

PolarFire® FPGA Ethernet Sensor Bridge for NVIDIA® – Revision 2.0

Compact, Cost-Optimized Sensor Bridge With Support for up to Four Cameras

Summary

The PolarFire® FPGA Ethernet Sensor Bridge Rev 2.0 is a compact, out-of-the-box ready sensor-bridging platform designed to accelerate AI application development with NVIDIA® IGX™ and Thor™, plus Jetson AGX Orin™ developer platforms.

Built on the PolarFire MPF200T FPGA, the platform helps developers replace complex proprietary sensor interfaces with a more flexible Ethernet-based architecture, simplifying sensor integration and enabling deterministic, low-latency data pipelines for edge AI design.

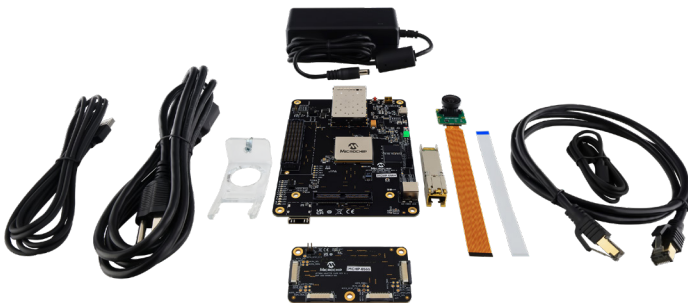
Rev 2.0 adds support for up to four MIPI® CSI-2® cameras, a 60% smaller form factor, direct compatibility with NVIDIA developer platforms, integrated latency measurement circuitry and FMC expansion for future interface support. It is well suited for evaluating and developing AI-driven systems for robotics, industrial automation, medical imaging and embedded vision.

Support for additional protocols, including CoaXPress®, SLVS-EC™, SDI, and JESD204B, is currently in development and will be available soon. For more information on upcoming releases, please contact FPGA_Marketing@microchip.com.

Key Features

- **Multi-Camera MIPI Support:** Rev 2.0 supports up to four MIPI CSI-2 cameras, enabling more scalable sensor architectures for stereo vision, sensor fusion and multi-view perception in edge AI systems. It also adds an FMC expansion connector to support future interface growth beyond standard MIPI, including options such as SLVS-EC, SDI, HDMI, and DisplayPort™ bridging without redesigning the core platform.
- **Compact, Cost-Optimized Platform:** Rev 2.0 delivers a 60% smaller form factor than the first-generation platform and is positioned to reduce overall system cost, making it better suited for space-constrained AI and embedded vision development.
- **Streamlined NVIDIA Developer Platform Connectivity:** Rev 2.0 adds direct NVIDIA Jetson™ connector compatibility and is pre-programmed for NVIDIA IGX and Thor, plus AGX Orin development kits, simplifying out-of-box setup for AI application development.
- **Deterministic Ethernet Sensor Pipeline:** Built on the PolarFire MPF200T FPGA, the platform converts sensor inputs into Ethernet-based data streams for deterministic, low-latency sensor ingestion and real-time AI processing. On-board latency measurement circuitry supports precise end-to-end performance validation from sensor capture to inference.
- **Low-Power PolarFire FPGA Architecture:** The platform leverages PolarFire FPGA technology for power-efficient, real-time sensor preprocessing and packetization, making it well suited for embedded vision, robotics and other power-sensitive edge systems.
- **NVIDIA Holoscan Integration:** Rev 2.0 works with the NVIDIA Holoscan sensor processing platform and Holoscan Sensor Bridge SDK, helping developers accelerate AI pipeline creation with optimized software components and sensor-to-AI workflow support.

Part number: MPF200-ETH-SENSOR-BRIDGE-R2



Advantages

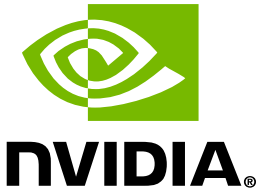
- 60% smaller platform (vs. prior version) with native Jetson connectivity for easier embedded integration.
- Validated end-to-end solution helps reduce integration risk, development time, and total system cost.
- Supports up to four cameras and future interface expansion through FMC. One camera included in base kit.
- PolarFire FPGA foundation delivers deterministic, low-power sensor processing.
- On-board latency measurement helps validate real-time performance.

