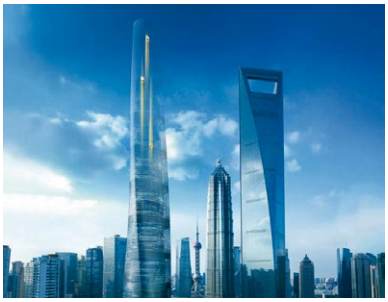
MITSUBISHI ELECTRIC
Changes for the Better

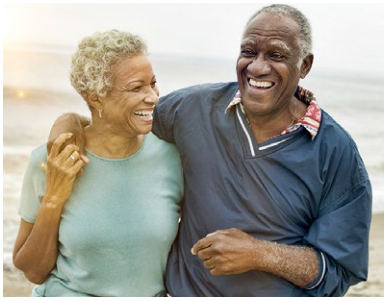
Automating the World

FACTORY AUTOMATION

iQ Platform-compatible PAC
MELSEC Process Control/Redundant System

MELSEC
PROCESS CONTROL





Our Factory Automation business is focused on "Automating the World" to make it a better, more sustainable environment supporting manufacturing and society, celebrating diversity and contributing towards an active and fulfilling role.

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.

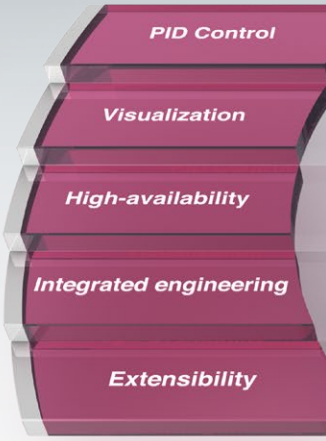
SUSTAINABLE DEVELOPMENT GOALS

The Mitsubishi Electric Group is actively solving social issues, such as decarbonization and labor shortages, by providing production sites with energy-saving equipment and solutions that utilize automation systems, thereby helping towards a sustainable society.

Contents

Highly-available process control in a scalable automation solution

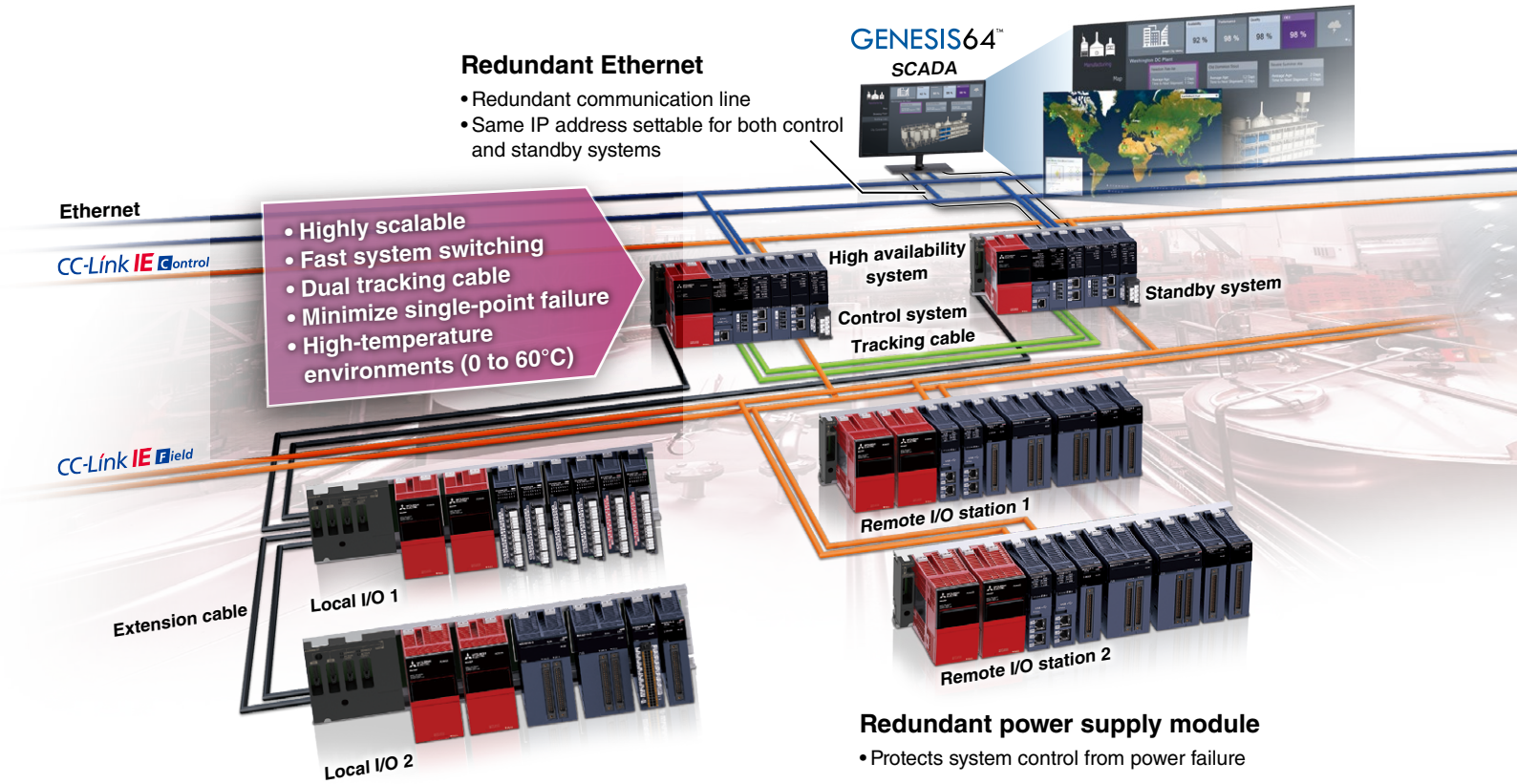
The MELSEC process/redundant system is an open and highly flexible general-purpose system, rather than highly-specialized distributed control system (DCS).
Mitsubishi Electric's e-F@ctory solution ensures plant-wide seamless communication via IIoT, optimizing the system through data analysis and utilization.



System monitoring control and data utilization

Extensive visualization

SCADA Software GENESIS64™, GT SoftGOT2000, and GOT2000 provide extensive visualization with their enhanced interconnectivity with the MELSEC iQ-R Series. Advanced features such as energy management, scheduling, alarm and event management, trending, reporting, historian, and Geo-SCADA monitoring realize intuitive factory-wide control.



Redundant extension base unit

- Connects directly to the redundant control system base unit
- Reduced single point of failure when either power supply or extension cabling fails

Redundant power supply module

- Protects system control from power failure

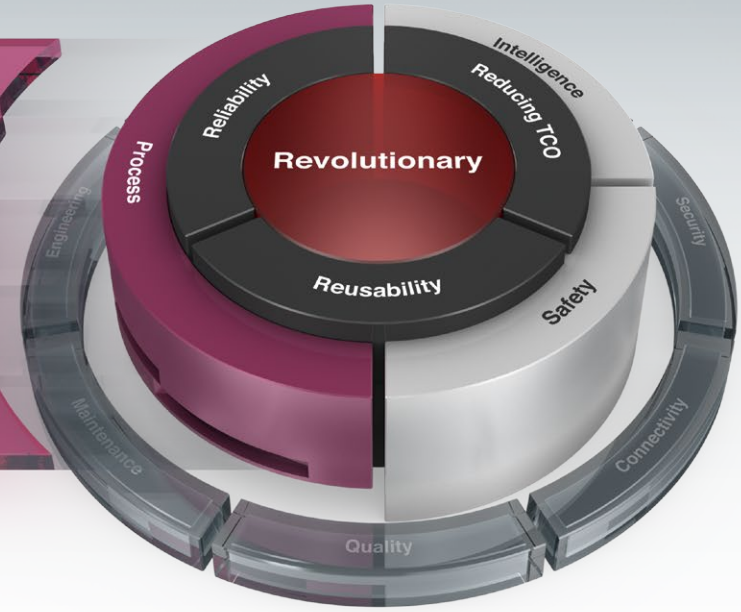
Remote station
Redundant remote network head module

- Enables continuous data communications by switching control between modules

Multi-level redundancy ensuring continuous control

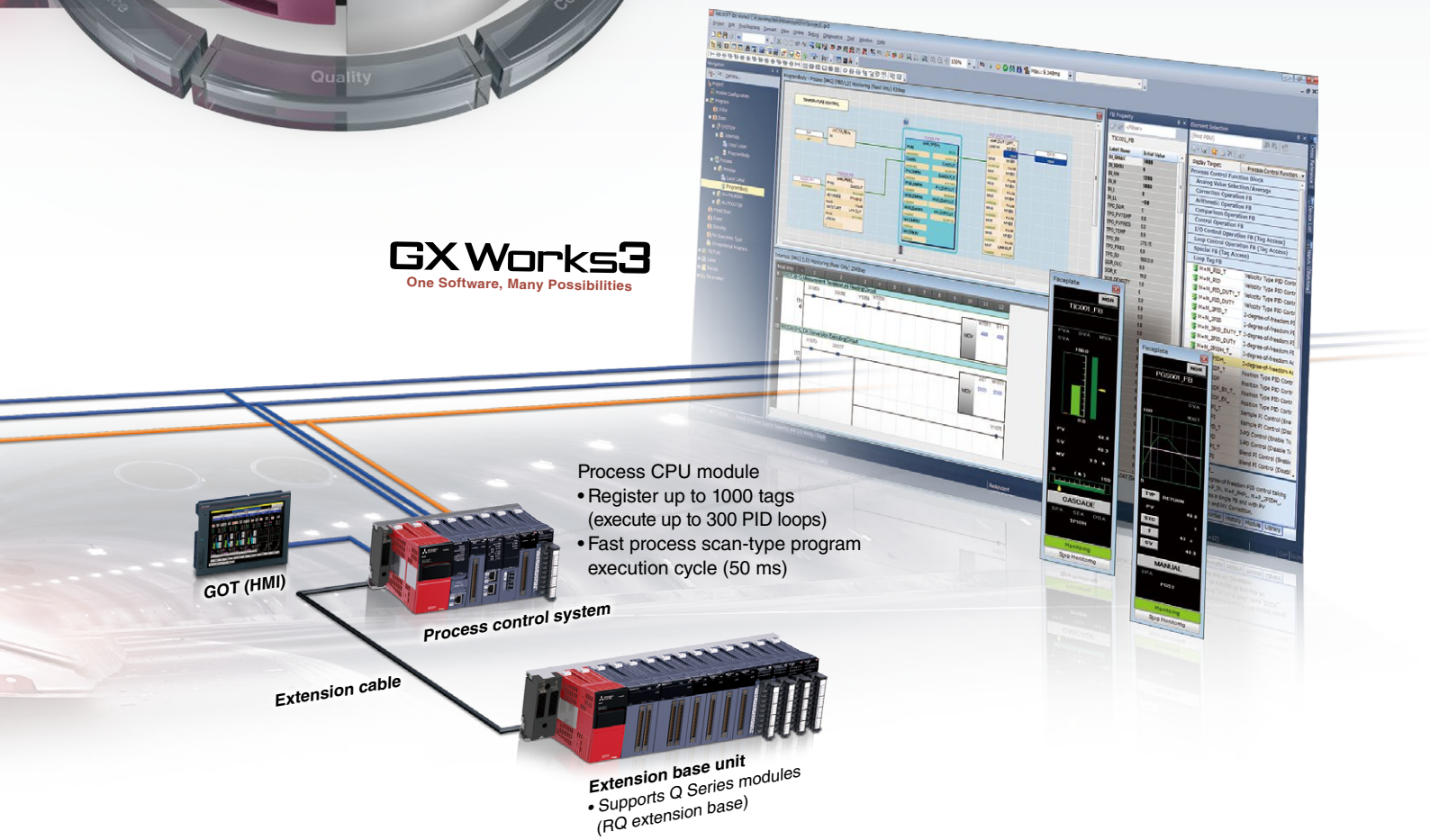
High availability

Highly reliable control systems can be easily realized minimizing the possibility of single-point failure at the visualization (SCADA), control, network, and extension cable levels, thereby avoiding system downtime and ensuring continuous control and operation of critical systems.



Mitsubishi Electric PAC MELSEC iQ-R
"Process" Movie

GX Works3
One Software, Many Possibilities



Embedded PID algorithms

PID control

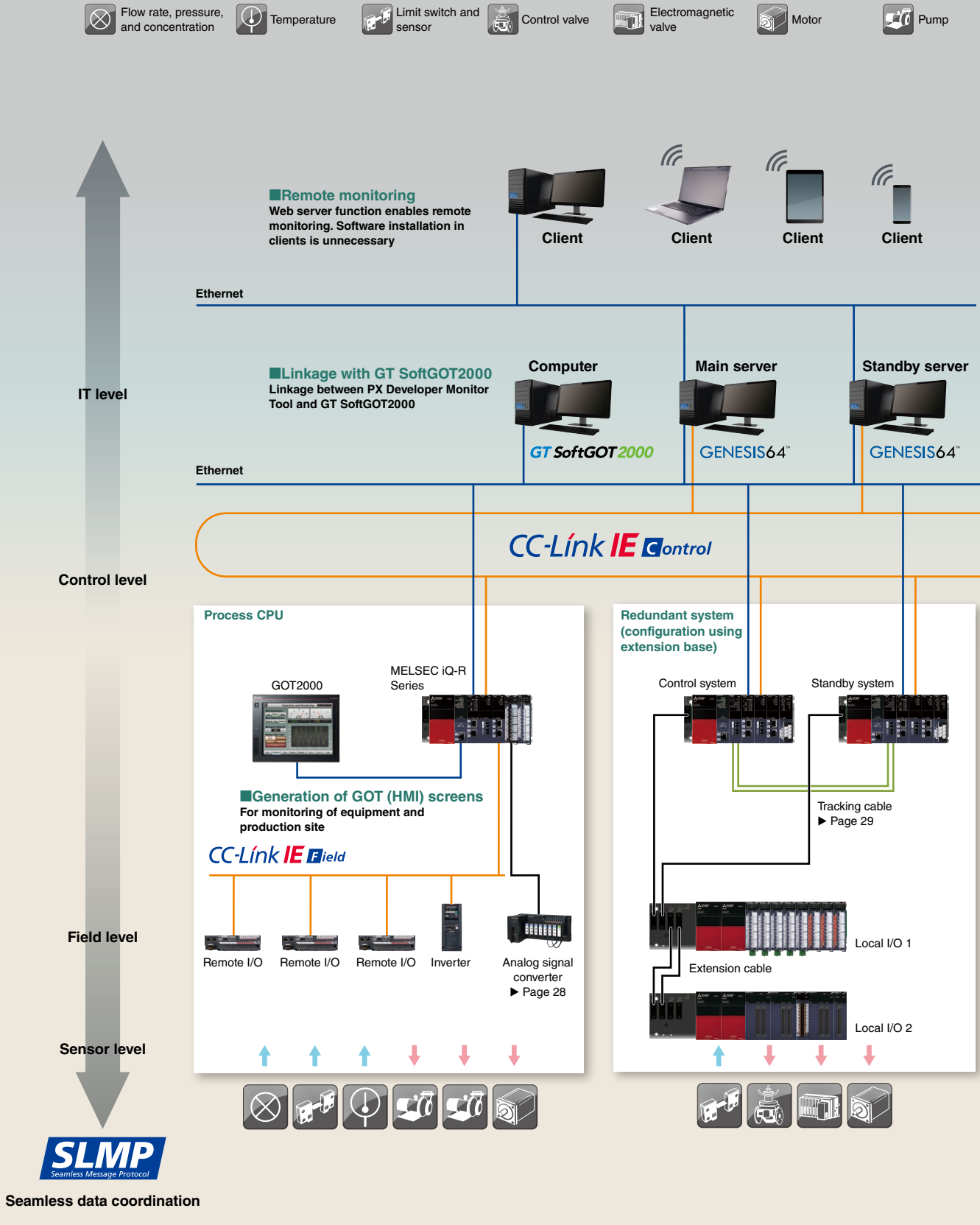
The process CPU includes dedicated algorithms such as two-degree-of-freedom PID, sample PI, and auto-tuning support advanced process control.

One package process control software

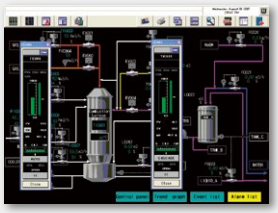
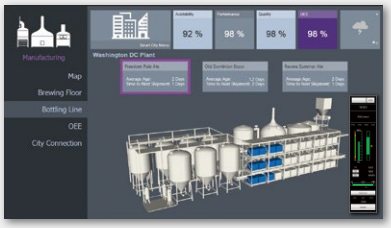
Integrated engineering

GX Works3, the standard integrated engineering software for the MELSEC iQ-R Series, makes programming redundant process control systems relatively easy. The program editor uses function block diagram (FBD) language for process control and simplifies system configuration with its intuitive features such as process tag label (variables) sharing, simple program structure, and easy project upload/download to the process CPU.

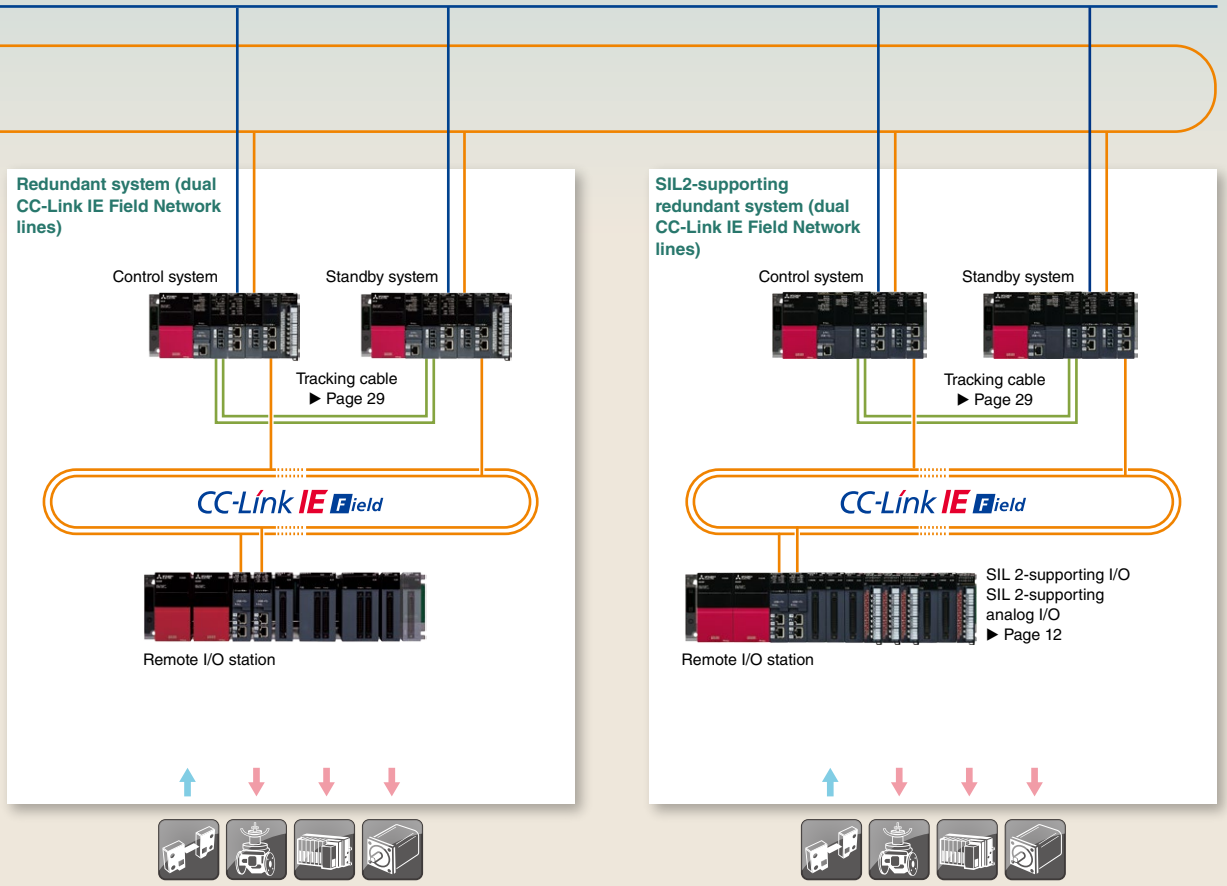
Next-generation process control system MELSEC iQ-R Series process CPU/redundant system/SIL 2-supporting redundant system



