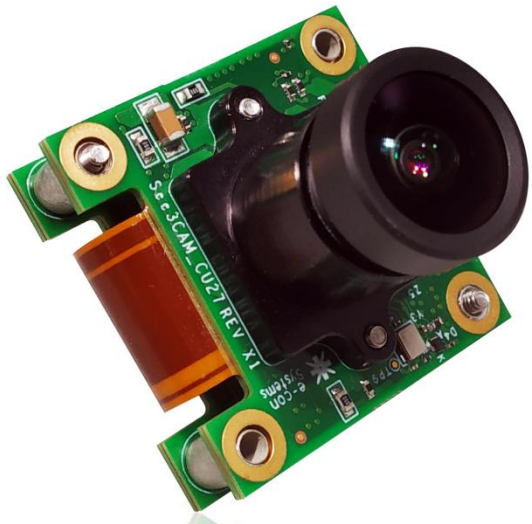
See3CAM_CU27

QtCAM Streaming Application User Manual



e-con Systems

Your Product Development Partner

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Disclaimer

The specifications of See3CAM_CU27 camera board and instructions on how to connect this board with PC are provided as reference only and e-con Systems reserves the right to edit/modify this document without any prior intimation of whatsoever.

Contents

Introduction to See3CAM_CU27

See3CAM_CU27 is a 2 MP, color, UVC compliant, USB 3.1 Gen 1 SuperSpeed camera from e-con Systems, a leading Embedded Product Design Services Company which specializes in the advanced camera solutions. It is the latest member of the See3CAM family of USB 3.1 Gen 1 SuperSpeed camera products.

See3CAM_CU27 is a 2 MP camera that is based on the 1/2.8" IMX462 CMOS image sensor. It is also backward compatible with the USB 2.0 high speed interface, albeit with few resolutions at lower frame rates.

See3CAM_CU27 is UVC compliant camera, and it does not require any drivers to be installed on the PC. The native UVC drivers of Windows and Linux Operating Systems (OS) will be compatible with this camera. e-con Systems also provides the sample application that demonstrates some of the features of this camera. However, this camera can utilize any DirectShow application such as Skype and so on.

e-con Systems provides a sample V4L2 application, called QtCAM, along with the See3CAM_CU27 camera.

This document describes about the usage of QtCAM application on Ubuntu [>=14.04 (LTS)] 32-bit and 64-bit Linux OS.

Prerequisites

The steps to initialize the device with the host computer are as follows:

1. Connect the one end of USB 3.1 Gen 1 cable to the USB 3.1 Gen 1 connector provided at the back of See3CAM_CU27.
2. Connect the other end of USB 3.1 Gen 1 cable to the USB 3.1 Gen 1 host controller on the computer.

Once connected, the LED on the device will glow indicating that the See3CAM_CU27 is powered up and ready to use.

As See3CAM_CU27 is a generic UVC device, Linux will automatically detect and installs the drivers.

To view the preview, QtCAM application must be installed. Refer to the *QtCAM_Streaming_Application_Installation_Manual_Rev_1_3.pdf*.

Description

See3CAM_CU27 is a USB 3.1 Gen 1 color camera capable of streaming the resolution and frame rates as listed in below table.

Table 1: See3CAM_CU27 Resolution and Frame Rates with FOV Crop

Format	Resolution	Frame Rate		% Crop in FOV	
		USB 3.1 Gen 1	USB 2.0	Horizontal	Vertical
UYVY	VGA (640 x 480)	120 fps	30 fps	41.87%	0%
	720P (1280 x 720)	80 fps	NS	0%	0%
	1080P (1920 x 1080)	60 fps	NS	0%	0%
MJPEG	VGA (640 x 480)	120 fps	30 fps	41.87%	0%
	720P (1280 x 720)	100 fps	30 fps	0%	0%
	1080P (1920 x 1080)	100 fps	30 fps	0%	0%

Note: The above-mentioned frame rates at MJPEG format is subject to change with different renderers, and PC configuration.

The camera controls of See3CAM_CU27 are as follows:

- Brightness
- Contrast
- Saturation
- Sharpness
- White Balance (both manual and automatic)
- Backlight Compensation
- Gain
- Exposure (both manual and automatic)
- Roll

The Field of View (FOV) of See3CAM_CU27 is shown below.

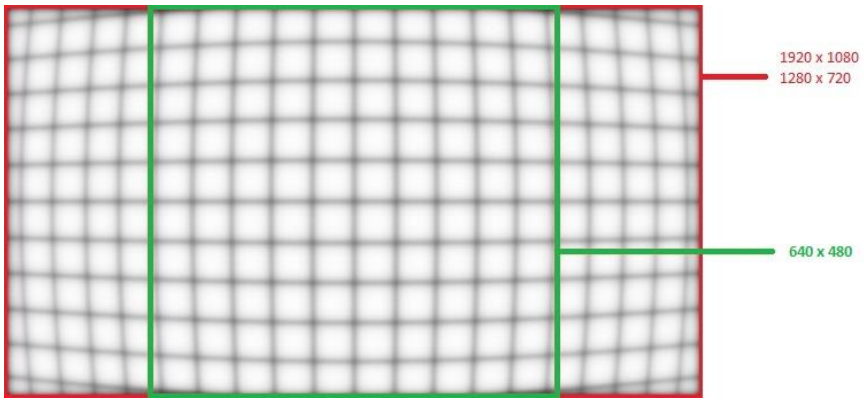

Figure 1: FOV of See3CAM_CU27

QtCAM Application

The QtCAM application is a simple interface for capturing and viewing video from the devices supported by the Linux UVC driver.

Using QtCAM application, you can perform the following:

- Enumerate and list all USB video devices connected.

- Change resolution and color space or compression for video stream if different resolutions are supported by the device.
- Display the currently configured values of preview in status bar.
- Capture the still images and set the path where still images will be saved.
- Display the current frame rate per second.

All the above listed properties can be configured by attractive and easy to use Graphical User Interface (GUI). The application is tested in Ubuntu [>=14.04 (LTS)] 32-bit and 64-bit Linux Distributions.

e-con Systems provides prebuilt binaries of the QtCAM application for the Linux distributions. The Linux distributions are:

- Ubuntu 32-bit (14.04 and 18.04 32-bit not supported)
- Ubuntu 64-bit

Launching the Application

The See3CAM USB 3.1 Gen 1 camera is connected to the Linux Development System. When the application is launched, you can view the home screen as shown below.

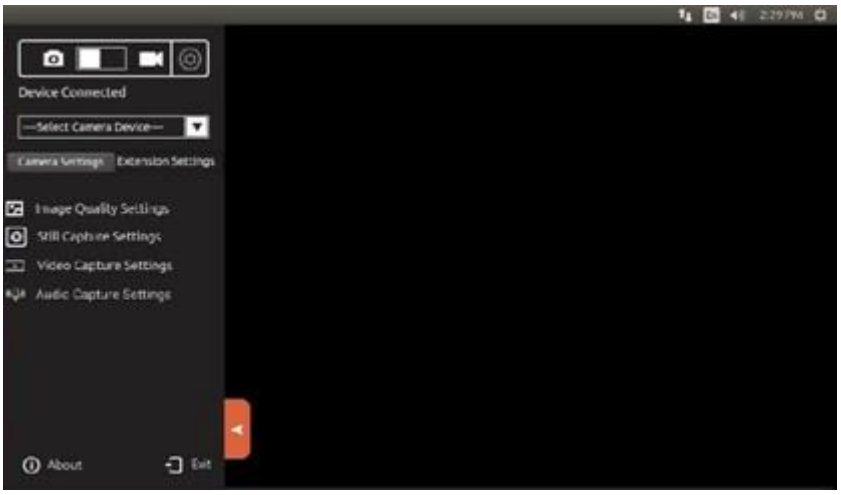

Figure 2: Home Screen

Application Features

This section describes the features that are supported in the current version of QtCAM application.

The features supported in QtCAM application are as follows:

Enumeration and Selection of Camera Device

The application will emulate only the USB cameras connected to the system. You can select any one of the cameras from the **Device Connected** drop-down list box and the corresponding preview is displayed in the right-hand side of the side bar.

The device name is displayed in the **Device Connected** drop-down list box as shown below.

