

IOT PLATFORM FOR HIGH-PRECISION SEISMIC AND STRUCTURAL MONITORING



We present an IoT-enabled sensing platform for high-fidelity seismic and structural vibration monitoring, addressing the growing need for scalable and reliable structural health monitoring of ageing infrastructure. The system bridges the gap between laboratory-grade precision and industrial deployment, enabling real-time data acquisition in demanding environments.

The platform combines Power over Ethernet (PoE) and Transmission Control Protocol/TCP-based communication for integrated power and high-bandwidth data transfer over a single cable. It incorporates high-performance commercial MEMS sensors and Message Queuing Telemetry Transport/MQTT-based alerting architecture, enabling autonomous operation, real-time notification delivery, and seamless integration with centralised monitoring or cloud-based analytics systems.

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+ Key benefits

Integrated power and data: PoE/TCP simplifies installation and eliminates the need for local power supply or battery maintenance

High-fidelity sensing: commercial MEMS sensors provide seismic-grade vibration data suitable for modal analysis

Scalable alerting architecture: MQTT-based messaging system for real-time threshold monitoring and low-latency alerts

Rapid deployment: standardised components support fast scaling across large infrastructure assets

+ Suggested applications

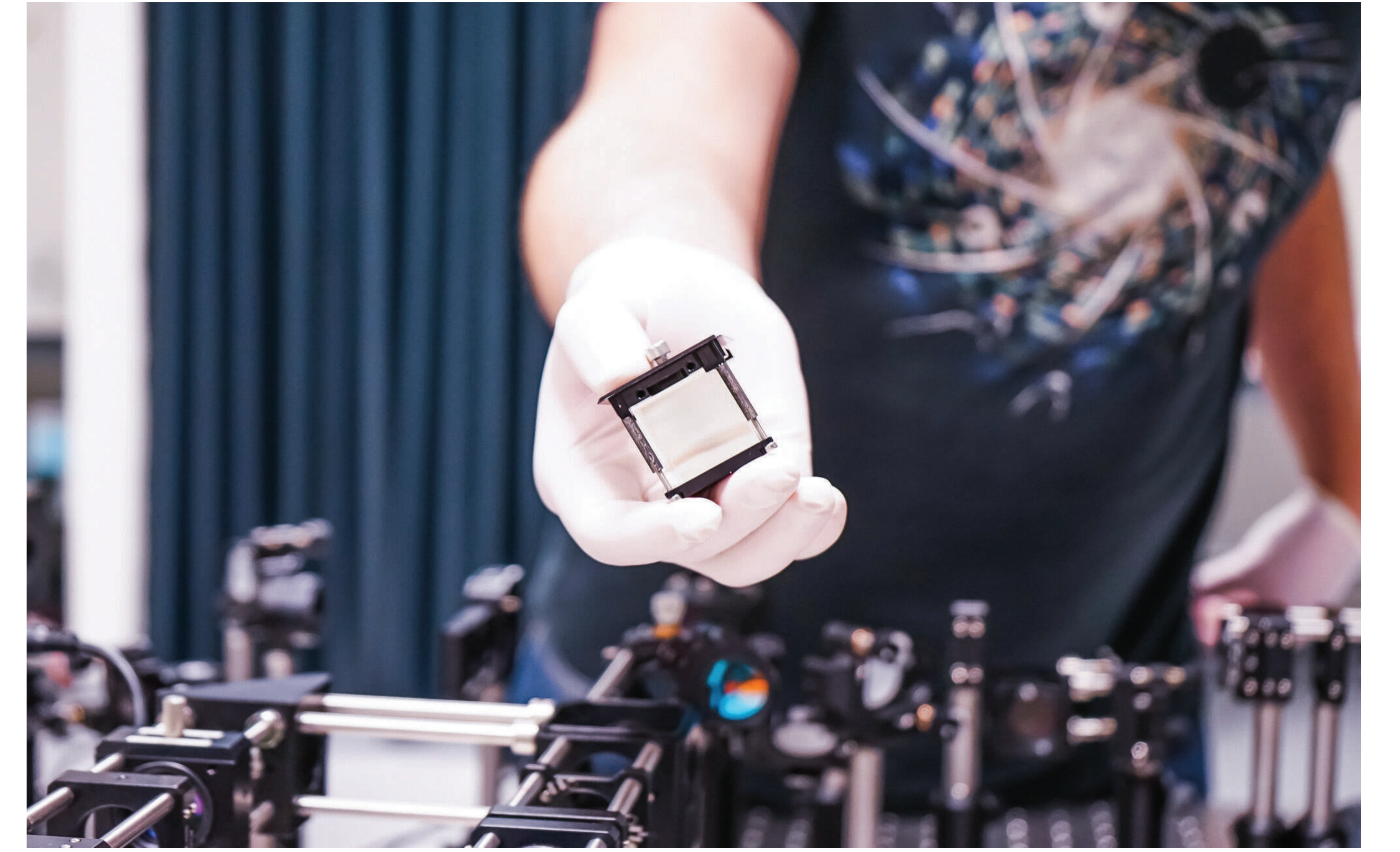
Critical infrastructure monitoring: bridges, dams, and tunnels

Urban seismic networks: deployable earthquake monitoring and early-warning systems

High-rise structures: vibration and wind-load monitoring in large buildings

Industrial assets: predictive maintenance of rotating machinery and sensitive equipment

Heritage preservation: non-invasive monitoring of historical structures



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