

Programmable Controllers  
MELSEC-Q series [QnU]

**e-Factory**



# 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.

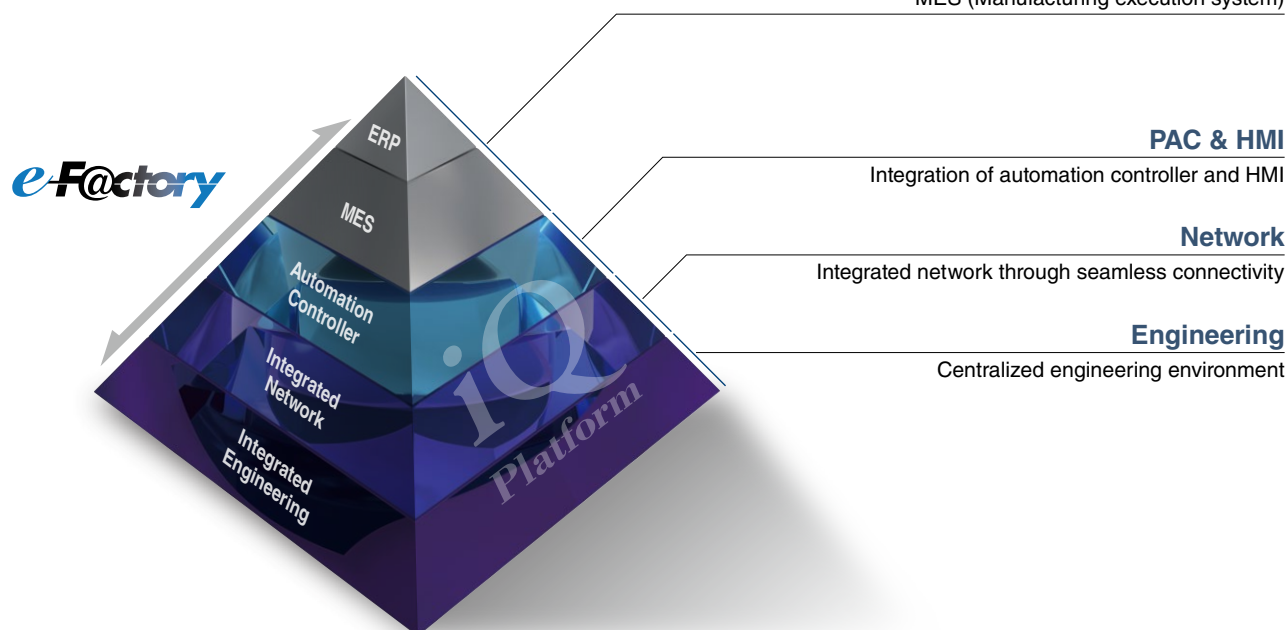




FA Integrated Platform  
"iQ Platform" Movie

## iQ Platform for maximum return on investment

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



## Further reduce TCO while securing your manufacturing assets

### Automation Controller

Improve productivity and product quality

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

### Integrated Network

Best-in-class integrated network optimizing production capabilities

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

### Centralized Engineering

Integrated engineering environment with system level features

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





# Universal Model



MELSEC  series  
QnU

LD instruction  
1.9 ns

1000K  
steps

Built-in  
Ethernet

Built-in  
USB

SD  
memory card  
slot

Security

Data  
logging  
function





Productivity

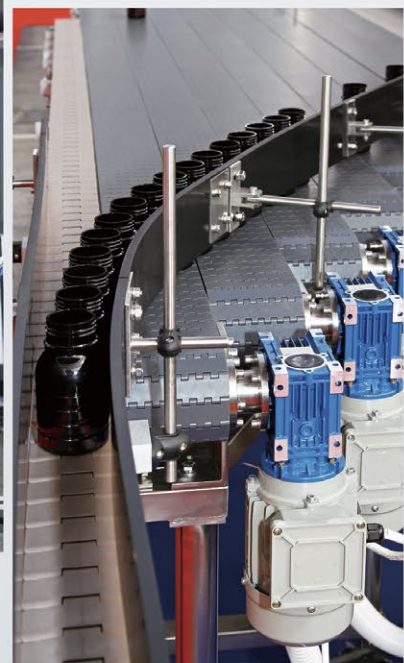
User-friendly

Maintenance cost

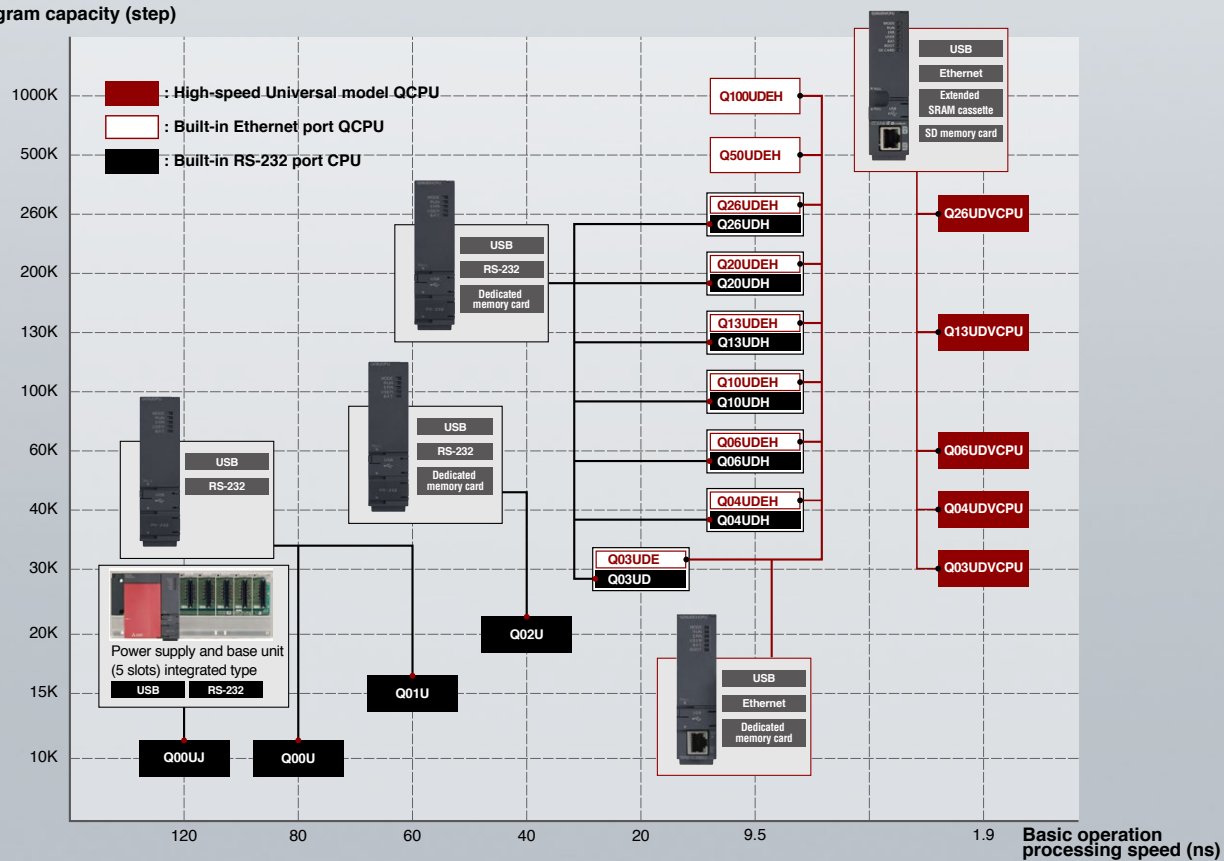
The MELSEC-Q Series has gained continuous supports since its release in 1999, helping to promote factory automation and support economic growth. High-speed and highly functional MELSEC-QnU Series was released in 2014. High quality and stable modules for versatile applications are widely used in many industries.

## I N D E X

|                          |      |                        |      |
|--------------------------|------|------------------------|------|
| QnU CPU.....             | P.6  | Module Lineup.....     | P.38 |
| • Productivity .....     | P.8  | Software.....          | P.50 |
| • User-friendly .....    | P.12 | Related Products ..... | P.60 |
| • Maintenance cost ..... | P.18 | Specifications .....   | P.63 |
| CPU Lineup .....         | P.20 | Support .....          | P.69 |
| Network.....             | P.24 | Product List.....      | P.72 |



## ■ MELSEC-Q Series Universal model lineup Program capacity (step)







## High-speed Universal model QCPU

Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV

|                                                                    |                                       |                     |                        |
|--------------------------------------------------------------------|---------------------------------------|---------------------|------------------------|
| Basic operation processing speed (LD instruction)<br><b>1.9 ns</b> | Program capacity<br><b>260K</b> steps |                     |                        |
| Ethernet                                                           | USB                                   | SD memory card slot | Extended SRAM cassette |
| Data logging function                                              | Security                              |                     |                        |

\*: This CPU type is only supported by GX Works2 (not supported by GX Developer).

## ■ High-speed Universal model QCPU

### SD memory card slot

- ▶ Data logging function
- ▶ Boot operation
- ▶ Backup/Restore



### CPU

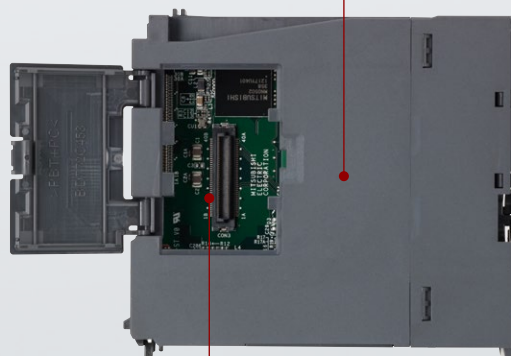
- ▶ Basic operation processing speed (LD instruction): 1.9 ns
- ▶ Program capacity: maximum 260K steps
- ▶ Fixed Scan interrupt program (minimum interval): 100 μs



Ethernet port



USB port



### Cassette port

- ▶ Expand standard RAM (up to 8 MB)
- ▶ Use simultaneously with SD memory card
- ▶ Continuously access file registers

### Security functions

Maximum of 32 character password is supported.

A mix of alphanumeric and special characters (\*, @, and & etc.) can be used further strengthening the security of the password. In addition, protection of intellectual property can be enhanced by blocking any unauthorized devices and only allowing registered devices to access the CPU.





# Productivity



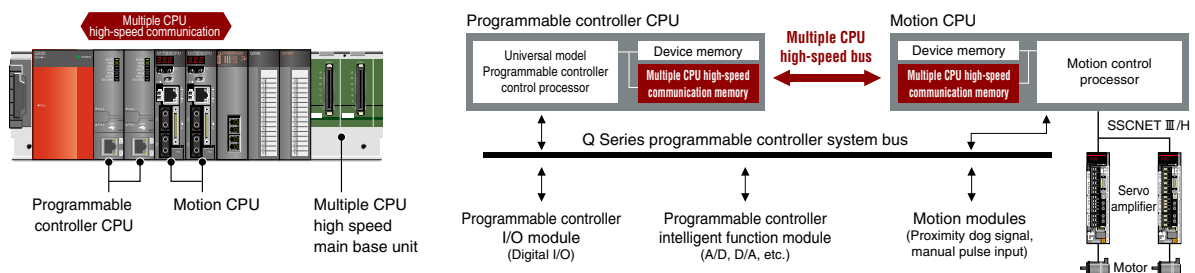
Basic operation processing speed (LD instruction):

# 1.9 ns

Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV

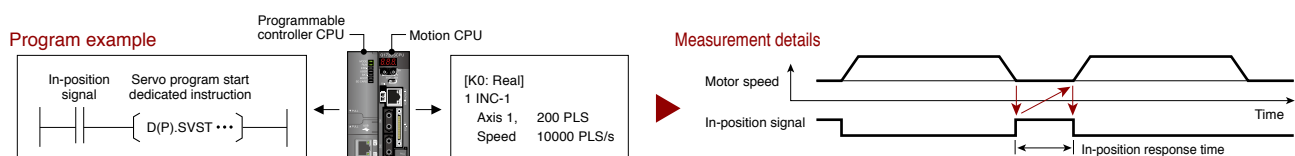
## ■ Multiple CPUs

To achieve high-speed synchronized control between multiple CPUs, a dedicated bus is used, independent of sequence program operation (0.88 ms operation cycle)\*1. This multiple CPU high-speed communication is synchronized with motion control to maximize efficiency.



## In-position response time

Fast in-position response time is realized between the motion CPU and programmable controller. The in-position signal is triggered by the servo amplifier of the first axis, with the time taken between the second axis at start-up and the speed command output of the programmable controller CPU.



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

## ■ Improved production time

As applications are getting larger and more complex it is essential to shorten the system operation cycle time. To achieve this, the ultra high-speed of 1.9 ns (LD instruction) processing enables to realize shorter operating cycles.

System performance can be improved by reducing the overall scan time, preventing any variances in performance. In addition to realization of high-speed control which is normally associated with microcomputer control.

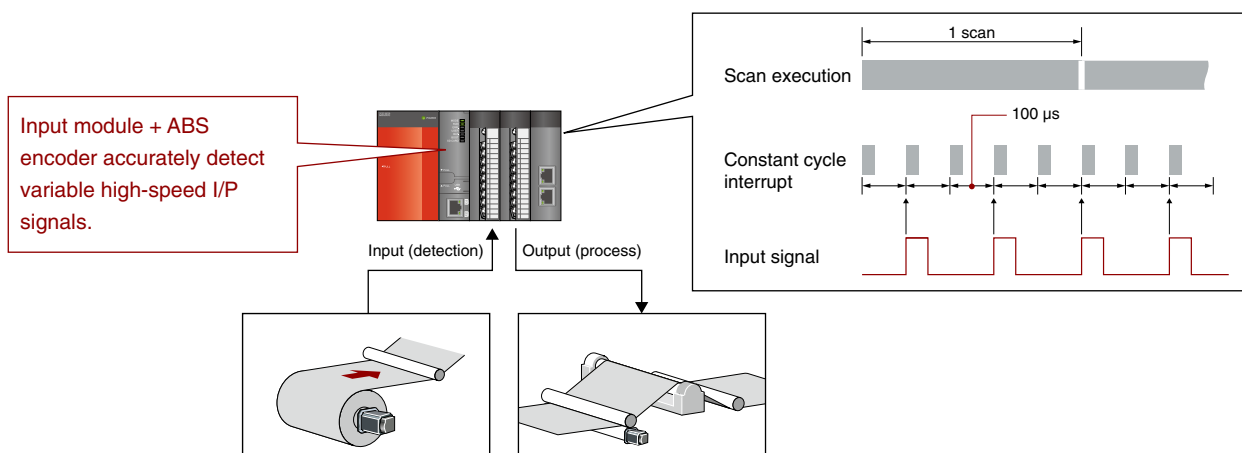
## ■ Data processing

High-speed floating point addition processing supports high-speed and high-precision operation processing. Also, double-precision floating-point operation instruction is included to simplify programming and reduce calculation errors when implementing complex equations.

## ■ Higher system accuracy

Minimal fixed scan interrupt program time is 100  $\mu$ s\*. High-speed I/O signals resulting in high-accuracy control system.

Example: High-speed position detection of film paper feed system

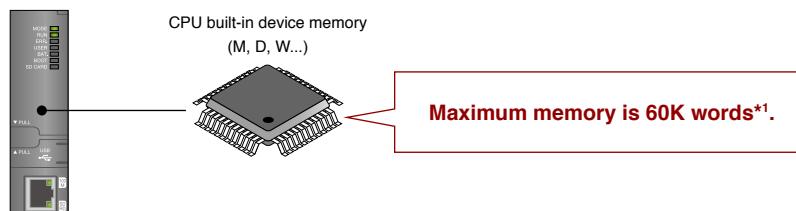


\*1: Only supported by High-speed Universal model QCPU and Universal model process CPU.

# Productivity

## ■ Basic functions

The maximum CPU's built-in device memory capacity is 60K words<sup>\*1</sup>. Support increasing control and quality data.

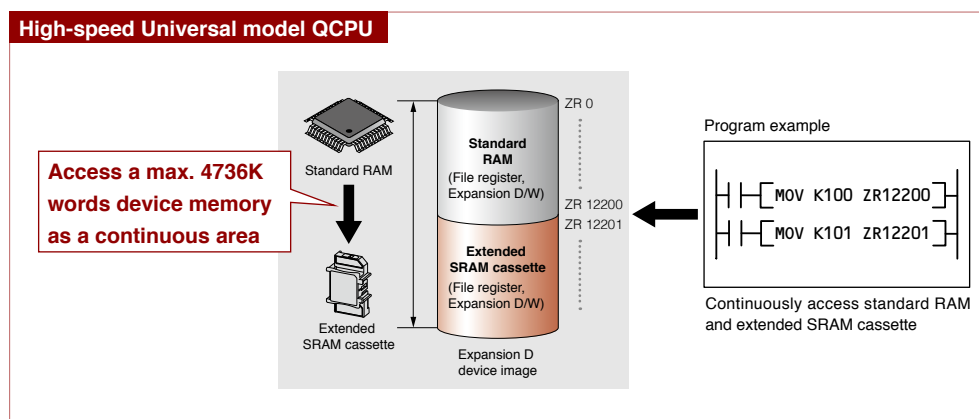


<sup>\*1</sup>: Only for Q13UDVCPU and Q26UDVCPU.

## ■ Large data volume at high-speed

When an 8 MB extended SRAM cassette 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 the device memory is insufficient, the file register area can be expanded easily by installing the extended SRAM cassette.



## ■ File register capacity<sup>\*2</sup>

| Model                                                           | Q03UDV                | Q04UDV                 | Q06UDV                 | Q13UDV                  | Q26UDV                  |
|-----------------------------------------------------------------|-----------------------|------------------------|------------------------|-------------------------|-------------------------|
| Extended SRAM cassette not installed<br>(Standard RAM capacity) | 96K words<br>(192 KB) | 128K words<br>(256 KB) | 384K words<br>(768 KB) | 512K words<br>(1024 KB) | 640K words<br>(1280 KB) |
| with Q4MCA-1MBS (1 MB) <sup>*3</sup>                            | 608K words            | 640K words             | 896K words             | 1024K words             | 1152K words             |
| with Q4MCA-2MBS (2 MB) <sup>*3</sup>                            | 1120K words           | 1152K words            | 1408K words            | 1536K words             | 1664K words             |
| with Q4MCA-4MBS (4 MB) <sup>*3</sup>                            | 2144K words           | 2176K words            | 2432K words            | 2560K words             | 2688K words             |
| with Q4MCA-8MBS (8 MB) <sup>*3</sup>                            | 4192K words           | 4224K words            | 4480K words            | 4608K words             | 4736K words             |

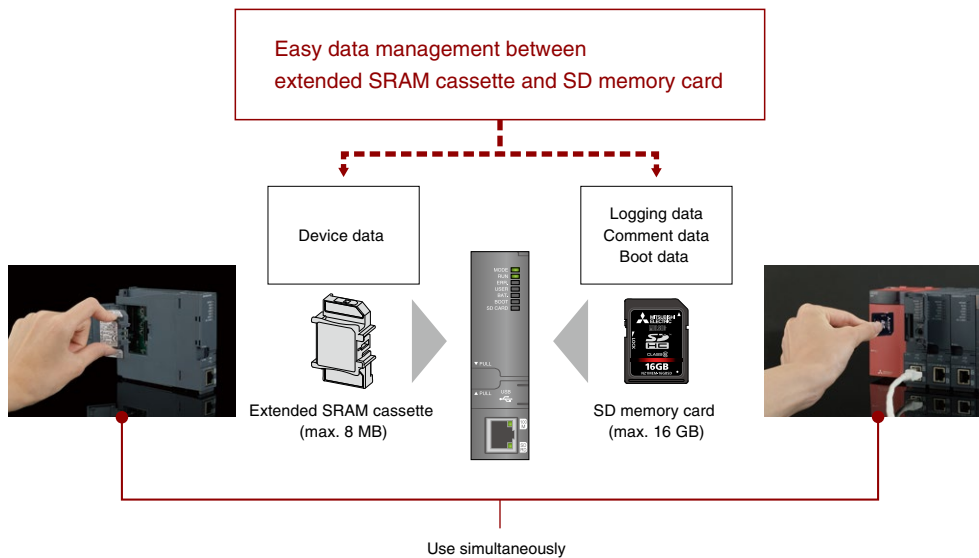
<sup>\*2</sup>: Maximum capacity when using extended SRAM cassette file as a file register. Total when CPU's standard RAM and extended SRAM cassette are installed.

<sup>\*3</sup>: Only High-speed Universal model QCPU.



## ■ SD memory card

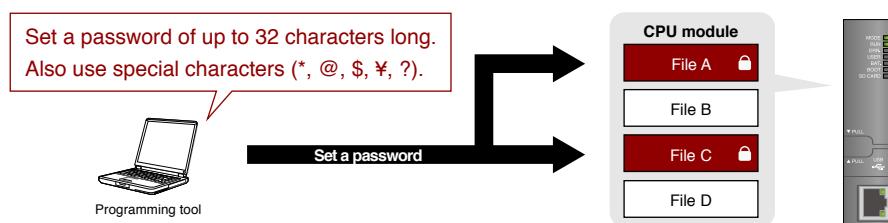
SD memory card is supported allowing easy data exchange with a personal computer. The SD memory card and extended SRAM cassette can be used at the same time allowing extension of file registers (with extended SRAM cassette), data file logging, boot data, and storing of large comment data (SD memory card).



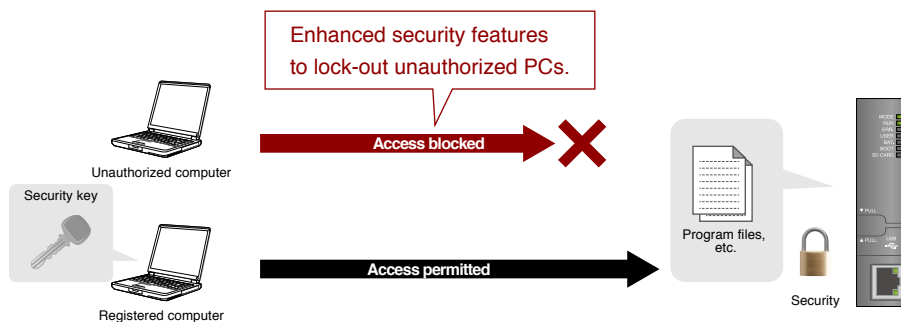
## ■ Protect important data

A max. 32-character file password can be set\*1.

Special characters (\*, @, &, etc.) can be used in addition to alphanumeric characters making it difficult to compromise the password.



Also protection of valuable intellectual property can be enhanced by only allowing preregistered devices to access the CPU, blocking out unauthorized users\*2.



\*1: Only supported by High-speed Universal model QCPU and Universal model process CPU. Other models use 4 character password system.

\*2: Only supported by High-speed Universal model QCPU and Universal model process CPU.



## User-friendly

### Data logging function

Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV

### Display collected data on a computer or GOT (HMI)



Logging data display and analysis tool  
GX Log Viewer

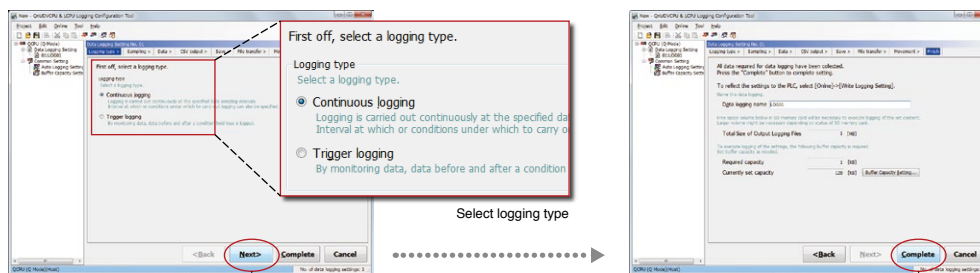


GOT log viewer function

### ■ Easy logging without a program

Save collected data in CSV format on an SD memory card just by completing easy settings with the dedicated setting tool wizard. Various reference materials including daily reports, form creation and general reports can be created easily within the saved CSV file. This data can be used for a wide variety of applications requiring traceability, production data, etc.

#### ■ Setting with Wizard screen

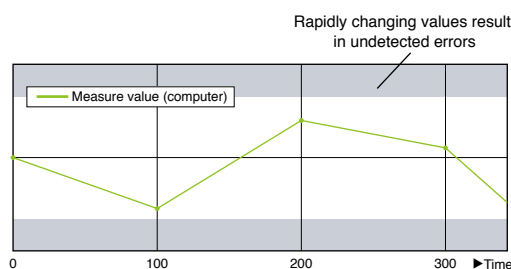


Enter settings according to the wizard.  
Click "Next" button to complete.

