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PowMr MPPT Charge Controller 30A

PowMr MPPT Charge Controller 30A User Manual

Model: MPPT Charge Controller 30A

Brand: PowMr

1. Introduction

The PowMr MPPT Charge Controller is an advanced, multi-functional device designed for off-grid solar power systems. It efficiently manages the power flow from your solar panels to your battery bank, ensuring optimal charging and extending battery life. This controller features Maximum Power Point Tracking (MPPT) technology for superior energy harvesting, automatic 12V/24V system voltage identification, and Bluetooth connectivity for convenient monitoring via a mobile application. It is compatible with various battery types, including Lithium, Sealed, Gel, and Flooded batteries, and incorporates comprehensive electronic protection functions for safe and reliable operation.



Figure 1.1: The PowMr MPPT Charge Controller is suitable for a wide range of off-grid applications, including residential solar systems, RVs, marine vessels, and remote power installations.

2. Key Features

- **30A MPPT Charge Controller:** Supports a maximum input current of 30 amps, with a maximum input solar power of 360W for 12V battery systems and 720W for 24V battery systems.
- **Negative Ground Design:** Compatible with any 12V/24V negative ground system, allowing safe earthing of negative connections.
- **High Efficiency:** Features Maximum Power Point Tracking (MPPT) technology with a tracking efficiency of no less than 99.9% and a charge conversion efficiency of 97.0%.
- **Automatic System Voltage Identification:** Automatically detects and adapts to 12V or 24V battery systems.
- **Battery Compatibility:** Supports Lithium, Sealed, Gel, and Flooded battery types.
- **4-Stage Charging:** Implements Bulk, Boost, Float, and Equalization charging stages for optimized battery health and longevity.
- **Temperature Compensation:** Optimized temperature compensation process for extended battery life.
- **Integrated Bluetooth Module:** Built-in Bluetooth for wireless monitoring and control via a compatible Android mobile application.

- **LCD Display:** Backlit LCD provides real-time operating data, energy recording, and statistical information.
- **Comprehensive Electronic Protection:** Includes protection against solar overload, solar short-circuit, low-voltage disconnect, over-charge, high-temperature current limit, and high-input-voltage current limit.
- **Power-off Memory Settings:** Retains settings even after power loss.



Figure 2.1: The PowMr MPPT Charge Controller, showcasing its compact design and the included Bluetooth communication module.

