

Overview



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Mitsubishi Electric's Smart Manufacturing Initiatives

In FY2020, Mitsubishi Electric Corporation celebrated the 100th year since its foundation. By drawing on technologies that we have cultivated for many years, we have been working to create values in the four sectors: life (living); industry for producing the essentials; infrastructure that supports society; and mobility that connects these items, aiming to realize Society 5.0 and achieve the SDGs. Our FA Systems business helps customers to make their factories smarter (smart manufacturing) by providing products and services that combine FA and IT as "e-F@ctory" integrated solutions for industry.

The Japanese manufacturing industry has traditionally depended on human intuition and know-how of experienced workers. However, the working population is decreasing due to the declining birthrate and aging population, and so conventional manufacturing that depends on humans can no longer be relied upon. To cope with the changing business environment, manufacturers around the world have been making their factories smarter using the Internet of Things (IoT), including Japan's "Connected Industries."

The business environment is also becoming harsher due to the globalization of companies, fiercer competition among companies, and the unclear situation of global politics and economic situations. In response, value creation and quick decision-making through digital transformation (DX) are crucial. Furthermore, business models also need to be changed, for example, in addition to the conventional provision of products, it is now also necessary to provide services and solutions.

Mitsubishi Electric was a pioneer by proposing that manufacturing be changed by e-F@ctory in 2003, before the terms "IoT" and "DX" were even invented, and has been supporting smart manufacturing. In manufacturing-oriented Japan, to cope with the intensifying global competition and to provide both goods and solutions, it is important to embrace technologies, expertise and know-how acquired at actual manufacturing sites that are specific to Japan, unlike in Europe and the U.S. where IT and digital technologies are used as the main tools.

Going forward, e-F@ctory will encompass the latest IoT, AI, control, and communication technologies, in addition to information linkage between manufacturing sites and IT systems, and will combine expertise acquired at manufacturing sites, data technologies, and edge computing for smart manufacturing.

This special issue introduces edge computing, compact AI, and time sensitive networking (TSN) as examples of advanced technologies for realizing smart manufacturing, and our latest FA products and solutions incorporating these technologies.

For edge computing, the open software platform Edgex that goes beyond the boundaries of companies and industries was adopted. The platform makes it easy to communicate with various units installed at manufacturing sites with different FA networks, realizing ecosystems that link with various types of software on the IT side.

Regarding compact AI, our AI technology "Maisart" was used to develop "Kotsumon," which is a system that automatically detects specific behavior from camera images to make operation analysis more efficient. We also have developed a testing technology that detects errors in equipment highly accurately to reduce equipment downtime.

Regarding TSN, we were one of the first companies in the world to apply TSN to industrial open networks^{*1} and have contributed to the standardization of "CC-Link IE TSN" that combines FA and IT and high-speed and high-accuracy control, providing many related products.

This special issue also describes the creation of solutions using software and the application package product "iQ Monozukuri," which was developed using our manufacturing knowledge cultivated to date. iQ Monozukuri supports data analysis and equipment testing at manufacturing sites and makes it possible to introduce, expand, operate, and maintain systems efficiently.

We will keep taking the initiative toward smart manufacturing by advancing our e-F@ctory while placing priority on manufacturing sites at all times. We aim to attain Society 5.0 and the SDGs by providing products that help alleviate the labor shortage.

¹ As of November 27, 2018, according to our research