

LP Viewer User Manual



OPT LineLaser 3D CameraSeries

V2.0

***For optimal performance, please read this manual before using this product.**

Please keep this manual in a safe place for future reference.

Preface

Be sure to read this user manual before use. After reading, keep it in a safe place for future reference.

3D Laser Sensor Software User Manual Provides operational instructions for the OPT LP Viewer setup software of the 3D laser sensor.

This manual has been compiled with the utmost accuracy. However, should you encounter any unclear, erroneous, or ambiguous content, please contact our sales department. Should any pages be missing or contain binding errors, we will provide replacements.

1. This manual is marked

This manual covers the OPT-LP-F2/E2 series models of the LP series. Unless otherwise specified, the OPT-LP-E2 is used as the example throughout. Similarly, the screen examples shown in this manual primarily feature the PT-LP-E2.

2. Meaning of Each Label

The following labels indicate important information in this book. Please be sure to read them carefully.

Tag	Prompt Information
 Danger	High potential risk, which could result in casualties if not avoided.
 Warning	Potential risks exist that, if not avoided, may result in injury, accidents, equipment damage, or business interruption.
 Be careful	Failure to comply with these precautions may result in minor or moderate injury to personnel.
 Note	Remind users of important actions or guard against potential harm.
 Important	Precautions and usage restrictions that must be observed during operation.
 Note	Additional information that must be observed for the proper use of this product.
 Reference	To better understand and utilize the information provided, here are some helpful tips.

Safety Precautions

3. Important Notes

 Danger	• Must not be used in hazardous environments such as flammable or explosive areas. • Do not touch the product heat dissipation components directly to avoid burns.
 Bewareful	• Before using the device, please verify that all functions and performance of this product are operating normally. • To reduce the risk of fire or electric shock, do not expose the product to rain or moisture.
 Warning	• Use this product only with the correct power supply voltage. Failure to do so may result in fire, electric shock, or malfunction. • Do not disassemble or modify this device for use. Doing so may result in fire or electric shock. • Before connecting cables or servicing equipment, turn off the main power supply. Failure to do so may result in electric shock. • Do not allow foreign objects such as metal fragments, dust, paper scraps, or wood shavings to enter the interior of this product. Failure to do so may result in fire, electric shock, malfunction, or accidents.
 Note	• Avoid installing the product in environments subject to vibration or impact, and keep it away from locations with electromagnetic interference. • Do not use the product in extremely hot, extremely cold, dusty, corrosive, or high-humidity environments. Refer to the product specifications sheet for specific temperature and humidity requirements. • Please retain all original packaging materials for the equipment. Should any issues arise, use these materials to securely package the equipment for return to the distributor or manufacturer. The company shall not be held liable for any accidental damage during transit caused by non-original packaging materials.

4. Installation Precautions

 Bewareful	To ensure normal and safe operation of this unit, do not install it in the following locations. Failure to comply may result in equipment damage and safety incidents. • Damp locations, dusty environments, poorly ventilated areas • Areas exposed to direct intense light or other high-temperature environments • Locations where exposure to corrosive or flammable gases is likely • Locations where equipment is not securely installed
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	• Areas where exposure to various liquids is likely • Areas prone to static electricity buildup
 Note	• Installation personnel must possess valid certification or relevant experience in low-voltage system installation and maintenance, along with proven expertise and qualifications in related work. • Installers must possess fundamental knowledge and operational skills in low-voltage wiring and low-voltage electronic circuit connections. • During product installation and use, all national and regional electrical safety regulations must be strictly adhered to.
 Bewareful	• Exercise caution during installation and handling to prevent the measuring head from falling, which could cause personal injury or equipment damage.
 Note	• Keep this product and its cables away from high-voltage lines and power lines whenever possible. Otherwise, interference may cause malfunctions or failures. • When securing cables, bundle them over protective materials such as spiral tubing. If the cable weight is concentrated at the bundling point, it may cause wire breakage or short circuits. • All devices, including this unit, are precision instruments. Avoid subjecting them to impact or vibration.

5. Precautions in Case of Abnormalities

 Warning	Immediately turn off the power under the following conditions. Continuing to use the device under abnormal conditions may result in fire or malfunction. For product repairs, please contact our sales department. • When water or foreign objects enter the interior of the main unit • In case of dropping or damage to the casing • When the controller emits smoke or an unusual odor
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6. Regarding Software Usage

 Note	• OPT LP Viewer is software that runs on Windows and should be installed on Windows. Please verify that your computer has Windows 7/10/11 installed and can run it properly. • It cannot be ruled out that unknown antivirus software may identify this program as a virus. We recommend adding this software to your antivirus program whitelist or disabling your
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	computer antivirus software. • Do not block the ventilation openings on the main unit or external devices, as this may prevent proper heat dissipation and cause malfunctions. • Do not allow excessive light (sunlight or intense artificial light) to shine directly into the lens for extended periods, as this may cause the imaging surface to burn out or malfunction.
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7. Regarding Entity Cleaning

 Note	• Dip a cloth into diluted neutral detergent, wring it out thoroughly, wipe away the dirt, then polish with a soft dry cloth.
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8. How to Maximize Your Computer Performance

Impact of Ambient Temperature

- Changes in ambient temperature may cause measurement errors. Ensure the ambient temperature remains constant. If the ambient temperature changes by 10 ° C, it takes approximately 60 minutes for the internal temperature distribution of this unit to stabilize.

About Warming Up

- After connecting the power supply, please wait approximately 30 minutes before use. The circuit remains unstable shortly after power-up, and measured values may gradually decrease.

Regarding the Operating Environment Illuminance

- Avoid using near lighting fixtures. If unavoidable, shield the device with a light shield or similar to prevent interference.

Impact of foreign objects and dust

Under the following conditions, measurement errors may occur due to the influence of foreign objects, dust, moisture, oil, or other substances.

- Attached to the cover glass: Use clean air to blow away impurities from the cover glass section. For heavy soiling, wipe with a soft cloth dampened with alcohol.
- Adhering to the surface of the measurement object: Please blow away or wipe off any dirt using clean air.
- Suspended particles or droplets entering the optical axis area: Implement countermeasures such as installing protective covers or air curtains for isolation.

Impact of Vibration

- If the measured object vibrates, the measurement values may be inaccurate.
- In this case, increasing the number of processing cycles for the moving average can enhance measurement accuracy.

Object to be measured

- Measurement values may be subject to error when the shape and surface condition of the measured object differ.

The Effect of Air Flow

- Due to the influence of slow air turbulence, measured values may be subject to deviation.

Table of Contents

第 1 章 OPT LPViewer System Requirements and Software Installation Steps	8
1.1 Required Configuration for Installation	9
1.2 Preparing for Installation	9
1. Installation Verification Checklist	9
1.3 Firewall	9
1.4 OPT LP Viewer Installation	10
1.5 Network Interface Card Configuration	11
第 2 章 Introduction to OPTLP Viewer Basic Operations and Interface	12
2.1 Basic Operations	13
1. Camera Connection	13
2. Change local IP	13
2.2 Toolbar Overview	14
1. Main Interface Toolbar	14
2. Image Window Toolbar	14
3. 3D Image Window Toolbar	14
2.3 Menu	15
1. Import Properties	15
2. Export Properties	15
3. Save GenICam XML	15
4. Full Screen	15
5. Visual Layout	16
6. View	16
7. Network Adapter Properties Settings	17
8. Terminal Monitoring	18
9. Configure IP	19
10. Log	19
11. Information Statistics	19
12. Firmware Update	20
13. Help	21
第 3 章 Camera Parameter Settings	22
3.1 Acquisition Settings	23
1. Trigger Settings	23
2. Line-scan mode	23
3. Frame End Settings:	25
4. Advanced Settings:	25
3.2 Shooting Settings	25
1. Collection Scope Settings:	26

2. 3D Display:	26
3.3 Profile Settings	27
1. Image Processing:	27
2. Contour Processing:	27
3.4 Correction Settings	28
1. Correction:	28
2. Scheme Settings:	31
3. Other Settings:	31
第 4 章 All Attribute Descriptions	32
1.1 All Properties	33
1. All Attributes Table:	33

LP Viewer Install SInstallation

OPT LPViewer System Requirements and Sotw are Installation Steps

This chapter describes the environment requirements and installation steps for the OPT LP Viewer software.

1.1 Required Configuration for Installation

OS	Windows 11 (Enterprise)* Windows 10 (Enterprise)* Windows 7 (SPI or later) (Professional/Ultimate)
CPU	Core i3 2.3 GHz or higher
Memory space	8GB or higher (16GB or higher recommended)
Level 2 cache	2MB or higher
Graphics card	Supports DirectX 9 with 128MB or more of video memory
Hard disk space	10GB or higher
Monitor	XGA (1024 x 768 pixels) or higher, 256 colors or higher
Interface	Ethernet 1000BASE-T/100BASE-TX

1.2 Preparing for Installation

1. Installation Verification Checklist:

- Windows Environment and Installation
Location OPT LP Viewer is software designed to run on Windows and should be installed on a Windows system. Please verify that your computer has Windows 7/10/11 installed and is capable of running it properly.
- Disk space: OPT LP Viewer can only be installed on a hard disk. The target hard disk must have 10GB of free space. If space is insufficient, free up sufficient space before proceeding with the installation.

1.3 Firewall

To ensure the software operates normally and

data transmission remains stable, and to prevent the system from identifying the client as a virus, please disable your firewall or add this software to the firewall whitelist. The steps for Windows 10 are as follows:

- 1 Open the System Firewall and Network Protection interface, as shown in Figure 1.3.1.

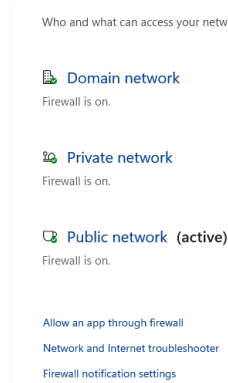


Figure 1.3.1 System Firewall Interface

- 2 Click the Network Options, then toggle the firewall switch to Off. As shown in Figure 1.1.2.

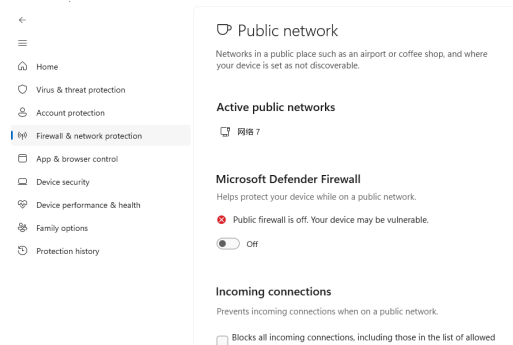


Figure 1.3.2 Disabling the System Firewall

- 3 Click Firewall Notification Settings and toggle notifications to Off. As shown in Figure 1.3.3.

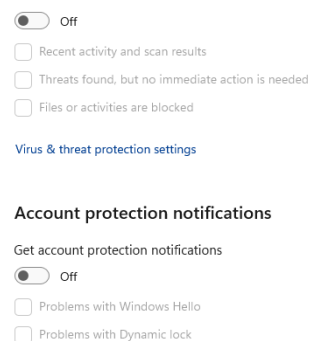


Figure 1.3.3 Firewall Disabled Notification

- 4 Tap Settings > Notifications & Actions, then toggle System Notifications to Off. As shown in Figure 1.3.4.

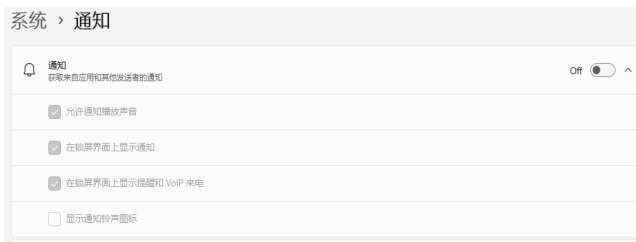


Figure 1.3.4 Disabling System Notifications

1.4 OPT LP Viewer Installation

Installation steps are as follows (using Windows 10 64-bit system as an example):

- 1 Extract the OPT LP Viewer software package to the specified installation path.
- 2 Open the folder where the files were extracted, locate the OPT LP Viewer_****_Setup application, and double-click to launch it, as shown in Figure 1.4.1.

名称	修改日期	类型	大小
2026.1.7 OPT LP Viewer_v4.0.0.0_Setup	1/7/2026 1:55 PM	应用程序	355,304 KB
2026.1.7 OPT LP Viewer_v4.0.0.0_Setup	1/16/2026 7:17 PM	Compressed (zipp...	354,910 KB

Figure 1.4.1 Launching the Installer

- 3 Begin installing the OPT LP Viewer_****_Setup application. Click the I agree to this agreement option, as shown in Figure 1.4.2.

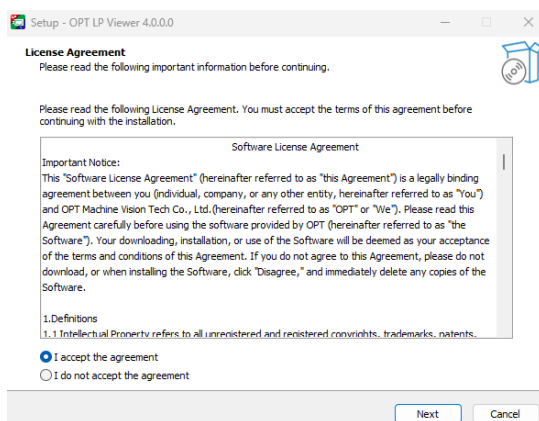


Figure 1.4.2 Installing Software

- 4 Click Next, then click Browse to select the installation path for the OPT LP Viewer software, as shown in Figure 1.4.3.

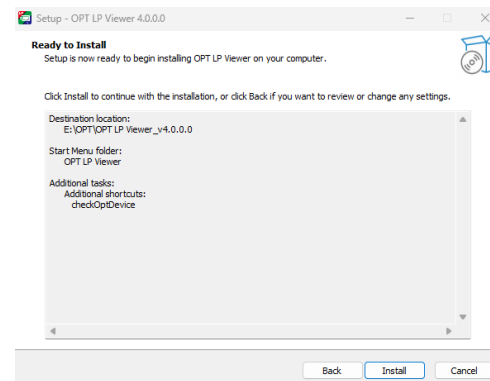


Figure 1.4.3 Selecting the Installation Location

- 5 Click Next to proceed to the installation preparation screen. Click Install to continue installing the software, as shown in Figure 1.4.4.