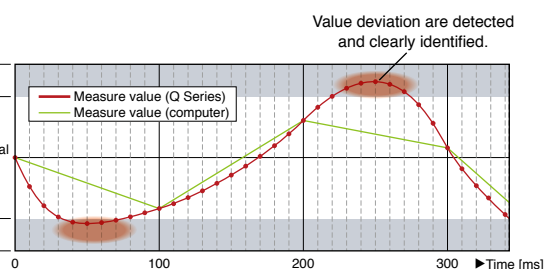
### ■ Logging of control data variances

Data is collected during each scan or within millisecond intervals allowing detection of control deviation even at very high speeds. Therefore, identification of errors can be conducted faster and in more detail.

#### ■ Generic sample data from a computer or external device at 100 ms intervals



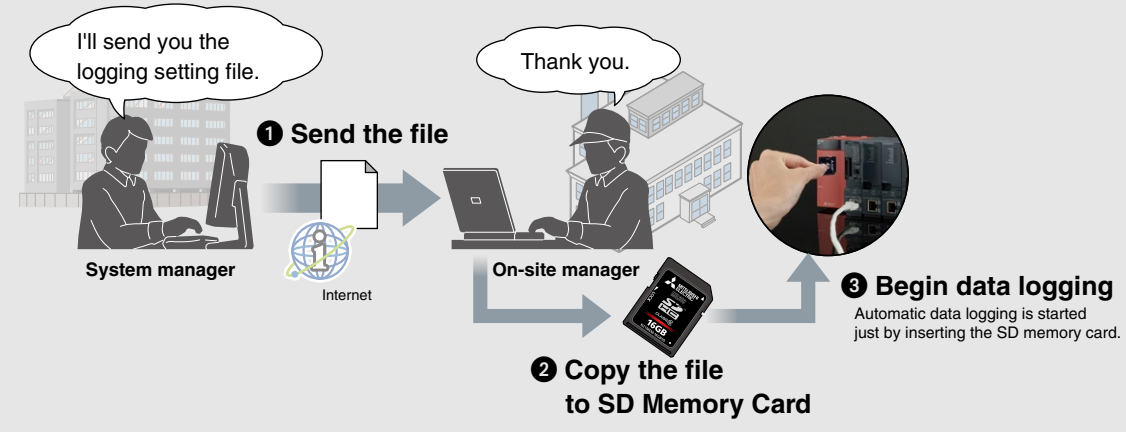
#### ■ Q Series CPU data logging function is capable of sampling data at much higher intervals as to detect fast changing values.



## ■ Automatic logging just by using an SD memory card

Automatic data logging realized just by inserting the SD memory card into the CPU, which is achieved as the memory card includes the logging configuration file. Instructing data logging remotely is also realized just by sending the configuration file by e-mail and copying onto the SD memory card.

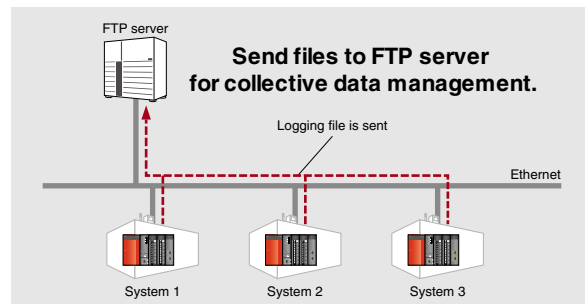
Example: Quickly setup for automatic data logging on-site



## ■ Automatically send logging files to FTP server

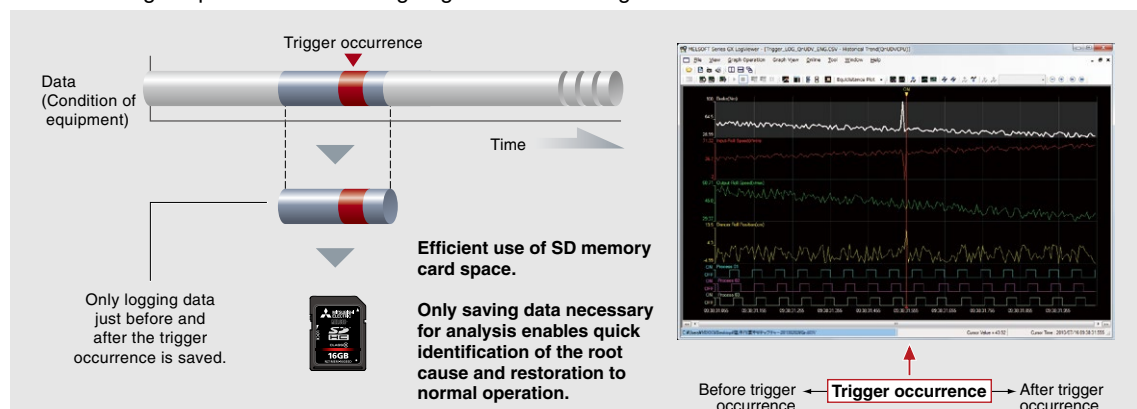
Data logging files stored on the SD memory card can be sent to FTP server just by making a simple setting with the Logging configuration tool. As the logging server can handle multiple files, management and maintenance tasks can be reduced.

■ File transfer feature



## ■ Quick troubleshooting response

Error causes and solutions can be quickly done as only the required data related to the problem is extracted, without having to spend time on filtering large volumes of diagnostic data.



### “GX LogViewer\*1” and “Logging configuration tool\*2” available for free

To obtain a copy of GX LogViewer and Logging configuration tool, please contact your local Mitsubishi Electric representative.

\*1: Refer to page 58 for details on GX LogViewer.  
\*2: The logging configuration tool is enclosed with GX Works2.



# User-friendly

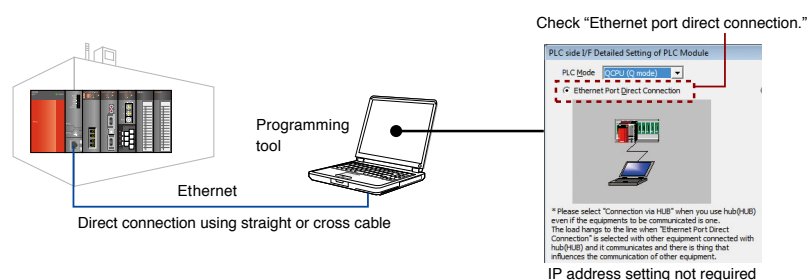
## CPU modules with Built-in Ethernet Port

Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV

Q03UDE, Q04UDEH, Q06UDEH, Q10UDEH, Q13UDEH, Q20UDEH, Q26UDEH, Q50UDEH, Q100UDEH

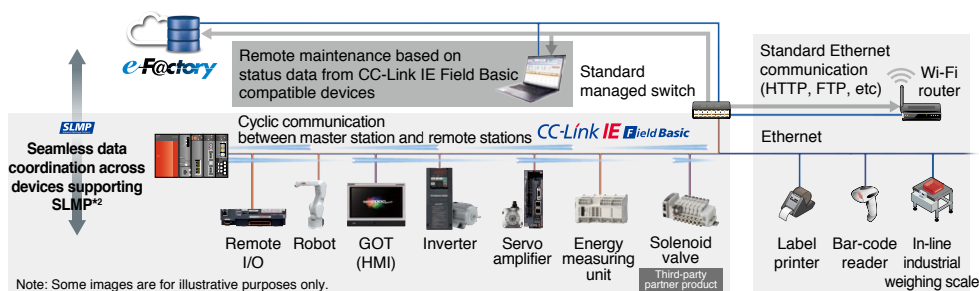
### ■ Easily connect to CPUs via Ethernet

IP address settings are not required to connect to CPU modules directly (one-to-one connection) using GX Works2 or GX Developer. Both straight and cross cables can be used, and are automatically identified by the CPU module. Therefore this connection method is as easy as using USB. Even operators who are not familiar with network settings can easily establish a connection.



### ■ CC-Link IE Field Network Basic does not require network module

Programmable controller CPUs with an embedded Ethernet port can be used as a master station<sup>\*1</sup>, eliminating the need for an additional network module. The network can be configured with a minimum number of modules reducing space and hardware cost.

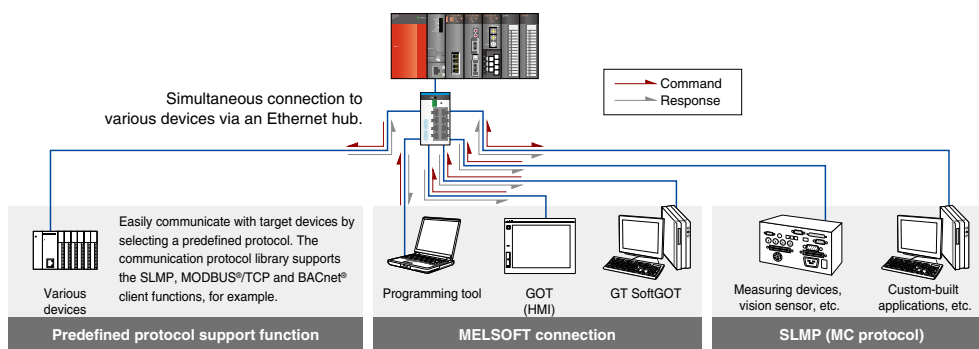


\*1: Only supported by High-speed Universal model QCPU and Universal model process CPU.

\*2: SLMP:Seamless Message Protocol

### ■ Easily connect to BACnet® and MODBUS®/TCP

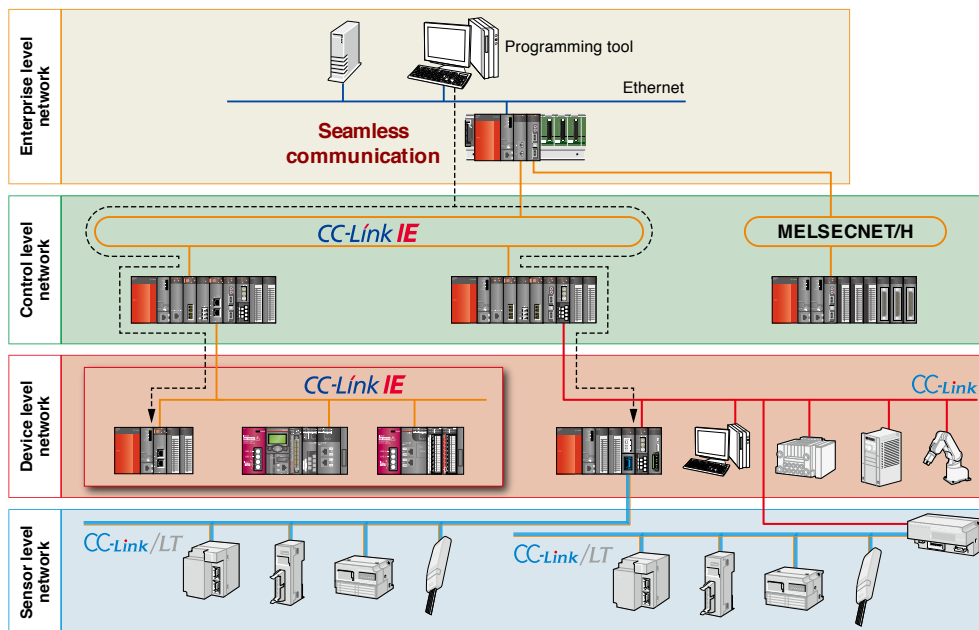
Ethernet realizes a high-speed connection, such as communication with external devices. By using predefined protocol support function<sup>\*3</sup>, various devices that require open network protocol support, such as BACnet® and MODBUS®/TCP are supported.



\*3: Only supported by High-speed Universal model QCPU and Universal model process CPU.

## Seamless communication across all layers

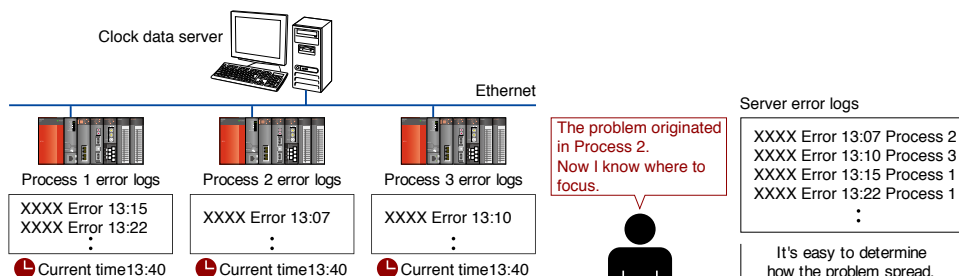
The Universal model QCPUs support a multitude of networking technologies including the high-speed, high-capacity CC-Link IE Control Network and CC-Link IE Field Network. Along with MELSECNET/H, Ethernet, and CC-Link, these networks may be accessed seamlessly beyond network type or hierarchy. Each programmable controller on the network can be accessed for programming and maintenance duties by using a personal computer with the appropriate engineering tools connected via Ethernet.



## Accurate clock data

The CPU module's clock is automatically corrected with the SNTP\*1 clock synchronization function. When CPU clock data is reliably synchronized between systems, any time-stamped events or errors that involve more than one CPU can be easily understood in terms of their order of occurrence and relationship.

\*1: SNTP Simple Network Time Protocol



## Program-less device data transfer

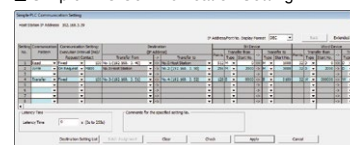
### Simple PLC communication function\*2

Using the programming tool, a simple parameter setting is all that is needed to transfer device data such as production information with no programming required.

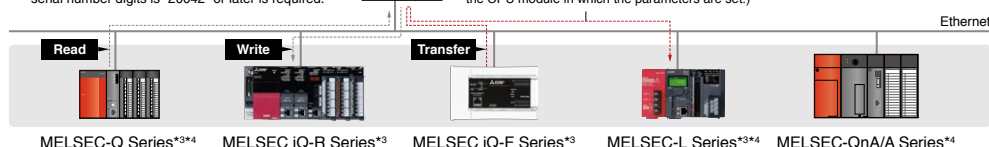
This function makes it possible to easily establish communications not only with Q Series, but also MELSEC iQ-R Series, iQ-F Series, L Series and QnA/A Series controllers.

\*2: QnUDVCPU or QnUDPVCPU module whose first five serial number digits is "20042" or later is required.

### Simple PLC Communication Setting



Data communication is also possible between the CPU modules in which the parameters are not set. (In that case, the data communication is done through the CPU module in which the parameters are set.)



\*3: Built-in Ethernet port CPU is supported.

\*4: CPU module and Ethernet interface module are supported.

# User-friendly

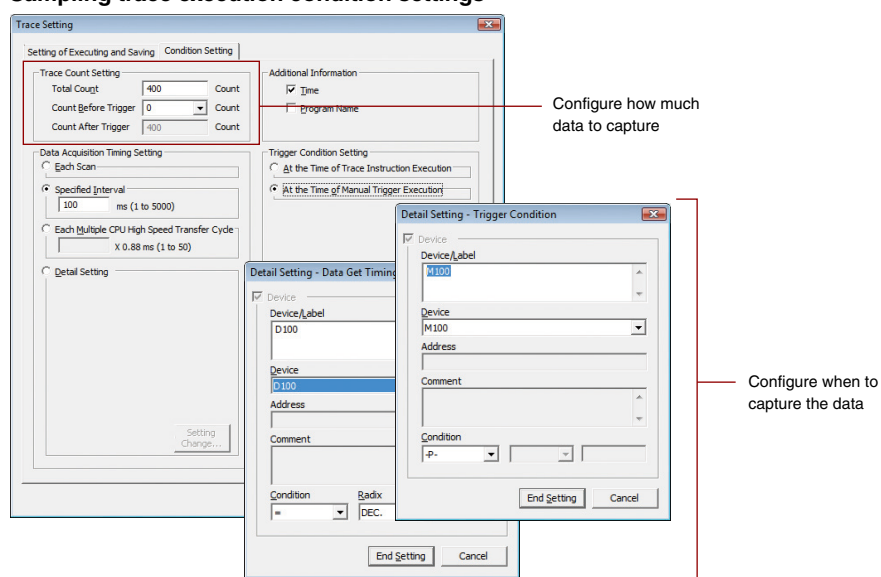
## ■ Sampling trace function\*1

The sampling trace function is a useful diagnostic tool for analyzing error data, and sequence of events for program debug, etc. It can help reduce the overall time required for startup and commissioning of equipment.

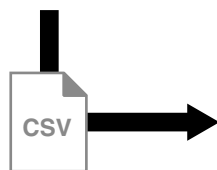
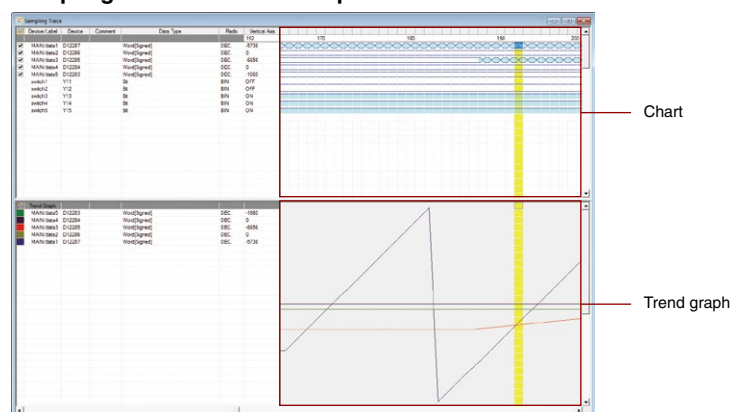
In the multiple CPU configuration it can help to determine the timing and transfer of data between CPU modules. Collected data can be easily analyzed within the programming software tool with differences in word device and bit device values conveniently shown in chart and graph form.

In addition, the results from sampling trace can be exported to GX LogViewer CSV file format for analysis within the software.

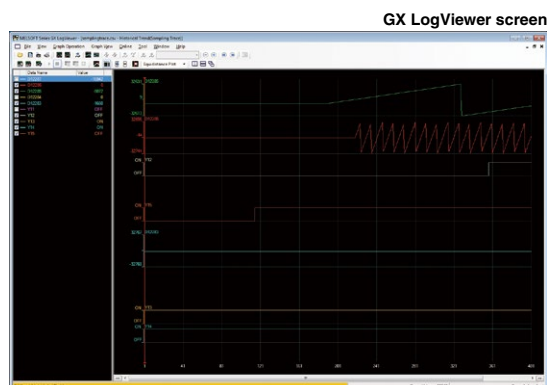
### Sampling trace execution condition settings



### Sampling Trace window: example results



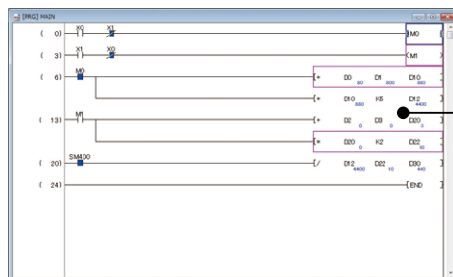
Display in GX LogViewer



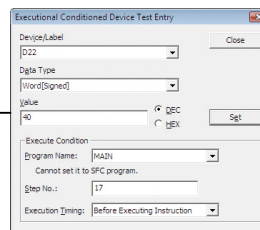
\*1: Not supported by Q00UJ.

## ■ Debugging process

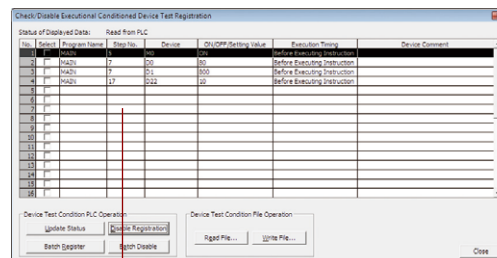
Universal model CPUs have the ability to use the “Executorial conditioned device test” function, which automatically sets device values to user specified values at any step during program simulation. Traditionally, to simulate real I/O or other device value change, a separate program would need to be written to perform debugging. By using the “Executorial conditioned device test” function, it is possible to debug even small portions of simple ladder programs without the need to modify the program or add rungs of ladder. Therefore, debugging can be completed faster and easier.



Devices that have been added to the executorial conditioned device test are highlighted by a pink box for easy identification.



Configure the device setting by choosing the step No. and execution timing (before/after instruction execution).



A list of all devices being controlled by the function is automatically generated and can be saved and recalled for further debugging at a later time.

## ■ Device point assignment

### Extended range of bit devices

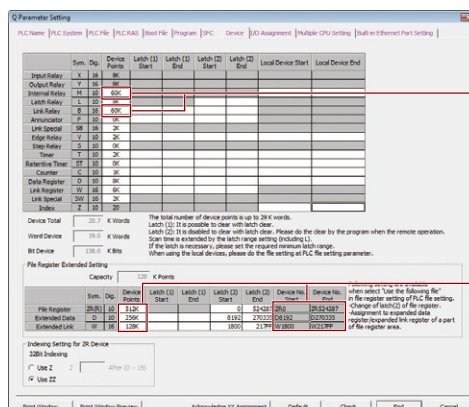
Bit devices, internal relay (M) and link relay (B), can now be assigned up to 60K points each.

Previous models are limited to 32K points.

The total number of device points remains the same, however greater flexibility of device utilization and programming is achieved.

### File register extended setting: data registers and link registers\*1

The number of Data Register (D) and Link Register (W) device points can be extended using standard ROM or a memory card. Previous models only allow the extension of File Register (R/ZR) device points. Using this setting, it is easy to create more data or link registers to accommodate program changes, etc.



**Extended range of bit devices**  
Internal relays (M) and link relays (B) can be assigned up to 60K points.

**File register extended setting**  
For example, the 896K points of word devices in the standard ROM area of a Q100UDEHCPU can be divided as follows.

- File register (R): 512K points
- Extended data register (D): 256K points
- Extended link register (W): 128K points

\*1: Not supported by Q00UJ.



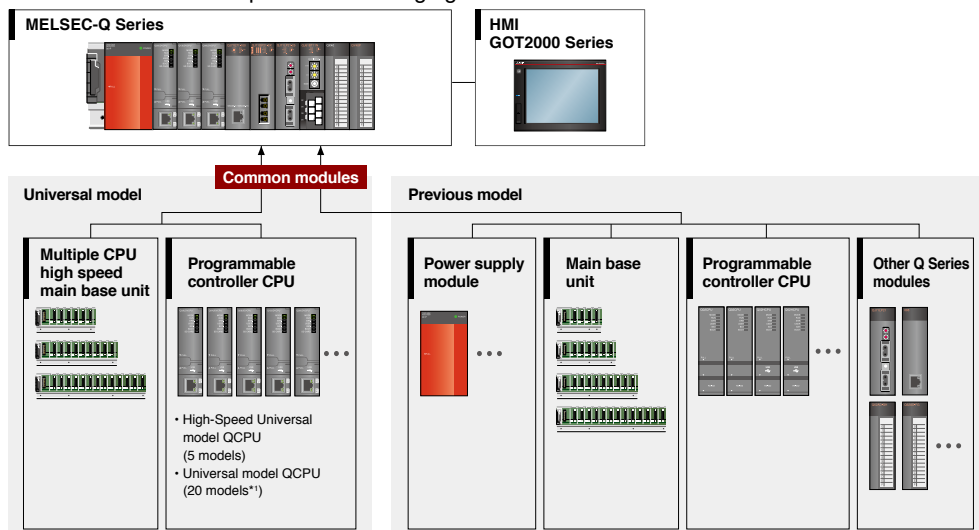
# Maintenance cost



## ■ Compatibility

### Use existing Q Series modules

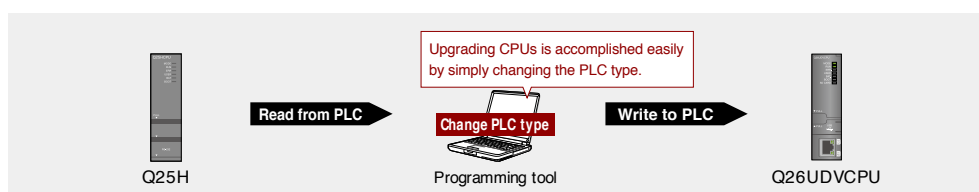
Conventional Q Series modules are compatible with the Universal model QCPU Series. Therefore, when requiring an upgrade, system maintenance costs of existing systems can be kept to a minimum with little disruption when changing over.



\*1: The Q00UJCPU is all-in-one type, with integrated power supply, 5-slot base unit, and CPU.

