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› EPEVER Tracer4210AN 40A MPPT Solar Charge Controller User Manual

EPEVER Tracer4210AN

EPEVER Tracer4210AN 40A MPPT Solar Charge Controller User Manual

Model: Tracer4210AN | Brand: EPEVER

1. INTRODUCTION AND OVERVIEW

The EPEVER Tracer4210AN is a 40A MPPT (Maximum Power Point Tracking) solar charge controller designed for 12V and 24V DC systems. It efficiently regulates power from solar panels to charge various battery types, including lead-acid (Sealed, AGM, GEL, Flooded) and lithium (LiFePO₄, Li(NiCoMn)O₂) batteries. This controller features an advanced MPPT control algorithm for high tracking and conversion efficiency, ensuring optimal energy harvest from your solar array. It includes multiple built-in protections for safe and stable operation, and an LCD screen for easy monitoring and parameter customization.

Easy to Use LCD Display

Achieve smart energy monitoring with intuitive visuals and real-time data



Figure 1.1: Front View of the EPEVER Tracer4210AN Controller.

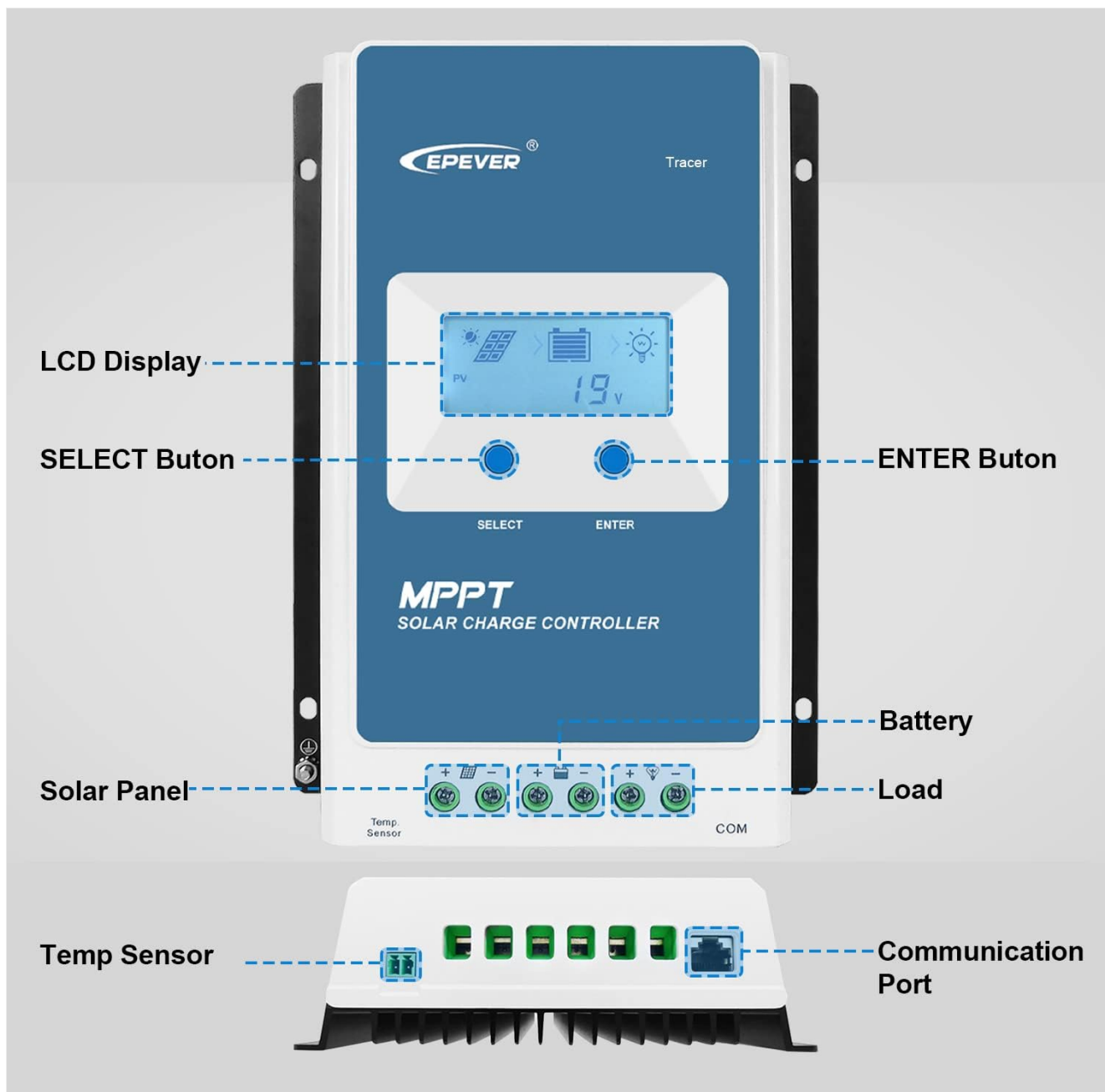


Figure 1.2: Back View of the EPEVER Tracer4210AN Controller.