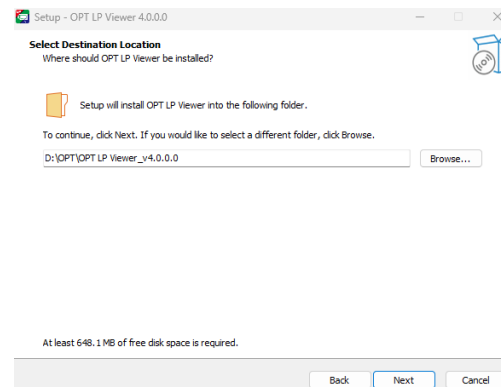


Figure 1.4.4 Preparation for Installation Interface

- 6 After installation is complete, you will need to restart your computer. Selecting Yes, restart the computer now will immediately restart this computer. Selecting No, restart the computer later will not restart the computer at this time. As shown in Figure 1.4.5.

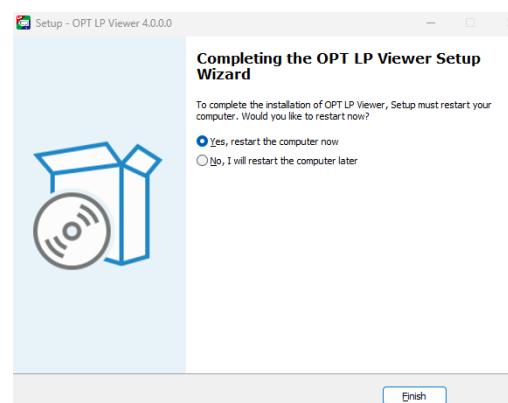


Figure 1.4.5 Installation Completion Interface

1.5 Network Interface Card Configuration

Open the Control Panel, select Network and Sharing Center, then click Change adapter options. Select the Ethernet port you need to modify, right-click the mouse, and choose Properties from the dropdown menu. After entering the Properties window, click Configure (C).... On the Configuration page, click the Advanced option. Set the following properties.

- 1 Locate the transfer buffer in the property list and set it to the maximum value. As shown in Figure 1.5.1.

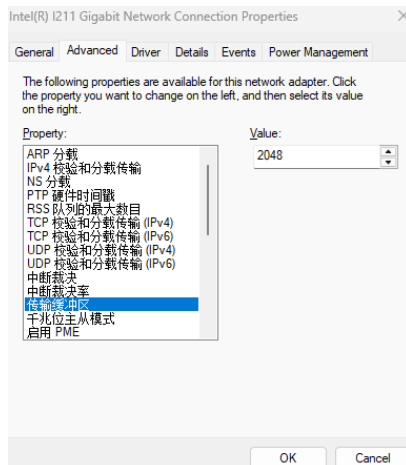


Figure 1.5.1 Transmission Buffer Configuration

- 2 Set the receive buffer to its maximum value. As shown in Figure 1.5.2.

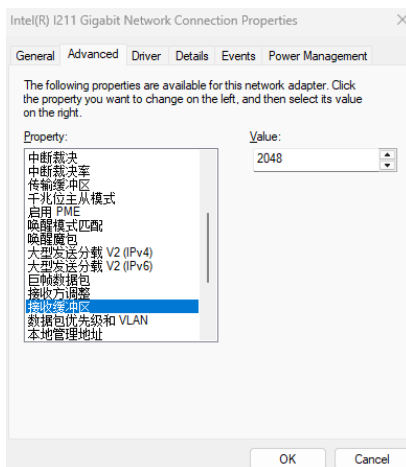


Figure 1.5.2 Receive Buffer Configuration

- 3 Enable jumbo frames and set them to the

maximum value, as shown in Figure 1.5.3.

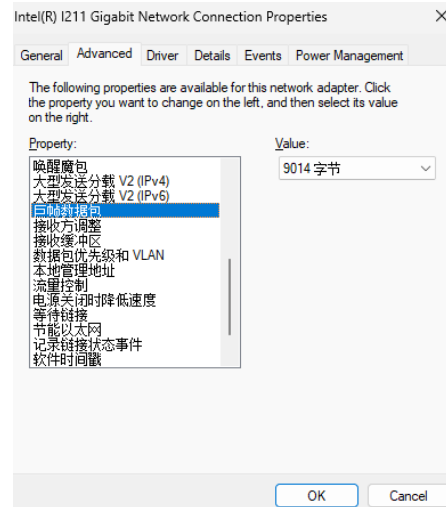


Figure 1.5.3 Jumbo Frame Packet Configuration

- 4 The speed and duplex settings were changed to 1 Gbps full-duplex, as shown in Figure 1.5.4.

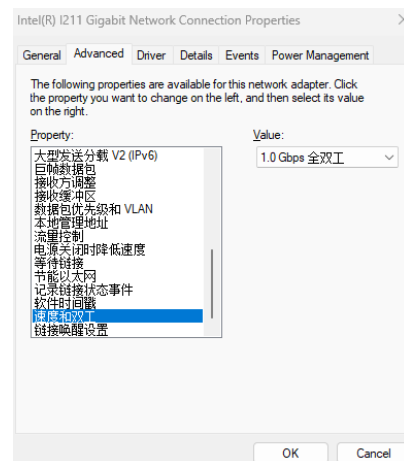


Figure 1.5.4 Speed and Duplex

- 5 Disable Energy Efficient Ethernet, as shown in Figure 1.5.4.

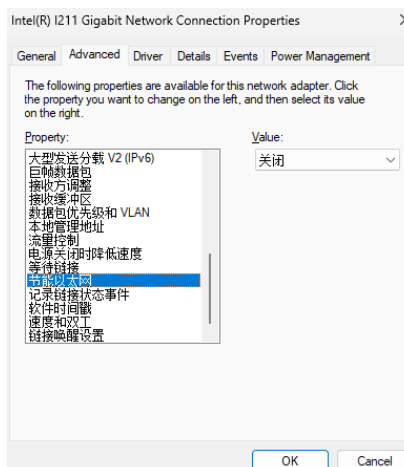


Figure 1.5.4 Energy-Efficient Ethernet Settings

Basic Operations and Interface Introduction

Introduction to OPTLP Viewer Basic Operations and Interface

This chapter explains the basic operations and interface for connecting the camera and using the OPT LP Viewer software.

2.1 Basic Operations

1. Camera Connection

- Camera connection steps are as follows:

1 After launching the software and entering the interface, select the camera to be configured from the device list, as shown in Figure 2.1.1.



Figure 2.1.1 Configuring the Camera IP

2 Click the button to connect the camera.

Configure the IP parameters as described below.

Figure 2.1.2: IP: Used to set the camera current IP

address. Subnet Mask: The camera subnet mask.

Gateway: The camera gateway. IP

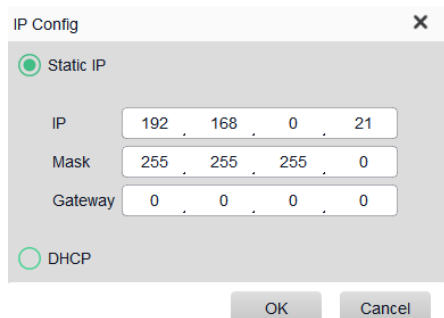


Figure 2.1.2 Configuring IP

3 After configuring the IP address, the camera model will appear in the upper-left corner of the software interface. Click to select the camera model, then choose the Connect Camera button, as shown in Figure 2.1.3.

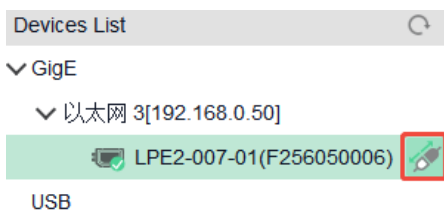


Figure 2.1.3 Connecting the Camera

- Note: If the camera disconnects during operation due to improper handling or a power

interruption, reconfigure the camera connection by following the steps above.

2. Change local IP

- To modify the local network IP address, follow these steps:

1 The factory default IP address for the camera is typically 192.168.0.XX. You can modify the camera IP address through its configuration interface or connect to the camera by changing your computer IP address. Click to open System Settings, select Network & Internet > Advanced network settings > Change adapter options. As shown in Figure 2.1.4.



Figure 2.1.4 Windows Settings Interface

2 Select the Ethernet connection, right-click it, and choose Properties from the context menu to open the Ethernet Properties dialog. Double-click Internet Protocol Version 4 (TCP/IPv4) to open its settings, as shown in Figure 2.1.5.

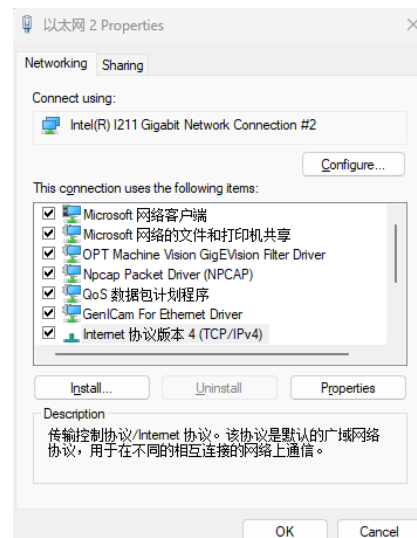


Figure 2.1.5 Ethernet Attribute Settings

3 Open Internet Protocol Version 4 (TCP/IPv4) and begin configuring the IP address, as shown in Figure 2.1.6.

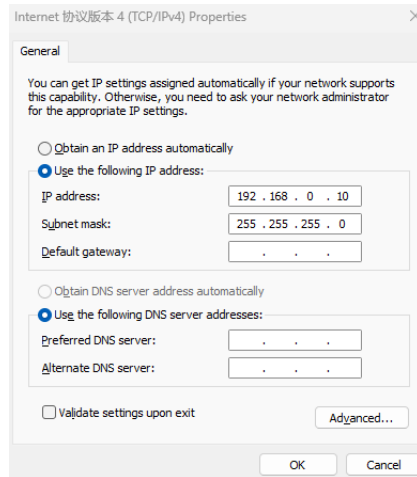


Figure 2.1.8 Modifying the Local IP Address

2.2 Toolbar Overview

1. Main Interface Toolbar

	Import Properties		Information Statistics
	Export Properties		Save Image Settings
	Visual Layout		Terminal Monitoring
	Full Screen		Help
	Log		Language Conversion

2. Image Window Toolbar

	Outline Display Interface		Save multiple copies
	Image Display Interface		Single-sheet storage
	3D Display Interface		3D rendering
	3D Display Interface		Simultaneous vertical and horizontal enlargement
	Depth Map Display Interface		Simultaneous reduction in both vertical and horizontal dimensions

	2D Display Interface		1:1 Display
	Single-frame capture		Adaptive Window Display
	Start collection		

3. 3D Image Window Toolbar

	Import image		Oblique view
	Point rendering		Top view
	Line rendering		Bird-eye view
	Face rendering		Left View
	Set dot size and line width		Right View
	Display color bar		Rear view
	Turn on/off the lights		Front view
	Switch Coordinate System		Clear Grid
	Reset View		Change the background color

2.3 Menu

1. Import Properties

Importing properties allows you to import the current properties of a camera. Select the camera whose properties you wish to import from the device list, then perform the import operation. After importing, the properties take effect in real time, as shown in Figure 2.3.1.

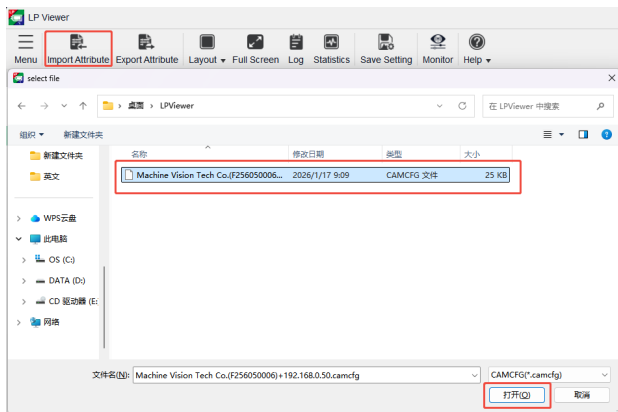


Figure 2.3.1 Import Properties

2. Export Properties

Export Properties can be used to save user customizations, application default settings, or camera attributes. Click Export Properties to save parameter settings and attributes to a local file. The file name corresponds to the currently saved camera name, as shown in Figure 2.3.2.

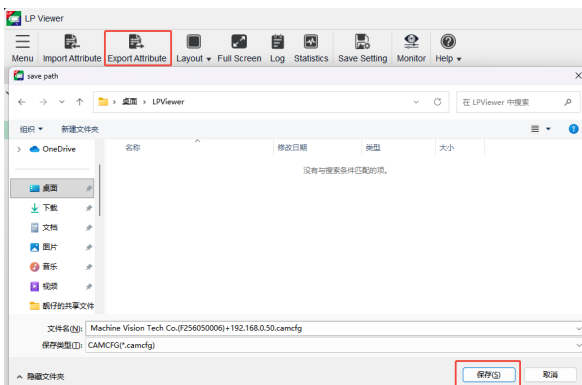


Figure 2.3.2 Exported Properties

3. Save GenICam XML

Select the connected device in the device list, right-click to open the context menu, and choose Save GenICam XML, as shown in Figure 2.3.3. This

function saves the GenICam file for the currently connected camera in XML format. By default, the GenICam file is named after the camera model, but users can modify the filename as needed. GenICam XML is an XML file generated by the camera according to the GenICam protocol. It contains relevant information transmitted from the camera to the computer, including camera property node information. For further details, refer to the following section.

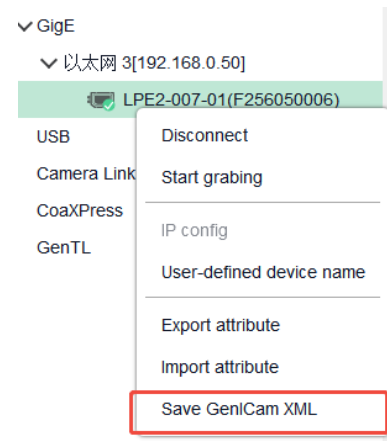


Figure 2.3.3 Saving GenICam XML

4. Full Screen

For the currently previewed window, clicking the Full Screen button in the menu bar or double-clicking the page will activate full-screen mode for the current preview camera image window. If the display layout is set to Single View, full-screen mode will activate the Single View layout, as shown in Figures 2.3.4 and 2.3.5. You can exit full-screen mode by pressing the Esc key or double-clicking the screen.