### Use existing Q Series programs

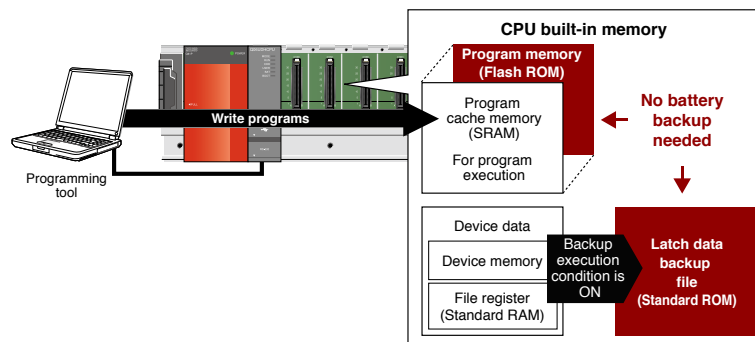
Conventional QCPU programs can be used just by changing the PLC type\*2 within the programming tool, which enables easy upgrade to the Universal model Series with little re-engineering required.



\*2: Depending on the program, the number of steps may vary when the PLC type is changed.

## ■ Automatically backup critical data

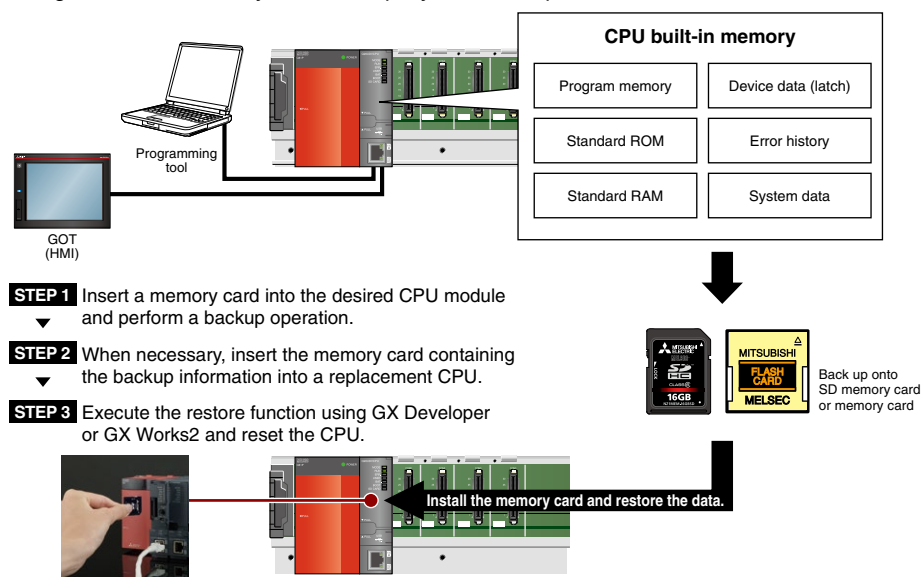
Programs and parameter files are automatically backed up to the program memory (Flash ROM) which does not require battery backup. This prevents loss of program and parameter data owing to failure in battery replacement. Also, back-up of important data such as device data can be registered to the standard ROM in order to prevent data loss due to a flat battery in case of planned outage during consecutive holidays. The backup data is restored automatically when the power is restored.



## ■ Shorten system down recovery time

### CPU module change function\*1

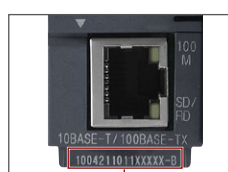
The CPU module change function allows the user to create a comprehensive backup of all CPU information to a memory card. In the unlikely event of a CPU failure or other catastrophic event, the backup data can be used to quickly program a new CPU module. Using this function, the system can rapidly be made operational and downtime can be minimized.



\*1: Not supported by Q00UJ, Q00U and Q01U.

## ■ Serial numbers

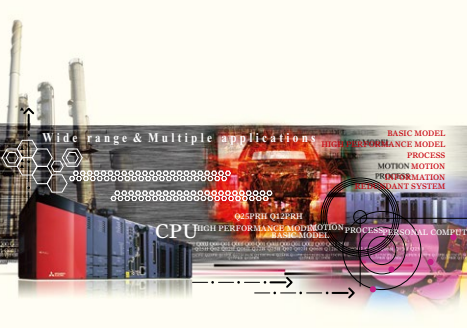
Serial numbers can be checked quickly without having to remove them from the base unit (No interruption of operation is necessary). Also, serial numbers may be checked using the “product information list” feature included in GX Developer and GX Works2.



Serial numbers are located on the bottom front of modules

| Base | Slot | Type | Series | Model Name | Point | I/O Address | Master PLC | Serial No.       | Ver. | Production Number |
|------|------|------|--------|------------|-------|-------------|------------|------------------|------|-------------------|
| 0    | 0    | CPU  | Q      | Q00UCPU    | -     | -           | -          | 1003200000000000 | B    | 1003251006000000  |
| 0    | 1    | -    | -      | Empty      | -     | -           | -          | -                | -    | -                 |
| 0    | 2    | -    | -      | Empty      | -     | -           | -          | -                | -    | -                 |
| 0    | 3    | -    | -      | Empty      | -     | -           | -          | -                | -    | -                 |
| 0    | 4    | -    | -      | Empty      | -     | -           | -          | -                | -    | -                 |

The serial numbers of connected modules appear in the Product Information List and can be exported in CSV format.



## Multiple CPUs ideal for distributed control and distributed function

The MELSEC-Q Series offers programmable controller, process, redundant, C language, motion, robot and CNC CPUs to cover various different control requirements.

With the multiple CPU configuration, a best-fit control system can be realized. In addition, high availability systems can be easily realized with the high-reliability redundant system range.

### CPU Lineup



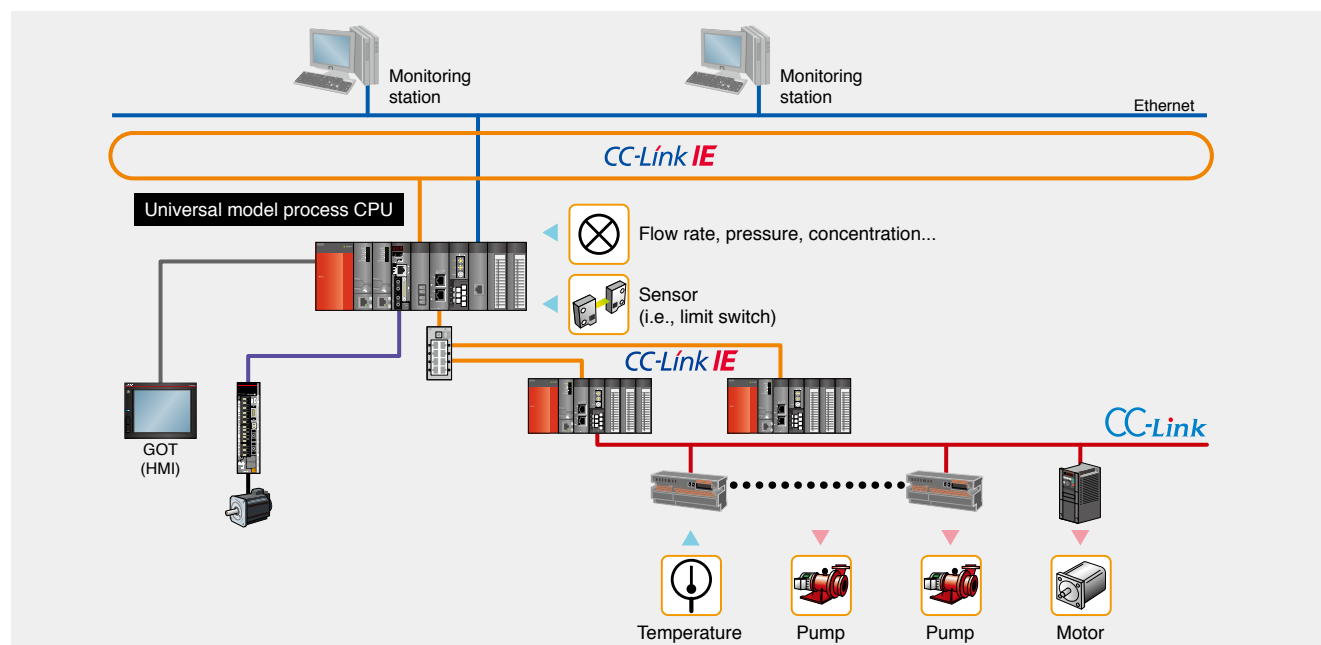
## MELSEC PROCESS

MELSEC process control is a flexible, highly reliable platform with advanced functionality designed to cost-effectively meet the needs of a wide range of industries.

### Detailed instrument control to match the process state

- Universal model process CPU..... Q04UDPVCPU, Q06UDPVCPU, Q13UDPVCPU, Q26UDPVCPU

MELSEC process controllers offer features that rival those of costly DCS systems at a fraction of the cost. A single CPU can control a large number of PID loops while simultaneously performing standard sequence control. In addition, PX Developer now supports GX Works2 programming software.



## Redundancy

### ● Redundant CPU.....Q12PRHCPU, Q25PRHCPU\*1

The redundant systems are designed to provide the users with systems that have the properties of Q Series and are not affected by sudden failures. The basic system including CPU module, power supply module, main base unit and network module is redundant to prevent system down. Programming can be performed without consciousness of redundancy.

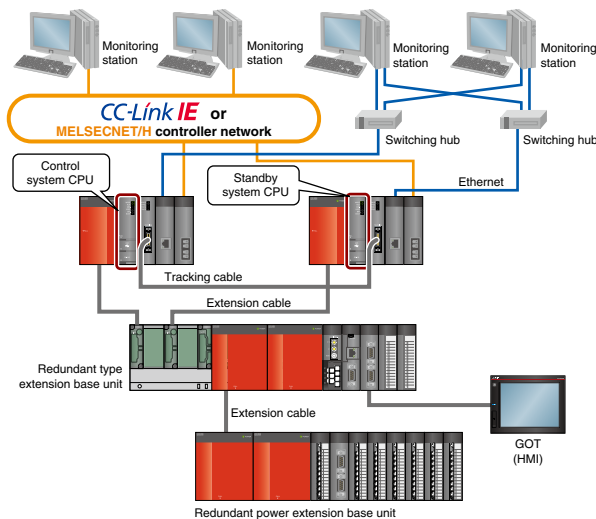
In addition, PX Developer now supports GX Works2 programming software.

With this connection between the two software, both sequence control and loop control programs can be used in the redundant CPU.



#### Redundant local I/O system

The CPU directly accesses I/O modules.  
Ideal for systems requiring high-speed response.



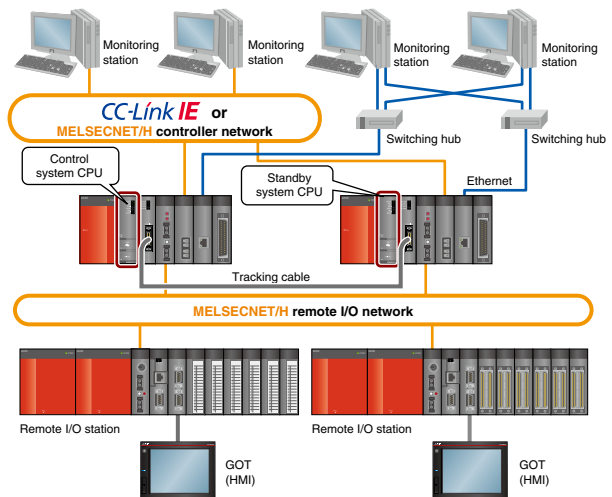
#### System switching time (Reference)

**Approximately 50 ms (Local I/O response time)**

- Standby CPU tracking data acquisition time
- CPU switching time: Min. 32 ms (without signal flow tracking)

#### Redundant remote I/O system

Ideal for distributed systems with multiple remote I/O stations.



#### System switching time (Reference)

**Approximately 800 ms (Remote I/O response time)**

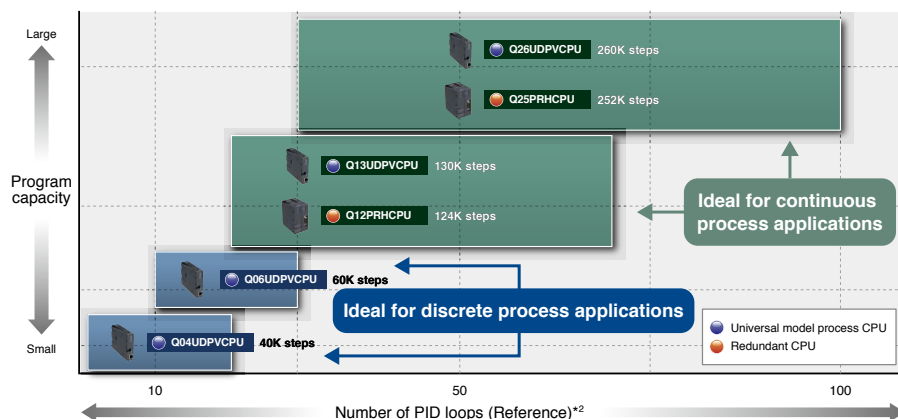
- Standby CPU tracking data acquisition time
- Output holding time of remote I/O station during control system switching: 700 to 800 ms
- CPU switching time: Min. 21 ms (without signal flow tracking)

#### Discrete process control

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

#### Continuous process control

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



\*1: Production will be discontinued in September 2022.

\*2: The number of PID loops may change if programs (other than loop control) are large. Refer to the PX Developer Version 1 Programming Manual or Process Technical Guide for details.



## Pre-installed systems with the C Controller

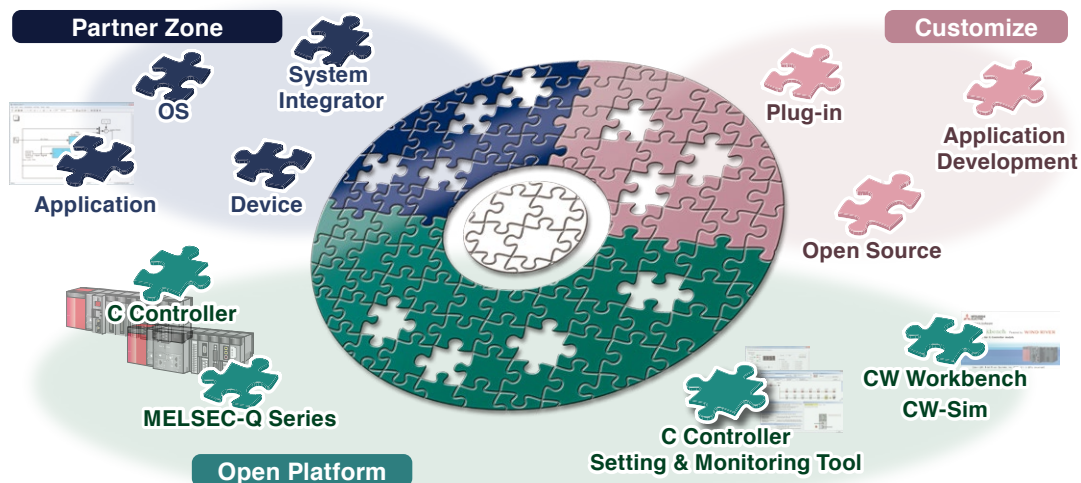
### ● C Controller CPU.....Q24DHCCPU-V, Q24DHCCPU-VG<sup>\*1</sup>, Q24DHCCPU-LS, Q26DHCCPU-LS, Q12DCCPU-V

The C Controller is a generic open platform controller that can execute C language type programs, based on the MELSEC system architecture. It utilizes industrial performance such as long term parts supply, high availability, and advanced functionality. The high-end model Q24DHCCPU-V/-VG comes pre-installed with VxWorks®, and supports advanced information processing and control system I/O. The standard model Q12DCCPU-V is a space saving controller that realizes high-speed I/O control. The Q24DHCCPU-LS and Q26DHCCPU-LS are OS independent controllers. Linux® based control can be easily realized by installing third-party partner OS, supporting advanced information processing with a user interface environment close to conventional personal computers. Wide scope of applications are realized with the availability of these controllers, used together with MELSEC-Q Series I/O modules, third-party products, open source, and customized applications/programs. Providing freedom with a robust, easier and high-performance system.

<sup>\*1</sup>: Set product (Q24DHCCPU-VG-B000/B002) with GENWARE® 3-VG by International Laboratory Corporation.

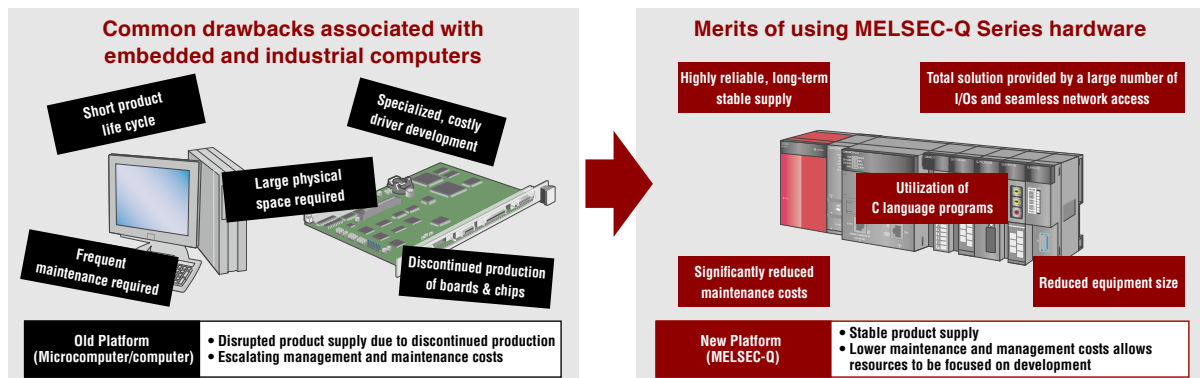
#### Ideal for a diverse range of systems, based on a generic platform architecture

Leveraging the C Controller to realizing customized systems, by utilization of third-party applications, installation of third-party partner OS, utilization of programs, and open source applications.



#### The C Controller overcomes the overheads associated with maintaining embedded computers (micro boards, etc.) and industrial computers realizing a cost effective solution.

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

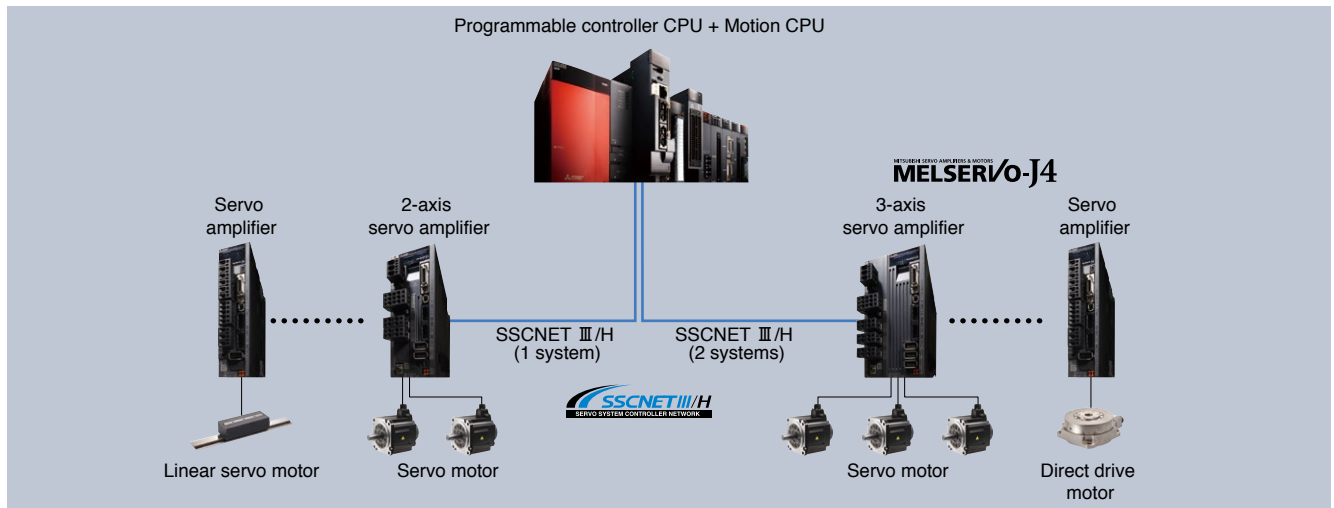




## Connecting with servo amplifiers and servo motors

### ● Motion CPU ..... Q173DSCPU, Q172DSCPU

Each MELSEC-Q Series Motion controller is capable of high-speed control of up to 32 axes (96 axes when using three CPUs together). Each Motion CPU is the same size as a standard Q Series programmable controller. The new generation Motion controller is packed with advanced functions while saving space with its smaller size.



## Automating production sites with robots

### ● Robot controller ..... CR800-Q

The iQ Platform compatible robot controller increases the speed of data communications between CPUs and dramatically reduces I/O processing times using a high-speed standard base between multiple CPUs.

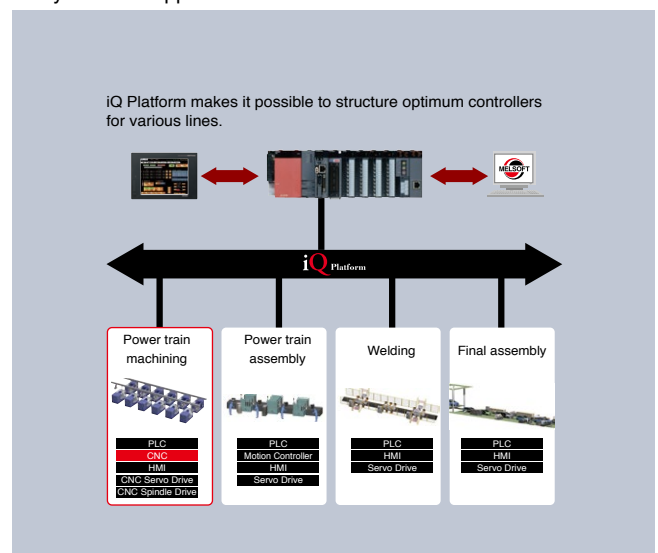


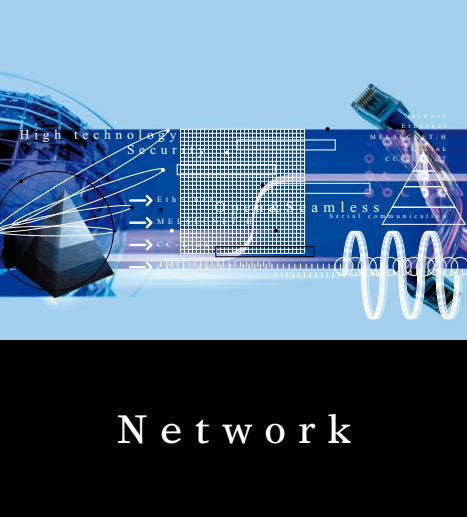
## Integrating the CNC with programmable controller

### ● CNCCPU ..... Q173NCCPU

This CNC controller is part of the Mitsubishi FA integration solution "iQ Platform".

The integration of the high-performance CNC and high-speed programmable controller helps reduce the total operation cycle time. Supporting a wide range of interface and I/O modules flexible to many different applications.

