MvToolkit

User Manual

Contents

Chapter 1 About this Documentation

The manual guides you to use the Software. To ensure the properness of usage and stability of the Software, refer to the contents below and read the manual carefully before installation and operation.

As GIFs and videos cannot be played in PDF document, you are recommended to read the online document.

1.1 Symbol Conventions

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

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

Chapter 2 Release Notes

This chapter introduces the updates and release dates for various versions of the Software.

2.1 V4.6.0

The first version was released on August 2025.

Chapter 3 Firmware Upgrade Tool

You can use the Tool to upgrade the firmware of GigE cameras, USB cameras, PCIe cameras, CoaXPress cameras, and frame grabbers.

Note

Frame Grabber related features are only available when you run the Software on Linux X86_64 type systems.

Main Window Introduction

The main window is as below and the descriptions are in the table.

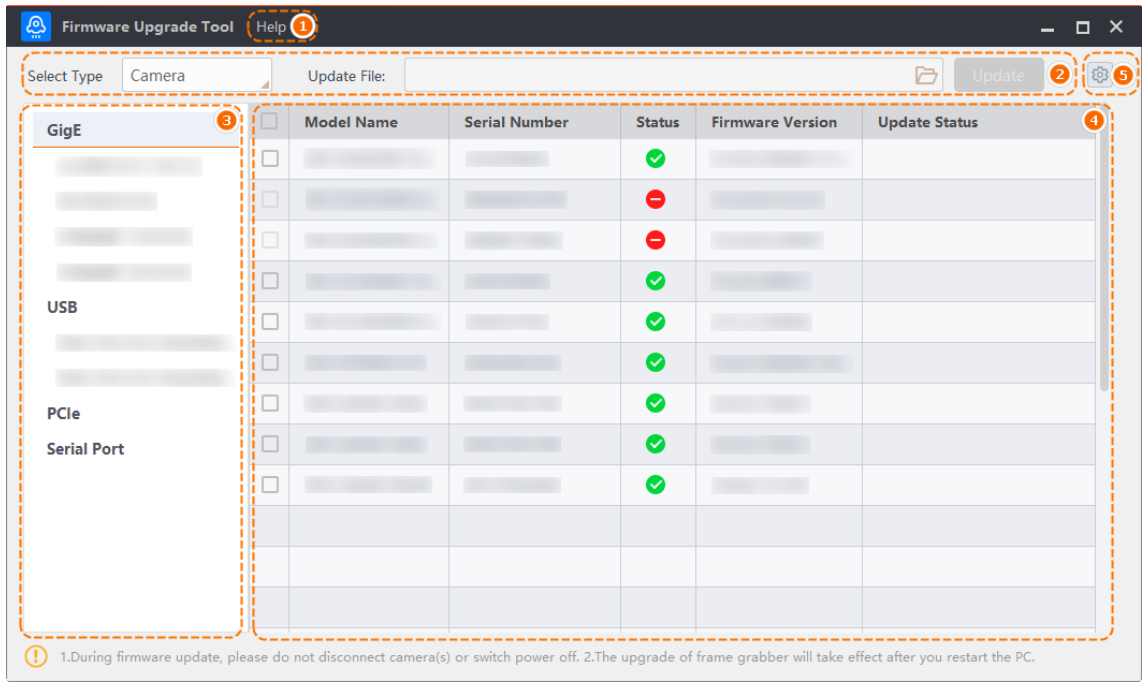

Figure 3-1 Firmware Upgrade Tool

Table 3-1 Main Window Description

Number	Area	Description
1	Help	You can select a language (English or Chinese) and view the version information.
2	Upgrading Configuration	• You can select a camera or frame grabber as the to-be-upgraded device type. • You can select an upgrade package for cameras and perform the upgrade here. **Note** To upgrade a frame grabber, select the upgrade package in Area 4.
3	Interface Information	You can view the interface information of your computer. The available operations may vary according to devices with different interfaces. See *Upgrade a Camera* .
4	Device Information	You can view devices and related information of different interfaces.
5	Device List Configuration	You can set information categories to display in area 3. The available information may vary according to interfaces.

3.1 Upgrade a Camera

The camera firmware upgrading process mainly contains three parts, and they are Search for Device, Start to Upgrade, and View Upgrading Status.

Search for Devices

After you open the Tool, you can select a camera in the **Select Type** area, and you can see the computer interface information displayed on the left. The available operations may vary according to devices with different interfaces.

