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PowMr 80amp/12V24V36V48V

PowMr 80A MPPT Solar Charge Controller User Manual

Model: 80amp/12V24V36V48V
Brand: PowMr

1. Product Overview

The PowMr 80A MPPT Solar Charge Controller is designed for efficient solar power management, compatible with 12V, 24V, 36V, and 48V battery systems. It features advanced Maximum Power Point Tracking (MPPT) technology, ensuring high tracking efficiency up to 99% and peak conversion efficiency up to 97%. This controller supports various battery types, including Lead-acid (Sealed, Gel, Flooded), Lithium (LiFePO4, Lithium-Ion), and user-defined settings. Its parallel connection capability allows for system expansion up to 12 units, increasing solar panel configurations and battery capacity. The unit also incorporates comprehensive multi-protection functions for safe and reliable operation.

2. Key Features

- **Parallel Connection Support:** Supports up to 12 units in parallel, enabling easy expansion of solar panel configurations and battery capacity.
- **Multi-stage Charge Algorithm:** Features 3 integrated charge modes (Bulk charge, Boost charge, Float charge) with adaptive boost charging to optimize charging cycles and extend battery life.
- **High Efficiency MPPT Technology:** Achieves tracking efficiencies up to 99% and peak conversion efficiencies up to 97% for optimal power harvesting.
- **Wide Voltage/Power Support:** Accepts PV input up to 160V. Recommended maximum PV input power: 960W (12V system), 1920W (24V system), 2880W (36V system), 3840W (48V system).
- **Versatile Battery Compatibility:** Compatible with 12/24/36/48V Lead-acid (Sealed, Gel, AGM, Flooded) and Lithium batteries (with activation function for Lithium).
- **Full Battery Charging Protection:** Includes PV array short-circuit protection, PV input over-current protection, load short-circuit protection, PV polarity reversal protection, battery polarity reversal protection, and over-temperature protection.

3. Product Components and Display



Figure 3.1: Front view of the PowMr 80A MPPT Solar Charge Controller.



Figure 3.2: Detailed view of the LCD display and connection ports. The display shows PV parameters, battery parameters, charging status, and day/night indicator. Ports include Battery Interface, PV Input Interface, Temperature Probe Port, and Parallel Communication Port.