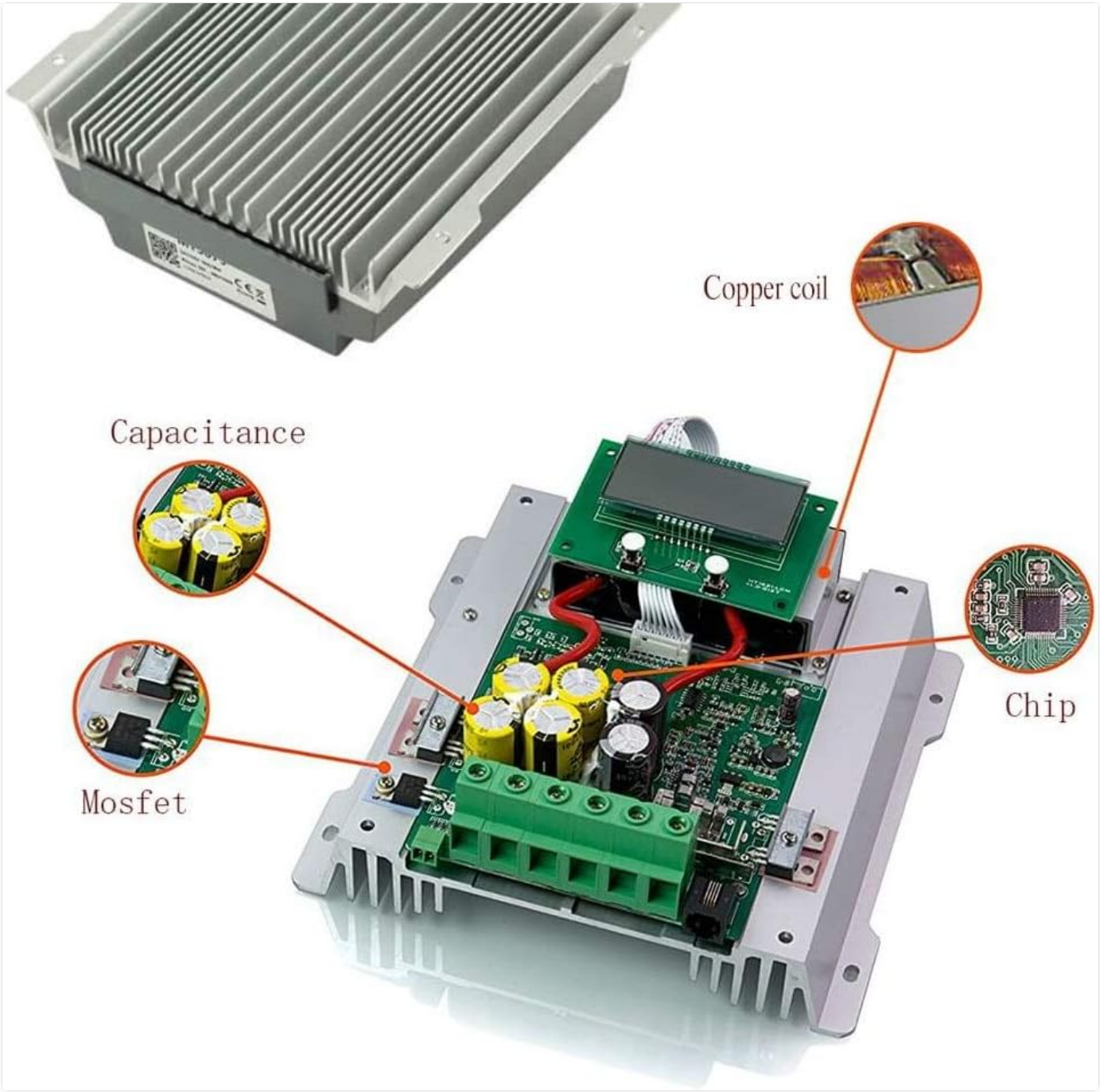


Figure 2.2: An internal view of the charge controller, highlighting key components such as capacitance, MOSFET, copper coil, and the main chip, which contribute to its quality and performance.

3. Installation and Setup

3.1 Safety Precautions

- Ensure all connections are secure and correct before applying power.
- Always connect a fuse directly to the battery to prevent short circuits in the battery wiring.
- Use only insulated tools during installation to prevent electrical shock.
- Install the controller in a well-ventilated area, away from direct sunlight, high temperatures, and moisture.
- Ensure proper grounding for safety, especially with the negative ground design.