Target Applications

- Robotics and humanoids
- Industrial automation and machine vision
- Automotive and autonomous sensing
- Medical imaging
- Smart infrastructure and video analytics

How the PolarFire FPGA Ethernet Sensor Bridge Rev 2.0 Connects to NVIDIA Devices

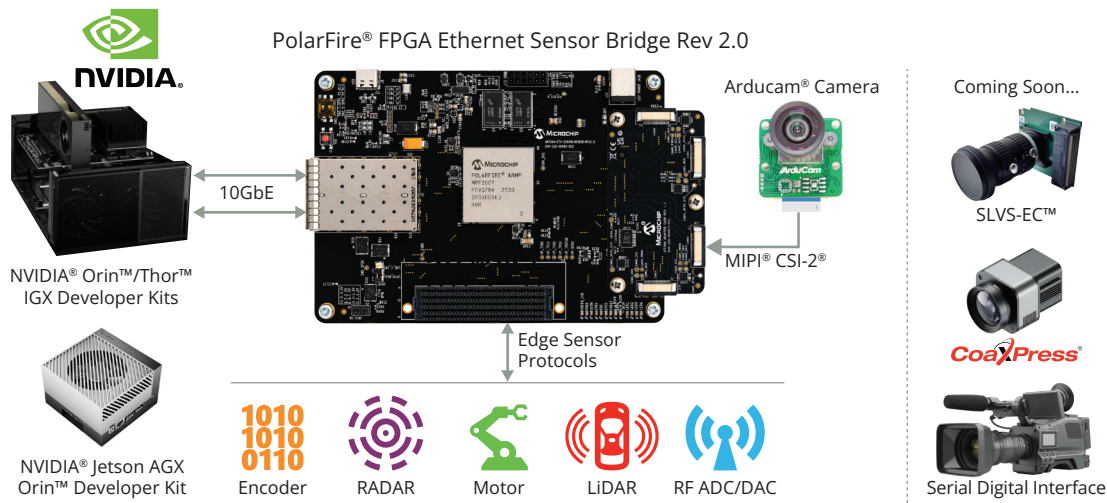
The PolarFire FPGA Ethernet Sensor Bridge Rev 2.0 connects MIPI CSI-2 sensor data to NVIDIA Orin development kits over dual 10 GbE Ethernet for use with the NVIDIA Holoscan Sensor Bridge workflow. It is based on the PolarFire MPF200T FPGA, supports up to four MIPI CSI-2 cameras, and adds native Jetson connector support to simplify connection to NVIDIA IGX and Thor, plus the Jetson AGX Orin development kit.



Here’s how it integrates with NVIDIA’s ecosystem:

- **Sensor-to-Ethernet bridging:** Rev 2.0 receives MIPI CSI-2 camera inputs and packetizes the data for transport over dual 10 GbE Ethernet SFP+ into the NVIDIA Holoscan pipeline.
- **Holoscan workflow support:** The platform works with the NVIDIA Holoscan Sensor Bridge SDK v2.5.X, which is the software environment identified in the Rev 2.0 materials.
- **Direct NVIDIA kit compatibility:** Rev 2.0 includes native Jetson connector support, and the materials state it is pre-programmed for NVIDIA Orin AGX and IGX development kits.
- **Latency visibility:** The Holoscan Sensor Bridge IP adds timestamping so the GPU can read timing information and measure data-path and pipeline latency.
- **Scalability:** Rev 2.0 expands support to up to four MIPI CSI-2 cameras and includes an FMC expansion connector for future interface growth.

Connecting Sensors with the PolarFire Ethernet Sensor Bridge Rev 2.0



For Additional Information including App Note and User Guide

- [PolarFire FPGA Ethernet Sensor Bridge Product Page](#)
- [PolarFire FPGA Ethernet Sensor Bridge Solution Page](#)

Part Number

Part Number	Sensor Protocols	Ethernet Ports	Memory
MPF200-ETH-SENSOR-BRIDGE-R2	MIPI® CSI-2® Note: CoaXPress®, SLVS-EC™, SDI, JESD204B protocols will be supported soon	Two 10 GbE SFP+	2 GB DDR4

