e-con Systems India Pvt Ltd

7th Floor, RR Tower – IV,

Super A-16 & A-17, Thiru-Vi-Ka Industrial Estate,

Guindy, Chennai - 600 032.

www.e-consystems.com

STEEReoCAM NANO

Datasheet

Revision 1.0

Monday, September 16th, 2019

Contents

STEEReoCAM

1 Revision History

Rev	Date	Description	Author
1.0	16-Sep-2019	Initial Release	Camera Team

2 Introduction

e-CAM20_Stereo_CUMI2311_NANO is a Stereo Vision camera for NVIDIA® Jetson NANO Development kit from e-con Systems, a leading Embedded Product Design Services company which specializes in the advanced camera solutions. Hereafter, e-CAM20_Stereo_CUMI2311_NANO will be mentioned as STEEReoCAM in further reference. It is based on OV2311 - global shutter monochrome image sensor from OmniVision.

STEEReoCAM is a monochrome 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. STEEReoCAM has two 1/2.9" OV2311 image sensors separated by an inter-ocular distance or base line of 100 mm. With Jetson NANO, STEEReoCAM can stream the resolution and frame rate as shown in below table.

S.NO	Resolution	Frame Rate (fps)
1	3200 x 1300	30

Table 1: Supported Resolution and Frame Rate

This document describes about the features of STEEReoCAM board, and the pin-outs of the connectors including with mechanical diagram.

3 Disclaimer

The specifications and features of STEEReoCAM board are provided here as reference only and e-con Systems reserve the right to edit/modify this document without any prior intimation of whatsoever.

4 Description

STEEReoCAM is a multi-board solution consisting of a camera board and a Adaptor board. The camera board has two OV2311 sensors. The Adaptor board has a 15-pin header and is interfaced to the J13 connector of the NVIDIA® Jetson NANO development kit. The camera board and the Adaptor board has a 30-pin micro-coaxial connectors and are connected through 30 cm micro-coaxial cable.

The OV2311 is a 1/2.9", 2 MP monochrome CMOS global shutter image sensor from OmniVision. It can support resolution up to 1600 x 1300 at 60 fps using OmniVision Pixel 3-GS technology.

STEEReoCAM has an on-board Micro-Controller Unit (MCU) to communicate with the image sensor and FPGA. This camera is provided with a 6-axis IMU, which comprises a 3D accelerometer and a 3D gyroscope. The accelerometer in the IMU is useful for measuring the linear accelerations and the gyroscope helps in measuring the angular accelerations.

4.1 Features

The features of STEEReoCAM are as follows:

- Multi-board solution
- 2-Lane output MIPI Interface.
- 2 MP monochrome camera sensor
- Standard M12 lens holder for use with customized optics or lenses for various applications
- On-board micro-controller to communicate with image sensor
- Inertial Measurement Unit (IMU)
- Automatic Gain control and Automatic Exposure control
- Base line distance of 100 mm
- Provided with pre-calibrated S-mount lens pair
- Synchronous stereo monochrome images
- Imaging applications
  - 2 MP CMOS image sensor
  - Resolution: 3200 x 1300
  - Output Video format: 10-bit Raw format
- Operating Voltage: 3.3V +/- 5%
- Operating Temperature: -30°C to 85°C
- RoHS compliant

4.2 CMOS Image Sensor Specifications

The below table lists the specifications of the CMOS image sensor used in this STEEReoCAM camera board.

Sensor Specification	
Type / Optical Size	1/2.9” Optical format CMOS image sensor

Resolution	1600 x 1300 (2 MP)
Sensor Type	10-bit Raw format
Pixel Size	3 µm x 3 µm
Sensor Active Area	4857.7 µm x 3955.9 µm
Shutter Type	Global shutter

Table 2: CMOS Image Sensor Specifications

For more information about OV2311 sensor or for *Datasheet*, please contact OmniVision.

5 Key Specifications

The below table lists the specifications of STEEReoCAM.

Description	Specification
Base Board Size (L x W)	135 mm x 20 mm
Video Format	10-bit Raw
Image Resolution	3200 x 1300 ((2*1600) x 1300)
Supported OS	Linux

Table 3: Key Specifications of STEEReoCAM

6 Pin Description

STEEReoCAM camera board has one 30-pin micro-coaxial connector (CN3) which is be connected to the CN2 connector of Adaptor board. The pin description of these connectors is explained below.

6.1 Connector Pin-out Details

The below table lists the pin-out details of camera board connector.

S.No	Signal Name	Pin Type	Description
1	VCC_3P3	POWER	3.3V power supply for camera board
2	VCC_3P3	POWER	3.3V power supply for camera board
3	VCC_1P8	POWER	1.8V power supply for camera board
4	GND	POWER	Ground signal for digital and analog
5	GND	POWER	Ground signal for digital and analog
6	MCU_GPIO	INPUT	Micro-controller Boot GPIO pulled down, by default
7	I2C_SCL	OUTPUT	I2C Clock signal. Pulled up to 1.8V
8	I2C_SDA	I/O	I2C Data Signal. Pulled up to 1.8V
9	GND	POWER	Ground signal for digital and analog
10	RSVD	-	Reserved
11	RSVD	-	Reserved
12	TRIGGER	INPUT	Camera Trigger signal
13	RSVD	-	Reserved
14	GND	POWER	Ground signal for digital and analog
15	MIPI_D1_N	INPUT	MIPI Data Lane 1 Differential Pair -
16	MIPI_D1_P	INPUT	MIPI Data Lane 1 Differential Pair +
17	GND	POWER	Ground signal for digital and analog
18	GND	POWER	Ground signal for digital and analog
19	MIPI_D0_N	INPUT	MIPI Data Lane 0 Differential Pair -
20	MIPI_D0_P	INPUT	MIPI Data Lane 0 Differential Pair +
21	MCU_RESET	OUTPUT	MCU reset signal (Active low)

