ECO-WORTHY US-L02M100N-MCWMZIUS2000L200-4

ECO-WORTHY 400W 1.6KWH Complete Solar Panel Kit Instruction Manual

Model: US-L02M100N-MCWMZIUS2000L200-4

1. Introduction

This instruction manual provides detailed guidance for the safe and efficient installation, operation, and maintenance of your ECO-WORTHY 400W 1.6KWH Complete Solar Panel Kit. This system is designed to provide reliable off-grid power for various applications, including RVs, cabins, sheds, and home backup. Please read this manual thoroughly before beginning installation or operation.

2. Package Contents

Verify that all components listed below are present and undamaged upon receipt. If any items are missing or damaged, please contact customer support.

- 4 x 100W Bifacial Solar Panels
- 1 x 40A MPPT Solar Charge Controller
- 1 x 2000W Pure Sine Wave Power Inverter
- 2 x 12V 100Ah Lithium Batteries (LiFePO4)
- 1 x Bluetooth Module 5.0
- 2 sets of Z-Brackets for solar panel mounting
- 1 pair of Y-Branch Connectors
- 1 x 16ft 8AWG Solar-Controller Cable
- Other necessary accessories (e.g., cables, connectors)

Image: All components included in the ECO-WORTHY 400W Complete Solar Panel Kit, featuring four solar panels, an MPPT controller, a power inverter, two lithium batteries, and various cables and mounting hardware.

3. Safety Information

Always prioritize safety during installation and operation. Failure to follow these instructions may result in injury, damage to equipment, or voiding of warranty.

- Read all instructions carefully before installation.
- Ensure all connections are secure and correctly polarized (positive to positive, negative to negative).
- Wear appropriate personal protective equipment (PPE), including gloves and eye protection.
- Do not attempt to disassemble or modify any components of the kit.
- Keep children and unauthorized personnel away from the installation area.
- Avoid short-circuiting the battery terminals or solar panel leads.
- Install in a well-ventilated area, away from flammable materials.
- Consult a qualified electrician if you are unsure about any part of the installation process.

4. Setup and Installation

The ECO-WORTHY 400W Solar Kit is designed for a straightforward four-step connection process. Follow these steps carefully for proper system setup.

Image: A detailed visual guide showing the four-step connection process for the ECO-WORTHY solar kit, including parallel battery connection, parallel solar panel connection, and wiring to the MPPT controller and inverter.

4.1. Step 1: Connecting the Batteries

Connect the two 12V 100Ah lithium batteries in parallel to achieve a 12V system with increased capacity. Ensure positive terminals are connected to positive terminals, and negative to negative.

- Identify the positive (+) and negative (-) terminals on both batteries.
- Using appropriate battery cables, connect the positive terminal of the first battery to the positive terminal of the second battery.
- Connect the negative terminal of the first battery to the negative terminal of the second battery.
- This parallel connection maintains a 12V system voltage while doubling the available amp-hours.

4.2. Step 2: Connecting Solar Panels

Connect the four 100W solar panels in parallel using the provided Y-branch connectors. This configuration increases the total current while maintaining the system voltage suitable for the 12V battery bank.

- Position the solar panels in an area with maximum sun exposure, ideally at a 30°-46° tilt angle.
- Connect the positive output of each solar panel to one input of the Y-branch connector.
- Connect the negative output of each solar panel to the other input of the Y-branch connector.
- The Y-branch connectors will combine the outputs into a single positive and negative lead for connection to the charge controller.

4.3. Step 3: Connecting Battery to Controller and Inverter

First, connect the battery bank to the MPPT charge controller, then connect the battery bank to the power inverter.

- **3.1 Connect Battery to Controller:** Locate the battery terminals on the 40A MPPT charge controller. Connect the positive lead from your parallel battery bank to the positive battery terminal on the controller. Connect the negative lead from the battery bank to the negative battery terminal on the controller. Ensure screws are securely tightened.
- **3.2 Connect Battery to Inverter:** Connect the positive lead from your parallel battery bank to the positive input terminal of the 2000W power inverter. Connect the negative lead from the battery bank to the negative input

terminal of the inverter. Ensure these connections are robust and secure.

4.4. Step 4: Connecting Solar Panel to Controller

Finally, connect the combined solar panel output to the MPPT charge controller.

