Hikrobot Co., Ltd.

Line Scan Light Controller

User Manual

HIKROBOT

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The symbols that may be found in this document are defined as follows.

Symbol	Description
Danger	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
Note	Provides additional information to emphasize or supplement important points of the main text.

Available Model

This manual is applicable to the Line Scan Light Controller.

Contact Information

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Contents

Chapter 1 Safety Instruction

The safety instructions are intended to ensure that the user can use the device correctly to avoid danger or property loss. Read and follow these safety instructions before installing, operating and maintaining the device.

1.1 Safety Claim

- To ensure personal and device safety, when installing, operating, and maintaining the device, follow the signs on the device and all safety instructions described in the manual.
- The note, caution and danger items in the manual do not represent all the safety instructions that should be observed, but only serve as a supplement to all the safety instructions.
- The device should be used in an environment that meets the design specifications, otherwise it may cause malfunctions, and malfunctions or component damage caused by non-compliance with relevant regulations are not within the scope of the device's quality assurance.
- Our company will not bear any legal responsibility for personal safety accidents and property losses caused by abnormal operation of the device.

1.2 Safety Instruction

⚠Caution

- Do not install the device if it is found that the device and accessories are damaged, rusted, water ingress, model mismatch, missing parts, etc., when unpacking.
- Avoid storage and transportation in places such as water splashing and rain, direct sunlight, strong electric fields, strong magnetic fields, and strong vibrations.
- Avoid dropping, smashing or vigorously vibrating the device and its components.
- It is forbidden to install the indoor device in an environment where it may be exposed to water or other liquids. If the device is damp, it may cause fire and electric shock hazard.
- Place the device in a place out of direct sunlight and ventilation, away from heat sources such as heaters and radiators.
- This is a Class A device. In the living environment, this device may cause radio interference. In this case, the user may be required to take practical measures against the interference.
- In the use of the device, you must be in strict compliance with the electrical safety regulations of the nation and region.
- Use the power adapter provided by the official manufacturer. The power adapter must meet the Limited Power Source (LPS) requirements. For specific requirements, please refer to the device's technical specifications.
- Do not cover the device's plug or outlet for disconnecting power supply.

- It is strictly forbidden to wire, maintain, and disassemble the device is powered on. Otherwise, there is a danger of electric shock.
- Make sure that the device is installed in good condition, the wiring is firm, and the power supply meets the requirements before powering on the device.
- If the device emits smoke, odor or noise, please turn off the power and unplug the power cord immediately, and contact the dealer or service center in time.
- If the device does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the device yourself. We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
- Please dispose of the device in strict accordance with the relevant national or regional regulations and standards to avoid environmental pollution and property damage.

Note

- Check whether the device's package is in good condition, whether there is damage, intrusion, moisture, deformation, etc. before unpacking.
- Check the surface of the device and accessories for damage, rust, bumps, etc. when unpacking.
- Check whether the quantity and information of the device and accessories are complete after unpacking.
- Store and transport the device according to the storage and transport conditions of the device, and the storage temperature and humidity should meet the requirements.
- It is strictly prohibited to transport the device in combination with items that may affect or damage the device.
- Quality requirements for installation and maintenance personnel:
  - Qualification certificate or working experience in weak current system installation and maintenance, and relevant working experience and qualifications. Besides, the personnel must possess the following knowledge and operation skills.
  - The basic knowledge and operation skills of low voltage wiring and low voltage electronic circuit connection.
  - The ability to comprehend the contents of this manual.
- Please read the manual and safety instructions carefully before installing the device.
- Please install the device strictly according to the installation method in this manual.
- Do not contact the device with strong acids, alkalis, oils, greases or organic solutions such as thinners.

1.3 Electromagnetic Interference Prevention

- Make sure that the shielding layer of cables is intact and 360° connected to the metal connector when using shielded cables.
- Do not route the device together with other equipment (especially servo motors, high-power devices, etc.), and control the distance between cables to more than 10 cm. Make sure to shield the cables if unavoidable.
- The control cable of the device and the power cable of the industrial light source must be wired separately to avoid bundled wiring.
- The power cable, data cable, signal cable, etc. of the device must be wired separately.

Make sure to ground them if the wiring groove is used to separate the wiring and the wiring groove is metal.

- During the wiring process, evaluate the wiring space reasonably, and do not pull the cables hard, so as not to damage the electrical performance of the cables.
- The unused cables of the device must be insulated.
- To avoid the accumulation of static electricity, ensure that other equipment (such as machines, internal components, etc.) and metal brackets on site are properly grounded.
- During the installation and use of the device, high voltage leakage must be avoided.
- Use a figure-eight bundle method if the device cable is too long.
- When connecting the device and metal accessories, they must be connected firmly to maintain good conductivity.
- Use a shielded network cable to connect to the device. If you use a self-made network cable, make sure that the shielding shell at the aviation head is well connected to the aluminum foil or metal braid of the shielding cable.

Chapter 2 Overview

2.1 Introduction

The line scan light controller supports outputting multichannel light sources and different control modes of light source, and provides I/O connectors, device management interface, and corresponding light controller software. It helps users realize fast and convenient deployment of light source on site.

2.2 Key Feature

- Supports using serial port or network interface to set parameters and manage the device.
- Provides multichannel inputs and outputs.
- Supports installation via slide rail or screw hole.
- Supports overcurrent, overload, short circuit protection.

Note

- Refer to the device's specifications for detailed parameters.
- The key feature may differ by device models.

Chapter 3 Appearance

Note

- Appearance here is for reference only. Refer to the device's specification for detailed dimension information.
- The specific appearance may differ by device models, and the actual device you purchased should prevail.

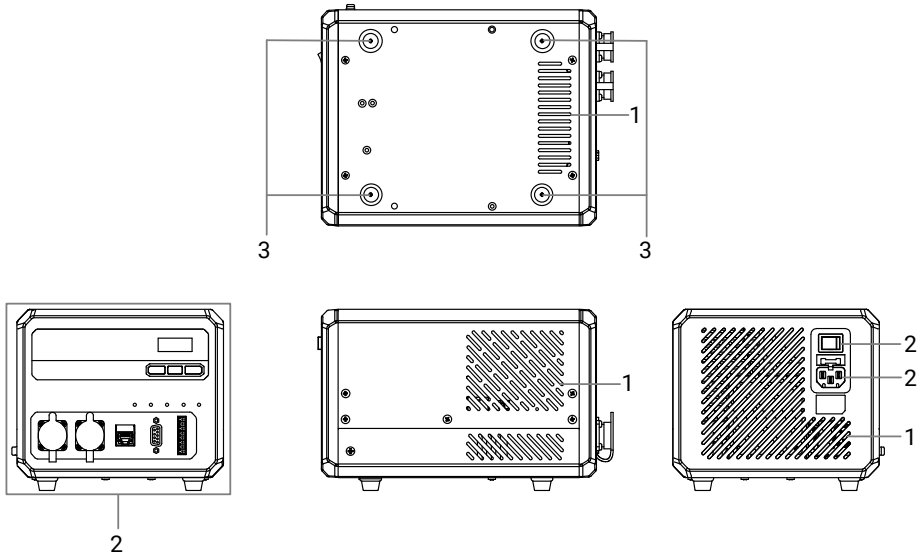

Figure 3-1 Appearance

Table 3-1 Component Description

No.	Name	Description
1	Ventilation Hole	It is used to cool the device.
2	Control Panel	It provides functions of power supply, network, serial port, digital I/O, indicator, button, display, etc. Refer to section ***Control Panel*** for details. **Note** The control panel may differ by device models.
3	Screw Hole	It is used to install the device, and you should use M3 screws. **Note** For device of MV-LE201-1200W48-4T, disassemble the stand pads to see the screw holes, and you should use M3 screws.

Chapter 4 Device Installation and Connection

4.1 Installation Preparation

You need to prepare following accessories before installation.

Table 4-1 Accessories

No.	Name	Quantity	Description
1	Power Cord	1	AC power cord that is included in the package.
2	Cable	1	You should use the cable when adjusting the device's parameters via software. ● Network connection: You should use the CAT-5e or CAT-6 network cable, and you need to purchase separately. ● Serial port connection: You should use the serial port extension cable, and you need to purchase separately.
3	I/O Terminal	1	It is used to connect trigger input/output interface for wiring. One I/O terminals is provided.
4	Screw Package	1	It refers to M3 × 7 screws, and they are included in the package.

4.2 Install Device

Before You Start

- Make sure that the device in the package is in good condition and all accessories are included.
- Make sure that all related devices are powered off during the installation.

The device supports two installation methods, including installation via slide rail and screw hole. Among them, screw hole installation is divided into rear installation and bottom installation.

Note

- The specific installation method may differ by device model, and you should select it according to actual demands.
- Here we take some models as examples to introduce installation, and appearance here is for reference only.

Installation via Screw Hole (Bottom Side)

Remove the device's four rubber pads first, and use four supplied screws to fix the device from bottom side to the installation position, as shown below.

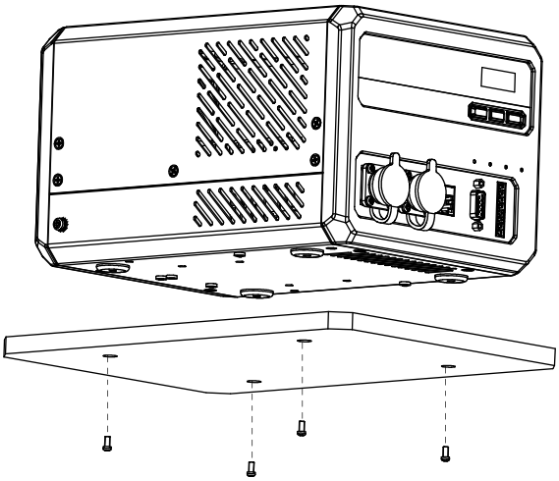

Figure 4-1 Installation via Screw Hole (Bottom Side)

4.3 Connect Device

Steps

1. Insert external light sources to the device's light source interface.
2. Use power cord to connect the device to a power supply.

Note

You need to press the power switch after connection.

3. (Optional) Use network cable or serial port cable to connect the device if you need to set parameters.
- Network connection: Use network cable to connect the device to a switch or PC via network interface.
- Serial port connection: Use serial port cable to connect the device to a PC via serial port.

Note

- You can press the control panel to adjust light source brightness without network or serial port connection.
- Refer to section ***Control Panel*** for detailed interface description.
- For PC that does not support RS-232 interface, you should use RS-232 to USB cable, and contact the cable manufacturer for the corresponding drive.

Chapter 5 Device Control Panel and Wiring

5.1 Control Panel

The device's control panel is shown below.

Note

The control panel may differ by device models.

The line scan light controller currently has two types of devices. Refer to the table below for detailed relation between device type and models.

Table 5-1 Device Type and Model

No.	Device Model
1	• MV-LE201-200W48-2TD • MV-LE201-500W48-2TD • MV-LE201-750W48-2TD
2	MV-LE201-1200W48-4T

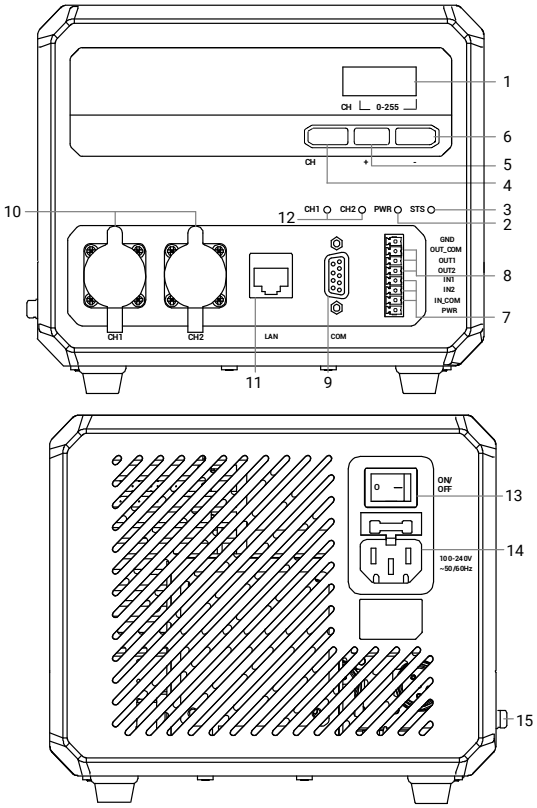

Figure 5-1 Control Panel (200 W, 500 W, and 750 W Devices)

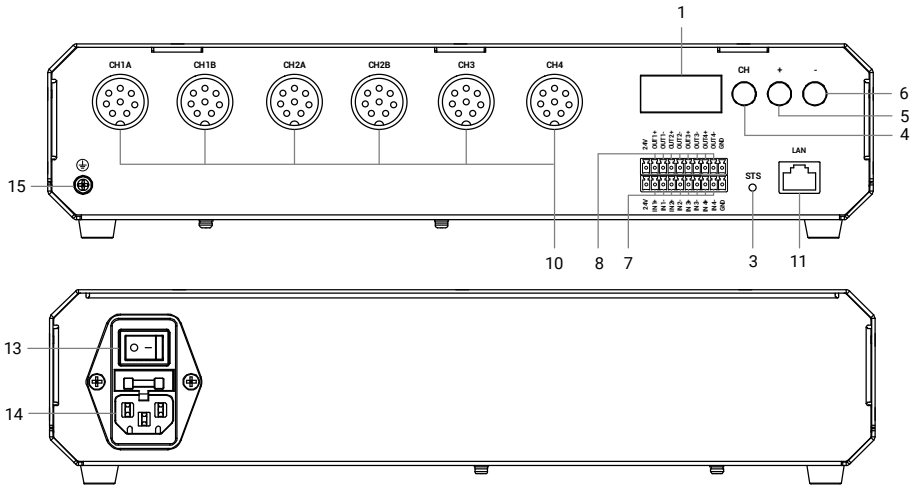

Figure 5-2 Control Panel (1200 W Device)

Table 5-2 Control Panel Description

No.	Name	Description
1	Display Screen	It displays the channel of external light source, the corresponding brightness value, or the corresponding working mode. Refer to section ***Display Screen*** for details.
2	PWR Indicator	It is a power indicator, and it is solid red when the device power connection is normal.
3	STS Indicator	It is a status indictor, and it is solid green when the device runs normally, and it is solid red when the device exception occurs.
4	Channel Button	Press it to switch the light source channels, light source brightness, and working modes of the device. Refer to section ***Channel Button*** for details. **Note** 1200 W device only support switching light source channels and working modes of the device.
5	+	• For 200 W, 500 W, and 750 W devices: Press it to switch the working mode of the light source channel and increase the brightness value of the light source that are displayed as 2nd to 4th digits on the display screen. • For 1200 W device: Press it to switch the working mode of the light source channel that is displayed as 4th digit on the display screen.
6	–	• For 200 W, 500 W, and 750 W devices: Press it to switch the working mode of the light source channel and reduce the brightness value of the light source that are

No.	Name	Description
		displayed as 2nd to 4th digits on the display screen. ● For 1200 W device: Press it to switch the working mode of the light source channel that is displayed as 4th digit on the display screen.
7	Trigger Input Interface	It provides trigger input function. Refer to section ***Trigger Input Interface*** for details.
8	Trigger Output Interface	It provides trigger output function. Refer to section ***Trigger Output Interface*** for details.
9	RS-232 Serial Port	It provides data transmission function, used for modifying device parameters through serial port control in the Demo. Refer to section ***RS-232 Serial Port*** for details.
10	Light Source Interface	● It is used to connect external light sources. Refer to section for details. **Note** ● 200 W, 500 W, and 750 W devices have two light source interfaces (CH1 to CH2). ● 1200 W device has four light source interfaces (CH1 to CH4), with CH1 and CH2 offering dual-channel interfaces.
11	Network Interface	It is fast Ethernet providing data transmission function, used for modifying device parameters through the network interface.
12	Light Source Indicator	It refers to light source indicators corresponding to light source interfaces (CH1 to CH2). ● The indicator is solid green when 200 W, 500 W, and 750 W devices' working mode is Triggered Always-On Mode. ● The indicator is flashing green when 200 W, 500 W, and 750 W devices' working mode is Triggered Always-Off Mode.
13	Power Switch	It is used to power on or off the device. **Note** ● Turn on the switch to connect the device to the power supply (corresponding to pressing the button in the "I" position). ● Turn off the switch to disconnect the device from the power supply (corresponding to pressing the button in the "O" position).
14	Power Interface	It is used to connect the power cord to power the device.

No.	Name	Description
		Note Do not replace the fuse in power interface by yourself if it is damaged. If necessary, contact technical support for help.
15	Ground	It is used to ground the device in case of electricity leakage.

5.2 Display Screen

The device's external light source information can be viewed through the display screen, with different models showing different content.

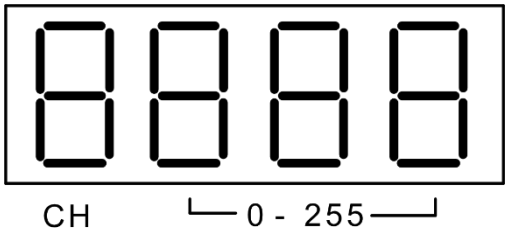

Figure 5-3 Display Screen

- 200 W, 500 W, and 750 W devices support display of the external light source channel, the working mode of the channel, and the brightness value of the channel.
  - When the display screen shows the external light source channel and its corresponding brightness value: the first digit indicates the light source channel of the device and the second to fourth digits indicate the brightness value of that channel with range from 0 to 255. A brightness value of 0 means the device is off, while a brightness value of 255 means the device is at its max. brightness value.
  - When the display screen shows the external light source channel and its working mode: the first digit indicates the light source channel of the device. If the second and third digits display “–”, the fourth digit shows the working mode, with “H” representing Triggered Always-On Mode and “L” representing Triggered Always-Off Mode. If the second to fourth digits display “Off”, it indicates the device is in a different working mode rather than Triggered Always-On or Triggered Always-Off Mode.
- 1200 W device only supports display of the external light source channel and the device working mode.
  The first digit indicates the light source channel of the device; the second to third digits display "–", which has no special meaning; the fourth digit shows the working mode, with the number “0” indicating Always-On mode, “1” indicating Follow Mode, and "2" indicating Multi-Light Control Mode.

The display screen also allows you to check the parameter saving status. When the device saves the configured parameters, “SAVE” will appear on the screen. For more details on parameter saving, please refer to sections ***View Device Control*** and ***Main Window***.

5.3 Channel Button

For 200 W, 500 W, and 750 W devices, you can use the Channel Button to switch the light source channels and adjust the working modes as well as brightness value of different light source channels.

- When the device is powered on, the display screen shows CH1 by default and its brightness value. The first digit on the display screen shows “1” for CH1, and the second to fourth digits display the brightness value of CH1. You can press the “+” or “–” button to increase or decrease the brightness value.
  Press the Channel Button once to switch the working mode for CH1. You can then use the “+” or “–” button to toggle between Triggered Always-On and Triggered Always-Off Mode.
- Press the Channel Button for the second time to switch the light source channel to CH2, with the first digit on the display screen showing “2”. You can press the “+” or “–” button to increase or decrease the brightness value.
  Press the Channel Button for the third time to switch the working mode for CH2. You can then use the “+” or “–” button to toggle between Triggered Always-On and Triggered Always-Off Mode.

For 1200 W device, you can use the Channel Button to switch the light source channels and adjust the working modes each light source channel.

- When the device is powered on, the display screen defaults to showing CH1 and its working mode. The first digit on the display screen shows "1" for CH1, and the fourth digit display its working mode. You can then press the “+” or “–” button to switch the working mode of CH1.
- Press the Channel Button once to switch the light source channel to CH2, with the first digit on the display screen showing "2". You can press the “+” or “–” button to switch the working mode of CH2.
- Press the Channel Button for the second time to switch the light source channel to CH3, with the first digit on the display screen showing "3". You can You can press the “+” or “–” button to switch the working mode of CH3.
- Press the Channel Button for the third time to switch the light source channel to CH4, with the first digit on the display screen showing "4". You can You can press the “+” or “–” button to switch the working mode of CH4.

Note

- To save the brightness and working mode settings, press the Channel Button again after completing the brightness value and working mode settings for all light source channels. When the first to the fourth digits on the display screen show “SAVE”, you can press the “+” button to save the brightness value and working mode settings for all Channels.
- If you set the brightness value and working mode for each channel but don’t manually save, the device will automatically save the settings after two minutes.

5.4 RS-232 Serial Port

The device has one RS-232 serial port that can be connected to external devices like PC via common 9-pin female connector for data transmission. You can refer to the table below for the specific pin name and function.

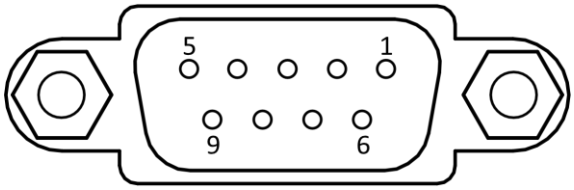

Figure 5-4 9-Pin Female Connector

Table 5-3 Pin Definitions of 9-Pin Female Connector

Pin No.	Name	Function
2	TX	Send data
3	RX	Receive data
5	GND	Signal ground

5.5 Trigger Input Interface

5.5.1 Pin Definition

The pin definition of trigger input interface may differ by device models, and there are two types of pin definitions. You can refer to the following section for details.

200 W, 500 W, and 750 W Devices

The first type of pin definition is applicable to the 200 W, 500 W, and 750 W device, and its pin definition is shown below.

