EPEVER XTRA4210N

EPEVER MPPT Solar Charge Controller User Manual

Model: XTRA4210N

Brand: EPEVER

1. Introduction

This manual provides detailed instructions for the installation, operation, and maintenance of your EPEVER MPPT Solar Charge Controller XTRA4210N. This advanced Maximum Power Point Tracking (MPPT) solar charge controller is designed to maximize energy harvest from solar panels for efficient battery charging in off-grid photovoltaic systems.
It supports various battery types including Lead-Acid (Sealed, Gel, Flooded) and Lithium (LiFePO4, Li(NiCoMn)O2, User-defined) and features common negative grounding for wide application compatibility. The kit includes the XTRA4210N controller, MT50 remote meter, RTS temperature sensor cable, and CC-RS485-USB-150U communication PC cable.

2. Safety Information

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

- **Risk of Electric Shock:** Do not remove the cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.
- **Risk of Electric Shock:** When the photovoltaic array is exposed to light, it supplies a DC voltage to this equipment.
- **Hot Surfaces:** To reduce the risk of burns, do not touch hot surfaces during operation.
- Always connect the battery first during installation and disconnect the solar panel last during uninstallation.
- Ensure correct polarity for all connections to prevent damage to the controller and connected devices.

3. Product Overview and Features

The EPEVER MPPT Solar Charge Controller XTRA4210N is designed for optimal performance and user convenience. Key features include:

- Advanced MPPT Technology with high tracking efficiency up to 99.5% and peak conversion efficiency of 98%.
- Automatic 12V/24V DC system voltage identification.
- Max PV input power: 520W for 12V systems, 1040W for 24V systems.

- Common negative grounding design for versatile applications.
- Support for multiple battery types: Sealed (AGM), Gel, Flooded, and User-defined Lithium (LiFePO4, Li(NiCoMn)O2).
- Four stages of charging (bulk, absorption, float, equalization) to prolong battery lifespan.
- Blacklight LCD Display with three color LED indicators for intuitive status monitoring.
- Comprehensive protection functions: PV Over Current/Power, PV Short Circuit, PV Reverse Polarity, Night Reverse Charging, Battery Reverse Polarity, Battery Over Voltage, Battery Over Discharge, Battery Overheating, Controller Overheating, Lithium Battery Low Temperature, Load Short Circuit, Load Overload, TVS High Voltage Transients.
- Real-Time energy statistics function.

Figure 1: EPEVER MPPT Solar Charge Controller XTRA4210N Kit Components.

Your browser does not support the video tag.

Video 1: EPEVER MPPT Solar Charge Controller XTRA Series Overview. This video provides a visual guide to the product, its components, and basic operation.

4. Setup and Installation

Follow these steps for proper installation. Always ensure the system is disconnected from power sources before making any connections.

4.1 Component Identification

Figure 2: Controller Top and Bottom View with Terminal Labels.

Figure 3: Controller Dimensions.

4.2 Wiring Steps

Important: Always connect the battery first! Do not use an electric screwdriver for connections.

1. **Connect the Battery:** Loosen the screws for the battery terminals. Connect the positive (+) and negative (-) battery cables to the corresponding terminals on the controller. Ensure correct polarity.
2. **Connect the Load:** Connect the load cables to the load terminals on the controller.
3. **Connect the Solar Panel (PV Array):** Connect the solar panel cables to the PV terminals on the controller. Ensure correct polarity.

Figure 4: Basic Connection Diagram.

For detailed visual instructions on wiring, refer to the "Unboxing and Installation" segment of Video 1.

5. Operating Instructions

The controller features an LCD display and LED indicators for monitoring system status and setting parameters.

