

MELSEC Consolidated Catalog

e-Factory



Programmable Controller

MELSEC

designed with automation in mind

GLOBAL IMPACT OF MITSUBISHI ELECTRIC



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

Changes for the Better

"Changes for the Better" represents the Mitsubishi Electric Group's attitude to "always strive to achieve something better", as we continue to change and grow. Each one of us shares a strong will and passion to continuously aim for change, reinforcing our commitment to creating "an even better tomorrow".

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.

Our advances in AI and IoT are adding new value to society in diverse areas from automation to information systems. The creation of game-changing solutions is helping to transform the world, which is why we are honored to be recognized in the 2019 "Forbes Digital 100" as one of world's most influential digital corporations.



Committed to ever higher customer satisfaction

Mitsubishi Electric is a global leader in the research, manufacturing and marketing of electrical and electronic equipment used in areas such as communications, consumer electronics, industrial technology, energy and transportation. Within this, the industrial automation business has grown significantly since the first induction motor was manufactured over 90 years ago and has closely followed the automation industry in Japan, Asia, and beyond. Mitsubishi Electric industrial automation boasts a wide-range of product areas such as production control, drives, and mechatronics that are used in various industries. In addition, Mitsubishi Electric offers e-F@ctory and iQ Platform, leveraging its total industrial automation solution portfolio.



Intelligence in everything automated—MELSEC

The MELSEC (Mitsubishi ELectric SEquence Control) brand is well known in the automation industry for robust quality and excellent performance that realizes a reduction in total cost of ownership (TCO). The MELSEC lineup consists of various products, the flagship products being the MELSEC-Q Series and recently introduced MELSEC iQ-R Series. These high-end programmable controllers, mainly used for controlling processes in manufacturing lines and advanced machines are complimented by small- to medium-sized controllers like the MELSEC-L Series, MELSEC-F Series and the new MELSEC iQ-F Series, which are commonly utilized for cell manufacturing and stand-alone applications. Over the years, a main characteristic of the MELSEC Series has been seamless connection, from the sensor level all the way through to Enterprise covering all aspects of manufacturing.

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Maximizing productivity and reducing costs across the entire enterprise

e-F@ctory is the Mitsubishi Electric solution for improving the performance of any manufacturing enterprise by enhancing productivity, and reducing the maintenance and operations costs together with seamless information flow throughout the plant. e-F@ctory uses a combination of factory automation and IT technologies, offering solutions to reduce the total cost of development, production, and maintenance by supporting advanced *Monozukuri**.

e-F@ctory helps to reduce overall costs and is achieved in the following four areas:

* Monozukuri is an initiative started in Japan for promoting its unique manufacturing style for continuous improvement in production processes and operations. The word is derived by combining the words "mono", the thing that is manufactured, and "zukuri", the process of manufacturing

Reduce energy costs

Energy saving solution

Modern manufacturing depends much on reducing energy costs as a way to realize an efficient manufacturing enterprise. e-F@ctory supports this by allowing visualization of real-time energy usage, helping to reduce the overall energy consumption.

Integrate FA and IT systems at low cost

Edge-computing (FA-IT information connection)

Edge computing enables point-of-origin processing by seamless data collection and analysis, realizing optimization of manufacturing operations improving various elements such as productivity and quality.

Reduce development, production, and maintenance costs

iQ Platform

The iQ Platform minimizes costs at all phases of the automation life cycle by improving development times, enhancing productivity, reducing maintenance costs, and making information more easily accessible. Integration is at the heart of the iQ Platform, with a highly intelligent controller platform as the core, combined with a seamless communication network and an integrated engineering environment.



Reduce setup and maintenance costs

iQ Sensor Solution

Easily setup and maintain various types of sensors. Maintenance and design costs can be reduced as compatible iQSS partner sensors can be managed together.



IT system

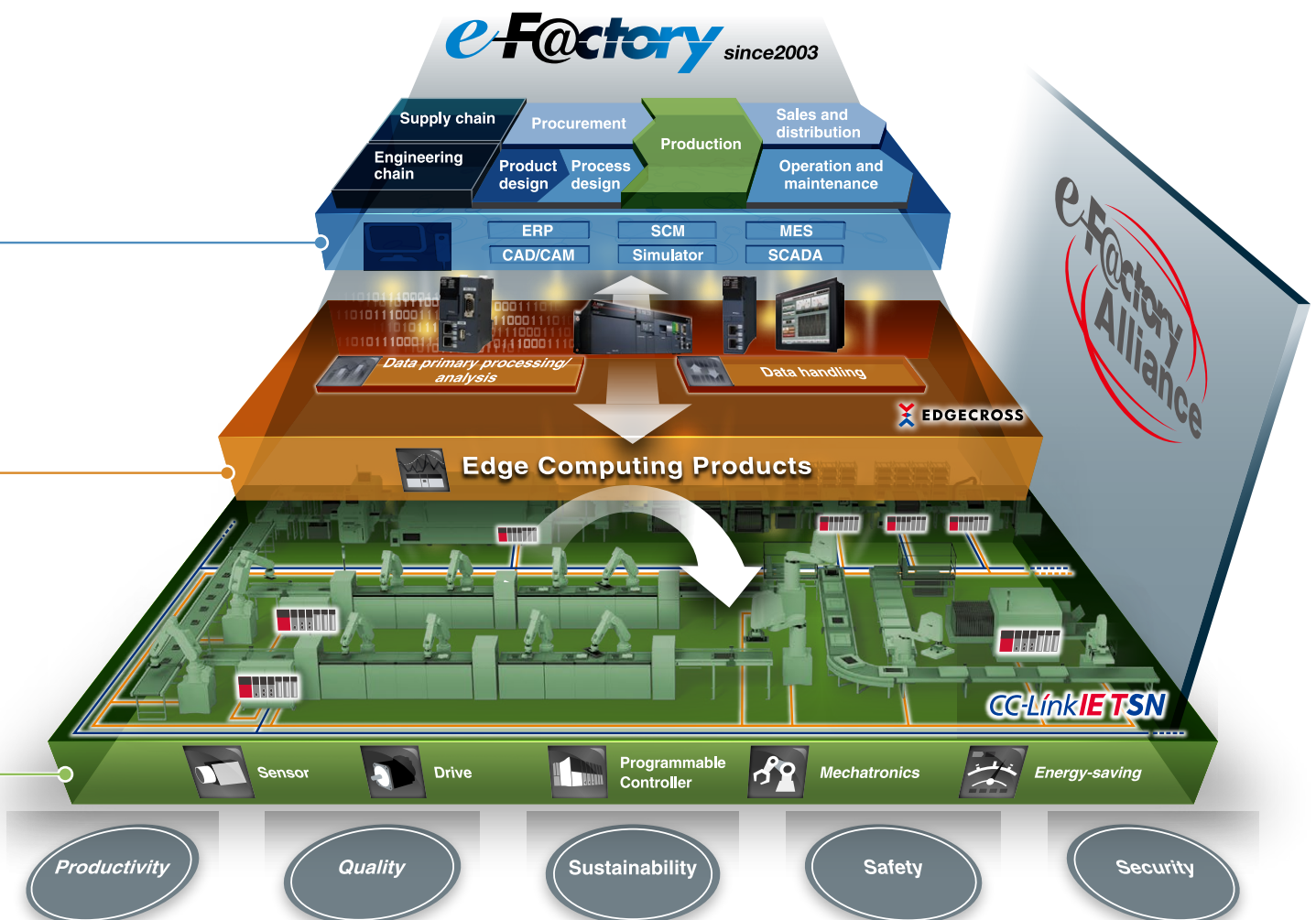
Edge-computing

Shop floor

For further details, please refer to the catalogs below.

"FA-IT Integrated Solution e-F@ctory: L(NA)16012E"

"iQ Sensor Solution: L(NA)16029ENG"



Best-in-class solutions across the ecosystem

e-F@ctory Alliance

The e-F@ctory Alliance is an ecosystem offering best-in-class solutions by combining products between Mitsubishi Electric and its various partners. Close collaboration with such partners broaden the choices for the customer and realize the best solution possible.



MELSEC

Comprehensive controller lineup available to meet customers' requirements, from small-scale and stand-alone to medium- and large-scale systems



Application-specific CPUs



Safety CPU*1



Process/Redundant CPU



C Controller



MELSECWinCPU



Motion CPU



iQ Platform

These best-in-class CPUs, integrated into the iQ Platform, are designed for specific needs across various different industry areas.

*1: R0SFCPU-SET includes both a safety CPU and safety function module

MELSEC iQ-R series



Optimum automation
control area

→ System size

Medium- to large-scale control



MELSEC iQ-R Series

A next-generation programmable automation controller (PAC), the MELSEC iQ-R Series incorporates a revolutionary high-speed system bus that improves productivity through advanced performance and functionality.



MELSEC-Q Series

The first to incorporate the multiple CPU architecture, the MELSEC-Q Series wide-range of CPUs enables control of multiple operations, improving the performance and scalability of the overall production system.

Small- to medium-scale control



MELSEC-L Series

The MELSEC-L Series is a baseless highly scalable controller ideal for applications having limited space. With various I/O functionality embedded into the CPU head, exceptional cost versus performance is achieved in a compact body.

Small-scale and stand-alone



MELSEC iQ-F Series

Designed to provide outstanding performance and superior drive control, the MELSEC iQ-F Series is a high-performance compact-class controller with a rich assortment of integrated functions.



MELSEC-F Series

Incorporating abundant features with a flexible system configuration, the MELSEC-F Series has a power supply, CPU and I/Os into a single compact body. Furthermore, a diverse range of options are available to further expand its capabilities.



Robot CPU



CNC CPU

MELSEC Designed with automation in mind

Mitsubishi Electric offers a wide range of controllers capable of satisfying the diversified application needs in various industries. The high-speed, high-accuracy controllers in the MELSEC series covers them all, providing highly flexible cost-effective solutions.

iQ-R : MELSEC iQ-R Series	Q : MELSEC-Q Series	L : MELSEC-L Series	iQ-F : MELSEC iQ-F Series	F : MELSEC-F Series
S : Safety	P : Process/Redundant system	C : C Controller	M : Servo system controller	R : Robot controller
N : CNC CPU				

Automotive

iQ-R **Q** **S** **M** **R** **N**



Improve productivity and realize flexibility in different automotive assembly lines with high-accuracy motion control, including linear/circular interpolation and electric cam profile.

Automated warehouse

iQ-R **Q** **iQ-F** **F** **C** **M** **R**



Realize advanced logistics coordination and eliminate errors in repetitive processes. Servo-based high-speed material handling and highly accurate positioning improving productivity and reduce energy consumption.

Food and beverage, CPG

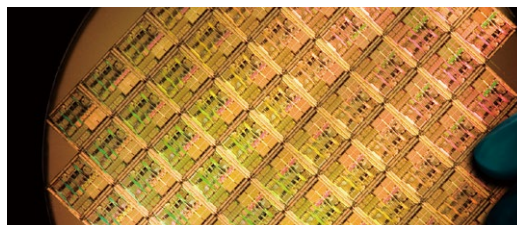
iQ-R **Q** **L** **iQ-F** **F** **P** **M**



Realize improvements in various packaging applications such as high-speed filling, which requires a highly accurate, continuous feed rate and precision.

Semiconductor

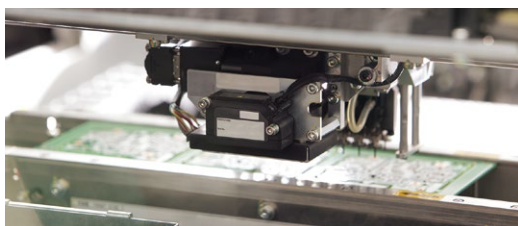
iQ-R **Q** **S** **C** **M**



Reduce maintenance costs using the high-durability MELSEC Series. Having the compact, robust design desired for semiconductor manufacturing, MELSEC products solve the small footprint, high-performance requirements.

Pick-and-place

iQ-R **M**



Achieve highly precise, fast and accurate placement of components in various sizes and shapes such as that required by SMT pick-and-place equipment, further improving productivity.

Flat panel display (FPD)

iQ-R **Q** **S** **C** **M** **R**



Improve the large data bandwidth and high performance requirements common in FPD manufacturing processes using MELSEC's integrated control platform. The integrated controller and network solution offer increased flexibility and enhanced performance.

Chemical

iQ-R Q P



Improve control of processes involving chemical manufacturing using highly scalable solutions that integrate process control and factory automation.

Inspection machines

iQ-R C



Easily integrate Inspection machine control into automated systems, thereby reducing maintenance and overall operational costs.

Renewable energy

iQ-R P C



Easily integrate renewable energy plant management utilizing plant-wide data acquisition and extensive real-time control, thereby reducing overall investment and maintenance costs.

Building automation

iQ-R Q L iQ-F F C



Increase security and ensure effective use of energy management capabilities by supporting various building automation protocols, resulting in a reduced carbon footprint.

Printing

iQ-R Q C M



Realize high-speed, high-quality printing through various solutions offered depending on the printing process involved such as roll paper feed-in, offset printing, binding, and sortation.

Injection molding

iQ-R Q iQ-F F M



Achieve reductions in machine operation costs and improve productivity by integrating MELSEC controllers that utilize an easy-to-use control platform combined with highly accurate motion control.

Machine tool

iQ-R Q L iQ-F F N



Improve productivity, operating efficiency and overall equipment effectiveness using the scalable control of MELSEC products, supporting tasks such as drilling, grinding, and milling.

General automation

iQ-R Q L iQ-F F C



Alternative automation applications such as automatic car washes and automated hydroponic farming require a high-level of automation similar to industrial solutions.

MELSEC Selection Guide

Controller lineup

Series	Modular type	Modular type	Baseless type
	 MELSEC IQ-R	 MELSEC-Q	 MELSEC-L
	PAC (Programmable automation controller)	Programmable controller CPU	Programmable controller CPU
Lineup	• Programmable controller CPU • CC-Link IE embedded CPU • Safety CPU • Process CPU^{*1} • C Controller • MELSECWinCPU • Motion CPU • Robot controller • CNC CPU	• Programmable controller CPU (Universal model) • Process CPU • Redundant CPU • C Controller • Motion CPU • Robot controller • CNC CPU	• Programmable controller CPU - Sink type - Source type
Control method	Stored program cyclic operation	Stored program cyclic operation	Stored program cyclic operation
I/O control mode	Refresh mode	Refresh mode	Refresh mode
Programming language	• Ladder diagram • Structured text (ST) • Sequential function chart (SFC)^{*2} • Function block diagram (FBD/LD) • Function block (FB) • C/C++^{*4}	• Ladder diagram • Structured text (ST) • Instruction list • MELSAP3 (SFC), MELSAP-L • Function block diagram (FBD) • Function block (FB) • C/C++^{*4}	• Ladder diagram • Structured text (ST) • Instruction list • MELSAP3 (SFC), MELSAP-L • Function block (FB)
Engineering environment	MELSOFT GX Works3 MELSOFT MT Works2 CW Workbench	MELSOFT GX Works2 MELSOFT PX Developer MELSOFT MT Works2 CW Workbench	MELSOFT GX Works2
Program size (K step)	1200	1000	260
Number of I/O points [X/Y] (point)	4096	4096	4096
Device/label memory/ standard RAM (K byte)	3380	1792	768
Data memory/ standard ROM (byte)	40M	16M	2M
Processing speed			
LD instruction (ns)	0.98	1.9	9.5
MOV instruction (ns)	1.96	3.9	19
Floating point addition (μs)	0.01	0.014	0.057
Memory interface			
Extended SRAM cassette	●	● ^{*3}	—
SD memory card	●	● ^{*3}	● ^{*6}
SRAM card, FLASH card, ATA card	—	● ^{*5}	—
External interface			
USB	●	●	●
Ethernet (1000BASE-T ^{*/} / 100BASE-TX/10BASE-T)	●	● ^{*8}	● ^{*6}
RS-232	—	● ^{*9}	● ^{*10}
RS-422/485	—	—	—
Display unit	—	—	●
CC-Link IE connection port			
Ethernet (1000BASE-T/100BASE-TX/10BASE-T)	● ^{*12}	—	—
Network connectivity (adapter/module)			
Ethernet (1000BASE-T ^{*13} /100BASE-TX/10BASE-T)	●	●	●
CC-Link IE TSN	●	—	—
CC-Link IE Control	●	●	—
CC-Link IE Field	●	● ^{*15}	●
CC-Link	●	●	●
CC-Link/LT	—	●	●
SSCNET III/H	●	●	●
AnyWire	●	●	●
BACnet®	●	●	●
MODBUS®/TCP	●	●	●
MODBUS®	●	●	●
General specifications			
Operating ambient temperature	0...55°C (60°C ^{*17})	0...55°C	0...55°C
Key features/functions	• Line manufacturing • Distributed control • Small-scale I/O control • Large-scale I/O control • Security • Inter-modular sync • Built-in database • Integrated network • Multiple CPU	• Process control • High-reliability control • C programming • Data logging • IT gateway • Advanced motion • Multiple CPU • Process control • High-reliability control	• Machine control • Distributed control • Small-scale I/O control • Large-scale I/O control • Space/cost saving • Integrated network • Extensive built-in functions • Data logging • Motion control • Real-time monitor

*1: Supports redundant system when paired with R6RFM

*2: SFC is not supported in redundant mode and by safety CPU

*3: Q□UDVCPU only.