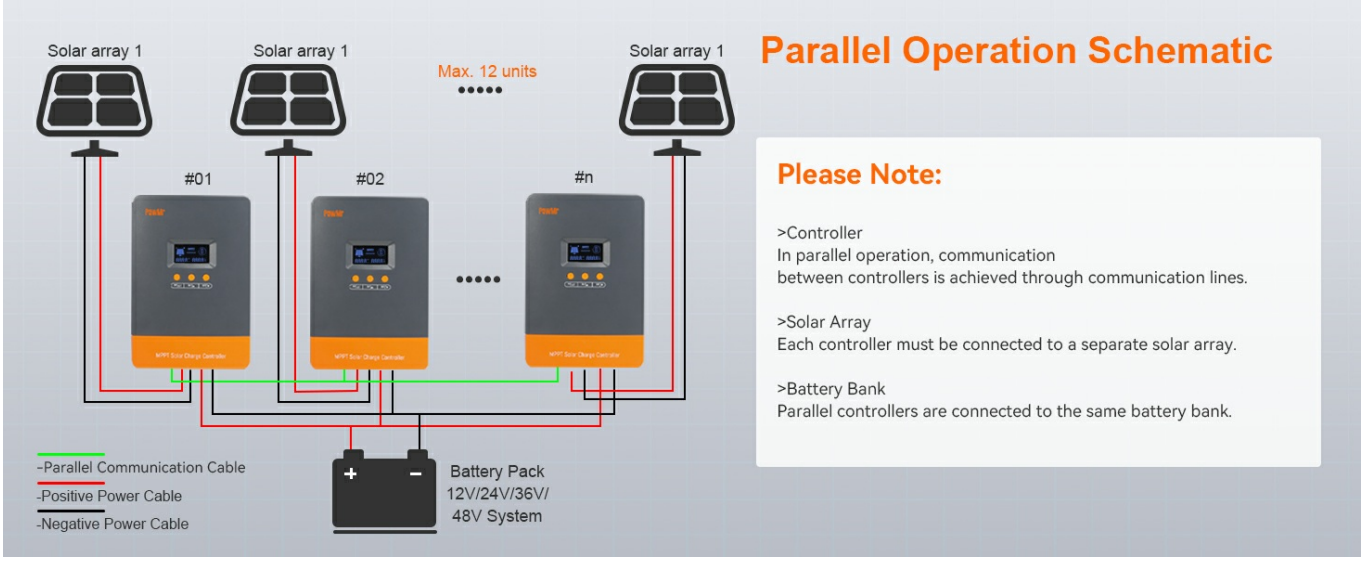


Figure 3.3: Product appearance and LCD display screen details. The buttons are PV/SET (for setting PV input parameters and confirming), BAT/▲ (for switching parameters and increasing values), and BAT/▼ (for switching parameters and decreasing values).

4. Installation Guide

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

4.1 Mounting the Controller

Mount the controller vertically on a wall or suitable surface using screws. Ensure there is ample space around the unit for heat dissipation, especially if installing multiple units in parallel.

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Video 4.1: Quick Installation Wiring Guide. This video demonstrates the physical mounting of the controller and initial wiring steps.

4.2 Wiring Connections

Before making any connections, ensure all circuit breakers are open. Connect the cables in the following order:

1. Remove the terminal cover from the bottom of the controller.
2. Connect the positive and negative battery cables to the battery terminals on the controller.
3. Connect the positive and negative solar array cables to the PV input terminals on the controller.
4. Install appropriate circuit breakers for each line (battery and solar array).
5. Replace the terminal cover.

