See3CAM_CU27

Getting Started Manual

e-con Systems

Your Product Development Partner

Version 1.0

e-con Systems

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Disclaimer

The specifications of the 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, USB 3.1 Gen 1 UVC interface 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 UVC interface camera products launched by e-con Systems.

See3CAM_CU27 is provided with the S-mount (also known as M12 board lens) lens holder. The S-mount is one of the most used small form factor lens mounts for board cameras. See3CAM_CU27 is a two-board solution given in single unit with help of rigid flex cable containing the camera sensor module board with 1/2.8" IMX462LQR CMOS sensor from SONY® and the USB 3.1 Gen 1 interface board. It is also backward compatible with the USB 2.0 high speed interface, albeit with fewer resolution at lower frame rates.

The below table lists the maximum frame rates supported.

Table 1: Maximum Frame Rates Supported

Format	Resolution	Frame Rate (fps)	
		USB 3.1 Gen 1	USB 2.0
UYVY	VGA (640 x 480)	120	30
	HD (1280 x 720)	80	-
	FHD (1920 x 1080)	60	-
MJPEG	VGA (640 x 480)	120	30
	HD (1280 x 720)	100	30
	FHD (1920 x 1080)	100	30

See3CAM_CU27 is a UVC compliant USB 3.1 Gen 1 camera that is also backward compatible with USB 2.0 host ports, and it does not require any special camera 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.

This document describes how to connect the See3CAM_CU27 board with USB 3.1 Gen 1 host PC.

Hardware Requirements

The hardware requirements are Desktop or Laptop with USB 3.1 Gen 1 or 2.0 ports.

Software Requirements

The software requirements are OSes with e-CAMView for Windows or QtCAM for Linux or any standard DirectShow application. The OSes are:

- Windows 8.1 or 10 (64-bit)
- Ubuntu 14.04 (64-bit) or 16.04 or 18.04 (64-bit)

Parts Supplied

The See3CAM_CU27 kit is supplied with the following parts:

- See3CAM_CU27 Camera
- USB 3.1 Gen 1 Type-A to Type-C Cable

You can find the above parts in the kit as shown in following table.

Table 2: Parts Supplied in See3CAM_CU27 Kit

Parts Supplied	Images
See3CAM_CU27	
USB 3.1 Gen 1 Type-A to Type-C Cable	

Description

See3CAM_CU27 is 30 mm x 30 mm x 26 mm (without lens) sized USB camera module. The camera has IMX462LQR CMOS image sensor from SONY® and USB

interface controller with USB Type-C connector. This See3CAM_CU27 is a ready-to-manufacture camera board with all the necessary firmware built-in and is compatible with the UVC version 1.1 standard. You can integrate this camera into the products, and this helps to cut short the time-to-market.

Setting Up See3CAM_CU27

This section describes how to connect See3CAM_CU27 to the PC. The See3CAM_CU27 camera is a USB 3.1 Gen 1 Type-C SuperSpeed client device. It is supplied along with a USB 3.1 Gen 1 Type-A to Type-C cable to connect to the USB Type-A host port.

The following sections describe the setting up of See3CAM_CU27.

See3CAM_CU27 to PC Host Interconnecting Cable

The USB 3.1 Gen 1 Type-A to Type-C cable is used to connect See3CAM_CU27 camera board to the PC and it will be provided by e-con Systems as shown in the following figure.

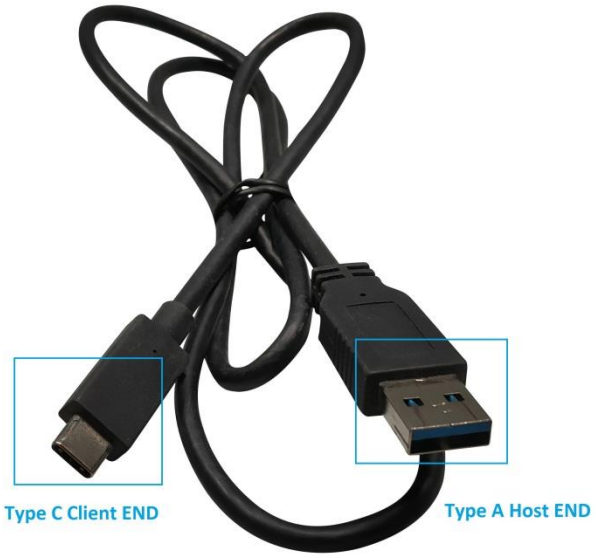

Figure 1: USB 3.1 Gen 1 Type-A to Type-C Cable

Connecting the Board with Host

Please follow the below steps to connect See3CAM_CU27 board with PC or Laptop.