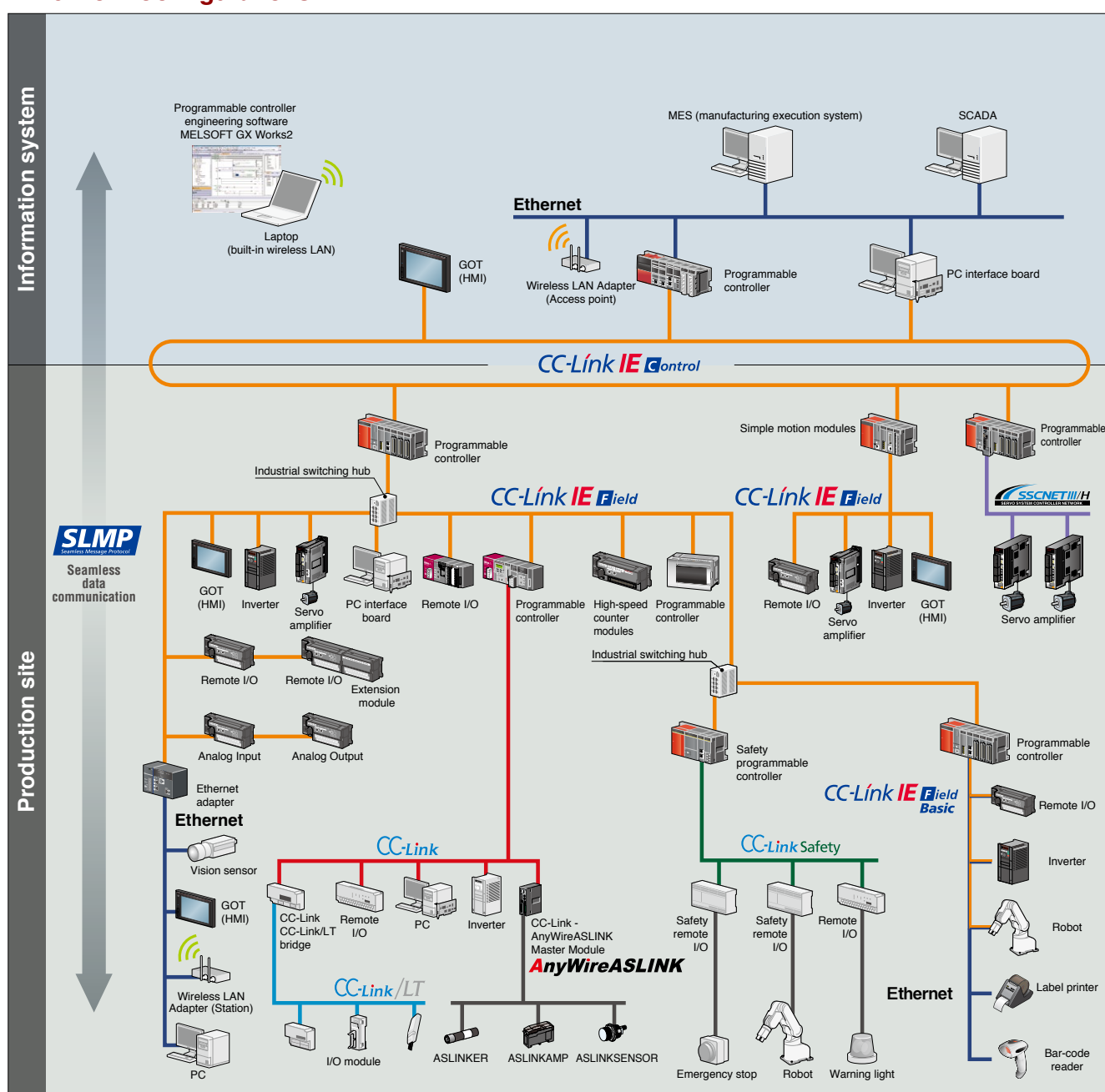




## Optimum network scalable to fit any application size

Enhanced information communication by networking is the essential requirement in the automation industry. The MELSEC-Q Series provides an open and seamless network environment integrating the following different level of automation networks: CC-Link IE; high-speed and large capacity Ethernet-based integrated open network that connects shop floor and IT system as the core of e-F@ctory, CC-Link; SEMI certified global standard network originating from Japan and Asia, CC-Link/LT; wire-saving sensor level network inherited CC-Link design concept, and AnyWire; sensor level distributed control network.

### Network Configurations

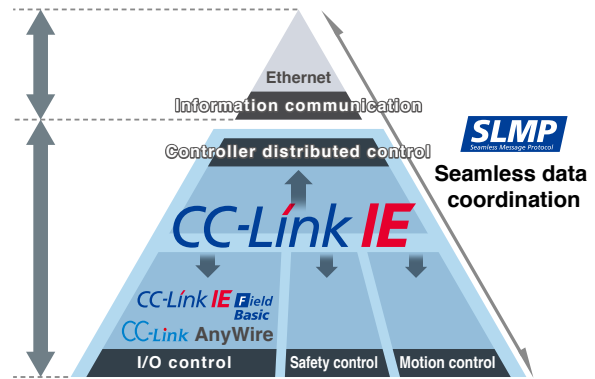


## Seamless communication

Seamless data communication through Ethernet, CC-Link IE, and CC-Link allow easy access to information, no matter where it resides on the network. Through this technology, it is possible to “drill down” from the Enterprise or IT layer through multiple networks accessing programming controllers using GX Works2 programming or other related software.

In addition, many devices supporting SLMP\*1 such as vision sensors and RFID controllers may be connected to the CC-Link IE.

\*1: SLMP (Seamless Message Protocol) is a protocol advocated by the CC-Link Partner Association.



### CC-Link IE Control

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

\*: Compatible modules: QJ71GP21-SX, QJ71GP21S-SX

### CC-Link IE Field

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

\*: Compatible modules: QJ71GF11-T2, QJ71GF11-T2 (safety control), QD77GF4, QD77GF8, QD77GF16 (motion control)

### CC-Link IE Field Basic

CC-Link IE Field Network Basic realizes easier network integration, as its cyclic communications stack is software-based, without requiring a dedicated ASIC helping to reduce implementation costs for device partners. CC-Link IE Field Network Basic, which is a part of CC-Link IE, realizes easier connection of Ethernet devices.

\*: Compatible modules: QnUDVCPU, QnUDPVCPU

### CC-Link

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

\*: Compatible module: QJ61BT11N

### CC-Link Safety

CC-Link Safety is a safety field network that prevents risks on the shop floor. This realizes a highly-reliable and a high-speed communication with less wiring.

\*: Compatible modules: QS0J61BT12

### CC-Link/LT

CC-Link/LT is a wire-saving sensor level network which is designed for use in panels between simple discrete devices. Its wiring system is based on reducing incorrect wiring and is based on CC-Link realizing high-speed and robust noise resistance features.

\*: Compatible module: QJ61CL12

### AnyWireASLINK

AnyWireASLINK makes it possible to centrally monitor (visibility) the state of all sensors from the programmable controller, by that improving productivity and reducing operation steps.

\*: Modules supporting AnyWireASLINK: QJ51AW12AL, NZ2AW1C2AL

### SSCNET III/H

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

\*: Compatible modules: QD77MS2, QD77MS4, QD77MS16

### BACnet®

This network supports the communication protocol standard BACnet® client function. This network is mainly used to monitor and control air-conditioning, lighting and fire detection, etc. in building automation system applications.

\*: Compatible modules: QnUDVCPU, QJ71E71-100 (client only)

### MODBUS®

Q-Series is now supporting the MODBUS® protocol network, realizing easy communication, with various MODBUS® slave devices compatible with Ethernet MODBUS®/TCP or RS-232/422/485 serial communication.

\*: Module supporting MODBUS®/TCP : QJ71MT91 (master/slave functions), QnUDVCPU, QJ71E71-100 (master only)

\*: Modules supporting MODBUS®: QJ71MB91 (master/slave functions), QJ71C24N (-R2/R4) (master only)

| Network \ Application          | Enterprise level network  | Control level network          | Device level network |                |                | Sensor level network |
|--------------------------------|---------------------------|--------------------------------|----------------------|----------------|----------------|----------------------|
|                                | Information communication | Controller distributed control | I/O control          | Safety control | Motion control | Control              |
| Ethernet                       | ●                         |                                |                      |                |                |                      |
| CC-Link IE Control             |                           | ●                              |                      |                |                |                      |
| CC-Link IE Field               |                           | ●                              | ●                    | ●              | ●              |                      |
| CC-Link IE Field Network Basic |                           |                                | ●                    |                |                |                      |
| CC-Link                        |                           |                                | ●                    |                |                |                      |
| CC-Link Safety                 |                           |                                |                      | ●              |                |                      |
| CC-Link/LT                     |                           |                                |                      |                |                | ●                    |
| AnyWireASLINK                  |                           |                                |                      |                |                | ●                    |
| SSCNET III/H                   |                           |                                |                      |                | ●              |                      |
| BACnet®                        | ●                         |                                |                      |                |                |                      |
| MODBUS®/TCP                    |                           | ●                              |                      |                |                |                      |
| MODBUS®                        |                           |                                | ●                    |                |                |                      |



## Distributed control network designed for large bandwidth and high-speed

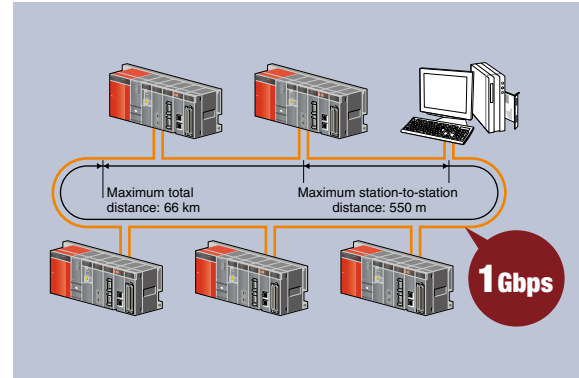
### ● CC-Link IE Control Network module

Standard model..... **QJ71GP21-SX**

With external power supply function..... **QJ71GP21S-SX**

- » Commercially available Ethernet components can be used for significant cost savings over alternative networks.
- » Deterministic, reliable performance helps to reduce operation cycle time. This cyclic data exchange is fixed and will not suffer from degraded performance even when large volumes of data are transferred.
- » Share massive amounts of data between controllers. (Up to 256K bytes of network shared memory per station)
- » The CC-Link IE Control Network modules, QJ71GP21-SX and QJ71GP21S-SX, may be configured as normal stations, or the control station.

**CC-Link IE**



### ■ Performance Specifications<sup>\*1</sup>

| Item                               |    | Specification                                                                         |                                     |
|------------------------------------|----|---------------------------------------------------------------------------------------|-------------------------------------|
| Max. link points per network       | LB | 32K points (32768 points, 4 KB)<br>(Safety CPU: 16K points (16384 points, 2 KB))      |                                     |
|                                    | LW | 128K points (131072 points, 256 KB)<br>(Safety CPU: 16K points (16384 points, 32 KB)) |                                     |
|                                    | LX | 8K points (8192 points, 1 KB)                                                         |                                     |
|                                    | LY | 8K points (8192 points, 1 KB)                                                         |                                     |
| Max. link points per station       | LB | Regular mode                                                                          | Extended mode <sup>*2</sup>         |
|                                    | LW | 16K points (16384 points, 2 KB)                                                       | 32K points (32768 points, 4 KB)     |
|                                    | LX | 16K points (16384 points, 32 KB)                                                      | 128K points (131072 points, 256 KB) |
|                                    | LY | 8K points (8192 points, 1 KB)                                                         | 8K points (8192 points, 1 KB)       |
| Communication speed                |    | 1 Gbps                                                                                |                                     |
| Number of stations per network     |    | 120 (1 control station plus 119 normal stations)                                      |                                     |
| Connection cable                   |    | Optical fiber cable (Multi-mode fiber)                                                |                                     |
| Overall cable distance             |    | 66000 m (When 120 stations are connected)                                             |                                     |
| Station-to-station distance (Max.) |    | 550 m (Core/Clad = 50/125 (m))                                                        |                                     |
| Max. number of networks            |    | 239                                                                                   |                                     |
| Max. number of groups              |    | 32                                                                                    |                                     |
| Network topology                   |    | Ring                                                                                  |                                     |

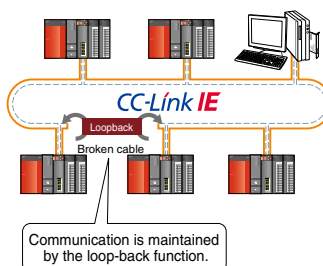
\*1: When the control station is a Universal model QCPU.

\*2: To use extended mode, (QJ71GP21(S)-SX) network modules and Universal model CPUs whose first five serial number digits are 12052 or later are required. All stations in the network must support the extended mode. Also, GX Works2 version 1.34 L or later is required.

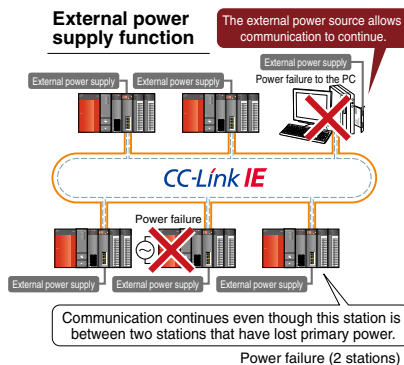
## Designed to continue functioning even in the worst possible scenarios

- The use of fiber optic cables which are completely immune to EMI and RFI noise allows the network to function in environments where other networks cannot. The dual loop design allows the network to continue functioning even if cables become damaged or the power is lost to a station.
- Additionally, CC-Link IE stations can be powered using an external supply. That allows communication to continue normally in the event of a loss of the primary power supply, without relying on the loop-back function.

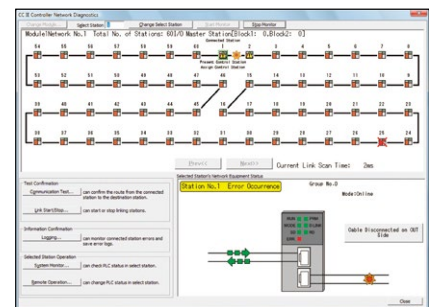
### Loopback function



### External power supply function



### Visual display of network connection status



View the network connection status of entire system to identify problems at a glance. The cause of problems can be quickly identified and suggested remedies implemented to minimize down time.



## CC-Link IE Field Network

### ● CC-Link IE Field Network module..... QJ71GF11-T2

- » Tremendous speed and bandwidth using commercially available cables and connectors. The network design (topology) is highly flexible to fit any layout.
- » Operates as either a master or local station. Perfect for managing remote I/O control and distributed control.
- » Devices from other stations can be accessed easily via transient communication using dedicated instructions.
- » Function blocks for transient communication are available to further simplify messaging.
- » The network can ensure 32-bit data integrity using the station-based block data assurance function. This forces pairs of word data to get updated together during link refresh.
- » The QJ71GF11-T2 CC-Link IE Field Network module can function as a local or master station.

**CC-Link IE**

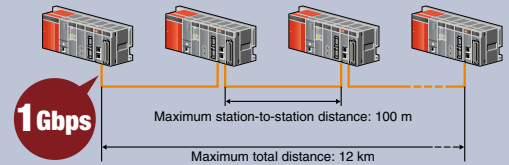
### ■ Performance Specifications

| Item                             | Specification                                                                   |
|----------------------------------|---------------------------------------------------------------------------------|
| Max. link points per network     | RX 16K points (16384 points, 2 KB)                                              |
|                                  | RY 16K points (16384 points, 2 KB)                                              |
|                                  | RWr 8K points (8192 points, 16 KB)                                              |
|                                  | RWw 8K points (8192 points, 16 KB)                                              |
| Max. link points per station     | RX 2K points (2048 points, 256 B)                                               |
|                                  | RY 2K points (2048 points, 256 B)                                               |
|                                  | RWr 1K points (1024 points, 2 KB)                                               |
|                                  | RWw 1K points (1024 points, 2 KB)                                               |
| Communication speed              | 1 Gbps                                                                          |
| Number of stations per network   | 121 (1 master station plus 120 device stations)                                 |
| Connection cable                 | Ethernet cable (Category 5e or higher, double shielded/STP)                     |
| Maximum overall cable distance   | Line topology 12 km (with 1 master station and 120 device stations connected)   |
|                                  | Star topology Depends on the system configuration.*1                            |
|                                  | Ring topology 12.1 km (with 1 master station and 120 device stations connected) |
| Max. station-to-station distance | 100 m                                                                           |
| Max. number of networks          | 239                                                                             |
| Network topology                 | Line, star, line and star mixed, or ring*2                                      |

\*1: Up to 20 hubs can be connected per network.

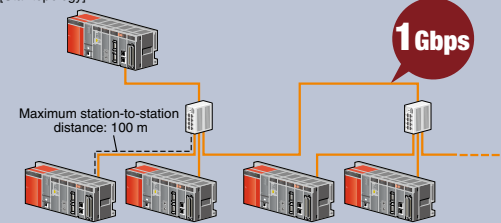
\*2: Ring networks may not be mixed with line or star networks. QJ71GF11-T2 network modules whose first five serial number digits are 12072 or later are required for ring networks. Additionally, GX Works2 version 1.34 L or later is required.

[Line topology]



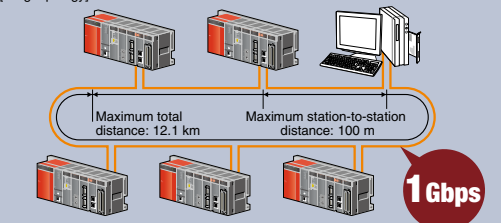
This method of connecting stations has two endpoints where stations are directly connected to each other and no hubs are necessary.

[Star topology]



Star networks are formed by connecting all stations to a hub.

[Ring topology]

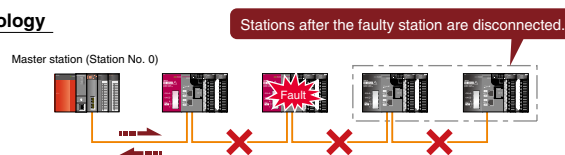


Ring networks have no end points and continue to function even if a connection becomes broken.

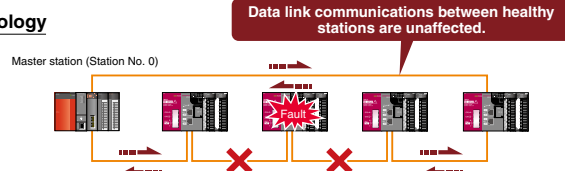
### Easy diagnosis functions

- In certain situations such as power loss, a station could be prevented from communicating. In a line network this can cause perfectly healthy stations can become separated from the network. In a ring network, only the faulty station is separated, thus increasing the system reliability.

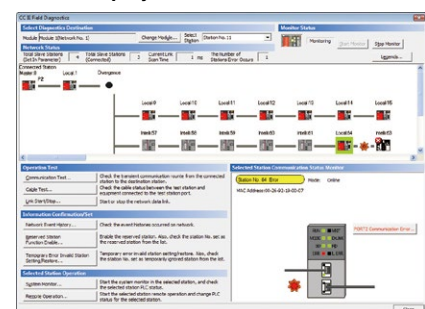
#### Line topology



#### Ring topology



### Visual display of network connection status



The network diagnostic tools in GX Works2<sup>3</sup> allow problems to be identified rapidly. In addition to a visual overview of the network and several other tools, detailed monitoring of CPUs and modules from any station, to any station is possible.

\*3: Not supported by GX Developer.



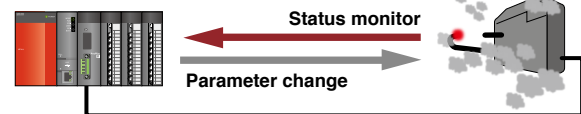
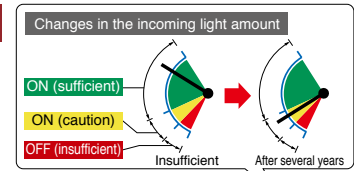


## Preventing intermittent operation stops

AnyWireASLINK can be used to monitor and save the sensor information within the programmable controller. Parameter settings of the AnyWireASLINK can also be changed via the programmable controller. Perform “preventive maintenance” with this function to prevent intermittent stops before they happen.

### Prevent intermittent stops with preventive maintenance

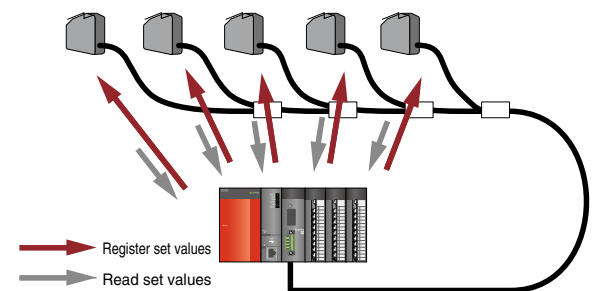
- Start maintenance early by checking the incoming light amount.
- Change the ON/OFF sensitivity to keep operating up to the maintenance period.



## Reducing the setup time, and providing the traceability

AnyWireASLINK enables the set value to be registered at once to multiple sensors via a GOT (HMI) or personal computer. Also, the initial set values can be re-confirmed easily without having to read each sensor individually.

- Register set values to multiple sensors, and automatically read the initial set values.



| Model                                            | QJ51AW12AL                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of connected I/O points                   | Max. 512 points (256 input points/256 output points)                                                                                                                                                                                                                                                                                                                                                 |
| Number of connected modules                      | Max. 128 modules (varies according to each slave module's current consumption)                                                                                                                                                                                                                                                                                                                       |
| Maximum transmission distance (overall length)*1 | 200 m*2                                                                                                                                                                                                                                                                                                                                                                                              |
| Transmission method                              | DC power superimposed total frame cyclic method                                                                                                                                                                                                                                                                                                                                                      |
| Connection style                                 | Bus type (multi-drop method, T-branch method, tree branch method)                                                                                                                                                                                                                                                                                                                                    |
| Transmission protocol                            | Dedicated protocol (AnyWireASLINK)                                                                                                                                                                                                                                                                                                                                                                   |
| Error control                                    | Checksum, double verification method                                                                                                                                                                                                                                                                                                                                                                 |
| Transmission clock                               | 27.0 kHz                                                                                                                                                                                                                                                                                                                                                                                             |
| RAS function                                     | Transmission cable break position detection function,<br>transmission cable short-circuit detection function,<br>transmission power drop detection function                                                                                                                                                                                                                                          |
| Transmission cable (DP, DN)                      | <ul style="list-style-type: none"> <li>• UL compatible universal 2-wire cable (VCTF, VCT 1.25 mm<sup>2</sup>, 0.75 mm<sup>2</sup>, rated temperature 70°C or more)</li> <li>• UL compatible universal cable (1.25 mm<sup>2</sup>, 0.75 mm<sup>2</sup>, rated temperature 70°C or more)</li> <li>• Dedicated flat cable (1.25 mm<sup>2</sup>, 0.75 mm<sup>2</sup>, rated temperature 90°C)</li> </ul> |
| Power cable (24 V, 0 V)*1                        | <ul style="list-style-type: none"> <li>• UL compatible universal 2-wire cable (VCTF, VCT 0.75 mm<sup>2</sup>...2.0 mm<sup>2</sup>, rated temperature 70°C or more)</li> <li>• UL compatible universal cable (0.75 mm<sup>2</sup>...2.0 mm<sup>2</sup>, rated temperature 70°C or more)</li> <li>• Dedicated flat cable (1.25 mm<sup>2</sup>, 0.75 mm<sup>2</sup>, rated temperature 90°C)</li> </ul> |
| Transmission cable supply current*1              | Using 1.25 mm <sup>2</sup> cable: Max. 2 A<br>Using 0.75 mm <sup>2</sup> cable: Max. 1 A                                                                                                                                                                                                                                                                                                             |
| External power supply                            | Voltage: 21.6...27.6 V DC (24 V DC -10...+15%), ripple voltage 0.5 Vp-p or less<br>Recommended voltage: 26.4 V DC (24 V DC +10%)<br>Module current consumption: 0.1 A<br>Transmission cable current supply: Max. 2 A*1                                                                                                                                                                               |

\*1: Refer to the manual for the relation of the overall length, transmission cable (DP, DN) wire diameter and transmission cable current supply. In some slave modules with cables, the wire diameter of the transmission cable (DP, DN) integrated with the module may be 0.75 mm<sup>2</sup> or less.

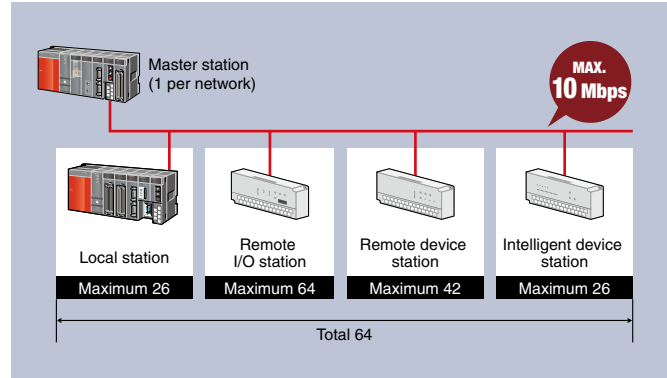
\*2: With the slave module having an integrated transmission cable (DP, DN) and module, the length of the transmission cable (DP, DN) is included in the overall length.



## Open field network with many compatible devices

### ● CC-Link network module .....QJ61BT11N

- » By building on reliable field bus technology, CC-Link is capable of moving large volumes of bit data, like ON/OFF relay status, and word data at high-speed.
- » CC-Link keeps cyclic transmission consistent and guarantees punctuality by separating it from message (transient) communication. Even if message communication becomes saturated, it will not affect the link scan time.
- » The QJ61BT11N module supports CC-Link version 1 and 2, and may be used as a local or master module.