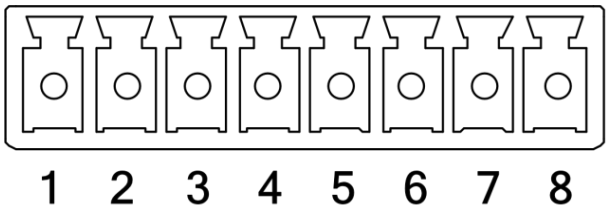

Figure 5-5 Trigger Input Interface

Table 5-4 Pin Definitions of Trigger Input Interface

Pin No.	Signal Name	Function
1	PWR	24 V power positive

Pin No.	Signal Name	Function
2	IN_COM	Input common port (without polarity)
3	IN2	CH2 opto-isolated signal input
4	IN1	CH1 opto-isolated signal input
8	GND	External device power ground

1200 W Device

The second type of pin definition is applicable to 1200 W device, and its pin definition is shown below.

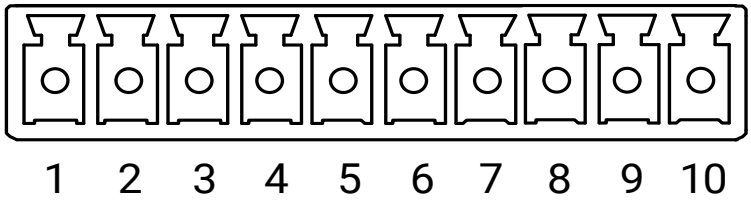

Figure 5-6 Trigger Input Interface

Table 5-5 Pin Definitions of Trigger Input Interface

Pin No.	Signal Name	Function
1	PWR	24 V power positive
2	IN1+	CH1 signal input positive
3	IN1–	CH1 signal input negative
4	IN2+	CH2 signal input positive
5	IN2–	CH2 signal input negative
6	IN3+	CH3 signal input positive
7	IN3–	CH3 signal input negative
8	IN4+	CH4 signal input positive
9	IN4–	CH4 signal input negative
10	GND	External device power ground

5.5.2 Electrical Feature

The 1200 W device has 4 differential input signals, which also support single-ended input simultaneously. The internal circuit is shown in the figure below.

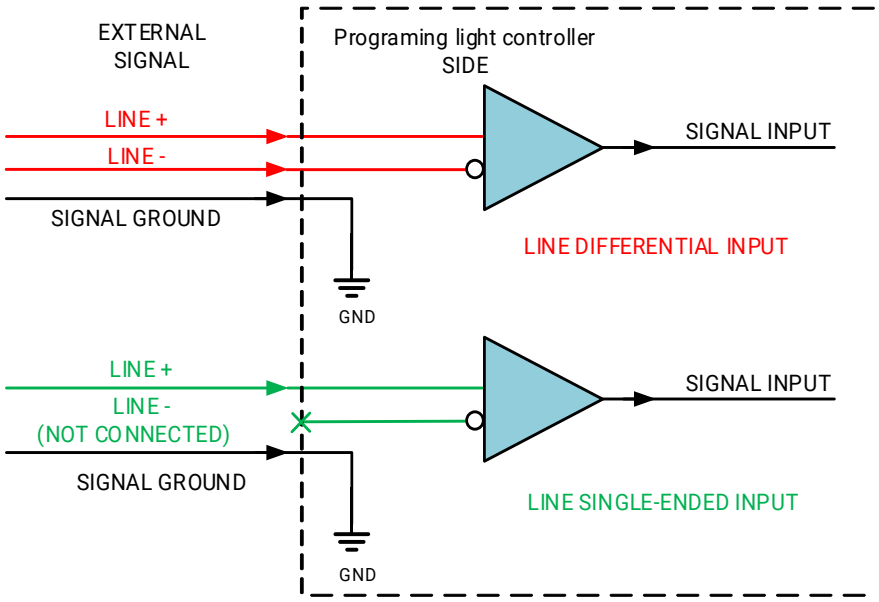

Figure 5-7 Differential Input Internal Circuit

Differential input supports RS-422 standard, RS-644 standard, TTL & LVTTL standard input signals.

● Using RS-422 standard input

If the differential input uses RS-422 standard signals, to ensure the normal operation of the light controller's input circuit, the light controller's ground signal must be connected to the external ground signal.

The RS-422 standard defines a bus structure connection where several devices' inputs can be connected to the RS-422 bus. Up to 10 devices can be connected simultaneously, with only one device being the “master” transmitter (D), and the other devices being "slave" receivers (R). The length of the wiring between the receiver and the bus should be kept as short as possible. The bus must have a 120Ω termination resistor (RT).

When the device is the last receiver on the bus, its termination resistor needs to be enabled, while the termination resistors on the remaining devices need to be disabled. Multiple terminating resistors should not be enabled on the bus, as this will reduce the reliability of the signal and may cause damage to RS-422 devices.

● Using RS-644 standard input

If the differential input uses RS-644 standard signals, then a 120Ω termination resistor must be enabled at the input end.

● Using TTL & LVTTL standard input

If the differential input uses TTL & LVTTL standard signals, the 120Ω termination resistor at the input end needs to be disabled. Please refer to the table below for the electrical characteristics required for connection.

Table 5-6 Electrical Features for TTL & LVTTL Inputs

Voltage Range	Definition
0V to 1V	Low Level

1V to 3V	Unstable voltage, not recommended for use.
3.3V to 24V	High Level

Note

Termination resistors, if required, should be connected at the external terminal.

5.5.3 Trigger Input Wiring

The device can receive input signal sent by external devices via trigger input interface.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can receive input signal sent by external devices via trigger input interface. Trigger input wiring may differ by external device type. Here we take IN1 signal as an example to introduce the trigger input wiring. The wiring methods for other interfaces are the same and can be inferred from section **Pin Definition**.

Note

- The wiring is as following if the light controller's PWR and GND are used to power the external device. The power supply is 24 V and max. output current is 150 mA. Refer to ***Input Signal Connecting PNP Device (Method 2)*** for details.
- The voltage of VCC should not be large than 24 V. Otherwise, the output signal exception may occur.
- Do not connect the device's power interface to other interfaces. Otherwise, short circuit may occur.

PNP Device as Input Signal

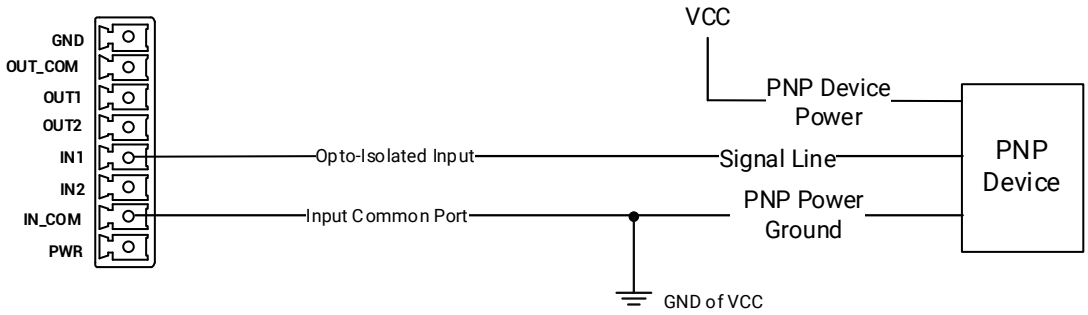

Figure 5-8 Input Signal Connecting PNP Device (Method 1)

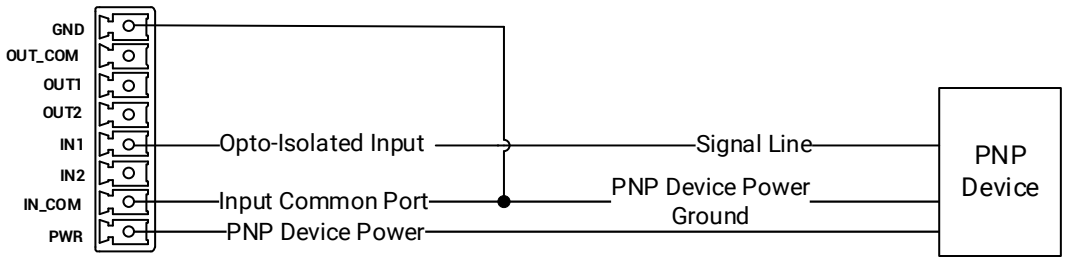

Figure 5-9 Input Signal Connecting PNP Device (Method 2)

NPN Device as Input Signal

The wiring is as following if the VCC of NPN device is 12 V or 24 V and without external resistor.

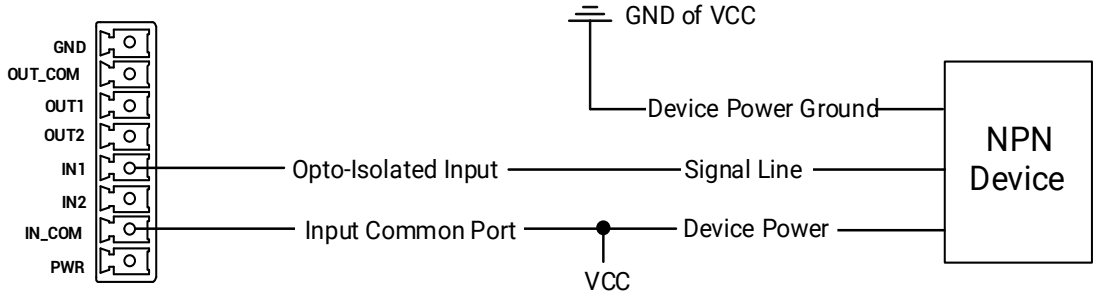

Figure 5-10 Input Signal Connecting NPN Device without External Resistor

The wiring is as following if the VCC of NPN device is 12 V or 24 V and with pull-up resistor.

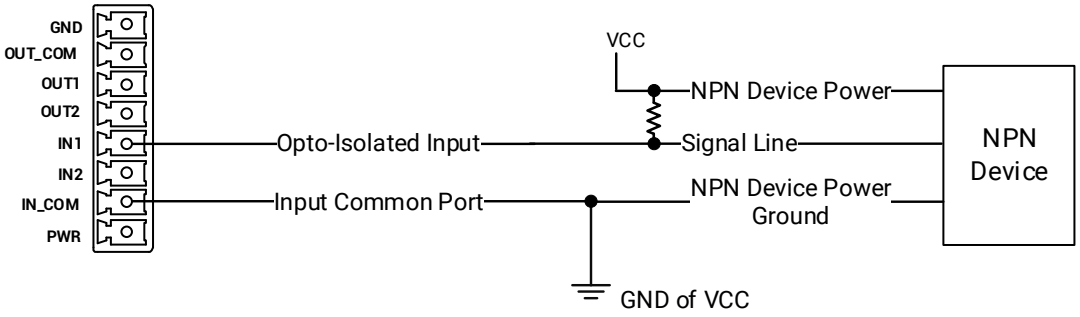

Figure 5-11 Input Signal Connecting NPN Device with Pull-Up Resistor

The resistance value (R) may differ when the VCC of the device changes. Refer to the table below for details.

Table 5-7 Relation between VCC and Resistance

VCC	R
12 VDC	1 kΩ
24 VDC	4.7 kΩ

1200 W Device

1200 W device can receive external input signals through the I/O interface, accepting either differential or single-ended signals. Here we take IN1± signal as an example to introduce the trigger input wiring. The wiring methods for other interfaces are the same and can be inferred from section **Pin Definition**.
When a differential signal source provides the trigger signal, the wiring is shown in the figure below.

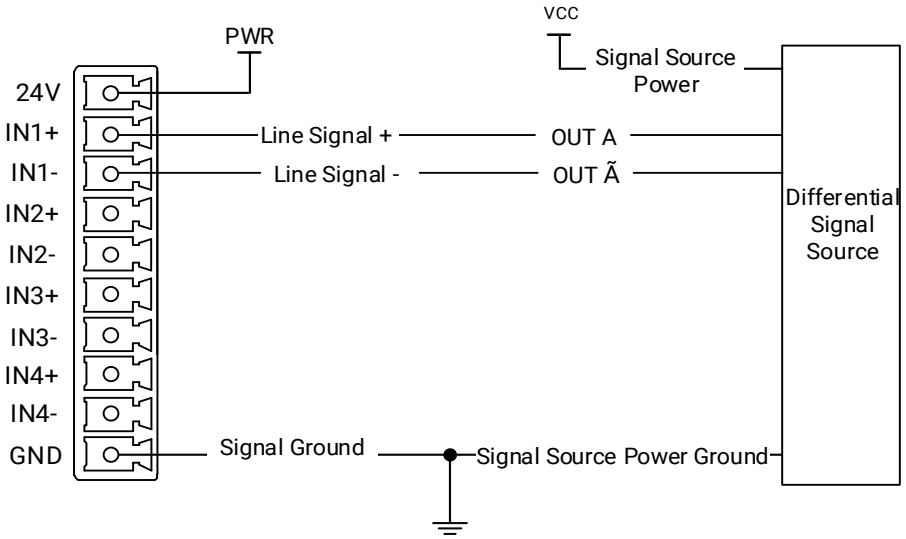

Figure 5-12 Differential Input Wiring

PNP Device as Input Signal

When a PNP single-ended signal source provides the signal, the wiring is as shown in the figure below.

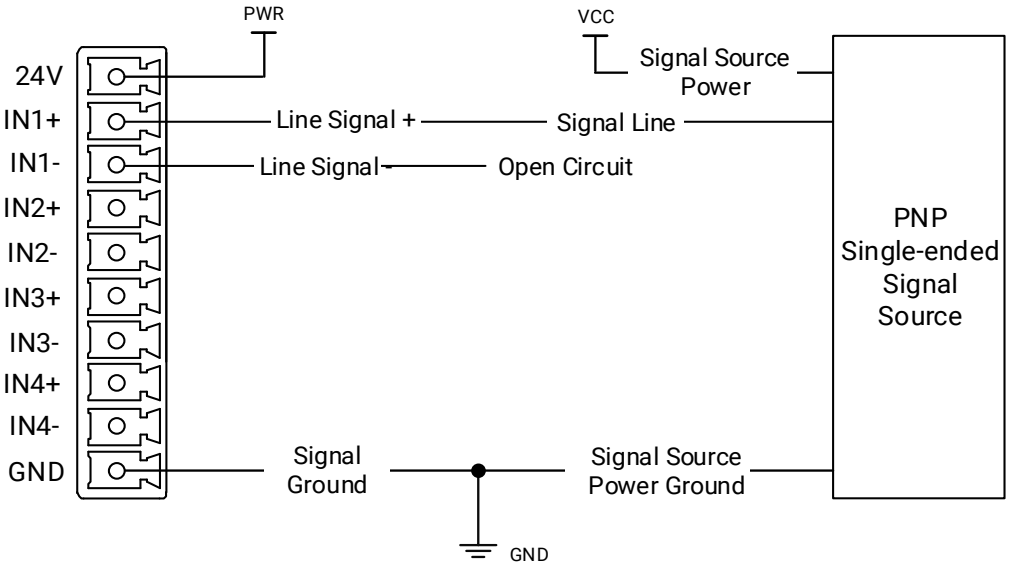

Figure 5-13 PNP Single-ended Input Wiring

NPN Device as Input Signal

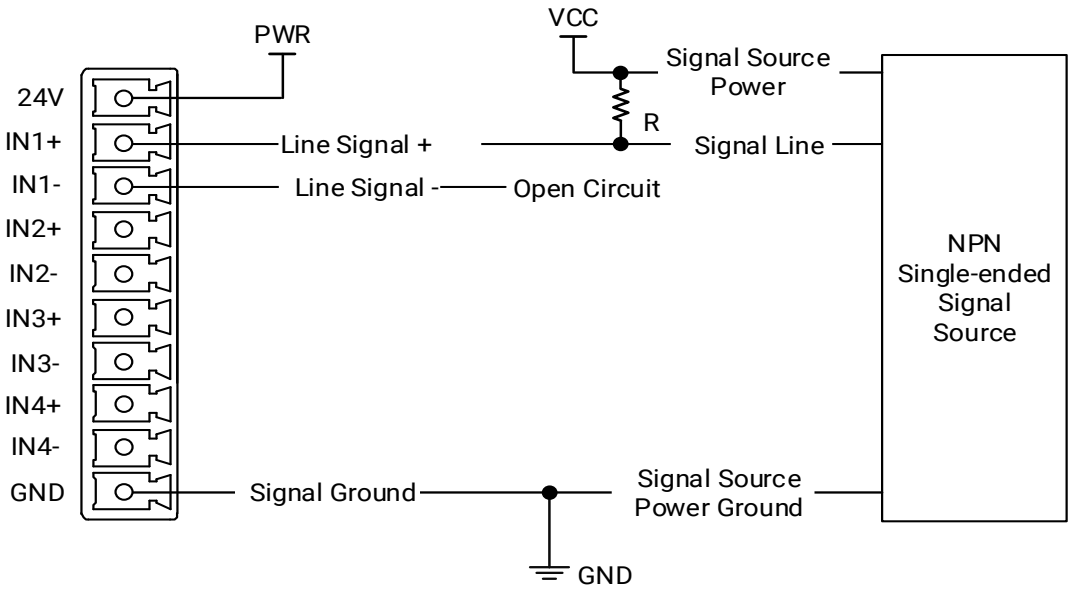

Figure 5-14 NPN Single-ended Input Wiring with Pull-Up Resistor

5.6 Trigger Output Interface

5.6.1 Pin Definition

The pin definition of trigger output interface may differ by device models, and there are two types of pin definitions. You can refer to the following section for details.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices support trigger output interface, and its pin definition is shown below.

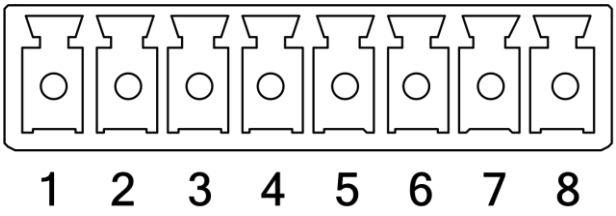

Figure 5-15 Trigger Output Interface

Table 5-8 Pin Definitions of Trigger Output Interface

Pin No.	Signal Name	Function
1	PWR	24 V power positive

Pin No.	Signal Name	Function
5	OUT2	CH2 opto-isolated signal output
6	OUT1	CH1 opto-isolated signal output
7	OUT_COM	Output common port (without polarity)
8	GND	External device power ground

1200 W Device

The 1200 W device supports trigger output interface, and its pin definition is shown below.

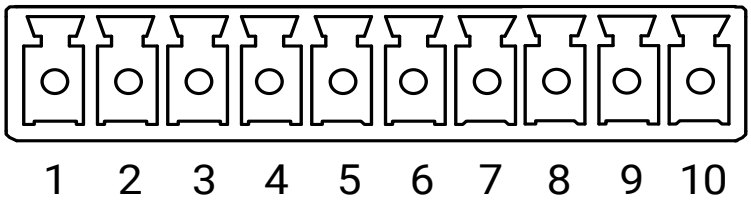

Figure 5-16 Trigger Output Interface

Table 5-9 Pin Definitions of Trigger Output Interface

Pin No.	Signal Name	Function
1	PWR	24 V power positive
2	OUT1+	CH1 signal output positive
3	OUT1–	CH1 signal output negative
4	OUT2+	CH2 signal output positive
5	OUT2–	CH2 signal output negative
6	OUT3+	CH3 signal output positive
7	OUT3–	CH3 signal output negative
8	OUT4+	CH4 signal output positive
9	OUT4–	CH4 signal output negative
10	GND	External device power ground

5.6.2 Electrical Feature

1200 W device has 4 differential output signals. The internal circuit is shown in the figure below.

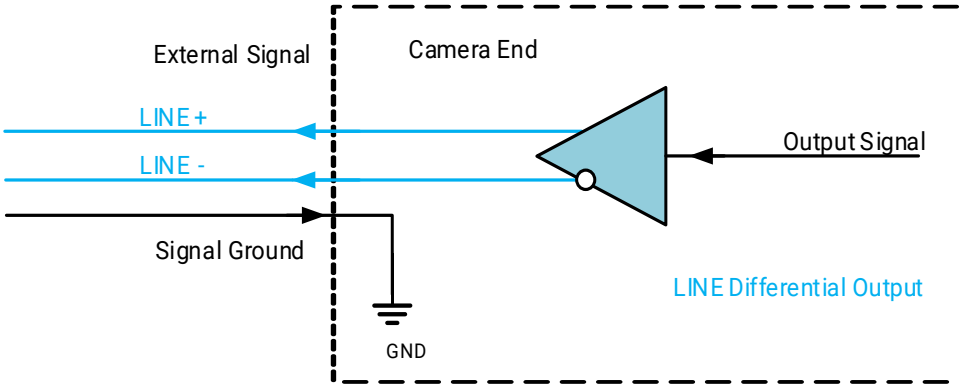

Figure 5-1 Differential Output Internal Circuit

Differential output can provide signals that comply with both the RS-422 standard and the RS-644 standard.

- Using RS-422 standard output

To ensure the normal operation of the camera's output circuit, it is necessary to connect the camera's ground signal with the external ground signal. This interface can act as a "master" transmitter, connecting to the RS-422 bus.

- Using RS-644 standard output

The signals output by the camera using the RS-422 standard cannot be directly connected to the RS-644 standard. When connecting the output to an RS-622 standard input, a resistor network needs to be added at the camera's output position. To ensure the normal operation of the camera's output circuit, it is necessary to connect the camera's ground signal with the external ground signal.

5.6.3 Trigger Output Wiring

The device can send output signal to external devices via trigger output interface.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can send output signal to external devices via trigger output interface. Trigger output wiring may differ by external device type. Here we take OUT1 signal as an example to introduce the trigger output wiring. The wiring methods for other interfaces are the same and can be inferred from section **Pin Definition**.