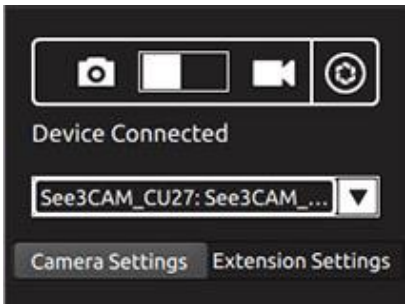

Figure 3: Selection of Camera Device

Note: The preview will not be displayed for the device if the camera is busy that is, if there are two instances of QtCAM application and both have the same camera selected then there will be no preview displayed in the second instance of the QtCAM application.

Still Capture

By default, this application will begin in still capture mode. If the application is in video mode, you can click the **Camera** icon to switch back to the still capture mode.

To capture the still image, you can either click the **Preview** or the **Capture Image** icon available in the side bar as shown below.

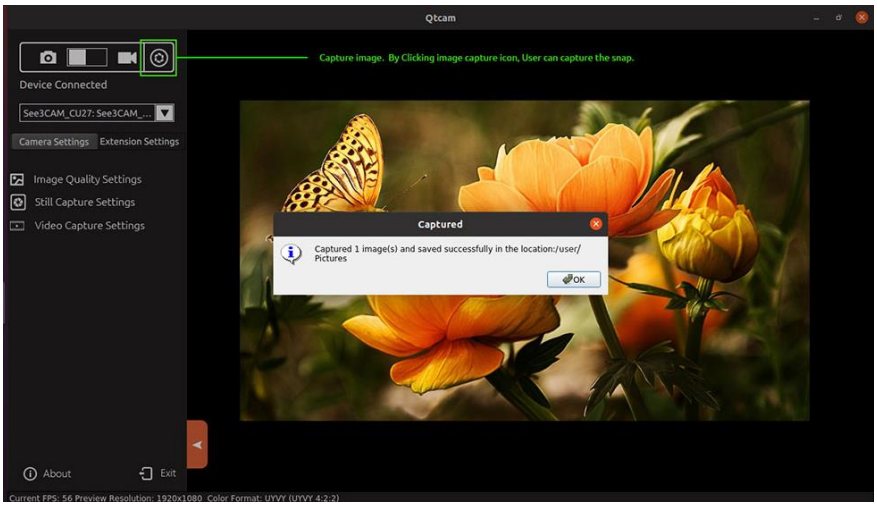

Figure 4: Still Capture

The image will be saved in the directory path which is selected in the image location available under the **Still Capture Settings** menu. The file name for captured image file is **Qtcam_YY_MM_dd:hh_mm_ss-x**, with the selected image extension format. If the extension format is jpg, the file name will be **Qtcam-YY_MM_dd:hh_mm_ss-x.jpg** [Where YY-Year, MM-Month, dd-day, hh-hour, mm-min, ss-x denotes image number updated when multiple images are captured within a second].

Video Recording

To record a video, you must click the **Video Record** icon to switch the application from capture mode to video mode. Then you can record a video by selecting the red color button available in the sidebar as shown below.

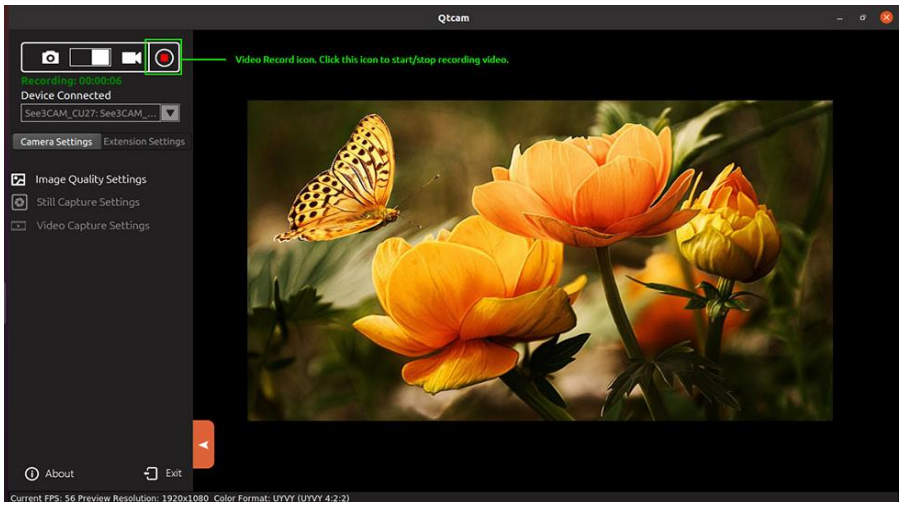

Figure 5: Video Recording

The video will be saved in the directory path which is selected in the video location path. The default name for recorded video file is **Qtcam-YY_MM_dd:hh_mm_ss**, with the video record extension format. If the extension format is avi, the file name will be **Qtcam-YY_MM_dd:hh_mm_ss.avi** as shown below.

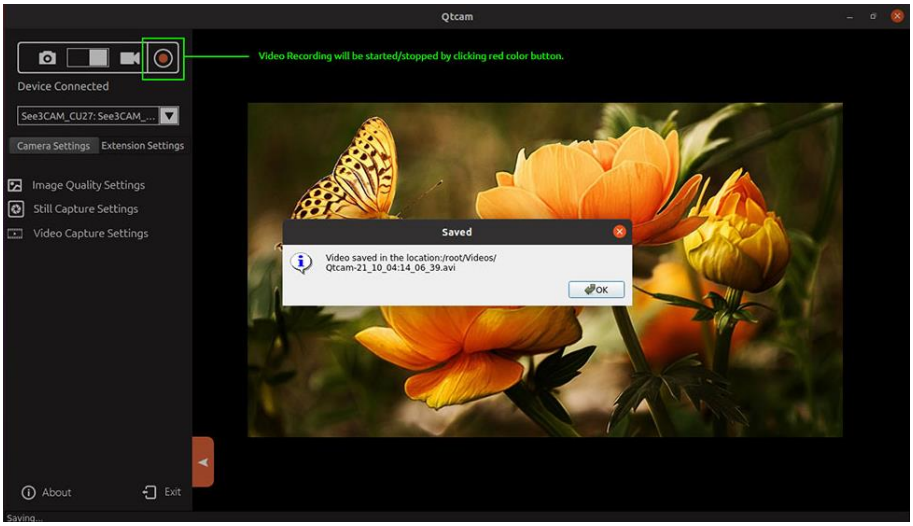

Figure 6: Video Saved Dialog Box

Once you click the **Video Record** icon, the video recording will begin. To stop recording, click the **Stop** icon which is available in the sidebar. During video recording, you cannot change the preview resolution and camera device.

For more details of video record format, video encoder format in video recording please refer the *Video Capture Settings* section.

Once you click the **Video Stop** icon while recording, the recording will be stopped, and the video file will be saved in the path specified in video location of Video Capture Settings.

Camera Settings

The camera settings of See3CAM_CU27 are listed as follows:

- Image Quality Settings
- Still Capture Settings
- Video Capture Settings

Image Quality Settings

On selecting the Image Quality Settings, a **Control** menu will display the camera control settings. You can adjust the video preview settings in the Menu tab. The sliders whose labels are not greyed can only be configured.

You can move the slider and configure the preview settings according to your needs. The value being set will be displayed in the text box based on the position of the

slider marker. As soon as the slider is moved to configure the values, the preview property will change at that instance.

The controls available in Image Quality Settings are as follows:

- Brightness
- Contrast
- Saturation
- Sharpness
- White Balance
- Gain
- Backlight Compensation
- Exposure
- Hardware Default

The values of See3CAM_CU27 controls are shown in below table.

Table 2: Values of See3CAM_CU27 Controls

Controls	Minimum Value	Maximum Value	Default Value	Manual Control	Auto Control
Brightness	0	238	128	YES	NO
Contrast	0	10	5	YES	NO
Saturation	0	63	32	YES	NO
Sharpness	0	4	2	YES	NO
White Balance	2500	12500	4500	YES	YES
Backlight Compensation	0	1	0	YES	NO
Gain	0	154	0	YES	NO
Exposure	5 (500 µs)	5000 (500 ms)	156 (15.6 ms)	YES	YES

Brightness

You can change the brightness values from a minimum value of 0 to 238 by moving the slider, and the exact changes will be reflected immediately in the preview. This brightness control increases the low light performance of See3CAM_CU27. The default value is 128.