### ■Performance Specifications

| Item                                                   |                         |           | Specification                                                                                                                                                  |
|--------------------------------------------------------|-------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication speed                                    |                         |           | Can select from 156 kbps/625 kbps/2.5 Mbps/5 Mbps/10 Mbps                                                                                                      |
| Transmission path                                      |                         |           | Bus (RS-485)                                                                                                                                                   |
| Maximum number of link points per system <sup>*1</sup> |                         |           | Remote inputs/outputs (RX, RY): 8192 points<br>Remote registers (RWw): 2048 points<br>Remote registers (RWr): 2048 points                                      |
| Maximum number of link points per system               | Expanded cyclic setting | Single    | Remote inputs/outputs (RX, RY): 32 points (30 points for local station)<br>Remote registers (RWw): 4 points<br>Remote registers (RWr): 4 points                |
|                                                        |                         | Double    | Remote inputs/outputs (RX, RY): 32 points (30 points for local station)<br>Remote registers (RWw): 8 points<br>Remote registers (RWr): 8 points                |
|                                                        |                         | Quadruple | Remote inputs/outputs (RX, RY): 64 points (62 points for local station)<br>Remote registers (RWw): 16 points<br>Remote registers (RWr): 16 points              |
|                                                        |                         | Octuple   | Remote inputs/outputs (RX, RY): 128 points (126 points for local station)<br>Remote registers (RWw): 32 points<br>Remote registers (RWr): 32 points            |
| Maximum number of connected stations (master station)  |                         |           | 64 <sup>*2</sup>                                                                                                                                               |
| Total distance/speed (When using Ver. 1.10)            |                         |           | 1200 m/156 kbps, 900 m/625 kbps, 400 m/2.5 Mbps, 160 m/5 Mbps, 100 m/10 Mbps<br>(Using repeaters, it is possible to extend the network distance up to 13.2 km) |

\*1: For CC-Link version 2.

\*2: Using only remote I/O stations.

## Device level wire-saving network

### ● CC-Link/LT network module .....QJ61CL12

- » The maximum of 64 stations can be updated in as little as 1.2 ms (at 2.5 Mbps). Choose from 3 transmission speeds according to the required transmission distance.
- » CC-Link/LT device stations do not require any parameters, only the transmission speed needs to be specified by the master station.
- » The QJ61CL12 CC-Link/LT network module can only function as a master station.



### ■Performance Specifications

| Item                   |                           | Specification                                 |
|------------------------|---------------------------|-----------------------------------------------|
| Communication speed    |                           | 156 kbps/625 kbps/2.5 Mbps                    |
| Transmission path      |                           | T-branch topology                             |
| Max. connected modules |                           | 64                                            |
| Overall distance       | Length of trunk line      | 35 m/2.5 Mbps, 100 m/625 kbps, 500 m/156 kbps |
|                        | Max. length drop line     | 4 m/2.5 Mbps, 16 m/625 kbps, 60 m/156 kbps    |
|                        | Overall length drop lines | 15 m/2.5 Mbps, 50 m/625 kbps, 200 m/156 kbps  |



## MELSECNET/H network

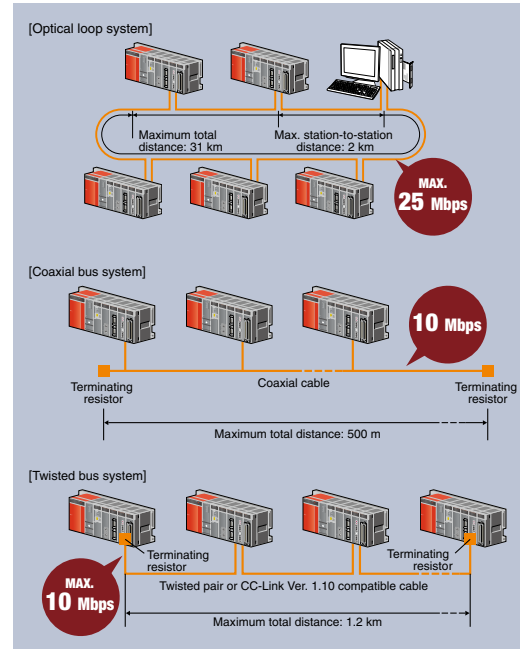
### ● MELSECNET/H network module

Optical loop type... **QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ72LP25-25, QJ72LP25G** (Remote I/O station)

Coaxial bus type ..... **QJ71BR11, QJ72BR15** (Remote I/O station)

Twisted bus type ..... **QJ71NT11B**

- » MELSECNET/H network systems support controller-to-controller, controller-to-personal computer, and controller-to-remote I/O station communications. Multiple wiring types are available and many functions designed to increase reliability are included, such as support for redundant systems.
- » Optical loop type: Communication speeds up to 25 Mbps. Fiber optic cable is immune to EMI/RFI noise. Up to 2 km between stations using GI type cable.
- » Coaxial bus type: Using low cost coaxial cable allows networks to be constructed at less cost than optical loop networks.
- » Twisted bus type: The combination of an affordable network module and twisted-pair cables allows a network system to be built at very low cost.



### ■ Performance Specifications

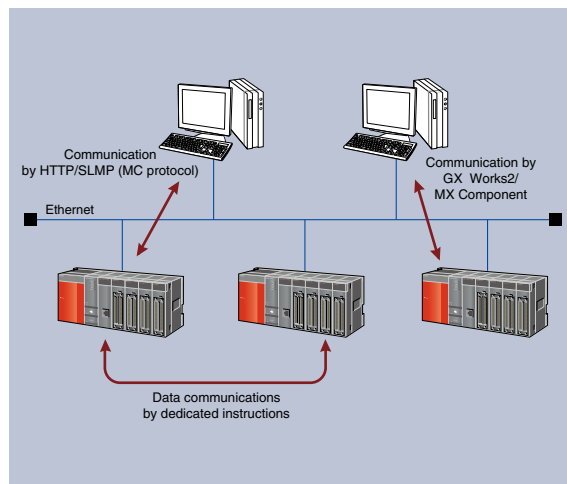
| Item                      |                                           |       | Specification                                                                                                                                                                                                                                                                                                                                                                              |                        |                                                                     |                 |                                                                  |                                                                                                               |
|---------------------------|-------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------|-----------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Network configurations    |                                           |       | Optical loop system                                                                                                                                                                                                                                                                                                                                                                        |                        | Coaxial bus system                                                  |                 | Twisted bus system                                               |                                                                                                               |
| Model                     |                                           |       | QJ71LP21(S)-25<br>QJ72LP25-25                                                                                                                                                                                                                                                                                                                                                              | QJ71LP21G<br>QJ72LP25G | QJ71BR11<br>QJ72BR15                                                |                 | QJ71NT11B                                                        |                                                                                                               |
| Cable                     |                                           |       | Fiber optic (SI)                                                                                                                                                                                                                                                                                                                                                                           | Fiber optic (GI)       | Coaxial (3C-2V)                                                     | Coaxial (5C-2V) | Twisted pair                                                     | CC-Link Ver. 1.10-compatible cable                                                                            |
| PLC to PLC network        | Maximum number of link points per network | LB    | 16384 points (8192 points in the MELSECNET/10 mode)                                                                                                                                                                                                                                                                                                                                        |                        |                                                                     |                 | 16384 points                                                     |                                                                                                               |
|                           |                                           | LW    | 16384 points (8192 points in the MELSECNET/10 mode)                                                                                                                                                                                                                                                                                                                                        |                        |                                                                     |                 | 16384 points                                                     |                                                                                                               |
|                           |                                           | LX/LY | 8192 points                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Maximum number of link points per station |       | <ul style="list-style-type: none"><li>• MELSECNET/H mode<br/><math>\{(LY + LB) / 8 + (2 \times LW)\} \leq 2000</math> bytes</li><li>• MELSECNET/H extended mode<br/><math>\{(LY + LB) / 8 + (2 \times LW)\} \leq 35840</math> bytes</li></ul>                                                                                                                                              |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Number of stations per network            |       | Up to 64 stations<br>(1 control station, 63 normal stations)                                                                                                                                                                                                                                                                                                                               |                        | Up to 32 stations (1 control station, 31 normal stations)           |                 |                                                                  |                                                                                                               |
| Remote I/O network        | Maximum number of link points per network | LB    | 16384 points<br>(Remote Master to Remote Sub-master or Remote I/O: 8192 points, Remote Sub-master or Remote I/O to Remote Master: 8192 points)                                                                                                                                                                                                                                             |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           |                                           | LW    | 16384 points<br>(Remote Master to Remote Sub-master or Remote I/O: 8192 points, Remote Sub-master or Remote I/O to Remote Master: 8192 points)                                                                                                                                                                                                                                             |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           |                                           | LX/LY | 8192 points                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Maximum number of link points per station |       | <ul style="list-style-type: none"><li>• Remote Master to Remote I/O <math>\{(LY + LB) / 8 + (2 \times LW)\} \leq 1600</math> bytes</li><li>• Remote I/O to Remote Master <math>\{(LX + LB) / 8 + (2 \times LW)\} \leq 1600</math> bytes</li><li>• Multiplexed Remote Master from/to Multiplexed Remote Sub-master <math>\{(LY + LB) / 8 + (2 \times LW)\} \leq 2000</math> bytes</li></ul> |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Maximum I/O points per remote I/O station |       | $X + Y \leq 4096$ points<br>If X/Y numbers are duplicated, only one side is taken into consideration.                                                                                                                                                                                                                                                                                      |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Device points per remote I/O station      | M     | 8192 points                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           |                                           | SM    | 2048 points                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           |                                           | D     | 12288 points                                                                                                                                                                                                                                                                                                                                                                               |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           |                                           | SD    | 2048 points                                                                                                                                                                                                                                                                                                                                                                                |                        |                                                                     |                 |                                                                  |                                                                                                               |
|                           | Number of stations per network            |       | Up to 65 stations (1 remote master station, 64 remote I/O stations)                                                                                                                                                                                                                                                                                                                        |                        | Up to 33 stations (1 remote master station, 32 remote I/O stations) |                 |                                                                  |                                                                                                               |
| Communication speed       |                                           |       | 25 Mbps/10 Mbps                                                                                                                                                                                                                                                                                                                                                                            |                        | 10 Mbps                                                             |                 | 156 kbps/312 kbps/625 kbps/1.25 Mbps/2.5 Mbps/5 Mbps/10 Mbps     |                                                                                                               |
| Overall distance          |                                           |       | 30 km                                                                                                                                                                                                                                                                                                                                                                                      |                        | 300 m                                                               | 500 m           | 1200 m/156 kbps, 600 m/312 kbps, 400 m/625 kbps, 200 m/1.25 Mbps | 1200 m/156 kbps, 900 m/312 kbps, 600 m/625 kbps, 400 m/1.25 Mbps, 200 m/2.5 Mbps, 150 m/5 Mbps, 100 m/10 Mbps |
| Distance between stations |                                           |       | Up to 1 km                                                                                                                                                                                                                                                                                                                                                                                 | 2 km                   | -                                                                   |                 | -                                                                |                                                                                                               |

## Interface module connectable with multiple Ethernet devices

### ● Ethernet interface module

**10BASE-T/100BASE-TX .....QJ71E71-100**

- » Use dedicated instructions for communication between programmable controller CPUs.
- » A communication library and sample code is available to allow a web server to access any of the Ethernet modules and exchange information with the programmable controller CPU module. In this way, the web server may host a web page that allows remote operation of a programmable controller over the Internet via web browser.
- » To improve programming, maintenance, and debugging efficiency, multiple CPU connections may be established simultaneously using GX Developer and GX Works2.
- » The E-mail Function allows Ethernet modules to send e-mail with attachments in binary, ASCII, and CSV formats via a mail server.
- » Perform existence checks and keep connections open using the KeepAlive or PING functions. This can be used to ensure connectivity and quickly discover errors.

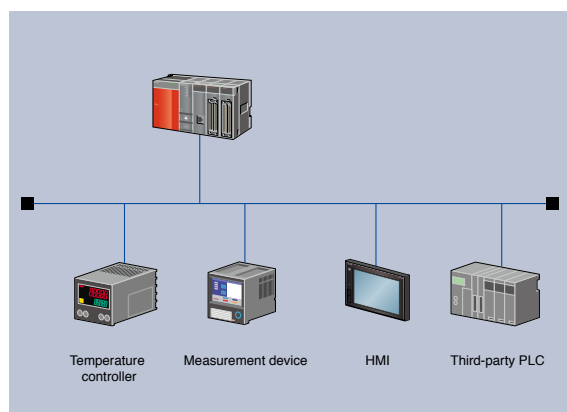


## Connect with a large variety of devices using the MODBUS® interface module

### ● MODBUS® interface module

**RS-232 1ch, RS-422/485 1ch .....QJ71MB91**  
**10BASE-T/100BASE-TX .....QJ71MT91**

- » Using the master function, communicate with third-party MODBUS® compatible slave devices.
- » Slave mode is also supported, which allows communication with other MODBUS® masters such as third-party programmable controllers.
- » Using the QJ71MB91 synchronization function, a master station may be connected to CH1 (RS-232) and communicate with multiple slaves connected to the CH2 (RS-422/485) interface.
- » The QJ71MT91 module is able to operate using the master and slave functions simultaneously.

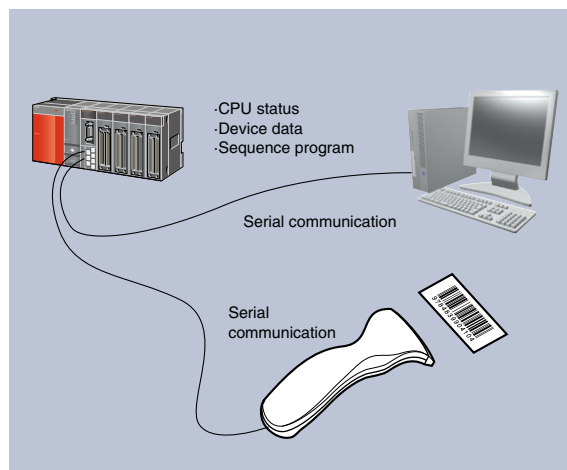


## These highly flexible communications modules allow connection to practically any serial device

### ● Serial communication module

**RS-232 1ch, RS-422/485 1ch .....QJ71C24N**  
**RS-232 2ch .....QJ71C24N-R2**  
**RS422/485 2ch .....QJ71C24N-R4**

- » Push the limits of serial technology: baud rates up to 230.4 kbps, distance up to 1200 m, and multiple block batch read/write up to 960 words from QCPU device memory.
- » External devices (personal computer, HMI, etc.) may read and write data in the programmable controller CPU using MC protocol.
- » Connect with intelligent devices using their native protocol (barcode reader, measurement device, etc.) by selecting non-procedure protocol and using a sequence program for communication control.
- » MELSOFT engineering tools can establish a connection to the programmable controller CPU through the serial connection to perform programming and maintenance duties.
- » Dedicated functions are available to facilitate RS-232 communication over public telephone lines using a serial modem. One of them, the remote password function, prevents unauthorized access to programmable controllers via the modem line.

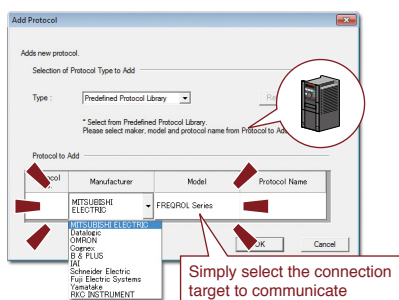




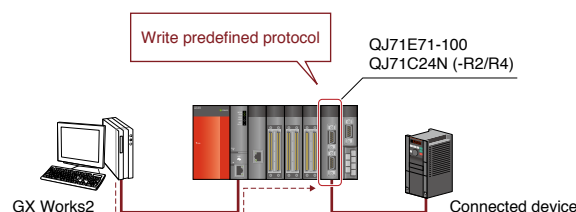
## Combination of Ethernet/serial communication module and GX Works2 (predefined protocol support function)

### Communication with any device can be started quickly only by selecting the device from the predefined protocol library

- 1 Select the manufacturer and model (series) of the device to be connected.  
There is no need for complicated predefined protocol setting for the device.  
Simply select from communications protocol libraries such as MODBUS® and BACnet®, which are prepared in advance.

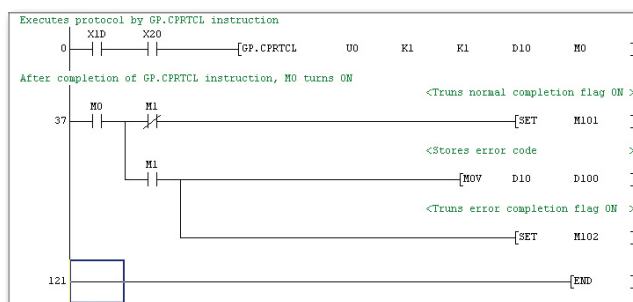


- 2 Write the predefined protocol to the module.  
Write the set predefined protocol to QJ71E71-100, QJ71C24N (-R2/R4) module. Up to 128 protocols can be set in one module.



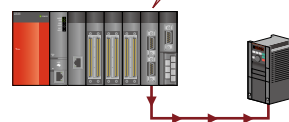
- 3 Execute the protocol with ladder program.

With ladder program, communication with any external device can be made only by executing a dedicated predefined protocol starting instruction.



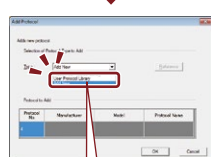
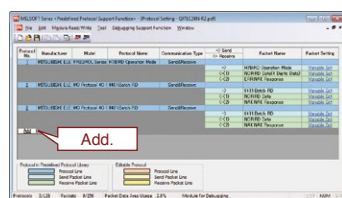
Execute dedicated instruction.

Communication starts

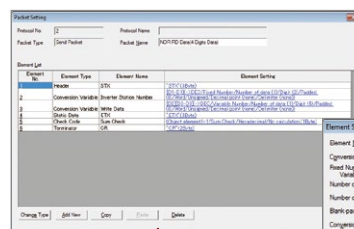
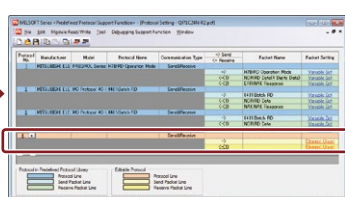


### Easy to prepare and edit predefined protocol

- Even if the device to be connected is not contained in the predefined protocol library, the device can be added easily.
- The contents of the prepared predefined protocol can be displayed in list form. The protocol can be edited easily.

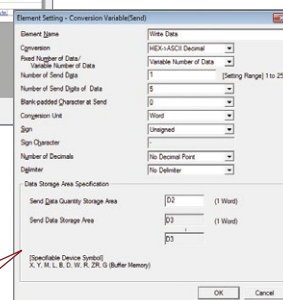


Select "Add New"



Packet setting screen

Edit this data as needed



\* Supported by QJ71C24N (-R2/R4) with the function version B and a serial number whose first 5 digits are 11062 or higher.  
\* Supported by products with the first five digits of the QJ71E71-100 product number of 15042 or later.

## Make the jump from shop floor data to valuable information in real time

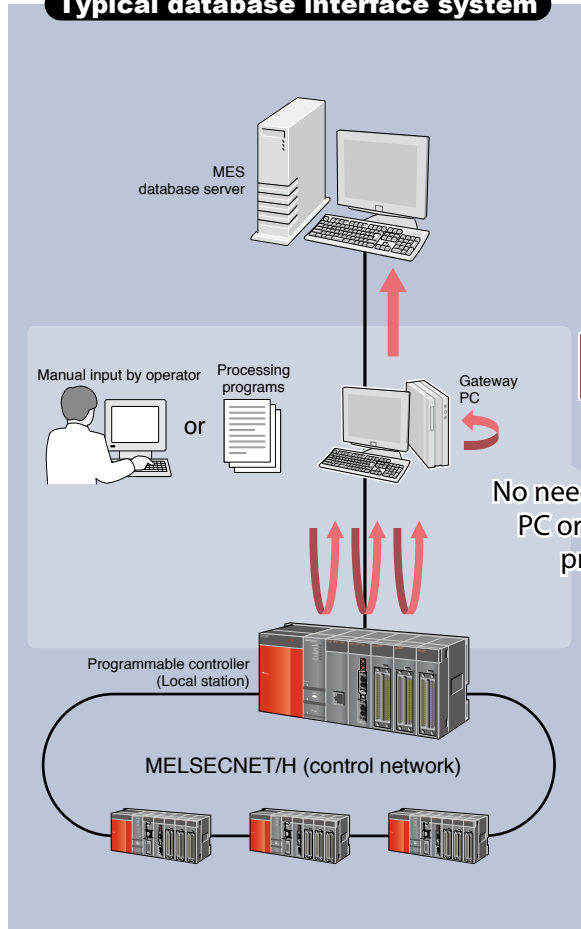
### ● MES interface module ..... QJ71MES96N

- » Simplify the process of connecting to enterprise system databases such as an MES\*1 by connecting directly. Configuration of the module is easy and does not require any programming.
- » When user-defined trigger conditions occur, the specified data is read and transferred via SQL text. This event-driven communication method reduces network loading when compared to conventional solutions, which are based on polling architecture.

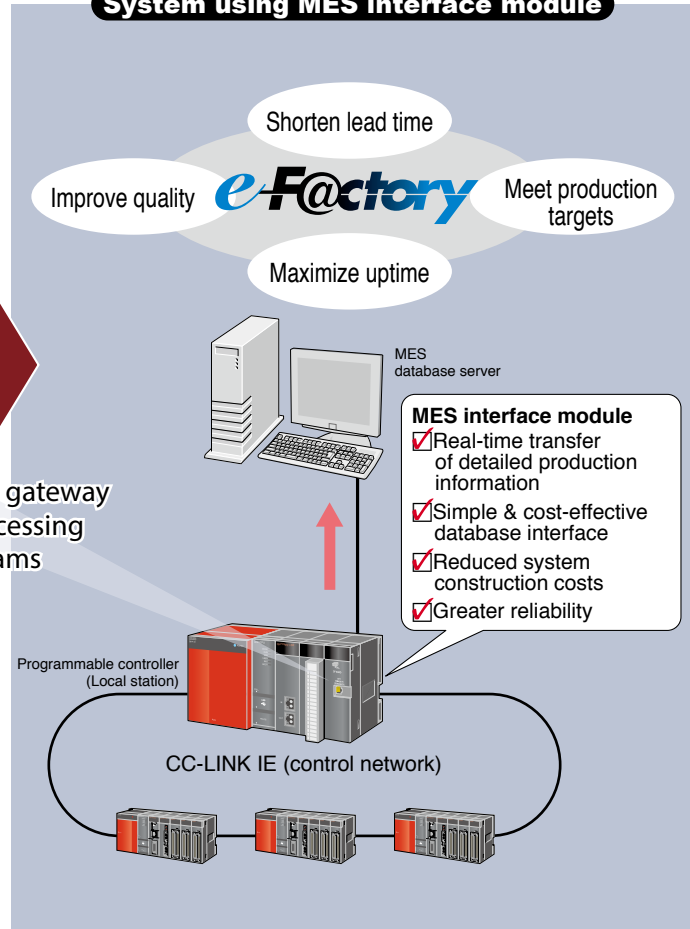
- » Executes pre-registered SQL jobs. Also receives production instructions from MES and downloads production information from the database.

\*1: MES (Manufacturing Execution System): A system that manages and controls production activities to optimize quality, production volume, delivery, costs, etc.

#### Typical database interface system



#### System using MES interface module



e-F@ctory is a solution for manufacturing that is one step ahead of the industry, enabling the overall total cost of development, production and maintenance to be reduced through the utilization of FA and information-processing technologies that continuously support customer improvement activities. The result, increased corporate value for the customer.





## Fulfill the need for traceability and discover a powerful troubleshooting tool

### ● High speed data logger module..... QD81DL96

#### » High speed data sampling function

The high speed data sampling function has the power to synchronize with the sequence program scan, ensuring that every value available to the program is logged for analysis. Using this method, it is possible to perform detailed operational analysis and identify existing or potential problems.

#### » Trigger logging function

Trigger logging allows the user to specify, in great detail, when data should be saved. This greatly simplifies the process of investigating why a problem has occurred and assists in the quick identification of solutions. Additionally, it allows CompactFlash memory card space to be used efficiently.

#### » The logging data display and analysis tool, GX LogViewer, has a simple and effective interface that is user customizable and includes features to maximize the efficiency of analyzing collected data. The High speed Data Logger Module Configuration Tool enables the user to create sophisticated data collection rules using an intuitive step-by-step process. The wizard like interface is beginner-friendly and includes features like importing global labels and device comments.

