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INNOVA-2020CRS

20MP Color GigE Camera based on Onsemi AR02020 Sensor

The Vadzo Innova-2020CRS is a 20MP colour camera built on the Onsemi AR2020 Hyperlux™ LP stacked backside-illuminated CMOS sensor, engineered for high-resolution imaging with low power consumption. Featuring a 1/1.8-inch sensor with 1.4 µm pixels, it captures detailed colour images at resolutions up to 5120 × 3840. The AR2020 sensor offers enhanced near-infrared (NIR) response at 850 nm and 940 nm, supporting imaging in infrared-illuminated scenes. Enhanced Dynamic Range (eDR) and Line-Interleaved HDR (LI-HDR) modes help capture image details in challenging lighting conditions. Wake on Motion (WOM) and Super Low Power modes support energy-efficient, always-ready operation at the edge.



Key Features

- 20MP colour imaging with Onsemi AR2020 Hyperlux™ LP stacked BSI CMOS sensor
- Maximum resolution of 5120 × 3840 pixels
- 1/1.8-inch sensor with 1.4 µm pixel size
- Low-power sensor architecture
- Line-Interleaved HDR (LI-HDR) support
- Enhanced Dynamic Range (eDR) for challenging lighting conditions
- Enhanced near-infrared response at 850 nm and 940 nm
- Wake on Motion (WOM) and Super Low Power modes
- Multiple subsampling modes: binning, summing, and skipping
- Still-image capture at up to 20MP resolution
- JPEG (JPG) and BMP image formats
- Gigabit Ethernet connectivity with 100Base-T and 1000Base-T modes
- Power over Ethernet (PoE), compliant with IEEE 802.3a

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1. Introduction

The Vadzo Innova-2020CRS is a high-resolution 20MP GigE colour camera built around the Onsemi AR2020 Hyperlux™ LP stacked backside-illuminated CMOS image sensor. Designed for applications that demand detailed image acquisition, low power consumption, and flexible system integration, the camera delivers colour images at resolutions of up to 5120 × 3840 pixels. Its 1/1.8-inch sensor with 1.4 µm pixels provides high-resolution imaging in a compact, industrial camera platform.

The Onsemi AR2020 sensor incorporates advanced imaging capabilities designed to support a wide range of operating conditions. Enhanced Dynamic Range (eDR) and Line-Interleaved HDR (LI-HDR) modes help capture image details in scenes with challenging lighting conditions. The sensor also offers enhanced near-infrared sensitivity, supporting imaging applications that use infrared illumination at wavelengths such as 850 nm and 940 nm. Multiple subsampling capabilities, including binning, summing, and skipping, provide flexibility for different image acquisition requirements.

The Innova-2020CRS supports still-image capture at resolutions of up to 20MP, with images available in JPEG (JPG) and BMP formats. This enables applications that require high-resolution colour images for inspection, analysis, documentation, and image processing.

The Vadzo Innova-2020CRS is suitable for applications including machine vision, surveillance and security, retail analytics, biometrics, video conferencing, and 3D or stereo imaging, where high-resolution colour image acquisition and flexible system integration are important.

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2. Technical Specifications

Category	Parameter	Specification
General Information	Product Family	Innova Series
	Camera Model	Vadzo Innova-2020CRS
Sensor	Sensor	Onsemi AR2020 Hyperlux™ LP CMOS
	Sensor Format	1/1.8"
	Pixel Size	1.4 µm × 1.4 µm
	Maximum Resolution	20MP – 5120(H) × 3840(V)
	Shutter	Rolling Shutter
	Chroma	Colour
Camera Data	Interface	100Base-T and 1000Base-T
	Pixel Depth	12-bit
	Output Format	H.264, H.265, MJPEG
	Exposure Control	Manual and Auto-Exposure
Camera Hardware	Lens	S-Mount (M12 Standard)
	Lens FOV	41° DFOV, 73° DFOV, 111° DFOV
	Connector	Standard RJ45 Ethernet
	Power Supply	PoE, IEEE 802.3af (36–57 V)
	Operating Temperature	−30°C to 70°C
	Dimensions	38 mm × 38 mm, three-board design
	Weight	45 g (without lens)
Camera Software	Video Resolutions	VGA, HD, Full HD and 4K
	Video Formats	H.264 , H.265 and MJPEG
	Still Image Resolution	Up to 20MP (5120 × 3840)
	Image Capture Format	JPEG and BMP
	Image Capture Mode	Software trigger
	Camera Controls	Brightness, Exposure, Contrast, Sharpness, Saturation, Gamma, Gain and White Balance
	Additional Controls	CBR, VBR, Quality Control, Flip, IR Brightness and IR-Cut Filter Control
	OS Supported	Windows, Linux and Android
Conformity	Compliance	ONVIF Profile S, T and G; RoHS 3 and REACH

