

Hikrobot Co., Ltd.

GigE Frame Grabber

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 GigE Frame Grabber.

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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, incorrect model, missing parts, etc. when unpacking.
- Avoid storing and transporting the device in places where have water splashing and rain, direct sunlight, strong electric fields, strong magnetic fields, strong vibrations, etc.
- Avoid dropping, smashing, or vigorously vibrating the device and components during handling.
- Do not touch the electronic components of the device with bare hands, which may cause damage to the device due to ESD.
- When installing the device, it needs to be installed by professionals under the condition of electrostatic protection. The PCB should not be exposed after the device is installed.
- 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.
- When the device is installed in a cabinet or terminal equipment, the cabinet or terminal equipment shall be provided with corresponding protective devices such as fireproof enclosures, electrical protective enclosures and mechanical protective enclosures, and

the protection level shall comply with IEC standards and local laws and regulations.

- In the use of the device, you must be in strict compliance with the electrical safety regulations of the nation and region.
- Make sure that the power consumption of ATX meets that of the device. For the specific power consumption of the device, please refer to the device's specifications.
- 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 is not working properly, contact the store or the nearest service center. Do not disassemble or modify the device in any way. (The company does not bear any liability for any problem arising from unauthorized modification 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.
- Please read the manual and safety instructions carefully before installing the device.
- The device must not be exposed to water droplets or splashes, and it is strictly prohibited to place anything containing liquids (such as vases) on the device.
- The device should not be placed with exposed flame sources, such as lighted candles.
- Do not touch sharp edges of 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.

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.
- Make sure that the connector metal barrier of the device is well connected to the PC and other chassis, and if necessary, copper foil should be used to enhance the grounding effect.
- 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.

Chapter 2 Overview

2.1 Introduction

The GigE frame grabber adopts four RJ45 interfaces and supports connecting to four cameras at most. It adopts onboard cache for image processing, which can reduce CPU load. The frame grabber can connect to the computer via the PCIe Gen2×4 bus and uses DMA technology to read acquired image data rapidly.

2.2 Key Feature

- Supports GigE Vision protocol and single channel can access to 1 Gbps at most.
- Supports PoE and single channel can provide 15 W at most.
- Adopts bus indicator and stream indicator to display frame grabber status in real time.
- Adopts multiple I/O interfaces and integrates inputs and outputs.
- Complies with general network protocol.
- Provides SDK for secondary development.
- Comply with GenICam standard.

Note

- The key features may differ by device models.
 - Refer to the specification of the frame grabber for detailed parameters.
-

Chapter 3 Appearance, Connector, and Indicator

3.1 Appearance

Note

- Refer to the specification of the frame grabber for specific appearance and dimension.
 - The appearance is subject to change, and the actual device you purchased shall prevail.
-

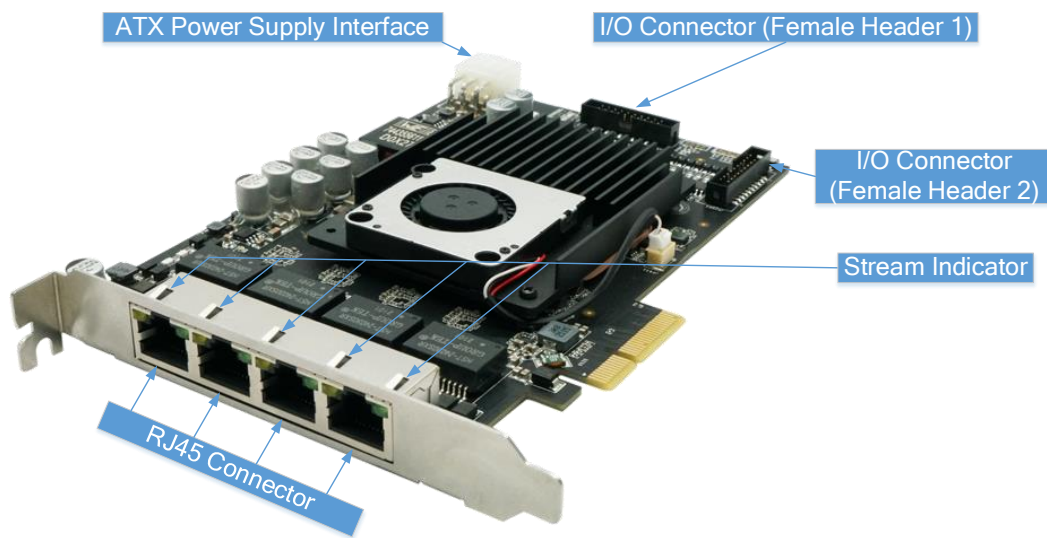


Figure 3-1 Appearance

3.2 ATX Power Supply Interface

The ATX power supply interface is used for PoE link power supply. When the RJ45 interface uses the PoE function, make sure that the interface is connected to the 6-pin ATX 12V power supply cable of the host. The connection diagram is shown below.

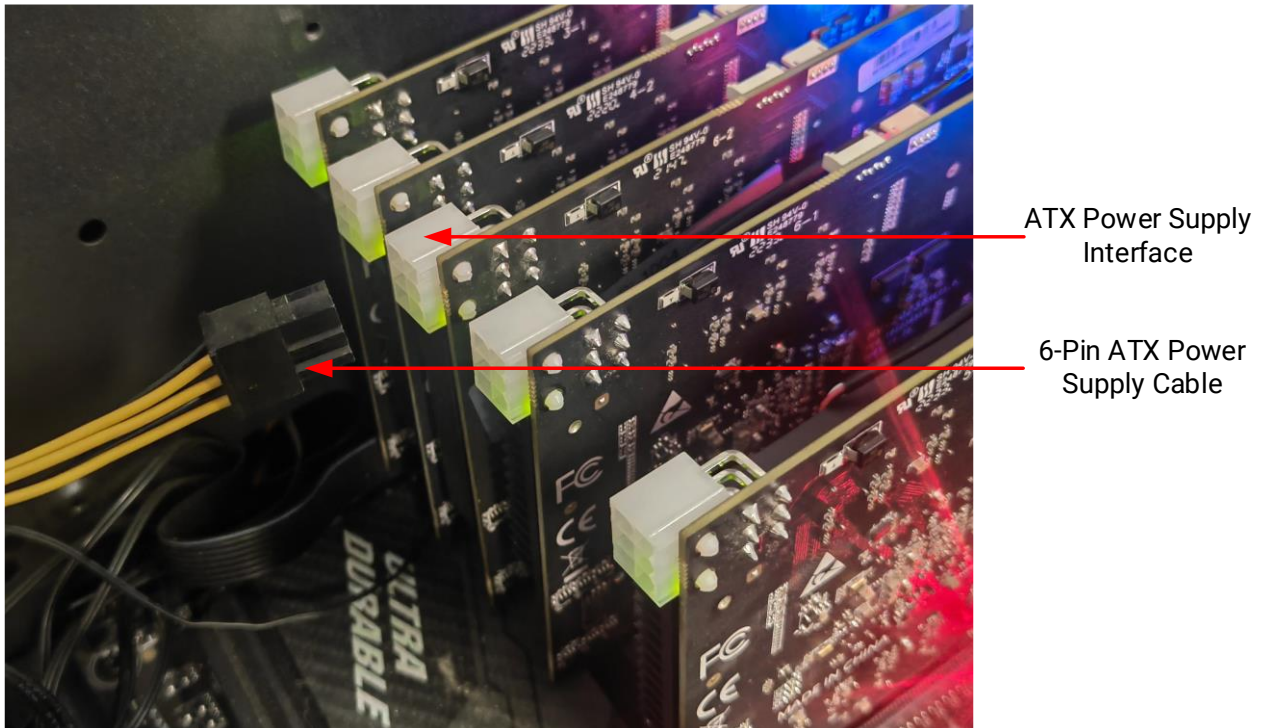


Figure 3-2 ATX Power Supply Interface

3.3 I/O Connector

The frame grabber has multiple I/O connectors that provide input and output signals. You can use the I/O cable to connect the frame grabber and external devices.

Female Header 1

Refer to the figure and table below for the pin definition of the female header 1.

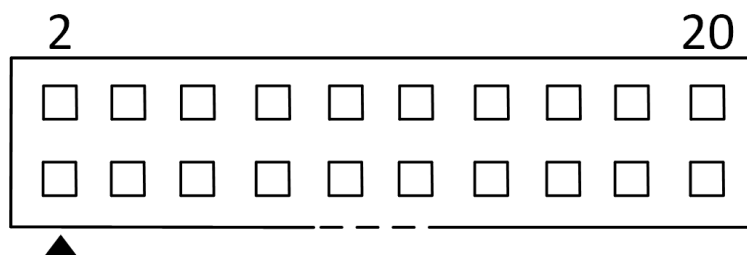


Figure 3-3 Female Header 1

Note

The non-isolated I/O ground can be used as the signal ground of other signals apart from opto coupler input/output.

Table 3-1 Pin Definition of Female Header 1

No.	Signal	Description	No.	Signal	Description
1	OPTO_IN0	Opto coupler input 0	11	TTL_INPUT0	TTL input 0
2	OPTO_IN1	Opto coupler input 1	12	TTL_INPUT1	TTL input 1
3	OPTO_IN2	Opto coupler input 2	13	TTL_INPUT2	TTL input 2
4	OPTO_IN3	Opto coupler input 3	14	TTL_INPUT3	TTL input 3
5	IN_COM	Opto coupler input ground	15	GND	Non-isolated I/O ground
6	OPTO_OUT0	Opto coupler output 0	16	TTL_OUTPUT0	TTL output 0
7	OPTO_OUT1	Opto coupler output 1	17	TTL_OUTPUT1	TTL output 1
8	OPTO_OUT2	Opto coupler output 2	18	TTL_OUTPUT2	TTL output 2
9	OPTO_OUT3	Opto coupler output 3	19	TTL_OUTPUT3	TTL output 3
10	OUT_COM	Opto coupler output ground	20	GND	Non-isolated I/O ground

Female Header 2

Refer to the figure and table below for the pin definition of the female header 2.

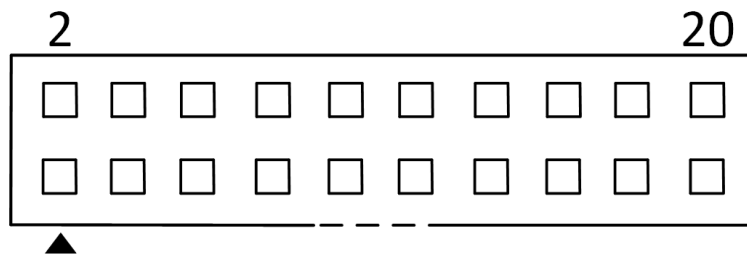


Figure 3-4 Female Header 2

Note

The non-isolated I/O ground can be used as the signal ground of other signals apart from opto coupler input/output.

Table 3-2 Pin Definition of Female Header 2

No.	Signal	Description	No.	Signal	Description
1	TX422_0P	422 output 0	11	GND	Non-isolated I/O ground
2	TX422_0N	422 output 0	12	TX422_2P	422 output 2

No.	Signal	Description	No.	Signal	Description
3	GND	Non-isolated I/O ground	13	TX422_2N	422 output 2
4	RX422_0P	422 input 0	14	RX422_2P	TTL input 2
5	RX422_0N	422 input 0	15	RX422_2N	422 input 2
6	GND	Non-isolated I/O ground	16	GND	Non-isolated I/O ground
7	TX422_1P	422 output 1	17	TX422_3P	TTL output 3
8	TX422_1N	422 output 1	18	TX422_3N	TTL output 3
9	RX422_1P	422 input 1	19	RX422_3P	TTL output 3
10	RX422_1N	422 input 1	20	RX422_3N	422 input 3

I/O Adapter Cable

The I/O adapter cable is shown below. One end of the cable is DB26 connector that can be connected to external devices. The 1 to 20 pins of the DB26 connector have the same pin definition with that of the female header, and 21 to 26 pins are reserved. The other end of the cable is female header that can be connect to the frame grabber's female header.

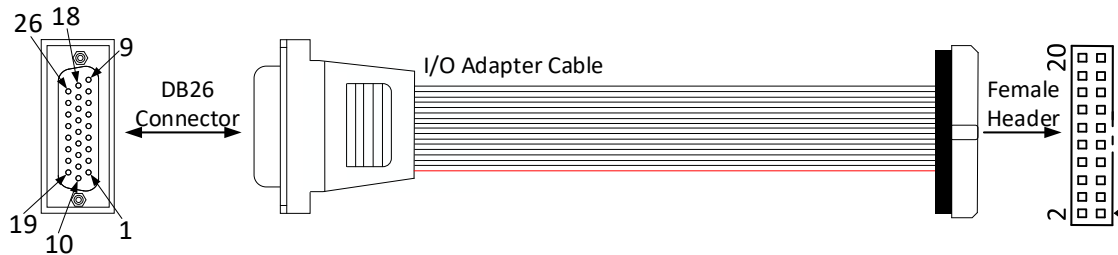


Figure 3-5 I/O Adapter Cable



Figure 3-6 I/O Adapter Cable

Note

- The I/O adapter cable is sold separately, and you can contact the technical support to purchase it.
 - MV-GE1104 frame grabber does not support I/O Connector
-

3.4 PCIe2.0 Interface

The frame grabber has a PCIe2.0 interface in x4 mode, which can be connected to the host. When in use, the PCIe2.0 interface of the frame grabber can be inserted into the X8 or X16 slots of the host, as shown below.

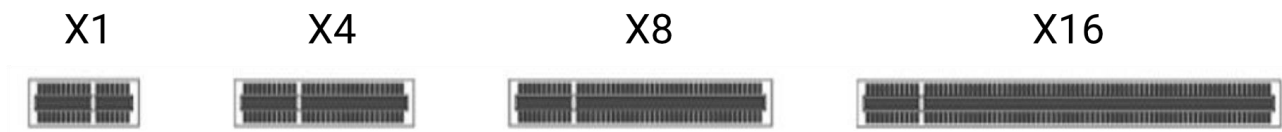


Figure 3-7 PCIe2.0 Interface

3.5 GigE Interface

The frame grabber has four RJ45 interfaces (0 to 3) that are used to connect GigE network.

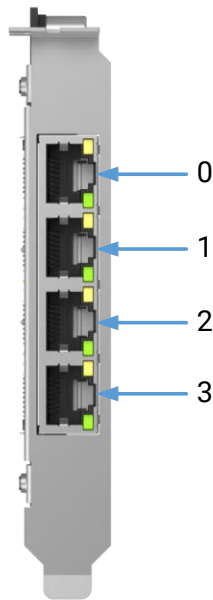


Figure 3-8 GigE Interface

Note

MV-GE1104 frame grabber does not support PoE function.

3.6 Indicator

The frame grabber has 3 types of indicators, including PoE indicator, bus indicator, and stream indicator.

PoE Indicator

PoE indicator is used to indicate the status of PoE 48 V power supply.

Table 3-3 PoE Indicator Definition

Status	Description
Solid	The power supply is normal.
Unlit	The power supply is abnormal or 6-pin ATX 12V power supply cable is not connected.

Note

MV-GE1104 frame grabber neither supports PoE function nor has PoE indicator.

Bus Indicator

Bus indicator is used to indicate whether the host's PCIe identifies the frame grabber.

Table 3-4 Bus Indicator Definition

Status	Description
Solid	The PCIe identifies the frame grabber.
Unlit	The PCIe does not identify the frame grabber

Stream Indicator

Stream indicator is used to indicate the status of GigE interface, and each GigE interface has 2 stream indicators.

Table 3-5 Stream Indicator Definition

Status	Description
Solid Green	The network is connected.
Flashing Yellow	The data is being transmitted.

Chapter 4 Installation

4.1 Installation Preparation

Table 4-1 Installation Preparation

Category	Name	Description
Software	MVS Client Software	It is used to enumerate and set the frame grabber parameters.
	MVS Tool Kit	It is used to provide tool kit for you to finish the frame grabber function configuration.
Hardware	GigE Network Cable	It is used to connect the frame grabber and cameras.
	I/O Adapter Cable	It is used to connect the frame grabber and external devices to realize I/O signal input/output.
API Function Library	SDK	It is used for the secondary development.
Firmware Package	MV_GE1004_... .zip MV_GE1104_... .zip	It is used to update the frame grabber firmware.

