

Vadzo Imaging launches 4K HDR USB camera portfolio for industrial vision, robotics, and advanced embedded systems

Advanced HDR imaging, high-resolution capture, and USB 3.2 Gen 1 UVC plug-and-play integration for demanding industrial and embedded vision applications

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/EINPresswire.com/ -- Vadzo Imaging, a global provider of embedded and industrial vision cameras, today announced a portfolio of high-resolution [4K HDR USB cameras](#) from its Falcon series, engineered for

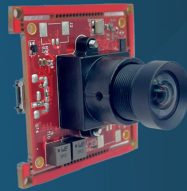
industrial inspection, robotics, AGV navigation, UAV imaging, and embedded edge AI applications. The portfolio, comprising the Falcon-830CRS, Falcon-821CRS, Falcon-1335CRA, and Falcon-2020MRS, combines advanced HDR imaging, high-resolution sensors, USB 3.2 Gen 1 connectivity, UVC plug-and-play operation, and support from the Vadzo VISPA ARC SDK, enabling OEMs and system integrators to deploy reliable vision systems in environments where lighting variability, integration complexity, and imaging accuracy directly affect operational outcomes.

Industrial vision systems operating in manufacturing, logistics, robotics, and inspection environments face a common set of constraints, high-contrast lighting from overhead fixtures, reflective surfaces, flickering artificial illumination, and the need for consistent image capture across continuous operation cycles. The Falcon series addresses these constraints at the sensor level, combining HDR modes, NIR sensitivity, low-power operation, and hardware trigger support with a compact board architecture that integrates directly into existing system designs without mechanical redesign.

Four Cameras. Four Distinct Capabilities. One Common Integration Path

[Falcon-830CRS - 4K HDR USB 3.2 Gen 1 UVC Camera](#) with Ultra-Low Power and Wake-on-Motion

The Falcon-830CRS is a 4K HDR USB 3.2 Gen 1 UVC camera built on the Onsemi AR0830 HyperLux™ LP sensor, 1/2.9" stacked BSI CMOS delivering 8MP resolution (3840 × 2160) at 30fps



HDR Imaging. Industrial-Grade. Ready for Integration.

Vadzo 4K HDR USB Cameras for Industrial & Embedded Vision
Falcon (USB 3.2 Gen 1) & Merlin (USB 2.0) Series Direct Global Availability for OEMs & System Integrator
Engineered for Drones, AGV's, AMR's, Smart Surveillance, and Kiosks.

- High Dynamic Range Imaging (~140dB HDR) for bright & dark scenes
- 4K Ultra HD Resolution & Low-Light Optimized
- USB 3.2 Gen 1 (Falcon) & USB 2.0 (Merlin) Interfaces
- UVC-Compliant Plug-and-Play Integration (Windows, Linux, Android)
- On-Board ISP: Noise Reduction, Tone Mapping & Exposure Optimization
- VISPA ARC SDK Support for ROI, Exposure, Triggering & Multi-Camera Control

4K HDR USB cameras

with a $1.4\mu\text{m} \times 1.4\mu\text{m}$ pixel. It supports Line Interleaved HDR (LI-HDR) and Enhanced Dynamic Range (eDR) modes alongside enhanced NIR sensitivity at 850nm and 940nm, making it suited for always-on embedded vision systems operating in variable and low-light industrial environments.

The AR0830 HyperLux™ LP sensor delivers the lowest power consumption among comparable offerings in the industry. Combined with Wake-on-Motion (WoM) and super low-power standby modes, the Falcon-830CRS is designed for event-driven imaging in power-constrained deployments - reducing processing overhead while maintaining 4K HDR capture capability. The compact board converts from $38\text{mm} \times 38\text{mm}$ to $32\text{mm} \times 32\text{mm}$, with GPIO support and S-Mount (M12) optics at a default 74° DFOV. Operating temperature range is -30°C to 70°C .