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3. Supported Resolutions and Frame Rates

3.1 Single Stream Mode

Resolution	H.264 (FPS)	H.265 (FPS)
640 × 480 (VGA)	80	80
1280 × 720 (HD)	60	60
1920 × 1080 (FHD)	60	60
3840 × 2160 (4K)	15	15

3.2 Multiple Stream Mode

Resolution	Stream 1 – H.264 (FPS)	Stream 2 – H.265 (FPS)
640 × 480 (VGA)	80	80
1280 × 720 (HD)	60	60
1920 × 1080 (FHD)	60	60
3840 × 2160 (4K)	15	15

4. Supported Camera Functions

The list of functions supported by the Innova-2020CRS camera includes:

- Resolution Control
- Image Format Setting
- Video Format Setting – H.264 and H.265
- Dual Stream Capability
- Still Image Capture upto 20MP
- Image Capture Rate of up to 7 FPS at 20MP
- Image Capture Software Trigger
- Gain Control – Auto and Manual
- Exposure Control – Auto and Manual
- White Balance – Auto and Manual
- Anti-Flicker – 50 Hz/60 Hz
- Contrast and Gamma Control
- Hue, Sharpness and Saturation Control

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5. GigE Interface

The camera features a standard RJ45 Ethernet interface supporting 100Base-T and 1000Base-T modes for flexible connectivity. Power over Ethernet (PoE), compliant with IEEE 802.3af, enables data communication and power delivery over a single Ethernet cable, simplifying installation and system integration. The GigE interface provides connectivity for camera control and image acquisition. Vadzo recommends using certified Ethernet cables for optimal performance and reliability.

6. Status LED

The status LEDs indicate the following connection states:

LED Colour	Indication
Green	Camera is powered ON and connected in 1000Base-T mode.
Orange	Camera is connected in 100Base-T mode.

7. IR LED Board

The IR LED board incorporates infrared illumination LEDs and IR-cut filter control to support imaging in different lighting conditions.

IR LED Brightness Control: The brightness of the IR LEDs can be adjusted through the web UI to suit the illumination requirements of the application.

IR-Cut Filter Control: The IR-cut filter supports two operating modes:

- Auto Mode: Automatically switches between day and night modes based on lighting conditions.
- Manual Mode: Allows users to switch between day and night modes through the web UI.

IR illumination and IR-cut filter settings provide flexible control for applications requiring colour imaging during the day and infrared-assisted imaging in low-light conditions.

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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% RH, non-condensing

