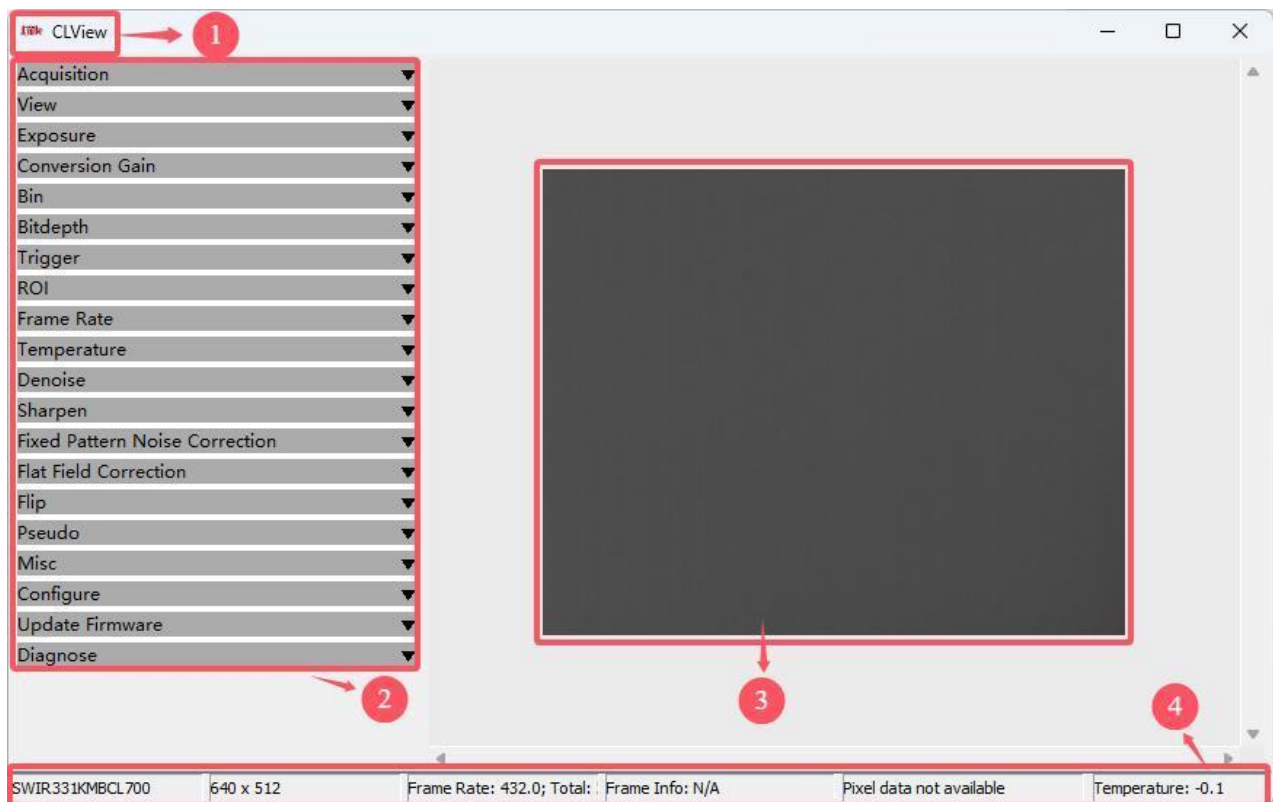


CLView User Manual

1 Application Window



1. Application title bar
2. Camera sidebar
3. Video display area
4. Camera status bar

2 Camera Sidebar

2.1 Acquisition

	<p>Camera Link: Select the frame grabber server and acquisition resource in the two lists. In Config File, select a CCF file that matches the camera.</p> <p>80 bit mode: Select this option when configuring the camera for 80-bit mode. The camera must also support this mode.</p> <p>COM: Select the virtual serial port that matches the frame grabber configuration.</p> <p>Start/Stop: Connect to the camera and start acquisition using the selected frame grabber, configuration file, and COM port. The button changes to Stop; click it to stop acquisition and close the camera connection.</p>
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Snap: Save the current frame. For 8-bit images, select BMP, TIFF, RAW, or JPEG; for images above 8 bits, select TIFF or RAW. A file save dialog opens unless Quick Save is enabled.