- Locate the solar panel input terminals on the 40A MPPT charge controller.
- Connect the positive lead from the Y-branch connected solar panels to the positive solar input terminal on the controller.
- Connect the negative lead from the Y-branch connected solar panels to the negative solar input terminal on the controller.
- Once all connections are made, the system should begin charging the batteries when sunlight is available.

5. Operating Instructions

Once installed, your ECO-WORTHY solar kit is designed for automatic operation. The MPPT controller manages battery charging, and the inverter converts DC power to AC power for your appliances.

5.1. Daily Power Output and Capacity

Under ideal conditions (4 hours of sufficient sunlight), the system can generate approximately 1.6KWH of power daily. With 6 hours of sufficient sunlight, the generation can reach 2.56KWH. The total storage capacity of the two 100Ah lithium batteries is 2.56KWH.

Image: An illustration showing the daily power output of 1.6KWH with 4 hours of sunlight and 2.56KWH with 6 hours of sunlight, along with the total battery storage capacity.

5.2. Connecting Appliances

The 2000W pure sine wave inverter provides AC 110V power for various devices. Ensure the total wattage of connected appliances does not exceed the inverter's rated power of 2000W (or 4000W surge).

- Plug your AC 110V devices directly into the inverter's outlets.
- Common appliances supported include TVs, air conditioners, refrigerators, microwaves, laptops, LED lights, electric fans, coffee makers, and mini-fridges.
- Monitor the inverter's display or the Bluetooth app for power consumption and battery status.

Image: A visual representation of the solar kit powering various household and RV appliances, including a microwave, laptop, LED lights, electric fan, television, coffee maker, router, and mini-fridge.

5.3. Bluetooth Monitoring

The included Bluetooth Module 5.0 allows you to monitor your battery status in real-time via a smartphone application. This provides data on total voltage, current, power, state of charge (SOC), remaining working time, and battery quantity.

- Download the ECO-WORTHY app from your smartphone's app store.
- Connect to the Bluetooth module following the app's instructions.
- Use the app to monitor system performance and receive fault warnings.

Image: A smartphone screen displaying real-time battery monitoring data via the ECO-WORTHY Bluetooth app, showing voltage, current, power, SOC, and remaining time.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your solar power system.

6.1. Solar Panels

- **Cleaning:** Regularly clean the surface of the solar panels to remove dust, dirt, leaves, and snow. A clean panel ensures maximum sunlight absorption and power generation. Use a soft cloth and water; avoid abrasive cleaners.
- **Inspection:** Periodically inspect panels for any physical damage, loose connections, or shading from nearby objects.

6.2. Batteries

- **Terminal Check:** Ensure battery terminals are clean, tight, and free from corrosion.
- **Environment:** Store batteries in a cool, dry, and well-ventilated area. Avoid extreme temperatures.
- **BMS:** The built-in Battery Management System (BMS) protects the lithium batteries from overcharge, over-discharge, over-current, and short circuits, requiring minimal user intervention for battery health.

6.3. General System Check

- **Wiring:** Periodically check all wiring and connections for signs of wear, fraying, or loosening.
- **Controller/Inverter:** Ensure the charge controller and inverter are free from dust and debris, and that their ventilation openings are not obstructed.

7. Troubleshooting

This section addresses common issues you might encounter with your solar kit. For problems not listed here, please contact ECO-WORTHY customer support.

7.1. Inverter Not Working Properly

Possible Cause: The battery voltage may be too high or too low, preventing the inverter from operating. Alternatively, the power draw of connected appliances might exceed the inverter's capacity, or the inverter could be overheating, triggering its protection function.
Solution:

- Check the battery voltage to ensure it is within the inverter's operating range (typically 10.5V-15V for a 12V system).
- Reduce the load by disconnecting some appliances. Ensure the total continuous power draw is below 2000W.
- If the inverter is hot, disconnect all loads and allow it to cool down. Restart the inverter after it has cooled.
- Verify all connections between the battery and inverter are secure.