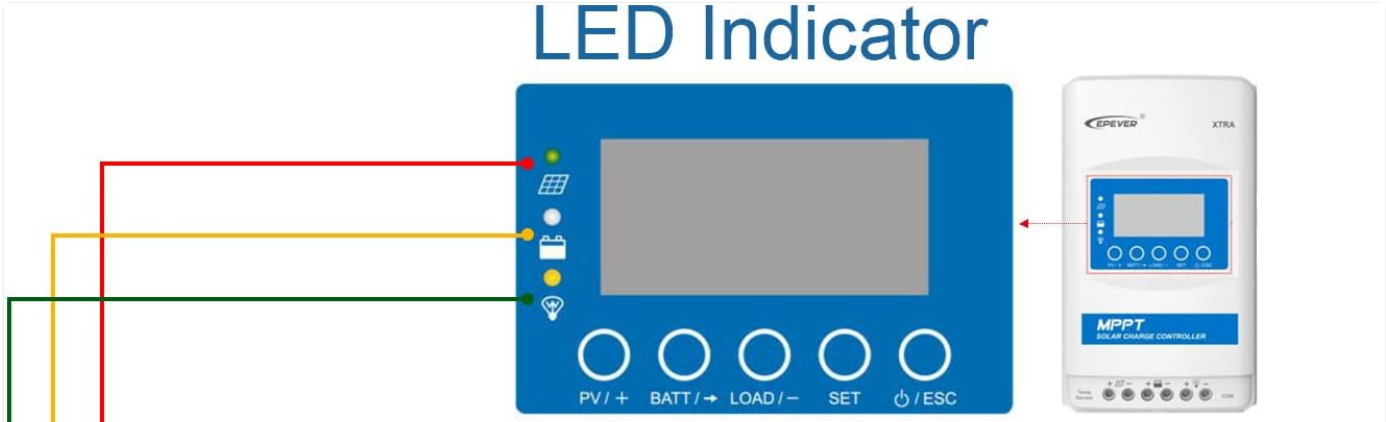
5.1 LCD Display and Navigation

The LCD displays various parameters such as PV voltage, battery voltage, load current, and generated energy. Use the buttons below the display to navigate through the screens and adjust settings.

Figure 5: LCD Display Screens and Parameters.

5.2 LED Indicators

The LED indicators provide quick visual feedback on the system's status:



Indicator	Color	Status	Instruction
	Green	On Solid	PV connection normal but low voltage(low irradiance) from PV, no charging
	Green	OFF	No PV voltage(night time) or PV connection problem
	Green	Slowly Flashing(1Hz)	In charging
	Green	Fast Flashing(4Hz)	PV Over voltage
	Green	On Solid	Normal
	Green	Slowly Flashing(1Hz)	Full
	Green	Fast Flashing(4Hz)	Over voltage
	Orange	On Solid	Under voltage
	Red	On Solid	Over discharged
	Red	Slowly Flashing(1Hz)	Battery Overheating Lithium battery Low temperature①
	Yellow	On Solid	Load ON
	Yellow	OFF	Load OFF
PV&BATTLED fast flashing			Controller Overheating System voltage error②

①When a lead-acid battery is used, the controller doesn't have the low temperature protection.

②When a lithium battery is used, the system voltage can't be identified automatically

Figure 6: LED Indicator Status and Instructions.

5.3 Setting Parameters

Parameters such as battery type, battery capacity, and load working mode can be configured directly from the controller's interface or via the MT50 remote meter. For detailed steps on setting parameters, refer to the "Setting Parameters" segment of Video 1.

- **Battery Type Selection:** Press the **BATT+/-** button for 5 seconds to enter the battery type interface. Use the **LOAD+/-** buttons to choose the battery type (Sealed, Gel, Flooded, User). Press **SET** to confirm.
- **Battery Capacity Setting:** From the battery type interface, press **BATT+/-** to access the battery capacity setting. Use **LOAD+/-** to adjust the capacity (Ah). Press **SET** to confirm.
- **Load Working Mode:** Press the **SET** button for 5 seconds to enter the load working mode interface. Use **LOAD+/-** to select the desired mode (e.g., Manual Control, Light ON/OFF, Light ON+Timer, Time Control). Press **SET** to confirm.
- **LCD Cycle Time:** Press the **SET** button for 5 seconds to enter the setting interface. Press **BATT+/-** twice for the LCD cycle time interface. Use **LOAD+/-** to set the cycle time. Press **SET** to confirm.

6. Maintenance

Regular maintenance ensures optimal performance and longevity of your solar charge controller. Perform the following checks periodically:

- Inspect all wiring and connections for loose connections, corrosion, or damage. Tighten as necessary.
- Clean the controller's exterior with a dry cloth to remove dust and debris. Ensure ventilation openings are clear.
- Check battery terminals for corrosion and clean if necessary.
- Monitor the LCD display for any error codes or unusual readings.
- Ensure the temperature sensor is securely attached to the battery for accurate temperature compensation.

