battery.
- **Boost Charging:** Charges the battery to a higher voltage to ensure a full charge.
- **Floating Charging:** Maintains the battery at a constant voltage, compensating for self-discharge.
- **Equalization (for certain battery types):** Periodically overcharges the battery to balance cell voltages.

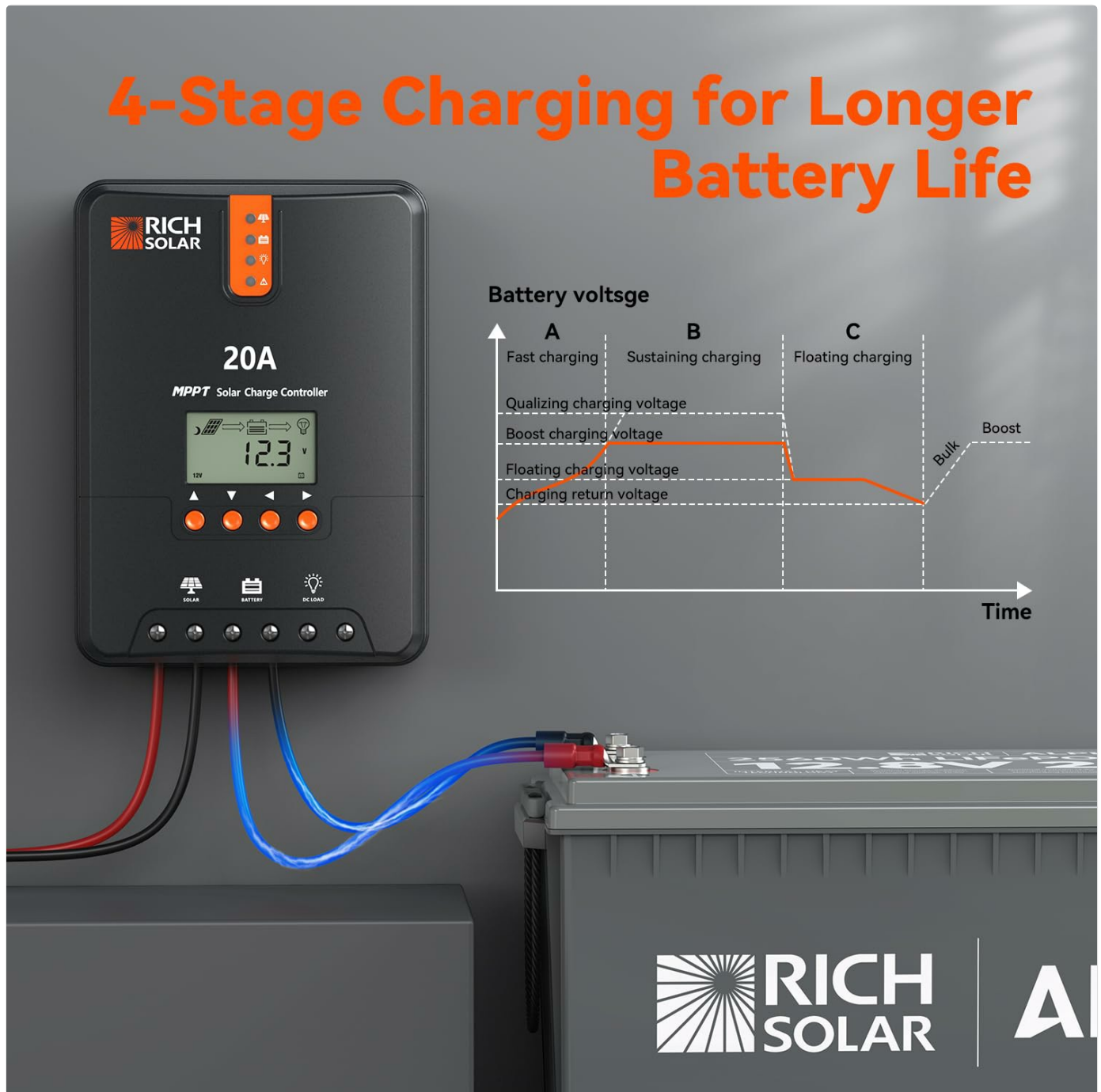


Figure 3.1: A graph depicting the 4-stage charging process (Fast, Sustaining, Floating, and Boost) for extended battery life.

3.3 Battery Temperature Compensation

The controller includes a temperature sensor to adjust charging parameters based on battery temperature, ensuring optimal and safe charging in varying environmental conditions (cold and heat).



