for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

# iQ Platform

## Integrated Automation Concept

Mitsubishi Electric FA Integrated Concept

# GLOBAL IMPACT OF MITSUBISHI ELECTRIC

Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

## *Changes for the Better*

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

**Energy and Electric Systems**
A wide range of power and electrical products from generators to large-scale displays.

**Electronic Devices**
A wide portfolio of cutting-edge semiconductor devices for systems and products.

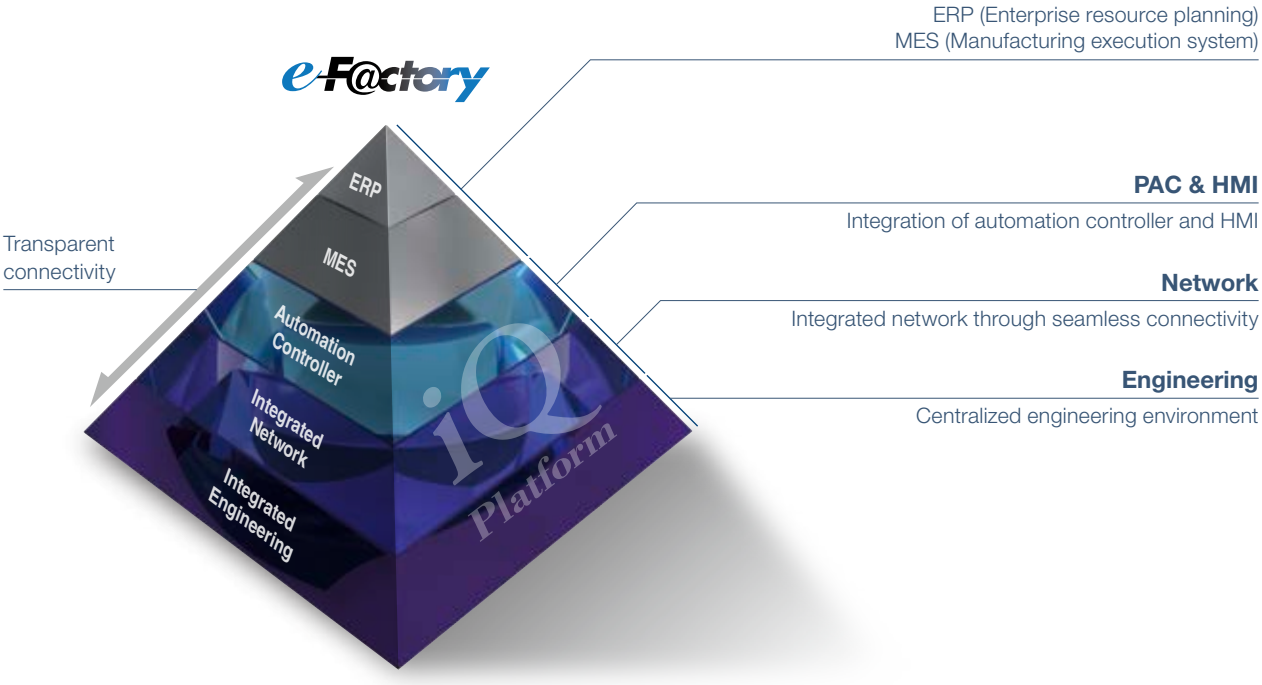
**Home Appliance**
Dependable consumer products like air conditioners and home entertainment systems.

**Information and Communication Systems**
Commercial and consumer-centric equipment, products and systems.

**Industrial Automation Systems**
Maximizing productivity and efficiency with cutting-edge automation technology.

# iQ Platform for maximum return on investment

Minimize TCO, Seamless integration, Maximize productivity, Transparent communications: these are common items that highlight the benefits of the iQ Platform and e-F@ctory. The iQ Platform minimizes TCO at all phases of the automation life cycle by improving development times, enhancing productivity, reducing maintenance costs, and making information more easily accessible across the plant. Together with e-F@ctory, offering various best-in-class solutions through its e-F@ctory alliance program, the capabilities of the manufacturing enterprise is enhanced even further realizing the next level for future intelligent manufacturing plants.




