

Comparison of camera functions between the old and new platforms

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This manual aims to introduce Daheng MER2 series cameras, about the differences between the new and old platforms, only the typical features are listed, not all the functional differences will be listed.

Some features are inconsistent between Mono and Color cameras. Finally, the Feature list of the camera shall prevail.

If you encounter problems in use, please contact Daheng Imaging technical support team.

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1. Timer:

The camera only supports one timer (Timer1), which can be started by a specified event or signal (only Exposure Start signal is supported). The Timer can configure a timer output signal that goes high on a specific event or signal and goes low after a specific duration. And the timer is cleared when the output signal goes low. A schematic diagram of the timer working process is as follows:

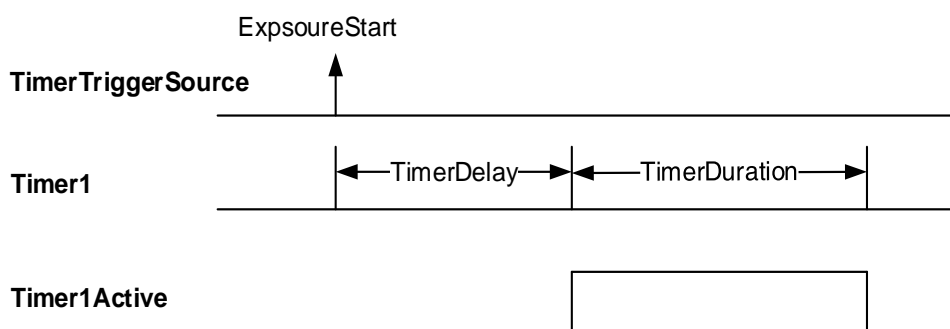


Figure 1 Timer1Active schematic diagram

After the acquisition is stopped, the timer is immediately cleared and the Timer1Active signal goes low immediately.

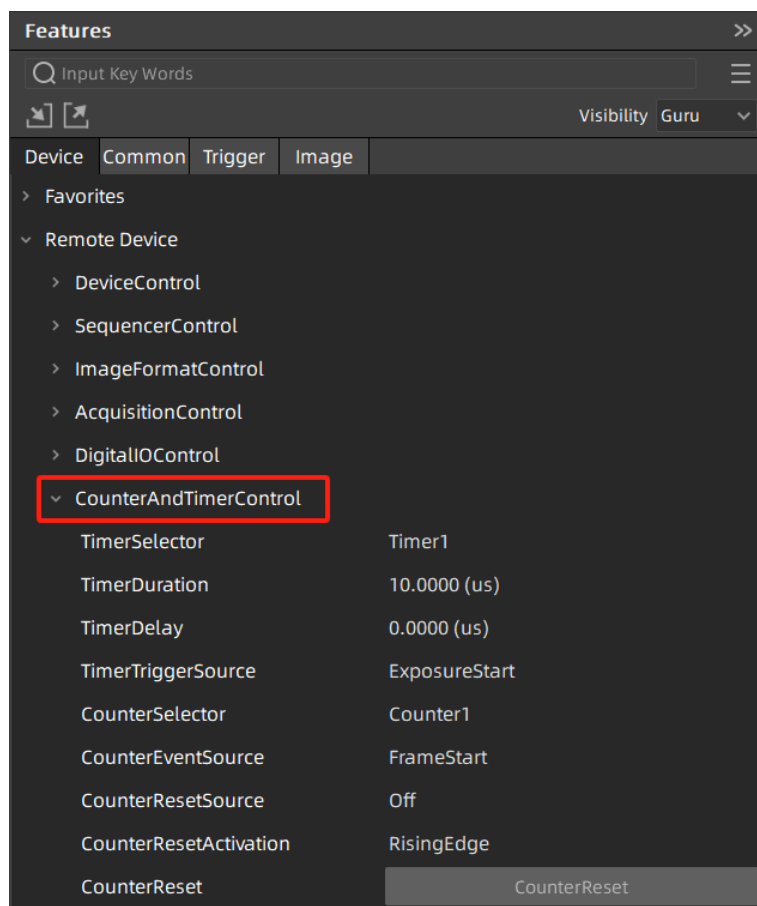


Figure 2 The location of the Timer in Galaxy Viewer

2. Counter:

The camera only supports one counter (Counter1), which can count the number of FrameTrigger, AcquisitionTrigger and FrameStart signals received by the camera. The counter starts counting from 0. You can select one of the above three signals to count by CounterEventSource. The FrameTrigger and AcquisitionTrigger signals of the counter statistics refer to the signals that have been triggered for filtering without a trigger delay.

If CounterValue is enabled, the statistical data can be inserted into the frame information and output with the image.

The counter can be reset by an external signal. The reset source is selected by CounterResetSource. Currently, the CounterResetSource option supports Off, SoftWare, Line0, Line2, and Line3. Among them, Off means no reset, SoftWare means software reset, Line0, Line2 or Line3 means reset through IO port input signal. The polarity of the reset signal only supports RisingEdge, which means reset the Counter on the rising edge of the reset signal.

