VADZO

FALCON-1335CRO

13MP Color OIS Autofocus UVC USB 3.0 Camera based on Onsemi AR1335 Sensor

Vadzo Falcon-1335CRO is a 4K Autofocus USB 3.0 Camera with optical image stabilization (OIS) based on Onsemi AR1335 Sensor coupled with high-performance ISP with support for features such as Optical Image Stabilization, ROI Based AE & AF, along with Digital PTZ, etc. The camera has a VCM-based Autofocus lens assembly that supports 50DFOV by default. You can stream videos in YUV422 and MJPEG format and capture images in BMP and JPEG format.

Key Features

- Sensor Model: AR1335 Onsemi Sensor
- Max Resolution: 13 MP
- Pixel Size: 1.1 µm x 1.1 µm
- Shutter: Rolling Shutter
- Lens FOV: 50DFOV
- Compliance: UVC, RoHS 3, REACH

Applications

- **Medical Devices Camera:** Ophthalmology Camera, Dermatoscope Camera, Digital Microscope Camera, Pathology Camera.
- **Mobile Robot Camera:** AGV cameras, AMR Camera, Drone Camera, Robotic ARM Camera.
- **Smart Surveillance Camera:** Facial Recognition, Day/Night Video Recording, Smart Parking, Pedestrian Safety.

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1. Introduction

Falcon-1335CRO is a UVC-compliant 4k Auto-Focus color USB 3.0 camera based on the Onsemi AR1335 sensor. It is also designed to be backward compatible with USB 2.0.

The camera incorporates the AR1335 CMOS sensor from Onsemi integrated with a Superspeed USB controller and optical image stabilization feature to perform functions such as Optical Image Stabilization, debayeirng, demosaicing, color correction, contrast correction, gamma correction, denoising, lens corrections, and so on. In addition to this, the ISP also supports Auto functions such as Auto-Focus, Auto-Exposure, and Auto-White Balance.

The Image Signal Processor is integrated with the USB 3.0 controller to provide a UVC-compliant USB 3.0 camera. The USB controller is also programmed to support the HID Pipeline, which shall support UVC extension functions that are not supported in the standard UVC drivers.

Vadzo Falcon-1335CRO incorporates a VCM-based Auto-Focus lens that enables continuous AF, On Shot triggered AF, and Manual focus control. Also, you can turn off OIS and use the camera as a regular autofocus camera.

2. Camera Specifications

General Information	
Product Family	Falcon series
Camera Model	Vadzo Falcon-1335CRO
Sensor	
Sensor	AR1335 CMOS sensor from Onsemi
Sensor Format	1/3.2”
Pixel Size	1.1 µm x 1.1 µm
Max Resolution	13MP – 4208(H) x 3120(V)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	USB 3.2 Gen 1 is Backward compatible with USB 2.0
Pixel Depth	8bit / 10bit

Output Format	YUV422 & MJPEG
Exposure Control	Manual Control via software & Auto-Exposure
Focus Control	Manual Control via software & Auto-Focus
GPIO	6 pins. 1x Digital Input, 1x Digital Output, 3x NC and GND
Camera Hardware	
Lens	VCM-based Auto-Focus with Focus range of 100mm to Infinity
Lens FOV	50DFOV
USB connector	Type C
GPIO connector	Connector on-board: Wurth 665106131822 Mating connector: Wurth 665006113322
Power Supply	USB powered
Power Requirement	Max: 1.75 W at 5VDC Min: 1.05 W at 5VDC
Operating Temperature	-30^{0}C to 70^{0}C
Dimension	38mm (L) x 38mm (B)
Weight	20 Grams
Camera Software	
Video Resolutions	VGA, HD, Full HD, 4K and 13MP
Video formats	YUV422 and MJPEG
Still Image Resolutions	VGA, HD, Full HD, 4K and 13MP
Image Capture formats	BMP and JPEG
Image Capture Modes	Software Trigger
UVC Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance, and Focus Control

Extension Controls	ROI-based Auto-Exposure, ROI-based Auto-Focus, Denoising, JPEG Compression, Digital PTZ
OS Supported	Windows, Linux, Android (need additional SDK)
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Resolution	**Frame Rates (FPS) in USB 3.0 Mode**	
	YUV	**MJPEG**
640 x 480 (VGA)	120	120
1280 x 720 (HD)	60	60
1920 x 1080 (FHD)	60	60
3840 x 2160 (4K)	15	30
4208 x 3120 (13MP)	9	20

4. Supported Camera Functions

The List of functions supported by the Falcon-1335CRO camera are:

- Optical Image Stabilization (OIS)
- Resolution Control
- Image Format Setting
- Video Format Setting – YUV/MJPEG
- Image Capture Software Trigger
- Exposure – Auto & Manual
- White Balance – Auto & Manual
- Focus – Auto & Manual
- Anti Flicker – 50Hz/60Hz
- Contrast Control
- Gamma Control
- Hue & Saturation Control
- Sharpness Control
- ROI Based Auto Functions – Focus & Exposure
- Q Factor Control
- Digital Pan, Tilt, and Zoom
- Unique ID

5. USB 3.0 Interface

The camera module's USB 3.0 connector is a standard USB Type C connector. It provides a nominal 5 Gbit/s SuperSpeed data transfer connection to supply power to the device and to transmit video data and control signals. The power supply must comply with the Universal Serial Bus 3.0 Specification. The nominal operating voltage is 5 VDC, effective on the camera module's connector. Connection assignments and numbering adhere to the Universal Serial Bus 3.0 standard. USB Certified 3.0 Gen 1 or higher cables to be used. Vadzo does not recommend non-certified USB cables.

