

Vadzo Vajra-2020MRS is a 20MP USB 3.0 Camera based on Onsemi Hyperlux™ LP AR2020 Sensor. The camera delivers a max resolution of 20MP and Video streaming of 5K, 4K, 1080p, and 720p. The camera comes with inherent capabilities such as enhanced dynamic range (eDR), excellent Low-Light and NIR Sensitivity. The camera comes with a M12/S-Mount lens holder that supports a 74DFOV lens by default. You shall be able to stream video in Y8 & Y12, capture images in Y8 format & Y12 format, and store in BMP format & RAW format respectively.

Key Features

- Sensor Model: AR2020 Onsemi Hyperlux™ LP
- Max Resolution: 20MP
- Pixel Size: 1.4 μm x 1.4 μm
- Shutter: Rolling Shutter
- Lens FOV: 74 DFOV
- Compliance: UVC, RoHS 3, REACH



Applications

- **Machine Vision Cameras:** Quality Inspection, Assembly Line Monitoring, Object Recognition and Classification, Surface Inspection, High-Speed Imaging.
- **Smart Surveillance Camera:** Iris Recognition, Day/Night Video Recording, Smart Parking.
- **Medical Devices:** Digital Pathology, Digital Microscopes, Ophthalmic Devices, Fluorescence Imaging.

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1. Introduction

Vajra-2020MRS is a UVC-compliant USB 3.2 Gen 2x2, Fixed-Focus Mono camera based on Onsemi Hyperlux™ LP AR2020 sensor. The camera is designed to be backward compatible with USB 2.0 as well. The camera incorporates the Onsemi's low-noise CMOS sensor that supports key features like enhanced HDR, Excellent NIR Response @850nm and 940nm, Wake on Motion, and so on.

2. Camera Specifications

General Information	
Product Family	Vajra series
Camera Model	Vadzo Vajra-2020MRS
Sensor	
Sensor	AR2020 CMOS sensor from Onsemi
Sensor Format	1/1.8"
Pixel Size	1.4µm x 1.4µm
Max Resolution	20MP - 5120(H) x 3840(V)
Shutter	Rolling Shutter
Chroma	Mono
Camera Data	
Interface	USB 3.2 Gen2x2 Type C connector
Pixel Depth	8bit / 12bit
Output Format	Y8 & Y12
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: 3 W at 5VDC Min: 2.5 W at 5VDC
Operating Temperature	-30°C to 70°C
Dimension	38mm (L) x 38mm (B)
Weight	13 Grams (Without Lens)
Camera Software	
Video Resolutions	VGA, HD, Full HD, 4K, 5K and 20MP
Video formats	Y8 & Y12
Still Image Resolutions	VGA, HD, Full HD, 4K, 5K and 20MP
Image Capture formats	BMP, RAW
Image Capture Modes	Software trigger
UVC Camera Controls	Brightness, Exposure
OS Supported	Windows, Linux.
Conformity	
Conformity	UVC Compliant, RoHS 3, REACH

3. Supported Resolutions

Resolution	Frame Rates (FPS) in USB 3.2 Gen2x2 Mode
	Y8
640 x 480 (VGA)	580
1280 x 720 (HD)	360
1920 x 1080 (FHD)	260
3840 x 2160 (4K)	84
5120 x 2880 (5K)	37
5120 x 3840 (20MP)	37

4. Supported Camera Functions

The List of functions supported by the Vajra-2020MRS camera are:

- Resolution Control
- Image Format Setting – Y8
- Video Format Setting - Y8
- Image Capture Software Trigger
- Dynamic ROI
- Gain & Exposure

5. USB 3.0 Interface

The camera module's USB 3.2 connector is a standard USB Type C connector. It provides a nominal 20 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 3.2 Gen 2x2 or higher cables to be used. Vadzo does not recommend non-certified USB cables.

6. Status LED

Status LED's indicate the below:

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

7. 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.

8. Enclosure



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