2. SAFETY INFORMATION

Before installing or operating the EPEVER Tracer4210AN solar charge controller, please read all instructions carefully. Improper installation or operation can lead to equipment damage, personal injury, or property damage. Always ensure proper ventilation around the controller. Do not expose the controller to water or excessive humidity. Disconnect all power sources before performing any maintenance or adjustments.

Important Connection Order: Always connect the battery first, then the load, and finally the solar panel. When disconnecting, reverse this order: disconnect the solar panel, then the load, and finally the battery.

3. PRODUCT FEATURES

- Advanced MPPT control algorithm for tracking efficiency greater than 98% and peak conversion efficiency of 99.5%.
- Automatic identification of 12V/24V DC system voltage.
- Supports various battery types: Lead-acid (Sealed, AGM, GEL, Flooded) and Lithium (LiFePO₄, Li(NiCoMn)O₂, User-defined).
- Built-in multiple protections: PV over-voltage, battery over-voltage, over-temperature, over-charging, short-circuit,

reverse polarity, and temperature compensation.

- Informative LCD screen and two buttons for customizable parameters and display of working status.
- 4-stage battery charging (Bulk, Boost, Float, and Equalization).
- Common negative grounded design.

Product model				
	1210AN	2210AN	3210AN	4210AN
Dimensions	6.77*5.47*1.73in	8.66*6.06*2.05in	8.99*6.46*2.17in	9.92*7.09*2.48in
Max power current	10A	20A	30A	40A
Power terminals	12AWG(4mm ²)	6AWG(16mm ²)		
MPPT voltage range	(Battery voltage+2V) ~72V			
Battery input Voltage range	8V~32V			
Max. PV input power	130W/12V 260W/24V	260W/12V 520W/24V	390W/12V 780W/24V	520W/12V 1040W/24V
Max. PV open Circuit voltage	100V②92V③			
Grounding	Common negative			
Weight	0.57kg	0.94kg	1.26kg	1.65kg



Figure 3.1: MPPT Tracking and Charge Conversion Efficiency.



Figure 3.2: Multiple Protection Features of the Controller.

4. PACKAGE CONTENTS

The package for your EPEVER Tracer4210AN solar charge controller typically includes:

- EPEVER Tracer4210AN MPPT Solar Charge Controller
- User Manual
- Certificate of Quality
- Small green connector (for temperature sensor)

Your browser does not support the video tag.

Video 4.1: Unboxing and overview of the EPEVER Tracer-AN Series MPPT Solar Charge Controller (demonstrated with a Tracer3210AN model), showing package contents and physical features.

5. SETUP AND INSTALLATION

Follow these steps for proper installation. Always ensure correct polarity and secure connections to prevent damage.

1. **Connect the Battery:** Loosen the screws on the battery terminals of the controller. Connect the positive (+) and negative (-) battery cables to the corresponding terminals. Ensure the connection is secure. The controller will automatically detect the system voltage (12V/24V).
2. **Connect the Load:** Loosen the screws on the load terminals. Connect the positive (+) and negative (-) load cables to the corresponding terminals.
3. **Connect the Solar Panel:** Loosen the screws on the solar panel (PV) terminals. Connect the positive (+) and negative (-) solar panel cables to the corresponding terminals.
4. **Connect Temperature Sensor (Optional):** Insert the remote temperature sensor into the designated port on the controller. This allows for accurate battery temperature compensation during charging.

Important: Always connect the battery first, then the load, and finally the solar panel. When disconnecting, reverse this order: disconnect the solar panel, then the load, and finally the battery.

