※ Thank you for selecting the Tracer LPLI 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.

※ Do not install this product in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.

MPPT Solar Charge Controller

---with built-in LED Driver

1. Safety Information

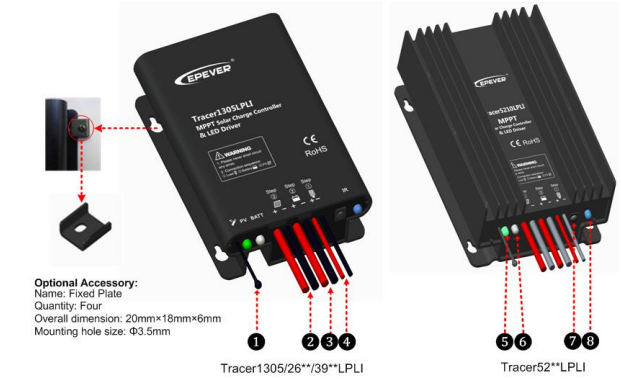
- Read all of the instructions in the manual before installation.
- DO NOT disassemble or attempt to repair the controller.
- Install external fast-acting fuses or breakers as required.
- Do disconnect the solar module and fast-acting fuses/ breakers near to battery before installing or moving the controller.
- Power connections must remain tight to avoid excessive heating from a loose connection.
- Only charge batteries that comply with the 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 Tracer LPLI series, MPPT solar charge controllers, combine the solar charge controller and LED constant current driver into one unit. It is ideal for solar LED Lighting, especially when the dimmer function is needed. 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 the system cost. The features are listed below:

- Advanced Maximum Power Point Tracking (MPPT) technology, with tracking efficiency of no less than 99.5%
- Maximum conversion efficiency of 98%
- Accurately multiple power points recognizing and tracking
- Ultra-fast tracking speed and guaranteed tracking efficiency
- Adopt high-quality components of ST, IR, and Infineon to ensure product lifespan
- Apply to lead-acid battery and lithium battery
- Lithium battery self-activating function
- Lithium battery low-temperature protection function
- Charging current limit, with settable current
- Lithium battery limit current in low temperature
- Intelligent power mode with 365-day lighting control technology
- Intelligent power reduction function
- Digital precision constant current control and the control accuracy are less than ±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
- Real-time energy statistics function
- Monitoring and setting parameters via Mobile APP and RC10 with IR function
- Aluminum housing for better cooling
- Wide working environment temperature(-40℃～60℃)
- IP68 waterproof degree

3. Product Features



Tracer1305/26**/39**LPLI Tracer52**LPLI

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

4. Wiring

● Reference for Serial connection of LED

System Voltage	Serial connection	Min. Output Voltage	Max. Output Voltage
12V	5～18 LED	15V	60V
24V	10～18 LED	30V	60V

NOTE: The above LED (1W, 3.3V) is calculated. If the user uses the unconventional LED, The actual LED voltage must be less than the Max. Load Output Voltage.

WARNING: Risk of electric shock! With the product's built-in boost LED driver, the output voltage is higher than the human safety voltage.

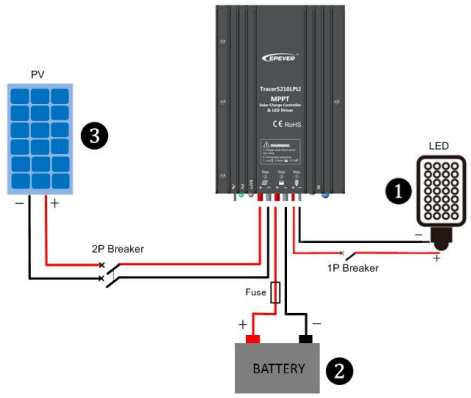
● Connection Order

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 fast-acting fuse or turn on the breaker during the installation. When disconnecting the system, the order will be reserved.

2) After powering on the controller, check the battery LED indicator on the controller; it will be green. If it's not green, please refer to chapter 9.

3) Connecting a fast-acting fuse in series through battery positive (+) in the circuit and the battery circuit fast-acting fuse must be 1.25 to 2 times the rated current. The installed distance is within 150mm.

NOTE: The controller can only charge or discharge alone but can carry out the discharge process to check the load preferentially.



● Load self-test function

The load is ON when the controller is powered on for 10 seconds. After 10 seconds, it restores to set working mode.

