

LUX WP series
Solar charge controller

User Manual

This user manual is subject to change without notice.

Solar charge controller LUX WP series User Manual

Thank you for choosing the **LUX WP** series solar controller. Please take the time to familiarise yourself with this user manual, as it will help you take full advantage of the controller's features. This manual gives important recommendations for installing, using, and programming the solar controller. Read this manual in full before installing or connecting the solar controller

1. Functions

The LUX WP series intelligent MPPT solar controller is programmable, waterproof and well-suited for a wide range of solar systems. The charging efficiency of this controller is higher than a traditional PWM controller, helping to get the most out of the solar panel.

- Innovative Maximum Power Point Tracking (MPPT) technology, tracking efficiency >99.9%
- High charge conversion efficiency of up to 97.5%
- Waterproof IP67, strong and durable aluminium case
- 12/24V system voltage automatic recognition
- Adjustable 5-stage timer for load output
- Monitoring of the running status and parameters
- Automatic temperature compensation
- Four stage charging: MPPT, boost, equalisation, float
- Automatic reconnection after low voltage disconnect by Battery Management System (BMS) on Li batteries
- Programmable charging voltages
- Automatic day/night tracking
- Configurable with an LCD remote programmer (LUX-PRG, purchased separately)
- Full automatic electronic protection functions.

2. Safety instructions and liability waiver

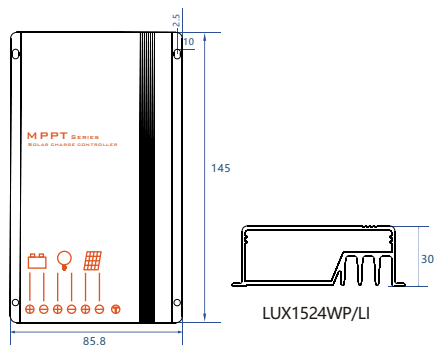
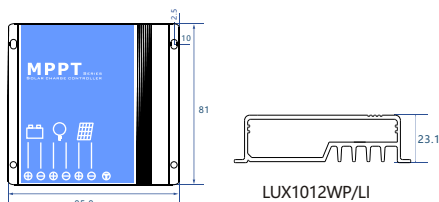
2.1 Safety

1. The solar charge controller may only be used in PV systems in accordance with this user manual and with solar panels specifications in line with the requirements of this controller. No energy source other than solar panels may be connected to the solar charge controller.
2. Batteries store a large amount of energy; never short-circuit a battery under any circumstances. We strongly recommend connecting an in-line fuse or circuit-breaker on the "+" wire between the battery and controller, no more than 15cm from the battery terminal.
3. Batteries can produce flammable gases. Avoid sparks and flames near the batteries. Make sure the battery is installed in a well ventilated area.
4. For LI models, only use batteries equipped with a suitable battery management system.
5. Avoid touching or short-circuiting any wires or terminals. Be aware that the voltages at certain points in the controller can be several times greater than the battery voltage. Use isolated tools and only perform any work in a dry environment.
6. Keep the battery and charge controller out of reach of children.

2.2 Liability

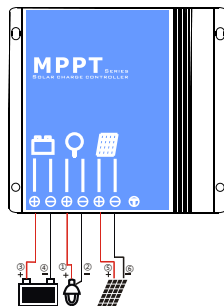
The manufacturer shall not be liable for damages to the controller or battery caused by use other than as instructed in this manual, or if the battery manufacturer's recommendations are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorised person, unusual use, incorrect setup, or bad system design.

3. Dimensions



4. Installation

The following diagram provides an overview of the terminals. Please make sure to follow the proper order of connection.



1. Connect the load first with corresponding red (positive) and black (negative) cables. These connections are optional.
2. Connect the battery with corresponding positive and negative cables. The load should turn on.
3. Connect the panel with corresponding positive and negative cables. If the panel is well lit the controller should begin charging.

Note: make sure the wire between battery and controller is as short as possible to prevent voltage drop. Minimum recommended wire size:

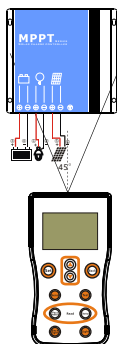
- 10A - 2.5mm²
- 15A - 4.0mm²

Solar charge controller LUX WP series User Manual

5. Remote control, default settings

Settings can be changed using the "LUX-PRG" infrared remote programmer (optional; purchased separately). For detailed instructions and settings, please see the LUX-PRG programmer remote manual.