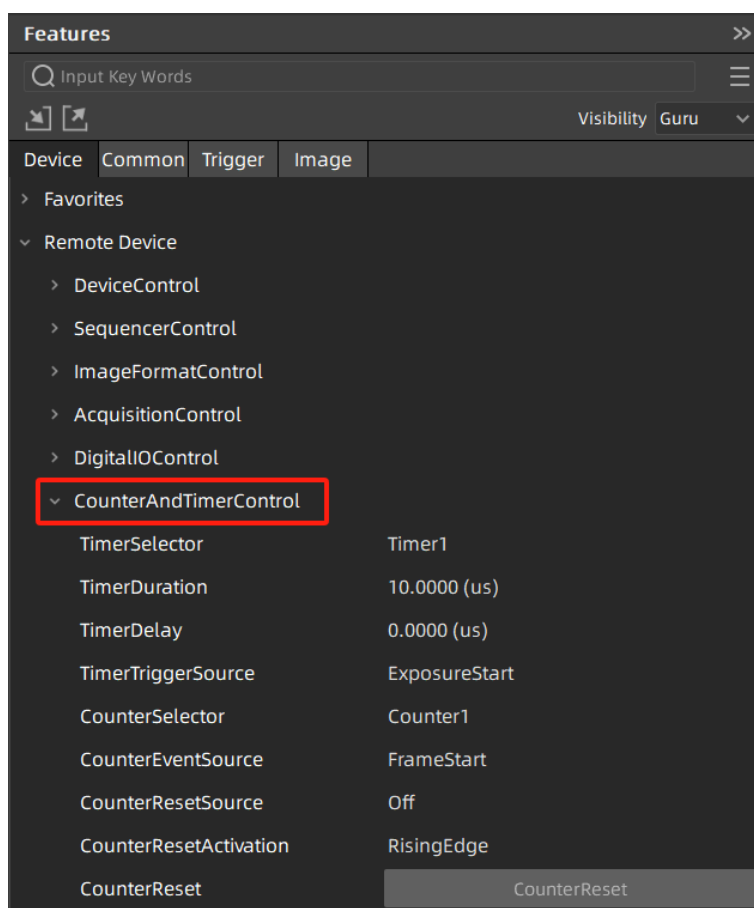


Figure 3 The location of the Counter in Galaxy Viewer

3. Reverse X and Reverse Y:

The Reverse X and Reverse Y features can mirror acquired images horizontally, vertically, or both.

3.1. Enabling Reverse X

To enable Reverse X, set the ReverseX parameter to true. The camera mirrors the image horizontally.



Figure 4 The original image



Figure 5 Reverse X enabled

3.2. Enabling Reverse Y

To enable Reverse Y, set the ReverseY parameter to true. The camera mirrors the image vertically.



Figure 6 The original image

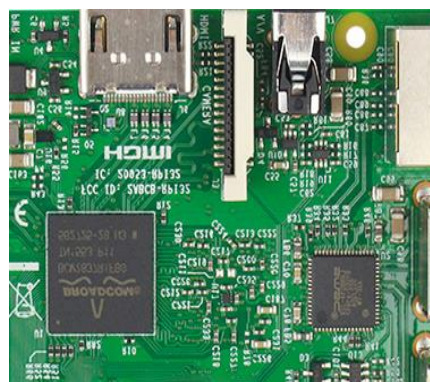


Figure 7 Reverse Y enabled

3.3. Enabling Reverse X and Y

To enable Reverse X and Y, set the ReverseX and ReverseY parameters to true. The camera mirrors the image horizontally and vertically.



Figure 8 The original image

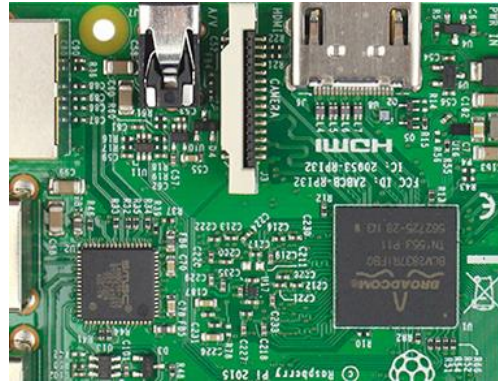


Figure 9 Reverse X and Y enabled

3.4. Using Image ROI with Reverse X or Reverse Y

If you have specified an image ROI while using Reverse X or Reverse Y, you must bear in mind that the position of the ROI relative to the sensor remains the same. Therefore, the camera acquires different portions of the image depending on whether the Reverse X or the Reverse Y feature is enabled:

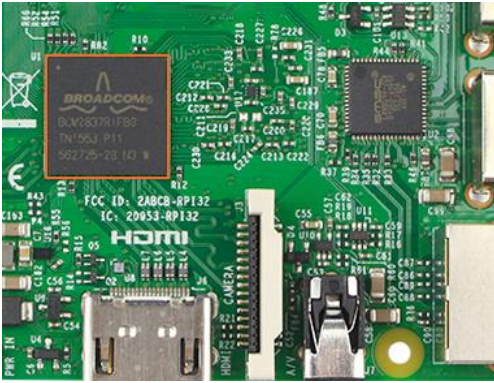


Figure 10 The original image

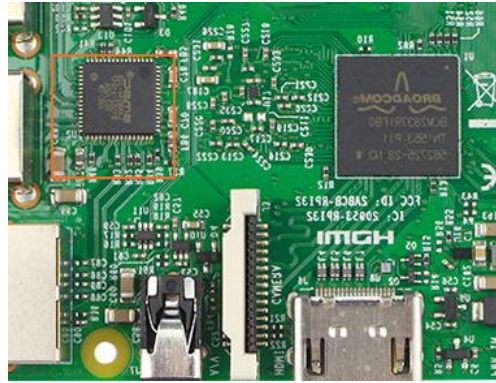


Figure 11 Reverse X enabled

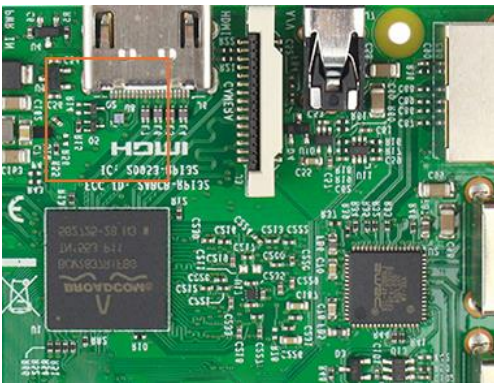


Figure 12 Reverse Y enabled

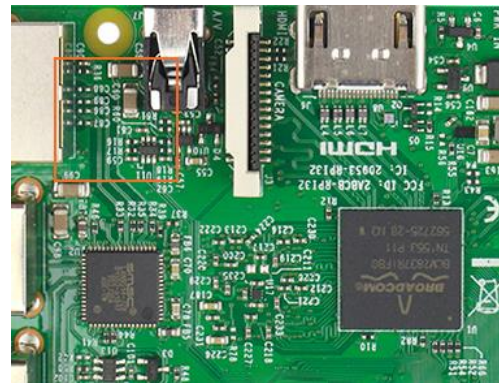


Figure 13 Reverse X and Y enabled

| Device | Common | Trigger | Image | |
|--------|---------------------|---------|-------|--|
| | OffsetY | 0 | | |
| | PixelFormat | Mono8 | | |
| | PixelSize | Bpp8 | | |
| | TestPatternGener... | Region0 | | |
| | TestPattern | Off | | |
| | BinningSelector | Region0 | | |
| | BinningHorizont... | Average | | |
| | BinningHorizontal | 1 | | |
| | BinningVertical... | Average | | |
| | BinningVertical | 1 | | |
| | DecimationHoriz... | 1 | | |
| | DecimationVertical | 1 | | |
| | ReverseX | false | | |
| | ReverseY | false | | |

Figure 14 The location of the Reverse in Galaxy Viewer

4. Binning:

The feature of Binning is to combine multiple pixels adjacent to each other in the sensor into a single value, and process the average value of multiple pixels or sum the multiple pixel values, which may increase the signal-to-noise ratio or the camera's response to light.

4.1. Binning Factors

Two types of Binning are available: horizontal Binning and vertical Binning. You can set the Binning factor in one or two directions.

Horizontal Binning is the processing of pixels in adjacent rows.

Vertical Binning is the processing of pixels in adjacent columns.

Binning factor 1: Disable Binning.

Binning factor 2, 4: Indicate the number of rows or columns to be processed.

For example, the horizontal Binning factor 2 indicates that the Binning is enabled in the horizontal direction, and the pixels of two adjacent rows are processed.

4.2. Binning Modes

The Binning mode defines how pixels are combined when Binning is enabled. Two types of the Binning mode are available: Sum and Average.

Sum: The values of the affected pixels are summed and then output as one pixel. This improves the signal-to-noise ratio, but also increases the camera's response to light.

Average: The values of the affected pixels are averaged. This greatly improves the signal-to-noise ratio without affecting the camera's response to light.

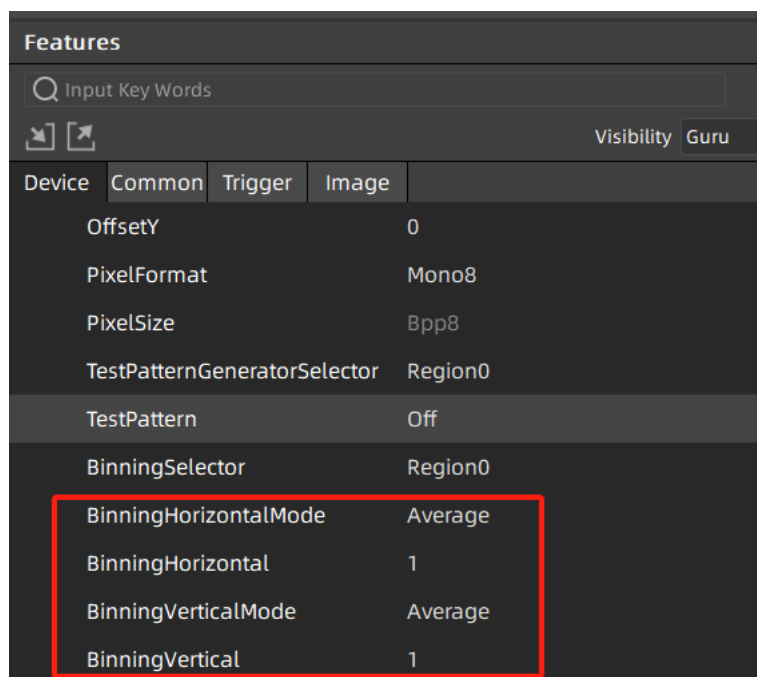


Figure 15 The location of the Binning in Galaxy Viewer

5. Decimation:

The Decimation can reduce the number of sensor pixel columns or rows that are transmitted by the camera, reducing the amount of data that needs to be transmitted and reducing bandwidth usage.

5.1. Configuring Decimation

To configure vertical Decimation, enter a value for the DecimationVertical parameter. To configure horizontal Decimation, enter a value for the DecimationHorizontal parameter.

The value of the parameters defines the Decimation factor. Depending on your camera model, the following values are available:

- 1: Disable Decimation.
- 2: Enable Decimation.