[Falcon-821CRS - 4K HDR USB 3.2 Gen 1 UVC Camera](#) with Industry-Leading 140dB Dynamic Range

The Falcon-821CRS is a 4K HDR USB 3.2 Gen 1 camera built on the Onsemi AR0821CS sensor, $1/1.7''$ BSI CMOS with 8.3MP resolution (3848×2168) and a $2.1\mu\text{m} \times 2.1\mu\text{m}$ DRPix™ BSI pixel. It delivers industry-leading embedded HDR (eHDR) capability exceeding 140dB, making it the strongest HDR performer in the Falcon portfolio and well suited for inspection environments with extreme lighting contrast, reflective surfaces, and simultaneously bright and dark regions within the same field of view.

The AR0821 sensor features a built-in statistics engine and supports multiple functional modes including binning, scaling, summing, windowing, context switching, and trigger. Applications include automated inspection lines, aerial imaging, AGV navigation, commercial surveillance, and retail analytics. The Falcon-821CRS operates across -30°C to 70°C with S-Mount optics and GPIO connectivity.

Falcon-1335CRA - 13MP 4K HDR USB Autofocus USB Camera with iHDR

The Falcon-1335CRA is a 13MP 4K autofocus USB 3.2 Gen 1 camera built on the Onsemi AR1335 sensor, $1/3.2''$ CMOS with a 4208×3120 pixel array and a $1.1\mu\text{m} \times 1.1\mu\text{m}$ BSI pixel. It supports 4K video at 30fps, 1080P at 60fps, and 720P at 120fps, with iHDR for reliable image capture across high-contrast scenes. The autofocus capability makes the Falcon-1335CRA particularly suited for document scanning, OCR, barcode reading, and inspection workflows where working distance varies or precise focus control is required.

The AR1335 incorporates 3D synchronization controls for stereo video capture, an on-chip temperature sensor, and programmable controls covering gain, exposure, frame size, image reversal, window size, and panning. The combination of 13MP resolution, 4K video, autofocus, and iHDR makes the Falcon-1335CRA suited for high-detail inspection, document processing, biometrics, and machine vision applications requiring both resolution depth and focus flexibility.

Falcon-2020MRS - 20MP Monochrome HDR USB 3.2 Gen 1 UVC Camera with 4K Binning and NIR Optimization

The Falcon-2020MRS is a 20MP monochrome USB 3.2 Gen 1 camera built on the Onsemi AR2020 HyperLux™ LP sensor, 1/1.8" stacked BSI CMOS with a 5120 × 3840 active pixel array and a 1.4µm × 1.4µm pixel. At full resolution it delivers 20MP imaging for applications requiring maximum detail capture. Through binning, the Falcon-2020MRS achieves 4K output, providing a flexible resolution path that allows the same camera to serve both ultra-high-resolution and bandwidth-optimized workflows within the same deployment.

The AR2020 sensor delivers the lowest power consumption in its class alongside enhanced NIR sensitivity at 850nm and 940nm, SmartROI, Wake-on-Motion, LI-HDR, and eDR. Global Reset Release (GRR), trigger, and context switching functional modes enable precise capture synchronization in multi-camera and time-critical industrial systems. The Falcon-2020MRS is suited for iris recognition, digital pathology, NIR surveillance, quality inspection, OCR, and machine vision applications where resolution is a primary design requirement.

Common Integration Platform

All four Falcon series cameras share a common integration foundation, USB 3.2 Gen 1 Type-C with backward compatibility to USB 2.0, full UVC compliance for driverless plug-and-play operation on Windows, Linux, and Android, and support for the Vadzo VISPA ARC SDK. The SDK provides APIs in C, C++, C#, and Python for ROI configuration, auto-exposure management, trigger and flash synchronization, binning, windowing, and firmware management, and is compatible with NVIDIA Jetson (all variants), Raspberry Pi 4 and 5, and any standard USB host.

"Industrial vision systems are increasingly being asked to perform in environments that were not originally designed for cameras such as variable lighting, tight spaces, and constrained power budgets," said Alwin Vincent, Product Manager, Vadzo Imaging. "The Falcon portfolio gives OEM teams a set of tools that address these constraints at the sensor level, so the engineering effort goes into the application rather than working around imaging limitations."

Target Applications

The Falcon-830CRS, Falcon-821CRS, Falcon-1335CRA, and Falcon-2020MRS are suited for industrial inspection and quality control systems because their HDR modes, eHDR at 140dB on the Falcon-821CRS, LI-HDR and eDR on the Falcon-830CRS and Falcon-2020MRS, and iHDR on the Falcon-1335CRA.

