

DH60A-R/W

Intelligent Wireless Dimming-Type Controller for LED Solar Street Lights

User Manual



☰	Model Selection	📶
01:	DH/Li/DL/MH	
02:	DHA/B/SESA/SH	
03:	DM60	

Version : V1.01

The above information is subject to change without prior notice.

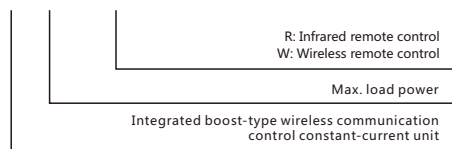
Main Features

- ◆ A wireless remote control function allows an adjustable remote control distance of 0.3 to 20m, with the signal able to penetrate plastic or aluminum shells. (DH60A-W)
- ◆ Adopts a highly efficient constant-voltage and limited-current mode of charging, easing the vulcanization effect caused by battery over-discharging.
- ◆ Boasts a high-temperature protection function. When the temperature rises above the set value, the charging and discharging circuits will be cut off so as to protect the battery.
- ◆ An all-new 10-stage load control mechanism renders load management more intelligent, energy-saving and flexible.
- ◆ Boasts an operating duration adjustment precision of 1 minute and a load power adjustment precision of 1%.
- ◆ An all-new intelligent power algorithm provides 3 optional intelligent power levels. The user can adjust the energy-saving level for the load based on battery voltage platform characteristics and the energy management method to realize an optimized balance between load brightness and operating duration.
- ◆ Digital and high-precision constant-current control boasts an efficiency of up to 96%, and the current adjustment precision reaches 10mA.
- ◆ Features a system status log function, able to record a maximum of 7 days of system status, comprehensively and effectively monitoring the system's conditions.
- ◆ An IP68 grade waterproof aluminum shell guarantees excellent heat dissipation and superb security.
- ◆ A range of protection measures such as battery reverse-connection protection, LED short-circuit and open-circuit protection, etc., put the system under comprehensive and constant guard.

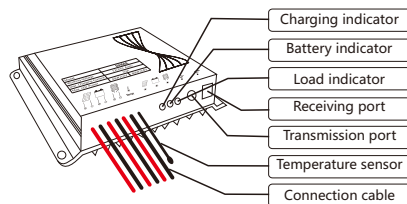
Exterior and Wiring

1. Model name composition

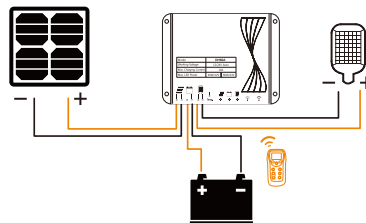
DH60A-R/W



2. Exterior



3.Wiring diagram



4.Wiring sequence: connect first the load, second the battery, and finally the solar panel.

LED Load Connection

- 1.With a built-in boost-type constant-current source, DH60A-R/W boasts a maximum output voltage of 60V, able to power up to 18 LED beads.
 - 2.This controller is of a boost type. When connecting the LED load, be sure to connect a lamp featuring a right number of serially connected LED beads.
- The number of connected LED beads is recommended as follows:

System voltage	Recommended minimum number of serially connected LED beads: n	Load output voltage V _{out}
12V	n ≥ 5	V _{out} ≥ 15V
24V	n ≥ 10	V _{out} ≥ 30V

3.In practical use, make sure you correctly connect the LED lamp before switching on the load.

Warning: if a wrong number of LED beads are connected in series, the LED load or the controller may get damaged. Always bear this in mind!

State Indicators

LED indicator	Indicated item	State	Meaning
	Charging	Steady on	Solar panel voltage higher than light control voltage
		Off	Solar panel voltage lower than light control voltage
		Slow flashing	Charging in process
		Quick flashing	System over-voltage
	Battery	Steady on	Normal battery function
		Off	Battery not connected
		Quick flashing	Battery over discharged
	Load	Steady on	Load turned on
		Slow flashing	Open-circuit LED load
		Quick flashing	Short-circuited LED load
		Off	Load turned off

Load Working Modes

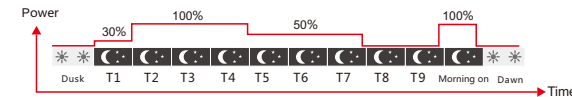
Controlled by the DH60A-R/W controller, the load's working time can be divided into 9 stages plus a 10th—morning on. The operating duration and power of each stage can be freely adjusted, with different combinations bringing about different control modes.

A.Normal working mode: operates according to time and power settings in sequence.

B.Soft start mode: with the operating duration and power of the 1st stage set to 30 minutes and 30% respectively, the system is able to warm up for a while before outputting in full power, which helps to solve the problem of lithium batteries' being unable to discharge at low temperatures.

C.Delay on mode: e.g. set the 1st-stage operating duration to 4 hours and power to 0%, and the system will delay switching on the lights by 4 hours.