7. Troubleshooting

If you encounter issues with your EPEVER MPPT Solar Charge Controller, refer to the LED indicator table (Figure 6) for initial diagnosis. Common issues and their solutions include:

- **No Display/Power:** Check battery connections and ensure the battery voltage is within the operating range.
- **No Charging:** Verify solar panel connections and ensure sufficient sunlight. Check PV voltage on the display.
- **Load Not Working:** Check load connections, ensure the load is not overloaded or short-circuited. Verify load working mode settings.
- **Battery Over-Discharged:** The battery indicator may show red. This indicates the battery voltage is too low. Disconnect the load and charge the battery.
- **System Voltage Error:** If using a lithium battery, ensure the correct system voltage (12V or 24V) is manually selected, as lithium batteries do not auto-identify system voltage.

For more complex issues, consult the comprehensive user manual provided with the product or contact EPEVER customer support.

8. Technical Specifications

Below are the key technical specifications for the EPEVER MPPT Solar Charge Controller XTRA4210N:

- **Rated Charge Current:** 40A
- **System Nominal Voltage:** 12V/24VDC Auto identifying
- **Battery Voltage Range:** 8V~32V
- **Max. PV Open Circuit Voltage:** 100VDC
- **Max. PV Input Power:** 520W/12V, 1040W/24V
- **Battery Types Supported:** Sealed (AGM), Gel, Flooded, LiFePO4 Lithium, Li(NiCoMn)O2 Lithium, Lithium User (9~68V)
- **Grounding:** Common Negative Ground
- **Display Type:** LCD

Electrical parameters

Model	XTRA 1210N	XTRA 2210N	XTRA 3210N	XTRA 4210N	XTRA 4415N
Nominal system voltage	12/24VDC auto work				12/24/36/48VDC auto work
Rated charge current	10A	20A	30A	40A	40A
Rated discharge current	10A	20A	30A	40A	40A
Battery input voltage range	8 ~ 32V				8~68V
Max. PV open circuit voltage	XTRA**10N :100Vat Min operating environment temop;92Vat 25°Cenvironment temp XTRA**15N :150Vat Min operating environment temop;138Vat 25°Cenvironment temp				
MPPT voltage range	XTRA**10N :(Battery voltage +2V) ~ 72V XTRA**15N:(Battery voltage +2V) ~ 108V				
Max.PV input power	130W/12V 260W/24V	260W/12V 520W/24V	390W/12V 780W/24V	520W/12V 1040W/24V	520W/12V;1040W/24V 1560W/36V;2080W/48V
Battery type	Sealed / Gel / Flooded;LiFePO4 / Li-NiCoMn / User Lithium battery(LiFePO4 /Li-NiCoMn/User)				
Dimension	175×143×48mm	217×158×56.5mm	230×165×63mm	255×185×67.8mm	255×185×83.2mm
Terminals	12AWG(4mm²)	6AWG(16mm²)	6AWG(16mm²)	6AWG(16mm²)	6AWG(16mm²)
Net weight	0.57kg	0.96kg	1.31kg	1.70kg	2.47kg


Figure 7: Electrical Parameters for XTRA Series Controllers.

9. Optional Accessories

Enhance the functionality of your EPEVER MPPT Solar Charge Controller with these optional accessories:

- **Remote Meter (MT50):** Displays all operating data and system working status on a large-screen LCD. Allows for simple operation, real-time alarm information, and diversified load control modes.
- **Remote Temperature Sensor (RTS300R47K3.81A):** Used for battery temperature compensation, ensuring accurate charging parameters.
- **RS485 Communication PC Cable (CC-RS485-USB-150U):** Enables monitoring and setting parameters via PC software.
- **WiFi Serial Adapter (eBox-WiFi-01):** Allows monitoring and setting parameters via mobile APP through WiFi signals.
- **RS485 to Bluetooth Adapter (eBox-BLE-01):** Enables monitoring and setting parameters via mobile APP through Bluetooth signals.
- **Logger (eLOG01):** Records operating status data of the controller for real-time monitoring via PC software.