*4: When using CW Workbench

*5: Does not support QnUDVCPU and certain models

*6: Does not support L02SCPU(-P)

*7: Supports the user Ethernet port of Q24DHCCPU-V/VG/LS and

Q26DHCCPU-LS only

*8: Supports Q□UDE(H)CPU and Q□UDVCPU only

*9: Does not support Q□UDE(H)CPU and Q□UDVCPU

*10: Supports L02SCPU(-P) only

*11: Supports FX3G only

Compact type		Compact type		
 MELSEC IQ-F		 MELSEC-F		
Programmable controller CPU		Programmable controller CPU		
FX5UJ	FX5U/FX5UC	FX3S	FX3G/FX3GC	FX3U/FX3UC
FX5UJ (screw terminal block type)	- FX5U (screw terminal block type) - FX5UC (connector type) - FX5UC (spring clamp terminal block type)	FX3S	- FX3G - FX3GC	- FX3U - FX3UC
Stored program cyclic operation		Stored program cyclic operation		
Refresh mode		Refresh mode		
- Ladder diagram - Structured text (ST) - Function block diagram (FBD/LD) - Function block (FB)		- Ladder diagram - Structured text (ST) - SFC for FX Series - Function block (FB)		
MELSOFT GX Works3		MELSOFT GX Works2		
48	128	4	32	64
256	384	30	128	256
120	120	—	—	—
5M	5M	—	—	—
34	34	210	210	65
34	34	520	520	640
3.06	3.06	11.96	11.96	14.2
—	—	●	●*11	●
●	●	—	—	—
—	—	—	—	—
●	—	●	●	●*14
●	●	—	—	—
—	—	●	●	●
—	●	●	●	●
—	—	●	●*11	●
—	—	—	—	—
●	●	●	●	●
●	●	—	—	—
—	—	—	—	—
●	●	—	—	—
●	●	●	●	●
—	—	●	●	●
●	●	—	●*16	●*16
●	●	●	●	●
—	—	—	—	—
●	●	—	—	—
●	●	●	●	●
-20...55°C*18		0...55°C		
- Machine control - Distributed control - Small-scale I/O control - Space/cost saving - Security - Integrated network - Extensive built-in functions - Motion control		- Machine control - Small-scale I/O control - Space/cost saving - Motion control		

*12: R□ENCPU only.

*13: Supports the MELSEC IQ-R Series only

*14: Supported by expansion board

*15: Does not support Q□(P)(H)CPU and Q□PRHCPU

*16: Supports SSCNET III

*17: Only supported when used together with extended temperature range main/extension base units

*18: Operating ambient temperature from -20°C is supported by products produced from June 2016 (serial number "166" or later). For details, on supported products, please refer to the relevant product manual.



MELSEC iQ-R series

Bridging the next generation of automation

iQ Platform

Revolutionary, next-generation controllers building a new era in automation

To succeed in highly competitive markets, it's important to build automation systems that ensure high productivity and consistent product quality. The MELSEC iQ-R Series has been developed from the ground up based on common problems faced by customers and rationalizing them into seven key areas: Productivity, Engineering, Maintenance, Quality, Connectivity, Security and Compatibility. Mitsubishi Electric is taking a three-point approach to solving these problems: Reducing TCO^{*1}, increasing Reliability and Reusability of existing assets. As a bridge to the next generation in automation, the MELSEC iQ-R Series is a driving force behind revolutionary progress in the future of manufacturing.

^{*1}: Total Cost of Ownership

Process



High-availability process control in a scalable automation solution

- Extensive visualization and data acquisition
- High-availability across multiple levels
- Easier maintenance and programming with integrated engineering software

Intelligence



Extensive data handling from shop floor to business process systems

- Direct data collection and analysis
- C/C++ based programming
- Collect factory data in real-time
- Expand features using third party partner applications

Productivity



Improve productivity through advanced performance/ functionality

- High-speed system bus realizing shorter cycle time
- Super-high-accuracy motion control utilizing advanced multiple CPU features
- Inter-modular synchronization resulting in increased processing accuracy

Engineering



Reducing development costs through intuitive engineering

- Intuitive engineering environment covering the product development cycle
- Simple point-and-click programming architecture
- Understanding globalization by multiple language support

Maintenance



Reduce maintenance costs and downtime utilizing easier maintenance features

- Visualize entire plant data in real-time
- Extensive preventative maintenance functions embedded into modules

Quality



Reliable and trusted MELSEC product quality

- Robust design ideal for harsh industrial environments
- Improve and maintain actual manufacturing quality
- Conforms to main international standards

Safety



System design flexibility with integrated safety control

- Integrated general and safety control
- Consolidated network topology
- Complies with international safety standards

Connectivity



Open integrated networking across the manufacturing enterprise

- High-speed/high-accuracy motion control reduces cycle time
- Flexible IIoT system configuration
- Improved system usability with engineering tool

Security



Robust security that can be relied on

- Protect intellectual property
- Unauthorized access protection across distributed control network

Compatibility



Extensive compatibility with existing products

- Utilize existing assets while taking advantage of cutting-edge technology
- Compatible with most existing MELSEC-Q Series I/O

■ Key features/functions

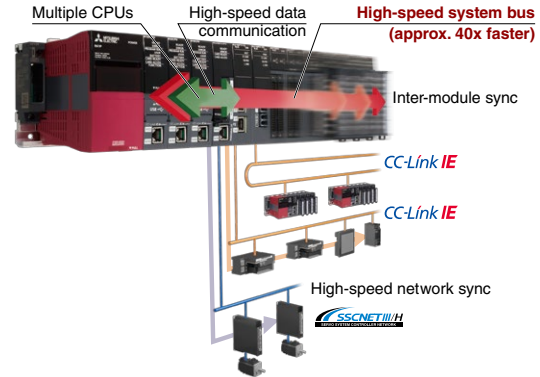
Line manufacturing	Machine control	Distributed control	Small-scale I/O control	Large-scale I/O control	Space/cost saving	Security
Inter-module sync	Built-in database	Integrated network	Multiple CPU	Process control	High-reliability control	Extensive built-in functions
C programming	Data logging	IT gateway	Motion control	Advanced motion	Safety	Real-time monitor

For further details, please refer to the catalog below.

"MELSEC iQ-R Series iQ Platform-compatible PAC:
L(NA)08298ENG"

Advanced performance/functions improve productivity

Integrating high-performance capabilities based on the high-end iQ-R system bus, high-speed network, and an advanced motion control system; applications requiring these characteristics can be easily realized using the MELSEC iQ-R Series as the core of the automation system.



Built-in database eliminates the need for a PC-based database server

Recipe data and production results data, previously managed using a database server, can now be managed via the database in the programmable controller. Use of dedicated commands for the built-in database makes it easy to search, add and update data on the fly.



Powerful security features protecting intellectual property

Functions such as hardware security key identification for protecting programs and an IP filter for preventing unauthorized access to the control system through the network are incorporated to protect customers intellectual property whilst ensuring secure and safe control throughout the plant.



Intuitive and easy engineering

With GX Works3 graphic based programming cannot be made any easier with various intuitive features such as graphic based system configuration, and an extensive module library provided as standard. In addition to multiple language support realizing a global engineering tool required for current automation needs.



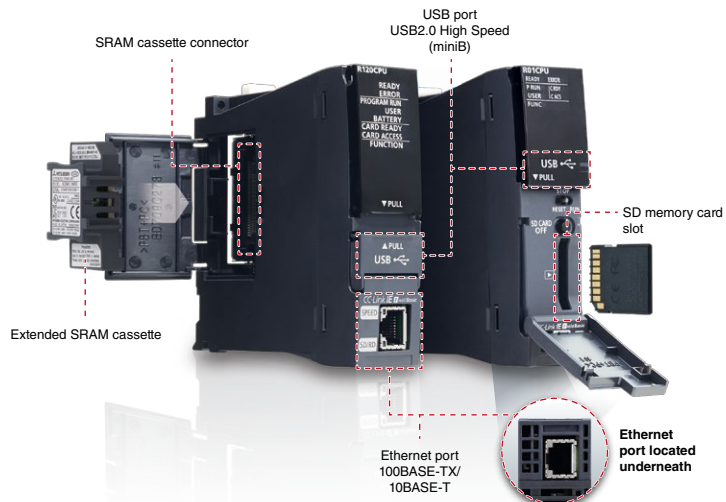
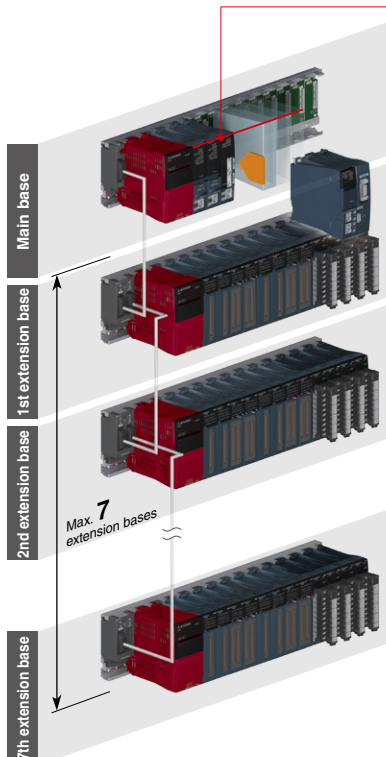
A wide range of modules supporting various different applications

The MELSEC iQ-R Series is a modular control system equipped with various modules such as CPUs, power supply, digital I/O, analog I/O and base unit and intelligent function modules, each having its own responsibility in the system. The core of the system is a base unit that interconnects all of the modules together and enables high-speed communications between each module. From small to large systems, scalability is simple. Up to seven extension bases can be connected and a maximum of 64 modules installed at any one time. An RQ extension base is also available, ensuring compatibility with existing MELSEC-Q Series modules.

R00CPU Program capacity 10K steps	R04ENCPU Program capacity 40K steps, CC-Link IE embedded
R01CPU Program capacity 15K steps	R08ENCPU Program capacity 80K steps, CC-Link IE embedded
R02CPU Program capacity 20K steps	R16ENCPU Program capacity 160K steps, CC-Link IE embedded
R04CPU Program capacity 40K steps	R32ENCPU Program capacity 320K steps, CC-Link IE embedded
R08CPU Program capacity 80K steps	R120ENCPU Program capacity 1200K steps, CC-Link IE embedded
R16CPU Program capacity 160K steps	
R32CPU Program capacity 320K steps	
R120CPU Program capacity 1200K steps	

MELSEC iQ-R series

System configuration



CPU modules

Install up to four CPU modules together

- Programmable controller CPU module
- CC-Link IE embedded CPU*1
- Motion CPU module
- Process CPU module
- SIL2 Process CPU module*2
- Safety CPU*3
- C Controller module
- MELSECWinCPU

*1: Multi-CPU is not supported.

*2: Product package includes a SIL2 process CPU and SIL2 function module.

*3: Product package includes a safety CPU and safety function module.

Power supply module

- Power supply module

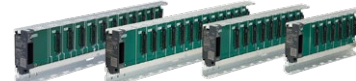


I/O & intelligent function modules

- Input module
- Output module
- I/O combined module
- Analog input module
- Analog input module (Channel isolation)
- Analog output module
- Analog output module (Channel isolation)
- Temperature input module
- Temperature control module
- Simple motion module
- Positioning module
- Flexible high-speed I/O control module
- High-speed counter module
- Ethernet interface module
- CC-Link IE Control network module
- CC-Link IE Field network master/local module
- CC-Link IE Field network remote head module
- AnyWireASLINK master module
- BACnet module
- CANopen® module
- CC-Link system master/local module
- Serial communication module
- GP-IB interface module
- MES Interface module
- OPC UA server module
- High-speed data logger module
- High-speed data communication module
- C intelligent function module
- Camera recorder module
- Recorder module

Base units

- Main base unit
- Extended temperature range main base



- Extension base unit
 - Extended temperature range extension base
- An extension base strictly for I/O and intelligent function modules.

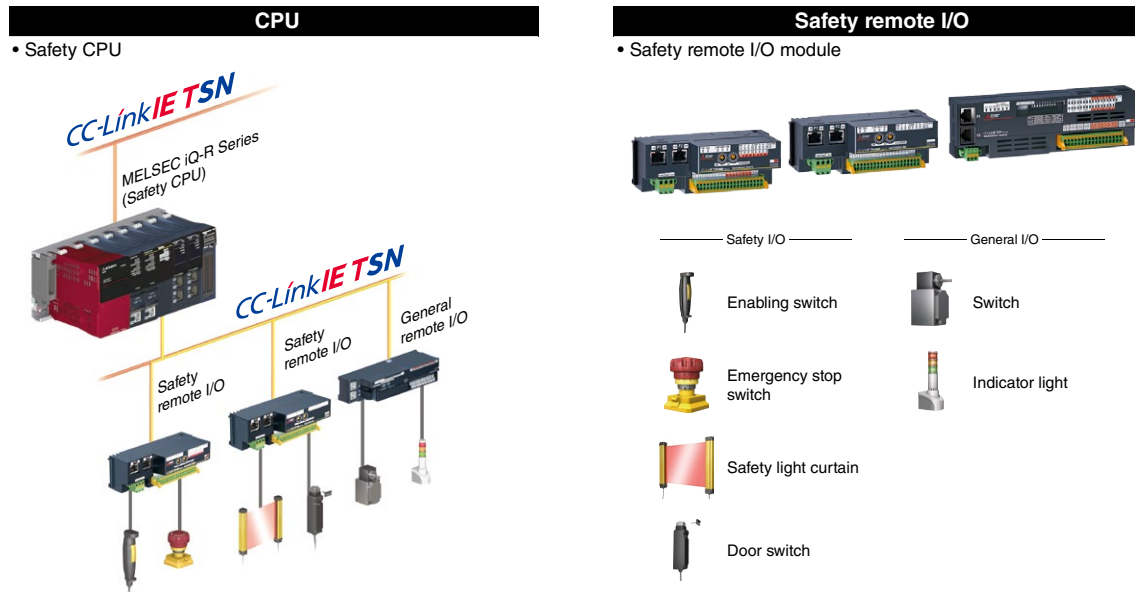


- RQ extension base unit
- An extension base for MELSEC-Q Series modules (further extensions requiring the MELSEC-Q Series extension base version).



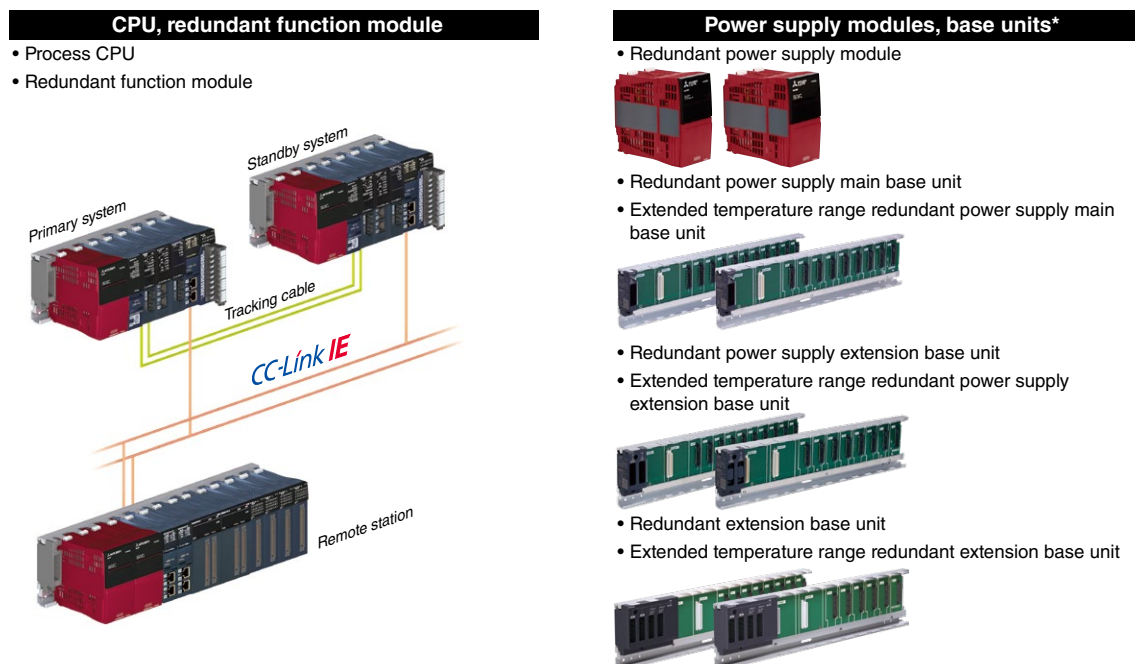
Integrated Safety control

The MELSEC iQ-R Series safety control system consists of a safety CPU that is compliant with international safety standards, ISO 13849-1 PL e and IEC 61508 SIL 3 and can execute both safety and general logic in the same CPU. The CPU module paired with the safety function module enables safety control and can be installed on a standard base unit realizing integration into an existing or new control system. Safety I/Os are controlled via CC-Link IE TSN connected to dedicated safety remote I/Os.



Highly-scalable redundant control

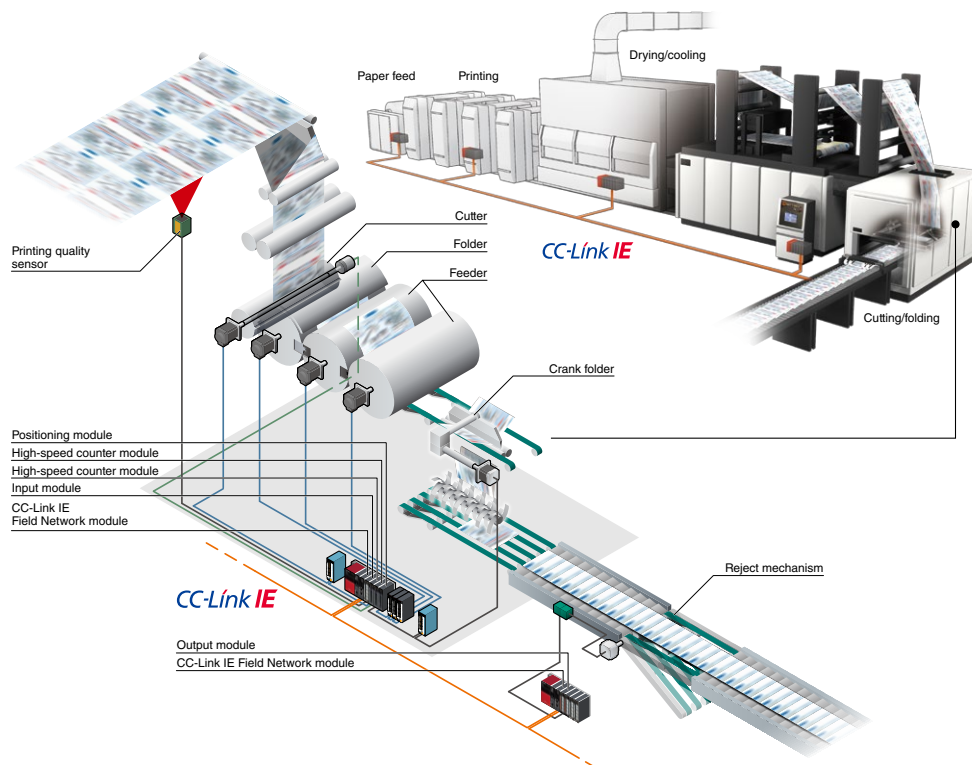
The MELSEC iQ-R Series redundant control system is based on a dual-system architecture where all modules on a primary system are duplicated onto a second or standby system with a tracking cable connecting the systems together. Both systems consist of the process CPU module and redundant function module, with the CPU module able to execute standard logic and process control. Remote I/O is controlled via the CC-Link IE Field Network, and dedicated base units supporting redundant power supplies come in either standard or extended temperature models.