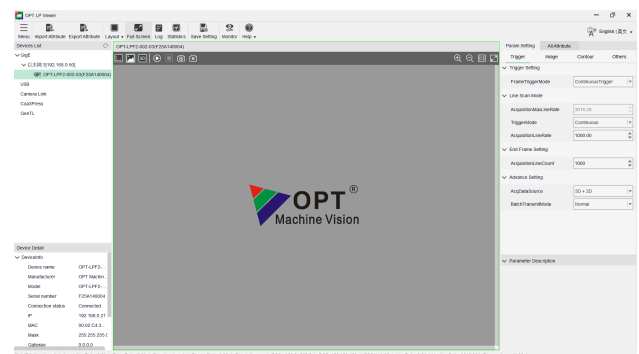


Figure 2.3.4 Preview Window

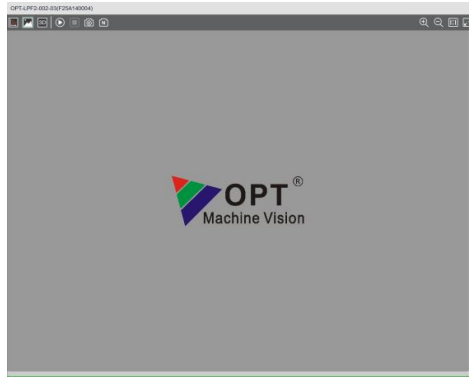


Figure 2.3.5 Full-Screen Window

When the display layout is set to multi-screen mode, to make a specific screen full-screen, select the camera window you want to expand. Click the maximize button in the top-right corner of the screen or double-click the screen itself to achieve full-screen mode. To revert, click the minimize button in the top-right corner of the screen or double-click the screen.

5. Visual Layout

Click the Menu Bar - Screen Layout to select a more flexible screen layout according to user needs. Screen layouts are categorized into Single Screen, Dual Screen, and Multi-Screen, as shown in Figure 2.3.6.

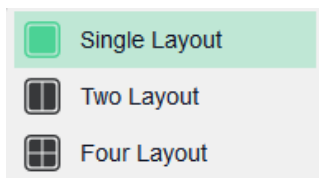


Figure 2.3.6 Screen Layout

When in single-screen mode, clicking the Start Capture button displays the image from the currently selected camera by default. The preview window in single-screen or full-screen preview mode is shown in Figure 2.3.7. For details regarding single-screen full-screen functionality, refer to the Full-Screen section.

To switch to the preview window of another connected camera on a single screen, select the desired camera from the device list. This action will change the image displayed in the preview window.

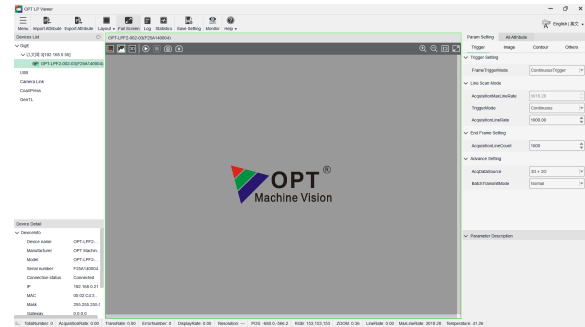


Figure 2.3.7 Single-Screen Preview

In dual-view mode, the preview windows of the first two connected cameras are displayed based on their connection time. To view other camera preview windows, switch to the quad-view layout, as shown in Figure 2.3.8. The quad-view layout operates similarly, as illustrated in Figure 2.3.9.

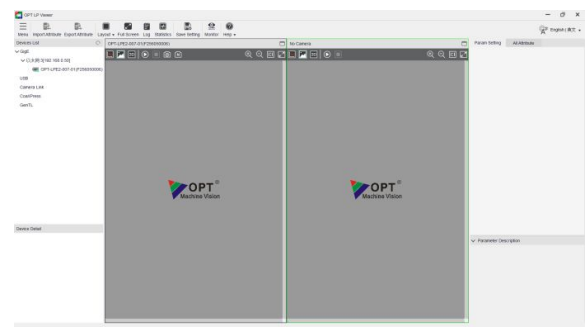


Figure 2.3.8 Dual-Screen Preview

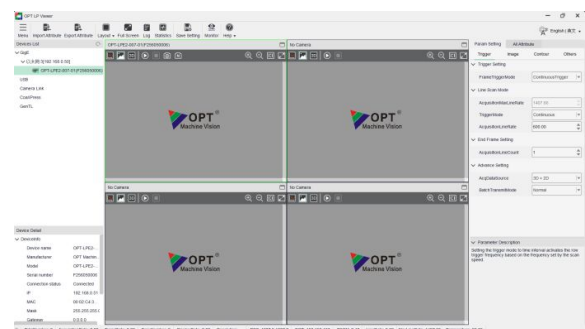


Figure 2.3.9 Four-Screen Preview

6. View

View: Customize interface display content based on user needs—adjust device lists, device details, frequently used attributes, and all attributes. Clicking the checkbox displays the selected content on the interface; unchecking it hides that content, as shown in Figures 2.3.10 and 2.3.11.

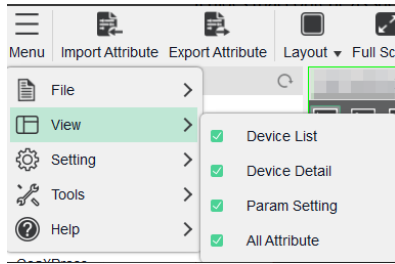


Figure 2.3.10 View

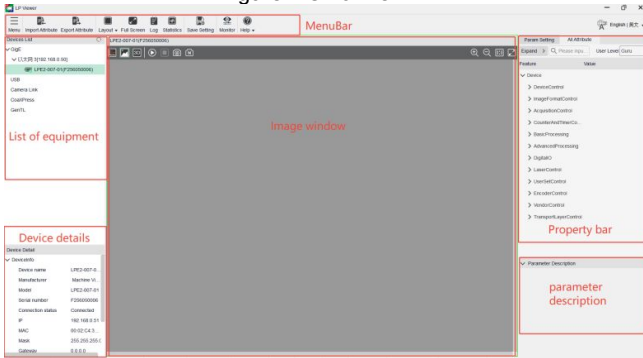


Figure 2.3.11 View

7. NetworkAdapter Properties Settings

During software operation, network connection performance can be optimized through network adapter properties to enhance access speeds, thereby reducing environmental impacts on data acquisition, as shown in Figure 2.3.12.

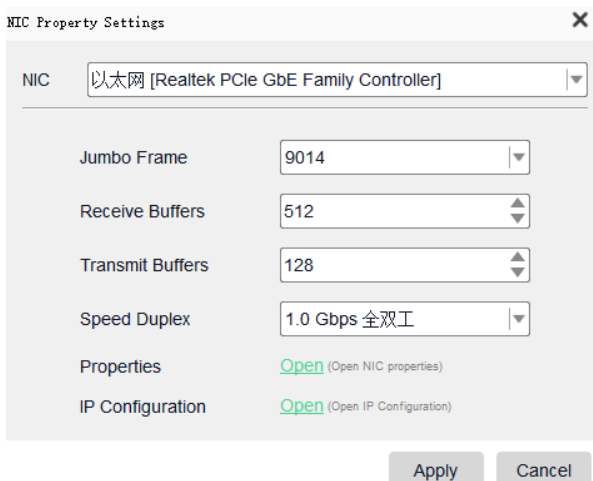


Figure 2.3.12 Network Card Properties Settings
Network Adapter Properties Parameter Description:

- Network Interface Card (NIC): A device that connects a computer to a local area network.

- Jumbo Frame: An Ethernet frame whose payload exceeds the standard 1500-byte limit. Also known as a giant frame or large frame.
- Receive Buffer: It is recommended to set the receive buffer to a larger value to help cache more packets.
- Transmission Buffer: It is recommended to set the transmission buffer to a larger value to avoid packet congestion caused by an insufficient buffer size.
- Speed and Duplex: Speed: Transmission rate; Duplex: Signal transmission mode.
- Network adapter properties: Click to view and modify network adapter settings. For details, see Modifying the Local IP Address.
- Set Network Adapter IP: Click to change the network adapter IP address. For details, see Modifying the Local IP.
- Image Saving Settings: Click Menu > Image Saving Settings. Before capturing images, you can enable the default image save switch and configure the image type and format to be saved, as shown in Figure 2.3.13.

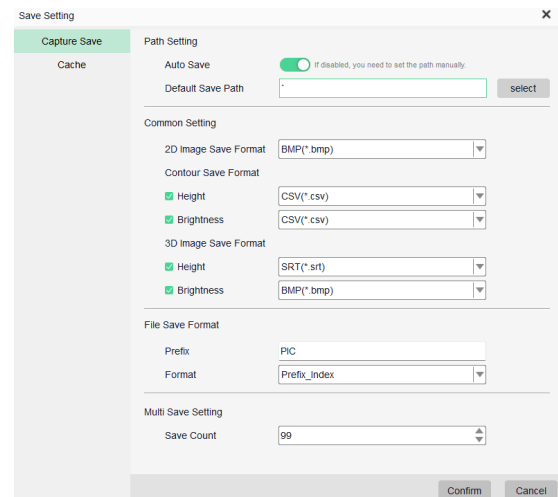


Figure 2.3.13 Save Image Settings
Save Image Settings Parameter Description:

- Default Path Settings: 1) Enable: When enabled, images will be saved to this path by default. When disabled, users must manually specify the path when saving images. 2) Save to

this path by default: Set the local path for saving images.

- **Public Settings:** (1) 2D Image Save Format: Select the default format for saving images in 2D image mode to a specified path. Supported formats include bmp, jpg, png, and tif. (2) Profile Save Format: Select the image type and format required for saving images in profile mode. Image types include height maps and brightness maps. Height maps support CSV, BIN, PCD, and SRT formats, while brightness maps only support CSV format. (3) 3D Image Save Format: Select the image type and format to save when using the contour mode. Image types include height maps and intensity maps. Height maps support srt, pcd, ply, csv, bin, obj, ecd, jxr, and tif formats; intensity maps support csv, bmp, jpg, and png formats.
- **File Saving Format:** (1) Prefix: The prefix appended to the filename when saving images. Supports Chinese, English, numbers, and other characters, but does not support any of the following characters: V:*? <>|. (2) Naming Format: Divided into three formats: Prefix_DateTime_IncrementalIndex, Prefix_DateTime, and Prefix_IncrementalIndex.
- **Multiple Image Save Settings:** Configure the number of images to save. The default is 20 images, with a setting range of [1, 99].
- **Acquiring Data Stream Cache Nodes:** Increasing the cache count prevents frame drops at high frame rates, resulting in smoother gameplay. However, this also consumes more memory and introduces additional latency. Typically, when operating at high frame rates with low cache sizes, a cache count exceeding 8 is recommended. At low frame rates with high cache sizes (recommended cache count: 4), frame drops are less likely while saving memory and reducing latency, as shown in Figure 2.3.16. The setting range is [1, 200].

- **Image Cache Nodes:** Increasing the number of cache nodes prevents frame drops at high frame rates. Raising this parameter resolves frame loss caused by insufficient hard drive read/write speeds or inadequate cache space. It preserves as many images as possible but also consumes more memory and introduces additional latency, as shown in Figure 2.3.14. The setting range is [1, 10000].

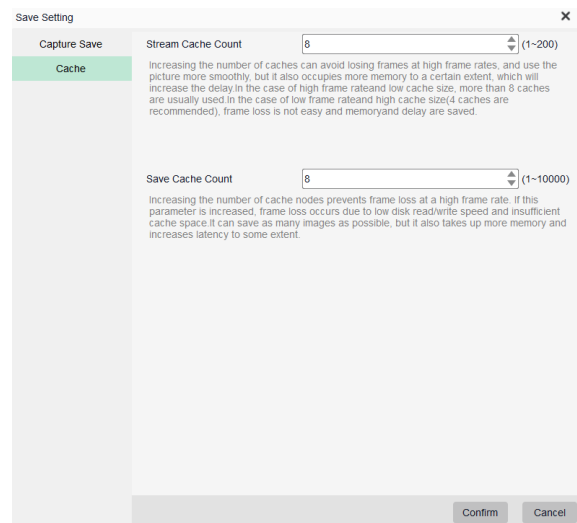
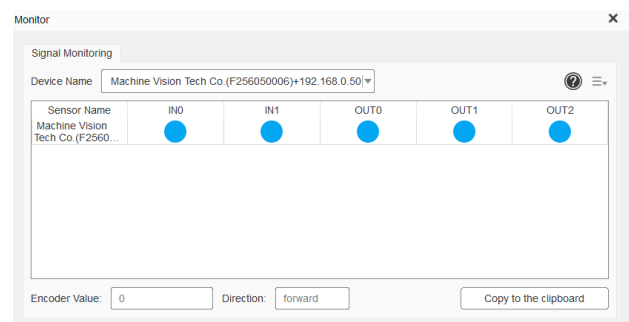


Figure 2.3.14 Cache Options

8. Terminal Monitoring

Terminal monitoring displays the input/output status of each terminal in chart form, confirming the ON/OFF status of each terminal, as shown in Figure 2.3.15.



2.3.15 Terminal Monitoring

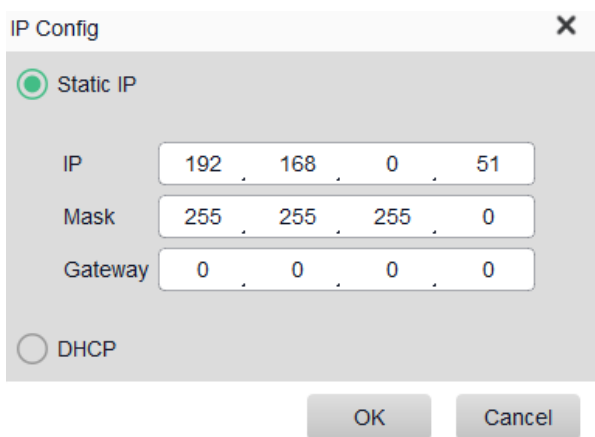
Terminal Monitoring Parameter Specifications:

- **Device Name:** Click the dropdown menu to select the device you wish to monitor.
- **Sensor Name:** Displays the name of the sensor currently being monitored.

