

CUPOWER

BORN TO BE LIGHT.



Instruction manual Firmware upgrade

Content

1. Signs and Professional Terms	3
1.1 Signs and their meanings.....	3
1.2 Professional terms and their meanings.....	3
1.3 DALI bus power supply.....	4
1.4 Address.....	4
1.5 Networking.....	4
1.6 CD DALI USB001.....	5
2. Firmware upgrade Installation	5
3. Instruction	8
3.1 Applicable system.....	8
3.2 Device.....	9
3.3 Connection.....	10
4. Firmware upgrade	11
4.1 Firmware upgrade concept.....	11
4.2 Firmware upgrade steps.....	12
5. Light Control Test	19
5.1 Address selection.....	19
5.2 Device genre selection.....	21
5.3 Shortcut Instruction.....	21
6. AOC Control Interface	23
7. Data Transfer Interface	24
8. Concluding remarks	25

Signs and Professional Terms

1.1 Signs and their meanings

The marks used in this manual and their meanings are as follows:

"1.": Indicates the number of the subdivision content after the subdivision of the content. The contents with different numbers belong to the juxtaposition relationship, and the numbers increase successively from 1.

"☞": Indicates the progression of a process, leading from one process to the next in a complete flow.

"!": Indicates the areas that need attention.

"→": Indicates the result that should be displayed after a step is completed. The arrow points to the result that should be produced by the specific operation.

"*": Indicates the supplements and comments on the previous content.

1.2 Professional terms and their meanings

DALI bus control network:

DALI bus control network refers to the building Lighting control system based on DALI (Digital Addressable Lighting Interface) technology. It connects the main controller of DALI, DALI device and DALI sensor through DALI bus to realize centralized control, dimming and monitoring of lighting equipment. The network can be remotely monitored and managed through a cloud platform or back-office management system, providing flexible and intelligent building lighting solutions. DALI bus building control network usually consists of the following parts:

(1) DALI master controller: DALI master controller is the core of the entire system, responsible for controlling and managing the devices on the DALI bus. It can send commands and receive feedback information to realize the control and monitoring of lighting equipment.

(2) DALI bus: DALI bus is a communication line connecting the main controller of DALI and DALI devices. It uses a simple two-wire structure to support the connection of multiple DALI devices. The DALI bus provides functions such as command transmission, state feedback and power supply.

(3) DALI device: DALI device is connected to the DALI bus can be controlled lighting equipment, such as lamps, dimmers, etc. Each DALI device has a unique address and can be controlled by sending and receiving commands via the DALI bus.

(4) DALI sensor: DALI sensor is a device used to detect environmental parameters, such as illumination sensor, temperature sensor, presence sensor, etc. They send the detected information to the DALI master controller through the DALI bus for analysis and utilization by the control system.

(5) Cloud platform/Background management system: Some DALI bus building control networks can also be connected to the cloud platform or background management system to achieve remote monitoring, centralized management and data analysis and other functions. Through the cloud platform, users can monitor and control the lighting system anytime and anywhere.

These parts together constitute a complete DALI bus building control network, which realizes the centralized control of lighting equipment, energy consumption management and intelligent functions.

1.3 DALI bus power supply

The DALI bus power supply is a power supply unit used to provide power to the devices and controllers in the DALI (Digital Addressable Lighting Interface) system, and its role is to ensure the normal operation of the DALI system and meet the power needs of the DALI device communication.

1.4 Address

In the DALI bus control network, the address for online upgrade is usually the address of the DALI master controller. Through the address of the DALI master controller, it is possible to communicate with the DALI device and send upgrade instructions. The specific address can be set and adjusted according to the actual system configuration and implementation plan. In general, the address of the DALI master controller is used as a unique control node in the network for communication, control, and management with DALI devices.

1.5 Networking

This manual refers to the DALI bus control network for short.

1.6 CD DALI USB001

USB-DALI tool used with the Firmware upgrade.

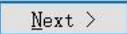
2. Firmware upgrade Installation

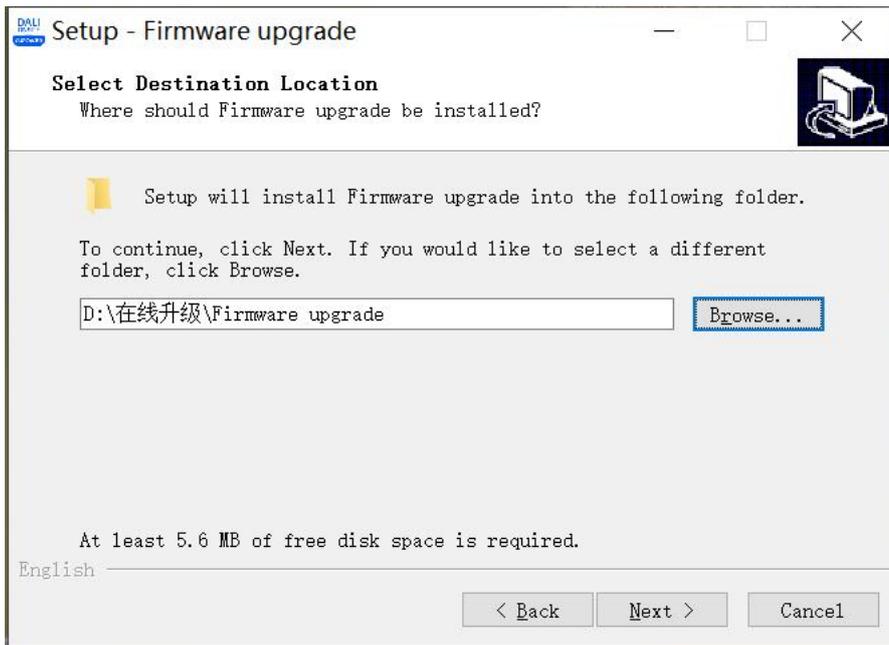
Uninstall the old version manually before installing the new version.

⇨ Locate the installation package and right-click → the option list appears.