Record/Stop: Click Record, choose an MP4 filename and location, and start recording. The button changes to Stop; click it to finish and save the video. Snap and Record are available only while acquisition is running.

Misc...: Open the additional acquisition functions menu.

Pause: Pause acquisition while keeping the camera connected. Click again to resume.

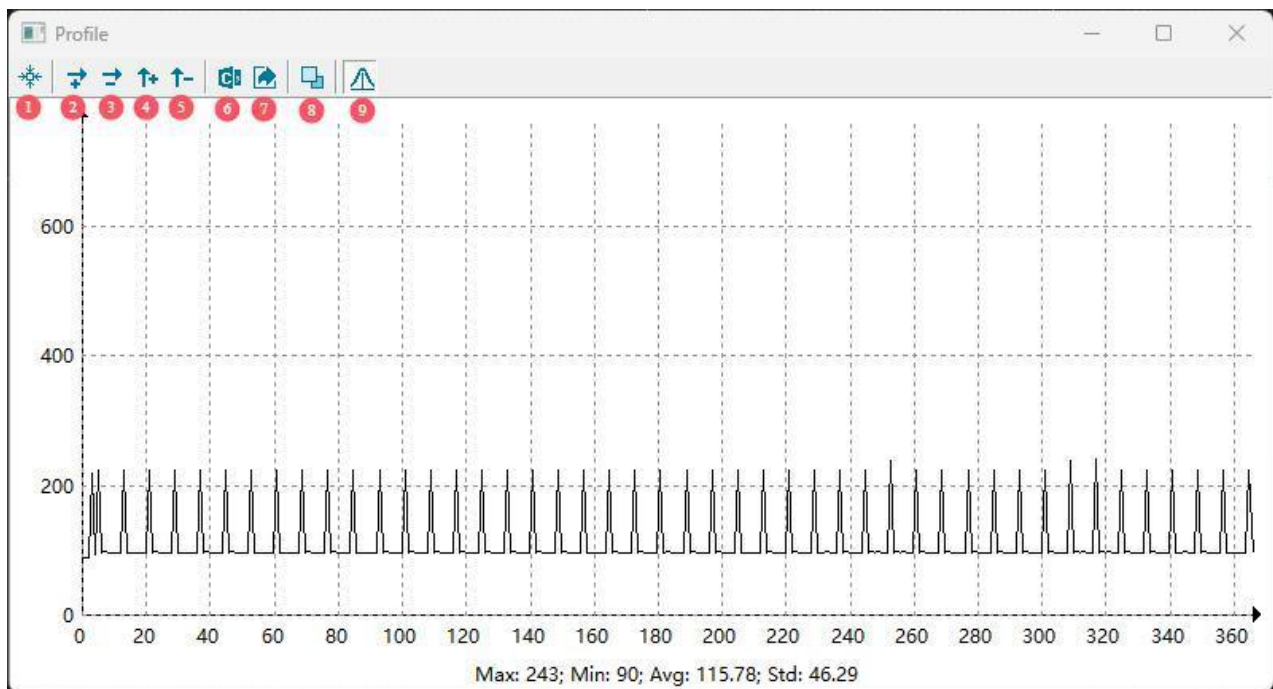
Save All: Choose an output folder, image format, and maximum buffer memory to save acquired images continuously. The menu item changes to Stop. Click it to stop queuing new images, then wait for buffered images to finish saving.

Quick Save: When selected, Snap saves a TIFF image directly without opening a save dialog. Files are saved in the application image folder as QuickImage_<number>.tiff. Clear this option to choose a file manually again.