- **Encoder Value:** Displays the current encoder value of the device. Use the button in the lower-right corner to copy the encoder value to the clipboard.
- **Direction:** Displays the current encoder direction—forward or reverse.

9. Configure IP

Configuring the IP address involves setting either a static IP or a dynamic IP. This configuration enables the camera IP to establish a proper connection with the software client, as shown in Figure 2.3.16.



The IP Config dialog box has a title bar with a close button. It contains two radio buttons: "Static IP" (selected) and "DHCP". Below the radio buttons are three input fields for IP, Mask, and Gateway, each with a numeric keypad. The IP field contains "192 . 168 . 0 . 51", the Mask field contains "255 . 255 . 255 . 0", and the Gateway field contains "0 . 0 . 0 . 0". At the bottom are "OK" and "Cancel" buttons.

Figure 2.3.16 Configuring IP Configuration of IP Parameters:

Static IP: A static IP (also known as a fixed IP address) is an IP address permanently assigned to a single device.

- **Dynamic IP:** An IP address allocation method that assigns an IP address only when the camera is connected. The IP address may change at any time.

10. Log

The log records and displays usage information during software operation, as shown in the figure below. Clicking Clear Log in the upper-right corner clears the displayed log entries. Selecting the device name and information type in the log window allows you to adjust the displayed content. By default, logs are sorted by time, as shown in Figure 2.3.17.

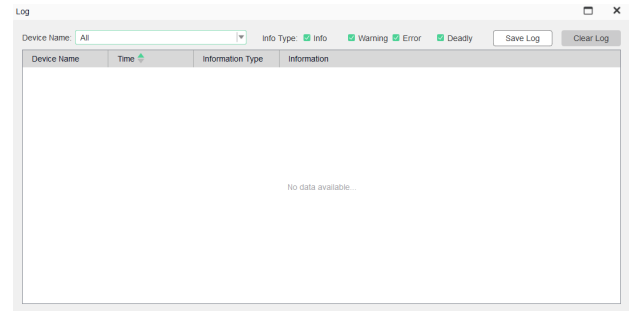


Figure 2.3.17 Log
Log Parameter Description:

- **Device Name:** When multiple devices are connected, use the dropdown options to determine whether to display log information for all devices or just one specific device.
- **Information Type:** Used to categorize log information. Selecting options displays logs of different categories. (1) Info: Indicates informational messages (2) Warning: Indicates cautionary messages (3) Error: Indicates critical issues (4) Deadly: Indicates fatal errors
- **Save Log:** Click the Save Log button to export the log information to a local file.
- **Clear Logs:** Click the Clear Logs button to clear the log information displayed in the current log window interface.

11. Information Statistics

Information Statistics monitors the status of connected cameras in real time. For cameras currently capturing footage, this interface displays the camera model and capture status. For cameras that are connected but not capturing, only the camera model is displayed, as shown in Figure 2.3.18.



DeviceId	TotalNumber	AcquisitionRate(Fps)	Bandwidth(Mbps)	Resolution	ErrorNumber	DisplayRate(Fps)	LineRate
Machine ...	0	0.00	0.00	---	0	0.00	0.00

Figure 2.3.18 Information Statistics
Statistical Parameter Description:

- **Device Name:** When multiple devices are connected, use the dropdown options to

determine whether to display log information for all devices or just one specific device.

- Total Frames: The total number of frames generated.
- Frame rate (Fps): Indicates the number of frames displayed per second during the capture process.
- Bandwidth (Mbps): The maximum number of bytes transferred per second.
- Resolution: Refers to the amount of information stored in an image, measured by the number of pixels per inch within the image.
- Error Frame Count: The number of frames lost due to packet loss during camera capture.
- Display Frame Rate (Fps): The frame rate currently displayed by the software.
- Line frequency: The number of lines scanned per second by the camera on the sensor.
- Maximum line frequency: The maximum number of lines per second that the camera can output on the sensor.
- Temperature: Displays the current temperature of the device.
- Custom display properties: Check the boxes for the statuses you wish to display; uncheck to hide them. The custom feature allows you to add additional properties to display, as shown in Figures 2, 3, and 19 below.

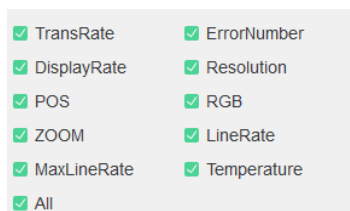


Figure 2.3.19 Custom Display Properties Button

Enter the full name of the attribute you wish to add, click the Add button, then click the checkbox button to the left of the attribute in the custom list. This will add the custom attribute parameter to the information statistics interface. To delete an added attribute, click the button to the right of the attribute,

as shown in Figure 2.3.20. A maximum of 5 custom attributes can be added.

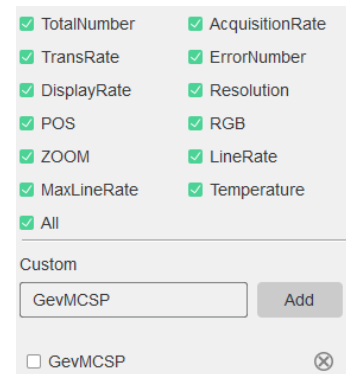


Figure 2.3.20 Add Custom Attributes

12. Firmware Update

Firmware Upgrade Procedure:

- 1 Select the cameras to be upgraded from the device list, as shown in Figure 2.3.21.



Figure 2.3.21

- 2 Click Menu > Tools > Firmware Upgrade to open the firmware upgrade tool, as shown in Figure 2.3.2 2 and Figure 2.3.2 3.

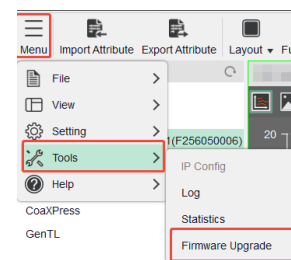


Figure 2.3.2 Menu - Firmware Upgrade Tool

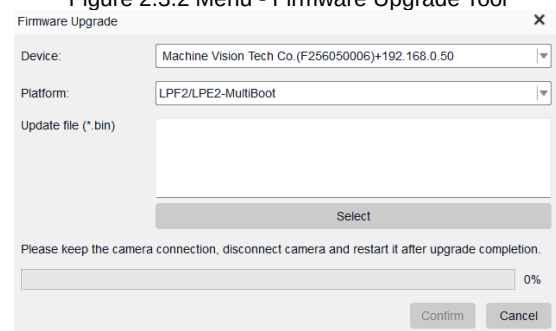


Figure 2.3.2 3 Firmware Upgrade Tool

- 3 Click to select the file and add the firmware

upgrade file, as shown in Figure 2.3.2 4.

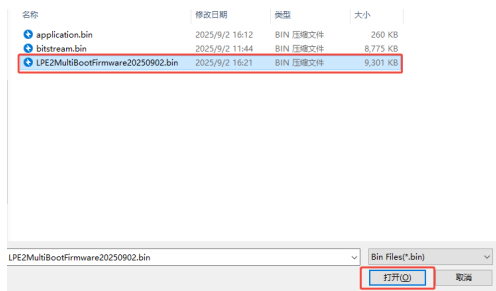


Figure 2.3.2 4 Select File

- 4 Click OK to begin upgrading the firmware. Keep the camera properly connected during the upgrade process, as shown in Figure 2.3.2 5.

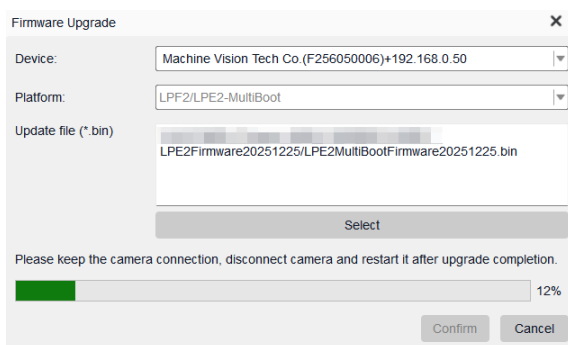


Figure 2.3.2 5 Firmware Upgrade

- 5 After the upgrade is successful, power off and restart the camera, as shown in Figure 2.3.2 6.

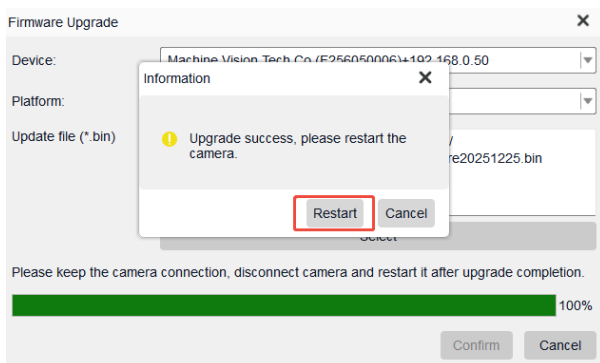


Figure 2.3.2 6 Upgrade Complete

13. Help

- About: Click Menu > Help > About to view software version information and company details, as shown in Figure 2.3.2 7.

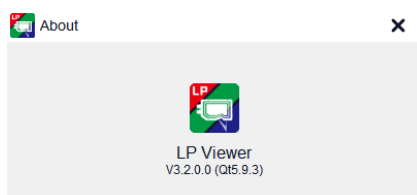


Figure 2.3.2 7 Regarding

- Help Documentation: Click Menu > Help > Help Documentation to view the help documentation for this software, as shown in Figure 2.3.2 8.

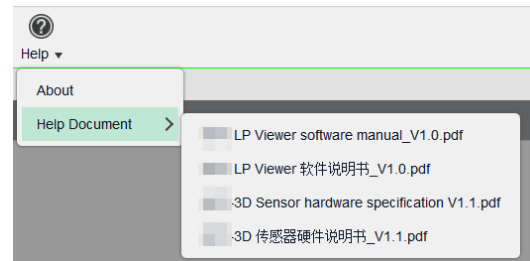


Figure 2.3.2 8 Help

ParameterSettings



Camera Parameter Settings

- Collection Settings
- Shooting Settings
- Outline Settings
- Correction Settings

This chapter explains the relevant settings and configuration steps for acquisition settings, capture settings, contour settings, correction settings, and parameter backup.

3.1 Acquisition Settings

The acquisition settings parameter sensor can be configured to trigger acquisition using either the frame signal generated internally by the software or an externally input frame signal, as shown in Figure 3.1.1.

Param Setting	All Attribute
Trigger	Image Contour Others
▼ Trigger Setting	
FrameTriggerMode	ContinuousTrigger
▼ Line Scan Mode	
AcquisitionMaxLineRate	1876.88
TriggerMode	Continuous
AcquisitionLineRate	600.00
▼ End Frame Setting	
AcquisitionLineCount	1000
▼ Advance Setting	
AcqDataSource	3D + 2D
BatchTransmitMode	Normal

Param Setting	All Attribute
Trigger	Image Contour Others
▼ Trigger Setting	
FrameTriggerMode	ContinuousTrigger
▼ Line Scan Mode	
AcquisitionMaxLineRate	1876.88
TriggerMode	Encoder
EncoderDivider	1
EncoderOutputMode	Motion
EncoderMode	OneCycleFourPulse
▼ End Frame Setting	
AcquisitionLineCount	1000
▼ Advance Setting	
AcqDataSource	3D + 2D
BatchTransmitMode	Normal

Figure 3.1.1 Acquisition Parameter Settings Interface

1. Trigger Settings

- **Frame Trigger Mode:** The trigger signal received by the camera before capturing each frame. After the camera starts operating, it will only begin capturing once it receives the frame trigger signal. Either internal or external triggering can be selected.
- **Continuous Trigger:** Automatically activates the trigger continuously. When set to continuous trigger mode, IO trigger input is ignored.
- **External Trigger:** When external trigger is selected, the sensor waits for an external trigger signal to begin image acquisition. Once the number of acquired lines equals the preset acquisition line count, the sensor halts the current acquisition task and waits for the next external trigger signal to activate and restart acquisition.
- **Frame Trigger Source:** Select Line1, Line2, or Software input source for frame triggering.
- **Generate Soft Trigger:** Click to generate a soft signal.

2. Line-scan mode

Configure the conditions for line-triggered acquisition by the camera. Select either time interval mode or encoder mode as needed. The camera captures images based on user-defined line-triggering conditions.

- **Maximum scan speed:** Displays the maximum acquisition line frequency (unit: Hz).
- **Time interval mode:** Automatically triggers continuous activation based on time intervals, performing sampling on an ongoing basis. As shown in Figure 3.1.2.

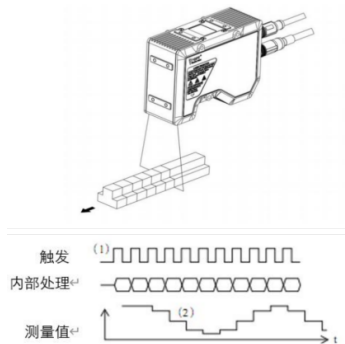


Figure 3.1.2 Time-Interval Triggered Acquisition

- **Scan Speed:** When the trigger mode is set to time interval, the frequency of line triggering will be activated based on the frequency set here (unit: Hz).
- **Encoder Mode:** Utilizes pulse signals from the encoder input terminals as trigger signals. Sampling is triggered and executed at any timing activation point, as shown in Figure 3.1.3.

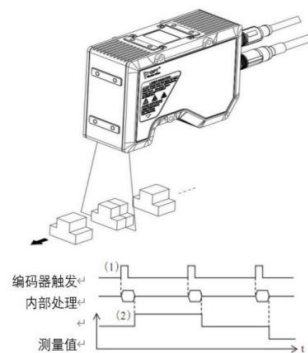


Figure 3.1.3 Encoder Triggered Acquisition

- **Encoder segmentation:** Set input parameters based on the sensor X-axis data interval and encoder pulse count value to adjust the sample contour capture to 1:1. When the encoder output speed is too fast, triggering can be activated after setting the interval. The setting range is [1,1000]. When the encoder segmentation interval is 5, as shown in Figure 3.1.4.

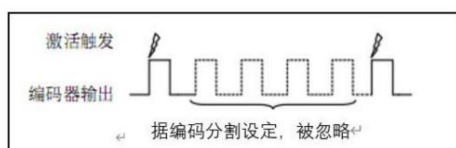


Figure 3.1.4 Coding Partition with a Partition Interval of 5
Note: When selecting encoder triggering, set the values for encoder segmentation, encoder mode, and encoder input mode. The trigger interval is based on

the pulse count value, not the number of encoder inputs. Encoder Mode: Triggering is achieved by connecting an encoder to match the motion mechanism. Encoder triggering supports five modes.