Step 1. Identification of USB Type-C Connector
Step 2. Insertion of USB Type-A to Type-C Cable in USB Type-C Connector
Step 3. Connecting See3CAM_CU27 to the USB Host

Step 1: Identification of USB Type-C Connector

The location of USB Type-C connector on See3CAM_CU27 board is shown in following figure.

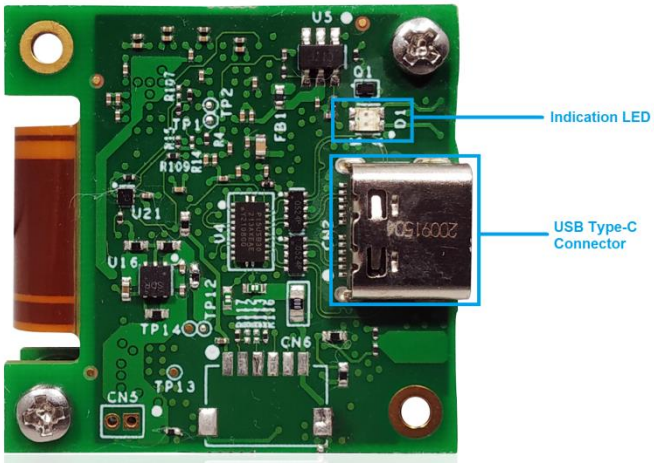

Figure 2: Location of USB Type-C Connector on See3CAM_CU27

Step 2: Insertion of USB Type-A to Type-C Cable in USB Type-C Connector

The USB Type-A to Type-C cable provided by e-con Systems must be inserted with USB Type-C connector of See3CAM_CU27 as shown in the following figure.

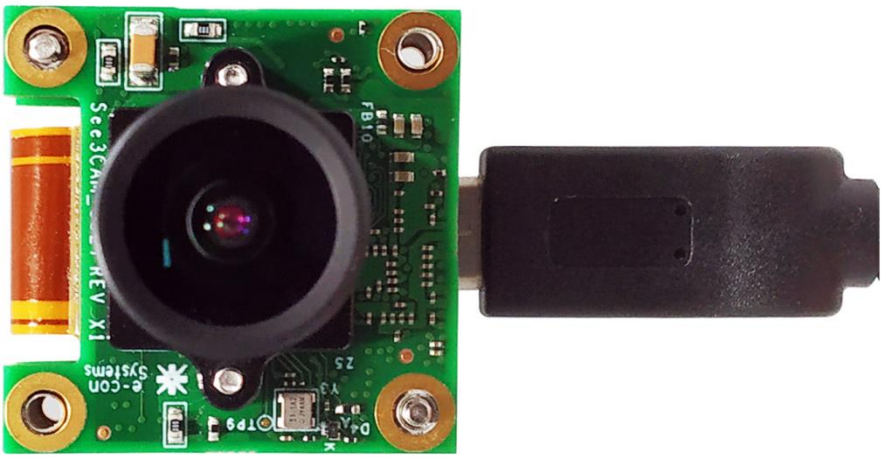

Figure 3: USB Type-A to Type-C Cable inserted on USB Type-C Connector of See3CAM_CU27

Step 3: Connecting See3CAM_CU27 to the USB Host

Identify a USB 3.1 Gen 1 port. The port which has the below logo is USB 3.1 Gen 1 port.

Figure 4: SuperSpeed USB 3.1 Gen 1 Logo

The USB Type-A to Type-C cable must be inserted to SuperSpeed USB 3.1 Gen 1 port of PC or Laptop as shown in following figure.

Figure 5: Connecting USB Type-A to Type-C Cable to SuperSpeed Port

After the insertion of USB Type-A to Type-C cable with USB Type-C connector on See3CAM_CU27 and USB host, the LED will glow in Red color. This indicates that the board is powered ON as shown in the following figure.

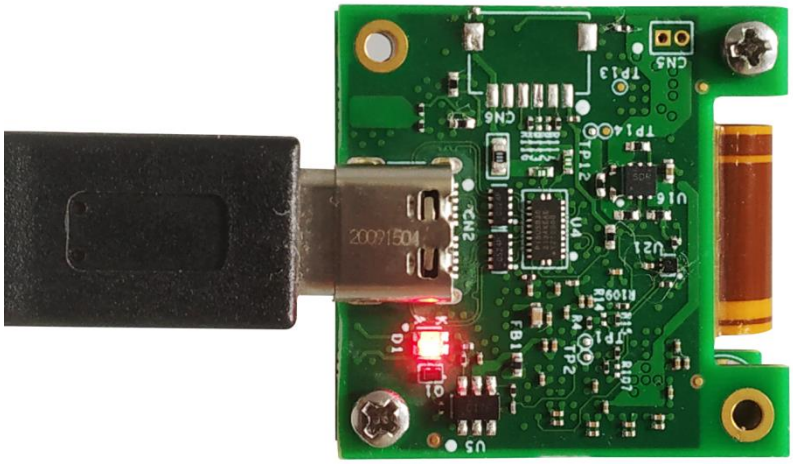

Figure 6: Status LED indicating Board Powered ON

After selecting See3CAM_CU27 in the e-CAMView application, the LED glows in Yellow color. This indicates that the camera is in streaming condition as shown in the following figure.

