EPEVER XTR2206N

EPEVER XTRA2206N Series MPPT Solar Charge Controller User Manual

Model: XTR2206N | Brand: EPEVER

1. Introduction

This manual provides essential information for the safe and efficient operation of your EPEVER XTRA2206N Series MPPT Solar Charge Controller. The XTRA series is an advanced Maximum Power Point Tracking (MPPT) charge controller designed for off-grid photovoltaic systems, offering high efficiency and reliability.

Key features include:

- Exceptional MPPT tracking and charge conversion efficiency for optimal power utilization.
- Compatibility with both lead-acid and lithium-ion batteries.
- Functions for limiting charging power and current, ensuring system stability.
- Standard Modbus communication protocol and isolated RS485 interface for seamless system integration.
- Support for optional LCD display units (XDB1/XDS1/XDS2) and accessories.



Figure 1.1: EPEVER XTRA2206N MPPT Solar Charge Controller (Angled View)

This image shows the EPEVER XTRA2206N MPPT Solar Charge Controller from an angled perspective, highlighting its compact design and front panel display and buttons.

2. Safety Information

Please read all instructions carefully before installation and operation. Failure to follow these instructions may result in serious injury, damage to the controller, or damage to other components of the system.

- Ensure all wiring is correctly sized and properly insulated.
- Always disconnect the solar array and battery before installing or moving the controller.
- Do not disassemble or attempt to repair the controller. Contact qualified personnel for service.
- Install the controller in a well-ventilated area, away from flammable materials and corrosive gases.
- Ensure proper grounding of the system.
- Wear appropriate personal protective equipment (PPE) during installation.

3. Product Overview

3.1 Components and Ports



Figure 3.1: Front View with Labeled Components

This image highlights the key external components of the controller, including the Display Unit, Mounting Holes for installation, and the Terminal Protection Cover.



Figure 3.2: Connection Ports Overview

This image provides a detailed view of the controller's connection ports: the RS485 Communication Port, Load Terminals, Battery Terminals, PV (Photovoltaic) Terminals, and the RTS (Remote Temperature Sensor) Port.

3.2 Features

The EPEVER XTRA2206N controller incorporates several advanced features for robust solar power management:



Figure 3.3: Key Features Diagram

This diagram visually summarizes the main features of the XTRA series controller, including its high MPPT efficiency, IP33 protection, real-time energy statistics, communication capabilities, battery compatibility, and power management functions.

- **High MPPT Efficiency:** Maximizes energy harvest from solar panels.
- **IP33 Ingress Protection:** Provides protection against solid objects larger than 2.5mm and water spray.
- **Real-Time Energy Statistics:** Monitors system performance.
- **Modbus Protocol & RS485:** Enables external communication and monitoring.
- **Optional LCD Display Units:** Allows for local monitoring and parameter setting.
- **High-Temp Power Derating:** Ensures stable operation in high-temperature environments by automatically reducing power.
- **Power & Current Limitation:** Protects the system from overcharging.
- **Multiple Load Modes:** Offers various load control options.
- **Supports Lead-Acid & Li-Ion Battery:** Versatile battery compatibility.
- **High Charging Conversion Efficiency:** Optimizes power transfer to the battery.

4. Setup and Installation

4.1 What's in the Box

Upon unpacking, verify that the following items are included:

- EPEVER XTRA2206N Series MPPT Solar Charge Controller
- User Manual (this document)

Note: Additional accessories such as optional display units (XDB1/XDS1/XDS2) or temperature sensors may be sold separately.

4.2 Mounting the Controller

The controller should be mounted vertically on a flat, non-flammable surface with adequate ventilation to allow for proper heat dissipation. Ensure there is at least 150mm (6 inches) of clearance above and below the controller for airflow.

1. Select a suitable mounting location that is protected from direct sunlight, rain, and excessive dust.
2. Mark the positions for the mounting holes using the controller as a template.
3. Drill appropriate holes and secure the controller using screws suitable for the mounting surface.



Figure 4.1: Front View of Controller

This image shows the front of the EPEVER XTRA2206N controller, illustrating its overall shape and the location of the display and buttons, which are relevant for planning mounting space.



Figure 4.2: Back View (Heat Sink)

This image displays the back of the controller, featuring the heat sink fins. Adequate airflow around these fins is crucial for the controller's thermal management and long-term performance.

4.3 Wiring Connections

Follow the wiring sequence below to ensure safe and correct installation. Always connect the battery first and disconnect the solar array last.

