

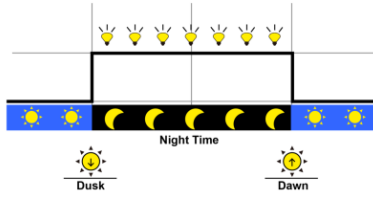
30s, 10s and 2s respectively.

NOTE: Just only the Load over load and the Load short circuit can be cleared by pressing the button.

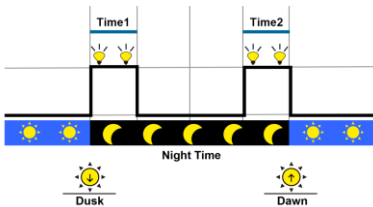
> Load control setting

(1) Manual Mode

(2) Light ON/OFF (Default)



(3) Light ON +Timer



(4) Output mode

The load will be on for 24 hours. The button is disabled.

(5) Test mode

The same as light ON/OFF mode but no 10 minutes delay. The test mode is only used to test load switch. It can return to the previous mode after controller restart.

NOTE: In the mode of Light ON/OFF and Light ON + Timer, the Load is turned on after 10minutes delay.

7. Protection

- 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.
- 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.
- 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 Overload**
Load will be switched off when 1.05 times rated current overload happens. Controller will automatically attempt to reconnect load for 5 times. If overload protection still exist after controller's 5 times attempts, user have to reduce load appliance, then press the button or repower the controller or wait for one night-day cycle (night time>3 hours).
- 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 press the button or disconnect and restart the controller or wait for one night-day cycle (night time>3 hours).
- Controller Overheating**
If the Internal temperature of the controller exceeds 85 °C, the controller will automatically start the overheating protection, and recover below 75 °C.
- 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 8V	Measure battery voltage with the multi-meter. Min.8V can start up the controller
Battery LED indicator	Battery voltage higher	Check if battery voltage is higher

green fast Flashing	than over voltage disconnect voltage(OVD)	than OVD, and disconnect the PV
Battery LED indicator red and display "E1"	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	Controller overheating	Please try to decline the environment's temperature, or the power of PV or the power of the load
Load terminals no output and display "E3" or "E4"	Over load or Short circuit	Please reduce the number of electric equipments or check carefully loads connection.

NOTE: If want to clear errors promptly, please restart the controller and disconnect the PV array firstly, then load and battery; and reconnect system according to "Chapter4".

9. Technical Specifications

Item	LS1024BPD	LS2024BPD
Nominal system voltage	12/24VDC Auto	
Battery input voltage range	8~32V	
Battery type	Sealed (Default) / Gel / Flooded	
Max. PV open circuit voltage	50V	
Rated current	10A	20A
Self-consumption	9.4mA/12V;12.2mA/24V	
Charge Circuit Voltage Drop	≤0.3V	
Discharge Circuit Voltage Drop	≤0.2V	
Temperature compensation coefficient	-3mV/°C/2V	
Working environment temperature	-35°C ~ +55°C	
Enclosure	IP67	
Grounding	Common Positive	
Overall dimension	108.5x64x25.6mm	108.5x83x25.6mm
Mounting dimension	100.5mm	100.5mm
Mounting hole size	Φ5	
Power cable	2.5mm ²	4.0mm ²
Net weight	0.33kg	0.41kg

Battery Voltage Control Parameters

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

Battery Type	Sealed	Gel	Flooded
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V
Charging Limit Voltage	15.0V	15.0V	15.0V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V
Equalize Charging Voltage	14.6V	—	14.8V
Boost Charging Voltage	14.4V	14.2V	14.6V
Float Charging Voltage	13.8V	13.8V	13.8V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V
Low Voltage Reconnect Voltage	11.6V	11.6V	11.6V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V
Under Voltage Warning Voltage	12.0V	12.0V	12.0V
Low Voltage Disconnect Voltage	11.1V	11.1V	11.1V
Discharging Limit Voltage	10.6V	10.6V	10.6V
Equalize Duration	120 min.	—	120 min.
Boost Duration	120 min.	120 min.	120 min.

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.

Any changes without prior notice! Version number: V2.1