## Further reduce TCO while securing your manufacturing assets

### Automation Controller

**Improve productivity and product quality**

1. High-speed system bus realizing improved system performance
2. On-screen multi-touch control enabling smooth GOT (HMI) operations

### Integrated Network

**Best-in-class integrated network optimizing production capabilities**

1. CC-Link IE supporting 1 Gbps high-speed communication
2. Seamless connectivity within all levels of manufacturing with SLMP

### Centralized Engineering

**Integrated engineering environment with system level features**

1. Automatic generation of system configuration
2. Share parameters across multiple engineering software via MELSOFT Navigator
3. Changes to system labels are reflected between PAC and HMI

## Advanced, high-speed integrated controllers

The iQ-Platform realizes consolidated controllers on one common platform. Various different controllers responsible for different aspects of automation control can be used together on one high-speed system bus. The various control CPUs utilize high-speed data communication via the backplane, further reducing cost as additional networks are not required and improving performance owing to the platform's large data bandwidth capability.

## Improved maintenance and lean manufacturing

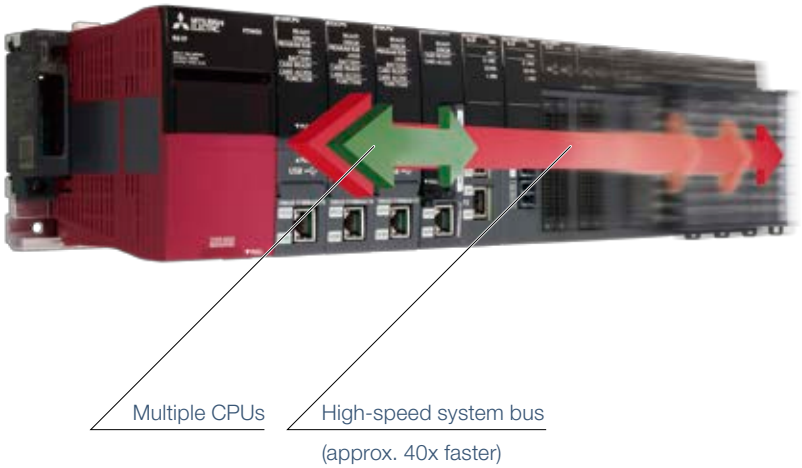
Maintenance is improved as spare parts are kept to a minimum by basing the control on one common automation platform. In addition, traceability within production is enhanced by direct connection to the Enterprise, the MES interface delivering IT information to the shop floor, thereby realizing lean manufacturing processes.

## High-accuracy motion control using high-speed multi-CPUs

The iQ-R Series servo controller system consists of a high-speed, high-capacity programmable controller CPU and a high-speed, high-accuracy motion CPU operating via a high-speed main base. Complex machine control is realized without compromising the operation speed.

## Advanced machine interface functionality

General machine operations such as that for the computer numerical control (CNC) can be easily realized on the HMI (GOT) without having to use a stand-alone system. The GOT2000 boasts advanced functionality such as high-speed processing, increased memory with expansion options through an SD memory card slot, and easy operability through its multi-touch gesture functionality.



## ■ MELSEC iQ-R Series

As a bridge to the next generation of automation, the MELSEC iQ-R Series is a high-end automation controller system including various features that help to reduce TCO*, improve reliability and reuse existing assets.

### Programmable controller

The core of the MELSEC iQ-R Series, the programmable controller CPU, includes various features such as an embedded database and high-speed processing that enable it to perform a wide range of control tasks. Five CPUs are available depending on program capacity (40K to 1200K steps).

### Motion controller

The motion CPU is capable of positioning, speed, torque, tightening and press-fit, advanced synchronous, and cam control, further satisfying high-mix and low-volume production in X-Y table, winding, packaging, and filling machines.

### C Controller

The C Controller is a reliable open platform for executing C/C++ applications. Having a robust design, C Controller is an attractive alternative to computers, which are usually associated with high maintenance costs.

