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› MarsRock 1400W Wind Solar Hybrid Charge Controller User Manual

Marsrock 1400W80BLA

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Model: 1400W80BLA

1. INTRODUCTION

The MarsRock 1400W Smart MPPT Booster Wind Solar Hybrid Charge Controller is an advanced device designed to efficiently manage power from both wind turbines and solar panels. It is ideal for off-grid systems, particularly for low-power applications such as street lamps and monitoring systems. This controller features intelligent MPPT (Maximum Power Point Tracking) technology for wind charging, PWM dump load control, and comprehensive protection functions to ensure the longevity and stable operation of your power system. It supports 12V/24V battery systems and is compatible with GEL and Lead-acid batteries.



Image 1.1: MarsRock 1400W Wind Solar Hybrid Charge Controller with included dump load resistor, cables, and mounting hardware.

2. SAFETY INFORMATION

Please read all safety instructions carefully before installation and operation. Failure to follow these instructions may result in electric shock, fire, or serious injury.

- Ensure all power sources (wind turbine, solar panels, battery) are disconnected before wiring or servicing the controller.
- Use appropriate personal protective equipment (PPE) such as insulated gloves and eye protection.
- All wiring must comply with local electrical codes and regulations.
- Do not disassemble or attempt to repair the controller. Refer to qualified service personnel.
- Install the controller in a well-ventilated area, away from flammable materials and direct sunlight.
- Ensure proper grounding of the system.
- Verify correct polarity for all connections to prevent damage to the controller and connected devices.

3. PRODUCT OVERVIEW

The controller features a robust design with clearly labeled terminals and an intuitive LCD display for monitoring system parameters.

