DH Series Gen4

Intelligent wireless LED
dimming type All-in-one
constant current solar street light controller

12V/24V(20W/50W/100W)

Instructions for Use

Version: **1.04** Subject to change without notice

1、Features

- Whole new 2.4G wireless/infrared remote control design allows manual modification of controller parameters and reading of system information.
- Full digital high precision constant current control, achieving the maximum efficiency of 96%.
- Human motion infrared/microwave sensing function, with sensing delay time settable.
- 9-Period light dimming and pre-dawn lighting design, working hours settable from 0 hours to 15 hours, power settable from 0% to 100%.
- Both lead-acid battery and lithium battery are applicable, operating parameters can be set by remote control;
- A variety of intelligent power modes are available for choice, with load power adjustable automatically according to the battery level.
- Very low sleep current for long-distance transportation and storage;
- System status recording allows recording of up to 7 days of system status, realizing full monitoring of the system;
- Metal shell, IP67 waterproof rating, applicable to a variety of harsh environments.
- High precision digital step-up constant current control algorithm provides high efficiency and high constant current accuracy, extending the service life of battery.
- Battery charge and discharge high and low temperature protections guarantee that when the temperature exceeds a certain temperature, the number of loads will be reduced or the load will be turned off.
- Battery reverse polarity protection, LED short circuit and open circuit protection, etc. are provided for full protection of the system.

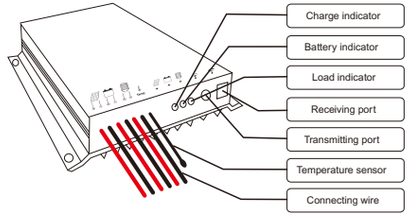
2、Appearance and wiring diagram

1、Model identification :

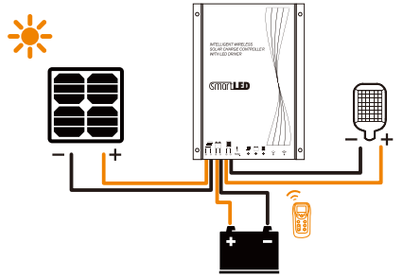
DH 120/100/60 -R/W

- 120/100/60 — Maximum load power
- -R/W — W: Wireless remote control; R: Infrared remote control
- DH — Product series model code, new generation all-in-one step-up constant current controller for wireless communication

2、External view :

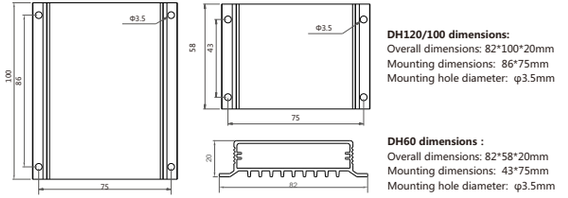


3、Wiring diagram :



4、Wiring sequence: Firstly connect the load, then the battery and finally the solar panel.

3、Dimensions



DH120/100 dimensions:
Overall dimensions: 82*100*20mm
Mounting dimensions: 86*75mm
Mounting hole diameter: φ3.5mm

DH60 dimensions :
Overall dimensions: 82*58*20mm
Mounting dimensions: 43*75mm
Mounting hole diameter: φ3.5mm

4、LED load connection

1、DH comes with a built-in step-up constant current source which offers a maximum output voltage of 60V and can drive as many as 18 LEDs.
2、This controller features a step-up design, so when connecting the LED loads, please confirm the right number of LED lights connected in series. Recommended number is shown below:

System voltage	The recommended minimum number of LED lights in series n	Load output voltage Vout
12V	n ≥ 5	V_{out} ≥ 30V
24V	n ≥ 10	V_{out} ≥ 15V

3、In use, please firstly connect the LED lights in place and then turn on the load.

Warning: If the number of LED lights connected in series is incorrect, the LED load or controller may be damaged, so please be careful!

5、Status indication

LED indicator	Indication content	Status	Function	Remote control system status
	Solar panel indication	Steady on	Solar panel voltage is higher than light control voltage	Idle
		Off	Solar panel voltage is lower than light control voltage	Idle
		Slow flash	In charging	Charging
		Double flash	Battery is fully charged	Fully charged
		Quick flash	Lithium battery BMS protection Battery overvoltage;PV panel overvoltage Over temperature (ambient temperature)	E-BMS Battery overvoltage PV panel overvoltage Over temperature
	Battery indication	Steady on	Battery works properly	Idle
		Off	Battery is not connected or lithium battery protection board overdischarge protection	/
		Quick flash	Battery over-discharge	Over discharge
		Single flash (One flash per 10 seconds)	Overdischarge, sleep	/
	Load indication	Steady on	Load is turned on	Discharging
		Off	Load is turned off	Idle
		Slow flash	Load is open circuited	Open circuit
		Quick flash	Load is short circuited	Short circuit

6、Load working mode

The loads of the DH series controller work in 9 periods and a predawn period. The working time and working power in each period can be adjusted freely, and different combinations can achieve different control modes.

