NI Industrial IoT Lab

The NI Industrial IoT Lab at National Instruments global headquarters in Austin, Texas, was specially designed and created to focus on the intelligent systems that bridge operational technology (OT) with information technology (IT) and the companies working on them.

A Space to Collaborate

Industrial Internet of Things (IIoT) solutions incorporate technologies from multiple companies and areas of expertise. One intent of the NI Industrial IoT Lab is to foster collaboration between different companies to prove out interoperability. In this space, communication protocols, controller hardware, I/O components, processing elements, and software platforms are combined to validate end-to-end solutions that will dramatically change the way businesses operate.

A Space to Innovate

Because IIoT technologies cut across a variety of industries and applications, the lab is outfitted with a wide range of features to help researchers, engineers, and data scientists innovate in an environment containing real-world elements without fear of impacting their own business operations. These features represent operational technologies in the field that need to be connected to enterprise IT systems to yield business gains. Features such as three-phase power access, a GPS drop, a fractional horsepower closed circuit pump skid, constant and variable speed water pumps, approximately 20 monitored building electrical circuits, and a dual network topology help researchers simulate some of the brownfield environments in which IIoT intelligent systems will be deployed.

A Space to Showcase

The lab is a working showcase for IIoT technologies, solutions, and systems architectures. Through demonstrations such as the on-site Industrial Internet Consortium testbeds, participating companies can promote innovative solutions and drive discussions with domain experts who are experiencing real-world challenges.

Use Cases

Built to scale as future technologies emerge, the lab includes operational focus for three industry/application areas: utility/microgrid, manufacturing/machine control, and asset monitoring for process industries. Here, technology experts work with domain experts to identify real-world problems, often called use cases, that can be addressed with IIoT technologies.

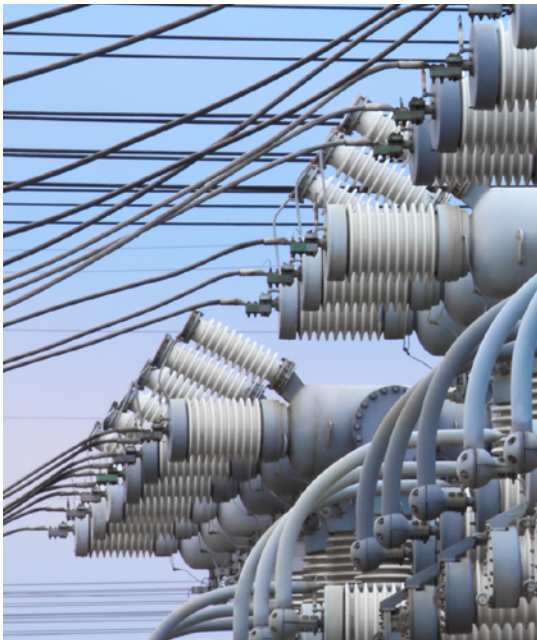
Example Technologies and Use Cases

Time-based networking standards to improve grid stability and quality with a high percentage of renewable generation:

- Microgrid reconnection without black start using active phase control
- Harmonic noise cancellation with dynamic inverter control

Sensor data and analytics to improve asset reliability and maintenance cost:

- Evaluation of compute location from the edge to on-site to the cloud
- Optimization of machine learning models for anomaly detection, diagnostics, and prognostics