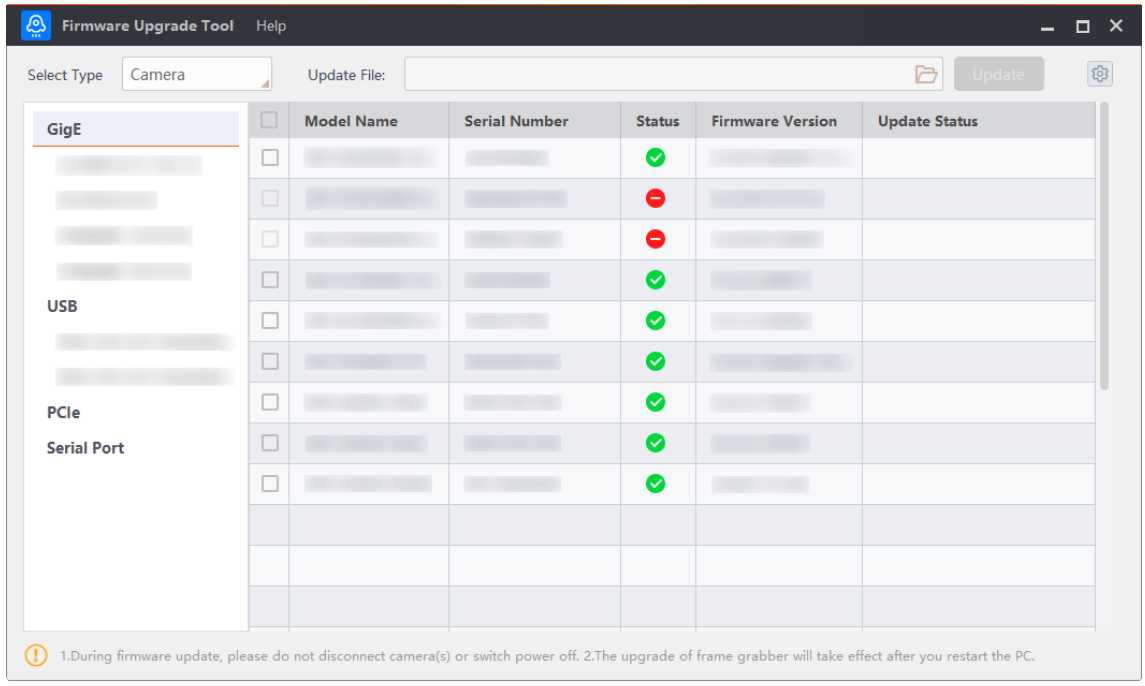

Figure 3-2 Upgrade a Camera

Upgrade Camera Firmware

- GigE and USB Interfaces:
  - Select **GigE** or **USB**, and the devices that can be found will be displayed on the right pane.
  - Select an interface under GigE or USB, and the devices that can be found will be displayed on the right pane.
  - The Tool can automatically refresh the devices under the enumeration of GigE and USB, or click ↻ to manually refresh the enumeration.
- PCIe Interface:
  - Select **PCIe**, and the devices that can be found will be displayed on the right pane.
  - Select an interface under PCIe, and the devices that can be found will be displayed on the right pane.
  - The Tool can automatically refresh the devices under the enumeration of PCIe, or click ↻ to manually refresh the enumeration.
- Serial Port Interface:
  - Select **Serial Port**, and the available devices will be displayed on the right pane.
  - Select an interface from Serial Port, and the available devices of the interface will be displayed on the right pane.
  - By default, the camera information under Serial Port will not be refreshed automatically. You can click ↻ on the right side of the Serial Port to refresh the enumeration manually.

Start to Upgrade

Check if the camera to be upgraded is available. Click to select a firmware upgrade package (dav file) in the upper right side of the Tool.
The Tool can upgrade the firmware of multiple cameras in a batch. Up to 20 cameras can be selected at the same time.

- If the upgrade package is for a specific model, only cameras of the same model can be upgraded in batch. For cameras of other models, the status bar will prompt "Upgrading failed. (Error code: 0x900006500) Firmware mismatch.".
- If the upgrade package is for multiple models, you can upgrade the cameras of multiple models in the upgrade package. For cameras of the other models that are not included in the upgrade package, if you upgrade them, the status bar will prompt "Upgrading Failed. (Error code: 0x900006500) Firmware mismatch.".

After selecting the firmware upgrading package, click **Upgrade**.

Note

- Do not disconnect the camera from the PC during firmware upgrade.
- The camera will reboot automatically after upgrading.

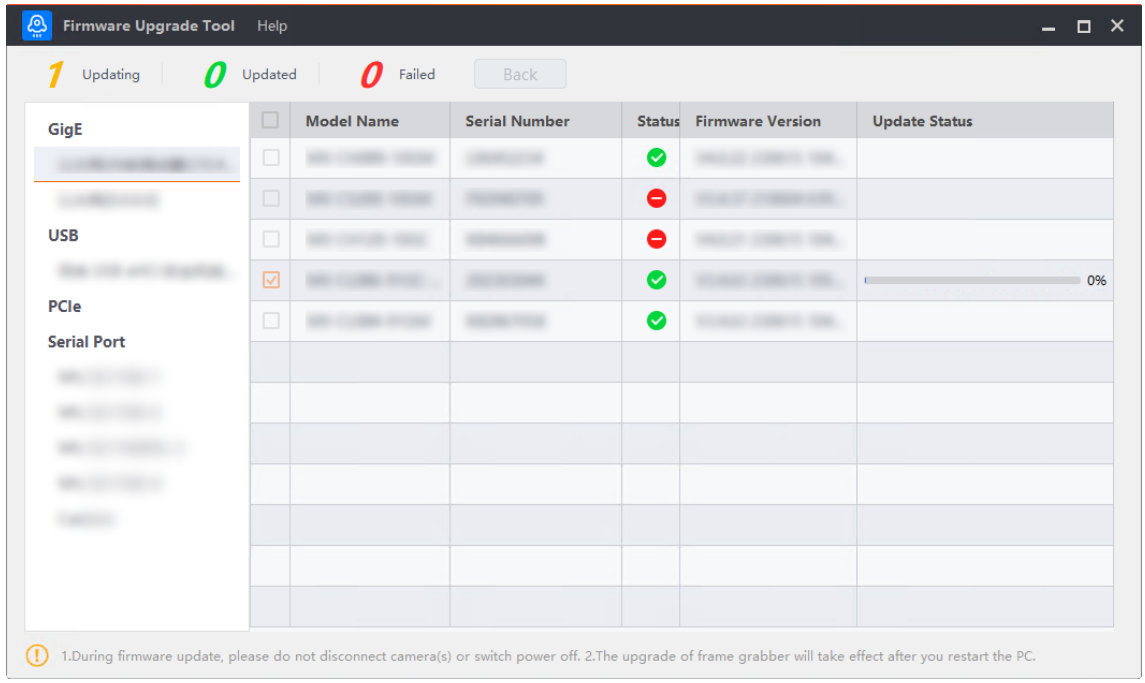

Figure 3-3 Upgrading Process

View Upgrading Status

In the upper-left corner, the upgrading information is displayed as shown below. You can click **Back** on the top of the Tool to go back to the initial interface. Also, on the right of the Tool, the upgrading status information of a selected device is displayed.