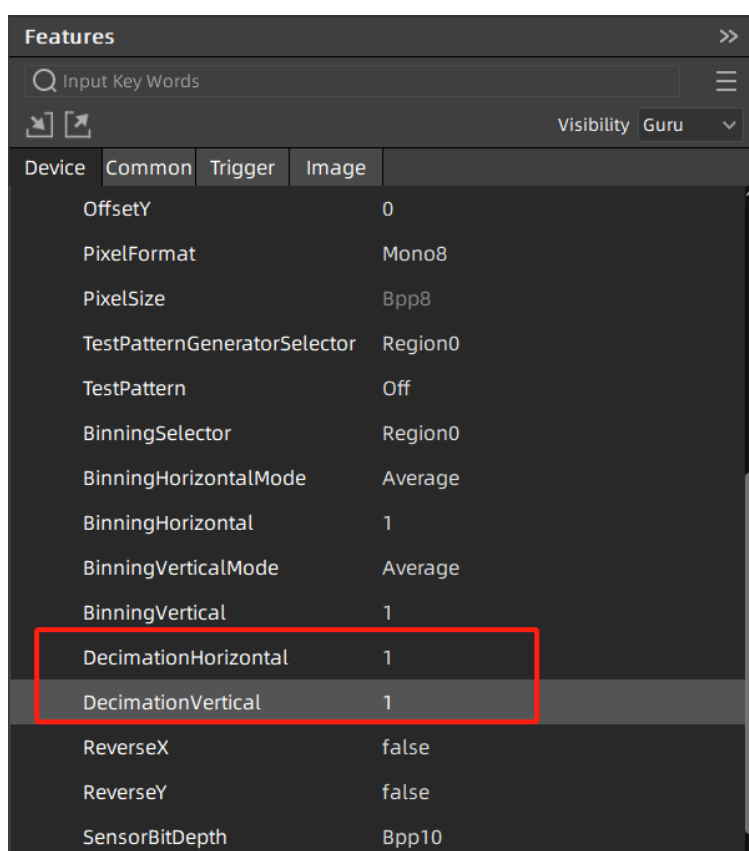


Figure 16 The location of the Binning in Galaxy Viewer

6. Remove Parameter Limits:

The range of camera parameters is usually limited, and these factory limits are designed to ensure the best camera performance and high image quality. However, for certain use cases, you may want to specify parameter values outside of the factory limits. You can use the remove parameter limits feature to expand the parameter range. The features of the extended range supported by different cameras may be different and the range may be different.

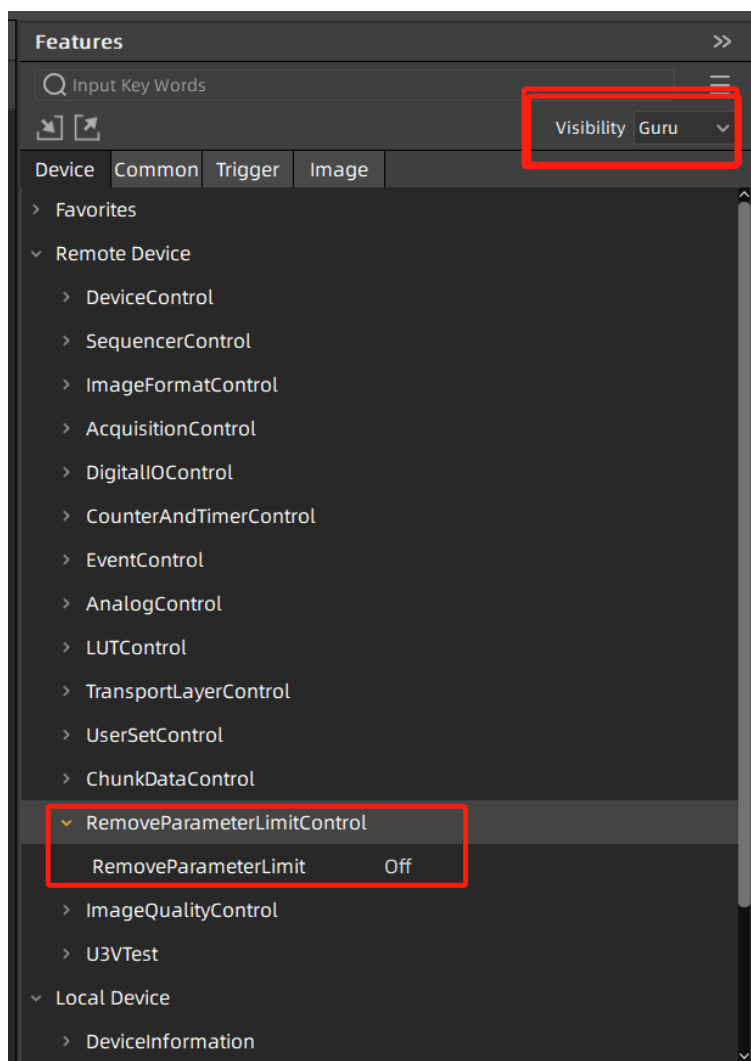


Figure 17 The location of this Feature in Galaxy Viewer

7. Gamma:

The Gamma can optimize the brightness of acquired images for display on a monitor.

7.1. Prerequisites

If the GammaEnable parameter is available, it must be set to true.

7.2. Additional parameters

Depending on your camera model, the following additional parameters are available:

GammaEnable: Enable or disable Gamma correction.

GammaMode: You can select one of the following Gamma correction modes:

User: The Gamma correction value can be set as expected.

sRGB: The camera's internal default Gamma correction value. This feature is used with the color transformation feature to convert images from RGB to sRGB. It is recommended to adjust Gamma to sRGB mode after enabling the color transformation feature.