### Process CPU

The Process CPU is designed specifically for medium- to large-scale process control systems requiring high-speed performance coupled with the handling of large PID loops. Hot-swapping of I/O modules is also possible, which adds further reliability to the control system.

## ■ MELSEC-Q Series

The MELSEC-Q Series offers a broad spectrum of automation controllers, realizing an increase in productivity and improvement in production processes.

### CNC CPU

Integration of high-performance CNC controllers improves control system operating time and performance, resulting in higher productivity. Standard I/O modules reduce maintenance costs as replacements are generally available.

### Robot controller

By integrating MELFA robots, it is possible to leverage communication with other controllers and HMI utilizing the multi-CPU capability and improve overall machine productivity.

## ■ MELSEC iQ-F Series Programmable controller

The MELSEC iQ-F Series is a compact next-generation controller that includes many integrated functions, enhanced processing performance, user-centric programming and improved connectivity to drive related control.

## ■ GOT2000 (HMI) Series

The GOT2000 improves productivity through its multiple advanced functions. The HMI can act as a seamless interface to other controllers within the production line, monitor production values, and offers easy-to-use multi-touch gesture operability. A high-resolution display enables viewing information clearly even when at a high zoom level.

* TCO: Total cost of ownership

## Reduce system configuration costs

Seamless connectivity is possible between production management systems, programmable controllers and other devices without having to worry about network hierarchies or boundaries. Monitoring and collecting data can be performed from virtually anywhere on the network, and on Ethernet devices supporting seamless message protocol (SLMP)*, such as vision sensors and RFID controllers.

### Seamless connectivity through all levels of manufacturing

SLMP eliminates concerns about network hierarchies and boundaries. Monitoring machines and collecting data can be performed from virtually anywhere on the network.

### High-speed and large bandwidth ideal for large-scale control systems

The Ethernet-based open network CC-Link IE is an industry-leading 1 Gbps high-speed, large-capacity network. The division of 1 Gbps broadband into uses for distributed control and field data communications secures the reliability of control communications and realizes real-time data collection, which can be difficult with standard Ethernet. In addition, SLMP-ready Ethernet devices such as a machine vision sensor or RFID controller can be connected to CC-Link IE without adding another network.

* SLMP: A simple client-server common protocol that enables communication between Ethernet products and CC-Link IE-compatible machines.

## Optimal network proposals for each level

### CC-Link IE Control

CC-Link IE Control is a high-reliability distributed control network designed to handle very large data communications (128K word) over a high-speed (1 Gbps) dual-loop optical or twisted-pair cable topology.