Note:

1. Changes in this control will not be effective in manual exposure mode.

2. Changes in brightness value may not be visible in some bright scenes.

Contrast

You can change the contrast values from a minimum value of 0 to 10 by moving the slider, and the exact changes will be reflected immediately in the preview. Increasing the contrast control increases the luminance of See3CAM_CU27. The default value is 5.

Saturation

You can change the saturation values from a minimum value of 0 to 63 by moving the slider, and the exact changes will be reflected immediately in the preview. Increasing the value of saturation control increases the intensity of the color of See3CAM_CU27. The default value is 32.

Sharpness

You can change the sharpness values from a minimum value of 0 to 4 by moving the slider, and the exact changes will be reflected immediately in the preview. This sharpness control increases clarity of See3CAM_CU27. The default value is 2.

White Balance

You can change the white balance values from a minimum value of 2500 to 12500 by moving the slider, and the exact changes will be reflected immediately in the preview. This white balance value decides the color temperature of See3CAM_CU27. The default value is 4500.

Gain

You can change the gain values from a minimum value of 0 to 154 by moving the slider, and the exact changes will be reflected immediately in the preview. The default value is 0. The slider value and its gain values are listed in below table.

Table 3: Slider Values Vs Gain Value

Slider Value	Gain (dB)
0	0
1	0.3
2	0.6
.	.
.	.
10	3.0
11	3.3
12	3.6
.	.
.	.
128	38.4
.	.
.	.
154	66.0

Note: This control increases will not be effective in auto exposure mode.

Backlight Compensation

You can change the backlight compensation ON/OFF from minimum value of 0 to 1. The default value is 0.

Exposure

See3CAM_CU27 supports both auto and manual exposure control which can be controlled using the **Camera Control** tab of the Video Capture Filter option. The exposure value could be manually changed by moving the slider, and See3CAM_CU27 supports exposure values ranging from 500 µs to 500ms represented from 5 to 5000 in the slider. The Default value is 156. The exposure values are configured inside the CMOS image sensor based on the sensor configuration and clock configuration details.

To obtain a good low light performance, it is essential to change the exposure according to the change in lighting conditions. To support this feature, See3CAM_CU27 has an auto exposure feature, by which the exposure of the camera will be changed according to the lighting conditions which gives the best low light performance.

The slider values are computed according to the UVC standards, and hence the exposure time that is applied is shown in below table.

Table 4: See3CAM_CU27 Slider Value-Exposure Time Mapping

Slider Value	Exposure Time
5	0.5 ms
6	0.6 ms
. .	. .
10	1 ms
11	1.1 ms
12	1.2 ms
. .	. .
100	10 ms
. .	. .
1000	100 ms
1250	125 ms
.	.
5000	500 ms

Hardware Default

The **Hardware Default** button is used to reset the Image Quality Settings values to the hardware default state. Once you click the **Hardware Default** button, all the control values and preview are set to the default mode as shown below.

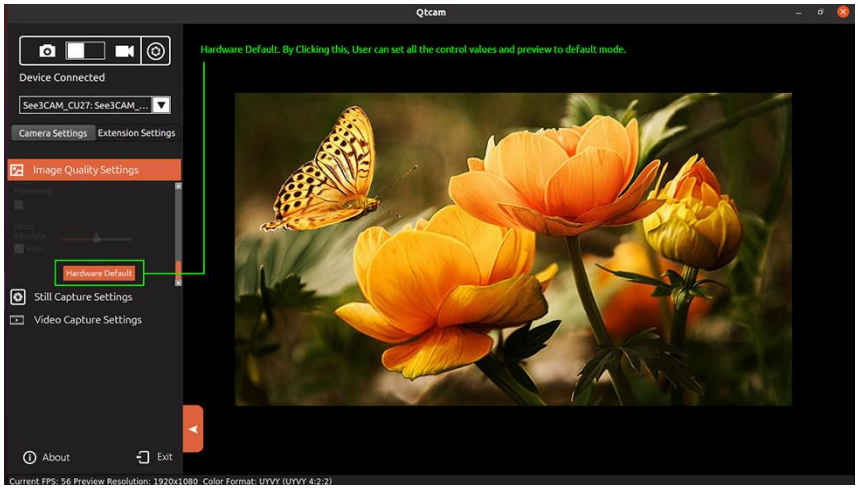

Figure 7: Hardware Default

Still Capture Settings

On selecting the Still Capture Settings, you can select still color space, still image resolution, capture image location path and image save format type.

The controls available in Still Capture Settings are as follows:

- Color Space or Compression
- Output Size
- Image Location
- Image Format

Color Space or Compression

To save the output image, you can select the still color format from the **Color Space/Compression** drop down list box as shown below.

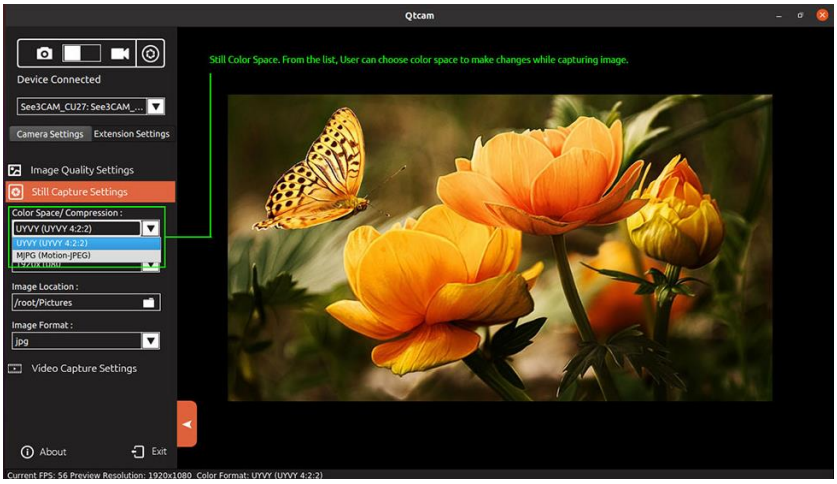

Figure 8: Still Color Format

The available two-colour space formats are as follows:

- UYVY (UYVY 4:2:2)

- MJPG (Motion-JPEG)

By default (while camera is selected), the **UYVY (UYVY 4:2:2)** color space will be selected, but you can change this any time.

Output Size

To change the output size, you can select the image resolution from the **Output Size** drop-down list box as shown below.

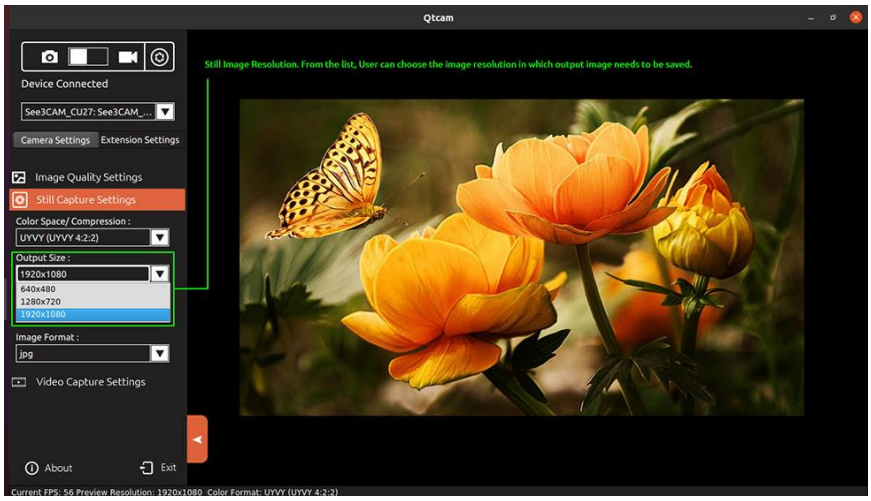

Figure 9: Still Image Resolution

The supported resolution list will be displayed based on still color space selection. It will be varied based on USB 3.1 Gen 1 or USB 2.0 and color space or compression formats.