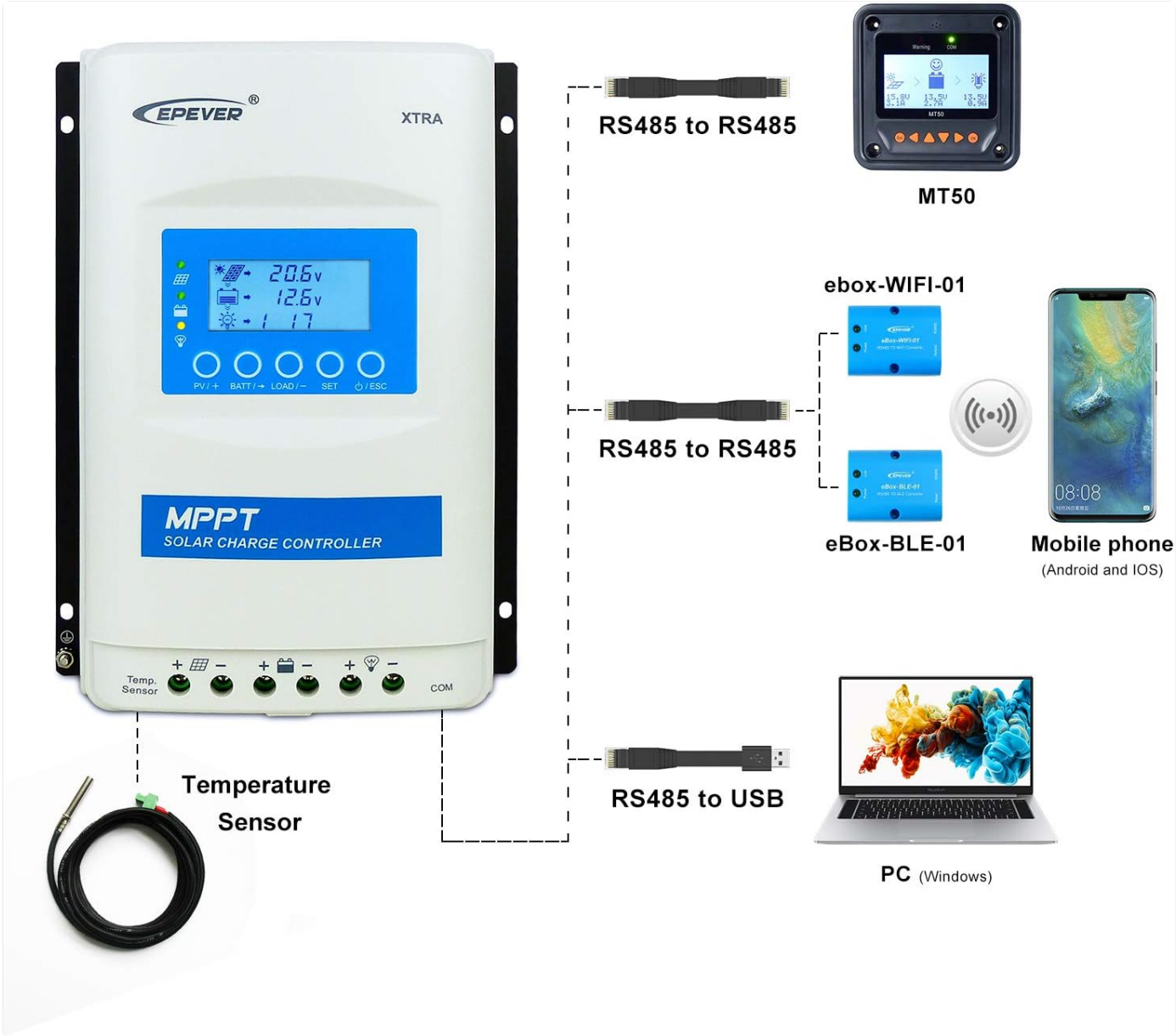


Figure 8: Controller Connectivity with Optional Accessories.

10. Warranty and Support

EPEVER products are manufactured to high-quality standards. For warranty information and technical support, please refer to the official EPEVER website or contact the authorized seller, Goland Century. Goland Century provides free technical support and has service centers in various regions to assist customers with their solar product needs.