(1) **Ignore backward movement:** Scanning is triggered only when the target object moves forward. If the target object moves backward, it must advance at least one encoder pitch to trigger the next scan, as shown in Figure 3.1.5.

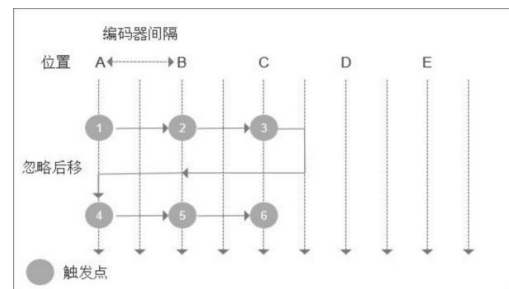


Figure 3.1.5 Ignoring Offset

(2) **Forward Movement Ignored:** Scanning is triggered only when the target object moves backward. If the target object moves forward, it must advance at least one encoder increment before triggering the next scan. As shown in Figure 3.1.6.

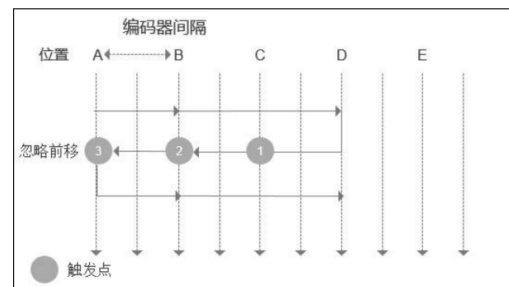


Figure 3.1.6 Ignoring Advance

(3) **Forward Tracking:** Scanning is triggered when the target object moves forward. If the target object moves backward, the distance traveled forward must exceed the distance traveled backward (recorded as tracking) plus one encoder pitch to trigger the next scan. As shown in Figure 3.1.7.

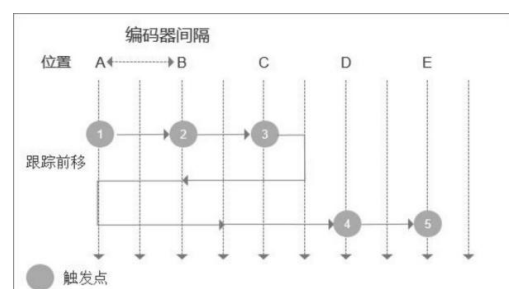


Figure 3.1.7 Tracking Advance

(4) Tracking Backward Movement: Scanning is triggered when the target object moves backward. If the target object moves forward, the distance traveled forward must exceed the distance the target moves forward (the forward distance is recorded as tracking) plus one encoder pitch to trigger the next scan. As shown in Figure 3.1.8.

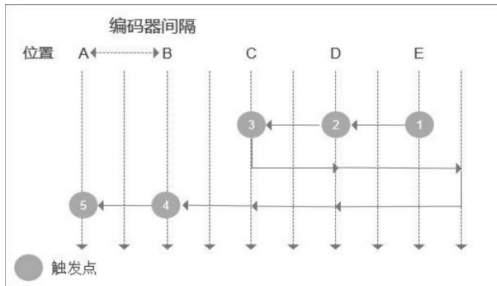


Figure 3.1.8 Tracking Shift

(5) Bidirectional: The target object triggers scanning when moving both forward and backward. As shown in Figure 3.1.9.

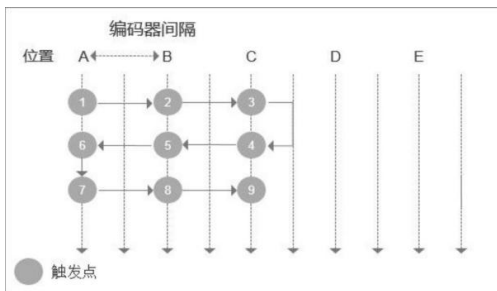


Figure 3.1.9 Bidirectional

- Encoder Input Mode: Select from the following options based on the encoder used: 2-phase 4-increment, 2-phase 2-increment, and 2-phase 1-increment. As shown in Figure 3.1.10.

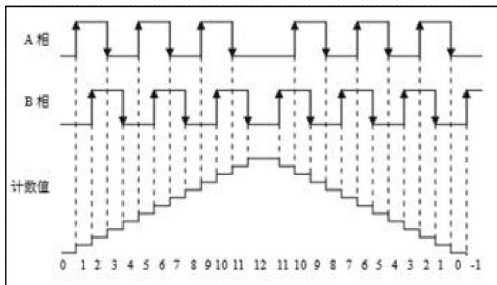


Figure 3.1. 10-2 Phase 4 Incremental Encoding Scheme

- The pulse count value increases by 2 phases, as shown in Figure 3.1.11.

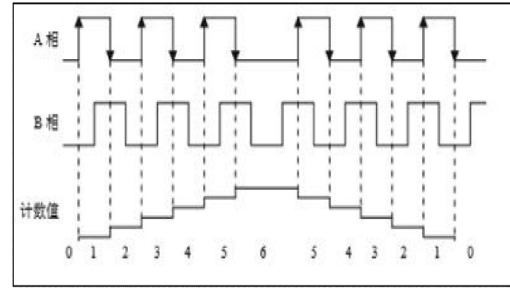


Figure 3.1.10 2-Phase 2 Incremental Encoding Mode

- The pulse count value increases by 1 for each phase, as shown in Figure 3.1.12.

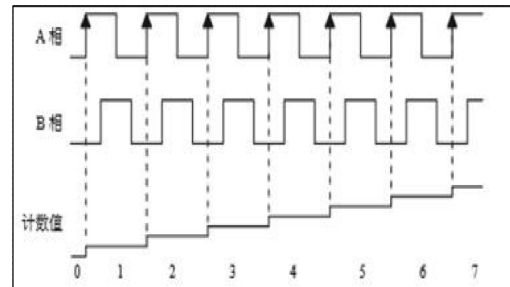


Figure 3.1.11 Two-Phase Incremental Encoding Mode

3. Frame End Settings:

- Total rows captured: Sets the total number of rows captured in the current capture screen.

4. Advanced Settings:

- Data Source Selection: Specify the data output content. You may choose to output both 3D and 2D data simultaneously, or output only 3D data.
- Batch Transfer Modes: Batch transfer modes include Standard (100 lines), Fast (400 lines), and Full Speed (800 lines). Select the appropriate mode based on the current scanning speed. When scanning at higher frequencies, choose a faster mode.

3.2 Shooting Settings

Shooting Settings Parameter Description:

By emitting a line laser, the reflected light from the object passes through the photosensitive lens to form an image on the imaging element, thereby acquiring the raw capture data of the contour. During capture settings, to obtain the desired contour, image

acquisition conditions should be set while simultaneously verifying the image. Sensor settings include acquisition range configuration and 3D display. As shown in Figure 3.2.1.

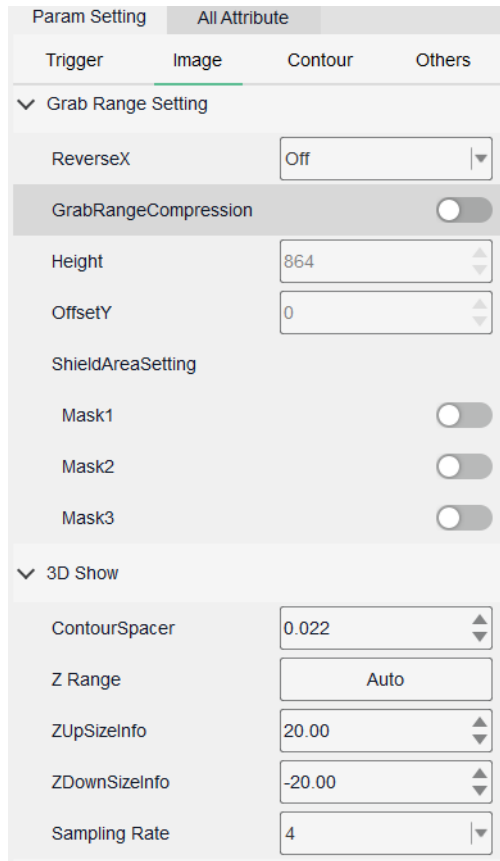


Figure 3.2.1 Shooting Settings Parameters Interface

1. CollectionScope Settings:

- X-Axis Mirroring: Select On to enable or Off to disable X-axis mirroring of captured profiles.
- Enable Compression Range: Press the button to activate compression range. Drag the ROI to adjust the compression area. Press the button again to disable compression range.
- Capture Range: The actual output image height (in pixels) after compression.
- Y-axis offset: Vertical displacement of the ROI image within the acquisition range, starting from the top edge. The maximum value is determined by the Height parameter.
- Mask Area Settings: A function that renders the imaging component ineffective by blocking stray

light it receives, thereby eliminating stray light interference. As shown in Figure 3.2.2. The setup method involves defining mask areas on the captured image using three mask ROIs: Mask1, Mask2, and Mask3. Click the Enable button to display the ROI, then drag the ROI to adjust the mask area.

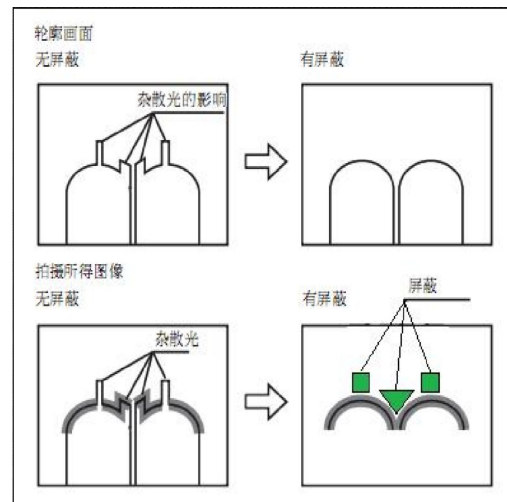


Figure 3.2.2 Shielded Area Settings

2. 3D Display:

- 3D Contour Display Spacing: Sets the display interval between rows in the Y-direction of the 3D point cloud map. Configure according to the actual acquisition interval to achieve accurate 3D visualization. The setting range is [0.0000, 1.0000].
- Z-axis display adjustment range: Set the minimum and maximum values for the Z-axis display range based on the height of the sample contour. Samples appear in different colors at varying heights, creating a layered visual effect. Automatically adjusts the Z-axis display range.
- Minimum Value: Displays the minimum value within the Z-axis display adjustment range. The actual setting range is dependent on the camera measurement range.
- Maximum Value: Displays the maximum value of the Z-axis display adjustment range. The actual setting range is dependent on the camera measurement range.
- Sampling Rate: Set the data sampling rate to

reduce the number of rows or columns used by the camera for capturing laser profiles, thereby lowering resolution. The setting range is {1, 2, 4, 8, 16, 32, 64, 128, Auto}. Auto: Automatically sets the optimal data sampling rate.

3.3 Profile Settings

Parameter Description for the Outline Settings Interface:

Conditions for setting the contour, calculations of contour data generated by the sensor, or settings for stabilizing the contour. As shown in Figure 3.3.1.

Param Setting	All Attribute
Trigger	Image
Image Processing HDR LinearSensing ExposureTime 100 LaserAdjustMode Manual LaserSetting 160	
Contour Processing InvalidPointNum 5 Threshold 10 LaserWidthLower 1 ExtractionMode Maximum ContinuousMode On HaloFilterEnable Off	
Filter Setting AvgFilterWinLen 5 MidFilterWinLen L5 TimeAxisAvgFitWinLen L5 TimeAxisMedFitWinLen L5	

Figure 3.3.1 Profile Settings Interface

1. Image Processing:

- HDR Function: Select the shooting component sensitivity characteristics from High Precision, High Dynamic 1, High Dynamic 2, High Dynamic 3, High Dynamic 4, or Custom Dynamic based on the subject.
- Exposure Time: Sets the maximum exposure

time for the imaging element in microseconds. The setting range is [30, 10000].

- Auto Brightness Control: Set the brightness value or adjustment range, which is determined by the combination of laser intensity and exposure time. Select either automatic or manual mode.
- Brightness: Adjust the brightness value.

2. Contour Processing:

- Lower limit: The minimum value for brightness settings or the lower boundary of the adjustment range.
- Upper Limit: The maximum value for brightness settings or the upper boundary of the adjustment range.
- Invalid Data Interpolation Points: Primarily fills gaps in contour data deemed undetectable due to excessive or insufficient light intensity. Setting range: [0,255].
- Peak Sensitivity: Sets the detection difficulty for identifying peaks at each X-coordinate when converting image data to contour data. Higher values indicate lower sensitivity, making it more difficult to detect peaks.
- Minimum Peak Width Filter: Compared to the original reflected light from the object, the shape of the photosensitive peak tends to broaden due to the influence of ambient light and multiple reflections. Utilizing this phenomenon, peaks with narrow widths are treated as suspicious peaks and excluded from detection processing. The setting range is [0,30].
- Maximum Peak Width Filter: Compared to the original reflected light from the object, the shape of the photosensitive peak tends to broaden due to the influence of ambient light and multiple reflections. Utilizing this phenomenon, peaks with a broader width are treated as suspicious peaks and excluded from detection processing. The setting range is [4,62].
- Select Peak: Refers to choosing one peak when multiple peaks exist at the same X-coordinate.

Criteria: The largest peak. Proximal: The peak at the nearest end (proximal end of the sensor head).

Distal: The peak at the farthest end (distal end of the sensor).

- Continuous Mode: Enable the button to select the peak with the smallest height difference between adjacent points; otherwise, disable it.
- X-axis smoothing: Applies moving window averaging to reduce random noise. Setting range: [0-15].
- Median in the X direction: Replaces the value of a data point with the median value within the specified window containing that data point. Apply the median filter to the profile, with the range set to {OFF, L3, L5, L7, L9}.
- Y-axis smoothing: Applies moving window averaging to reduce random noise. Available settings: {OFF, L3, L5, L7, L9, L11, L13}.
- Median in the Y direction: Replaces the value of a data point with the median value within the specified window containing that data point. Apply a median filter to the contour with the following range options: {OFF, L3, L5, L7, L9}.

3.4 Correction Settings

1. Correction:

When the contour becomes unstable due to the influence of the object shape and surface profile, stabilization can be achieved through correction settings. As shown in Figure 3.4.1.