Note

- The wiring is as following if the light controller's PWR and GND are used to power the external device. The power supply is 24 V and max. output current is 150 mA. Refer to ***Output Signal Connecting PNP Device (Method 2)*** for details.
- The voltage of VCC should not be large than 24 V. Otherwise, the output signal exception may occur.
- Do not connect the device's power interface to other interfaces. Otherwise, short circuit may occur.

PNP Device as External Device

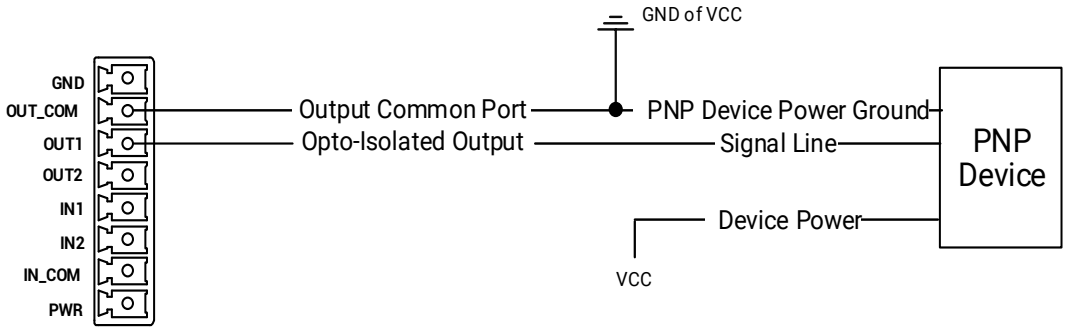

Figure 5-2 Output Signal Connecting PNP Device (Method 1)

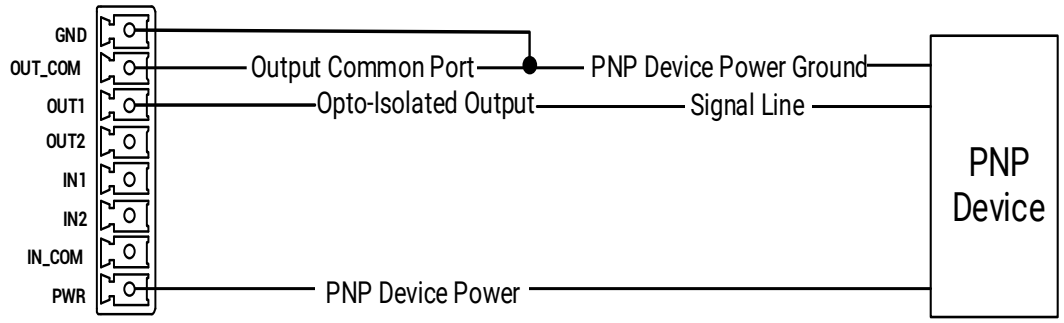

Figure 5-3 Output Signal Connecting PNP Device (Method 2)

NPN Device as External Device

The wiring is as following if the VCC of NPN device is 12 V or 24 V and without external resistance.

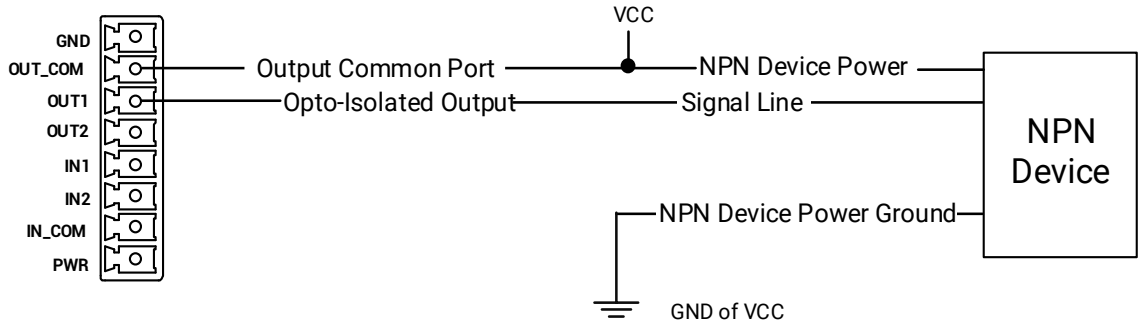

Figure 5-4 Output Signal Connecting NPN Device without External Resistance

The wiring is as following if the VCC of NPN device is 12 V or 24 V and with pull-up resistance.

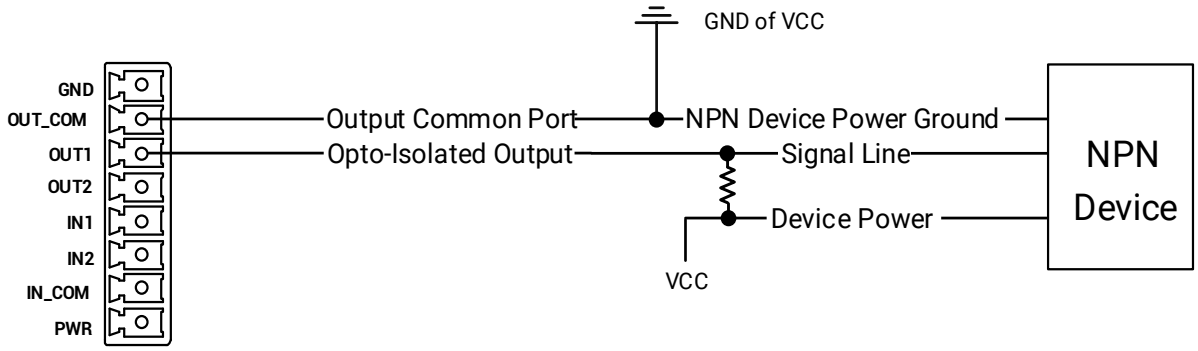

Figure 5-5 Output Signal Connecting NPN Device with Pull-Up Resistance

The resistance value (R) may differ when the VCC of the device changes. Refer to the table below for details.

Table 5-10 Relation between VCC and Resistance

VCC	R
12 VDC	1 KΩ
24 VDC	4.7 KΩ

1200 W Device

1200 W device can send output signal to external devices via trigger output interface. Trigger output wiring may differ by external device type. Here we take OUT1± signal as an example to introduce the trigger output wiring. The wiring methods for other interfaces are the same and can be inferred from section **Pin Definition**.
The wiring is shown in the figure below for a differential output.

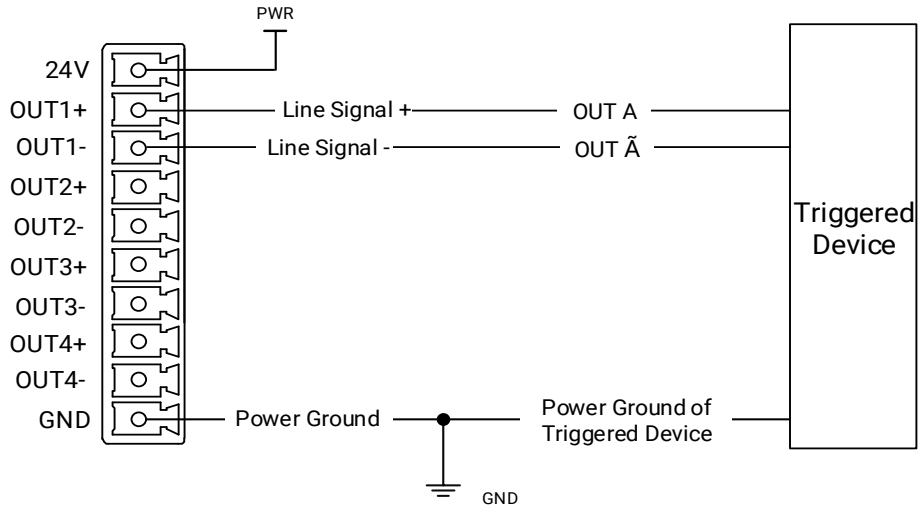

Figure 5-6 Differential Output wiring

A pull-up resistor is required for a single-ended output, with a resistance range of 1 to 10 KΩ. The VCC voltage value should match the required trigger voltage value. The wiring is shown in the figure below.

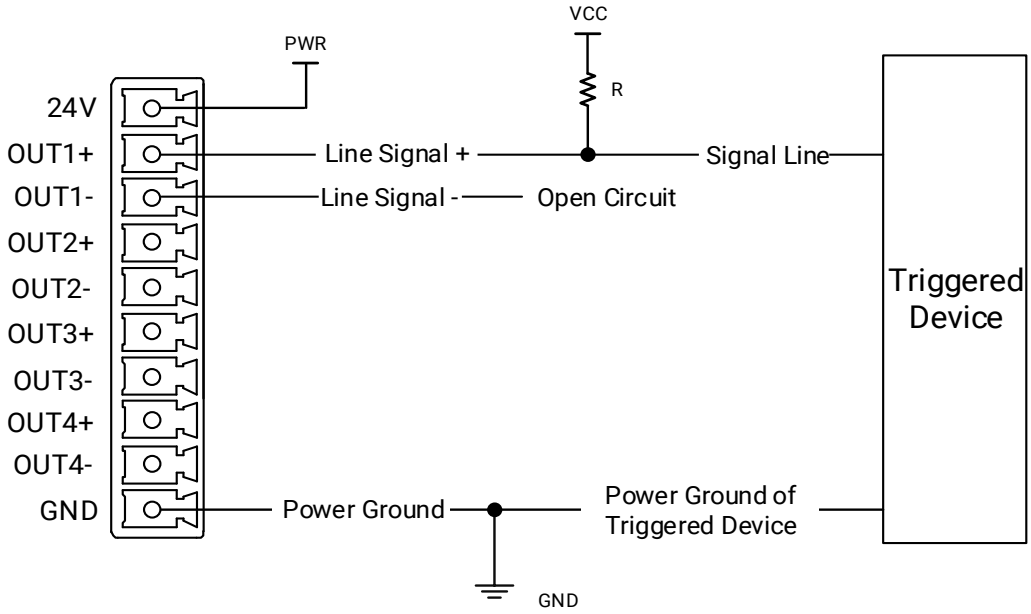

Figure 5-7 Single-Ended Output wiring

5.7 Light Source Interface

The device's light source interfaces can be connected to external light source devices via 19M-8H (Female) light source interfaces, as shown in the figure below. For pin definitions, please refer to the table below.

Note

- The light source interface may differ by device models. Refer to the device's specifications for specific types.
- The shell of connected external light source devices should meet V-0 flame retardant.

19M-8H Interface

The device adopts 19M-8H interface (Female) as its light source interface. The appearance and pin definition of 19M-8H interface (Female) is shown below.

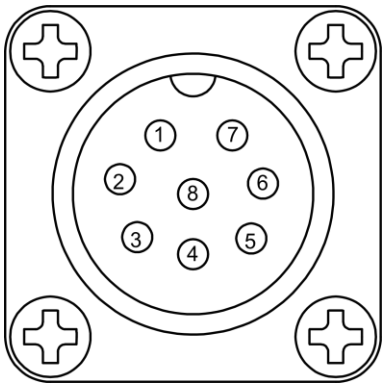

Figure 5-8 19M-8H Interface (Female)

Table 5-11 Pin Definitions of 19M-8H Interface

Pin No.	Name	Function
1	LED+	Light source power supply positive
2	LED+	Light source power supply positive
3	LED–	Light source power supply negative
4	LED–	Light source power supply negative
5	GND	Light source model recognition ground
6	ADC	Light source model recognition positive
7	12V	Fan power of line scan light source
8	GND	Fan power ground of line scan light source

Chapter 6 MVS Client Software Operation

This section introduces how to use the MVS client software to set parameters of the device.

6.1 Install MVS Client Software

Note

- The MVS client software is compatible with 32/64-bit Windows 7/10, 64-bit Windows 11, and 32/64-bit Linux operating systems. Here we take Windows as an example.
- The graphic user interface may differ by different versions of the client software you use.
- The client software has integrated driver required by hardware, and no need to download and install other drivers.
- You can download the client software from ***en.hikrobotics.com***.

Steps

1. Double-click the MVS installation package.
2. Select the language.
3. Read and check **Terms of the License Agreement**.

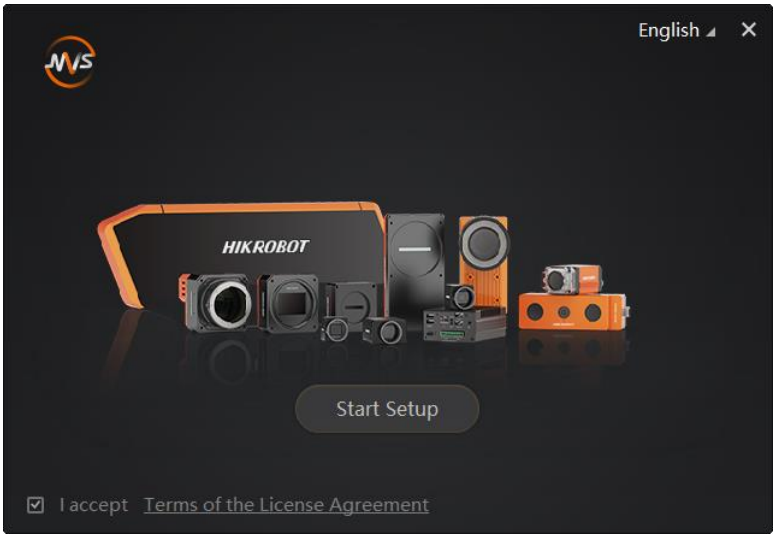

Figure 6-1 Installation Interface

4. Click **Start Setup**.
5. Select installation directory, driver, and others.

- **Select Driver**: You can check **GIGE**, **USB 3.0** and **PCIE** according to actual demands.
- **Others**: Check **Enable built-in debug features** to make it easier to use breakpoints while the device is connected and streaming images. Check **Enable Jumbo Frame for All NICs** to enhance network transmission performance. Check **PCIe-CML**, **PCIe-CXP**, **PCIE-GEV**, **PCIE-XoF** to enumerate the corresponding frame grabbers.

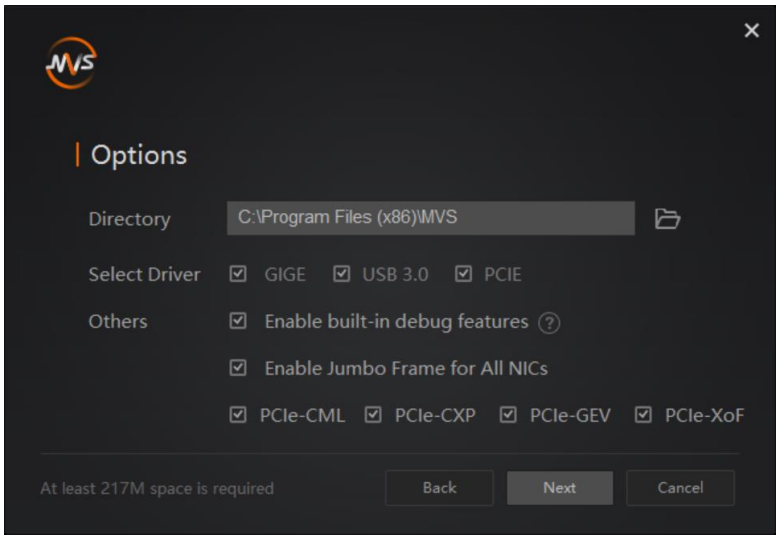

Figure 6-2 Installation Options

Note

- Regarding options, it is recommended to keep default settings.
- **PCIe-CML**, **PCIe-CXP**, **PCIE-GEV**, **PCIE-XoF** can be checked only when **PCIE** is checked.
- **PCIe-CML**, **PCIe-CXP**, **PCIE-GEV**, **PCIE-XoF** supports frame grabbers developed by our company only.

6. Click **Next** to install.
7. Finish the installation process according to the prompts.

6.2 Set PC Environment

To ensure stable client running and data transmission, you are recommended to set PC environment.

6.2.1 Turn off Firewall

Steps

Note

For different Windows versions, the path name or interface may differ. Please refer to the actual condition.

1. Go to Windows Firewall.
- Windows 7 system: Click **Start** → **Control Panel** → **Windows Firewall**.
- Windows 10 system: Click **Start** → **Control Panel** → **System and Security** → **Windows Defender Firewall**.
- Windows 11 system: Click **Start** → **Settings** → **Privacy & security** → **Windows Security** → **Firewall & network protection**.

2. For Windows 7 and 10 system, click **Turn Windows Defender Firewall on or off** on the left. For Windows 11, select the network and turn off in **Microsoft Defender Firewall**.
3. Select **Turn off Windows Defender Firewall (not recommended)**.

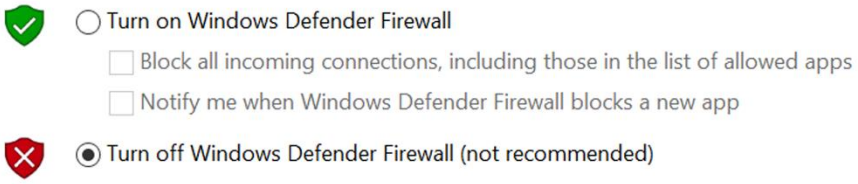

Figure 6-3 Windows Defender Firewall

4. Click **OK**.

6.2.2 Set PC Network

Steps

Note

For different Windows versions, the specific setting path and interface may differ. Please refer to the actual condition.

1. Go to PC network settings page: **Start** → **Control Panel** → **Network and Internet** → **Network and Sharing Center** → **Change adapter settings**.
2. Select NIC, and set the IP obtainment mode.

- Select **Obtain an IP address automatically** to get an IP address of the PC automatically.
- Or select **Use the following IP address** to set an IP address for the PC manually.

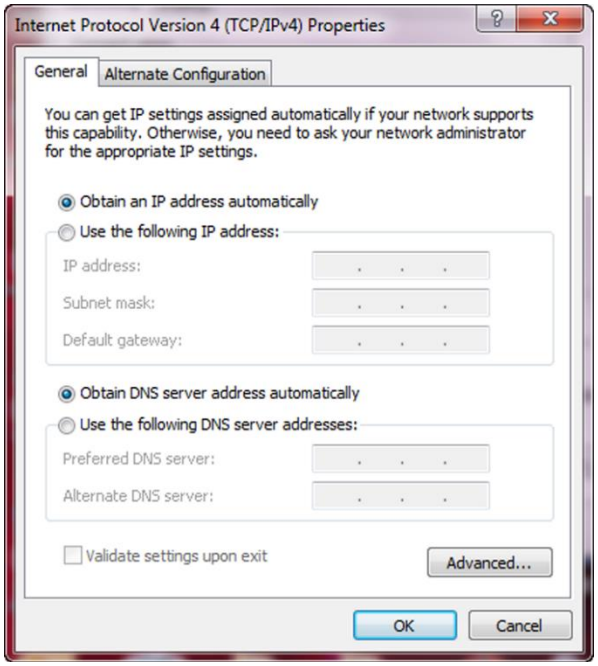

Figure 6-4 Set PC Network

6.3 Set Device Network

After the installation of the client software, if the device in the device list is unreachable, you should set the device's network.

Steps

1. Double-click the client software to run it, and the **Device List** window will pop up.
2. Click in device list to search for the device.
3. Select a device to be connected.
4. Right-click the device, and click **Modify IP**.
5. Set **IP Address**, **Subnet Mask**, and **Default Gateway**.
6. Click OK.

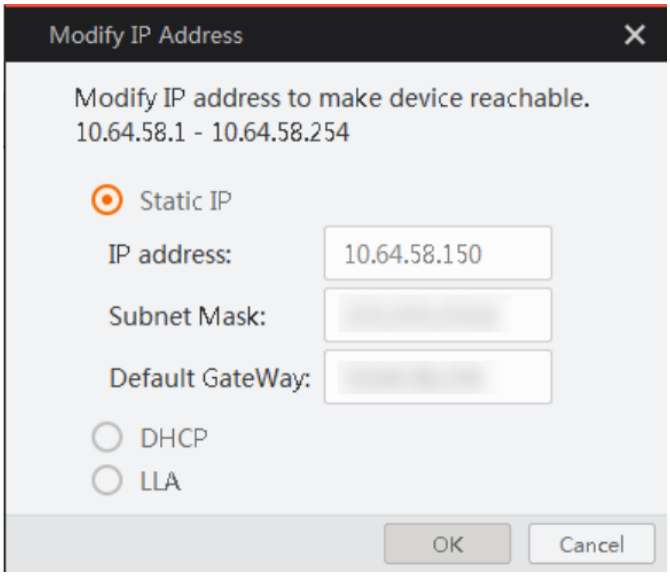

Figure 6-5 Set Device Network

6.4 Operate MVS Client Software

Note

Here we take devices with network interface as an example to introduce how to operate the MVS client software.

Steps

1. Double-click the client software to run it.
2. Click in **GigE** to search the device.

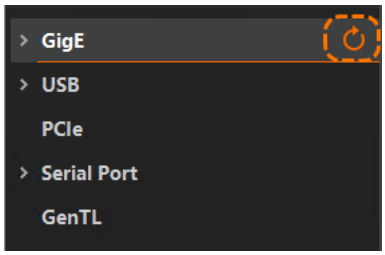

Figure 6-6 Search Device

Note

You can click in **Serial Port** to search devices with serial port.

3. Double-click the device or click to connect the device to the client software. The main window of the client software is shown below.