1. **Connect the Battery:** Connect the battery to the controller's battery terminals (BATT+/-). Ensure correct polarity. The controller will power on.
2. **Connect the Solar Array:** Connect the solar panels to the controller's PV terminals (PV+/-). Ensure correct polarity.
3. **Connect the Load (Optional):** Connect the DC load to the controller's load terminals (LOAD+/-). Ensure correct polarity.
4. **Connect RTS (Optional):** If using a remote temperature sensor, connect it to the RTS port.
5. **Connect RS485 (Optional):** For communication with external devices, connect the RS485 cable to the RS485 port.

Warning: Incorrect wiring polarity can damage the controller and other components. Always double-check connections before applying power.

5. Operating Instructions

5.1 Initial Power-Up

Once the battery is connected, the controller will perform a self-test and the display (if an optional display unit is connected) will show system information. The controller will automatically begin charging the battery from the solar array

when sufficient solar power is available.

5.2 Display and Buttons (with Optional Display Unit)

If an optional display unit (XDB1/XDS1/XDS2) is connected, you can monitor system parameters and adjust settings. Refer to the specific manual for your display unit for detailed navigation and parameter setting instructions.

- **PV Status:** Indicates solar panel voltage and current.
- **Battery Status:** Displays battery voltage, charging current, and state of charge.
- **Load Status:** Shows load current and power consumption.
- **System Parameters:** Allows viewing and modification of battery type, charging voltage limits, load control modes, etc.

5.3 Load Control Modes

The controller supports various load control modes to manage the DC output to your loads. These modes typically include:

- **Manual Control:** Turn load ON/OFF manually.
- **Light Control:** Load turns ON at dusk and OFF at dawn.
- **Light Control + Timer:** Load turns ON at dusk and stays ON for a set duration.
- **Dual-Timer Control:** Load turns ON for two separate time periods.
- **Test Mode:** For system testing.

Refer to the display unit manual or communication protocol documentation for detailed configuration of these modes.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your solar charge controller.

- **Check Connections:** Periodically inspect all wiring connections for tightness and corrosion. Re-tighten if necessary.
- **Clean Controller:** Keep the controller clean and free of dust and debris. Use a dry cloth to wipe the surface. Ensure ventilation openings are not blocked.
- **Inspect Wiring:** Check for any signs of wear, fraying, or damage to the insulation of all cables. Replace damaged cables immediately.
- **Battery Maintenance:** Follow the battery manufacturer's recommendations for maintenance. Ensure battery terminals are clean and free of corrosion.
- **Environmental Check:** Ensure the installation environment remains within the specified temperature and humidity ranges.

Caution: Before performing any maintenance, disconnect all power sources (solar array and battery) from the controller.

7. Troubleshooting

This section provides solutions to common issues you might encounter. For problems not listed here, please contact EPEVER customer support.

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
Controller not powering on.	Battery not connected or reverse polarity; Battery voltage too low.	Check battery connections and polarity; Charge battery externally if voltage is below minimum operating level.
No charging from solar panels.	Solar panels not connected or reverse polarity; Insufficient sunlight; PV voltage too low or too high.	Check PV connections and polarity; Ensure panels are in direct sunlight; Verify PV voltage is within controller's operating range.
Load not working.	Load not connected or reverse polarity; Load current exceeds controller rating; Battery voltage too low (LVD activated); Load control mode setting.	Check load connections and polarity; Reduce load or use external power; Charge battery; Adjust load control mode settings.
Controller overheating.	Insufficient ventilation; Overload condition.	Ensure adequate airflow around the controller; Reduce load or PV input if consistently overloaded.

8. Specifications

The following table outlines the key specifications for the EPEVER XTRA2206N Series MPPT Solar Charge Controller:

Parameter	Value
Product Dimensions	8.54 x 6.22 x 2.22 inches
Weight	30.42 Pounds
Item Model Number	XTR2206N
Date First Available	August 16, 2022
ASIN	B0B9VZHV4W
Color	Blue and white
Brand	EPEVER
Max Charge/Discharge Current	20A (as per product title)

9. Warranty and Support

EPEVER products are designed for reliability and performance. For specific warranty terms and conditions, please refer to the warranty card included with your product or visit the official EPEVER website.

For technical support, troubleshooting assistance, or inquiries regarding spare parts, please contact EPEVER customer service through their official channels. When contacting support, please have your product model number (XTR2206N) and purchase information ready.

Manufacturer: HUIZHOU EPEVER TECHNOLOGY CO., LTD.

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