

THE ART OF MANUFACTURING



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ISSUE 9

Mitsubishi Electric Factory Automation Customer Magazine

LET'S GET DIGITAL!

Building a New Era: Human Ingenuity Meets AI Innovation



A Cognitive Future

Exploring the next evolution of manufacturing



Rising to the Challenge of Integration

The story of the development of this next generation controller.



The window to your factory

Accelerating plant-wide digital transformation



The world is changing.

There is a lot going on right now, especially in the world of automation. You have probably seen a plethora of humanoid robots references on social media; you may have even read about breakthroughs in solid-state battery development and the evolving "vibe" programming tools that utilize AI to create new code. While these technologies have yet to reach many factories, they are all potential game changers. Imagine untethered automation using humanoid robots with batteries that offer huge energy density, are physically light, and can fully charge in minutes — that's just one possible scenario. Add AI-supported programming combined with 3D simulation and you might think you're in a utopia. Sorry to say, that's still a way off for now. Having said that, there are plenty of things that can be done today: new technologies that can be applied and experiences to be shared — and that's exactly what we aim to do with this magazine: keep you updated, inspire you, and show that there is a lot that can be achieved now with today's tools.

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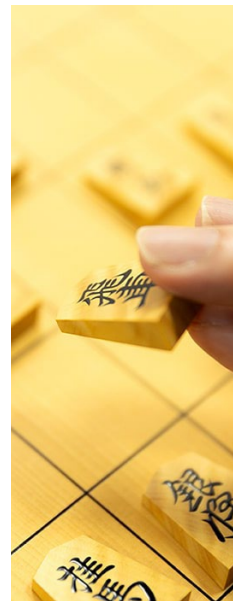
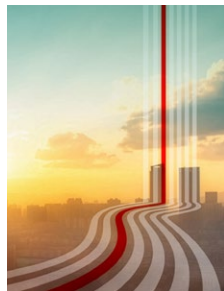
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Contents

Let's Get Digital!	3
A Cognitive Future	4
MELSEC MX Controller: Rising to the Challenge of Integration	8
Empowering the Next Generation to Shape the Future	11
GOT 3000: The window to your factory	12
Case Study: Kagome Co., Ltd.	14
Security as a foundation for digital manufacturing	16
Case Study: Seiko Corporation	18
News from Around the World	20
A Taste of Japan	22
The People behind Automating the World	24
Did you know?	26



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Let's Get Digital, Let me hear your factory talk!



Manufacturing technology is characterised by constant, multifaceted change and is currently at a conceptual level inflection point, driven by AI and digital transformation. In effect, live data is making factories much more visible and communicative so we are now able to effectively “listen” to what the factory is telling us!

As recently as the turn of this century manufacturing control technology was based on programmable logic controllers (PLCs), while emerging technologies included multi-axis robots capable of performing intricate tasks and touch screen human machine interfaces (HMIs) which took user-friendliness to new levels.

Naturally, technology has moved on since then. The IIoT (the Industrial Internet of Things), which interconnects industrial machinery and devices to give us advanced data analytics, and hence Industry 4.0, had as profound an effect on manufacturing as the general internet had on the wider world. Cloud and edge computing have allowed us to handle data quickly and efficiently. This has led to the development of techniques such as digital twins - real-time virtual representations of machines and production systems.

Looking back, we can see how all of these individual developments slot neatly together and work as one harmonious system, rather than as separate competing things.

Now with the increasing adoption of AI, we are on the cusp of the next major advance. It is tempting to see this as being a daunting leap into the unknown. However, the reality is far more pragmatic; AI will drive the next stage in technical evolution, manifest as steady steps of augmentation in system design and capability. As always there will be a need for informed, responsible decision-making to ensure safety and security while enhancing system performance.

We are moving from the automation of physical processes to 'cognition', where digital systems can quickly analyse data and thus 'learn, adapt and anticipate'. Immediate operational decisions will increasingly be made by machines, freeing up engineers and managers to concentrate on longer-term strategic thinking.

The nature of manufacturing demands that technology moves forward at pace to improve product quality whilst increasing efficiency. With the evolution of cognitive control systems, production is entering a new phase of intelligent connectivity, where insight drives performance and systems learn continuously from operation. ■

Bob Dobson, Editor & Automation Industry Commentator



special feature

Alan Turing (1912–1954) was a British mathematician, logician, and "father of modern computing" who devised the theoretical Turing machine. During WWII, he played a crucial role at Bletchley Park in breaking the German Enigma code, significantly aiding the Allied war effort.

A Cognitive Future

In his 1950 paper "Computing Machinery and Intelligence", Alan Turing posed the question: "Can machines think?" To explore it, he devised the imitation game, what we now call the Turing Test, in which a machine and a human each try to convince an interrogator, through conversation alone, that they are human.

Fast forward to today: large language models, generative AI, and autonomous systems dominate headlines and boardrooms...

...and whilst it's tempting to think we've finally reached the future Turing imagined, have we truly answered his question?

Exponential Change

Looking back across the history of production, one pattern is clear: the pace of change is accelerating.

The 18th century brought steam power. Then, electricity arrived, though it took more than 50 years for electric motors to become commercially viable. It wasn't until Henry Ford's assembly line in the early 1900s that true production at scale emerged, making standardization a new art form. You could have any color car you wanted, as long as it was black.

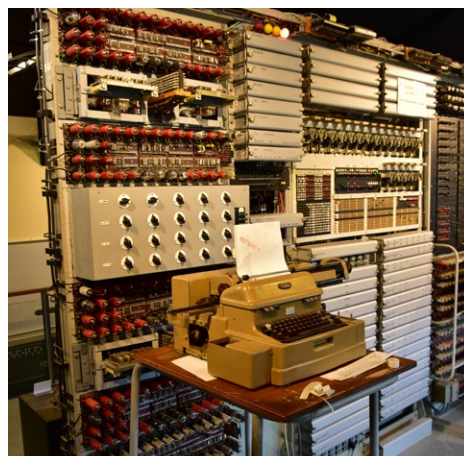
By the 1970s, programmable logic controllers (PLCs) and industrial robots were transforming factories again. Around 2010, Industry 4.0 took hold, blending digitalization, connectivity, and data. Now, as we approach 2026, AI has become mainstream, and the cycle of transformation keeps shortening. Each leap forward invites the same question: What's next, and what does it mean for how we think about intelligence itself?

Cognitive Manufacturing

For an entity to think, it needs cognitive skills: the ability to learn, remember, and solve problems. In manufacturing, those "mental" abilities come from transistors, software and cyber-physical systems. When automation meets analytics, IoT, and AI, production systems begin to reason. They draw conclusions from multimodal data, recognize patterns, and adjust autonomously. In short, they learn.

Industry 4.0 gave us digital transformation with data, connectivity, and insight. Society 5.0, Japan's vision of a "smart society," adds purpose, human-centricity and sustainability.

Cognitive Manufacturing sits between the two: where technology and society meet, and where production becomes both intelligent and aware.



