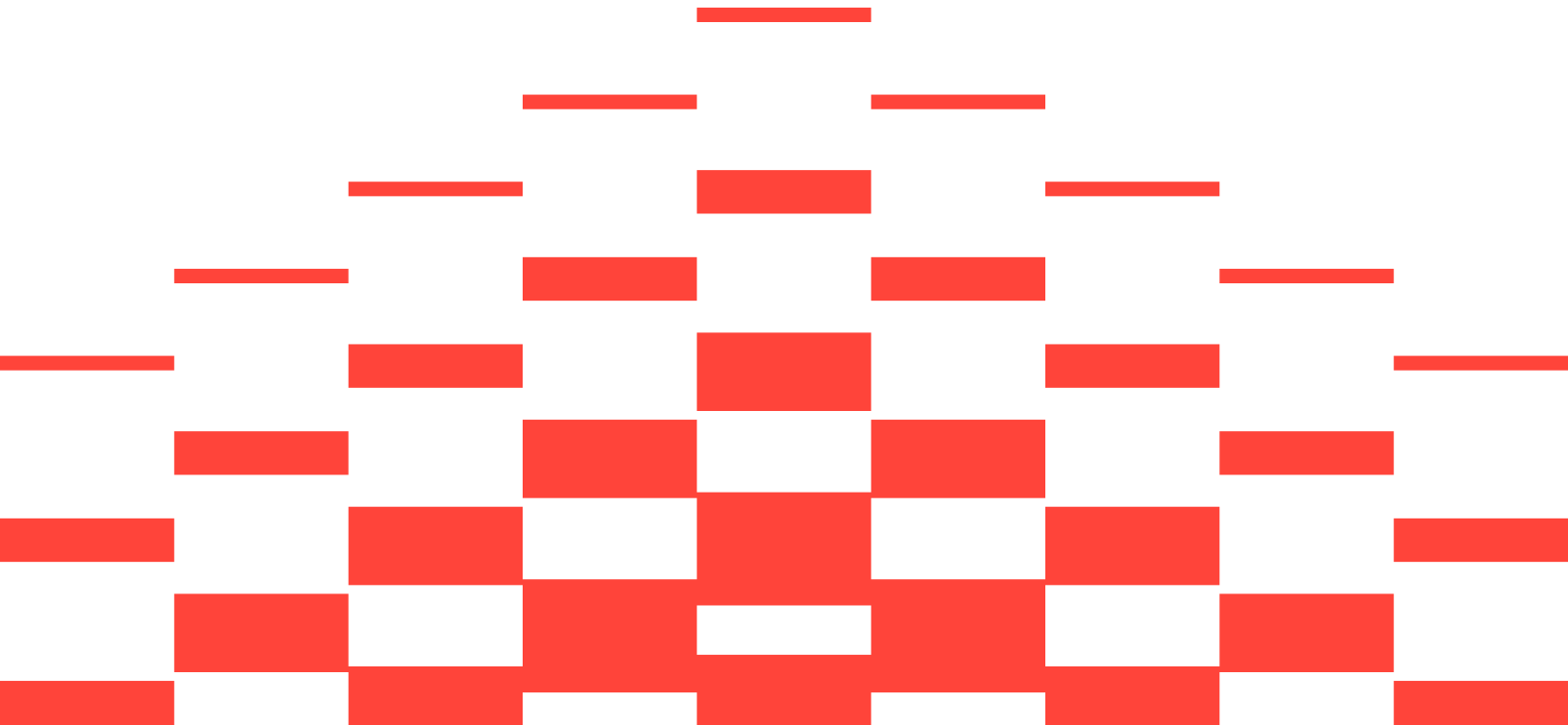


Case Study

Building the Next Generation of Resilient Industrial Analyzers

How Servomex Reduced Development Time and Secured Critical Embedded Systems With a Robust QNX Foundation



Customer Background

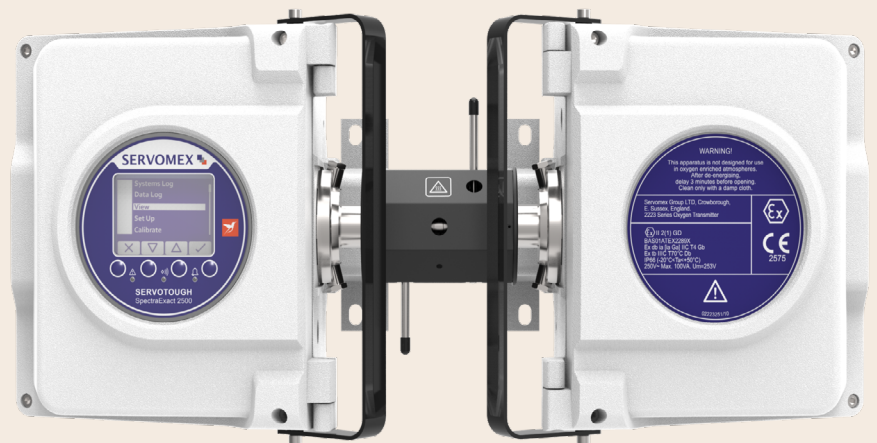
Servomex, a global leader in premium gas analysis, was established in 1952, in Crowborough, UK, and now operates in over 20 countries. With global centers of excellence in the UK and the US, Servomex delivers premium gas analysis for critical environments and complex applications worldwide.