3.2 Wiring Diagram

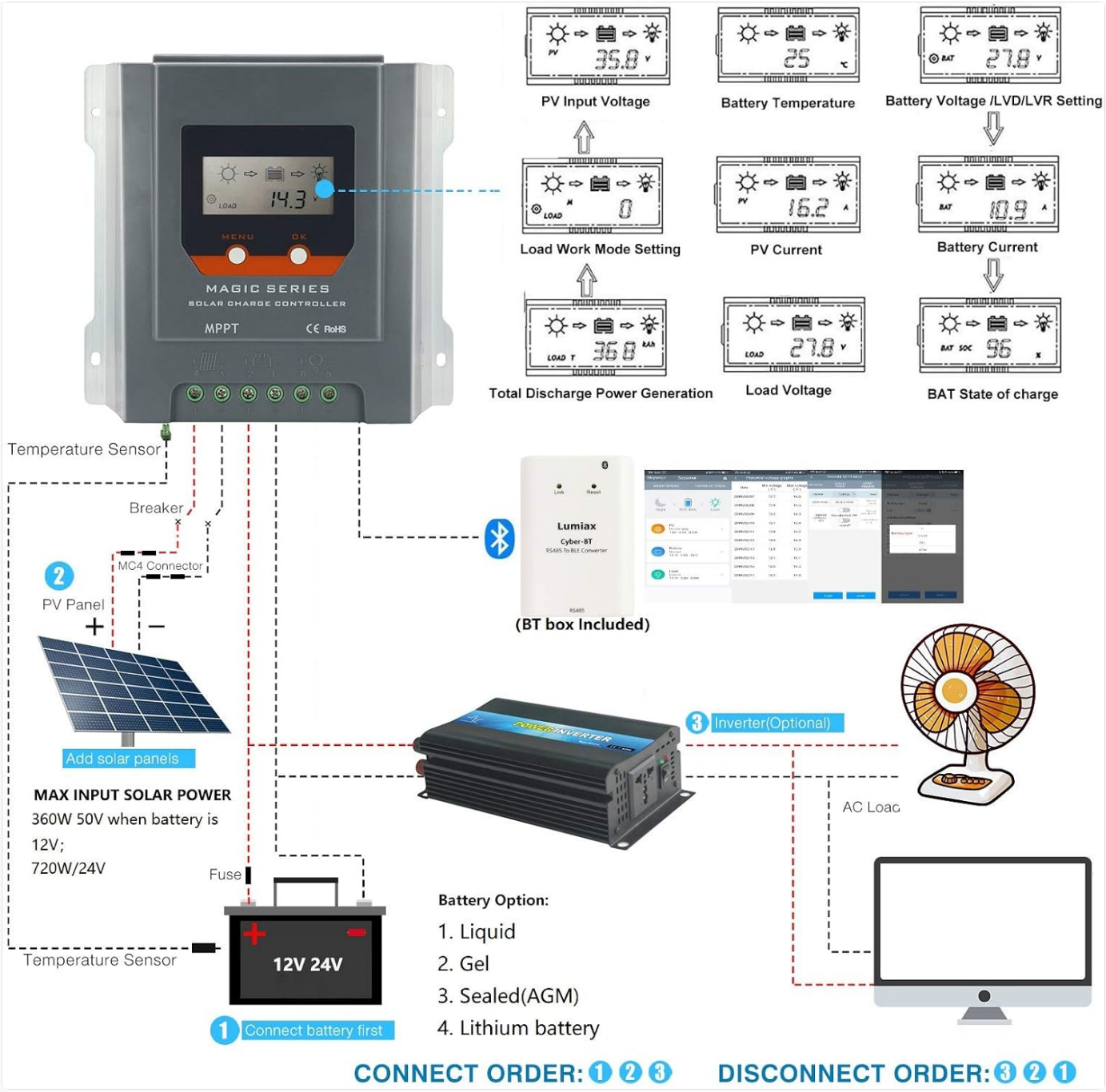


Figure 3.1: Comprehensive wiring diagram illustrating the connection sequence for the PowMr MPPT Charge Controller, including battery, solar panels, and optional inverter/load connections. A temperature sensor is also shown for accurate battery charging.

3.3 Connection Order

Follow these steps to connect the system components in the correct order:

1. **Connect Battery First:** Connect the battery to the charge controller's battery terminals. Ensure correct polarity (positive to positive, negative to negative). The controller will auto-identify the 12V or 24V system voltage.
2. **Add Solar Panels:** Connect the solar panels to the PV input terminals of the charge controller. Ensure the maximum input voltage (Voc) of your solar array does not exceed 50V.
3. **Connect Load (Optional):** If using the DC load output, connect your DC load to the load terminals.
4. **Connect Inverter (Optional):** If using an inverter, connect it to the battery terminals (not the load terminals) as shown in the diagram.

3.4 Disconnection Order

To safely disconnect the system, follow these steps in reverse order:

1. **Disconnect Load:** Disconnect any loads connected to the controller.
2. **Disconnect Solar Panels:** Disconnect the solar panels from the PV input terminals.
3. **Disconnect Battery:** Finally, disconnect the battery from the charge controller.

4. Operation

4.1 LCD Display and Navigation

The controller features a backlit LCD that displays various system parameters. Use the "MENU" and "OK" buttons to navigate through the display screens and adjust settings.