* For more information about supported modules for each base unit, please refer to the relevant product manual.

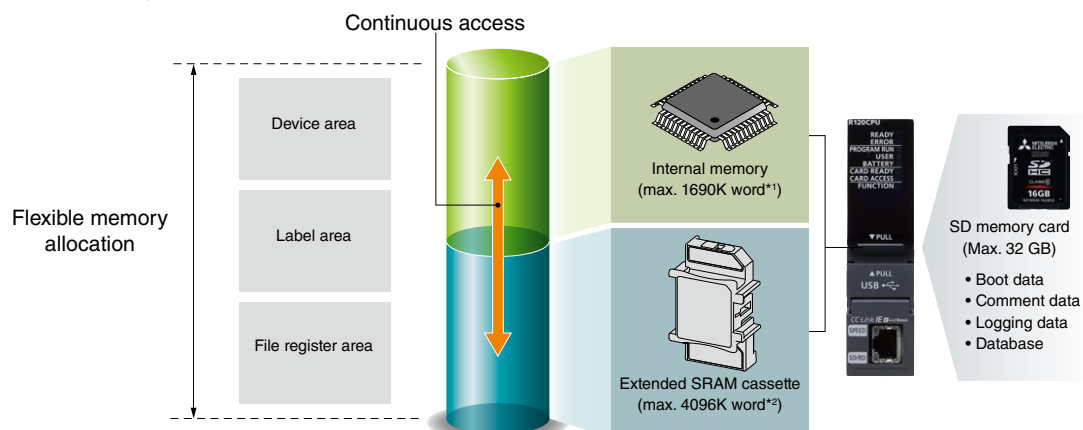
Highly accurate synchronization

The MELSEC iQ-R Series system provides highly accurate synchronization between modules on the control system which is realized through inter-module synchronization. Additionally, use of the CC-Link IE Field Network realizes network-level synchronization, providing node-level synchronization that ensures deterministic data flow void of any influence from data transmission delays. This is ideal for applications such as “cutting and folding” inside an offset printer, which requires synchronization between the printing quality sensor, high-speed rotary cutter, folding roller and conveyor.



Flexible, large-capacity data storage

The MELSEC iQ-R Series programmable controller CPU is designed to allow an external SRAM cassette to be installed directly into the CPU module. This option makes it possible to increase internal device memory to an impressive 5786K words, expanding device/label memory even further. An SD memory card can be used at the same time, expanding data logging memory and the capacity of the internal database, which is ideal for large-scale systems. In general, management of programmable controller internal data is quite flexible, making programming even easier by allowing various data area allocations to be changed within the CPU memory and SRAM cassette.

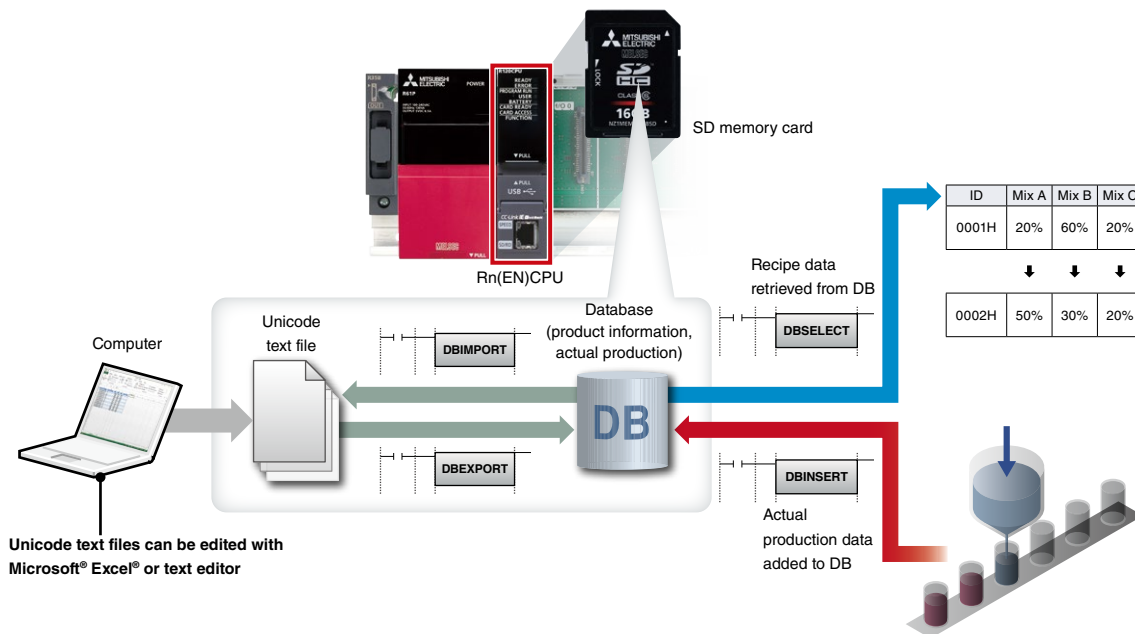


*1: Based on R120CPU.

*2: Based on NZ2MC-8MBS (8 MB).

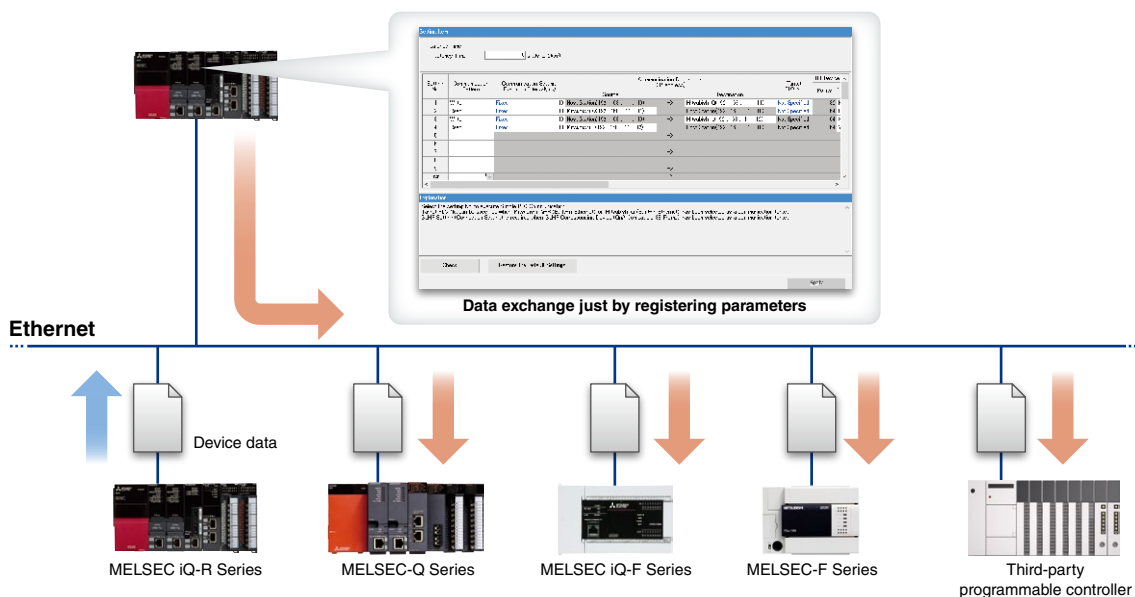
Data management utilizing internal database (DB)

The CPU includes an internal database that can be installed into the SD memory card. This feature allows, for example, a selection of database commands that can add/delete/change records to be utilized for simple recipe functions. It is also much easier to import/export Unicode files for use in spreadsheets. This is a very useful feature, especially for the food and beverage industry where multiple product variations are produced using the same machine process.



Easier data sharing without programming

Simple CPU communication function enables device data communications using the existing Ethernet and serial communication ports just by setting parameters. Communication protocols of third-party manufacturers are also supported, which enables easy data sharing.





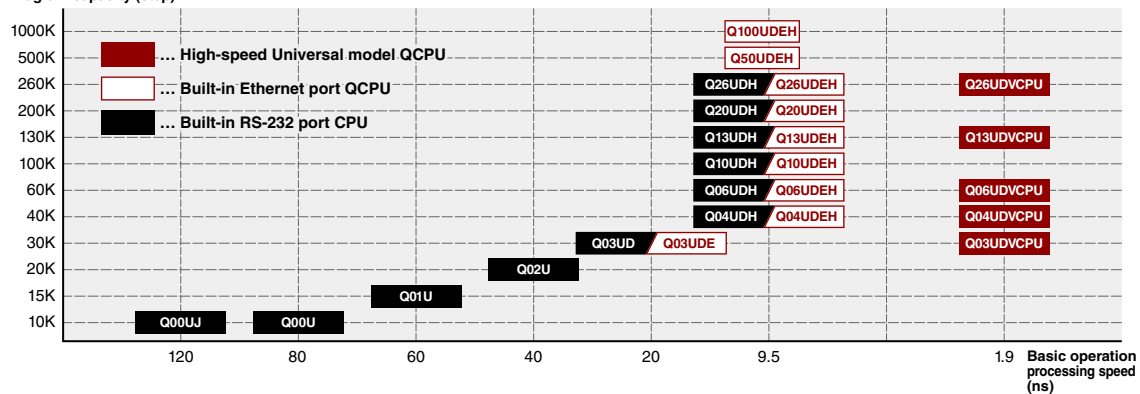
MELSEC Q series

iQ Platform

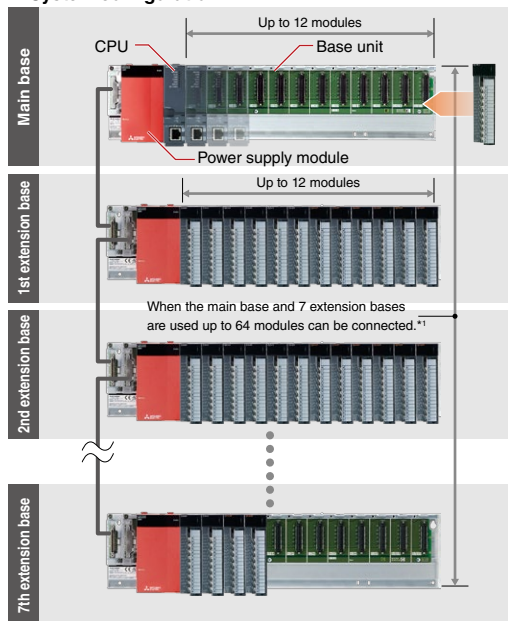
Productivity, usability, and maintenance cost

The MELSEC-Q Series, which has been used by many customers since its release in 1999, has promoted automation and contributed to economic growth. In 2014, the high-speed and highly functional MELSEC-QnU Series was released and its range of products are ideal for applications requiring high quality and stable operation that are well received in a variety of industries.

Program capacity (step)

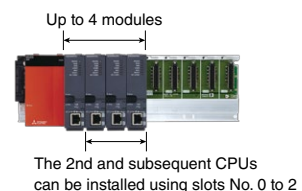


System configuration



CPU modules

- Install up to four CPU modules together*2
- Programmable controller CPU
 - Motion CPU
 - Process CPU
 - Redundant CPU
 - C Controller
 - Robot controller
 - CNC CPU



Base units*3



- Main base (3, 5, 8, 12)
- Multiple CPU high-speed main base (5, 8, 12)
- Slim type main base (2, 3, 5)
- Redundant power main base (8)
- Extension base (2, 3, 5, 8, 12)
- Redundant power extension base (8)
- Redundant type extension base (5)

Power supply modules



- Power supply
- Power supply with life function
- Slim type power supply
- Redundant power supply

I/O & intelligent function modules



- I/O module
- Interrupt module
- Analog I/O module
- Load cell input module
- CT input module
- Temperature input module
- Temperature control module
- Loop control module
- Simple motion module
- Positioning module
- High-speed counter module
- Channel isolated pulse input module
- Energy measuring module
- Isolation monitoring module
- MES interface module
- High-speed data logger module
- Web server module
- Intelligent communication module
- Network module

*1: The maximum number of modules that can be installed depends on the CPU configuration.

*2: Except redundant CPU.

*3: The number within brackets is the number of slots.

Key features/functions

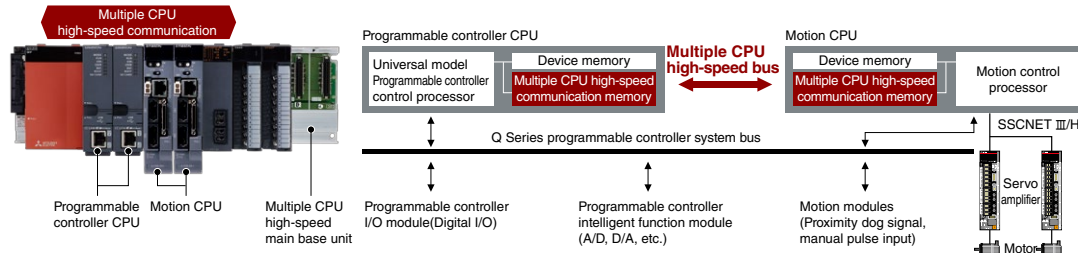
Line manufacturing	Machine control	Distributed control	Small-scale I/O control	Large-scale I/O control	Space/cost saving	Security
Inter-module sync	Built-in database	Integrated network	Multiple CPU	Process control	High-reliability control	Extensive built-in functions
C programming	Data logging	IT gateway	Motion control	Advanced motion	Safety	Real-time monitor

For further details, please refer to the catalog below.

"Programmable Controllers MELSEC-Q series [QnU]: L(NA)08101E"

Multiple CPUs

High-speed synchronized control between multiple CPUs independent of control programming (0.88 ms operation cycle)*¹ is achieved. This multiple CPU high-speed communication is synchronized with motion control to maximize computational efficiency.

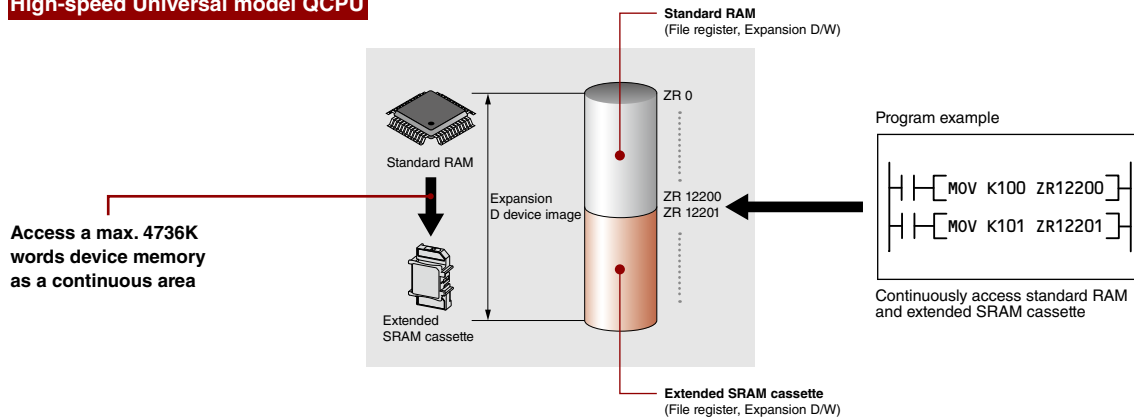


*1: Q00UJ, Q00U, Q01U, and Q02U are not supported.

Large data volume at high-speed

When an 8 MB extended SRAM cassette*² is installed in the High-Speed Universal model QCPU, the standard RAM can be as one continuous file register with up to 4736K words capacity, simplifying the user program. Even if device memory is insufficient, the file register area can be expanded easily by installing an extended SRAM cassette.

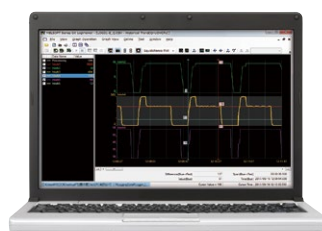
High-speed Universal model QCPU



*2: Only supported by Q03UDV, Q04UDV, Q06UDV, Q13UDV, and Q26UDV.

Easy logging*³

The logging data can be saved on an SD memory card by following the setup assistant windows. The data saved in CSV format can be displayed on a computer or GOT (HMI). Various reference materials including daily and general reports can be created easily using the saved CSV file. This data can be used for a wide variety of applications requiring traceability, production data, etc.



Logging data display and analysis tool
GX LogViewer



GOT (HMI) log viewer function

*3: Supports Q03UDV, Q04UDV, Q06UDV, Q13UDV, and Q26UDV.