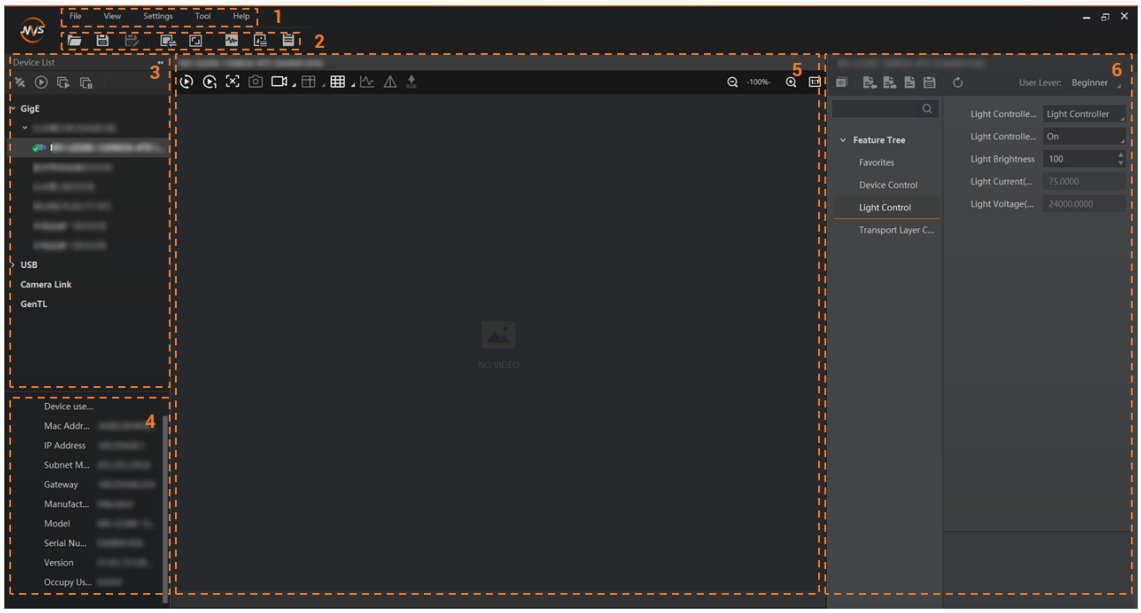

Figure 6-7 Main Window

Note

For specific main window of the client software, please refer to the actual device you got.

Table 6-1 Main Window Description

No.	Name	Description
1	Menu Bar	The menu bar displays function modules, including File, View, Settings, Tool, and Help.
2	Control Toolbar	The control toolbar provides quick operations for the device.

No.	Name	Description
3	Device List Panel	This panel displays device list, and you can connect or disconnect device, modify device IP address, etc.
4	Device Information Panel	This panel displays the detailed device information.
5	Display Window	This area displays the images in real-time. You can click different icons to capture and save image, record, etc.
6	Feature Panel	It displays the device's features.

4. Click ▸ in the device's feature panel to unfold the specific parameters, and set them according to actual demands.

Note

The device's feature tree and parameters may differ by device models.

Table 6-2 Feature Tree Description

Feature Name	Description
Device Control	You can view device information, edit its name, reset the device, etc.
Light Control	You can set the device's brightness and working mode.
Digital IO Control	You can set the different input and output signals.
Counter and Timer Control	You can view and set the timer-related parameters.
Sequencer Control	You can set the polling-related parameters in the Multi-Light Control Mode.
Transport Layer Control	You can view and set the parameters of the device's transport layer.

6.5 Set Light Control

The light control configures brightness and working mode for different light source interfaces. The configuration method for light source control varies across different models of devices.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices support setting various light control working modes, including Always-On Mode, Input 1/2 Mode, Timer 1/2 Mode, etc.

Before You Start

Make sure light sources are connected to the corresponding interfaces and other wirings completed.

Steps

1. Select correct channel from **Light Controller Selector** according to light source wirings.

Note

- **Light Controller 1** to **Light Controller 2** is corresponding to CH1 to CH2.

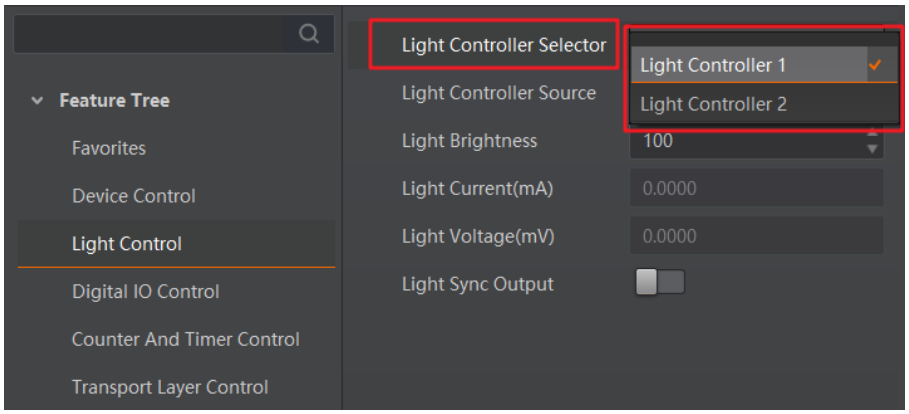

Figure 6-8 Light Controller Selector

2. Select different working modes from **Light Controller Source**.

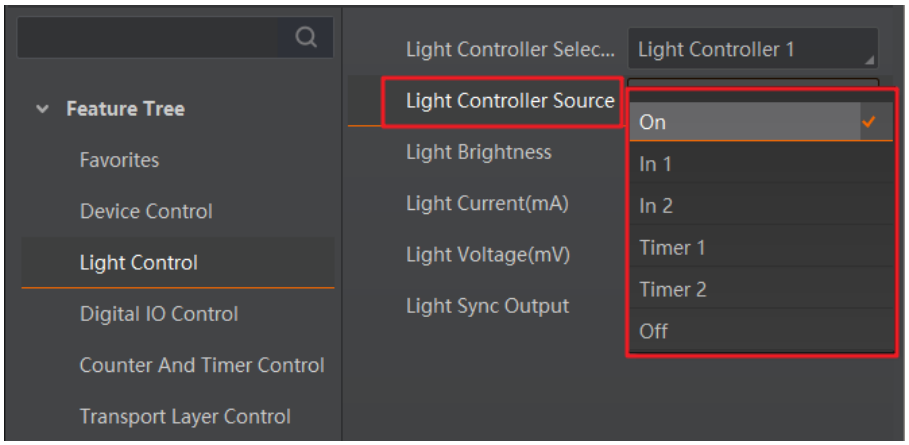

Figure 6-9 Light Controller Source

Table 6-3 Light Controller Source Description

Working Mode	Description
On	The light source is on all the time.
In 1/2	Use trigger input interface signal (IN 1/2) to control light source output.
Timer 1/2	Use timer 1/2 trigger signals to control light source output.
Off	The light source is off.

3. Set **Light Brightness**. The range is between 0 to 255.

Figure 6-10 Set Light Brightness

4. (Optional) Enable **Light Sync Output** to let the settings of one light source apply to other light source channels.

Figure 6-11 Enable Light Sync Output

Note

The parameter of **Light Sync Output** may differ by device models.

1200 W Device

1200 W device supports setting various light control working modes, including Always-On Mode, Follow Mode, Multi-Light Control Mode, etc.

Note

1200 W device does not support the adjustment of light source brightness.

Before You Start

Make sure light sources are connected to the corresponding interfaces and other wirings completed.

Steps

1. Select correct channel from **Light Controller Selector** according to light source wirings.

Note

Light Controller 1 to **Light Controller 4** is corresponding to CH1 to CH4.

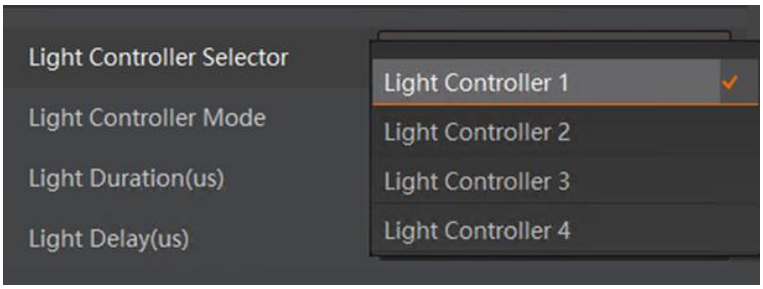

Figure 6-12 Set Light Controller Selector

2. Select different working modes from **Light Controller Mode**.

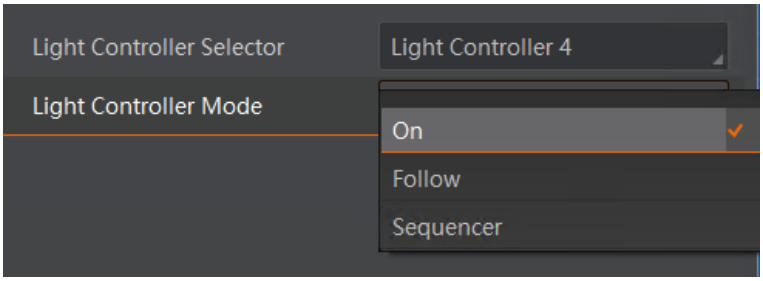

Figure 6-13 Set Light Controller Source

Table 6-4 Light Controller Source Description

Working Mode	Description
On	The light source is on all the time.
Follow	Use trigger input interface signal (IN 1/2/3/4) to control light source output.
Sequencer	By triggering the input interfaces IN 1/2/3/4 signals or timer 1/2/3/4 trigger signals, the light output control is carried out according to the specified stroboscopic logic.

Note

In On Mode and Follow Mode, the four light source channels can be controlled individually. In Multi-Light Control Mode, the working mode for all four light source channels is Multi-Light Control Mode.

- When the working mode is set to On Mode (Light Controller Mode parameter is set to On), the light source remains continuously on with a brightness of 255 by default.
- When the working mode is set to follow mode (Light Controller Mode parameter is set to Follow), the light source is triggered by the input interfaces IN 1/2/3/4 by default. At this point, upon receiving the trigger signal, the light controller turns on the light source based on the set Light Duration (μs) and Light Delay (μs) parameters. In this mode, the four light source channels can be controlled individually.

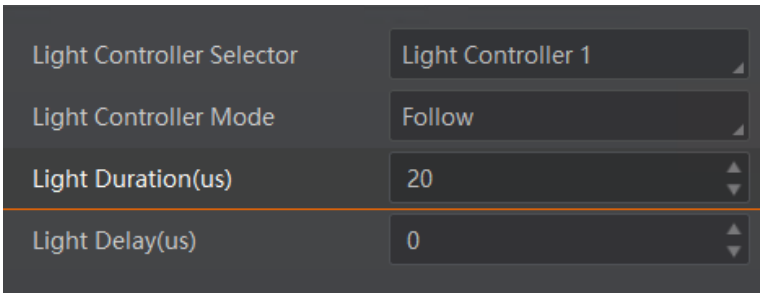

Figure 6-14 Set Duration and Delay Time for the Light Source

Taking the Light Controller Selector parameter set to Light Controller 1 and the Light Trigger Activation parameter set to Rising Edge as an example, the principle of triggering the light source with a rising edge in Follow Mode is shown in the figure below.

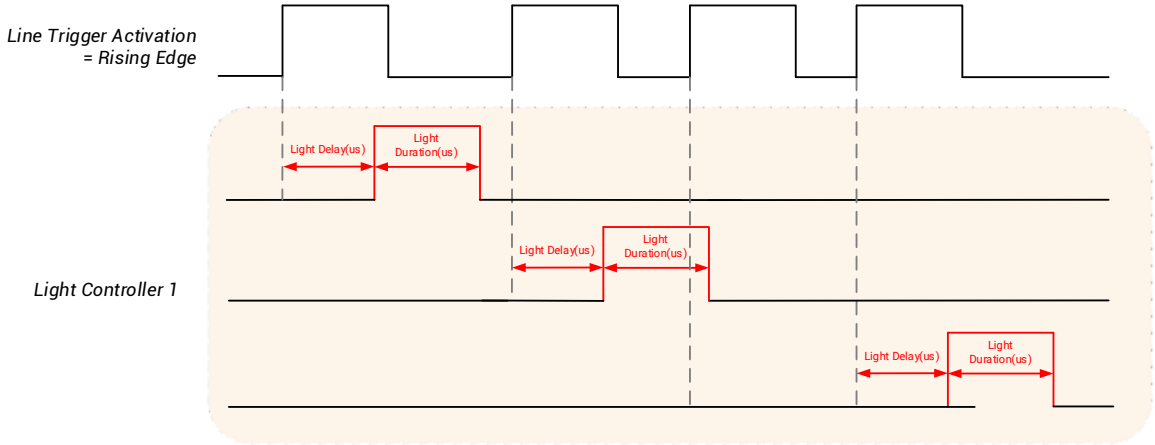

Figure 6-15 Light Source Triggered on by Rising Edge in Follow Mode

Taking the Light Controller Selector parameter set to Light Controller 1 and the Light Trigger Activation parameter set to High Level as an example, the principle of turning on the light source with a high-level trigger in Follow Mode is shown in the figure below.

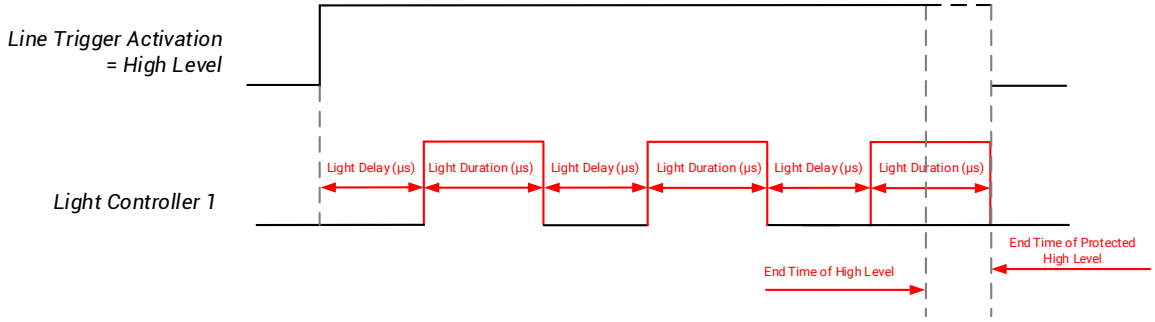

Figure 6-16 Light Source Turned on by High-Level Trigger in Follow Mode

- When the device's working mode is set to Multi-Light Control Mode (Light Controller Mode parameter is set to Sequencer), all light source channels are in Multi-Light Control Mode. Adjust the illumination duration and delay time for different light sources using the Light Duration (μs) and Light Delay (μs) parameters.

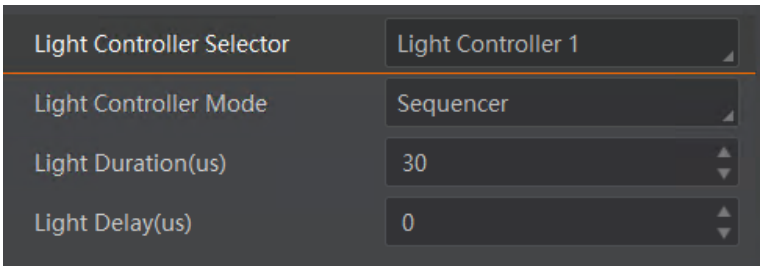

Figure 6-17 Multi-Light Control Mode

6.6 Set Digital IO Control

The device provides multiple configurable input signals output signals. You can go to Digital IO Control to set related parameters.

Note

- 200 W, 500 W, and 750 W devices provide 2 input signals (In 1 to In 2) and 2 output signals (Out 1 to Out 2).
- 1200 W device provides 4 input signals (In 1 to In 4) and 4 output signals (Out 1 to Out 4).

6.6.1 Set IO Input

The device can receive multiple input signals and perform related settings on the received I/O signals. The final I/O signals can serve as both I/O output signals and signal sources for light source control. The configuration methods for light source control vary among different models of devices.

Note

For specific details regarding the I/O input interface and wiring methods, please refer to section ***Trigger Input Interface***.

200 W, 500 W, and 750 W Devices

The devices can set parameters such as **Line Inverter** and **Line Debounce Time** for the received I/O signals.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** from **In 1** to **In 2**.

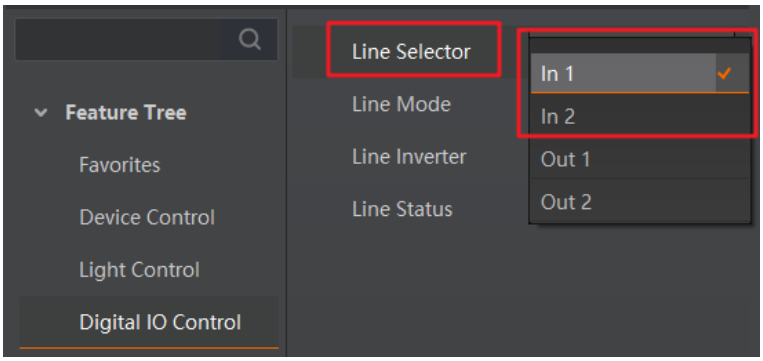

Figure 6-18 Select Line Selector

2. (Optional) Enable **Line Inverter** to invert selected electrical level status of input signals.

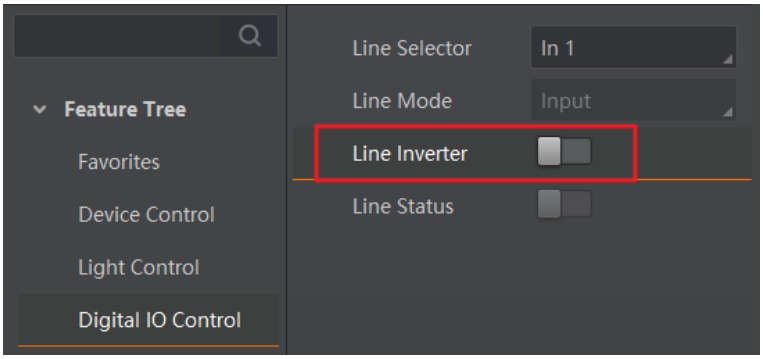

Figure 6-19 Enable Line Inverter

3. (Optional) Set **Line Debounce Time** according to actual demands. The range is between 0 ms to 1000 ms.

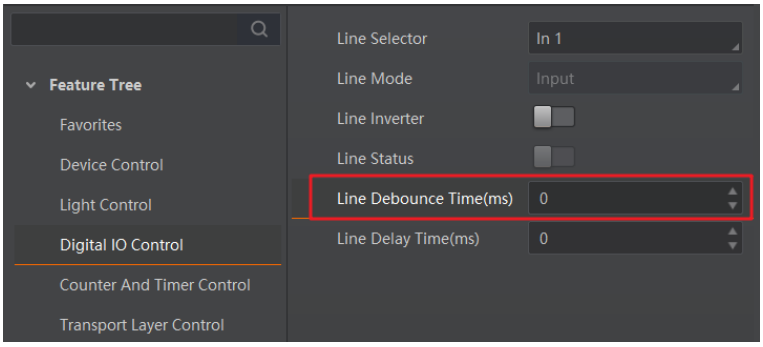

Figure 6-20 Set Line Debounce Time

Note

The parameter of **Line Debounce Time** may differ by device models.

4. (Optional) Set **Line Delay Time** according to actual demands.

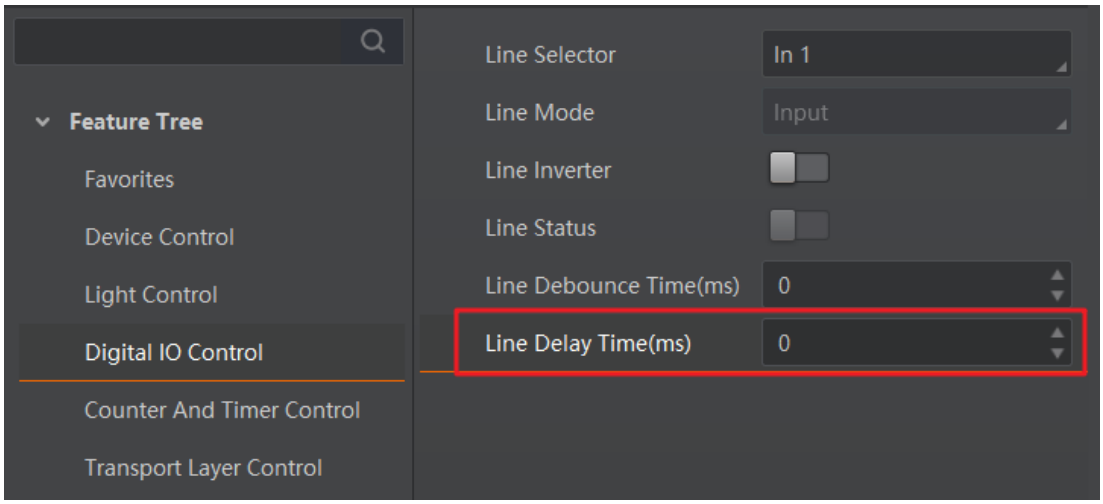

Figure 6-21 Set Line Delay Time

Note

The parameter of **Line Delay Time** may differ by device models.

1200 W Device

1200 W device can set parameters such as **Light Trigger Activation** and **Line Debounce Time** for the received I/O signals.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** from **In 1** to **In 4**.