5. LED Indicators

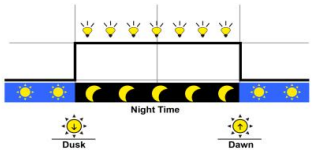
Indicator	Color	Status	Instruction
PV	Green	On Solid	PV connection normal but low voltage(irradiance) from PV, no charging
	Green	OFF	No PV voltage(night time) or PV connection problem
	Green	Slowly Flashing(1Hz)	In charging
	Green	Fast Flashing(4Hz)	PV Over voltage
BATT	Green	On Solid	Normal
	Green	Slowly Flashing(1Hz)	Full
	Green	Fast Flashing(4Hz)	Overvoltage
	Orange	On Solid	Under voltage
	Red	On Solid	Over discharged Low temperature
	Red	Fast Flashing(4Hz)	Battery Overheating
Charging indicator(green) and battery indicator(orange) flash twice			Set parameters successfully
Charging indicator(green) and battery indicator(orange) fast flash simultaneously			System voltage error※

※ When the battery type is a lithium battery, the controller cannot recognize the system voltage automatically.

6. Load Working Mode

1) Manual Mode

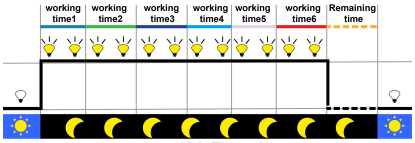
2) Light ON/OFF(Default)



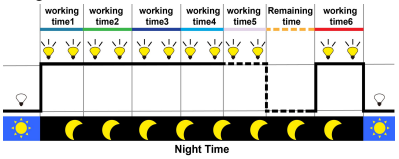
Turn-On voltage (Adjustable): 5V (12Vsystem), delay10min.
Turn-Off voltage (Adjustable): 6V (12Vsystem), delay10min.
Note: 24V system voltage×2

3) Light ON + Timer

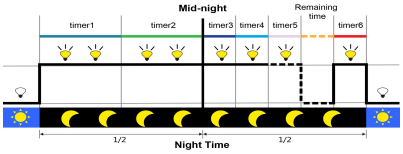
Light ON + Timer1



Light ON + Timer2



Light ON + Timer3



4) Real-time Control

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

5) Intelligent Power Reduction Mode

When the battery voltage goes lower than the "Reduce Power Start Voltage (adjustable)," the intelligent power reduction mode is enabled. The LED output current is automatically reduced linearly with the battery's voltage drop. When the battery voltage goes lower than the "Reduce Power End Voltage (adjustable)," the LED output current is 2% of the rated load current. The minimum percentage can be set to 1%. Also, when

the battery voltage exceeds "Reduce Power Start Voltage," the controller exits the intelligent power reduction mode.

NOTE: In Light ON/OFF and Light ON/Timer mode, the load is turned on after a 1-minute delay (the delay time can be set).

7. Setting Operation



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

1) IR Remote Control—RC10

2) Super Parameter Programmer—FC-01

This method can realize one-key setting operation which is suitable for bulk quantity products setting or applied in the projects.

3) Mobile APP+eBox-WIFI&IR-01/02

Real-time monitoring and setting the parameters

Note: Please refer to the user manual of handheld device

8. Protection

Protection	Conditions	Status
PV Reverse Polarity	The PV can be reversely connected with a controller when: ✓ Only the PV connects with the controller; ✓ The battery is positively connected, and the open-circuit voltage of the PV is lower than 85V (This requirement is only for Tracer26/39/5210LPLI).	The controller is not damaged
Battery Reverse Polarity	The battery can be reversed when the PV is not connecting or the connection is reversed. **WARNING: The controller will be damaged when the PV connection is correct while the battery connection is reversed!**	
Battery Over Voltage	The battery voltage reaches the OVD	Stop charging
Battery Over Discharge	The battery voltage reaches the LVD	stop discharging
Battery Overheating	The temperature sensor is higher than 65℃	Output is OFF
	The temperature sensor is less than 55℃	Output is ON
Lithium battery Low Temperature (Default 35℃)	The temperature sensor is less than the low-temperature value	Lithium battery stops charging
	The temperature sensor is higher than the low-temperature value	Lithium battery charging
Lithium battery limit current in low temperature	Limit current temperature T1>T2>T3>T4>T5>T6 Limit current I1>I2>I3>I4>I5>I6	When the temperature is lower than T1, the charging current is I1; when the temperature is lower than T2, the charging current is I2, and so on. However, when the temperature rises gradually from T4 to T1, it is performed at I4.
Load Short Circuit	Load current ≥2.5 times rated current First short circuit, the output is OFF 5s. Second short circuit, the output is OFF 10s. Third short circuit, the output is OFF 15s. Fourth short circuit, the output is OFF 20s. Fifth short circuit, the output is OFF 25s. Sixth short circuit, the output is OFF.	Output is OFF **Clear the fault:** Restart the controller or wait for one night-day cycle (night time>3 hours).

