INU-100 USB Deviceserver & Flow Metering

After Growth, Bringing Outlier Calibration Systems into the Multinational Fold

IIoT Case Study: Flow Metering

After Growth, Bringing Outlier Calibration Systems into the Multinational Fold

When a multinational firm grows into new national markets, IT changes follow. Case in point: St. Louis, MO-based Emerson Automation Solutions and its Micro Motion division in Boulder, CO, which specializes in flow automation and measurement. Whether oil, gas, water, beverages, pharmaceuticals or shampoo ingredients, if it can flow as liquid, Micro Motion's meters measure and regulate its route through pipes, pumps, and mixing processes.

The Premise

To ensure high confidence in flow measurement, the accuracy of such meters is obviously of critical importance. That's why Emerson also runs its own calibration centers, where flow meters are rigorously tested before shipment and periodically thereafter. Emerson runs approximately 34 such centers of various sizes around the world, according to Micro Motion's senior calibration engineer. Which brings us to an Emerson facility in Cluj, a city in northwestern Romania. Cluj is among the newest of Emerson's four largest-scale calibration labs, at least half a football field in size, testing all kinds of flow meters with water from a swimming-pool size tank.

When built, Cluj's flow calibration lab ran on a completely different type of software system from the one devised by Emerson and used in the rest of its labs around the world. It relied on a series of "11 custom-made PCs running a little program that nobody could find the code to anymore," in the words of the senior calibration engineer. The flow sensors in the lab transmitted data to their own custom computers through RS232 HART adapters, using a serial interface long abandoned by printers but still common in the process industry.

At a glance

Emerson Calibration Lab, Cluj/Romania (one of >30 such Emerson labs worldwide)

- Simultaneously calibrates up to 44 Micro Motion flowmeters. Flow meters are calibrated while measuring water pumped from one tank to another.
- Flow meters under test, running HART protocol, are attached to a HART/USB adapter, which itself is attached to a INU-100 USB Deviceserver.
- The meter data is then transferred via Gigabit network to the local control unit PC, running Emerson's Cal Wizard software, as well as SEH UTN Manager for assignment of meter to virtualized USB port.

Advantages

- Streamlined workflow / standardization across all Emerson calibration labs: The HART-USB adapters and the INU-100 can be located near the calibration lines, eliminating very long HART/serial cabling between the meter and the control unit.
- It is very simple to establish new locations (only Ethernet is needed).
- All data can be processed on-premise while also easily transferred to a centralized data center. The data center (or any control unit PC, anywhere) has access to the units under test, for great flexibility in operator location.

Research and Tests

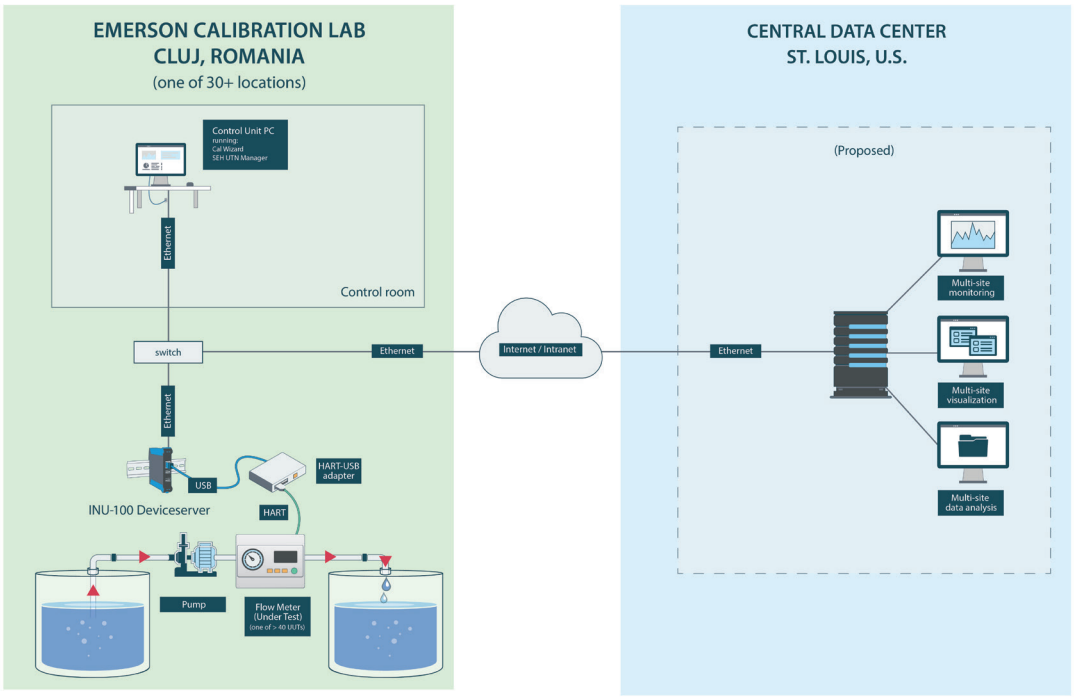
From 11 custom PCs and code to one Emerson-standard calibration system – over existing Ethernet.