MELSEC iQ-R series

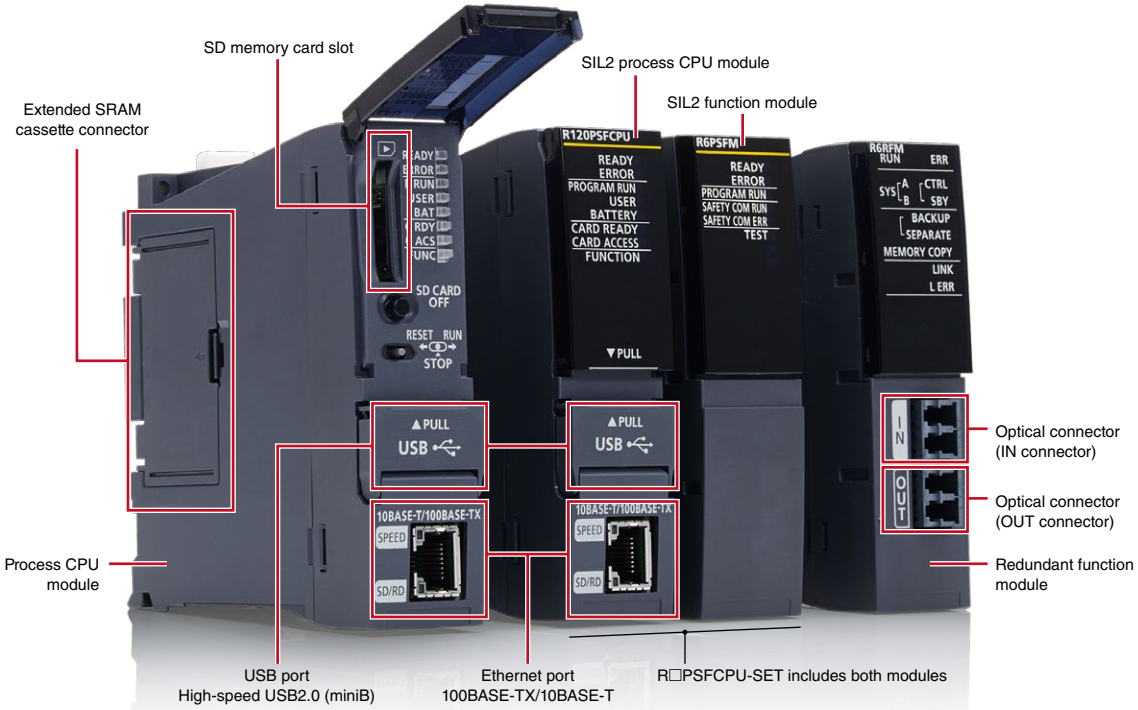
Shop floor monitoring	Central monitoring (simplified monitoring)	Central monitoring (advanced monitoring)
 GOT2000	 GT SoftGOT2000	 GENESIS64™
Small	Medium	Large-scale
• Suitable for rugged environments • Operability suitable for the production site	• Easily configure a monitoring system by the extensive compatibility between the monitoring tool and GT SoftGOT	• Extensive monitoring functions unique to SCADA • Web-based monitoring of server/client configuration

▶System size



MELSEC iQ-R Series

Process CPU module, SIL2 process CPU module, Redundant function module

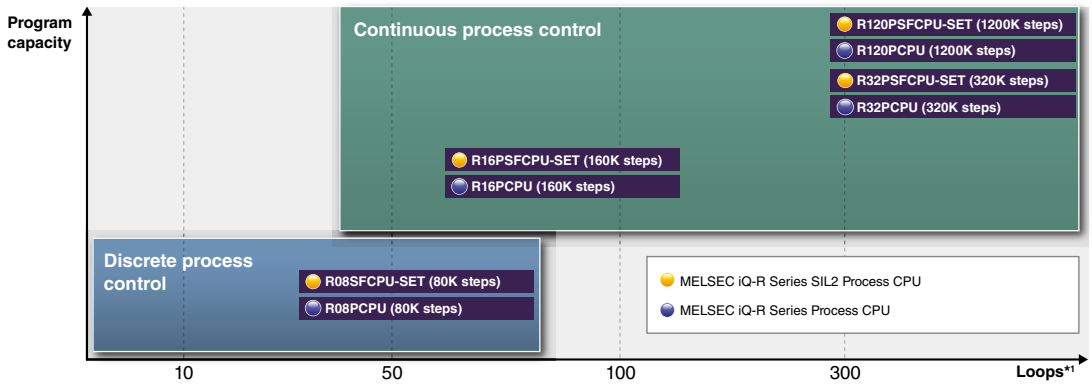


Flexible process control in a cost-efficient automation control solution

The MELSEC process control system consists of specialized controllers specifically designed for use in process automation. The CPUs are highly flexible utilizing standard automation control system features rather than DCS solutions that can be costly to replace and maintain.

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

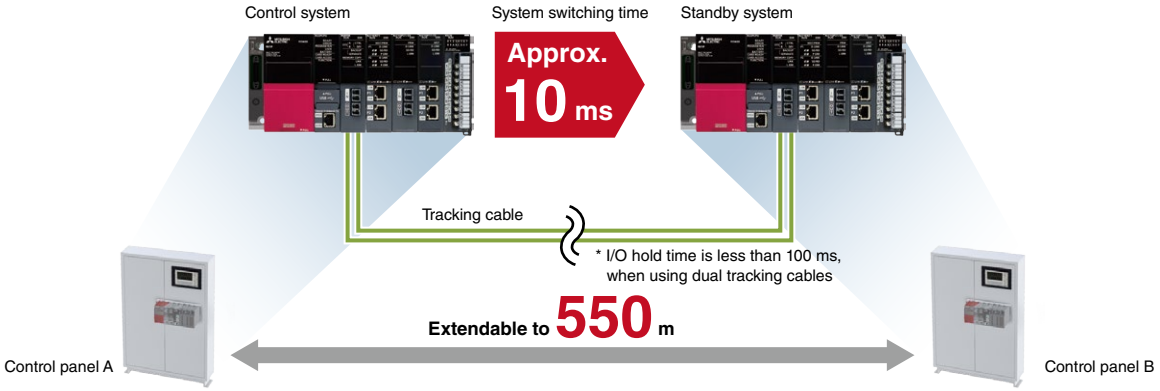
Continuous process control Chemical, steel, waste disposal and food plants, DCS replacement, etc.



*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.

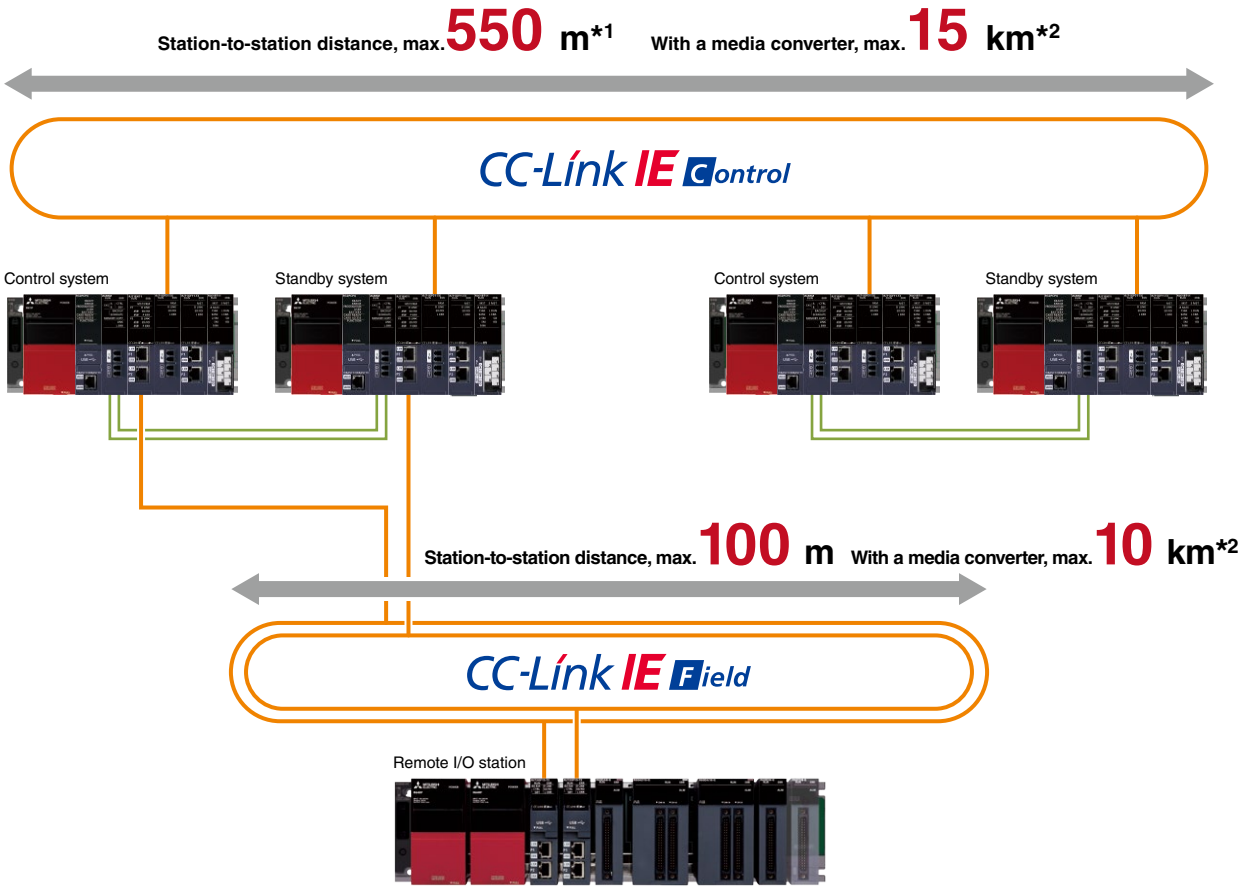
Redundant system remote location and high-speed switching

Optical-fiber tracking cables enable the standby system to be installed in a remote location up to 550 m from the control (primary) system. The tracking cables are immune to noise interference and support fast data transfer rates. System switching speed from the control system to the standby system has also been improved to speeds of approximately 10 ms, further improving system reliability.



Distributed system deployment with CC-Link IE Controller/Field Networks

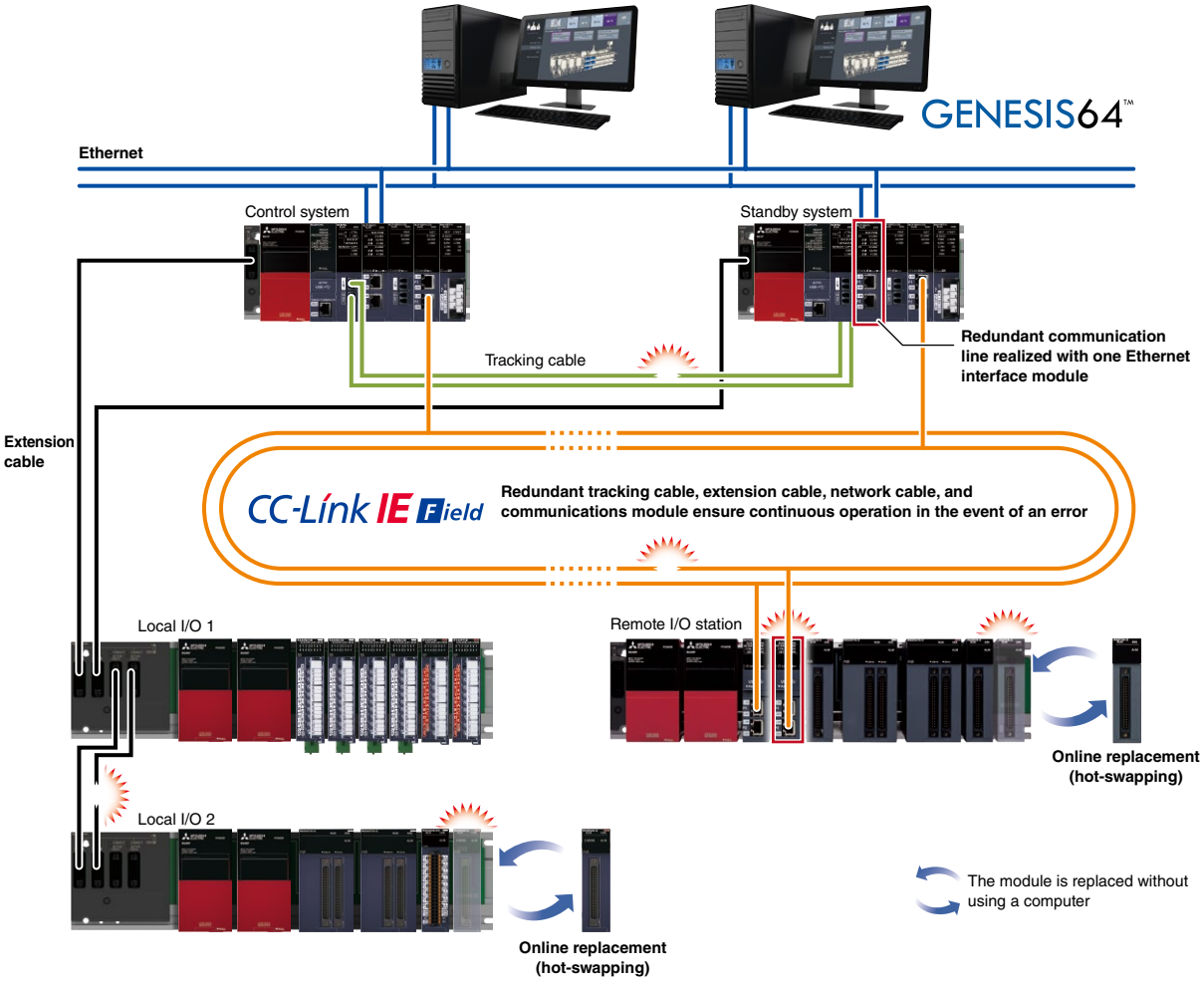
By using a media converter, the station-to-station distance on the CC-Link IE Controller Network can be extended up to 15 km and the station-to-station distance on the CC-Link IE Field Network can be extended up to 10 km, allowing distributed configuration of systems.



*1. Because the distance between the redundant systems is limited to 550 m, the station-to-station distance is also limited to 550 m.
*2. Compatible with industrial media converters manufactured by Mitsubishi Electric System & Service Co., Ltd.
For CC-Link IE Controller Network, please refer to DMC-1000SL-DC on page 30. For CC-Link IE Field Network, please refer to DMC-1000SL-DC or DMC-1000TS-DC on page 30.

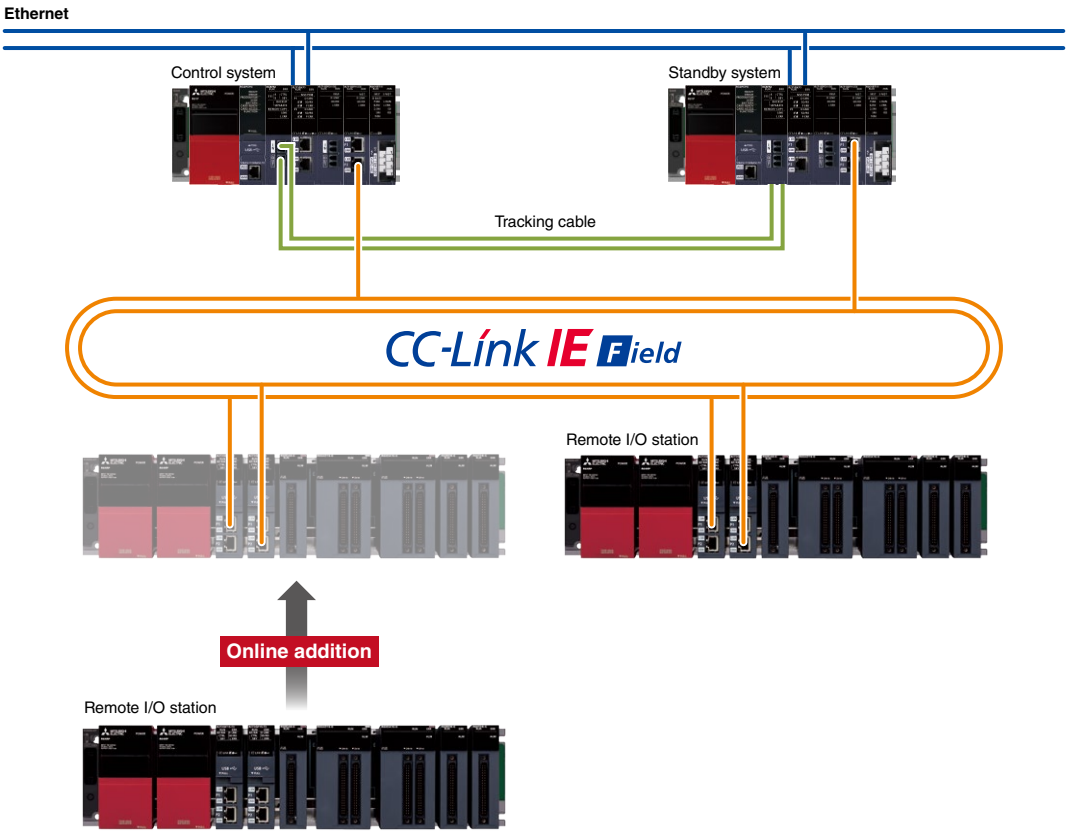
Improve reliability with reduced single-point failure

A multi-level redundant system can be realized by installing dual control systems consisting of the control (primary) and standby CPUs. Combined with a dual extension cable topology for both the redundant extension base units and network cabling of the CC-Link IE Field Networks together with dual remote stations, the risk of singe-point failure can be minimized. Online replacement of cables and modules (hot-swapping) is possible while continuously operating the system when an error occurs, enabling prompt troubleshooting.



Online addition of a remote I/O station while the system is running

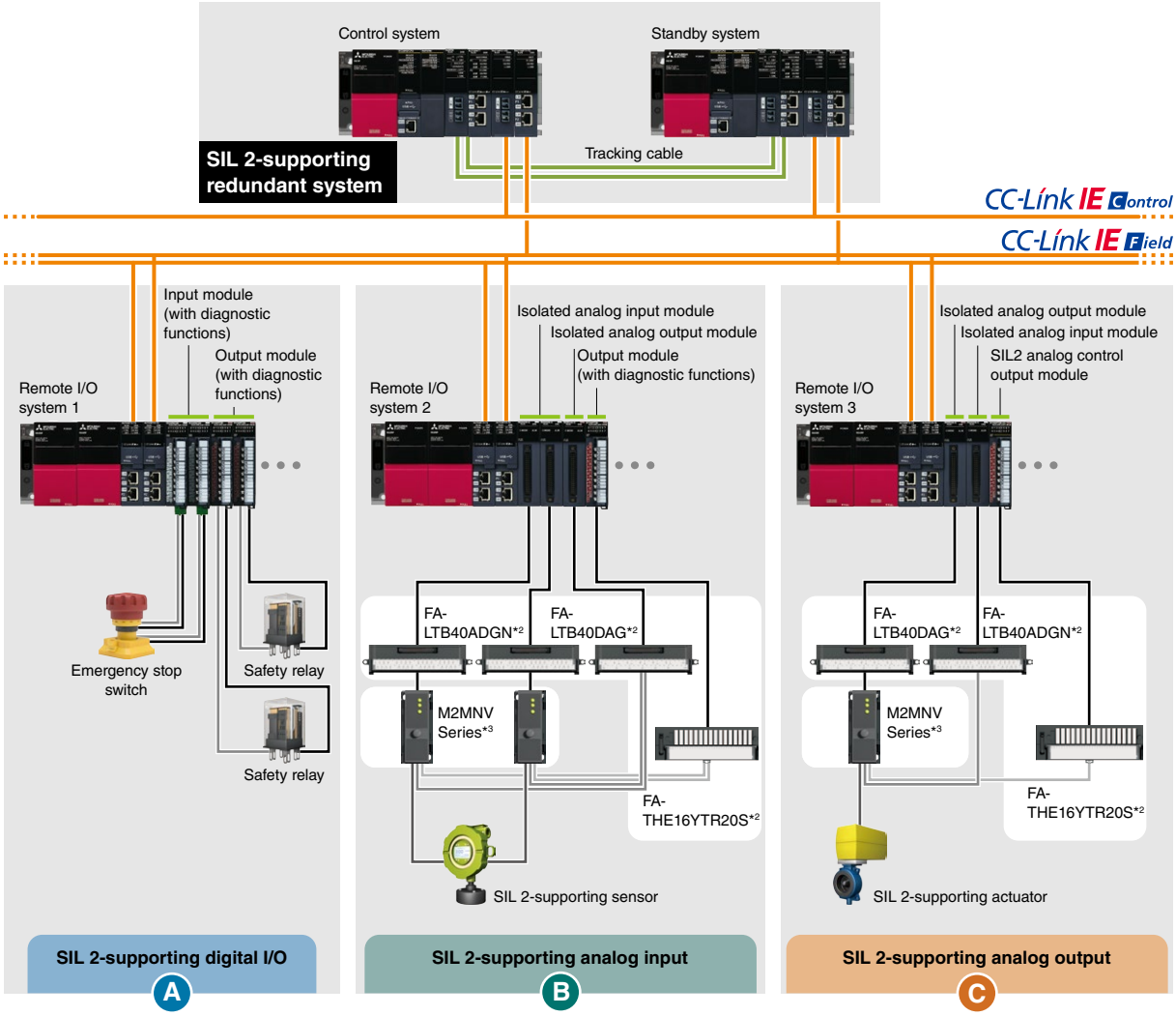
Utilizing dedicated instructions to set parameters of the CC-Link IE Field Network master/local module, remote I/O stations can be added online while the system is running, improving the system availability.