4.2 Install Frame Grabber

Before You Start

- Power off the host before installing the frame grabber, and then power on the host after the frame grabber is installed to avoid damage to it.
- In order to avoid the damage of human body static electricity to the frame grabber, make sure to clear the body static electricity before installing the frame grabber. Under normal circumstances, you can choose to touch the ground or computer metal shell and other simple methods to quickly release the body static electricity.

Steps

1. Insert the frame grabber into the computer's PCIe2.0 × 4 slot or above.
2. Use screws to fix the frame grabber with the host.
3. Use the cable of 6-pin ATX 12V to connect the frame grabber's ATX power supply interface to the host if PoE function is used.
4. Use GigE network cable to connect the camera and the frame grabber.

4.3 Install MVS Client Software

Note

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

Steps

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

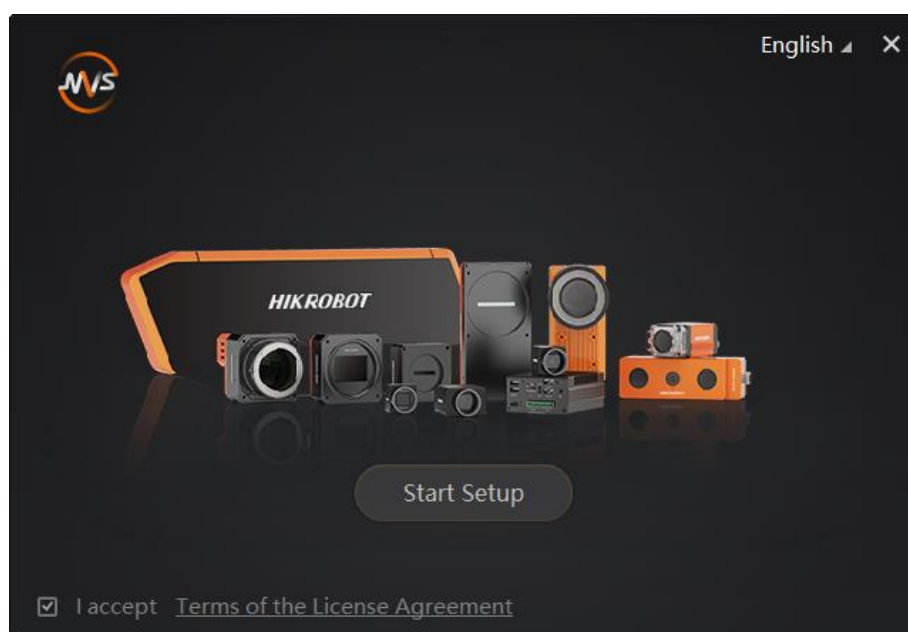


Figure 4-1 Installation Window

4. Click **Start Setup**.
5. Select installation directory, driver and others.
 - **Select Driver:** You can select **GIGE**, **USB 3.0** and **PCIE** according to actual demands.
 - **Others:** Select **Enable built-in debug features** to make it easier to use breakpoints while the device is connected and streaming images. Select **Enable Jumbo Frame for All NICs** to enhance network transmission performance. Select **PCie-CML**, **PCie-CXP**, **PCIE-GEV**, **PCIE-XoF** to enumerate the corresponding frame grabbers.

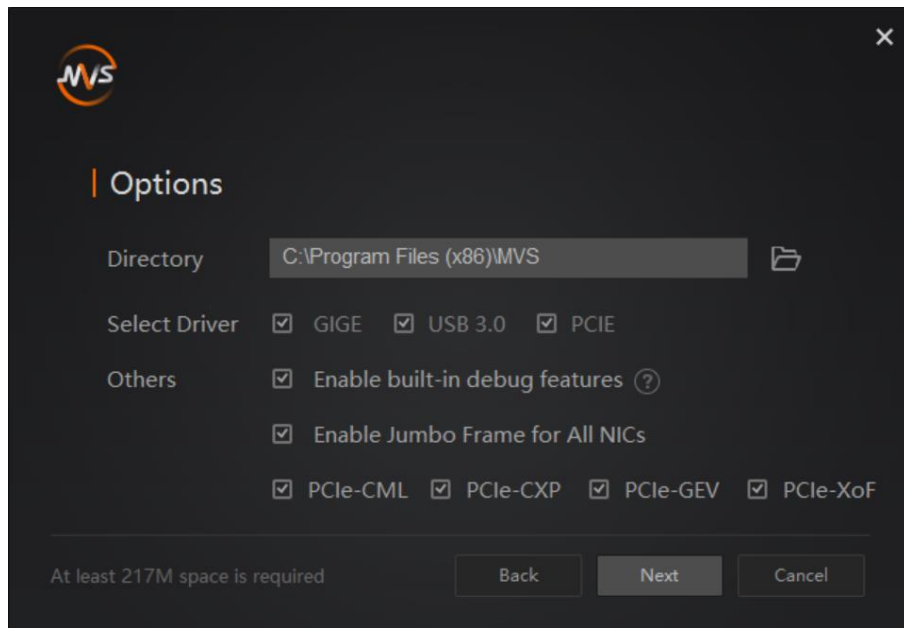


Figure 4-2 Installation Options

 Note

- Regarding options, it is recommended to keep default settings.
 - **PCle-CML, PCle-CXP, PCIE-GEV, PCIE-XoF** can be checked only when **PCIE** is checked.
 - **PCle-CML, PCle-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.

Chapter 5 Basic Operation of Client Software

5.1 PCIe

The frame grabber and the camera connected to the frame grabber can be enumerated via PCIe in the device list of the MVS client software. You can also set parameters and update firmware of the frame grabber via the client software.

Steps

Note

Refer to the user manual of the camera and client software for detailed operations.

1. Run the MVS client software.
2. Click  in **PCIe** in device list, and the client software will enumerate the frame grabber automatically.
3. Click  in the specific frame grabber name to connect it. The main window of the client software is shown below.

5.2 Client Software Layout

The main window of the MVS client software is displayed after you connect a frame grabber to it.

Note

- For specific main window of the MVS client software, please refer to the actual one you got.
 - The feature tree displayed in the client software may differ by device models.
-

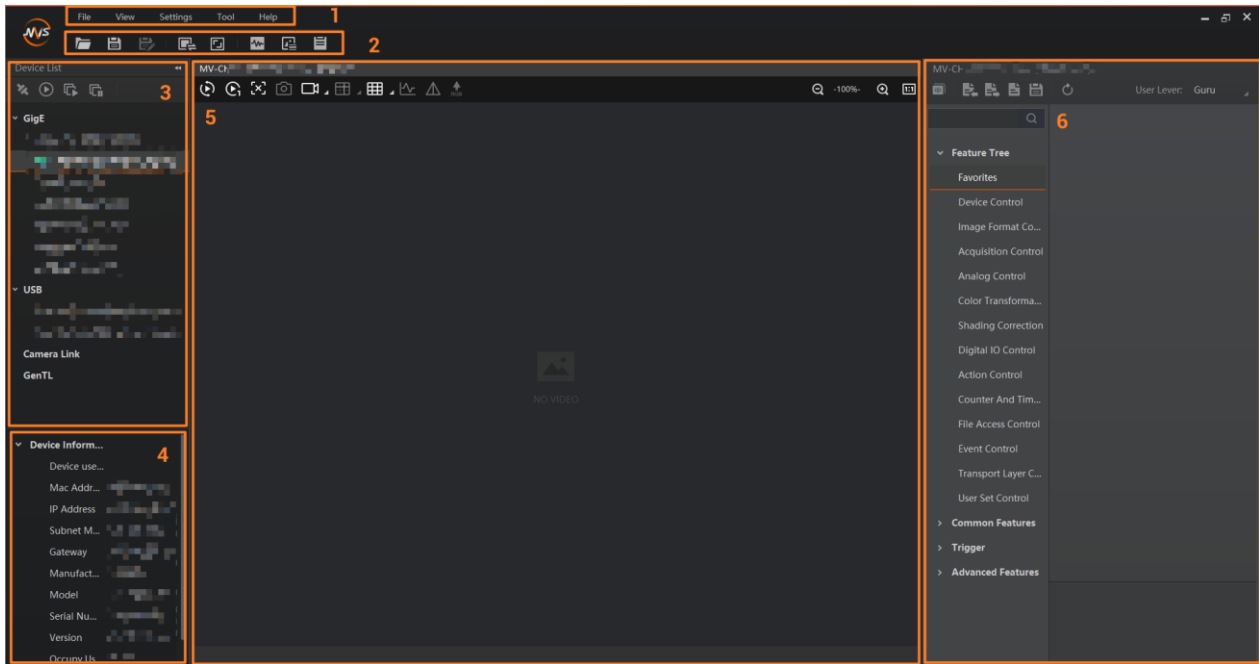


Figure 5-1 Main Window

Table 5-1 Main Window Description

No.	Area 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.
3	Device List Panel	This panel displays device list, and you can connect or disconnect device, etc.
4	Device Information Panel	This panel displays the detailed device information.
5	Display Window	This area displays the acquisition images in real-time. You can click different icons to capture and save image, record, etc.
6	Feature Panel	You can view and set features of the selected device.

Table 5-2 Parameter Description

Parameter Name	Description
Device Control	It displays the basic information about the frame grabber.
GigE	It sets PoE related parameters.
Stream	It selects specific stream, enables frame delay and quick frame mode, etc.

Parameter Name	Description
Encoder Control	It sets signal sources and other parameters of the encoder.
Digital IO Control	It sets the I/O signals.
Counter and Timer Control	It sets signal sources and other parameters of the counter.
User Set Control	It allows loading or saving default or user-defined settings.

5.3 GigE

MV-GE1104 frame grabber not only supports enumeration via PCIe, but also via virtual network interface card (NIC).

Note

Under the virtual NIC, only the first connected camera can acquire images from the card side through DMA.

Steps

1. Go to **GigE** in device list, and find the virtual NIC of MV-GE1104 and its connected cameras.

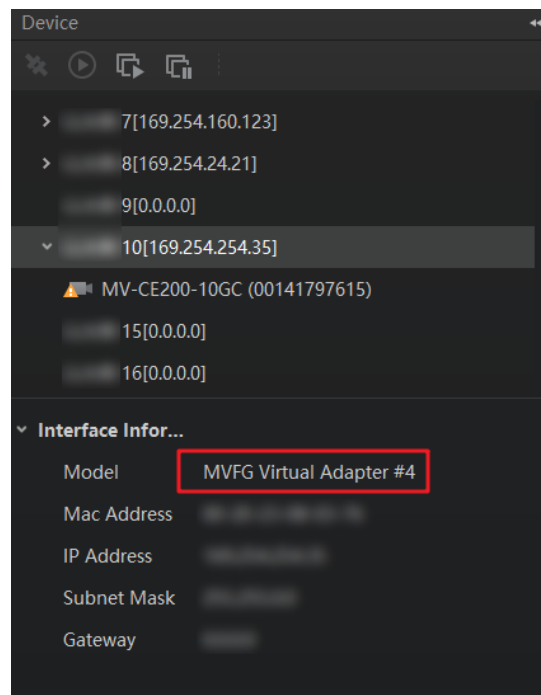


Figure 5-2 Virtual NIC

2. Right click the virtual NIC of MV-GE1104 after selecting it, and click **NIC Settings**.

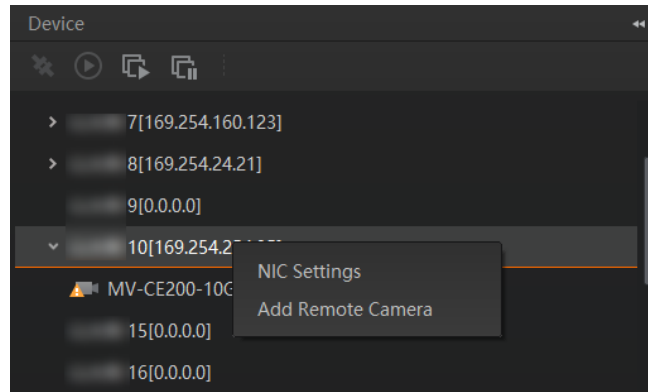


Figure 5-3 NIC Settings

3. Set parameters of the NIC via the NIC configurator tool according to actual demands.

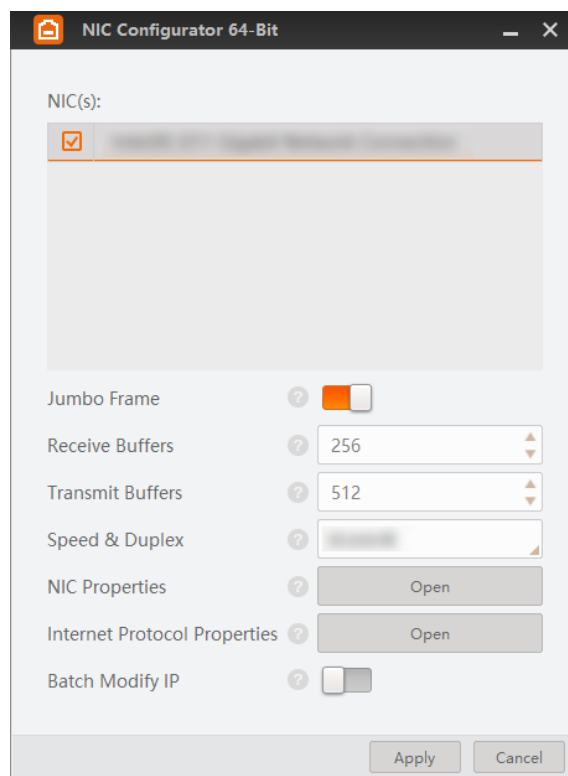
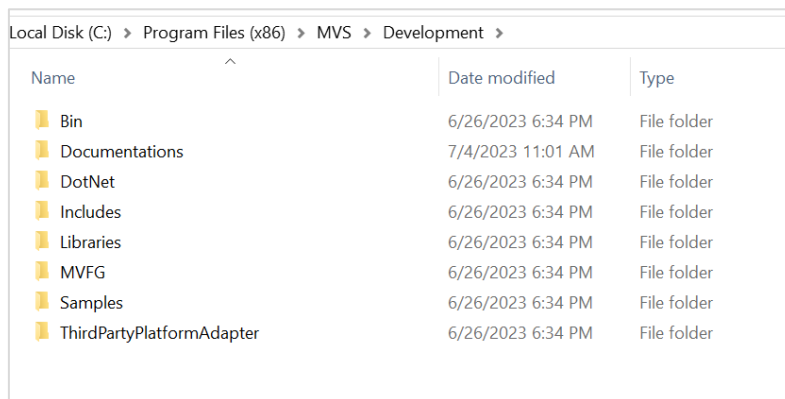


Figure 5-4 Set NIC Parameters

5.4 Secondary Development

Users can perform secondary development of the frame grabber. The SDK secondary development data path is located in C:\Program Files (x86)\MVS\Development, as shown

below. Refer to the following table for the specific contents of each folder.



Name	Date modified	Type
Bin	6/26/2023 6:34 PM	File folder
Documentations	7/4/2023 11:01 AM	File folder
DotNet	6/26/2023 6:34 PM	File folder
Includes	6/26/2023 6:34 PM	File folder
Libraries	6/26/2023 6:34 PM	File folder
MVFG	6/26/2023 6:34 PM	File folder
Samples	6/26/2023 6:34 PM	File folder
ThirdPartyPlatformAdapter	6/26/2023 6:34 PM	File folder

Figure 5-5 Secondary Development

Table 5-3 Parameter Description

Folder Name	Content Description
Bin	It is the result of the compilation.
Documentations	It is secondary development documentation, including SDK development guide and Demo instructions.
DotNet	.NET assembly.
Includes	Header files.
Libraries	Static library.
MVFG	The SDK contents of frame grabber, including secondary development documentation, some dynamic libraries developed in C#, header files, static library, sample code, and third-party platform plug-ins.
Samples	Sample code for various programming languages.
ThirdPartyPlatformAdapter	Third-party platform plug-ins.