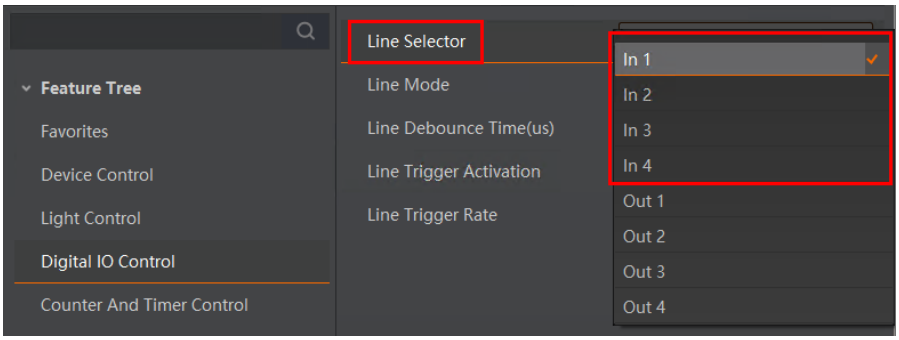

Figure 6-22 Select Line Selector

2. (Optional) Set **Line Debounce Time** according to actual demands. The range is between 0 ms to 1000 ms.

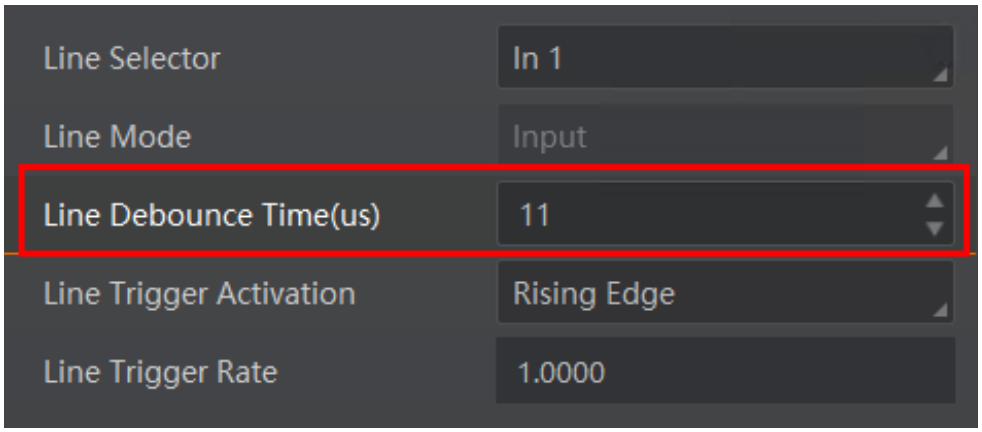

Figure 6-23 Set Line Debounce Time

3. Set **Light Trigger Activation** according to actual demands. It can be set to trigger on the rising edge, falling edge, high level, or low level of the signal source. Please refer to the table below for the specific working principle and corresponding parameters.

Table 6-5 Light Controller Source Description

Light Trigger Activation	Parameter	Working Principle
Rising Edge	Digital IO Control > Line Trigger Activation	When the external device provides a level signal on the rising edge, the device receives the signal and triggers.
Falling Edge		When the external device provides a level signal on the falling edge, the device receives the signal and triggers.
Level High		When the external device provides a level signal at a high level, the device receives the signal and remains triggered continuously.
Level Low		When the external device provides a level signal at a low level, the device receives the signal and remains triggered continuously.

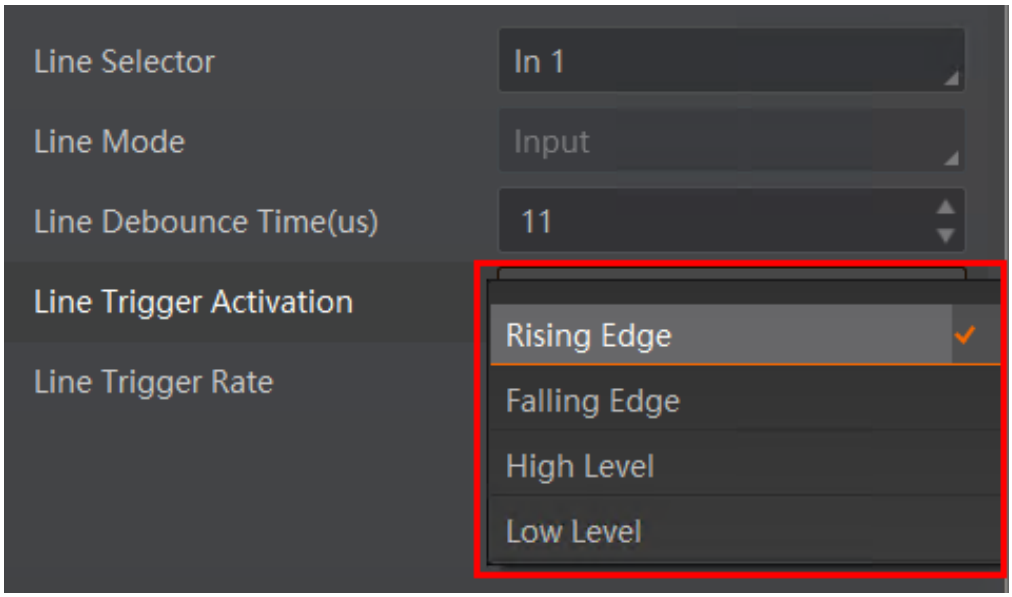

Figure 6-24 Select Line Trigger Activation

4. Setting **Frequency Convert Ratio** allows for frequency division or multiplication of the input signal. When the value of Frequency Convert Ratio is less than 1, division is performed; when the value is greater than 1, multiplication is performed.

Note

The parameter of **Frequency Convert Ratio** is only effective when the working mode is set to **Multi-Light Control Mode.**

6.6.2 Set IO Output

The device supports setting multiple output signals, and outputs them after inverting the output level status. The final I/O signals are transmitted to external devices through the light controller, which then controls the external devices to perform specific operations. The light source control configuration methods differ by device models.

Note

For specific details regarding the I/O output interface and wiring methods, please refer to section ***Trigger Output Interface***.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can set parameters such as **Line Inverter** and **Line Debounce Time** for the received I/O signals.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** from **Out 1** to **Out 2**.

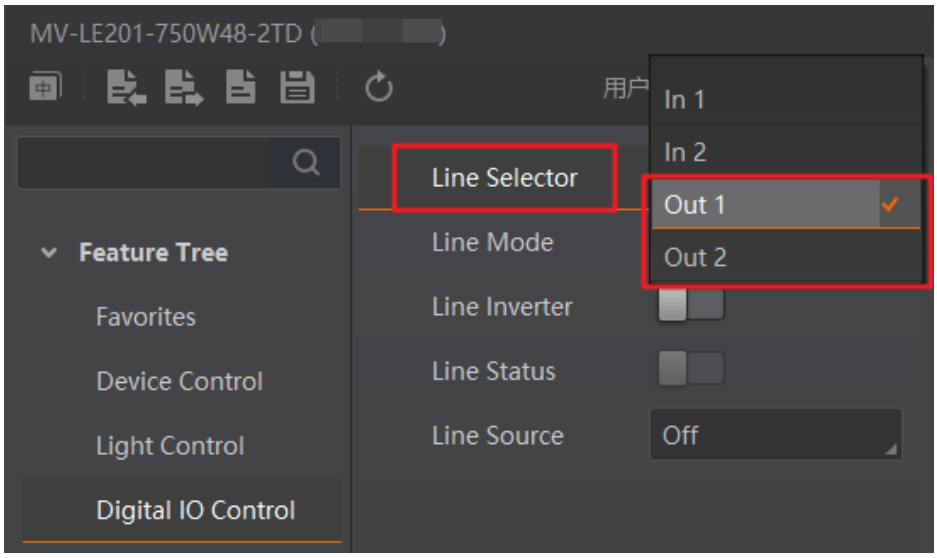

Figure 6-25 Select Line Selector

2. (Optional) Enable **Line Inverter** to invert selected electrical level status of output signals.

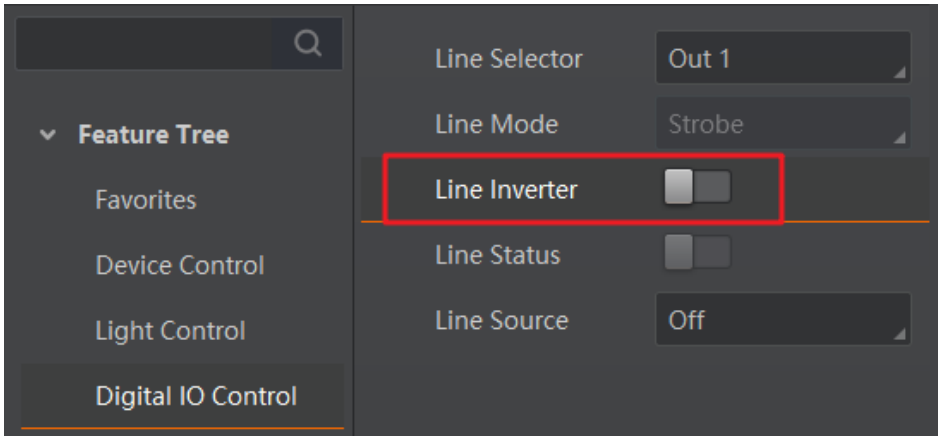

Figure 6-26 Enable Line Inverter

3. Select the signal source of outputted signals in **Line Source**. You can select two input channels (In 1 to In 2), two timer control signals (Timer 1 to Timer 2), and the option to turn off the signal source (Off), as shown in the figure below.

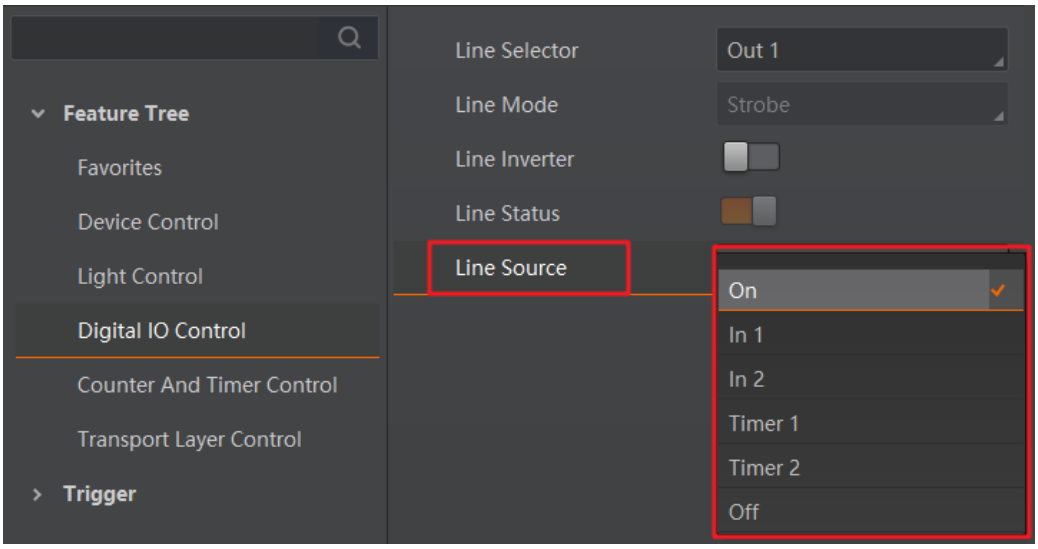

Figure 6-27 Select Line Source

1200 W Device

1200 W device can set **Line Duration** for the received I/O signals.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** from **Out 1** to **Out 4**.

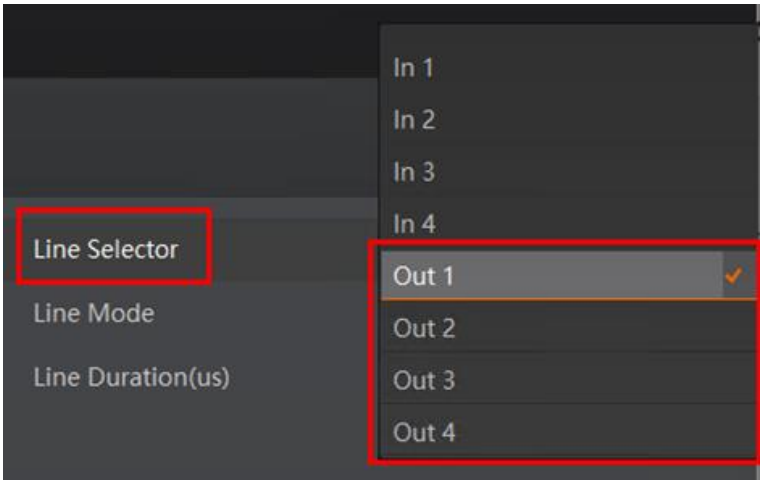

Figure 6-28 Select Line Selector

2. Set **Light Duration** according to actual demands, unit: microsecond.

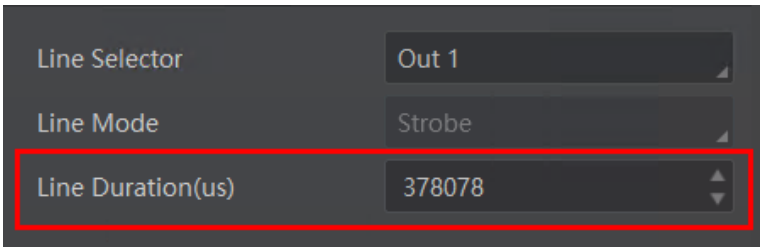

Figure 6-29 Set Light Duration

6.7 Set Timer Control

The timer control can output the corresponding signal by setting the high level and low level duration of the timer signal, under the condition of the selected timer mode and corresponding parameters. You can go to **Counter and Timer Control** to set related parameters.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can output corresponding signals based on the selected timer mode by setting the duration of the high and low levels of the timer signal.

Before You Start

Make sure light sources are connected to the corresponding interfaces and other wirings completed.

Steps

1. Select one timer from **Timer Selector**.

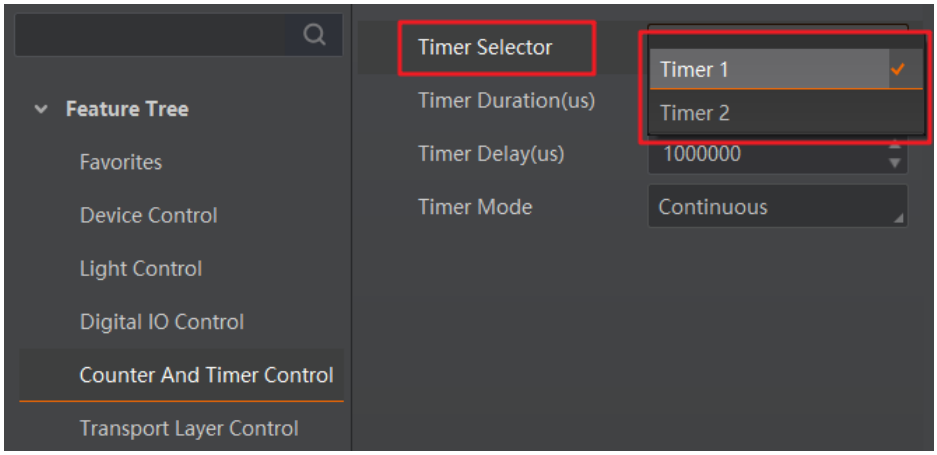

Figure 6-30 Select Timer Selector

2. Set **Timer Duration** and **Timer Delay** according to actual demands. The principle of timer output is shown below.

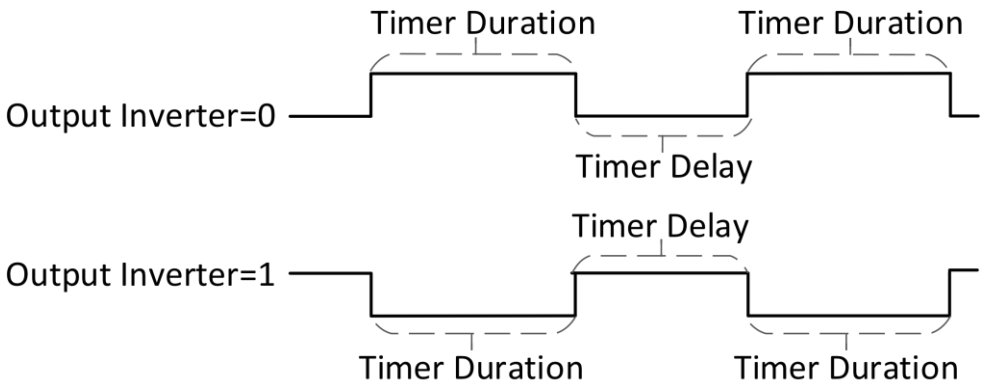

Figure 6-31 Principle of Timer Output

3. Set **Timer Mode** according to actual demands.

- Continuous: The device outputs signals are continuously in accordance with configured **Timer Duration** and **Timer Delay**.
- Burst: If **Burst** is selected as **Timer Mode**, you need to follow steps below to set other parameters.

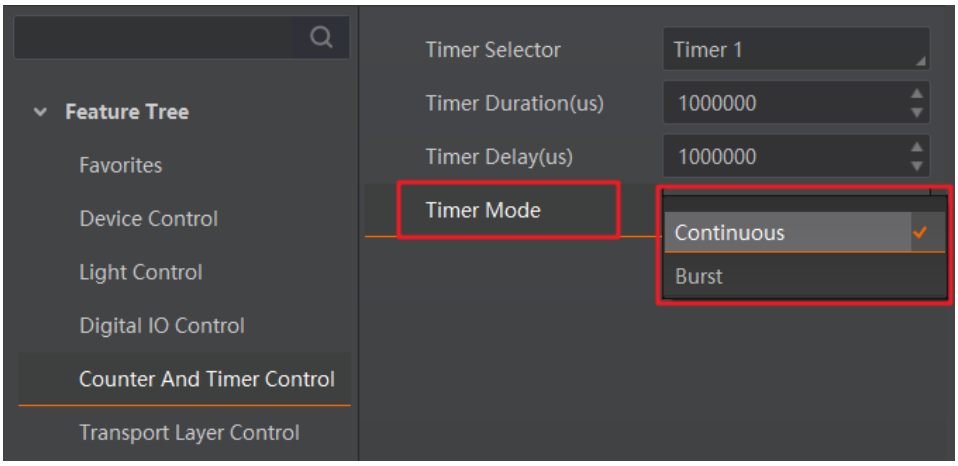

Figure 6-32 Select Timer Mode

4. Set **Timer Burst Count** to configure burst count of the light source.

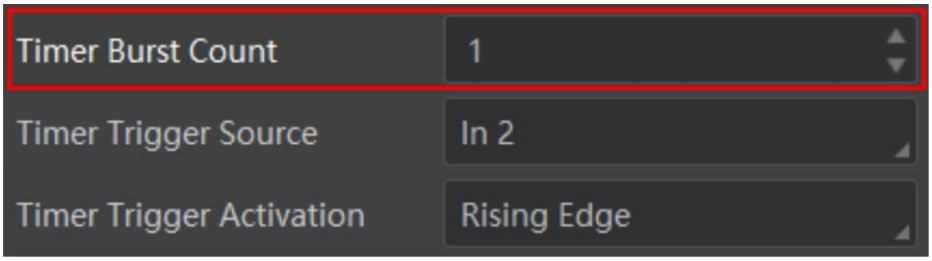

Figure 6-33 Set Timer Burst Count

5. Set **Timer Trigger Source** according to actual demands.

- If **Software** is selected as **Timer Trigger Source**, you can click **Execute** in **Trigger Software** to send trigger signals to the device.

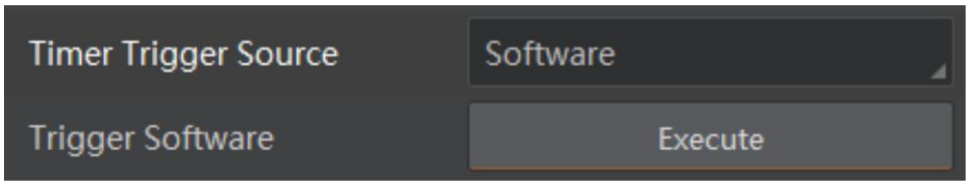

Figure 6-34 Set Software Trigger

- If **In 1** to **In 2** is selected as **Timer Trigger Source**, the external device sends trigger signals to the device, and you can set trigger activation in **Timer Trigger Activation**.

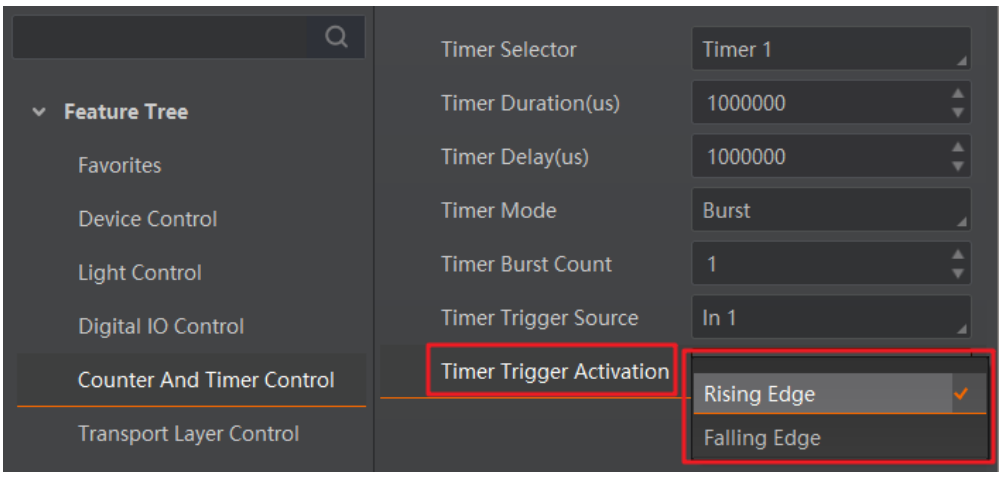

Figure 6-35 Set Hardware Trigger

1200 W Device

The timer control functions of the 1200 W devices need to be used in conjunction with the Multi-control Light Mode, that is, when **Light Control > Light Controller Mode** is set to **Sequencer**, and **Sequencer Control > Sequencer Trigger Source** is set to **Timer 1/2/3/4**, the timer control-related configurations can take effect.