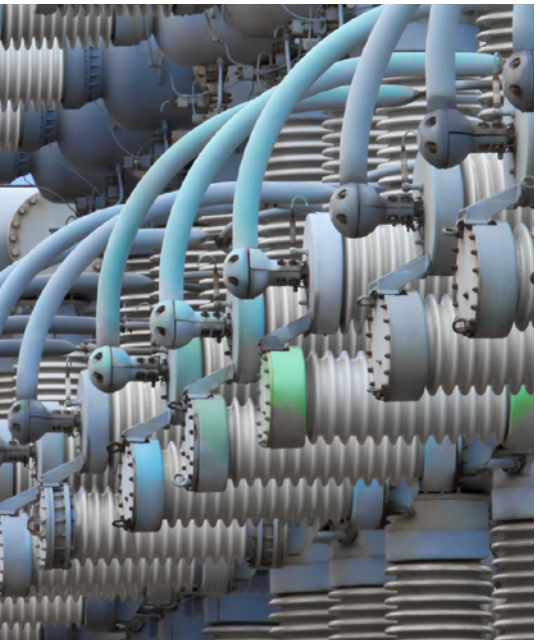


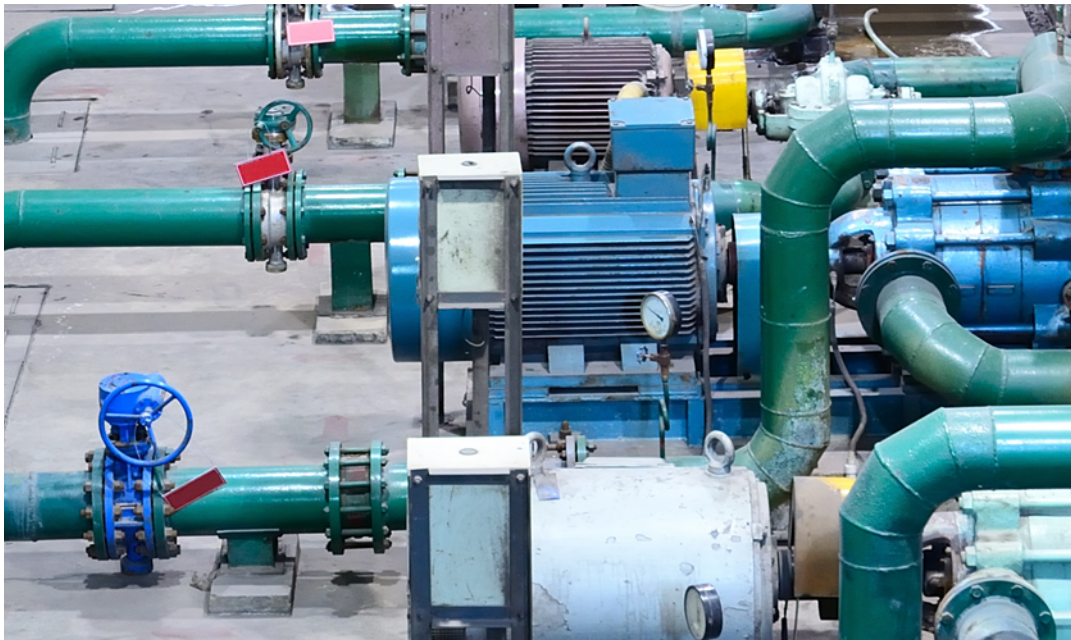
NI Industrial IoT Lab Features

- Approximately 1000 sq ft of physical space dedicated to IIoT technology innovation and demonstration
- Easy access to meeting rooms, cafeteria, and built-in mechanisms for IT, security, shipping, parking, and so on
- Internal machine shop and demo-building shop in the same building (Mopac A)
- Flexible room design that allows for adjustable power and communication drops as testbed designs evolve; room includes eight 20 A single-phase circuits and one three-phase circuit, a GPS drop, and dual network pulls
- Three workstations each with a computer featuring dual displays to show marketing material (slides) and demo execution (software)
- Centrally located dual 70 in. monitors to display feeds from the workstations; monitor area serves as a presentation/demo center for tours or, with a rollout conference table, as a meeting space
- Noise-isolated server closet with flexible wiring pulls to the main room and dedicated AC cooling; this allows hot and noisy equipment to be hosted outside the physical space but still be easily accessible, with short wiring pulls for modifying connectivity
- Secure remote access so collaborative companies can access the equipment in the lab from anywhere in the world for their test and development needs
- Additional tables, chairs, power strips, and so on for hosting larger plugfests

About NI

NI accelerates productivity, innovation, and discovery through an open, software-centric platform approach for developing any system that needs test, measurement, and control. When spending time and energy making technology work gets in the way of focusing on a solution, that's a problem. And that's where NI comes in. We enable you to get your job done faster—regardless of application or industry.





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