3.2 Upgrade a Frame Grabber

The frame grabber firmware upgrading process mainly contains three parts, and they are Search for Device, Start to Upgrade, and View Upgrading Status.

Search for Devices

After you open the tool, select **FrameGrabber** in **Select Type**, and all connected PCIe devices displays on the left.

Note

By default, the Tool automatically enumerates connected frame grabbers every 30 seconds. You can also click ↻ to re-enumerate.

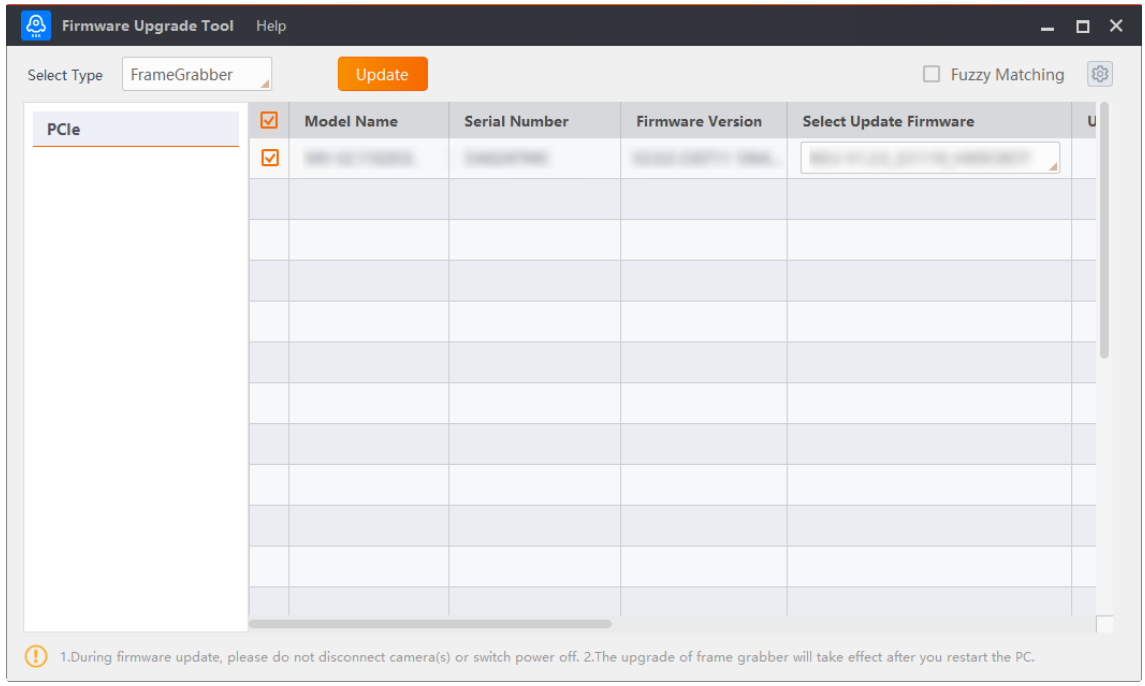

Figure 3-4 Upgrade Frame Grabber Firmware

Start to Upgrade

Please contact technical support to get the firmware driver packages of the to-be-upgraded frame grabbers.
Before upgrading, ensure the frame grabber(s) to be upgraded are available during upgrading process.

1. Install the firmware driver under the directory: C:\Program Files (x86)\Common Files\{Software Name}\FirmWare.
   Once installed, the Tool detects and displays available firmware, as shown below.

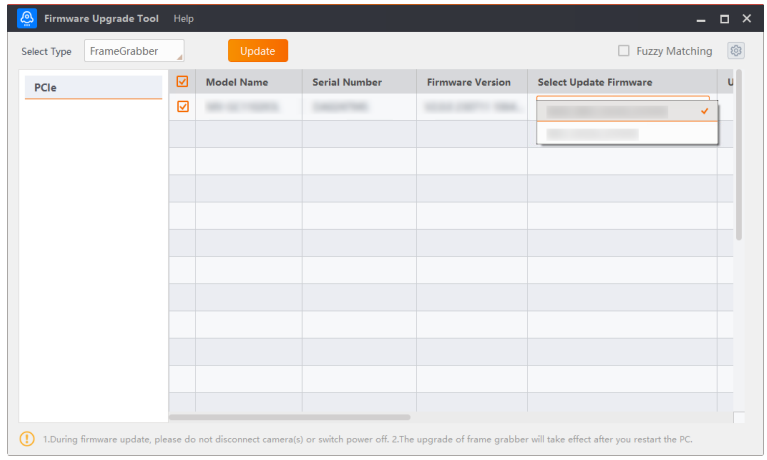

Figure 3-5 Upgrade Frame Grabber

2. Select frame grabber(s) to be upgraded.
3. Select required firmware in **Select Update Firmware** for each frame grabber.

Note

- The Tool supports upgrading up-to-20 frame grabbers in a batch.
- The Tool supports fuzzy searching of firmware files. To enable this functionality, enable **Fuzzy Matching**.