D.Morning on mode: the controller will automatically calculate the length of the night and intelligently adjust the time point for switching on the load in the morning, thereby making the morning on time more accurate. Meanwhile, when the set time exceeds the length of night, the load will still be switched on at dawn with the set time overridden.



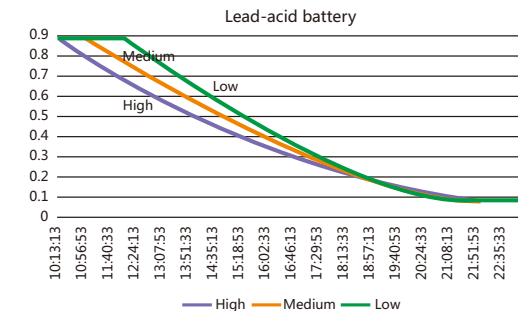
E. Test mode: in daily use, the controller works in the light control + time control mode, but when test is needed during installation, you can use the remote control to switch on the load, and then the LED load will change its power according to the remote control settings. The test mode lasts for 1 minute, and after that, the system will automatically restore the normal working mode.

Intelligent LED Power Control

When the controller's "intelligent power" mode is activated by the user, the LED load's power can be automatically adjusted according to the battery capacity. While the operating duration and load power set by the user are still valid, the system will choose the smaller one from between the automatically adjusted power and the power set by the user as the load output power. Besides, the remote control can be used to select different intelligent power levels: High (energy efficiency grade 1), Medium (energy efficiency grade 2) and Low (energy efficiency grade 3).

For example: when the remaining battery capacity is 50% and the load power calculated in the intelligent power mode is 60%, and if the load power set by the user is 100%, then the final load power is 60%; however, if the load power set by the user is 20% instead, the final load power will also become 20% accordingly.

The typical curve of intelligent power is shown below:

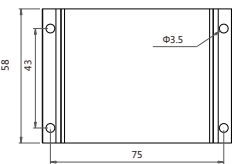


Parameter Access and Modification

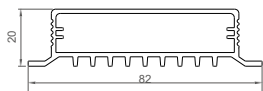
The DH60A-R/W controller can be used to set parameters including load operating duration, load operating power, light control delay and charging voltage, etc. When finishing settings through the remote control, aim it at the controller and press the "Send" key to save the settings. Besides, current parameter settings in the controller can also be accessed to make sure the settings are correct.

Installation dimensions

1. Controller dimensions



Dimensions of DH60A-R/W are as follows:
 External dimensions: 82×58×20 (mm)
 Installation dimensions: 43×75 (mm)
 Installation hole diameter: 3.5 (mm)

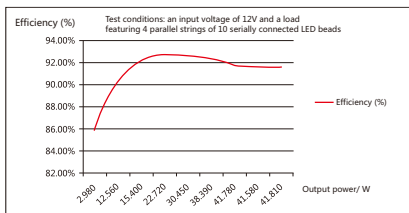


System Status Log

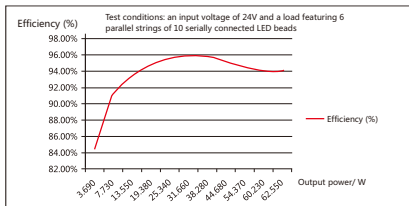
The DH60A-R/W controller can record the operating status of the whole system, including operating days, over-dischargings, full-chargings, etc. And besides, it can also keep a record of battery voltage changes in a week, enabling the user to have a clear understanding of the system and conduct better analysis on it. The user needs to use the remote control to read the system's operating status, and when the reading is successfully done, the parameters will be recorded in the remote control.