Colossus: a set of computers developed by British codebreakers in the years 1943–1945



Cognitive science studies how the brain processes information. Here, it refers to AI systems that understand, learn, and make optimal decisions like humans, adapting flexibly to changes and problems.

special feature



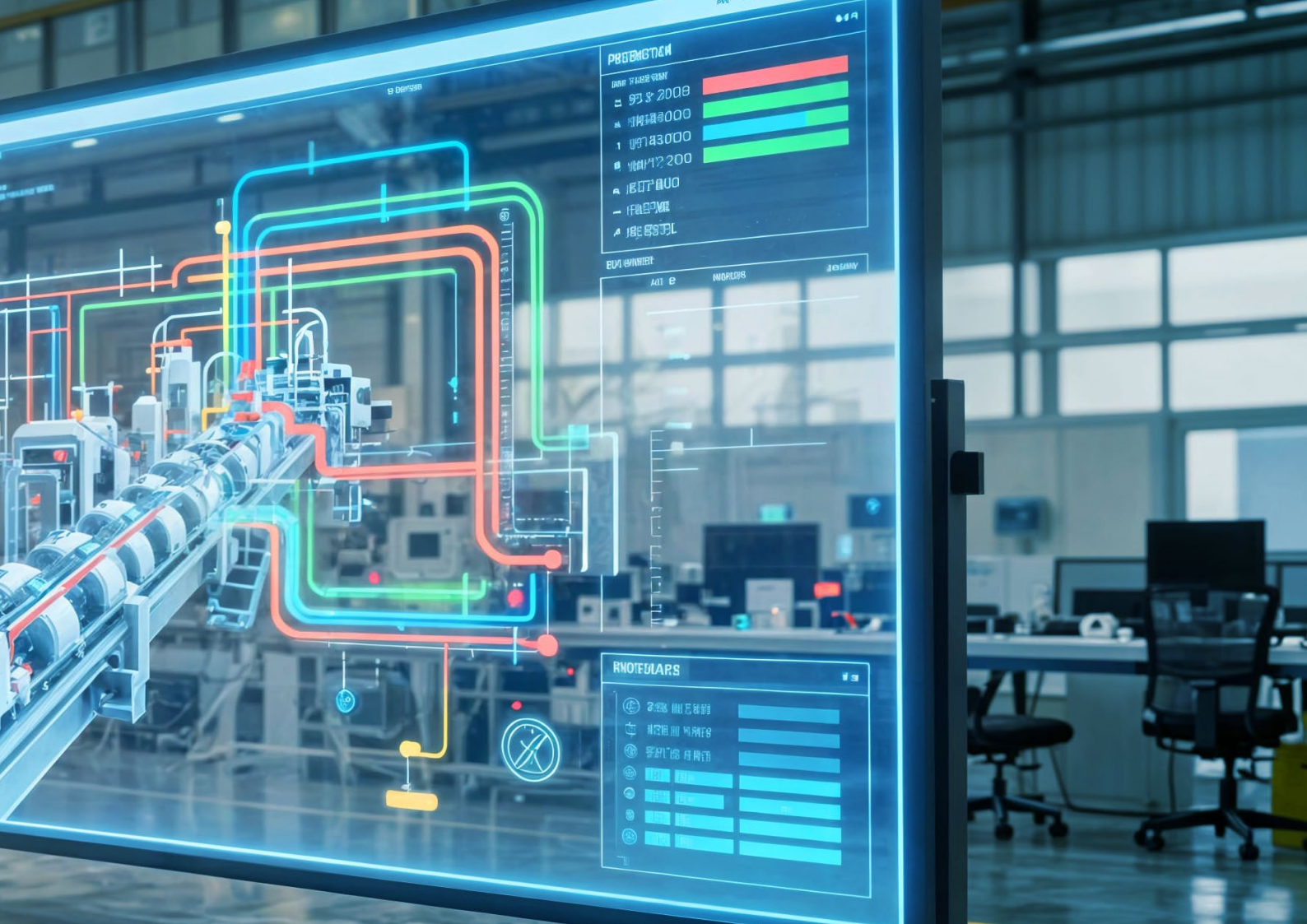
Connected systems transform raw production data into real-time insight and action.

Key Enablers of Cognition in Manufacturing

Cognitive Manufacturing doesn't happen by chance. It's built on a foundation of technologies and principles that make production systems more intelligent, adaptive, and sustainable. These are not just digital tools; they are the building blocks of a new way of thinking about manufacturing itself.

- Artificial Intelligence (AI) enables perception, learning, and reasoning. In factories, that translates to faster decisions, predictive maintenance, and more resilient processes.
- Digital Twins, especially Cognitive Digital Twins (CDTs), create virtual mirrors of physical assets that don't just simulate but learn continuously through feedback and data.
- Cloud and Edge Computing form the hybrid infrastructure. Edge devices handle instant decisions locally, while the cloud performs deeper analytics. The result is speed, scalability, and responsiveness.
- Cybersecurity underpins everything. As Operational Technology (OT) connects to IT networks, protecting PLCs, HMIs, and data flows becomes essential for both safety and trust.
- IIoT and Cyber-Physical Systems (CPS) link the physical and digital worlds, creating the data fabric that allows AI to act with precision and context.

And crucially, people should remain at the center. Through AR, VR, and simulation-based training, human expertise evolves alongside machine intelligence, being amplified by it rather than replaced by it.



The Factory of the Future

In the cognitive factory, machines don't just do, they understand. They learn from every process, adapt to context, and capture human know-how before it's lost.

Think of Harry Brearley, the Sheffield metallurgist who accidentally discovered stainless steel in 1913 while investigating gun barrel erosion. That insight, born of observation and curiosity, are a foundation of modern industry. Cognitive Manufacturing aims to preserve and multiply those moments, turning tacit, experiential knowledge into shared, living intelligence.

Here, data isn't just combined for a 360-degree view. It's expanded into a 720-degree perspective that includes time, interdependencies, and prediction. Machines not only see what is happening but also anticipate what could happen and how it connects to everything else.

On these factory floors, Cognitive Digital Twins orchestrate entire production lines. Operators use AR overlays to visualize real-time insights. Predictive systems adjust automatically to prevent downtime. Every process, human or machine, becomes part of a continuous learning loop.

The result is not simply automation, but awareness. Not machines that think instead of us, but systems that think with us.

As Turing's question evolves, it's no longer "Can machines think?" It's "How can machines and humans think together?" ■

About this article

This article is part of an ongoing exploration of how manufacturing is evolving beyond automation toward cognition — where data, machines, and human insight converge.

What do you think: are we teaching machines to think, or are they teaching us to see differently?

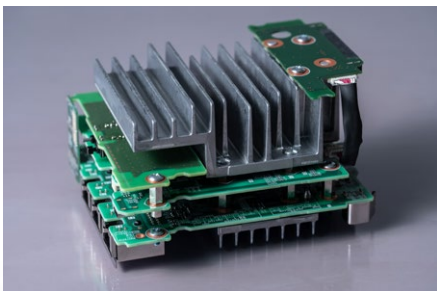
MELSEC MX Controller:

Rising to the Challenge of Integration

The story of the development of this next generation controller.



A diversified and sophisticated system can be constructed by using the MX-R models with the MELSEC iQ-R Series modules, and the MX-F models with the MELSEC iQ-F Series modules.



