

Vadzo Imaging Launches Vajra-235CGS: 2.3 MP Global Shutter USB 3.2 Gen 2×2 Camera based on Onsemi AR0235 HyperLux(TM) SG

*2MP Color Global Shutter Camera
Featuring the Onsemi® AR0235
HyperLux™ SG Sensor and Infineon EZ-
USB™ FX20 with 20 Gbps USB 3.2 Gen
2×2 Streaming*

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/EINPresswire.com/ -- Vadzo Imaging today announced the launch of the Vajra-235CGS, a high-speed 2.3 MP Color Onsemi AR0235 [global shutter USB 3.2 Gen 2×2 UVC camera](#) designed for motion-critical machine vision and

embedded AI systems. Powered by the Onsemi® AR0235 HyperLux™ SG image sensor and the Infineon EZ-USB™ FX20 controller, the camera enables dual-lane 20 Gbps image streaming over a single USB-C interface, providing significantly higher throughput than conventional USB vision cameras. This architecture allows developers to capture and process high-speed image data with minimal latency and consistent bandwidth, making it well suited for robotics, industrial inspection, and real-time automation environments.

The AR0235 HyperLux™ SG sensor features a 1/2.8-inch 2.3 MP global shutter architecture (1920 × 1200) optimized for accurate capture of fast-moving scenes at high frame rates while maintaining low noise and excellent image clarity. The sensor's advanced pixel design ensures artifact-free motion capture without rolling distortion, which is essential for robotics guidance, barcode scanning, and automated quality inspection. Combined with onboard image processing, dynamic ROI control, and full UVC plug-and-play compatibility across Windows, Linux, and embedded platforms, the Vajra-235CGS, [AR0235 global shutter camera](#) enables rapid integration into next-generation vision systems ranging from industrial automation and smart retail to AI-powered embedded devices.

Core Capabilities of the Vajra-235CGS AR0235 Color Global Shutter USB 3.2 Gen 2x2 Camera

Ultra-High-Bandwidth USB 3.2 Gen 2×2 Interface - The Vajra-235CGS leverages Vadzo's dual-lane



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USB 3.2 Gen 2×2 architecture, powered by the Infineon EZ-USB™ FX20 controller, to deliver up to 20 Gbps image streaming over a single USB-C interface. This high-throughput design enables reliable transmission of high-speed image data with low latency and consistent bandwidth, supporting motion-critical machine vision, robotics, and industrial automation systems.

2.3 MP HyperLux™ SG Global Shutter Imaging - At the heart of the camera is the Onsemi® AR0235 HyperLux™ SG image sensor, featuring a 1/2.8-inch optical format with 1920 × 1200 active pixels. The sensor's advanced global shutter architecture captures fast-moving scenes without motion distortion, ensuring accurate object detection and measurement in high-speed industrial applications. The sensor is also capable of high-frame-rate capture of moving scenes, enabling reliable vision performance in robotics and automation environments.

High Image Fidelity in Dynamic Lighting - The HyperLux™ SG sensor architecture delivers low noise performance, high linear full-well capacity, and excellent global shutter efficiency, producing clear and stable images in both bright and low-light conditions. These characteristics make the camera well suited for environments such as factory automation, scanning systems, and smart devices where lighting conditions can vary.

Advanced Sensor Controls for Application Optimization - The Vajra-235CGS provides flexible sensor-level configuration capabilities, including dynamic Region-of-Interest (ROI) selection, pixel binning, windowing, and frame timing control. These features allow developers to increase frame rates, optimize bandwidth usage, and focus processing on critical regions within a scene.

Integrated Image Signal Processing - An onboard image signal processor (ISP) performs the complete color processing pipeline, including demosaicing, automatic exposure, white balance adjustment, and noise reduction. By executing these functions on-camera, the system reduces dependency on host processing resources and improves overall end-to-end imaging efficiency for embedded vision platforms.

Flexible Software Integration - The Vajra-235CGS, [2MP global shutter camera](#) is fully UVC compliant, enabling plug-and-play operation across Windows, Linux, and embedded platforms. Developers can also leverage the Vadzo VISPA ARC SDK for deeper control over sensor configuration, image parameters, and streaming pipelines using C, C++, C#, and Python APIs.