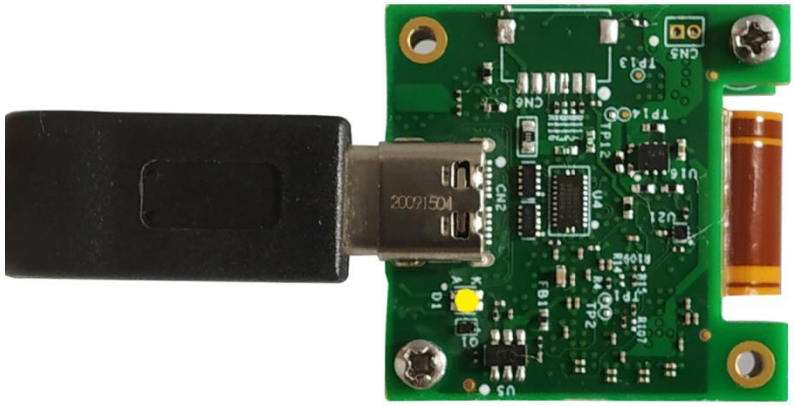

Figure 7: Status LED indicating Camera Streaming

Ensuring the Device is connected to Host in Windows from Device Manager

After the insertion of board to host, you must confirm that See3CAM_CU27 is properly connected to host from imaging devices.

Go to **Control Panel → Device Manager → See3CAM_CU27**. The **See3CAM_CU27** camera listed under **Camera** is shown in below figure.

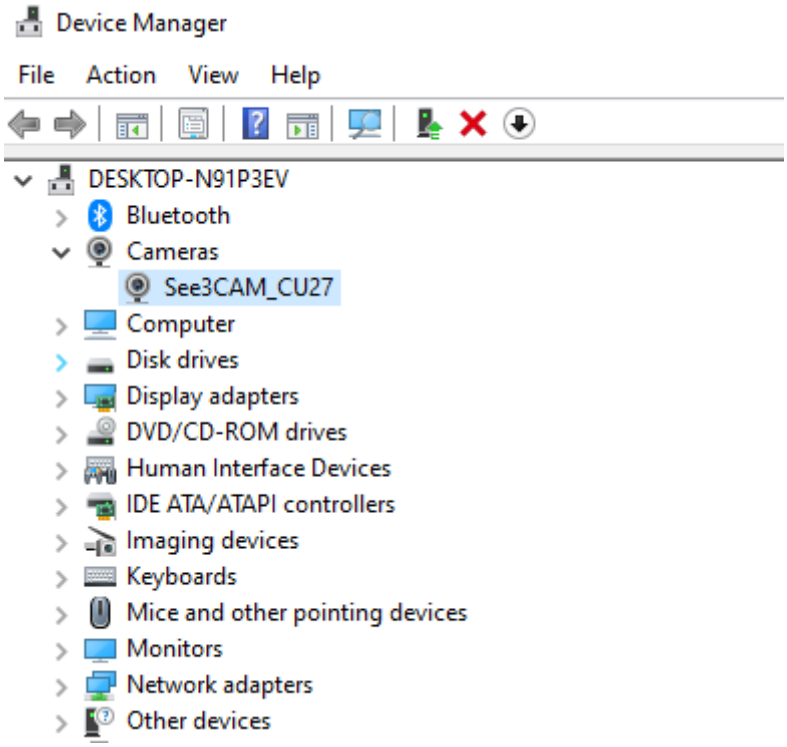

Figure 8: Camera showing See3CAM_CU27 connected to Host

If you notice **See3CAM_CU27** listed under **Camera**, then the board is properly connected to the host.

Ensuring the Device is connected to Host in Windows from e-CAMView

After the insertion of board to host, you need to confirm that See3CAM_CU27 is properly connected to host from e-CAMView application.

Open e-CAMView application and select the **Devices** menu. The See3CAM_CU27 device must be listed as shown in below figure.