Emerson decided to replace these little custom boxes with one centralized computer in the control room, standardizing it with their other facilities. And rather than repull all that wiring, the decision was made to replace the custom boxes with their RS232 interfaces with a USB device server using an existing Ethernet network. A web search led Emerson to SEH Computertechnik GmbH, a Bielefeld, Germany-based firm with U.S. headquarters in Phoenixville, PA. Its industrial, DIN-mounted INU-100 Deviceserver conveys USB 2.0 and 3.0 data streams over IP networks.

Micro Motion's calibration engineers tested the INU-100 device servers at headquarters, using a proprietary software test „that just pretty much hammers the transmitters that we use in calibration as fast as it can go for about 20 minutes," says the engineer. The INU-100 reliably withstood the punishment where another contender did not. The other USB device server didn't support USB 3.0, either, and its manufacturer could not commit to upgrading. In the dynamic environment of flow monitoring and regulation, USB 3.0 Gigabit speeds are critical.

Features
INU-100 USB Deviceserver

- USB devices are integrated seamlessly and comfortably
- Access control via a PC/Industrial PC possible
- The use of standard USB devices allows for a cost-effective solution
- Fail-safe and highly available
- The integrated change-over (CO) relay allows for automatic or event-controlled switching
- Fast data transfer with up to 100 MB/s
- The INU-100 ensures highest data security during transmission



To standardize, consolidate, and enable remote administration of its calibration software, Micro Motion installed SEH Technology's INU-100 USB Deviceservers, which networked the meters to one control room PC over Ethernet. The installation replaced 11 custom-made PCs on the lab floor.

„Excellent uptime and throughput" in the company's Romanian lab. „Our reliability of communications just immediately always skyrockets when we do this. We are planning on migrating to more INU-100s as we upgrade more worldwide facilities over the coming months and years."

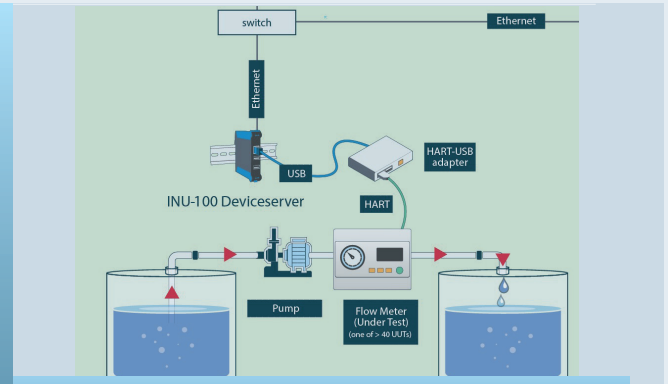
Senior Calibration Engineer, Micro Motion

The Results

The Cluj facility has now installed 22 INU-100 USB-to-network devices in its upgraded cal lab, managed through SEH UTN Manager software running on a PC in the control room. These now route flow sensor signals for all devices under test to the network switch over Ethernet. When 35 concurrently running USB devices exceeded UTN Manager's processing limit, SEH's software team obliged its customer with a quick revision.

Now the lab's Cal Wizard — Emerson's proprietary standard calibration software — runs on the same control room PC with SEH's software. Today, the lab can test up to 44 meters at once on various lines with various pumps.

Micro Motion reports no issues since that raised limit a year ago. Its senior engineer cites „excellent uptime and throughput" in the company's Romanian lab. „Our reliability of communications just immediately always skyrockets when we do this," he notes. They are planning on migrating to more INU-100s as they upgrade more worldwide facilities over the coming months and years.



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Emerson Automation Solutions

Emerson (NYSE: EMR), headquartered in St. Louis, Missouri (USA), is a global technology and engineering company providing innovative solutions for customers in industrial, commercial, and residential markets. Emerson Automation Solutions business helps process, hybrid, and discrete manufacturers maximize production, protect personnel and the environment while optimizing their energy and operating costs. Emerson Commercial & Residential Solutions business helps ensure human comfort and health, protect food quality and safety, advance energy efficiency, and create sustainable infrastructure.

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SEH Computertechnik GmbH

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All SEH products are developed and produced at the company's headquarters in Bielefeld, Germany. U.S. headquarters are located in Phoenixville, PA, with offices across Europe, Asia and North America.

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