4. Click **Upgrade** to upgrade them.

Note

- Keep the device(s) connected when upgrading.
- The frame grabber(s) will reboot automatically when upgraded.

View Upgrading Status

Once the upgrading starts, you can view the status on top, as shown below. The upgrading progress also displays in **Update Status**.
In case of upgrading failure, you can click **Back** to return to the initial window and redo the upgrading.

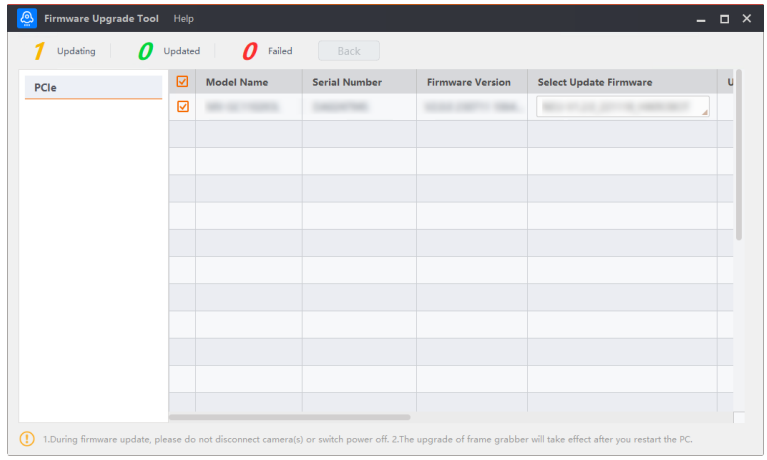

Figure 3-6 Upgrading Frame Grabber

Chapter 4 Feature Import/Export Tool

This tool allows you to import and export the parameters of one or multiple cameras or frame grabbers.

4.1 Main Window Introduction

This section introduces the tool's main window.

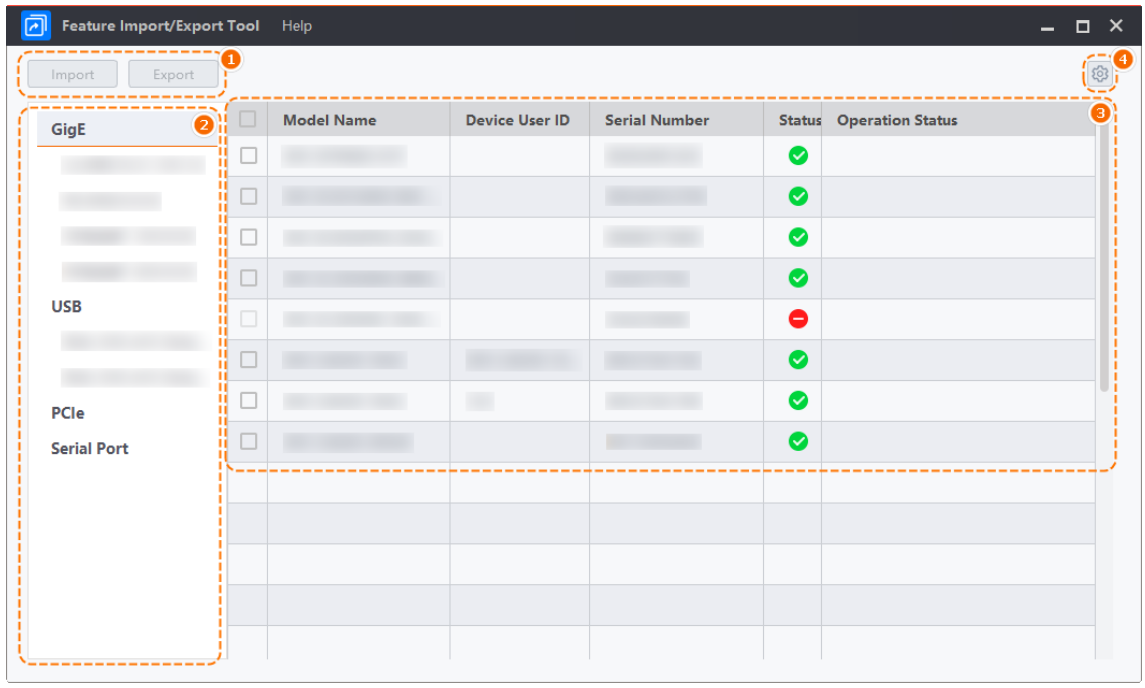

Figure 4-1 Main Page of Tool

Table 4-1 Main Page Description

No.	Function	Description
1	Import/Export	Import/Export the parameters of the selected camera(s) or frame grabber(s).
2	Interface Information	Display the interface information on the current PC.

No.	Function	Description
3	Device Information	Display the cameras or frame grabbers and the related information under different interfaces.
4	Device Information Configuration	Set the device information to be displayed in Area 3 as needed. The information can be different when you select different interfaces.

4.2 Import/Export Features

The tool supports importing or exporting the parameters of one or multiple cameras or frame grabbers.

Before You Start

Make sure the cameras or frame grabbers whose features need to be imported or exported are available.

Steps

1. **Optional:** Select an interface on the left side of the tool according to actual needs.

   Note

   By default, all cameras or frame grabbers under all interfaces are displayed.

2. **Optional:** Click in the upper-right corner to set the camera or frame grabber information to be displayed.
3. Select the camera(s) or frame grabber(s) whose features need to be imported or exported.

   Note

   Cameras and frame grabbers can not be imported or exported simultaneously.