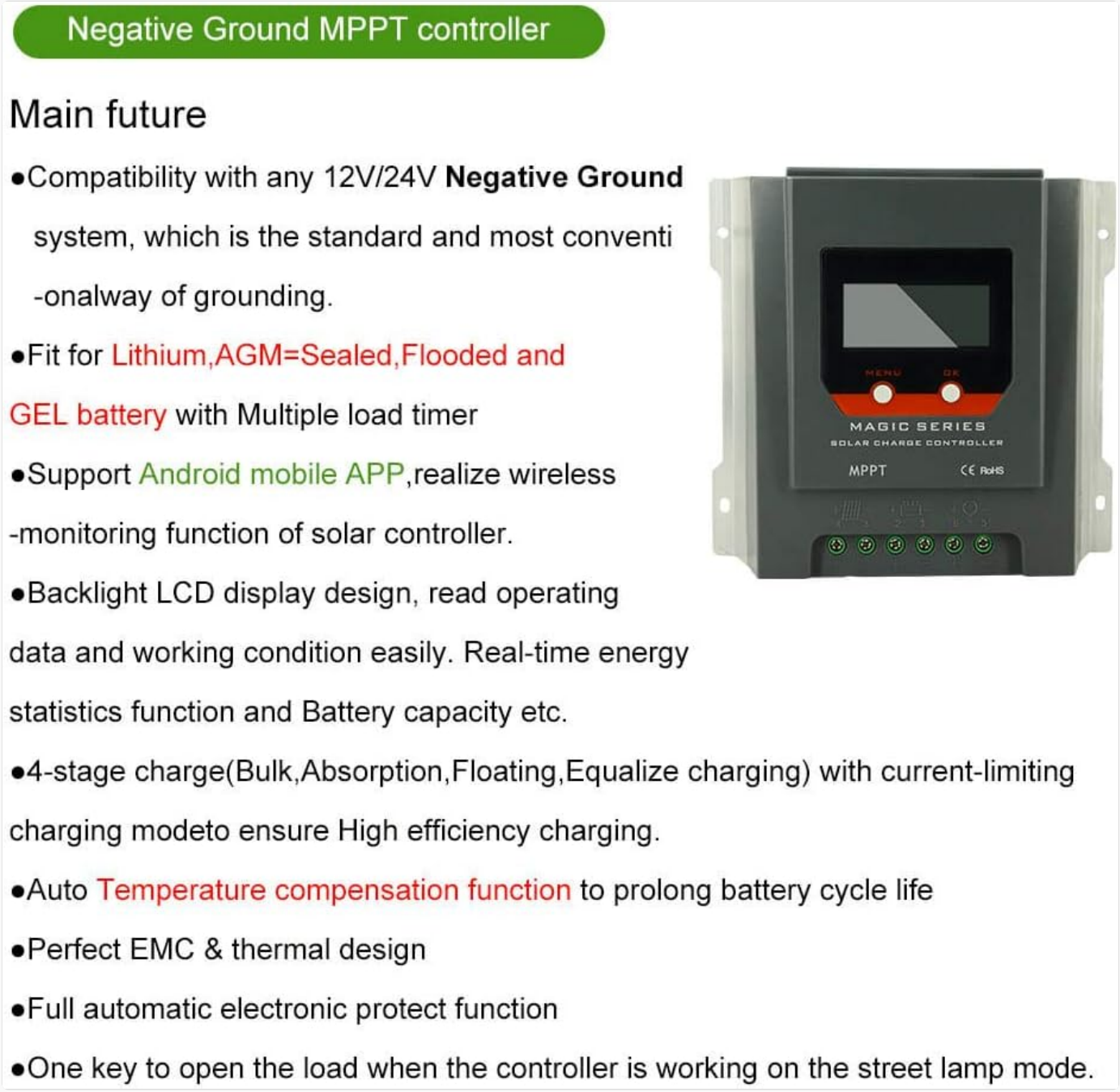


Figure 4.1: Examples of information displayed on the controller's LCD, including PV input voltage, battery temperature, battery voltage, load work mode, PV current, battery current, total discharge power generation, load voltage, and battery state of charge.

The display provides real-time data and historical energy recording, allowing you to monitor the performance of your solar system. Refer to the detailed manual for specific button functions and menu navigation.

4.2 Bluetooth Connectivity and Mobile App

The PowMr MPPT Charge Controller includes a built-in Bluetooth module for wireless monitoring and parameter adjustment via a mobile application. The official application for this controller is named **"Solar Life"** and is compatible with Android phones.

