

MPPT Solar Charge Controller

---Model:Tracer5206EPLI

Switching the light on/off automatically

MPPT solar charge controller 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, Remote Meter 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 30mA
- Maximum output efficiency of 96%
- 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 Tracer1306/2606EPLI



Figure 2 Tracer3906/5206EPLI

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

4. Wiring

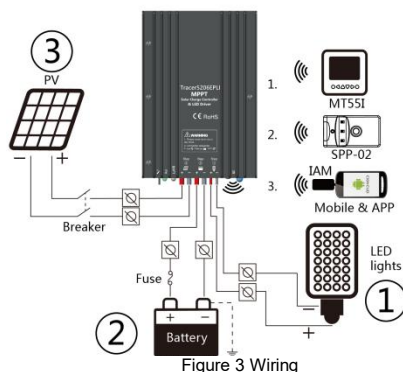


Figure 3 Wiring

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.

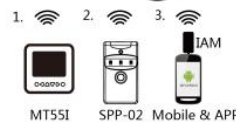
4. LED Indicators

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
		Slowly Flashing(1Hz)	In charging
		Green Fast Flashing(4Hz)	PV Over voltage
		Green On Solid	Normal
BATT	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

5. Setting Operation

n realize controller load modes and parameters through IR function:

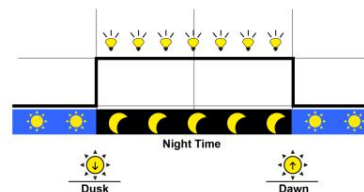
- 1) Infrared Remote Meter—MT551.
- 2) Super Parameter Programmer—SPP-02.
- 3) Mobile APP, IAM(Ir-Android-Micro).



6. Load Set

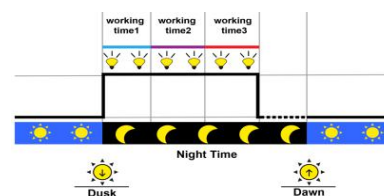
- 1) Manual Mode

2) Light ON/OFF(Default)

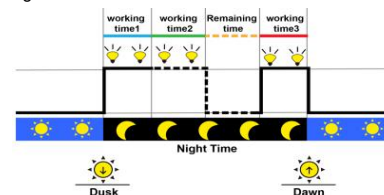


3) Light ON + Timer

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.

7. Protection

- PV Over Current Limit**
The controller will limit charge power in rated charge power. An over-sized PV array will not operate at maximum power point.
- PV Short Circuit**
If the PV array short circuit, the controller will stop charging, clear it to resume normal operation.
- 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 reverse 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 detect 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 50 °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.

8. 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 disconnect the PV
Battery LED indicator red	Battery over discharged	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 ② Reduce 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 handbook the user device manual

9. Technical Specifications

Item	Tracer5206EPLI
Nominal system voltage	12/24VDC Auto
Battery input voltage range	9V~32V
Rated charge current	20A
Rated charge power	520W/24V
Max. PV open circuit voltage	60V at minimum operating environment temperature 46V at 25 °C environment temperature
MPP Voltage range	Battery voltage+2V~36V
Max. output current ^④	6.8A
Max. output power	200W
Output voltage range	Max. battery voltage+2V~60V
Load open circuit voltage	60V
Maximum output efficiency	96%
Output current control accuracy	≤30mA
Battery Type	Sealed(Default) / Gel / Flooded / User
Self-consumption	≤20mA/12V;≤24mA/24V
Temperature compensation coefficient	-3mV/°C/2V
Communication distance of IR	≤6m
Communication angle of IR	≤15°
Working environment temperature	-40 °C ~ +60 °C
Enclosure	IP68(1.5m,72h)
Overall dimension	212.25x105 x52.1mm
Mounting dimension	198.25x94mm
Mounting hole size	Φ3.5
Power cable	PV/BAT:12AWG(4.0mm ²) LOAD:16AWG(1.5mm ²)
Net weight	1.63kg

Battery Voltage Control Parameters (below parameters are in 12V system at 25 °C, please double the values in 24V system)

Battery Type Select	Sealed	Gel	Flooded	User
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V	9~17V
Charging Limit Voltage	15.0V	15.0V	15.0V	9~17V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V	9~17V
Equalize Charging Voltage	14.6V	—	14.8V	9~17V
Boost Charging Voltage	14.4V	14.2V	14.6V	9~17V
Float Charging Voltage	13.8V	13.8V	13.8V	9~17V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V	9~17V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V	9~17V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V	9~17V
Under Voltage Warning Voltage	12.0V	12.0V	12.0V	9~17V
Low Voltage Disconnect Voltage	11.1V	11.1V	11.1V	9~17V
Discharging Limit Voltage	10.6V	10.6V	10.6V	9~17V
Equalize Duration	120 min	—	120 min	0~180 min
Boost Duration	120 min	120 min	120 min	10~180 min

NOTE:

1) The default battery type is Sealed, For Sealed, Gel, Flooded battery type, the voltage point is fixed, unable to be modified. The adjusting range of equalize duration is 0 to 180min and boost duration is 10 to 180min.

2) User type is the user defined battery type. The default value is the same as sealed type. When modify it, please follow the below logistic relation:

- Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Reconnect Charging Voltage.
- Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage.
- Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage.
- Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage.
- Boost Reconnect Charging voltage > Low Voltage Disconnect Voltage.

10. Disclaimer

- Damage from improper use or use in an unsuitable environment.
- PV or load current, voltage or power exceeding the rated value of controller.
- 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.