### CC-Link IE Field

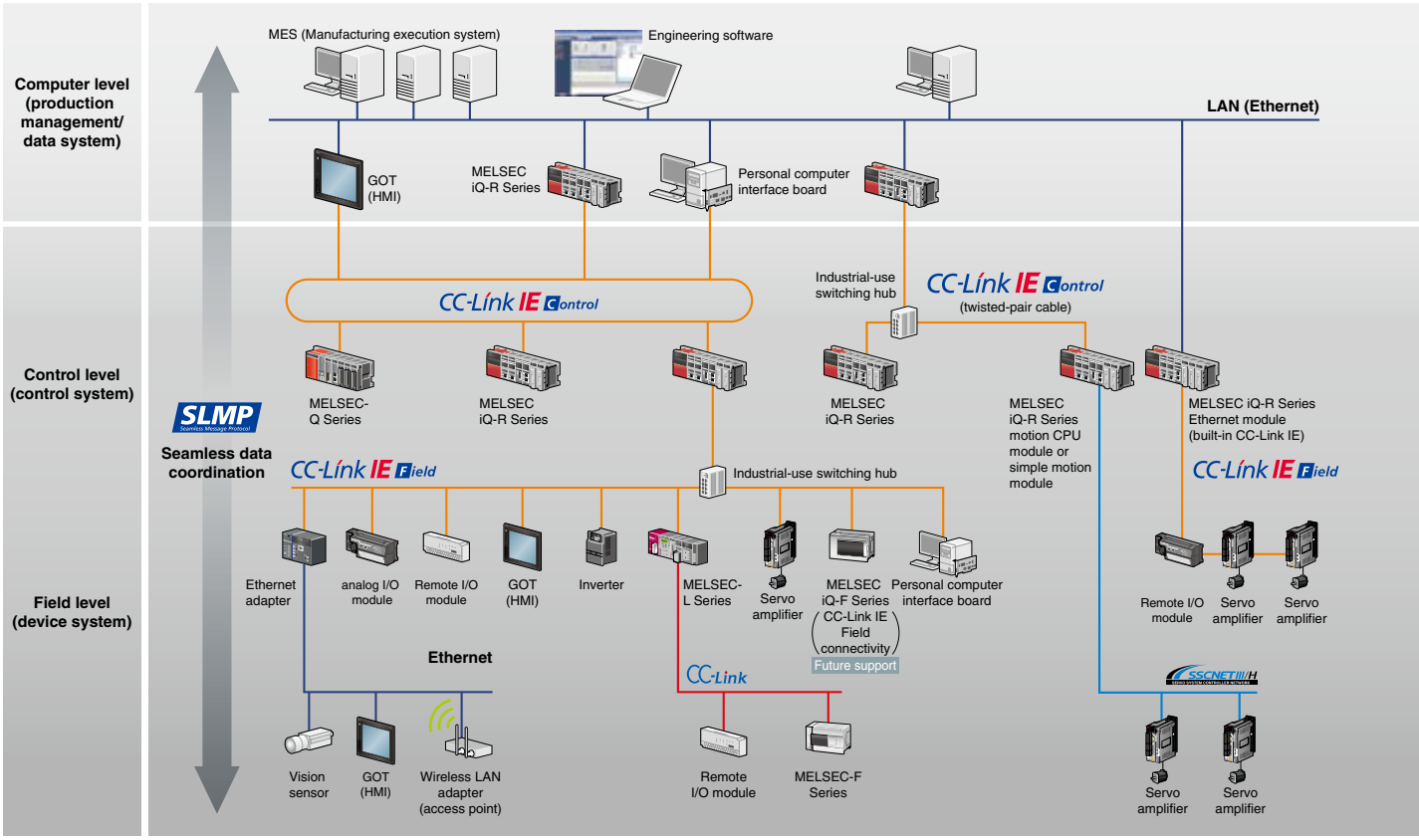
CC-Link IE Field is a versatile gigabit Ethernet-based network integrating controller, I/O control, safety control, and motion control in a flexible wiring topology supporting star, ring, and line configurations.

### CC-Link

CC-Link is a high-speed and highly reliable deterministic I/O control network that realizes reduced wiring while offering multi-vendor compatible products. This open field network is a global standard, originating from Japan and Asia.

### SSCNET Ⅲ/H

SSCNET Ⅲ/H is a dedicated high-speed, high performance, highly reliable servo system control network that offers flexible long-distance wiring capabilities based on optical-fiber cable topology.




## Utilize Gigabit & Ethernet advantages at field/ device level

The high-speed CC-Link IE Field network realizes fast communication between devices improving, system performance, especially for large production lines with various configurations. In addition to this, high-speed CPU processing ensures deterministic control performance by realizing a shorter program scan time.

MELSERVO servo amplifiers are connected to CC-Link IE Field via a dedicated interface, realizing high-speed and high-accuracy control applications.

FA Integrated Engineering Software

MELSOFT iQ Works

## Integrated engineering environment for further reduction of TCO

MELSOFT iQ Works is an integrated software suite consisting of GX Works3, MT Works2, GT Works3, RT ToolBox2 mini and FR Configurator2, which are programming software for each respective product. The strength of this powerful integrated software suite is the easy-to-use graphical system design, which brings a substantial reduction in repetitious tasks and errors while helping to reduce the overall TCO.

The integrated engineering software enables easier system project creation throughout the engineering process, ensuring consistency through every step such as for system design, programming, debugging and maintenance.

