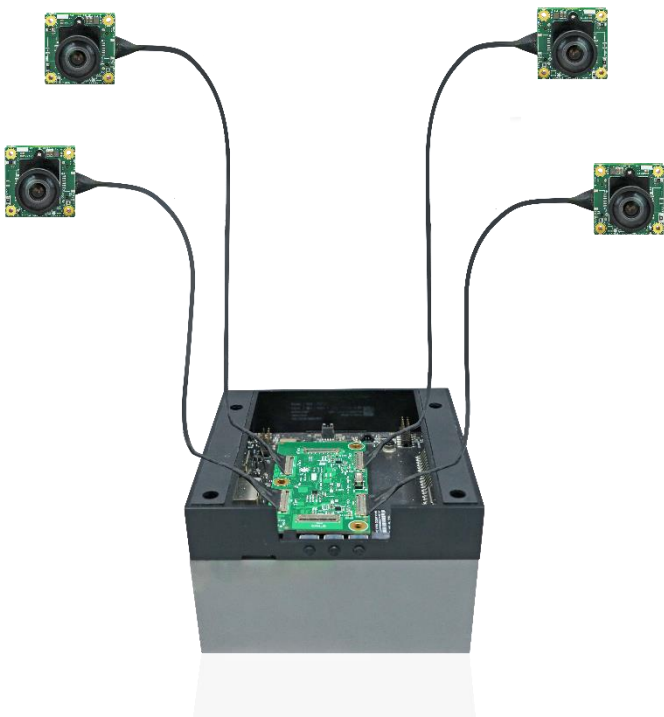


e-CAM56\_CUOAGX

# eCAM\_Argus\_MultiCamera Application User Manual



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e-con Systems

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**e-con Systems**

Think Camera. Think e-con.

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# Introduction to e-CAM56\_CUOAGX

e-CAM56\_CUOAGX is a 5 MP MIPI camera from e-con Systems, a company with over two decades of experience in designing, developing, and manufacturing OEM cameras. It contains up to four IMX568 camera modules in 4-lane mode which are connected to the Jetson AGX Orin™ development kit. The prebuild driver for this camera along with the camera board is provided by e-con Systems.

The NVIDIA® Jetson AGX Orin™ development kit is a small, powerful, computer for embedded applications and Artificial Intelligence (AI) Internet of Things (IoT). It is pre-flashed with a Linux environment, includes support for many common APIs and is supported by NVIDIA® complete development toolchain. The Jetson AGX Orin™ development kit supports multiple cameras. This document describes about the usage of application and the special features of the application when it is used with e-CAM56\_CUOAGX on the Linux operating systems.

## Description

The supported resolutions and frame rates in 4-lane mode for Jetson AGX Orin™ development kit is listed in below table.

**Table 1: Supported Resolutions and Frame Rates**

Lane	Resolution	Frame Rate in 10-bit	Frame Rate in 12-bit
4	2432 x 2048	79	67
4	1920 x 1080	142	121
4	1280 x 720	202	172
4	640 x 480	280	240

The camera controls of e-CAM56\_CUOAGX are as follows:

- Auto exposure (AE) AntiBanding Mode
- AE Lock
- Denoise Mode
- Denoise Strength
- Edge Enhance Mode
- Edge Enhance Strength
- ISP Digital Gain Range
- Exposure Compensation
- Exposure Time Range
- Sensor Gain Range
- Sensor Frame Rate
- AWB Mode

The eCAM\_Argus\_MultiCamera is a sample libArgus based camera application used to demonstrate the functioning of e-CAM521\_CUMI568C\_MOD module boards in Jetson AGX Orin™ development kit.

Using eCAM\_Argus\_MultiCamera application, you can perform the following:

- Enumerate and list all video capture devices connected.
- Stream all available resolutions if different resolutions are supported by the device.
- Change controls for all available cameras.
- Capture images in RAW and JPEG formats.
- Record H264 encoded videos.

e-con Systems provides eCAM\_Argus\_MultiCamera binary file of the application along with source code. Please refer to the *e-CAM56\_CUOAGX\_Release\_Notes\_<REV>.pdf* for the compatible Linux distribution version (L4T version).

# Identifying the Deliverables

This section describes about identifying the deliverables.

The release package contains the application source code and eCAM\_Argus\_MultiCamera application executable. The commands and output messages in this manual are represented by different colors as shown in below table.