4. Import or export features.
   - Click **Import**, select the MFS file from local PC, and click **Open**.

     Note

     When importing multiple cameras, you can only batch import the features of cameras which are of the same model. If there are cameras or frame grabbers which are of different models, the error prompt will pop up.
   - Click **Export**, select the file saving path on your local PC, and click **Select**.

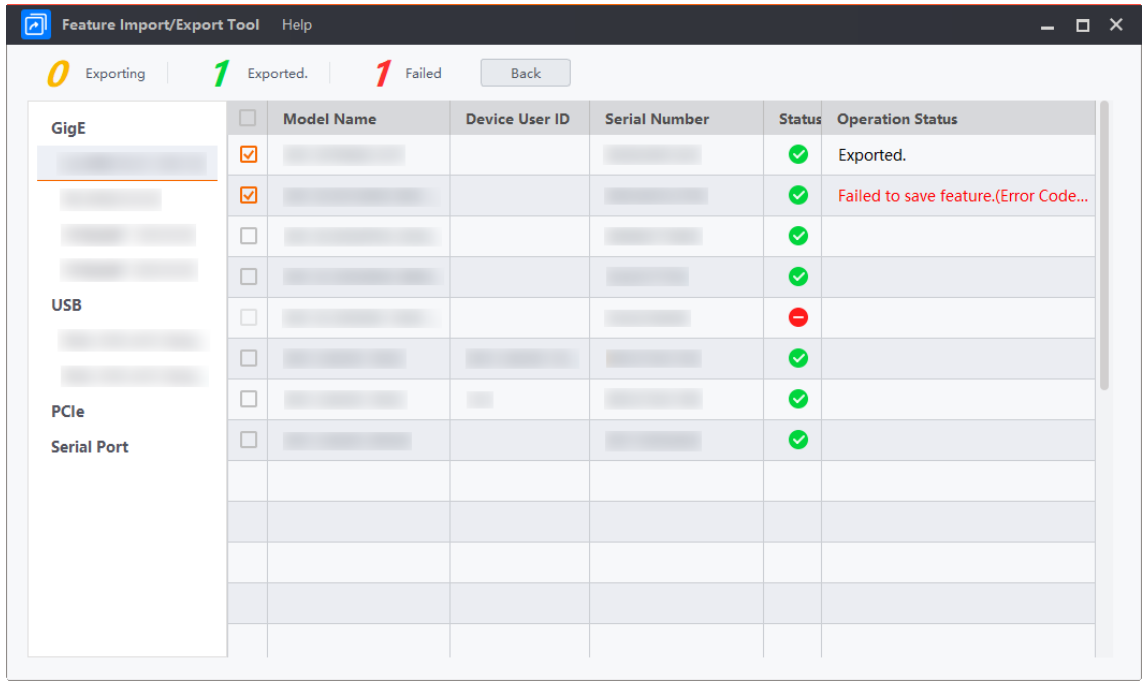

Figure 4-2 Export Features of Multiple Cameras

The tool starts importing or exporting camera or frame grabber features. The overall importing or exporting results will show on the upper side of the page. And you can view the status of the selected camera(s) or frame grabber(s) in the Operation Status column.

5. **Optional:** Click **Back** to exit the current page.

Chapter 5 Event Configuration Tool

The **Event Configuration Tool** provides a reference for viewing and configuring frame grabbers' events.

Note

This tool is only available when you run the Software on Linux x86_64 type system.

The Tool supports the following types of frame grabbers:

- Camera Link frame grabber
- Coax Press frame grabber
- GigE frame grabber
- 10 GigE frame grabber (supports some models)
- Fiber Optic frame grabber

5.1 Main Window Introduction

The section introduces the **Event Configuration Tool**'s main window.