1、**General working mode:** Operate in turn according to set time and power.

2、**Delayed lighting mode: For example, if the working time of the first period is set to 4 hours, and the power of** the first period is set to 0%, the system will delay 4 hours to turn on the light.

3、**Predawn mode:** The controller automatically calculates the night length and intelligently adjusts the predawn lighting point to make the predawn lighting time more accurate.

4、**Test mode: The controller in normal use works under a light control + time control mode. During installation or** it needs commissioning, the loads (LED lights) can be turned on by a remote control and the loads can change power based on settings of the remote control. The test mode lasts for 1 minute and then the system will automatically return to normal operation.

Adjusting Items	Parameters	Default value
Working time of the first period	0–15 hours	4
Working power of the first period	0 % – 1 0 0 %	100%
Working time of the second period	0–15 hours	0
Working power of the second period	0 % – 1 0 0 %	0%
Working time of the third period	0–15 hours	4
Working power of the third period	0 % – 1 0 0 %	50%
Working time of the predawn period	0–15 hours	0
Working power of the predawn period	0 % – 1 0 0 %	30%

7、LED intelligent power control

The DH series controller is available in various intelligent power modes for selection according to the actual lithium battery capacity, the number of rainy days and other factors. The specific intelligent power modes are: High, Moderate, Low, Auto, USE (user-defined), No (off).

(1) Intelligent power levels:

High -The battery capacity at the starting point of power derating is high, and the load lighting time is the longest. It is suitable for use in areas with more rainy days or poor lighting conditions.

Moderate-The battery capacity at the starting point of power derating is moderate, and the load lighting time is moderate. It is suitable for the scenarios where both brightness and the number of rainy days are considered.

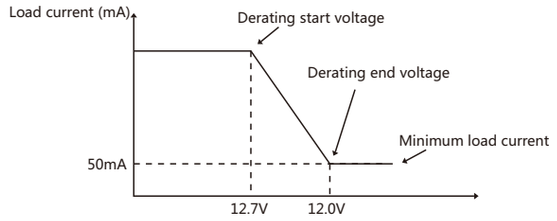
Low-The battery capacity at the starting point of power derating is low, and the load lighting time is the shortest. It is suitable for scenarios with high lighting requirements.

Auto-Intelligent **P**ower **M**ode **a**utomatically **s**elects **h**igh/moderate/low **l**evels **b**ased **o**n **p**arameters such as charge levels and power consumption of the day; for example, in summer, the charge level is large, it runs in low power mode, and the lighting effect is better; in winter, the charge level is small , it runs in high power mode, the load works in the power saving mode and can hold in more rainy days.

USE (user-defined)-The user is allowed to set the derating start voltage, the derating end voltage, and the minimum load current value for the intelligent power.

No(off)-The intelligent power mode is turned off, and the load power is output according to the power of the set time period.

(2) Intelligent power curve:



8. Parameters reading and modification

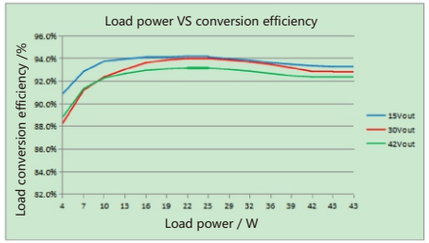
The DH series controller allows for setting of load working time, load working power, light control delay, charge voltage and other parameters. After the parameters have been adjusted on the remote control, press the "Send" button on the controller to set. In addition, the set parameters in the current controller can be read to determine whether the parameter settings are correct.

9. System status recording

The DH series controller can record running status of the whole system, including the number of running days, the number of over-discharges, the number of full charges, etc., and it can also record the change of battery voltage in one week, so that users can understand and analyze the system more clearly. Users need to read the running status on the remote control. After that, the parameters will be recorded in the remote control.