By default (while camera is selected), the **1280x720** output size will be selected, but you can change this any time.

Image Location

To change the image location, you must click the **Folder** icon or the text box. The **Select a folder** dialog box will open to select the new location. You must click the **Choose** button to change the path. The default path is **/home/@user/Pictures** as shown below.

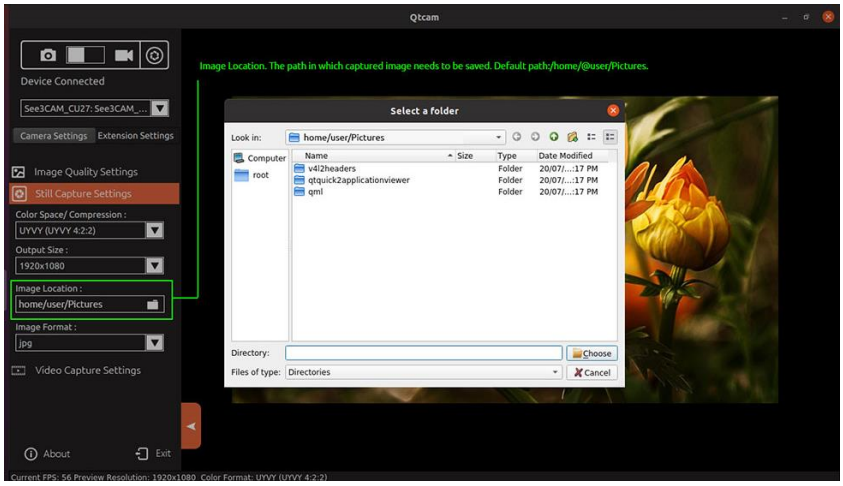

Figure 10: Image Location

Image Format

You can choose the image format from the **Image Format** drop-down list box and the captured images are saved as per the selected image format. The default format is jpg as shown below.

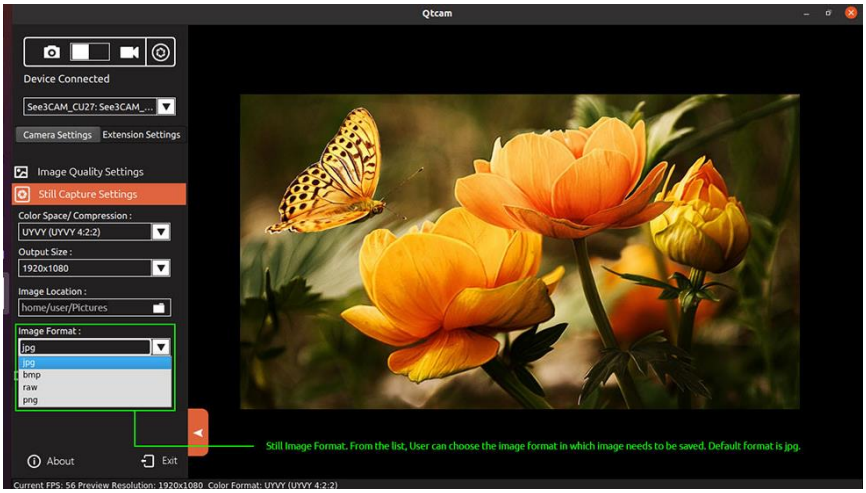

Figure 11: Still Image Format

The image formats available are as follows:

- jpg
- bmp
- raw
- png

Video Capture Settings

On selecting the Video Capture Settings, you can select their video color space, preview resolution, video encoder format, video container (Extension) and video location.

The controls available in Video Capture Settings are as follows:

Frame Rate

To make changes in preview, you can select the frame rate from the **Frame Rate** drop-down list box as shown below.

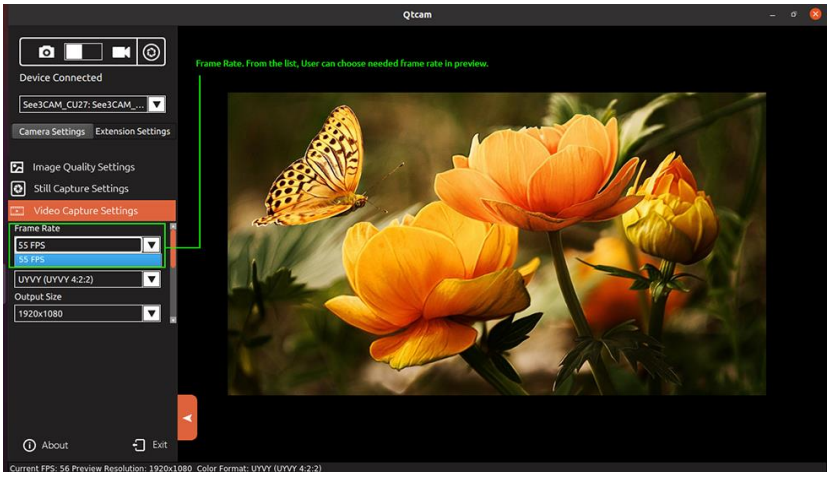

Figure 12: Frame Rate

The frame rate displayed is the maximum expected fps for the current resolution (output size).

Color Space or Compression

To make changes in color space, you can choose the color space from the **Color Space/Compression** drop-down list box as shown below.

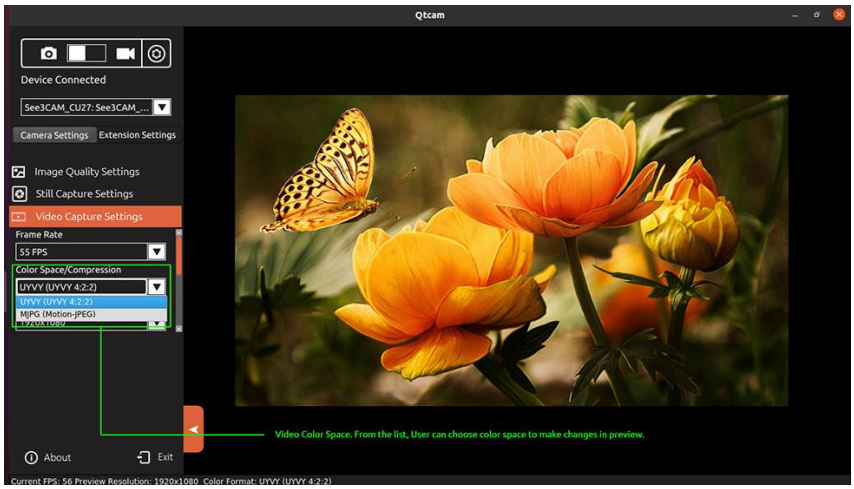

Figure 13: Video Color Format

The two video color formats available are as follows:

- UYVY (UYVY 4:2:2)
- MJPG (Motion-JPEG)

By default (while camera is selected), the **UYVY (UYVY 4:2:2)** color space will be selected, but you can change this any time. The preview will be updated as per the selected color space.

Output Size

To change the preview size, you can select the preview resolution from the **Output Size** drop-down list box as shown below.

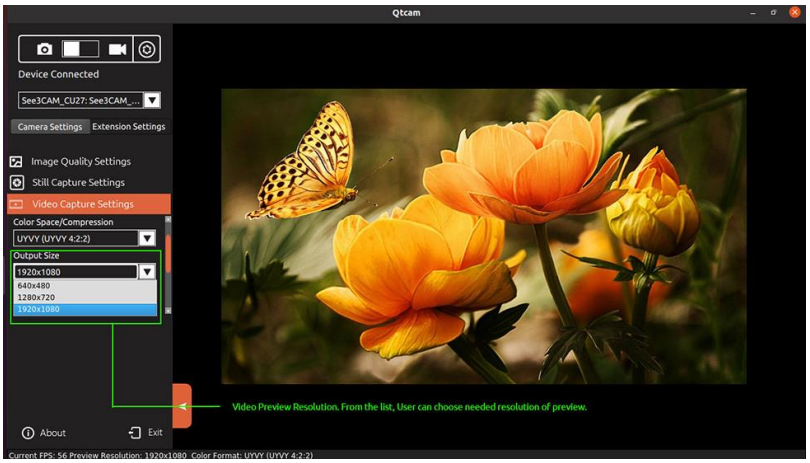

Figure 14: Video Resolution

Refer *Table 1* for the supported resolution list and frame rates. By default (while camera is selected), the **640x480** output size will be selected, but you can change this any time. The preview will be updated as per the selected output size once you select from the list.