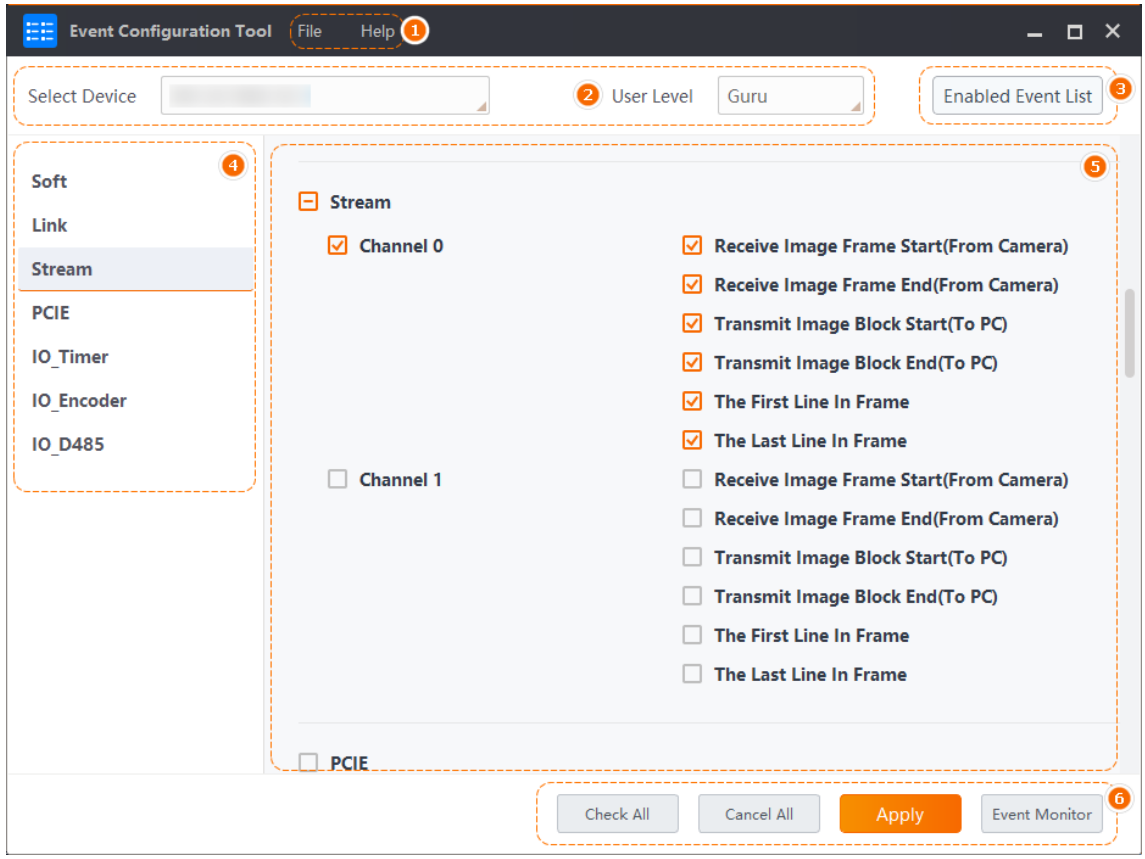

Figure 5-1 Event Configuration Tool Main Window

No.	Name	Description
1	Menu Bar	• Click **Help** to switch the tool language to Chinese or English, view the user manual, and view the tool version. • Click **File** to import/export events of frame grabbers.
2	Basic Configuration	• Select a device to configure events. • Set the user level as **Recommended** or **Guru**. **Recommended** is selected by default.
3	Configuring Result	The result of event configurations.
4	Event Type	Display all event types of the selected device.

No.	Name	Description
5	Event Details	Display channels and all their events of different types.
6	Operations	Select all events, deselect all, apply events, and view events via **Event Monitor**.

5.2 Configure the Event

With this Tool, you can set frame grabbers displaying, or import/export the events.

Steps

1. On the top left, click **Select Device** to select a frame grabber to configure events.
   Once connected, the Tool displays all available event types on the left pane.
2. **Optional:** Modify **User Level**.

   Note

   Guru mode supports more event types than **Recommended**.
3. Select specific required events on the right.

   Note

   - You can hover on the event to view the node name and enumeration value.
   - When you select one event, you can press "ctrl+c" to copy the node name of the event.
   - When you select one event, its corresponding sample code displays at the bottom part of the tool and you can press the "ctrl+c" to copy the sample code.

   - Check a channel of an event type to select all events in the channel.
   - Check an event type to check all events in all channels of the type.
   - On the lower right, click **Check All** to select all events of the frame grabber; click **Cancel All** to cancel selecting all events.
4. **Optional:** Perform the following operations as required.

   Copy Event Name

   Click on the name of an event and press "Ctrl + C" to copy the name of the event.

   Copy Demo Code

   Click the name of the an event and the demo code displays at the bottom part. You can then select and press "Ctrl+C" to copy the demo code.

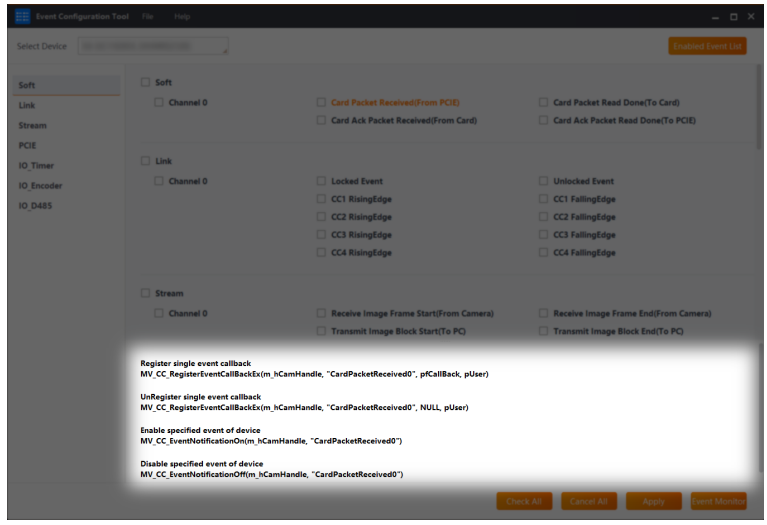

Figure 5-2 Demo Code

5. Click **Apply** on the lower right.

   For failed attempts, the Tool prompts **Failed Application**.

6. **Optional:** Click **Enabled Event List** on the top right to view applied events.

