See3CAM_24CUG

QtCAM Streaming Application Installation Manual

e-con Systems

Your Product Development Partner

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Introduction to See3CAM_24CUG

See3CAM_24CUG is a 2.3 MP, color, global shutter, UVC compliant, USB 3.1 Gen1 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 Gen1 SuperSpeed camera products launched by e-con Systems.

See3CAM_24CUG is a 2.3 MP color camera with the S-mount (also known as M12 board lens) lens holder. The S-mount is one of the most commonly used small form-factor lens mounts for board cameras. See3CAM_24CUG is a single board solution containing the 1/2.6" AR0234 CMOS image sensor from Aptina™ with USB 3.1 Gen1 interface. It is also backward compatible with the USB 2.0 high speed interface, albeit at lower frame rates.

See3CAM_24CUG is an 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_24CUG camera. QtCAM is a V4L2 video viewer and capture software for the Linux UVC driver, but customized to demonstrate some of the features of See3CAM_24CUG.

This document describes how to install the QtCAM application on the host PC and how to launch the QtCAM application.

Description

The QtCAM application is a simple interface for capturing and viewing video from the devices supported by Linux UVC driver. This tool also supports Extension Unit control of e-con Systems See3CAM USB 3.1 Gen1 webcam products.

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.
- Configure UVC Extension control, if supported by device.
- 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 32-bit and 18.04 32-bit not supported)
- Ubuntu 64-bit

This section describes how to install the QtCAM application on the host PC.

You can install the QtCAM application in OSes as follows:

- Ubuntu 14.04
- Ubuntu 16.04
- Ubuntu 18.04

If QtCAM application is already installed in the PC, you must run the following commands to remove the older version QtCAM application.

```
$ sudo rm -rf /usr/share/applications/Qtcam*.desktop
$ sudo rm -rf /usr/share/qml
$ sudo apt-get remove qtcam
```

Note: Building package support for Ubuntu 15.10 is not available.

Installing the Application in Ubuntu 14.04

To install QtCAM application in Ubuntu 14.04, you must run the following commands.

```
$ sudo apt-add-repository ppa:qtcam/trusty
$ sudo apt-get update
$ sudo apt-get install qtcam
```

Installing the Application in Ubuntu 16.04

To install QtCAM application in Ubuntu 16.04, you must run the following commands.

```
$ sudo apt-add-repository ppa:qtcam/xenial
$ sudo apt-get update
$ sudo apt-get install qtcam
```

Installing the Application in Ubuntu 18.04

To install QtCAM application in Ubuntu 18.04, you must run the following commands.

```
$ sudo apt-add-repository ppa:qtcam/bionic
$ sudo apt-get update
$ sudo apt-get install qtcam
```

Launching the Application

Once the installation is completed, you can click the **Qtcam** icon in Dash home to launch the application as shown below.
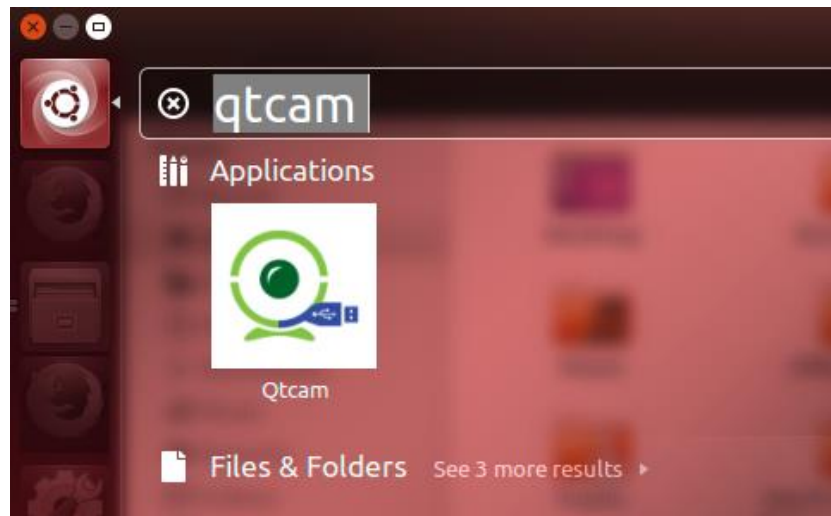

Figure 1: Launching the Application

You can also run the following command in terminal to launch the application.

```
$ sudo qtcam
```