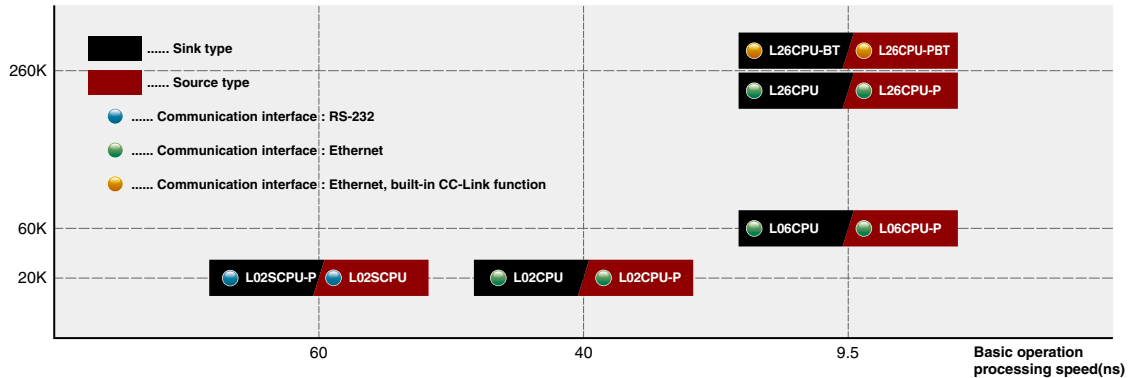


MELSEC *L* series

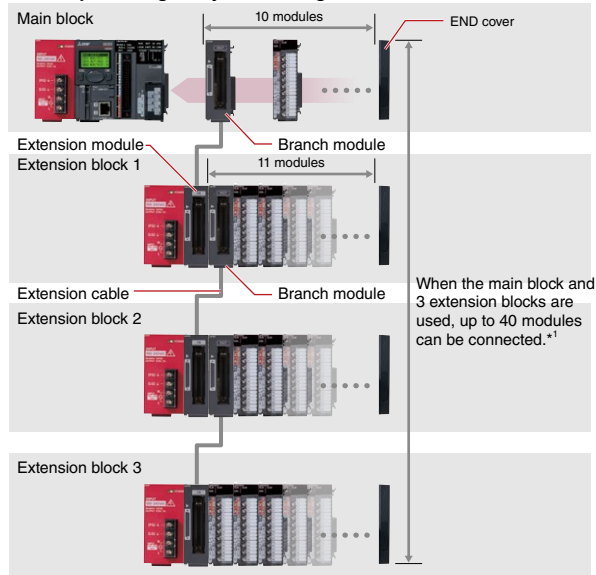
Convenience that fits in the palm of your hand

The L Series is a compact-class controller, part of the MELSEC products renowned for exceptional cost verses performance and strong reliability. It provides the performance, functions, and capabilities required for today's demanding applications in a small package.

Program capacity (step)



Example of largest system configuration with L26CPU-BT



CPU module*2	Number of extension blocks	Number of supported modules*3
L02SCPU(-P) L02CPU(-P)	Up to 2	Main block: 10 Extension block: 11
L06CPU(-P) L26CPU(-P) L26CPU(-P)BT	Up to 3	

*1: Total number of I/O, intelligent function, and network modules.
Does not include branch module.

*2: CPU modules whose first five serial number digits are 13072 or later.

*3: Total number of I/O, intelligent function, network, and branch modules.

Does not include power supply module, CPU module, display unit, extension module, RS-232 adapter, RS-422/485 adapter and END cover.

CPU module



- Programmable controller CPU (sink type/source type)
- Built-in communication interface
 - RS-232
 - Ethernet
 - Ethernet + CC-Link

Option



- Display unit
- RS-232 adapter
- RS-422/485 adapter
- Battery
- SD/SDHC memory card

Power supply modules



- Power supply module
- Power supply module (slim type)

Branch/extension modules



- Branch module
- Extension module

Modules



- I/O module
- Analog module
- Multiple input (voltage/current/temperature) module
- Temperature input module
- Temperature control module
- Simple motion module
- Positioning module
- High-speed counter module
- Flexible high-speed I/O control module
- Network module

Key features/functions

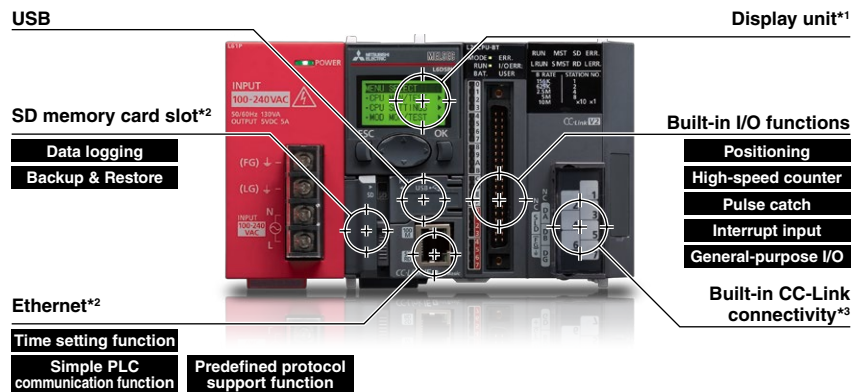
Line manufacturing	Machine control	Distributed control	Small-scale I/O control	Large-scale I/O control	Space/cost saving	Security
Inter-modular sync	Built-in database	Integrated network	Multiple CPU	Process control	High-reliability control	Extensive built-in functions
C programming	Data logging	IT gateway	Motion control	Advanced motion	Safety	Real-time monitor

For further details, please refer to the catalog below.

"Programmable Controllers MELSEC-L series: L(NA)08159E"

Various built-in I/O features and communication interfaces come as standard

In its compact body, a large variety of I/O features are built in as standard. Due to an abundance of advanced functionality, L Series CPUs are flexible enough to meet a wide variety of needs. With a display unit enabling routine operation without a computer, an SD memory card, and easy-to-use programming environment, the L Series dramatically improves system designing and system operation and contributes to improve work efficiency. The display unit*1 shows system statuses and enables setting changes to be made without a program. Even when an error occurs, the error status can be easily checked, assisting troubleshooting on-site.



*1: Option (sold separately). Not compatible with L02SCPU (-P).

*2: Supports L02CPU (-P), L06CPU(-P), L26CPU(-P), L26CPU(-P) BT.

*3: Supports L26CPU(-P) BT.

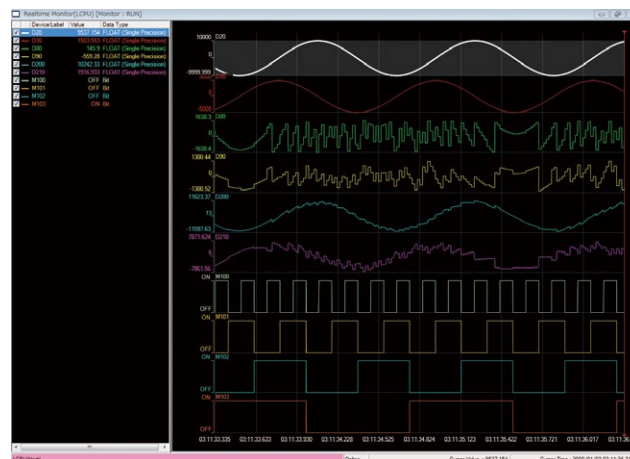
Gain more flexibility with an integrated system bus structure

L Series modules do not require a base unit. Having an integrated system bus structure, the L Series can be attached directly to a DIN rail by using the minimal required space. Furthermore, adding modules to the system is not restricted by the number of available base unit slots, and costs may be reduced due to the elimination of extension base units.



Real-time monitor and easy logging

Device values in the CPU can be monitored in real-time with a detailed setting including interval and timing. Additionally, changes in the device value can be monitored within the GX LogViewer trend graph and are exportable to a computer for further analysis.





MELSEC iQ-F series

The next level of industry

iQ Platform

Designed on the concepts of outstanding performance, superior drive control and user centric programming, the MELSEC-F Series has been reborn as the MELSEC iQ-F Series. From stand-alone use to networked system applications, the MELSEC iQ-F Series brings business to the next level of industry.



Screw terminal block type

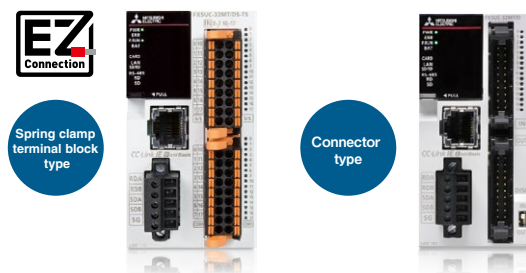
Maximum control points	Program capacity	Pulse train	Maximum
512^{*1} points	64k/128k steps	200kpps	4 axes

FX5U

All-in-one model

This all-round CPU can be utilized for a wide range of applications, realizing IoT of equipment and facilities.

High-speed counter function	Positioning function
Ethernet port	RS-485 port
SD memory card slot	Analog I/O



Spring clamp terminal block type

Connector type

Maximum control points	Program capacity	Pulse train	Maximum
512^{*1} points	64k/128k steps	200kpps	4 axes

FX5UC

Compact model

Its compact design reduces space in the control panel. Additional spring-clamp terminal blocks are newly available.

High-speed counter function	Positioning function
Ethernet port	RS-485 port
SD memory card slot	



Screw terminal block type

Maximum control points	Program capacity	Pulse train	Maximum
256 points	48k steps	200kpps	3 axes

FX5UJ

Built-in USB (Mini-B) connector

This easy to use module with various functionalities embedded achieves a cost-effective performance.

High-speed counter function	Positioning function
Ethernet port	USB (Mini-B) connector
SD memory card slot	

*1: Maximum control points including remote I/O points

■ Key features/functions

Line manufacturing	Machine control	Distributed control	Small-scale I/O control	Large-scale I/O control	Space/cost saving	Security
Inter-modular sync	Built-in database	Integrated network	Multiple CPU	Process control	High-reliability control	Extensive built-in functions
C programming	Data logging	IT gateway	Motion control	Advanced motion	Safety	Real-time monitor

For further details, please refer to the catalog below.

"MELSEC iQ-F Series iQ Platform-compatible PLC:
L(NA)08428ENG"

Performance

Outstanding performance

- Extensive built-in functions
- Debugging, extensive IoT functions
- Enhanced security functions

Integration

Cooperation with driving devices

- Easy built-in positioning
- Highly accurate positioning control (no special software required) by motion module and simple motion module

Programmer's workbench

Improvement of programming environment

- Simple point and click programming architecture
- Reduced development time with FB
- Parameterized setup for a variety of functions



Built-in functions

Even easier to use with the effective built-in functions. Supports customers to "go one step ahead in manufacturing".



Network/communication/ information-sharing

Lineup of modules compatible with various open networks, including CC-Link IE TSN and OPC UA.



Positioning control

Not only built-in positioning but full positioning is also possible by using extension modules.



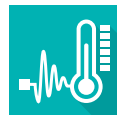
Safety control

Safety extension modules are compliant with international safety standards (Category 4, PL e, and SIL3), ensuring safety of the facility.



High-speed counter

The high-performance, high-speed counter built-in the CPU module enables high-speed I/O signal acquisition with a simple program.



Analog control

Analog control suitable for the application is possible by using expansion modules in addition to the analog input/output function of the FX5U CPU module.



Programming environment

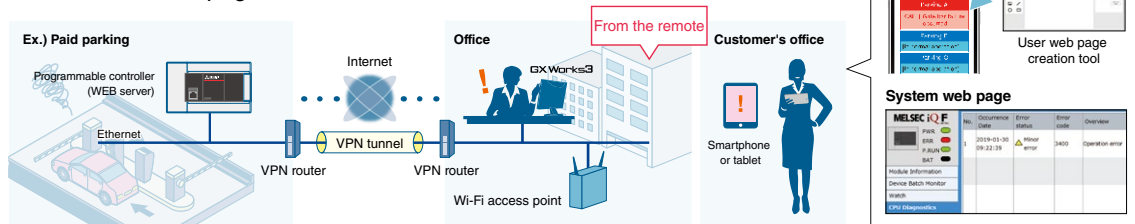
Graphic-based configuration realizing easier programming just by selecting parts.



Built-in functions

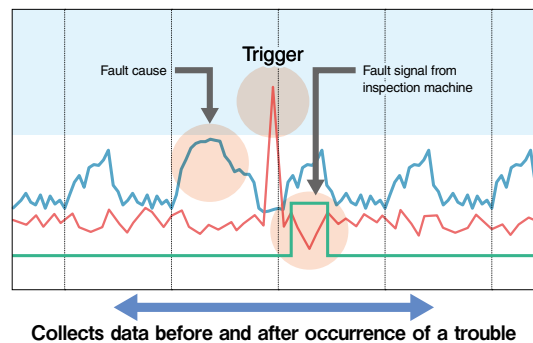
Web server function

- Monitoring of equipment from remote locations
- Simple diagnosis just by accessing the programmable controller without a program
- Accessible from a smart phone and tablet
- Customized web pages can also be created with software



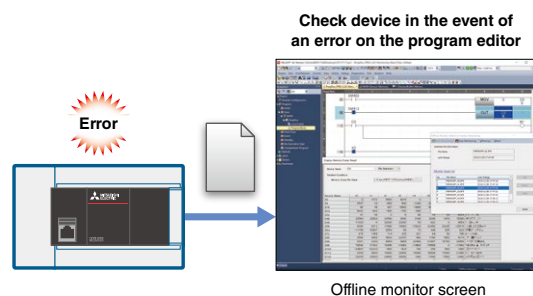
Data logging function

- Collection of logged data without a program
- Output in CSV format
- Support debugging and analysis of equipment



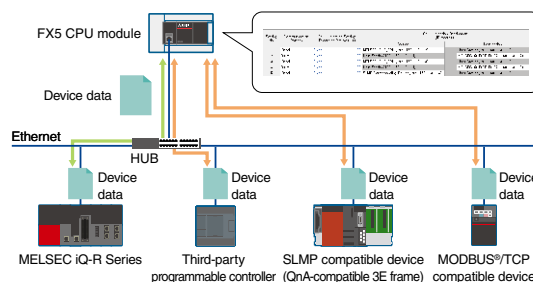
Memory dump function

- Batch save devices when an error occurs
- Check the saved data on the program editor
- Support debugging and analysis at an error



Simple CPU communication function

- Communication is possible just by registering parameters without a program
- Connectable with other third-party programmable controllers

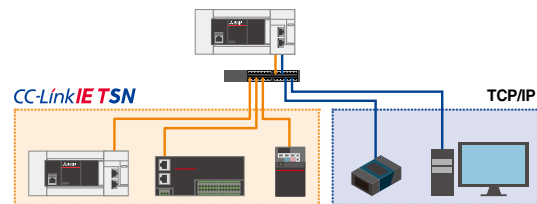




Network/Communication/Information-sharing

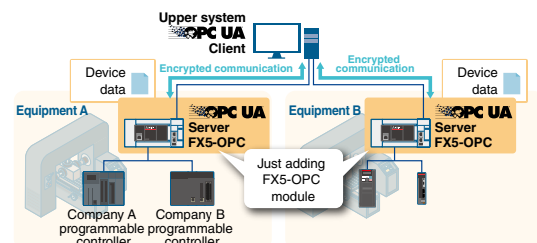
CC-Link IE TSN

- Support CC-Link IE TSN master/local station
- Real-time communication with many TSN-compatible devices connected
- Combine real-time control and TCP/IP communication. Realize flexible system configuration on the same network



Direct access to the upper IT system

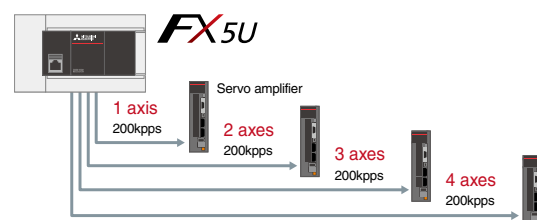
- Support OPC UA server
- Access to the upper IT system
- Low-cost system without a gateway computer
- Enhanced security with encrypted communication



Positioning control

Built-in positioning

- Positioning of 200kpps x 4 axes maximum
- Improved usability by supporting various controls such as linear interpolation operation
- A wide range of applications can be supported by expanding positioning modules



High-accuracy motion control

- High-accuracy motion control is possible by utilizing the motion module and simple motion module
- Support various operation modes such as interaxis synchronous operation and S-curve acceleration/deceleration operation
- The motion module can connect CC-Link IE TSN compatible devices also



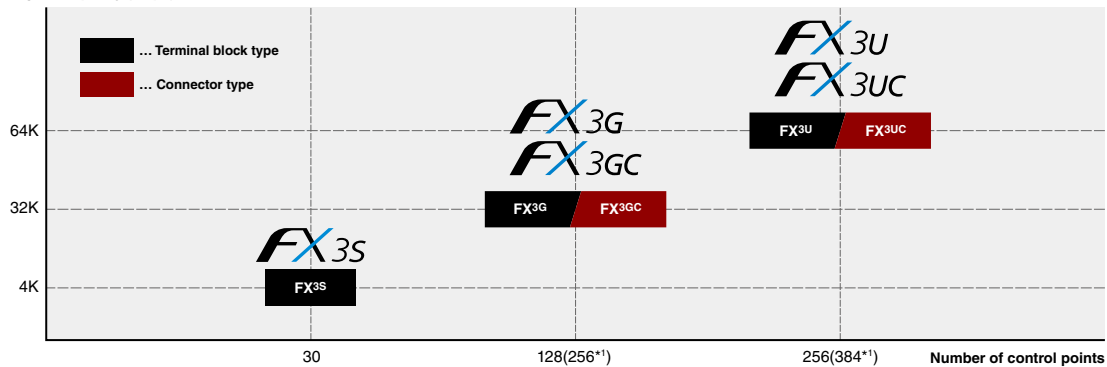
MELSEC-F



The third generation of micro programmable controller, the FX3 Series

The FX Series is renowned for its speed, capacity, performance and extensive features. Integrated with many features including analog, communication, Ethernet, and positioning, the FX3 Series realizes high-performance in many different applications.

Program capacity (steps)



*1: Number of maximum I/O points including remote I/O.

System configuration



Main units



- FX3U/FX3UC
- FX3G/FX3GC
- FX3S

Special adapters



- Analog I/O
- Communication
- Data collection
- High-speed I/O

Expansion units



- I/O extension block
- Analog I/O block
- Temperature control block
- Temperature sensor input block
- Positioning control block
- Communication/network block
- Extension power supply unit

Expansion boards



- Communication
- Analog I/O
- 8-point variable analog potentiometer
- Extended I/O
- Special adapter connection

Options



- Display module
- Memory cassette
- Battery
- Extension cable
- Conversion adapter

*2: Connectable special adapters, extension units, expansion boards, and other options differ by the models. For details, please refer to the manual of the relevant product.

Key features/functions

Line manufacturing	Machine control	Distributed control	Small-scale I/O control	Large-scale I/O control	Space/cost saving	Security
Inter-modular sync	Built-in database	Integrated network	Multiple CPU	Process control	High-reliability control	Extensive built-in functions
C programming	Data logging	IT gateway	Motion control	Advanced motion	Safety	Real-time monitor

For further details, please refer to the catalog below.