Chapter 6 Operating Principle

The onboard diagram of the frame grabber is shown below. The working process of streaming from the designated camera via the frame grabber is as follows:

After the frame grabber establishes a connection with the camera, the PC side sends a streaming control instruction to the frame grabber through PCIe, and after the frame grabber GVCP data packet and MAC layer processing, the network packet is sent through the external PHY. The external PHY receives the camera network data packet, extracts the valid GVSP stream data packet after MAC layer parsing, sends it to the stream extraction module for image extraction, storage and ISP image processing, and transmits the valid image data to the PC side through PCIe.

Besides, MV-GE1004 frame grabber supports ToE trigger function. External I/O trigger sends action network packets to trigger the camera.

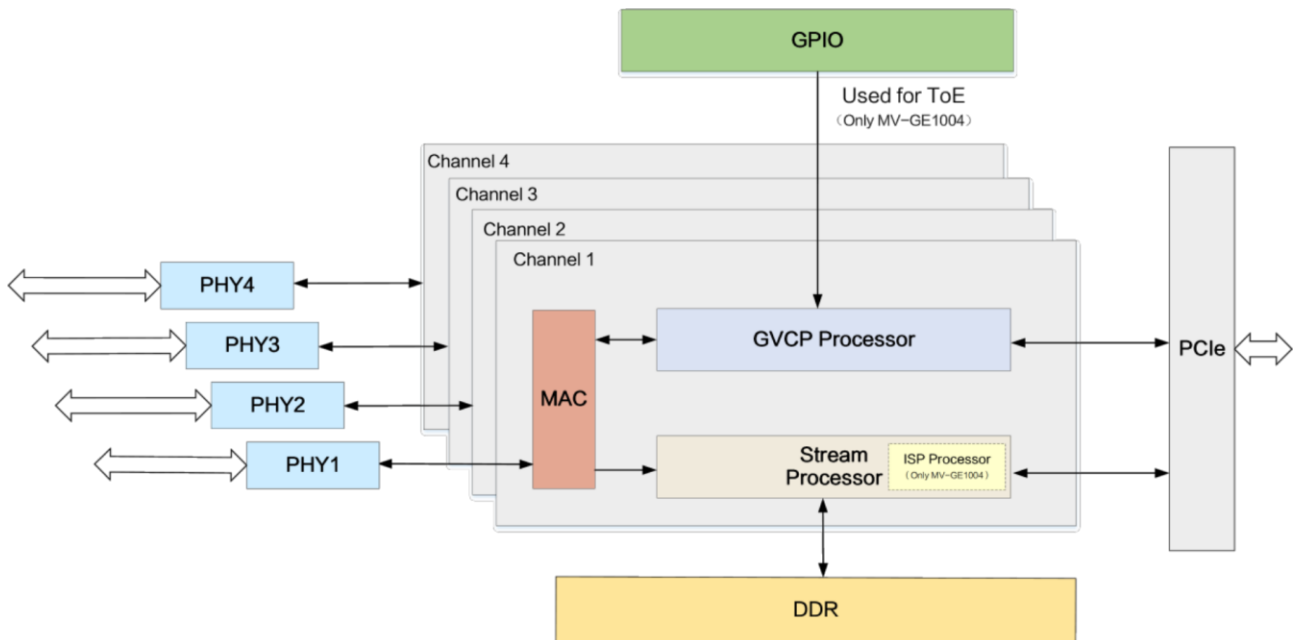


Figure 4-1 Operating Principle

Chapter 7 I/O Introduction

Note

MV-GE1004 frame grabber does not support I/O input and output.

7.1 I/O Electrical Feature

7.1.1 Opto Coupler Input

The frame grabber has 4 opto coupler-isolated input signals, and their internal circuit is shown below.

Note

The max. input current is 25 mA.

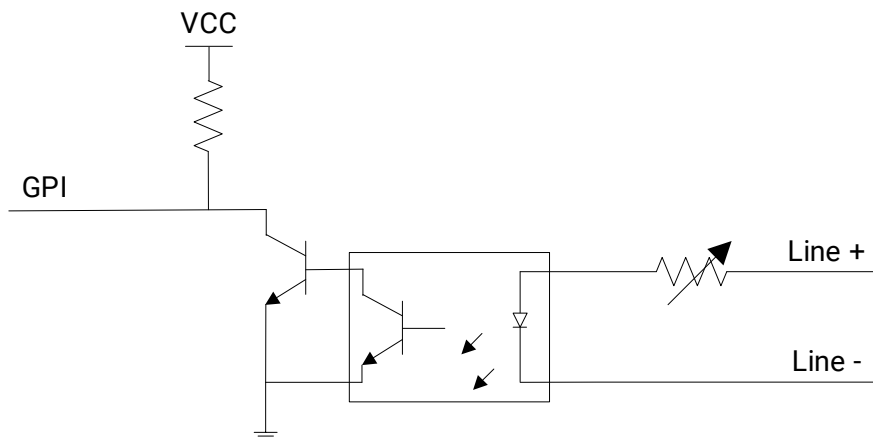


Figure 7-1 Internal Circuit of Opto Coupler Input

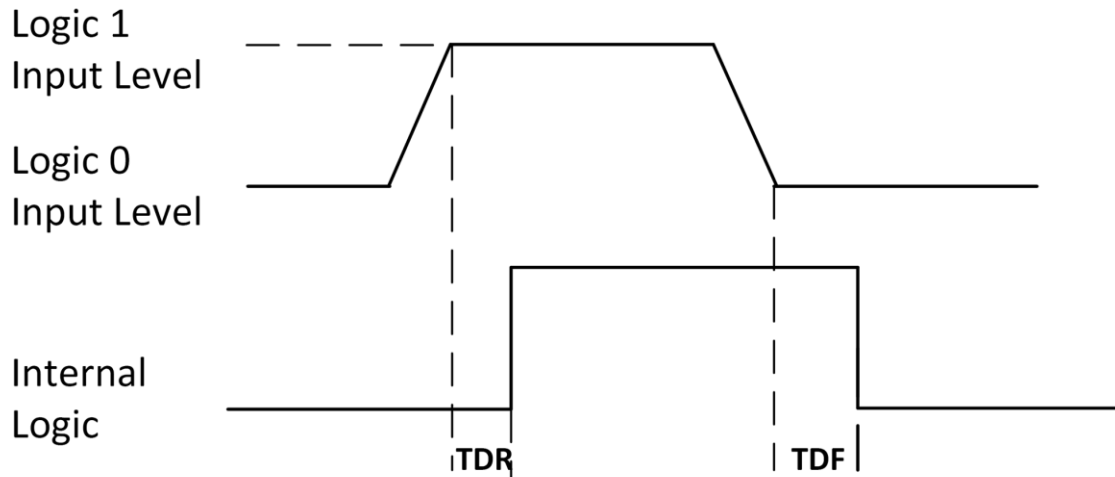


Figure 7-2 Input Logic Level

Note

- The electric circuit status is not stable when the input voltage is between 1 VDC and 1.5 VDC, and avoid this voltage range.
- The breakdown voltage is 30 VDC and keep voltage stable.

Table 7-1 Opto Coupler Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	0 VDC to 1 VDC
Input Logic Level High	VH	1.5 VDC to 24 VDC
Input Rising Delay	TDR	1.8 μ s to 4.6 μ s
Input Falling Delay	TDF	16.8 μ s to 22 μ s

7.1.2 Opto Coupler Output

The frame grabber has 4 opto coupler-isolated output signals, and their internal circuit is shown below.

Note

The max. output current is 25 mA.

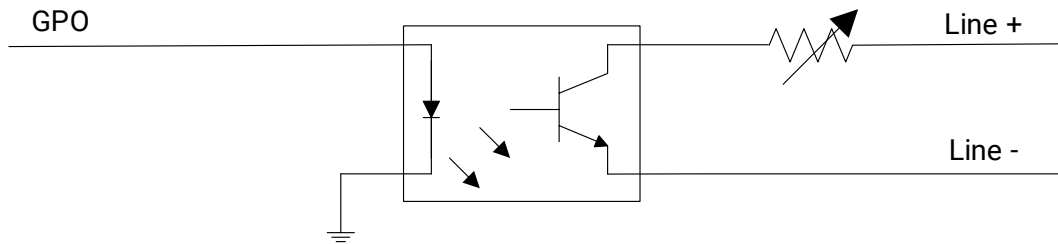


Figure 7-3 Internal Circuit of Opto Coupler Output

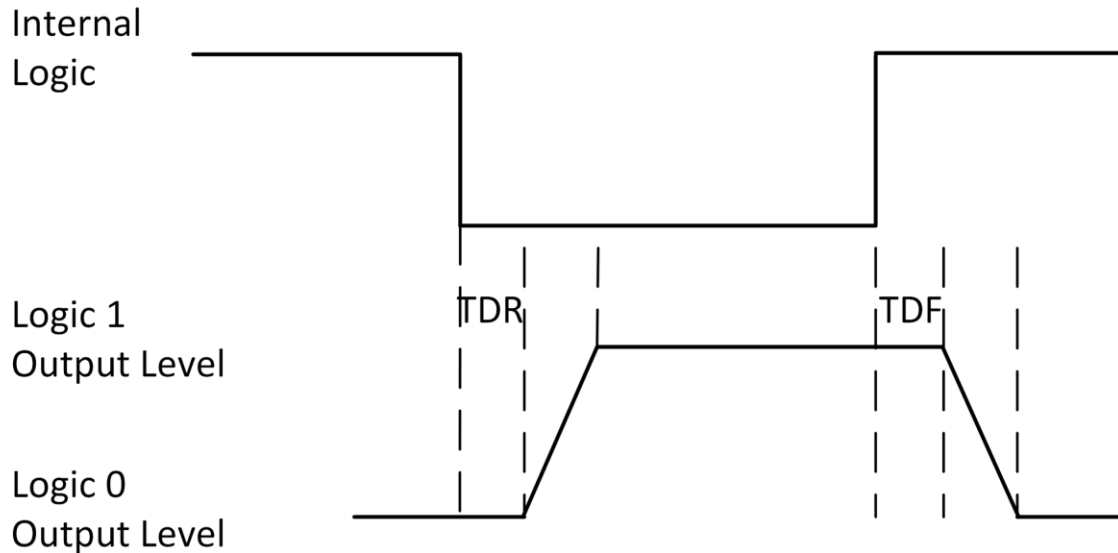


Figure 7-4 Output Logic Level

When the external voltage is 3.3 VDC and the external resistance is 1 K Ω , the electrical feature of opto coupler output is shown below.

Table 7-2 Opto Coupler Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	575 mV
Output Logic Level High	VH	3.3 VDC
Output Rising Time	TR	8.4 μ s
Output Falling Time	TF	1.9 μ s
Output Rising Delay	TDR	15 μ s to 60 μ s
Output Falling Delay	TDF	3 μ s to 6 μ s

With different external voltages and resistances, the corresponding current and parameters of output logic level low are shown below.

Table 7-3 Parameter of Output Logic Level Low

External Voltage	External Resistance	VL	Output Current
3.3 VDC	1 K Ω	575 mV	2.7 mA
5 VDC	1 K Ω	840 mV	4.1 mA
12 VDC	2.4 K Ω	915 mV	4.6 mA
24 VDC	4.7 K Ω	975 mV	4.9 mA

7.1.3 TTL Input/Output

The frame grabber has 4 TTL input signals and 4 TTL output signals. Their internal circuit is shown below, and A stands for signal input and Y stands for signal output.

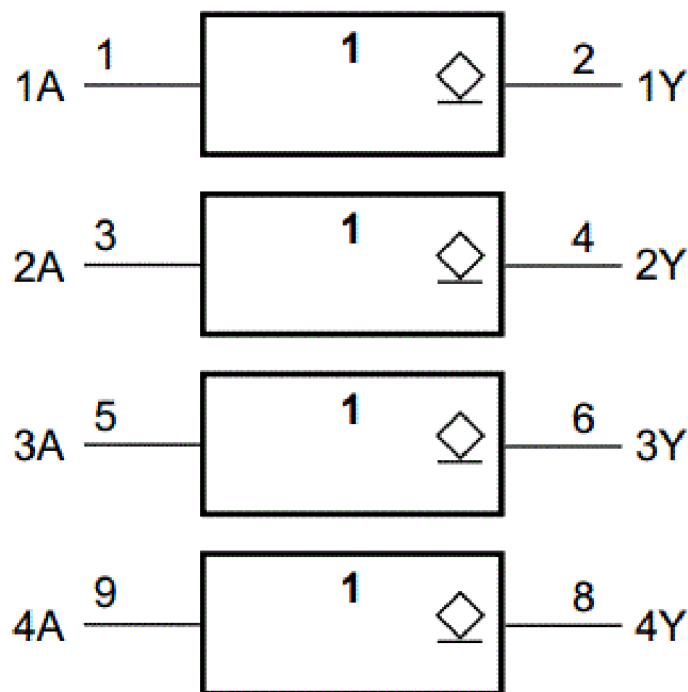


Figure 7-5 Internal Circuit of TTL Input/Output

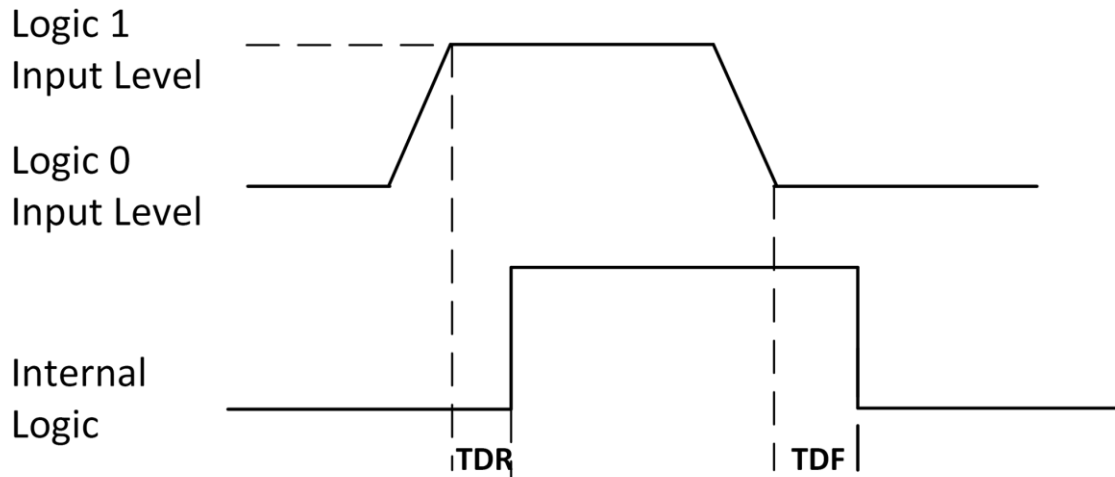


Figure 7-6 Logic Level of TTL Input/Output

The electrical feature of the TTL input/output is shown below.

Table 7-4 TTL Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VIL	0 VDC to 0.8 VDC
Input Logic Level High	VIH	2 VDC to 5 VDC
Input Rising Delay	TDR	< 10 ns
Input Falling Delay	TDF	< 10 ns

Table 7-5 TTL Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VOL	0 VDC to 0.4 VDC
Output Logic Level High	VOH	2.4 VDC to 5 VDC
Output Rising Delay	TDR	< 10 ns
Output Falling Delay	TDF	< 10 ns

7.1.4 422 Input/Output

The frame grabber has four 422 input signals and four 422 output signals. The internal circuit of 422 input/output is shown below. A and B stand for 422 differential input, and Y and Z stand for 422 differential output.

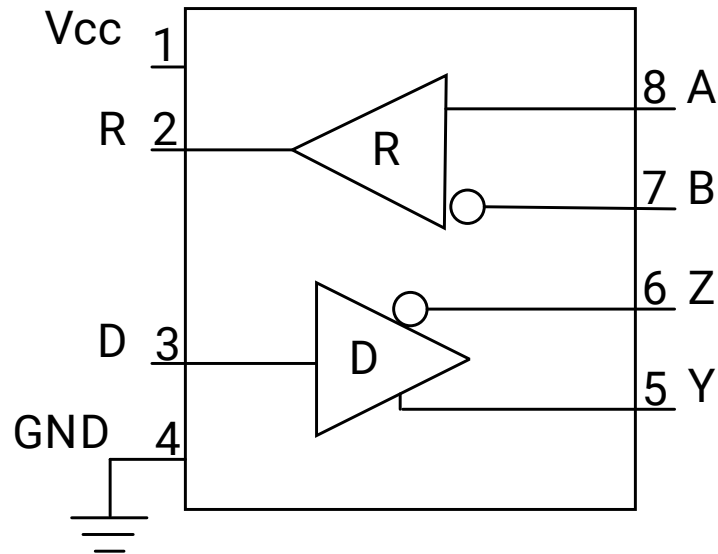


Figure 7-7 Internal Circuit of 422 Input/Output

The differential signal threshold is -0.2 V and $+0.2\text{ V}$. The electrical feature of 422 input/output is shown below.