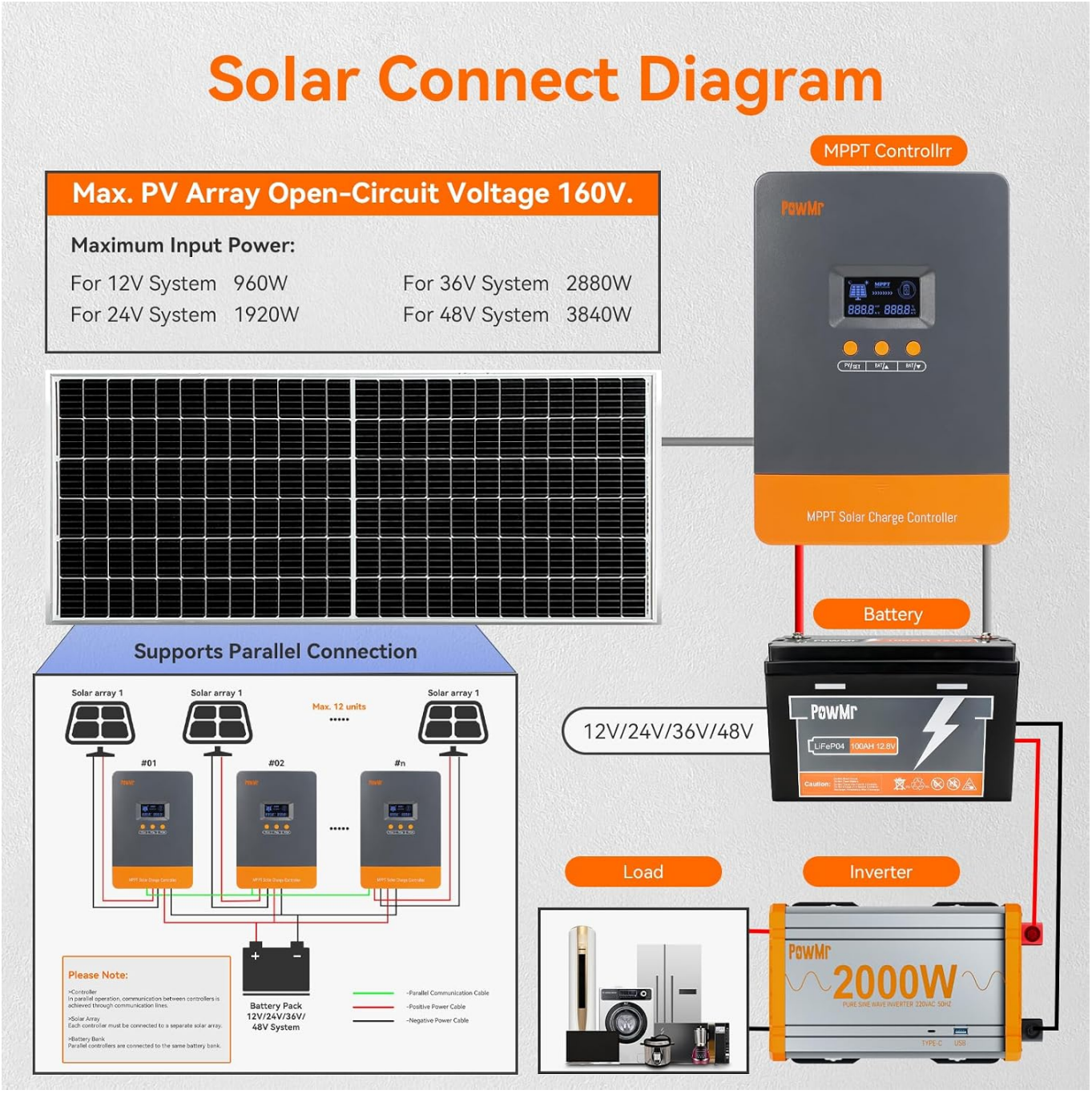


Figure 4.1: Solar Connect Diagram illustrating the connections between the solar panel, MPPT controller, battery, and inverter. Max PV Array Open-Circuit Voltage is 160V. Maximum input power varies by system voltage: 960W for 12V, 1920W for 24V, 2880W for 36V, and 3840W for 48V.

4.3 Powering On

First, close the battery circuit breaker. Then, close the solar circuit breaker. The controller display should power on.

5. Operating Instructions

5.1 Battery Type Configuration

The controller supports various battery types. It is essential to configure the correct battery type for optimal charging and battery health. Use the PV/SET, BAT/▲, and BAT/▼ buttons to navigate and select the appropriate battery type (e.g., Sealed, Gel, Flooded, LiFePO4, Lithium-Ion, User-defined).



Figure 5.1: The controller supports Sealed Lead-Acid (SLA), Gel Sealed Lead-Acid (GSL), Flooded Lead-Acid (FLB), LiFePO4 (LI), Lithium-Ion (LN), and User-defined (USE) battery types. Lithium battery activation function is available when 'Lithium Battery' is selected.

5.2 Multi-stage Charging

The controller employs a three-stage charging algorithm: Bulk charge, Boost charge, and Float charge. This optimizes the charging process and helps prolong battery lifespan by preventing overcharging.

6. Parallel Connection Setup

The PowMr 80A MPPT Solar Charge Controller supports parallel operation for increased capacity. Up to 12 units can be connected in parallel.

6.1 Assembling Parallel Communication Cable

To enable parallel communication, assemble the provided parallel communication cable. This cable connects the

communication ports of multiple controllers.

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Video 6.1: Parallel Installation Guide. This video provides detailed instructions on how to set up multiple controllers in parallel, including assembling the communication cables and configuring the main controller.