"PROGRAMMABLE CONTROLLERS FX Family Catalog: L(NA)08490ENG"

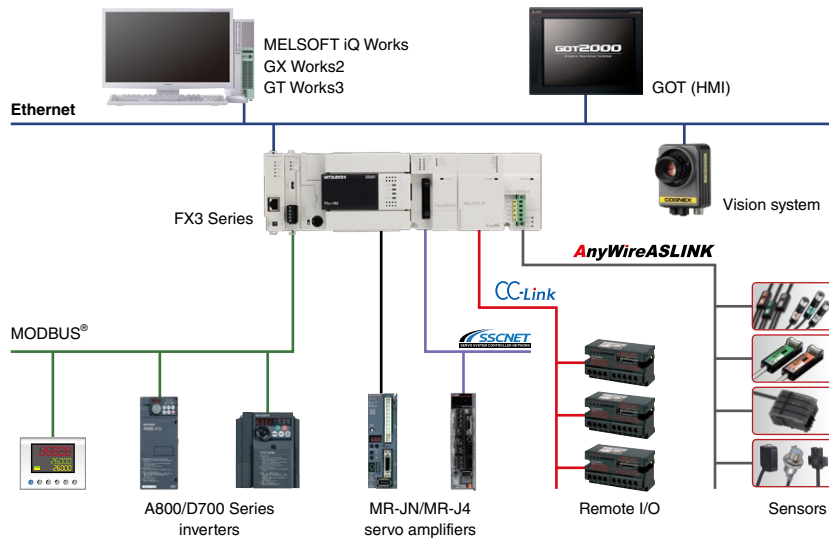
Extensive built-in functions

Including high-speed counter, positioning, high-speed I/O, communication ports, 24 V DC power supply, and other built-in functions, the main control unit can be easily connected with various different external control devices.



Combining with other Mitsubishi Electric factory automation products

In addition to its extensive built-in functions, the FX Series is highly scalable by being connectable to various different devices such as analog, positioning, communication networks, and sensor control through its expansion unit capability.





For further details, please refer to the catalog and broadcast below.

"Safety Programmable Controller/Safety Controller:
L(NA)08192E"

"MELSEC iQ-R Series Broadcast Safety CPU module,
Safety Remote I/O module: R003ENG"

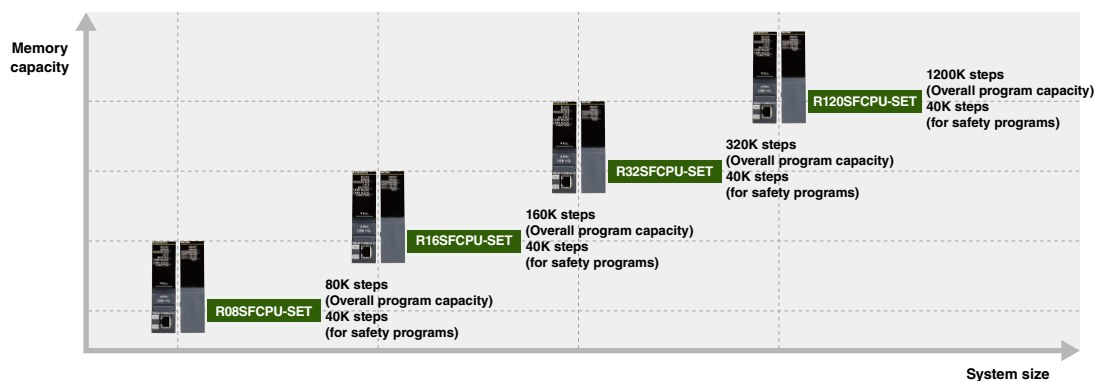
MELSEC Safety iQ Platform

Integrated safety control on the shop floor

iQ-R series

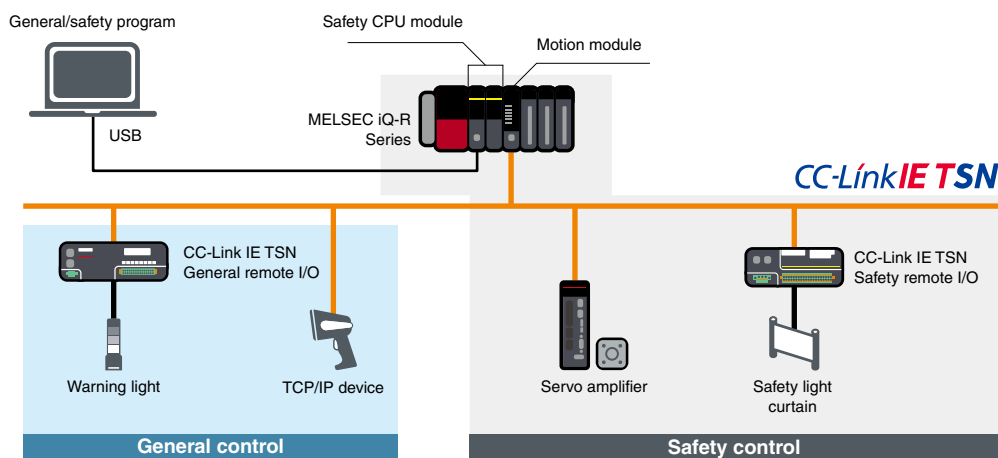
Integrated safety control offering a total system solution

The safety CPU module compliant with the international safety standards enables control of both general and safety programs in the same module, optimizing space on the iQ-R rack. The system using the safety CPU can also reduce wiring since safety switches and safety light curtains can be connected via the CC-Link IE TSN which integrates both general and safety communications. The entire system can be programmed using GX Works3 programming software as standard.



Safety communication on the same network

Establishing a safety communication is as easy as configuring a CC-Link IE TSN. The physical layer and data communications is based on Ethernet technology and enables commercial cables, adapters, and hubs to be used. The safety communication also takes advantage of highly flexible features offered by CC-Link IE TSN.



For further details, please refer to the catalog and broadcast below.

"MELSEC PROCESS CONTROL/REDUNDANT SYSTEM:
L(NA)08030E"

"MELSEC iQ-R Series Broadcast Process CPU/
Redundant System/SIL2 Redundant System: R007ENG"

MELSEC PROCESS CONTROL

iQ
Platform

High-speed processing for
full-scale monitoring and control

iQ-R series

Q series

Flexible process control in a cost-efficient automation control solution

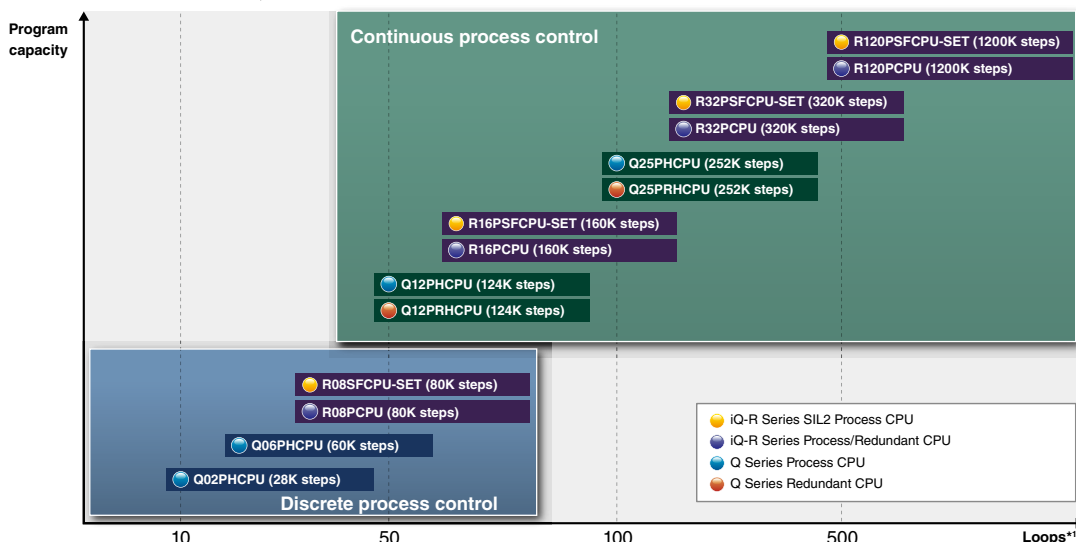
The MELSEC process control system consists of a number of specialized controllers specifically designed for use in process automation. The CPUs are highly flexible utilizing standard automation control system features rather than highly-specialized distributed control system (DCS) solutions that can be costly to replace and maintain. The system is available in two types, general and high-reliability.

Discrete process control

Food processing equipment, semiconductor systems, air-conditioning equipment, industrial furnaces, etc.

Continuous process control

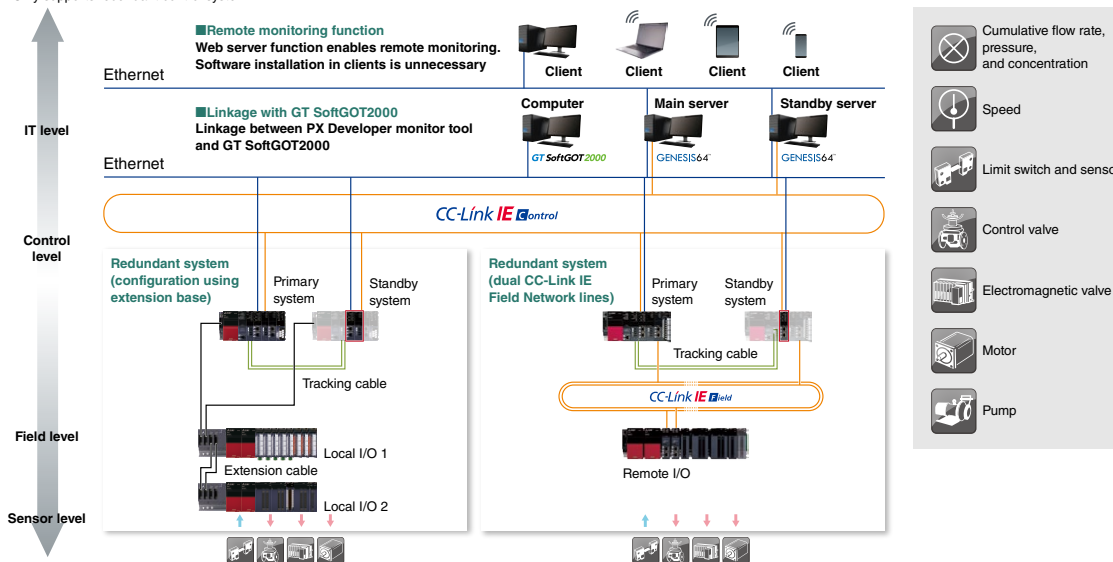
Chemical, steel, environmental and water treatment plants, DCS replacement, etc.



*1: The maximum amount of usable loops may change depending on the actual program size used. Please refer to the relevant manuals for further details.

The MELSEC iQ-R Series process CPU includes dedicated algorithms (such as two-degree-of-freedom PID, sample PI, and auto-tuning), and supports memory sizes of up to 1200K steps. In addition, when paired with a redundant function module, a highly reliable (redundant) control system can be realized. The SIL2 process CPU*2 also realizes a redundant system conforming to IEC 61508 SIL 2 safety standard.

*2: Only supports redundant control system.





For further details, please refer to the catalog and broadcast below.

"C Controller/C Intelligent Function Module Consolidated Catalog:
L(NA)08165E"

"MELSEC iQ-R Series Broadcast e-Factory
Advanced Information Modules: R005ENG"

C Controller ^{iQ} Platform

Open platform utilizing edge computing for optimizing productivity

iQ-R series

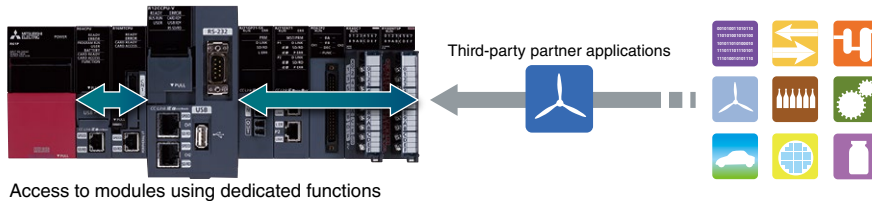
Robust and deterministic alternative to microcomputer/computer based systems

The MELSEC C Controller product range is capable of programming using C language and offers a realistic alternative to mainstream microcomputer/computer based systems. Being part of the MELSEC Series, the C Controller utilizes its robust industrial design and long product life cycle, offering an easy way to realize a cost-efficient solution together with supporting partner products, open source and custom-made applications. This lineup is further enhanced with the new MELSEC iQ-R Series multi-core Arm®-based C Controller with VxWorks® 6.9 pre-installed.



Easier to configure various control systems

Highly customizable solution enables the integration of partner products, open source applications, and OS-independent capabilities onto a generic open platform.



Access to modules using dedicated functions

Reduce common overhead expenses realizing a cost effective solution

The C Controller platform is a solution that realizes computer-level functionality without the burden of high maintenance costs usually associated with computers. In addition, by being based on the MELSEC control system, the C Controller has a robust design that is ideal for industrial environments.

Common drawbacks associated with embedded and industrial computers

- Discontinued production of boards & chips
- Specialized, costly driver development
- Short product life cycle
- Large physical space required
- Frequent maintenance required

Old Platform
(Microcomputer/
computer)

- Disrupted product supply due to discontinued production
- Escalating management and maintenance costs



Merits of using MELSEC hardware

- Highly reliable, long-term stable supply
- Utilization of C language programs
- Significantly reduced maintenance costs
- Reduced equipment size
- Total solution provided by a large number of I/Os and seamless network access

New Platform
(MELSEC-Q/
MELSEC iQ-R)

- Stable product supply
- Lower maintenance and management costs allows resources to be focused on development



MELSECWinCPU ^{iQ} Platform

Control and information processing on one base unit

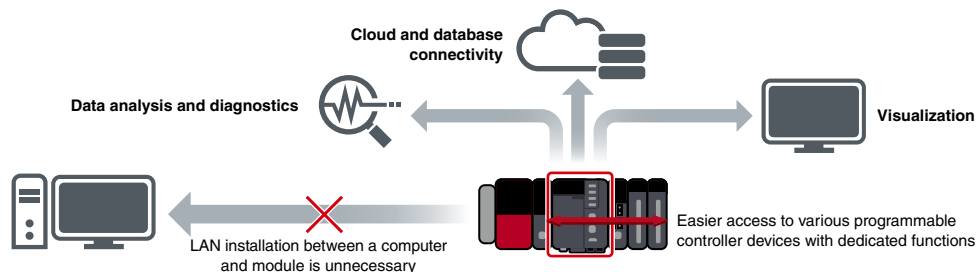
iQ-R series

Information processing using widely available software and hardware: control data utilization

The MELSECWinCPU module, which is incorporated into the multiple CPUs architecture complementing the controller CPU, is ideal for information processing. Utilizing the familiar Windows® assets in the office, the controller CPU data can be calculated and processed. Edge computing such as data exchange with a computer is easily realized. Easy-to-understand development environment such as Microsoft® Visual Basic® and Visual C#® as well as existing development assets can be utilized.

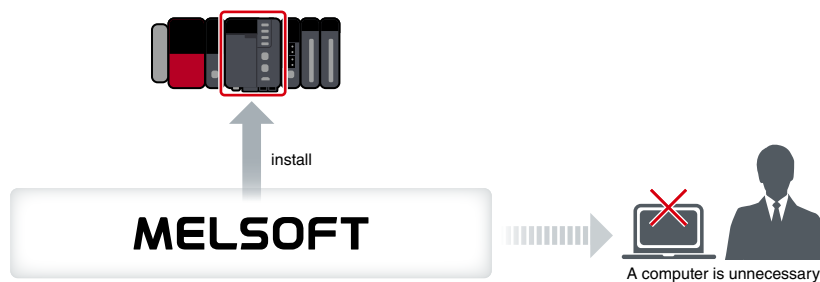
Information system utilizing Windows® OS is easily configured

The IT system on the production site can be configured using Microsoft® Visual Studio® development environment. The MELSECWinCPU can easily communicate with the programmable controller system by using pre-installed functions (C Controller module dedicated functions and MELSEC communication functions). A computer is no longer necessary in the production site, therefore eliminating any issues of LAN installation.



On-site maintenance reduces risk of data breach

Due to growing security concern, it is becoming increasingly difficult to bring computers to the production site. The MELSECWinCPU module is an excellent alternative to a computer. Installing the MELSECWinCPU in the panel can reduce the risk of technology and data theft as well as virus invasion. When the engineering software is installed and a keyboard, mouse and display are connected, urgent maintenance is easily handled.





SERVO SYSTEM CONTROLLER **iQ** Platform

Total system performance leads to maximum performance

iQ-R series

Q series

L series

iQ-F series

Lineup capable of responding to versatile sizes and applications

A full lineup of servo system controllers supports all types of system configurations. Simple Motion modules are ideal for simple positioning control and motion modules for high-speed and multi-axis systems. Motion CPUs are incorporated into the multi-CPU architecture, allowing control load to be separated.

Simple motion module

MELSEC iQ-R Series

MELSEC-Q Series

MELSEC-L Series

MELSEC iQ-F Series

The modules enable simple positioning effectively by setting control programs and advanced synchronous control such as cam control. Using a functional safety module, a safety system can also be configured.

Motion module

MELSEC iQ-R Series

MELSEC iQ-F Series

Highly functional motion modules are fully capable of performing in any motion control applications.

- Achieve higher performance in the existing system
- Implement a high-performance system in preparation for future expansion
- Improve usability of control as well as maintenance.

The variety of products can respond to these requirements.

Two modes are available

The simple motion mode enables utilization of existing program assets of the Simple Motion module. While the PLCopen® motion control FB mode supports FB library, making programming even easier with its intuitive features.

Simple motion mode

A motion profile table positioning control and advanced synchronous control by synchronized parameter setting are possible. Motion control is possible by control programs only.

Simple Motion

Motion profile table

Advanced synchronous control

Digital oscilloscope

PLCopen® motion control FB mode

Use ladder, FBD or ST language for programming. The created programs can be uploaded either to the controller CPU or motion module or both. Select a configuration according to applications.

PLCopen®

ST language

PLCopen® Motion Control FB

Logging

CC-Link IE TSN-compatible servo amplifier

Use the motion module in combination with the CC-Link IE TSN-compatible servo amplifier MELSERVO-J5. Wiring the Ethernet-based CC-Link IE TSN is easily done using a LAN cable. High-accuracy synchronous control of multi-axis system with less delay is achieved.