2.2 View

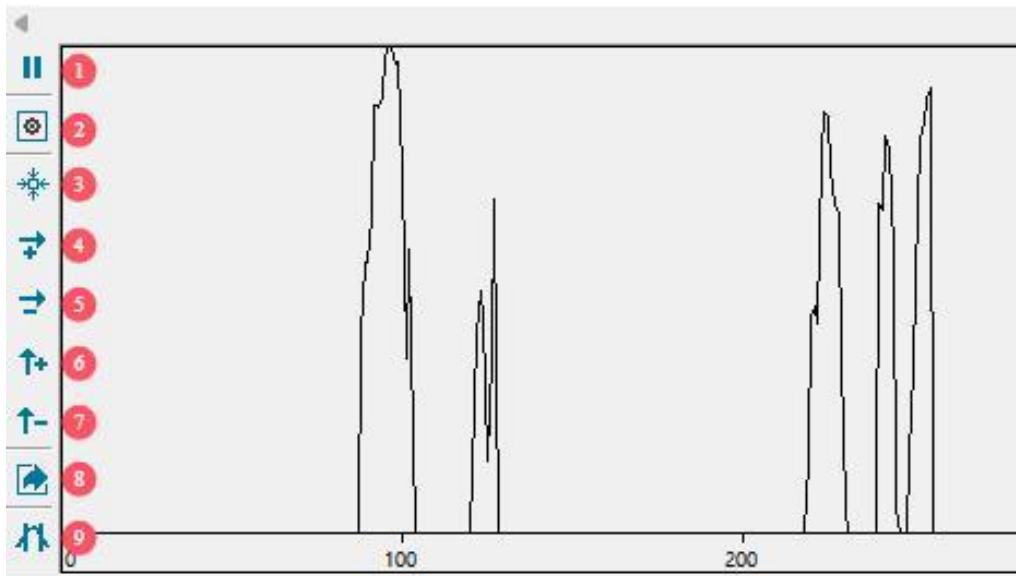
	<p>ZOOM: Select a zoom level to enlarge or reduce the video display.</p> <p>Display interpolation algorithm: Select smooth or sharpen interpolation for the display.</p> <p>Profile: Open the profile window and show a movable sampling line in the video. Move the line to inspect pixel values along it.</p> <p>Histogram: Select to display the histogram below the video area.</p> <p>Grey Calibration: Select to display the live grayscale value in the video area.</p>
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2.2.1 Profile



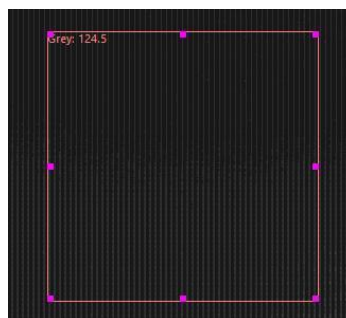
1. Restore the profile plot to its original scale.
2. Zoom in on the horizontal axis of the current profile.
3. Zoom out on the horizontal axis. This button is disabled when the horizontal axis is not zoomed in.
4. Zoom in on the vertical axis of the current profile.
5. Zoom out on the vertical axis. This button is disabled when the vertical axis is not zoomed in.
6. Open Microsoft Excel and populate a new workbook with profile data. Excel must be installed; save the workbook from Excel.
7. Export profile data to TXT. Choose a save path directly. Grayscale data uses one value per line; color data contains R, G, B, and luminance columns.
8. Open the system color palette to set the profile window background color.
9. Hide or show the image grayscale statistics.

2.2.2 Histogram



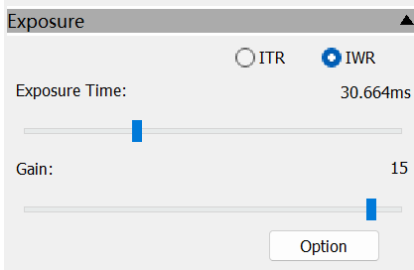
1. Start/Pause: Start or pause histogram updates.
2. Options: Select a logarithmic or linear vertical scale and choose whether to display the mean grayscale value and standard deviation.
3. 1:1: Restore the histogram to its original scale after zooming.
4. X Zoom In: Zoom in on the horizontal axis.
5. X Zoom Out: Zoom out on the horizontal axis.
6. Y Zoom In: Zoom in on the vertical axis.
7. Y Zoom Out: Zoom out on the vertical axis.
8. Export: Export histogram data to a txt file.
9. **Level range:** Set the left and right limits and select Enable to apply grayscale mapping to acquired images. The left limit must not exceed the right limit.

2.2.3 Grey calibration



Enable gray calibration to view the mean grayscale value in the selected area. Drag any of the eight handles on the rectangle to adjust the selected area.