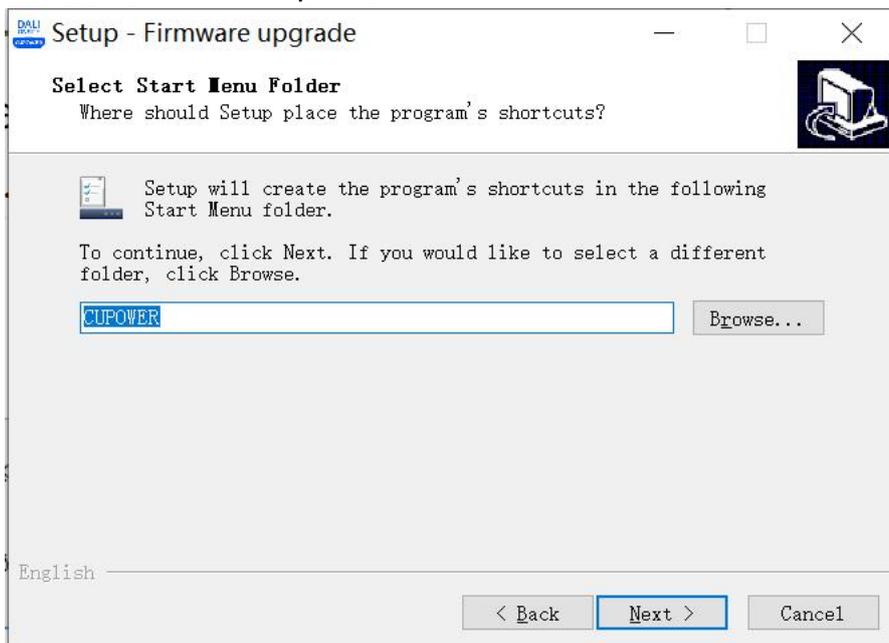
⇨ In the option list and left-click  以管理员身份运行(A) → The installation wizard box pops up.



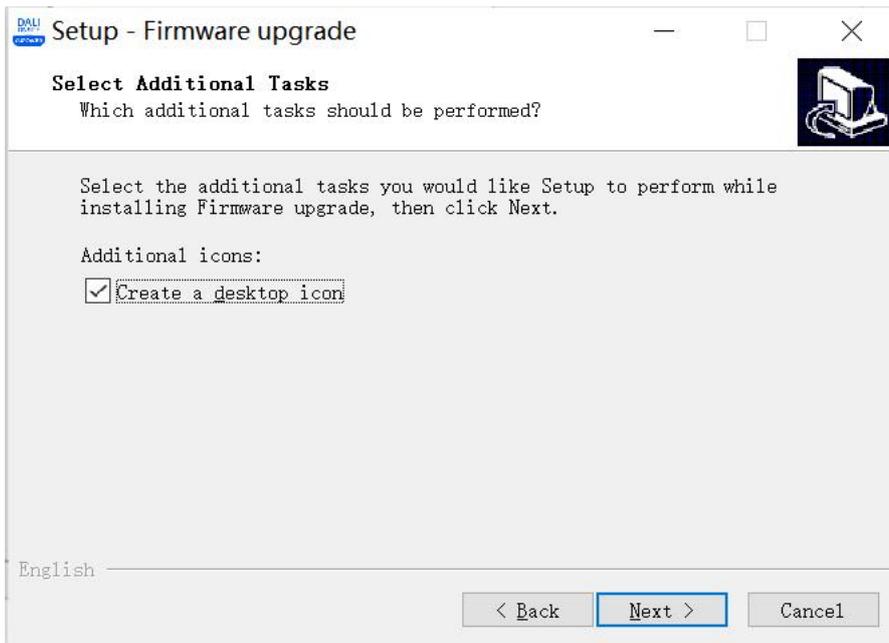
⇨ Click on  → The Firmware upgrade installation location selection box pops up.



⇒ Click on **Browse...**, select the folder you want to save to (* must have at least 5.6MB of free disk space).

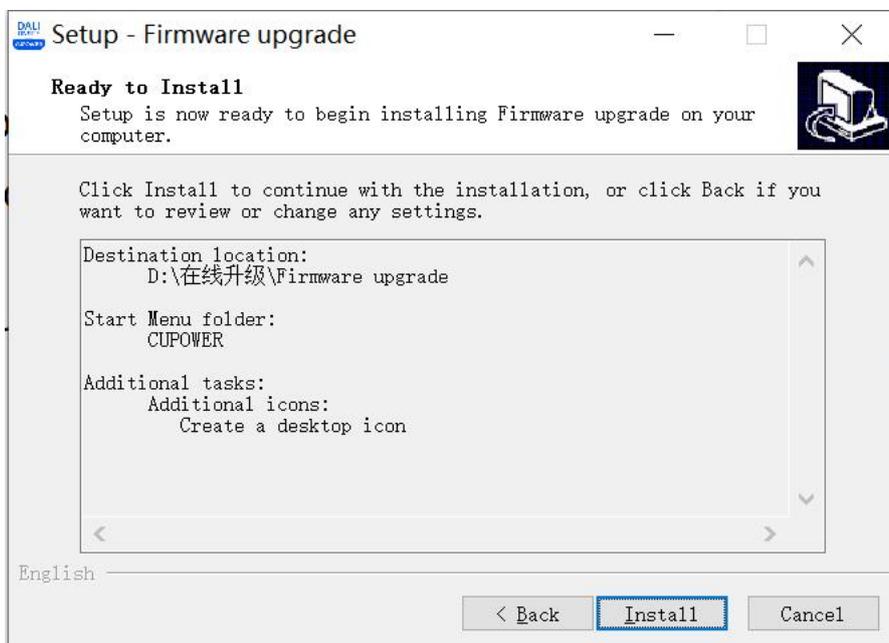


⇒ Click on **Next >** → To enter the additional task selection screen.

