See3CAM_24CUG

Getting Started Manual

e-con Systems

Your Product Development Partner

Version 1.2

e-con Systems

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Disclaimer

The specifications of the See3CAM_24CUG 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_24CUG

See3CAM_24CUG is a 2.3 MP Global shutter colour, 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.

See3CAM_24CUG is a 2.3 MP colour 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 camera sensor module board with global shutter sensor AR0234CS from ON Semiconductor® and the USB 3.1 Gen 1 UVC interface board. It is also backward compatible with the USB 2.0 high speed interface, albeit at lower frame rates.

With USB 3.1 Gen 1 interface to the host PC, this See3CAM_24CUG can stream UYVY HD (1280 x 720) at 120, 60 fps, FHD (1920 x 1080) at 60 fps, 2MP (1920 x 1200) at 58 fps. See3CAM_24CUG also streams MJPEG HD (1280 x 720) at 120, 60 fps, FHD (1920 x 1080) at 120, 60, 30 fps, 2MP (1920 x 1200) at 114 and 60 fps.

When connected to USB 2.0 host ports, See3CAM_24CUG supports UYVY HD (1280 x 720) at 15 fps, FHD (1920 x 1080) at 8 fps, 2MP (1920 x 1200) at 6 fps. See3CAM_24CUG also streams MJPEG HD (1280 x 720) at 120, 60 fps, FHD (1920 x 1080) at 120, 60, 30 fps, 2MP (1920 x 1200) at 114 and 60 fps.

See3CAM_24CUG 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_24CUG 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 USB 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

- Ubuntu 14.04 or 16.04 or 18.04

Parts Supplied

The See3CAM_24CUG kit is supplied with the following parts:

- See3CAM_24CUG 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 1: Parts Supplied in See3CAM_24CUG Kit

Parts Supplied	Images
See3CAM_24CUG	
USB 3.1 Gen 1 Type-A to Type-C Cable	

Description

See3CAM_24CUG is a single-board solution of size 30 mm x 30 mm x 26 mm (without lens). The module (MOD) board has global shutter sensor AR0234CS from ON Semiconductor® and the base board has the USB interface controller and the USB Type-C connector. This See3CAM_24CUG is a ready-to-manufacture camera board with all the necessary firmware built-in and is compatible with the UVC standard. You can integrate this camera into the products, and this helps to cut short the time-to-market. This camera board is UVC compatible and works with the standard drivers available with Windows and Linux OS. There is no need for any additional driver installation.

Setting Up See3CAM_24CUG

This section describes how to connect See3CAM_24CUG to the PC. The See3CAM_24CUG 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_24CUG.

See3CAM_24CUG to PC Host Interconnecting Cable

The USB 3.1 Gen 1 Type-A to Type-C cable is used to connect See3CAM_24CUG camera board to the PC and it is provided by e-con Systems. The following figure shows the detailed view of the USB 3.1 Gen 1 Type-A to Type-C cable.

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_24CUG board with PC or Laptop.

Step 1: Identification of USB Type-C Connector

The location of USB Type-C connector on the See3CAM_24CUG base board is shown in following figure.

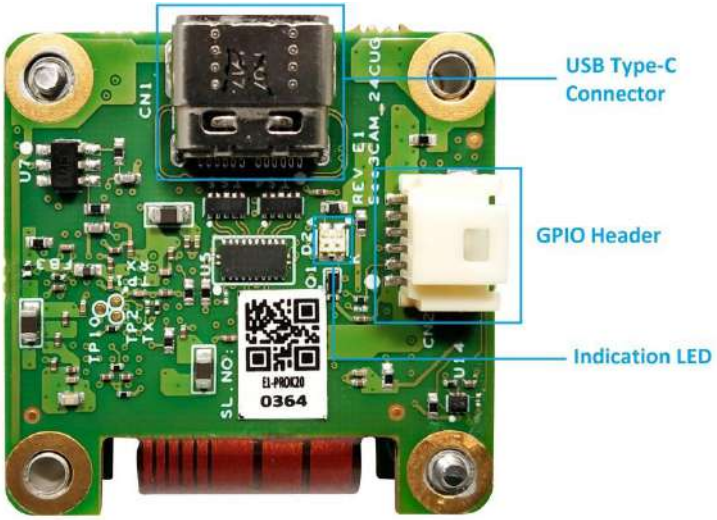

Figure 2: Location of USB Type-C Connector on See3CAM_24CUG

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 to the USB Type-C connector of See3CAM_24CUG as shown in the following figure.