Before You Start

Make sure light sources are connected to the corresponding interfaces and other wirings completed.

Steps

1. Select one timer from Timer Selector.

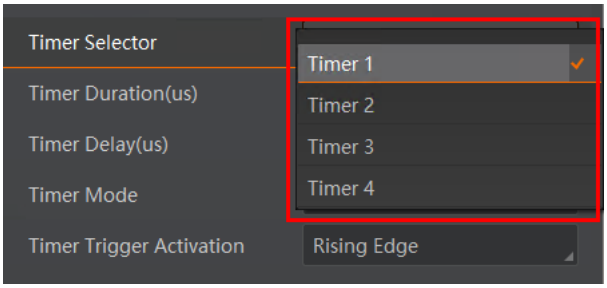

Figure 6-36 Select Timer Selector

2. Set the duration of the high and low levels respectively through the Timer Duration and Timer Delay.
3. Set Timer Trigger Activation, which can be either rising edge trigger or falling edge trigger, as shown in the figure below.

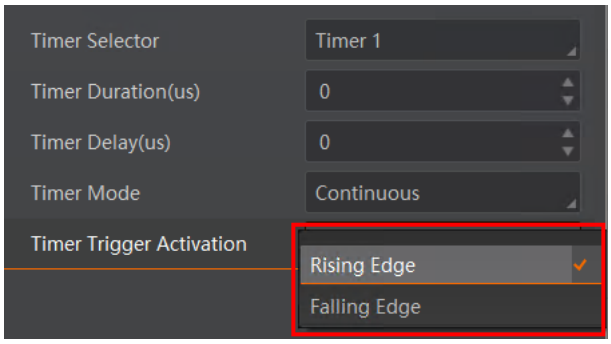

Figure 6-37 Select Timer Trigger Activation

4. Set **Timer Mode**, as shown in the figure below.

- When selecting **Continuous**, the light controller triggers polling according to the trigger response method set in Timer Trigger Activation. During the high and low level durations set by Timer Duration and Timer Delay, the light source emits light according to the set polling logic until the next trigger signal arrives, and there is no need to proceed with the following steps.
- When selecting **Burst**, in addition to being related to the set trigger response method and the durations of high and low levels, you also need to set the timer trigger parameters according to the following steps, and the light controller outputs the timer signal based on the final settings.

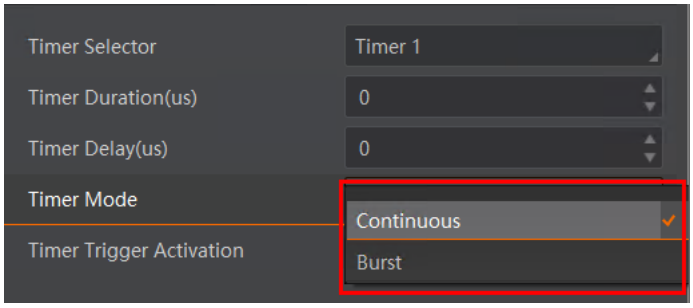

Figure 6-38 Select Timer Mode

5. Set **Timer Trigger Source**, as shown in the figure below.

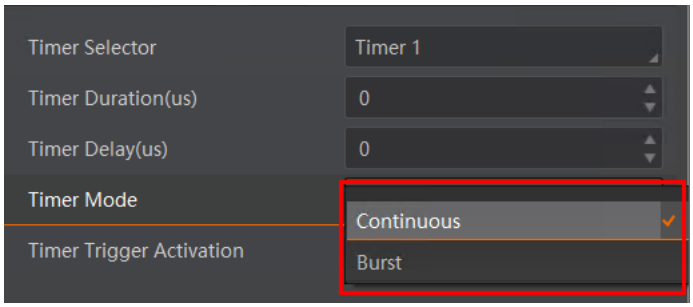

Figure 6-39 Select Timer Trigger Source

6. Set **Timer Trigger Source**, which only supports software triggering. That is, when Timer Trigger Source is set to Software, a trigger signal can be sent to the light controller by pressing the Execute button in Trigger Software, as shown in the figure below.

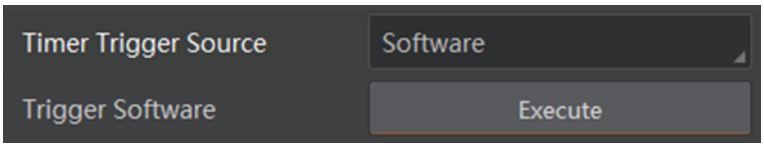

Figure 6-40 Set Timer Trigger Source

6.8 Set Sequencer Controller

1200 W device supports a Multi-Light Control Mode. Under this mode, it is necessary to set parameters about **Sequencer Control.**

Before You Start

Connect the light source through the light source interface and ensure that the network cable of the device is correctly connected. For details, please refer to section ***Connect Device***.

Steps

1. Set the polling trigger source signal through the **Sequencer Trigger Source**, with options for external trigger (In 1 to In 4) or timer trigger (Timer 1 to Timer 4).

Note

For external trigger source configurations, please refer to section ***200 W, 500 W, and 750 W Devices*** in ***Set IO Input***. For timer trigger configurations, please refer to section ***1200 W Device*** in the ***Set Timer Control***.

2. Set **Sequencer Controller Num** according to actual needs.

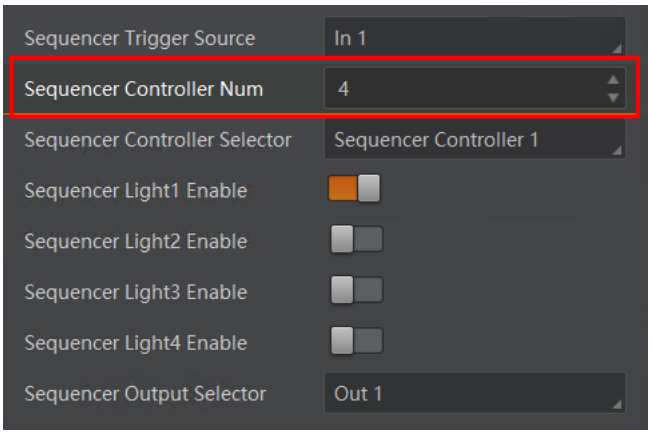

Figure 6-41 Select Sequencer Controller Num

3. Select a specific polling group through **Sequencer Controller Selector**.
4. Enable the **Sequencer Light 1/2/3/4 Enable** to set which light sources should be turned on in that polling group.
5. Set the final I/O signal sent from the light controller to the external device through **Sequencer Output Selector**, with options for Out 1/2/3/4, corresponding to OUT1 to OUT4 on the device end.

- The principle of **Sequencer Controller** to light up the light sources is shown in the figure below.
- The polling trigger source is set to Timer 1 trigger, i.e., **Sequencer Trigger Source** is set to **Timer 1**;
- Timer 1 trigger is set to trigger on the rising edge, i.e., **Timer Trigger Activation** is set to **Rising Edge**;
- The Sequencer Controller Num is set to 4;
- Sequencer Controller 1 enables Light 2, polling group 2 enables Light 1 and Light 3, polling group 3 enables Light 2, Light 3, and Light 4, and polling group 4 enables Light 3 and Light 4.

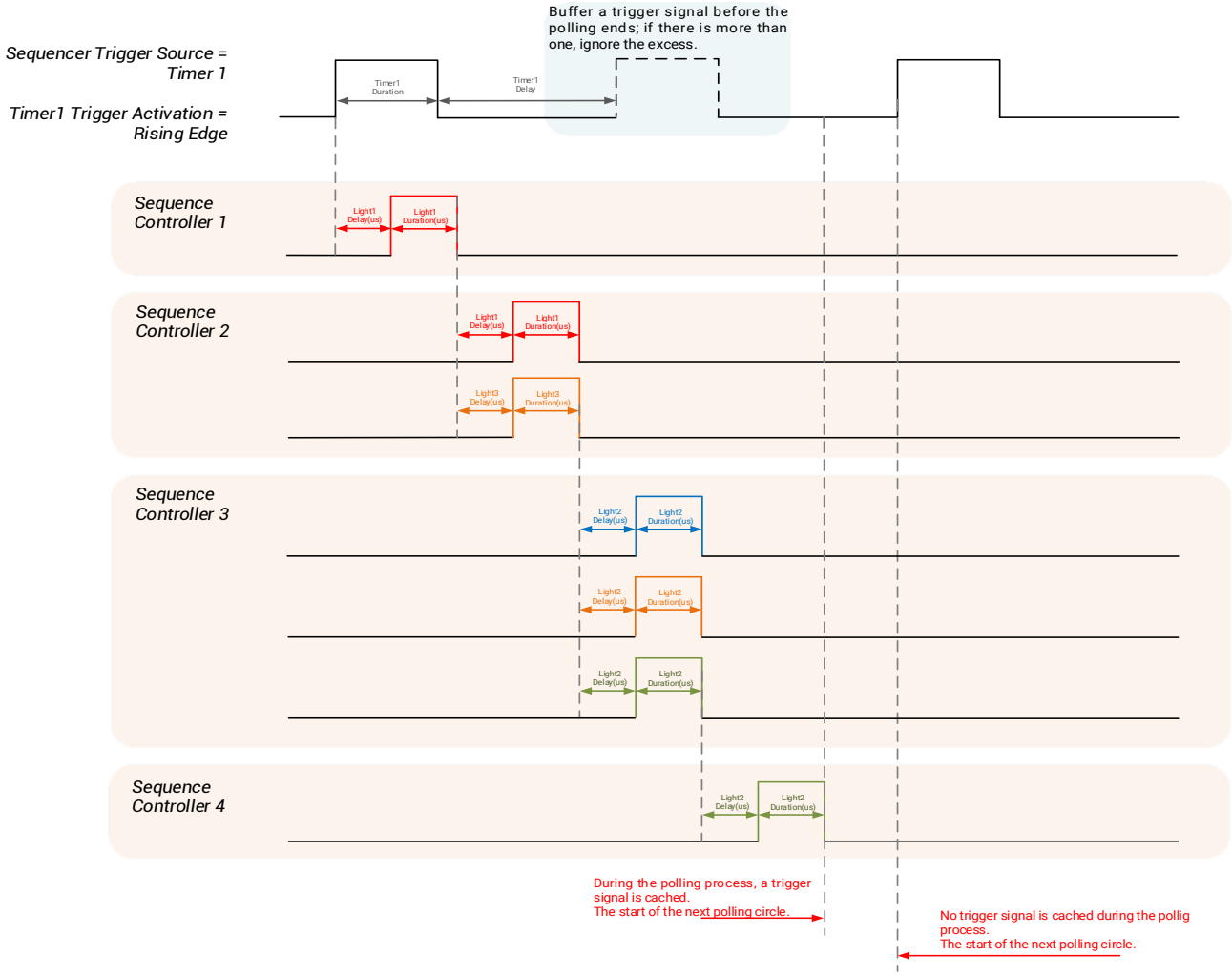

Figure 6-42 Principle of Sequencer Controller

6.9 View Transport Layer Control

Through the Transport Layer Control properties of the light controller, you can view its MAC address, IP address, GEV version number, etc. For specific parameter introduction of the Transport Layer Control properties, please refer to the table below.

Table 6-6 Transport Layer Control Parameters

Parameters	Read/Write	Description
GEV Version Major	Read Only	It displays the major version of the GEV version.
GEV Version Minor	Read Only	It displays the minor version of the GEV version.
GEV Device Mode Is Big Endian	Read Only	It displays the byte order of the device register.
GEV Device Mode Character Set	Read Only	It displays the character set used in the device register.

Parameters	Read/Write	Description
GEV Interface Selector	Read Only	It is used to select network interface.
GEV MAC Address	Read Only	It displays the MAC address of network interface.
GEV Current IP Configuration LLA	Read Only	It is on by default. IP address can be acquired by light controller via LLA.
GEV Current IP Configuration Persistent IP	Read/Write	If it is enabled, and static IP mode is configured for light controller, static IP will be loaded.
GEV Current IP Address	Read Only	It displays the IP address of the current network interface.
GEV Current Subnet Mask	Read Only	It displays the subnet mask of the current network interface.
GEV Current Default Gateway	Read Only	It displays the default gateway of the current network interface.
GEV First URL	Read Only	It displays the first preferred URL for the XML profile.
GEV Second URL	Read Only	It displays the second preferred URL for the XML profile.
GEV Number Of Interfaces	Read Only	It displays the number of supported network interfaces.
GEV Persistent IP Address	Read/Write	It displays the static IP address of the current network interface. It takes effect only when static IP address is applied.
GEV Persistent Subnet Mask	Read/Write	It displays the static subnet mask linked to static IP address of the current network interface. It takes effect only when static IP address is applied.
GEV Persistent Default Gateway	Read/Write	It displays the static default gateway of the current network interface. It takes effect only when static IP address is applied.
GEV Message Channel Count	Read Only	It displays the number of supported message channels.
GEV Heartbeat Timeout (ms)	Read/Write	It displays the heartbeat timeout duration, unit: ms. With heartbeat detection mechanism, the camera checks whether the information transmission channel is normal. After heartbeat function is enabled and if there is no heartbeat response from SDK within the timeout duration,

Parameters	Read/Write	Description
		the status of an occupied camera will be cleared.
GEV CCP	Read/Write	It is used to control the application access permission for the device.

6.10 View Device Control

You can go to **Device Control** to view the device's information, and detailed parameters are as followed.

Table 6-7 Device Control Parameters

Parameters	Read/Write	Description
Device Vendor Name	Read Only	It is the device's vendor name.
Device Model Name	Read Only	It is the device's model information.
Device Manufacturer Info.	Read Only	It is the device's manufacturer information.
Device Version	Read Only	It is the device's version information.
Device Serial Number	Read Only	It is the device's serial No.
Device User ID	Read/Write	It is the device name and it is empty by default. You can set it according to your preference. ● If User ID is empty, the client software displays the device model (serial No.). ● If you set it, the client software displays the User ID you set (serial No.).
Device Uptime(s)	Read Only	It is the period of time when device is powered up.
Device Link Speed (Mbps)	Read Only	It is the device's link speed.
Board Device Type	Read Only	It is the device type.
Device Character Set	Read Only	It is the character set used by the strings of the device.
Device Reset	Read/Write	Click **Execute** to reset the device.
User Set Save	Read/Write	Click **Execute** to save the device's parameters. **Note** If you do not manually save parameters after configuration, the configured parameters will be automatically saved after 2 minutes.

Parameters	Read/Write	Description
User Set Reset	Read/Write	Click **Execute** to reset the device's parameters.

6.11 Update Firmware

You can use the MVS Tool Kit to update the device's firmware.

Note

The MVS Tool Kit is installed by default when you install the MVS client software.

Steps

1. Go to **All** → **Configuration Tool** → **Firmware Upgrade Tool** after running MVS Tool Kit.
2. Click in the corresponding device interface type like GigE to search devices.

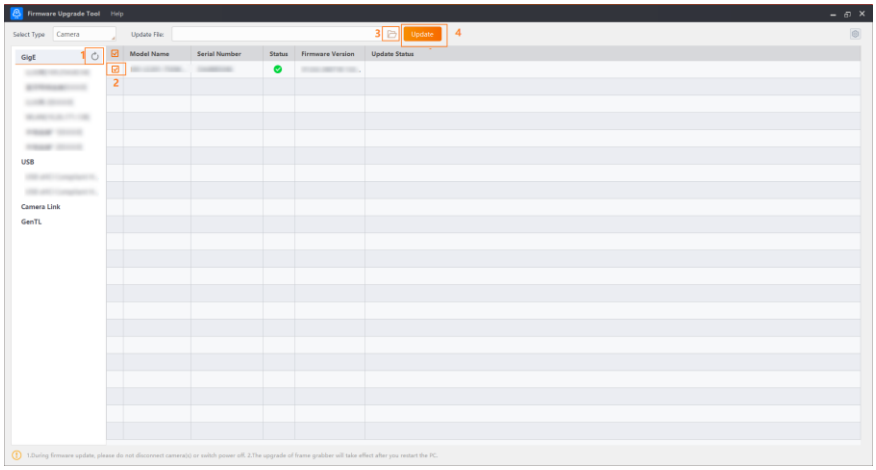

Figure 6-43 Update Firmware

Note

Devices with serial port should be searched in Camera Link.

3. Check to select the device you want to update.
4. Click to select update files (.dav files) in the local PC.
5. Click **Update** to start updating.

Note

- The device will restart automatically after updating the firmware.
- The firmware updating process may take a few minutes, please wait patiently.
- During firmware updating, do not disconnect the device or switch power off.

Chapter 7 Light Controller Configuration Tool

7.1 Main Window

After connecting light controller via network cable or serial port cable, you can use light controller configuration tool to set its parameters. The main window of the light controller configuration tool is shown below.

Note

- Here we take using serial port cable to connect the device to a PC for an example.
- You can contact technical support to get the light controller configuration tool.
- .Net3.5 and SDK runtime library of industrial camera are required when running light controller. You can contact technical support to get SDK runtime library.

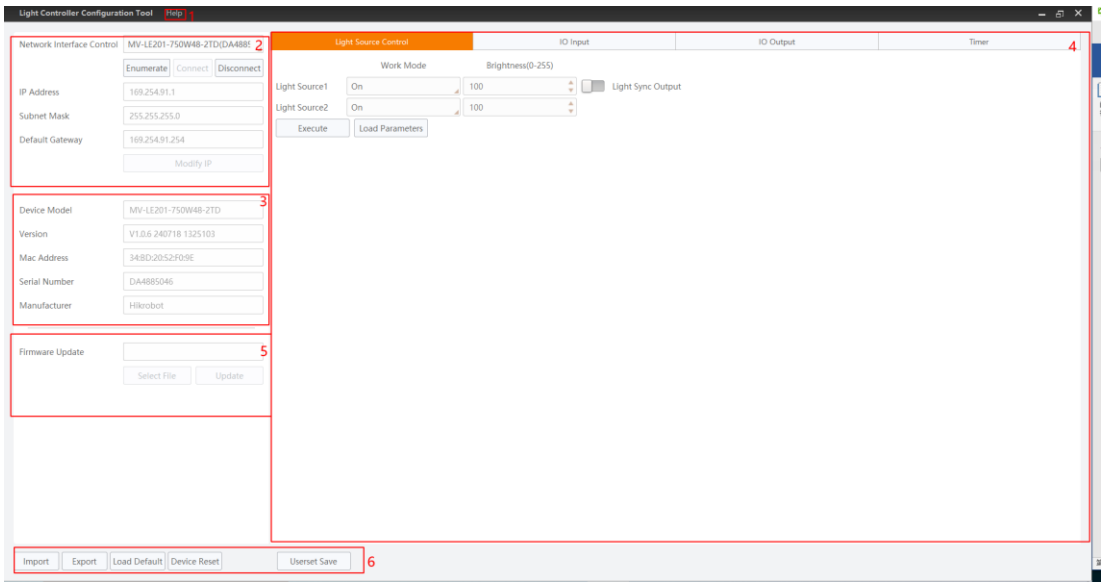

Figure 7-1 Main Window of Light Controller Configuration Tool

Table 7-1 Main Window Description

No.	Area Name	Description
1	Menu	The operation provides assistance, allowing the selection of the tool's language (Chinese and English), and viewing the tool's version information.
2	Network Interface/Serial Port Control	You can connect/disconnect/enumerate device here via light controller after using network cable or serial port cable to connect the device physically. After connection, you can view device information.
3	Device Information	It displays detailed device information.

No.	Area Name	Description
4	Control Parameters	You can configure the parameters for the device's light source control, IO input, IO output, timers, and sequencer controllers. For serial devices, you can also set device parameters through the serial command line. **Note** Only 1200 W device supports sequencer controller.
5	Firmware Update	You can update the device’s firmware here. **Note** Disconnect device in Network Interface/Serial Port Control area before updating firmware.
6	Configuration Management	For importing, exporting, resetting, saving the current device parameters, as well as restarting the device or enabling multi-window mode: ● Import Parameters: Import external parameter configuration files into the tool. ● Export Parameters: Export parameter configuration files to the local system. ● Reset parameters: The device resets parameters to default ones. ● Restart device: The device restarts. **Note** ● When saving device parameters, you can check the save status through the device display. Refer to section ***Display Screen*** for details. ● If the parameter configuration is completed and not manually saved, the device will automatically save the parameters after 2 minutes. ● Multi-Window Mode: After checking this option, when configuring parameters for modules such as IO input, IO output, timers, and sequencer controller, separate configuration windows will pop up for setting, as shown in ***Multi-Window Mode***.