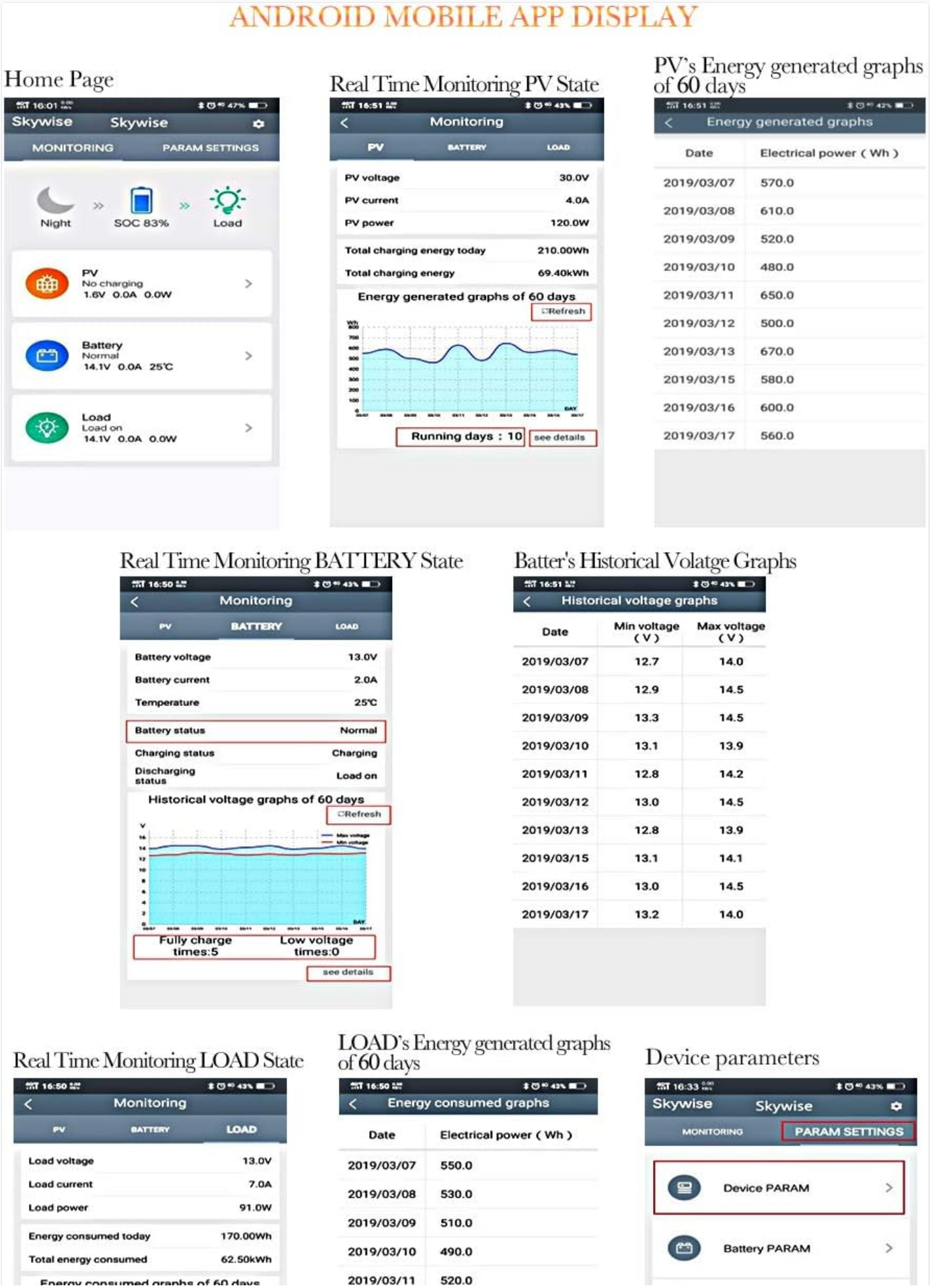




Figure 4.2: Screenshots from the "Solar Life" mobile application, demonstrating its interface for real-time monitoring of PV, battery, and load states, as well as historical data logging and device parameter settings.

To connect via Bluetooth:

1. Ensure the Bluetooth module is properly connected to the charge controller.
2. Download and install the "Solar Life" app from your Android app store.
3. Open the app and search for the Bluetooth device. You may need to refresh the device list or restart the app if the controller is not immediately found.
4. Select your controller from the list to establish a connection.