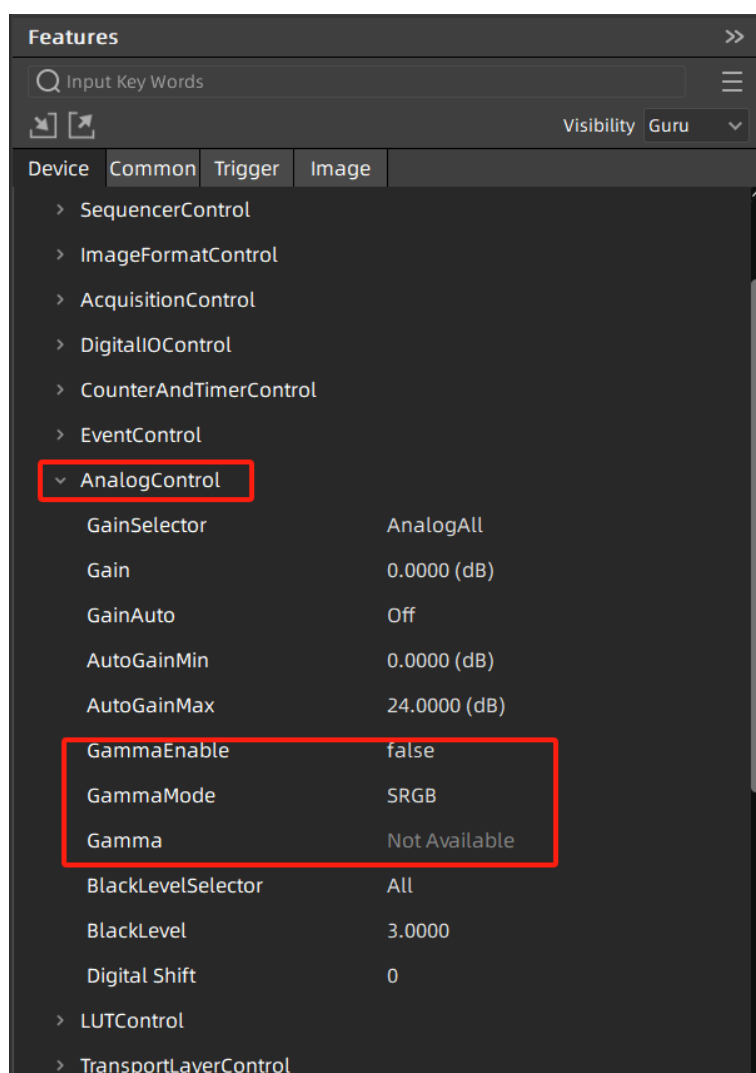


Figure 18 The location of the Gamma in Galaxy Viewer

8. LUT:

When the analog signal that is read out by the sensor has been converted via ADC, generally, the raw data bit depth is larger than 8 bits, there are 12 bits, 10 bits, etc. The feature of lookup table is to replace some pixel values in the 8 bits, 10 bits, and 12 bits images by values defined by the user.

The lookup table can be a linear lookup table or a non-linear lookup table, created entirely by the user.

You can also use the LUTValueAll function to create an entire lookup table.

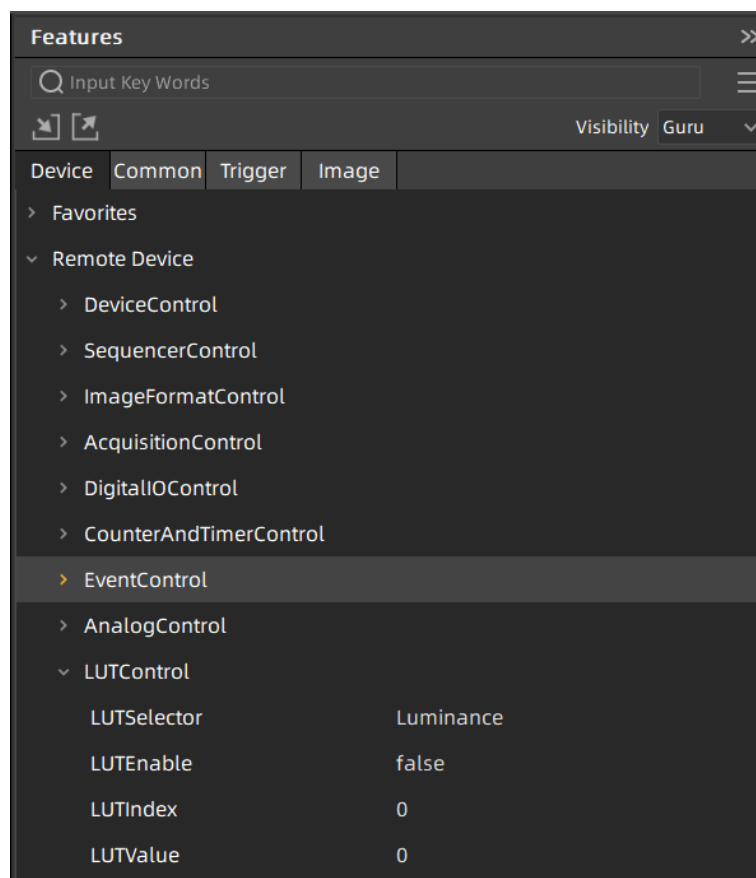


Figure 19 The location of the Lut in Galaxy Viewer

9. Ultra Short exposure time mode:

In UltraShort exposure time mode, the MERCURY2 USB3 Vision camera only supports manual adjustment of the exposure time. Since standard exposure time mode is the default setting, if you want to set the UltraShort exposure time mode, you first need to adjust the visibility level to guru and set the ExposureTimeMode to UltraShort under the acquisition control features window.