Robotics and AGV developers benefit from the Falcon series because the combination of HDR imaging, NIR sensitivity, hardware trigger support, and multi-camera synchronization via the VISPA ARC SDK enables accurate object recognition and navigation in warehouse and industrial

environments with mixed and variable ambient lighting.

UAV and drone manufacturers are suited to the Falcon-830CRS and Falcon-2020MRS because their compact board architecture, ultra-low power consumption, and HDR capability enable reliable aerial imaging across rapidly changing outdoor lighting conditions without adding significant payload weight.

Medical device and diagnostic equipment manufacturers benefit from the Falcon-1335CRA and Falcon-2020MRS because their autofocus capability, high resolution, and NIR optimization support pathology imaging, iris recognition, and diagnostic capture applications where image detail and focus accuracy directly affect clinical and analytical outcomes.

Document scanning and OCR system integrators benefit from the Falcon-1335CRA because its autofocus, 13MP resolution, and iHDR deliver sharp, high-detail capture across varying working distances and ambient lighting conditions - reducing error rates in automated document processing and barcode reading workflows.

Frequently Asked Questions

Which Falcon camera is best for industrial inspection with reflective surfaces and high-contrast lighting?

The Falcon-821CRS AR0821 4K HDR USB 3.2 Gen 1 UVC Camera is best suited for high-contrast industrial inspection because its Onsemi AR0821 sensor delivers eHDR exceeding 140dB, the highest dynamic range in the Falcon portfolio, preserving detail across bright highlights and deep shadows simultaneously. For always-on or power-constrained inspection deployments, the Falcon-830CRS offers LI-HDR and eDR with the lowest power consumption in its sensor class.

Which camera should I choose for document scanning, barcode reading, or OCR?

The Falcon-1335CRA AR1335 4K HDR USB 3.2 Gen 1 UVC Camera is best suited for document scanning and OCR because its autofocus capability, 13MP resolution, and iHDR deliver sharp, high-detail capture across varying working distances and ambient lighting conditions, reducing error rates in automated document processing workflows.

Can the Falcon-2020MRS deliver 4K output despite being a 20MP camera?

Yes. The Falcon-2020MRS AR2020 HDR USB 3.2 Gen 1 UVC Camera achieves 4K output through binning, providing a flexible resolution path that allows the same camera to serve both ultra-high-resolution 20MP workflows and bandwidth-optimized 4K deployments within the same system architecture.

Are all four cameras compatible with NVIDIA Jetson and Raspberry Pi?

Yes. All Falcon series cameras are UVC-compliant and compatible with NVIDIA Jetson (all variants) and Raspberry Pi 4 and 5, as well as any Linux, Windows, or Android host with a standard USB controller. The VISPA ARC SDK supports direct integration into vision pipelines on these platforms.

Do these cameras support multi-camera synchronization for industrial automation?

Yes. The cameras support hardware trigger control, flash synchronization, and multi-camera coordination for all Falcon series cameras, enabling coordinated imaging across inspection lines, robotics systems, and UAV fleets with consistent timing and exposure control.

Availability

The Falcon-830CRS USB 3.2 Gen 1 Camera, Falcon-821CRS USB 3.2 Gen 1 Camera, Falcon-1335CRA USB 3.2 Gen 1 Camera, and Falcon-2020MRS USB 3.2 Gen 1 Camera are available now for OEM evaluation and production deployment. Engineering teams can access technical documentation, evaluation units, and direct applications engineering support through Vadzo's online store at vadzoimaging.com. For volume orders, and OEM customization, contact support@vadzoimaging.com.

About Vadzo Imaging

Vadzo Imaging develops high-performance embedded and machine vision cameras for OEMs and system integrators building next-generation intelligent systems. The company delivers imaging platforms across USB, MIPI, GigE, Wi-Fi, and SerDes interfaces, supporting applications in industrial automation, robotics, healthcare, smart mobility, and edge AI. Beyond hardware, Vadzo provides end-to-end imaging expertise including sensor integration, ISP tuning, firmware development, and software platforms that accelerate development and deployment at scale.

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