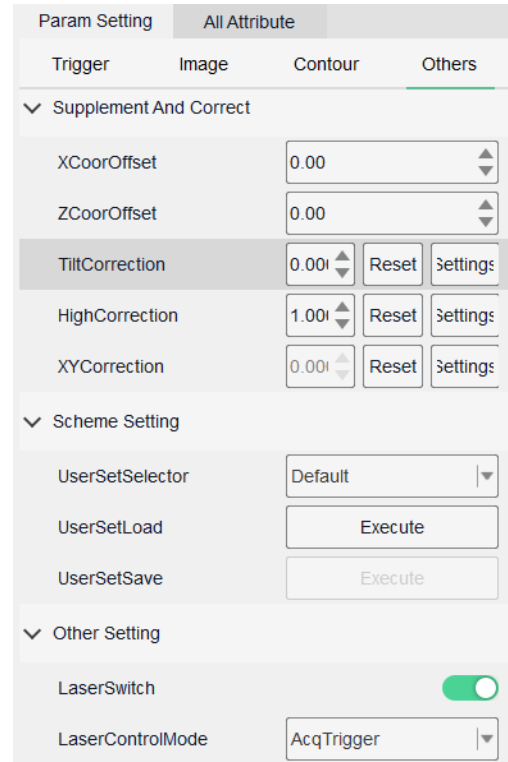


Figure 3.4.1 Correction Settings

- X-axis offset (mm): Configure the sensor to adjust the image contour data translation along the X-axis, measured in millimeters.
- Z-axis offset (mm): Configure the sensor to adjust the image contour data translation along the Z-axis, measured in millimeters.
- Tilt Correction: Corrects tilt errors in the X-axis direction caused by the tilt of the sensor head setup, the target object, or the object placement platform. The tilt correction range is [-44.4270, 44.4270], as shown in Figures 3.4.2 and 3.4.3.

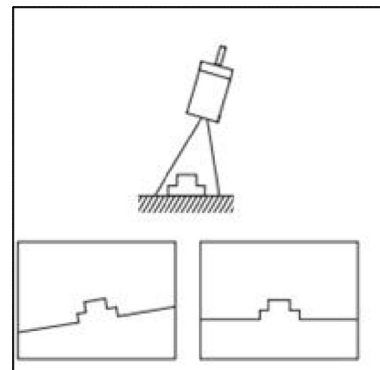


Figure 3.4.2 Demonstration of Tilt Correction

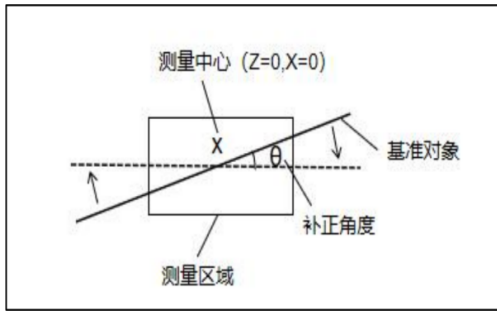


Figure 3.4.3 Tilt Correction Angle

- Height Correction: Corrects height errors in the Z-axis direction caused by tilting of the sensor head setup, the object, or the object placement platform. The measured profile is corrected based on the obtained correction coefficients, as shown in Figure 3.4.4.

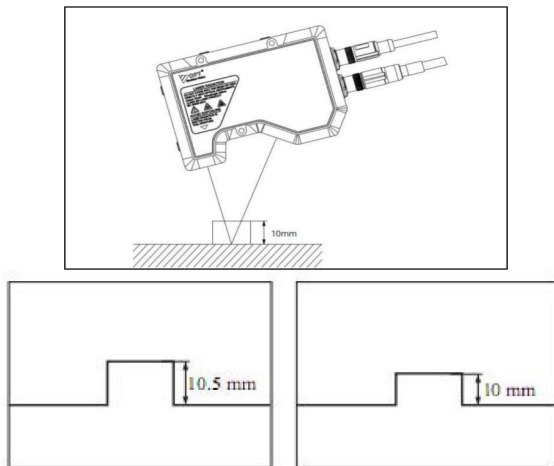


Figure 3.4.4 Height Correction Demonstration Diagram

- Note: The correction factor is set within the range of [0.0000, 2.0000] times.
- Example: The steps for tilt measurement correction are as follows:

Click the Settings button to enter the tilt correction

page, as shown in Figure 3.4.5.

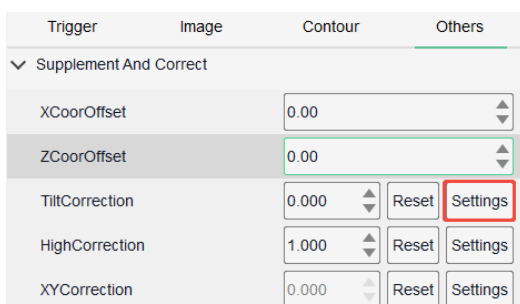


Figure 3.4.5 Entering the Tilt Correction Interface

- 2 After entering the tilt correction interface, click the Scan Profile button to perform a profile scan and acquire profile data, as shown in Figure 3.4.6.

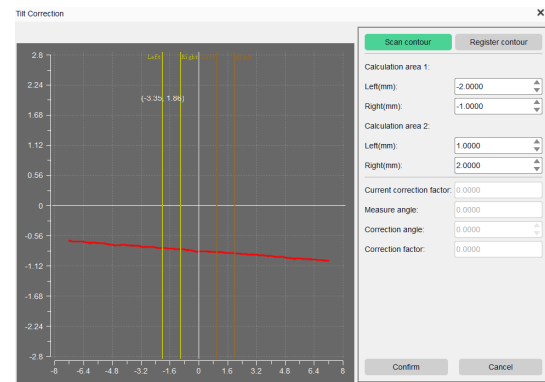


Figure 3.4.6 Obtaining the Profile

- 3 After obtaining the contour data, drag within the contour map interface or enter values on the right to adjust the position and width of Left and Right for Calculation Areas 1 and 2, as shown in Figure 3.4.7. Make the drawn calculation areas as large as possible to capture more data for computation, resulting in a more pronounced correction effect.

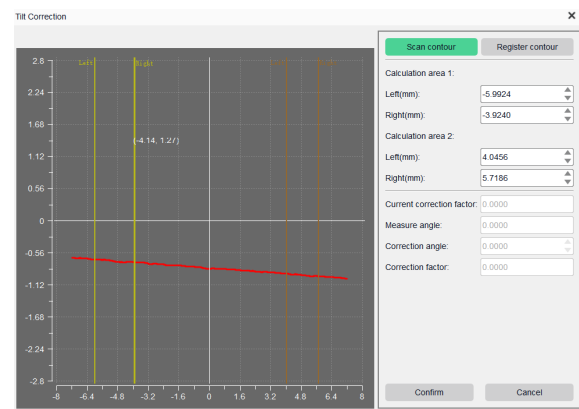


Figure 3.4.7 Drawing the Calculation Region

- 4 Click Register Profile. If the installation error tilt angle is known, enter the correction angle in the editing interface and click the OK button to perform tilt compensation. If the installation tilt error angle is unknown, simply click the OK button, as shown in Figure 3.4.8.

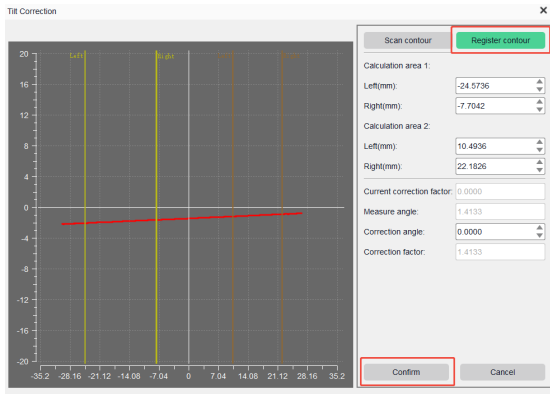


Figure 3.4.8 Register Profile, Input Correction Angle

- 5 The corrected contour obtained through angle calibration correction is shown in Figure 3.4.9.

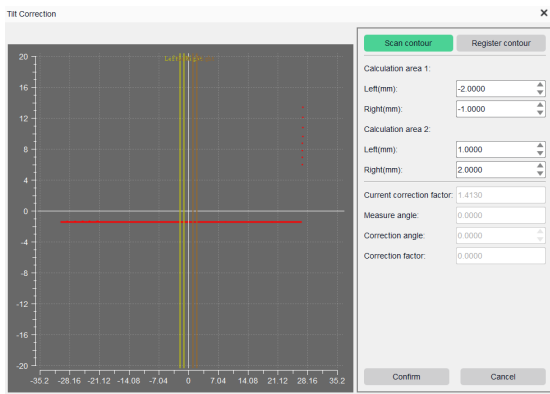


Figure 3.4.9 Profile Diagram After Tilt Correction

- The procedure for altitude correction is as follows:

- 1 **Note:** For more accurate elevation correction data, tilt correction must be performed before elevation correction. Click the Settings button to enter the elevation correction page, as shown in Figure 3.4.10.

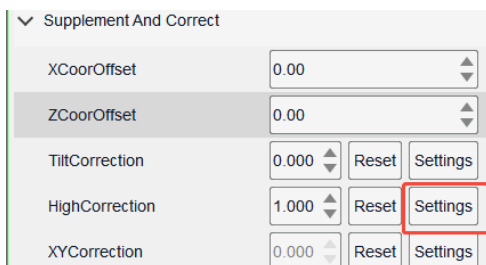


Figure 3.4.10 Entering the Altitude Correction Interface

- 2 After entering the height correction interface, click the Scan Profile button to perform a profile scan and acquire profile data, as shown in Figure 3.4.11.

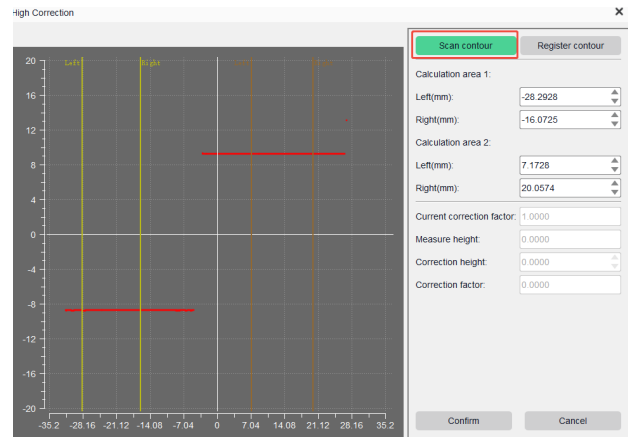


Figure 3.4.11 Obtaining the Profile

- 3 On the acquired contour, adjust the positions of Calculation Area 1 and Calculation Area 2 (Calculation Area 1 and Calculation Area 2 must be located at different step heights), as shown in Figure 3.4.12.

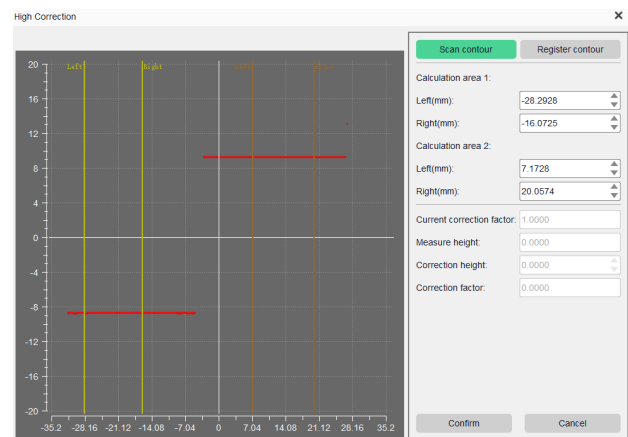


Figure 3.4.12 Drawing the Calculation Region

- 4 After clicking Register Profile, enter the correction height (actual height of the standard block, unit: millimeters) in the right-hand editing interface, then click the OK button to perform height correction, as shown in Figure 3.4.13.

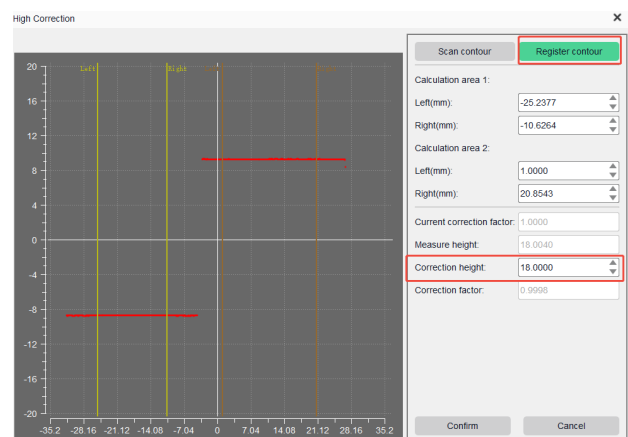


Figure 3.4.13 Register Profile, Enter Correction Height

5 The corrected contour obtained through calibration angle correction is shown in Figure 3.4.14.

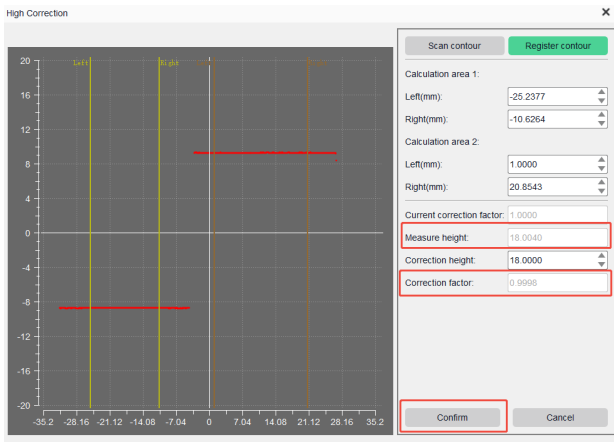


Figure 3.4.14 Height-Corrected Profile Diagram

2. Scheme Settings:

- Parameter Selection: Save and load backup settings for all properties on the current device layer. Settings remain effective after restart. As shown in Figure 3.1.15.