Note: be sure to only set one controller at a time



5.1 Reading the parameters

Press the "Parameter" key of the LUX-PRG unit to read the setting parameters of the controller. The table below summarises the load settings; note that many of these settings are only relevant for systems where the load is powered through the controller. These settings (e.g. timer) do not affect the charging function.

Num	Name	LUX...WP	LUX...WP LI
1	Time1	24H	24H
2	Dim1 ¹	100%	100%
3	Time2	0H	0H
4	Dim2	100%	100%
5	Time3	0H	0H
6	Dim3	100%	100%
7	Time4	0H	0H
8	Dim4	100%	100%
9	Time5	0H	0H
10	Dim5	100%	100%
11	D/N Thr	8.0V	8.0V
12	D/N Dly	0min	0min
13	Load I ²	0.3A	0.3A
14	Dim Auto	No	No
15	Battery	GEL	LI
16	CVT ³	—	14.2V
17	CVR ³	—	14.0V
18	LVD	11.0V	10.8V
19	LVR	12.0V	11.5V
20	0°C Chg	—	Yes

1. If the dimming function is set to 0%, the load will be off. Otherwise, the load will be on.
2. "Load I" and "Dim Auto" settings are for DC series controllers with built-in LED driver, and do not affect the operation of this controller
3. CVT (Charging Target Voltage) and CVR (Charging Recovery Voltage) are for lithium batteries.

5.2 Reading the running status

Press the "Status" key of the LUX-PRG programmer to read the running status of the controller. This will display the current mode of the controller and any measured values.

Num	Name	Status	Unit
Status: Charging/discharging			
1	Batt V	Battery voltage	V
2	Load I	Load current	A
3	Load V	Load voltage	V
4	PV V	PV voltage	V
5	PV I	PV current	A
6	Energy	Total generated power	AH
7	OD Times	Over discharge times	Times
8	FC Times	Fully charged times	Times
9	Day1-HV	A day ago highest voltage	V
10	Day1-LV	A day ago lowest voltage	V
11	Day2-HV	Two days ago highest voltage	V
12	Day2-LV	Two days ago lowest voltage	V
13	Day3-HV	Three days ago highest voltage	V
14	Day3-LV	Three days ago lowest voltage	V

5.3 Test function (streetlight mode)

Press the "Test" key of the LUX-PRG programmer, the controller will turn on the load for 30s. If the load is programmed to be off during daytime, this can verify correct installation and help with troubleshooting.

Note: In the default "24h" mode, the test key is invalid.

6. Starting up the controller

6.1 Self test

As soon as the controller is powered it starts a self test routine. After this, the LED display will change to normal operation.

6.2 System voltage

The controller adjusts itself automatically to 12V or 24V system voltage. If the battery voltage on start-up is 10V-15V then the controller infers a 12V system. If the battery voltage is 20V-30V the controller infers a 24V system.

Note: LUX1012WP and LUX1012WP-LI are only suitable for a 12V systems

6.3 Battery type

This charge controller is compatible with either lead acid or lithium rechargeable batteries, depending on the model. If your controller is for lead acid batteries, the default settings will be suitable for many different types of lead acid batteries. It is your responsibility to check and ensure that these settings are correct for your battery, otherwise they must be amended.

See **11. Technical Data** for compatible battery voltage ranges.

Solar charge controller LUX WP series User Manual

7. Loud output timer modes

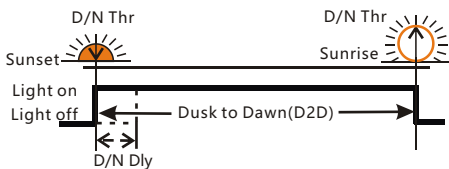
The controller has advanced day/night time control functions. The load on/off timings can be set based on your needs as shown below.

7.1 Standard (24H)



If "Time1" is set to "24H" and sent to the controller successfully, the controller's load will always be on.