2.3 Exposure

 The Exposure panel features a title bar with an expand/collapse icon. Below it, there are two radio buttons: 'ITR' (unselected) and 'IWR' (selected). The 'Exposure Time' is displayed as '30.664ms' next to a horizontal slider. Below this, the 'Gain' is set to '15' with another horizontal slider. An 'Option' button is located at the bottom right of the panel.	<p>Exposure Time: Drag the slider or click the value to enter an exposure time. The camera determines the range. Manual adjustment is disabled during auto exposure.</p> <p>Gain: Drag the slider or click the value to set exposure gain. The available range and displayed units depend on the model.</p> <p>ITR/IWR: Select exposure and readout mode when supported. ITR reads after exposure; IWR allows overlap. Option opens sequence exposure settings.</p>
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2.4 Conversion Gain

 The Conversion Gain panel has a title bar with an expand/collapse icon. It contains three radio buttons: 'HCG' (selected), 'MCG' (unselected), and 'LCG' (unselected).	<p>Select a supported conversion gain. HCG, MCG, and LCG are common labels; some models display numbered levels. Use the options shown for the camera.</p> <ol style="list-style-type: none">1. HCG: High conversion gain.2. MCG: Medium conversion gain.3. LCG: Low conversion gain.
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2.5 Black Level

 The Black Level panel includes a title bar with an expand/collapse icon. It shows a horizontal slider for adjusting the black level, with the current value '0' displayed on the right.	<p>Black Level: Set the camera black level to adjust the baseline grayscale value in dark areas.</p> <p>Drag the slider, or click the value on the right and enter a black level in the dialog. The available range depends on the camera.</p> <p>Adjusting the black level can improve dark-area visibility. A value that is too low may remove shadow detail; a value that is too high makes the background brighter.</p>
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2.6 Hardware Binning

 The Hardware Binning panel has a title bar with an expand/collapse icon. It contains two dropdown menus: 'Method' and 'Number'.	<ol style="list-style-type: none">1. Choose Additive in Method to sum pixels using the horizontal x vertical factors in Number. This can increase brightness; exposure time is not changed automatically.2. Choose Average to average each selected pixel group. Available factors and output dimensions depend on the model. Changing Number resets the ROI and recreates acquisition buffers.
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2.7 Bitdepth

 The Bit Depth panel features a title bar with an expand/collapse icon and a single dropdown menu for selecting the output bit depth.	<p>Select a supported output bit depth. Changing it updates the frame grabber format and recreates acquisition buffers. This panel is unavailable when only one bit depth is supported.</p>
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2.8 Trigger

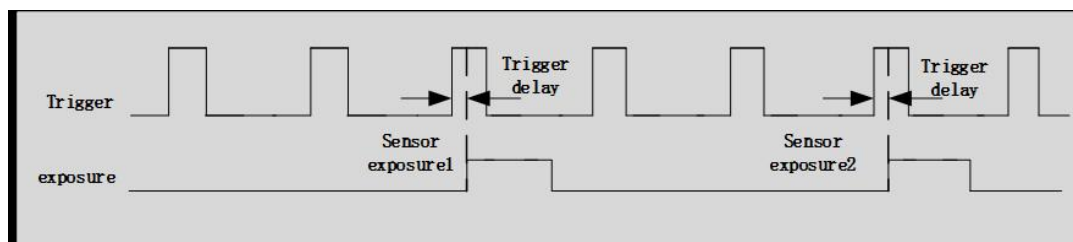
<div> <div>Trigger</div> <div> ☐ Trigger <div>Option</div> </div> <div> Trigger Source <div>Isolated input</div> </div> <div> <div>Software Trigger</div> <div>1</div> </div> </div>	<p>Trigger: Select to enable trigger mode; clear to return to non-triggered operation. Option opens IO Control settings.</p> <p>Trigger Source: Lists only sources supported by the camera, which may include isolated input, GPIO0, GPIO1, Counter, PWM, Software, and CC1–CC4.</p>
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Trigger source	Description
Opto-isolated input	Acquire images from the opto-isolated trigger input. Select Isolated Input in Trigger Source when supported. Use the model hardware manual for voltage, current, and wiring requirements.
GPIO0	Acquire images from the GPIO0 trigger input. Available only when GPIO0 triggering is supported. Use the model hardware manual for voltage, current, and wiring requirements. Open Trigger > Option. In IO Control, select GPIO0, set GPIO Mode to Input, and confirm to apply.
GPIO1	Acquire images from the GPIO1 trigger input. Available only when GPIO1 triggering is supported. Use the model hardware manual for voltage, current, and wiring requirements. Open Trigger > Option. In IO Control, select GPIO1, set GPIO Mode to Input, and confirm to apply.