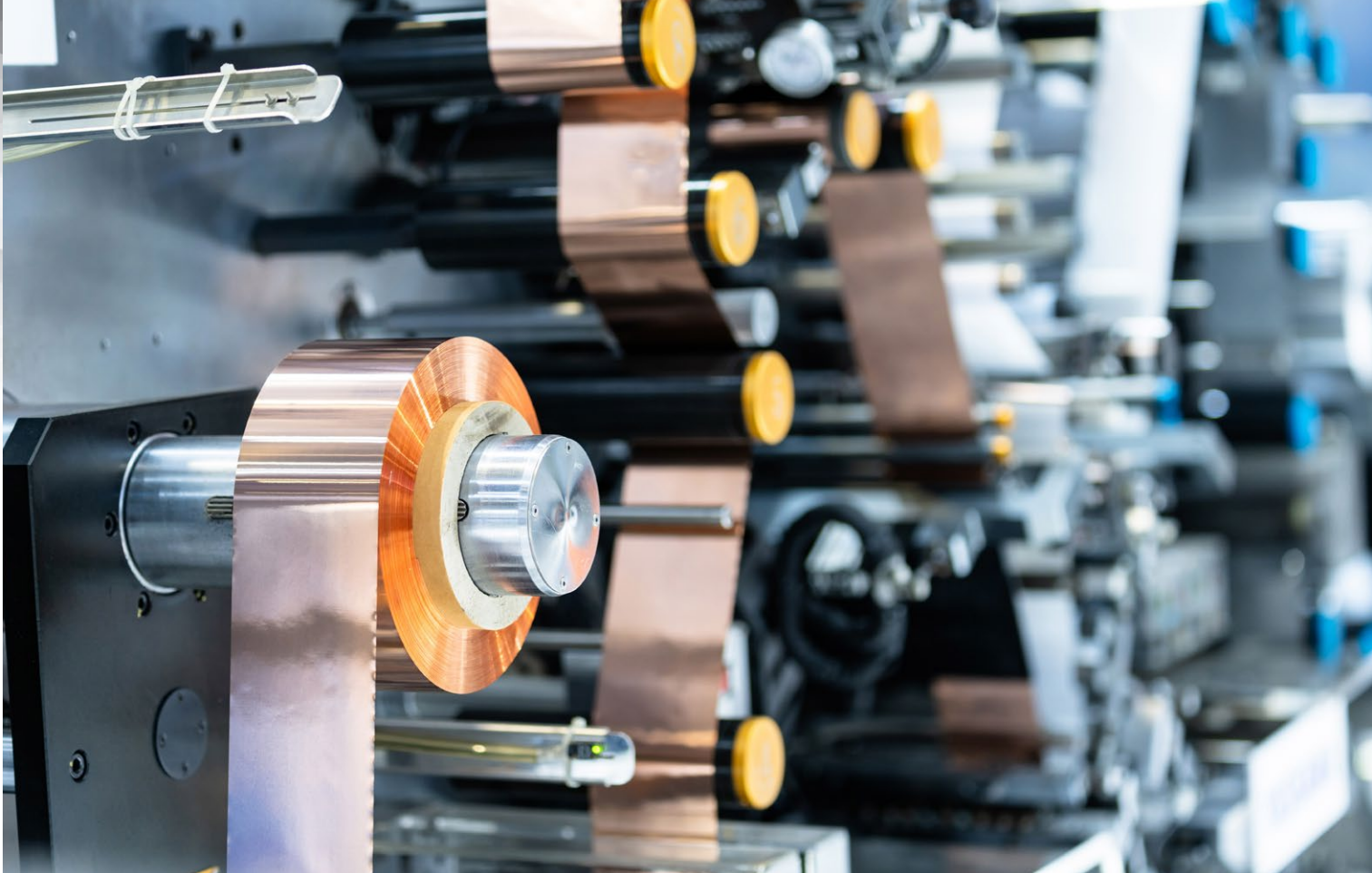
The shape of the heat sink was optimized to fit into a three-slot size housing.

In early 2025, Mitsubishi Electric unveiled the MELSEC MX Controller, a groundbreaking integrated controller designed to meet the evolving demands of factory automation (FA). This new product represents a strategic shift from pursuing ever-higher raw performance toward achieving deeper integration of control functions. The journey to this innovation was marked by global market pressures, bold engineering decisions, and organizational transformation, culminating in a controller that redefines multi-axis control and system integration.

The story begins with a growing challenge voiced by Mitsubishi Electric's international sales teams. Shintaro Watanabe, stationed in Europe, observed a rapid rise in demand for multi-axis machines at manufacturing sites, a trend that competitors were capitalizing on more swiftly. Meanwhile, Akira Okabe in China highlighted the soaring need for multi-axis control in lithium-ion battery production, where precise tension management of laminated films is critical. Both recognized a looming crisis: Mitsubishi Electric's existing controllers could not keep pace with these complex, integrated control requirements.

Historically, Mitsubishi Electric's controllers excelled by offering integrated control on a common platform through a multi-CPU architecture. This allowed users to combine sequencer, motion, and other CPUs to tailor solutions. However, as multi-axis control scaled beyond 200 axes in some applications, this distributed control approach began to show its limits. The overhead of data sharing and communication between multiple CPUs hindered performance gains, especially when high-speed, synchronous control was essential.

Faced with this challenge, a dedicated team at Mitsubishi Electric's Nagoya Works, led by Yoshihiro Sugiyama, embarked on a project to develop the next generation of programmable logic controllers (PLCs). Their vision was clear: to integrate sequence and motion control into a single platform, enabling faster and more cohesive multi-axis control. This marked a departure from simply enhancing hardware performance toward creating a truly integrated controller. Reflecting this broader scope, the new product was named a "controller" rather than a PLC.



Multi-axis control demands more than speed. Integrated systems enable precision, synchronisation and scale.

A critical strategic decision was whether to continue using Mitsubishi Electric's proprietary ASIC (application-specific integrated circuit) technology or to adopt a general-purpose microprocessor. ASICs, while delivering high performance, require lengthy development cycles of five to six years, limiting agility in upgrading capabilities. Motion control, however, demands continuous performance improvements. The team chose to embrace a general-purpose microprocessor, accepting the risk of commoditization—where hardware performance advantages could be eroded as competitors adopt similar components—in exchange for the ability to rapidly improve processing power with each new chip generation.

This decision set the stage for a complex development process. Selecting the right microprocessor involved extensive testing, including building dozens of test boards and conducting firmware trials with users. The team grappled with technical trade-offs such as cache memory size and heat dissipation. Mitsubishi Electric's longstanding commitment to fanless designs, which reduce maintenance burdens for customers, posed a challenge since general-purpose microprocessors generate more heat than ASICs. Through innovative thermal simulations and heat sink design, the team succeeded in fitting the new controller into a compact three-slot housing without compromising reliability.

Parallel to the high-end controller development, Mitsubishi Electric also pursued an entry-level integrated controller to serve users who might not require extensive multi-axis control but still valued integration. This effort involved consolidating development teams from different locations, fostering closer collaboration and accelerating progress.