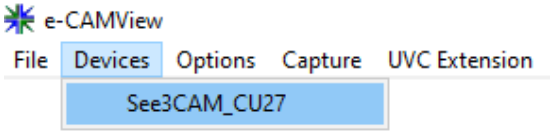

Figure 9: e-CAMView displaying See3CAM_CU27 connected to Host

If you notice **See3CAM_CU27** listed under **Devices** menu, then the board is properly connected to the host.

Ensuring the Device is connected to Host in Linux from Terminal

The steps to confirm that See3CAM_CU27 is properly connected to host are as follows:

1. Connect the device to the PC which supports the Ubuntu versions.
2. Open the terminal.
3. Run the following command to display the details of the device.

```
$dmesg
```

You can view the details of the device as shown in below figure.

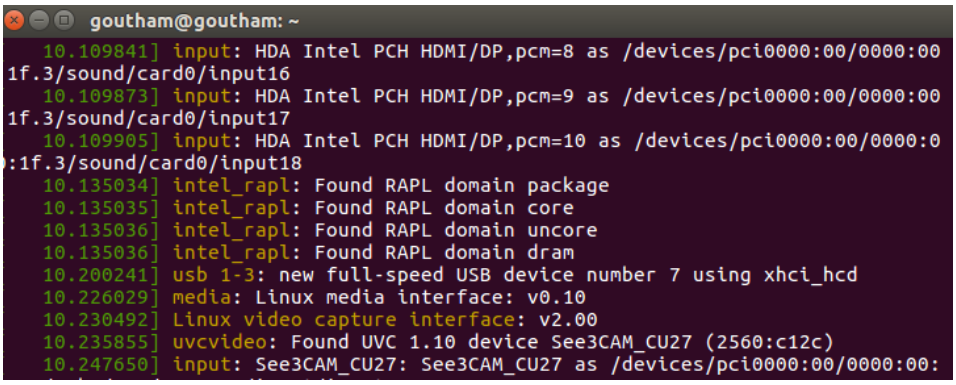

Figure 10: Imaging Devices showing See3CAM_CU27 connected to Host

If you notice that **See3CAM_CU27** is displayed in the product name, then the board is properly connected to the host.

Ensuring the Device is connected to Host in Linux from QtCAM Application

The steps to confirm that See3CAM_CU27 is properly connected to host are as follows:

1. Open QtCAM application.
2. Go to **Device Connected** drop-down list box. You can view **See3CAM_CU27** as shown in below figure.

Figure 11: Qtcam showing See3CAM_CU27 device

If you notice **See3CAM_CU27** listed under **Device Connected** drop-down list box, then the board is properly connected to the host.

Troubleshooting

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. In case 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 either e-CAMView or QtCAM or any standard streaming application to start streaming.

In the e-CAMView sample application, the device is selected but preview window is White.

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

In the e-CAMView 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.

Device connected, indication LED is Red, and the device is not listed in the application or device manager.

It seems like device firmware is corrupted. Try re-flashing firmware image using firmware updater application from Developer Resources website. If this does not help, contact e-con Systems online support support@e-consystems.com.

Device connected, streaming with Yellow LED showing frequent or intermittent blinks. Sometimes frame corruption seen in streaming window.

It seems like there is 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. You can visit the blog https://www.e-consystems.com/blog/camera/?p=1720 for more information on USB practical bandwidths.

1. **I am video conferencing with one of your USB cameras in my 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:

   - Disconnect other USB devices which are connected to the same host and connect only the USB camera and test it.
   - Use powered USB hub to overcome this issue.
   - 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 many cameras simultaneously but unable to get a clear preview.**

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

   - Disconnect other USB devices which are connected to the same host and connect only the USB camera and test it.
   - Use powered USB hub to overcome this issue.
   - Check in different desktop PCs in different USB ports.

3. **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. You could also observe this behaviour while switching the resolution of the camera.

4. **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.

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

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

6. **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.

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

8. **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.

9. **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.

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

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

11. **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.

12. **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.

What's Next?

After ensuring that the device is connected to host properly, you need to refer the *e-CAMView Streaming Application Installation Manual See3CAM_CU27* to install e-CAMView, a sample DirectShow application that demonstrates the features of See3CAM_CU27.

Glossary

CMOS: Complementary Metal Oxide Semiconductor.

LED: Light Emitting Diode.

OS: Operating Systems.

USB: Universal Serial Bus.

USB 2.0: Universal Serial Bus High Speed.

USB 3.1 Gen 1: Universal Serial Bus Super Speed**.**

USB Type-C Connector: USB Type-C (Industry name for USB 3.1) reversible connector.

UVC: USB Video Class.

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

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	08-October-2021	Initial Draft	Camera Team