VADZO

FALCON-830CRS

8MP Color HDR UVC USB 3.0 Camera based on Onsemi Hyperlux™ LP AR0830 Sensor

Vadzo Falcon-830CRS is an advanced 4K HDR USB 3.0 camera based on Onsemi AR0830 Hyperlux™ LP product family sensor with an On-board high-performance ISP, featuring Wake-on-Motion, Super low-power mode, Line interleaved HDR (LI-HDR) and enhanced Dynamic Range (eDR) modes. This high-resolution 8MP camera is engineered for excellent performance under different lighting conditions. The camera comes with an M12/S-Mount lens holder that supports a 74DFOV lens by default. You shall be able to stream video in YUV and MJPEG format and capture images in BMP and JPEG format.

Key Features

- Sensor Model: AR0830 Onsemi Hyperlux™ LP
- Max Resolution: 8.3 MP
- Pixel Size: 1.4 µm x 1.4 µm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: UVC, RoHS 3, REACH

Applications

- **Smart Security Camera:** Wearables, Vision-based Biometrics, Smart Access, Facial Recognition, Day/night Video Recording, Smart Parking, Pedestrian Safety.
- **Retail In-store Camera:** Customer Behaviour, Inventory Management, Self-checkout Systems.
- **Machine Vision Camera:** Product Inspection & Quality Control, Assembly Robots, AGVs (Automated Guided Vehicles).
- **Kiosk Camera:** Retail Kiosks, Document Scanning, OCR, Barcode Reading, Facial Recognition, Demographic Analysis.

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1. Introduction

Vadzo Falcon-830CRS is a UVC Compliant USB 3.0 Fixed-Focus color camera based on Onsemi AR0830 CMOS sensor from Onsemi Hyperlux™ LP family. The camera is designed to be backward compatible with USB 2.0 as well.

The camera incorporates the AR0830 sensor from Onsemi integrated with an on-board Image Signal Processor (ISP) that supports key features like Enhanced Dynamic Range (eDR), Line Interleaved HDR (LI-HDR), Wake-on-Motion (WOM), Super Low Power (SLP) mode, Auto Exposure, Auto White Balance, and more. The camera supports high-quality image capture in BMP and JPEG formats and video streaming in YUV422 and MJPEG formats.

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

2. Camera Specifications

General Information	
Product Family	Falcon series
Camera Model	Vadzo Falcon-830CRS
Sensor	
Sensor	AR0830 Sensor from Onsemi Hyperlux™
Sensor Format	1/2.9”
Pixel Size	1.4 µm x 1.4 µm
Max Resolution	8.3 MP – 3848(H) x 2168(V)
Shutter	Rolling Shutter
Chroma	Color
Camera Data	
Interface	USB 3.2 Gen1 Backward compatible to USB 2.0
Pixel Depth	8bit
Output Format	YUV422

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Exposure Control	Manual Control via software & Auto-Exposure
GPIO	6 pins. 1x Digital Input, 1x Digital Output, 3x NC and GND
Camera Hardware	
Lens	S Mount (M12 Standard)
USB connector	Type C
GPIO connector	Connector on-board: Wurth 665306124022 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 85^{0}C
Dimension	38mm (L) x 38mm (B) convertible to 32mm (L) x 32mm (B)
Weight	13 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, HD, Full HD, and 4K
Video formats	YUV422 & MJPEG
Still Image Resolutions	VGA, HD, Full HD, and 4K
Image Capture formats	BMP & JPEG
Image Capture Modes	Software trigger
UVC Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain, White Balance.
Extension Controls	Denoising, LFM
OS Supported	Windows, Linux, Android (need additional SDK)
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

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3. Supported Resolutions

Resolution	FPS in USB 3.0 Mode (YUV)	FPS in USB 3.0 Mode (MJPEG)
640 x 480 (VGA)	60	60
1280 x 720 (HD)	60	60
1920 x 1080 (FHD)	30	60
3864 x 2192 (4K)	15	30

4. Supported Camera Functions

The List of functions supported by the Falcon-830CRS camera are:

- Resolution Control
- Image Format Setting
- Video Format Setting – YUV422 & MJPEG
- Image Capture Software Trigger
- Gain – Auto & Manual
- Exposure – Auto & Manual
- White Balance – Auto & Manual
- Anti Flicker – 50Hz/60Hz
- Contrast Control
- Gamma Control
- Hue & Saturation Control
- Sharpness Control

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.

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6. Status LED

Status LED's indicate the below:

- Red color indicates Device is powered ON with no Streaming.
- Yellow color indicates: Camera is currently Streaming.

7. General Purpose I/O Lines

GPIO lines are terminated through Six (6) pin socket connector from Würth Elektronik part number 665306124022. 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

**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 Vadzo Imaging customisation program.*

Recommended mating connector from Würth Elektronik part number 665006113322.

8. Temperature and Humidity Specifications

Description	Specification
Operating Temperature	-30^{0}C to 85^{0}C
Storage Temperature	-30^{0}C to 85^{0}C
Humidity	20% to 80%, Relative, non-condensing.

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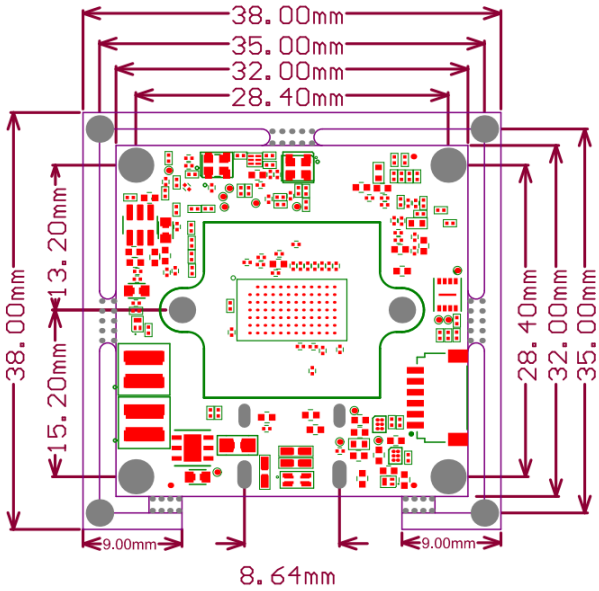
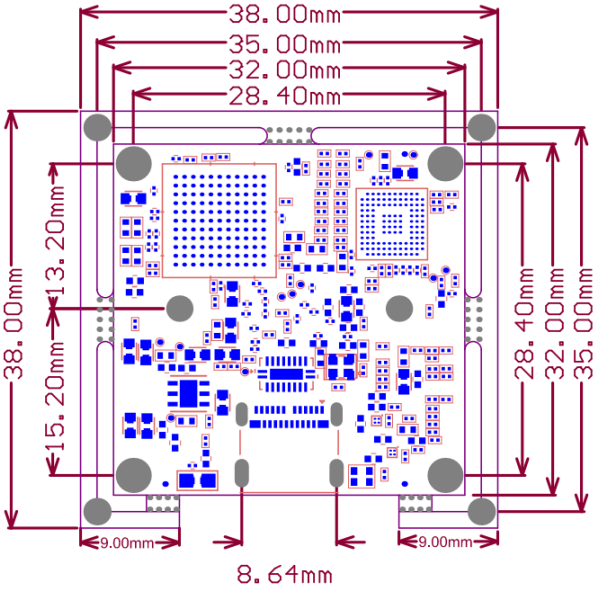
9. Dimensions

Board Top Side – 2D



Board Bottom Side - 2D



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