Transforming Vacuum Testing with Industrial IoT

How Spilvac Achieved Professional Testing Without the Complexity

Customer: Spilvac (spilvac.au) | **Solution:** Pinebox Edge Device | **Industry:** Industrial Equipment Manufacturing

Spilvac, an Australian manufacturer of industrial vacuum cleaning equipment, required a solution for product testing, quality assurance, and field diagnostics. Traditional data acquisition or PLC-based systems presented significant barriers:

- **High Costs:** Expensive hardware and proprietary software licenses make it impractical to deploy multiple dedicated test systems.
- **Specialized Skills:** Configuration requires programming expertise, creating bottlenecks and limiting who could perform or modify tests.
- **Integration Complexity:** Most comparable systems are not native to IO-Link sensors, requiring costly and complex gateways.
- **Lack of Portability:** Lab-based systems could not be used for on-site troubleshooting, leading to logistical challenges and customer downtime.

These challenges made it difficult to implement a consistent, data-driven testing methodology across Spilvac's R&D, production, and service departments.

The Solution: The Pinetek Pinebox

Spilvac developed a powerful and portable testing system by integrating the Pinebox, an Industrial IoT Edge Computing Device from Pinetek Networks with four IO-Link-compatible master ports, into a custom enclosure with IO-Link flow sensors.

The Pinebox directly addressed Spilvac's needs by delivering a solution that is accessible, flexible, and cost-effective.

Test system with sensors and enclosure

Robert Johnston from Spilvac points out several key features that made the difference:

- **Browser-Based Interface:** The entire system is configured and monitored through a web interface, with no extra software required. Utilizing a tablet or notebook, the Spilvac team can visualize data and modify the logic without the software installation or additional licensing.
- **Low-Code Environment:** The Pinebox's embedded Node-RED environment allowed Spilvac's engineers to create sophisticated test workflows without extensive programming. This significantly reduces development time and cost.
- **Native IO-Link Integration:** The integrated IO-Link compatible master ports eliminate the need for external protocol gateways, simplifying the architecture. The web interface allows direct parameterization of the connected sensors without special tools or training. The IO-Link Sensors can seamlessly be integrated into the Node-RED workflow.

- **Accessible to the Whole Team:** Crucially, the lower skill required for setting up empowers more team members to configure and manage the test system, even without a deep PLC background. Spilvac confirmed they were able to create their ideal solution with minimal prior experience.

Inside the test enclosure: Pinebox, Wi-Fi access and power distribution

From Lab to Field

Spilvac now deploys its Pinebox-powered test system across the entire product lifecycle, maximizing its investment.

In Research & Development, engineers test and validate products during the development phase. Real-time flow visualization provides immediate feedback, accelerating design iterations and leading to more optimized equipment.

For Quality Assurance, the system is integrated into end-of-line testing. This ensures that the performance of every industrial-grade product meets stringent quality standards before shipping. By capturing a snapshot of performance data, Spilvac creates a permanent, traceable quality record for each unit.

The system's portability truly shines in **Field Service**. When customers report issues, technicians can take the test enclosure on-site for immediate troubleshooting. Instead of shipping equipment back or guessing at problems, this setup enables them to visualize the unit's actual performance and resolve issues quickly with objective data.

One of Spilvac's dashboards

The Future is Collaborative

Spilvac's success demonstrates how the Pinebox removes traditional barriers to professional-grade testing. Its combination of browser accessibility, low-code configuration, and portability delivers capabilities previously impractical with conventional equipment—at a fraction of the cost.

This real-world success and feedback from partners like Spilvac directly drives the Pinebox's evolution, such as the upcoming Wi-Fi integration.

Pinebox: Industrial IoT Edge Device with IO-Link Master, Node-RED, and web interface
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