Mitsubishi Electric Introduces MX Controller

– The Mastermind of Manufacturing

Ratingen, Germany - 9th of July 2025

Mitsubishi Electric Corporation has announced the launch of the MX Controller series, expanding its MELSEC product line with advanced technology that specifically addresses high-precision motion synchronisation, cybersecurity and integrated control challenges faced by modern manufacturers in their digital transformation journey.

Image Caption: Mitsubishi Electric MX Controller
[Source: Mitsubishi Electric Europe]

The MX-R and MX-F models represent Mitsubishi Electric's most advanced industrial controllers. They serve as central processing units that integrate sequence control, motion control and network communication within a single module. This integration eliminates the need for separate components typically required in conventional systems, reducing hardware requirements, simplifying system

architecture, and streamlining the engineering process. For system designers, this consolidated approach results in more compact control cabinets, less complex wiring, and easier maintenance while maintaining high-performance control capabilities.

The MX Controller, designed as a comprehensive control solution, combines four key technical aspects: engineering precision, intelligent integration, cybersecurity, and reliability.

"We observe that manufacturing processes increasingly demand faster control and integrated capabilities that exceed conventional PLC functionality" said Daniel Sperlich, Strategic Product Manager for Controllers in the EMEA region at Mitsubishi Electric. "The MX Controller addresses these advanced requirements through the combination of high-speed PLC functions, precise motion control, IO/OT, cybersecurity, and other embedded functions in a single platform that reduces system complexity while enhancing manufacturing performance."

The MX controller models, MX-F and MX-R, address diverse manufacturing needs, with capabilities ranging from 8 axes for compact systems to 256 axes for large-scale production environments. The MXF model is typically deployed in packaging lines, labeling machines, and pick-and-place applications where space efficiency and cost-effectiveness are priorities - without compromise in performance. Meanwhile, the MXR model excels in more complex scenarios such as battery production lines, semiconductor manufacturing, and high-precision cutting systems where multi-axis synchronisation is critical.

Engineering Precision

The MX Controller is designed for applications where engineering precision is critical. Its advanced architecture enables ultra-fast, highly accurate synchronisation tailored to the needs of demanding manufacturing processes.

Key features include:

- Synchronisation cycles as short as 0.125 ms, providing rapid and consistent machine coordination.
- Microsecond-level timing accuracy with TSN, allowing precise operation across connected devices and networks.
- Mark detection and cutter control with 1 μs precision, ideal for high-speed packaging and semiconductor handling.
- Mixed calculation cycles per axis (e.g. 125 μs, 500 μs, 2 ms), so each part of the system can run at its optimal control speed, allowing for even tighter tolerances in production.

As Daniel Sperlich from Mitsubishi Electric explains, even the most advanced and precisely synchronised production lines can encounter unexpected disruptions. In such cases, fast and accurate diagnostics are essential for minimising downtime and protecting productivity: "Sometimes unpredicted events happen that can't be foreseen, caused by mechanical issues or external factors. Like in a dashcam, video and production data can be saved automatically, with cycle-accurate precision. Together with our software and AI support, it lets you recover the machine with minimum time loss." This combination of high-precision control and rapid diagnostics guarantees consistently accurate manufacturing results, enabling producers to maintain the highest engineering standards even in the most demanding environments,

whether they are on site or remotely connected.

Intelligent Integration

The MX Controller enables flexible expansion and adapts easily to changing manufacturing needs. Supporting protocols such as OPC UA, MQTT, and CC-Link IE TSN, it integrates with both existing and future smart factory systems, connecting devices like robots, sensors, and SCADA platforms. Its high-performance multi-core CPU and large memory ensure efficient analytics and real-time control, providing full visibility and coordinated operation across the production environment. This seamless integration makes it straightforward to implement data-driven strategies, from shop floor automation to business intelligence. Compatibility with iQ-R and iQ-F modules protects prior investments and empowers step-by-step upgrades.

Cybersecurity

The MX Controller has received TÜV Rheinland certification according to IEC 62443-4-1 and IEC 62443-4-2 standards, meeting internationally recognised security requirements. This certification verifies protection against unauthorised access and cyber attacks for industrial infrastructure.

The controller includes specific security features such as encrypted communication, user authentication and access control mechanisms, and secure data storage. These protective measures safeguard both operational control systems and sensitive production data.

In connected manufacturing environments, the MX Controller protects intellectual property and sensitive data using robust protocols. Its

comprehensive safeguards provide the trusted foundation needed for Industry 4.0, enabling safe data exchange between the production floor and enterprise systems.

Reliability

The MX Controller is designed to support high system availability through features like built-in diagnostics and automatic fault data recording — helping manufacturers respond swiftly to unexpected events and reduce downtime. It maintains backward compatibility with iQ-R and iQ-F modules, allowing manufacturers to use proven components while adding new control capabilities without complete system replacement.

"At Mitsubishi Electric, we believe that technology should empower people," explains Daniel Sperlich. "The MX Controller isn't just about automation – it's about giving you the tools to innovate, optimize, and grow your business with minimal disruption and maximum reliability."

Strategic Market Timing

The launch of the MX Controller comes at a strategic time for manufacturers seeking advanced control solutions. The machine control systems market is experiencing significant growth, with the Consegic Business Intelligence report projecting an increase from USD 6,38 billion in 2024 to over USD 10.86 billion by 2032, at a CAGR of 7.5%. This growth underscores the increasing demand for precisely the capabilities that the MX Controller delivers: high-speed synchronisation, integrated functionality, and secure connectivity between operational and information systems.

About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognised world leader in the manufacture, marketing, and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation, and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 5,521.7 billion yen (U.S.$ 36.8 billion*) in the fiscal year ended March 31, 2025.

For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥150=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2025.

About Mitsubishi Electric Factory Automation Business Group
Offering a vast range of automation and processing technologies, including controllers, drive products, power distribution and control products, electrical discharge machines, electron beam machines, laser processing machines, computerised numerical controllers, and industrial robots, Mitsubishi Electric helps bring higher productivity – and quality – to the factory floor. In addition, its extensive service networks around the globe provide direct communication and comprehensive support to customers. The global slogan "Automating the World" shows the company's approach to leveraging automation for the betterment of society, through the application of advanced technology, sharing know-how, and supporting customers as a trusted partner.

For more about the story behind "Automating the World" please visit:

www.MitsubishiElectric.com/fa/about-us/automating-the-world

Factory   Automation   EMEA

Mitsubishi Electric Europe B.V., Factory Automation EMEA has its European headquarters in Ratingen near Dusseldorf, Germany. It is a part of Mitsubishi Electric Europe B.V. which has been represented in Germany since 1978, a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan. The role of Factory Automation EMEA is to manage sales, service, and support across its network of local branches and distributors throughout the EMEA region.

For more information, please visit emea.mitsubishielectric.com/fa

About e-F@ctory

e-F@ctory is Mitsubishi Electric's integrated concept to build reliable and flexible manufacturing systems that enable users to achieve many of their high-speed, information-driven manufacturing aspirations. Through its partner solution activity, the e-F@ctory Alliance, and its work with open network associations such as the CC-Link Partners Association (CLPA), users can build comprehensive solutions based on a wide-ranging "best in class" principle.

In summary, e-F@ctory and the e-F@ctory Alliance enable customers to achieve integrated manufacturing but still retain the ability to choose the most optimal suppliers and solutions.

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