### Efficient project management through intuitive workspace

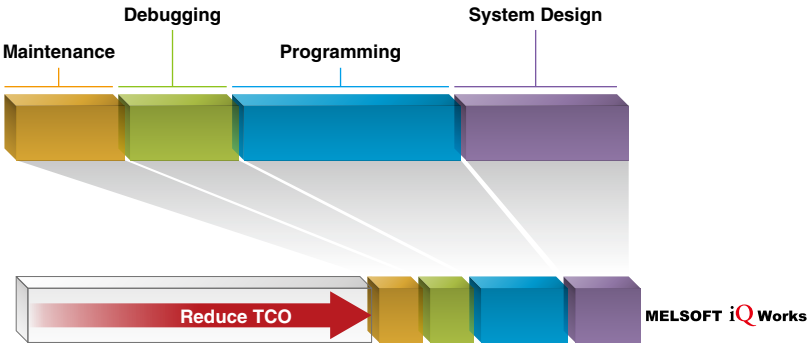
The main workspace supports easy management of multiple projects, with correlations between different products shown as visual representations. This is ideal for large projects as various control systems can be subdivided into manageable groups.

### Graphic-based system configuration, multiple parameter registration

System-level configuration is graphic-based, simplifying project design with parameters capable of being registered. This directly reduces the possibility of errors when setting each system component.

### Centralized label database reduces engineering time

The label database is unified, allowing centralized management of system-wide global labels. The dynamic labeling structure enables system label sharing, which ensures that labels can be used without being conscious of device names, and is also responsive to system configuration changes without having to modify labels within each programming tool.



## System management software
## MELSOFT Navigator

System level graphic-based configuration tool that simplifies the system design by providing a visual representation of the system. System management features such as system-wide parameterization, labels and block reading of project data are also included.

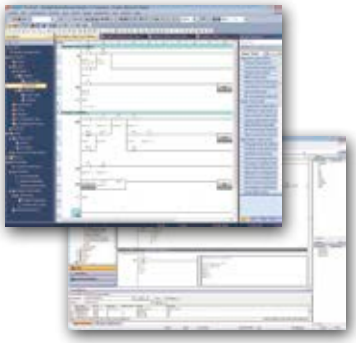
## Programmable controller engineering software

### MELSOFT GX Works3

Graphical and intuitive operability, easy programing by just "selecting", and diagnosis function for easy troubleshooting reduces engineering cost.

### MELSOFT GX Works2

Incorporating legacy support of programs created with GX Developer, GX Works2 further improves its functionality resulting in reduced engineering costs.



## Motion controller engineering software
## MELSOFT MT Works2

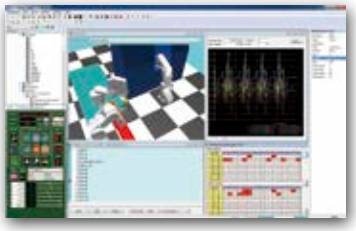
The motion control design and maintenance software includes intuitive graphic based programming together with a digital oscilloscope simulator.

## HMI/GOT screen design software
## MELSOFT GT Works3

The GOT (Graphic Operation Terminal) screen creation software has been designed with 3 main features; Simplicity, Graphic Design, and Easy-Usability, further helping to create graphic screens with fewer steps.

## Robot engineering software
## MELSOFT RT ToolBox2 mini

This robot setup software supports various steps from programming, to commissioning, evaluation, and maintenance. In addition, improved preventative maintenance is realized through the use of an integrated 3D robot simulator.



## Inverter setup software
## MELSOFT FR Configurator2

This software simplifies the setup and maintenance of AC inverters. Parameters can be registered easily and distributed to multiple inverters when replacing, and activation of the PLC function all from one setup screen.