7.2 Dusk to Dawn (D2D)

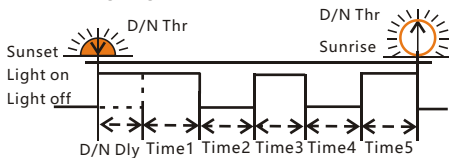


If "Time1" is set to "D2D", the controller works in dusk to dawn mode. The load will turn on while the sun is down, as determined by the solar panel voltage.

Note: the dimming setting will still be active in this mode.

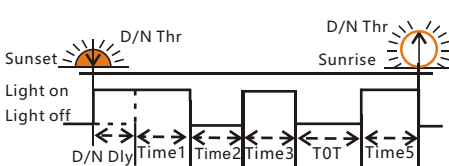
If "Time1" is set to D2D mode then "Time4" cannot be set to TOT mode.

7.3 Five-stage night mode



Time 1-5 and Dim 1-5 can be set individually to give variable load power throughout the night.

7.4 TOT mode (turn on before dawn)



If "Time4" is set to "TOT" then the controller will determine Time4 based on Time5 and previous data on the time of sunrise.

Note: while this setting is applied, "Time1" cannot be set to D2D mode.

8. LVD, LVR, Threshold

8.1 Low Voltage Disconnect (LVD)

When the battery voltage drops below the LVD voltage, the controller will disconnect the load to prevent deep discharge of the battery. If this occurs, the battery should be well charged before resuming use.

LVD ranges for 12V/24V systems:

- LUX WP: 10.8~11.8V/21.6~23.6V
- LUX WP-LI: 9.0~30V

8.2 Low Voltage Reconnect (LVR)

If the low voltage disconnect is triggered, the controller will restore load connection only when the battery voltage increases above the LVR voltage.

LVR ranges for 12V/24V systems:

- LUX WP: 11.4~12.8V/22.8~25.6V
- LUX WP-LI: 9.6~31V

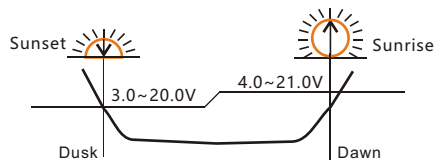
Note: LVR should be at least 0.6V/1.2V higher than LVD for a 12V/24V system.

8.3 Day/Night threshold, Day/Night delay

The controller recognises day and night based on the solar panel open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used.

D/N Thr Setting range: 3.0~20.0V

The actual time of turning on/off can be delayed by up to 30 minutes from the time the threshold was reached using the Day/Night delay setting (D/N Dly).



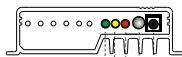
Notes:

1. The D/N Thr setting is based on the open circuit voltage, this may be 1V higher than the setting data giving a range of 4.0~21.0V.
2. The controller will automatically adjust the day/night threshold if the lowest solar voltage is higher than the D/N Thr. The load will have no output the first night, then 24 hours later the controller will automatically adjust the setting to give output the following night.

Solar charge controller LUX WP series User Manual

9. LED indicators, faults and alarms

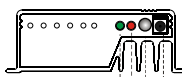
9.1 LED Display Explanation



LUX1012WP/LI

Green
Yellow| Emitter
Red Receiver

LED	Status	Function
Green LED	On	Solar panel is correctly connected, but it is not charging
	Fast flash(0.1/0.1s)	MPPT charging
	Flash(0.5s/0.5s)	Equal or Boost Charging
	Slow flash(0.5/2s)	Float Charging
Yellow LED	Off	Over voltage protection
	On	Battery is normal
	Slow flash(0.5/2s)	Battery voltage is low
	Fast flash(0.1/0.1s)	Low voltage protection
Red LED	Off	Normal working mode
	On	The output power is 0.
	Flash(0.5s/0.5s)	Over temperature
	Fast flash(0.1/0.1s)	Short circuit or over-current protection



LUX1524WP/LI

Green LED| Emitter
Red LED Receiver

LED	Status	Function
Green LED	On	Battery connected, no charging
	Slow flash(0.5s/2s)	Battery connected, charging
	Fast flash(0.1s/0.1s)	MPPT Charging
	Fast flash(0.2s/0.5s)	Equalization charging
	Flash(0.5s on/0.5s off)	Boost charging
	Slow flash(1s/1s)	Float charging
Red LED	Off	No fault detected
	On	Low voltage protection
	Slow flash(1s/1s)	Overcurrent or short circuit protection
	Flashing(0.5s/0.5s)	Over temperature protection
	Fast flash(0.1s/0.1s)	Over voltage protection
Red Green	Both off	No connection to battery
	Both on 1s	Start up Self test

Detailed fault information can be read by LUX-PRG remote controller.