**Table 3: Notation of Colors**

Color	Notation
Blue	Commands running in Jetson development kit
Red	Output message in Jetson development kit
Orange	Commands running in host PC

The steps for identifying the deliverables are as follows:

1. Copy the release package tar file to the home directory of the board.
2. Run the following commands to extract the e-CAM56\_CUOAGX release package.

```
tar -xaf e-  
CAM56_CUOAGX_JETSON_XAVIER_ORIN_<L4T_version>_<release  
_date>_<release_version>.tar.gz  
cd e-  
CAM56_CUOAGX_JETSON_XAVIER_ORIN_<L4T_version>_<release  
_date>_<release_version>
```

The source code for the eCAM\_Argus\_MultiCamera application is present in the release package at the following location.

**Application/eCAM\_Argus\_MultiCamera/Source/eCAM\_Argus\_MultiCamera.tar.gz**

# Building and Installing MultiCam Application from Source

---

This section describes about building and installing the eCAM\_Argus\_MultiCamera application from the source.

The steps to build and install MultiCam application from the source are as follows:

1. Run the following commands to install the dependency libraries.

```
$ sudo apt-add-repository universe
$ sudo apt-get update
$ sudo apt-get install cmake build-essential pkg-config libx11-dev libgtk-3-dev libexpat1-dev libjpeg-dev libgstreamer1.0-dev libgstreamer-plugins-base1.0-dev libv4l-dev v4l-utils
```

**Note:** If the installation process stops with the **could not get lock /var/lib/dpkg/lock** message, run the following command to remove the file and proceed with the installation.

```
$ sudo rm /var/lib/dpkg/lock
```

2. Run the following commands to enter the source directory.

```
$ cd Application/eCAM_Argus_MultiCamera/Source/
$ tar -xvf eCAM_Argus_MultiCamera.tar.gz
$ cd eCAM_Argus_MultiCamera/argus/
$ mkdir build && cd build
```

3. Run the following make commands to build the MultiCam application from the source.

```
$ cmake ..
$ make -j4
```

4. Run the following make install command to install the build application.

```
$ sudo make install
```

The application will be installed in **/usr/local/bin** location.

# Launching the Application

This section describes about launching the eCAM\_Argus\_MultiCamera application.

The steps to launch the application are as follows:

1. Connect the e-CAM56\_CUOAGX camera module to the Jetson AGX Orin™ development kit.
2. Run the following command with your IP address of the Jetson AGX Orin™ development kit board to create SSH session from a Linux PC.

```
ssh nvidia@<ip-address>
```

The module drivers for e-CAM56\_CUOAGX provided by e-con Systems will be loaded automatically during board boot.

**Note:** The below commands must run in the ssh connection which is established from the host PC. Since the commands run in the Jetson AGX Orin™ development kit, they follow the same color notation.

3. Run the following command to check whether all the connected cameras are initialized.

```
$ sudo dmesg | grep "Detected eimx568 sensor"
```

The output message appears as shown below.

```
Detected eimx568 sensor
Detected eimx568 sensor
```

The output message indicates that all the cameras connected are initialized properly.

4. Run the following command to check the presence of video nodes.

```
$ ls /dev/video*
```

The output message for a dual camera setup appears as shown below.

```
/dev/video0
/dev/video1
```

**Note:** The number of video node entries will be the same as the number of connected cameras.

5. Run the following command before starting the application.

```
$ export DISPLAY=:0
```

6. Run the following commands to achieve maximum frame rate before launching the eCAM\_Argus\_MultiCamera application in the Jetson AGX Orin™ development kit.



```
$ sudo jetson_clocks  
$ sudo nvpmodel -m 0
```

7. Run the following command to launch the eCAM\_Argus\_MultiCamera application from the terminal.

```
$ eCAM_Argus_MultiCamera
```

When application is launched, the menu control will appear in the host PC and video display window will appear on the display connected to the Jetson AGX Orin™ development kit.

To close the application, enter the option to quit from the application provided in the terminal UI or press **Ctrl + C** to effectively disable streaming and then continue to close the application using the terminal UI.

**Note: Maximum 4 cameras can be streamed using this eCAM\_Argus\_MultiCamera application.**

# Application Features

This section describes about the MultiCam application features.