Recognizing that customers require frequent, tailored functionality upgrades, the project introduced an add-on framework. By providing a software development kit (SDK) and training to co-creation centers worldwide, Mitsubishi Electric empowered local teams to develop customized extensions, enhancing flexibility and responsiveness to diverse user needs.

As development progressed, the team confronted new challenges. They realized that heavily modifying open-source software libraries to differentiate their product could complicate future maintenance and security updates. In a bold move, they reverted to using these libraries largely unmodified, even if it meant rewriting some components, to ensure long-term maintainability.

Security also became a paramount concern. After achieving process certification for the international cybersecurity standard IEC 62443-4-1, the team undertook the demanding task of obtaining product-level certification IEC 62443-4-2, becoming pioneers in Japan's FA controller market. This required revisiting design documentation and source code, further tightening the development schedule.

Despite these hurdles, the MELSEC MX Controller emerged as a versatile platform integrating sequence control, motion control, and network functions. A standout innovation is its use of CC-Link IE TSN technology, which allows multiple communication cycles to coexist on the same network. This enables the controller to manage hundreds of axes simultaneously without sacrificing precision or speed by grouping high-precision and lower-speed control tasks effectively.



Okabe (left) and Watanabe (right) both sensed a crisis while working in different countries



Over 100 engineers came together with one common goal, to design and make a controller that would power the future.

To accelerate market adoption, Mitsubishi Electric began supplying pre-release samples to select customers in early 2024. This approach allowed users to test the controller in real-world conditions ahead of full release, facilitating a smoother transition from competitor products. The MX-F model, in particular, gained attention for offering cost-effective motion control solutions.

The development of the MELSEC MX Controller was a monumental effort involving over 100 engineers and extensive cross-departmental collaboration. Beyond the technical achievements, the project fostered new connections among engineers and refined processes for specification writing and information sharing, laying a foundation for future innovations.

By integrating decades of expertise into a single, cohesive platform, Mitsubishi Electric's MELSEC MX Controller sets a new standard for factory automation. It embodies a forward-looking vision that balances performance, integration, maintainability, and security, empowering manufacturers to meet the complex demands of modern production with confidence. ■

About this article

For the full story behind the MELSEC MX Controller's development, including detailed insights from the engineers and global teams involved, please read the complete article: MELSEC MX Controller: Rising to the challenge of integration.



<https://www.mitsubishielectric.com/fa/the-art-of-manufacturing/focus/insights23/report01.html>



Empowering the Next Generation to Shape the Future



An educational initiative by Mitsubishi Electric

Complementing the technological leap exemplified by the MX Controller is the MECA student competition—a dynamic platform where aspiring engineers gain invaluable real-world experience.

Teams of students design, build, and demonstrate automated systems under realistic constraints, honing skills in systems integration, troubleshooting, and creative problem-solving. This hands-on approach bridges the gap between theory and practice, preparing participants to thrive in modern manufacturing environments

Recent competitions in Vietnam and South Korea reveal a virtuous cycle: advanced automation technologies inspire educational initiatives, while engaged students and emerging engineers help drive innovation forward. Industry mentors and experts play a crucial role in this ecosystem, sharing knowledge and best practices that ensure new technologies are effectively adopted.

Looking ahead, the future of manufacturing depends not only on cutting-edge tools but also on nurturing talent capable of leveraging them. By fostering strong partnerships between technology developers, manufacturers, and educational programs, we can empower the next generation of engineers to unlock the full potential of next-generation automation.

As for the next steps of the MECA Cup: in 2026, two inaugural events will take place. The first is a new MECA initiative launching in Japan early in the year. The second is the crowning event—the first-ever global MECA Frontier Forum—bringing together winners from each regional MECA competition to battle for the honor of becoming global champions. This exciting event is scheduled for September 2026. ■



Participants at the first MECA Cup Korea 2025



Scenes from the fifth MECA Cup Vietnam

MECA Korea Competition



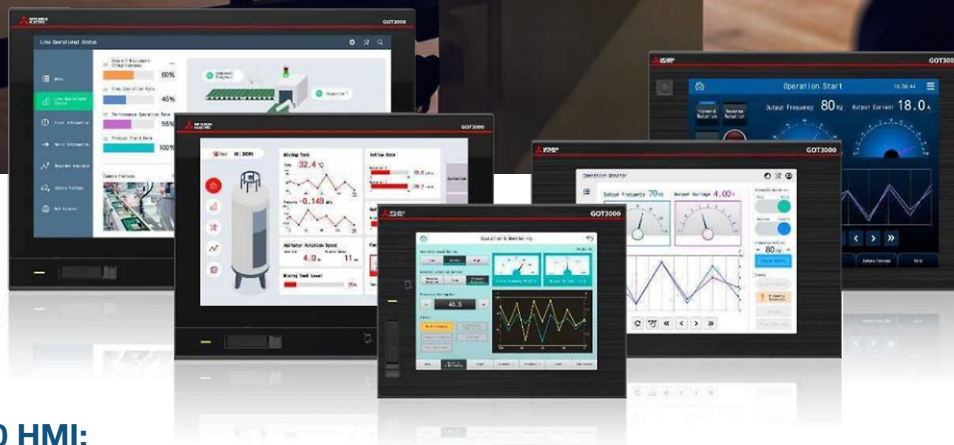
<https://www.mitsubishielectric.com/fa/the-art-of-manufacturing/focus/world-roundup23/>

MECA Vietnam Competition



<https://www.mitsubishielectric.com/fa/the-art-of-manufacturing/focus/world-roundup22/>

launch pad



GOT3000 HMI:

The window to your factory

Accelerating plant-wide digital transformation

The launch of the GOT3000 Human-Machine Interface (HMI) series, brings additional support to the manufacturing sector's accelerating digital transformation (DX) with powerful new capabilities that enhance connectivity, usability and system integration.



With the built-in OPC UA server, GOT3000 serves as a gateway, enabling data integration between IT and OT systems.

As manufacturing businesses pursue greater efficiency, real-time visibility, and smarter automation, the requirements placed on HMI devices have grown significantly. In response, Mitsubishi Electric has built on its extensive experience in the sector and engineered the GOT3000 to act not only as a machine interface but as a secure gateway between factory equipment and higher-level IT systems. This allows users to unlock new value from production data while preserving the ease of use and reliability they expect from Mitsubishi Electric.

Built for connectivity in the era of DX

The GOT3000's role extends far beyond screen interaction. By supporting international standards for industrial communication, such as OPC UA Client¹ and OPC-UA Server and Cloud, it enables seamless integration with higher-level information systems and a wide range of factory automation (FA) devices.

The device also includes a built-in web browser, allowing users to configure and monitor equipment without a PC, and supports advanced communication features such as NFC contactless tag reading and USB-C connectivity. It also offers USB camera connectivity and built-in HDMI output, and is designed to support network camera² connectivity in the future, further expanding its capabilities for real-time monitoring and system integration.

Secure remote access is enabled through encrypted communication, data encryption, and built-in VPN capabilities, making it easy to manage multiple devices from a central location via the cloud. This ensures that the GOT3000 is ready to help enable remote maintenance, predictive monitoring, and other key DX initiatives.

