

User Manual for LTD2410RP Series Solar Charger

Item # MSC10LVDW

Main Features

1. High charging efficiency, tandem PWM charging way, longer battery life;
2. Perfect protection, including short-circuit protection, overcurrent protection, low-voltage protection, over-voltage protection and lighting protection;
3. Configurable battery type and parameters, applicable to sealed, open and gel lead-acid battery.
4. Manual switch available, applicable to uninterrupted solar power supply system;
5. Multiple load working modes, configurable light-operated timing way on any time length;
5. Multi-period and multi-power load control way, customized period, the number of periods and period-related power;
7. IP68 waterproofing grade and aluminum cover design is applicable to all kinds of extreme environments.

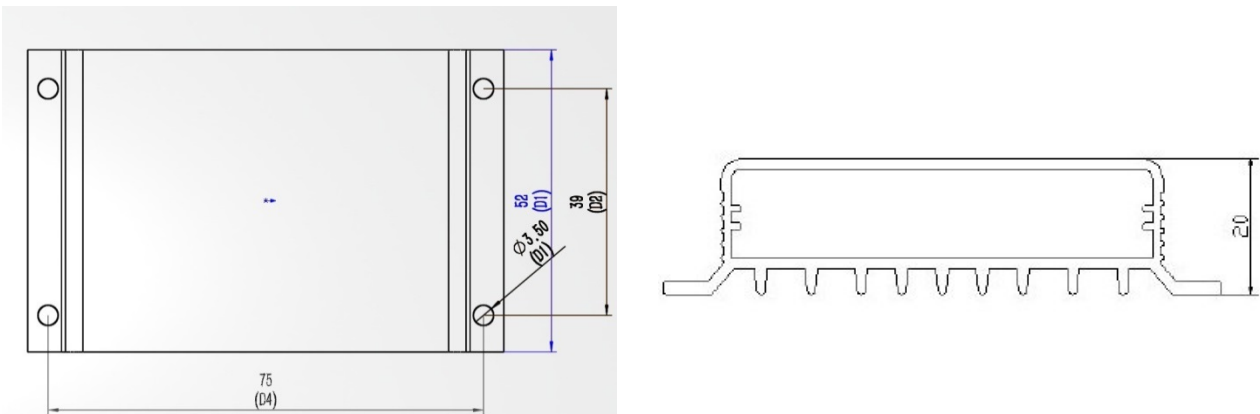
Installation and Connection

1. Controller should be fixed reliably according to the dimension as follow:

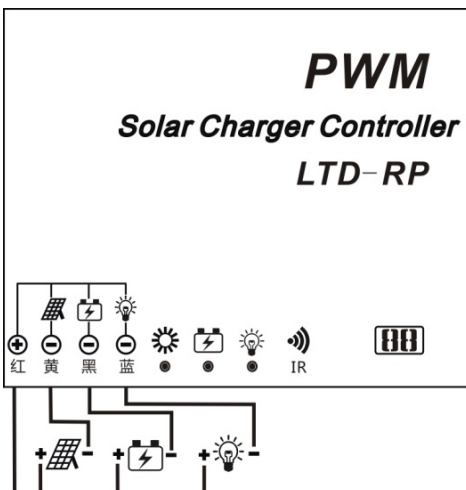
External dimensions: 82mm X 52mm X 20mm

Installation dimension: 39mm X 75mm

Pore size: 3.5mm



2. Connect to system components. Connect to the positive and negative terminal of storage battery by the following sequence. The controller will automatically identify battery voltage and start working. If the system nixie tube works on 12V, it displays “12”. If the system nixie tube works on 24V, it displays “24”. Then, connect to positive and negative terminals of solar photovoltaic panel by sequence. When sunshine is available, the indicator light of charging will be on. If not, please check the connection. At last, completion is followed by the connection to the negative and positive poles of loads.



Suggestion for Usage

1. The controller will identify the voltage of storage battery after powered. In usage, please connect to storage battery first and guarantee reliable connection.
2. As the controller will emit heat during working, installation in well-ventilated environment is suggested.
3. Choose the large-capacity cables for connection to avoid too much loss in the circuit and controller makes an inaccurate reading.
4. It is very important to keep the storage battery fully charged at least once a month. Otherwise long-term damage is possible. The storage battery can only be fully charged when incoming energy is higher than load consumption. Remember this when configuring the system.