Figure 3: USB Type-A to Type-C Cable inserted on USB Type-C Connector of See3CAM_24CUG

Step 3: Connecting the Board to Host

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

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 figures.

Figure 5: USB Type-A to Type-C Cable-Host Side

Figure 6: 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_24CUG 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 7: Status LED indicating Board Powered ON

After selecting the See3CAM_24CUG 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 8: 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_24CUG is properly connected to host from Imaging devices.

Navigate to **Control Panel > Device Manager > See3CAM_24CUG**. You can view **See3CAM_24CUG** listed under **Cameras** as shown in the following figure.

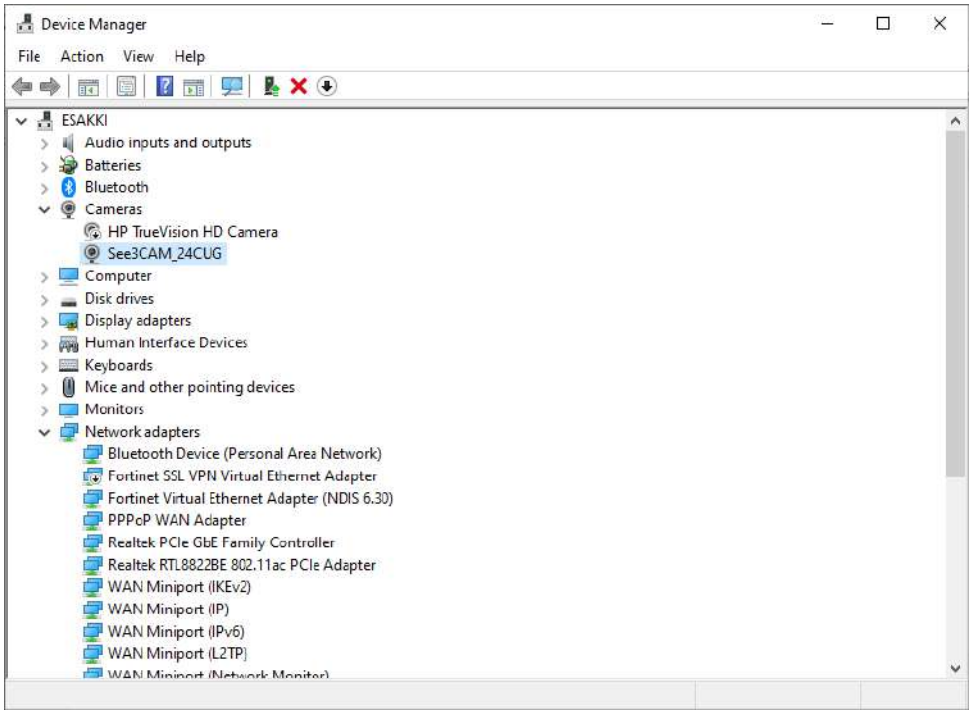

Figure 9: Imaging Devices showing See3CAM_24CUG connected to Host

If you notice **See3CAM_24CUG** listed under **Cameras**, 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 must confirm that See3CAM_24CUG is properly connected to host from e-CAMview.

Open e-CAMView application and select the **Devices** menu. See3CAM_24CUG must be listed as shown in the following figure.

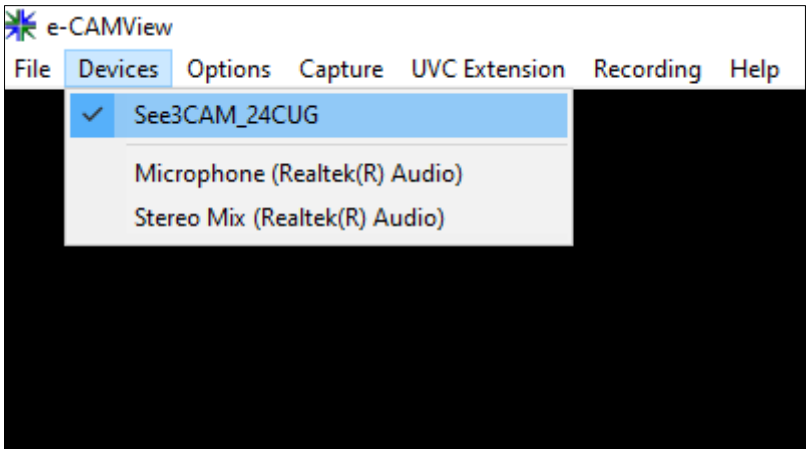

Figure 10: e-CAMView displaying See3CAM_24CUG connected to Host

If you notice **See3CAM_24CUG** 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 the See3CAM_24CUG 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.

```
$ sudo dmesg
```