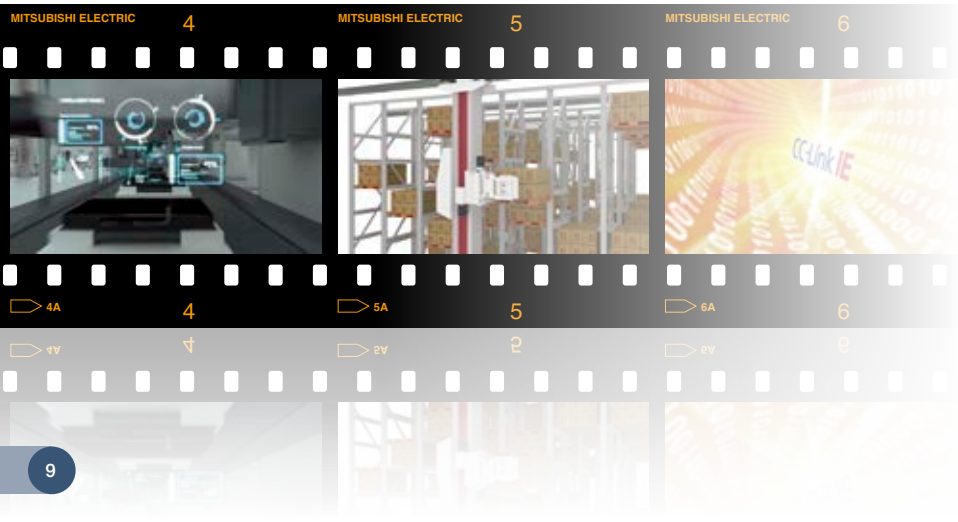
## Reduce TCO with iQ Platform seamless integration and optimization capabilities

The integrated controller and HMI of the iQ Platform offer the system designer the option to implement an optimized control system that integrates different control processes onto one common platform. The high-speed system bus enables fast data communication between these processes and ensures that the high-accuracy requirements of the application are satisfied.

### Making it all work together

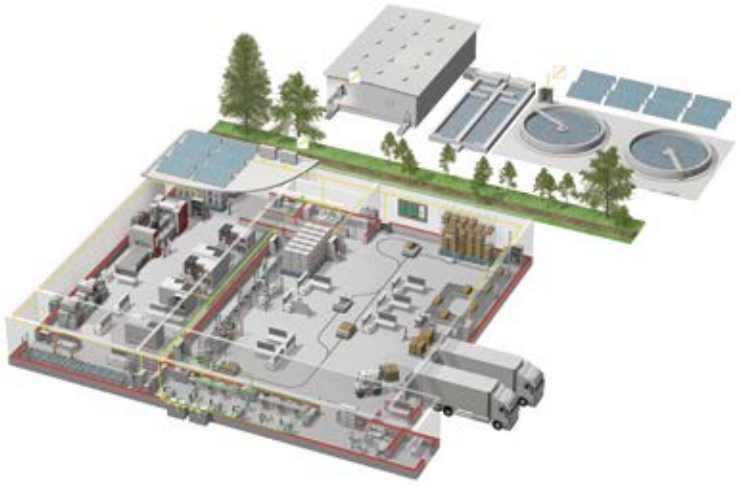
When processes require control systems to be separated, the seamless network architecture of the iQ Platform is the ideal system. It offers a best-in-class multiple hierarchy, high-speed network solution with seamless communication between the various network layers at very fast communication speeds.

The engineering environment compliments the hardware integration by enabling various project management features to be shared across the separate programming and design software. This provides an easy, cost-effective way to setup and design the control machine.
Overall the iQ Platform integrated solution offers an optimum system where various processes can be put together easily. At the same time, it provides a low-cost solution that contributes to enhancing the competitiveness of the system.




### iQ Platform promotional movie

# YOUR SOLUTION PARTNER



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

## A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over $40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.

Low voltage: MCCB, MCB, ACB

Medium voltage: VCB, VCC

Power monitoring, energy management

Compact and Modular Controllers

Inverters, Servos and Motors

Visualization: HMIs, Software, MES connectivity

Numerical Control (NC)

Robots: SCARA, Articulated arm

Processing machines: EDM, Lasers, IDS

Air-conditioning, Photovoltaic, EDS

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