Engineering with ease

While the GOT3000 introduces a host of powerful new capabilities, it continues to prioritize ease of use with engineering tools and workflows that will feel instantly familiar to existing GOT users. The platform retains the intuitive screen design environment that engineers rely on, now enhanced with improved functionality to accelerate interface development and customization.

Compatibility with Mitsubishi Electric's new MX Controller, the all-in-one high spec motion and digital control platform, allows for even greater system integration, streamlining communication between HMI and controller and reducing engineering overhead. This support for a wide variety of connectivity standards, including the CC-Link IE TSN industrial network, and legacy systems ensures that the GOT3000 can fit smoothly into a broad range of production environments.

Smarter, smoother, sharper

At the heart of the GOT3000 is a newly developed high-definition display, capable of rendering up to 16 million colors in impressive detail. This vivid visual clarity is paired with a capacitive multi-touch touchscreen (PCAP), enabling precise, responsive control with familiar gestures such as swiping, pinching, and tapping, enhancing operator comfort and reducing the possibility of input errors.

The interface also supports dynamic frame animations, providing smoother transitions and more engaging screen navigation, while live video display via camera connection allows real-time visual monitoring of processes. Video can be recorded and displayed live. In the event of a malfunction, users can simultaneously view both the recorded footage and the current live feed to investigate the root cause, enabling quicker recovery from issues.

A milestone release from a trusted automation leader

Available globally from September 2025, the GOT3000 is set to become a central component for smart factories of the future. Designed for demanding industries such as automotive, semiconductor, material handling, and pharmaceuticals, it enables manufacturers to take the next step in their digital journey with confidence.

“With the GOT3000, we're enabling customers to advance their digital transformation with confidence, combining advanced performance with trusted engineering to drive the next generation of smart production”

Go Wakamatsu,
General Manager, HMI System Dept.
at Mitsubishi Electric.

Built on over 12 years of HMI design expertise and informed by feedback from thousands of users, the GOT3000 not only reflects our long legacy of successful HMI developments, but delivers what customers need for smarter, more efficient manufacturing. ■

Learn more



<https://www.mitsubishielectric.com/fa/products/hmi/got/items/got3000/>



¹ As for OPC UA, server functionality is supported as standard, while client functionality will be supported in the future. ² Network camera connectivity will be supported in the future.

KAGOME CO., LTD.

Harnessing AI to save energy



Kagome's Fujimi factory manufactures Yasai Seikatsu 100 brand of mixed vegetable and fruit juices.

Kagome Co., Ltd. has harnessed Mitsubishi Electric's EcoWebServerIII and EcoAdviser to turn vast energy datasets into actionable improvements at its Fujimi Factory in Nagano Prefecture. Since bringing its newest production building online in October 2021, the food and beverage maker — known for its Yasai Seikatsu 100 juice range — has used AI diagnostics, clear visual dashboards and on-site empowerment to drive energy savings and cut carbon emissions well beyond regulatory targets.

Turning numbers into action

The Fujimi Factory already collected energy usage data with an EcoWebServer installation, but staff found raw numbers alone weren't enough to identify where the biggest savings could be made. Working with distributor Tachibana Eletech Co., Ltd., Kagome introduced EcoAdviser, Mitsubishi Electric's energy-saving support software, to visualize and analyze measurement points across the entire facility.

EcoAdviser brings data into an accessible format — graphs, charts and comparative displays that make it simple for operators as well as energy managers to see what's happening at each production station. Crucially, the system includes AI diagnostics that can sift through the thousands of daily measurement points and flag priorities for improvement in order of impact.



Practical improvements on the line

Kagome began by focusing on the packaging process — blowers that remove condensation, case packers and shrink wrappers at the end of the line. Because these machines only need to run when filled cartons arrive, the team used EcoAdviser to synchronize their start-up with the flow of production. AI analysis of power consumption and production quantities revealed timing-related energy losses; by optimizing start-up procedures, the factory reduced unnecessary running time and power use.

Encouraged by that success, the team expanded the approach to sterilization and shipment preparation. In sterilization, reducing steam consumption proved a key lever; EcoAdviser's visibility into steam and electricity use revealed opportunities to cut consumption without compromising product quality. A separate review of pallet-transport compressors showed one unit could handle the load, allowing the factory to shut down the second compressor and save more energy.

Empowering on-site teams and accelerating PDCA

A standout outcome of the project has been its effect on people and processes. Production staff were trained to operate EcoAdviser themselves and now use its dashboards to run their own PDCA (Plan, Do, Check, Act) cycles. The visualized, before-and-after comparisons make the results of interventions immediately clear, which Miyairi says has boosted motivation across the shop floor: "They can immediately see how effective their actions have been by comparing before and after data."

Ryota Takemura, Production Engineering Supervisor at the Fujimi Factory, highlights the scale of the data challenge: "We have about a thousand energy measurement points at the factory. Looking at monthly data would mean thirty days' worth of measurements. It would be practically impossible for a human to go through that amount of data and spot inefficiencies." That is where EcoAdviser's AI diagnostics have been essential, prioritizing issues and suggesting where on-site teams should focus.

Measurable carbon reductions beyond compliance

The combined measures have translated into tangible environmental results. Kagome submitted more than 30 improvement proposals in FY2023, many already implemented, and has reduced CO₂ emissions by about 190 tonnes over three years.

By comparison, the factory's obligation under Japan's Energy Conservation Act is to cut roughly 50 tonnes of CO₂ annually — a target Kagome has surpassed several times with a mix of solar, biomass and AI-driven energy management.w

Looking ahead, Kagome plans to continue using EcoAdviser's AI features to uncover further opportunities across its facility. As Miyairi notes, most factory staff are eager to make improvements; what they need is clear, accessible data. EcoAdviser provides that visibility and, in doing so, turns employee enthusiasm into measurable reductions in energy use and emissions. ■



Miyairi and Takemura use EcoAdviser to empower workers to take the lead in energy saving.



EcoAdviser enables integrated management of energy consumption information for the whole factory.

Kagome Co., Ltd. Company founded 1899

Business areas: Manufacture and sale of condiments, preserved foods and beverages; purchase, production and sale of seeds, seedlings, fruits and vegetables; development and sale of health support services. Read the full story at:



<https://www.mitsubishielectric.com/fa/our-stories/045/>



Security as a foundation for digital manufacturing

Global software team earns ISO/IEC 27001 certification, strengthening customer trust in secure digital operations

As manufacturing, infrastructure, and buildings become increasingly software-driven, cybersecurity is no longer a specialist concern confined to IT departments. It has become a core operational requirement, shaping how digital platforms are designed, deployed, and trusted over their full lifecycle.

Against this backdrop, Mitsubishi Electric Iconics Digital Solutions, the software group behind the GENESIS industrial automation and building management platform, has achieved ISO/IEC 27001:2022 certification for its information security management system (ISMS). Awarded by the British Standards Institution (BSI), the business improvement and standards company, the certification confirms an enterprise-wide approach to protecting customer data, intellectual property, and the resilience of software and corporate operations.