Once the command is entered in terminal, the screen appears as shown below.
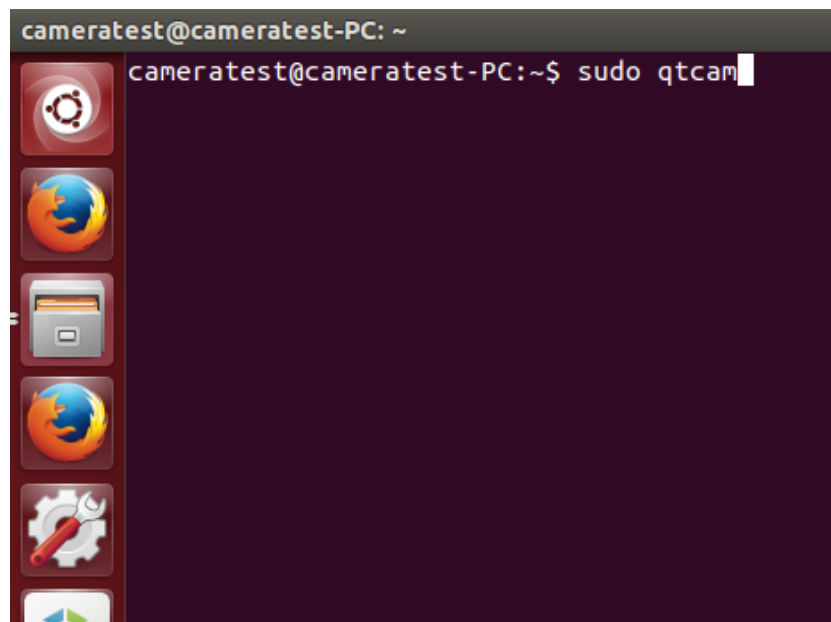

Figure 2: Command in Terminal

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

A 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.

A 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.

You need to install the latest version of QtCAM application from the Developer Resources website.

In QtCAM sample application, the device is selected but the preview window is Black and indication LED blinks between Red and Yellow continuously.

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

1. **What is See3CAM_24CUG?**

   See3CAM_24CUG is a 2.3 MP, color, UVC compliant, USB 3.1 Gen1 camera with the S-mount (also known as M12 board lens) lens holder. It is a two-board solution containing the camera sensor module board with 1/2.6" AR0234 CMOS image sensor from ON Semiconductor and the USB 3.1 Gen1 interface board.

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

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

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

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

4. **The frame rate is not consistent in UYVY format. Can I fix it?**

   Yes, the camera is designed to allow exposure till 66.66 ms in auto exposure mode and hence the frame rates can drop till 15 fps. You can either set the maximum exposure limit using exposure compensation (in UVC Extension menu) or choose manual exposure to get desired frame rates.

5. **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 or increase De-Noise value in UVC Extension menu since both decreases the frame size and improves frame rates.

6. **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 the blog https://www.e-consystems.com/blog/camera/?p=1720 for more information on USB practical bandwidths.

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

Yes. All resolutions available in UYVY do support multiple frame rates. You can switch it to a lower frame rate to improve stability. For MJPEG, reducing the Q-factor value will improve stability in case of any issues. If it is still required to reduce the frame rates, contact sales@e-consystems.com.

8. **How to use external trigger option in See3CAM_24CUG?**

The external trigger option can be used to capture still images in Master mode and it can be utilized for external synchronization in Trigger mode. Please refer the *See3CAM_24CUG_Hardware_Trigger_Application_Note.pdf.*

9. **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. The hardware/software/firmware customization of the kit will be provided by e-con Systems based on your requirements. e-con Systems will also manufacture your custom cameras and will be supplied.

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

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

11. **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).

12. **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.

13. **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.

After launching the QtCAM application, you can refer to the *QtCAM Streaming Application User Manual See3CAM_24CUG* to know more about See3CAM_24CUG features.

CMOS: Complementary Metal Oxide Semiconductor.

GUI: Graphical User Interface.

ISP: Image Signal Processor.

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

OS: Operating Systems.

USB: Universal Serial Bus.

USB 2.0: Universal Serial Bus High Speed.

USB 3.1 Gen1: Universal Serial Bus Super Speed.

UVC: USB Video Class.

V4L2: Video4Linux2 is a collection of device drivers and API for supporting real-time video capture on Linux systems.

Support

Contact Us

If you need any support on See3CAM_24CUG 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	01-Feb-2021	Initial Draft	Camera Team
1.1	27-Feb-2021	Added Changes	Camera Team