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 may be less than 8.5V	Measure battery voltage with the multi-meter. Min.8.5V can start up the controller
Battery LED indicator green fast Flashing	Battery over voltage	Check if the battery voltage is higher than OVD, and disconnect the PV
Battery LED indicator red	Battery over discharged①	When the battery voltage is restored to or above the 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 declines below 50ºC, the controller resumes.
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 the LED light. ④Output short circuit.	① Check the connecting cable. ② Check the load's mode and parameters. ③The voltage of the LED light is not within the output voltage range of the controller. ④Check the connecting cables and LED light.
The dimming function is invalid	The controller does not match the LED light source. This product is step-up voltage control. If the input voltage is lower than the rated voltage, it is not working.	①Replace the LED light ②Reduce the rated voltage grade and replace the product model For example, changes the 24V system to a 12V system and replace the corresponding controller

①After the battery is over-discharged, the battery indicator is still red, and the load is off all the time until the voltage is lower than the Low Voltage Reconnect Voltage (LVR). To judge whether the system is normal or not, firstly, measure whether the battery voltage is higher than the LVR; if not, restart the controller to detect whether the load is normal.

NOTE: The LVR can be set, but you must pay more attention to modifying it. Or, the battery may be damaged if the LVR is too low.

10. Technical Specifications

Item		Tracer1305LPLI	Tracer2606LPLI	Tracer3906LPLI	Tracer5206LPLI	Tracer2610LPLI	Tracer3910LPLI	Tracer5210LPLI
Nominal system voltage		12VDC	12/24VDC					
Battery input voltage range		8.5～16VDC	8.5～32VDC					
Rated charge current①		10A/12V	10A	15A	20A	10A	15A	20A
Rated charge power		130W/12V	130W/12V; 260W/24V	200W/12V; 400W/24V	260W/12V; 520W/24V	130W/12V; 260W/24V	200W/12V; 400W/24V	260W/12V; 520W/24V
Max. PV open circuit voltage		50V (Min. Temp.) 45V(25℃)	60V(at minimum operating environment temperature) 46V(at 25℃ environment temperature)			100V(at minimum operating environment temperature) 92V(at 25℃ 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 power②		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		
Load over-voltage protection		50V	63V			100V		
Maximum output efficiency		96%						
Output current control accuracy		≤2%						
Battery Type		**Lead-acid battery:** Sealed(default)/Gel/Flooded/User**; Lithium battery:**LiFePO4/Li-NiCoMn/User						
Lead-acid	Equalize Charging Voltage	Sealed:14.6V; Flooded:14.8V; User:9-17V (24Vsystem×2)						
	Boost Charging Voltage	Sealed:14.4V; Gel:14.2V; Flooded:14.6V; User:9-17V(24Vsystem×2)						
	Float Charging Voltage	Sealed/Gel/Flooded:13.8V; User:9-17V(24Vsystem×2)						
	Low Voltage Reconnect Voltage	Sealed/Gel/Flooded:12.6V; User:9-17V(24Vsystem×2)						
	Low Voltage Disconnect Voltage	Sealed/Gel/Flooded:11.1V; User:9-17V(24Vsystem×2)						
Lithium	Boost Charging Voltage	LiFePO4(4s):14.5V; Li-NiCoMn(3s):12.5V; User:9-17V(24Vsystem×2)						
	Low Voltage Reconnect Voltage	LiFePO4(4s):12.8V; Li-NiCoMn(3s):10.5V; User:9-17V(24Vsystem×2)						
	Low Voltage Disconnect Voltage	LiFePO4(4s):11.1V; Li-NiCoMn(3s):9.3V; User:9-17V(24Vsystem×2)						
Self-consumption		≤15mA/12V; ≤22mA/24V						
Communication		IR communication						
Work temperature range		-40℃～+60℃						
Enclosure		IP68(1.5m,72h)						
Dimension (L x W x H)		124×89×30mm		150×93.5×32.7mm	153×105×52.1mm	124×89×30mm	150×93.5×32.7mm	153×105×52.1mm
Mounting hole size		Φ3.5mm						
Mounting size (L x W)		88×76mm		120×83mm	120×94mm	88×76mm	120×83mm	120×94mm
Power cable		PV/BAT:14AWG(2.5mm²) LOAD:18AWG(1.0mm²)			PV/BAT:12AWG(4mm²) LOAD:16AWG(1.5mm²)	PV/BAT:12AWG(2.5mm²) LOAD:18AWG(1.0mm²)		PV/BAT:12AWG(4mm²) LOAD:16AWG(1.5mm²)
Net weight		0.52kg	0.52kg	0.71kg	1.18kg	0.52kg	0.71kg	1.18kg

①The controller has the charge current limit function. The charge current can be set via the app and remote controller.

② The Max. output power is the same for the 12V or 24V system, shown above the table.

Any changes without prior notice! Version number: V2.6