Table 7-6 422 Input Electrical Feature

Input (A-B)	Output (R)
Higher than $+0.2\text{ V}$	High
Lower than -0.2 V	Low

Table 7-7 422 Output Electrical Feature

Input (D)	Output (Y)	Output (Z)
Low	Low	High
High	High	Low

7.2 I/O Wiring

7.2.1 I/O Input Wiring

Opto Coupler Input Wiring

Note

Wirings may differ by types of external devices providing input signals.

- PNP Device

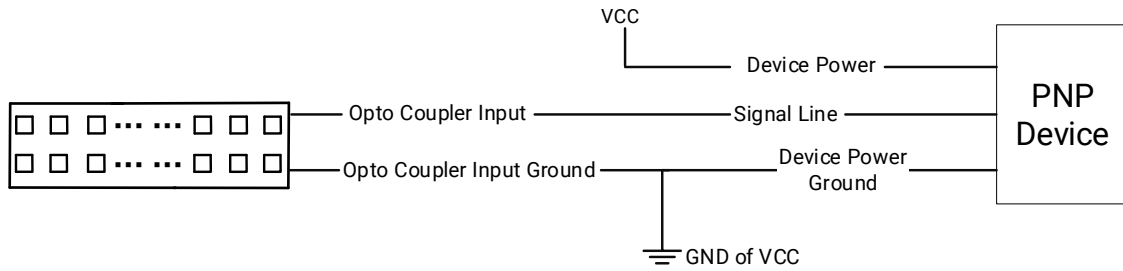


Figure 7-8 Opto Coupler Input Connects PNP Device

- NPN Device

If the VCC of NPN device is 24 V, it is recommend to use 1 K Ω to 4.7 K Ω pull-up resistor.
If the VCC of NPN device is 12 V, it is recommend to use 1 K Ω pull-up resistor.

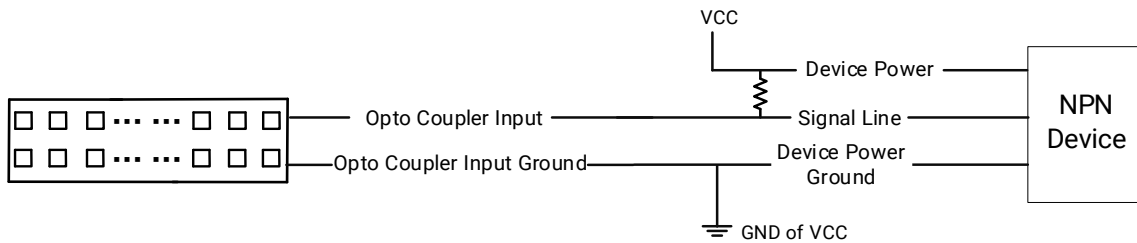


Figure 7-9 Opto Coupler Input Connects NPN Device

- Switch

If the VCC of the switch is 24 V, it is recommended to use a series resistor of 1 K Ω to 4.7 K Ω to protect the circuit.

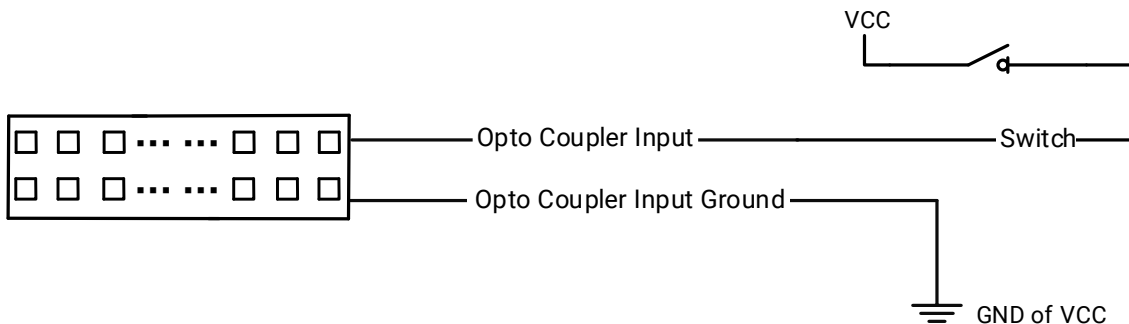


Figure 7-10 Opto Coupler Input Connects a Switch

TTL Input Wiring

When the frame grabber receives the TTL input signals, you can directly connect the frame grabber's signal with the electrical level of external devices.

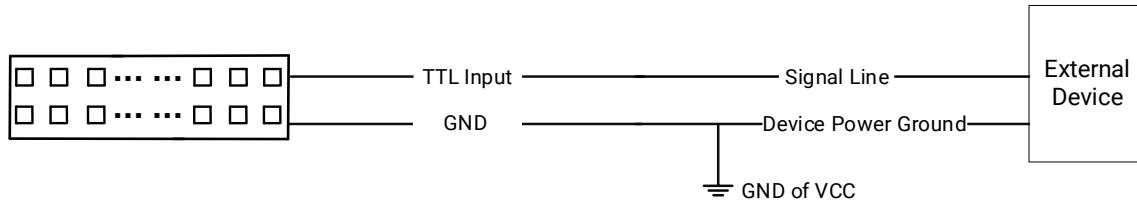


Figure 7-11 TTL Input Connects External Device

422 Input Wiring

When the frame grabber receives the 422 input signals, you can directly connect the frame grabber's P/N/GND terminal with that of external devices.

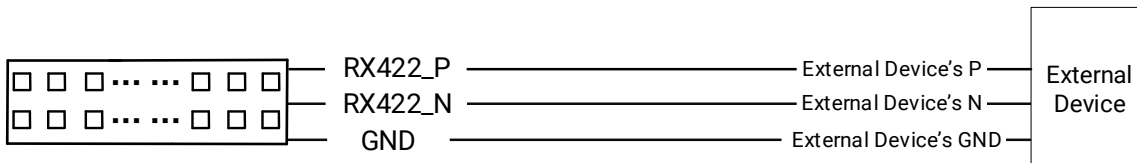


Figure 7-12 422 Input Connects External Device

7.2.2 I/O Output Wiring

Opto Coupler Output Wiring

Note

Wirings may differ by types of external devices providing output signals.

- PNP Device

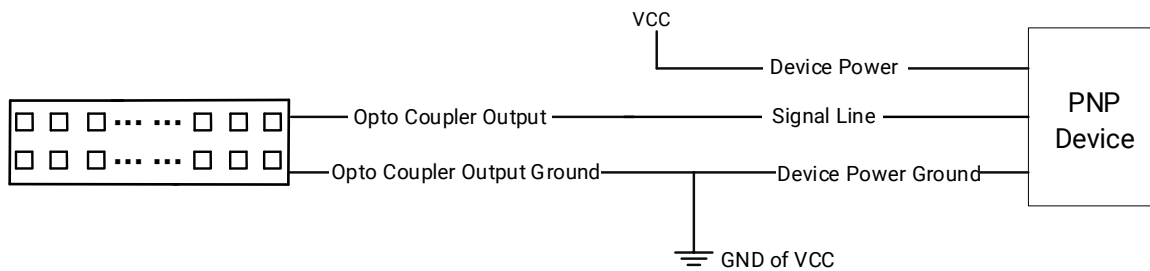


Figure 7-13 Opto Coupler Output Connects PNP Device

- NPN Device

If the VCC of NPN device is 24 V, it is recommend to use 1 K Ω to 4.7 K Ω pull-up resistor.

If the VCC of NPN device is 12 V, it is recommend to use 1 K Ω pull-up resistor.

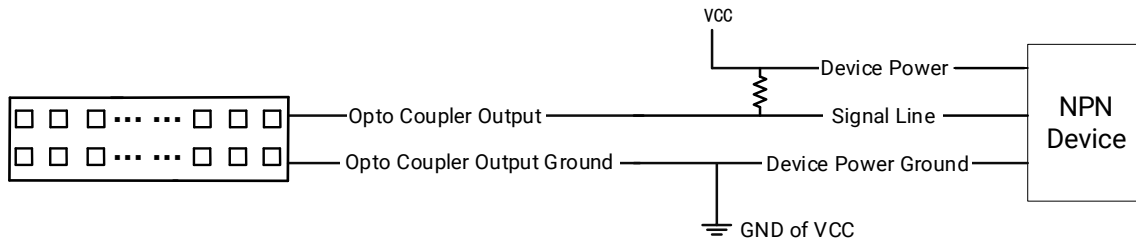


Figure 7-14 Opto Coupler Output Connects NPN Device

TTL Output Wiring

When the frame grabber receives the TTL output signal, you can directly connect the frame grabber's signal with the electrical level of external devices.

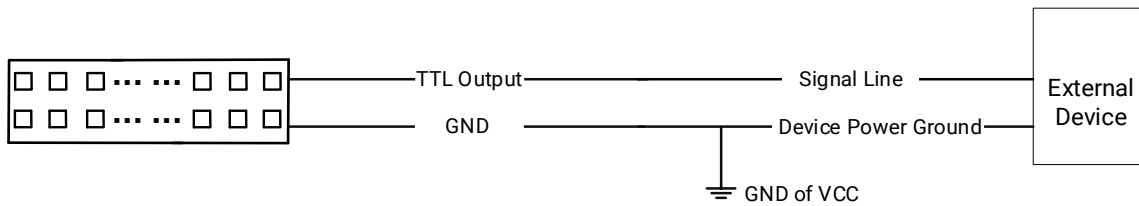


Figure 7-15 TTL Output Connects External Device

422 Output Wiring

When the frame grabber receives the 422 output signal, you can directly connect the frame grabber's P/N/GND terminal with that of external devices.

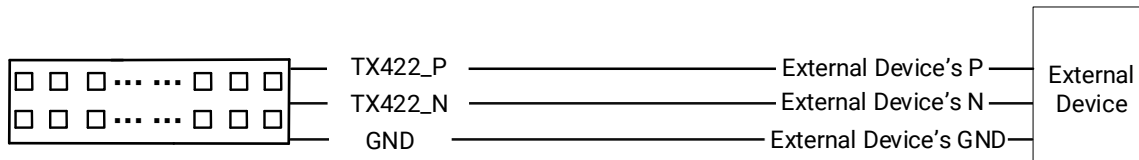


Figure 7-16 422 Output Connects External Device

7.3 Input and Output Signals

The frame grabber provides 4 pairs of opto coupler-isolated input/output signals, 4 pairs of TTL input/output signals, and 4 pairs of 422 input/output signals. You can set related parameters via **Digital IO Control**.

7.3.1 Input Signal

The frame grabber can receive multiple input signals that can be used as the signal source

of output signal, encoder, and timer.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** according to actual demands.

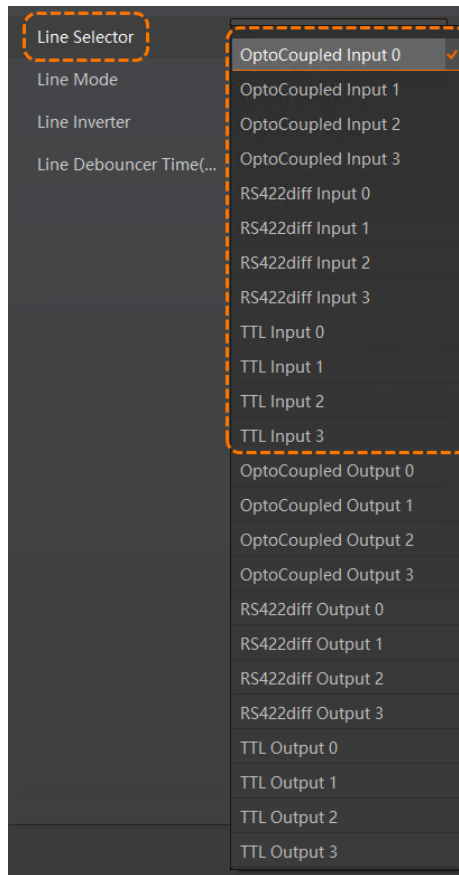


Figure 7-17 Line Selector

2. Select **Input** as **Line Mode**.
3. (Optional) Enable **Line Inverter** if you want to invert the electrical level of selected lines.

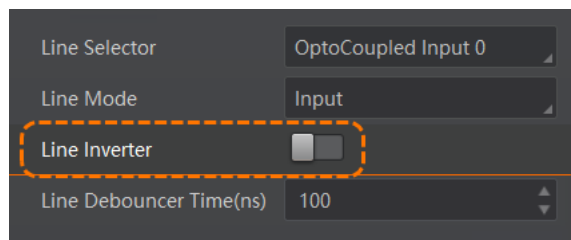


Figure 7-18 Enable Line Inverter

Note

The line inverter is disabled by default.

4. (Optional) Set **Line Debouncer Time(ns)** if the trigger signal sent by external devices to the frame grabber has signal bounce that may cause false trigger. Thus, it is necessary to debounce the trigger signal.

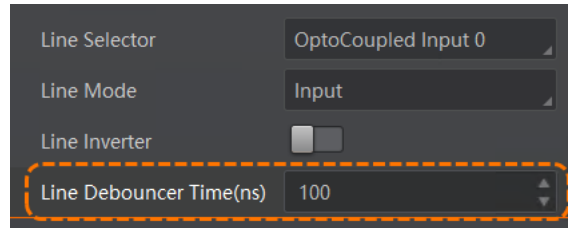


Figure 7-19 Set Line Debouncer Time

Note

The trigger signal will be ignored if the configured line debouncer time is larger than that of the trigger signal.

The sequence diagram is shown below.

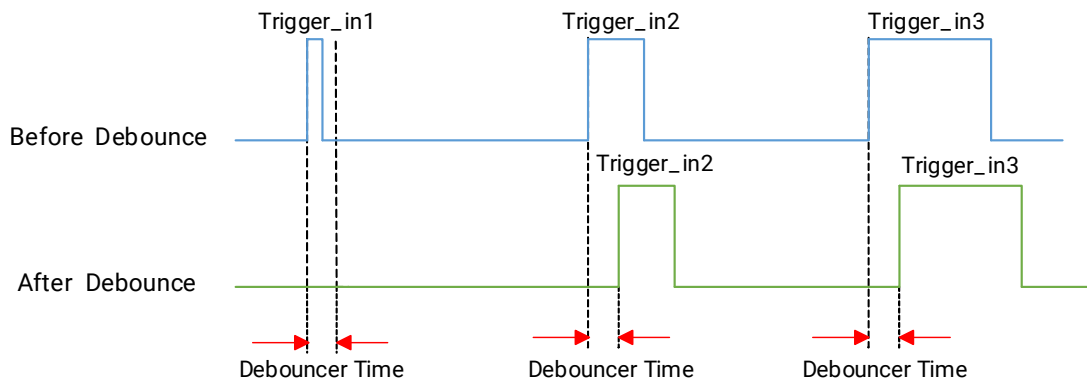


Figure 7-20 Sequence Diagram

Taking **OptoCoupled Input 0** as **Line Selector** as an example, the principle of trigger debouncer and line inverter is shown below.