22	GND	POWER	Ground signal for digital and analog
23	RSVD	-	Reserved
24	MIPI_CLK_N	INPUT	MIPI Clock Lane Differential Pair -
25	MIPI_CLK_P	INTPUT	MIPI Clock Lane Differential Pair +
26	GND	POWER	Ground signal for digital and analog
27	RSVD	-	Reserved
28	RSVD	-	Reserved
29	RSVD	-	Reserved
30	RSVD	-	Reserved

Table 4: Camera Board Connector Mapping Details

6.2 Flash Connector Pin-out Details

The below table lists the pin-outs of 4-pin Flash output connector (CN4).

Pin No	Signal Name	Pin Type	Description
1	VCC_1P8	POWER	1.8V Power supply
2	CAM1_FLASH	OUTPUT	Right sensor flash output
3	CAM2_FLASH	OUTPUT	Left sensor flash output
4	GND	POWER	Ground signal

Table 5: CN4 Flash Connector Pin Details

7 Connector Part Numbers

The below table lists the connectors used in STEEReoCAM camera board and Adaptor board.

Connector	Description	Manufacturer	Part Number
Mating Interface Connector on Adaptor Board to mate with	15-pin FFC 1mm pitch connector	TE Connectivity	1-84953-5 Pin 1 to 1 mating

NANO Development Kit			
Micro-coaxial Camera Connectors on Adaptor Board and Camera Board	0.4 mm Pitch Fully Shielded 30-pin Receptacle Connector	I-PEX	20682-030E-02 Pin 1 to 1 mating
Micro-Coaxial Cable Assembly to connect Camera Board and Adaptor Board	30 cm Length Cable Pin 1 to 1	I-PEX	81214-530B-300-1
External Flash Connector	1 mm Pitch 2-pin Top Entry Header	JST Sales America Inc	BM04B-SRSS-TB (LF)(SN)
FFC cable to connect Adaptor board with Jetson NANO Development kit	15 Position FFC, FPC Cable 1mm pitch, 152mm length	Wurth electronics	686615152001

Table 6: Connector Part Numbers

8 Electrical Specification

The electrical specification of STEEReoCAM are as follows:

- Recommended Operating Condition
- Power Consumption

The values described in this section are measured in e-con Systems lab and this can be used as reference only. The current measurements are typical values and are subject to change for different camera boards under different conditions. However, these values can be taken as a reference for power estimation and power supply design.

8.1 Recommended Operating Condition

The below table lists the current consumed by the STEEReoCAM camera board and Adaptor board under various operating conditions.

Parameter	Typical Operating Voltage (V)	Typical Operating Current (mA)	Typical Power consumption (mW)
Input voltage	3.3	160	528

Table 7: Recommended Operating Condition

8.2 Recommended Operating Temperature

The below table lists the operating temperature range of STEEReoCAM.

Parameter Description	Temperature Range
Operating Temperature*	-30°C to 85°C

Note: The default lens supplied with this camera has an operating range of -20°C to 60°C. Customers can choose wider operating temperature lens as per their requirements.

9 Mechanical Specifications

The STEEReoCAM Adaptor board size is 30 mm x 30 mm, and the STEEReoCAM camera board size is 135 mm x 20mm. The board drawing and dimensions are given below.

9.1 STEEReoCAM Board Dimensions

The NANO Adaptor board with mechanical dimensions is shown below.

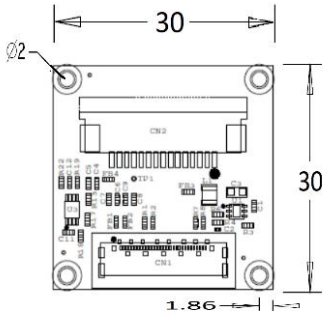

Figure 1: Front View of NANO Adaptor Board Mechanical Dimensions

The STEEReoCAM camera board with mechanical dimensions is shown below.

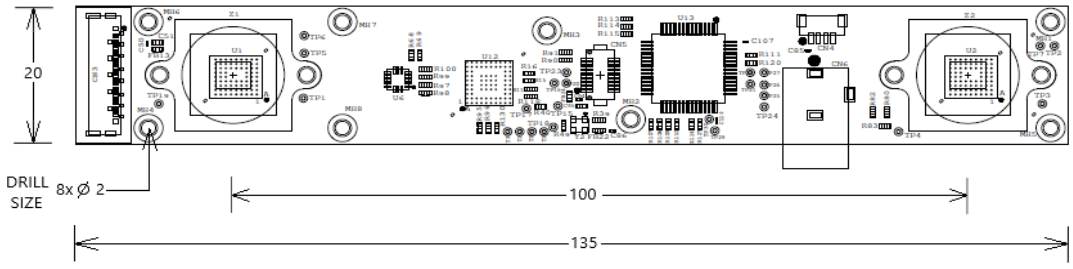

Figure 2: STEEReoCAM Camera Board Mechanical Dimensions

Note: All dimensions are in mm.

Support

Contact Us

If you need any support on STEEReoCAM 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