Rather than a one-off audit, the certification reflects how security is embedded into day-to-day development, governance, and decision-making across the organisation.

Why it matters

ISO/IEC 27001 is the globally recognised framework for establishing, operating, and continuously improving an ISMS. Meeting its requirements demonstrates structured, repeatable processes for identifying and managing information security risks across people, processes, and technology.

For customers operating in regulated or mission-critical environments, independent certification provides assurance that security controls are not ad hoc or reactive. Instead, they are assessed by a third party and governed through a documented, auditable approach to risk management, incident response, and continuous improvement.

As digitalisation accelerates and software platforms play a greater role in operations, this level of assurance has become a prerequisite rather than a differentiator.



Cybersecurity as an operational concern

The growing importance of cybersecurity is also reflected in regulation. In Europe, initiatives such as the Cyber Resilience Act signal a shift toward clearer expectations around security-by-design, lifecycle responsibility, and accountability for software and connected systems.

While regulatory frameworks differ by region, the direction of travel is consistent. Manufacturers and operators are increasingly expected to demonstrate that cybersecurity risks are understood, managed, and addressed throughout the lifetime of digital products and platforms.

In this context, cybersecurity is not simply about preventing breaches. It is about operational continuity, safety, and trust. A cyber incident can disrupt production, compromise safety systems, or expose sensitive intellectual property, with consequences that extend far beyond IT.

Practical benefits for customers

The certified ISMS delivers tangible advantages for organisations deploying digital platforms such as GENESIS:

- Stronger safeguards for data, intellectual property, and digital infrastructure
- Greater confidence when deploying solutions in complex, compliance-driven environments
- Ongoing refinement of risk management and incident response practices
- A recognised benchmark that simplifies vendor assessment and security due diligence

For customers, this reduces uncertainty during procurement and shortens evaluation cycles, particularly where cybersecurity requirements are becoming more explicit.

Security embedded into daily operations

ISO/IEC 27001 certification is not a static milestone. The standard mandates regular risk assessments, internal audits, and management reviews to ensure that security practices evolve alongside changing threats and business needs.

Within Mitsubishi Electric Iconics Digital Solutions, this means security considerations are integrated into product roadmaps, software development lifecycles, and operational procedures. Cross-functional teams collaborate to review controls, address emerging risks, and maintain alignment between technical measures and governance processes.

This structured approach supports transparency and predictability around security posture, both internally and for customers.

A stronger foundation for trust and growth

BSI's assessment confirms that rigorous criteria were met across governance, technical controls, and operational readiness. For customers, that translates into a stronger foundation for adopting software platforms in demanding environments, from manufacturing operations and critical infrastructure to smart buildings and cloud-based systems.

As digital transformation deepens and regulatory expectations rise, an auditable, standards-based approach to information security helps organisations move forward with confidence, reducing friction while reinforcing trust.

Looking ahead, the team will continue refining its ISMS and aligning future product enhancements with evolving standards and expectations. The underlying message is straightforward: in a digital manufacturing landscape, security is not an add-on. It is a core element of how systems are designed, delivered, and sustained. ■

SEIKO CORPORATION

Simulation brings clarity to production



Based in Shizuoka City, Seiko Corporation designs and manufactures liquid filling machines and other packaging systems.

Seiko Corporation, a packaging systems manufacturer, is using Mitsubishi Electric's MELSOFT Gemini 3D simulator to help design its packaging lines. The tool's ability to simulate the optimal line configuration virtually right from the planning stage of a project has reduced the need for on-site adjustments after installation.

Based in Shizuoka City, Seiko Corporation designs and manufactures liquid filling machines and other packaging systems. The company has earned a strong reputation for its all-in-one bottling machines, which handle the entire process from filling to capping, delivering outstanding reliability, quality and productivity for its customers.

A bottling machine forms part of a wider packaging line that also includes upstream and downstream processes such as container supply, labelling and boxing. Each line must be designed to maximize production efficiency based on the layout of the customer's facility. In the past, on-site adjustments were often required after installation to fine-tune performance to each customer's requirements.

However, making such adjustments once a system is in place can be challenging.



"We realized that being able to simulate a line from the planning stage would help us to make proposals more efficiently," explains Kotaro Murayama of the company's Technology Planning Department.

That realization led Seiko to adopt Mitsubishi Electric's MELSOFT Gemini, a powerful tool that allows equipment layout and operation timing to be simulated in a 3D virtual environment. By verifying the system on a computer during the design stage, potential issues can be identified and resolved early, ensuring trouble-free installation, and eliminating the need for later adjustments.

Finding the optimal layout and operation at the design stage

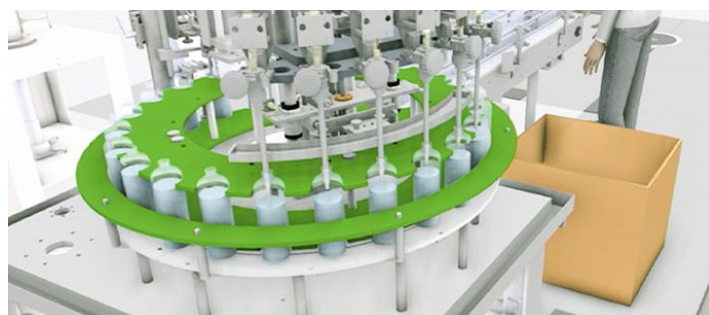
The Seiko team attended several days of training on Gemini before using it to create a 3D model of a bottling machine. Once familiar with the software, they simulated how containers move through the packaging line. When deciding on the layout, designers must consider operating and stopping conditions, conveyor speeds and other interrelated factors – all of which can be checked virtually within Gemini.

Using Gemini, designers can configure each piece of equipment under realistic operating conditions. This makes it possible to identify bottlenecks as containers move along the line and to ensure that all processes stay synchronized to maintain the overall throughput. By testing different configurations and parameters, designers can determine the optimal layout and conveyor settings in advance.

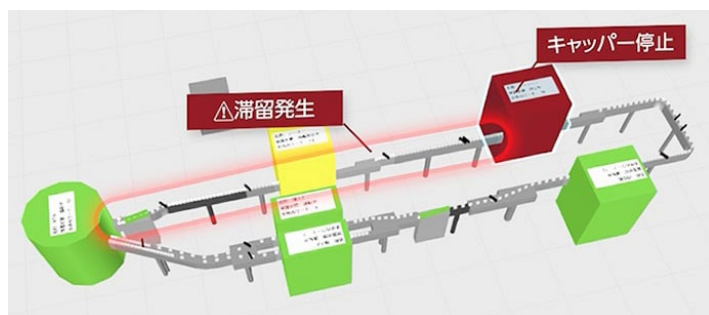
Hiroyoshi Matsuzaki of the Technology Planning Department is impressed by Gemini's effectiveness: "Being able to perform simulations without using the actual equipment is a huge advantage. Checks that would have been performed on-site can now be done at the design stage, which reduces the commissioning time of the packaging line."

Seiko now plans to establish an environment where all employees, not just trained specialists, can utilize existing design data to perform simulations using Gemini. To realize this, the company is creating a library of its most frequently used equipment and components in Gemini's catalog.