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

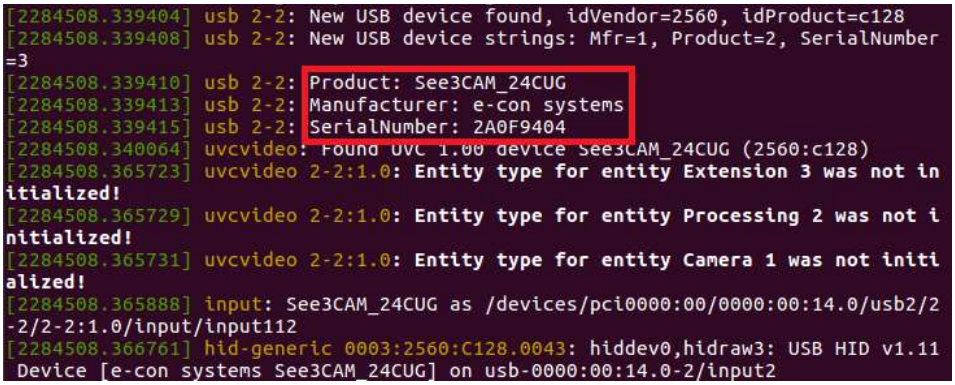

Figure 11: Imaging Devices showing See3CAM_24CUG connected to Host

If you notice that the **See3CAM_24CUG** 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 the See3CAM_24CUG is properly connected to host are as follows:

1. Open **QtCAM** application.
2. Navigate to **Device Connected** drop-down list, you can view **See3CAM_24CUG** as shown in the following figure.

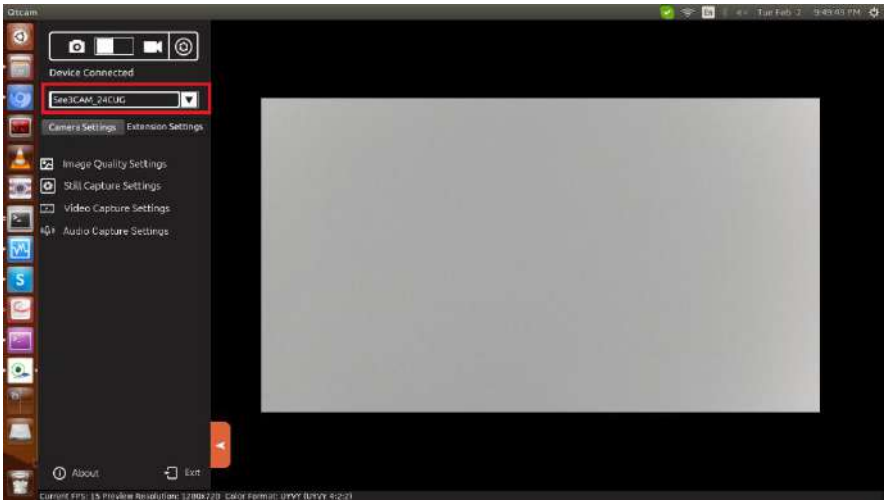

Figure 12: Imaging Devices showing See3CAM_24CUG connected to Host

If you notice **See3CAM_24CUG** listed under **Device Connected** drop-down list, 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.

See3CAM_24CUG 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 USB Hub is used, use external power.

See3CAM_24CUG device connected, power indication LED is Red.

The device is powered up and ready to stream image data. You can use e-CAMView or QtCAM application to start streaming.

See3CAM_24CUG device connected, power 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.

See3CAM_24CUG 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. Visit the blog https://www.e-consystems.com/blog/camera/?p=1720 for more information on USB practical bandwidth.

FAQ

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 single-board solution containing the camera sensor module board with 1/2.6" AR0234 CMOS image sensor from Aptina™ and the USB 3.1 Gen1 interface board.

2. **Does the See3CAM_24CUG device support trigger mode?**

   Yes. See3CAM_24CUG will support trigger mode.

3. **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.

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

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

5. **I can view the 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 a single USB host or 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.

6. **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.

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

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

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

   The supported OSes are Windows 8.1 and 10 and Linux Ubuntu 14.04, 16.04, and 18.04.

9. **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.

10. 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_24CUG* to install e-CAMView, a sample DirectShow application that demonstrates the features of See3CAM_24CUG.

Glossary

CMOS: Complementary Metal Oxide Semiconductor.

ISP: Image Signal Processor.

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.

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	29-January-2021	Initial Draft	Camera Team
1.1	27-Febraury-2021	Added Changes	Camera Team
1.2	08-March-2021	FAQ updated	Camera Team