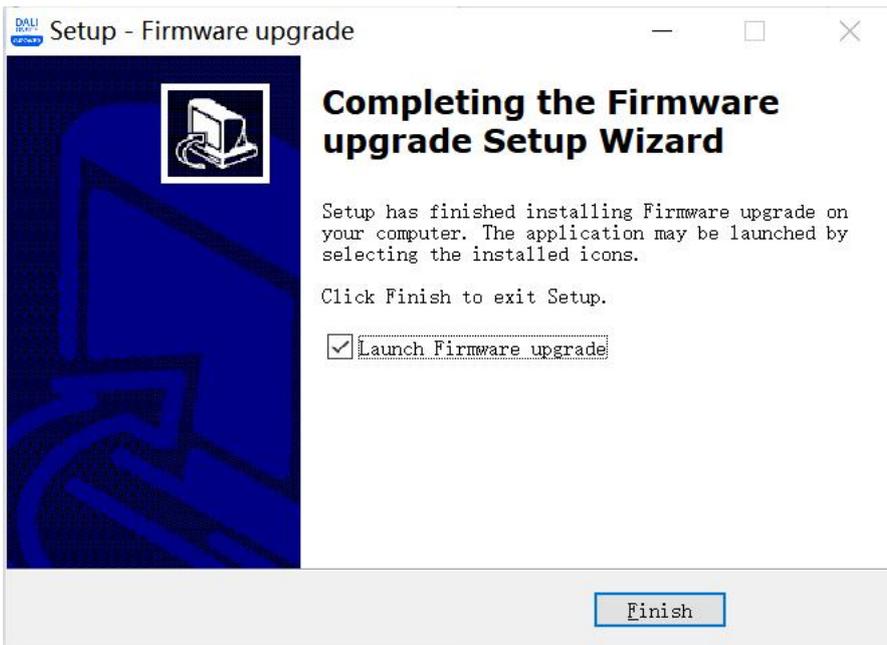


⇒ Select Create Desktop shortcut if you want to create a desktop shortcut for Firmware upgrade. Deselect Create desktop shortcut if you do not want to create a desktop shortcut for Firmware upgrade.

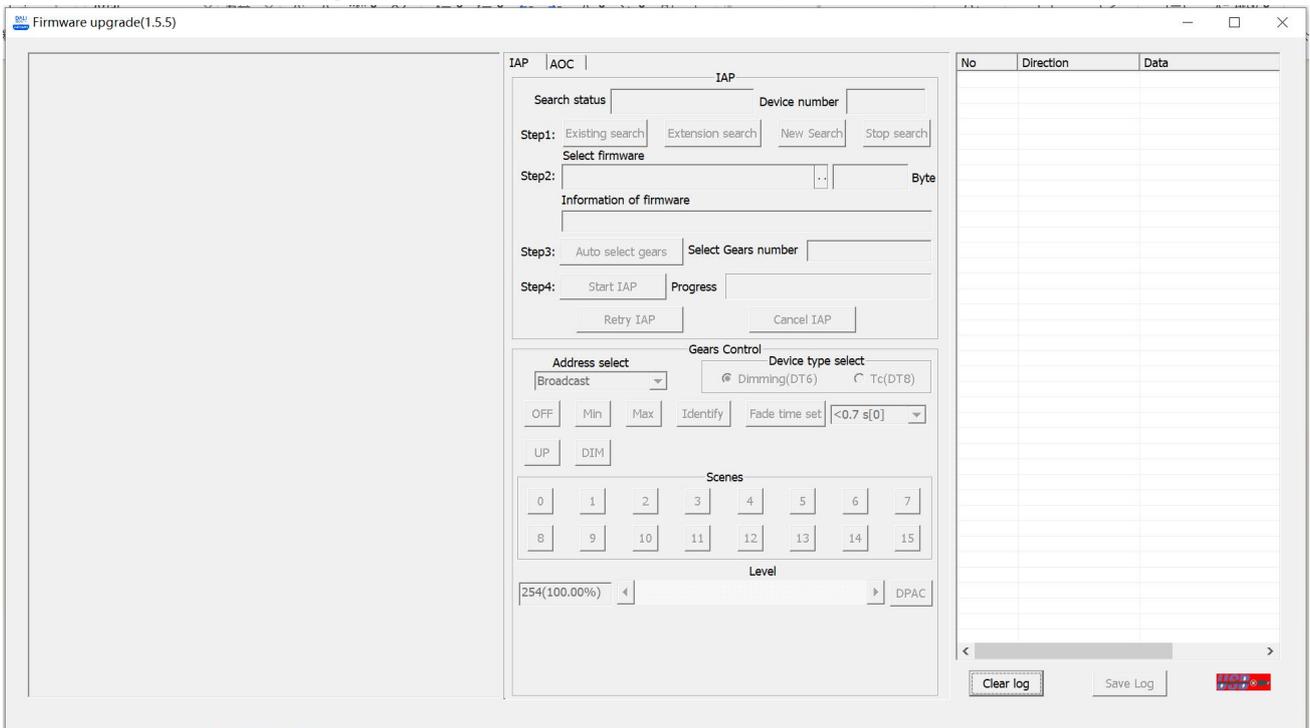
⇒ Click on **Next >** → To enter the Firmware upgrade installation preparation screen.



⇒ Click on **Install** → Firmware upgrade enters installation and completes installation (You can choose whether to run Firmware upgrade immediately after installation, Run is selected here).



⇒ Click on **Finish** → After the Firmware upgrade is installed successfully, the Firmware upgrade is automatically enabled. (* if the Firmware upgrade is not run in the previous step, the Firmware upgrade will not be automatically enabled.)



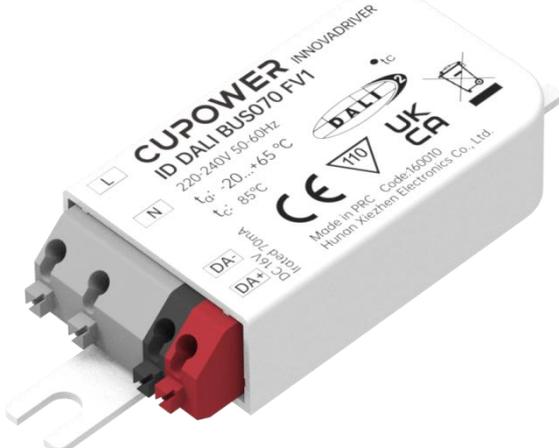
3. Instruction

3.1 Applicable system

Operating system later than Windows 7 (including Windows 7).