2.8.1 Counter Frequency Division Mode

In counter frequency division mode, the camera divides the external trigger frequency by the preset counter value before acquiring images. For example, when the counter is set to 3, one acquisition is triggered for every three input trigger signals.

Counter Value: [1,1023]

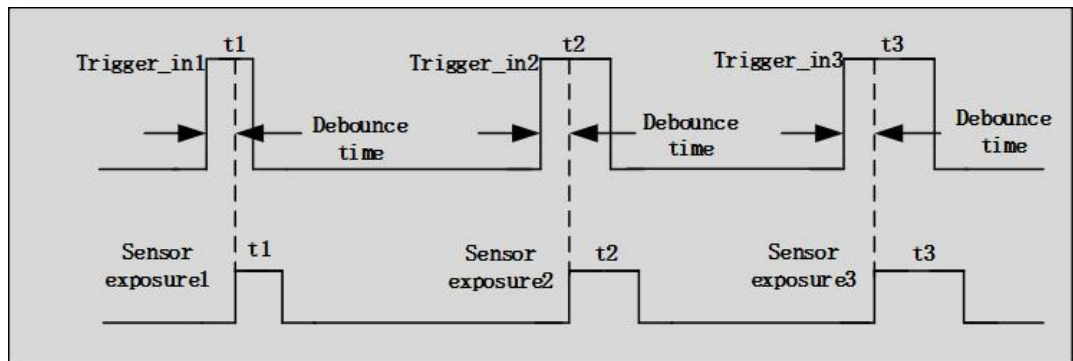


Select Counter in Trigger Source. Open Trigger > Option > IO Control and set Counter Source and Counter Value. The source can be isolated input, GPIO0, or GPIO1. Configure a GPIO line as Input before using it.

Trigger Continued

2.8.2 PWM Pulse Mode

PWM mode uses the input pulse width to control exposure time. Select PWM in Trigger Source and set PWM Source under Trigger > Option > IO Control. Configure GPIO0 or GPIO1 as Input before using that line.



2.8.3 Software Trigger

Software trigger: Enable Trigger, select Software, enter the frame count, and click Software Trigger. CLView sends commands through the selected COM control channel. Click Stop to end early; triggering ends automatically after the requested frames arrive.

For sequence exposure, open Exposure > Option > Sequence, select Hardware in Type, set Number, and double-click exposure times to edit them. Confirm to apply. The table configures per-frame exposure times; it has no gain or delay columns.

2.9 ROI

<p>The ROI dialog box contains the following fields and buttons:</p> <ul style="list-style-type: none">X Offset: 0Y Offset: 0Width: 1024Height: 16FrameLineCount: 16Buttons: Set, Reset, ROI N	<p>Set X/Y offsets and Width/Height, then click Set. Values are aligned for the model. Reset restores the full acquisition area for the current binning. You can also adjust the single ROI rectangle in the video before clicking Set.</p> <p>FrameLineCount: Shown for line-scan cameras. Set the number of acquired lines per frame and click Set.</p> <p>ROI N: On cameras supporting multiple ROIs, open the dialog to set horizontal and vertical region counts, offsets, and sizes, then confirm.</p>
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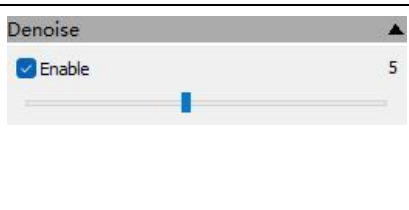
2.10 Frame Rate

<p>The Frame Rate dialog box shows a slider control and a status bar. The status bar displays the value 174.</p>	<p>Drag the slider or click the value to set the target frame rate, from 1 to the current camera maximum. Read the actual acquisition rate in the status bar.</p>
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2.11 Temperature

 The Temperature control panel features a title bar with an upward arrow. Below it are two checkboxes: 'TEC' and 'Fan', both currently unchecked. At the bottom, there is a 'Target (°C):' label followed by a text input field containing the number '0' and a 'Set' button.	<p>TEC: Select to enable thermoelectric cooling. The camera fan is also enabled by default.</p> <p>Fan: Select to enable the fan. Turning the fan off also disables TEC cooling.</p> <p>Target: Enter the target temperature and click Set to apply.</p>
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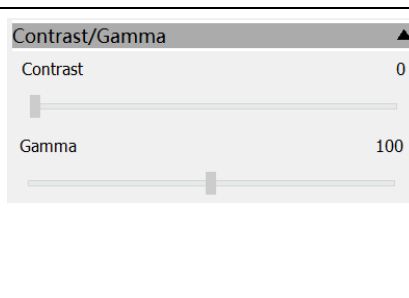
2.12 Denoise