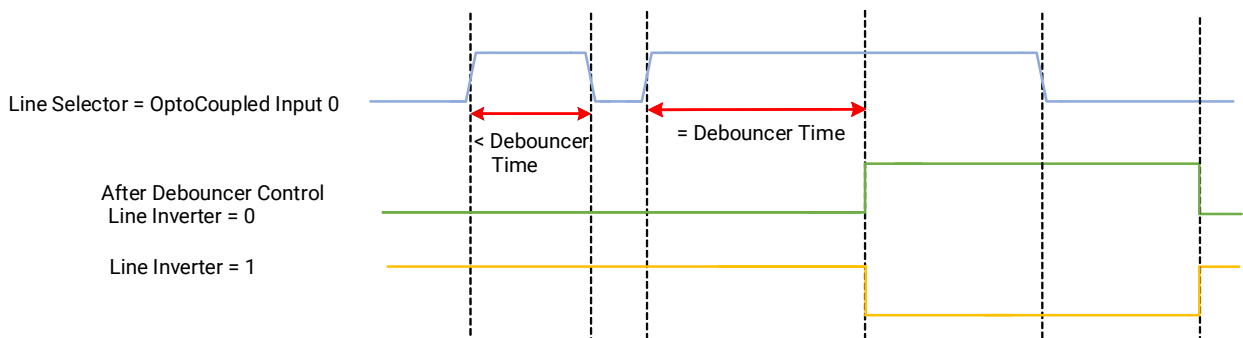


Figure 7-21 Principle

The code below shows the process of setting input signals.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};
```

```
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);  
  
unsigned int nInterfaceIndex = 0;  
  
void* hInterface = NULL;  
  
MV_CC_CreateInterface(&hInterface, stInterfaceList.plInterfaceInfos[nInterfaceIndex]);  
  
MV_CC_OpenInterface(hInterface, NULL);  
  
  
MV_CC_SetEnumValueByString(hInterface, "LineSelector", "OptoCoupledInput0");  
MV_CC_SetEnumValueByString(hInterface, "LineMode", "Input");  
MV_CC_SetIntValueEx(hInterface, "LineDebouncerTimeNs", 100);  
  
  
MV_CC_CloseInterface(hInterface);  
MV_CC_DestroyInterface(hInterface);
```

7.3.2 Encoder Control

The encoder control is used to select encoder sources and set trigger signal mode sent by signal source A and B. It can also count the outputted signal quantity.

Steps

1. Select **Encoder 0** or **Encoder 1** as **Encoder Selector**.
2. Select corresponding signal sources or off as **Encoder Source A** and **Encoder Source B**.

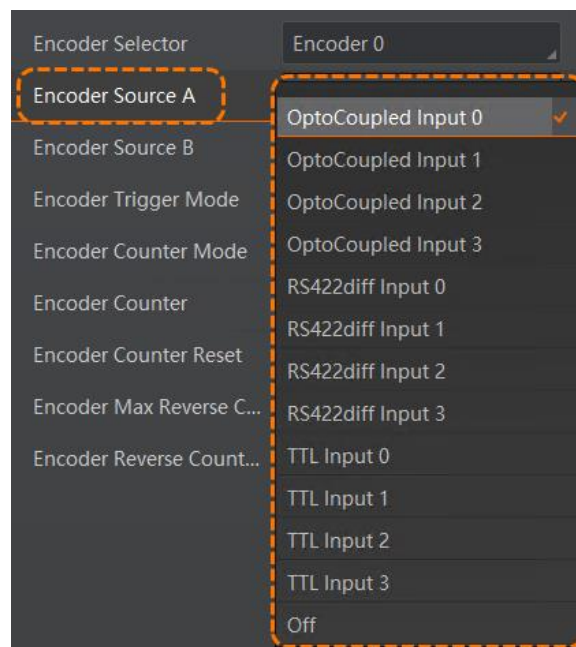


Figure 7-22 Select Encoder Source

3. Set Encoder Trigger Mode.

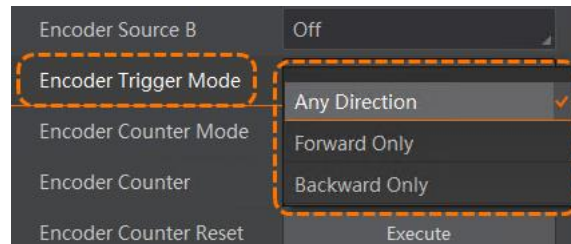


Figure 7-23 Select Encoder Trigger Mode

- **Any Direction** means that the frame grabber will output forward and backward signals.
 - **Forward Only** means that the frame grabber will output forward signal only.
 - **Backward Only** means that the frame grabber will output backward signal only.
- The forward and backward signals of the encoder are judged according to the signals of Encoder A and Encoder B, and the principle is shown below.

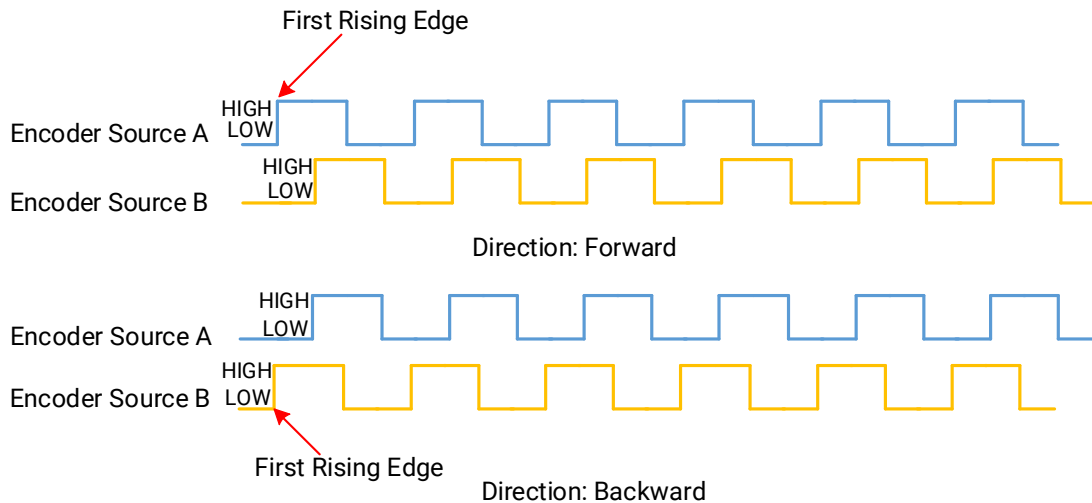


Figure 7-24 Principle

The output signal of the encoder is different if various trigger modes are selected, and the principle is shown below.

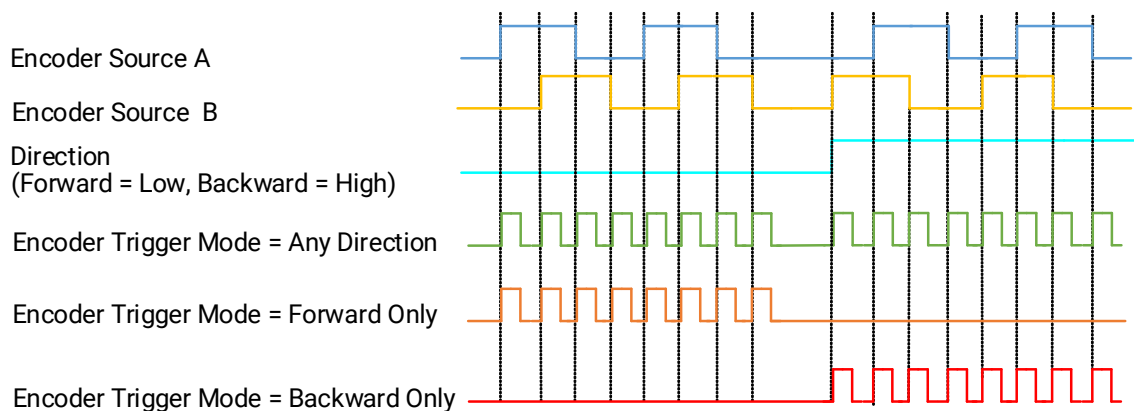


Figure 7-25 Encoder Trigger Signal Mode Principle

4. Set **Encoder Counter Mode**.

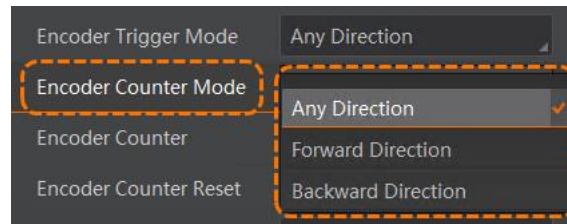


Figure 7-26 Set Encoder Counter Mode

- **Any Direction** means that both forward and backward signals will count.
- **Forward Direction** means that count increases with the forward signals and decreases with the backward signals.
- **Backward Direction** means that the count increases with the backward signals and decreases with the forward signals. When the count decreases with the forward signals, it starts from the max. set counter value.

If the encoder selects different counter modes, and its principle is shown below.

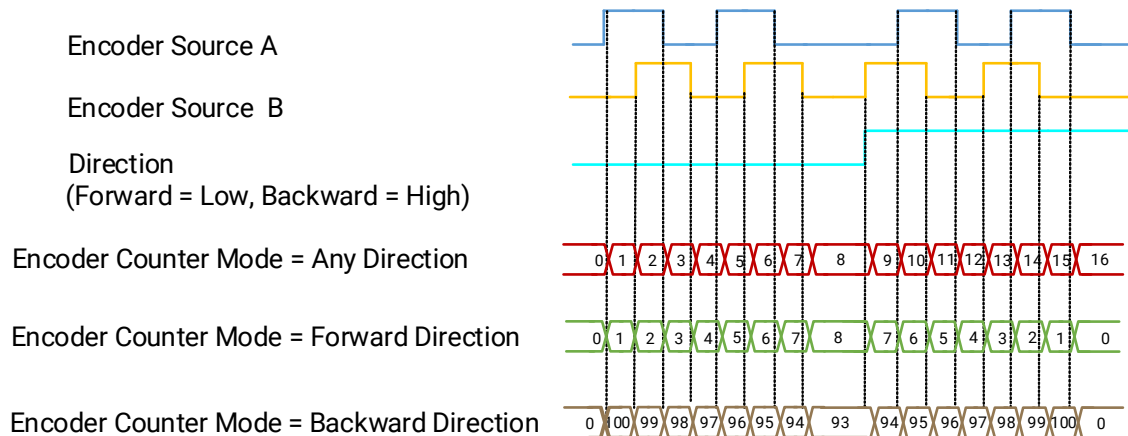


Figure 7-27 Encoder Counter Mode Principle

5. View counter value in **Encoder Counter**.
6. (Optional) Click **Execute** in **Encoder Counter Reset** to reset the counter.
7. (Optional) Set **Encoder Max Reverse Counter** to avoid outputting images if the object moves backward accidentally, and click **Execute** in **Encoder Reverse Counter Reset** to let the camera output images again.

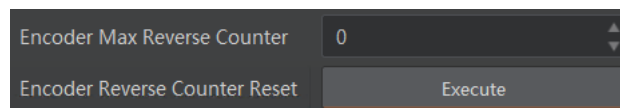


Figure 7-28 Set Encoder Max Reverse Counter

The maximum value for handling encoder reverse can be determined by setting the **Encoder Max Reverse Counter**. By default, the reverse is not handled, that is **Encoder Max Reverse Counter = 0**. Taking the **Encoder Max Reverse Counter = 4** as an example, the output of the encoder under different trigger signal modes is introduced.

- If **Forward Only** is selected in **Encoder Trigger Mode**, the principle is shown below.

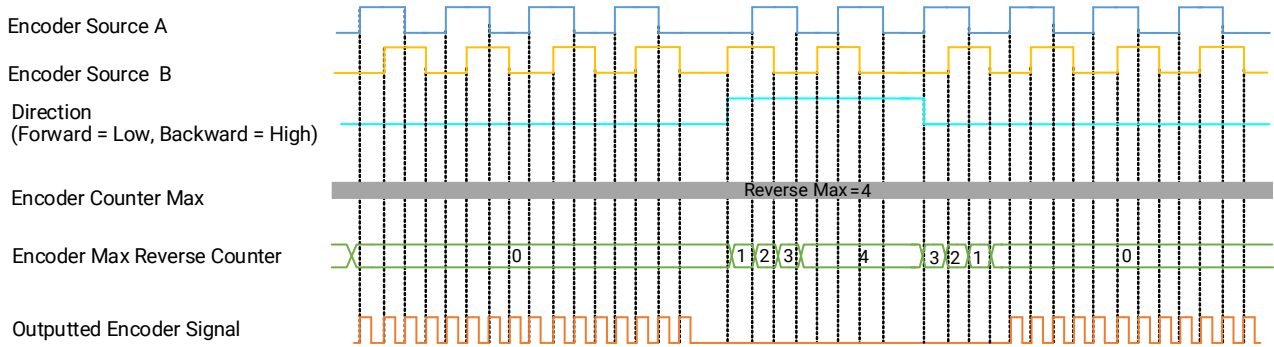


Figure 7-29 Forward Principle

- If **Backward Only** is selected in **Encoder Trigger Mode**, the principle is shown below.

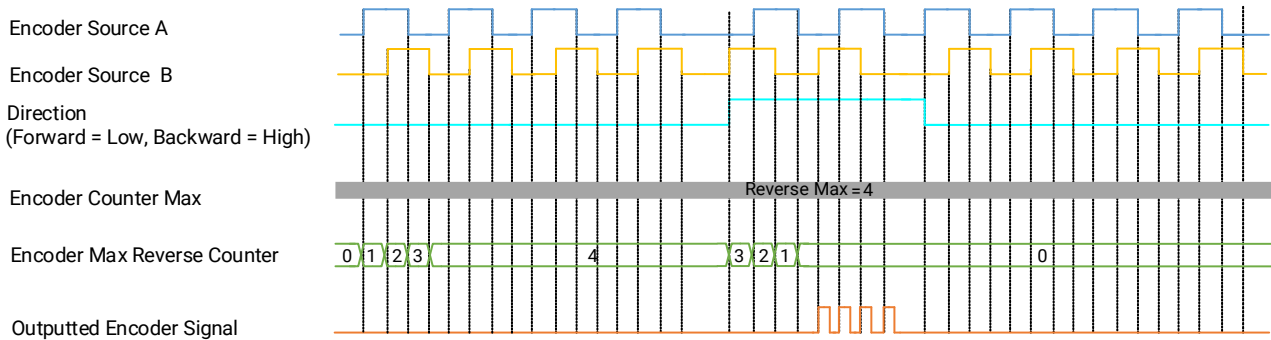


Figure 7-30 Backward Principle

- If **Any Direction** is selected in **Encoder Trigger Mode**, the principle is shown below.

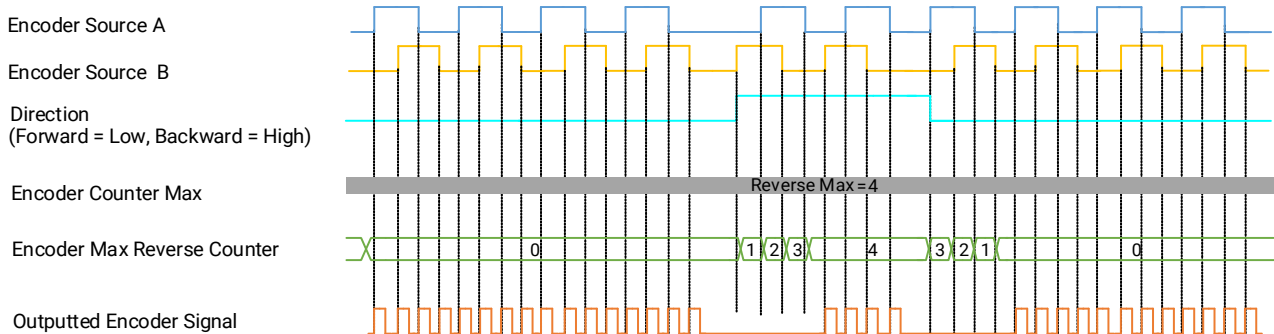


Figure 7-31 Any Direction Principle

The code below shows the process of setting encoder control.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);
unsigned int nInterfaceIndex = 0;
void* hInterface = NULL;
MV_CC_CreateInterface(&hInterface, stInterfaceList.pInterfaceInfos[nInterfaceIndex]);
MV_CC_OpenInterface(hInterface, NULL);
```

```

MV_CC_SetEnumValueByString(hInterface, "EncoderSelector", "Encoder0");
MV_CC_SetEnumValueByString(hInterface, "EncoderSourceA", "OptoCoupledInput0");
MV_CC_SetEnumValueByString(hInterface, "EncoderSourceB", "Off");
MV_CC_SetEnumValueByString(hInterface, "EncoderTriggerMode", "AnyDirection");
MV_CC_SetEnumValueByString(hInterface, "EncoderCounterMode", "BackwardDirection");
MVCC_INTVALUE_EX stIntValue = {0};
MV_CC_GetIntValueEx(hInterface, "EncoderCounter", &stIntValue);

MV_CC_CloseInterface(hInterface);
MV_CC_DestroyInterface(hInterface);

```

7.3.3 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 setting corresponding trigger source and trigger activation.