Once connected, the app allows you to view real-time data, access historical energy logs (up to 60 days for battery voltage, charge energy, and discharge energy), and configure certain parameters. Note that for consistent data logging and connection, the app may require the phone to remain in proximity to the controller.

5. Maintenance

Regular maintenance ensures the longevity and optimal performance of your PowMr MPPT Charge Controller.

- **Visual Inspection:** Periodically inspect the controller and all wiring for any signs of damage, corrosion, or loose connections. Ensure ventilation openings are clear of dust and debris.
- **Cleaning:** Clean the exterior of the controller with a dry, soft cloth. Do not use liquid cleaners or solvents.
- **Connection Check:** Verify that all terminal connections are tight and secure. Loose connections can lead to overheating and poor performance.
- **Battery Health:** Monitor your battery's health and voltage regularly through the LCD display or the mobile app. Ensure batteries are maintained according to their manufacturer's guidelines.
- **Firmware Updates:** Check the PowMr official website or contact support for any available firmware updates that may improve performance or add features.

6. Troubleshooting

This section addresses common issues you might encounter with your PowMr MPPT Charge Controller.

- **Controller Not Powering On:**
  - Check battery connections and ensure correct polarity.
  - Verify battery voltage is within the operating range (9V-15V for 12V system, 18V-30V for 24V system).
  - Inspect any inline fuses or circuit breakers for the battery connection.
- **No Solar Charging / Low Charge Current:**

- Ensure solar panels are connected correctly and receiving adequate sunlight.
- Check PV input voltage on the LCD; it should be higher than battery voltage for charging to occur.
- Verify that the controller is not in float or equalization mode if the battery is not fully charged.
- Confirm battery type setting in the controller matches your battery. Incorrect settings can lead to improper charging.

- **Bluetooth Connectivity Issues (App not connecting):**
  - Ensure the "Solar Life" app is installed and updated.
  - Verify Bluetooth is enabled on your mobile device.
  - Try restarting the app or toggling Bluetooth on your phone.
  - If persistent, try temporarily disconnecting and reconnecting the Bluetooth module or the controller's power to reset it.
  - Ensure your phone is within range of the controller.
- **Error Codes (e.g., E4):**
  - Specific error codes indicate particular faults. Consult the full product manual for a complete list of error codes and their meanings.
  - An "E4" error code, as reported by some users, may indicate an internal fault or a problem with the battery connection. Try power cycling the unit (disconnecting battery, then solar, waiting a few minutes, then reconnecting battery first, then solar). If the error persists, contact customer support.
- **Incorrect Battery State of Charge (SOC) Reading:**
  - Ensure the battery type setting is correct for your battery chemistry (Lithium, Sealed, Gel, Flooded).
  - Verify the battery voltage displayed on the controller matches a multimeter reading at the battery terminals. Significant discrepancies may indicate a wiring issue or a faulty battery.

If you encounter issues not covered here or if troubleshooting steps do not resolve the problem, please contact PowMr customer support for assistance.

7. Specifications

Parameter	Value
Max Input Current	30 Amp
Max Input Solar Power (12V System)	360W
Max Input Solar Power (24V System)	720W
Max Input Voltage	50V
System Voltage	12V/24V Auto-Identify
Battery Compatibility	Lithium, Sealed, Gel, Flooded
Charging Stages	4-stage (Bulk, Boost, Float, Equalization)
Tracking Efficiency	>99.9%
Charge Conversion Efficiency	97.0%

Parameter	Value
Self-consumption	7mA
Temperature Compensation	-4.17mV/K per cell (boost/equalization), -3.33mV/K per cell (floating)
Protection Degree	IP32
Dimensions	7.44 x 7.16 x 2.28 inches
Item Weight	3.56 pounds
Manufacturer	PowMr

8. Warranty and Support

PowMr products are designed for reliability and performance. For information regarding warranty coverage, technical support, or service, please refer to the warranty card included with your product or visit the official PowMr website. You can also contact PowMr customer service directly through their website or the contact information provided in your product packaging for assistance with any questions or issues.

For the latest information and resources, please visit the PowMr Store on Amazon.

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