9.2 Faults & Alarms

Fault	Reason	Troubleshooting
Loads are not powered	Low battery capacity	Recharge battery above LVR.
	Overload or load short-circuit	Switch off all loads, remove short-circuit. Wait 1 minute.
	Battery overheating	Controller will turn the system off until temperature is below 60°C.
High voltage at battery terminal	Battery overvoltage	One of the charging sources attached to battery is faulty.
	Battery wires, fuse or terminals have high resistance	Check battery wires, fuse and battery.
Incorrect system voltage	Battery voltage not in the right range	Charge or discharge battery to correct the voltage
Battery not charging	Power cannot be supplied	Check panels and wire connections

10. Safety features

	Solar terminal	Battery terminal	Load terminal
Reverse polarity	Protected ¹	Protected	Protected ¹
Short circuit	Protected	Protected ²	Switches off immediately
Over current	—	—	Switches off with delay
Reverse Current	Protected	—	—
Over voltage	Max.55V ³	Max. 35V ³	—
Under voltage	—	—	Switches off
Over temp.	The controller cuts off the load if the temperature reaches the set value.		

1. Controller can protect itself, but load may be damaged
2. Battery must be separately protected by fuse
3. Please refer to **11. Technical data** for maximum recommended voltages

Warning: The combination of different error conditions may cause damage to the controller
Always remove the error before you continue connecting the controller

Solar charge controller LUX WP series User Manual

11. Technical data

Where two values are given separated by "/", these represent the separate values for 12V/24V systems

Item	LUX1012WP	LUX1012WP-LI	LUX1524WP	LUX1524WP-LI
System Voltage	12V		12/24V	
Max Charging Current	10A		15A	
MPPT Charging Voltage	<14.4V@25°C	<CVT	<14.4/28.8V@25°C	<CVT
Boost Voltage	14.4V @25°C	—	14.4/28.8V @25°C	—
Equalization Voltage	14.8V @25°C	—	14.8/29.6V @25°C	—
Float Voltage	13.7V @25°C	—	13.7/27.4V @25°C	—
Charging voltage target	—	10~17.0V	—	10.0~32.0V
Charging voltage recovery	—	9.2~16.8V	—	9.2~31.8V
Low Volt. Disconnect	10.8~11.8V	9.0~15.0V	10.8~11.8/21.6~23.6V,SOC1~5	9.0~30.0V
Reconnect Voltage	11.4~12.8V	9.6~16.0V	11.4~12.8/22.8~25.6V	9.6~31.0V
Overcharge Protect	15.5V	CVT+0.2V	15.5/31.0V	CVT+0.2V
Max volt on Bat. terminal	25V		35V	
Temp. Compensation	-30mV/°C (Boost, Equalization), -18mV/°C (Float) ¹¹			
Battery Type	Liquid, Gel, AGM	Lithium	Liquid, Gel, AGM	Lithium
Max volt on PV terminal	45V		55V ¹²	
Max input power	130W		200W/400W	
Dusk/Dawn detect volt.	3.0~8.0V		3.0~20.0V (Programmable)	
Day/Night delay time	0~30Min (Programmable)			
MPPT tracking range	(Battery Voltage + 1.0V) ~Voc*0.9 ¹³			
Output Current	10A		15A	
Max tracking efficiency	>99.9%			
Max charge conversion	96.5%		97.5%	
Self consumption	6mA			
Dimensions	85.8 * 81 * 23.1mm		85.8 * 145 * 30mm	
Weight	260g		600g	
Wire Size	2.5mm ²		4mm ²	
Ambient temperature	-35~+60°C			
Ambient humidity	0~100%RH			
Protection degree	IP67			
Max Altitude	4000m			

1. Temperature compensation only suitable for Liquid, Gel and AGM batteries
2. Maximum solar panel voltage at minimum ambient temperature
3. Voc is the open circuit voltage of the panel, measure when the panel is disconnected