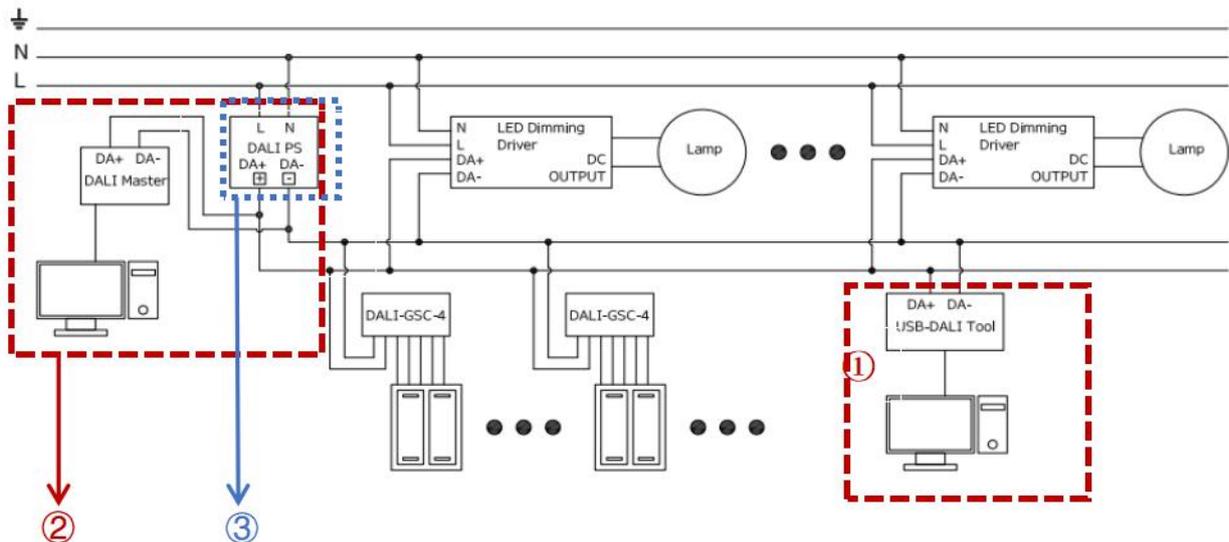
3.2 Device

Devices are shown below.

Device required	Outlook
Computer	--
DALI bus power supply	 <p>The image shows a white rectangular DALI bus power supply. The top surface is labeled with 'CUPOWER INNOVADRIVER', 'ID DALI BUS070 FV1', '220-240V 50-60Hz', 't_c: -20...+65 °C', and 't_c: 85°C'. It also features a DALI logo, a UKCA mark, and CE certification. On the left side, there are two screw terminals for power input and a red terminal for DALI communication. A small white tab is visible on the bottom left.</p>
i-Master	 <p>The image shows a white rectangular DALI USB controller. The top surface is labeled with 'CUPOWER DALI USB Controller', 'CD DALI USB0001 PRO', 'K (Relay ON)', 'Internal DALI supply', 'Power On', 'DALI Communication', 'DIM/Start-stop', 'CUPOWER Europe GmbH', 'Aberweg 5a, 58675 Hemer, Germany', 'DC: 24V0.5 A', 'USB', 'Hunan Xuehen Electronics Co., Ltd.', 'Made in PRC', and 'www.cupower.com'. On the left side, there are four screw terminals labeled K, Internal DALI supply, Power On, and DALI Communication. On the right side, there are two screw terminals labeled K and DA. A USB port is visible on the bottom left.</p>

3.3 Connection

The connection diagram is shown below.



*Figure 1 shows the USB-DALI tool(i-Master) and the connected PC.

*DALI (Digital Addressable Lighting Interface) bus system needs to provide power supply to DALI devices and controllers, the common DALI bus power supply has two types:

1.DALI bus power supply (as shown in Figure 2) : In this configuration, the DALI bus power supply not only supplies power to the DALI bus devices in the network, but also provides additional power for the DALI bus. In this way, DALI bus power supply is required to provide sufficient current and voltage to meet the power consumption requirements of DALI devices.

2.External power supply (external bus power supply is shown in Figure 3) : In this configuration, the DALI bus device and the DALI bus power supply are separately supplied. The DALI bus power supply is connected to the DALI device through an external power supply, thus providing it with the power it needs. In this configuration, the main function of the DALI bus power supply is to provide signals for transmission and control, rather than directly powering the DALI device.

*During an online upgrade,i-Master sends a command to mute the DALI-2 authenticated DALI main controller. Connecting a DALI main controller that is not DALI-2 certified may interfere with the online upgrade of the DALI network. Therefore, disconnect the DALI main controller before the online upgrade. In this case, even if the DALI host is equipped with the DALI bus dimming power supply, the DALI network cannot be

connected. Therefore, choose an external power supply that passes the DALI-2 standard. (the power output is 16V DC and the output current is 250mA)

! Do not power the DALI bus control network or i-Master during the connection.

! The DALI bus power supply requires a dedicated DALI bus driver with rated output voltage of 16 V and rated output current of 250 mA.

DALI network intelligent lighting system with i-Master is shown in the following figure.