The input features that are supported in the current version of eCAM\_Argus\_MultiCamera application are as follows:

- [Number of Streaming Cameras](#)
- [Listing Features of Connected Device](#)

Run the following command to list the command line features.

```
$ eCAM_Argus_MultiCamera --help
```

The features will appear as shown below.

```
nvidia@nvidia-desktop:~/e-con_CameraApplication/eCAM_Argus_MultiCamera/argus$ eCAM_Argus_MultiCamera --help
Executing Argus Sample: eCAM_Argus_MultiCamera
Usage: eCAM_Argus_MultiCamera [OPTION]... [ACTION]...
Options are set and actions are executed in the order they occur. Multiple
actions can be executed.
Mandatory arguments to long options are mandatory for short options too.

Options:
  -o, --displayoptionchanges[=0 or 1]  display changed options and actions  Default is '0'.
                                       Default argument is '1'.
  -s, --sensormode=INDEX               Sensor Mode index.  Default is '0'.
  -n, --cameras=COUNT                Num. of Cameras  Default is '6'.
  -p, --preview=BOOL                  Preview Enable/Disable  Default is '1'.

Actions:
  -h, --help                          display this help and exit
  -x, --exit                           exit from the program
  -O, --displayoptionvalues            display all options and values
  -l, --listdevices                    List all available CameraDevices, then exit
```

## Number of Streaming Cameras

Run the following command to stream the desired number of cameras.

```
$ eCAM_Argus_MultiCamera --cameras=<N>
```

or

```
$ eCAM_Argus_MultiCamera -n <Num of Cameras>
```

## Selecting Sensor Mode Index

Run the following command to stream the desired sensor mode.

```
$ eCAM_Argus_MultiCamera --sensormode=<INDEX>
```

or

```
$ eCAM_Argus_MultiCamera -s <INDEX>
```

The supported formats and resolutions for 4-lane mode in Jetson AGX Orin™ development kit is listed in below table.

**Table 5: Supported Formats and Resolutions**

Lane	Resolution	Frame Rate in 10-bit	Frame Rate in 12-bit
4	2432 x 2048	79	67
4	1920 x 1080	142	121
4	1280 x 720	202	172
4	640 x 480	280	240

## Listing Features of Connected Device

After choosing the device ID, you can view the screen similar to the screen shown below.

Choice ID	Description
1.	Modify/Select Device
2.	Burst Capture
3.	Exit Application
Enter your choice	1

The options to change/modify/utilize the camera modules are as follows:

- [Modify/Select Device](#)
- [Burst Capture](#)
- [Exit Application](#)

## Modify/Select Device

When you enter the choice ID to select the modify/select device option, the number of devices launched will be displayed with the range of input device ID. Enter the option for using the e-CAM56\_CUOAGX setup; you can view the screen similar to the screen shown below.

No. of. Devices Launched	2	Range [ 0 - 1 ]
Choose Device ID	1	

Enter the option to select the required Device ID, and you can view the device specific options as shown below.

Choice ID	Description
1.	List Controls
2.	Get Control Value
3.	Set Control Value
4.	Get Stream Metadata
5.	Image Capture
6.	Video Record
7.	Main Menu
Enter your choice	

The device specific options are as follows:

- [List/Get/Set Controls](#)
- [Get Stream Metadata](#)
- [Image Capture](#)
- [Video Record](#)
- [Main Menu](#)

You can choose the course of action on the selected device.

### List/Get/Set Controls

Enter the choice ID 1 to view the list of controls options. The list of controls option displays the number of controls enumerated in the selected device ID with the minimum and maximum values as shown below.

Printing Sensor and ISP Controls with Range/Values		
CTRL ID	Control Name	Valid Values
1	AE AntiBanding	Valid strings are 'off', 'auto', '50hz', '60hz' or an index in the range [0, 3].
2	AE Lock	Valid values need to be in the range [0, 1].
3	Denoise Mode	Valid strings are 'off', 'fast', 'high' or an index in the range [0, 2].
4	Denoise Strength	Valid values need to be in the range [-1, 1].
5	EdgeEnhance Mode	Valid strings are 'off', 'fast', 'high' or an index in the range [0, 2].
6	EdgeEnhance Strength	Valid values need to be in the range [-1, 1].
7	ISP Gain Range	Valid values need to be in the range [1.1, 1.1].
8	Exposure Compensation	Valid values need to be in the range [-2, 2].
9	Exposure Time Range	Valid values need to be in the range [450000, 450000000, 450000, 450000000].
10	Sensor Gain Range	Valid values need to be in the range [1.01158, 15, 1.01158, 15].
11	Sensor Frame Rate	Valid values need to be in the range [2.5, 35].
12	AWB Mode	Valid strings are 'auto', 'incan', 'fluo', 'warm', 'day', 'cloudy', 'twil', 'shade' or an index in the range [0, 7].