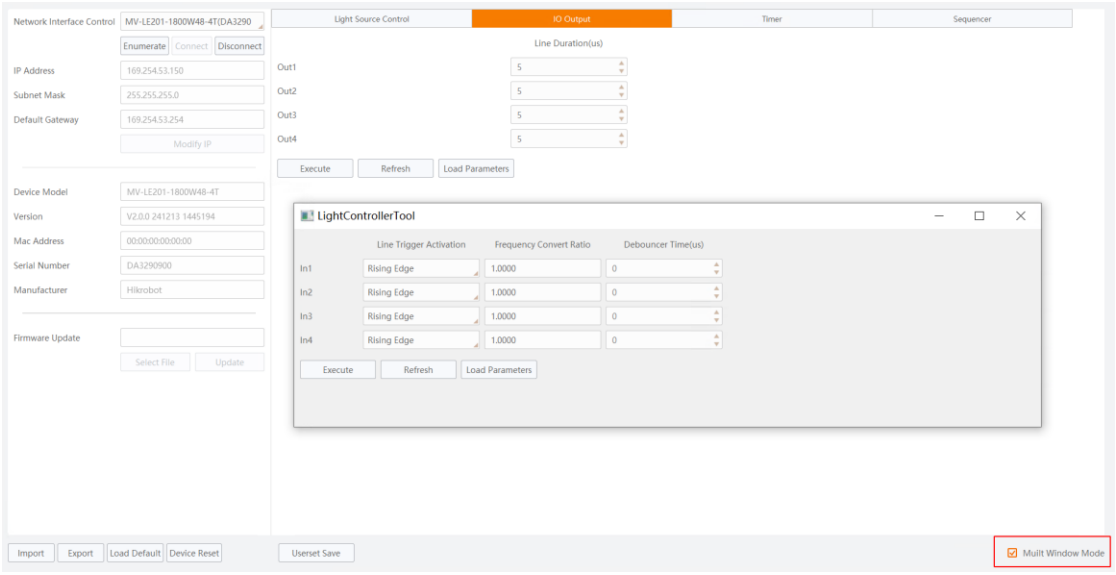

Figure 7-2 Multi-Window Mode

Note

When running the tool, it requires dependencies on .Net 3.5 and the industrial camera SDK runtime library. If there is a need for the industrial camera SDK runtime library, please contact technical support to obtain it.

7.2 Connect Device via Controller

After using network cable or serial port cable to connect the device physically, you can use digital light controller to connect the device and set related parameters.

7.2.1 Network Interface Control via Controller

The network interface control module connects to the device via the network interface, and after a successful connection, parameter settings are made through the related modules on the right. The related modules are: light source control, IO input, IO output, timer, and sequencer controller.

Note

Only 1200 W device supports sequencer controller.

Before You Start

Use network cable to connect the device to a switch or PC via network interface.

Steps

1. Run the digital light controller, and select Network Interface.

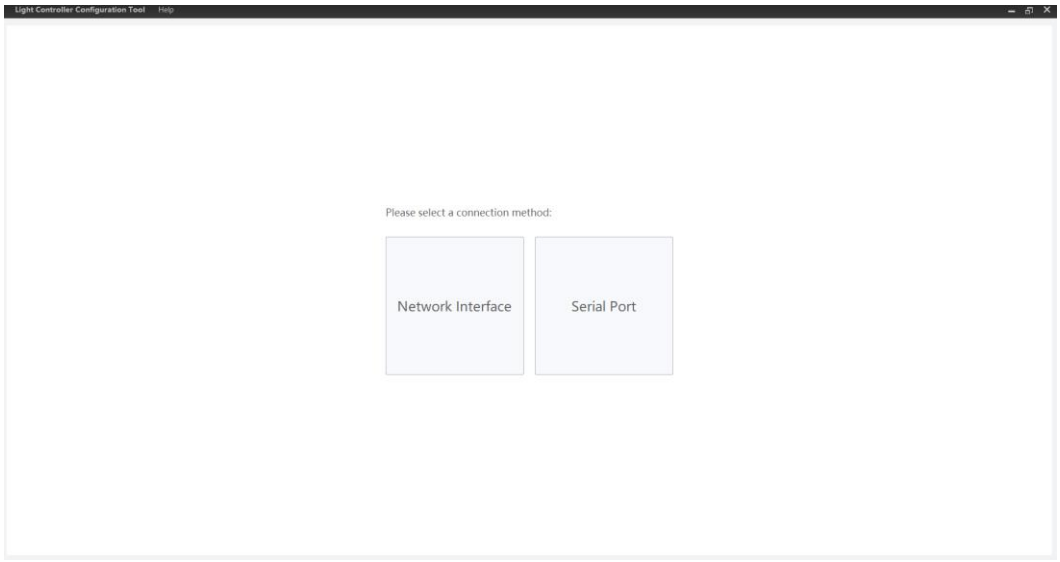

Figure 7-3 Select Network Interface

2. Click **Enumerate**, and select the device according to actual demands.
3. Click **Connect**, and the controller will display the device information, and you can set parameters accordingly. Click **Disconnect** to disconnect the device.

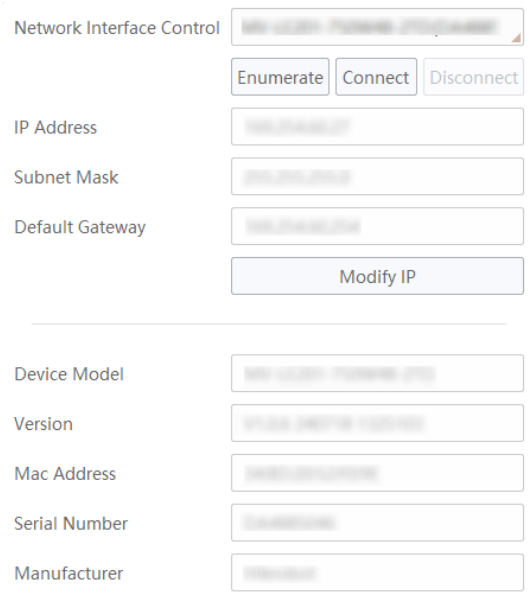

Figure 7-4 Network Interface Connection

4. If the light controller is in an unreachable state, it cannot be connected, and the IP of the light controller needs to be set manually. Click to modify the IP parameters, in the IP address modification dialog box, select Static IP, refer to the reachable subnet of the light controller (as shown in the red box below), set the IP address, subnet mask, and default gateway of the light controller, and click OK, as shown in the figure below.

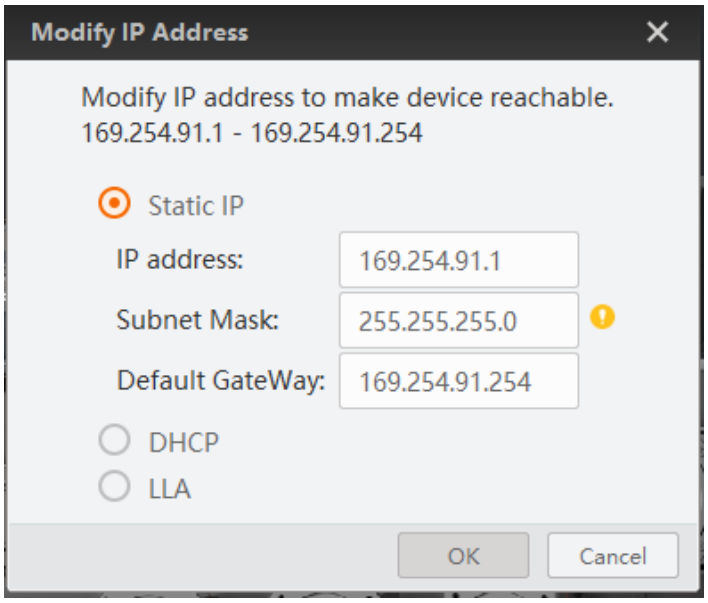

Figure 7-5 Modify IP Address

7.2.2 Serial Port Control via Controller

The serial port control module connects to the device via the serial port, and after a successful connection, parameter settings are made through the related modules on the right. The parameter control modules are: light source control, IO input, IO output, timer, and command line.

Before You Start

Use serial port cable to connect the device to a PC via serial port.

Steps

1. Run the digital light controller, and select Serial Port.

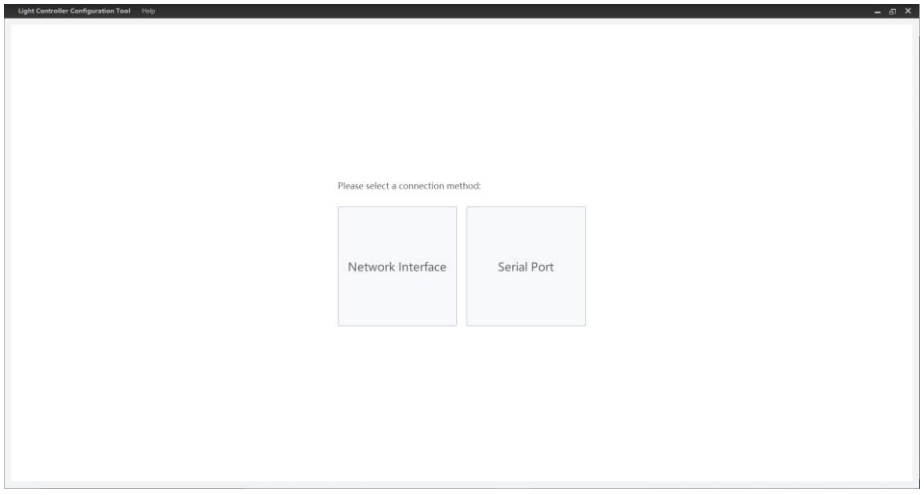

Figure 7-6 Select Serial Port

2. Click **Enumerate**, and select the device according to actual demands.
3. Select **Baud Rate** according to actual demands.
4. Click **Connect**, and the controller will display the device information, and you can set parameters accordingly. Click **Disconnect** to disconnect the device.

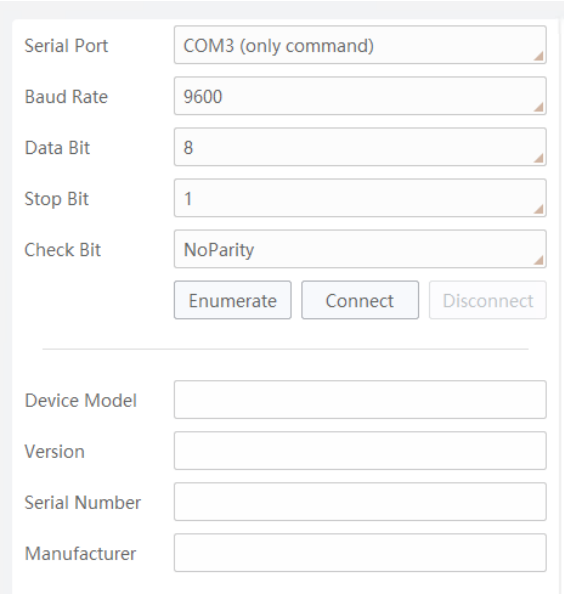

Figure 7-7 Serial Port Connection

7.3 Light Source Control

The light source control module may differ by device models, and there are two types of light source control modules. You can refer to the following section for details.

200 W, 500 W, and 750 W Devices

They can use the light source control module to set the light source brightness value and working mode, and at the same time, they can obtain the current parameters of the device, as shown in the figure below.

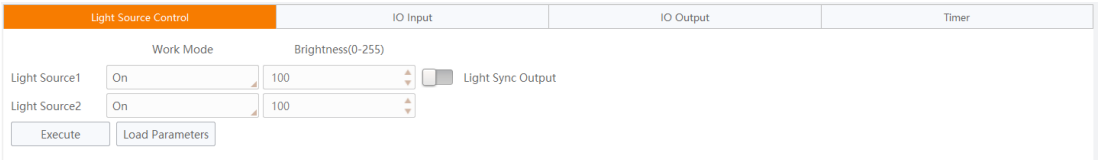

Figure 7-8 Light Source Control

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the current parameters of the light source.

2. Select light source from **Light Source 1** to **Light Source 2** corresponding CH1 to CH2 according to actual demands.
3. Select **Work Mode** according to actual demands.

Table 7-2 Working Mode Description

Working Mode	Description
Solid	The light source is in solid status.
Input 1/2	Use trigger input interface signal (IN 1/2) to control light source output.
Timer 1/2	Use timer 1/2 trigger signals to control light source output.
Off	The light source is turned off.

4. Set **Brightness** according to actual demands, and it ranges from 0 to 255.
5. Click **Execute** to let the device execute configured parameters.
6. (Optional) Check **Light Sync Output** to let the settings of CH 1 channel apply to other light source channels.

1200 W Device

1200 W device can set the working mode, light duration, and light delay time of the light source through the light source control module, as shown in the following figure.

Note

1200 W device does not support the adjustment of light source brightness.

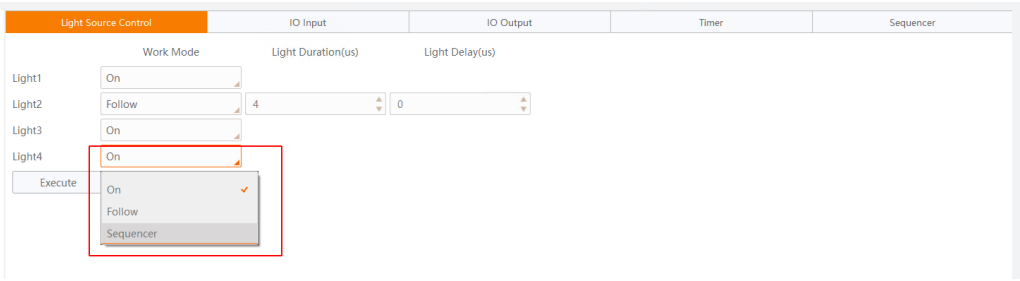

Figure 7-9 Light Source Control

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the current parameters of the light source.
2. Select light source from **Light Source 1** to **Light Source 4** corresponding CH1 to CH4 according to actual demands.
3. Select **Work Mode** according to actual demands.

Table 7-3 Light Source Control Working Mode

Working Mode	Description
On	The light source is in solid status.
Follow	Use trigger input interface signal (IN 1/2/3/4) to control light source output.
Sequencer	By triggering the input interface signals IN 1/2/3/4 or the timer 1/2/3/4 trigger signals, the light path output control is carried out according to the multi-light control logic.

Note

In constant mode and follow mode, the four light source channels can be controlled separately; in Sequencer mode, the working mode for all four light source channels is Sequencer mode.

- When the working mode is set to constant mode, the light source is in solid state, with a default brightness of 255.
- When the working mode is set to follow mode, it defaults to triggering through the input interfaces IN 1/2/3/4.
  After the light controller receives the trigger signal, it lights up the light source according to the set light duration (in microsecond) and light delay time (in microsecond). At this time, the four light source channels can be controlled separately.
- When the working mode is set to Sequencer mode, all light source channels are in Sequencer mode. Set the illumination duration (in microsecond) and light delay time (in microsecond) for all light sources to control their duration and delay time.

7.4 I/O Control Input

The I/O control input module may differ by device models, and there are two types of I/O control input modules. You can refer to the following section for details.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can set the debounce time and delay time for the input interfaces, obtain the level status of the input interfaces, and simultaneously set the inversion of the current level status through the IO input module, as shown in the figure below.

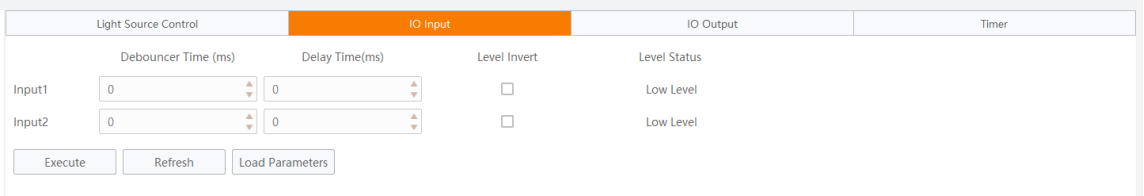

Figure 7-10 I/O Control Input

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the input parameters.
2. Use **Debouncer Time** to perform debounce of the trigger input signal source. The value should be between 0 and 1000, and the unit is ms.
3. Use **Delay Time** to set the delay time for the trigger input signal source. The value should be between 0 and 1000, and the unit is ms.
4. Check **Invert** to invert selected electrical level status of input signals.
5. Click **Refresh** to display the electrical level status of input signals, including **High Level** and **Low Level**.
6. Click **Execute** to let the device execute configured parameters.

1200 W Device

1200 W device can set the trigger polarity, trigger frequency division, and delay time of the input interface through the IO input module, as shown in the figure below.

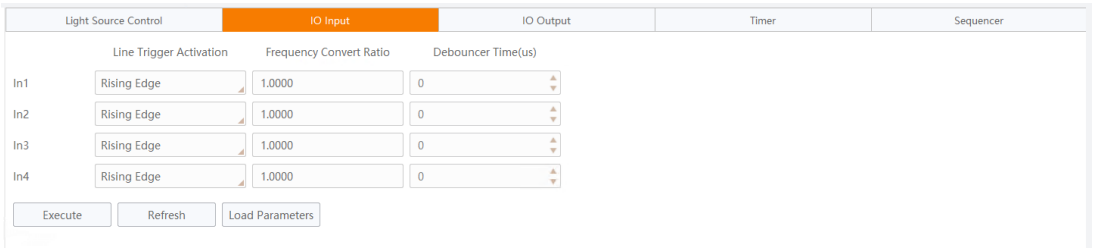

Figure 7-11 I/O Control Input

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the input parameters.
2. By using **Line Trigger Activation**, the trigger response method for the trigger input signal source can be set. It is possible to trigger on the rising edge, falling edge, high level, or low level of the signal source. For details on each trigger response method and their working principles, please refer to the table below.

Table 7-4 Trigger Response Mode

Trigger Polarity	Working Principles
Rising Edge	When the external device provides a signal level that transitions on the rising edge, the device receives the signal and triggers.
Falling Edge	When the external device provides a signal level that transitions on the falling edge, the device receives the signal and triggers.
High Level	When the external device provides a signal level that transitions on the falling edge, the device receives the signal and triggers.
Low Level	When the external device provides a signal level that is low, the device receives the signal and remains triggered continuously.

Frequency Convert Ratio: By using the trigger frequency division/multiplication parameter, the frequency of the input signal can be divided or multiplied. When the parameter value is less than 1, a frequency division operation is performed; when the parameter value is greater than 1, a frequency multiplication operation is performed.

Note

The trigger frequency multiplication parameter is only effective when the working mode is set to Sequencer mode.

3. Use **Debouncer Time** to perform debounce of the trigger input signal source. The value should be between 0 and 1000, and the unit is μs.
4. Click **Refresh** to display the electrical level status of input signals, including **High Level** and **Low Level**.
5. Click **Execute** to let the device execute configured parameters.

7.5 I/O Control Output

The I/O control output module may differ by device models, and there are two types of I/O control output modules. You can refer to the following section for details.

200 W, 500 W, and 750 W Devices

The device can set the signal source and level inversion for each trigger output port through the IO output module, as shown in the figure below.

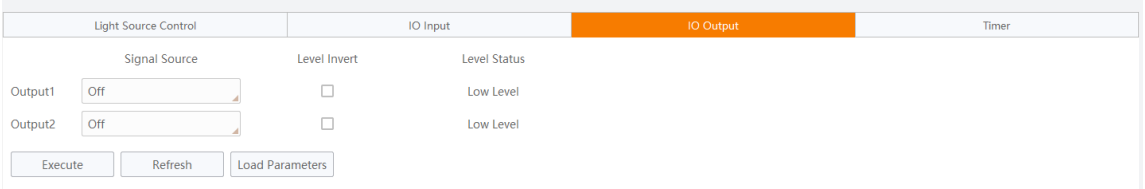

Figure 7-12 I/O Control Output

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the output parameters.
2. Select **Signal Source** of trigger output. The types and descriptions of signal sources are show below.

Table 7-5 Trigger Output Signal Source

Signal Source	Description
Solid	The light source is in solid state.
IN 1/2	Using IN1/2 input signals as the trigger output signal source.
Timer 1/2	Using timer 1/2 signals as the trigger output signal source.
Off	The signal source is in the off state.

3. Check **Invert** to invert selected electrical level status of output signals.
4. Click **Refresh** to display the electrical level status of output signals, including **High Level** and **Low Level**.
5. Click **Execute** to let the device execute configured parameters.

1200 W Device

1200 W device can set the signal output duration for each trigger output port through the IO output module, as shown in the figure below.

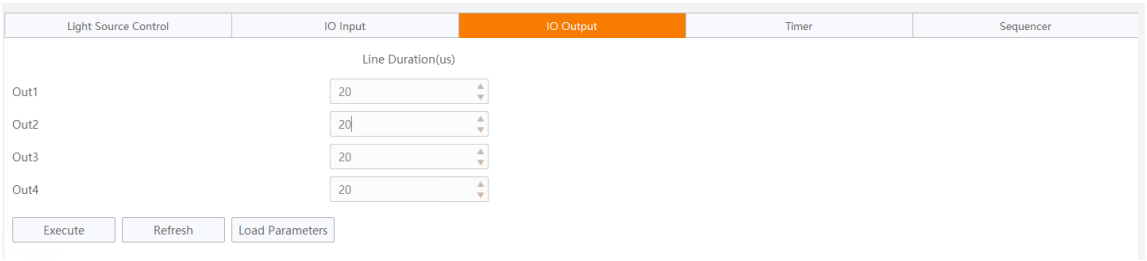

Figure 7-13 I/O Control Output

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

- Click **Load Parameters** to get the output parameters.
- Use **Line Durations** to set the duration of the signal output from the signal source. The value should be between 0 and 1000000 and the unit is μs.
- Click **Refresh** to display the electrical level status of output signals, including **High Level** and **Low Level**.
- Click **Execute** to let the device execute configured parameters.

7.6 Timer

The timer acts as an internal clock and provides a continuous square wave based on trigger conditions. When the device' trigger source selects the timer, the device will generate the corresponding trigger square wave according to the configured delay time and pulse width to delay the trigger of the external device.

200 W, 500 W, and 750 W Devices

200 W, 500 W, and 750 W devices can set parameters such as the trigger mode, trigger source, and trigger edge of the timer signal through the timer module, as shown in the figure below.