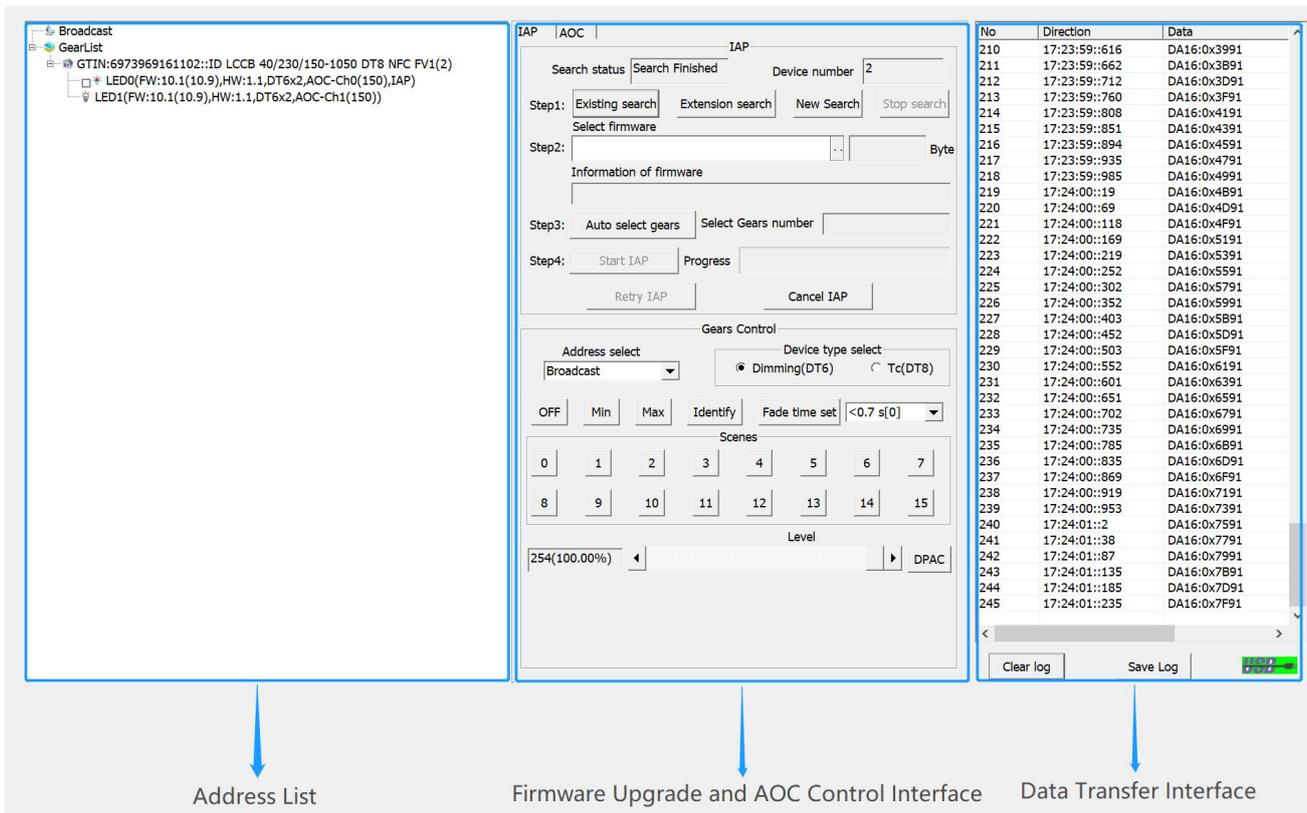
4. Firmware upgrade

4.1 Firmware upgrade concept

Firmware upgrade, sometimes referred to as firmware refresh, write, rewrite, or refresh, refers to the process of writing new firmware to the chip, replacing the original firmware. Through a special upgrade program, the working program or source code in the hardware is improved, so that it can be improved in compatibility, performance or function. Firmware online updates provide instant software or system updates, ensuring that users are always using the latest version of the software. When a large number of products need to upgrade the firmware, it can provide users with convenient and real-time software updates to avoid unnecessary troubles in production. After an online upgrade of the controlled device using Firmware upgrade(Firmware upgrade V1.5.5) software, the historical configuration of the controlled device will still be retained. This means that the upgraded device will retain its previous Settings and configurations without losing any important data. This ensures that the upgraded device can continue to operate seamlessly and without having to reconfigure all parameters. This provides convenience and efficiency and reduces the inconvenience of upgrading.

! Before performing an online upgrade, if you need to temporarily change the configuration of the controlled device, you need to power it off for more than 5 seconds after the configuration change. This will ensure that the temporarily changed configuration is correctly saved after the upgrade.

The following picture shows the Firmware upgrade software interface.



* The address list shows the controlled device and its address information, the firmware upgrade and AOC control interface is the operating interface for firmware upgrade and change the AOC, and the data transfer interface is the interface for real-time broadcast of DALI signal transmission.

4.2 Firmware upgrade steps

The following figure shows the firmware upgrade page.

The IAP interface includes the following elements:

- Search status:** Search Finished
- Device number:** 2
- Step 1:** Existing search, Extension search, New Search, Stop search
- Step 2:** Select firmware (input field), Byte
- Information of firmware:** (input field)
- Step 3:** Auto select gears, Select Gears number (input field)
- Step 4:** Start IAP, Progress (input field)
- Buttons:** Retry IAP, Cancel IAP

The general steps of firmware upgrade interface:

step1 ⇨ step2 ⇨ step3 ⇨ step4

The operations of Step1-4 are described in detail as follows.

1.step1:

step1 selection	How to use	Applicable scene
Existing search	Select Existing search → Search for controlled devices with assigned addresses on the network to be tested.	The addresses have been assigned to all controlled devices and the preset configuration needs to be retained. (*scan mode is used during online upgrade.)
Extension search	Select Extension search → Save the assigned address data and assign addresses to other controlled devices that do not have assigned addresses in the network to be tested.	A networking scenario in which some controlled devices have assigned addresses and others have not, and you want to save the configuration of the controlled devices with assigned addresses.
New Search	If no address is assigned or the address is the same before the firmware upgrade, select New Search → Assign an address to the controlled device in the network to be tested.	A network in which no controlled device is assigned an address, a network in which the controlled device has the same address, or a network in which you want to reset the configuration of all controlled devices.
Stop search	Select Stop search → Stop searching for devices under test or assigned addresses with assigned addresses.	Scenarios where scanning needs to be stopped.

! The new allocation clears all the assigned address data before reassigning addresses to all controlled devices. The configuration is reset, and the address of the same controlled device may change. Choose carefully when upgrading online!

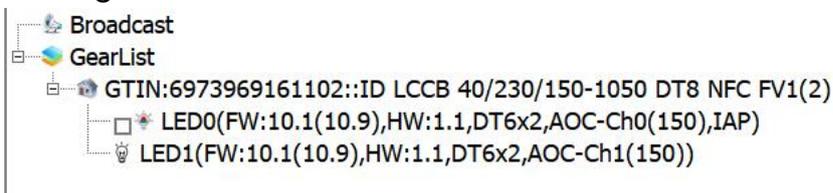
! Before scanning devices, check whether the network, DALI bus, CD DALI USB001, and PC are successfully connected. If the connection is not successful, the scan starts, and the Search Error window will pop up, as shown in the following figure. In addition, the data transmission speed on the data transmission interface is slow.