When you enter choice ID 2, the controls in the above figure will appear again followed with options to get the control value by choosing the control ID. To change the control value, you must enter choice ID 3 instead of 2.

The list of controls are as follows:

- [AE AntiBanding](#)
- [AE Lock](#)
- [Denoise Mode](#)
- [Denoise Strength](#)
- [Edge Enhance Mode](#)
- [Edge Enhance Strength](#)
- [ISP Gain Range](#)
- [Exposure Compensation](#)
- [Exposure Time Range](#)

- [Sensor Gain Range](#)
- [Sensor Frame Rate](#)
- [AWB Mode](#)

The values of e-CAM56\_CUOAGX controls are shown in below table.

**Table 6: Values of e-CAM56\_CUOAGX Controls**

Controls	Valid Values	Default Value	Manual Control	Auto Control
AE AntiBanding	Off, auto, 50Hz, 60Hz or [0,3]	Auto	YES	YES
AE Lock	[0,1]	1	YES	NO
Denoise Mode	Off, fast, high or [0,2]	Off	YES	NO
Denoise Strength	[-1,1]	-1	YES	NO
Edge Enhance Mode	Off, fast, high or [0,2]	Fast	YES	NO
Edge Enhance Strength	[-1, 1]	-1	YES	NO
ISP Gain Range	[1]	1	NO	NO
Exposure Compensation	[-2, 2]	0	YES	NO
Exposure Time Range	[450000,400000000] to [450000,400000000]	[450000,200 000000]	YES	YES
Sensor Gain Range	[1.012,15.849] to [1.012, 15.849]	[1.012, 15.849]	YES	YES
Sensor Frame rate	[2.5,35] (based on sensor mode)	35 (based on sensor mode)	YES	NO
AWB Mode	[0,7]	0	YES	YES

### AE Antibanding

Enter the option 1 to view the AE Antibanding menu as shown below.

Choose the Control ID Number	1
Current AE Antibanding Mode	auto
Valid Control Values/Range	Valid strings are 'off', 'auto', '50hz', '60hz' or an index in the range [0, 3].
Enter User Control Value	2
Updated AE Antibanding Mode	50hz

The eCAM\_Argus\_MultiCamera application supports the AE anti-banding modes as follows:

- Off
- Auto
- 50Hz
- 60Hz

By default, the AE anti-banding mode is auto.

## AE Lock

Enter the option 2 to view the AE Lock menu as shown below.

Choose the Control ID Number	2
Current AE Lock	1
Valid Control Values/Range	Valid values need to be in the range [0, 1].
Enter User Control Value	1
Updated AE Lock	1

When you select the AE Lock menu, it locks the exposure to current values. By default, the AE Lock is selected.

## Denoise Mode

Enter the option 3 to view the Denoise Mode menu as shown below.

Choose the Control ID Number	3
Current Denoise Mode	off
Valid Control Values/Range	Valid strings are 'off', 'fast', 'high' or an index in the range [0, 2].
Enter User Control Value	1
Updated Denoise Mode	fast

You can select the required denoise modes, by entering the valid values or ranges. The eCAM\_Argus\_MultiCamera application supports the denoise modes as follows:

- Off
- Fast
- High Quality

The default denoise mode is off.

**Note:** When the denoise mode is set to high quality, there is no significant difference due to the denoising capabilities in the current release.

## Denoise Strength

Enter the option 4 to view the Denoise Strength menu as shown below.

Choose the Control ID Number	4
Current Denoise Strength	1
Valid Control Values/Range	Valid values need to be in the range [-1, 1].
Enter User Control Value	0
Updated Denoise Strength	0

You can also change the denoise strength value from a minimum value of -1.0 to a maximum value of 1.0. The default denoise strength value is 1.0.

