

Thank you for selecting the Tracer EPLI series MPPT solar charge controller with built-in LED driver. Please read this manual carefully before using the product and pay attention to the safety information.

MPPT Solar Charge Controller

---with built in LED Driver

Thank you for selecting the EPSolar Tracer EPLI series MPPT solar charge controller. It combines solar charge controller and LED constant current driver into one unit which is ideal for solar LED Lighting, especially when dimmer function is needed. The control parameter can be programmed via IR communication, such as Mobile APP, RC-01 and SPP-02.

1. Safety Information

- Read all of the instructions in the manual before installation.
- DO NOT disassemble or attempt to repair the controller.
- Install external fuse or breaker as required.
- Do disconnect the solar module and fuse/ breakers near to battery before installing or moving the controller.
- Power connections must remain tight to avoid excessive heating from a loose connection.
- Only charge batteries that comply with the parameters of controller.
- Battery connection may be wired to one battery or a bank of batteries.
- Risk of electric shock, the PV and load can produce high voltages when the controller is working.

2. Overview

The advanced Maximum Power Point Tracking charging methods enables the system charging and discharging management to obtain the most radical optimization. Increase the system flexibility, yet lower down the system cost. The features are listed below:

- High quality components, perfecting system performance, with maximum conversion efficiency of 98%
- Advanced Maximum Power Point Tracking (MPPT) technology, with tracking efficiency no less than 99.5%
- Ultra-fast tracking speed and guaranteed tracking efficiency
- Accurately recognizing and tracking of multiple power points
- 12/24VDC automatically identifying system voltage or user-defined working voltage
- Digital precision constant current control and the control accuracy are less than $\pm 2\%$
- Maximum output efficiency of 96%
- PV and Load power limitation function
- The output current can be adjusted among the rated power and current range
- Without any button, parameter setting via Mobile APP, Remoter Meter and SPP with IR function
- Aluminum housing for better cooling
- Real-time energy statistics function
- Battery temperature compensation function
- IP68 waterproof degree

3. Product Features



Figure 1 Tracer1305/26**/39**EPLI



Figure 2 Tracer52**EPLI

①	Charging Status LED indicator	⑤	Temperature Sensor
②	Battery Status LED indicator	⑥	PV Positive and Negative Wires
③	Infrared Receiver Module	⑦	Battery Positive and Negative Wires
④	Infrared LED	⑧	Load Positive and Negative Wires



Optional Accessory:

Name: Fixed Plate
Quantity: Four
Overall dimension: 20mm×18mm×6mm
Mounting hole size: $\Phi 3.5$ mm

4. Wiring

- 1) Connect components to the charge controller in the sequence as shown above and pay much attention to the "+" and "-". Please don't insert the fuse or turn on the breaker during the installation. When disconnecting the system, the order will be reserved.
- 2) After power on the controller, check the battery LED indicator on the controller, it will be green. If it's not green, please refer to chapter 8.
- 3) Connecting a fuse in series through battery positive (+) in the circuit and the battery circuit fuse must be 1.25 to 2 times to the rated current. The installed distance is within 150mm.
- 4) The process of charging and discharging can't operate simultaneously, and the discharging process is prior to charging.

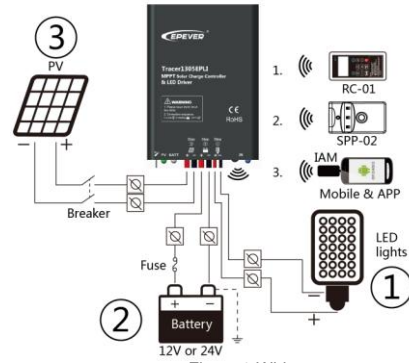


Figure 3 Wiring

5. LED Indicators

Indicator	Color	Status	Instruction
PV	Green	On Solid	PV connection normal but low voltage(irradiance) from PV, no charging
		OFF	No PV voltage(night time) or PV connection problem
	Green	Slowly Flashing(1Hz)	In charging
	Green	Fast Flashing(4Hz)	PV Over voltage
BATT	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	Fast Flashing(4Hz)	Battery Overheating
Charging (green) and battery indicator (orange) flashing simultaneously			System voltage error

6. Setting Operation



Figure 4 Setting Ways

There are three methods that it can realize controller load modes and parameters through IR function:

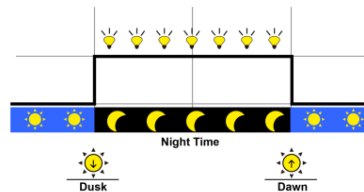
- 1) IR Remote Control—RC-01.
- 2) Super Parameter Programmer—SPP-02.
- 3) Mobile APP, IAM(Ir-Android-Micro).