Video Record Format

To record the video in avi format, you can select the record format in the **Video Record Format** drop-down list box as shown below.

Figure 15: Video Record Format

By default, the available video format is avi.

Video Encoder Format

To record the video in MJPG format, you can select the encoder format in the **Video Encoder Format** drop-down list box as shown below.

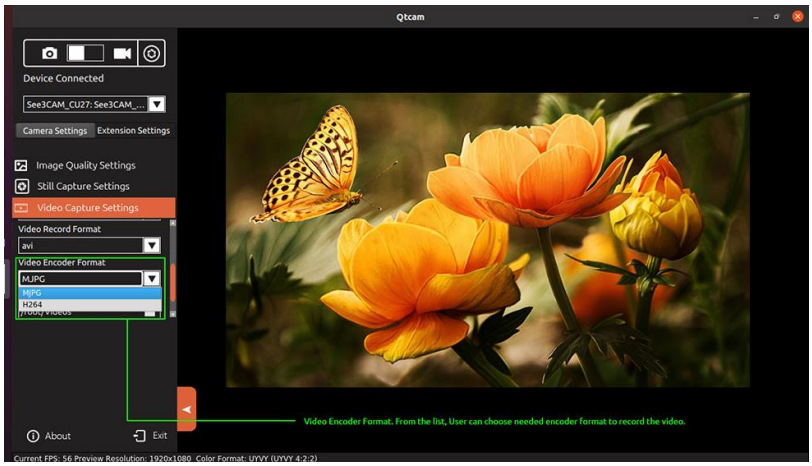

Figure 16: Video Encoder Format

The video encoder formats available are as follows:

- MJPG
- H264

Video Location

To change the video location, you must click the **Folder** icon or the text box. The **Select a folder** dialog box will open to select the new location. You must click the **Choose** button to change the path. The default path is **/home/@user/Videos** as shown below.

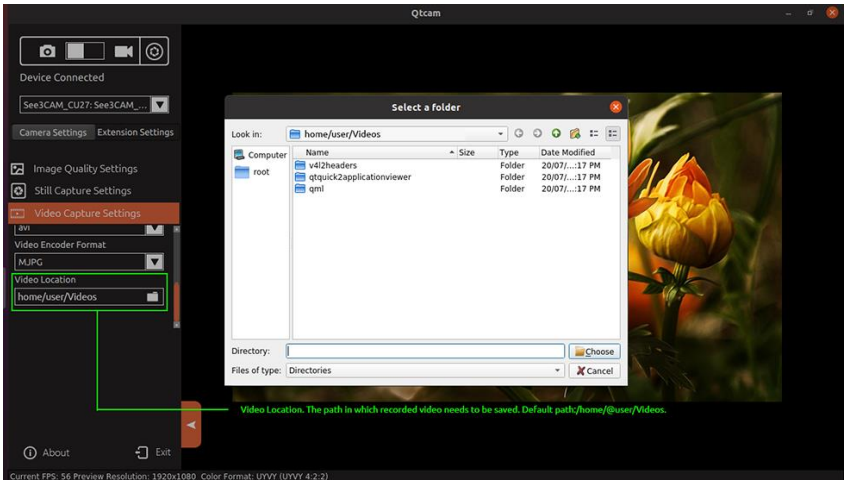

Figure 17: Video Location

Display Current Frame Rate Achieved

The frame rate will be affected by various environmental parameters. The current frame rate achieved is displayed all the time in status bar as shown below.

Figure 18: Current Frame Rate Achieved

Extension Settings

If the device supports extension unit, the extension unit controls will appear on selecting the See3CAM controls tab. The See3CAM_CU27 camera has some additional controls and features and are listed as extension controls, hence they are not included in the standard UVC controls.

The extension unit is used to select the extended HID controls of See3CAM_CU27. This can be performed by modifying the appropriate controls of the extension unit.

The controls available in Extension Settings are as follows:

- AWB Presets
- Q-Factor
- AE Metering Mode
- Image Capture
- Flicker Detection Control
- Roll
- Denoise
- Default
- Serial Number
- Firmware Version
- ISP Firmware Version

AWB Presets

The AWB presets allows to select the predefined white balance mode which decides the color temperature of See3CAM_CU27 camera. The default value is auto. When AWB check box is deselected, the available modes will be displayed as shown below.

Figure 19: AWB Preset

Note:

- If AWB Lock check box is selected, then the change in AWB mode does not reflect in the preview.
- When white balance in Image Quality Settings (Qtcam) / Video Capture Filter (e-CAMView) is changed to manual, custom preset will be selected.
- When AWB preset is changed, corresponding color temperature will be selected in slider value of white balance in Image Quality Settings.

The preset and its color temperature is listed in below table.

Table 5: Preset and its Color Temperature

Preset	Color Temperature
Cloudy	6575K
Daylight	5500K
Flash	5000K
Cool White Fluorescent	3700K
Tungsten	3000K
Candlelight	2800K
Horizon	2270K
Custom	2500K to 12500K

Q-Factor

The MJPEG quality factor can be controlled through this control. Q-factor of a JPEG compression determines the quality of the JPEG frame. You can select either auto or manual. The Default value is 88. You can select the Q-factor value with range of 0 to 100 by moving the slider as shown below.

Figure 20: Q-Factor

AE Metering Mode

Auto exposure metering mode allows to select different auto exposure modes such as center-weighted average, all block integral, spot 1 (small area), spot 2 (large area) and custom ROI modes.

The Default value is center-weighted average.

Note:

- When Manual Exposure is selected in Camera Settings, AE OFF will beselected by default in AE metering mode.
- If AE lock is selected, AE metering mode drop down box will be greyed.
- If AE lock is selected and Exposure in Camera Settings is changed to Manual, automatically AE lock will be deselected.
- If Manual is selected and then AE lock is selected. AE lock will be automatically deselected.

When you click the drop-down list box, you can view the available modes as shown below.

Figure 21: AE Metering Mode

The weight table of center-weighted average, all block integral, spot 1 (small area), spot 2 (large area) are shown in below figures.

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	2	2	2	2	0	0	0	0	0	0
0	0	0	0	0	0	2	2	2	2	0	0	0	0	0	0
0	0	0	0	2	2	2	3	3	2	2	2	0	0	0	0
0	0	0	0	2	2	2	3	3	2	2	2	0	0	0	0
0	0	0	2	2	3	3	4	4	3	3	2	2	0	0	0
0	0	0	2	2	3	3	4	4	3	3	2	2	0	0	0
0	0	0	2	3	4	4	5	5	4	4	3	2	0	0	0
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0	0	2	3	3	4	6	6	6	6	4	3	3	2	0	0
0	0	2	3	3	4	6	6	6	6	4	3	3	2	0	0
0	0	0	2	3	4	5	5	5	5	4	3	2	0	0	0
0	0	0	2	3	4	5	5	5	5	4	3	2	0	0	0
0	0	0	2	3	3	4	4	4	4	3	3	2	0	0	0
0	0	0	2	3	3	4	4	4	4	3	3	2	0	0	0
0	0	0	2	2	3	3	3	3	3	3	2	2	0	0	0
0	0	0	2	2	3	3	3	3	3	3	2	2	0	0	0
0	0	0	0	0	0	2	2	2	2	0	0	0	0	0	0
0	0	0	0	0	0	2	2	2	2	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 22: Center-Weighted Average - Weight Table

