Vadzo Imaging Demonstrates Production-Ready 13MP MIPI CSI-2 Camera Integration on Raspberry Pi 5

13MP Camera Streaming with Native V4L2 and Linux Media Controller Enables High-Resolution Embedded Vision on Raspberry Pi 5

AR1335 13MP MIPI CSI-2 Camera

JERUSALEM, ISRAEL, June 1, 2026 /EINPresswire.com/ -- Vadzo Imaging today announced the successful validation of its Bolt-1335CRO 13MP autofocus camera with color optical image stabilization (OIS) MIPI CSI-2 camera on Raspberry Pi 5, demonstrating a production-ready approach for high-resolution camera integration using a fully native Linux pipeline. The validation confirms that developers can integrate a MIPI CSI-2 camera with Raspberry Pi 5 to achieve stable 13MP image capture, deterministic video streaming, and full sensor control using the Linux media controller and V4L2 framework, without relying on proprietary middleware.

By leveraging the enhanced CSI bandwidth of Raspberry Pi 5, the system supports reliable streaming at both Full HD (1920 × 1080 @ 30 FPS) and full 13MP resolution (4208 × 3120). This enables developers building embedded vision systems on Raspberry Pi 5 for robotics, industrial automation, smart retail, and AI-based edge applications

Native MIPI CSI-2 Camera Integration on Raspberry Pi 5 Using V4L2

The validated system demonstrates how to integrate an MIPI CSI-2 camera on Raspberry Pi 5 using V4L2 and the Linux media controller framework. Unlike USB-based camera architectures that rely on external bridge hardware, the MIPI CSI-2 interface provides direct sensor-to-processor communication, resulting in:

Lower latency and higher bandwidth efficiency

Deterministic frame delivery for real-time systems

Direct access to sensor-level controls

"The integration of this OIS camera is implemented using the Linux media controller framework and V4L2 subsystem, including:

Device Tree overlay configuration

Kernel driver initialization

Firmware-based sensor configuration

Media pipeline setup and negotiation

Once initialized, the camera registers as standard V4L2 capture and sub-device nodes, allowing developers to use GStreamer pipelines and OpenCV applications on Raspberry Pi 5 without additional middleware layers.

13MP Image Streaming Performance on Raspberry Pi 5

Vadzo's validation confirms the 13MP autofocus camera streaming on Raspberry Pi 5 remains stable across multiple configurations, including:

1920 × 1080 @ 30 FPS (Full HD)

4208 × 3120 (13MP full resolution capture)

Media pipeline configuration was verified for each resolution to ensure correct negotiation before streaming. Full-resolution capture was successfully validated using runtime scaling in GStreamer pipelines, demonstrating that Raspberry Pi 5 can handle high-bandwidth 13MP camera workloads while maintaining predictable performance.

Advanced Imaging Control Using V4L2

The Bolt-1335CRO OIS camera enables full control through standard V4L2 interfaces on Raspberry Pi 5, allowing developers to adjust:

Brightness, contrast, and saturation

Automatic and manual exposure

Automatic and manual white balance

Horizontal and vertical image flipping.

Switching between automatic and manual modes was validated during live streaming, ensuring smooth parameter transitions and stable image output, which is critical for controlled imaging environments.

What This Means for Developers

This validation demonstrates how to use a MIPI CSI-2 camera with Raspberry Pi 5 in production systems. Developers can:

Integrate a Raspberry Pi 5 camera using MIPI CSI-2 without proprietary drivers.

Achieve stable 13MP image streaming with deterministic performance.

Use standard Linux tools such as V4L2, GStreamer, and OpenCV.

Access low-level camera controls for advanced image tuning

Build production-grade embedded vision systems on Raspberry Pi 5

Executive Quote

"Developers need more than just a sensor to build reliable vision systems," said Ashu Gupta, Product Manager at Vadzo Imaging. "Our work with the Bolt-1335CRO on Raspberry Pi 5 shows how to achieve stable, high-resolution performance in real-world deployments."

Applications Enabled by High-Resolution CSI Cameras on Raspberry Pi 5

The validated solution enables a wide range of Raspberry Pi 5 embedded vision applications:

Industrial Automation and Inspection - High-resolution image capture for defect detection, quality inspection, and continuous production monitoring.

Robotics and Autonomous Systems - Vision systems for navigation, object detection, and real-time feedback in AGVs, AMRs, and robotic arms.

Smart Retail and Intelligent Systems - Shelf analytics, product recognition, and AI-driven customer interaction systems requiring accurate color reproduction.

Medical and Diagnostic Imaging - Applications requiring precise color rendering and stable exposure control for clinical and analytical workflows.

Expanding the Bolt MIPI CSI-2 Portfolio

The Bolt-1335CRO is part of Vadzo Imaging's MIPI CSI-2 camera portfolio for Raspberry Pi 5 and embedded platforms. The portfolio includes color and monochrome cameras across multiple resolutions, supported by validated firmware, Linux drivers, and full V4L2 compatibility.

By enabling high-resolution camera integration on Raspberry Pi 5, Vadzo continues to advance scalable imaging solutions for robotics, automation, and edge AI applications.

Frequently Asked Questions:

1) What is the Bolt-1335CRO, and what makes it unique?

The Bolt-1335CRO is a 13MP autofocus OIS camera with MIPI CSI-2 interface, validated on Raspberry Pi 5. It stands out by offering stable, high-resolution imaging using a fully native Linux pipeline without any proprietary middleware.

2) What resolutions does the 13MP autofocus camera support on Raspberry Pi 5?

The 13MP autofocus camera supports Full HD (1920 × 1080 @ 30 FPS) for smooth video streaming and full 13MP resolution (4208 × 3120) for high-resolution image capture.

3) Does the OIS camera require proprietary drivers on Raspberry Pi 5?

No. The OIS camera integrates using standard Linux tools V4L2, GStreamer, and OpenCV with no proprietary drivers or middleware required.

4) What industries is the Raspberry Pi 5 camera suited for?

The Raspberry Pi 5 camera is suited for industrial automation, robotics, smart retail, and medical imaging, any application requiring high-resolution, stable, and color-accurate embedded vision.

About Vadzo Imaging

Vadzo Imaging develops embedded vision cameras and imaging platforms for Raspberry Pi, embedded Linux systems, and OEM devices. The company specializes in MIPI CSI-2 and USB camera integration, Linux media framework development, ISP tuning, and firmware customization, enabling customers to build production-ready embedded vision solutions.

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