Typical Efficiency Curve

1. Typical load efficiency curve of 12V system



2. Typical load efficiency curve of 24V system



Frequently Met Abnormalities and Solutions

No.	Symptoms	Causes	Solutions
1	When connected to the battery, the controller fails to respond, with the indicators not lighting up and no response to remote control operation.	A. The battery is experiencing some power supply issue.	A1. Check whether the battery connection is in good condition. A2. Check whether voltage is present on battery terminals.
2	The load indicator flashes slowly and the LED lamp is flickering.	A. The lamp features too high a number of serially connected beads, with the controller's max. load boost voltage exceeded.	A1. Replace the current lamp with one featuring an appropriate number of LED beads connected properly.
3	The load indicator flashes slowly and the LED lamp fails to light up.	A. The LED lamp is not properly wired. B. The LED lamp is reversely connected.	A1. Check whether the LED lamp is correctly connected. B1. Reconnect the LED lamp.
4	The load indicator is steadily on and the LED lamp fails to light up.	A. The controller's boost circuit gets damaged.	A1. Replace the controller.
5	Dimming is not possible with the LED lamp.	A. The lamp is a 3-in-series or buck one with a wrong number of LED beads connected in series.	A1. Replace the current lamp with a boost (S or more in series) one.
6	The load indicator flashes quickly and the LED lamp fails to light up.	A. The LED load is short-circuited or the LED lamp features too small a number of serially connected beads.	A1. Replace the current lamp with one featuring an appropriate number of LED beads connected properly.
7	Both the load indicator and the LED lamp fail to light up.	A. Light control delay is still in effect. B. The controller is connected to the battery, but has been disconnected from the solar panel for 12 hours or longer, and load operating time is over.	A1. Check whether the lamp will light up after light control delay time is over. B1. Power the controller off and then on again. B2. Connect the solar panel and charge the battery for at least 10 minutes, and then test the load.
8	The battery indicator flashes quickly, and the load lamp fails to light up.	A. Battery capacity is low.	A1. Check whether the solar panel charges normally and if it's blocked. A2. Check whether wiring of the battery and the solar panel disconnects or loosens.
9	The load is only on for a short time.	A. Battery capacity is low. B. Load power is excessively large.	A1. Check whether the solar panel charges normally and if it's configured correctly. A2. Open the "Intelligent Power" Option. B1. Check whether the controller's current setting is correct and if the load power is normal.
10	The load is on, but the current fails to reach the set value.	A. Current is regulated by Intelligent Power. B. The LED lamp's power exceeds the rated value.	A1. Switch off "Intelligent Power" and measure the load current again. B1. Turn down the set current or mount a lamp with a smaller number of beads connected in series in replace of the current one.
11	The LED load is on during day time or on only for a single night.	A. The solar panel is not connected. B. The solar panel is reversely connected.	A1. Check whether the solar panel is correctly and reliably connected. B1. Reverse the connection in day time to see whether the charging indicator flashes.
12	While sunlight is present during day time, the solar panel indicator doesn't light up.	A. The solar panel malfunctions or is connected incorrectly.	A1. Check whether the solar panel is correctly connected and whether it's blocked.
13	The LED load won't light up during night time and the charging indicator is steadily on or flashes quickly.	A. The solar panel is experiencing a light source interference issue. B. The controller's charging MOS fails.	A1. Check the ambient environment of the solar panel. B1. Replace the controller.
14	The wireless remote control fails to function.	A. Model selection is incorrect. B. Remote control mode (infrared or wireless) selection is incorrect. C. The wireless remote control distance set is too short. D. The remote control's battery capacity is low.	A1. Press the "Sleep" and "-" keys at the same time to call out the "Model Selection" screen, and select the right model. B1. Press the "+" and "-" keys at the same time to call out the "Remote Control Settings" screen, and select "Infrared" or "Wireless". C1. Press the "+" and "-" keys at the same time to call out the "Remote Control Settings" screen, and try again after turning up the "Remote Control Distance" option. D1. Mount 2 AA batteries to replace the existing ones.

Note: for detailed parameter and status information, refer to CU-ALL2 Instruction Manual.

Parameter details

Parameter	Value	Adjustable or not	Default
Model	DH60A-R DH60A-W		
Remote control mode	Infrared remote control Wireless remote control		
System voltage	12V/24V		
Output power	40W/12V,60W/24V		
Output current	0.15A ~ 2.64A	✓	330mA
No-load loss	13mA/12V; 21mA / 24V 14mA/12V; 22mA/24V		
Wireless remote control distance	5 to 10m (typical) 0.1 to 20m (adjustable)		
Charging current	10A		
Solar energy input voltage	< 55V		
Typical constant-current source efficiency	90% ~ 96%		
Operating stages	9 stages + morning on	✓	
Time adjustment precision	1 minute		
Power adjustment precision	1%		
Current adjustment precision	10mA		
Over-voltage protection	16.0V ; ×2/24V		
Charging voltage limit	15.5V ; ×2/24V		
Equalizing charging voltage	15.2V ; ×2/24V (25°C)		
Equalizing charging interval	30 days		
Boost charging voltage	14.2V ~ 15.0V ; ×2/24V (25°C)	✓	14.4V
Floating charging voltage	13.2V ~ 14.0V ; ×2/24V (25°C)	✓	13.8V
Over-discharge return voltage	12.0V ~ 13.0V ; ×2/24V	✓	12.6V
Over-discharge voltage	9.8V ~ 11.8V ; ×2/24V	✓	11.0V
Current accuracy	±3% (load current > 300mA)		
Load output voltage	< 60V		
Light control voltage	5V ~ 11V	✓	5V
Light control delay	0min ~ 60min	✓	1min
Operating temperature	-35°C ~ +65°C ;	✓	
Intelligent power	High, medium and low	✓	Medium
Protection degree	IP68		
Weight	170g		
Dimensions (mm)	58*82*20		

Note: parameter settings shall comply with the following rule: boost charging voltage > floating charging voltage > over-discharge return voltage > over-discharge voltage.