## Edge Enhance Mode

Enter the option 5 to view the Edge Enhance Mode menu as shown below.

```

=====
Choose the Control ID Number | 5
=====
Current Edge Enhance Mode | fast
=====
Valid Control Values/Range | Valid strings are 'off', 'fast', 'high' or an index in the range [0, 2].
=====
Enter User Control Value | 0
=====
Updated Edge Enhance Mode | off
=====
  
```

You can select the required edge enhance mode, by entering the valid values or ranges. The eCAM\_Argus\_MultiCamera application supports the edge enhance modes as follows:

- Off
- Fast
- High Quality

The default edge enhance mode is Fast.

### Edge Enhance Strength

Enter the option 6 to view the Edge Enhance Strength menu as shown below.

```

=====
Choose the Control ID Number | 6
=====
Current Edge Enhance Strength | -1
=====
Valid Control Values/Range | Valid values need to be in the range [-1, 1].
=====
Enter User Control Value | 0
=====
Updated Edge Enhance Strength | 0
=====
  
```

You can also change the edge enhance strength value from a minimum value of -1.0 to a maximum value of 1.0. The default edge enhance strength value is -1.0.

### ISP Gain Range

Enter the option 7 to view the ISP Gain Range menu as shown below.

```

=====
Choose the Control ID Number | 7
=====
Current ISP Digital Gain Range | 1,1
=====
Valid Control Values/Range | Valid values need to be in the range [1,1, 1,1].
=====
Enter User Control Value | 1
=====
  
```

The ISP gain value can be changed from a minimum value of 1 to a maximum value of 256. This gain corresponds to the digital gain additionally provided by the ISP (over and above the sensor gain) and the default value depends upon the luminance of the source. Jetson AGX Orin™ development kit ISP can support a digital gain range of 1 to 256 (amplification factor) corresponding to roughly 0 to 48.16 dB. However, in e- CAM56\_CUOAGX, ISP gain has been restricted to 1(Af), according to Nvidia standards. To change ISP Digital gain range, you must change the value of the parameter `ispDigitalGain.MaxIspDigitalGain`, which is in the `camera_overrides_jetson-orin.isp` file provided by e-con systems.

Ex: `ispDigitalGain.MaxIspDigitalGain=256.0000;`

## Exposure Compensation

Enter the option 8 to view the Exposure Compensation menu as shown below.

Choose the Control ID Number	8
Current Exp. Compensation Value	0
Valid Control Values/Range	Valid values need to be in the range [-2, 2].
Enter User Control Value	-1,1
Updated Exp. Compensation Value	-1

The exposure compensation value can be changed from a minimum value of -2 to a maximum value of +2. The default exposure compensation value is set to 0.

## Exposure Time Range

Enter the option 9 to view the Exposure Time Range menu as shown below.

Choose the Control ID Number	9
Current Exposure Time Range	450000,400000000
Valid Control Values/Range	Valid values need to be in the range [450000,400000000, 450000,400000000]
Enter User Control Value	5000000,10000000
Updated Exposure Time Range	5000000,10000000

The exposure time range can be changed from a minimum value of 450000 to a maximum value of 400000000 by manually entering the values. Here, the exposure time is denoted in nano seconds (ns) scale. The default exposure set by the application depends upon the luminance of the source. The exposure is controlled by the ISP. However, to set a specific exposure value, you can manually set both the lower and higher range fields to that same specific value.

## Sensor Gain Range

Enter the option 10 to view the Sensor Gain Range menu as shown below.

Choose the Control ID Number	10
Current Sensor Gain Range	1.01150,15
Valid Control Values/Range	Valid values need to be in the range [1.01150,15, 1.01150,15].
Enter User Control Value	2.012,2.012
Updated Sensor Gain Range	2.012,2.012

The sensor gain range can be changed from a minimum value of 1.012 to a maximum value of 15 which is represented in amplification factor. IMX568 can support a sensor gain range of 0 to 24 dB corresponding to roughly 1.012 to 15.849 (amplification factor). The default gain value depends upon the luminance of the source. However, to set a specific constant sensor gain value, you can manually set both the lower and higher range fields to that same specific value.

## Sensor Frame Rate

Enter the option 11 to view the Sensor Frame Rate menu as shown below.