Mixed configuration of SIL 2-supporting and non-supporting modules

The MELSEC iQ-R Series SIL2 redundant system meets global needs by complying with SIL 2*1, which is required in the field of public infrastructure where high reliability is required.

*1. Since December 2022, SIL 2 compliance has been switched from compliance certification by TÜV Rheinland to self-declaration by our company.



A SIL 2-supporting digital I/O

SIL 2-supporting safety inputs and outputs are configured by having a set of two input modules (RX40NC6B) and two output modules (RY40PT5B) with diagnostic functions.

B SIL 2-supporting analog input

SIL 2-supporting analog inputs are configured by having four modules in total. This consists of two analog input modules (R60AD8-G) with channel isolation, one analog output module (R60DA8-G) with channel isolation, and one digital output module (RY40PT5B) with diagnostic functions. The resulting digital value is verified with the calculated digital value.

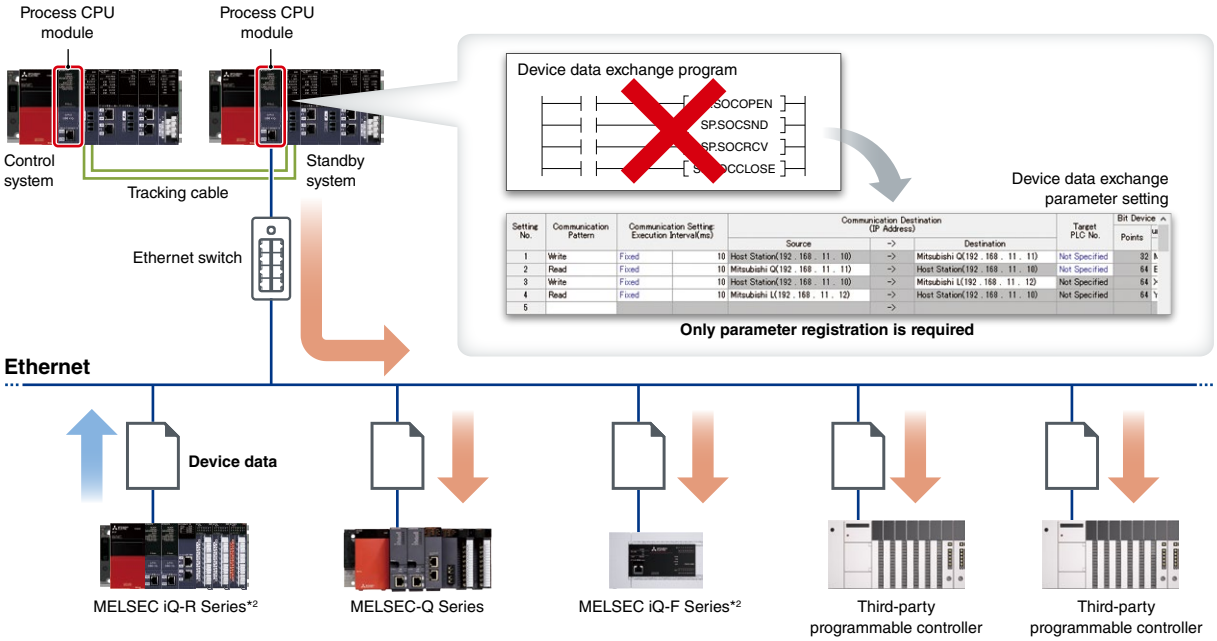
C SIL 2-supporting analog output

SIL 2-supporting analog outputs are configured to have three modules in total. This consists of one analog output module (R60DA8-G) with channel isolation, one analog input module (R60AD8-G) with channel isolation, and one SIL2 analog control output module (RY40PT5B-AS). The resulting analog output value is verified with the set value.

*2. These products are manufactured by Mitsubishi Electric Engineering Co., Ltd.
*3. These products are manufactured by a third-party, for further information please contact your local Mitsubishi Electric sales office or representative.

Easy data coordination with third-party programmable controllers just by registering parameters

- The process CPU module allows device data exchange with third-party programmable controllers as well as Mitsubishi Electric programmable controllers without the need to change the existing programmable controllers' program (simple CPU communication function)
- Simple CPU communication function can be used via the built-in Ethernet port of the process CPU without using an Ethernet interface module*1



*1. When used in the redundant system, a communication failure of the built-in CPU Ethernet is not subject to the system switching factor, but it is possible to switch the system by program. For program examples, please refer to the MELSEC iQ-R CPU Module User's Manual (Application) (IB-0300411ENG).
*2. Supported by the embedded Ethernet port only.

List of connectable devices supported by simple CPU communication function

Ethernet connection

Communication source	Communication destination
Process CPU module (built-in Ethernet port part)	MELSEC iQ-R (built-in Ethernet)
	MELSEC iQ-F (built-in Ethernet)
	MELSEC-Q (built-in Ethernet)
	MELSEC-L (built-in Ethernet)
	SLMP-compatible device (QnA compatible 3E frame)
	MELSEC-A/AnS (via Ethernet interface module)*3
	MELSEC-F (via Ethernet interface module)*3
RJ71EN71	MELSEC iQ-R (built-in Ethernet, via Ethernet interface module)
	MELSEC iQ-F (built-in Ethernet)
	MELSEC-Q (built-in Ethernet, via Ethernet interface module)
	MELSEC-L (built-in Ethernet, via Ethernet interface module)
	SLMP-compatible device (QnA compatible 3E frame)
	MELSEC-A/AnS (via Ethernet interface module)*4
	MELSEC-F (via Ethernet interface module)*4
	OMRON (CS/CJ Series) (FINS)
	KEYENCE (KV Series) (SLMP (MC protocol QnA-compatible 3E frame))
	Panasonic (FP2SH/FP7 Series) (MEWTOCOL)
	YASKAWA MP3000 Series/MP2000 Series (extended MEMOBUS)
	Yokogawa FA-M3 Series (personal computer link)
	MODBUS®/TCP-compatible device (MODBUS®/TCP)
	Fuji Electric MICREX-SX Series (loader command)*5
	JTEKT TOYOPUC Series (computer link)*5
	SIEMENS S7 Series (S7 communication)*5

*3. Supported version is "34" or later.
*4. Supported version is "39" or later.
*5. Supported version is "42" or later.

Serial connection

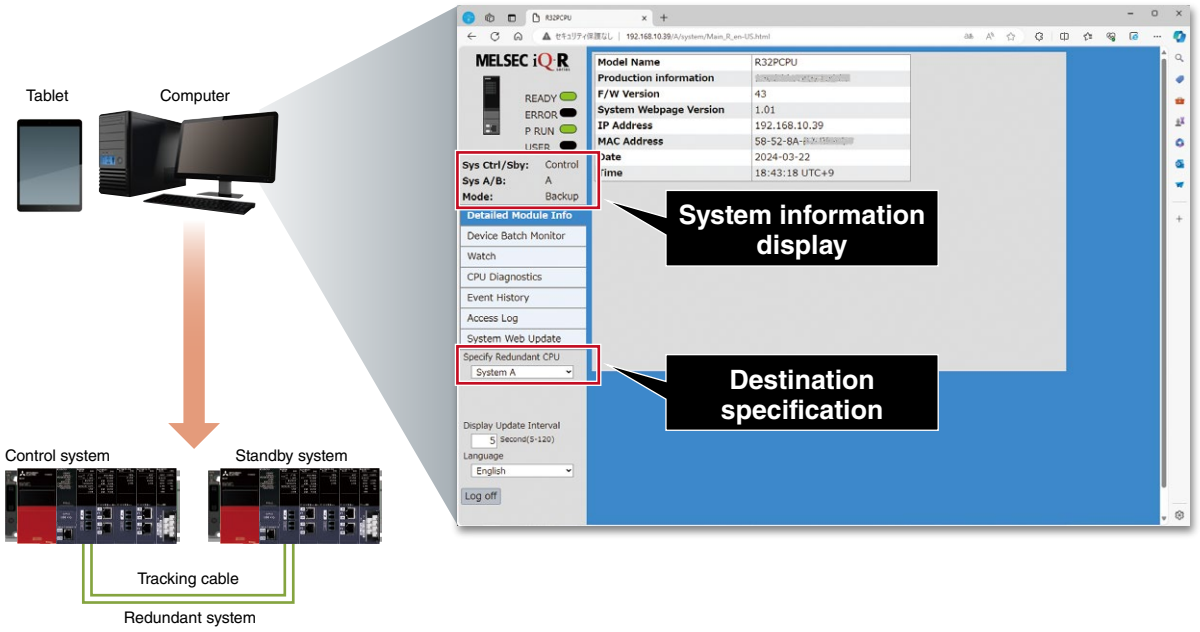
Communication source	Communication destination
RJ71C24	MELSEC-A/AnS Series (CPU embedded COM)
	MODBUS® (RTU) compatible devices (MODBUS®)*6
	MODBUS® (ASCII) compatible devices (MODBUS®)*6

*6. Supported version is "15" or later.

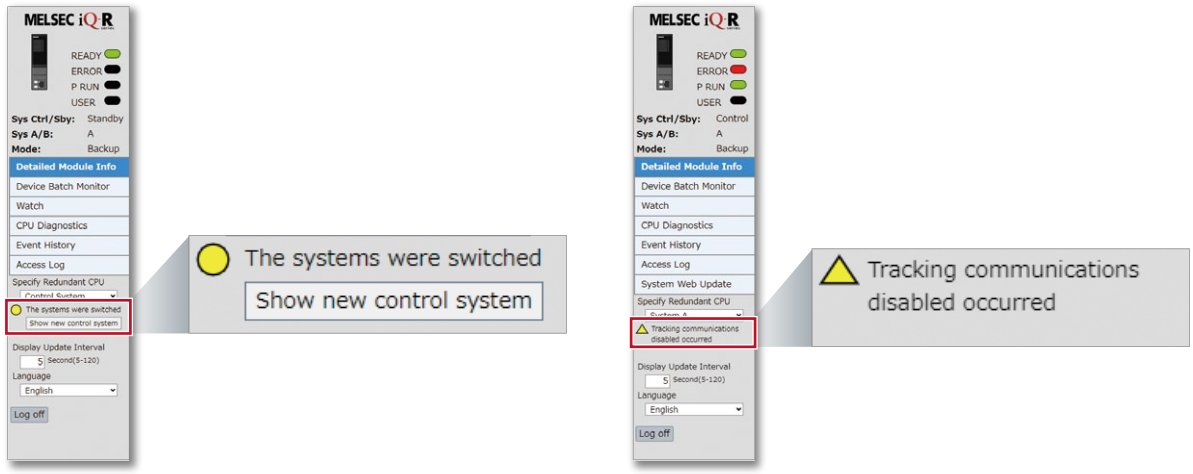
Easily diagnose and monitor redundant systems from a web browser

- CPU diagnostics and device monitoring*1 can be done via a web browser on a computer or tablet utilizing the CPU internal web server function without the need for screen creation by the customer
- Primary diagnosis when an error occurs can be easily performed without the engineering software GX Works3
- On the diagnosis screen, the system to be connected can be switched from the menu
- Information, control/standby status, and operation mode on the system (system A or B) of the currently connected process CPU (redundant mode) can be checked
- By using the “User Web Page Design Tool”, customized web page can be easily created by freely arranging provided graphic parts*2

*1. A system web page file is required to use the web server function of the MELSEC iQ-R series CPU module. For details on how to obtain the file, please consult your local Mitsubishi representative.
*2. For details on how to obtain the “User Web Page Design Tool”, please consult with your local Mitsubishi representative.



- The system status can be checked at a glance by displaying a message when tracking communications are disabled or systems are switched



Process CPU module/SIL2 process CPU module specifications

LD : Ladder diagram ST : Structured text FBD : Function block diagram SFC : Sequential function chart

Item	R08PCPU	R16PCPU	R32PCPU	R120PCPU	R08PSFCPU -SET*1	R16PSFCPU -SET*1	R32PSFCPU -SET*1	R120PSFCPU -SET*1
Operation control method	Stored program cyclic operation							
I/O control mode	Refresh mode (Direct access I/O is available by specifying direct access I/O (DX, DY))							
Programming language	LD ST FBD SFC				LD ST*2 FBD*2			
Extended programming language	Function block (FB), label programming (system/local/global)							
Program execution type	Initial*2, scan*2, fixed scan, event execution*2, standby*2							
Number of I/O points (X/Y)	4096	4096	4096	4096	4096	4096	4096	4096
Constant scan (ms) (function for keeping regular scan time)	0.2…2000 (setting available in 0.1 ms increments)							
Memory capacity								
Program capacity (step)	80K	160K	320K	1200K	80K*3	160K*3	320K*3	1200K*3
Program memory (byte)	320K	640K	1280K	4800K	320K	640K	1280K	4800K
Device/label memory (ECC type)*4 (byte)	1188K	1720K	2316K	3380K	1178K	1710K	2306K	3370K
Data memory (byte)	5M	10M	20M	40M	5M	10M	20M	40M
Instruction processing time								
LD instruction (ns)	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
MOV instruction (ns)	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
E + instruction (floating-point addition) (ns)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Structured text IF instruction*5 (ns)	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Structured text FOR instruction*5 (ns)	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
PC MIX value*6 (instructions/μs)	419	419	419	419	419	419	419	419
Interface connection port								
High-speed USB2.0 (miniB)	●	●	●	●	●	●	●	●
Ethernet (100BASE-TX/10BASE-T)	●	●	●	●	●	●	●	●
Memory interface								
SD memory card	●	●	●	●	●	●	●	●
Extended SRAM cassette	●	●	●	●	●	●	●	●
Safety standard								
IEC 61508 SIL 2	-	-	-	-	●	●	●	●
Function*7								
Multiple interrupt	●	●	●	●	●	●	●	●
Standard PID control	●	●	●	●	●	●	●	●
Process control	●	●	●	●	●	●	●	●
Data logging	●	●	●	●	-	-	-	-
Security function	●	●	●	●	●	●	●	●
Inter-module synchronization*8	●	●	●	●	-	-	-	-
SLMP communication	●	●	●	●	●	●	●	●
Online module change	●	●	●	●	●	●	●	●
Simple CPU communication*9	●	●	●	●	-	-	-	-
Web server	●	●	●	●	-	-	-	-

*1. Product package includes a SIL2 process CPU module (R□PSFCPU) and SIL2 function module (R6PSFM).
*2. Cannot be used for safety control programs.
*3. Program capacity of 40K steps is allocated for safety program.
*4. An extended SRAM cassette expands the device/label memory area. (NZ2MC-8MBSE expands the device/label memory area conforming to ECC type memory.)
*5. The IF or FOR statement of the structured text consists of several instructions, which may increase the processing time period.
*6. Average number of instructions such as for basic instructions and data processing executed in 1 μs. The larger the value, the faster the processing speed.
*7. Memory dump and real-time monitor are not supported.
*8. Inter-module synchronization is not supported when used in redundant mode.
*9. For the list of connectable devices supported by simple CPU communication function, please refer to the "the list of connectable devices supported by simple CPU communication function" on page 13

Redundant function module specifications

Item	R6RFM
Connection cable	Multi-mode optical fiber cable*10
Max. distance (m)	550 (when the core outer diameter is 50 μm)
Tracking cable data capacity (word)	1M

*10. For the optical fiber cable made by Mitsubishi Electric System and Service, please refer to page 29.

MELSEC iQ-R Series

Functional modules ideal for process control

While inheriting the features of the MELSEC-Q Series, even faster and high-resolution isolated analog I/O modules are available. By utilizing I/O modules with diagnostic functions and HART® communication protocol supporting analog input modules, a system that enables preventive maintenance of devices and improves its serviceability can be built.

MELSEC iQ-R Series functional modules for process control, number of channels*1

Number of channels	Channel isolated analog input				HART® communication protocol supporting analog input
	Voltage/current input	Input from 2-wire transmitter	Thermocouple input	RTD input	
16	R60AD16-G	-	-	-	-
8	R60AD8-G	-	R60TD8-G	R60RD8-G	R60ADI8-HA
6	-	R60AD6-DG	-	-	-

Number of channels	Channel isolated analog output *1	Temperature control*1		Channel isolated pulse input
	Voltage/current output	Thermocouple input	RTD input	
16	R60DA16-G	-	-	-
8	R60DA8-G	-	-	RD60P8-G
4	-	R60TCTRT2TT2-TS R60TCTRT2TT2 (BW)	R60TCRT4-TS R60TCRT4 (BW)	-
1	-	-	-	-

*1. For modules replaceable online, please refer to the relevant manual.

Diagnostic function enables preventive maintenance

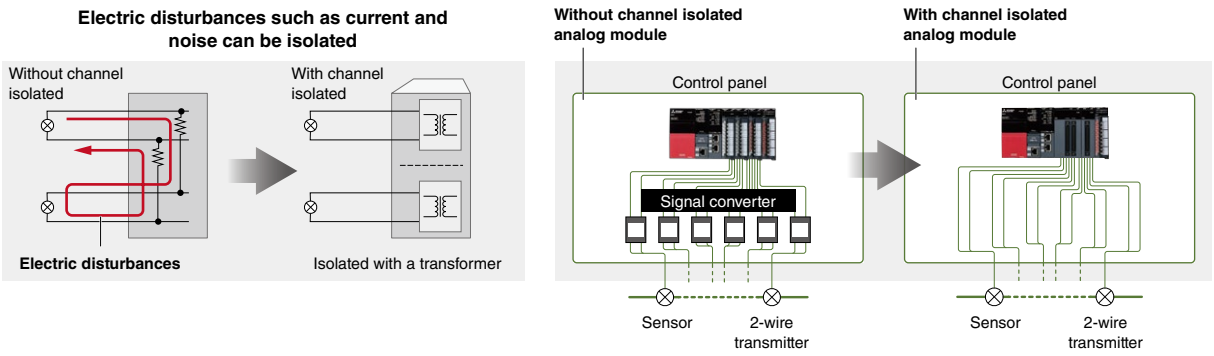
RX40NC6B RY40PT5B

I/O modules with diagnostic functions include cable-disconnection and short-circuit detection functions, which are not available on regular I/O modules. By monitoring disconnections and short circuits, system malfunctions can be prevented before they occur.

Provides channel-to-channel isolation and low-cost system construction

R60AD8-G R60AD16-G R60DA8-G R60DA16-G

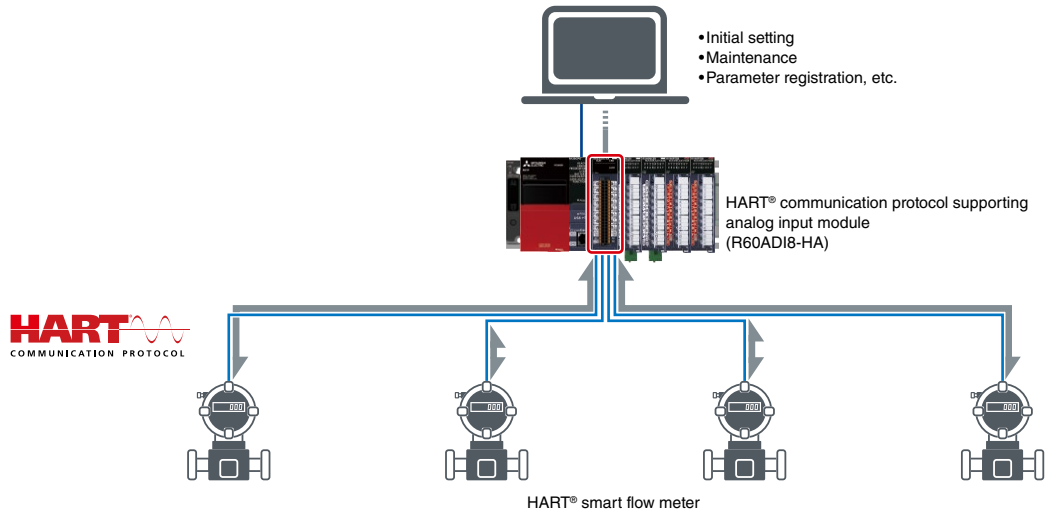
In the process control systems, galvanic channel isolation between analog input and output channels is required to prevent current and noise interference. Due to the large number of analog inputs and outputs, it is necessary to reduce the module price per channel. The 16-channel analog I/O modules, which support the same connector shape as the 8-channel, enables system construction at a low cost.



HART® communication enables communication with field devices

R60ADI8-HA

Communication with field devices supporting HART® communication is possible. The HART® communication protocol supporting analog input module can read the data held by each device and write parameters to each device. Preventive maintenance of field devices and reduction of maintenance time can be realized.

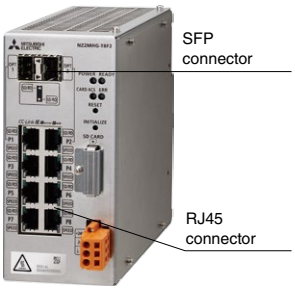


Network module

The open industrial network CC-Link IE enables system construction using the MELSEC iQ-R Series modules. An Ethernet-based network allows the use of widely available cables and connectors. It supports star, line, and ring topologies to build flexible systems. In the redundant system, a highly reliable network with reduced single point failure using redundant CC-Link IE Field Network and redundant remote head module can be configured.