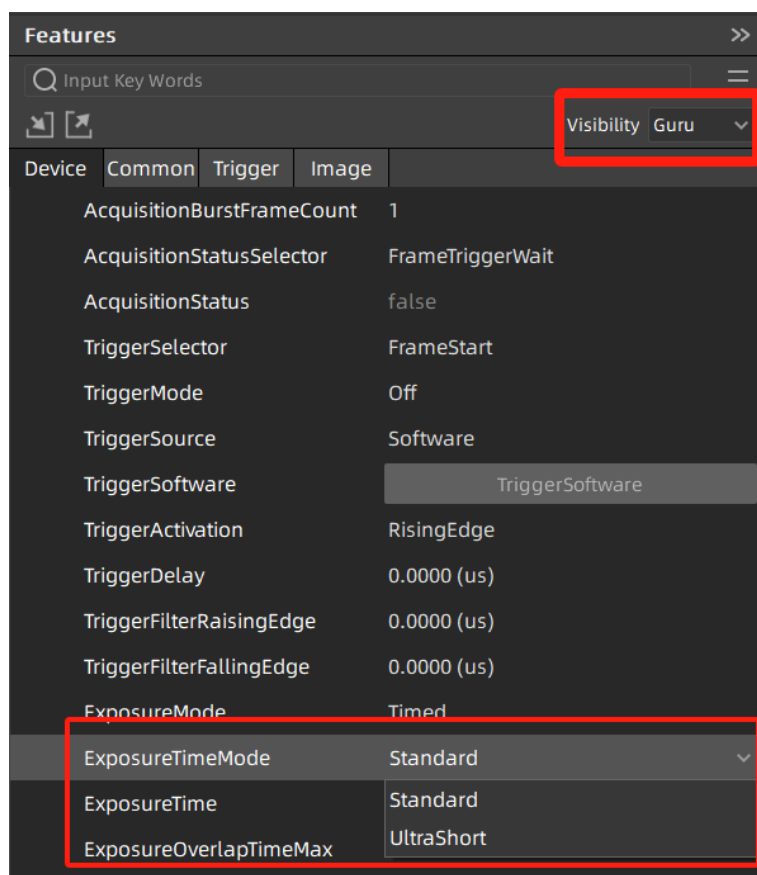


Figure 20 The location of the Ultrashort in Galaxy Viewer

10. Light Source Preset:

The new platform cameras in order to make a more ideal state after power on. Therefore, it will be preset to Daylight-6500K. If you want to keep the same with the old platform, change it to OFF Mode.

The MER2/ME2P/ME2S series camera supports light source preset function, and provides Off mode, Custom mode, and four specified common color temperature light source modes. The camera provides the corresponding white balance coefficient and color transformation coefficient in the four specified color temperature light source modes. The function support of different models varies slightly.

10.1. Off Mode

The camera does not perform white balance and color conversion processing on the image by default, and you need to input the white balance coefficient manually or use the auto white balance function. Perform color correction in Off mode is the same as without color correction.

10.2. Custom Mode

The camera does not perform white balance and color conversion processing on the image by default.

Users can perform automatic white balance, or manually input white balance coefficients, and it supports color conversion enable control and manually input color conversion coefficients.

10.3. Daylight-6500K

When the user selects Daylight-6500K in the light source preset, the camera will perform white balance processing on the image by default. If the external environment light source used is D65 light source, the image will not produce color deviation.

Even if the current light source is selected as the light source preset, users can also manually adjust the white balance coefficient.

Users can turn on the color conversion enable switch and calibrate according to the color conversion coefficient of the Daylight-6500K light source (manual input of color correction coefficients is not supported).

The option operation of Daylight5000K, CoolWhiteFluorescence, INCA is the same as Daylight-6500K.

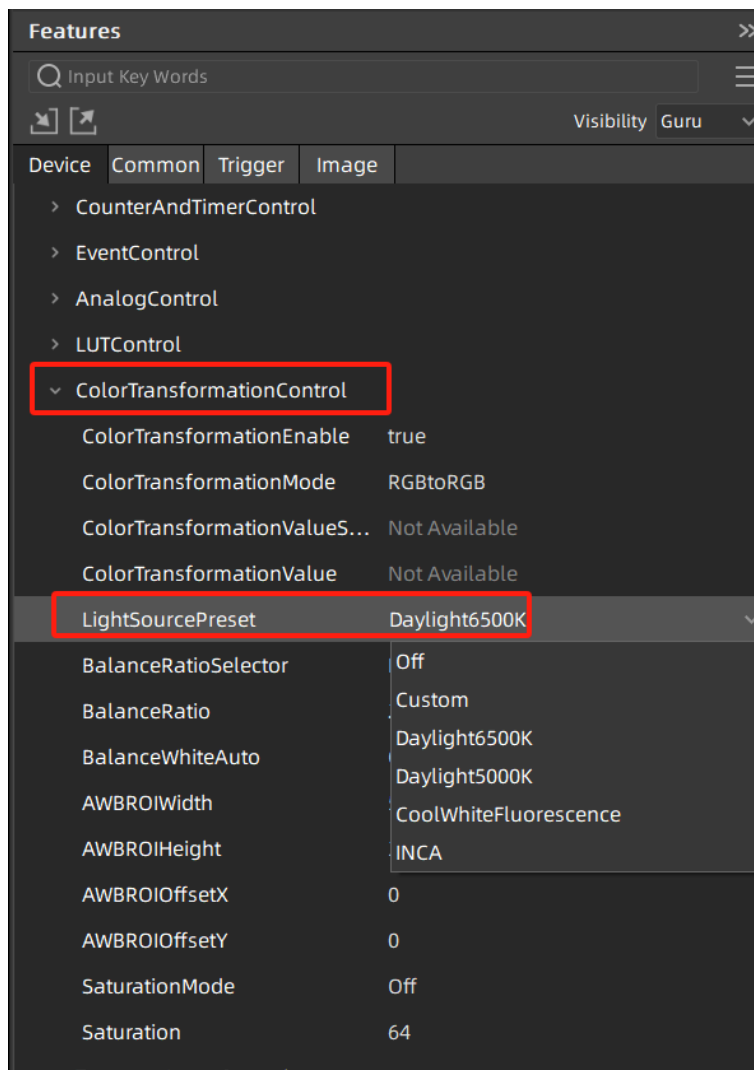


Figure 21 The location of the Feature in Galaxy Viewer

11. Saturation:

Some MERCURY2 cameras support saturation function. Saturation function can changes the colorfulness (intensity) of the colors to achieve the goal image effect.