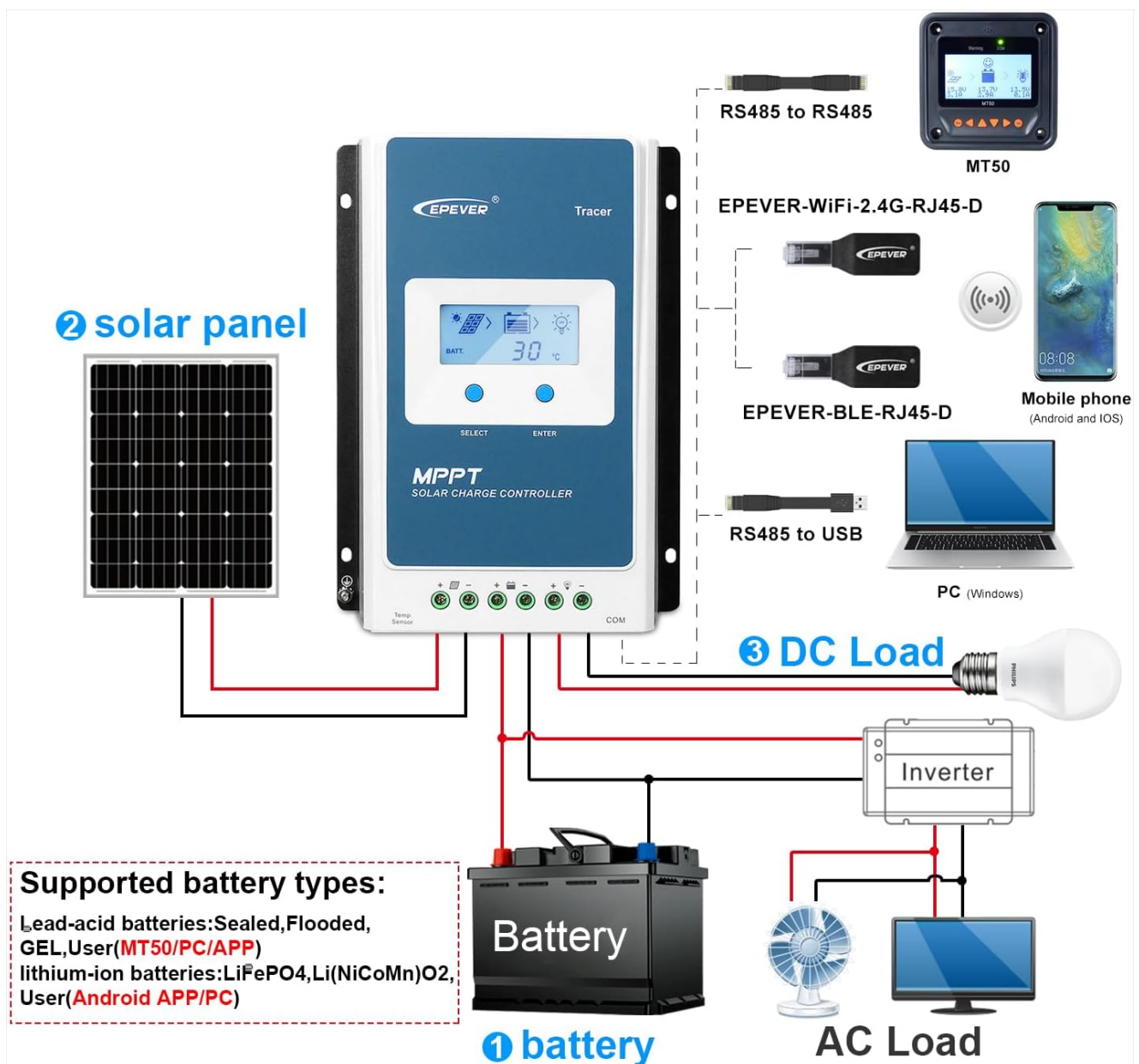


Figure 5.1: Basic Connection Diagram for the Solar Charge Controller.