■ Related products

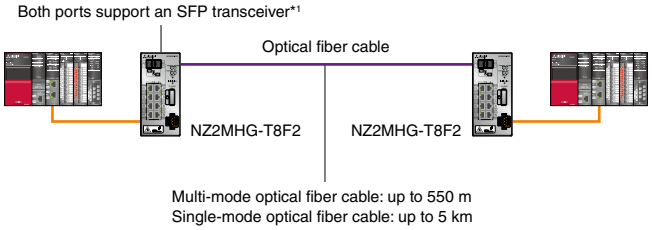
Managed CC-Link IE switch NZ2MHG-T8F2



- Connectable to CC-Link IE and Ethernet devices simultaneously
- ERP- and LA- style redundant topologies between switches continue communication at network failure including cable disconnection, by switching network paths
- With an SFP transceiver*1, long-distance optical fiber cable, which is ideal for systems requiring facility-to-facility landline communication, is available
- Supports VLAN and can manage multiple networks by one switch

SFP for long-distance communication

With its long-distance data transmission feature, optical fiber cables are ideal for facility-to-facility long-distance communications



*1. Either the optical port (OPT1/OPT2) or RJ45 port (P1/P2) can be used at a time.

Network/advanced information modules and compatible process CPUs/remote head modules

M …Main base E … Extension base

Product name		Model	Process CPU			SIL2 process CPU	CC-Link IE Field Network remote head module	
			Process mode	Redundant mode		-	General	Redundant
			M E	M	E	M	M E	
Network module								
CC-Link IE Controller Network		RJ71GP21-SX, RJ71GP21S-SX	●	●	-	●	-	-
		RJ71EN71	-	-	-	-	-	-
CC-Link IE Field Network		RJ71GF11-T2	●	●	-	●	-	-
		RJ71EN71	●	-	-	-	-	-
CC-Link		RJ61BT11	●	●	●	●	●	●
AnyWireASLINK		RJ51AW12AL	●	-	-	-	●	-
MELSECNET/H		RJ71LP21-25	●	●	-	-	-	-
		RJ71BR11	-	-	-	-	-	-
Ethernet		RJ71EN71	●	●	●	●	●	●
MODBUS®/TCP	Master station	RJ71EN71	●	●	●*1	●	●*1	●*1
	Slave station	RJ71EN71	●	●	●	●	●	●
MODBUS® RTU	Master station	RJ71C24, RJ71C24-R2, RJ71C24-R4	●*2	●*2	●*2	-	●*2	●*2
	Slave station	RJ71C24, RJ71C24-R2, RJ71C24-R4	●	●	●	-	●	-
PROFIBUS®-DP	Master station	RJ71PB91V	●	●	-	●	●	●
	Slave station	RJ71PB91V	●	-	●	-	●	●
CANopen®		RJ71CN91	●	-	-	-	-	-
EtherNet/IP™		RJ71EIP91	●	-	-	-	-	-
DeviceNet®		RJ71DN91	●	-	●	-	-	-
FL-net		ER-1FL2-T*3	●	-	●	-	●	●
BACnet®		RJ71BAC96	●	-	●	-	●	-
GP-IB interface		RJ71GB91	●	-	-	-	-	-
Serial communication		RJ71C24, RJ71C24-R2, RJ71C24-R4	●	●	●	-	●	●
Advanced information module								
MES interface		RD81MES96N	●	-	-	-	-	-
OPC UA server		RD81OPC96	●	●	-	-	-	-
High-speed data logger		RD81DL96	●	-	●	-	-	-
High-speed data communication		RD81DC96	●	-	-	-	-	-
C intelligent function		RD55UP06-V	●	●	-	-	-	-
		RD55UP12-V	●	●	-	-	-	-

*1. Supported with the simple CPU communication function.
*2. Supported with predefined protocol support function.
*3. Mitsubishi Electric Engineering product

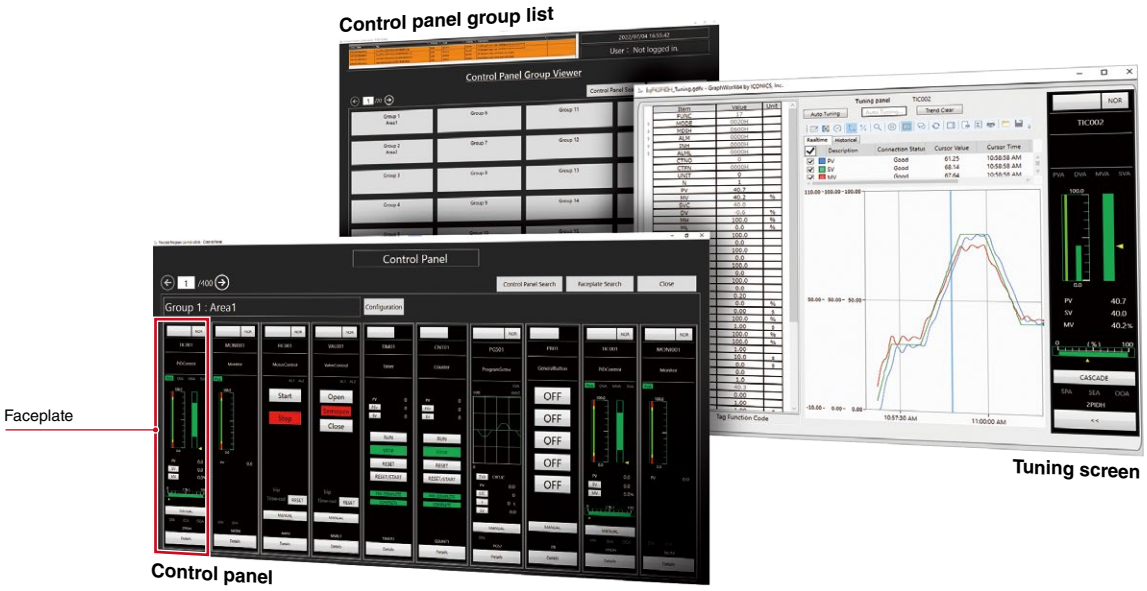
For details on GENESIS64™,
please see the "ICONICS Automation Software Suite (L(NA)08785ENG)".

GENESIS64™

Construct advanced, diverse monitoring system with SCADA

Equipped with standard screens essential for process monitoring

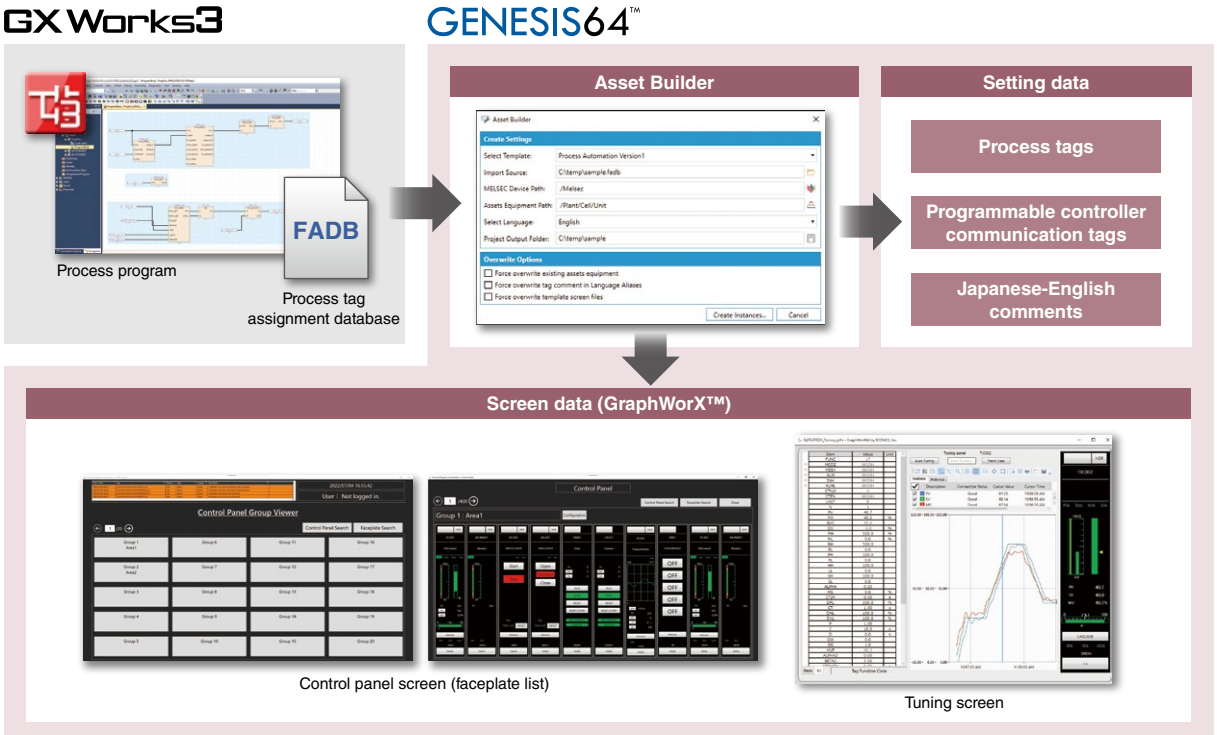
Screens necessary for process control system monitoring such as faceplates are available. Combined with the extensive features of SCADA, an advanced monitoring system comparable to DCS can be constructed.



Automatic setting data generation from the GX Works3-created process program

Utilizing process programs created with the engineering software GX Works3, screens and settings such as communication tags are automatically generated for immediate use.*1 Time for setting can be reduced and system configuration is smoothly done.

*1. Supported with the MELSEC iQ-R Series only. To remotely monitor this screen via a web browser, please use Microsoft Edge® (IE mode).

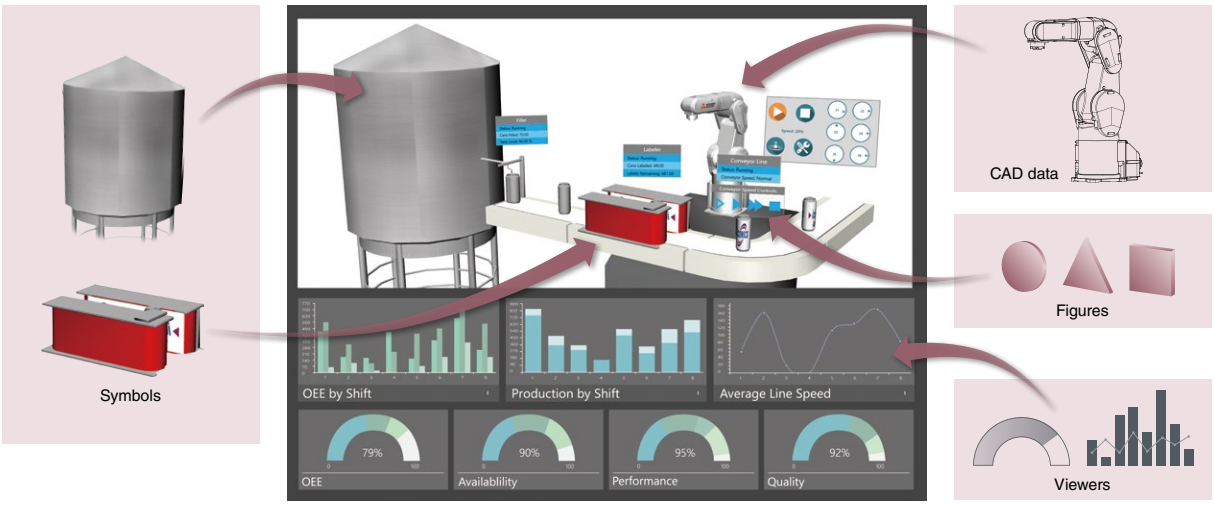


Extensive functions

■ Graphic creation/visualization

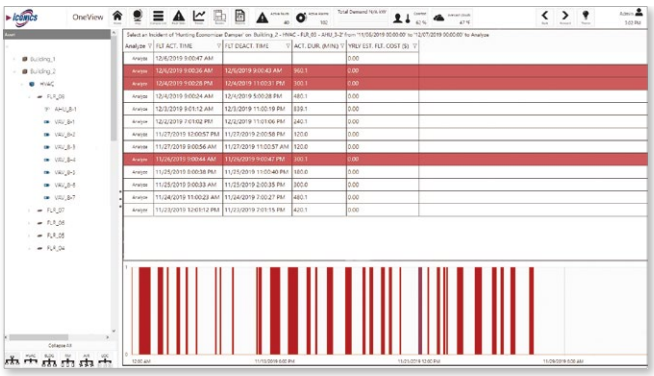
Stunning and user-friendly graphics can be created at a low cost using provided 2D, 3D*1 symbols and CAD data.

*1. GENESIS64™ Basic SCADA does not support 3D.



■ Alarm visualization/notification

Notify your personnel of abnormal conditions and events in real time with ANSI/ISA-18.2 compliant features. The number of alarms for each selected factory line and equipment and the breakdown of alarm statuses can be easily checked. Alarms of process tags in GX Works3 can also be checked with simple settings.



	Present	Active	Acked
area A	43	10	2
factory A	3	0	0
factory B	0	0	0
factory C	1	0	0
factory D	1	0	0
factory E	11	2	1
factory F	5	0	0
factory G	10	7	0
factory line A	3	1	0

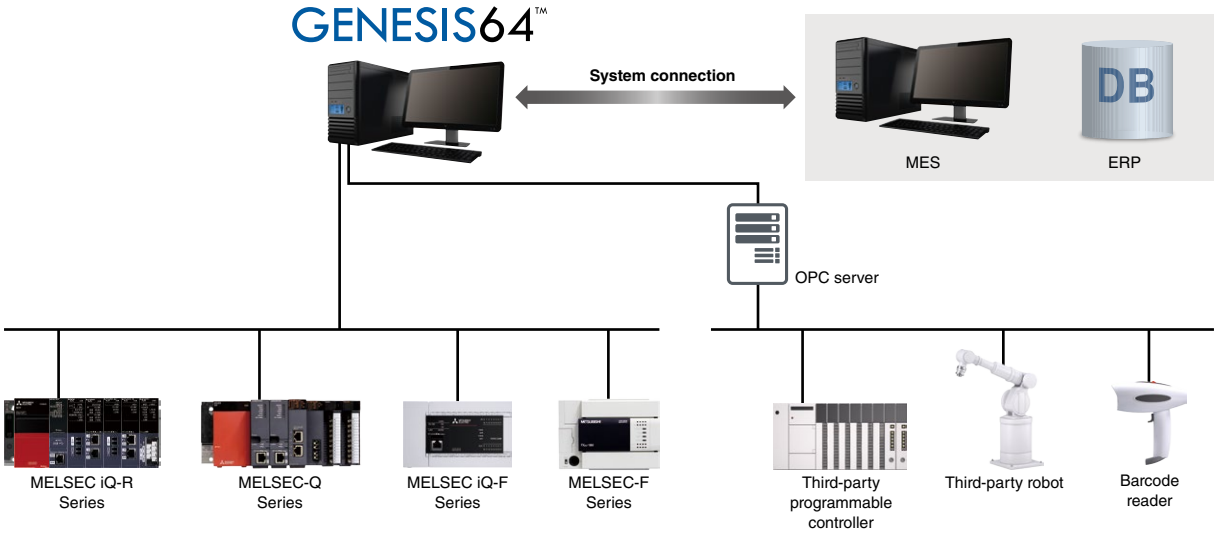
Visualize alarms according to the equipment and factory line configuration created with AssetWorX™

Operator
Check an alarm to troubleshoot promptly

Notify an alarm to the remote field

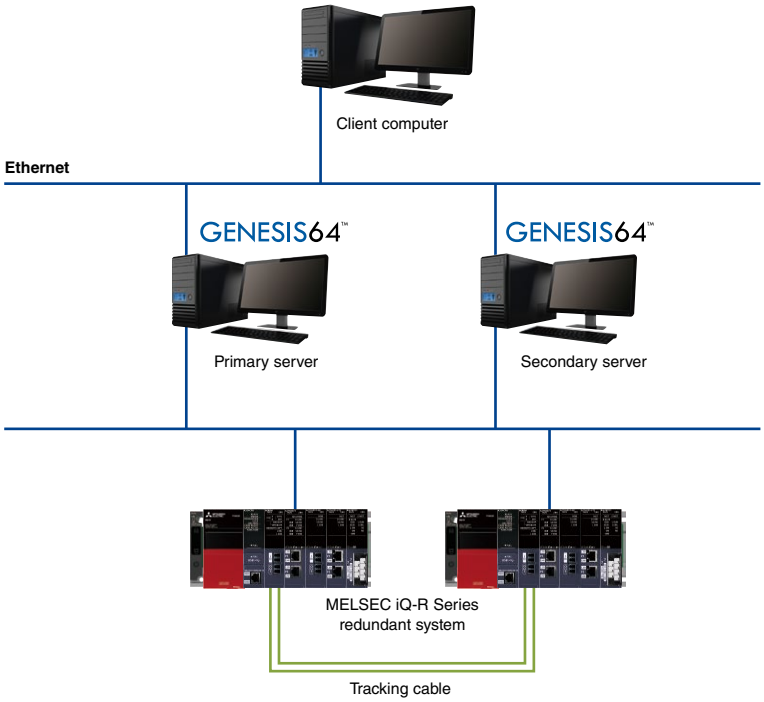
■ Open connectivity

In addition to being able to directly connect with Mitsubishi Electric factory automation products, GENESIS64 also supports open industry-standard protocols such as OPC™, BACnet®, and MODBUS®, as well as various databases like SQL Server®, Oracle®, and ODBC.



■ Server redundancy

Redundant servers ensure continuous operation and highly reliable data collection even when an error occurs.



■ Web-based monitoring

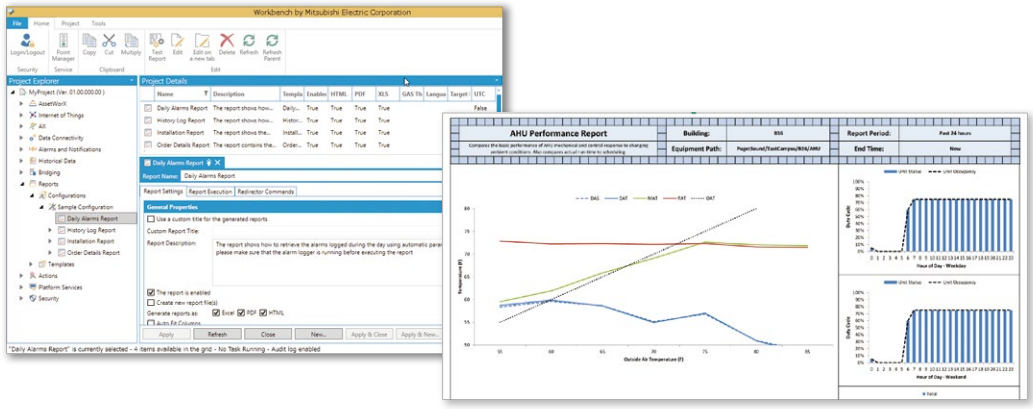
Remote monitoring via web browsers is possible. Installation of GENESIS64™ in the client computer is unnecessary.

■ Trend display

Real-time and historical trends are available. The trend display format can be modified while the system is running, such as adding or removing pens, adjusting the scale, pausing, and overlapping or splitting the view.

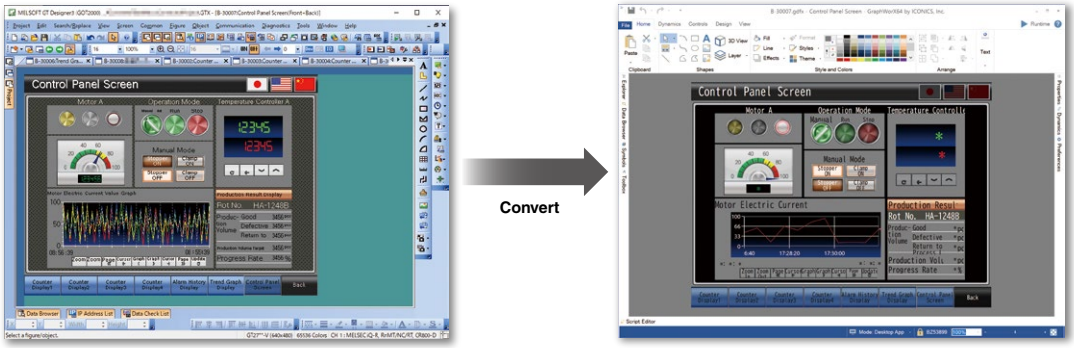
■ Automated reporting

Turn volumes of server-stored data into manufacturing intelligence with the powerful reporting feature. Create reports by time or location in Excel®, HTML, or PDF format.