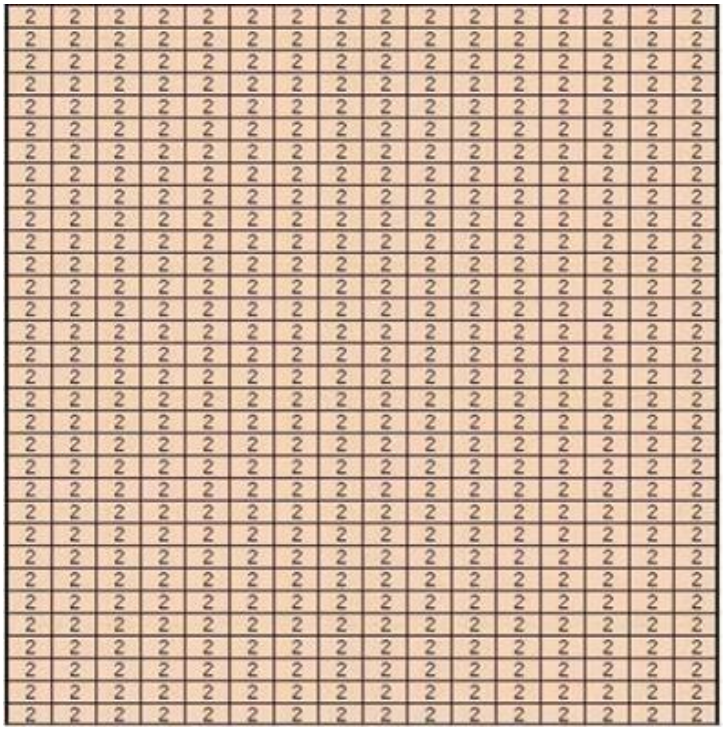

Figure 23: All Block Integral - Weight Table

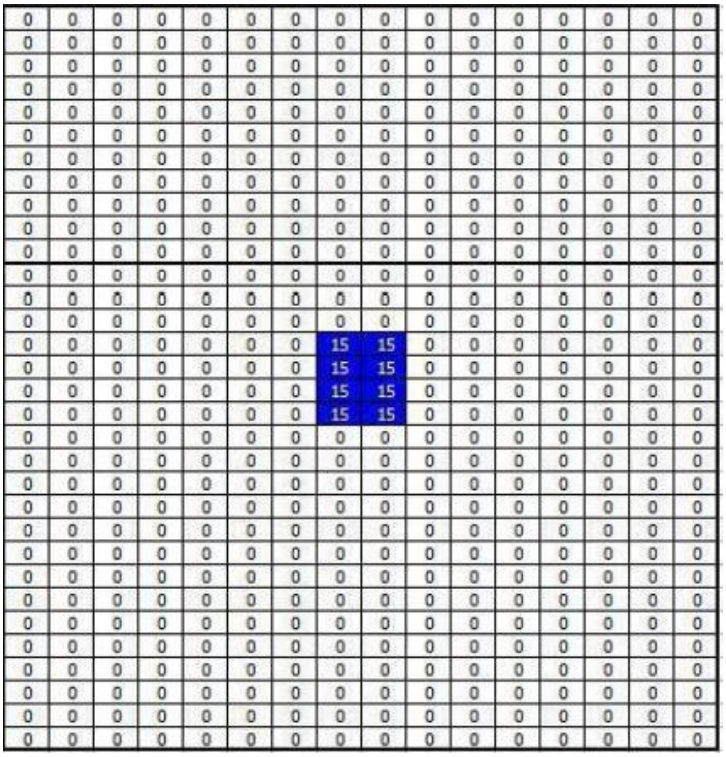

Figure 24: Spot1 (Small Area) - Weight Table

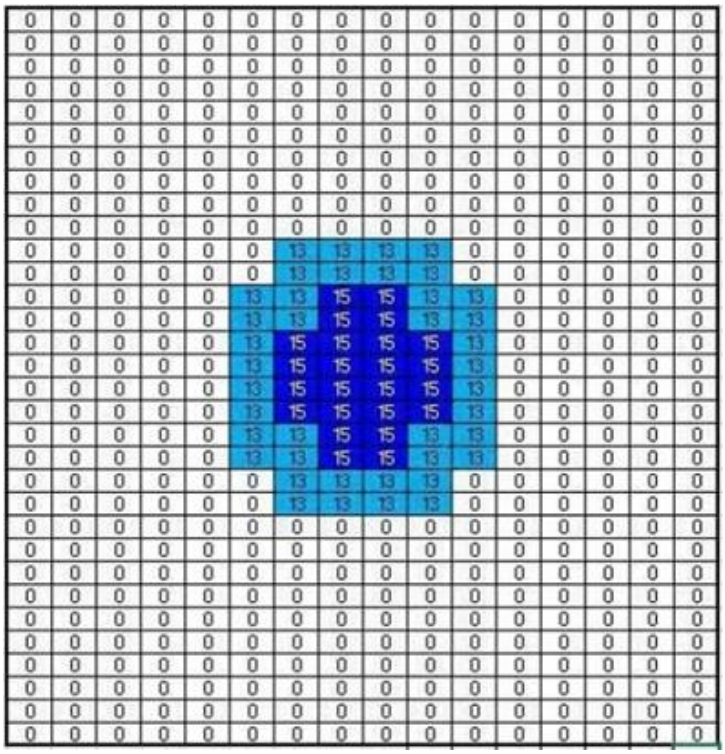

Figure 25: Spot2 (Large Area) - Weight Table

Image Capture

You can select the burst size from 1 to 5 from the **Burst Length** drop-down list box as shown below.

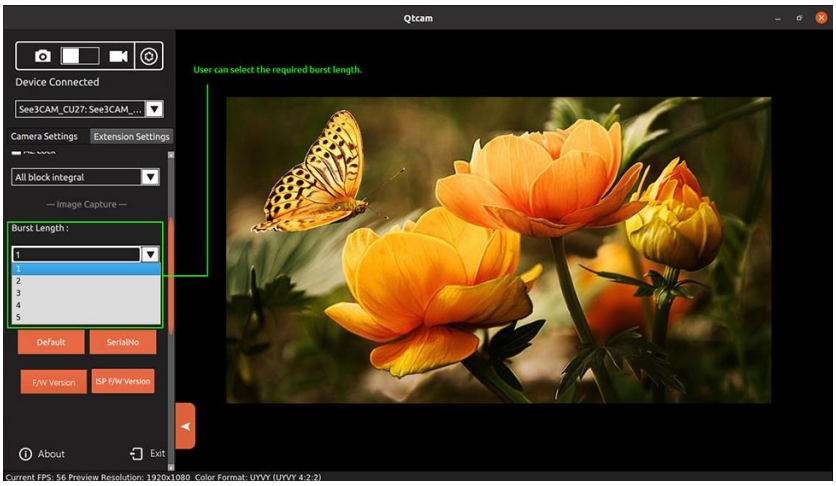

Figure 26: Image Capture

The default value is 1. When still captured, certain number of images will be saved based on burst sizeselected in the location selected in still capture properties.

Flicker Detection Control

Flicker detection is used to avoid flicker in the video preview due to AC light sources. You can select between auto mode, or force 50Hz and 60Hz or completely disable

the flicker avoidance. Default value is Auto. When you click the drop-down list box, you can view the available modes as shown below.

Figure 27: Flicker Detection Control

Roll

You can select the roll control to change the image orientation horizontally or vertically by moving slider value 0 and 180. Default value is 0.

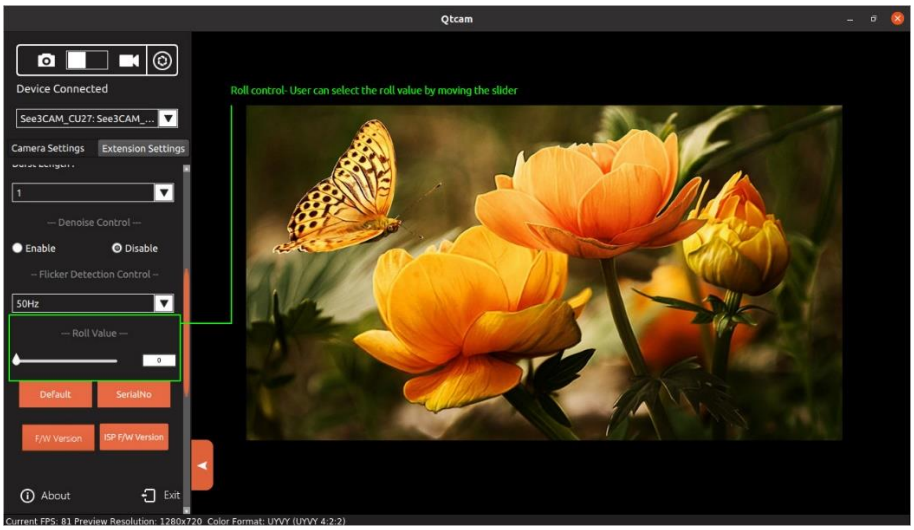

Figure 28: Roll Control

Denoise

When you click the denoise control, you can view the screen similar to the screen shown below.