6.2 Parallel Operation Schematic

In a parallel setup, one controller acts as the main controller, and others are slave controllers. Communication between controllers is achieved through dedicated communication lines. Each controller must be connected to a separate solar array, and all parallel controllers are connected to the same battery bank.

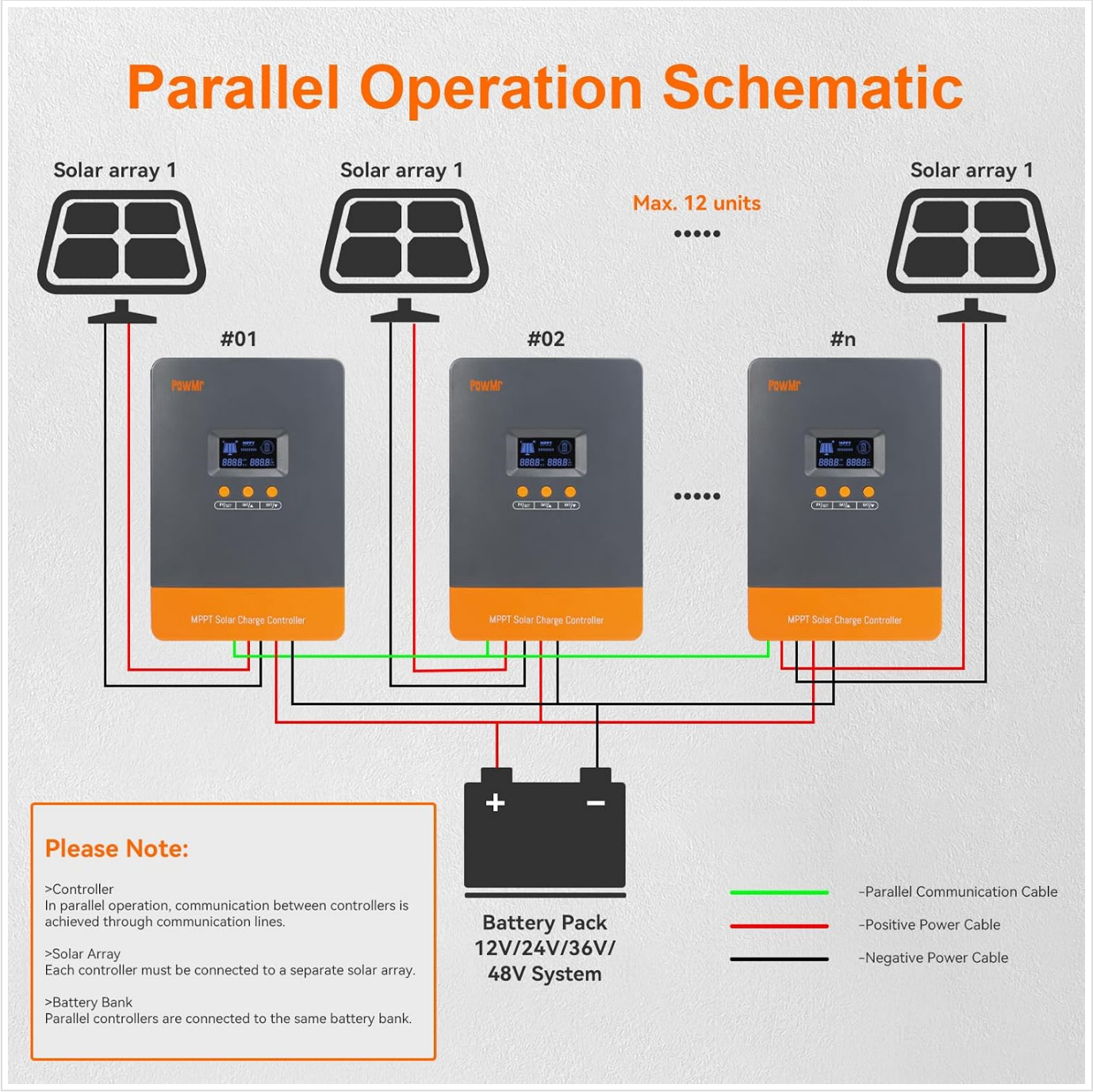


Figure 6.1: Schematic showing multiple PowMr MPPT Solar Charge Controllers connected in parallel to a single battery bank. Each controller connects to its own solar array. Parallel communication cables (green) connect the controllers, while positive (red) and negative (black) power cables connect to the battery bank.