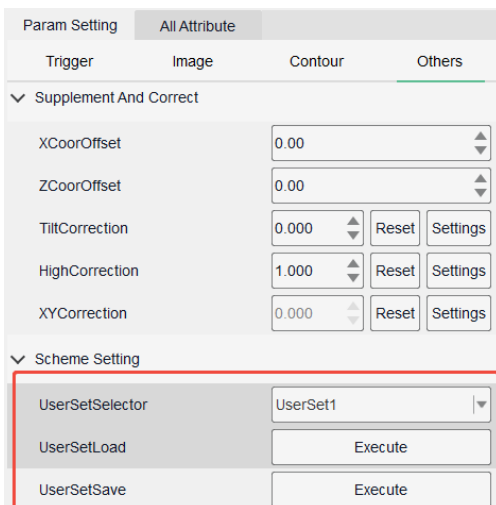


Figure 3.1.15 Scheme Settings

(1) Parameter selection options include: Default Parameters (factory settings), Backup 1, Backup 2, Backup 3, and Backup 4. Selecting any of these options will display the chosen parameter scheme each time the camera is connected.

- Parameter Load: Click this button to load the selected configuration from the parameter options.
- Parameter Save: Click this button to save

and back up the current device layer property settings to the selected parameter scheme.

3. Other Settings:

- Laser: Press the button to turn on the laser; press it again to turn it off.
- Automatic Laser Control: Constant On: When the camera is connected and the laser enable button is activated, the laser remains constantly on. Capture Only: When the camera is connected and the laser enable button is activated, the laser is only enabled during the capture process and turns off upon capture completion. As shown in Figure 3.1.16.

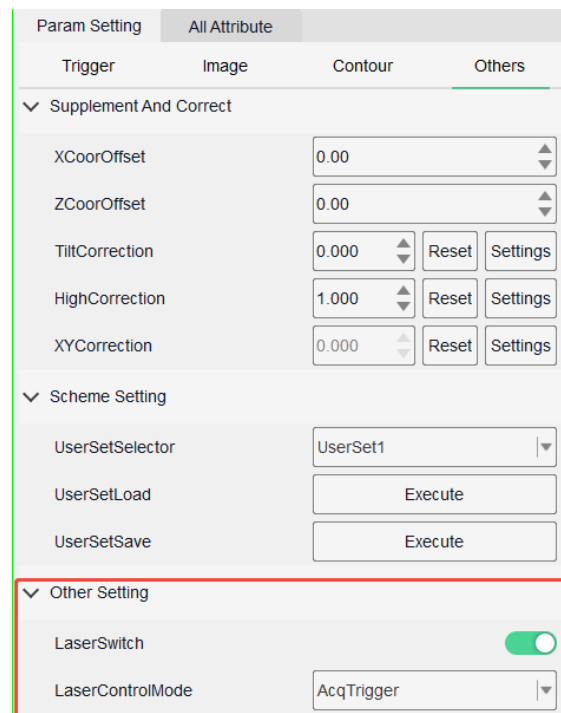


Figure 3.1.16 Other Setting

All Properties

All Attribute Descriptions

- Collection Settings
- Shooting Settings
- Outline Settings
- Correction Settings

This chapter explains the relevant settings and configuration steps for acquisition settings, capture settings, contour settings, correction settings, and parameter backup.

1.1 All Properties

1. All Attributes Table:

- Table 4-1 below contains parameter names in both Chinese and English, along with parameter descriptions.

	参数名称（英文）	参数名称（中文）	参数描述（英文）	参数描述（中文）
DeviceControl	DeviceVendorName	设备供应商名称	Name of the manufacturer of the device.	设备供应商名称
	DeviceModelName	设备型号名称	Model of the device.	设备型号名称
	DeviceManufacturerInfo	设备制造商信息	Manufacturer information about the device.	设备制造商信息
	DeviceVersion	设备版本	Version of the device	设备版本
	DeviceID	设备序列号	Device identifier (serial number	设备序列号
	DeviceUserID	用户自定义设备名称	User-programmable device identifier	用户自定义设备名称
	DeviceScanType	设备扫描类型	Scan type of the sensor	设备扫描类型
	DeviceTemperature	设备主板温度	The Camera's internal temperature	设备主板温度
	DeviceReset	设备重启	Resets the device to its power up state	设备重启
ImageFormatControl	WidthMax	宽度最大值	Maximum width (in pixels) of the image. The dimension is calculated after horizontal binning, decimation or any other function changing the horizontal dimensions of the image	图像的最大宽度（像素）。尺寸是在水平分组、抽取或任何其他改变图像水平尺寸的函数之后计算的
	HeightMax	高度最大值	Maximum height (in pixels) of the image. This dimension is calculated after vertical binning, decimation or any other function changing the vertical dimensions of the image	图像的最大高度（像素）。该尺寸是在垂直分割、抽取或任何其他改变图像垂直尺寸的函数之后计算的
	Width	图像高度（像素为单位）	Width of the Image provided by the device (in pixels)	设备提供的图像宽度（以像素为单位）
	Height	图像宽度（像素为单位）	Height of the image provided by the device (in pixels)	实际输出的图像高度（以像素为单位）
	OffsetX	（图像）X 偏移	Horizontal offset from the origin to the AOI (in pixels)	从原点到感兴趣区域的水平偏移（以像素为单位）
	ReverseX	（图像）X 翻转	Reverses the horizontal readout direction	图像水平翻转
	CenterImageY	Y 居中	This enumeration sets the centering mode of the selective active part of the image	Y 方向上是否将输出的图像放在中间

in both languages.

	ReverseY	(图像) Y 翻转	Reverses the vertical readout directi	图像垂直翻转
	OffsetY	(图像) Y 偏移	Defines whether to put the selected height of the image in the center	图像垂直偏移量, 从上边开始偏移, 最大值由 Height 的值决定
	PixelFormat	像素格式	Format of the pixel to use for acquisition.	图像输出格式。不同型号支持格式不同
	TestImageEnable	测试图像使能	Defines whether to enable the test image.	选择测试图像 (当 TestImageEnable 为 On 时才有效)
AcquisitionControl	AcquisitionMode	采集模式	Sets the acquisition mode of the device. It defines mainly the number of frames to capture during an acquisition and the way the acquisition stops	设置设备的采集模式。它主要定义在采集期间捕获的帧数以及采集停止的方式
	AcquisitionStart	采集开始	This enumeration value selects the acquisition start trigger for configuration	此枚举值选择用于配置的获取开始触发器
	AcquisitionStop	采集停止	Stops the Acquisition of the device at the end of the current Frame. It is mainly used when AcquisitionMode is Continuous but can be used in any acquisition mode	在当前帧结束时停止采集。它主要用于连续采集时, 但也可以用于任何采集模式
	AcquisitionAbort	采集中断	Immediately aborts the Acquisition of the device	立即终止设备的获取
	AcquisitionLineCount	采集行数	This value sets the number line of 3D image	设置 3D 图像 Y 方向行数
	AcquisitionFrameCount	采集帧数	This value sets the number of frames acquired in the multiframe acquisition mode	设置多帧采集模式下采集的帧数
	TriggerSelector	触发选择	This enumeration selects the trigger type to configure. Once a trigger type has been selected, all changes to the trigger settings will be applied to the selected trigger	设置采集触发类型。一旦选择了触发器类型, 对触发器设置的所有更改将应用于所选的触发器
	TriggerMode	触发模式	This enumeration sets the trigger mode for the selected trigger	此枚举设置所选触发类型的触发模式
	TriggerSoftware	软触发	This command generates a software trigger signal. The software trigger signal will be used if the trigger source is set to 'software'	该命令生成一个软件触发信号。如果触发源设置为“software”, 则使用软件触发信号
	TriggerSource	触发源	This enumeration sets the signal source for the selected trigger	此枚举为所选触发类型设置触发信号源

	TriggerActivation	触发方式	This enumeration sets the signal transition needed to activate the selected trigger.	触发方式。包含上升沿、下降沿、双沿及高、低电平五种触发方式
	TriggerDelay	触发延时	This integer value sets the trigger delay in microseconds to apply after the trigger reception before effectively activating it	设置触发延迟（以微秒为单位），指当相机收到触发信号到触发生效的时间
	TriggerStatus	触发状态	Returns the current status of trigger	返回当前触发器的状态
	FrameBurst	帧无限制	This enumeration sets the burst mode of capturing image	设置捕获图像的突发模式
	ExposureTime	曝光时间	The exposure timer in microseconds	设置曝光时间，以微秒为单位
	AcquisitionLineRate	采集帧率	Controls the acquisition rate (in Hertz) at which the lines are	当采集行频使能为 0n 时，采集行频设置才生效
	AcquisitionLineRateEnable	采集帧率使能	This enumeration sets the manual line rate mode	采集行频使能
	AcquisitionMaxLineRate	最大采集帧率	Shows the maximum acquisition Line rate (in Hertz)	最大采集行频 (Hz)
	AcquisitionActualLineRate	实际采集帧率	Shows the achieved acquisition Line rate (in Hertz)	实际采集行频 (Hz)
	FramePeriod	帧周期	Controls the frame period (in ms) at which the frames are captured	帧触发周期 (ms)
CounterAndTimerControl	CounterSelector	计数器选择	Selects which counter to configure	选择需要配置的计数器，包含 counter0 与 counter1 两个计数器
	CounterEventSource	计数器事件源	Selects the events that will be the source to increment counter	选择将作为自增计数器源的事件
	CounterResetSource	复位计数器事件源	Selects the signals that will be the source to reset counter	计数器复位源事件，计数器复位值为 0
	CounterResetSoftware	软件复位计数器	Generates a software trigger signal to reset counter when the reset source is set to 'software'	当复位源设置为软件触发信号
	CounterValue	计数值	Reads the current value of selected counter	读取当前选择的计数器的值
	TimerSelector	定时器选择	Selects which timer to configure	选择目标的计时器进行设置
	TimerTriggerSource	定时器触发源	Selects the source of the trigger to start the Timer	选择计时器的触发源
	TimerDuration	定时器持续时间	Sets the duration (in microsecond) of the Timer pulse	设置设备计时器的保持时间（以微秒为单位）
	TimerDelay	定时器延时	Sets the duration (in microsecond) of the delay to apply at the reception of a trigger before starting the timer	设置计时器在接受触发后的延时时间（以微秒为单位）
BasicProcessing	ImageMaskSelector	图像屏蔽区域选	Selects the mask area of image	选择图像屏蔽框

		择		
	ImageMask	图像屏蔽区域开关	Activates the ImageMask	开启/关闭图像屏蔽框
	Xup	X 上移	Sets the Xup	屏蔽框的左上角 X 坐标
	Yup	Y 上移	Sets the Yup	屏蔽框的左上角 Y 坐标
	Xdown	X 下	Sets the Xdown	屏蔽框的右上角 X 坐标
	Ydown	Y 下	Sets the Ydown	屏蔽框的右上角 Y 坐标
	Xleft	X 左移	Sets the Xleft	屏蔽框的左下角 X 坐标
	Yleft	Y 左移	Sets the Yleft	屏蔽框的左下角 Y 坐标
	Xright	X 右移	Sets the Xright	屏蔽框的右下角 X 坐标
	Yright	Y 右移	Sets the Yright	屏蔽框的右下角 Y 坐标
	Gain	传感器增益	Sensor Gain	模拟增益
	Gama	伽马	The coefficient of gamma transformation	伽马变换系数
	SensingMode	(HDR) 感应模式	Selects the sensing mode	选择 HDR 模式
	ImageDisplayMode	图像显示模式	Display images in HDR mode	以 HDR 模式显示图像
	ExposureRatio	曝光比例	The ratio of short exposure to the long	短曝光与长曝光的比率
	HFpnCorrection	FPN 校正	Activates the correction of Column FPN	开启/关闭 FPN 校正
	FlatFieldCorrectionMode	平场校正	Selects the mode for the Flat Field Correction	选择平场校正的模式
	FlatFieldCorrectionActiveSet	平场校正系数集	Selects the current set of Flat Field coefficients	选择平场校正系数集，用于保存不同用户的平场校正系数集。
	FlatFieldCorrectionType	平场校正类型	Selects the type of Flat Field Correction	选择平场校正的类型
	FlatFieldCorrectionAlgorithm	平场校正算法	Selects the Algorithm to calculate Flat Field Correction	选择计算平场校正的算法
	FlatFieldCalibrationMode	平场校正模式	Selects the mode for the PRNU target	选择目标 PRNU 的模式
	FlatFieldCalibrationTarget	平场校正目标	Sets the Target Pixel Value for the PRNU (Gain) calibration	设置平场校正后校准的目标灰度值
	CalibrateFPN	校正 FPN	Start Fixed Pattern Noise calibration	启动固定模式噪声校准 (FPN)
	CalibratePRNU	校正 PRNU	Start Photo Response Non-Uniformity calibration.	启动非均匀性校准
	CalibrationSave	校正保存	Saves the current coefficients set to the selected user Set	保存当前的平场校正系数到已选的系数集

	CalibrationResetCoefficients	复位校正系数	Resets the current coefficients to non-active values	将当前平场校正系数重置为非活动值
	FlatFieldCorrectionPixelXCoordinate	平场校正像素坐标	Sets the X Coordinate of the correction values to access	设置平场校正要访问的修正值的 X 坐标
	FlatFieldCorrectionGain	平场校正增益	Sets the gain for the currently selected pixel	读取本次矫正后像素的增益
	FlatFieldCorrectionOffset	平场校正偏移	Sets the offset for the currently selected pixel	读取本次矫正后像素的偏移量。
AdvancedProcessing	EnableExtraction	开启/关闭 3D 算法	Activates the 3D algorithm	开启/关闭 3D 算法
	DynamicThresholdMode	动态阈值模式	Selects the mode for dynamic threshold	选择动态阈值的模式
	HaloFilterEnable	光晕过滤启动	Remove the stripe of multi-peaks if enable	如果允许，删除多峰条纹
	ContinuousMode	连续模式	Makes continuous outline a top priority	将连续的大纲作为首要任务
	ConsecutivePoints	连续模式阈值	Sets the threshold of the continuity algorithm	设置连续性算法的阈值
	Threshold	(峰值灵敏度) 阈值	Sets the threshold of the 3D COG algorithm	设置 3D COG 算法的阈值
	StripeNum	(激光线) 数量	Sets the number of laser beam on image	设置图像上的激光束数目
	PeakNumTh	(光晕过滤) 峰值阈值	Sets the maximum number of peak on each stripe	设置每个条带上的最大峰值数
	MinimumGradient	边缘灵敏度	Sets the minimum gradient of laser beam on image	设置图像上激光束的最小梯度
	YCoordGradient	(连续模式) Y 坐标梯度	Sets the Y coordinate gradient for consecutive algorithm	设置连续算法的 Y 坐标梯度
	LaserWidthLower	最小峰值宽度过滤器	Sets the minimum width of the bright area	设置明亮区域的最小宽度
	LaserWidthUpper	最大峰值宽度过滤器	Sets the maximum width of the bright area	设置明亮区域的最大宽度
	EnableOverwideFilter	启用宽度过滤器	Activates the overwide bright area filter	激活过宽亮区过滤器
	ExtractionMode	轮廓提取模式	Selects the mode for extracting outline	选择提取轮廓的模式
	EnableImage	启用/关闭图像	Activates the ImageMask	启用/关闭图像
	EnableCalibration	启用/关闭校准	Activates the Calibration	启用/关闭校准
	BatchEnable	启用/关闭批量	Activates the Batch	激活批处理
	BatchNumber	批处理数	Sets the Outline numbers of each Batch	设置批处理数 (批轮廓刷新数)