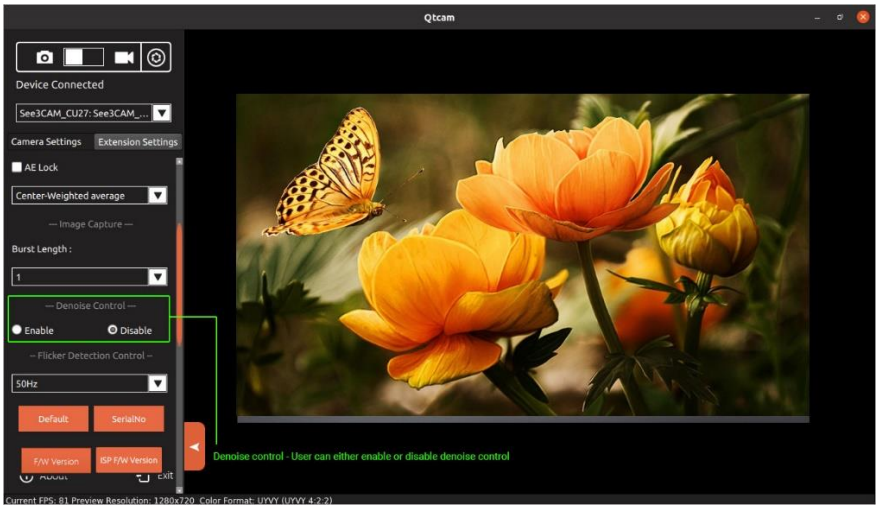

Figure 29: Denoise

You can select disable or enable option in denoise control. By default, disable option will be selected.

Default

To set all extension unit control values to default values, you can click the **Default** button. You can view the screen similar to the screen shown below.

Figure 30: Default

Serial Number

When you click the **SerialNo** button, the serial number of the camera will be displayed as shown below.

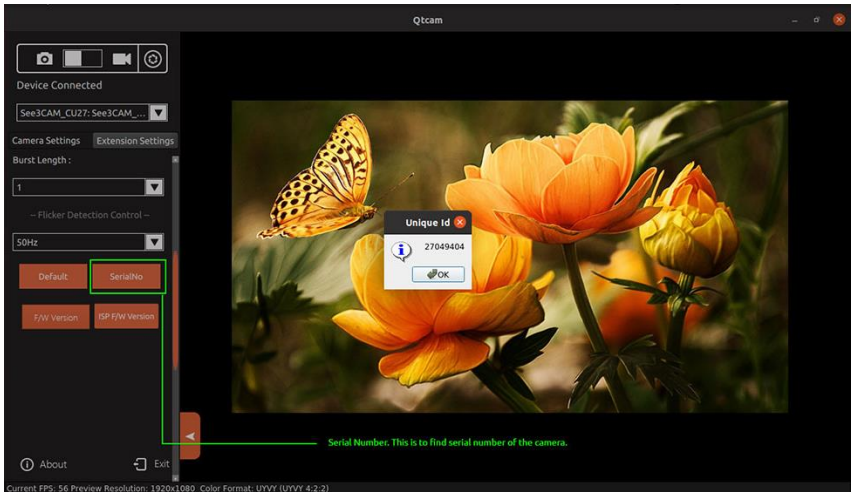

Figure 31: Serial Number

Firmware Version

When you click the **F/W Version** button, the current firmware version running on the camera will be displayed as shown below.

Figure 32: Firmware Version

ISP Firmware Version

When you click the **ISP F/W Version** button, the current ISP firmware version running on the camera will be displayed as shown below.

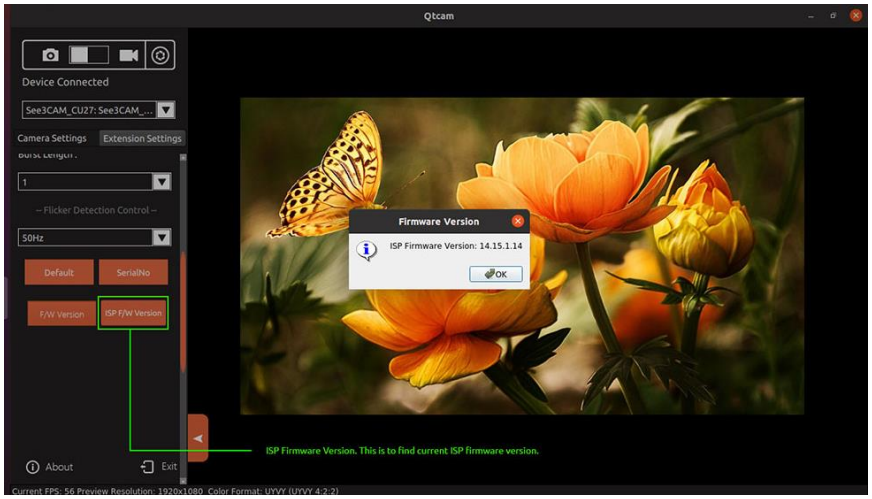

Figure 33: ISP Firmware Version

About

When you click the **About** button available in the side bar, the application name, version, and copyrights will be displayed as shown below.

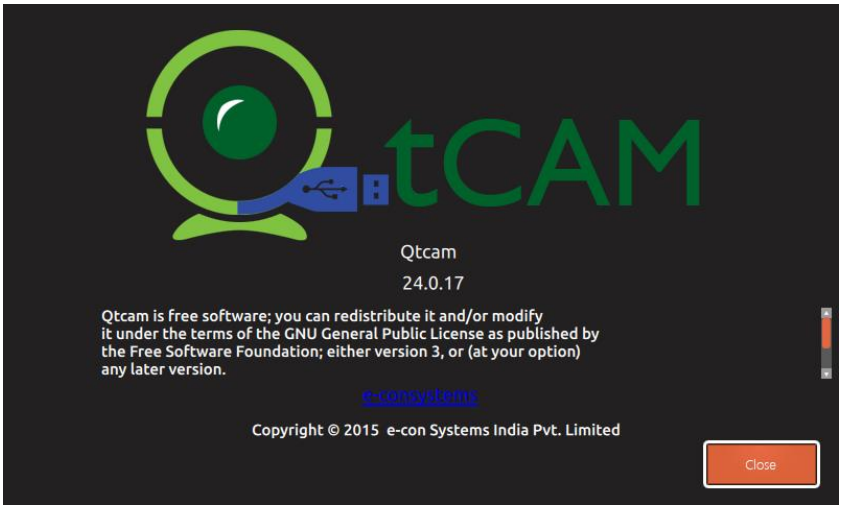

Figure 34: About Screen

Exit

To close the application, you can click the **Exit** button available in the side bar as shown below.

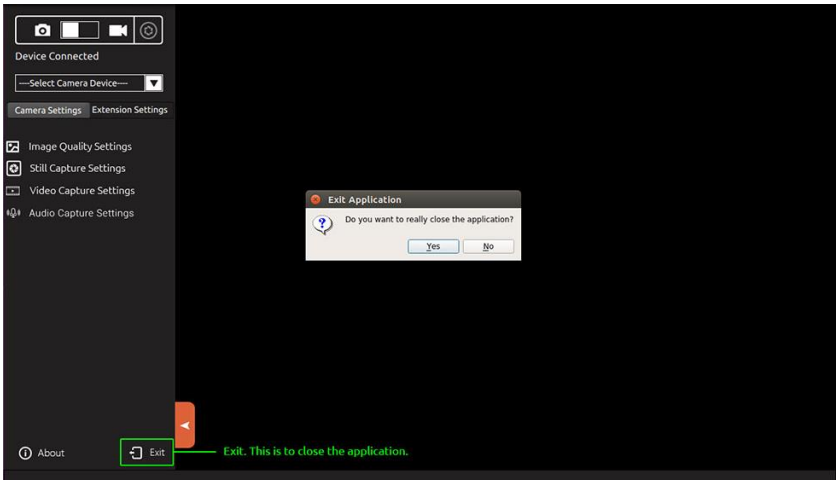

Figure 35: Exit Application

Troubleshooting

In this section, you can view the list of commonly occurring issues and their troubleshooting steps.