Status Indication

LED Lamp	Indication	Status	Function
Green LED	Charging	Constantly on	Charging is in constant-voltage charging stage.
		Quick blinking	Charging is in direct-charging stage.
		Slow blinking	Charging is in floating stage.
		Constantly off	Insufficient voltage of solar panel
RGB LED (red, green, and blue)	Indicator light of storage battery	Green constantly on	High battery
		Yellow constantly on	Medium battery
		Red constantly on	Low battery
		Green blinks slowly	Full charge
		Slow blinking	Low voltage
		Constantly off	Unable to work due to excessively low battery
Red LED	Indication of loads	Constantly on	Loads enabled
		Quick blinking	Loads are short-circuited.
		Slow blinking	Loads are overcurrent.
		Constantly off	Loads disabled

Mode Description and Setting Table

LTD_RP series controller has 6 working modes. Setting table is shown as follows.

1. Sole light control (L): when sunlight is not available and light intensity declines to start point, the controller confirms start signal after 10s delay and enables load according to setting parameters. Load starts working. When sunlight is available and light intensity rises to start point, controller confirms shut-down signal after 60s delay and disables the output. Load stops working.
2. Light + time control (1~9): starting process is the same with sole light control. When load times out, it is closed automatically. Duration varies 1~9 hours.
3. Debug mode (d): this mode is applied in system debugging to examine the proper installation of system. When light signal is available, load is enabled. When light signal is unavailable, load is disabled.
4. Constant-on mode (0): powered load maintains output status. This mode is applicable to the loads which should be powered all through 24h.
5. 3 time intervals of light control (3T): load output is divided into 3 configurable time intervals (0~12). User can set the output percentage for each time interval.

Display	Mode	Display	Mode
1	1h light-time control	9	9h light-time control
2	2h light-time control	8	8h light-time control
3	3h light-time control	L	Sole light control mode
4	4h light-time control	H	Manual mode
5	5h light-time control	d	Debugging mode
6	6h light-time control	0	Constant-on mode
7	7h light-time control	3T	3 time intervals of light control

Setting Method

Parameter setting of 3 time intervals of light control

Button T1, T2, and T3 set the time length of each interval;

Button T1, P2, and P3 set the power of each interval.

Press on “3T” button to switch to 3-interval mode. Under 3T mode, press corresponding button to have LED display setting items. For example, after button T1 is pressed, LED displays “T1” by blinking, indicating current setting is the first time interval. After 3s, LED displays corresponding parameters. At this time, user can adjust the parameters by up/down button. Time length can vary 0~12h and each step is 1h. Power can vary 0~100% and each step is 5%. When power is 100, LED displays “A0”.

Safety Recommendations

1. Please do not immerse the controller into corrosive liquids. This would cause the controller to be damaged and to release poisonous gases.
2. When connecting to 24V system, the voltage of solar panel may exceed the safety voltage of human. Please operate with insulating tools and keep hands dry.
3. As the storage battery contains large capacity of energy. Do not short-circuit the storage battery in any case. It is recommended to connect a fuse in tandem way to storage battery.
4. Storage battery may produce combustible gases. Please keep it from any spark.
5. Please keep the storage battery and controller out of the reach of children.
6. Please conform to the safety recommendations of storage battery manufacturer.

Electric Parameter Table

Model	LTD2405RP	LTD2410RP	LTD2415RP	LTD2420RP
Rated charging current	5A	10A	15A	20A
Rated discharge current	5A	10A	15A	20A
Short-circuit current protection	35A			
System voltage	12V/24V auto adaptation			
Over-current protection	< 1.3 times rated current, lasting for 60sec < 1.6 times rated current, lasting for 5sec > 1.6 times rated current, close the loads immediately			

Standby consumption	<5mA	
Voltage drop in charging loop	≤0.26V	
Voltage drop in discharging loop	≤0.15V	
Overvoltage protection	17V X2/24V	
Working temperature	-35°C to +55°C	
Promoting charging voltage	14.6V X2/24V	
Direct-charging voltage	14.6V X2/24V	
Even charging voltage	14.2V X2/24V	
Float charge voltage	13.8V X2/24V	
Charging recovery voltage	13.2V X2/24V	
Discharge end-off voltage	11V X2/24V	
Discharge end-off voltage	12.6V X2/24V	
Control mode	PWM pulse modulation technology	
Dimension/Weight	82mm X 52mm X 20mm/150g	

Common Faults and Solutions

Faults	Display	Cause	Solution
No-response after powered	LED lamps off	Low battery	Replace the battery or charge
		Damaged controller	Contact supplier
Loads without output	Red indicator light of storage battery blinks slowly.	Low battery	The battery will return to normal when the voltage recovers to 12.6V.
	Red indicator light of loads blinks quickly.	Short-circuit	After short-circuit causes are solved, it will return to normal after 1min.
Storage battery doesn't work at daytime.	Indicator light of solar panel goes off.	Solar panel is installed improperly or polarity being opposite.	Eliminate the causes of improper installation and opposite polarity.