6. Status LED

Status LEDs indicate the below:

- Red color indicates the Device is powered ON with no Streaming.
- The yellow color indicates the camera is currently Streaming.

7. General-Purpose I/O Lines

GPIO lines are terminated through Six (6) pin socket connectors from Würth Elektronik part number 665106131822. Refer to the below table for GPIO Connector Pin Numbering and Assignments.

Pin	Line	Function
1	Power	Do not use.
2	-	Do not use*
3	-	Do not use*
4	Input1	General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU Preset: Input Line
5	Output1	General Purpose I/O (GPIO) line with 1.8V tolerant directly connected to MCU Preset: Output Line
6	GND	Ground

**The Vadzo engineering team shall be able to enable the IOs on the firmware level as per the end user technical requirements under the purview of the Vadzo Imaging customization program.*

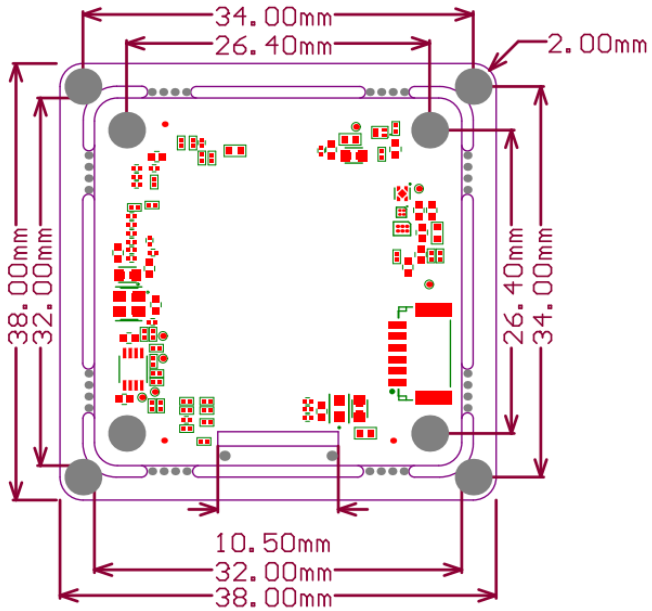
Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

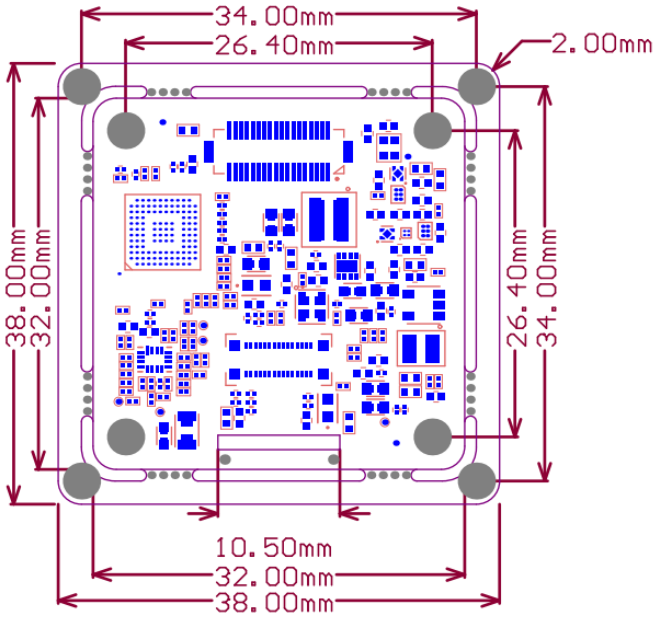
Description	Specification
Operating Temperature	-30°C to 70°C
Storage Temperature	-30°C to 70°C
Humidity	20% to 80%, Relative, non-condensing.

9. Dimensions

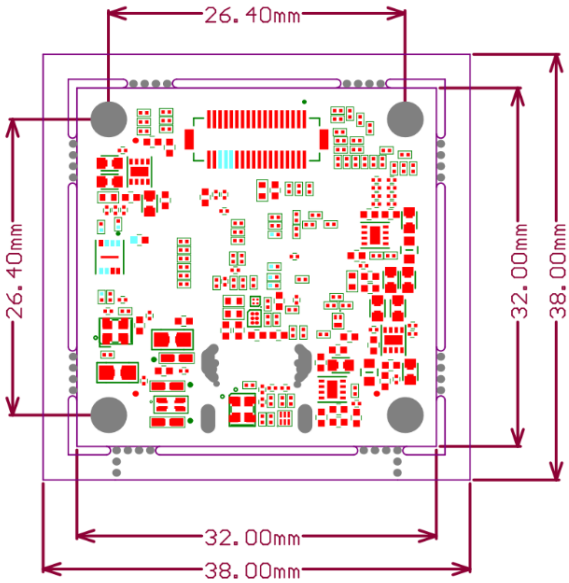
Board Top Side – 2D



Board Bottom Side - 2D



USB Board Top Side – 2D



USB Board Bottom Side – 2D