Steps

1. Go to Advanced Setting, and select one timer from **Timer 0** to **Timer 3** as **Timer Selector**.
2. Set **Timer Duration(μs)**, **Timer Delay(μs)**, and **Timer Frequency (HZ)** according to actual demands. The principle of timer output is shown below.

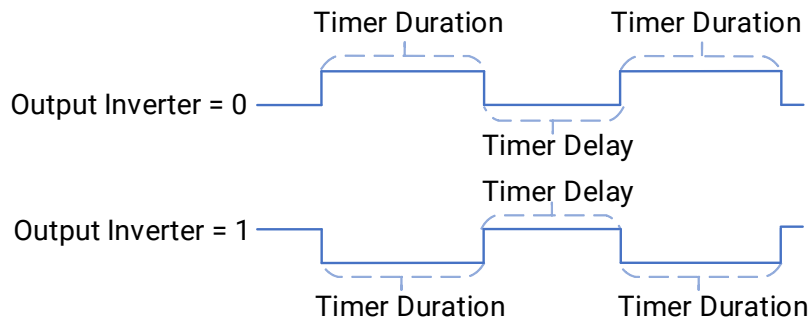


Figure 7-32 Principle of Timer Output

Note

The output signal of the timer is related to the settings of level inversion. Please set according to the demands.

3. Select trigger source from **Timer Trigger Source**.

Note

- If **Continuous** is selected as **Timer Trigger Source**, the frame grabber will output signal continuously according to configured duration. The trigger activation will not impact this process.

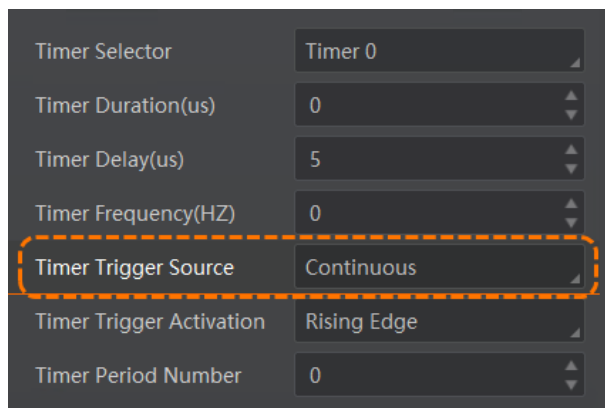


Figure 7-33 Continuous

- If other trigger sources are selected as **Timer Trigger Source**, the frame grabber will output signal when receiving the trigger signal.
-

4. Set **Timer Trigger Activation** according to actual demands.

Table 7-8 Timer Trigger Activation Parameter

Timer Trigger Activation	Description
Rising Edge	When the electrical level signal given by external devices is in rising edge, the frame grabber receives the trigger source and starts to output configured timer signal.
Falling Edge	When the electrical level signal given by external devices is in falling edge, the frame grabber receives the trigger source and starts to output configured timer signal.
Any Edge	When the electrical level signal given by external devices is in rising edge or falling edge, the frame grabber receives the trigger source and starts to output configured timer signal.
High Level	When the electrical level signal given by external devices is in high level, the frame grabber receives the trigger source and starts to output configured timer signal.
Low Level	When the electrical level signal given by external devices is in low level, the frame grabber receives the trigger source and starts to output configured timer signal.

Taking **OptpCoupled Input 0** as **Timer Trigger Source** and **Any Edge** as **Timer Trigger Activation** as an example, when the hardware trigger signal given by the external device is on the rising edge or falling edge, and the frame grabber receives the trigger signal and outputs the corresponding timer signal. The principle is shown below.

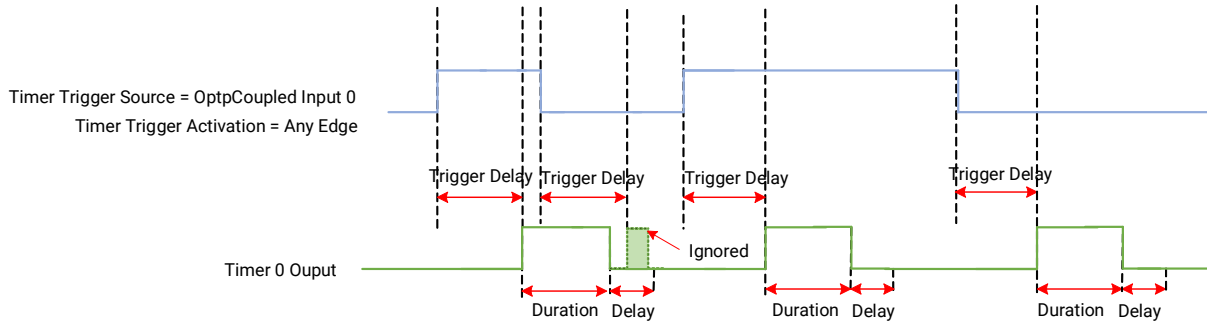


Figure 7-34 Principle

5. (Optional) If it is necessary to set the period of the output timer signal (one rising edge and one falling edge are one period), the number of timer periods can be set via the **Timer Period Number** and the **Timer** of n periods can be continuously outputted once triggered. The code below shows the process of setting the timer parameters.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);
unsigned int nInterfaceIndex = 0;
void* hInterface = NULL;
MV_CC_CreateInterface(&hInterface, stInterfaceList.pInterfaceInfos[nInterfaceIndex]);
MV_CC_OpenInterface(hInterface, NULL);

MV_CC_SetEnumValueByString(hInterface, "TimerSelector", "Timer0");
MV_CC_SetIntValueEx(hInterface, "TimerDuration", 1000);
MV_CC_SetIntValueEx(hInterface, "TimerDelay", 1000);
MV_CC_SetIntValueEx(hInterface, "TimerFrequency", 100);
MV_CC_SetEnumValueByString(hInterface, "TimerTriggerSource", "D485InOut0");
MV_CC_SetEnumValueByString(hInterface, "TimerTriggerActivation", "RisingEdge");

MV_CC_CloseInterface(hInterface);
MV_CC_DestroyInterface(hInterface);
```

7.3.4 Output Signal

The frame grabber supports setting multiple output signals that can be sent to external devices via the frame grabber.

Steps

1. Go to **Digital IO Control**, and select **Line Selector** according to actual demands.

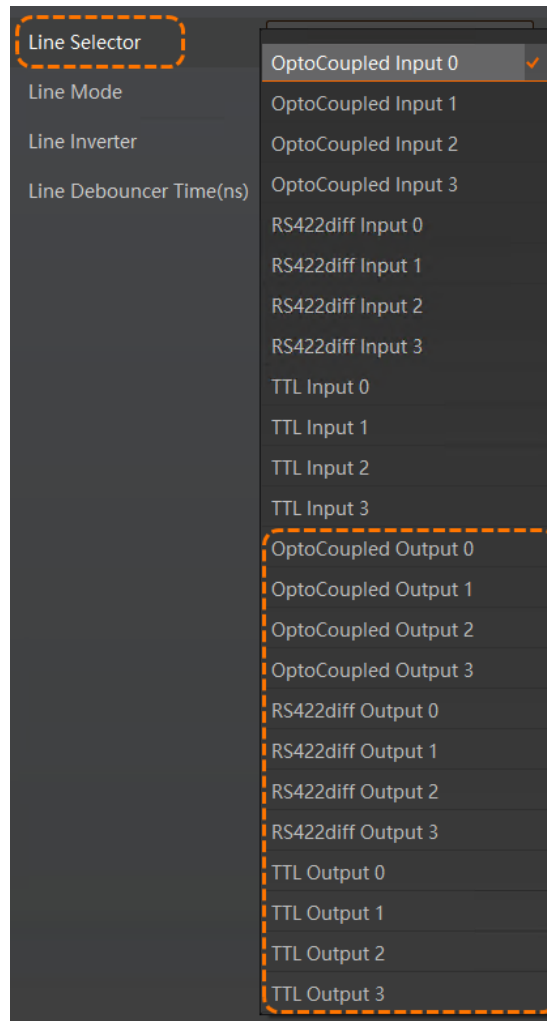


Figure 7-35 Line Selector

2. Select **Output** as **Line Mode**.

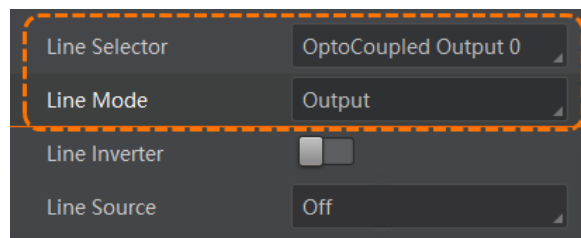


Figure 7-36 Set Output Signal

3. (Optional) Enable **Line Inverter** to invert the electrical level of selected lines.

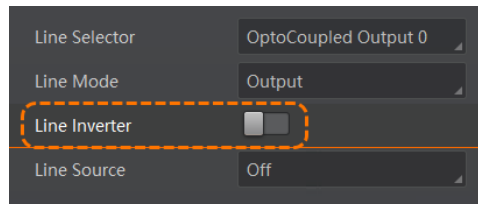


Figure 7-37 Enable Line Inverter

Note

The line inverter is disabled by default.

Take **OptpCoupled Output 0** as **Line Source** as an example and the principle of line inverter is shown below.

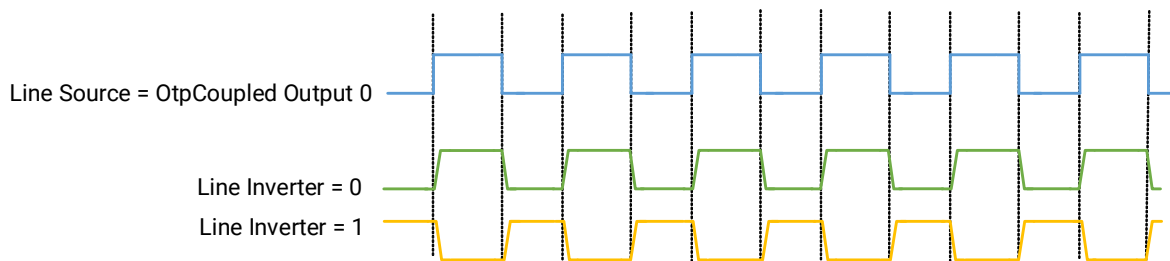


Figure 7-38 Principle

4. The frame grabber supports multiple output signal sources sent by external devices.

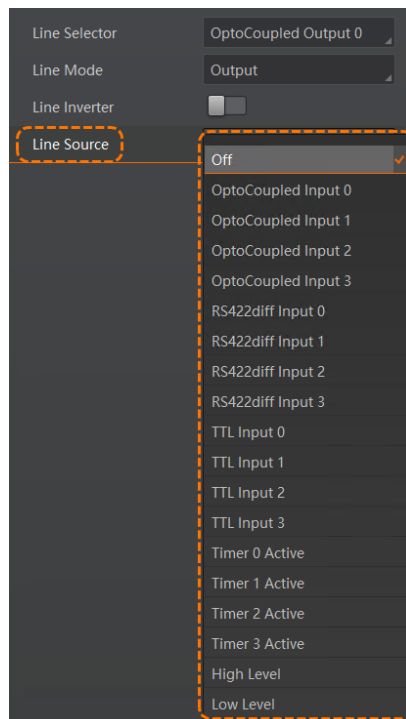


Figure 7-39 Select Line Source

The code below shows the process of setting the output signal.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};  
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);  
unsigned int nInterfaceIndex = 0;  
void* hInterface = NULL;  
MV_CC_CreateInterface(&hInterface, stInterfaceList.pInterfaceInfos[nInterfaceIndex]);  
MV_CC_OpenInterface(hInterface, NULL);  
  
MV_CC_SetEnumValueByString(hInterface, "LineSelector", "OptoCoupledOutput0");  
MV_CC_SetEnumValueByString(hInterface, "LineMode", "Strobe");  
MV_CC_SetEnumValueByString(hInterface, "LineSource", "Timer0Active");  
  
MV_CC_CloseInterface(hInterface);  
MV_CC_DestroyInterface(hInterface);
```

Chapter 8 Other Functions

8.1 PoE

The PoE can control the power supply of cameras connected to the frame grabber, and display voltage, current, and power consumption of connected cameras in real time.

Steps

Note

- Make sure that the cable of 6-pin ATX 12V is connected to the frame grabber' s ATX power supply interface with the computer before using the PoE function.
 - MV-GE1104 frame grabber does not support PoE function.
-

1. Go to **GigE** and select one frame grabber connector in **Port Selector**.

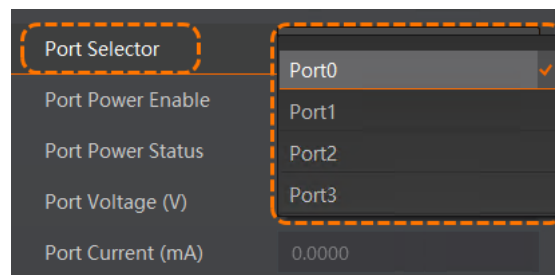


Figure 8-1 Port Selector

Note

Port 0 to Port 3 correspond to 0 to 3 connector of the frame grabber.

2. Enable **Port Power Enable** to let the connector selected in **Port Selector** support PoE.
 - The **Port Power Status** is **On** if the camera connection is detected.
 - The **Port Power Status** is **Off** if the camera connection is not detected.
3. View the voltage, current, and power consumption of connected cameras in the corresponding connector.
 - **Port Voltage (V)** displays the voltage of the camera.
 - **Port Current (mA)** displays the current of the camera.
 - **Port Power (mW)** displays the power consumption of the camera.

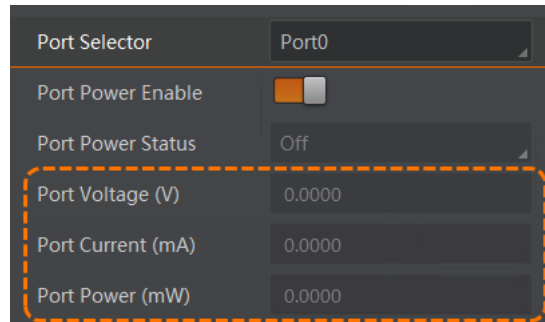


Figure 8-2 Voltage, Current and Power Consumption

8.2 Action Control

The action control is used to synchronize parameters of the frame grabber and cameras. The frame grabber sends trigger signals to the camera, and the camera starts to acquire images. You can go to **GigE > GigE TOE** to set related parameters.

Note

- MV-GE1104 frame grabber does not support action control function.
- Make sure that **Action 1** is selected as **Trigger Source** before you use the GigE action control function.

Steps

1. Go to **GigE** and select one frame grabber connector in **Port Selector**.

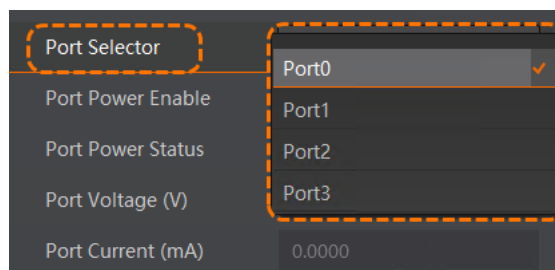


Figure 8-3 Port Selector

Note

Port 0 to **Port 3** correspond to 0 to 3 connector of the frame grabber.

2. Unfold **GigE TOE** and enable **Action Enable**.

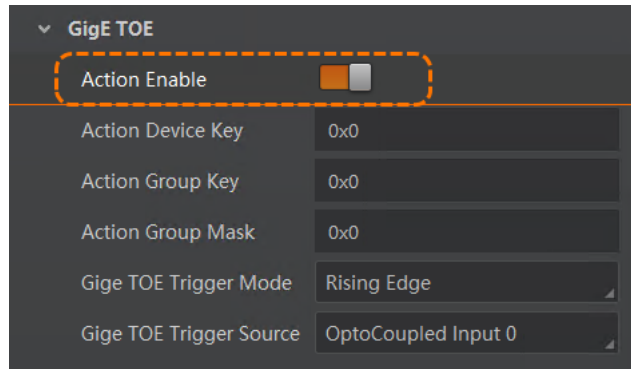


Figure 8-4 Enable Action Enable

3. Set **Action Device Key**, **Action Group Key**, and **Action Group Mask**.

Note

The configured parameters here are displayed in hexadecimal.