6.3 Setting Parallel Code and Synchronization

After connecting the parallel communication cables, power on the system by closing the battery circuit breaker first. Then, set the parallel code on the main controller. The device with the smallest code becomes the main controller. After setup, define the battery type on the main controller, and the slave controllers will automatically synchronize their configurations

with the main controller.

7. Protection Functions

The PowMr 80A MPPT Solar Charge Controller is equipped with multiple protection features to ensure system safety and longevity:

- **Photovoltaic Input Overcurrent Protection:** Prevents damage from excessive current from the solar array.
- **Photovoltaic Array Short Circuit Protection:** Protects against short circuits in the solar panel array.
- **Reversed Photovoltaic Polarity Protection:** Safeguards the system if solar panel polarity is accidentally reversed.
- **Overvoltage Protection for Batteries:** Prevents battery damage due to excessive charging voltage.
- **Overdischarge Protection for Batteries:** Protects batteries from deep discharge, extending their lifespan.
- **Over-temperature Protection:** Shuts down or reduces charging current if the controller's internal temperature exceeds safe limits.



Figure 7.1: Visual representation of the six multi-protection functions integrated into the controller.

8. Specifications

Feature	Specification
Brand	PowMr
Model	80amp/12V24V36V48V
System Voltage	12V/24V/36V/48V Auto
Max PV Input Voltage	160V

Feature	Specification
Max PV Input Power (12V System)	960W
Max PV Input Power (24V System)	1920W
Max PV Input Power (36V System)	2880W
Max PV Input Power (48V System)	3840W
Tracking Efficiency	Up to 99%
Peak Conversion Efficiency	Up to 97%
Supported Battery Types	Lead-acid (Sealed, Gel, AGM, Flooded), Lithium (LiFePO4, Lithium-Ion), User-defined
Parallel Connections	Up to 12 units
Item Weight	5.37 pounds
Package Dimensions	12.44 x 9.33 x 4.49 inches
Operating Temperature	Up to 60 Degrees Celsius

9. Troubleshooting

This section provides general guidance for common issues. For specific error codes or persistent problems, refer to the detailed troubleshooting section in the full product manual or contact customer support.

- **No Display/No Power:**
  - Check battery connections and ensure they are secure and correctly polarized.
  - Verify that the battery circuit breaker is closed and functioning.
  - Ensure battery voltage is within the controller's operating range.
- **No Charging/Low Charging Current:**
  - Confirm solar panel connections are secure and correctly polarized.
  - Check the solar circuit breaker.
  - Verify PV input voltage is within the controller's acceptable range (Max 160V).
  - Ensure there is sufficient sunlight on the solar panels.
  - Check if the correct battery type is selected in the controller settings.
- **Overheating:**

- Ensure adequate ventilation around the controller.
- Verify that the heat dissipation vents are not blocked.
- Reduce load or solar input if consistently overheating in high ambient temperatures.

- **Parallel Connection Issues:**
  - Ensure parallel communication cables are correctly connected between all controllers.
  - Verify that the main controller is correctly configured and slave controllers have synchronized.
  - Check that each controller is connected to a separate solar array and all are connected to the same battery bank.

10. Warranty and Support

PowMr products are designed for reliability and performance. For warranty information, technical support, or service inquiries, please refer to the official PowMr website or contact their customer service department. Keep your purchase receipt as proof of purchase for warranty claims.
For additional resources and support, visit the PowMr Store on Amazon.

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