VISPA ARC SDK for Developer Integration

The Vadzo VISPA ARC SDK provides developers with a powerful software framework to configure, control, and integrate the Vajra-235CGS camera into industrial and embedded vision systems. Designed for rapid system integration and flexible deployment, the SDK enables direct access to camera parameters, streaming controls, and sensor configuration for high-performance imaging applications.

Through VISPA ARC, developers can configure dynamic Regions of Interest (ROI) to optimize field

of view and increase processing efficiency. The SDK also supports ROI-based Auto Exposure, enabling stable and consistent image acquisition even in scenes with uneven illumination.

For motion-sensitive applications such as robotics, industrial inspection, and automated scanning, the SDK provides hardware trigger control and flash synchronization, ensuring accurate timing for image capture. Developers can further access advanced sensor functions including binning, windowing, and frame timing adjustments, allowing the camera to be tuned for specific performance requirements.

The VISPA ARC SDK also includes tools for camera configuration management, firmware updates, and system diagnostics, simplifying deployment and lifecycle management for OEM devices.

Supported Programming Languages: C, C++, C#, Python

Supported Platforms: Windows, Linux, and embedded systems

Target Applications

The Vajra-235CGS global shutter camera is designed for vision systems that require accurate motion capture, reliable high-speed imaging, and low-latency data transfer. Typical applications include:

Industrial Automation and Machine Vision: High-speed conveyor inspection, automated quality control, and precision measurement systems encounter consistent challenges from motion blur and geometric distortion when cameras cannot capture the full frame simultaneously. The Vajra-235CGS global shutter captures every pixel at the same moment, eliminating distortion on fast-moving parts and ensuring dimensional measurements and surface defect classifications are based on undistorted geometry. Dynamic ROI control further optimizes throughput for line-scan-style configurations where only a horizontal strip across the frame is relevant to the inspection task.

Autonomous Robots and Mobile Platforms: AGVs and AMRs operating in warehouse and factory environments encounter variable ambient lighting, mixed fluorescent and LED zones, reflective floor markings, and rapid camera motion during transit. Rolling shutter cameras introduce barcode and QR code skew at robot travel speeds that exceed acceptable tolerances for reliable read rates. The Vajra-235CGS global shutter eliminates skew distortion at full platform speed, while the onboard ISP's automatic exposure control maintains stable image brightness across lighting transitions without manual reconfiguration. The USB-C interface and compact form factor simplify direct integration onto AGV and AMR chassis.

Scanning and Smart Retail Systems: Barcode readers, smart checkout systems, and ID verification kiosks require cameras that can reliably decode symbologies under inconsistent ambient lighting and at varying subject distances. The Vajra-235CGS, 2MP color global shutter camera captures clean, undistorted barcode and QR code images across a wide range of

presentation speeds, while the onboard white balance and exposure processing adapts to mixed lighting environments common in retail and logistics settings. UVC compliance enables plug-and-play integration into existing kiosk and terminal architectures without driver development.

3D Imaging and Structured-Light Systems: Structured-light depth sensing requires precise, distortion-free capture of projected fringe or dot patterns at the exact moment of illumination. The Vajra-235CGS hardware trigger input and flash synchronization output, accessible via the VISPA ARC SDK, allow the camera to fire in exact coordination with the structured-light projector. Global shutter ensures the full projected pattern is captured simultaneously without the per-row timing offset that causes phase errors in fringe analysis. The sensor's low noise characteristics support reliable pattern deformation measurement at the low contrast levels encountered in metrology and dimensional inspection applications.

Medical and Scientific Instrumentation: Digital microscopy, laboratory automation, and diagnostic imaging systems require consistent, high-fidelity image output across extended operating periods. The Vajra-235CGS global shutter eliminates motion artifacts during automated stage traversal, while onboard ISP processing delivers color-calibrated output suitable for visual analysis and downstream machine learning classification. UVC compliance simplifies integration into laboratory workstation and embedded controller environments without custom driver development.