By creating an Excel® layout file and transferring it to the module, the report function can automatically fill in the numbers using sampled data to create reports on a reoccurring basis. All kinds of reports may be created that include charts, graphs, and other visual aids. It is even possible to e-mail the reports automatically.

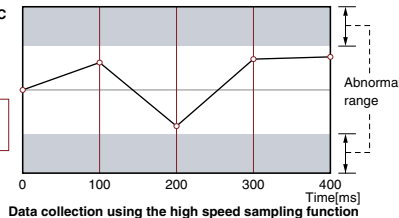
#### » Automatic generation of reports including graphs

By creating an Excel® layout file and transferring it to the module, the report function can automatically fill in the numbers using sampled data to create reports on a reoccurring basis. All kinds of reports may be created that include charts, graphs, and other visual aids. It is even possible to e-mail the reports automatically.

### High speed data sampling function

Generic sample data from PC or external device at 100 ms intervals

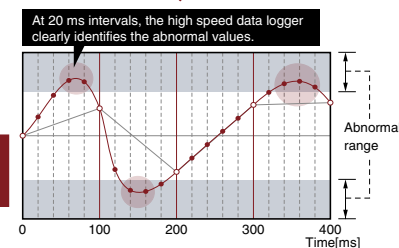
Traditional data logging methods are unable to detect the abnormal values.



Data collection using the high speed sampling function

The high speed data logger module is capable of sampling data at much higher intervals as to detect fast changing values. (fastest down to 1 ms)

Synchronize the sample rate to the scan time to reveal all values entering the sequence program.



At 20 ms intervals, the high speed data logger clearly identifies the abnormal values.

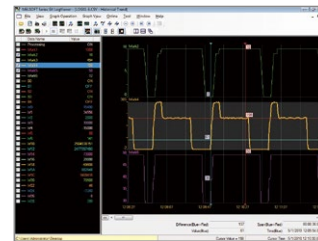
#### CPUs that support the high speed data sampling function

- High-speed Universal model QCPU Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV, Q03UD(E), Q04UD(E)H, Q06UD(E)H, Q10UD(E)H, Q13UD(E)H, Q20UD(E)H, Q26UD(E)H, Q50UDEH, Q100UDEH (Compatible with QnU CPU modules starting with serial No. \* 11012\* or higher.)
- Universal model QCPU

\* The high speed data sampling function supports only the host control CPU. (Other stations on the network are not supported.)

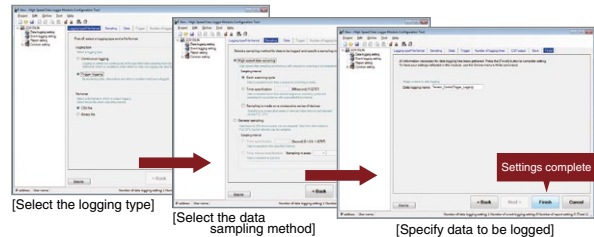
### High speed data logger module tools

#### Data display and analysis tool: GX LogViewer



View a list of events or a trend graph [pictured left] either in real-time (online) or historical (saved file) modes. Helpful features ensure key information is immediately visible.

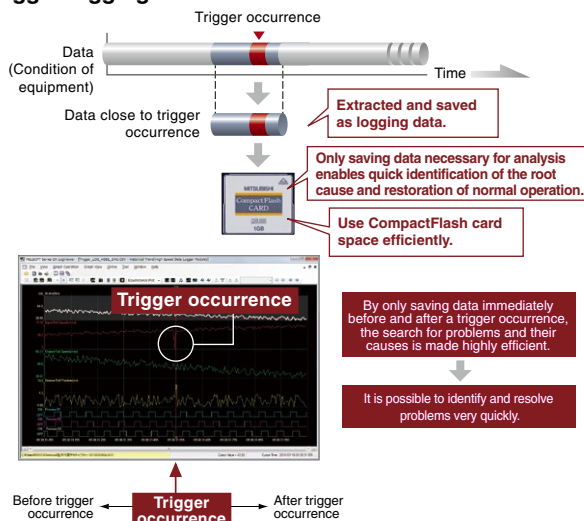
#### High speed data logger module configuration tool



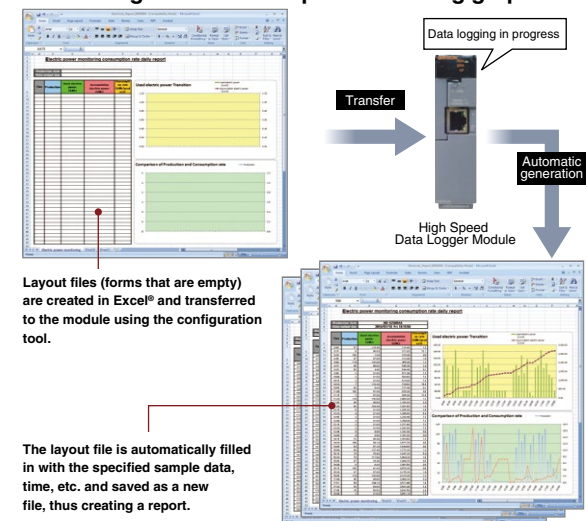
Even making sophisticated data collection rules is easy to do using the intuitive step-by-step configuration process.

\* The High speed Data Logger Module Tools are available at no additional cost. Please contact your nearest Mitsubishi Electric representative for details.

### Trigger logging function



### Automatic generation of reports including graphs



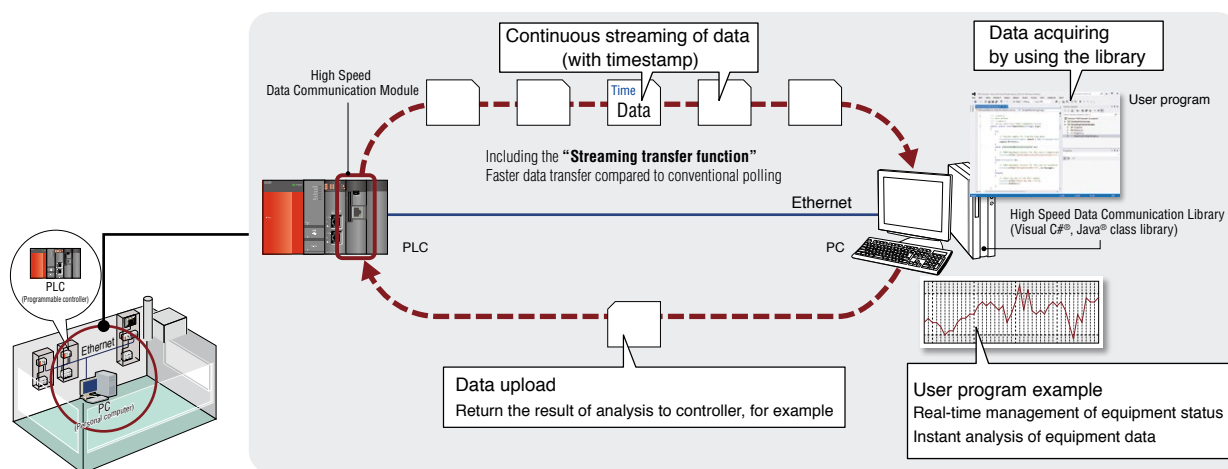
## Supporting productivity and enhanced device value through real-time transfer of control data

### ● High speed data communication module ..... QJ71DC96

» High data accuracy communication from the programmable controller to the personal computer can be easily realized with the high-speed data communication module (QJ71DC96). Data can be streamed at high speed to the personal computer by synchronizing with the controller scan cycle without having to continuously poll data as was previously achieved. This feature realizes improved productivity by resulting in real-time control data analysis on the personal computer.

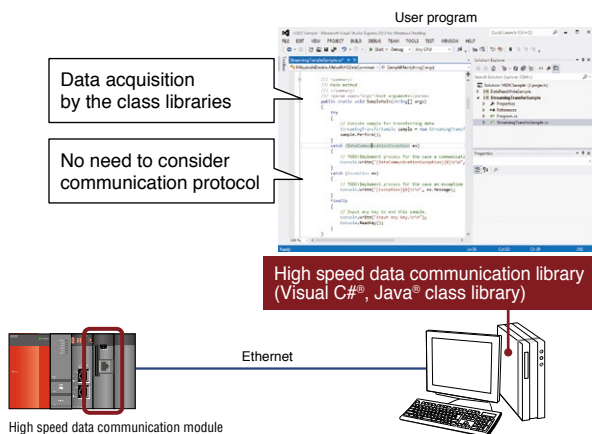
#### Fast and reliable large data transfer in real-time

- Transfer of large data volumes across a very short sampling period can be realized with “Streaming transfer” feature. High data integrity can be easily achieved across TCP/IP Ethernet to personal computer based servers.



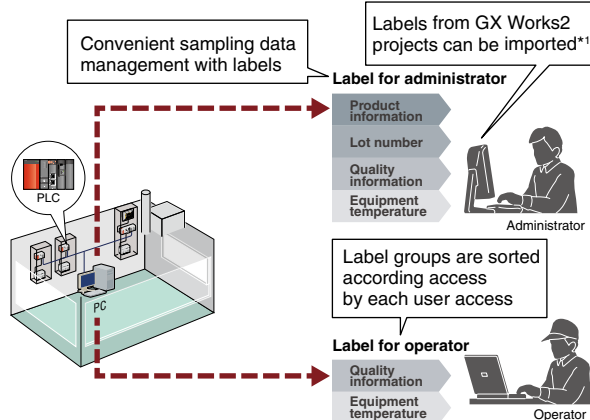
#### Data acquisition without considering protocol

- Communication between the module and a personal computer is provided in the form of Visual C#® and Java® class libraries. These class libraries enable a simple personal computer program to acquire data from the programmable controller without considering the communication protocol.



#### Labels for effective data sampling

- Labeling (naming) each personal computer data makes classifications of transferring data simple. Multiple labels are grouped and sorted as label groups by equipment or user. Label group access control corresponding to user levels is also possible.



\*1: The engineering software GX Works2 Version 1.44 W or later is required when the global labels of GX Works2 project are imported to the Configuration Tool of this module.



## Ethernet related products

### ● Industrial switching hub

**NZ2EHG-T8N\*<sup>1</sup>**

Powered by CONTEC

- » Supports the transmission speed of 10 Mbps/100 Mbps/1 Gbps.
- » Equipped with Auto MDI/MDI-X and auto-negotiation functions.
- » Saves up to 60% power consumption\*<sup>2</sup> by using the automatic power adjustment function.
- » Operates in ambient temperatures of 0 to 50C°, with the fan-less configuration.
- » Compatible with DIN rail installation, enabling the hub to be installed in various orientations.

\*1: The rated input voltage is 12 to 24 V DC.

\*2: For comparison, power consumption was measured when all 8 ports were used and not used.

This product was developed and manufactured by Contec Co. Ltd. Please note that the specifications and conditions of guarantee differ from MELSEC Series products.



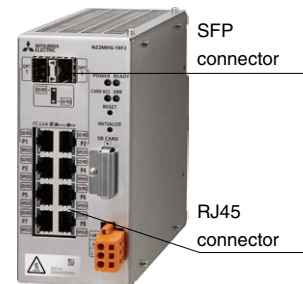
### ● Managed CC-Link IE switch

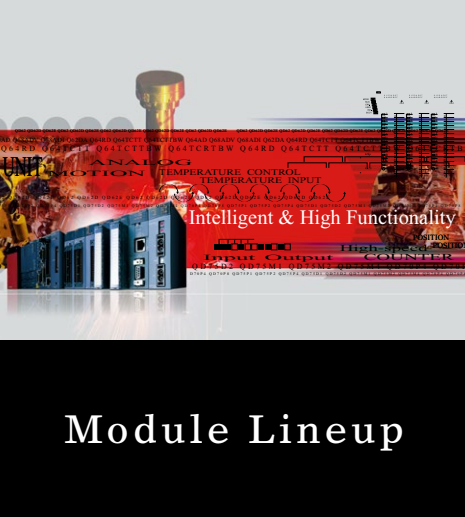
**NZ2MHG-T8F2\*<sup>3</sup>**

- » Supports the transmission speed of 10 Mbps/100 Mbps/1 Gbps
- » 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\*<sup>4</sup>, long-distance optical cable, which is ideal for systems requiring facility-to-facility landline communication is available
- » Supports VLAN and can manage multiple networks by one switch
- » Supports SNMP, which enables monitoring of the entire network and easy identification of faulty areas (system maintainability is improved with this feature)

\*3: The rated input voltage is 24 V DC.

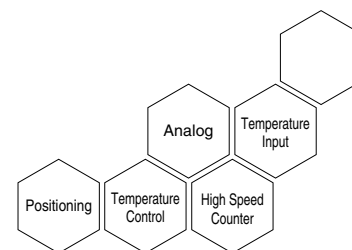
\*4: Either the optical port (OPT1/OPT2) or RJ45 port (P1/P2) can be used at a time.





## Comprehensive range of I/O and intelligent function modules

The Q Series I/O and intelligent function module lineup is extensive and capable of meeting the needs of a wide range of applications. Some of the available modules include motion control, serial communication, temperature control, temperature input, standard digital and analog I/O modules, and channel isolated analog modules. Attain the ideal solution for the application, whether it be high speed positioning or high accuracy temperature control.



### Input modules, Interrupt module

| Point     | DC input |          |                   |                                             |                          | DC/AC input       | AC input        |                |
|-----------|----------|----------|-------------------|---------------------------------------------|--------------------------|-------------------|-----------------|----------------|
|           | 5 V DC   |          | 5/12 V DC         | 24 V DC                                     |                          | 48 V DC/AC        | 100...120 V AC  | 100...240 V AC |
|           | Positive | Negative | Positive/Negative | Positive                                    | Negative                 | Positive/Negative |                 |                |
| 8 points  | -        | -        | -                 | -                                           | -                        | -                 | -               | QX28           |
| 16 points | QX70H    | QX90H    | QX70              | QX40<br>QX40-TS<br>QX40-S1<br>QX40H<br>QI60 | QX80<br>QX80H<br>QX80-TS | QX50              | QX10<br>QX10-TS | -              |
| 32 points | -        | -        | QX71              | QX41<br>QX41-S1<br>QX41-S2                  | QX81<br>QX81-S2          | -                 | -               | -              |
| 64 points | -        | -        | QX72              | QX42<br>QX42-S1                             | QX82<br>QX82-S1          | -                 | -               | -              |

### Output modules

| Point     | Contact output    | TRIAC output   | Transistor output |             |                  |                           |                 |
|-----------|-------------------|----------------|-------------------|-------------|------------------|---------------------------|-----------------|
|           | 24 V DC, 240 V AC | 100...240 V AC | 5...12 V DC       | 5...24 V DC |                  | 12...24 V DC              |                 |
|           |                   |                | Sink type         | Sink type   | Sink/Source type | Sink type                 | Source type     |
| 8 points  | QY18A             | -              | -                 | -           | QY68A            | -                         | -               |
| 16 points | QY10<br>QY10-TS   | QY22           | QY70              | -           | -                | QY40P<br>QY40P-TS<br>QY50 | QY80<br>QY80-TS |
| 32 points | -                 | -              | QY71              | QY41H       | -                | QY41P                     | QY81P           |
| 64 points | -                 | -              | -                 | -           | -                | QY42P                     | QY82P           |

### I/O combined module

| I/O points          | DC input/transistor output                              |
|---------------------|---------------------------------------------------------|
|                     | 24 V DC positive/12...24 V DC sink type                 |
| 8 points/7 points   | QX48Y57                                                 |
| 32 points/32 points | QH42P (occupy 32 points)<br>QX41Y41P (occupy 64 points) |

## Analog modules

| Number of channels | Channel isolated | Analog input                  |               |                     |           |          |                            |          | Analog output        |                |
|--------------------|------------------|-------------------------------|---------------|---------------------|-----------|----------|----------------------------|----------|----------------------|----------------|
|                    |                  | Voltage input                 | Current input | Signal conditioning | Load cell | CT input | Temperature input          |          | Voltage output       | Current output |
|                    |                  |                               |               |                     |           |          | Temperature input          | RTD      |                      |                |
| 1                  | ●                | -                             | -             | -                   | Q61LD     | -        | -                          | -        | -                    | -              |
| 2                  | ●                | -                             | -             | Q62AD-DGH           | -         | -        | -                          | -        | Q62DA-FG             |                |
|                    | -                | -                             | -             | -                   | -         | -        | -                          | -        | Q62DAN<br>Q64AD2DA*1 |                |
| 4                  | ●                | Q64AD-GH                      |               | -                   | -         | -        | Q64TD<br>Q64TDV-GH         | Q64RD-G  | -                    | -              |
|                    | -                | Q64AD<br>Q64ADH<br>Q64AD2DA*1 |               | -                   | -         | -        | -                          | Q64RD    | Q64DAN<br>Q64DAH     |                |
| 6                  | ●                | -                             | -             | Q66AD-DG            | -         | -        | -                          | -        | Q66DA-G              |                |
| 8                  | ●                | Q68AD-G                       |               | -                   | -         | -        | Q68TD-G-H01<br>Q68TD-G-H02 | Q68RD3-G | -                    | -              |
|                    | -                | Q68ADV                        | Q68ADI        | -                   | -         | Q68CT    | -                          | -        | Q68DAVN              | Q68DAIN        |

\*1: I/O combined module

## Temperature control modules

| Number of channels | Wire break detection | Input        |            |
|--------------------|----------------------|--------------|------------|
|                    |                      | Thermocouple | RTD        |
| 4                  | ●                    | Q64TCTTBWN   | Q64TCRTBWN |
|                    | -                    | Q64TCTTN     | Q64TCRTN   |

## Loop control module

| Number of channels | Input   |         |              |     |
|--------------------|---------|---------|--------------|-----|
|                    | Voltage | Current | Thermocouple | RTD |
| 2                  | Q62HLC  |         |              |     |

## Simple motion modules

| Number of axes | CC-Link IE Field | SSCNET III/H |
|----------------|------------------|--------------|
| 2              | -                | QD77MS2      |
| 4              | QD77GF4          | QD77MS4      |
| 8              | QD77GF8          | -            |
| 16             | QD77GF16         | QD77MS16     |

## Positioning modules

| Number of axes | Specialized functionality type |                           | Simple control and fast-response type |                           |
|----------------|--------------------------------|---------------------------|---------------------------------------|---------------------------|
|                | Open collector output          | Differential drive output | Open collector output                 | Differential drive output |
| 1              | QD75P1N                        | QD75D1N                   | -                                     | -                         |
| 2              | QD75P2N                        | QD75D2N                   | -                                     | -                         |
| 3              | -                              | -                         | -                                     | -                         |
| 4              | QD75P4N                        | QD75D4N                   | QD70P4                                | QD70D4                    |
| 8              | -                              | -                         | QD70P8                                | QD70D8                    |

## High-speed counter modules, Pulse input module

| Number of channels |               | Maximum counting speed | Channel isolated | Input specifications     |         |         |                           |
|--------------------|---------------|------------------------|------------------|--------------------------|---------|---------|---------------------------|
|                    |               |                        |                  | 5 V DC                   | 12 V DC | 24 V DC | Differential drive output |
| 2                  | 2-phase input | 200 kpps               | -                | QD62<br>QD62E<br>QD65PD2 |         |         | -                         |
|                    |               | 500 kpps               |                  | -                        | -       | -       | QD62D                     |
|                    |               | 4 Mpps                 |                  | -                        | -       | -       | QD64D2                    |
|                    |               | 8 Mpps                 |                  | -                        | -       | -       | QD65PD2                   |
| 6                  | 2-phase input | 200 kpps               | -                | QD63P6                   | -       | -       | -                         |
| 8                  | 1-phase input | 30 kpps                | ●                | QD60P8-G                 |         |         | -                         |

## Energy measuring modules, Insulation monitoring module

| Number of channels | Energy measuring   | Insulation monitoring |
|--------------------|--------------------|-----------------------|
| 1                  | QE81WH<br>QE81WH4W | -                     |
| 2                  | -                  | QE82LG                |
| 3                  | QE83WH4W           | -                     |
| 4                  | QE84WH             | -                     |



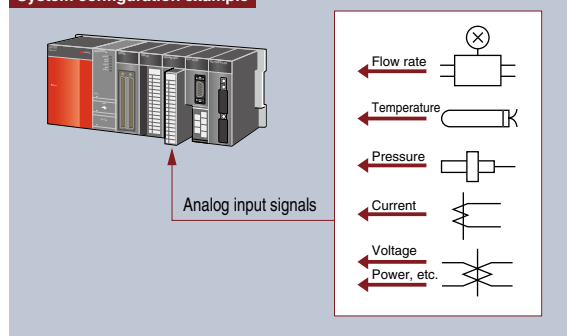
# Application specific intelligent modules

A range of analog modules ideal for process control applications

## Isolated analog modules suitable for process control

- Channel isolated high resolution analog-digital converter module ..... **Q64AD-GH**
- Channel isolated high resolution analog-digital converter module  
(with signal conditioning function) ..... **Q62AD-DGH**
- Channel isolated high resolution digital-analog converter module ..... **Q62DA-FG**
- Channel isolated analog-digital converter module .... **Q68AD-G**
- Channel isolated analog-digital converter module  
(with signal conditioning function) ..... **Q66AD-DG**
- Channel isolated digital-analog converter module .... **Q66DA-G**

System configuration example



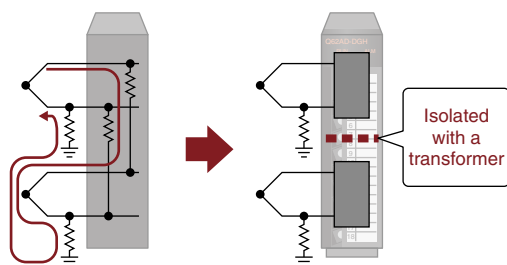
The channel isolated analog modules are specifically designed for process control applications by offering high accuracy conversion combined with high isolation voltage. Flow meters, pressure gauges, etc. can be directly connected to the analog input, and control valves to the analog output. Hardware and installation costs can be substantially reduced because external isolation amplifiers are not required. When used with a general purpose controller, a low cost process control solution can be created.

## High dielectric withstand voltage

- Electric disturbances such as current and noise can be isolated.

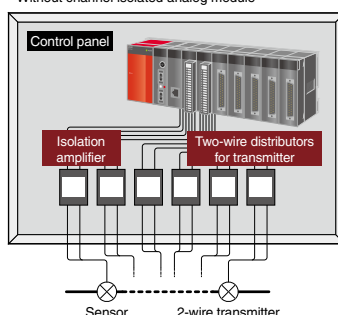
• Standard analog input module

• Isolated analog input module

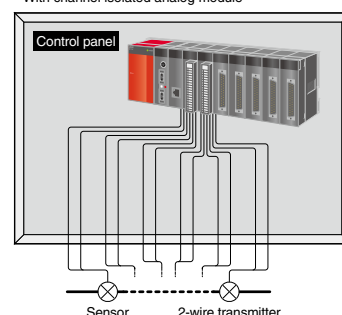


- External signal converters are not required.

• Without channel isolated analog module



• With channel isolated analog module

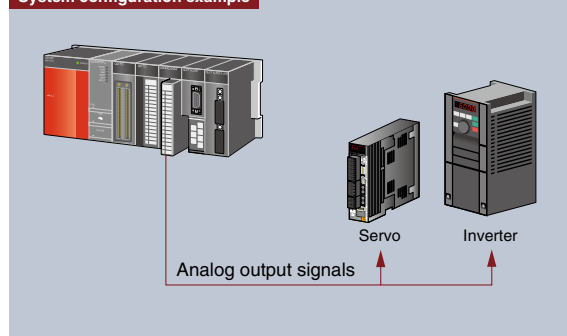


## High conversion speed analog modules

- High speed analog-digital converter module ..... **Q64ADH**
- Analog-digital converter module ..... **Q68ADV, Q68ADI**
- High speed digital-analog converter module ..... **Q64DAH**
- Digital-analog converter module ..... **Q62DAN, Q64DAN, Q68DAVN, Q68DAIN**
- Analog-digital/Digital-analog converter module .... **Q64AD2DA**

Many high-speed A/D and D/A conversion (analog) modules are available. These modules are feature packed to allow maximum flexibility when connecting to devices. Both speed and accuracy are great enough to control sensitive motion applications using servos or inverters.