"Moving forward, we will be able to detect potential issues at the planning and concept stage, even before the design stage," says Murayama. "As well as reducing the time we need to spend working on site, I think this will be a huge advantage to customers in terms of reducing the overall lead time. We can leverage these benefits to develop more functional systems and improve productivity, providing highly optimized solutions for our customers." ■



A filling machine modeled using Gemini. Operation timing can be verified on screen



Simulation of a whole line to check for bottlenecks or other issues

Seiko Corporation. Company founded 1881

Business areas: Design and manufacture of bottling and packaging machinery for food, beverage, cosmetics, toiletry, chemical, and pharmaceutical industries, including filling, capping, inspection, palletising, and complete packaging line systems, as well as custom-built production solutions. Read the full story at:



<https://www.mitsubishielectric.com/fa/our-stories/046/>



News from around the world

THAILAND

Students from KMITL Win First Place at MECA Thailand

Education

A team of undergraduate students from King Mongkut's Institute of Technology Ladkrabang (KMITL) won first prize at MECA Thailand 2025 with a project using AI to improve quality and reduce waste in surfactant manufacturing, helping lower environmental impact.

Focused on solving decarbonization challenges in Thailand's industrial sector, the competition gave students a platform to develop practical engineering solutions and gain exposure to industry professionals. Projects were judged by industry and Mitsubishi Electric experts on innovation, environmental impact, and technical and business feasibility. The event also included Technology Hackathon workshops, a Greenbot application concept challenge for and a programme of industry seminars, highlighting MECA's role in nurturing future engineering talent.



GLOBAL

Mitsubishi Electric acquires Nozomi Networks

Investment

Mitsubishi Electric has completed the acquisition of Nozomi Networks, a U.S.-based specialist in operational technology (OT) cybersecurity. Nozomi Networks is known for its intrusion detection and network visibility solutions used in manufacturing and critical infrastructure environments.

The acquisition strengthens Mitsubishi Electric's cybersecurity capabilities at a time when connected factories and infrastructure face rising cyber risk. By bringing Nozomi Networks fully into the group, Mitsubishi Electric aims to enhance secure digital transformation initiatives and expand value-added cybersecurity services, supporting customers as OT, IT, and IoT systems become increasingly interconnected.



JAPAN

Machines day off

Event

Mitsubishi Electric marked "Machine Day" in Japan with a short film celebrating the role of machines in supporting everyday life and industry. The video reflects on the relationship between people and technology, highlighting how engineering quietly underpins safety, productivity, and social infrastructure.

The piece aligns with Mitsubishi Electric's long-term emphasis on human-centred automation, positioning machines not as replacements for people, but as partners in progress.

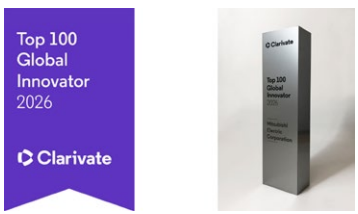


GLOBAL

Mitsubishi Electric Named to Clarivate Top 100 Global Innovators 2026

Innovation Hub

Mitsubishi Electric has been named to the Clarivate Top 100 Global Innovators list for 2026 for the 14th consecutive year. The recognition, based on patent influence, success rate, geographic investment and rarity, places the company 17th overall among organisations that have filed at least 500 patent applications since 2000 and maintained more than 100 inventions registered between 2020 and 2024. The award reflects Mitsubishi Electric’s sustained investment in intellectual property and its alignment with business and R&D strategies aimed at addressing societal challenges and driving sustainable innovation.



CHINA

Mitsubishi Electric invests in ADT Technology Service

Investment

Mitsubishi Electric Corporation has invested in ADT Technology Service (Suzhou), a manufacturing software company in Jiangsu Province, China, to accelerate growth of its factory automation business and strengthen total solution capabilities. Through its local headquarters, Mitsubishi Electric Intelligent Manufacturing Technology (China) Group, the companies signed a strategic collaboration agreement. ADT provides AI-based intelligent manufacturing services, including manufacturing management software, process improvement consulting, and smart manufacturing diagnostics. The investment will integrate ADT’s services with Mitsubishi Electric’s FA equipment and control software to support automation in China.



GLOBAL

Mitsubishi Electric Receives CDP A List Ratings for Climate and Water

Award

Mitsubishi Electric Corporation announced that it has been selected for the highest “A List” ratings in both Climate Change and Water Security by CDP. This marks the company’s eighth inclusion on the A List since 2016 and the third consecutive year it has received top ratings in both categories.

CDP evaluates corporate environmental performance and disclosure based on data reported by approximately 24,800 companies worldwide, representing nearly two-thirds of global market capitalization. In 2024, only around 2% of reporting companies achieved A List status, with just 0.3% earning the top rating in both climate and water categories.

Mitsubishi Electric positions sustainability as a core element of its management strategy and promotes initiatives aimed at carbon neutrality, circular economy development, and nature-positive outcomes. The company will continue working across its global value chains to reduce environmental impact and contribute to a more sustainable society.



Please visit our Media Library to watch more.

<https://www.mitsubishielectric.com/fa/media-library/index.html>

Taste_{of} Japan

Choose better, not best: The pride of a shogi master

Still advancing through the ranks in his fifties, Masataka Sugimoto (8th dan) is a professional shogi player who has never lost his ambition to keep improving. Outside of the shogi fan community, he is best known for mentoring a shogi prodigy called Sōta Fujii. Here, he talks about how to maintain the desire to better yourself, as well as his thoughts on cultivating talent in others.



In 2016, Japan was hit by “Fujii fever” when a young prodigy named Sōta Fujii burst onto the shogi scene, sparking a renewed interest in the game of shogi (Japanese chess) across the country. As well as the young hero, another shogi player was thrust into the limelight: Fujii’s mentor, Masataka Sugimoto.

Having started to take on apprentices from his early thirties – an unusually young age for a shogi master – Sugimoto is successful both as a professional player and as a mentor.

From his experience of teaching many apprentices, he knew at once that Fujii had a talent on a par with shogi legend Yoshiharu Habu. Like Habu, Fujii would go on to hold all seven major professional shogi titles at the same time.

Sugimoto shares his tips for “reading ahead” as only a shogi player can, striking a balance between self-improvement and fostering the next generation, as well as the best way to engage with AI – now commonly used in the world of shogi.



AI has developed to the extent that it can now clearly show what is the “best” answer in shogi. But many professional players choose “better” rather than “best” – in other words, believing in their own best, rather than the answer given by AI. I think this shows that what AI believes is best and what humans believe is best are two different things.

Perhaps this is just the pride of a professional player speaking, though! I would like more people to enjoy the human aspect of shogi – the players’ personalities and emotions, beyond winning or losing. I hope this will attract more shogi players and fans.

What is Shogi?

Often referred to as “Japanese chess,” shogi is a strategic board game played by two opponents, each commanding 20 pieces. While it shares similarities with Western chess, shogi has several unique features. Most notably, captured pieces can be returned to the board as your own. This creates a dynamic, fast-paced game full of reversals and surprises.

Shogi players advance through a ranking system starting from the kyū levels, progressing to dan levels. Becoming a professional requires reaching 4th dan – an achievement that can take years of intense training in the apprentice school system.

