

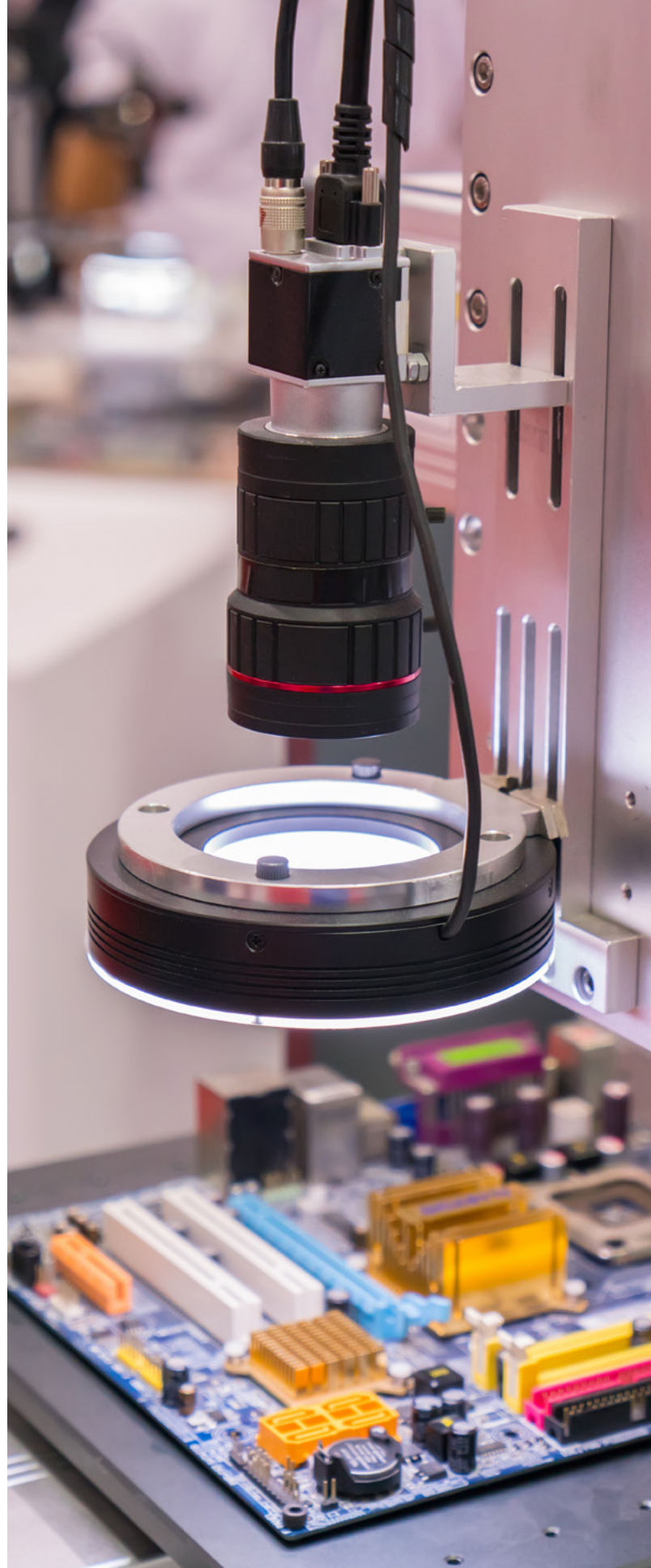
SOLUTION BRIEF

Easily Deploying Industrial Machine Learning with OnLogic and Edge Impulse

Introduction

As the demand for intelligent devices grows, organizations are increasingly moving processing to the edge to unlock real-time insights and reduce operational costs. OnLogic and Edge Impulse have partnered to simplify this transition, combining industrial-grade hardware with the industry-leading machine learning operations (MLOps) platform for edge AI. Central to this solution is the OnLogic Factor 101 (FR101), a high-performance computer powered by Qualcomm® technology. This collaboration makes onboarding advanced AI onto Qualcomm silicon seamless, allowing teams to move from prototype to production deployment with unprecedented speed.

Let's dive in.



The Challenge

Deploying AI at the edge typically presents technical challenges, including:

1. **Harsh industrial environments:** Industrial settings feature extreme dust, wide temperature fluctuations, and continuous vibration that cause standard commercial hardware to fail.
2. **Complex silicon architectures:** Capitalizing on new hardware architectures like Qualcomm often requires specialized low-level programming expertise, creating a steep learning curve for development teams.
3. **High data throughput requirements:** Real-time computer vision applications demand massive data throughput, frequently bottlenecking standard edge gateways.
4. **Model optimization bottlenecks:** Selecting and optimizing the right AI model for specific hardware latency and memory constraints can consume months of engineering resources.





The Solution: A Unified AI Stack for the Edge

The combined OnLogic and Edge Impulse solution provides a "unified stack" that bridges the gap between sophisticated AI models and rugged physical environments.

OnLogic provides the "brawn" with the FR101, a fanless, industrial-grade system built around the Qualcomm QCS6490 processor. This partnership ensures models are "Edge Impulse Ready," making it easy to harness Qualcomm's high-performance NPU without deep low-level coding.