System configuration example





### High accuracy temperature input modules

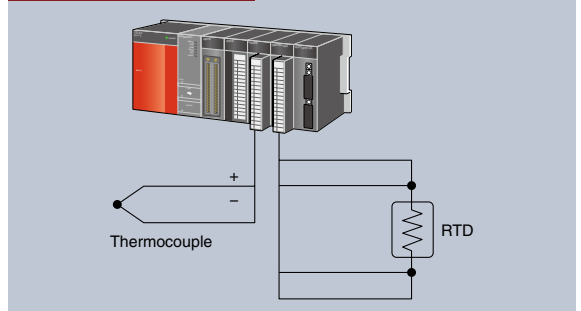
#### ● Temperature input module

Thermocouple input module ..... **Q64TD, Q64TDV-GH, Q68TD-G-H01, Q68TD-G-H02**

RTD input module ..... **Q64RD, Q64RD-G, Q68RD3-G**

Temperature data can be captured by connecting a thermocouple or a resistance temperature detector. Multi-channel (8-channel) input types and channel-isolated types are available. An optimum model for the intended application can be selected.

System configuration example



### PID loop control integrated temperature control modules

#### ● Temperature control module

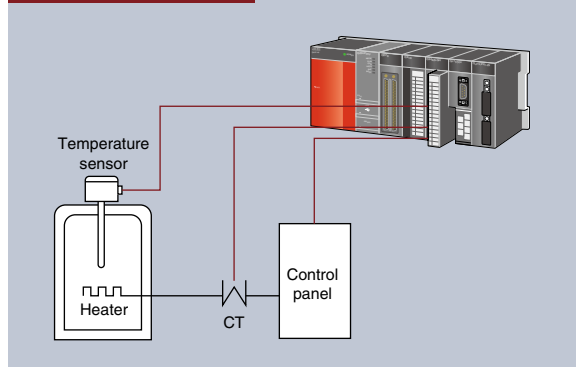
Thermocouple input module ..... **Q64TCTTN, Q64TCTTBWN**

Platinum RTD input module ..... **Q64TCRTN, Q64TCRTBWN**

The devices which require high stability of temperature control such as extrusion forming machines, these modules prevent overheating and overcooling. The standard control (heating or cooling) or heating-cooling control (heating and cooling) mode can be selected depending on the machine to be controlled.

In addition, the mixed control mode (combination of standard control and heating-cooling control) can be selected.

System configuration example



#### ● Peak current suppression function

This function avoids simultaneously turning on outputs to control the peak current. It can save energy and reduce the running cost.

#### ● Simultaneous temperature rise function

This function allows several loops to reach the set value at the same time to conduct uniform temperature control.

It prevents idling and is effective in saving energy and reducing running cost.

#### ● Self-tuning function

The PID constant is automatically adjusted during control.

The automatic tuning cost (time, materials and power) can be reduced.

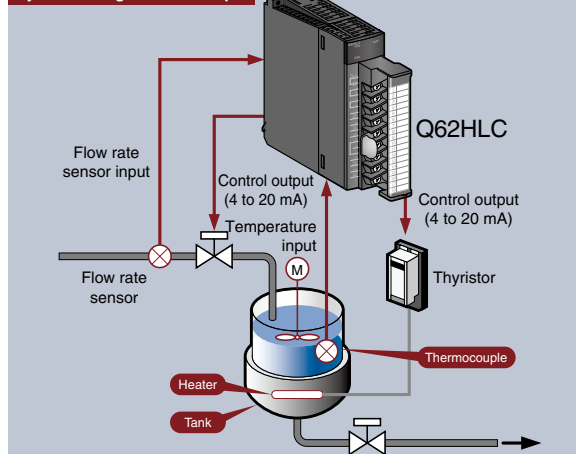
### Loop control module ideal for temperature and flow rate control environments which require fast response

#### ● Loop control module ..... **Q62HLC**

With its speed-proportional control format and 25 ms sampling cycle, the loop control module is well suited for high-precision, high-resolution thermocouple inputs, micro voltage inputs, voltage inputs, current inputs, and current outputs. It is also ideal for sudden temperature change control, pressure control, and flow control applications which require fast response.

- Connectable to JIS, IEC, NBS, ASTM standards compliant thermocouples.
- Permits analog value measurements of various input ranges by using micro voltage, voltage, and current input sensors.
- Offers program control while automatically changing the target values (SV) and PID constants [proportional band (P), integral time (I), derivative time (D)] in a time-specific manner, as well as a cascade control function that permits control with CH 1 as the master, and CH 2 as the slave.

System configuration example



## Interface with all types of load cell with the load cell I/P module

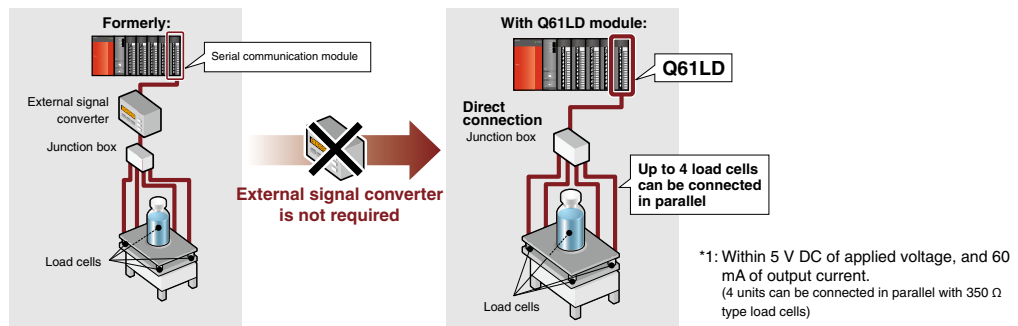
### ● Load cell input module.....Q61LD

Load cells can now be directly connected to the programmable controller system without requiring an external signal converter. The module achieves highly accurate measurement with steady data conversion speed that guarantees the accuracy of load cells.

#### Separate signal converter not required.

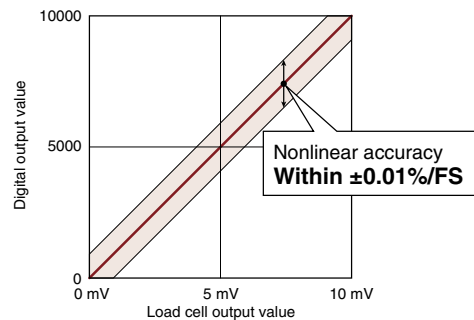
#### Reduce engineering costs by directly connecting a load cell to the programmable controller

- Any type of load cell\*<sup>1</sup> such as magnetostriction, capacitive, gyroscope, or strain gauge.
- 6-wire system (combination of remote sensing and ratiometric methods) or 4-wire system load cells.



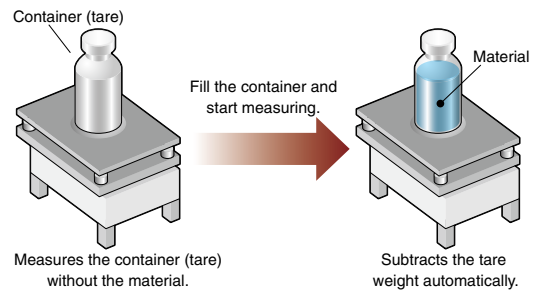
- Applications requiring high accuracy can be achieved by connecting the load cell directly to the programmable controller.

- Nonlinear accuracy: Within  $\pm 0.01\%$ /FS
  - Zero drift: Within  $\pm 0.25 \mu\text{V}/^\circ\text{C}$  RTI
  - Gain drift: Within  $\pm 15 \text{ ppm}/^\circ\text{C}$
- (Load cell rated output is 2 mV/V, ambient temperature is 25°C, and the tare weight subtraction function is not used.)



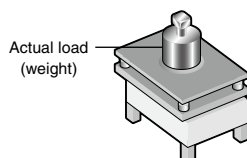
#### Zero offset function

This function subtracts the tare weight automatically relative to the load cell usage range when calibrating measuring instruments. Using this function can improve the accuracy of the measuring instrument.



#### Static load calibration function

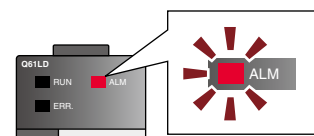
The gross weight value can be accurately calibrated by applying the actual load (weight) onto the load cell.



#### Input signal error detection function

Load cell input signal errors can be detected.

- Input signal error
- Weight capacity over error
- Zero point out of range
- Exceed conversion error





## Direct CT sensor connection reduces wiring and saves space

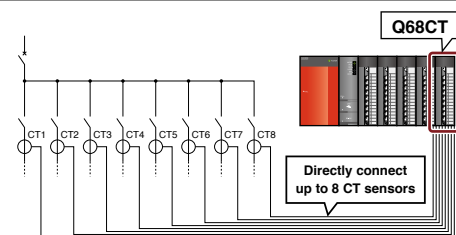
### ● CT input module ..... Q68CT

The direct connection of the CT sensor\*<sup>1</sup> and the programmable controller has eliminated the need to connect a separate signal converter. Very accurate measurements can be achieved with stable data conversion speed for load control of systems and devices, monitoring of operations, and control and monitoring of power systems.

\*1: The CT (Current Transformer) sensor refers to an instrument transformer, a current sensor is essential for measuring alternating currents.

#### Direct CT sensor connection reduces wiring and saves space

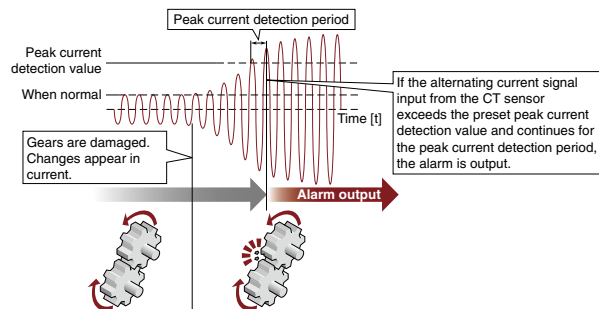
- Directly connect to the CT sensor without an external signal converter.  
The AC current for up to eight channels can be measured with one unit, by that reducing the wiring steps and costs.
- Set the CT sensor type (input range) for each channel. CT sensors with 0 to 5 AAC or 0 to 600 AAC can be used by one unit.



#### Predictive maintenance of devices by detecting the peak current.

##### Peak current detection function

- The device can be serviced and troubleshooting performed by detecting the peak current.  
With a motor for example, the load applied on the motor is changed by the gear wear and damage, and the load current suddenly changes. The device trouble can be diagnosed by detecting the transient peak current at this time.



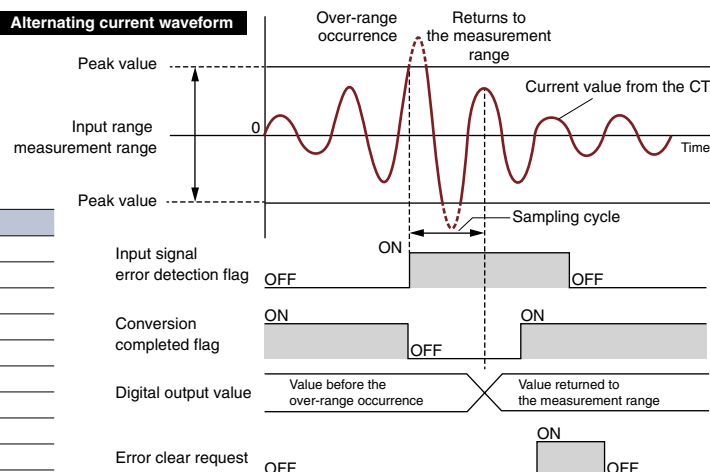
##### Input signal error detection function

- Over-range (peak value over) of the CT input value can be detected. Since the flow of a large current exceeding the range of the measurement target can be detected, errors in the measurement target can be monitored.

| Input range setting | Detection level           |
|---------------------|---------------------------|
| 0...5 A (AC)        | Approximately 6.25 A (AC) |
| 0...50 A (AC)       | Approximately 62.5 A (AC) |
| 0...100 A (AC)      | Approximately 125 A (AC)  |
| 0...200 A (AC)      | Approximately 250 A (AC)  |
| 0...400 A (AC)      | Approximately 500 A (AC)  |
| 0...600 A (AC)      | Approximately 750 A (AC)  |

##### Connectable CT sensors

| Model      | Manufacturer                                                | Analog input range          |
|------------|-------------------------------------------------------------|-----------------------------|
| EMU-CT50   | Mitsubishi Electric Corporation                             | 0...50 A (AC)               |
| EMU-CT100  |                                                             | 0...100 A (AC)              |
| EMU-CT400  |                                                             | 0...400 A (AC)              |
| EMU-CT600  |                                                             | 0...600 A (AC)              |
| CTF-5A     | Multi Measuring Instruments Co., Ltd. (introduced products) | 0...5 A (AC)                |
| CTF-50A    |                                                             | 0...50 A (AC)               |
| CTF-100A   |                                                             | 0...100 A (AC)              |
| CTF-200A   |                                                             | 0...200 A (AC)              |
| CTF-400A   |                                                             | 0...400 A (AC)              |
| CTF-600A   |                                                             | 0...600 A (AC)              |
| CTL-10-3FC | U.R.D. Co., Ltd. (introduced products)                      | 0...5 A (AC), 0...50 A (AC) |
| CTL-16-3FC |                                                             | 0...100 A (AC)              |
| CTL-24-3FC |                                                             | 0...200 A (AC)              |
| CTL-36-6SC |                                                             | 0...400 A (AC)              |
| CTL-36-9SC |                                                             | 0...600 A (AC)              |



Simple motion module for positioning control and synchronous control

Advanced control but simple use

Speed/torque control and synchronous control are supported in addition to the traditional positioning control. Using the “simple motion module setting tool”, operations such as positioning setting, monitoring and debugging can be performed easily. In addition, data synchronized with the motion controller can be collected and displayed in waveform.

Simple motion module

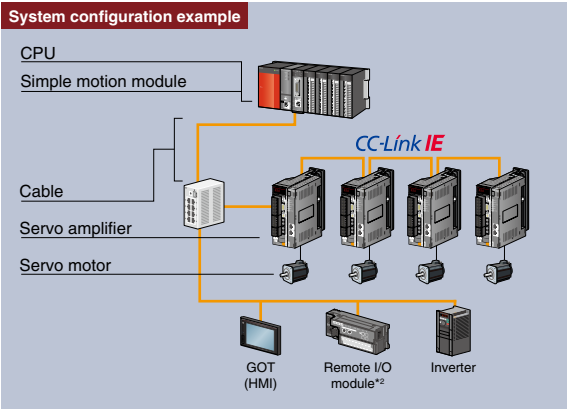
CC-Link IE Field Network connection type .....QD77GF□

The □ in the above model indicates the number of axes (4, 8, 16).

The simple motion module supports the general purpose CC-Link IE Field Network, with its flexible wiring. This module can be used as the CC-Link IE Field's master station\*1 while retaining the simple motion module's functions. This realizes flexible networking supporting connection to various devices such as GOT(HMI), remote I/O, inverter, etc.

\*1: QD77GF4, QD77GF8, QD77GF16 master station transmission style can use the line type or star type. Up to 104 slave devices can be connected to one network.

\*2: The setting and diagnosis function using GX Works2 is disabled.

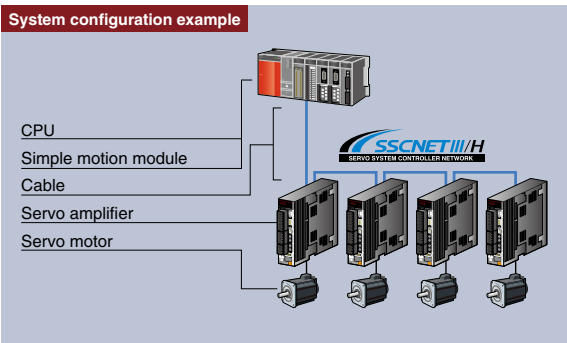


|                                     |                                       | QD77GF4                                                                                                                                                                                                                           | QD77GF8 | QD77GF16 |                 |               |         |         |         |         |         |         |
|-------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|-----------------|---------------|---------|---------|---------|---------|---------|---------|
| Maximum number of control axes      |                                       | 4-axes                                                                                                                                                                                                                            | 8-axes  | 16-axes  |                 |               |         |         |         |         |         |         |
| Servo amplifier connection method   |                                       | CC-Link IE Field Network                                                                                                                                                                                                          |         |          |                 |               |         |         |         |         |         |         |
| Maximum distance between stations   |                                       | 100 m                                                                                                                                                                                                                             |         |          |                 |               |         |         |         |         |         |         |
| Control system                      |                                       | PTP (Point to Point) control, path control (both linear and arc can be set), speed control, speed/position switching control, position/speed switching control, speed-torque control, synchronous control, electronic cam control |         |          |                 |               |         |         |         |         |         |         |
| Starting time                       | 1-axis linear control                 | <table><tr><th>Operation cycle</th><th>Starting time</th></tr><tr><td>0.88 ms</td><td>1.77 ms</td></tr><tr><td>1.77 ms</td><td>3.55 ms</td></tr><tr><td>3.55 ms</td><td>7.11 ms</td></tr></table>                                 |         |          | Operation cycle | Starting time | 0.88 ms | 1.77 ms | 1.77 ms | 3.55 ms | 3.55 ms | 7.11 ms |
|                                     | Operation cycle                       |                                                                                                                                                                                                                                   |         |          | Starting time   |               |         |         |         |         |         |         |
|                                     | 0.88 ms                               |                                                                                                                                                                                                                                   |         |          | 1.77 ms         |               |         |         |         |         |         |         |
|                                     | 1.77 ms                               |                                                                                                                                                                                                                                   |         |          | 3.55 ms         |               |         |         |         |         |         |         |
|                                     | 3.55 ms                               |                                                                                                                                                                                                                                   |         |          | 7.11 ms         |               |         |         |         |         |         |         |
|                                     | 1-axis speed control                  |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
|                                     | 2-axis linear interpolation control   |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
|                                     | 2-axis circular interpolation control |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
|                                     | 2-axis speed control                  |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
| 3-axis linear interpolation control |                                       |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
| 3-axis speed control                |                                       |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
| 4-axis linear interpolation control |                                       |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |
| 4-axis speed control                |                                       |                                                                                                                                                                                                                                   |         |          |                 |               |         |         |         |         |         |         |

SSCNET Ⅲ/H connection type .....QD77MS□

The □ in the above model indicates the number of axes (2, 4, 16).

The SSCNET Ⅲ/H connection reduces wiring, enables connections of up to 100 m between stations, and easily supports absolute position settings. The upper limit LS, lower limit LS, and near-point dog signals can be input from the servo amplifier, thus greatly reducing wiring. In addition to positioning control and speed control, processes such as synchronous control and electronic cam control can be performed.



|                                   |                                       | QD77MS2                                                                                                                                                                                                                                                                                               | QD77MS4 | QD77MS16 |  |  |
|-----------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|--|--|
| Maximum number of control axes    |                                       | 2-axes                                                                                                                                                                                                                                                                                                | 4-axes  | 16-axes  |  |  |
| Servo amplifier connection method |                                       | SSCNET Ⅲ/H                                                                                                                                                                                                                                                                                            |         |          |  |  |
| Maximum distance between stations |                                       | 100 m                                                                                                                                                                                                                                                                                                 |         |          |  |  |
| Control system                    |                                       | PTP (Point to Point) control, path control (both linear and arc can be set), speed control, speed/position switching control, position/speed switching control, speed-torque control (press-fit control), synchronous control, electronic cam control, torque control, tightening & press-fit control |         |          |  |  |
| Starting time                     | 1-axis linear control                 | 0.88 ms                                                                                                                                                                                                                                                                                               | 0.88 ms | 1.77 ms  |  |  |
|                                   | 1-axis speed control                  |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 2-axis linear interpolation control   |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 2-axis circular interpolation control |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 2-axis speed control                  | -                                                                                                                                                                                                                                                                                                     |         |          |  |  |
|                                   | 3-axis linear interpolation control   |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 3-axis speed control                  |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 4-axis linear interpolation control   |                                                                                                                                                                                                                                                                                                       |         |          |  |  |
|                                   | 4-axis speed control                  |                                                                                                                                                                                                                                                                                                       |         |          |  |  |





## A large selection of motion control solutions are available to fit any motion application.

### High-speed, accurate positioning control

Various types of motion control are supported including 2 to 4-axis linear interpolation, 2-axis circular interpolation, speed control, speed/position changeover, path control and constant speed control. Making settings (including positioning data), monitoring, and debugging is made much easier using GX Works2's built-in intelligent function module tools or the stand-alone tool, GX Configurator-QP. For servo control, Q Series leverages the benefits of SSCNET, a Mitsubishi high performance motion control network. This allows Mitsubishi intelligent digital servos to be connected by a simple daisy chain cable that reduces cost and increases performance.

#### ● Positioning module

Open collector pulse train output type ..... **QD75P□N**

Differential driver pulse train output type ..... **QD75D□N**

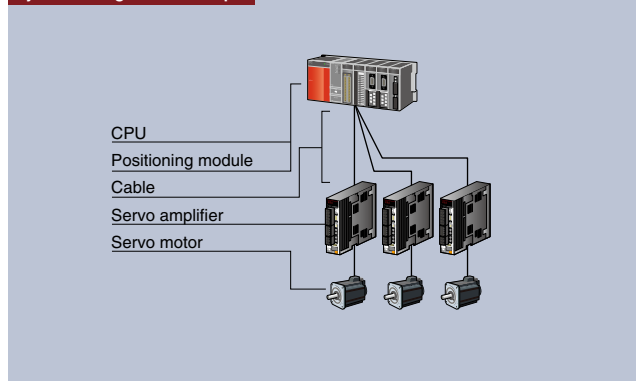
The □ in the above model indicates the number of axes (1, 2, 4).

For compatibility with the widest range of motion hardware, both open collector and differential driver type positioning modules are available. Transmission of high-speed pulses, up to 4 Mpps, to a servo amplifier can be made reliably up to 10 meters away. These pulse train output positioning modules can provide a high level of speed and accuracy for practically any application.

|                                        | QD75P□N                                                                                                                                                            | QD75D□N                   |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Pulse train output format              | Open collector output                                                                                                                                              | Differential drive output |
| Max. output pulse                      | 200 kpps                                                                                                                                                           | 4 Mpps                    |
| Max. connection distance to drive unit | 2 m                                                                                                                                                                | 10 m                      |
| Control system                         | PTP (Point To Point) control, path control (linear arc, and helical can be set), speed control, speed-position switching control, position-speed switching control |                           |
| Starting time <sup>*1</sup>            | 1-axis linear control                                                                                                                                              | 1.5 ms                    |
|                                        | 1-axis speed control                                                                                                                                               | 1.5 ms                    |
|                                        | 2-axis linear interpolation control                                                                                                                                | 1.5 ms                    |
|                                        | 2-axis circular interpolation control                                                                                                                              | 2.0 ms                    |
|                                        | 2-axis speed control                                                                                                                                               | 1.5 ms                    |
|                                        | 3-axis linear interpolation control                                                                                                                                | 1.7 ms                    |
|                                        | 3-axis helical interpolation control                                                                                                                               | 2.6 ms                    |
|                                        | 3-axis speed control                                                                                                                                               | 1.7 ms                    |
|                                        | 4-axis linear interpolation control                                                                                                                                | 1.8 ms                    |
|                                        | 4-axis speed control                                                                                                                                               | 1.8 ms                    |

\*1: Using the pre-reading start function, the actual starting time can be shortened.

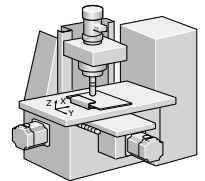
#### System configuration example



#### Application example • X-Y table control

##### Function

- 2-axis linear interpolation
- 3-axis linear interpolation
- 2-axis circular interpolation
- Constant speed pass control
- 3-axis helical interpolation



The ideal solution for simple multi-axis positioning

These modules are ideal for high-speed linear positioning control in a multi-axis system. Easily satisfying the requirements for simple positioning control applications, these modules include functions, such as positioning control, speed control and variable positioning control.

● Positioning module

Open collector pulse train output type .....QD70P□

Differential driver pulse train output type .....QD70D□

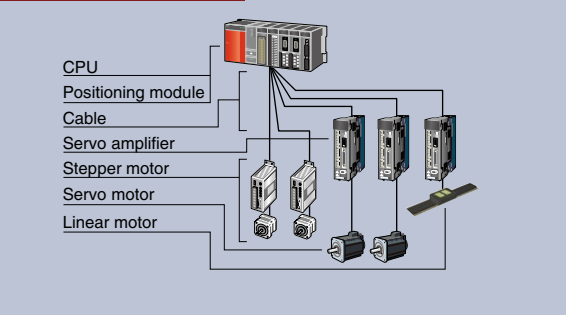
The □ in the above model indicates the number of axes (4, 8).