11.1. Prerequisites

If the SaturationEnable parameter is available, it must be set to On.

11.2. Configuring saturation

Enter the expected value for the Saturation parameter and the range is 0 to 128. By default, the parameter is set to 64 (no saturation perform)

11.3. Effect images



Figure 22 Before saturation



Figure 23 After saturation

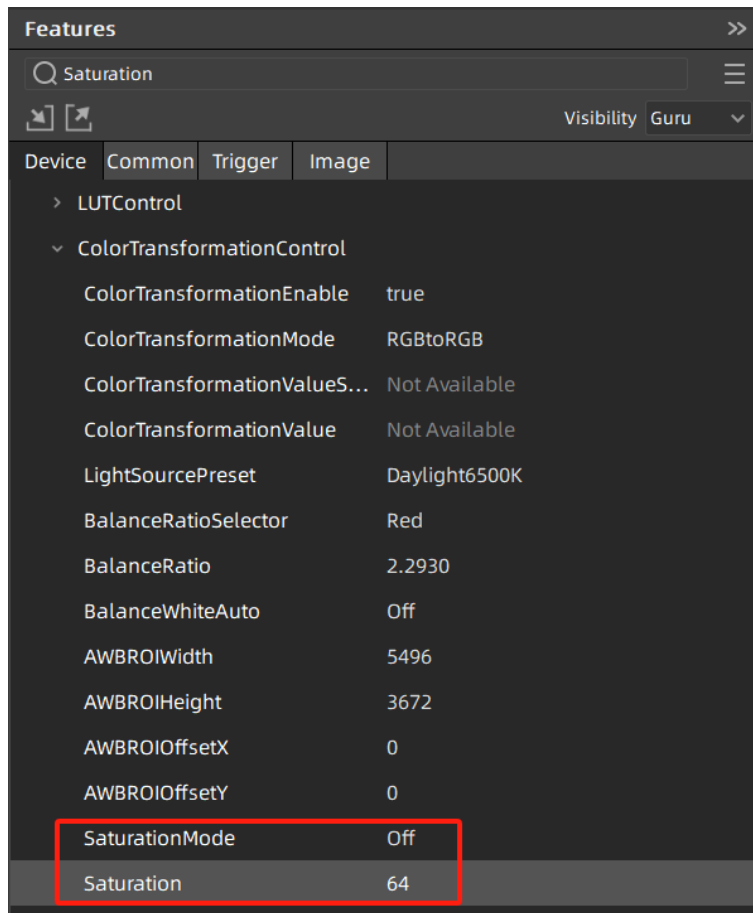


Figure 24 The location of the Saturation in Galaxy Viewer

12. Sharpness:

The sharpness algorithm integrated in the camera can significantly improve the definition of the edges of the image. The higher the definition, the clearer the contour corresponding to the image. This feature can improve the accuracy of image analysis, thus improving the recognition rate of edge detection and OCR.

The sharpness supported by the camera include sharpness and sharpness with noise suppression

12.1. Enable sharpness

ON means that the sharpness feature is enabled.