TOP SIDE

MPPT 40A



BOTTOM SIDE

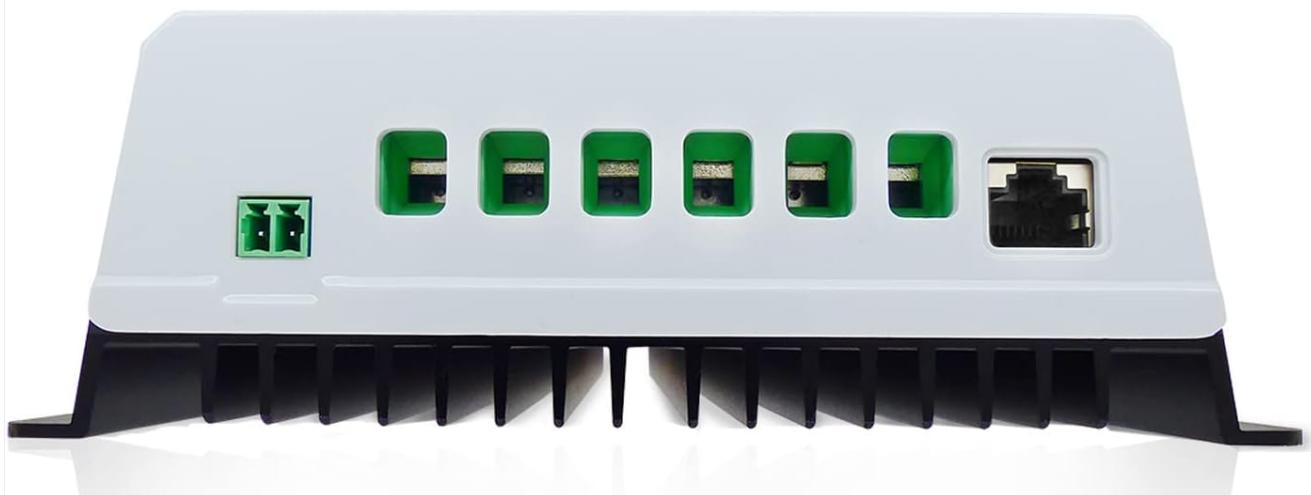


Figure 5.2: Supported Battery Types for the Controller.

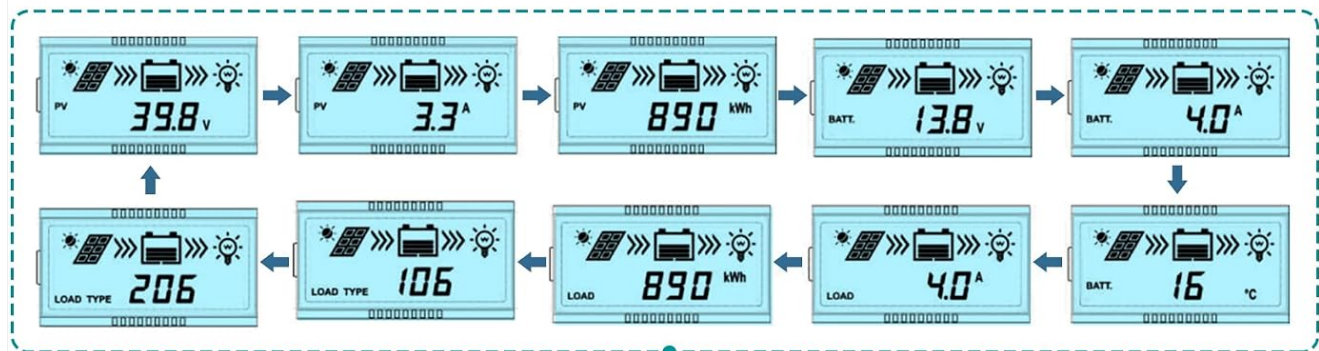
6. OPERATING INSTRUCTIONS

The controller features an LCD display and two buttons ("SELECT" and "ENTER") for monitoring system status and configuring parameters.

6.1 LCD Display and Button Functions

The LCD displays various system parameters such as battery voltage, charging current, load current, and temperature. Use the "SELECT" button to browse through different display interfaces and the "ENTER" button to confirm selections or enter settings mode.

Browse interface



Support Battery Type



Set the Battery Type with the LCD

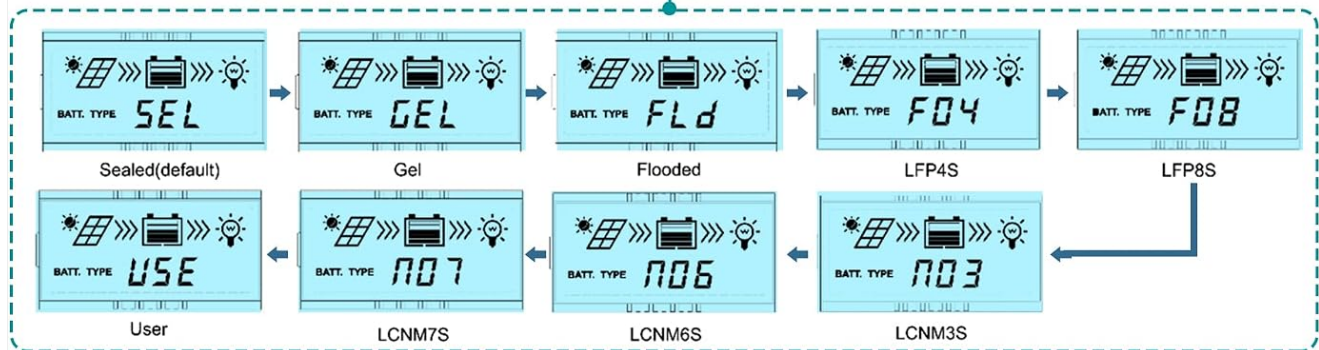


Figure 6.1: LCD Display showing system parameters.