Servomex is a designer and developer of proprietary sensing technology, with 23 active and pending patent families. Servomex has a large installed base with approximately 80,000 analyzers in the field globally. By developing groundbreaking sensor technology, Servomex skillfully builds reliable industrial gas analyzers and seamlessly incorporates these analyzers into comprehensive systems. This empowers Servomex's customers to achieve their objectives with utmost safety and efficiency. Servomex deploys these analyzers across

industries such as oil and gas, chemical processing, healthcare, and environmental monitoring, helping customers achieve cleaner, safer, and more efficient operations.

Delivering Industry-Changing Gas Analysis for Five Key Applications

- Process Control
- Quality
- Safety
- Emissions
- Combustion





Industrial Analyzers Are Complex Embedded Devices

Servomex's core technologies focus on the measurement of gas composition and moisture content across a wide range of industrial applications. These measurements support quality, safety, process control, and emissions monitoring, spanning concentration ranges from bulk percentage levels down to trace ppm and ppb sensitivities, including ultra-low moisture detection.

The industries and customers that Servomex supports serve highly critical environments and complex systems that require:

- High precision
- High availability
- High resilience
- Meet critical operational excellence targets for processes

These applications include cleaner energy production, efficient chemical manufacturing processes, quality industrial and medical gas production, and increasingly pure environments for high-yield advanced semiconductor manufacturing.

The Challenge

Modern industrial embedded systems demand high resilience, deterministic operational excellence and availability for complex applications. When embedded systems operate in mission-critical environments, there is no room for compromising on the performance, safety and security of the operations. Robust foundational platforms are hence inevitable to run resilient systems that can meet the needs of complex environments. Other challenges include achieving optimal power efficiency and environmental resilience while also meeting reliable connectivity requirements.

Addressing the Challenges and Developing Modern Resilient Industrial Gas Analyzers

Since Servomex's products serve the markets requiring extremely high levels of purity and sensitivity, often measured in parts per trillion, ensuring absolute accuracy and reliability is paramount. This created the need for a robust foundational platform capable of consistently powering Servomex's embedded systems while meeting stringent requirements for real-time performance and precise security.

The Solution

The demanding requirements of highly sensitive complex embedded devices operating in highly mission-critical environments made it imperative for Servomex to choose a robust foundational platform that runs on reliable hardware. Servomex chose QNX operating system (OS) as the core foundational software within the Servomex product architecture for its gas analyzers. Given that performance and security were critical requirements, Servomex built its embedded system with QNX SDP (Software Development Platform) being the backbone for real-time performance, precision and scalability. QNX OS's unique microkernel architecture enabled Servomex to build secure industrial gas analyzers.

Servomex has used the QNX OS and the NXP i.MX processors for decades. To build its next generation of mission-critical industrial gas analyzers, Servomex decided to upgrade the platform to manage advanced security and energy-efficient edge computing with efficient fault tolerance handling, which ideally can be co-designed from both the software and hardware point of view. Based on long-term partnership and trust, adopting QNX OS along with NXP i.MX 93 applications processors naturally became the best choice.



How Servomex Accelerated Development and Compliance

The Results

Servomex achieved cybersecurity compliance through a trusted foundational platform.

Servomex’s products operate in mission-critical and safety-sensitive environments where security, EU CRA (Cyber Resilience Act) compliance is a must. It was imperative that Servomex needed a pre-certified OS that can effectively help in complying with the safety and security standards.

Many of the EU CRA primary guidelines include extensive cybersecurity compliance that includes:

- Vulnerability management and reporting
- Having a secure configuration for embedded devices
- Building a secure-by-design development approach and lifecycle support for products

QNX offered a comprehensive framework for enabling Servomex with EU CRA—both from a development platform perspective with its safe and secure-by-design microkernel architecture’s foundational software as well as from an organizational cybersecurity compliance perspective. In addition, QNX’s continuous focus on upgrading its product roadmap to meet the latest safety and security standards provided Servomex with a reliable platform to meet future needs.

QNX was essential for Servomex to achieve full compliance of their products to work in the field. Particularly QNX OS with its secure-by-design microkernel architecture provided the trusted platform module components required for Servomex that helped it adhere to the new EU CRA regulations. This enabled Servomex to augment the reliability of their industrial gas analyzers in the field, earning valuable customer trust and confidence.