APP software can be downloaded from the website of <http://www.epsolarpv.com>.

Note: Please refer to the user manual of handheld device.

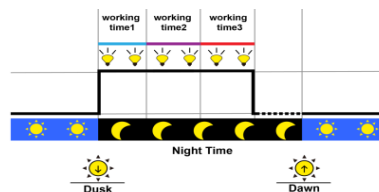
7. Load Working Mode

- 1) Manual Mode
- 2) Light ON/OFF(Default)

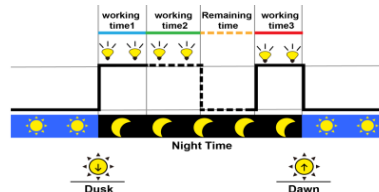


- 3) Light ON + Timer

Light ON + Timer1



Light ON + Timer2



4) Real-time Control

Control the load ON/OFF time through setting real-time clock.


NOTE: In the mode of Light ON/OFF and Light ON/Timer, the Load is turned on after 10Min. delay.
8. Protection
PV Reverse Polarity

Fully protection against PV reverse polarity, correct the wire connection to resume normal operation.


WARNING: Controller will be damaged when the PV array straight polarity and the actual operation power of the PV array is 1.5 times greater than the rated charge power!
Battery Reverse Polarity

Fully protection against battery reverse polarity, correct the wire connection to resume normal operation.

Battery Over Voltage

When the battery voltage reaches to the set point of Over Voltage Disconnect Voltage, the controller will stop charging the battery to protect the battery from being over charged to break down.

Battery Over Discharge

When the battery voltage reaches to the set point of Low Voltage Disconnect Voltage, the controller will stop discharging the battery to protect the battery from being over discharged to break down.

Battery Overheating

The controller detects the environment temperature through the external temperature sensor. If the environment temperature exceeds 65 °C, the controller will automatically start the overheating protection to stop working, and recover below 55 °C.

Load Short Circuit

 Load will be switched off when load short circuit (≥ 4 times rated current) happens. Controller will automatically attempt to reconnect load for 5 times. If short circuit protection still exist after controller's 5 times attempts, user have to clear short circuit, then restart the controller or wait for one night-day cycle (night time >3 hours).

Temperature sensor break down

If the temperature sensor short-circuited or damaged, the controller will be charging or discharging at the default temperature 25 °C to prevent the battery damaged from overcharging or over discharged.

High Voltage Transients

The controller is protected against small high voltage transients. In lightning prone areas, additional external suppression is recommended.

9. Troubleshooting

Faults	Possible reasons	Troubleshooting
LED Charging indicator turn off during daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV and battery wire connections are correct and tight
No LED indicator	Battery voltage maybe less than 9V	Measure battery voltage with the multi-meter. Min.9V can start up the controller
Battery LED indicator green fast Flashing	Battery over voltage	Check if battery voltage is higher than OVD, and