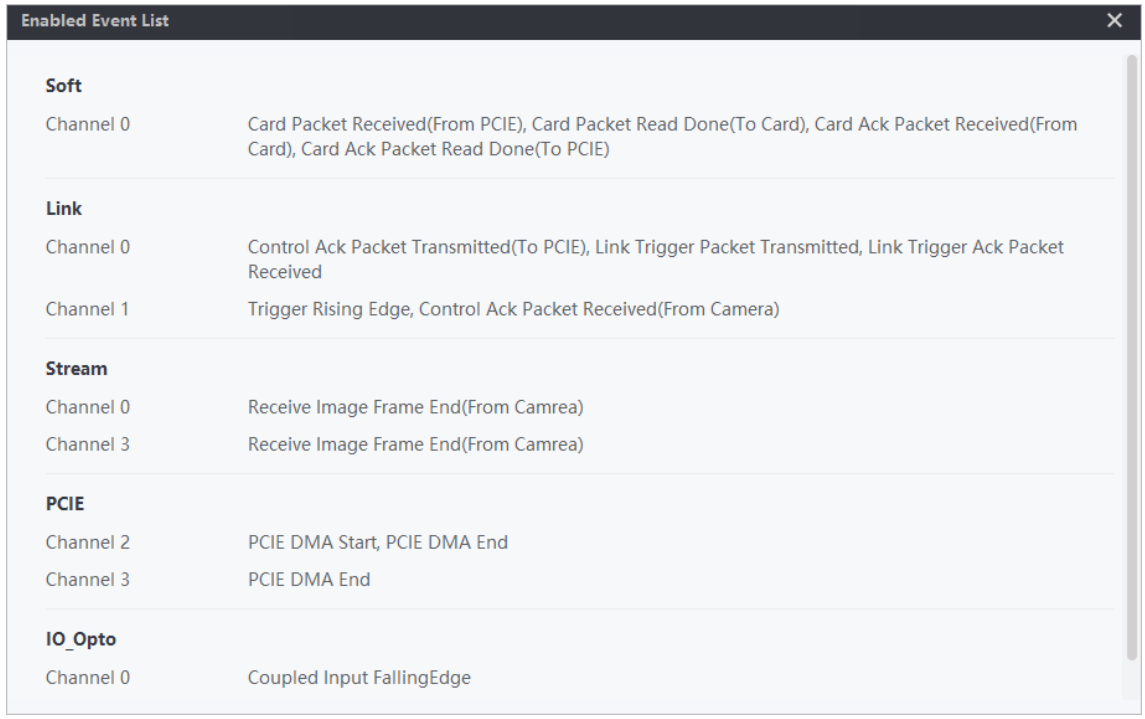

Figure 5-3 Enabled Event List

7. **Optional:** Import or export events.
   - Click **File** → **Import** , select an etc file to open it.

Note

- The tool only supports importing etc files of the same frame grabber model.
- Once imported, the events' status will be automatically checked and the events will be applied by default.

- Click **File** → **Export** , select a saving path, and click **Save**. By default, the file will be saved in C:\Users\Administrator\{Software Name}\Data\EventTool.

8. **Optional:** Click **Event Monitor** to view event results. You can also open the event monitor through the Software. For details, see *Event Monitor* in the user manual.

Chapter 6 PCIe Diagnostic Tool

The **PCIe Diagnostic Tool** can read the memory value of the frame grabber's debugging status in real time.

Note

This tool is only available when you run the Software on Linux x86_64 type system.

The Tool supports the following types of frame grabbers:

- Camera Link frame grabber
- Coax Press frame grabber
- GigE frame grabber
- 10 GigE frame grabber (support some models)
- Fiber Optic frame grabber

6.1 Main Window Introduction

This section introduces the tool's main window.