■ GOT (HMI) screen conversion

GOT (HMI) screen data created with GT Designer3 can be converted to GENESIS64™ data. There is no need to create additional screens for GENESIS64™, reducing engineering time. It is possible to build a system that allows for on-site monitoring and operation with GOT, and remote monitoring in the office with GENESIS64™.



Screen created with GT Designer3

Screen converted for GENESIS64™

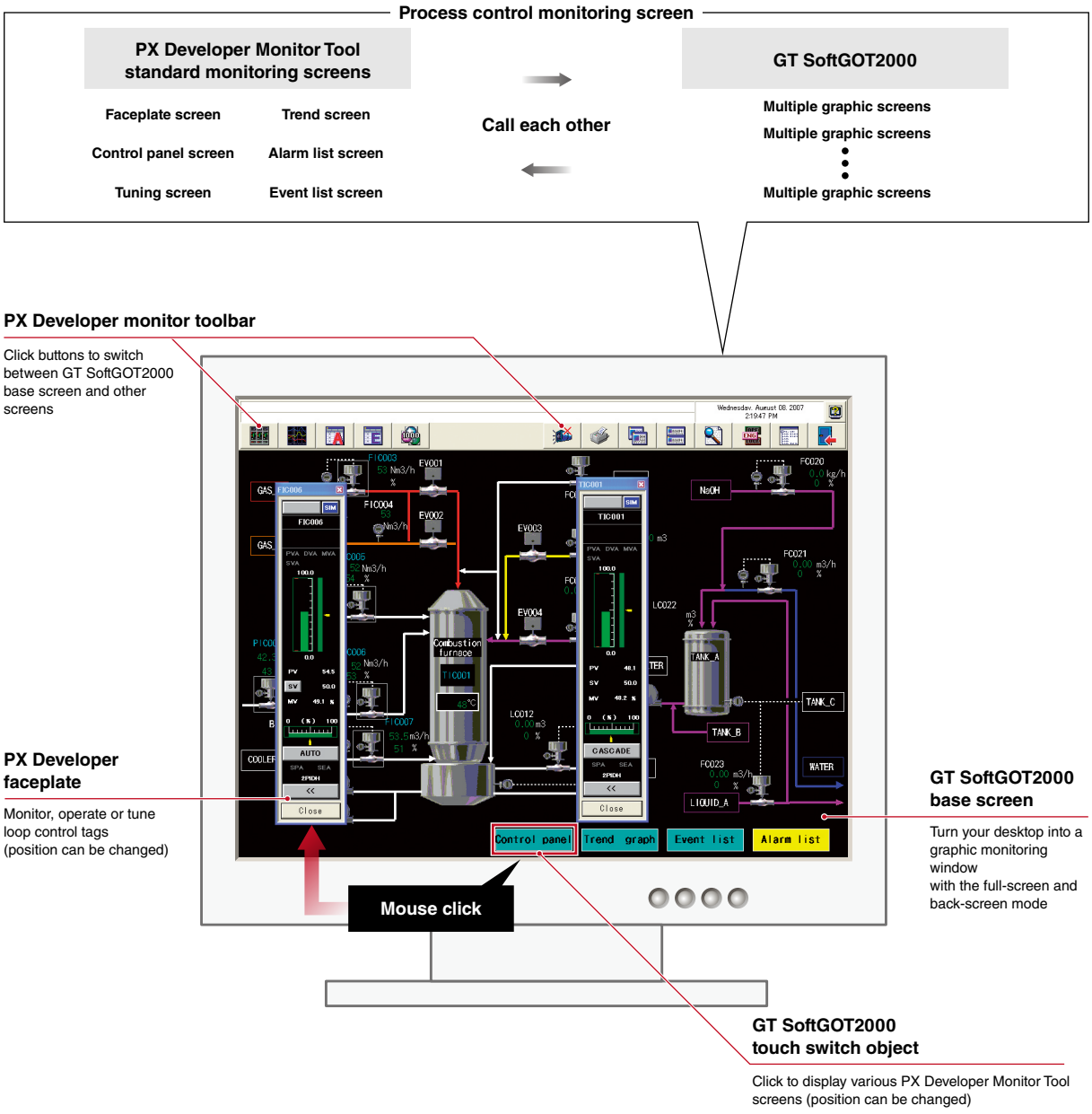
Linkage with GT SoftGOT2000

Easily create process control monitoring screens

For more information on GT SoftGOT2000,
please refer to "GT SoftGOT2000 Solutions Catalog (L(NA)08606ENG)".

- PX Developer Monitor Tool and GT SoftGOT2000 can mutually call their screens*1, significantly reducing process control screen creation time
- Since it can be used on a computer, it is ideal for monitoring in the office
- GOT2000 screens can be used, eliminating the need to create new screens

*1. GT SoftGOT2000: Supported by PX Developer Ver.1.40S or later.



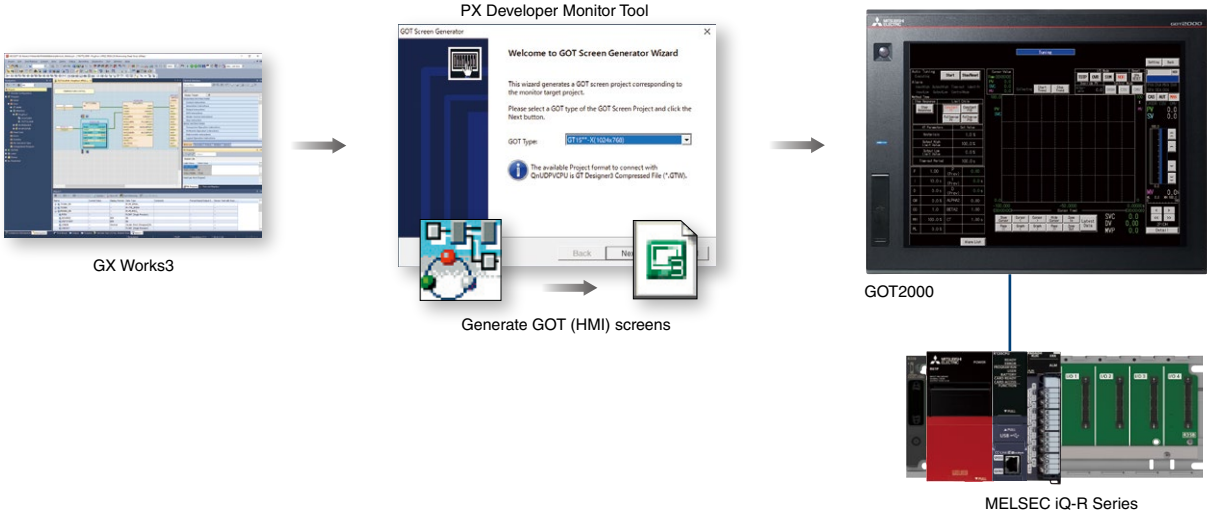
Generation of GOT (HMI) screens

Easily create GOT2000 process control monitoring screens

For more information on GOT2000, please refer to "GOT2000 Series Catalog (L(NA)08270ENG)".

- Faceplates and tuning screens for GOT2000 can be automatically generated from GX Works3 projects
- There is no need to set the assigned devices of tag data or create programs for automatically generated screens*1

*1. Cannot be used to monitor multiple CPUs.



MELSEC iQ-R Series-compatible CPU modules

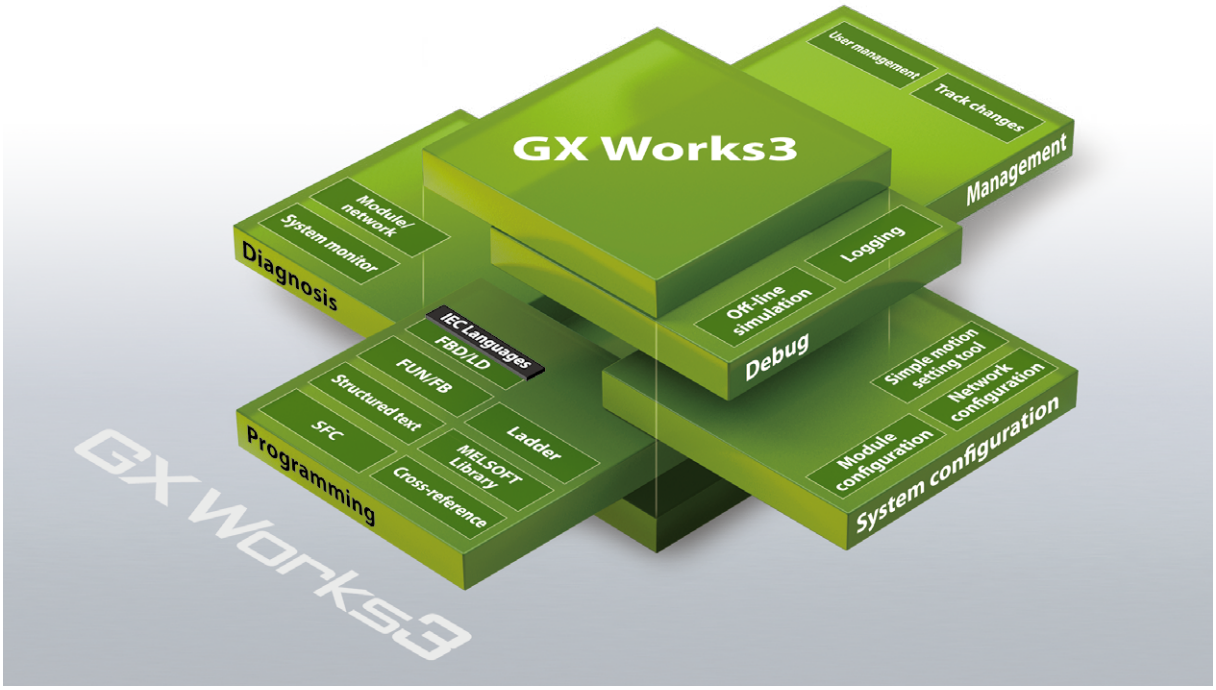
Item	Details
Process CPU	R08PCPU, R16PCPU, R32PCPU, R120PCPU
SIL2 process CPU	R08PSFCPU-SET, R16PSFCPU-SET, R32PSFCPU-SET, R120PSFCPU-SET

GX Works3

One Software, Many Possibilities

Mitsubishi Electric
MELSOFT GX Works3
"Promotion" Movie

GX Works3 consists of various different components that help to simplify project creation and maintenance tasks. A system design console that enables projects to be created at the system overview stage has been added. Additionally, the main programming languages are supported and their labels (variables) are shared, further simplifying programming. Various debug and maintenance features are also included.



Project lifecycle engineering

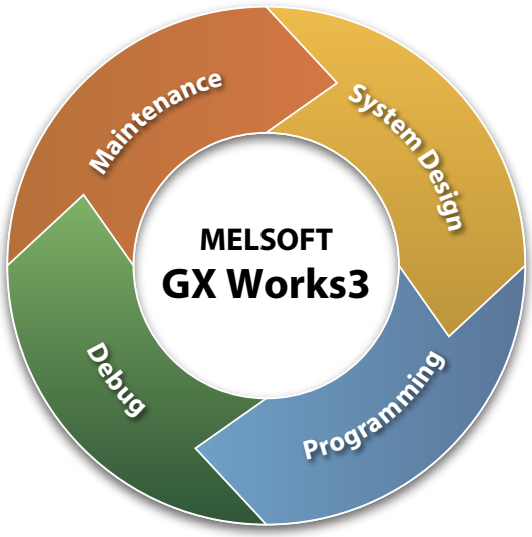
Various features have been consolidated into an integrated engineering environment that enables easier project creation throughout the engineering process, ensuring consistency through every step.

■ System-wide design
- Easy system configuration with parts library
- Direct module parameter registration
- Integrated simple motion module setup

■ Multiple programming languages
- Complies with IEC 61131-3
- Supports main programming languages
- Consistency between different programming tabs

■ Simple to debug
- Various online monitoring
- Hardware simulator (emulator)
- Data logging

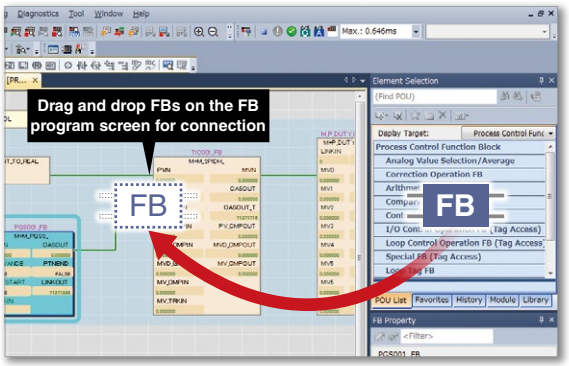
■ Straightforward maintenance
- System monitoring
- Module and network diagnostics
- Multi-language commenting



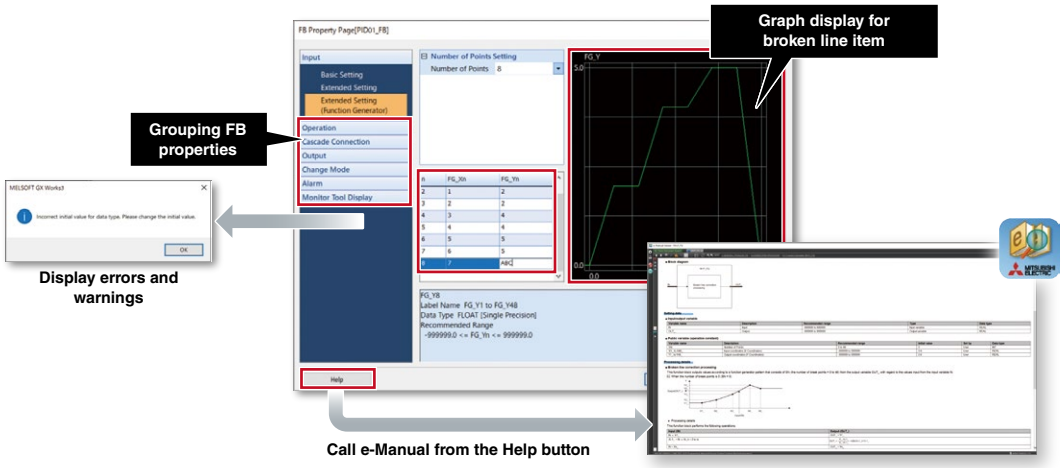
Build a process control system with easy programming

- Engineering software GX Works3 provides an intuitive programming environment where process control programs can be easily created by connecting function blocks such as Tag FBs for process control on the screen by drag & drop operation
- The FB property page allows visual parameter setting of Tag FBs for process control

Easy programming with process control FBs



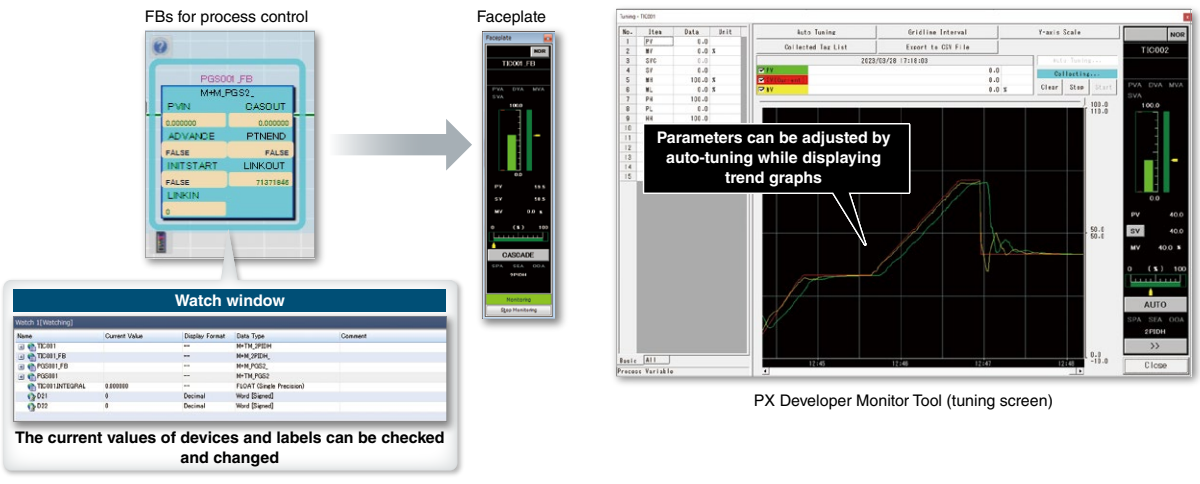
Simple settings using FB property page



*Supports Tag FBs provided by all manufacturers and user-defined Tag FBs.

- Tag FBs for process control simplify system startup adjustments by enabling monitoring on the faceplate, trend display on PX Developer Monitor Tool, and parameter setting through auto-tuning

Monitoring and tuning of process control FBs



PX Developer Monitor Tool (tuning screen)

- Ladder, function block diagram (process control programming), sequential function chart, and structured text are supported

Factory automation partner products

We offer a wide range of labor-saving devices from our factory automation partners to enhance the versatility of our programmable controllers.

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED

Analog signal converter FA-AT series

- Signal conversion modules for various analog signals are available to optimize the configurations of the programmable controller analog modules.
- Isolation between channels prevents undesirable current flow.
- Signal conversion modules can be easily installed and removed.
- Dedicated cables for programmable controller analog modules are available, making connections easier and reducing the risk of wiring errors.

Input modules

Item	Model	Outline
Voltage input	FA-ATSVM1XV□□	0…5 V DC, 1…5 V, –10…+10 V
Current input	FA-ATSVM1XA420	4…20 mA DC
Distributor	FA-ATSVM1XD	2-wire transmitter
RTD input	FA-ATSVM1XR□□	Pt100 (–200…+650°C, 0…+100/200°C) JPt100 (–200…+600°C)
Thermocouple input	FA-ATSVM1XT□□	Type B thermocouple (+600…+1700°C) Type S thermocouple (0…+1600°C) Type E thermocouple (–200…+900°C) Type T thermocouple (–200…+350°C) Type R thermocouple (0…+1600°C) Type K thermocouple (–200…+1200°C, 0…+400/600/800°C) Type J thermocouple (–40…+750°C) Type N thermocouple (–200…+1250°C)

Output modules

Item	Model	Outline
Voltage → voltage output	FA-ATSVM1YV□□	0…5 V DC, 1…5 V DC, 0…10 V DC, –10…+10 V DC
Voltage → current output	FA-ATSVM1YA□□	0…20 mA DC, 4…20 mA DC
Current → voltage output	FA-ATSAM1YV□□	0…5 V DC, 1…5 V DC, 0…10 V DC, –10…+10 V DC
Current → current output	FA-ATSAM1YA□□	0…20 mA DC, 4…20 mA DC

FA-ATFTMXY FA-ATNDM5

Input/output modules

Item	Model	Outline
Signal pass-through	FA-ATFTMXY	• Pass-through module for non-isolated signals (The current is converted into voltage.)
Dummy module	FA-ATNDM5	• Dust protector • Quantity: 5

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED

NAGOYA ENGINEERING OFFICE | 1-9, Daiko-Minami, 1-Chome, Higashi-ku, Nagoya, Aichi 461-0047 Japan

Website www.mitsubishielectricengineering.com/sales/fa/meefan/ ▶Contact US

Optical cable

QP-AW QG-AW QG-B QG-BU QG-C QG-DL QG-VCT

- QP-AW is made of plastic material having break-proof*1 and superior bending characteristics*2
- A wide range of lineup supports versatile environments. CC-Link Partner Association recommended products
- The indoor and outdoor use cables are free of tension members, and have an allowable tension equivalent to the reinforced type for outdoor use that allows them to be pulled directly
- QG-BU for indoor use supports the high flame resistant UL Listed (UL Type OFNR) compatible cable that has passed the UL1666 Riser Flame Test
- Reinforced type outdoor use cables are waterproof, and can be used even in flooded or temporarily submerged areas
- A connector boot with improved bending characteristics reduces the possibility of fiber breakage at the connector base

LCF connector
Duplex LC connector (IEC 61754-20)

Model			QP-AW*3	QG-AW	QG-B	QG-BU	QG-VCT	QG-C	QG-DL	
Operating environment/ application			In the control panel	In the control panel	Indoor	Indoor, UL approved	Indoor, movable	Outdoor	Outdoor, reinforced (water shielding)	
Max. cable length			10 m	550 m						
Optical fiber types			Multi-mode optical fiber (GI)							
Material/ outer diameter	Core		Plastic/ 55 ± 5 µm	Fused quartz/50 ± 3 µm						
	Clad		Plastic/ 490 ± 5 µm	Fused quartz/125 ± 2 µm						
	Code jacket	Material	PVC (blue)	PVC (orange)						
		Outer diameter	ø2.0 mm × 2	ø2.0 mm × 2	ø2.0 mm × 2	ø1.8 mm × 2	ø2.0 mm × 2		ø2.0 mm × 2, 4, 6, 8	
	Cable jacket	Material	-	-	Flame retardant PE (orange)	Flame retardant PVC (blue)	Elastic PVC (orange)	Flame retardant PE (black)	LAP sheath (black)	
		Outer diameter	-	-	ø6.0 mm	ø5.0 mm	ø6.0 mm		2, 4 cores	10.0 mm
									6 cores	11.0 mm
									8 cores	12.0 mm
Operable temperature range			–20…60°C							
Adaptable connector			LCF connector*4, SC connector*3, FC connector*3							

*1. The allowable tension is about twice the QG-AW.
*2. The allowable bending radius is about 1/2 times the QG-AW.
*3. The QP-AW does not support the following.
•SC, FC connector
•Processing of connectors at the site, fusion splice
•Splice connection of connectors
•Media converter and connection terminal
*4. Use LCF connector for connection to the CC-Link IE Controller Network products. (LCF connector: two LC connectors are connected) When installing CC-Link IE Controller Network-compatible optical cable, please refer to the installation manual of the CC-Link Partner Association.