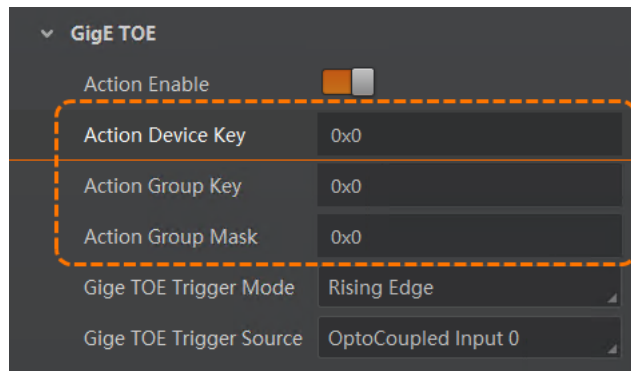


Figure 8-5 Set Parameters

Table 8-1 Advanced IO Mode

Frame Grabber Parameter Name	Camera Parameter Name	Requirement
GigE > GigE TOE > Action Device Key	Action Control > Action Device Key	Parameter values should be consistent.
GigE > GigE TOE > Action Group Key	Action Control > Action Group Key	Parameter values should be consistent.
GigE > GigE TOE > Action Group Mask	Action Control > Action Group Mask	Perform a bitwise AND operation, with the result being valid if it is non-zero.

4. Set **GigE TOE Trigger Mode** according to actual demands.

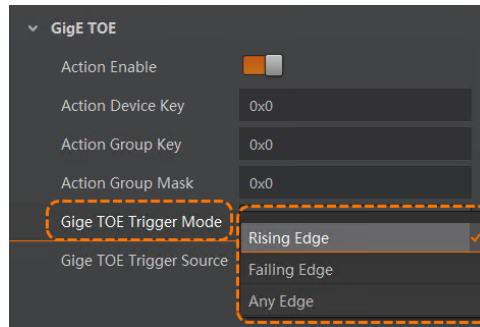


Figure 8-6 Set GigE TOE Trigger Mode

Table 8-2 GigE TOE Trigger Mode

Parameter	Description
Rising Edge	When the electrical level signal given by the frame grabber is in rising edge, the camera receives the trigger source and starts to output images.
Falling Edge	When the electrical level signal given by the frame grabber is in falling edge, the camera receives the trigger source and starts to output images.
Any Edge	When the electrical level signal given by the frame grabber is in rising edge or falling edge, the camera receives the trigger source and starts to output images.

- Set the trigger source of the frame grabber in **GigE TOE Trigger Source**. When the action control related parameter value is the same as that of the camera, the trigger source can be set for sending action control signal.

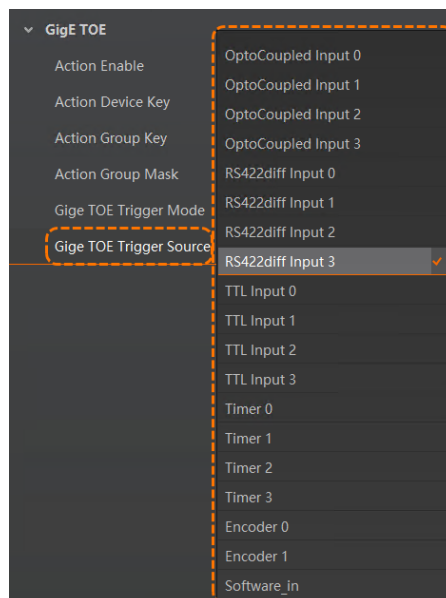


Figure 8-7 Set GigE TOE Trigger Source

6. (Optional) Click **Execute** in **Action Trigger Software** if **Software_In** is selected as **GigE TOE Trigger Source** to realize software trigger.

8.3 Frame Processing

Frame processing is used to configure the image output method of the camera connected to the frame grabber, including the caching mechanism and fast readout of image data.

Steps

1. Go to **Stream** and select **Stream Selector** according to actual demands.

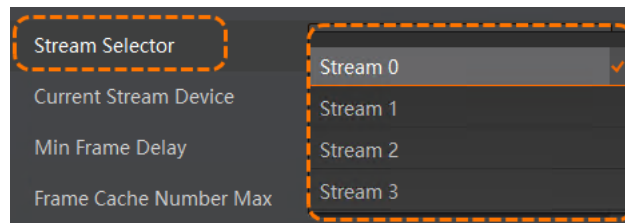


Figure 8-8 Stream Selector

Note

Stream 0 to Stream 3 corresponds to 0 to 3 connector of the frame grabber.

2. (Optional) Set the caching mechanism for images via **Min Frame Delay**.
- Enable **Min Frame Delay** to always cache the latest image data in the space for the image to be sent next, and any unsent image data is directly discarded.
 - Disabled **Min Frame Delay** to cache the latest image data in the space for unsent images. If the cache space reaches its upper limit, the oldest unsent image data is discarded.

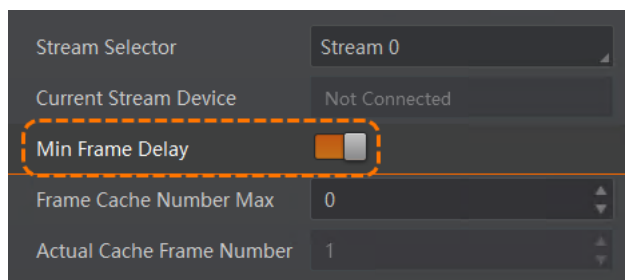


Figure 8-9 Min. Frame Delay

Note

MV-GE1104 frame grabber does not support **Min. Frame Delay**.

8.4 Image Parameters

The MV-GE1104 frame grabber supports multiple ISP functions, including ROI, horizontal mirroring, image interpolation, Gamma correction, etc. The image parameters supported may differ by different firmware packets, as shown below.

Table 8-3 Supported Functions by Firmware Packet

Firmware Packet	Supported Functions
MV_GE1004_... .zip	• ROI • Horizontal mirroring • Image interpolation • Gamma correction  Note Isp Enable should be enabled before setting the parameters.
MV_GE1004_HB_... .zip	HB decompression.

8.4.1 Set ROI

When you are only interested in some details in the image, you can use Region of Interest (ROI) function. ROI can be done on the basis of the original image and according to the preset width and height of the frame grabber and the offsets in the X and Y directions.

Steps

1. Go to **Stream > Image Format**, and enable **ISP Enable**.
2. Enable **ISP ROI Enable**, and set following parameters.
 - **Width**: It stands for horizontal width in original image.
 - **Height**: It stands for vertical height in original image.
 - **Offset X**: It stands for horizontal offset.
 - **Offset Y**: It stands for vertical offset.



Figure 8-10 ROI Parameters

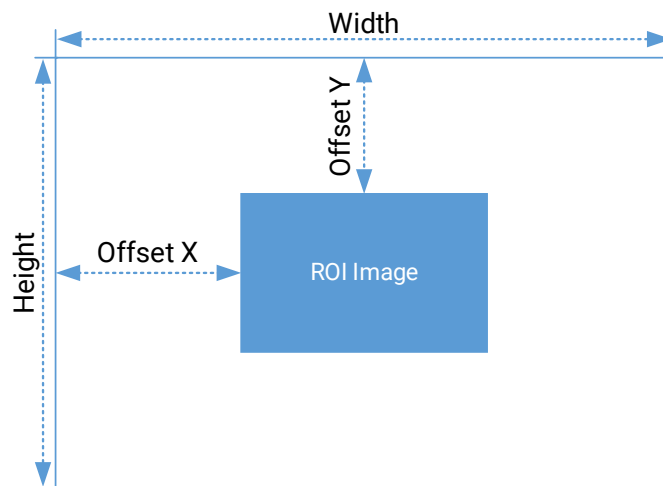


Figure 8-11 ROI Demonstration

8.4.2 Set Reverse X

The reverse X function allows you to mirror acquired images horizontally.

Steps

1. Go to **Stream > Image Format**, and enable **ISP Enable**.
2. Enable **ISP Mirror X Enable**.

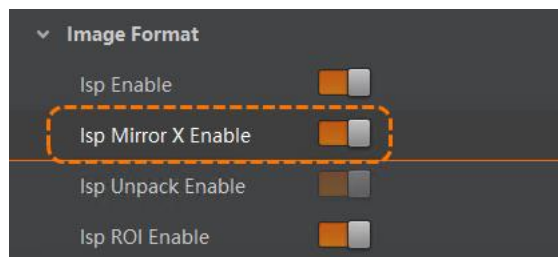


Figure 8-12 Enable ISP Mirror X Enable

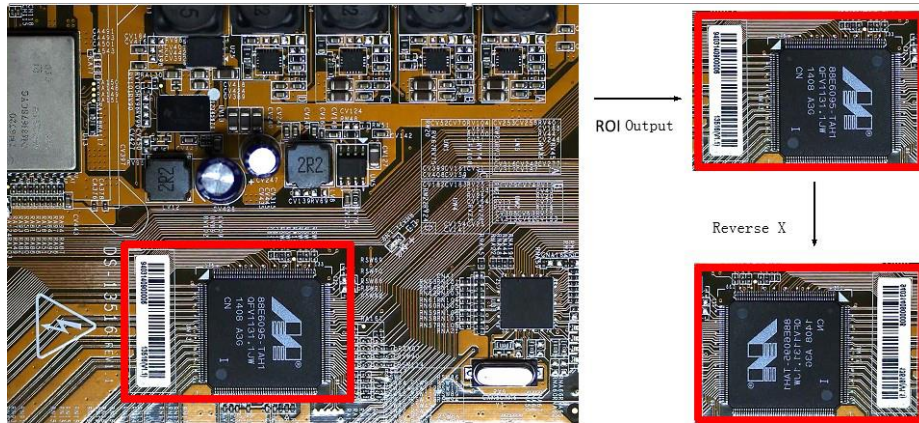


Figure 8-13 Reverse Demonstration

8.4.3 Set Image Interpolation

You can transform Bayer 8 pixel format to RGB 8 format by enabling **ISP Hamilton Enable**.

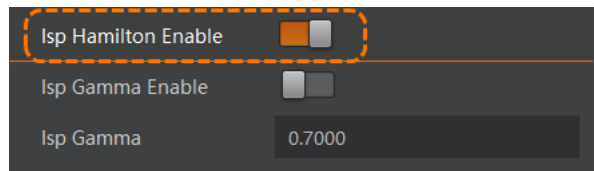


Figure 8-14 Set Image Interpolation

8.4.4 Set Gamma Correction

The frame grabber supports Gamma correction function for images outputted by the camera. Generally, the output of the camera's sensor is linear with the photons that are illuminated on the photosensitive surface of the sensor. Gamma correction provides a non-linear mapping mechanism as shown below.

- Gamma value between 0.5 and 1: image brightness increases, dark area becomes brighter.
- Gamma value between 1 and 4: image brightness decreases, dark area becomes darker.

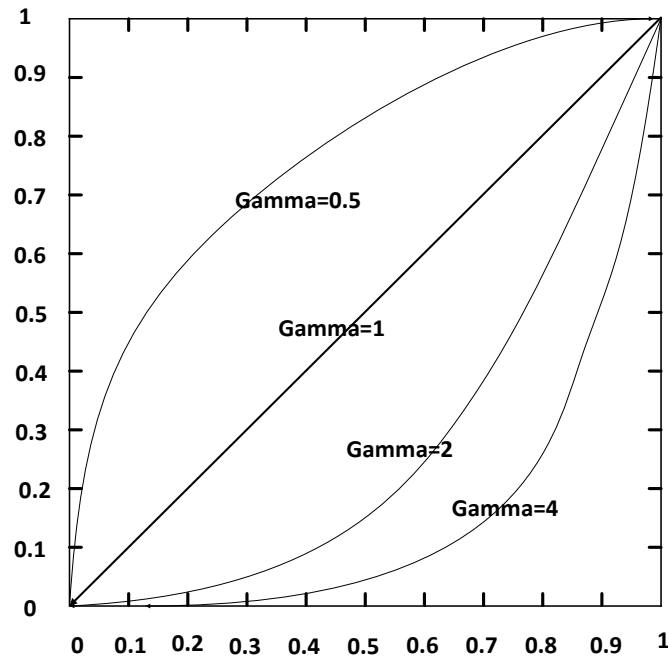


Figure 8-15 Gamma Curve

Steps

1. Go to **Stream > Image Format**, and enable **ISP Enable**.
2. Enable **ISP Gamma Enable**, and enter **ISP Gamma**, range: [0, 4].

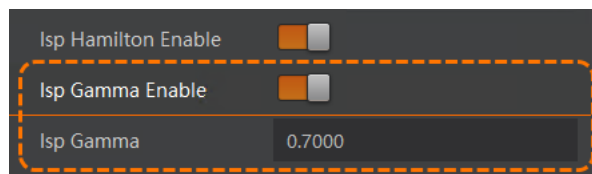


Figure 8-16 Set Gamma Correction

8.4.5 Set HB Decompression

The frame grabber supports lossless decompression of compressed camera image data.

Steps

1. Go to **Stream > Image Format**.
2. Enable **HB Decompression**.

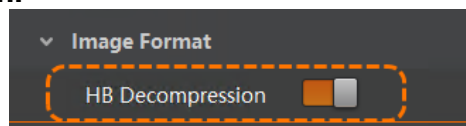


Figure 8-17 Enable HB Decompression

8.5 Device Control

In **Device Control**, you can view device information.

Table 8-4 Device Control Parameter Description

Parameter	Read/Write	Description
Device Vendor Name	Read Only	It is the name of device manufacturer.
Device Model Name	Read Only	It is the device model.
Manufacture Info	Read Only	It is the manufacturer information.
Device Family Name	Read Only	It is the product name.
Device Version	Read Only	It is the device version.
Device Firmware Version	Read Only	It is the device firmware version.
Device Serial Number	Read Only	It is the device serial number.
Device User ID	Read & Write	It is the device name. It is empty by default. • If it is empty, the device name is the device model (device serial number). • If it is not empty, the device name is the set ID (device serial number).
Device Uptime (s)	Read Only	It is the period of time when device is powered up.
Board Device Type	Read Only	It is the device type.
Device Temperature Selector	Read & Write	It selects what the device components you want to display its temperature in Device Temperature .
Device Temperature	Read Only	It displays the real-time temperature of the device components you selected in Device Temperature Selector .
PCIe Max Link Speed	Read Only	It is the max. link speed that PCIe supports.
PCIe Maximum Link Width	Read Only	It is the max. link width that PCIe supports.
Connection Port Number	Read Only	It is the device connection port No.
Connection Port Selector	Write	It selects the port for device connection.
Connection Port MAC Address	Read Only	It is the MAC address of device connection port.
Device Connection	Read & Write	It selects the device connection.

Parameter	Read/Write	Description
Selector		
Device Connection Speed (Mbps)	Read Only	It is the device connection speed.
Device Timestamp Tick Frequency (Hz)	Read Only	It is the device timestamp tick frequency.
Device Log Storage	Read & Write	It is used to enable or disable device log storage.

8.6 Firmware Update

You can use the MVS client software to update the frame grabber's firmware.

Steps

1. Run MVS client software and click  in the PCIe to enumerate frame grabbers.
2. Right-click the device to be updated, and click **Upgrade Firmware**.
3. Click  to select the corresponding firmware upgrade package (.dav) from the local PC.