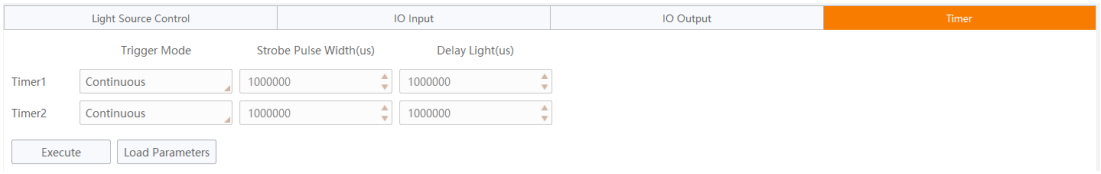

Figure 7-14 Timer Trigger

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the current timer's parameters.
2. Select **Trigger Mode** according to actual demands, including continuous and discontinuous mode.

Note

In the continuous mode, the light source will strobe flash continuously. While in the burst mode, the light source will strobe flash based on specific number.

3. Set **Strobe Pulse Width** (duration of the light source illumination for each strobe cycle) according to actual demands.
4. Set **Delay Light** (the delay time for the light source to illuminate) according to actual demands.
5. When selecting **Burst** mode, the following parameters need to be set.

- Set the signal source for the timer trigger. For details on the various trigger sources and their meanings, please refer to the table below.

Table 7-6 Trigger Source of Timer

Trigger Source	Description
Software Trigger	By using software triggering, a trigger signal is provided for the timer trigger.

Trigger Source	Description
	When the trigger source is set to software trigger, after clicking execute, a trigger signal can be sent to the light controller by clicking the software trigger button.
Input 1/2	Use IN 1/2 input signal as the trigger signal of the timer.

- Trigger Edge: Set the response method for the timer trigger, with options for the rising edge or the falling edge. When the trigger source is set to software trigger, the trigger type parameter is not supported.
- Trigger Amount: It sets the number of times the light source flashes.

6. Click **Execute** to send the configured parameters to the device and initiate the operation.

1200 W Device

The timer control function of 1200 W device needs to be used in conjunction with the Sequencer working mode, that is, when the working mode parameter under the light source control module is set to Sequencer, and the polling trigger source parameter under the sequencer module is set to timer 1/2/3/4, the timer module-related configurations can take effect.

Through the timer module, you can set the trigger mode, trigger polarity, strobe pulse width, and delay lighting parameters for the timer signal, as shown in the figure below.

Figure 7-15 Timer Trigger

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click Get Parameters to get the current timer's parameters.
2. Select the timer trigger mode, you can choose between continuous or single-shot mode.

Note

In the continuous mode, the light source will strobe flash continuously. While in the discontinuous mode, the light source will strobe flash based on specific number.

3. Set **Strobe Pulse Width** (duration of the light source illumination for each strobe cycle) according to actual demands.
4. Set **Delay Light** (the delay time for the light source to illuminate) according to actual demands.
5. When selecting **Burst** mode, the following parameters need to be set.

- Trigger Source: Set the timer trigger signal source to software trigger. After clicking

Execute, the trigger signal can be sent to the light controller by clicking **Trigger Software** button.

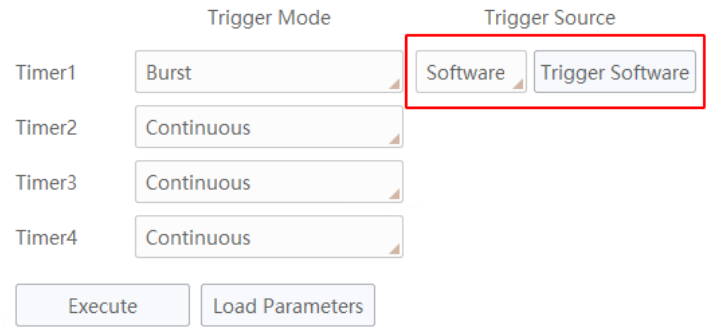

Figure 7-16 Software Trigger

- Trigger Times: Set the number of times the light source will strobe.

6. Click **Execute** to let the device execute configured parameters.

7.7 Sequencer Controller

The device supports the Sequencer working mode. In Sequencer mode, you need to set the polling control parameters through the sequencer module, as shown in the figure below.

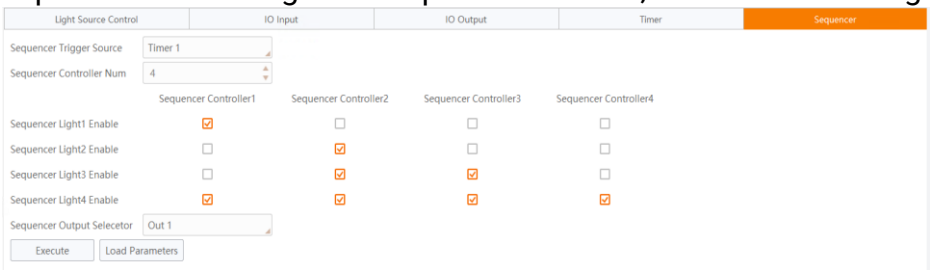

Figure 7-17 Sequencer Controller

Before You Start

Make sure that related wirings are completed and light source devices are connected.

Steps

1. Click **Load Parameters** to get the current timer's parameters.
2. Set the trigger signal for light source polling through the sequencer trigger source parameters, with options for external trigger (Input 1/2/3/4) or timer trigger (Timer 1/2/3/4).

Note

For external trigger source configurations, please refer to section ***1200 W Device*** in ***Set IO Input***. For timer trigger configurations, please refer to section ***1200 W Device*** in the ***Set Timer Control***.

3. Set the number of groups participating in the polling through the sequencer group parameter.

4. Check Enable Sequencer Light * under Sequencer * to set which light source needs to be turned on in this group polling.
5. Set the final I/O signal sent to external devices through the light controller using the polling output selection parameter. You can choose Output 1/2/3/4, which corresponds to OUT1/OUT2/OUT3/OUT4 on the device end.
6. Click **Execute** to let the device execute configured parameters.

7.8 Command Line

When the light controller is connected to the device via a serial port, you can set the device parameters through the serial command line. For more details, you can refer to section ***Appendix A Serial Communication Command List***.

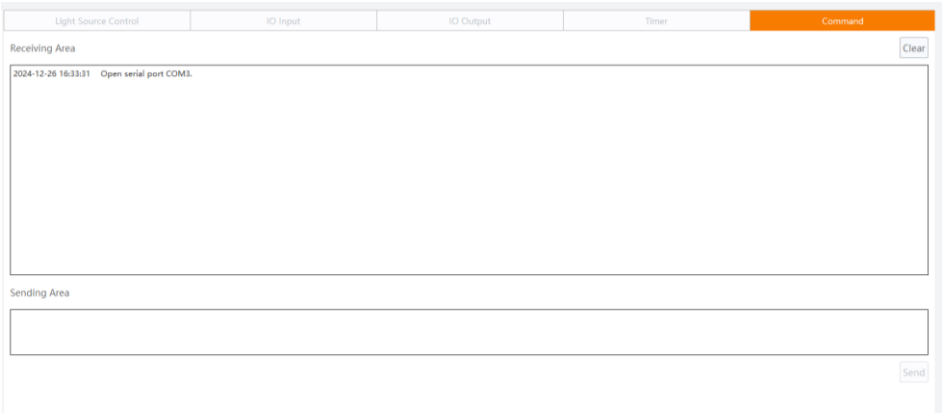

Figure 7-18 Serial Command Line

Before You Start

Connect the light source to the interface and ensure that the cables of the device are correctly connected. For details, please refer to section **Connect Device**.
The tool has enumerated the line scan light controller.

Steps

1. Select the COM port with "only command" in the drop-down serial port, as shown in the figure below.

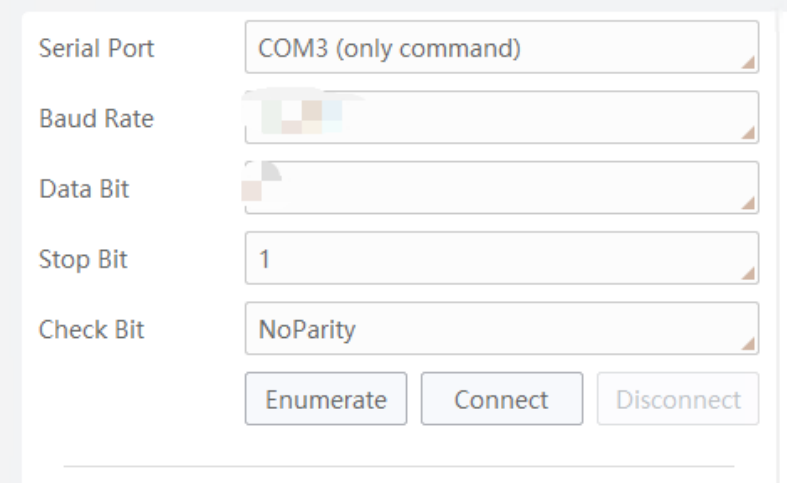

Figure 7-19 Select COM Port

2. Click **Connect**, and a command line module will appear on the right side of the tool's interface.
3. Enter the corresponding serial port command in the send box, and after clicking Send, the receive area will display the corresponding content.
4. (Optional) Click **Clear** in the upper-right corner of the receive area to clear its contents.

7.9 Update Firmware

The device supports updating firmware via the light controller.

Before You Start

Disconnect device in Network Interface/Serial Port Control area before updating firmware.

Steps

1. Click **Select File** to select firmware package (dav files).
2. Click **Update** to update the firmware.

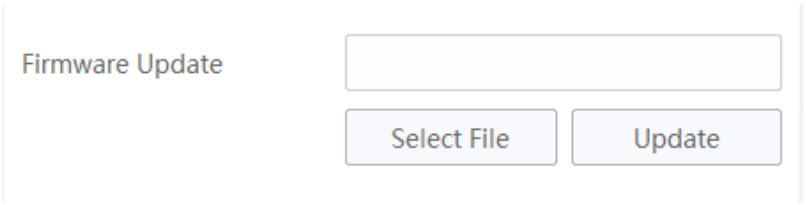

Figure 7-20 Update Firmware

Note

The device will restart automatically after updating is completed.

Chapter 8 FAQ (Frequently Asked Question)

8.1 Why PWR indicator on the control panel is unlit?

Table 8-1 Question 1

Possible Cause	Solution
The device is not powered on or the power switch is not pressed.	Check the power wiring, and make sure that the PWR indicator is solid red after powering on the device.

8.2 Why light source devices cannot be turned on?

Table 8-2 Question 2

Possible Cause	Solution
There is no voltage in the external trigger signal.	Check if there is broken circuit, incorrect polarity, etc.
Incorrect external trigger wiring.	Make sure that the light source interface of the light controller corresponds to correct external light source devices.
Incorrect light source work mode setting.	Set the light source mode as solid, and increase the brightness at the same time.

8.3 Why light source devices cannot be triggered?

Table 8-3 Question 3

Possible Cause	Solution
There is no voltage in the external trigger signal.	Check if trigger signal types or wirings are correct.
Incorrect external trigger wiring.	Make sure that the trigger related wirings are correct.
The voltage of the external trigger signal is too low.	Increase the voltage of the trigger signal

8.4 Why light source lights off intermittently?

Table 8-4 Question 4

Possible Cause	Solution
The load is too high and power switch power supply executes overload protection.	Reduce the load on the controller.

Chapter 9 Revision History

Table 9-1 Revision History

Version	Revision Date	Revision Details
V1.0.0	Feb. 20, 2025	Original version.
V1.0.1	Mar. 12, 2026	Update Sections ***Channel Button*** and ***Trigger Output Interface***.

Appendix A Serial Communication Command List

The serial port information used by the device as follows:

- Communication Protocol: RS-232
- Serial Baud Rate: 115200 bps
- Serial Data Bits: 8
- Serial Stop Bit: 1
- Serial Parity: None

Table A-1 Serial Communication Command List

Function	Start Symbol	Function Identifier	Channel Field	Data Field	End Symbol	Command	Description
Read Brightness	S	L	A to F	--	#	● Send: SLA# ● Return: LA0100	● Read the brightness of CH1. ● Reading the brightness of CH1 is 100.
						● Send: SLABCD# ● Return: LA0100B0080C0255D0010	● Read the brightness of CH1 to CH4. ● Reading the brightness of CH1 to CH4 is 100, 80, 255, and 10.
Set Brightness	S	L	A to F	Brightness level: 0000 to 0255	#	● Send: SLA0100# ● Return: LA0100	● Set the brightness of CH1 to 100. ● Setting the brightness of CH1 to 100 succeeded.
						● Send: SLA0100B0080C0255D0010# ● Return: LA0100B0080C0255D0010	● Set the brightness of CH1 to CH4 to 100, 80, 255, and 10. ● Setting the brightness of CH1 to CH4 to 100, 80, 255, and 10 succeeded.
Set Continuous/Trigger/Strobe Mode	S	T	A to F	0000/0001/0002 (continuous/trigger/strobe)	#	● Send: ST0000# ● Return: T0000	● Set continuous mode ● Setting continuous mode succeeds
						● Send: ST0001# ● Return: T0001	● Set trigger mode ● Setting trigger mode succeeds
						● Send: ST0002# ● Return: T0002	● Set strobe mode ● Setting strobe mode succeeds
Set On/Off	S	W	A to F	0000/0001 (on/off)	#	● Send: SWA0000# ● Return: WA0000	● Set the status of CH1 to On. ● Setting the status of CH1 to On succeeded.
						● Send: SWA0001B0000C0001D0001# ● Return: WA0001B0000C0001D0001	● Set the status of CH1 to CH4 to Off, On, Off, and Off. ● Setting the status of CH1 to CH4 to Off, On, Off, and Off succeeded.
Read Trigger Debounce Time	S	G	A to F	--	#	● Send: SGA# ● Return: GA0001	● Read the trigger debounce time of CH1. ● Reading the trigger debounce time of CH1 is 1 ms
Set Trigger Debounce Time	S	G	A to F	0000 to 1000 (unit: ms)	#	● Send: SGA0100# ● Return: GA0100	● Set the trigger debounce time of CH1 to 100 ms. ● Setting the trigger debounce time of CH1 to 100 ms succeeded.
Read Trigger Delay Time	S	H	A to F	--	#	● Send: SHA# ● Return: HA0100	● Read the trigger delay time of CH1. ● Reading the trigger delay time of CH1 is 100 ms
Set Trigger Delay Time	S	H	A to F	0000 to 1000 (unit: ms)	#	● Send: SHA0100# ● Return: HA0100	● Set the trigger delay time of CH1 to 100 ms.

Function	Start Symbol	Function Identifier	Channel Field	Data Field	End Symbol	Command	Description
							● Setting the trigger delay time of CH1 to 100 ms succeeded.
Set Trigger Level Inversion	S	I	A to F	0000/0001 (false/true)	#	● Send: SIA0001# ● Return: IA0001	● Set the trigger level inversion of CH1 to true. ● Setting the trigger level inversion of CH1 to true succeeded.
Read Trigger Level Status	S	J	A to F	--	#	● Send: SJA# ● Return: JA0001	● Read the trigger level status of CH1. ● Reading the trigger level status of CH1 is high.
Set IO Output Port Level Inversion	S	K	A to F	0000/0001 (false/true)	#	● Send: SKA0001# ● Return: KA0001	● Set the output port level inversion of CH1 to true. ● Setting the output port level inversion of CH1 to true succeeded.
Set IO Output Port Signal Source	S	M	A to F	0000/0001/0002 /0003 (on/in/timer/off)	#	● Send: SMA0002# ● Return: MA0002	● Set the IO output port signal source of CH1 to timer. ● Setting the IO output port signal source of CH1 to timer succeeded.
Read IO Output Port Level Status	S	N	A to F	--	#	● Send: SNA# ● Return: NA0001	● Read the IO output port level status of CH1. ● Reading the IO output port level status of CH1 is high.
Read Timer Duration	S	O	A to F	--	#	● Send: SOA# ● Return: OA0600	● Read the timer duration of CH1. ● Reading the timer duration of CH1 is 600 μs.
Set Timer Duration	S	O	A to F	0600 to 30000000 (unit: μs)	#	● Send: SOA0600# ● Return: OA0600	● Set the timer duration of CH1 to 600 μs . ● Setting the timer duration of CH1 to 600 μs succeeded.
Read Timer Delay Time	S	P	A to F	--	#	● Send: SPA# ● Return: PA0600	● Read the timer delay time of CH1. ● Reading the timer delay time of CH1 is 600 μs.
						● Send: SPABCD# ● Return: PA0999B0888C0777D0666	● Read the timer delay time of CH1 to CH4. ● Reading the timer delay time of CH1 to CH4 is 999 μs, 888 μs, 777 μs, 600 μs.
Set Timer Delay Time	S	P	A to F	0600 to 30000000 (unit: μs)	#	● Send: SPA0600# ● Return: PA0600	● Set the timer delay time of CH1. ● Setting the timer delay time of CH1 to 600 μs succeeded.
						● Send: SPA0999B0888C0777D0666# ● Return: PA0999B0888C0777D0666	● Set the timer delay time of CH1 to CH4 to 999 μs, 888 μs, 777 μs, 666 μs. ● Setting the timer delay time of CH1 to CH4 to 999 μs, 888 μs, 777 μs, 666 μs succeeded.
Set Count Value of the Timer under Burst Mode	S	R	A to F	0001 to 1023	#	● Send: SRA0100# ● Return: RA0100	● Set the count value of the timer under burst mode of CH1 ● Setting the count value of the timer under burst mode of CH1 to 100 succeeded.
Set the Trigger Source of the Timer under Burst Mode	S	V	A to F	0000/0001 (Software/in)	#	● Send: SVA0001# ● Return: VA0001	● Set the trigger source of the timer under burst mode for CH1 to in. ● Setting the trigger source of the timer under burst mode for CH1 to in succeeded.

Function	Start Symbol	Function Identifier	Channel Field	Data Field	End Symbol	Command	Description
Set Trigger Source of the Timer under Burst Mode to Trigger Once When it is Set to Software Trigger	S	X	A to F	0001	#	● Send: SXA0001# ● Return: XA0001	● Set the trigger source of the timer under burst mode for CH1 to trigger once when it is set to software trigger. ● Setting the trigger source of the timer under burst mode for CH1 to trigger once when it is set to software trigger succeeded.
Set the Trigger Edge When the Trigger Source of the Timer under Burst Mode is an External Signal	S	Y	A to F	0000/0001 (Rising Edge/Falling Edge)	#	● Send: SYA0001# ● Return: YA0001	● Set the trigger edge to Falling Edge when the trigger source of the timer under burst mode is an external signal. ● Setting the trigger edge to Falling Edge when the trigger source of the timer under burst mode is an external signal succeeded.
Save User Set/Restore Default	S	U	--	0000/0001 (save/reset)	#	● Send: SU0000# ● Return: U0000	● Save user parameters. ● Saving user parameters succeeded.
						● Send: SU0001# ● Return: U0001	● Restore user parameters to default. ● Restoring user parameters to default succeeded.
Read the Number of Light Source Channels	S	Z	--	000	#	● Send: SZ0000# ● Return: Z0004	● Read the number of light source channels. ● Reading the number of light source channels for controller is four.
Read/Set Error Return	--	L/P/T/W/ U/G/H/I/ J/K/M/N /O/Q/R /V/X/Y/Z	A to F or Empty	XXXX	--	Return: LAXXXX	An error occurs or invalid parameters are sent while searching/setting the brightness parameter of CH1.
						Return: PAXXXX	An error occurs or invalid parameters are sent while searching/setting the pulse width time parameter of CH1.
						Return: TAXXXX	An error occurs or invalid parameters are sent while searching/setting Solid/Trigger mode.
						Return: WAXXXX	An error occurs or invalid parameters are sent while searching/setting On/Off status of CH1.
						Return: UAXXXX	An error occurs or invalid parameters are sent while saving parameters or restoring default.
						Return: GAXXXX	An error occurs or invalid parameters are sent while setting the trigger debounce time of CH1.
						Return: HAXXXX	An error occurs or invalid parameters are sent while reading trigger debounce time of CH1.
						Return: IAXXXX	An error occurs or invalid parameters are sent while setting the trigger level inversion of CH1.
						Return: JAXXXX	An error occurs or invalid parameters are sent while reading the trigger level inversion of CH1.
						Return: KAXXXX	An error occurs or invalid parameters are sent while setting the output port level inversion of CH1.
						Return: MAXXXX	An error occurs or invalid parameters are sent while setting the output port signal source of CH1.
						Return: NAXXXX	An error occurs or invalid parameters are sent while reading the output port level inversion of CH1.
						Return: OAXXXX	An error occurs or invalid parameters are sent while reading/setting the timer duration of CH1.
						Return: RAXXXX	An error occurs or invalid parameters are sent while setting the count value of the timer under burst mode of CH1.
						Return: VAXXXX	An error occurs or invalid parameters are sent while setting the trigger source of the timer under burst mode for CH1.
Read/Set Error Return	--	L/P/T/W/ U/G/H/I/ J/K/M/N	A to F or Empty	XXXX	--	Return: XAXXXX	An error occurs or invalid parameters are sent while setting the trigger source of the timer under burst mode for CH1 to trigger once when it is set to software trigger.

Function	Start Symbol	Function Identifier	Channel Field	Data Field	End Symbol	Command	Description
		/O/Q/R/V /X/Y/Z				Return: YAXXXX	An error occurs or invalid parameters are sent while setting the trigger edge when the trigger source of the timer under burst mode is in.
						Return: ZAXXXX	An error occurs or invalid parameters are sent while reading the number of light source channels.

Note

A to F represents CH1 to CH6.

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