7.2. Battery Not Charging Normally

Possible Cause: This issue can be related to incorrect connection methods for the solar panels or battery, or the charge controller settings.
Solution:

- **Connection Order:** Always connect the battery to the charge controller first, then connect the solar panels to the controller. Disconnect in the reverse order (solar panels first, then battery).
- **Wiring:** Ensure all solar panel and battery connections to the MPPT controller are correct and secure, observing polarity.
- **Solar Panel Array:** This system is equipped with 4 x 100W solar panels and 2 x 12.8V 100Ah lithium batteries. It is recommended to use a parallel connection for the batteries and solar panels to form a 12V array.
- **Shading:** Check if solar panels are shaded. Even partial shading can significantly reduce output.
- **Controller Settings:** Verify the MPPT controller settings are configured for a 12V lithium battery system.

7.3. Bluetooth Module Connection Issues

Possible Cause: Interference, incorrect pairing, or app issues.

Solution:

- Ensure the Bluetooth module is properly connected to the charge controller.
- Restart your smartphone's Bluetooth and the ECO-WORTHY app.
- Ensure your phone is within close proximity to the Bluetooth module.
- Check for app updates or reinstall the app if problems persist.

8. Specifications

8.1. 100W Solar Panel (x4)

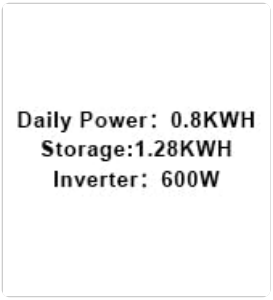

Image: A visual display of the 100W solar panel and its detailed electrical and physical specifications.

Rated Power	100W
Solar Cell Type	Monocrystalline
Maximum/Peak Voltage (Vmp)	19.5V
Open Circuit Voltage (Voc)	22.7V
Short Circuit Current (Isc)	5.55A
Maximum Current (Imp)	5.13A
Dimensions (L x W x H)	35.24" x 23.03" x 1.37" (895 x 585 x 35mm)
Weight	14.55 lbs (6.6 kg)

8.2. 12V 100Ah Lithium Battery (x2)

Image: A visual display of the 12V 100Ah lithium battery and its detailed specifications, highlighting its LiFePO4 chemistry and built-in BMS.

Battery Capacity	100Ah
Battery Voltage	12.8V
Maximum Charge/Discharge Current	50A / 100A

Maximum Charge Voltage	14.6V
Discharge Cut-Off Voltage	10V
Battery Size	10.2" x 6.6" x 8.2"
Weight	22.4 lbs
Life Cycle	>3000 cycles
Features	Built-in BMS (Battery Management System)

8.3. 2000W Pure Sine Wave Inverter

Image: A visual display of the 2000W pure sine wave inverter and its detailed electrical and physical specifications.

Output Continuous Watts	2000W
Surge Capacity (Peak Power)	4000W
Rated Frequency	60Hz
Rated AC Output	115VAC ± 10%, 9.5A
Dimensions (L x W x H)	16.8" x 9.8" x 4.1"
Assembled Weight	10.89 lbs

8.4. 40A MPPT Charge Controller

Image: A visual display of the 40A MPPT charge controller with its Bluetooth module and detailed electrical and physical specifications.

Battery Voltage	12V/24V auto
Battery Voltage Range	9-30VDC
Max PV Open-Circuit Voltage	100V
Nominal Max. Input Power	560W (12V) / 1120W (24V)

Max Battery Charging Current	40A
Rated Load Current	20A
Size	8.66" x 5.83" x 2.52" (220 x 148 x 64mm)
Weight	3.3 lbs (1.5 kg)
Max Wire Size	25mm² / #3 AWG

9. Warranty and Support

ECO-WORTHY provides customer support for product inquiries, installation assistance, and troubleshooting. For specific warranty details, please refer to the documentation included with your purchase or contact ECO-WORTHY directly.

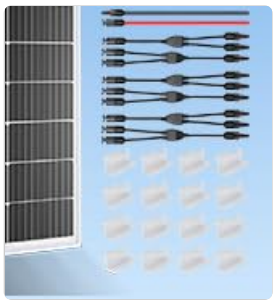

Image: A flowchart illustrating ECO-WORTHY's 7x24 customer service process, covering order placement, logistics, goods inspection, replacements for damaged or undelivered items, and support for installation or usage difficulties.

If you encounter any difficulties with installation, operation, or if you receive damaged goods, please contact ECO-WORTHY customer service for prompt assistance. They offer support for various stages, from order to post-installation.