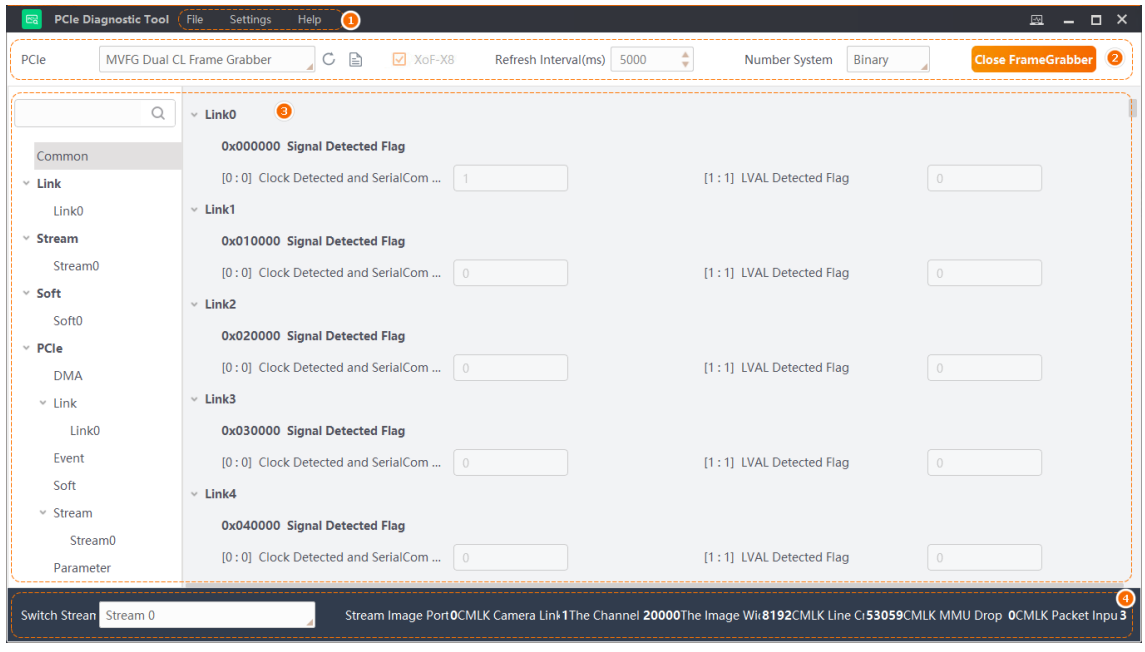

Figure 6-1 Main Interface

Table 6-1 Main Interface Description

No.	Item	Description
1	Menu Bar	The menu bar provides functions of importing/exporting data files, setting general parameters, and other operations for help. • **File**: You can import external data files or export diagnosis files. ◦ Click **File** → **Import** to import external data files to the tool. ◦ Click **File** → **Export** to export the diagnosis files to the local PC. • **Settings**: You can configure parameters for the diagnosis files to be exported. ◦ **Auto Export**: If enabled, the diagnosis files will be exported automatically. ◦ **Export Path**: You can configure the saving path for the diagnosis files to be exported. ◦ **File Count**: You can configure the number of diagnosis files to be exported automatically. • **Help**: You can select the language (Chinese or English) for the use of the tool, view the user manual, and view the tool version information.
2	Frame Grabber Settings	You can select a frame grabber for real-time frame grabbing and perform the following operations in the setting area. • Refresh Frame Grabber: Click to refresh the frame grabber. • View Frame Grabber: Click to view the frame grabber information. • Check Memory and CPU: Click in the upper-right corner to check the memory and CPU usage. • XoF-X8: Enable this when the connected frame grabber is of the XoF-X8 type. • Set Refresh Interval: You can set the interval for refreshing the debugging status after the frame grabber starts working. The unit is "ms" and the default interval (5,000 ms) is recommended. • Set Number System: You can set the number system to **Binary**, **Decimal**, or **Hexadecimal** for displaying debugging status.

No.	Item	Description
3	Diagnostic Monitoring	You can monitor the memory value of the frame grabber's PCIe debugging status in real time in the diagnostic monitoring area. See details in ***Diagnostic Monitoring*** .
4	Streaming Monitoring	By selecting a stream type from the drop-down list in the **Switch Stream** area, you can monitor the streaming status of the frame grabber in real time, including the stream status and stream transmit status. • **Stream Transmit Enable**: It refers to the streaming status of the frame grabber and it can be 0 (streaming is disabled) or 1 (streaming is enabled). • **GVSP Packet Input Sof Cnt**: It refers to the number of lost frames of the frame grabber. • **GVSP Packet Input Data_last Cnt**: It refers to the number of frames transmitted to the tool. **Note** The interface may vary with the frame grabber types. The actual interface shall prevail.

6.2 Diagnostic Monitoring

By connecting frame grabbers with the tool to grab frames, you can monitor the memory value of the frame grabber's PCIe debugging status in real time.

Select a frame grabber model from the drop-down list in the upper-left corner and click **Open FrameGrabber** in the upper-right corner.

You can enter keywords of debugging status or address in the search box on the left and click to search for the target information. The Common page displays the frequent debugging status information.

The tool can monitor 4 types of debugging status for the frame grabber, including **Link**, **Stream**, **Soft**, and **PCIe**.

- **Link**: Transmitted register data.
- **Stream**: Data stream, etc.
- **Soft**: Registers related with Soft software, SDK, serial port configuration, etc.
- **PCIe**: Transmission protocols, APIs, status, counting, etc.

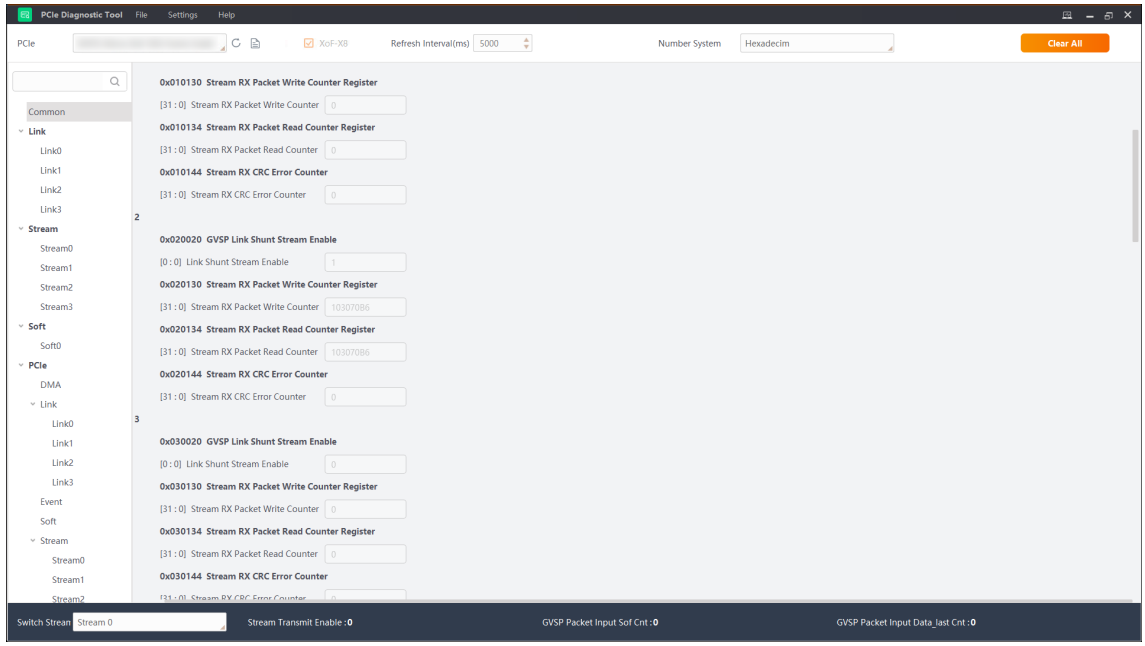

Figure 6-2 Diagnostic Monitoring

Note

Click **Close FrameGrabber** to stop grabbing frames.

Chapter 7 Legal Information

About this Manual

The Manual includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of this Manual at the company website.
Please use this Manual with the guidance and assistance of professionals trained in supporting the Product.

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