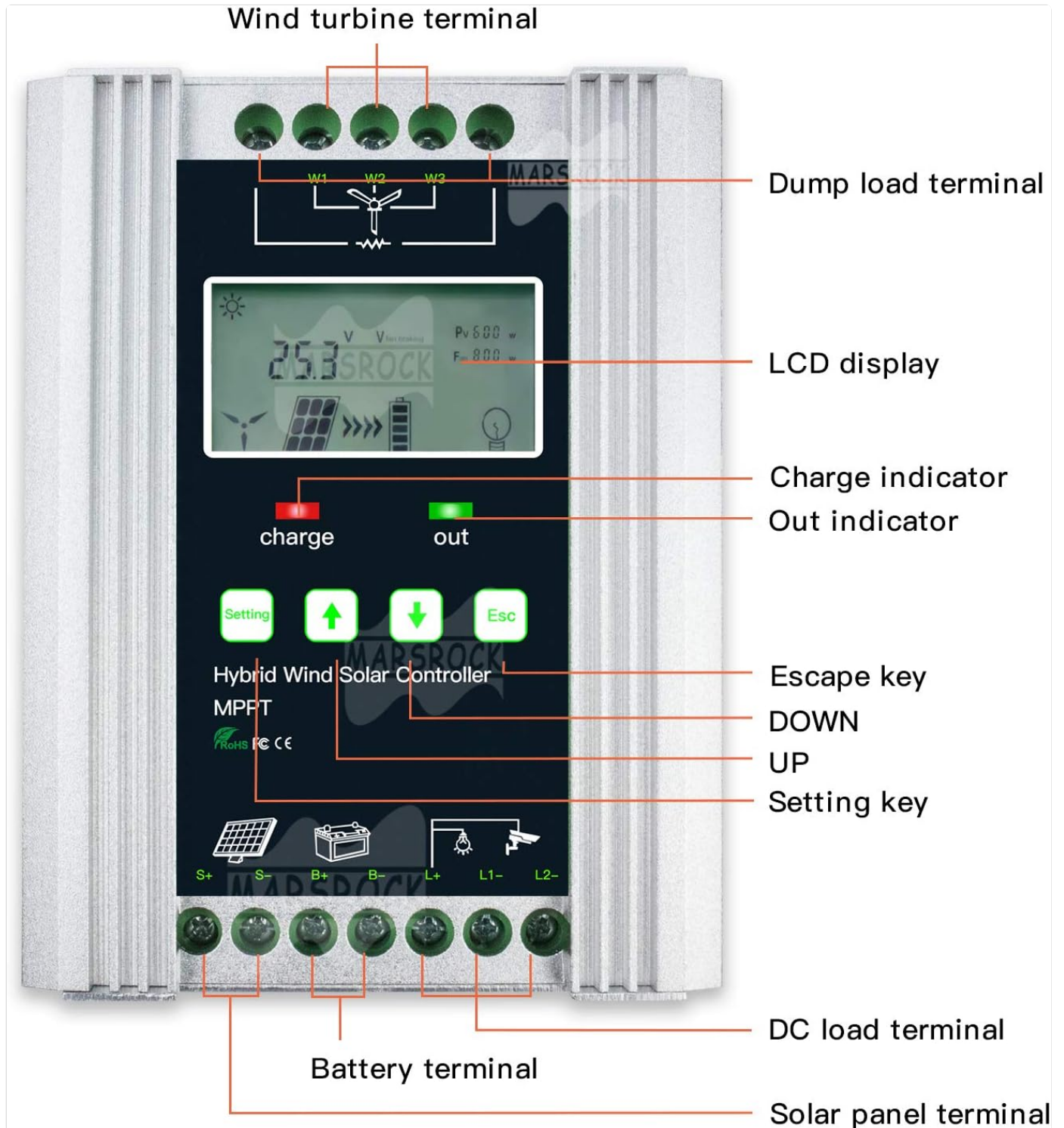


Image 3.1: Front panel and terminal identification.

3.1. Components and Indicators

- **Wind Turbine Terminal (W1, W2, W3):** Connections for the three-phase AC output of the wind turbine.
- **Dump Load Terminal:** Connection for the external dump load resistor to dissipate excess energy.
- **LCD Display:** Shows real-time system parameters such as voltage, current, power, and operating status.
- **Charge Indicator:** LED indicating battery charging status.
- **Out Indicator:** LED indicating DC load output status.
- **Setting Key:** Enters parameter setting mode.
- **UP/DOWN Keys:** Navigate through menu options and adjust parameter values.

- **Escape Key (Esc):** Exits current menu or setting.
- **Solar Panel Terminal (S+, S-):** Connections for the positive and negative terminals of the solar panels.
- **Battery Terminal (B+, B-):** Connections for the positive and negative terminals of the battery bank.
- **DC Load Terminal (L1+, L1-, L2+, L2-):** Connections for DC loads.

4. SPECIFICATIONS

Parameter	Value
System Voltage	12V/24V Auto Identify
Max Wind Power	800W
Max Solar Power	600W
Total Rated Power	1400W
Solar Panel Voltage Range	18-32VDC
Solar Panel Max Current	20A
Wind Turbine Voltage (AC)	AC24V
Wind Turbine Voltage (DC)	DC41.6V
Wind Turbine Max Current	26.7A
DC Load Output	24VDC/30A (15A*2)
Max Battery Charging Current	46.7A
Over Charge Protection (24V Battery)	28.8V
Floating Charge Voltage (24V Battery)	27.6V
Control Mode	Wind MPPT (boost), PWM dump load, PWM Over current Limiting
Operating Temperature	-25°C ~ +55°C
Dimensions (L x W x H)	16.26 x 13.97 x 6.6 cm (6.4 x 5.5 x 2.6 inches)
Material	Metal



Image 4.1: Controller dimensions.

5. SETUP AND INSTALLATION

Proper installation is crucial for the safe and efficient operation of the hybrid charge controller. Follow the wiring diagram carefully.

5.1. Installation Location

- Choose a dry, well-ventilated location, protected from direct sunlight, rain, and excessive dust.
- Ensure sufficient clearance around the controller for heat dissipation.
- Mount the controller vertically on a non-flammable surface.

5.2. Wiring Sequence

Always connect components in the following order to prevent damage:

1. **Connect the Battery:** Connect the positive (B+) and negative (B-) terminals of the battery bank to the corresponding battery terminals on the controller. Ensure correct polarity. The controller will automatically detect the system voltage (12V or 24V).
2. **Connect the Dump Load:** Connect the external dump load resistor to the dedicated dump load terminals on the controller. This resistor is essential for dissipating excess energy from the wind turbine.