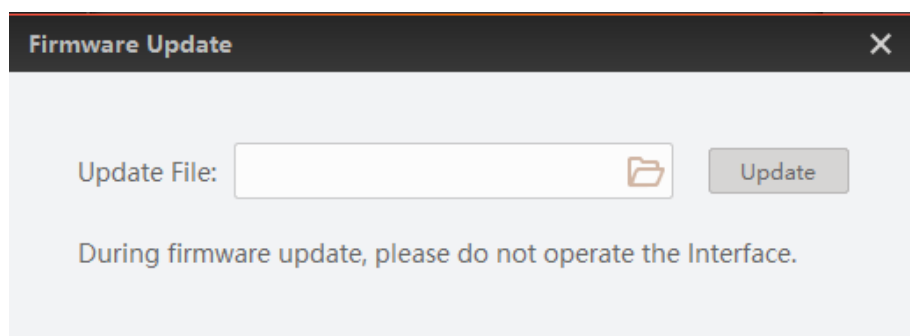


Figure 8-18 Select Update File

4. Click **Update** to start updating.

Note

- Do not power off the frame grabber during updating.
- Restart the computer to check the frame grabber's function after updating.

8.7 User Set Customization

This function allows loading or saving default or user-defined settings. The frame grabber supports 4 sets of parameters, including 1 default set and 3 user sets, and the relation

among four sets of parameters is shown below.

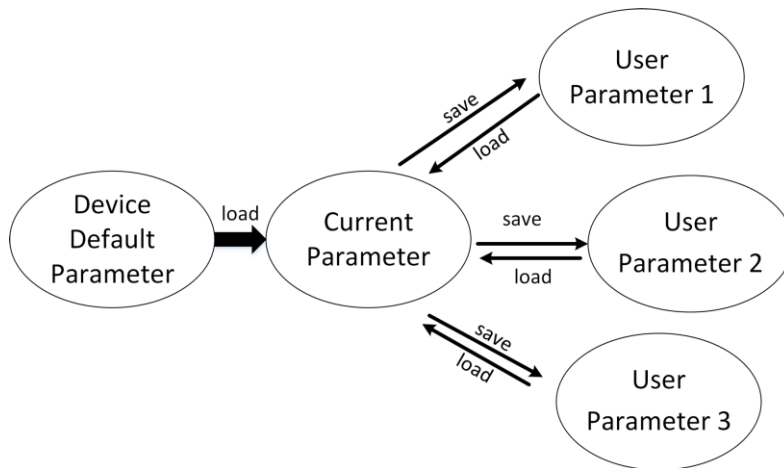


Figure 8-19 Parameter Relation

8.7.1 Save User Set

Steps

1. Go to **User Set Control**, and select a user set in **User Set Selector**.

Note

Here we take selecting **User Set 1** as an example.

2. Click **Execute** in **User Set Save** to save parameters.
3. View **User Set Save Status**:
 - **Saving**: User parameters are being saved.
 - **Ready**: User parameters have been saved.

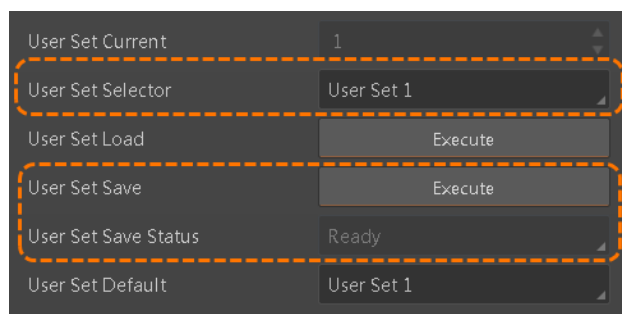


Figure 8-20 Save User Set

Note

Only MV-GE1100 frame grabber supports **User Set Save Status**.

8.7.2 Load User Set

Note

Loading user set is available only when the device is connected but without live view.

Steps

1. Go to **User Set Control**, and select a user set in **User Set Selector**.

Note

Here we take selecting **User Set 1** as an example.

2. Click **Execute** in **User Set Load** to load parameter.

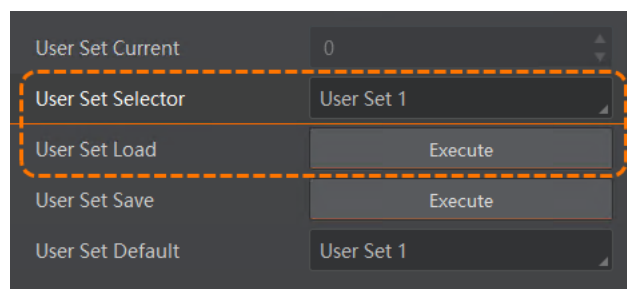


Figure 8-21 Load User Set

8.7.3 Set User Default

You can also set default parameter by clicking **User Set Control**, and select a user set in **User Set Default**.

Note

Here we take selecting **User Set 1** as an example.

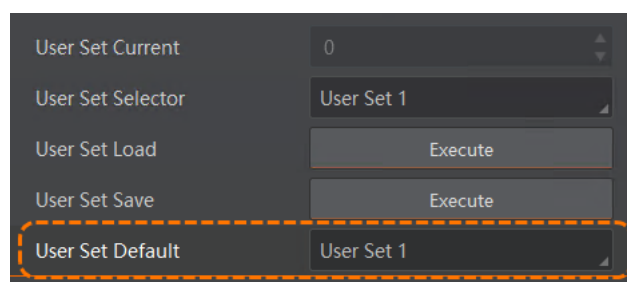


Figure 8-22 Set User Default

The code below shows the process of setting user parameters.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};
```

```
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);  
  
unsigned int nIndex = 0;  
  
void* hInterface = NULL;  
  
MV_CC_CreateInterface(&hInterface, stInterfaceList.pInterfaceInfos[nIndex]);  
  
MV_CC_OpenInterface(hInterface, NULL);  
  
  
MV_CC_SetEnumValueByString(hInterface, "UserSetSelector", "UserSet1");  
  
MV_CC_SetCommandValue(hInterface, "UserSetSave");  
  
MV_CC_SetCommandValue(hInterface, "UserSetLoad");  
  
MV_CC_SetEnumValueByString(hInterface, "UserSetDefault", "UserSet1");  
  
  
MV_CC_CloseInterface(hInterface);  
  
MV_CC_DestroyInterface(hInterface);
```

8.8 File Access

The file access function can be used to import or export the feature files of the frame grabber and save them in MFA format. Currently, only **User Set 1/2/3**, **License Notice**, and **Log File** are supported.

Steps

1. Go to the feature tree, and click  to open the file access dialogue box.

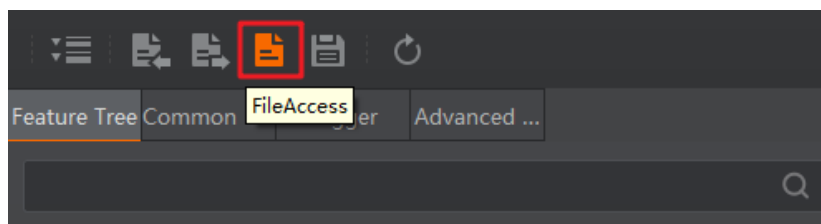


Figure 8-23 File Access

2. Select **Device Feature**, and click **Import** or **Export**.

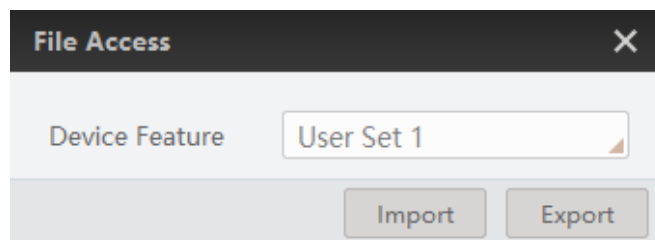


Figure 8-24 Import or Export

3. Select a MFA file from local PC to import or select a saving path and enter file name to save and export.

Note

- If User Set 1/2/3 is selected as device feature, you need to load the corresponding user set you selected to take effect. Refer to section **User Set Control** for details.
 - Importing and exporting the device feature among the same model of frame grabbers are supported.
 - **License Notice** and **Log File** support exporting only.
-

The code below shows the process of importing or exporting the frame grabber feature settings.

```
MV_INTERFACE_INFO_LIST stInterfaceList = {0};
MV_CC_EnumInterfaces(MV_GIGE_INTERFACE, &stInterfaceList);
unsigned int nInterfaceIndex = 0;
void* hInterface = NULL;
MV_CC_CreateInterface(&hInterface, stInterfaceList.pInterfaceInfos[nInterfaceIndex]);
MV_CC_OpenInterface(hInterface, NULL);

MV_CC_FILE_ACCESS stFileAccess = {0};
stFileAccess.pUserFileName = "UserSet1.mfa";
stFileAccess.pDevFileName = "UserSet1";
MV_CC_FileAccessRead(hInterface, &stFileAccess);
MV_CC_FileAccessWrite(hInterface, &stFileAccess);

MV_CC_CloseInterface(hInterface);
MV_CC_DestroyInterface(hInterface);
```

Chapter 9 FAQ (Frequently Asked Questions)

There may be some problems when using the frame grabber. If the problems below occur, follow the guidance to solve by yourself. If you cannot solve them or have other problems, contact the technical support in time.

9.1 Why the frame grabber cannot be enumerated?

Table 9-1 Question 1

Possible Cause	Solution
Improper installation of the driver.	Make sure that MVS 3.4.1 or later is installed correctly. If the client is installed correctly, uninstall and reinstall it. Anti-virus software or firewall may intercept the driver. You can disable the firewall and uninstall the anti-virus software. If it is required to enable the firewall and anti-virus software, make sure that the MVS client software is on the allowlist before uninstalling and reinstalling it.
The MVS client software or other software is using the frame grabber.	Close the MVS client software or other software that is using the frame grabber. It should be noted that there may be processes after the MVS client software or the software using the frame grabber is closed, causing the frame grabber to be occupied and unsearchable. You can shut down the MVS process or the process of the software that uses the frame grabber in the task manager. If you cannot confirm whether there are processes occupying the frame grabber, you can try to restart the PC.
Insufficient power supply of the mainboard.	Power the frame grabber independently.

9.2 Why the camera connected to the frame grabber cannot be enumerated?

Table 9-2 Question 2

Possible Cause	Solution
The camera is not working normally.	Check if the camera is working normally and if power supply is normal.
Improper wiring of the data cable.	Check the wiring of the data cable.

9.3 Why the camera's frame rate is not stable?

Table 9-3 Question 3

Possible Cause	Solution
Insufficient PCIe bandwidth.	Replace PCIe slot to meet PCIe 2.0 x4 bandwidth. It should be noted that some PCIe slots designed by the PC share a bandwidth for several slots, which may cause insufficient bandwidth. You can view and set If the ROI can meet the application requirements, you can use the ROI function to increase the frame rate.
Low CPU performance.	Use high performance CPU.

Chapter 10 Revision History

Table 10-1 Revision History

Version	Date	Revision Details
V2.1.0	Sep. 11, 2025	• Adjust the document structure. • Edit Chapter 5 Basic Operation of Client Software • Add sample codes in sections Input Signal, Encoder Control, Timer Control, Output Signal, User Set Customization, and File Access. • Add section HB Decompression. • Edit section Firmware Update. • Edit Chapter 9 FAQ (Frequently Asked Questions).
V2.0.0	Sep. 14, 2023	• Modify section Overview. • Add section Basic Operation of MVS Client Software. • Add section Operating Principle. • Add section Frame Grabber Accessories.
V1.1.1	Aug. 31, 2022	• Modify section Client Software Layout. • Modify section Timer Control. • Add section GigE Action Control. • Add section Stream. • Add section Set Image Parameters. • Modify section Update Firmware. • Add section User Set Control. • Add section File Access Control.
V1.0.1	Apr. 18, 2022	• Modify section Install MVS Client Software. • Add section Basic Operation of MVS Client Software. • Modify section Update Firmware.
V1.0.0	Sep. 27, 2021	Original version.

Appendix A Frame Grabber Accessories

When using the frame grabber, you need to prepare these cables: GigE network cable, I/O cable. The appearance of accessories is shown below.

Note

You need to purchase frame grabber accessories separately and they are not included in the package.

GigE Network Cable

The GigE network cable is used to establish the data transmission between the frame grabber and the camera. It provides two lengths of 3 m or 5 m, which can be selected as required.



Figure A-1 GigE Network Cable

Note

Refer to the datasheet of the corresponding product for the specific size and parameter of the GigE network cable.

I/O Cable

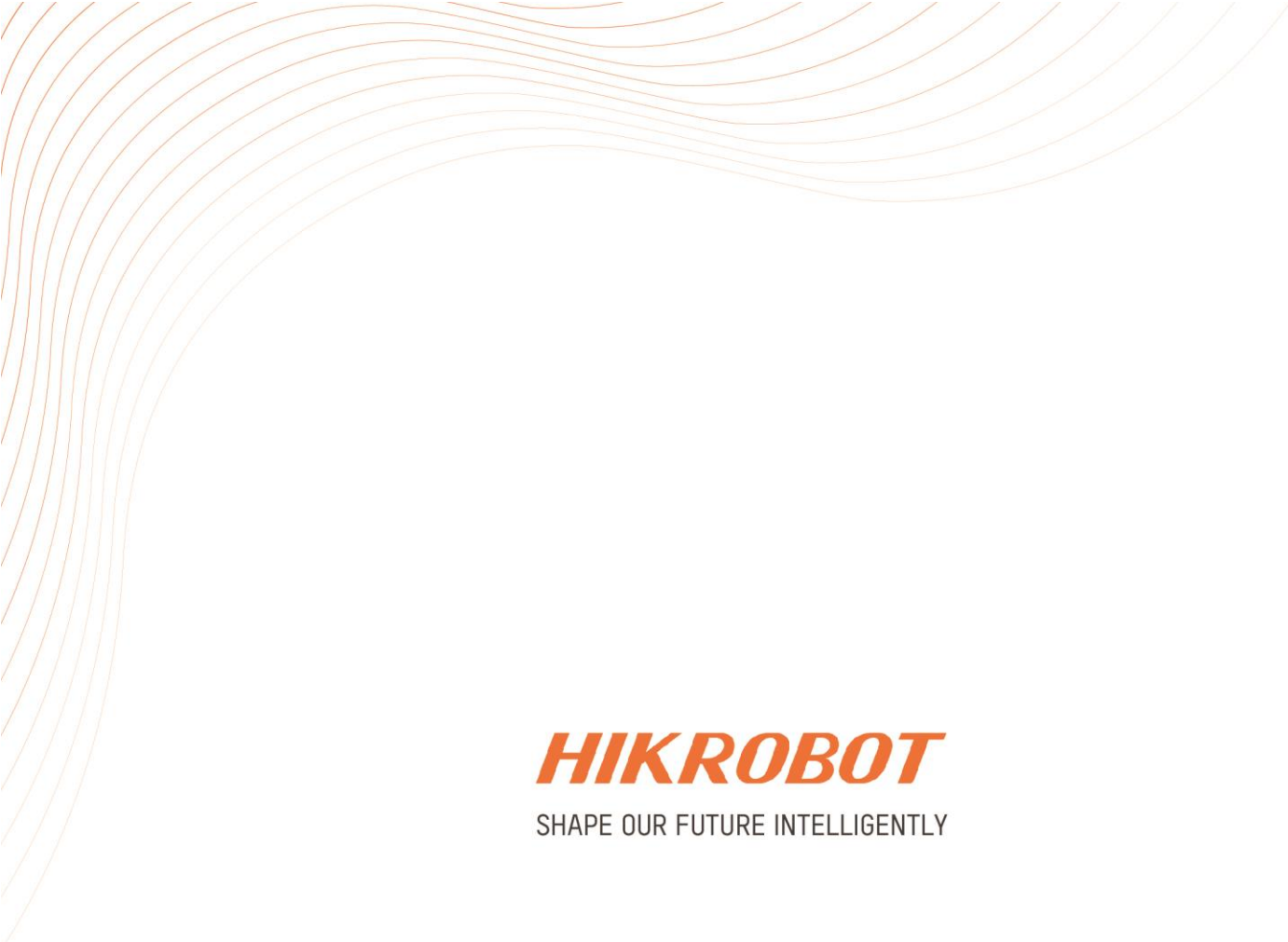
I/O extension cable (DB26 to open) is used for I/O trigger signal wiring of DB26 connector of the frame grabber, as shown below. Refer to the section **2.3.2 I/O Connector** for pin definition. The cable has shielding protection, providing two lengths of 3 m or 5 m, which can be selected as required.



Figure A-2 I/O Cable

Note

Refer to the datasheet of the corresponding product for the specific size and parameter of the I/O cable.



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