Choose the Control ID Number	11
Current Frame Rate	35
Valid Control Values/Range	Valid values need to be in the range [2.5, 35].
Enter User Control Value	20
Updated Frame Rate	20

The sensor frame rate can be changed from a minimum value of 2.5 to a maximum value of 35 (varies depending on the sensor mode index) which is represented in frames per second(fps). The default frame rate value depends upon the sensor mode index streamed.

### **AWB Mode**

Enter the option 12 to view the AWB mode menu as shown below.

Choose the Control ID Number	12
Current AWB Mode	auto
Valid Control Values/Range	Valid strings are 'auto', 'incan', 'fluo', 'warm', 'day', 'cloudy', 'twil', 'shade' or an index in the range [0, 7].

The AWB mode can be changed from a minimum value of 0 to a maximum value of 7. The default AWB mode value is 0 (Auto). The values from 1-7 denotes various lighting conditions applying which performs White balance for the specific lighting condition.

### **Get Stream Metadata**

The Get Stream Metadata option is provided to query the properties of the captured frame. The metadata contains the data as follows:

- Capture API ID
- AE Lock Status
- Frame Duration
- Stream Frame Rate
- ISP Digital gain
- Frame Readout time
- Frame Scene Luminance
- Sensor Gain
- Sensor Exposure Time
- Sensor ISO Sensitivity
- Sensor Timestamp

The stream metadata can be viewed in the terminal UI as shown below.

Camera Device	0
Capture API ID	34613
AE Lock Stat	1
Frame Duration(ms)	50
Stream FrameRate	20
ISP Dig. Gain	1
Frame Readout	25155
Frame Scene Lux	2189.41
Sensor Gain	2.012
Sensor Exposure	9999
Sensor ISO Sens.	201
Sensor TimeStamp	3807893060

## Image Capture

You can capture images from single camera device by entering the option 5 available along with the listing of camera devices. After entering the option, the format in which the image must be saved will be displayed as shown below.

1.	JPEG Capture
2.	RAW Capture
Enter your choice	1
Image Saved to	/home/nvidia/IMG_cam_0_p_4294_13-2-2024_13h.6m.57s.jpg

The formats available to save the image are as follows.

- JPEG Capture
- RAW Capture

The format in which the images will be saved is mentioned below.

For example,

**JPEG Image:** /home/<username>/IMG\_cam\_<dev>\_p\_PID\_DD-MM-YY\_<time>.jpg

**RAW Image:** /home/<username>/IMG\_cam\_<dev>\_p\_PID\_DD-MM-YY\_<time>.nv12

**Note:** The RAW format mentioned refers to the uncompressed YUV planar format output from the ISP.

## Video Record

You can record videos from a single camera by entering the option 6 available along with the listing of camera devices. After entering the option, the format in which the video must be recorded will be displayed as shown below.

1.	RAW Frame Dump
2.	H264 Encoded
Enter your choice	1
Saving uncompressed RAW video to	/home/nvidia/VID_cam_0_p_4294_13-7-57.raw
PRODUCER: Done -- exiting.	

The supported video recording formats in this application are as follows:

- RAW Frame Dump
- H264 Encoded

The format in which the video recorded is mentioned below.

For example,

**RAW:** /home/<username>/VID\_cam\_<dev>\_p\_PID\_<time>.raw

**H264:** /home/<username>/VID\_cam\_<dev>\_p\_PID\_<time>.mp4

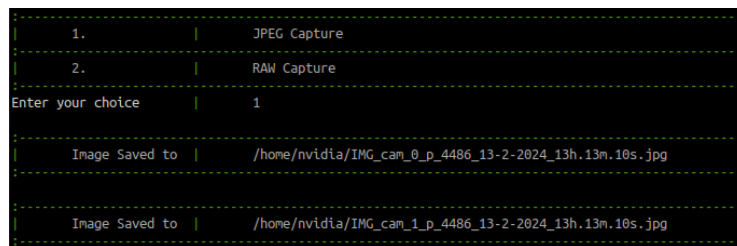
**Note:** When the RAW Frame Dump format is selected, the timer is restricted to 5 seconds and the video stream automatically closes.

## Main Menu

Enter the option 7 to navigate to the main menu.

## Burst Capture

The Burst Capture option helps to concurrently capture images from all the devices actively running on the application. When you select the Burst Capture option, you can view the supported formats to save images as shown below.



The supported formats to save images are as follows:

- JPEG Capture
- RAW Capture

The format in which the images will be saved is mentioned below.