 The Denoise control panel has a title bar with an upward arrow. It includes an 'Enable' checkbox which is checked, and a slider control to its right. The slider is positioned at a value of 5, with the number '5' displayed at the right end of the slider track.	<p>Image noise is unwanted variation introduced during acquisition, transmission, processing, compression, or storage. Sources include the sensor, ambient lighting changes, and electronic interference.</p> <p>Select Enable, then drag the slider to adjust the noise reduction strength for the image.</p>
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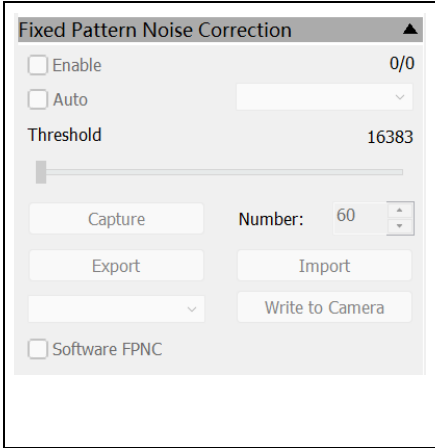
2.13 Sharpen

 The Sharpen control panel features a title bar with an upward arrow. It contains a single slider control. The slider is positioned at the far left, and the number '0' is displayed at the right end of the slider track.	<p>Sharpness controls how clearly image details are shown. Drag the slider to the right to increase sharpness. The leftmost position disables sharpening.</p>
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2.14 Contrast Gamma

 The Contrast/Gamma control panel has a title bar with an upward arrow. It contains two slider controls. The first slider is labeled 'Contrast' and has a value of 0 displayed at its right end. The second slider is labeled 'Gamma' and has a value of 100 displayed at its right end.	<p>Contrast: Drag the slider to adjust grayscale differences between light and dark areas. The default value is 0.</p> <p>Gamma: Drag the slider to adjust midtone brightness. The default value is 100, corresponding to gamma 1.0. Values below 100 brighten midtones; values above 100 darken them.</p> <p>Restore Contrast to 0 and Gamma to 100 to return to the default appearance.</p>
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2.15 Fixed Pattern Noise Correction

	<p>Threshold: Drag the slider or click the value to set the camera FPNC threshold.</p> <p>Enable: Enable camera-side FPNC using data stored in the camera.</p> <p>Auto: Select the correction slot by conversion gain. Clear to select the active slot manually on the right.</p> <p>Export/Import: Export or import .fpnc data. The file dimensions must match the current image.</p> <p>Write to Camera: Write captured or imported data to the slot selected below.</p> <p>Software FPNC: Apply captured or imported data on the PC. Enabling it disables camera FPNC.</p>
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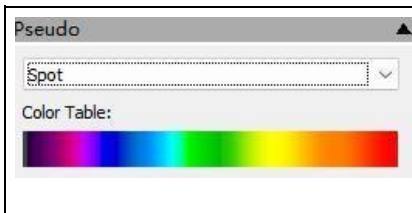
Keep the field uniform and acquisition running. Set Number and click Capture. Then enable Software FPNC, or select a slot and click Write to Camera. After writing succeeds, power cycle the camera as prompted before enabling camera correction.

When Camera FPNC and Calibrate are shown, use them to enable onboard correction or run onboard calibration. These controls appear only on supported models.