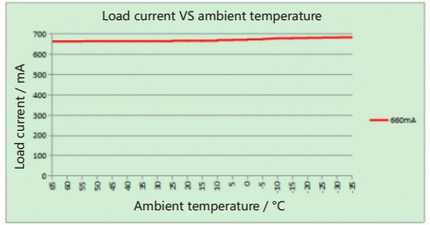
10. Typical efficiency curves

(1) Load efficiency:



(2) Current accuracy:

Load current setting to 660mA



11. Sleep and wake-up

Enter sleep mode:

(1) Press the [OFF] button on the CU remote control or mini remote control. The controller turns off all external control devices, and enters sleep state with very low power consumption to avoid battery feed due to long time no use.

(2) When detecting battery over-discharge or 10-minute continuous open circuit/short circuit of load, the controller automatically enters sleep mode to save battery power, and battery indicator flashes once every 10 seconds.

Wake up from sleep mode:

(1) In sleep mode, press the [ON] button on the CU remote control or mini remote control to wake up the controller and resume normal operation, only for IR remote control type.

(2) PV wake up:

A. If [Yes] is selected for the [PV wakeup] function, after the controller enters sleep mode, the PV panel connected can wake it up and conduct charging during the day with good conditions for charging, and the loads can be automatically turned on at night.

B. If [No] is selected for the [PV wakeup] function, after the controller enters sleep mode, the PV panel connected can wake it up and conduct charging during the day with good conditions for charging, while the controller will continue to enter sleep mode at night.

12. Common exceptions

Exceptions	Causes
Remote control cannot work	The remote control password is incorrect or Remote control mode (infrared or wireless) is not selected correctly or Wireless remote control distance setting is too short or The remote control battery is low
There is no response when the controller is connected to batteryIndicator does not light up and remote control does not respond	Battery is problematic in power supply or controller goes to sleep mode
Charging is normal, but the load does not light upThe LED indicator on the controller does not light up.	Controller is in sleep state
Battery indicator flashes quickly The LED load does not light up	Battery is low
Load lighting time is short	Battery is low or load power is excessive
The load lighting current does not reach the set value	Load current is regulated in intelligent power mode Or LED power exceeds the rated value
Load indicator flashes LED indicator does not light up	Load is open circuited orLED load wiring is shorted or the number of LEDs in series is too few
LED load dimming fails	The number of LEDs in series is incorrect 3 LEDs or step-down LEDs are used
Light is on during the day or LED load only lights up one night	Solar panel is not connected or the panel is reversed
The charge indicator does not flash slowly and the panel does not charge when there is sunlight during the day	Solar panel failure or solar panel wiring error
LED load does not light up, battery indicator is steady on	Solar panel voltage is not lower than light control voltage or the delay time has not been up yet while the controller time runs up.
Charge indicator flashes quickly No charging current	Lithium battery BMS overcharge protection

Note: For detailed parameters and status information, please refer to the CU-ALL5 manual.

13. Technical parameters

Items	Values			Adjustable	Default
Model	DH60	DH100	DH120		
Remote control type	2.4G wireless remote control: -W Infrared remote control: -R				
System voltage	12V/24V				
Zero load loss	-R： <10mA/12V；<15mA/24V -W：<32mA/12V；<38mA/24V				
Sleep loss	<0.8MA/12V； <8MA/24V				
Maximum charge current	10A	15A	20A		
Solar input voltage	≤ 55V				
Typical efficiency of constant current source	90% ~ 96%				
Output power	40W/12V 60W/24V	50W/12V 100W/24V	60W/12V 120W/24V		
Output current	50mA～2000mA	50mA～3300mA	50mA～4000mA	√	330mA
Load output voltage	15V-60V				
Over voltage	Lead-acid battery: 16V; lithium battery: charge voltage +2V				
Equalizing charge voltage	Lead-acid battery: 14.6V; lithium battery: no equalizing charge				
Equalizing charge interval	30 days				
Boost charge voltage (lead-acid) Charge voltage (lithium)	9.00V ～17.00V, settable			√	12.45V
Floating charge voltage (lead-acid) Charge return voltage (lithium)	9.00V ～17.00V, settable			√	12.00V
Over discharge voltage	9.00V ～17.00V, settable			√	09.20V
Over discharge return voltage	9.00V ～17.00V, settable			√	10.20V
Temperature compensation	Lead-acid battery: -3.0mV/℃/2V; lithium battery: no compensation				
Current accuracy	< 3%				
Light control voltage	3V ~ 11V			√	5V
Light control delay	5s～60s/2min～60min			√	10s
Operating temperature	-35℃ ~ +65℃				
IP rating	IP67				
Weight	150g	280g	280g		

Material Code : 104145