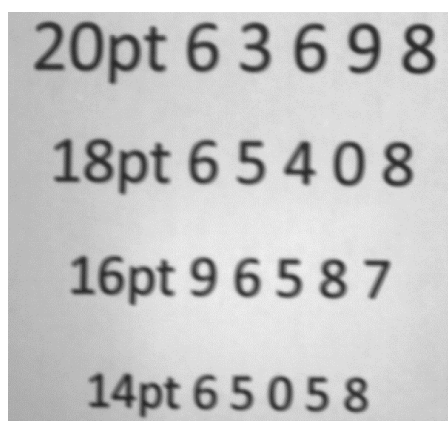


Figure 25 Before sharpness adjustment

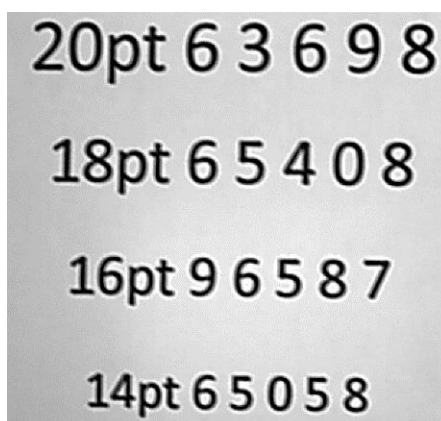


Figure 26 After sharpness adjustment

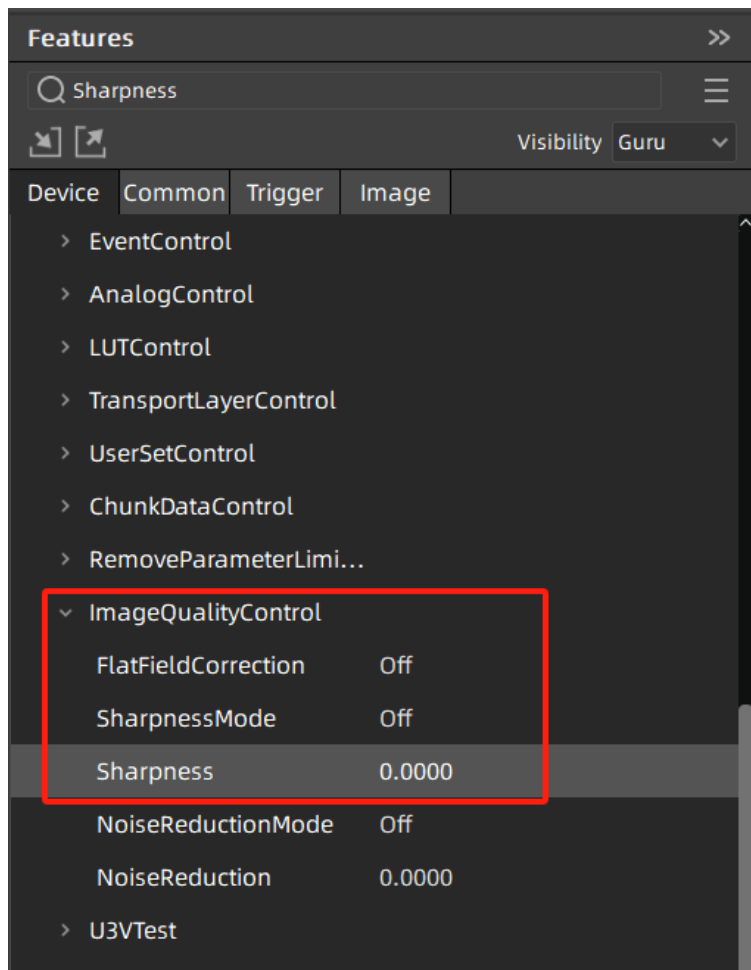


Figure 27 The location of the Sharpness in Galaxy Viewer

13. Noise Reduction:

During the digitization and transmission of an image, it is often disturbed by the noise of the imaging device and the external environment, which will cause the image with noise. The process of reducing or suppressing the noise in the image is called image noise reduction.

Adjust the noise reduction value can adjust the noise reduction intensity of the camera on the image. The adjustment range is 0-4.0. The larger the value, the higher the degree of noise reduction.

Noise reduction feature: determine whether to enable noise reduction. ON means that the noise reduction feature is enabled. And OFF means that the noise reduction feature is disabled.

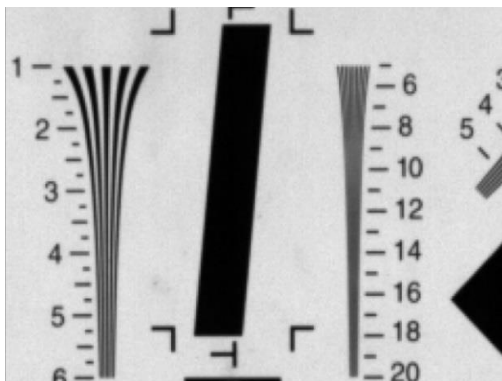


Figure 28 Before noise reduction

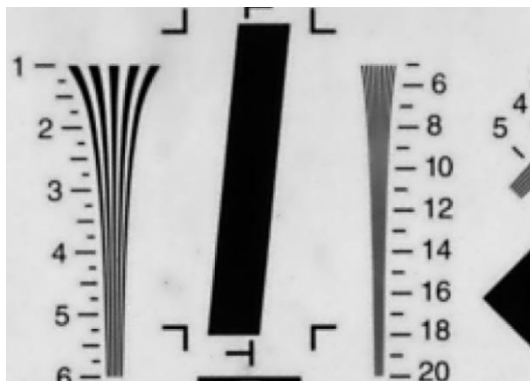


Figure 29 After noise reduction

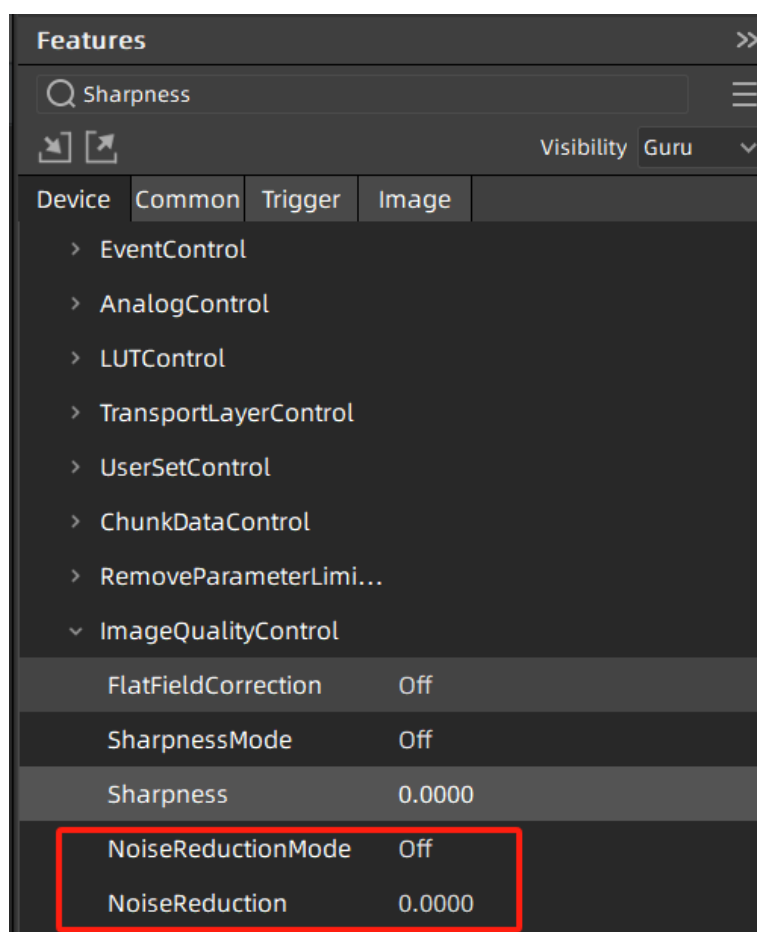


Figure 30 The location of the Noise reduction in Galaxy Viewer

14. Version history

| No. | Version | Changees | Release Date |
|-----|---------|-----------------|--------------|
| 1 | V1.0.0 | Initial release | 2023-12 |