	SinData	正弦数据	Sine value of Rotate angle	旋转角的正弦值
	CosData	余弦数据	Cos value of Rotate angle	旋转角的余弦值
	XCoorOffset	X 方向偏移	Shift in the horizon	横向移动
	ZCoorOffset	Z 方向偏移	Shift in the vertical	纵向移动
	ZCoorScale	Z 坐标缩放 (高度校正)	Scale in the vertical	高度矫正
	DepthDataType	深度图数据类型	Selects the data type of depth info	选择深度信息的数据类型
	Scaler	(物理) 标量	Scale of physical height of object under testing	被测物体的物理高度
	InvalidPointNum	无效数据补间点数	Number of Invalid point	无效数据补间点数
	MidFilterWinLen	中间滤波值 (X 方向平滑值)	Window length of X axis middle filter	X 方向中间值滤波
	AvgFilterWinLen	平均滤波值 (X 方向中间值)	Window length of average filter	X 方向平滑滤波
	TimeAxisMedF1tWinLen	时间轴中值拟合值 (Y 方向平滑值)	Window length of Y axis median filter	Y 方向 (时间轴) 中间值滤波
	TimeAxisAvgF1tWinLen	时间轴中值拟合值 (Y 方向中间值)	Window length of average filter required for time axis	Y 方向 (时间轴) 平滑滤波
	XInterval	X 点间隔	Interval of X axis points	X 轴点间隔
	XSizeInfo	X 视野宽度	Physical Size of the Width of the view	轮廓视图宽度的物理大小
	ZUpSizeInfo	Z 上视野	Physical Up Size of the Height of the view	轮廓视图高度的物理向上大小
	ZDownSizeInfo	Z 下视野	Physical Down Size of the Height of the view	轮廓视图高度的物理向下大小
	OutlineLengthMax	轮廓长度最大值	Maximum width (in pixels) of the 3Dimage. The dimension is calculated after horizontal binning, decimation or any other function changing the horizontal dimensions of the image	3D 图像的最大宽度 (以像素为单位)。该尺寸是在水平合并、下采样或任何其他改变图像水平尺寸的函数之后计算的
	PointsOffsetX	X 点偏移	Starting point of outline	X 轴点偏移
	PointsNum	X 点数量	the number of points	X 轴点数
DigitalI0	LineSelector	线路选择	This enumeration selects the I/O line to configure. Once a line has been selected, all changes to the line	用于选择要进行配置的外部 I0 线

			settings will be applied to the selected line	
	LineLogic	行逻辑	Line Logic	行逻辑
	LineSource	线路触发源	This enumeration selects the internally generated camera signal (source signal) for the selected line when the selected line is an output	当选择 IO 线为输出时，可以选择触发源
	LineInverter	行信号取反	This boolean value enables the signal inverter function for the selected input or output line.	用于控制所选输入或输出线的信号取反
	LineDebouncerTime	触发信号消抖时间	Sets the value of the selected line debouncer time	当 IO 线为输入时，可设置消抖时间的长度。小于设置值的脉冲认为是一个无效的触发输入。
	LineStatus	行信号状态	This boolean value indicates the current logical state for the selected line at the time of polling.	用于指示所选输入或输出线的当前状态
	LineStatusAll	行信号全部状态	This integer value is a single bitfield that indicates the current logical state of all available lines at time of polling	用于返回所有可用线的当前状态
LaserControl	LaserSwitch	激光开关	LaserSwitch	打开/关闭激光
	LaserControlMode	激光控制模式	This enumeration sets for the control of laser light.	设置用于控制激光
	LaserAdjustMode	激光亮度调整模式	This enumeration sets for adjusting intensity of laser light.	设置用于调整激光的强度
	Laser IntensityLevel	激光强度级别	Sets the intensity of laser light in auto mode	在自动模式下设置激光光的强度
	EvaluationOutput	评估输出	EvaluationOutput	原始图像中的亮区域的暗亮程度。原始图像数据中反应出来的激光线越亮，其值越大；反之越小。
	LaserboundaryLeft	激光边界左	LaserboundaryLeft	激光左边界范围
	LaserboundaryRight	激光边界右	LaserboundaryRight	激光右边界范围
	UpperBound	激光亮度最大值	Laser brightnessUpperBound	自动激光亮度最大值
	LowerBound	激光亮度最大值	Laser brightnessLowerBound	自动激光亮度最小值
	Lasersetting	激光亮度设置	Laser brightness setting	激光亮度值设置
UserSetControl	UserSetSelector	用户参数选择	Selects the feature User Set to load, save or configure.	选择要加载、保存或配置的用户参数
	UserSetLoad	用户参数加载	Loads the User Set specified by UserSetSelector to the device and makes it active.	将指定的用户参数加载到设备并激活

	UserSetSave	用户参数保存	Save the User Set specified by UserSetSelector to the non-volatile memory of the device.	将指定的用户参数保存到设备的非易失性存储器中
EncoderControl	EncoderMode	编码器模式	Encoder Mode	选择编码器模式
	EncoderDivider	编码信号分割	Sets how many Encoder increments/decrements are needed to generate an Encoder Output Pulse	编码器输出脉冲分频设置（编码分割）
	EncoderFilterTime	编码信号过滤时间	Sets how long Encoder inputs are needed to filter	设置编码器输入进行过滤的时间
	EncoderOutputMode	编码器输出方式	Encoder Output Mode	选择编码器输出方式
	EncoderResetSource	编码器复位源	Encoder Reset Source	选择将作为编码器位移复位源的信号
	EncoderLatchSource	编码器锁定源	Encoder Latch Source	编码器位移锁存源
	EncoderSoftware	编码器软触发按钮	Generates a internal pulse that is used when the encoder reset source is set to 'software'.	生成一个内部脉冲，当编码器位移复位源设置为“软件”时使用
	EncoderStatus	编码器状态	Encoder Status	返回编码器的运动状态
	EncoderFreqInHz	编码器频率（Hz）	Encoder running frequency in Hz.	编码器运行频率，单位为 Hz
	EncoderTimeout	编码信号超时	Sets the maximum internal between encoder counter increments or decrease before the status turns to static	设置在编码器运动状态变为静止之前编码器停止运动的最大时间间隔
	EncoderValue	编码值	Current value of the position counter of encoder	读取或写入选定编码器当前位置值。写入到 EncoderValue 通常用于设置编码器位移计数器的起始值
	EncoderValueAtLatch	编码值锁定值	Position value at last latch moment	读取所选编码器的已锁存的位移值
TransportLayerControl	PayloadSize	采集数据大小	Provides the number of bytes transferred for each image or chunk on the stream channel. This includes any end-of-line, end-of-frame statistics or other stamp data. This is the total size of data payload for a data block.	每个报文的长度
	GevVersionMajor	Gev 主要版本	Major version of the specification.	规范的主要版本
	GevVersionMinor	Gev 次要版本	Minor version of the specification.	规范的次要版本
	GevDeviceModelsBigEndian	设备寄存器的结束值	Endianness of the device registers.	设备寄存器的结束值

GevDeviceModeCharacterSet	Gev 设备寄存器	Character set used by all the strings of the bootstrap registers.	引导寄存器的所有字符串使用的字符集
GevInterfaceSelector	Gev 设备网口数	Selects which physical network interface to control.	设备的网口个数，该值从 0 开始计时，所以值为 0
GevMACAddress	Gev 设备 MAC 地址	MAC address of the network interface.	网口的 MAC 地址
GevSupportedionSelector	选择 Gev 支持的选项	Selects the GEV ion to interrogate for existing support	GevSupportedionSelector 在现有的项目中选择一个去支持 GEV 访问。 GevSupportedion 返回，GevSupportedionSelector 选择项是否支持所选的 GEV
GevSupportedion	Gev 支持的选项返回	Returns if the selected GEV ion is supported.	是否支持 GevSupportedionSelector 选中的功能。
GevCurrentIPConfigurationLLA	开启 LLA 功能	Indicates if Link Local Address IP configuration scheme is activated on the given network interface.	GevCurrentIPConfigurationLLA 中选择 True 时，设备上电后 IP 为 LLA 方式。
GevCurrentIPConfigurationDHCP	开启 DHCP 功能	Indicates if DHCP IP configuration scheme is activated on the given network interface.	GevCurrentIPConfigurationDHCP 中选择 True 时，设备上电后 IP 为 DHCP 方式，可自动获取设备 IP。
GevCurrentIPConfigurationPersistentIP	静态 IP 功能	Indicates if PersistentIP configuration scheme is activated on the given network interface.	指示在给定的网络接口上是否激活了 PersistentIP 配置方案
GevCurrentIPAddress	当前设备 IP 地址	Reports the IP address for the given network interface.	当前设备 IP 地址
GevCurrentSubnetMask	当前设备子掩码	Provides the subnet mask of the given interface.	当前设备子掩码
GevCurrentDefaultGateway	当前设备网关	Indicates the default gateway IP address to be used on the given network interface	当前设备网关
GevFirstURL	获取 GenICam XML 的第一个 URL 地址。	Indicates the first URL to the XML device description file. The First URL is used as the first choice by the application to retrieve the XML device description file.	获取 GenICam XML 的第一个 URL 地址
GevSecondURL	获取 GenICam XML 的第二个 URL 地址	Indicates the second URL to the XML device description file. This URL is an alternative if the application was unsuccessful to	获取 GenICam XML 的第二个 URL 地址

		URL 地址。	retrieve the device description file using the first URL	
	GevNumberOfInterfaces	网络接口数量	Indicates the number of physical network interfaces supported by this device.	设备支持的物理网络接口数量
	GevPersistentIPAddress	静态 IP 地址	Indicates the Persistent IP address for this network interface. It is only used when the device boots with the Persistent IP configuration scheme.	设置设备的静态 IP 地址
	GevPersistentSubnetMask	静态 IP 地址子掩码	Indicates the Persistent subnet mask associated with the Persistent IP address on this network interface	设置设备的静态 IP 的子掩码
	GevPersistentDefaultGateway	静态 IP 地址子网关	Indicates the persistent default gateway for this network interface. It is only used when the device boots with the Persistent IP configuration scheme.	设置设备的静态 IP 的网关
	GevMessageChannelCount	消息通道数	Indicates the number of message channels supported by this device.	显示设备支持的消息通道数
	GevStreamChannelCount	流通道数	Indicates the number of stream channels supported by this device.	本设备支持的流通道数
	GevHeartbeatTimeout	心跳时间	Indicates the current heartbeat timeout in milliseconds.	当前心跳超时时间，单位为毫秒
	GevTimestampTickFrequency	定义 Gev 时间戳频率	Indicates the number of timestamp ticks during 1 second (frequency in Hz)	表示 1 秒内时间戳的次数，单位为 Hz
	GevTimestampControlLatch	Gev 时间戳锁存	Latches current timestamp counter into GevTimestampValue.	将当前的时间戳锁存到 GevTimestampValue 中
	GevTimestampControlReset	Gev 时间戳重置	Resets the Timestamp counter to 0.	将时间戳计数器重置为 0
	GevTimestampValue	存储锁存的 Gev 时间戳	Returns the latched 64-bit value of the timestamp counter.	返回时间戳计数器的锁存 64 位值
	GevCCP	Gev 访问权限设置	Controls the device access privilege of an application.	控制应用程序的设备访问权限
	GevMCPHostPort	Gev 端口	Indicates the port to which the device must send messages. Setting this value to 0 closes the message channel	设置相机消息通道目的端口
	GevMCDA	Gev 目的地址	Indicates the destination IP address for the message channel	设置相机消息通道的目的地址
	GevMCTT	Gev 超时时间	Provides the transmission timeout value in milliseconds.	消息通道超时时间
	GevMCRC	Gev 重传最大次数	Indicates the number of retransmissions allowed when a message channel message times out.	消息通道重传最大次数
	GevMCSP	Gev 源端口	This feature indicates the source port for the message channel.	此特性指示消息通道的源端口

	GevStreamChannelSelector	选择要控制的 Gev	Selects the stream channel to control.	选择要控制的流通道
	GevSCPInterfaceIndex	网络接口索引	Index of network interface to use (from 0 to 3).	要使用的网络接口索引(从 0 到 3)
	GevSCPHostPort	Gev 端口号	Indicates the port to which the device must send data stream. Setting this value to 0 closes the stream channel.	相机流通道使用的端口号。 将此值设置为 0 将关闭流通道
	GevSCPSFireTestPacket	发送测试报文	Sends a test packet. When this feature is set, the device will fire one test packet.	当设置此功能时，设备将触发一个测试包
	GevSCPSDoNotFragment	分片发送	The state of this feature is copied into the "do not fragment" bit of IP header of each stream packet. It can be used by the application to prevent IP fragmentation of packets on the stream channel	如果报文过长，是否进行分片发送，并在 IP 头中增加分片位置 1
	GevSCPSBigEndian	设置像素数据流的结束	Endianness of multi-byte pixel data for this stream.	设置流通道的像素数据流的结束
	GevSCPSPacketSize	设置流通道的报文长度	Specifies the stream packet size in bytes to send on this channel	设置流通道的报文长度。(以字节为单位)
	GevSCPD	设置报文之间的间隔	Indicates the delay (in timestamp counter unit) to insert between each packet for this stream channel. This can be used as a crude flow-control mechanism if the application or the network infrastructure cannot keep up with the packets coming from the device.	修改此数值可以降低对网卡的要求，但是最大带宽会受一定的影响，单帧的获取时间会加长
	GevSCDA	流通道的目的 IP 地址	Indicates the destination IP address for this stream channel.	流通道的目的 IP 地址

Table 4.1 All Properties