Figure 3.2: The controller connected to a battery with a smart temperature sensor, illustrating its ability to compensate for cold and heat.

3.4 Battery Type Selection

The controller is compatible with various deep cycle battery types. Ensure the correct battery type (Sealed, Gel, Flooded, or Lithium) is selected in the controller's settings for proper charging. Refer to the detailed settings menu in the full manual for specific instructions on changing battery types.

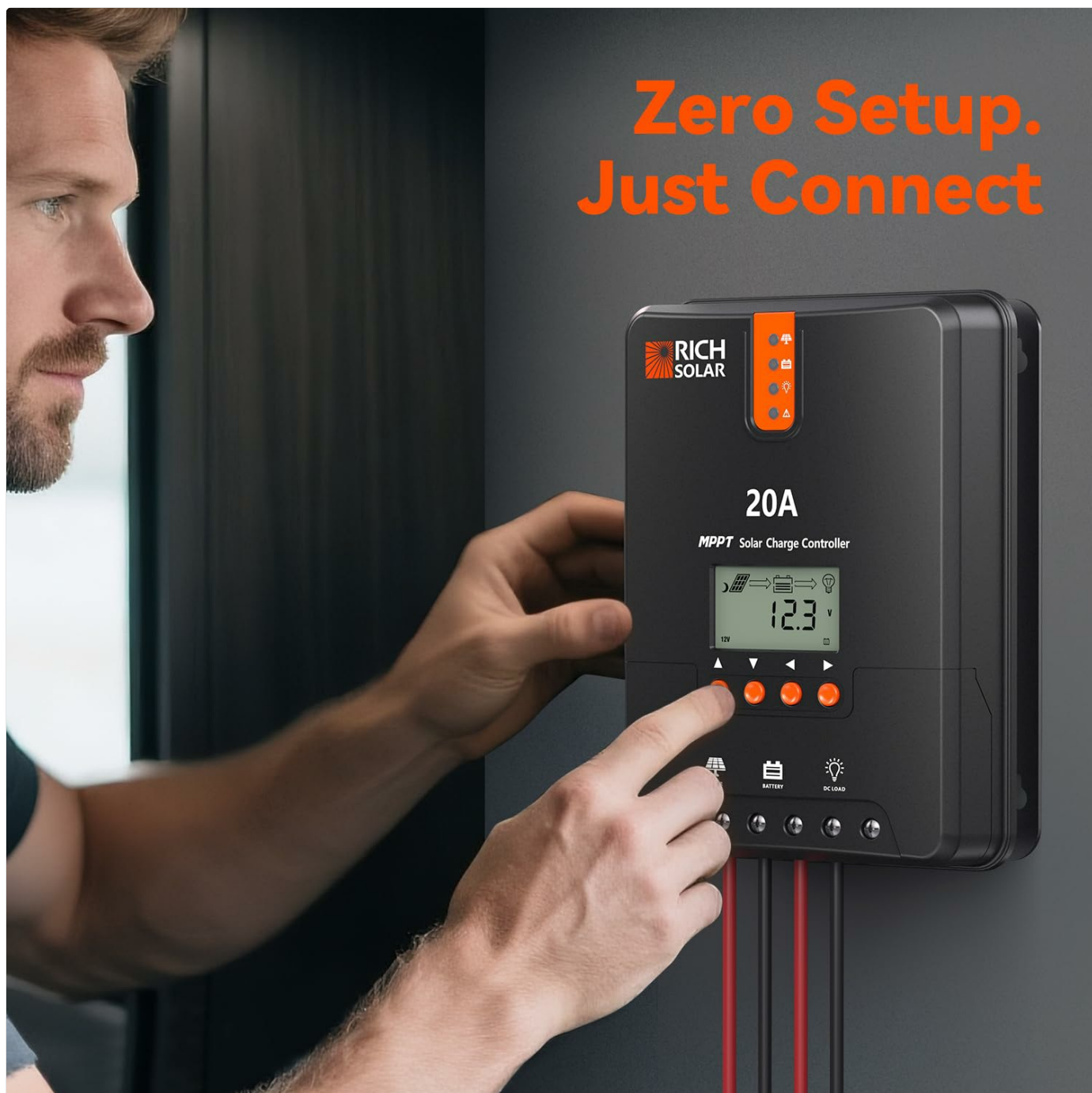


Figure 3.3: The controller shown with different battery types (Li, SLD, GEL, FLD, AGM), indicating its compatibility with multiple 12V/24V batteries.