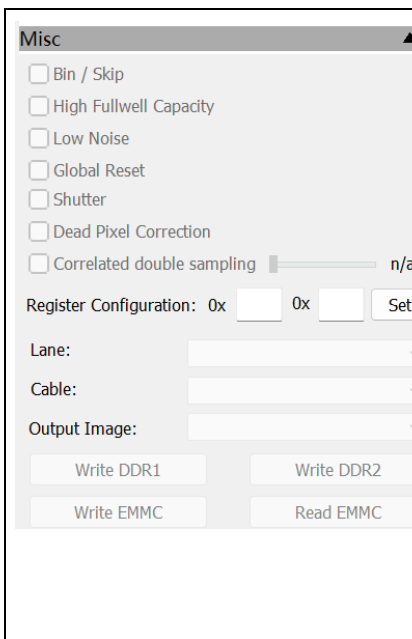
2.16 Flip

	<ol style="list-style-type: none">1. Horizontal: Select if the displayed video is horizontally reversed relative to the scene.2. Vertical: Select if the displayed video is vertically reversed relative to the scene.
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2.17 Pseudo

	<p>Pseudocolor enhances the visibility of image features, especially in grayscale images or images with little color information. Different colors help distinguish regions.</p> <p>Select a pseudocolor palette or choose Disable to turn it off. This controls the video display mapping.</p>
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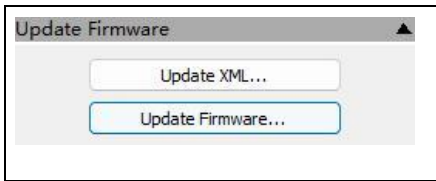
2.18 Misc

	<p>Bin/Skip: Mode writing is not implemented for this control in the current version. This checkbox cannot switch between binning and skipping.</p> <p>High Fullwell Capacity: Mode writing is not implemented for this control in the current version. This checkbox cannot enable high full-well mode.</p> <p>Low Noise Mode: Enable low-noise mode on supported cameras; the frame rate may decrease.</p> <p>Global Reset Mode: Enable global reset shutter mode.</p> <p>Shutter: Control the mechanical shutter.</p> <p>Correlated double sampling: Enable CDS and adjust its parameter with the adjacent slider on supported cameras.</p> <p>Lane: Select the displayed 2-, 4-, or 8-lane option on supported cameras.</p> <p>Cable: Select single- or dual-cable operation on supported cameras. Match the frame grabber configuration to the physical connection.</p>
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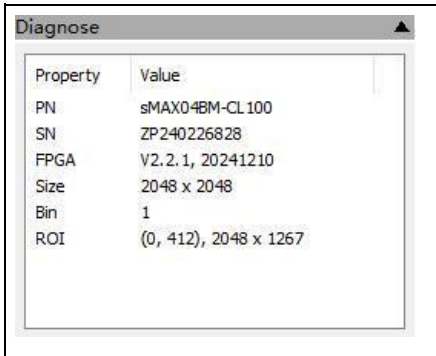
2.19 Configure

	<p>Save: Store the current parameters in the camera and report success or failure.</p> <p>Load: Load saved parameters from the camera and update the controls and acquisition format.</p> <p>Factory Setting: Load the camera factory settings.</p>
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2.20 Update Firmware

	<p>Update XML: Select an XML file. Parsing and expression checks run before it is written to the camera. A failed check prevents writing.</p> <p>Update Firmware: Select a model-compatible .ufw or .spi file, confirm the update, and monitor the progress dialog.</p>
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2.21 Diagnose

 <table border="1" data-bbox="167 616 558 884"><thead><tr><th>Property</th><th>Value</th></tr></thead><tbody><tr><td>PN</td><td>sMAX04BM-CL100</td></tr><tr><td>SN</td><td>ZP240226828</td></tr><tr><td>FPGA</td><td>V2.2.1, 20241210</td></tr><tr><td>Size</td><td>2048 x 2048</td></tr><tr><td>Bin</td><td>1</td></tr><tr><td>ROI</td><td>(0, 412), 2048 x 1267</td></tr></tbody></table>	Property	Value	PN	sMAX04BM-CL100	SN	ZP240226828	FPGA	V2.2.1, 20241210	Size	2048 x 2048	Bin	1	ROI	(0, 412), 2048 x 1267	<p>PN: Camera model name.</p> <p>SN: Camera serial number.</p> <p>FPGA: Camera FPGA version and date.</p> <p>Size: Current acquired image width and height.</p> <p>Bin: Camera digital binning value.</p> <p>ROI: Camera-reported ROI offsets (X, Y) and dimensions (Width x Height).</p>
Property	Value														
PN	sMAX04BM-CL100														
SN	ZP240226828														
FPGA	V2.2.1, 20241210														
Size	2048 x 2048														
Bin	1														
ROI	(0, 412), 2048 x 1267														