* During the process of assigning addresses and addressing devices, the scanning status and number of scanned devices can be monitored in real time. The scanning status is divided into search for and come to an end, and the number of scanned devices is broadcast in real time during the scanning process, as shown in the following figure.



* Assigned addresses and searched controlled devices are listed in the address list.

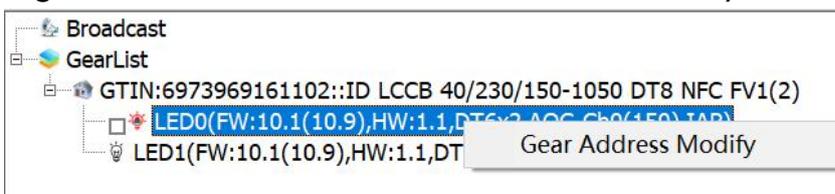


FW (Firmware) and HW (Hardware) are the versions displayed during the scan. The firmware is not automatically updated after the upgrade. It can be displayed as the upgraded version only after **Existing search** again.

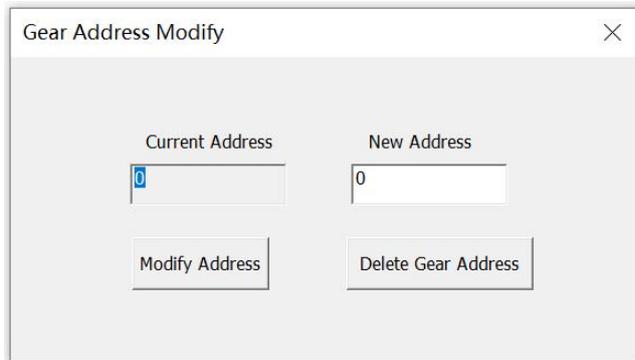
* After scanning for the controlled device, you can change or delete the address of the controlled device as follows:

A. Change address

Right-click the controlled device whose address you want to change →



⇒ Left-click **Gear Address Modify** → The dialog box of setting the driver address pops up.



⇒ Enter the new address as required

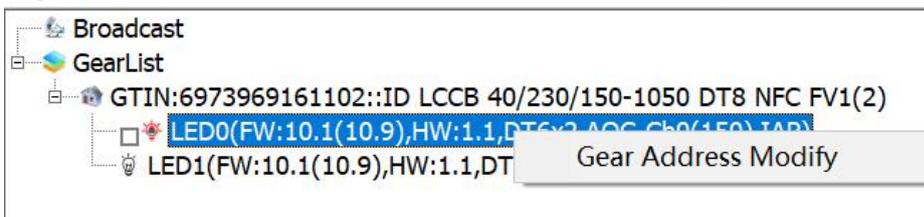


⇒ Select **Modify Address** → Change address successfully, the "Success" box pops up.

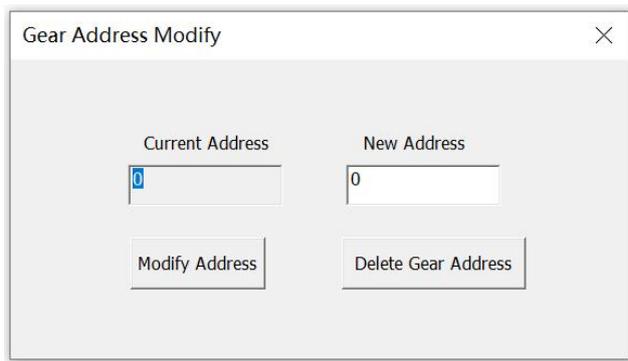


B.Delete address

Right-click the controlled device whose address you want to change →



⇒ Left-click **Gear Address Modify** → The dialog box of setting the driver address pops up.



Click on **Delete Gear Address** → Delete address successfully (*no any box pops up, but click on **Existing search** again reveals that the original address has indeed been deleted)

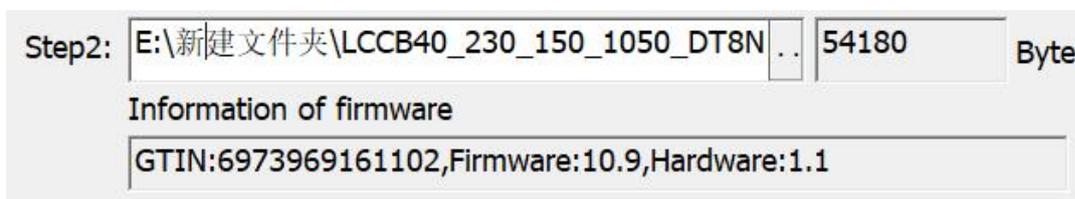
! After the device scanning is completed, check whether the controlled devices and their addresses found are the same as the number of controlled devices connected to the DALI network.

2.step2:

Verify that you have downloaded and saved the corresponding program file in your computer.

Click on  Browse the computer file, select the upgrade program file corresponding to the controlled device to be upgraded (*file format is bin file), and add it to the program window.

Wait for the computer to load the program → Select the program successfully, as shown below.



* where Byte indicates the number of bytes of program data, indicating the program size, and firmware information shows the GTIN number of the sample, the current firmware version and hardware version.

3.step3:

Confirm to add the bin file corresponding to the controlled device to be tested.

Select **Auto select gears** Screen out controlled devices to be tested.

⇒ Wait for screening out → After the screening out is completed, the window will display the result, as shown in the figure below.



4.step4:

After completing step1, step2 and step3 in turn.

⇒ Click on **Start IAP** → The controlled device is off, out of the working status, and enters the online upgrade status.

⇒ Wait for the firmware upgrade. (*Generally, the online upgrade lasts 15 to 30 minutes. If the online upgrade exceeds this period, an error may occur.)

⇒ When the firmware upgrade is complete → the upgrade is successful, the lamp of the controlled device automatically works at the power on brightness value, returns to the working state, and a reminder indicating that the upgrade is successful pops up, as shown in the following figure.



*Firmware upgrade can only select one bin file for online upgrade at a time. Therefore, only controlled devices of the same model can be upgraded at the same time. If there are multiple controlled devices to be upgraded in the address list, upgrade them online one by one.

* If you want to stop updating, click "Cancel Firmware update".



* During the upgrade process, you can view the upgrade progress, which is represented by the blue progress bar, as shown in the following figure.