MITSUBISHI ELECTRIC SERVO SYSTEM
MELSERVO-J5



For further details, please refer to the catalogs below.

"MITSUBISHI ELECTRIC AC Servo System MELSERVO-J5:
L(NA)03179ENG"
"SERVO SYSTEM CONTROLLERS MELSEC IQ-R SERIES/
MELSEC IQ-F SERIES: L(NA)03100"
"MITSUBISHI SERVO SYSTEM CONTROLLERS: L(NA)03062"

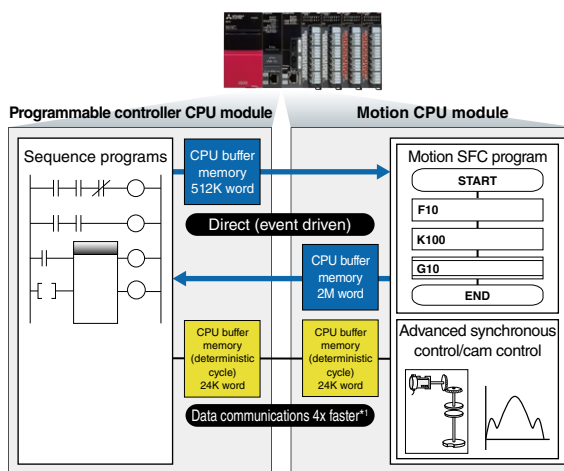
● Motion controller

MELSEC IQ-R Series MELSEC-Q Series

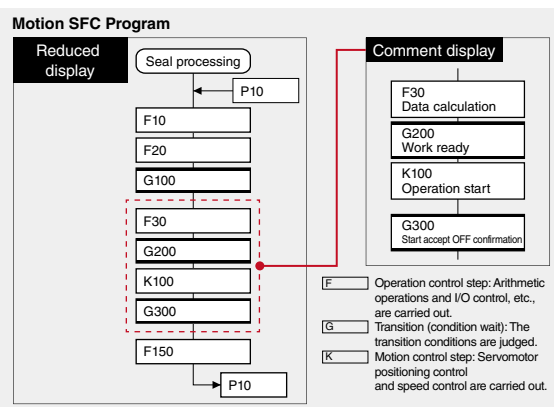
- Increase productivity by supporting the iQ Platform
- Advanced synchronous control and cam control
- Safety system using the Functional Safety Unit

In production lines responding to high variety and variable quantity production, recipe data needs to be instantly reflected to the motor operation according to commands from the computer. In the multi-CPU configuration of controller CPU and motion CPU, recipe data and production results data constantly changing can be handled via a large memory area shared.

*1: Four times faster compared to existing models.



The SFC (Sequential Function Chart) type language which enables programming in clearly identifiable steps is ideal for complex motion control of increased number of axes. This is extremely useful where faster machine response with excellent event processing capability is required.

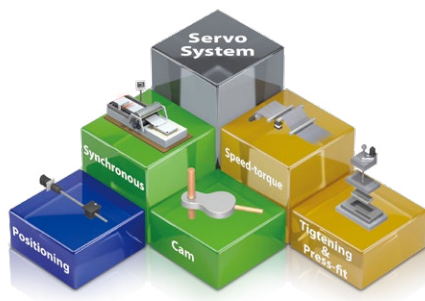


► Extensive motion control

Positioning, speed-torque (press-fit) and advanced synchronous control among other forms of motion control for various equipment, including X-Y table, packaging and press-fitting machines. Ideal features designed to provide optimal solutions for machines and applications.

Control

Versatile motion control support different machines.



Functions*2

Select the functions best suited to match equipment.

Cam auto-generation	Mark detection function	Optional data monitor	Absolute position system
Unlimited length feed	Target position change function	Safety observation function	M-code output
Digital oscilloscope function	Master-slave operation	Vision system	

*2: Availability of functions and function names differ according to models.

► SSCNET III/H compatible servo amplifier

High-accuracy positioning and smooth operation can be achieved with a combination of the motion CPUs and MELSERVO-J4 Series servo amplifiers.

MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-J4





For further details, please refer to the catalog below.

"MITSUBISHI ELECTRIC INDUSTRIAL ROBOT
MELFA FR Series: L(NA)-09091ENG"

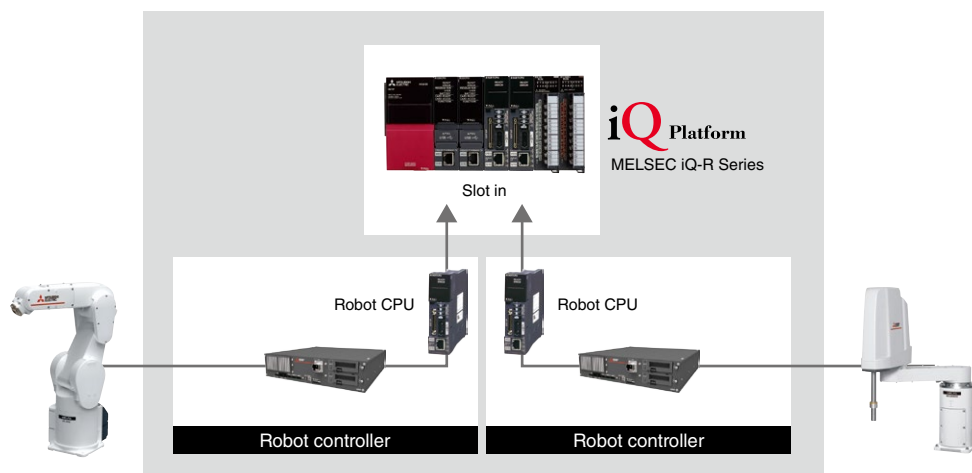
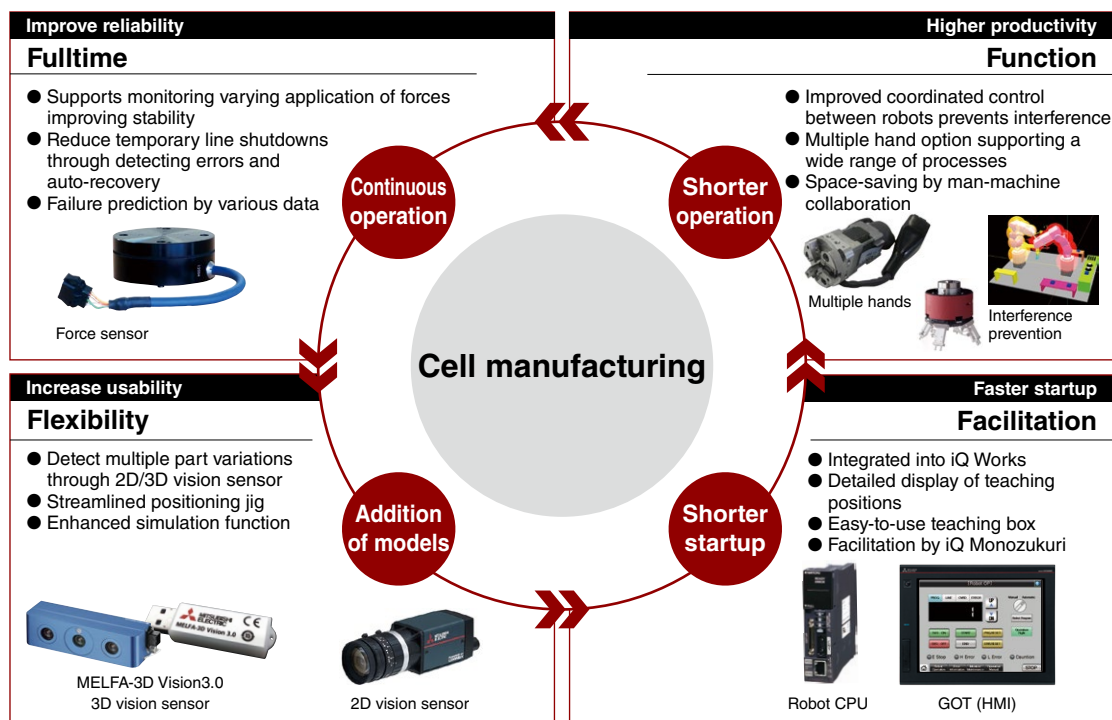
ROBOT CONTROLLER **iQ** Platform

Opening up multiple communication
options through integration to the iQ Platform

iQ-R series

Leveraging the integration of robots into manufacturing lines

By integrating the use of MELFA robots into the iQ Platform, it's possible to leverage communication with the automation controller, motion control and HMI. Utilizing the multi-CPU capabilities and integrated network/engineering environment, optimizing productivity can be achieved regardless of how complex or demanding the application.



For further details, please refer to the catalog below.

"NUMERICAL CONTROL (CNC) C80 Series: BNP-A1235ENG"



CNC CPU iQ
Platform

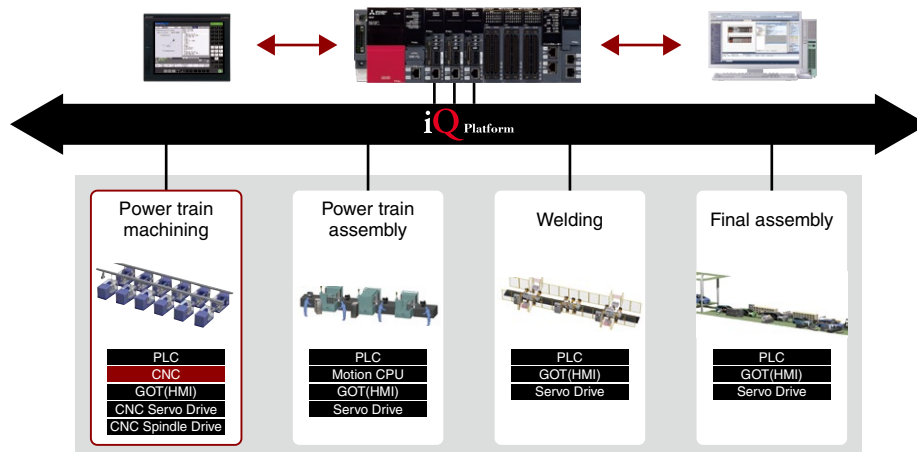
Providing maximum reduction in TCO

iQ-R series

Integrating high-performance CNCs and high-speed programmable controllers

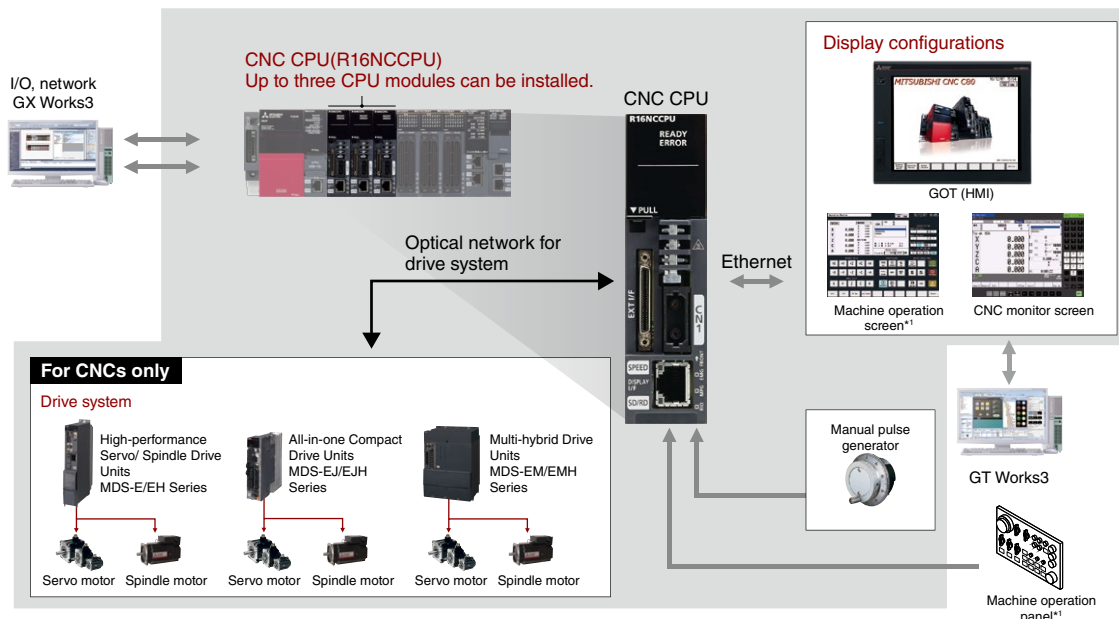
Integrate high-performance CNCs with the iQ Platform and experience substantially enhanced overall control system operation time, improving performance and enhancing productivity. Using standard modules contributes to reducing maintenance costs even further as replacements are generally available.

iQ Platform makes it possible to optimize controller use for various lines.



High-speed communication between CNCs and programmable controllers

High-speed CPU processing supported by fast communication bus speeds enable high-speed communication between controllers.

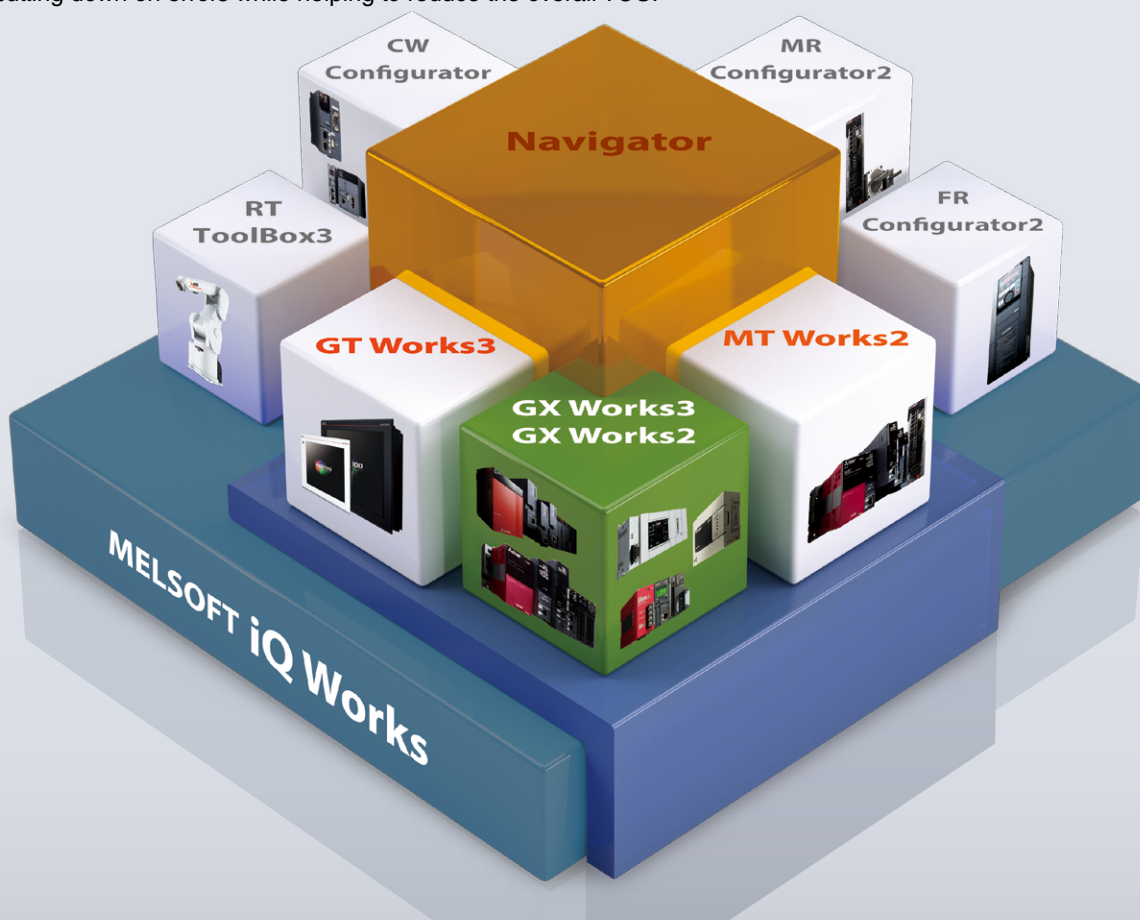


*1: Made by the machine tool builder

Programmable controller engineering software

MELSOFT iQ Works

MELSOFT iQ Works is an integrated software suite consisting of GX Works3, MT Works2, GT Works3, RT ToolBox3 and FR Configurator2, which are programming software for each respective product. Integration is further enhanced with MELSOFT Navigator as the central system configuration incorporating an easy-to-use, graphical user interface with additional project-sharing features such as system labels and parameters. The advantages of this powerful integrated software suite are that system design is made much easier with a substantial reduction in repetitious tasks, cutting down on errors while helping to reduce the overall TCO.



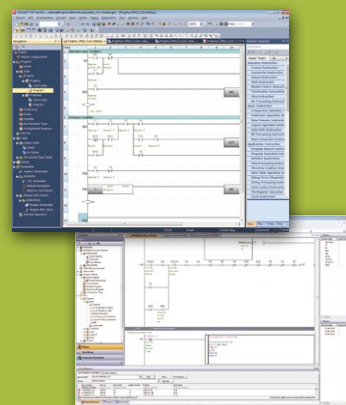
Programmable controller engineering software

MELSOFT GX Works3

Latest generation of software available for the MELSEC iQ-R and iQ-F Series control systems. Includes a graphic-based system configuration, integrated motion control setup, multiple language support, in addition to extensive diagnosis and troubleshooting functions.

MELSOFT GX Works2

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



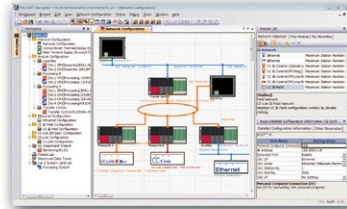
For further details, please refer to the catalog below.

"Mitsubishi iQ Platform Compatible FA Integrated Engineering Software MELSOFT iQ Works:L(NA)08232ENG"

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.



HMI/GOT screen design software

MELSOFT GT Works3

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



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.

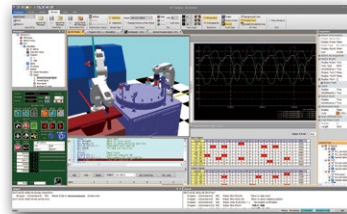


Robot engineering software

MELSOFT RT ToolBox3*1

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.