3.5 Bluetooth Connectivity

The RS232 port allows communication with the optional BT-1 Bluetooth module. Once connected, you can pair the module with a smartphone app to monitor system performance and adjust settings remotely.

4. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your RICH SOLAR MPPT 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. Loose connections

can lead to overheating and poor performance.

- **Ventilation:** Ensure that the ventilation openings are not obstructed to allow for proper heat dissipation.
- **Environmental Check:** Verify that the installation environment remains within the recommended temperature and humidity ranges.

5. TROUBLESHOOTING

This section provides guidance on common issues you might encounter. For more complex problems or error codes not listed, please refer to the comprehensive user manual or contact RICH SOLAR support.

Problem	Possible Cause	Solution
Controller not powering on	No battery connection or low battery voltage.	Check battery connections and ensure battery voltage is above the minimum operating voltage.
No charging from solar panels	Solar panel disconnected, insufficient sunlight, or incorrect polarity.	Verify solar panel connections, ensure adequate sunlight, and check polarity.
Battery not fully charging	Incorrect battery type setting, undersized solar array, or battery degradation.	Confirm battery type setting, consider adding more solar panels, or test battery health.
Error Code E15 (or similar)	Specific system fault (e.g., battery overcharged, internal error).	Refer to the full manual for specific error code definitions and troubleshooting steps. Often, disconnecting and reconnecting the battery can reset minor errors. If persistent, contact support.

Intelligent Protection Features:

The controller is equipped with multiple protection mechanisms to ensure system safety:

- Over-discharging Protection
- Overcharging Protection
- Overload Protection
- Short Circuit Protection
- Reverse Polarity Protection
- Reverse Current Protection
- Temperature Compensation

Intelligent Protection



Figure 5.1: Visual representation of the intelligent protection features, including over-discharging, overcharging, overload, short circuit, reverse polarity, reverse current, and temperature compensation.

6. SPECIFICATIONS

Technical specifications for the RICH SOLAR 20A MPPT Solar Charge Controller (Model: RS-MPPT20).

Parameter	Value
Nominal System Voltage	12V/24V Auto Recognition
Rated Battery Current	20A
Rated Load Current	20A
Max. PV Input Short Current	25A
Max. Battery Voltage	32V
Max Solar Input Voltage	100 VDC
Mounting Oval	0.30 x 0.18 in
Net Weight	1.4 kg (3.08 lb)
Discharge Circuit Voltage Drop	$\leq 0.15V$
Overall Dimension (L x W x H)	20.98 x 15.09 x 5.94 cm (8.27 x 5.94 x 2.34 inches)
Material	Aluminium

Parameter	Value
Colour	Black



Figure 6.1: A visual summary of the key specifications for the RICH SOLAR 20A MPPT Solar Charge Controller.

7. WARRANTY AND SUPPORT

RICH SOLAR is committed to providing high-quality products and excellent customer service.

7.1 Warranty Information

For detailed warranty terms and conditions, please refer to the official RICH SOLAR website or the warranty card included with your product. The warranty typically covers manufacturing defects and ensures the product meets its specified performance standards.

7.2 Customer Support

If you have any questions, require technical assistance, or need to report an issue, please contact RICH SOLAR customer support. RICH SOLAR offers dedicated U.S. support to assist you.

- **Online Resources:** Visit the official RICH SOLAR website for FAQs, additional manuals, and product information.
- **Contact Information:** Refer to the product packaging or the RICH SOLAR website for the most current contact details (phone, email, or live chat).



Figure 7.1: Images showcasing the RICH SOLAR team and facilities, emphasizing their commitment to American design and dedicated support.



About RICH SOLAR

Since 2005, RICH SOLAR has focused on "Making Renewable Energy Easy" by providing the highest quality solar products with easy installation, great prices, and rock-solid customer support. Whether you're looking to outfit your own tiny home or RV, or searching for a reliable partner for your off-grid solar customers, RICH SOLAR remains your "one-stop-shop" for off-grid solar products.

What problem are we solving?

To make renewable energy easy by providing a reliable and quality solar energy system at a lowercost.

What makes our products unique?

RICH SOLAR is focused on bringing the highest standard of solar products to market while providing excellent customer support.

Why do we love what we do?

RICH SOLAR envisions providing the most efficient renewable energy solutions that can generate and supply reliable and affordable energy.

Figure 7.2: Information about RICH SOLAR's company background and mission to make renewable energy accessible.

© 2024 RICH SOLAR. All rights reserved.

For the latest information and updates, please visit the official [RICH SOLAR Store](#).

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question