! During the upgrade process, clicking within 2 seconds of starting the upgrade and click on **Cancel IAP**, may cause the controlled device to fail to enter the boot program, the address of the controlled device cannot be scanned by "re-searching the device", and the address cannot be reassigned (Sometimes more than one controlled device is upgraded online).

The solution to this problem is: click on **Auto select gears** again. After screening out, click on **Retry IAP** no matter how many qualified devices are. After the restart and upgrade is completed, you can click on **Existing search**, then you can search for the previously lost devices. If it is still not found, you need to power off at least 10sec, try several times, try several times failed, you need to check the circuit and signal line connection is stable.

! If the firmware update is cancelled in the middle of the upgrade process (2s after the upgrade is started), the "IAP Failure!" box pops up. As shown in the following figure, it will also cause that some controlled devices cannot be scanned when the device is searched again.



The solution to this problem is: click on **Retry IAP**, after the restart upgrade is completed, you can start **Existing search** again, then you can search for the previously lost device. If it is still not found, you need to power off at least 10sec, try several times, try several times failed, you need to check the circuit and signal line connection is stable.

General precautions

! When this software is used for DALI control (such as sending control signals, firmware upgrade, etc.), any operation of DALI data transmission (such as sending control signals, reading real-time information of the device, etc.) should not be carried out simultaneously by other DALI upper computer software. Otherwise, the data transmission of DALI bus will be confused, resulting in errors in DALI control.

! During the online upgrade of the sample, do not power off or disconnect the DALI bus; otherwise, the information transmission will be incomplete and the upgrade will fail.

5. Light Control Test

The light control test module can quickly carry out some simple control tests on the controlled device in the networking test. It is necessary to select the address and device type first, and then send quick instructions to the selected products in the networking for communication testing in DALI networking.

5.1 Address selection

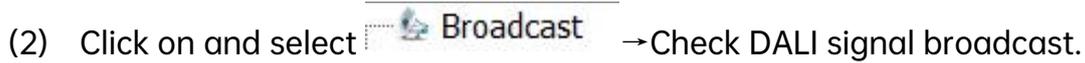
Address Selection	Function	Number
Broadcast	After selection, all the controlled devices in the network can send DALI commands at the same time for control	1(Broadcast)
Specific destination address	After selection, DALI control can be performed on the controlled device of the target address	64 (Gear Addr0-63)
Address group	After the address group is selected, DALI control can be implemented on the controlled devices in the selected address group	16 (Gear Group0-15)

1.Broadcast. There are two options for broadcasting instructions.



⇒ Select "Broadcast".

→ Check DALI signal broadcast.

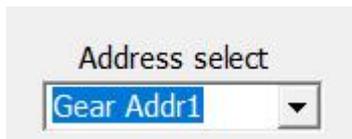


2.Specific address. There are two options for selecting a specific destination address.



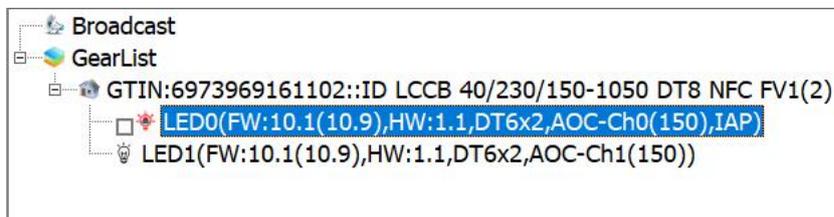
⇒ Click on the destination address.

→ Select the destination address as shown below.



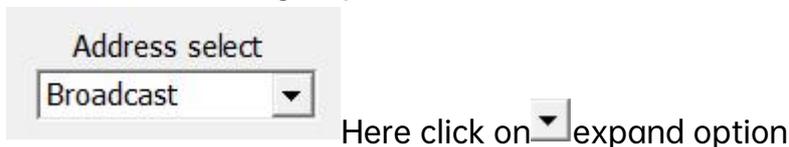
* Only one address can be selected at a time in the address selection section.

(2) Click select destination address → Select destination address



* There is no limit on the number of choices in the address list, as long as the sample address appears in the address list, you can choose.

(3) Select address group



⇒ Click on the destination address

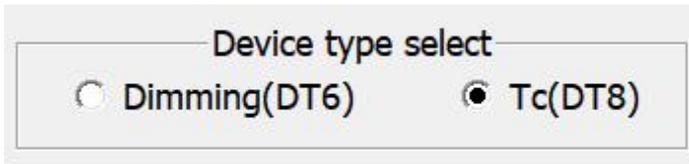
→ Select the destination address as shown below.



* Only one address group can be selected. After an address group is selected, the member addresses in the address group are automatically selected in the address list.

5.2 Device genre selection

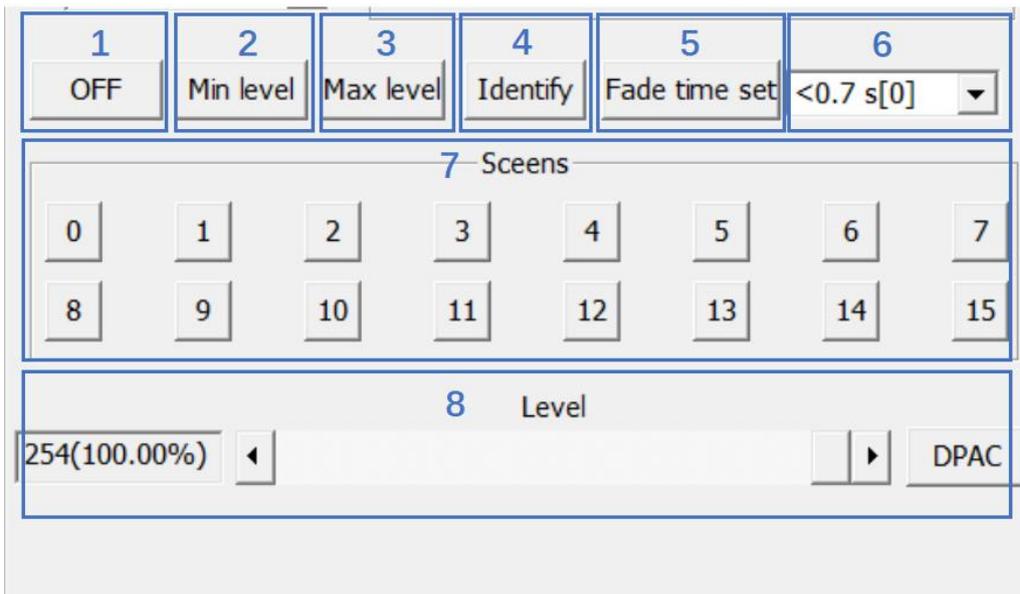
In the test process, the equipment type needs to be selected by the operator according to the actual equipment type of the prototype. There are three types of equipment types, as shown in the following figure, before a device type indicates that the device type is selected.