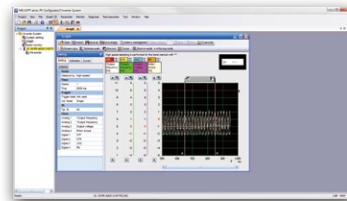
*1: RT ToolBox3 mini (simplified version) will be installed if iQ Works product ID is used. When RT ToolBox3 (with simulation function) is required, please purchase RT ToolBox3 product ID.



Inverter setup software

MELSOFT FR Configurator2

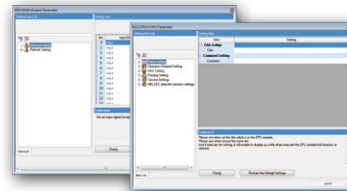
Simplifies the setup and maintenance of AC inverters. Parameters can be registered easily and distributed to multiple inverters when replacing, and activation of the PLC function all from one setup screen.



C Controller setting and monitoring tool

MELSOFT CW Configurator

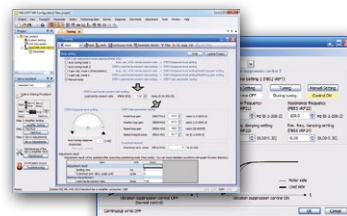
This C Controller parameter setting and monitoring software simplifies parameter setting, diagnostics, monitoring and testing. Using CW Configurator is as easy as using the MELSEC iQ-R engineering software GX Works3, which shares similar interfaces.



Servo setup software

MELSOFT MR Configurator2

Servo setup software used for easy monitoring, diagnosis, registering parameters, and testing of the servo amplifier.



Programmable controller engineering software

GX Works3

Reducing development costs through intuitive engineering

The engineering software is sometimes considered a fundamental part of the control system in addition to the hardware components. The core of the system, it includes various steps of the product life cycle, from the design stage all the way to commissioning and maintenance of the control system. Today, intuitive, easy-to-use software suites are expected as a standard for modern manufacturing needs. GX Works3 is the latest generation of programming and maintenance software offered by Mitsubishi Electric specifically designed for the MELSEC iQ-R and MELSEC iQ-F Series control system. It includes many new features and technologies to ensure a trouble-free engineering environment solution.

Intuitive engineering software covering the product development cycle

Graphic-based configuration realizing easier programming

Various intuitive features such as graphic-based system configuration and an extensive module library (module label/FB) provided as standard.

Integrated motion-control system configuration

From setting simple motion module parameters and positioning data setup to servo amplifier configuration, everything is packaged into an easy-to-use engineering environment.

Complies with IEC 61131-3

GX Works3 realizes structured programming such as ladder and ST, making project standardization across multiple users even easier.

Simple point and click programming architecture

System design Programming Debug/maintenance

Straightforward graphic based system configuration design

- Simply drag and drop from the module list to easily create system configuration
- Directly setup parameters for each module
- Automatically reflect changes in the layout to the module parameters

System design Programming Debug/maintenance

MELSOFT library enables efficient programming through “Module Label/FB”

- Assign convenient label names to internal devices, rather than manually entering a device name every time
- Simply drag & drop module FBs from the MELSOFT Library directly into the ladder program, making programming even easier

System design Programming Debug/maintenance

Extensive version control features

- Flexibly register program change (historical) save points
- Easily visualize and confirm program changes

Global realization by multi-language support

To adhere to today's global production needs, GX Works3 supports multi-language features at various levels, from the multiple language software menu to the device comment language switching feature.

Navigation window

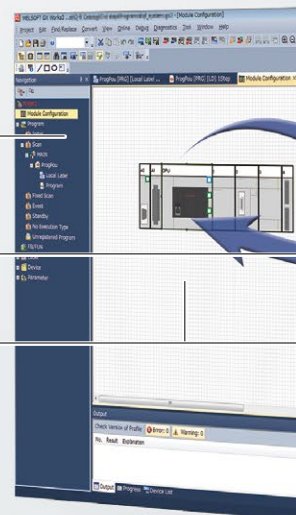
Easily access project components
Organize program file list.

Module configuration

Easily parameterize each module directly from the configuration editor.

Module list

Simply drag & drop modules directly into the module configuration.



For further details, please refer to the catalog below.

"Programmable controller engineering software
MELSOFT GX Works3: L(NA)08334ENG"

GX Works3

One Software, Many Possibilities

Reduce engineering time by 60%*1

Tab view multiple editors

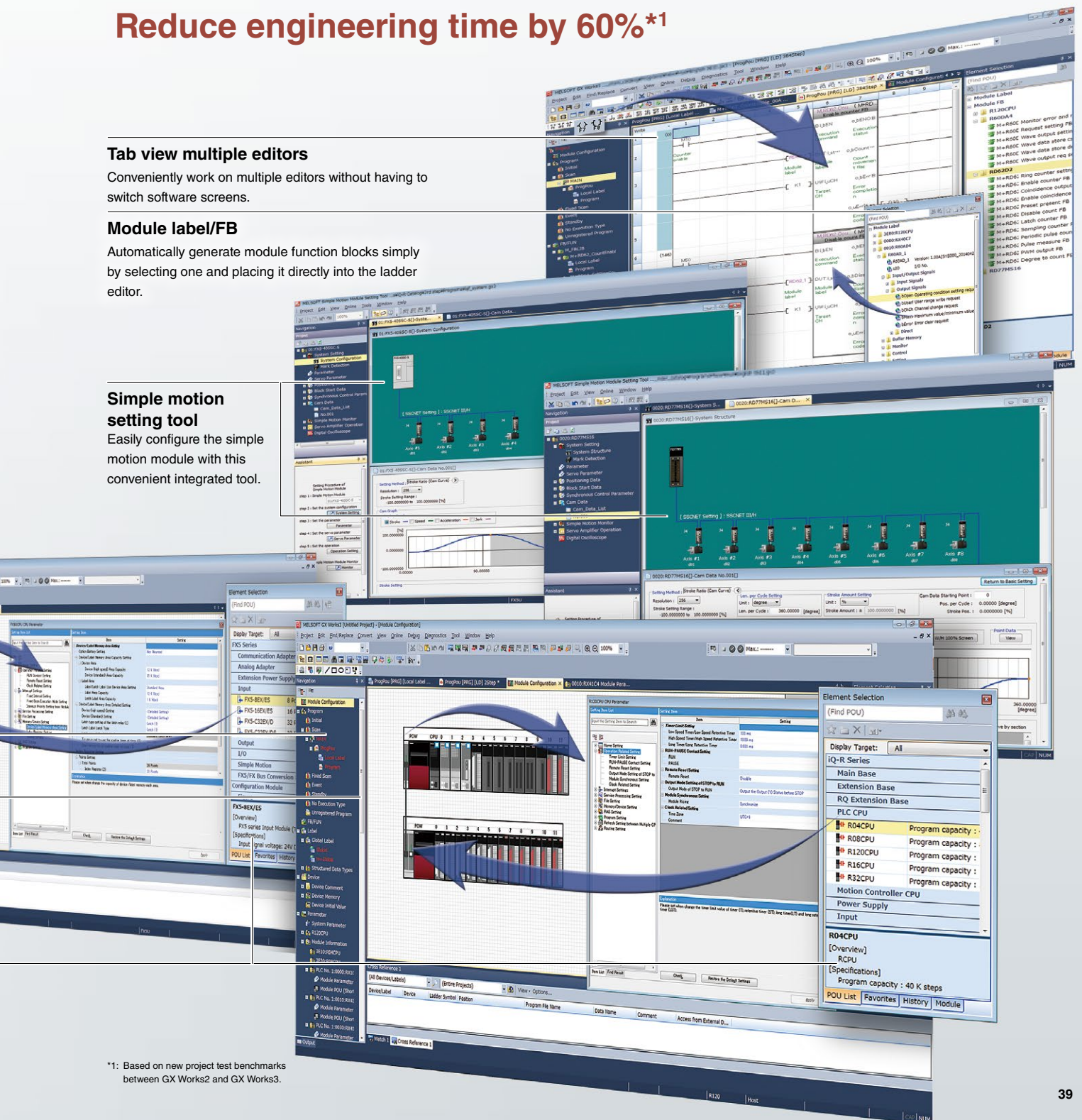
Conveniently work on multiple editors without having to switch software screens.

Module label/FB

Automatically generate module function blocks simply by selecting one and placing it directly into the ladder editor.

Simple motion setting tool

Easily configure the simple motion module with this convenient integrated tool.



*1: Based on new project test benchmarks between GX Works2 and GX Works3.

Programmable controller engineering software

GX Works2

The screenshot displays the MELSOFT Series GX Works2 software interface. The left sidebar contains a project tree view showing the engineering process, including sections for Parameters, Global Device Comment, Program Setting, and Program. The main workspace shows a ladder logic diagram with various components like timers (T23), counters (C1), and devices (X0, X43, X4F, X0F, Y26, M149, M130). A 'PRG]Write Auto 576 Step' window is open, showing a list of steps and their associated operations. A 'GX Simulator2' window is also visible, showing a 'Tool Options' dialog with 'Switch' and 'LED' sections. The 'Switch' section has buttons for 'RESET', 'STOP', and 'RUN'. The 'LED' section shows 'MODE', 'RUN', 'ERR.', and 'USER' indicators. The bottom right corner features a 'Find' and 'Browse' section with a table of data names and their filtering conditions.

Easily setup intelligent function modules

Title display enables program contents to be checked at a glance

Project tree view showing the engineering process

Easily switch connection targets within the same window

Sample comments are available to quickly input comments

A comment for a word device can be set at bit level, differentiating similar devices

In-line ST for directly inserting operation instructions into the ladder

Offline debugging with hardware emulation

Intuitive cross-reference list displays devices used in the program

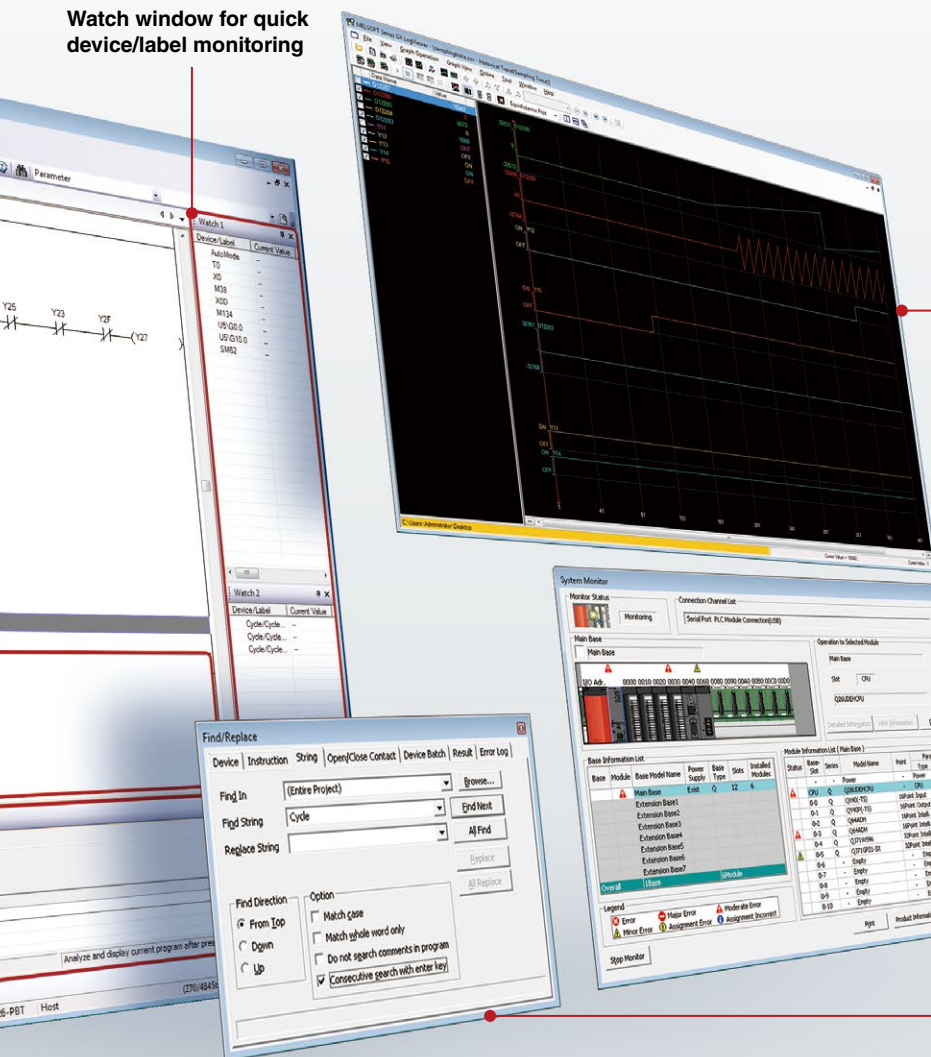
For further details, please refer to the catalog below.

"Programmable Controller Engineering Software
MELSOFT GX Works2: L(NA)08122ENG"

Engineering software designed for easy usability

GX Works2 has been designed to realize intuitive programming, maintenance, and debugging through various integrated features. The software supports IEC 61131-3 programming amongst the compatible programming languages, making it easy to use across multiple applications. It has an extensive maintenance features set, allowing easy setup of the control system, connected networks, and various intelligent I/O. GX Works2 is designed with customers in mind including consolidated "all-in-one" packaged programming that integrates programming, configuration and simulation tools.

Watch window for quick
device/label monitoring



Sampling trace enables
reduced setup and
maintenance

System monitoring
provides easier
maintenance

Further simplify debugging
with device search functionality

Intuitive project management

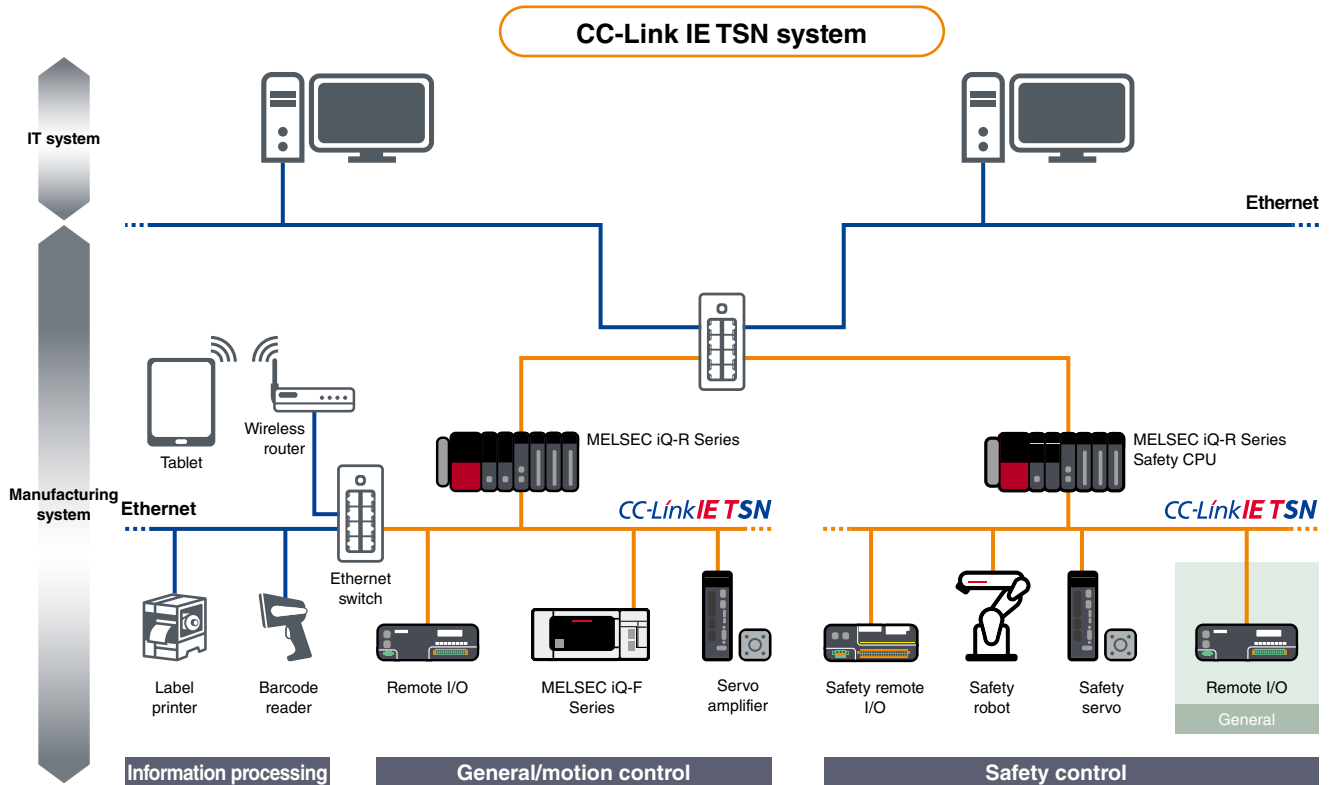
The project tree view, which is situated to the left of the docking window, enables easy understanding and management of the entire project. Various features such as viewing titles and handling multiple projects enable a very efficient and cost-effective way to manage projects, substantially reducing the overall engineering time. Project restoration is also easy using the back-up and restore feature.

Extensive program standardization

Program standardization is simplified using function blocks (FBs) within the program. The FBs make it easy to duplicate programming code that can be used multiple times in the project, or for other projects. This reduces programming time and realizes more efficient programming. A function library is also available, enabling standard FBs to be imported into projects, which saves on initial creation time.

Easy maintenance and debugging

Dedicated system monitoring and PLC diagnostics simplify control system maintenance and make error monitoring easy. Various security features are incorporated to protect intellectual property, such as controlling access to projects involving multi-person development teams using hierarchical-dependent access. Debugging using comments and project simulation is fairly easy, requiring no hardware.



CC-Link IE TSN (Ethernet-based)

Ethernet-based network enables mixing of information processing and control information, making network expansion and replacement easier. Scalable system is realized with highly-accurate synchronous control and highly-efficient data transfer. Establishing a flexible and reliable safety communication is as easy as configuring a general communication network.