Mitsubishi Electric System & Service

Industrial media converter

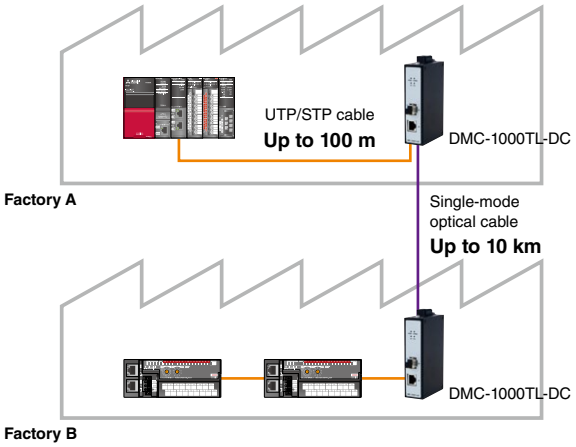
DMC-1000TL-DC DMC-1000TS-DC

- Converting 1000BASE-T/100BASE-TX to 1000BASE-LX/SX and vice versa can extend the station to station distance (DMC-1000TL-DC: maximum 10 km, DMC-1000TS-DC: maximum 550 m)
- Noise immunity performance ideal for FA environments ensures use as noise/lightening measures to protect communication line
- Complies with UL/CE/FCC standards enabling export to Europe and North America


DMC-1000TL-DC


DMC-1000TS-DC

Application example (DMC-1000TL-DC)



Specification*1

Item		DMC-1000TL-DC	DMC-1000TS-DC
Conforming standard		IEEE802.3z (1000BASE-LX)	IEEE802.3z (1000BASE-SX)
Compatible cable	Type	1000BASE-LX compatible single mode optical cable	1000BASE-SX compatible Multi-mode optical cable (core/clad: 50/125 µm Band: 500 MHz·km or higher λ = 850 nm)
	Connector	Double LC connector (IEC 61754-20)	
	Method for connection	Crossing (A to B, B to A)	
Transmission distance		Max. 10 km	Max. 550 m

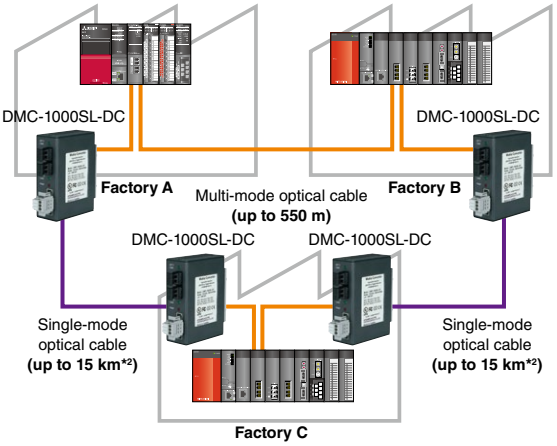
*1. Specifications described is about the configuration using optical cables only. For further details, please refer to the relevant product manuals.

Industrial media converter

DMC-1000SL-DC

- When the station-to-station distance is greater than 550 m, two of these units with optical cable can extend the total station-to-station distance up to 15 km
- Equipped with the link pass through function, this converter supports the network loop-back function in case of a cable disconnection

Application example



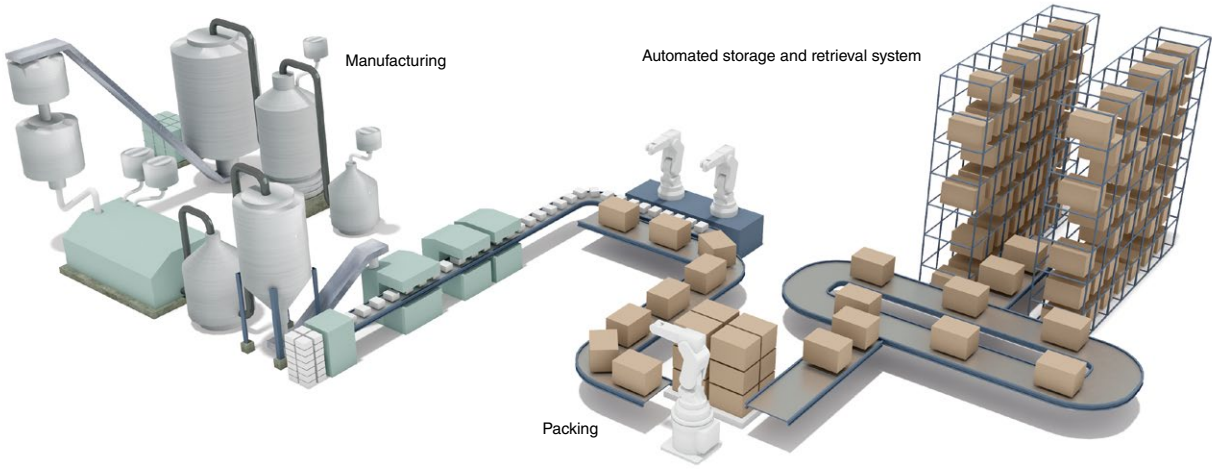
Specifications

Item		DMC-1000SL-DC	
		OPT1 port	OPT2 port
Conforming standard		IEEE802.3z Gigabit Ethernet (1000BASE-LX)	IEEE802.3z Gigabit Ethernet (1000BASE-SX)
Transmission format		Full duplex system	
Compatible cable	Optical fiber	1000BASE-LX compatible single-mode optical cable	1000BASE-SX compatible multi-mode optical cable*3 (core/clad 50/125 µm area 500 MHz·km or higher λ = 850 nm)
	Connector	Duplex LC connector (IEC 61754-20 compliant)	
	Method for connection	Crossing (A to B, B to A)	
Power supply specification		20.4…26.4 V DC (Power supply terminal block)	
Standards		UL, CE, FCC Part15 Class B, VccI Class B	
Max. number of connectable devices between stations		4	

*2. Multi-mode optical cable can be also used for connection. The transmission distance is up to 550 m.
*3. To connect to the CC-link IE Controller Network product, use the Mitsubishi Electric System & Service QG Series optical cable.

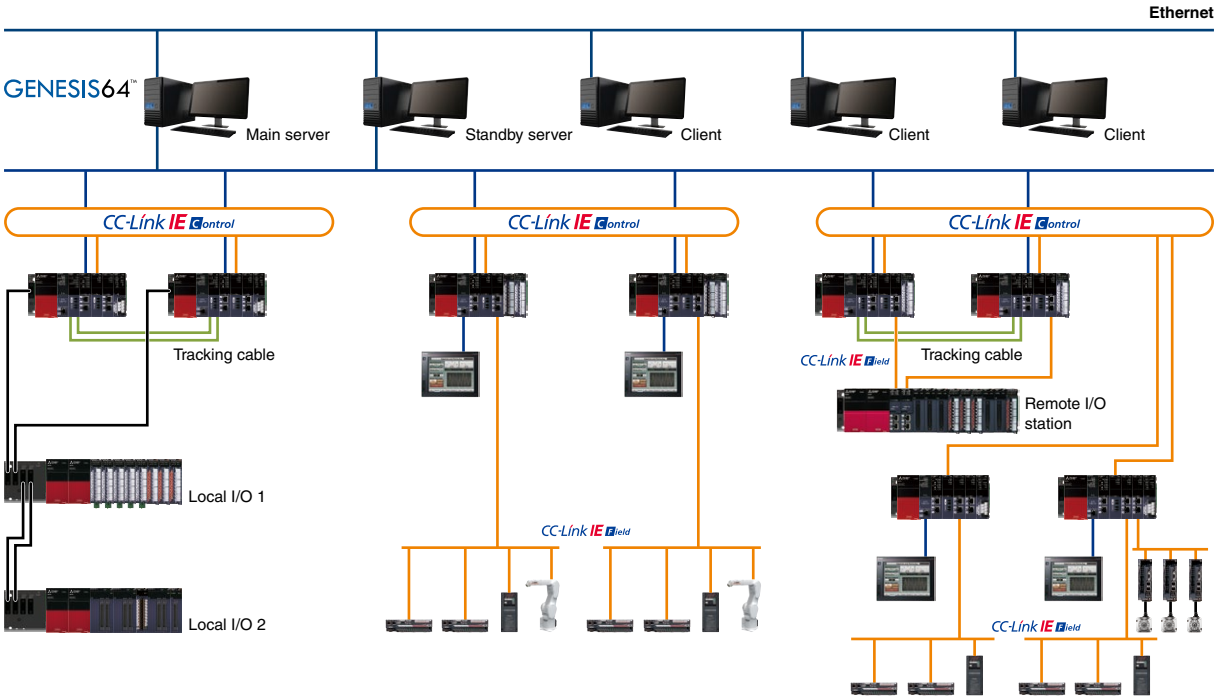
Fine chemicals

For production plants of chemical industry products such as pharmaceuticals, cosmetics, detergents, paints, and advanced materials, Mitsubishi Electric proposes a total solution utilizing MELSEC iQ-R Series, GENESIS64™, and HMI (GOT) for monitoring and controlling manufacturing processes and utilities, as well as production management.



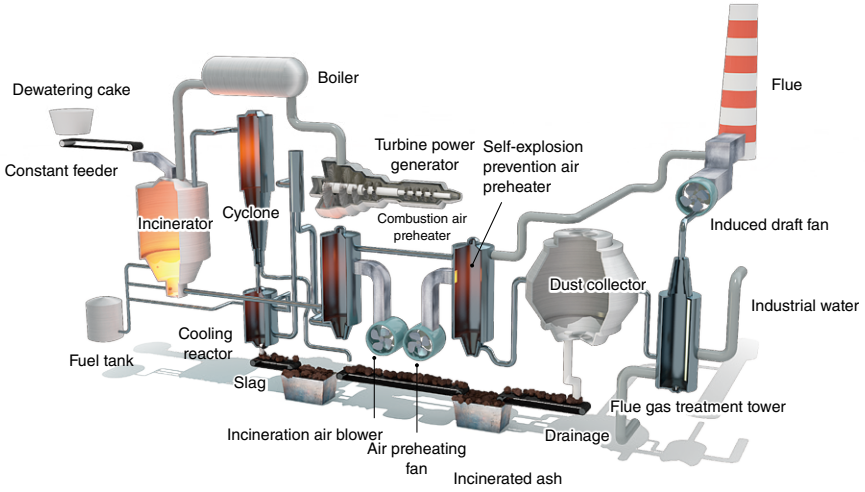
- A single process CPU combines functions previously handled by dedicated controllers, such as DDC and temperature controllers
- Easy-to-use, general-purpose programmable controller allows the user to modify programs
- Prevent system downtime with redundant CPUs, power supplies, and networks

System configuration



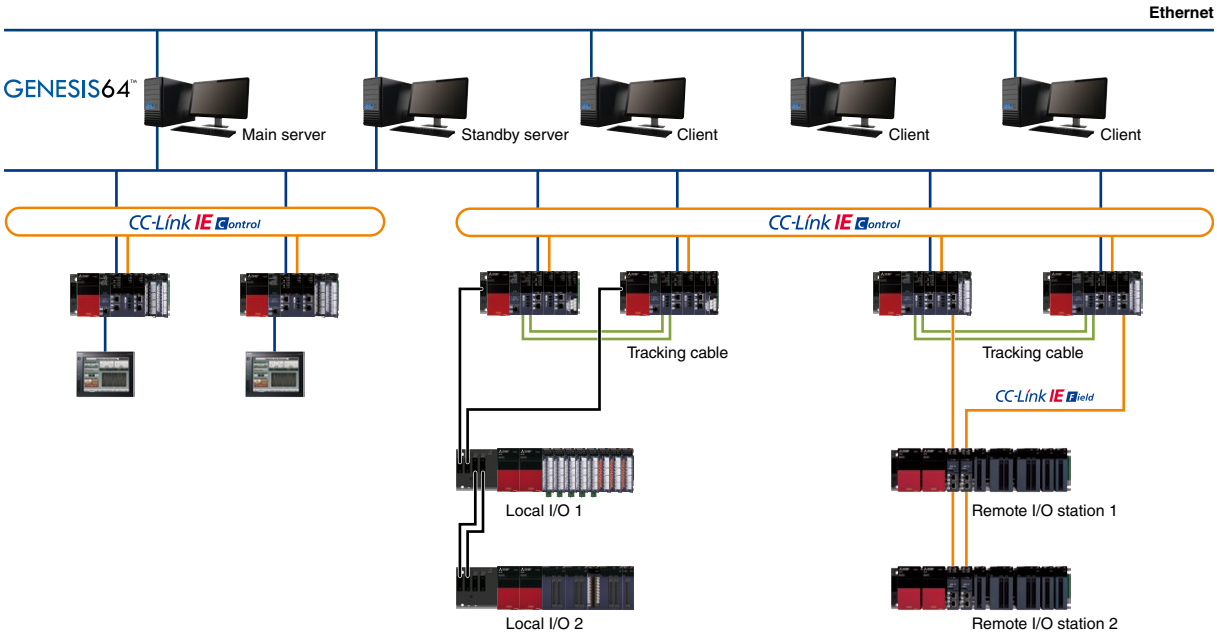
Waste treatment plant

Mitsubishi Electric offers the MELSEC iQ-R Series, GENESIS64™, and HMI (GOT) for monitoring control of the incinerators, boilers, utilities, gas treatment, and power generation processes in waste treatment plants. A highly reliable system can be built with redundant CPUs, networks, and SCADA servers. Our total solution includes highly reliable process control through redundant systems and energy generation visualization using GENESIS64™ and HMI (GOT).



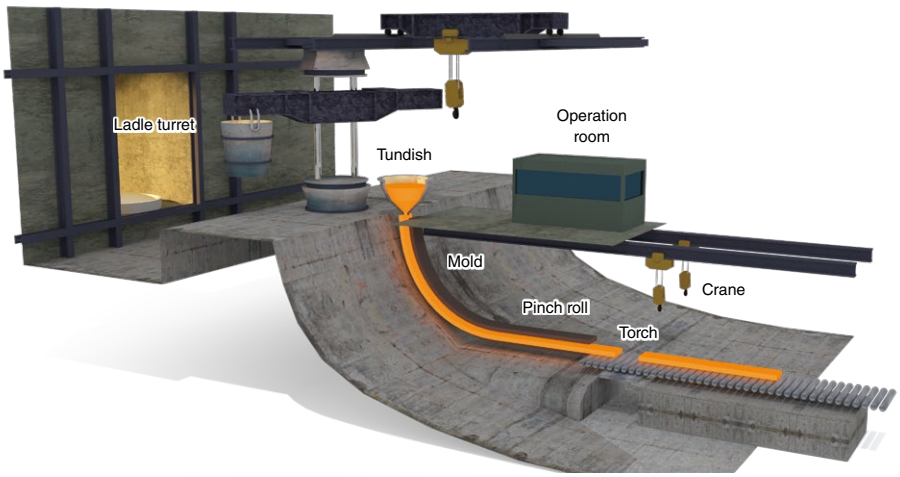
- Waste incinerator controls, such as furnace pressure control and boiler feedwater control, are easily implemented with FBD programs
- A highly reliable system is achieved by configuring a redundant system with the MELSEC iQ-R Series process CPU

System configuration



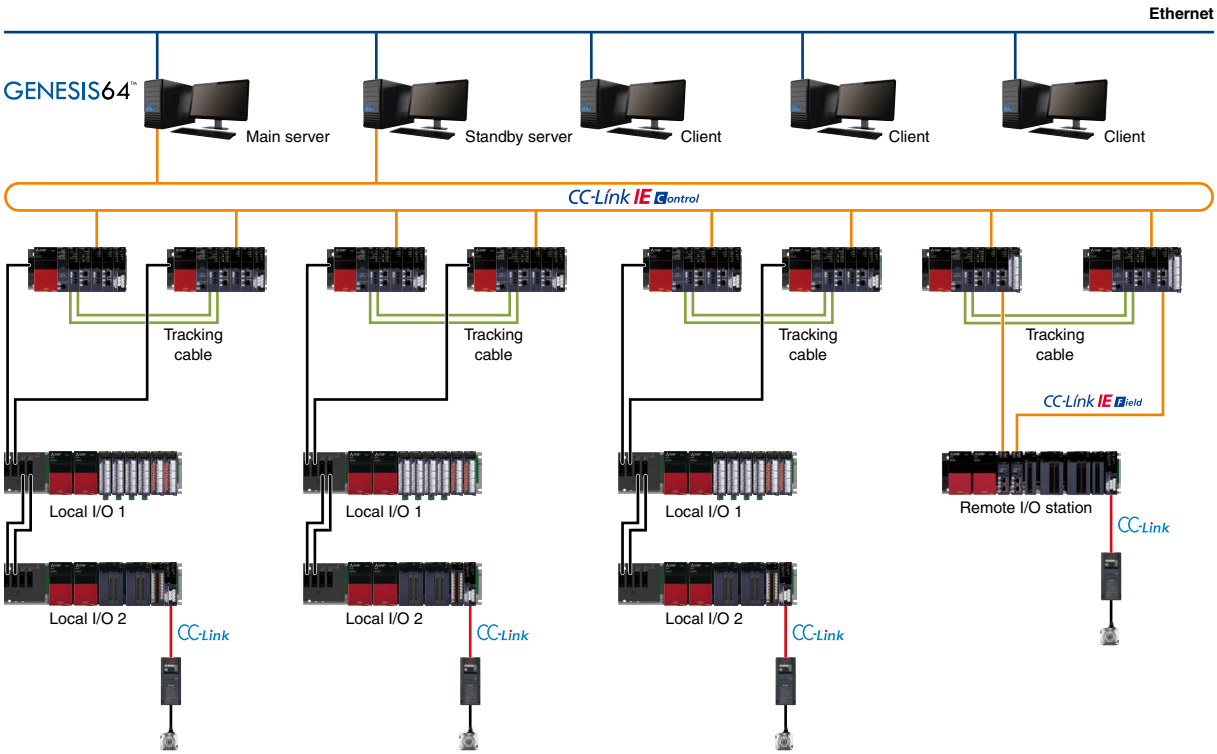
Steel industry

Mitsubishi Electric offers the MELSEC iQ-R Series, GENESIS64™, and HMI (GOT) for monitoring control of the processes and utilities at steel plants. A highly reliable system can be built with redundant CPUs, networks, and SCADA servers. A system with a hierarchical network can be built by integrated connection of programmable controllers via CC-Link IE Controller Network and distributed connection of I/Os via CC-Link IE Field Network.