10. Technical Specifications

Item	Models	Tracer1305EPLI	Tracer2606EPLI	Tracer3906EPLI	Tracer5206EPLI	Tracer2610EPLI	Tracer3910EPLI	Tracer5210EPLI
Nominal system voltage		12VDC	12/24VDC Auto					
Battery input voltage range		9~16VDC	9~32VDC					
Rated charge current		10A/12V	10A	15A	20A	10A	15A	20A
Rated charge power		130W/12V	130W/12V 260W/24V	195W/12V 390W/24V	260W/12V 520W/24V	130W/12V 260W/24V	195W/12V 390W/24V	260W/12V 520W/24V
Max. PV open circuit voltage ^o		48V (Min. Temp.) 45V(25°C)	58V at minimum operating environment temperature 46V at 25°C environment temperature			95V at minimum operating environment temperature 92V at 25°C environment temperature		
MPP Voltage range		(Battery voltage+2V)~36V						(Battery voltage+2V)~72V
Max. output current		3.3A	3.3A	4.5A	6.6A	3.3A	4.5A	6.6A
Max. output power		100W	100W	130W	200W	100W	130W	200W
Output voltage range		(Max. battery voltage+2V)~46V	(Max. battery voltage+2V)~58V			(Max. battery voltage+2V)~80V		
Load open circuit voltage		46V	58V			80V		
Maximum output efficiency		96%						
Output current control accuracy		$\leq 2\%$						
Battery Type		Sealed(Default) / Gel / Flooded /User						
Equalize Charging Voltage ^{**}		Sealed:14.6V / Gel:— / Flooded:14.8V / User:9~17V						
Boost Charging Voltage ^{**}		Sealed:14.4V / Gel:14.2V / Flooded:14.6V / User:9~17V						
Float Charging Voltage ^{**}		Sealed / Gel / Flooded:13.8V / User:9~17V						
Low Voltage Reconnect Voltage ^{**}		Sealed / Gel / Flooded:12.6V / User:9~17V						
Low Voltage Disconnect Voltage ^{**}		Sealed / Gel / Flooded:11.1V / User:9~17V						
Self-consumption		$\leq 15\text{mA}/12\text{V}; \leq 22\text{mA}/24\text{V}$						
Temperature compensation coefficient		-3mV/°C/2V						
Communication		IR communication						
Working environment temperature		-40°C~+60°C						
Enclosure		IP68(1.5m,72h)						
Overall dimension		124x89x30mm	150x93.5x32.7mm	153x105x52.1mm	124x89x30mm	150x93.5x32.7mm	153x105x52.1mm	
Mounting hole size		$\Phi 3.5\text{mm}$						
Mounting dimension		88x76mm	120x83mm	120x94mm	88x76mm	120x83mm	120x94mm	
Power cable		PV/BAT:14AWG(2.5mm ²) LOAD:18AWG(1.0mm ²)			PV/BAT:12AWG(4mm ²) LOAD:16AWG(1.5mm ²)	PV/BAT:14AWG(2.5mm ²) LOAD:18AWG(1.0mm ²)		PV/BAT:12AWG(4mm ²) LOAD:16AWG(1.5mm ²)
Net weight		0.51kg	0.52kg	0.75kg	1.19kg	0.52kg	0.75kg	1.18kg

**** Above parameters are in 12V system at 25 °C, please double the values in 24V system.**

		disconnect the PV
Battery LED indicator red	Battery over discharged ^①	When the battery voltage is restored to or above LVR point (low voltage reconnect voltage), the load will recover
Battery LED indicator red flashing	Battery Overheating	The controller will automatically turn the system off. But while the temperature decline to be below 50 °C, the controller will resume.
Charging(green) and battery indicator (orange)flashing simultaneously	System voltage error	Check whether the battery voltage match with the controller's working voltage. If not please change to a suitable battery or reset the working voltage
Powering on normally, the load is off	①The connecting wires are error or virtually connected ②Load mode is not appropriate. ③This controller does not match with the LED light. ④Output short circuit.	① Check the connecting cable. ② Check the load's mode and parameters. ③The voltage of LED light is not within the output voltage range of controller. ④Check the connecting cables and LED light.
The dimming function is invalid	The controller does not match with the LED light source. This product is a step-up voltage control, if input voltage is lower than the rated voltage, it is not working.	①Replace the LED light. ②Reduce system rated voltage grade and replace the product model. For example 24V system change to 12V system, and replace the corresponding controller
Parameter settings fail	Infrared communication error	Refer to handheld the user device manual

①When the battery is over discharged, the battery indicator will be red and the load will be off all the time before the voltage is more than the Low Voltage Reconnect Voltage (LVRV). In order to judge the system is normal or not, firstly measuring the battery voltage whether is more than LVRV; if not, restarting the controller to detect the load whether it is normal.

Note: The LVRV can be set, but it must pay more attention that it maybe damages the battery if the LVRV is too low.

11. Disclaimer

This warranty does not apply under the following conditions:

- Damage from improper use or use in an unsuitable environment.
- PV or load current, voltage or power exceeding the rated value of controller.
- The controller is working temperature exceed the limit working environment temperature.
- User disassembly or attempted repair the controller without permission.
- The controller is damaged due to natural elements such as lightning.
- The controller is damaged during transportation and shipment.

Any changes without prior notice! Version number: V3.1