Upgrade to NXP i.MX 93 Applications Processors and QNX OS 8.0



“Intelligent and Secure Edge Processor Family for Entry-Level IoT Applications”

- Energy Efficient Compute Engine
- Machine Learning and Vision
- Rich Set of High-Speed and Memory Interfaces
- Industrial Networking and Enhanced Reliability

QNX Software Development Platform (SDP) Delivers

- High Performance and Throughput
- Safety and Security
- Multicore and Scalability Support

Servomex Builds Reliable and Robust Gas Analyzers and Platform

QNX SDP (Software Development Platform) used on NXP i.MX 93 applications processors, highlighting key compute features, QNX SDP capabilities, and Servomex gas analyzer implementation



Choosing QNX as a primary foundational platform helped us immensely in developing our next generation platform that powers our mission-critical industrial gas analyzers used in most sensitive environments where accuracy, timing and precision are paramount.

Tony Dodd, Software Development Manager and Product Architect at Servomex.



"At NXP, we are proud to partner with Servomex & QNX in powering their next-generation industrial gas analyzers. The NXP i.MX 93 applications processors deliver the perfect balance of energy efficiency, advanced security, and edge computing performance required for mission-critical environments. By combining robust processing capabilities with a scalable platform, we enable Servomex to accelerate innovation while meeting stringent safety and reliability standards.

Jim Hoffman, Senior Product Marketing Manager at NXP.

Why QNX OS?

QNX OS provides a solid foundational platform to Servomex where reliable execution, deterministic real-time behavior within mission-critical environments are paramount to develop Servomex's industrial gas analyzers. Its microkernel-based real-time OS along with priority-based real-time scheduling and the underlying tools and services formed a robust platform that could meet the demands of Servomex. With QNX providing security and defense in depth to protect systems, Servomex adopted a hardened QNX software foundation that ensures safe operations and future-proof product lines.

While evaluating various platforms, Servomex chose QNX originally and upgraded to the newer QNX OS primarily due to the following reasons:

1. QNX microkernel architecture: aligned with the needs to maximize availability of the core services, e.g. the provision of a gas measurement and control output for plant operation, while also running other less critical support services in the same hardware. It could also detect, protect and recover a fault or a thread without noticeable impact on the core services.
2. The availability of the board support package (BSP) and middleware on NXP i.MX 93 processors makes this choice easier, where Servomex could focus on its own applications development rather than spending time on system integrations.
3. A dependable QNX framework for building secure-by-design embedded products adhering to regulations such as the EU CRA and robust future roadmap on helping navigate the requirements.

Why NXP i.MX 93 Applications Processors?

Choosing the right hardware platform where QNX OS can efficiently run was also an important choice for Servomex. The NXP i.MX 93 applications processors were chosen for Servomex's next-generation platform because they offer:

- **Energy Efficiency:** Optimized for low-power operation, ensuring continuous performance in industrial systems
- **Edge AI and Compute:** Delivers advanced processing for real-time analytics and decision-making at the edge
- **Integrated Security:** Built-in security features help meet compliance requirements such as the EU Cyber Resilience Act that works well with a secure-by-design microkernel-architecture-based QNX OS
- **Industrial-Grade Reliability:** Designed for long-term availability and robust operation in harsh environments
- **Accelerated Development:** Availability of BSP and middleware for QNX OS simplifies integration and speeds time-to-market

The i.MX 93 applications processors deliver efficient

machine learning (ML) acceleration and advanced security with an integrated [EdgeLock® secure enclave](#) to support energy-efficient edge computing.

Optimizing performance and power efficiency for industrial automation, i.MX 93 processors are built with NXP's innovative Energy Flex architecture. The SoCs offer a rich set of peripherals targeting the industrial market.

What's Next?

There are other parallel projects that are planned and Servomex looks forward to adopting the best technology that QNX and NXP offer to serve their customers and industries which can help them build mission-critical industrial embedded applications and be competitive in the ever-changing industrial ecosystem.

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QNX OS is exciting for us as it builds on what's gone before, whilst enabling us to build better and faster with more modern tooling and access many advances in software and hardware security features.

Tony Dodd, Software Development Manager and Product Architect at Servomex.

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About QNX

QNX, a division of BlackBerry Limited, enhances the human experience and amplifies technology-driven industries, providing a trusted foundation for software-defined businesses to thrive. The business leads the way in delivering safe and secure operating systems, hypervisors, middleware, solutions, and development tools, along with support and services delivered by trusted embedded software experts. QNX® technology has been deployed in the world's most critical embedded systems, including more than 275 million vehicles on the road today. QNX® software is trusted across industries including automotive, medical devices, industrial controls, robotics, commercial vehicles, rail, and aerospace and defense. Founded in 1980, QNX is headquartered in Ottawa, Canada.

Learn more at qnx.com →

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