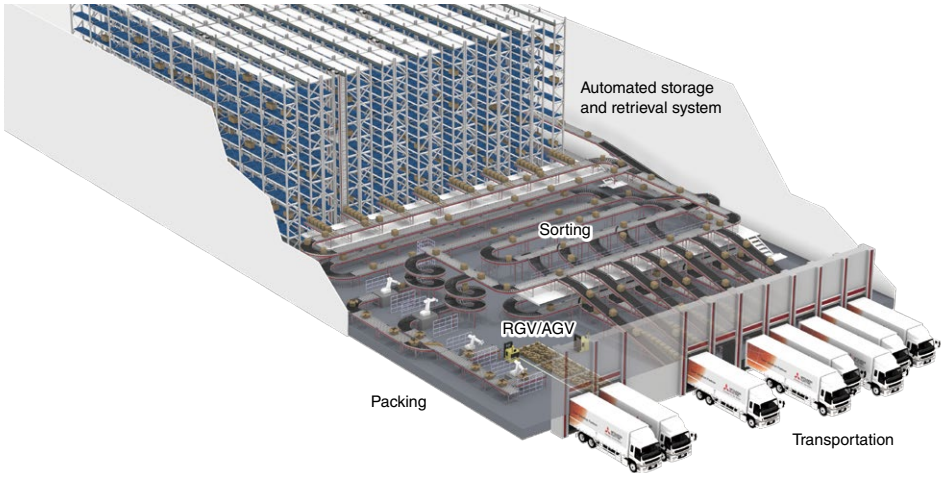
- Electrical control and process control are combined into one CPU, instead of using separate controllers for loop control (controller) and for electrical control (programmable controller). This results in a cost-effective system that takes up less space and offers high-speed controllability
- High-speed controllability delivers high-resolution PID pulse-width control. Increased accuracy and responsiveness of stopper position control significantly improves level controllability

System configuration



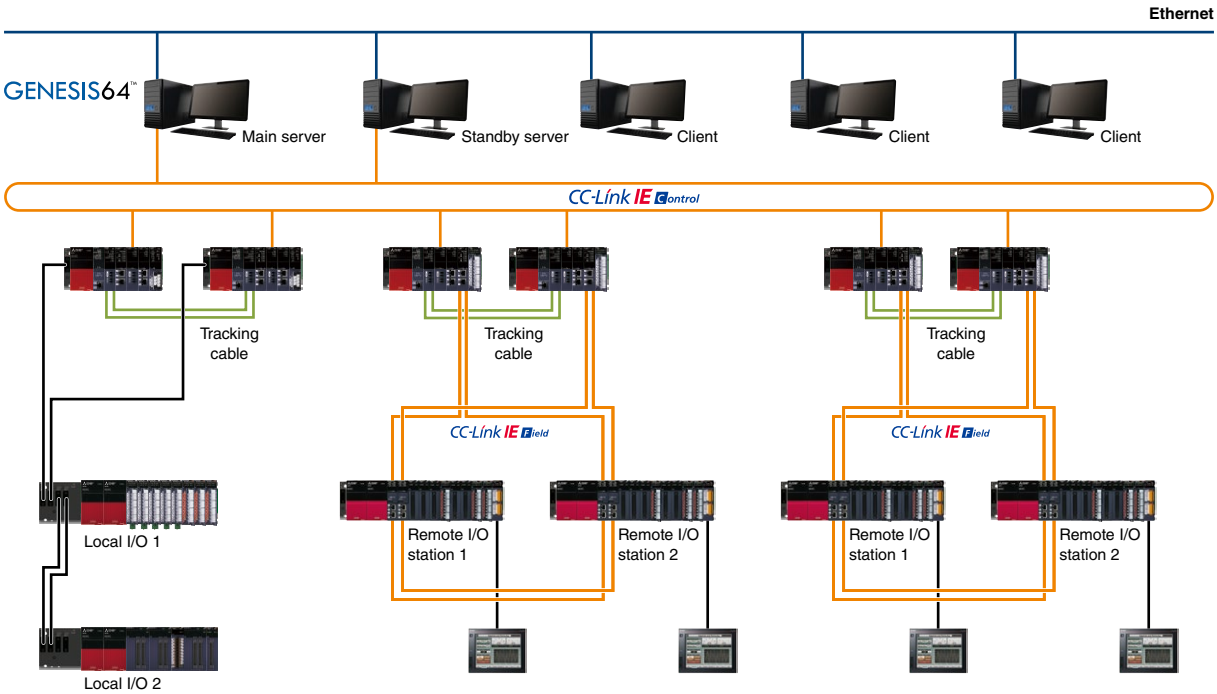
Material handling

Logistics and material handling systems must be kept running to keep goods flowing in and out of warehouses. The MELSEC iQ-R Series, GENESIS64™, and HMI (GOT) allow building a highly reliable system with redundant CPUs, networks, and SCADA servers.



- Multiple on-site HMIs (GOTs) allow simultaneous operation by multiple operators
- The MELSEC iQ-R Series redundant system delivers high reliability in factory automation
- Redundant GENESIS64™ server configuration increases monitoring reliability

System configuration



Discover the latest information in Factory Automation

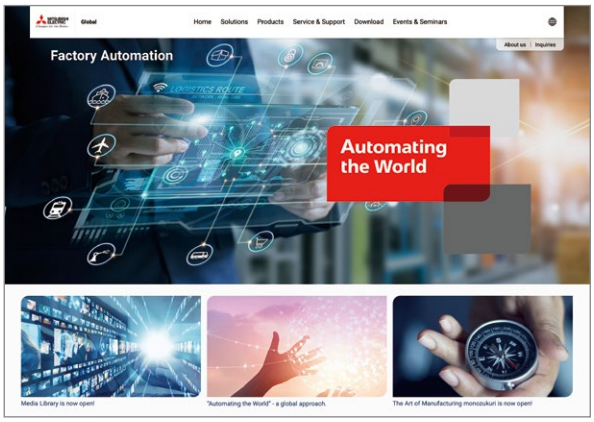
Factory Automation Global website

Mitsubishi Electric Factory Automation provides a mix of services to support its customers worldwide.
A consolidated global website is the main portal, offering a selection of support tools and a window to its local Mitsubishi Electric sales and support network.

From here you can find:

- Overview of available factory automation products
- Library of downloadable literature
- Support tools such as online e-learning courses, terminology dictionary, etc.
- Global sales and service network portal
- Latest news related to Mitsubishi Electric factory automation

Mitsubishi Electric Factory Automation Global website:
www.MitsubishiElectric.com/fa



Online e-learning

An extensive library of e-learning courses covering the factory automation product range has been prepared.
Courses from beginner to advanced levels of difficulty are available in various languages.

Beginner level

Designed for newcomers to Mitsubishi Electric Factory Automation products gaining a background of the fundamentals and an overview of various products related to the course.

Basic to Advanced levels

These courses are designed to provide education at all levels. Various different features are explained with application examples providing an easy and informative resource for in-house company training.

Find information on products, factory automation, e-F@ctory solutions and other topics

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Innovative next-generation, e-Manual

e-Manual Viewer

The e-Manual viewer is a next-generation digital manual offered by Mitsubishi Electric that consolidates factory automation products manuals into an easy-to-use package with various useful features integrated into the viewer. The e-Manual allows multiple manuals to be cross-searched at once, further reducing time for setting up products and troubleshooting.

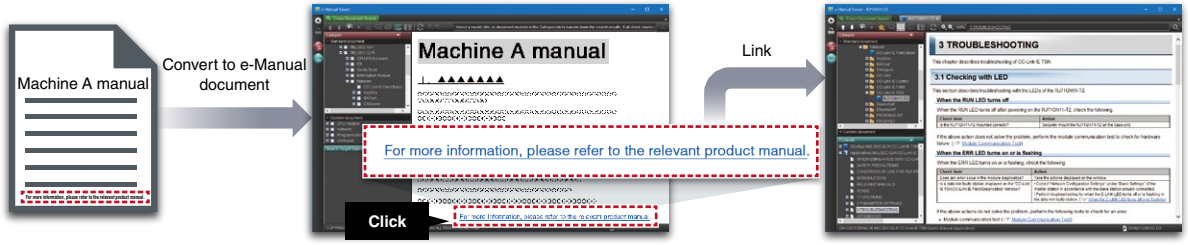
Key features included

- One-stop database containing all required manuals, with local file cache
- Included with GX Works3 engineering software
- Also available in tablet version
- Easily download manuals all at once
- Multiple users can share the latest manuals and knowhow with document sharing function
- Directly port sample programs within manuals to GX Works3
- Downloaded manuals are usable offline

Windows®-compliant

e-Manual Create

e-Manual Create is software for converting word files and chm files to e-Manual documents. e-Manual Create allows users to directly refer to Mitsubishi Electric e-Manuals from user's customized device maintenance manuals and such, supporting quick troubleshooting and reduction in document creation process.



Windows®-compliant

* To obtain the Windows® version of e-Manual Viewer and e-Manual Create, please contact your local Mitsubishi Electric sales office or representative.

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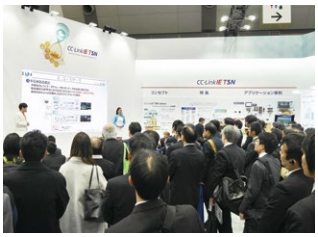
CC-Link Partner Association (CLPA) - Actively promoting worldwide adoption of CC-Link Family

Proactively supporting CC-Link Family, from promotion to specification development

The CC-Link Partner Association (CLPA) was established to promote the worldwide adoption of the CC-Link open-field network. In 2018, CLPA has developed CC-Link IE TSN, the world's first open industrial network utilizes Time-Sensitive Networking (TSN) technology, which is an extension of standard Ethernet, to accelerate the construction of smart factories utilizing Industrial IoT (IIoT). By conducting promotional activities such as organizing trade shows and seminars, conducting conformance tests, and providing catalogs, brochures and website information, CLPA activities are successfully increasing the number of CC-Link partner manufacturers and CC-Link Family-compatible products. CLPA will provide a variety of development methods and develop a truly open industrial network on a global scale.

Seminar



Trade show

Conformance testing lab

Visit the CLPA website for the latest CC-Link Family information.

CLPA website
www.cc-link.org/en

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e-mail: info@cc-link.org

Global influence of CC-Link Family continues to spread

Centered in Japan, the CLPA has established bases of operations in 10 regions around the world. We lead the way in further opening up CC-Link Family network technology to the world. From helping vendors develop compatible products to consultation concerning system construction for our users, we provide a wide range of support services.

Japan	● CLPA Headquarters CT			
Asia-Pacific	● CLPA-China CT	● CLPA-India	● CLPC-ASEAN	
	● CLPA-Korea CT	● CLPA-Taiwan	● CLPC-Thailand	
EMEA	● CLPA-Europe CT			
	● CLPA-Turkey			
Americas	● CLPA-Americas			
	● CLPA-Mexico			

CT : Conformance testing lab

Regional Offices ▶

General specifications

The general specifications for the MELSEC iQ-R Series and Q Series are as follows.

Item	Specification					
Series	MELSEC iQ-R Series				MELSEC-Q Series	
Operating ambient temperature (°C)	0…55 (when a base unit other than an extended temperature range base unit is used)				0…55	
	0…60 (when an extended temperature range base unit is used)*1					
Storage ambient temperature (°C)	–25…75					
Operating ambient humidity (% RH)	5…95, non-condensing					
Storage ambient humidity (% RH)						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5…8.4 Hz	-	3.5 mm	10 times each in X, Y, Z directions
			8.4…150 Hz	9.8 m/s^2	-	
		Under continuous vibration	5…8.4 Hz	-	1.75 mm	-
			8.4…150 Hz	4.9 m/s^2	-	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s^2, 3 times each in X, Y, and Z bidirections)					
Operating atmosphere	No corrosive gases*2, no flammable gases, no excessive conductive dust					
Operating altitude*3 (m)	0…2000*4					
Installation location	Inside a control panel					
Overvoltage category*5	≤ Ⅱ					
Pollution degree*6	≤ 2					

*1. Enables standard MELSEC iQ-R Series modules to support extended operating ambient temperature of 0 to 60°C, ensuring the same performance as the standard operating ambient temperature (0 to 55°C). When requiring to use in an ambient temperature environment higher than 60°C, please consult your local Mitsubishi Electric representative.

*2. The special coated product, which improves resistance to corrosive gas concentrations as specified in IEC 60721-3-3:1994 3C2, is available for the use in a corrosive gas environment.

*3. Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.

*4. When used at an altitude higher than 2000 m, the upper limits of the permissible voltage and the operating ambient temperature become lower. Please consult your local Mitsubishi Electric representative.

*5. This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category Ⅱ applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*6. This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

Product list

MELSEC iQ-R Series

Only representative products used in process control of the MELSEC iQ-R Series are listed. For information on other products, please refer to "MELSEC iQ-R Series iQ Platform-compatible PAC Catalog (L(NA)08298ENG)."

CPU modules

Product name	Model	Outline
Process CPU	R08PCPU	Program capacity: 80K steps, basic operation processing speed (LD instruction): 0.98 ns
	R16PCPU	Program capacity: 160K steps, basic operation processing speed (LD instruction): 0.98 ns
	R32PCPU	Program capacity: 320K steps, basic operation processing speed (LD instruction): 0.98 ns
	R120PCPU	Program capacity: 1200K steps, basic operation processing speed (LD instruction): 0.98 ns
SIL2 process CPU	R08PSFCPU-SET	Program capacity: 80K steps (40K steps for safety programs) basic operation processing speed (LD instruction): 0.98 ns
	R16PSFCPU-SET	Program capacity: 160K steps (40K steps for safety programs) basic operation processing speed (LD instruction): 0.98 ns
	R32PSFCPU-SET	Program capacity: 320K steps (40K steps for safety programs) basic operation processing speed (LD instruction): 0.98 ns
	R120PSFCPU-SET	Program capacity: 1200K steps (40K steps for safety programs) basic operation processing speed (LD instruction): 0.98 ns
Redundant function module	R6RFM	By combining with a process CPU module or SIL2 process CPU module, a redundant control system can be built

Base units

Product name	Model	Outline
Main base	R33B	3 slots, for MELSEC iQ-R Series modules
	R35B	5 slots, for MELSEC iQ-R Series modules
	R38B	8 slots, for MELSEC iQ-R Series modules
	R312B	12 slots, for MELSEC iQ-R Series modules
Redundant power supply main base	R310RB	10 slots, for MELSEC iQ-R Series modules, redundant system (remote I/O)
Extended temperature range main base	R310B-HT	10 slots, for MELSEC iQ-R Series modules, operating ambient temperature: 0…60°C
Extended temperature range redundant power supply main base	R38RB-HT	8 slots, for MELSEC iQ-R Series modules, redundant system (remote I/O) operating ambient temperature: 0…60°C
Redundant power supply extension base	R610RB	10 slots, for MELSEC iQ-R Series modules, redundant system (remote I/O)
Redundant extension base	R68WRB	8 slots, for MELSEC iQ-R Series modules, redundant system (local I/O)
Extended temperature range extension base	R610B-HT	10 slots, for MELSEC iQ-R Series modules, operating ambient temperature: 0…60°C
Extended temperature range redundant power supply extension base	R68RB-HT	8 slots, for MELSEC iQ-R Series modules, redundant system (remote I/O) operating ambient temperature: 0…60°C
Extended temperature range redundant extension base	R66WRB-HT	6 slots, for MELSEC iQ-R Series modules, redundant system (local I/O) operating ambient temperature: 0…60°C
Extension cable	RC06B	0.6 m cable for extension and RQ extension base units
	RC12B	1.2 m cable for extension and RQ extension base units
	RC30B	3 m cable for extension and RQ extension base units
	RC50B	5 m cable for extension and RQ extension base units
	RC100B	10 m cable for extension and RQ extension base units

Power supply modules

Product name	Model	Outline
Power supply	R61P	AC power supply, input: 100…240 V AC, output: 5 V DC/6.5 A
	R62P	AC power supply, input: 100…240 V AC, output: 5 V DC/3.5 A, 24 V DC/0.6 A
	R63P	DC power supply, input: 24 V DC, output: 5 V DC/6.5 A
	R64P	AC power supply, input: 100…240 V AC, output: 5 V DC/9 A
	R69P	DC power supply, input: 24 V DC, output: 5 V DC/9 A
	R63RP	DC power supply, input: 24 V DC, output: 5 V DC/6.5 A, for redundant power supply system
	R64RP	AC power supply, input: 100…240 V AC, output: 5 V DC/9 A, for redundant power supply system
	R69RP	DC power supply, input: 24 V DC, output: 5 V DC/9 A, for redundant power supply system

I/O modules

Product name	Model	Outline
DC input with diagnostic functions	RX40NC6B	16 points, 24 V DC (input current: 6.0 mA), negative common, screw terminal block
Transistor output with diagnostic functions	RY40PT5B	Transistor (source) output: 16 points, 24 V DC, screw terminal block

Analog modules

Product name	Model	Outline
Analog input	R60AD4	4 channels for voltage/current inputs –10…10 V DC/–32000…32000, 0…20 mA DC/0…32000, 80 µs/channel, screw terminal block
	R60ADV8	8 channels for voltage inputs –10…10 V DC/–32000…32000, 80 µs/channel, screw terminal block
	R60ADI8	8 channels for current inputs 0…20 mA DC/0…32000, 80 µs/channel, screw terminal block
	R60ADI8-HA	8 channels for current inputs 4…20 mA DC/0…32000, 80 ms/8 channels, HART® communication, spring-clamp terminal block
	R60AD8-G	8 channels for voltage/current inputs, channel isolated –10…10 V DC/–32000…32000, 0…20 mA DC/0…32000, 10 ms/channel, 40-pin connector
	R60AD16-G	16 channels for voltage/current inputs, channel isolated –10…10 V DC/–32000…32000, 0…20 mA DC/0…32000, 10 ms/channel 40-pin connector (2x)
High-speed analog input	R60ADH4	4 channels for voltage/current inputs –10…10 V DC/–32000…32000, 0…20 mA DC/0…32000, 1 µs/channel, screw terminal block
Channel isolated analog input module	R60AD6-DG	6 channels for current inputs, channel isolated 4…20 mA DC (2-wire transmitter is connected)/0…32000, 0…20 mA DC/0…32000, 10 ms/channel 40-pin connector
Analog output	R60DA4	4 channels for voltage/current outputs –32000…32000/–10…10 V DC, 0…32000/0…20 mA DC, 80 µs/channel, screw terminal block
	R60DAV8	8 channels for voltage outputs –32000…32000/–10…10 V DC, 80 µs/channel, screw terminal block
	R60DAI8	8 channels for current outputs 0…32000/0…20 mA DC, 80 µs/channel, screw terminal block
	R60DA8-G	8 channels for voltage/current outputs, channel isolated –32000…32000/–12…12 V DC, 0…32000/0…20 mA DC, 1 ms/channel, 40-pin connector
	R60DA16-G	16 channels for voltage/current outputs, channel isolated –32000…32000/–12…12 V DC, 0…32000/0…20 mA DC, 1 ms/channel 40-pin connector (2x)
High-speed analog output	R60DAH4	4 channels for voltage/current outputs –32000…32000/–10…10 V DC, 0…32000/0…20 mA DC, 1 µs/channel, screw terminal block
SIL2 analog control output	RY40PT5B-AS	Transistor (source) output: 16 points, 24 V DC (max. load current: 0.5 A/point), screw terminal block
Temperature input	R60TD8-G	Thermocouple (B, R, S, K, E, J, T, N), 8 channels for inputs, channel isolated, 30 ms/channel, 40-pin connector
	R60RD8-G	RTD (Pt100, JPt100, Ni100, Pt50), 8 channels for inputs, channel isolated, 10 ms/channel 40-pin connector
Temperature control	R60TCTRT2TT2-TS	Thermocouple (B, R, S, K, E, J, T, N, U, L, PLⅡ, W5Re/W26Re), 4 channels for inputs (2 channels can also be used for RTD inputs), spring-clamp terminal block type
	R60TCTRT2TT2	Thermocouple (B, R, S, K, E, J, T, N, U, L, PLⅡ, W5Re/W26Re), 4 channels for inputs (2 channels can also be used for RTD inputs), screw terminal block
	R60TCRT4-TS	RTD (Pt100, JPt100), 4 channels for inputs, spring-clamp terminal block type
	R60TCRT4	RTD (Pt100, JPt100), 4 channels for inputs, screw terminal block
	R60TCTRT2TT2BW	Thermocouple (B, R, S, K, E, J, T, N, U, L, PLⅡ, W5Re/W26Re), 4 channels for inputs (2 channels can also be used for RTD inputs), heater disconnection detection, screw terminal block

Channel isolated pulse input modules

Product name	Model	Outline
Channel isolated pulse input	RD60P8-G	5/12…24 V DC input: 8 channels; Channel isolated; Max. counting speed: 30k pulses/s

Network modules

DB … Co-branded product*1

Product name	Model	Outline
CC-Link IE Controller Network	RJ71GP21-SX	1 Gbps, optical fiber cable, control/normal station (standard type)
	RJ71GP21S-SX	1 Gbps, optical fiber cable, control/normal station (with external power supply)
CC-Link IE Field Network master/local	RJ71GF11-T2	1 Gbps, master/local station
CC-Link IE Field Network remote head	RJ72GF15-T2	1 Gbps, intelligent device station
CC-Link system master/local	RJ61BT11	Max. 10 Mbps, master/local station, CC-Link Ver.2-compatible
AnyWireASLINK master	RJ51AW12AL DB	AnyWireASLINK system-compatible, master station
MELSECNET/H network	RJ71LP21-25	Max. 25 Mbps, SI/H-PCF/broadband H-PCF/QSI/broadband silica glass optical fiber cable control/normal station (PLC to PLC network)
	RJ71BR11	Coaxial bus type, 10 Mbps, coaxial cable, control/normal station (PLC to PLC network)
Terminating resistor	A6RCON-R75	Terminating resistor for MELSECNET/H coaxial bus system, 75 Ω
Ethernet (CC-Link IE embedded)	RJ71EN71	1 Gbps/100 Mbps/10 Mbps: 2 ports Multi-network connectivity (Ethernet/CC-Link IE Field/CC-Link IE Controller Network (twisted pair cable))
PROFIBUS-DP	RJ71PB91V	PROFIBUS® system-compatible, DP master/slave
CANopen®	RJ71CN91	CANopen® system-compatible, NMT master/NMT slave
EtherNet/IP network interface	RJ71EIP91	EtherNet/IP™ system-compatible, scanner
DeviceNet master/slave	RJ71DN91	DeviceNet® system-compatible, master/slave
BACnet®	RJ71BAC96 DB	BACnet® system-compatible, controller/workstation
GP-IB interface	RJ71GB91	GP-IB system-compatible, controller/device
Serial communication	RJ71C24	Max. 230.4 kbps, RS-232: 1 channel, RS-422/485: 1 channel
	RJ71C24-R2	Max. 230.4 kbps, RS-232: 2 channels
	RJ71C24-R4	Max. 230.4 kbps, RS-422/485: 2 channels

*1. General specifications and product guarantee conditions for co-branded products may vary from those of general MELSEC products.
For more information, please refer to the relevant product manuals or contact your local Mitsubishi Electric sales office or representative.