9. Dimensions

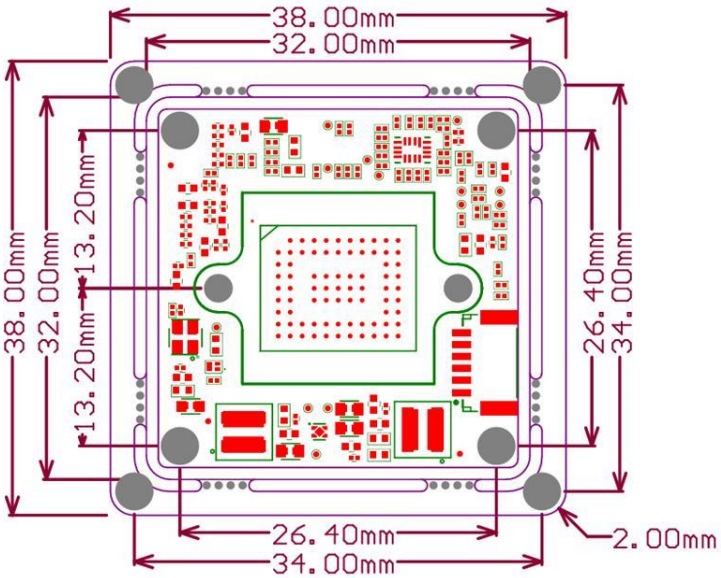
The Innova-2020CRS features a three-board camera design.

Board	Description
Board 1	Top Board – 2D drawing
Board 2	Base Board – 2D drawing
Board 3	ATR PoE Board – 2D drawing

Overall dimensions: 38 mm × 38 mm.

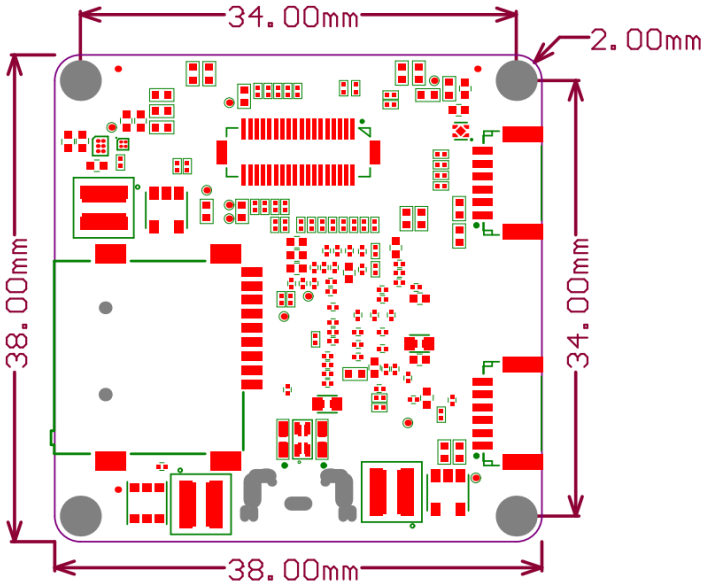
10. 2D Diagrams

10.1 Board 1: Top Board

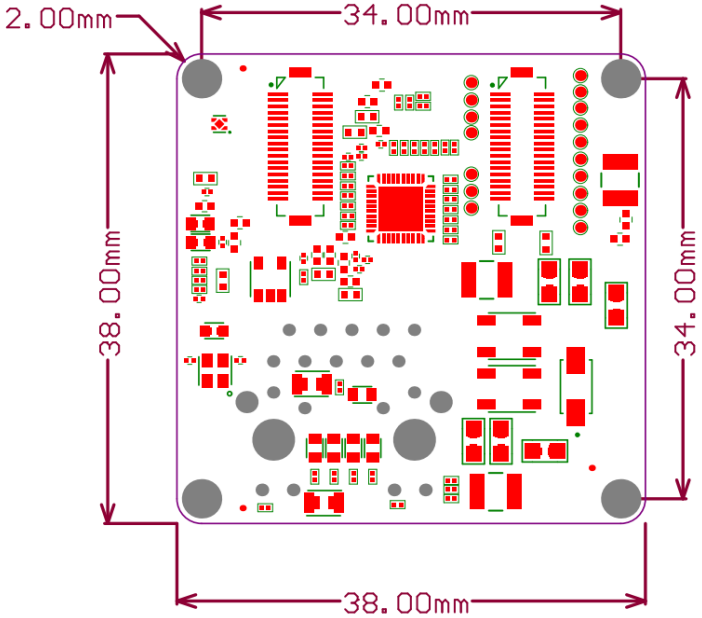


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10.2 Board 2: Base Board



10.3 Board 3: ATR PoE Board



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