3. **Connect the Wind Turbine:** Connect the three-phase AC output wires of your wind turbine to the W1, W2, W3 terminals.
4. **Connect the Solar Panels:** Connect the positive (S+) and negative (S-) wires from your solar panel array to the solar panel terminals on the controller. Ensure correct polarity.
5. **Connect the DC Load (Optional):** If using, connect your DC loads to the L1+, L2+, L2- terminals. Ensure the total load does not exceed the controller's rated DC load capacity.



Image 5.1: Comprehensive wiring diagram for the hybrid system.

After all connections are made, double-check all polarities and connections before powering on the system. Incorrect wiring can cause severe damage to the controller and connected components.

6. OPERATING INSTRUCTIONS

The controller's LCD display and four-button interface allow for easy monitoring and parameter adjustment.

6.1. LCD Display Navigation

The LCD cycles through various screens displaying real-time data. Use the UP/DOWN buttons to manually cycle through screens or the SETTING button to enter parameter adjustment mode.

LCD



Image 6.1: Various LCD display screens showing system status and parameters.

- **Main Screen:** Displays battery voltage, wind power, solar power, and charge status.
- **Float Voltage (Vfloat):** Shows the battery float charge voltage setting.
- **Over Voltage (Vover):** Indicates the over-charge protection voltage.
- **No Braking (V no braking):** Displays the voltage threshold for wind turbine braking.
- **Time Setting:** Allows adjustment of load control timing (if enabled).

6.2. Parameter Settings

To adjust parameters:

1. Press the **SETTING** button to enter the parameter setting mode. The first adjustable parameter will blink.
2. Use the **UP** and **DOWN** buttons to adjust the value.
3. Press **SETTING** again to confirm the value and move to the next parameter.

4. Press **Esc** to exit the setting mode at any time.

Refer to the specific parameters in the controller's menu for detailed descriptions and recommended values based on your battery type and system requirements.

6.3. Load Control Modes

The controller supports various DC load working modes, including light control and time control functions. These can be configured via the setting menu to automate the turning on/off of connected DC loads based on ambient light or a set schedule.

7. MAINTENANCE

Regular maintenance ensures optimal performance and extends the lifespan of your MarsRock Hybrid Charge Controller.

- **Check Connections:** Periodically inspect all wiring connections for tightness and corrosion. Loose connections can cause overheating and poor performance.
- **Clean Controller:** Keep the controller clean and free of dust and debris. Use a soft, dry cloth. Do not use liquid cleaners. Ensure ventilation openings are not blocked.
- **Battery Inspection:** Regularly check battery terminals for corrosion and ensure battery fluid levels (for flooded lead-acid batteries) are adequate.
- **System Monitoring:** Monitor the LCD display regularly for any unusual readings or error codes.
- **Environmental Check:** Ensure the installation environment remains within the specified temperature and humidity ranges.

8. TROUBLESHOOTING

This section provides solutions to common issues you might encounter.

Problem	Possible Cause	Solution
Controller LCD is off / No power	Battery not connected or reverse polarity; Blown fuse; Low battery voltage.	Check battery connections and polarity; Check inline fuses; Charge battery or replace if faulty.
Battery not charging from solar	Solar panels not connected; Incorrect solar panel polarity; Insufficient sunlight; Damaged solar panel or wiring.	Verify solar panel connections and polarity; Ensure panels are in direct sunlight; Inspect panels and wiring for damage.
Battery not charging from wind	Wind turbine not connected; Insufficient wind speed; Damaged wind turbine or wiring.	Verify wind turbine connections; Ensure adequate wind speed; Inspect turbine and wiring for damage.
DC Load not working	Load not connected; Overload protection activated; Low battery voltage; Load control setting.	Check load connections; Reduce load; Charge battery; Adjust load control settings on the controller.
Controller overheating	Poor ventilation; Overload; Faulty dump load.	Ensure adequate airflow around controller; Reduce system load; Check dump load resistor for proper function.

9. WARRANTY AND SUPPORT

MarsRock products are manufactured to high quality standards. For warranty information or technical support, please contact your point of purchase or the manufacturer directly. Keep your purchase receipt as proof of purchase.

Manufacturer: Marsrock Power

For further assistance, you may refer to the contact information provided on the product packaging or the official Marsrock website.

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