Embedded Vision and Edge AI Devices: Compact vision modules for AI inference, drones, smart infrastructure monitoring, and always-on embedded devices benefit from the Vajra-235CGS's combination of high-bandwidth USB-C output, onboard ISP preprocessing, and UVC plug-and-play operation. The camera delivers inference-ready color frames to the host at high frame rates while minimizing the host-side preprocessing overhead that constrains throughput on power- and resource-constrained edge platforms. ROI configuration further reduces per-frame data volume for applications where full-frame inference is unnecessary.

Frequently Asked Questions

What imaging advantages does the Onsemi AR0235 HyperLux™ SG sensor provide compared to earlier AR0235 variants?

The HyperLux™ SG designation reflects Onsemi's updated pixel architecture targeting higher linear full-well capacity and improved global shutter efficiency. Higher full-well capacity extends the sensor's usable dynamic range before highlight saturation — important in industrial environments where specular reflections from metal or glass surfaces coexist with dark regions in the same frame. Improved global shutter efficiency reduces image lag and kTC noise under global shutter readout, producing cleaner frames at high frame rates without the noise floor increase that affected earlier CMOS global shutter designs at speed.

Is the Vajra-235CGS suitable for structured-light 3D imaging, and what sensor and interface

features support this?

Structured-light systems project a known pattern onto a surface and derive depth from deformation in the reflected pattern. This requires the camera to capture the projected pattern at the precise moment of illumination and to do so without the row-timing offset that rolling shutter introduces into fringe phase analysis. The Vajra-235CGS global shutter captures the full projected pattern simultaneously. Hardware trigger input and flash synchronization, accessible via the VISPA ARC SDK, allow the camera to fire in exact coordination with the projector. The sensor's low noise and high full-well capacity support reliable phase extraction at the low-contrast pattern deformation levels encountered in fine metrology applications.

What does dynamic ROI control enable, and when is it practically relevant in robotics and automation?

In most robotics and inspection deployments, only a portion of the sensor's full 1920×1200 field contains relevant information at any given time. A barcode reader may only need a horizontal strip across the frame center, while a robotic guidance system may track a small region around a detected part. Streaming the full frame in these cases wastes USB bandwidth and increases host processing latency. Dynamic ROI allows the active pixel region to be defined on the sensor itself, so only that area is read out and transmitted. Reducing the active pixel count directly increases achievable frame rates and lowers per-frame data size, enabling faster control loop rates without sacrificing image quality in the region that matters.

What does UVC compliance mean for cross-platform deployment and OEM integration?

UVC (USB Video Class) is a standardized USB device class that allows cameras to operate without custom kernel drivers on any compliant operating system. The Vajra-235CGS enumerates as a standard video device on Windows, Linux, and embedded Linux distributions, including platforms running on Raspberry Pi, NVIDIA Jetson, and similar SBCs. This eliminates driver qualification from the integration process and simplifies deployment across heterogeneous OS environments in multi-site or multi-platform production systems. For OEMs shipping into customer environments with managed IT infrastructure, plug-and-play operation without driver installation is a practical requirement the Vajra-235CGS meets out of the box.

Availability

The Vajra-235CGS color global shutter USB 3.2 Gen 2×2 camera is available for OEM evaluation and production deployment. Engineering samples, technical documentation, and integration support are available through Vadzo Imaging. Customers can request evaluation units, customization options, and design-in assistance to accelerate development of robotics, industrial automation, smart retail, and embedded vision systems. For technical inquiries, pricing, or sample requests, visit www.vadzoimaging.com or contact the Vadzo Imaging sales team.

About Vadzo Imaging

Vadzo Imaging designs and manufactures embedded vision cameras and imaging platforms for OEMs building next-generation intelligent systems. The company develops camera solutions across USB, MIPI, GigE, Wi-Fi, and SerDes interfaces, supporting applications in industrial automation, robotics, healthcare devices, smart infrastructure, and edge AI. Beyond camera hardware, Vadzo provides end-to-end imaging expertise, including sensor integration, ISP tuning, firmware development, and software tools that help customers accelerate product development and deploy reliable vision systems at scale.

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