6.2 Setting Battery Type

To set the battery type:

1. Press the "ENTER" button and hold for 5 seconds under the battery voltage interface.
2. Press the "SELECT" button when the battery type interface is flashing to cycle through available battery types (SEL, GEL, FLD, LiFePO4, Li(NiCoMn)O2, USE).
3. Press the "ENTER" button to confirm the selected battery type.



Figure 6.2: Steps for Setting Battery Type via LCD.

6.3 Setting Load Working Mode

To set the load working mode:

1. Press the "ENTER" button and hold for 5 seconds under the load mode interface.
2. Press the "SELECT" button when the load mode interface is flashing to choose the desired mode.
3. Press the "ENTER" button to confirm the load mode.

Caution: Setting Light ON/OFF, Test mode, and Manual mode via Timer1. Timer2 will be disabled and display "2n".

7. MAINTENANCE

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

- **Clean the Controller:** Keep the controller clean and free from dust and debris. Use a dry cloth to wipe the surface.
- **Check Connections:** Periodically inspect all wiring connections (solar panel, battery, load) to ensure they are tight and free from corrosion. Loose connections can cause overheating and damage.
- **Inspect for Damage:** Check for any visible signs of damage to the controller, cables, or terminals.
- **Verify Ventilation:** Ensure that the controller's heat sink and ventilation openings are not blocked to allow for proper heat dissipation.

8. TROUBLESHOOTING

If you encounter issues with your EPEVER Tracer4210AN, refer to the following general troubleshooting tips. For detailed error codes and solutions, consult the full user manual provided with the product.

- **No Display/Power:** Check battery connections and ensure the battery has sufficient voltage. Verify all fuses in the system.
- **No Charging:** Ensure solar panels are connected correctly and receiving sunlight. Check PV voltage and current on the LCD. Verify battery type settings.
- **Load Not Working:** Check load connections and ensure the load is within the controller's rated current. Verify load working mode settings.
- **Over-voltage/Under-voltage Alarms:** Check battery voltage and ensure it is within the safe operating range for the selected

battery type.

The controller has multiple built-in protections (PV over-voltage, battery over-voltage, over-temperature, over-charging, short-circuit, reverse polarity) which may activate to protect the system. If a protection is triggered, the LCD may display an error code or indicator. Address the underlying cause before resetting or restarting the system.

9. SPECIFICATIONS

Below are the key technical specifications for the EPEVER Tracer4210AN 40A MPPT Solar Charge Controller.

EPEVER Tracer4210AN Specifications

Parameter	Value
Model	Tracer4210AN
Nominal System Voltage	12/24V Auto
Battery Type	Lead-acid (Sealed/Gel/Flooded)/Lithium (LiFePO4/Li(NiCoMn)O2)/User
Battery Input Voltage Range	8~32V
Rated Charge Current	40A
Rated Discharge Current	40A
Rated Charge Power	520W/12V, 1040W/24V
Max. Conversion Efficiency	≥98.0%
Tracking Efficiency	≥99.5%
Max. PV Open Circuit Voltage	100V (at min. operating temp), 92V (at 25°C ambient temp)
MPPT Voltage Range	(Battery voltage +2V) ~ 72V
Equalization Voltage (Flooded)	14.8V
Boost Voltage (Flooded)	14.6V
Float Voltage (Flooded)	13.8V
Low Voltage Reconnect Voltage (Flooded)	12.6V
Low Voltage Disconnect Voltage (Flooded)	11.1V
Self-consumption	≤12mA
Enclosure	IP30
Communication Interface	RS485 (RJ45)
Grounding	Common Negative
Operating Temperature Range	-25°C ~ +45°C (100% input and output)
Dimensions (LxWxH)	250x180x63mm (approx. 10.8"L x 7.6"W x 3.2"H)
Net Weight	1.65kg

MPPT tracking efficiency of not less than 99.5%



Charge conversion efficiency up to 98%



Figure 9.1: Physical Dimensions of the Controller.

10. WARRANTY AND SUPPORT

The EPEVER Tracer4210AN Solar Charge Controller comes with a 1-year warranty. For warranty claims or technical support, please contact your vendor or EPEVER customer service.

For advanced parameter settings and monitoring, optional accessories are available:

- Remote Meter MT50
- eBOX-WIFI/BLE-01 (for APP monitoring)
- CC-USB-RS485-150U cable (for PC software)
- Remote Temperature Sensor (RTS300R47K3.81A)



Figure 10.1: EPEVER Brand Logo.