Device connected, power indication LED is OFF or switching between Red and OFF state.

It seems like there is no proper power input to the device. You need to check the cable or USB connector integrity. If a USB Hub is used, use external power.

Device connected, power indication LED is Red.

The device is powered up and ready to stream image data. You need to use QtCAM or any standard streaming application to start streaming.

In QtCAM sample application, the device is selected but the preview window is White.

It seems like you are using an older version of QtCAM. You need to install the latest version of QtCAM application. You can find the latest application in the Developer Resources website.

In QtCAM sample application, the device is selected but the preview window is Blank and the streaming Green LED light blinks continuously.

It seems like no image is received from the camera. Contact e-con Systems online support support@e-consystems.com.

The QtCAM application is enabled in Ubuntu 14.04 (64-bit), Ubuntu 16.04 (64-bit and 32-bit), and Ubuntu 18.04 (64-bit) Linux Distribution only.

This is a known limitation.

In Ubuntu 16.04, YUY (Raw) video encoder format is not supported.

This is a known issue.

In this version, audio recording is not supported while video recording.

This is a known issue. e-con Systems planned to give support for audio recording in future.

1. **I am video conferencing with one of e-con Systems USB camera in laptop. During the call, sometimes the LED at the backside flickers and when the camera flickers, the preview stops and resumes.**

   It might be due to bandwidth limitation issue. Please try the following steps:

   1. Please disconnect other USB devices which are connected to the same host and connect only the USB camera and test it.
   2. Please use powered USB hub to overcome this issue.
   3. Please check in different desktop PCs in different USB ports, if it is working fine.

   If you still face the same issue, please write to techsupport@e-consystems.com with your requirement in detail to get immediate support.

2. **I am using four cameras simultaneously but unable to get a clear preview.**

   It might be due to bandwidth limitation issue. Please try the following steps:

   1. Please disconnect other USB devices which are connected to the same host and connect only the USB camera and test it.
   2. Please use powered USB hub to overcome this issue.
   3. Please check in different desktop PCs in different USB ports.

3. **I am using one of your See3CAM and getting low fps even in QtCAM application. I have not achieved half of the fps that was advertised.**

   - Due to the configuration of the testing machine and its performance.
   - If you have connected multiple devices to the same host controller then due to bandwidth limitation you will get low fps. Please disconnect all the devices and connect only e-con Systems See3CAM and test it.

4. **I am using your See3CAM_CU27 camera. The LED flashes Yellow and Red color while attempting still image capture.**

   This is expected behaviour. While performing still image capture, the preview will be stopped and resume after the image capture.

   This is the reason the LED will blink from Red to Yellow and vice versa. You could also observe this behaviour while switching the resolution of the camera.

5. **I am unable to access the extension unit features of See3CAM using QtCAM.**

   Please launch QtCAM with sudo command.

6. **I have been using See3CAM for the past few months or days, today suddenly the camera failed to enumerate, and it is not showing up in sample QtCAM application.**

   Please launch the sample QtCAM application and check the following conditions:

   1. Check the camera in different (USB 3.1 Gen 1 or USB 2.0) ports in the same PC.
   2. Check the camera in different (USB 3.1 Gen 1 or USB 2.0) ports in different PC.
   3. Check the camera with different USB 3.1 Gen 1 cable in different (USB 3.1 Gen 1or USB 2.0) ports and in different PC.
   4. Repeat the above tests in different OS (Windows 8.1, 10 and Linux), if you get the same issue.

   If the camera performs well in another PC, then there might be an issue with your testing PC. If you still face any issue after performing the above test, please write to techsupport@e-consystems.com with your requirement in detail to get immediate support.

7. **Do you have any sample application in Android platform?**

   Yes, e-con Systems have an application in Android platform. The application is **Webeecam - Android USB Camera App**. Please refer the following website to know more.

   https://www.e-consystems.com/android-usb-camera-app.asp.

   Please visit following blog to know the list of cameras that are supported by Webeecam.

   http://blog.webeecam.com/webeecam-android-usb-camera-app/supported-cameras-and-devices/.

8. **Can I get access to ISP registers?**

   No. The option is not available by default but will be provided on case-to-case basis with firmware customization.

9. **Can I get access to image sensor registers?**

   No. The sensor registers are directly controlled by the ISP.

10. **The frame rate is not consistent in MJPEG format. Can I fix it?**

    Yes, but the frame rate may still get reduced due to the scene details or the frame size which in turn affects the rendering capability from PC to PC. Performance improvement can be seen based on graphic card or display adapter capability. To increase the frame rates, you can decrease Q-Factor.

11. **I can view frame corruption while streaming. Can this be avoided?**

    Yes, this is due to bandwidth limitation in USB host. This may occur when multiple cameras are connected to single USB host or in USB hosts of less powerful embedded boards. Visit e-con Systems blog https://www.e-consystems.com/blog/camera/?p=1720 for more information on USB practical bandwidths.

12. **I need reliable operation when I connect multiple cameras to same host or when I connect to an embedded board. Do I have options?**

    For MJPEG, reducing the Q-Factor will improve stability in case of any issues. If it is still required to reduce the frame rates, contact sales@e-consystems.com.

13. **What sort of support does e-con Systems provide along with the camera?**

    e-con Systems will provide the basic support on the evaluation for all the customers who have purchased the camera. e-con Systems will provide the hardware/software/firmware customization of the kit based on your requirements. e-con Systems will also manufacture your custom cameras and will be supplied.

14. **Is there any software available with the camera?**

    Yes, e-con Systems provide e-CAMView for Windows and QtCAM for Linux sample application demonstrating the capabilities of this camera.

15. **What are the supported OSes?**

    The supported OSes are Windows 8.1 and 10 and Linux Ubuntu 14.04 (64-bit), 16.04 (32-bit and 64-bit) and 18.04 (64-bit).

16. **The camera is not suitable for my requirements. Can I return the camera?**

    No, the kit is non-returnable and non-refundable. However, the kit is under warranty and e-con Systems will replace for any failed kit under warranty terms.

17. **The camera is getting very hot. Is it suitable for usage?**

    Yes, but the camera module needs an external heat sink to dissipate the heat for prolonged usage.

Glossary

CMOS: Complementary Metal Oxide Semiconductor.

MJPEG: Motion Joint Photographic Experts Group (A type of frame compression).

ROI: Region of Interest.

USB: Universal Serial Bus.

USB 2.0: Universal Serial Bus High speed.

USB 3.1 Gen 1: Universal Serial Bus Super speed.

UVC Compliant: USB Video Class Compliant.

UYVY: YUV422 16-bit image format with UYVY ordering.

VGA: Video Graphics Array (Industry name for 640 x 480 resolution).

Q-Factor: Value that is used as a scale factor for the quantization table.

Support

Contact Us

If you need any support on See3CAM_CU27 product, please contact us using the Live Chat option available on our website - https://www.e-consystems.com/

Creating a Ticket

If you need to create a ticket for any type of issue, please visit the ticketing page on our website - https://www.e-consystems.com/create-ticket.asp

RMA

To know about our Return Material Authorization (RMA) policy, please visit the RMA Policy page on our website - https://www.e-consystems.com/RMA-Policy.asp

General Product Warranty Terms

To know about our General Product Warranty Terms, please visit the General Warranty Terms page on our website - https://www.e-consystems.com/warranty.asp

Revision History

Rev	Date	Description	Author
1.0	13-Oct-2021	Initial Draft	Camera Team
1.1	29-Oct-2021	Updated QA comments	Camera Team
1.2	06-Dec-2021	Changed Maximum value for Exposure and Added Denoise in extension settings Removed zoom control	Camera Team
1.3	23-Dec-2021	Added Roll Control in extension settings	Camera Team
1.4	28-Dec-2021	Added table for gain control	Camera Team
1.5	12-Jan-2022	Updated changes	Camera Team
1.6	04-Feb-2022	Updated changes	Camera Team
1.7	14-Mar-2022	Updated changes	Camera Team
1.8	13-Apr-2022	Updated changes	Camera Team