►Flexible IIoT system configuration

CC-Link IE TSN utilizes TSN technology together with its support of TCP/IP communications enables mixing of information communication (non real-time) with Ethernet communication devices. This allows TCP/IP communication devices to be used without affecting real-time deterministic communications, thereby giving greater flexibility when connecting machines and equipment.

►Reduce startup, engineering and maintenance costs

Through its support of SNMP, general Ethernet diagnostics software can be used to identify the network-related errors of CC-Link IE TSN and Ethernet devices more easily. The internal clocks of devices can be synchronized to within the microsecond, making it possible to log historical events in sequence and easily identify the cause of an error.

►Increased productivity

Improved communication performance enables shorter production cycle time. Compared to current systems, adding further control axes and remote I/Os is much easier. In addition, optimum communication cycle times can be realized by supporting both high-speed and low-speed cycle communications according to device specifications.

►Various development methods available supporting different products

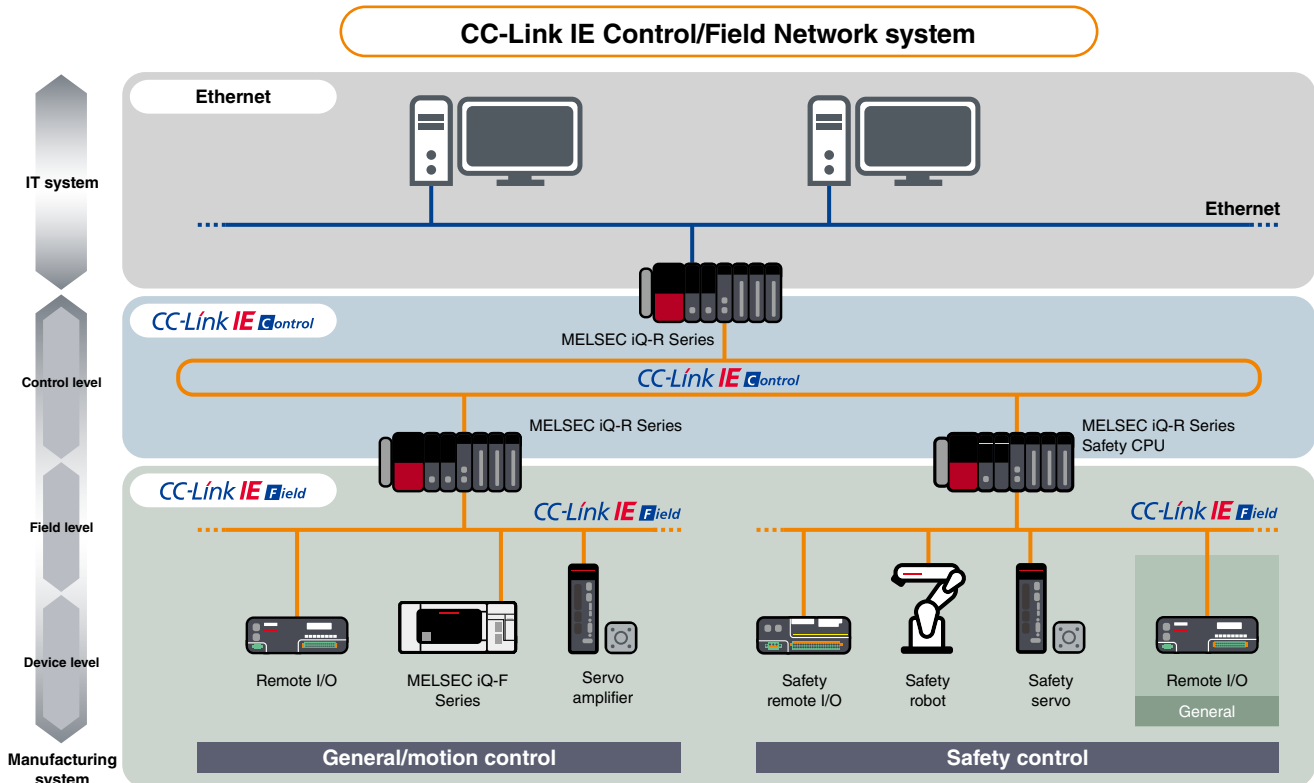
Product development for CC-Link IE TSN partner product vendors is relatively simple since various options are available. These include a dedicated ASIC/FPGA option for devices that require high performance, and a software protocol stack suitable for lower cost devices that can utilize a general Ethernet chip for network implementation.

For further details, please refer to the catalogs below.

"CC-Link IE TSN Product Catalog: L(NA)08656ENG"

"Ethernet-based Open Network CC-Link IE Product Catalog:
L(NA)08111E"

"Open Filed Network CC-Link Compatible Product Catalog:
L(NA)08038E"



CC-Link IE Control Network (Ethernet-based)

MELSEC iQ-R Series	MELSEC-Q Series	MELSEC-L Series	MELSEC iQ-F Series
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Use of optical fiber cable with long-distance and noise immunity performance allows high-speed and large-capacity communication between controllers. A large-scale network system where up to 120 stations connectable can be configured.

CC-Link IE Field Network (Ethernet-based)

MELSEC iQ-R Series	MELSEC-Q Series	MELSEC-L Series	MELSEC iQ-F Series
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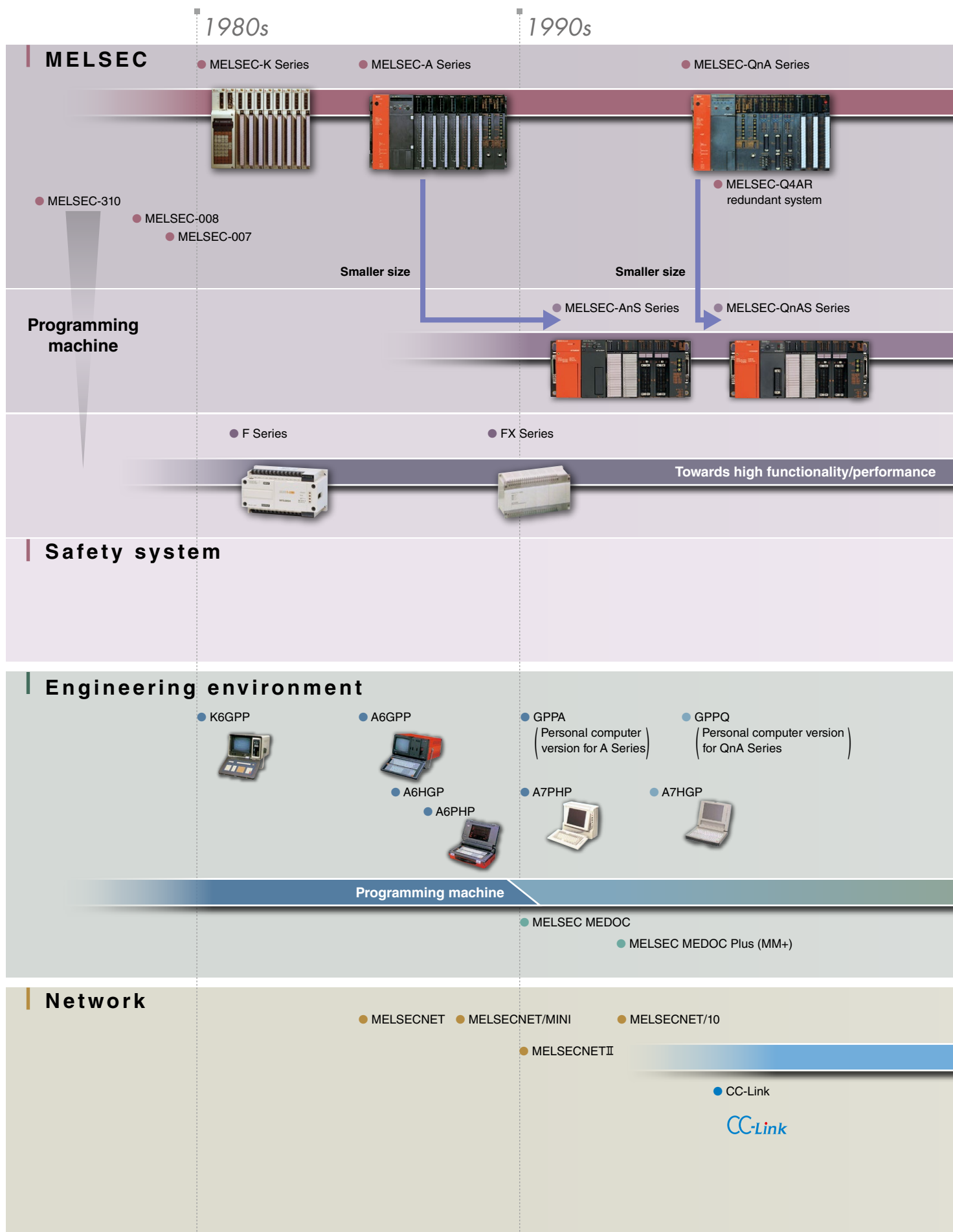
Using widely available Ethernet cables, 1 Gbps high-speed communication with remote devices is possible. Choose a best fit topology from a line, star, or ring according to the production site layout. Up to 120 remote devices can be connected, enabling a small- to large-scale system configuration.

CC-Link IE (RS-485-based)

MELSEC iQ-R Series	MELSEC-Q Series	MELSEC-L Series	MELSEC iQ-F Series
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The RS-485-based CC-Link Network is available in five communication speeds (156kpps, 625kpps, 2.5 Mbps, 5 Mbps, 10 Mbps) according to the overall system distance and installation environment. The remote station can communicate with 32 remote devices maximum. The network can be used for a small- to large-scale network system.

MELSEC History



MELSEC with history and experience.

Satisfying new challenges while utilizing past expertise

2000s

2010s

2020s

● MELSEC-Q Series

● MELSEC iQ-R Series

Towards high functionality/performance

Medium- to large-scale control



- MELSEC-Q Process CPU
- MELSEC-Q redundant system
- MELSEC-Q C Controller



- MELSEC iQ-R C Controller
- MELSEC iQ-R CC-Link IE embedded CPU
- MELSEC iQ-R Safety CPU
- MELSEC iQ-R Process CPU/redundant system
- MELSEC iQ-R SIL2 Process CPU
- MELSEC iQ-R Entry-level CPU
- MELSEC iQ-R MELSECWinCPU

● MELSEC-L Series

Towards high functionality/performance

Small- to medium-scale control



● FX3 Series

● MELSEC iQ-F Series

Small-scale and stand-alone



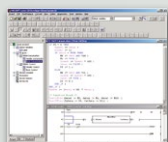
- MELSEC-QS Series Safety programmable controller
- MELSEC-WS Series Safety controller

● MELSEC iQ-R Series Safety CPU

Safety control



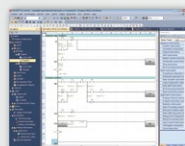
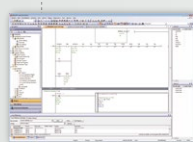
● MELSOFT GX Developer (Windows® version GPP)



● MELSOFT iQ Works

● MELSOFT GX Works2

● MELSOFT GX Works3



Personal computer software

● MELSOFT GX IEC Developer

● MELSECNET/H

● CC-Link/LT

● CC-Link Safety ● CC-Link IE Field

● CC-Link IE Control supporting twisted pair cable

● CC-Link IE Control

● CC-Link IE Field safety communication function

● CC-Link IE Field Basic

CC-Link IE

CC-Link IE Field Basic

● CC-Link IE Field motion function

● CC-Link IE TSN

CC-Link IE TSN

FA Partner

FA goods

MITSUBISHI ELECTRIC ENGINEERING CO., LTD.

Useful products to be used in combination with MELSEC programmable controllers are available. Use of these products will help reduce commissioning time of panel design, implementation time of facility replacement, etc.

Five methods for smart factory

Time and wire saving devices



01

Easy wiring for innovative solutions

Network devices



02

Introduction of small-scale IoT to reform production sites

Products for monitoring and traceability



03

Visualization (monitoring and diagnosis) of production sites

Upgrade tool products



04

Upgrading system leading to smart factory

Products for system maintenance



05

Stable operation for productivity improvement



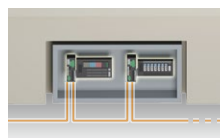
Time and wire saving devices

Our products can offer innovative solutions by reducing wiring work for PLCs (programmable controllers), servo systems, and HMI (Human Machine Interfaces).



Network devices

We provide products to use the CC-Link Family, SSCNET, or FL-net communication.



Products for monitoring and traceability

Our products and solutions enable monitoring and diagnosis.



Upgrade tool products

System can be upgraded for smart factory using our products for upgrading PLCs (programmable controllers) and devices and software for servo system.



Products for system maintenance

We provide products to reduce cost and time for maintenance in production sites.



FACTORY AUTOMATION SOLUTION PARTS

mitsubishi electric system & service co., ltd.

Cables / Network device-related products

Renewal Tool-related products

Inverter-related products

Factory Automation Solution Parts

www.melsc.co.jp/business/overseas/

For details of Mitsubishi Electric System & Service Co., Ltd. products, please contact us via email.
OVERSEAS SERVICE SECTION mail: osb.webmaster@melsc.jp

Extensive global support coverage providing expert help whenever needed

■ Global FA centers

■ EMEA

Europe FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch
Tel: +48-12-347-65-81

Germany FA Center

MITSUBISHI ELECTRIC EUROPE B.V. German Branch
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UK FA Center

MITSUBISHI ELECTRIC EUROPE B.V. UK Branch
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Czech Republic FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch
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Italy FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch
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Russia FA Center

MITSUBISHI ELECTRIC (RUSSIA) LLC ST.
Petersburg Branch
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Turkey FA Center

MITSUBISHI ELECTRIC TURKEY A.S. Umraniye Branch
Tel: +90-216-526-3990 / Fax: +90-216-526-3995

■ Asia-Pacific

China

Beijing FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Beijing FA Center
Tel: +86-10-6518-8830 / Fax: +86-10-6518-2938

Guangzhou FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Guangzhou FA Center
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Shanghai FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Shanghai FA Center
Tel: +86-21-2322-3030 / Fax: +86-21-2322-3000

Tianjin FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD.
Tianjin FA Center
Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017

Taiwan

Taipei FA Center

SETSUYO ENTERPRISE CO., LTD.
Tel: +886-2-2299-9917 / Fax: +886-2-2299-9963

Korea

Korea FA Center

MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.
Tel: +82-2-3660-9632 / Fax: +82-2-3664-0475

Thailand

Thailand FA Center

MITSUBISHI ELECTRIC FACTORY AUTOMATION
(THAILAND) CO., LTD.
Tel: +66-2682-6522-31 / Fax: +66-2682-6020

ASEAN

ASEAN FA Center

MITSUBISHI ELECTRIC ASIA PTE. LTD.
Tel: +65-6470-2480 / Fax: +65-6476-7439

Malaysia

Malaysia FA Center

Malaysia FA Center
Tel: +60-3-7626-5080 / Fax: +60-3-7658-3544

Indonesia

Indonesia FA Center

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Vietnam

Hanoi FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED
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Ho Chi Minh FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED
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Philippines

Philippines FA Center

MELCO Factory Automation Philippines Inc.
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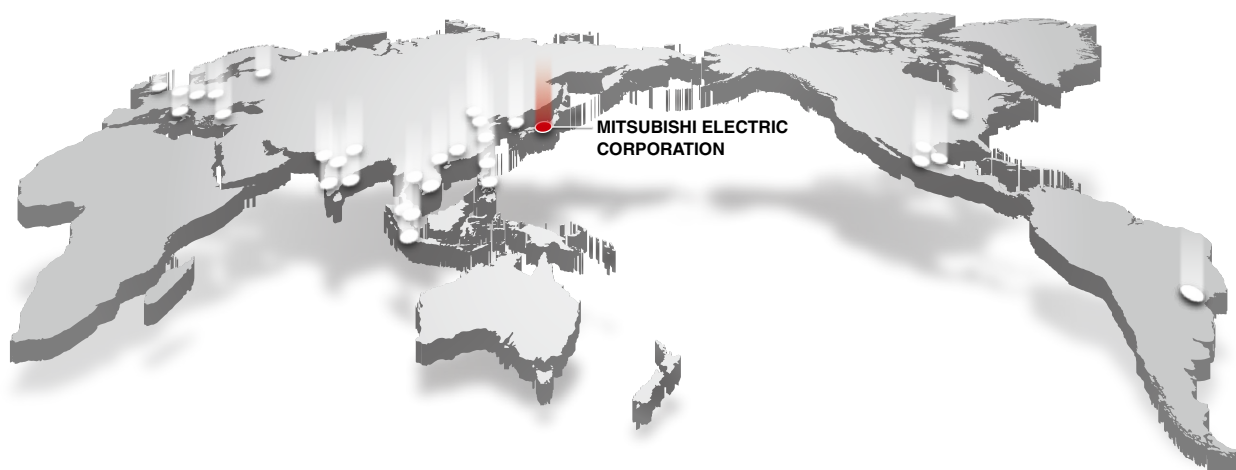
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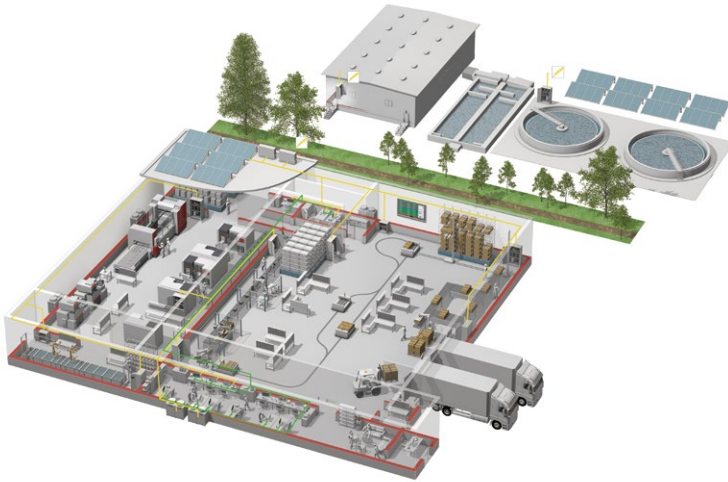
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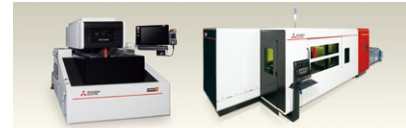
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