Among the pieces, the rook (hisha) stands out as especially powerful. It can move across the board in straight lines and, when promoted, gains additional diagonal movement. Because of its strength and versatility, many players build their strategies around it, making the rook a key focus for both offence and defence.

Masataka Sugimoto: Profile

Masataka is an orthodox Ranging Rook player and a leading authority on the Double Ranging Rook. At the age of 50, he became the fourth oldest player to be promoted to the prestigious B2 class of professional shogi.

He currently runs a shogi research institute and is dedicated to nurturing the next generation of players, including seven-title holder Sōta Fujii and women’s shogi professional Ito Murota.

Read the full four part story for a fascinating glimpse into an intriguing world:



<https://www.mitsubishielectric.com/fa/the-art-of-manufacturing/column/expert-views38/>

The people behind Automating the World

Six perspectives on how people, technology and responsibility are shaping modern manufacturing



Behind every automation system are people dedicated to advancing manufacturing. At Mitsubishi Electric, our long-term vision, engineering responsibility, and commitment to “contributing to society through automation” drive us to embrace new challenges.

“The Road to Automating the World” series features interviews with Mitsubishi Electric FA Division employees from around the globe. We asked them about their motivations for joining the company, what values guide their daily work, and their sincere dreams for the future of manufacturing under the banner of “Automating the World.”

Read more about our people Automating the World



<https://www.mitsubishielectric.com/fa/about-us/automating-the-world/road-to-automating-the-world/>

1

Kentaro Arimizu
Head of the Mechatronics New Business Promotion Group
Mechatronics Business Division
Joined 2010



Maintaining a “Win-Win-Win” for customers, sales companies and Mitsubishi Electric

Drawn to Mitsubishi Electric’s resilience—even maintaining profitability after the Lehman Shock—Kentaro joined the company. With a strong commitment to technology and quality, he is working to automate metal 3D printers, aiming to improve efficiency and quality on the shop floor. He values a mindset of “continuous thinking” and “never running away,” and is dedicated to creating new value that benefits customers, distributors, and the company alike.

2

Kim Dae-Sik
Group Manager, Servo Systems Marketing 2 Team
Drive Systems Business Unit,
Mitsubishi Electric Automation Korea
Joined 2008



Believing manufacturing must become a socially responsible industry

With a background in electronic engineering, Kim joined Mitsubishi Electric to leverage his expertise. As a servo system sales leader, he focuses on market analysis and optimal proposals, always striving to “see things from the customer’s perspective.” Inspired by his experience solving delivery issues, he now aims to become a trusted partner by utilizing AI and IoT for sustainable manufacturing, contributing to the social value of the industry.

3

Rong Gang
Deputy Director, China Co-creation Center
Mitsubishi Electric Automation (China) Ltd
Joined 1998



Creating the future of factory automation through co-creation

After studying industrial automation and techno-economics and gaining hands-on experience, Rong joined Mitsubishi Electric. She has played a key role in launching the FA division, providing technical support, and promoting e-F@ctory business. Now, as Deputy Director of the China Co-Creation Center, she takes pride in technology and uncompromising quality, delivering high-quality solutions while bridging cultural differences between Japan and China. She is committed to contributing to the future of industry through cutting-edge technology.

4

Lukasz Sendeki
Marketing & Technical Support Department Manager
Mitsubishi Electric Europe B.V., Poland Branch
Joined 2009



Finding harmony between people and technology

After studying heavy industry management, Lukasz joined Mitsubishi Electric with a desire to grow on the international stage. As director of the FA division overseeing Central and Eastern Europe, he emphasizes building excellent teams and people-focused business, adapting flexibly to diverse cultures and situations. He is dedicated to improving quality of life, creating jobs, and protecting the environment, while leveraging advanced technology to realize a more human-centered manufacturing and a better society.

5

Yohei Tsujita
Associate Expert, Digital Manufacturing Engineering Section
Production Systems Planning Department, Nagoya Works
Joined 2018



Having fun with monozukuri and data utilisation

Driven by a passion for manufacturing, Yohei joined Mitsubishi Electric and has been involved in developing mass production technology for the “HK Series” servo motors. Through data-driven trial and error, he achieved mass production of “coreless iron cores.” Now, he is working to transform manufacturing sites with digital technology, promoting the use of on-site data through PoC projects. By leveraging both user and developer perspectives, he is committed to enhancing the appeal and quality of manufacturing.

6

Nguyen Hoang Kim
Senior Marketing Executive, Factory Automation Department
Mitsubishi Electric Vietnam
Joined 2022



Empowering the next generation of manufacturing professionals

Inspired by Mitsubishi Electric’s commitment to nurturing young talent, Nguyen joined the company. Through the MECA project, she finds fulfillment in supporting students’ growth, emphasizing attentive care and thoughtful support in project management. She believes manufacturing is “bringing heartfelt ideas to life,” and has seen student ideas implemented in real production settings. Kim is dedicated to creating an environment where young engineers can thrive as “change makers” in the industry.

Did you know?

e-F@ctory anticipated today's cognitive factory long before Industry 4.0 had a name

In 2003, Mitsubishi Electric introduced e-F@ctory at a time when factories were automated but fragmented. PLCs, HMIs, and machines operated reliably, yet production data remained siloed, OT / IT systems were deliberately separated, where improvement activities relied heavily on experience and offline analysis.

e-F@ctory challenged this model by connecting shop-floor control with information systems, enabling production data to be visualised, analysed, and utilized in near real-time by the people closest to the process. It reframed factory automation from a collection of machines into a connected, learning system.

1,385+
partners

in the e-F@ctory Alliance, enabling localised solutions

30%
cost reduction

reported through preventative maintenance and 365-day non-stop operation

80,000
installations worldwide

supporting manufacturers across multiple industries

70%
productivity improvement

through full maintenance automation

e-F@ctory

From integration to cognition

Over time, the principles behind e-F@ctory have continued to evolve. What began as data integration and visualisation has expanded into simulation, optimisation, and learning systems that support more complex production environments. By combining real-time data with models of factory behaviour, manufacturers can test changes virtually, anticipate issues, and optimise performance before problems occur.

These capabilities form the practical foundation of what is now described as Cognitive Manufacturing. Production systems no longer just execute instructions; they learn from operation, adapt to context, and support human judgement with insight and prediction.

Looking ahead

As factories face growing complexity, skills shortages, cybersecurity demands, and sustainability pressures, the need for systems that understand, not just automate, is increasing. The cognitive factory is not defined by a single technology, but by how well data, systems, and people work together.

Seen in this light, e-F@ctory was not an early version of Industry 4.0, but a precursor to a more mature way of thinking about manufacturing. One where integration enables understanding, and understanding enables better decisions. The next phase is not about more data, but about turning experience and insight into shared, living intelligence across the factory.

For full details visit <https://www.mitsubishielectric.com/fa/solutions/efactory/>

Digital Twins made easy



**Automating
the World**

MELSOFT GEMINI

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Providing tips to solve manufacturing issues and the latest trends in Mitsubishi Electric Factory Automation.

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