For example,

**JPEG Image:** /home/nvidia/IMG\_cam\_<dev>\_p\_PID\_DD-MM-YYYY\_<time>.jpg

**RAW Image:** /home/nvidia/IMG\_cam\_<dev>\_p\_PID\_DD-MM-YYYY\_<time>.nv12

**Note:** The RAW format mentioned refers to the uncompressed YUV planar format output from the ISP.

## Burst Record

The Burst Record option helps to concurrently record H264 encoded videos from all the active devices running on the application. When you select the Burst Record option, you can view the screen similar to the screen shown below.

```
-----:
| Saving Video to | /home/nvidia/VID_cam_0_p_7334_19h-10m-13s.mp4
|-----:
Opening in BLOCKING MODE
NvMMLiteOpen : Block : BlockType = 4
===== NVMEDIA: NVENC =====
NvMMLiteBlockCreate : Block : BlockType = 4
875967048
842091865
create video encoder return true
CONSUMER: Created Video Encoder Pipeline
H264: Profile = 66, Level = 51
-----:
| Saving Video to | /home/nvidia/VID_cam_1_p_7334_19h-10m-14s.mp4
|-----:
Opening in BLOCKING MODE
NvMMLiteOpen : Block : BlockType = 4
===== NVMEDIA: NVENC =====
NvMMLiteBlockCreate : Block : BlockType = 4
875967048
842091865
create video encoder return true
CONSUMER: Created Video Encoder Pipeline
H264: Profile = 66, Level = 51
-----:
| 1. | Stop recording video
|-----:
```

## Exit Application

Enter the Choice ID 3 to exit the application.

# Troubleshooting

---

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

## **When I capture a JPEG image and leave the application on free running for one or two hours, I am getting a JPEG encoder timeout.**

This is a known limitation. Once the JPEG encoder timeout occurs, the streaming will be fine. But when you try to capture an image, the application would hang.

To recover the application, you must kill the application and run the following command

```
$ sudo service nvargus-daemon restart
```

## **What should I do when I am unable to close application using Ctrl+C**

Use **Ctrl+Z** to exit from the eCAM\_Argus\_MultiCamera application.

## **What should I do when I encounter a streaming issue?**

Run the following commands before launching the application.

```
sudo jetson_clocks  
sudo /home/max-isp-vi-clks.sh  
sudo nvpmode1 -m 0
```

## **When I try to Burst Capture for raw images it causes the application to close.**

This is a known limitation, To recover the application, you must kill the application and run the following command

```
$ sudo service nvargus-daemon restart
```

## **Burst capture with to save the still images with RAW format not working.**

This is a known issue and will be fixed in the next release.

## **Video recording option with h264 format gives segmentation fault.**

This is a known issue and will be fixed in the next release.

## **ISP digital gain control value change through error on terminal**

This is a known behaviour. As we have limited the ISP digital gain value to 1.

When try to set the control value, applications through an error.

1. **Why the preview frame rate becomes slow when I record videos using camera? Why the recorded video plays very fast?**

You must run the following commands before opening the application.

```
$ sudo jetson_clocks  
$ sudo /home/max-isp-vi-clks.sh  
$ sudo nvpmode1 -m 0
```

If the required clock is not provided to the ISP and VI, the performance issues might occur while streaming and recording simultaneously.

2. **Why auto mode in AE antibanding is not working?**

This is a known issue in NVIDIA® ISP.

3. **Why is burst record option missing in certain sensor modes?**

Burst record option is supported when the frame rate is 30 fps or below.

## What's Next?

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After understanding the usage of eCAM\_Argus\_MultiCamera application, you can refer to the *e-CAM56\_CUOAGX Release Notes* to understand more about e-CAM56\_CUOAGX.

# Glossary

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**ISP:** Image Signal Processor.

**JPEG:** Joint Photographic Experts Group.

**MIPI:** Mobile Industry Processor Interface.

**SSH:** Secure Shell.



# Support

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## **Contact Us**

If you need any support on e-CAM56\_CUOAGX 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	12-Feb-2024	Initial Draft	Camera Dev Team
1.1	11-Mar-2024	Updated eCAM_Argus_MultiCamera application for L4T35.4.1	Camera Dev Team
1.2	22-Mar-2024	Updated product image in home page	Camera Dev Team