*Tc (DT8) is selected.

5.3 Shortcut Instruction

The shortcut commands to choose from for the light control test are shown below.



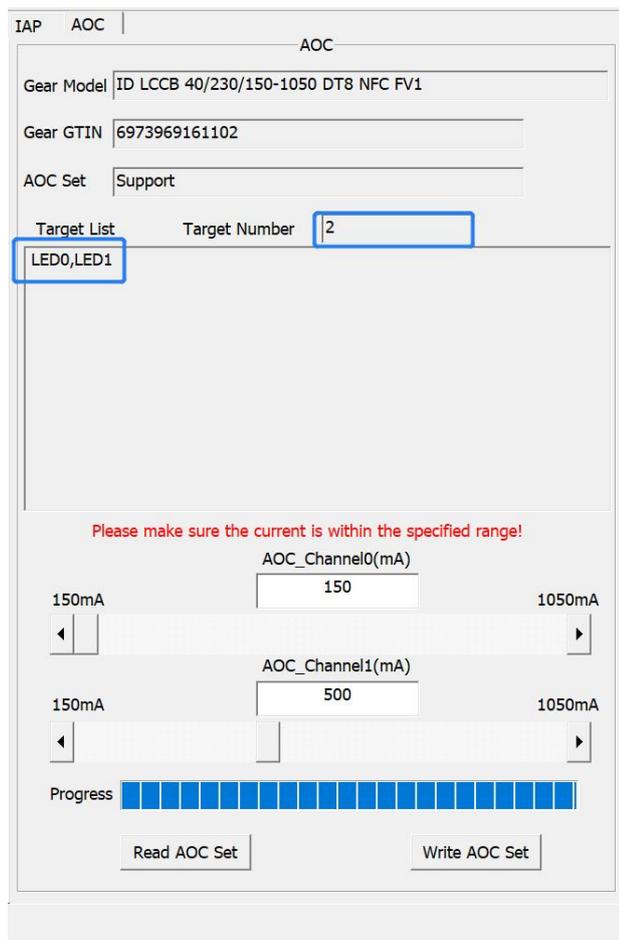
Number	Shortcut command naming	Function
1	Close	Set the output brightness to 0
2	Minimum brightness	Set the output brightness to the lowest brightness set by the controlled device
3	Maximum brightness	Set the output brightness to the maximum brightness set by the controlled device
4	Identify	Identify the specific address of the luminaire, the successful identification of the corresponding luminaire will be turned off 5 times
5	Fade time	-
6	Fade time drop-down selection	-
7	Scene	-
8	Brightness	This brightness setting directly sets the brightness of the selected controlled device or broadcast all controlled devices, and can be any value within 0%-100% (accurate to two decimal places).

! Sometimes in networking, when broadcasting control of many controlled devices, theoretically all controlled devices should be on and off simultaneously. However, in actual work, due to the influence factors such as the power line connected to each controlled device and the transmission time difference of DALI branch line, the

controlled devices may not be on and off synchronously. In this case, it can be identified in groups to reduce the number of controlled devices identified at the same time.

6. AOC Control Interface

The following figure shows the AOC Control page. It will display which address is selected and show the number of addresses. And it can control the current value.



Only one address or all addresses can be selected for the same device.

Click the **Select All For AOC** → Select all addresses, can set current values for all addresses simultaneously.

After setting the current, click **Write AOC Set** to save the data.

! When setting the current, it is necessary to ensure that the current is within the range specified in the specifications. If any damage is caused by exceeding the range, please take responsibility on your own.

7. Data Transfer Interface

During the firmware upgrade process, there is a real-time data transmission broadcast on the right side of the IAP, showing the serial number, direction and transmitted data. For example, during an upgrade, the data transfer interface is shown in the following figure.

o	Direction	Data
25053	18:28:57::361 ...	12 71 00 00 00 00 00 D6 F8 00 00 00 00 0...
25054	18:28:57::375 ...	12 F9 00 0A BD 00 00 00 00 00 00 00 00 0...
25055	18:28:57::408 ...	12 7A BD 00 00 00 01 9D F9 00 00 00 00 0...
25056	18:28:57::422 ...	12 71 00 00 00 00 00 D6 F9 00 00 00 00 0...
25057	18:28:57::437 ...	12 FA 00 0A BD 7F 25 00 00 00 00 00 00 0...
25058	18:28:57::470 ...	12 7A BD 7F 25 00 01 9D FA 00 00 00 00 0...
25059	18:28:57::485 ...	12 71 00 00 00 00 00 D6 FA 00 00 00 00 0...
25060	18:28:57::498 ...	12 FB 00 0A BD 08 00 00 00 00 00 00 00 0...
25061	18:28:57::530 ...	12 7A BD 08 00 00 01 91 FB 00 00 00 00 0...
25062	18:28:57::545 ...	12 71 00 00 00 00 00 D6 FB 00 00 00 00 0...

Transfer data records can be saved or cleared:

Save data transmission process records:

Click on **Save Log**

☞ Select the location you want to save to save → Save the data successfully

Delete data:

Click on **Clear log** → Clear the data successfully.

8. Concluding remarks

Firmware Upgrade, as the upper computer software of Cupower's i-Master, can upgrade the tested device online and verify whether the operation is successful. This enables the control gear to be upgraded via the host computer only, reducing the risk and cost of dismantling the casing involved in traditional upgrades and providing great ease of operation. Additionally, allows for simple DALI control and scene setting.



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