Edge Impulse provides the "brains," offering an intuitive MLOps platform to collect & prepare data, as well as train, optimize, and monitor models, specifically for the target hardware's constraints. The platform combines automation, low-code development tools, and scalable deployment workflows to simplify the edge AI development lifecycle. The Visual Inspection application developed by Edge Impulse and utilized by this solution, accelerates development & deployment of any smart quality management strategy with an out-of-the-box, complete AI-based computer vision application.

For more information, visit:

www.edgeimpulse.com/visual-inspection

Use Cases

- **Visual inspection, anomaly detection and quality control:** Detect abnormal data or defects like cracks, scratches, etc on parts in fast model production line.
- **Worker safety:** Implement PPE compliance before entry to the work area by detecting and monitoring keep-out/safety line violations to automatically halt heavy machinery.
- **Asset and inventory tracking:** Automate the counting process of items like pallets and inventory in warehouse environments.
- **Predictive maintenance:** Use sensor fusion (vibration, acoustic, and environmental data in one model) to detect machinery failure before it occurs.



Why OnLogic

Reliable AI deployment requires hardware that can match the sophistication of the software while surviving the rigors of the field. The OnLogic FR101 provides a stable, industrial-grade foundation that prevents thermal throttling and protects internal components from the environmental hazards common in factories and warehouses.

- **Industrial ruggedness:** Fanless designs built to withstand dust, debris, and vibration in manufacturing facilities.
- **High-speed connectivity:** The FR101 features a 10 GbE LAN port designed to eliminate data bottlenecks in high-resolution vision applications.
- **15-year lifecycle support:** The QCS6490 chip features a long-term availability guarantee, ensuring your project remains stable and reproducible for years to come.

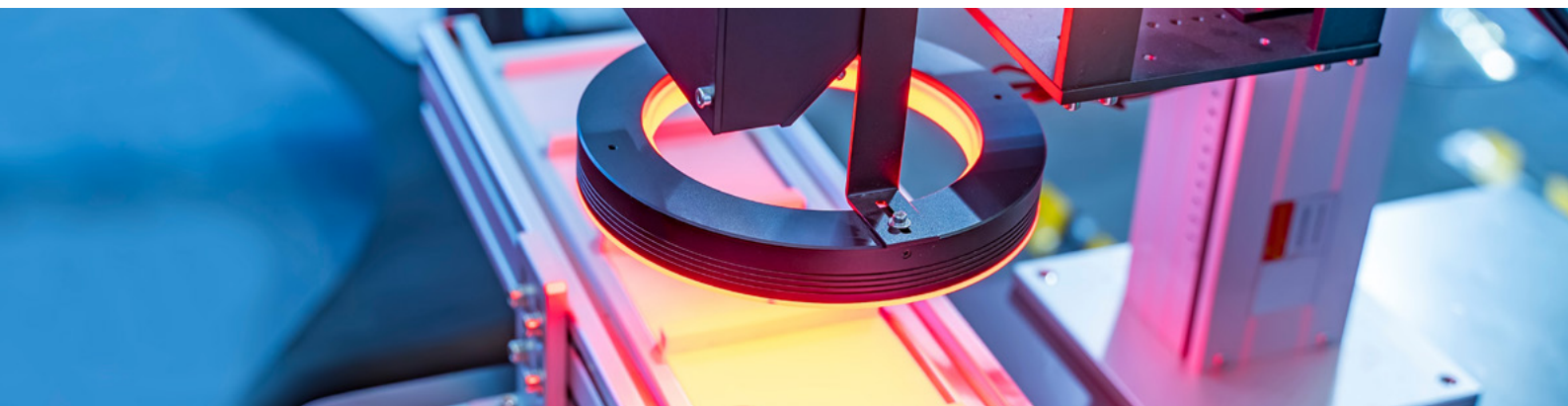
Why Edge Impulse

Successful deployment requires selecting an efficient software platform that can transform raw sensor data into actionable intelligence without the burden of manual coding. The Edge Impulse MLOps platform reduces complexity, simplifies the edge AI development lifecycle, and accelerates time to value through key platform capabilities:

- **Unified development workflow:** Go from raw data collection and preparation, and AI experimentation, to one-click deployments to Qualcomm-based hardware.
- **Industry ready models:** FOMO, FOMO-AD, and YOLO-Pro were designed to run on Edge devices for industrial applications.
- **Model search:** EON Tuner automatically finds the best computer vision model for your application within the specific latency and memory constraints of the FR101.
- **Deep Qualcomm integration:** Optimized models specifically for the Qualcomm Hexagon™ NPU, ensuring maximum performance and power efficiency.

Key Capabilities

1. **Real-time edge inference** — Achieve rapid on-device processing with the FR101's high-performance hardware.
2. **Ultra-small form factor** — Industrial-grade power in a palm-sized chassis designed for tight enclosures.
3. **Support for 5 concurrent cameras** — Capable of running multiple high-resolution streams for real-time tracking.
4. **On-device privacy** — Local processing ensures sensitive data remains secure within your facility.



ONLOGIC



EDGE IMPULSE

Get Started Today

Deploying machine learning models on industrial hardware is easier than ever.
Learn how to configure the FR101 with Edge Impulse by reviewing [this setup guide](#).

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