Advanced information modules

Product name	Model	Outline
MES interface	RD81MES96N	Database connection (MX MESInterface-R “SW1DND-RMESIF” is required.)
OPC UA server	RD81OPC96	Embedded OPC UA server (MX OPC UA Module Configurator-R “SW1DND-ROPCUA” is required.)
High-speed data logger	RD81DL96	File server connection (High-speed data logger module tool “SW1DNN-RDLUTL” is required.)*2
High-speed data communication	RD81DC96	Program connection (High-speed data communication module tool “SW1DNN-RDCUTL” is required.)*2
C intelligent function	RD55UP06-V	C/C++ program execution, RAM: 128 MB (CW Workbench/Wind River® Workbench 3.3*2/TimeStorm®/ Visual Studio® are required for programming. Setting and monitoring is done using GX Works3.)
	RD55UP12-V	C/C++ program execution, RAM: 1 GB (CW Workbench/Wind River® Workbench 3.3*2/TimeStorm®/ Visual Studio® are required for programming. Setting and monitoring is done using GX Works3.)

*2. For information on how to obtain the software, please contact your local Mitsubishi Electric sales office or representative.

MELSEC-Q Series

Only representative products used in process control of the MELSEC-Q Series are listed. For information on other products, please refer to "Programmable Controllers MELSEC-Q series [QnU] Catalog (L(NA)08101E)."

CPU modules

Product name	Model	Outline
Universal model process CPU	Q04UDPVCPU	Program capacity: 40K steps, basic operation processing speed (LD instruction): 1.9 ns
	Q06UDPVCPU	Program capacity: 60K steps, basic operation processing speed (LD instruction): 1.9 ns
	Q13UDPVCPU	Program capacity: 130K steps, basic operation processing speed (LD instruction): 1.9 ns
	Q26UDPVCPU	Program capacity: 260K steps, basic operation processing speed (LD instruction): 1.9 ns

Base units

Product name	Model	Outline
Main base	Q33B	3 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q35B	5 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q38B	8 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q312B	12 slots, 1 power supply module required, for MELSEC-Q Series modules
Multiple CPU high speed main base	Q35DB	5 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q38DB	8 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q312DB	12 slots, 1 power supply module required, for MELSEC-Q Series modules
Redundant power main base	Q38RB	8 slots, 2 redundant power supply modules required, for MELSEC-Q Series modules
Extension base	Q63B	3 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q65B	5 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q68B	8 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q612B	12 slots, 1 power supply module required, for MELSEC-Q Series modules
	Q52B	2 slots, power supply module not required, for MELSEC-Q Series modules
	Q55B	5 slots, power supply module not required, for MELSEC-Q Series modules
Redundant power extension base	Q68RB	8 slots, 2 redundant power supply modules required, for MELSEC-Q Series modules
Extension cable	QC05B	0.45 m cable for extension base unit
	QC06B	0.6 m cable for extension base unit
	QC12B	1.2 m cable for extension base unit
	QC30B	3 m cable for extension base unit
	QC50B	5 m cable for extension base unit
	QC100B	10 m cable for extension base unit

Power supply modules

Product name	Model	Outline
Power supply	Q61P	AC power supply, input: 100…240 V AC, output: 5 V DC/6 A
	Q62P	AC power supply, input: 100…240 V AC, output: 5 V DC/3 A, 24 V DC/0.6 A
	Q63P	DC power supply, input: 24 V DC, output: 5 V DC/6 A
	Q64PN	AC power supply, input: 100…240 V AC, output: 5 V DC/8.5 A
Power supply with life detection	Q61P-D	AC power supply, input: 100…240 V AC, output: 5 V DC/6 A
Redundant power supply	Q63RP	DC power supply, input: 24 V DC, output: 5 V DC/8.5 A
	Q64RPN	AC power supply, input: 100…240 V AC, output: 5 V DC/8.5 A

Analog modules

Product name	Model	Outline
Analog input	Q68ADV	8 channels for voltage inputs, –10…10 V DC output (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, 0…16000, –16000…16000, 80 µs/channel, screw terminal block
	Q62AD-DGH	2 channels for current inputs, channel isolated, 4…20 mA DC output (resolution): 0…32000, 0…64000, 10 ms/2 channels, screw terminal block
	Q66AD-DG	6 channels for current inputs, channel isolated, 4…20 mA DC (2-wire transmitter is connected), 0…20 mA DC output (resolution): 0…4000, 0…12000, 10 ms/channel, 40-pin connector
	Q68ADI	8 channels for current inputs, 0…20 mA DC output (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, 0…16000, –16000… 16000, 80 µs/channel, screw terminal block
	Q64ADH	4 channels for voltage/current inputs, –10…10 V DC, 0…20 mA DC output (resolution): 0…20000, –20000…20000, –5000…22500, 20 µs/channel, screw terminal block
	Q64AD	4 channels for voltage/current inputs, –10…10 V DC, 0…20 mA DC output (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, 0…16000, –16000… 16000, 80 µs/channel, screw terminal block
	Q64AD-GH	4 channels for voltage/current inputs, galvanic channel isolation, –10…10 V DC, 0…20 mA DC output (resolution): 0…32000, –320 00…32000, 0…64000, –64000…64000, 10 ms/4 channels screw terminal block
	Q68AD-G	8 channels for voltage/current inputs, channel isolated, –10…10 V DC, 0…20 mA DC output (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, 0…16000, –16000… 16000, 10 ms/channel, 40-pin connector
Analog output	Q68DAVN	8 channels for voltage outputs, –10…10 V DC input (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, –16000…16000 80 µs/channel, screw terminal block
	Q68DAIN	8 channels for current outputs, 0…20 mA DC input (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, 80 µs/channel, screw terminal block
	Q64DAH	4 channels for voltage/current inputs, –10…10 V DC, 0…20 mA DC input (resolution): 0…20000, –20000…20000, 20 µs/channel, screw terminal block
	Q62DAN	2 channels for voltage/current inputs, –10…10 V DC, 0…20 mA DC input (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, –16000…16000 80 µs/channel, screw terminal block
	Q62DA-FG	2 channels for voltage/current inputs, channel isolated, –12…12 V DC, 0…22 mA DC input (resolution): 0…12000, –12000…12000, –16000…16000, 10 ms/2 channels, screw terminal block
	Q64DAN	4 channels for voltage/current inputs, –10…10 V DC, 0…20 mA DC input (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, –16000…16000 80 µs/channel, screw terminal block
	Q66DA-G	6 channels for voltage/current inputs, channel isolated, –12…12 V DC, 0…22 mA DC input (resolution): 0…4000, –4000…4000, 0…12000, –12000…12000, –16000…16000 6 ms/channel, 40-pin connector
Analog input/output	Q64AD2DA	4 channels for inputs, voltage/current inputs: –10…10 V DC, 0…20 mA DC » output (resolution): 0…4000, –4000…4000, 0…12000, 0…16000, –16000…16000 » conversion speed: 500 µs/channel 2 channels for outputs, input (resolution): 0…4000, –4000…4000, 0…12000, –16000…16000 » voltage/current output: –10…10 V DC, 0…20 mA DC » conversion speed: 500 µs/channel screw terminal block
Load cell input	Q61LD	1 channel, input (load cell output): 0.0…3.3 mV/V, output (resolution): 0…10000, 10 ms, screw terminal block
CT input	Q68CT	8 channels, input voltage: CT 0…5 A AC, 0…50 A AC, 0…100 A AC, 0…200 A AC, 0…400 A AC, 0…600 A AC, output: 0…10000, screw terminal block
Temperature input	Q64TD	Thermocouple (B, R, S, K, E, J, T, N), 4 channels for inputs, channel isolated, disconnection detection function, 40 ms/channel, screw terminal block
	Q64TDV-GH	Thermocouple (B, R, S, K, E, J, T, N), 4 channels for inputs, channel isolated, disconnection detection function, sampling cycle × 3, screw terminal block
	Q68TD-G-H01*1	Thermocouple (B, R, S, K, E, J, T, N), 8 channels for inputs, channel isolated, disconnection monitor function, 320 ms/8 channels, 40-pin connector
	Q68TD-G-H02	Thermocouple (B, R, S, K, E, J, T, N), 8 channels for inputs, channel isolated, disconnection detection function, 640 ms/8 channels, 40-pin connector
	Q64RD	Platinum RTD (Pt100, JPt100), 4 channels for inputs, disconnection detection function, 40 ms/channel, screw terminal block
	Q64RD-G	Platinum RTD (Pt100, JPt100), nickel RTD (Ni100), 4 channels for inputs, channel isolated, disconnection detection function, 40 ms/channel, screw terminal block
	Q68RD3-G	Platinum RTD (Pt100, JPt100), nickel RTD (Ni100), 8 channels for inputs, channel isolated, disconnection detection function, 320 ms/8 channels, 40-pin connector
Temperature control	Q64TCTTN	Thermocouple (K, J, T, B, S, E, R, N, U, L, PLⅡ, W5Re/W26Re), 4 channels for inputs, channel isolated, screw terminal block
	Q64TCTTBWN	Thermocouple (K, J, T, B, S, E, R, N, U, L, PLⅡ, W5Re/W26Re), 4 channels for inputs, channel isolated, heater disconnection detection function, screw terminal block
	Q64TCRTN	Platinum RTD (Pt100, JPt100), 4 channels for inputs, channel isolated, screw terminal block
	Q64TCRTBWN	Platinum RTD (Pt100, JPt100), 4 channels for inputs, channel isolated, heater disconnection detection function, screw terminal block
Loop control	Q62HLC	2 channels for thermocouple/micro voltage/voltage/current inputs/outputs, 25 ms/2 channels (input), 4…20 mA DC 25 ms/2 channels (output) screw terminal block

*1. Depending on the combination of power supply module and base unit, the installable slot position may be limited.

Channel isolated pulse input modules

Product name	Model	Outline
Channel isolated pulse input	QD60P8-G	8 channels, 30 kpps/10 kpps/1 kpps/100 pps/50 pps/10 pps/1 pps/0.1 pps, count input signal: 5/12…24 V DC

Network modules

Product name	Model	Outline
CC-Link IE Controller Network	QJ71GP21-SX	1 Gbps, optical fiber cable, control/normal station
	QJ71GP21S-SX	1 Gbps, optical fiber cable, control/normal station (with external power supply)
CC-Link IE Field Network master/local	QJ71GF11-T2	1 Gbps, master/local station
CC-Link system master/local	QJ61BT11N	Max. 10 Mbps, master/local station, CC-Link Ver.2 supported
MELSECNET/H network	QJ71LP21-25	Max. 25 Mbps, SI/QSI/H-PCF/broadband H-PCF optical fiber cable control/normal station (PLC to PLC network)/remote master station (remote I/O network)
	QJ71LP21S-25	Max. 25 Mbps, SI/QSI/H-PCF/broadband H-PCF optical fiber cable control/normal station (PLC to PLC network)/remote master station (remote I/O network), with external power supply function
	QJ72LP25-25	Max. 25 Mbps, SI/QSI/H-PCF/broadband H-PCF optical fiber cable remote station (remote I/O network)
	QJ71LP21G	10 Mbps, GI optical fiber cable control/normal station (PLC to PLC network)/remote master station (remote I/O network)
	QJ72LP25G	10 Mbps, GI optical fiber cable remote station (remote I/O network)
	QJ71BR11	10 Mbps, coaxial cable control/normal station (PLC to PLC network)/remote master station (remote I/O network)
	QJ72BR15	10 Mbps, coaxial cable, remote station (remote I/O network)
MODBUS® interface	QJ71MB91	MODBUS® RTU/ASCII, master/slave
	QJ71MT91	MODBUS®/TCP, master/slave
PROFIBUS®-DP master	QJ71PB92V	PROFIBUS® system compatible, DP master
	QJ71PB93D	PROFIBUS® system compatible, DP slave
DeviceNet® master/slave	QJ71DN91	DeviceNet® system compatible, master/slave
FL-net (OPCN-2) interface	QJ71FL71-T-F01	Ver. 2.00 compatible

Advanced information modules

Product name	Model	Outline
MES interface	QJ71MES96N	MES interface module (MX MESInterface and CompactFlash card are required)
Web server	QJ71WS96	Web server module 10BASE-T/100BASE-TX 1 channel, RS-232 1 channel
High-speed data logger	QD81DL96	High-speed data logger module 10BASE-T/100BASE-TX (CompactFlash card is required)
High-speed data communication	QJ71DC96	High-speed data communication module 10BASE-T/100BASE-TX (CompactFlash card is required)

Network interface board

Product name	Model	Outline
CC-Link IE Controller Network	Q81BD-J71GP21-SX	PCI Express® bus, Japanese/English OS compatible, 1 Gbps, optical fiber cable control/normal station (controller network)
	Q81BD-J71GP21S-SX	PCI Express® bus, Japanese/English OS compatible, 1 Gbps, optical fiber cable control/normal station (controller network), with external power supply function
	Q80BD-J71GP21-SX	PCI bus/PCI-X bus, Japanese/English OS compatible, 1 Gbps, optical fiber cable control/normal station (controller network)
	Q80BD-J71GP21S-SX	PCI bus/PCI-X bus, Japanese/English OS compatible, 1 Gbps, optical fiber cable control/normal station (controller network), with external power supply function
CC-Link IE Field Network	Q81BD-J71GF11-T2	PCI Express® bus, Japanese/English OS compatible, 1 Gbps, master/local station
	Q80BD-J71GF11-T2	PCI bus/PCI-X bus, Japanese/English OS compatible, 1 Gbps, master/local station
CC-Link	Q81BD-J61BT11	PCI Express® bus, Japanese/English OS compatible, Max. 10 Mbps master/local station, CC-Link Ver.2 supported
	Q80BD-J61BT11N	PCI bus, English OS compatible, Max. 10 Mbps, master/local station, CC-Link Ver.2 supported
MELSECNET/H	Q81BD-J71LP21-25	PCI Express® bus, Japanese/English OS compatible, Max. 25 Mbps SI/QSI/H-PCF/broadband H-PCF optical fiber cable, control/normal station (controller network)
	Q80BD-J71LP21-25	PCI bus, Japanese/English OS compatible, Max. 25 Mbps, SI/QSI/H-PCF/broadband H-PCF optical fiber cable control/normal station (controller network)
	Q80BD-J71LP21G	PCI bus, Japanese/English OS compatible, 10 Mbps, GI optical fiber cable control/normal station (controller network)
	Q80BD-J71BR11	PCI bus, Japanese/English OS compatible, 10 Mbps, coaxial cable control/normal station (controller network)

Software

Product name	Model	Outline
GENESIS64™ Basic SCADA*1	GEN64-BASIC	SCADA software • GENESIS64™ server product for configuration and runtime with modular licensing for small to medium applications
GENESIS64™ Advanced*1	GEN64-APP	SCADA software • GENESIS64™ server product for configuration and runtime with comprehensive licensing for large and distributed applications

*1. For details on the product configuration, please refer to "ICONICS Automation Software Suite (L(NA)08785ENG)."

Product name	Outline	Supported by	
		MELSEC iQ-R Series	MELSEC-Q Series
MELSOFT iQ Works	FA engineering software*2 • System management software: MELSOFT Navigator • Programmable controller engineering software: MELSOFT GX Works3*3 (including GX Works2 and PX Developer*4) • Motion controller engineering software: MELSOFT MT Works2 • HMI/GOT screen design software: MELSOFT GT Works3 • Robot engineering software: MELSOFT RT ToolBox3*5 • Inverter setup software: MELSOFT FR Configurator2 • Servo setup software: MELSOFT MR Configurator2 • C Controller setting and monitoring tool: MELSOFT CW Configurator	●	●
MELSOFT GX Works3*3	• Programmable controller engineering software (including GX Works2 and PX Developer*4)	●	●*6
MELSOFT GX Works2*7	• Programmable controller engineering software	-	●

Product name	Model	Outline	Supported by	
			MELSEC iQ-R Series	MELSEC-Q Series
MELSOFT PX Developer*7	SW1D5C-FBDQ-E	Process control FBD software package	-*8	●
	SW1DNC-FBDQMON-E	Process control FBD software package monitoring tool	●	●

*2. For detailed information about supported modules, please refer to the manuals of the relevant software package.
*3. The MELSOFT GX Works3 menu is switchable between Japanese, English, and simplified Chinese.
*4. Includes both programming tool and monitoring tool for process control.
*5. 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.
*6. Only the included GX Works2 and PX Developer are supported.
*7. GX Works2 and PX Developer are included in MELSOFT iQ Works and GX Works3. If you are considering a purchase, please consider purchasing MELSOFT iQ Works or GX Works3.
*8. Only the included PX Developer monitoring tool is supported.

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This publication explains the typical features and functions of the products herein and does not provide restrictions or other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; or any other duties.

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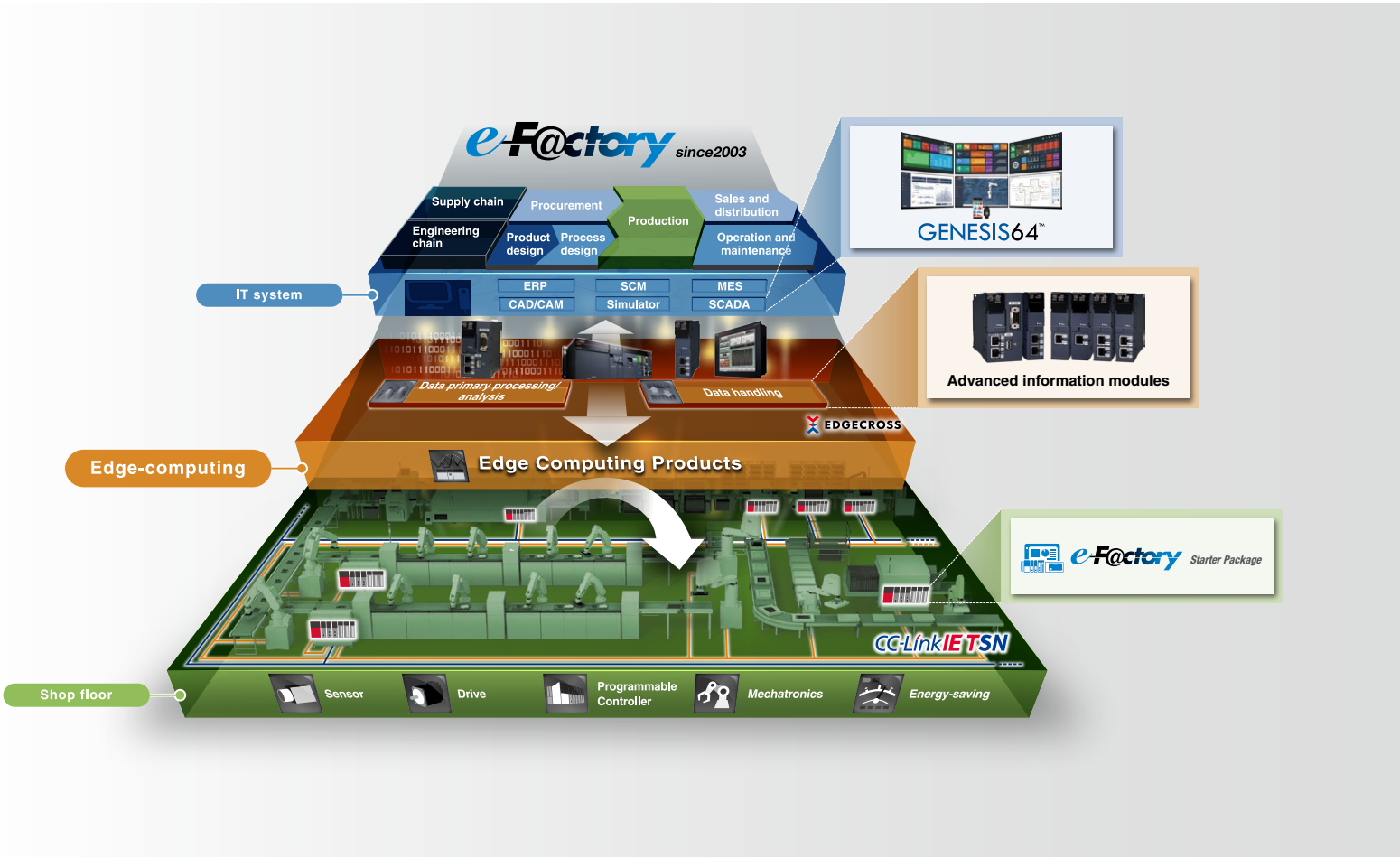

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Mitsubishi Electric's e-F@ctory concept utilizes both FA and IT technologies, to reduce the total cost of development, production and maintenance, with the aim of achieving manufacturing that is a "step ahead of the times". It is supported by the e-F@ctory Alliance Partners covering software, devices, and system integration, creating the optimal e-F@ctory architecture to meet the end users needs and investment plans.

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