These modules are a great match for stepper motor control. Acceleration and deceleration can be performed smoothly with very fine changes in speed. “Fast start processing” is a basic feature that allows for a single axis positioning start time of just 0.1 ms.

|                                        |                             | QD70P□                                                                                     | QD70D□                    |
|----------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------|---------------------------|
| Pulse train output format              |                             | Open collector output                                                                      | Differential drive output |
| Max. output pulse                      |                             | 200 kpps                                                                                   | 4 Mpps                    |
| Max. connection distance to drive unit |                             | 2 m                                                                                        | 10 m                      |
| Control system                         |                             | PTP (Point To Point) control, path control (linear only), speed-position switching control |                           |
| Starting time                          | 1-axis start                | 0.1 ms                                                                                     |                           |
|                                        | 4-axis simultaneous start*1 | 0.2 ms                                                                                     |                           |
|                                        | 8-axis simultaneous start*1 | 0.4 ms                                                                                     |                           |

\*1: When START signal switches ON within 1 scan. There are no start delays between axes.

System configuration example





## A selection of high-speed counter modules and pulse counter module for accuracy intensive, high resolution control applications is available

### Pulse input modules capable of high-speed counting

#### ● High-speed counter module

Standard type.....**QD62, QD62E, QD62D**

Multi-channel high-speed counter module ..... **QD63P6**

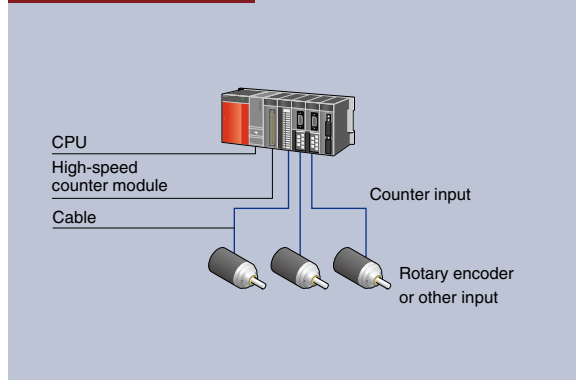
4 Mpps compatible high-speed counter module ..... **QD64D2**

Multi-function counter/timer module ..... **QD65PD2**

Inputs may be connected to a variety of devices for positioning control, precision measurement, etc. The maximum counting speed may be adjusted via parameter (excluding QD64D2) for more reliable counting at lower frequencies.

- » External coincidence output (QD64D2 includes 2 per channel): Select coincidence output, continuous comparison (QD64D2 only), or the coincidence detection interrupt function for flexible high-speed external device control.
- » Many functions are available to satisfy application requirements including the coincidence output test function (QD64D2 only), latch counter function (excluding QD63P6), and preset function.
- » Calculate pulses at speeds up to 8 Mpps (4 multiples of 2 phases). Perform precise position tracking using a high-resolution encoder for demanding applications such as semiconductor and LCD manufacturing. (QD65PD2)

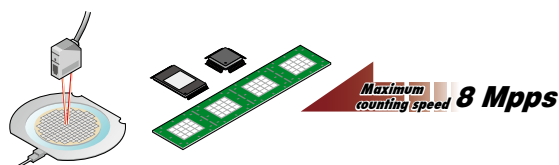
System configuration example



|                       |              | QD62<br>(DC input sinking<br>output type)                                                              | QD62E<br>(DC input sourcing<br>output type) | QD62D<br>(differential input<br>sinking output type)                                                                 | QD63P6<br>(DC input)                                                                                                                          | QD64D2<br>(DC input,<br>sink output type)                                                                                                                               | QD65PD2<br>(DC/Differential input, external output terminals)                                                                                                                                                                                                                 |
|-----------------------|--------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of channels    |              | 2 channels                                                                                             |                                             |                                                                                                                      | 6 channels                                                                                                                                    |                                                                                                                                                                         | 2 channels                                                                                                                                                                                                                                                                    |
| Count input<br>signal | Phase        | 1-phase input, 2-phase input, CW/CCW                                                                   |                                             |                                                                                                                      |                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                               |
|                       | Signal level | 5/12/24 V DC 2...5 mA                                                                                  |                                             | EIA Standard RS-422-A<br>Differential line driver level (AM26LS31 [manufactured by Texas Instruments] or equivalent) | 5 V DC<br>6.4...11.5 mA                                                                                                                       | EIA Standard RS-422-A, differential line driver level (AM26LS31 [manufactured by Texas Instruments Incorporated] or equivalent)                                         | [Differential input]<br>EIA Standards RS-422-A, differential line driver level (AM26LS31 [manufactured by Texas Instruments] or equivalent)<br>[DC input]<br>5/12/24 V DC, 7...10 mA                                                                                          |
|                       | Pulse input  | 1-phase pulse input (x1, x2), CW/CCW, 2-phase (x1, x2, x4)                                             |                                             |                                                                                                                      |                                                                                                                                               |                                                                                                                                                                         |                                                                                                                                                                                                                                                                               |
| Counting speed (max.) |              | 200 kpps                                                                                               |                                             | 500 kpps                                                                                                             | 200 kpps                                                                                                                                      | 4 Mpps                                                                                                                                                                  | [Differential input].....8 Mpps [DC input].....200 kpps                                                                                                                                                                                                                       |
| Function              |              | -Linear counter function<br>-Ring counter function<br>-Coincidence output function<br>-Preset function |                                             | -Latch counter function<br>-Count disable function<br>-Sampling counter function<br>-Periodic pulse counter function | -Linear counter function<br>-Ring counter function<br>-Coincidence detection function<br>-Preset function<br>-Periodic pulse counter function | -Linear counter function<br>-Ring counter function<br>-Coincidence detection function<br>-Continuous comparison function<br>-Preset function<br>-Latch counter function | -Linear counter function<br>-Ring counter function<br>-Coincidence output function<br>-Cam switch function<br>-Preset/replace function<br>-Latch counter function<br>-Sampling counter function<br>-Periodic pulse counter function<br>-Count disable/preset/replace function |

#### Multi-function counter/timer module (QD65PD2)

- **Perform extremely accurate position tracking**  
Counting speed up to 8 Mpps (4 multiples of 2 phases)



- **Multiple functions designed for ease of use**

Pulse measurement function

With a resolution of 100 ns, it is possible to perform highly accurate pulse measurement.

PWM output function

Precisely control PWM output up to 200 kHz. With a resolution of 0.1 μs, superfine control of the duty cycle is possible.

Cam switch function

Configure up to 16 cam settings and use up to 8 dedicated outputs. The cam switch function enables highly accurate timing control.

- **Perform sophisticated control using coincidence detection**

The coincidence output function allows complex applications to be supported. Depending on the situation, either the cam switch function or the coincidence output function can be used.

#### ● Channel isolated pulse input module..... **QD60P8-G**

This module is appropriate for the measurement of input pulse counts (related to speed, revolution, instantaneous flow rate, etc.) and the measurement of quantities (length, cumulative flow, and so forth). The QD60P8-G operates on a 10 ms control cycle, thus the minimum value refresh time is 10 ms. The count cycle setting can be changed to the desired time for cumulative count values and moving average pulse counts (sampling pulse counts).

|                       |              | QD60P8-G                          |
|-----------------------|--------------|-----------------------------------|
| Number of channels    |              | 8 channels                        |
| Count input<br>signal | Phase        | 1-phase input                     |
|                       | Signal level | 5 V DC/12...24 V DC, ≥ 4 mA       |
|                       | Pulse input  | 1-phase pulse input               |
| Counting speed (max.) |              | 30 k/10 k/1 k/100/50/10/1/0.1 pps |

Power measuring and insulation monitoring modules for easily measuring various energy information

Rack installation type energy measuring module

- Energy measuring module .....QE81WH
- Energy measuring module (multi-circuit) .....QE84WH
- Energy measuring module (three-phase 4-wire product).....QE81WH4W
- Energy measuring module (multi-circuit, three-phase 4-wire product) ...QE83WH4W

Using only one module, highly detailed information about electric energy (consumption and regeneration), reactive energy, current, voltage, electric power, power factor, and frequency can be measured. Minimum and maximum values are constantly monitored and 2 types of upper/lower limit warnings can be implemented without any programming. The amount of electric power used by output devices only while ON can be measured.

The power rate during device operation and the power rate in takt units can be retrieved. The multi-circuit product allows power to be measured in a smaller space as up to four circuits can be measured with a three-phase 3-wire product in one slot, and up to three circuits with a three-phase 4-wire product. For example, one unit can be used to measure other loads from the control panel trunk.

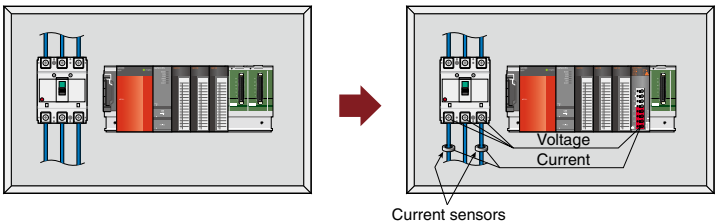
In addition, the parameters can be set easily with GX Works2 (Version 1.91 V and higher).

| Model                          |                                           | QE81WH                                                                                                                                                                                                | QE84WH*1   | QE81WH4W                                                                                                                                                               | QE83WH4W*1 |
|--------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Phase wire system              |                                           | Single-phase 2-wire/single-phase 3-wire/three-phase 3-wire                                                                                                                                            |            | Three-phase 4-wire*2                                                                                                                                                   |            |
| Instrument rating              | Voltage circuit                           | 110 V AC, 220 V AC common (single-phase 2-wire, three-phase 3-wire)                                                                                                                                   |            | 63.5/110 V AC...277/480 V AC                                                                                                                                           |            |
|                                |                                           | 110 V AC (1 - 2 line, 2 - 3 line)<br>220 V AC (1 - 3 line) (single-phase 3-wire)                                                                                                                      |            |                                                                                                                                                                        |            |
|                                | Current circuit                           | Using two-stage configuration in combination with commercially-available voltage transformer (VT). Primary voltage value can be set up to 6,600 V.                                                    |            |                                                                                                                                                                        |            |
|                                |                                           | 50, 100, 250, 400, 600 A AC<br>(Using dedicated split type current sensor. Each value indicates current sensor's primary current value.)                                                              |            |                                                                                                                                                                        |            |
|                                |                                           | 5 A AC<br>(Using dedicated 5 A current sensor. 5 A current sensor is used with two-stage configuration in combination with current transformer (CT). Primary current value can be set up to 6,000 A.) |            |                                                                                                                                                                        |            |
| Frequency                      | 50/60 Hz (frequency automatically judged) |                                                                                                                                                                                                       |            |                                                                                                                                                                        |            |
| Number of measurement circuits |                                           | 1 circuit                                                                                                                                                                                             | 4 circuits | 1 circuit                                                                                                                                                              | 3 circuits |
| Measurement items              |                                           | Power rate (consumption, regenerative), reactive power rate, period power rate, current, voltage, power, reactive power, power factory, frequency                                                     |            | Power rate (consumption, regenerative), reactive power rate, period power rate, current, voltage, power, reactive power, apparent power rate, power factory, frequency |            |

\*1: Current measurement mode is provided. Up to eight circuits can be measured when measuring only the current value.  
\*2: The separate voltage transformer (QE8WH4VT) is required for the three-phase 4-wire compatible products.

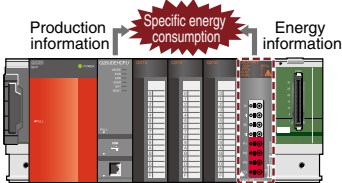
Minimal impact on control panel layout

- By installing the energy measuring module onto the open slot of the base unit, measuring instrument can be added without changing the layout in the control panel.



Allows for detailed power measurement at high speed (250 ms)

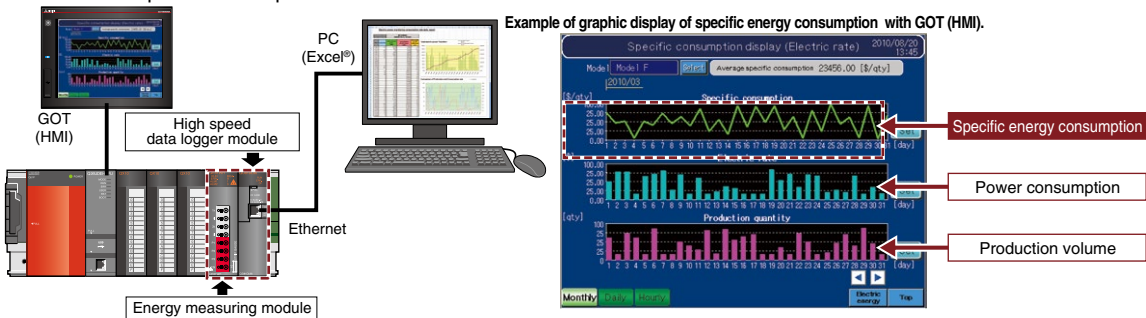
- Allows for easy specific energy consumption<sup>\*3</sup> management by matching the “production information” of the CPU module with the “energy information” of the energy measuring module.
- Since measured data is automatically collected in a buffer memory at 250 ms, detailed specific energy consumption management is also available.



\*3: The specific energy consumption is a numerical value displayed by “dividing energy consumption by production volume,” which is one type of index that measures energy productivity. Improving this number leads to improved productivity and energy conservation.

Allows for easy construction of a “visualization” system

- Allows for easy graphic display of specific energy consumption with a GOT (HMI) installed on the control panel at the manufacturing site.
- Combination with the “high-speed data logger module (QD81DL96)” allows specific energy consumption analysis to be easily performed with a personal computer.



Example of graphic display of specific energy consumption with GOT (HMI).



## Insulation monitoring module measuring leakage current

### ● Insulation monitoring module .....QE82LG

Leakage current can be measured for safety measures. Risks of electric shock are detected by monitoring leakage current ( $I_o$ ).

The isolated state of equipment can be constantly monitored.

The resistive leakage current ( $I_{or}$ ) is measured to constantly monitor the deterioration of equipment insulation.

Two-stage warning is provided for each measurement item. Two-stage warning for each of leakage current ( $I_o$ ) and resistive leakage current ( $I_{or}$ ) can be issued via program-less communication. The two-stage warning function can be used to give a warning for calling for attention and a hazard warning.

One module can monitor two circuits. One module can monitor two circuits of power supplies of the same phase/wire type on the same system.

In addition, the parameters can be set easily with GX Works2 (Version 1.91V and higher).

Measurement items

Leakage current ( $I_o$ ) and resistive leakage current ( $I_{or}$ )

| Model              |                                           |                                           | Details                                                                                   |
|--------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------|
| Phase/wire type    |                                           |                                           | Common to single-phase 2-wire and single-phase 3-wire/three-phase 3-wire types            |
| Instrument ratings | Voltage circuit <sup>*1,2</sup>           | Single-phase 2-wire<br>Three-phase 3-wire | Common to 110 V AC and 220 V AC                                                           |
|                    |                                           | Single-phase 3-wire                       | 110 V AC (between wires 1 and 2, between wires 2 and 3), 220 V AC (between wires 1 and 3) |
|                    | Leakage current circuit                   |                                           | 1 A AC (ZCT is used. Primary current of ZCT)                                              |
|                    | Frequency                                 |                                           | 50/60 Hz (automatic discrimination of frequency)                                          |
|                    | Number of circuits which can be monitored |                                           | 2 circuits <sup>*3</sup>                                                                  |

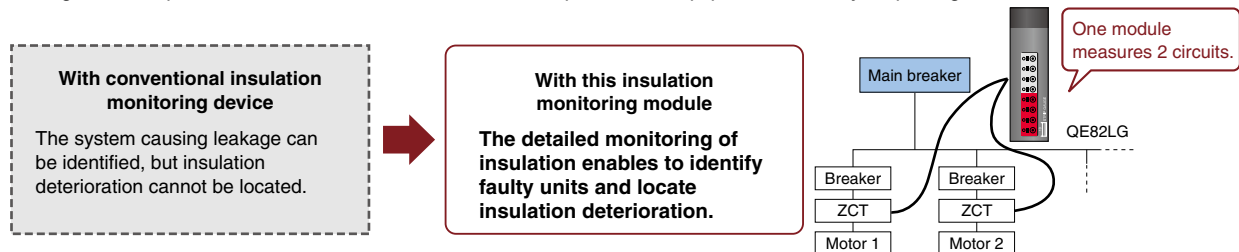
\*1: The module can be connected directly to 110-V and 220-V power supplies. To connect to a 440-V power supply, an external voltage transformer (VT) is necessary. Leakage current cannot be measured if voltage input is not provided.

\*2: Resistive leakage current ( $I_{or}$ ) can be measured on single-phase 3-wire and three-phase 3-wire delta circuits. On special circuits, such as three-phase 3-wire star circuits, high-resistance grounding circuits and capacitor grounding circuits, only  $I_o$  can be measured.

\*3: Leakage current ( $I_o$ ,  $I_{or}$ ) measurement on CH1 and CH2 can be performed only on circuits on the same system as the voltage input.

### Early detection of insulation deterioration of production equipment

- The structure directly connected to programmable controller in the control panel saves space and facilitates measurement of leakage current in places close to loads.
- Failures caused by leakage (earth fault) and insulation of motor loads in production equipment can be monitored. Progression of insulation deterioration is not overlooked.
- The upper limit warning monitor can be set in two stages. Insulation deterioration and condition can be observed at an early stage, so that preventive measures can be taken before production equipment suddenly stops or goes down.



### $I_{or}$ method realizes constant monitoring of insulation deterioration of equipment

- With the conventional systems, such as inverter circuits with large capacitive leakage current ( $I_{oc}$ ), it has difficulty for insulation monitoring.

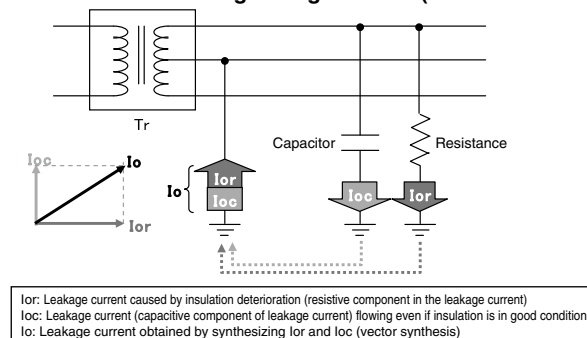
The module is capable of measuring resistive leakage current ( $I_{or}$ ) and removes the capacitive leakage current then monitors the accurate leakage current caused by insulation deterioration.

- Resistive leakage current ( $I_{or}$ ) is constantly measured even during operation of equipment. Signs of insulation deterioration can be detected without power interruption.

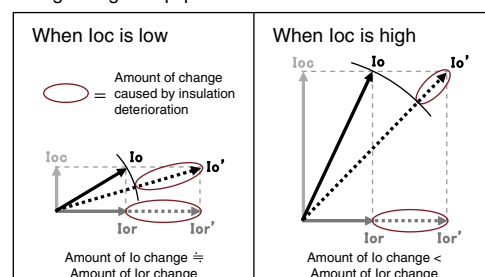
**Leakage current ( $I_o$ ) is affected by capacitive leakage current ( $I_{oc}$ ) of entire equipment.**

**Therefore, resistive leakage current ( $I_{or}$ ) measurement is effective in diagnosis of insulation deterioration.**

#### ■ Method of measuring leakage current ( $I_o$ measurement and $I_{or}$ measurement)



- Capacitive leakage current ( $I_{oc}$ ) fluctuates in equipment with long wiring or equipment with inverter devices and filters







# MELSOFT integrated FA software

Automation has brought tremendous productivity benefits to industrial and commercial applications. By creating the MELSOFT integrated FA software family of products, Mitsubishi Electric is aiming to bring similar productivity benefits to system designers, automation engineers, operators, and maintenance personnel. MELSOFT engineering tools are undergoing continuous evolution in order to meet the demands of new technologies and applications.

## Programmable Controller Engineering Software

### GX Works2

# GX Works2

GX Works2 focuses on driving down total cost by including features that speed up commissioning, reduce downtime, improve programming productivity, and provide strong security.

### ● User interface that is “easy to use” by design

The programming tool GX Works2 has been developed from the ground up to be intuitive for all users and allow anyone to begin programming easily. The user interface and other functions provide a comfortable programming environment that enables improvements in design efficiency.

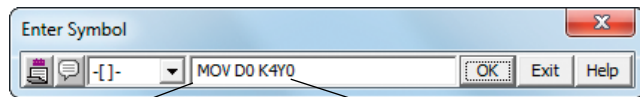
Annotations for the GX Works2 interface:

- Fully integrated intelligent function module management tools:** Points to the left-hand project tree.
- Use tabs to easily switch between programs, parameters, and other screens:** Points to the top navigation tabs.
- Improve readability by hiding ladder rungs not relevant to the current operation:** Points to the main ladder logic display area.
- Use “Watch windows” to conveniently monitor pertinent values:** Points to the Watch 1 and Watch 2 windows on the right.
- Project tree gives compressive look at flow of information in program and structure:** Points to the left-hand project tree.
- Program titles help to identify the content of each program:** Points to the top navigation tabs.
- Cross reference devices and labels with ease:** Points to the Cross Reference window at the bottom.
- Use the Inline-ST\*1 feature to quickly write complex expressions in ladder programs:** Points to the ladder logic rung showing an inline ST expression.

\*1: In-line ST can be only be created in projects that use labels.

## ● Easily create circuits with few key inputs

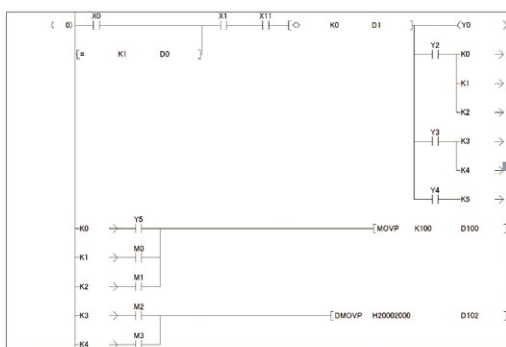
The program can be easily modified using the keyboard shortcut [ Alt ] + [ ← ] / [ → ] or [ Alt ] + [ ↑ ] / [ ↓ ] keys.



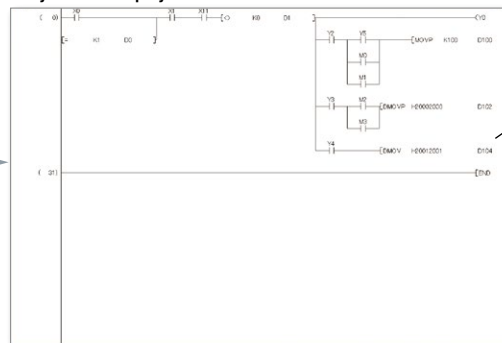
■ Editing the circuit  
[ Alt ] + [ → ] ... MOV → D0 → K4Y0  
[ Alt ] + [ ← ] ... K4Y0 → D0 → MOV



■ Changing the device No.  
[ Alt ] + [ ↑ ] ... K4Y0 → K4Y1 → K4Y2  
[ Alt ] + [ ↓ ] ... K4Y2 → K4Y1 → K4Y0



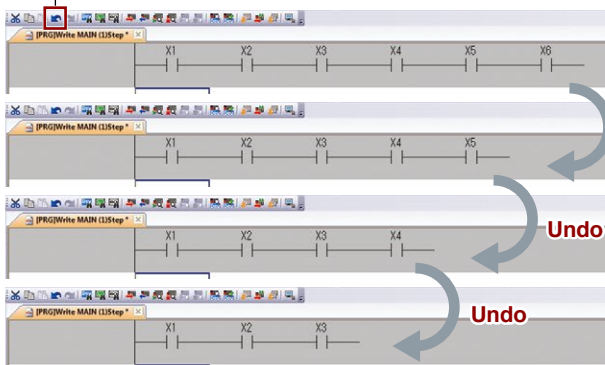
Easy-to-read display



The number of contacts on one line can be changed to 9, 11, 13, 17 or 21 contacts.

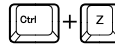
The circuit line doesn't wrap, easier to read.

Click the Undo button.

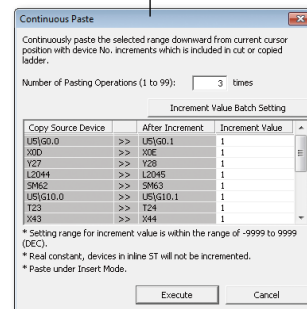


Undo

Use Undo ( [ Ctrl ] + [ Z ] ) to go back to up to 30 previous input steps.

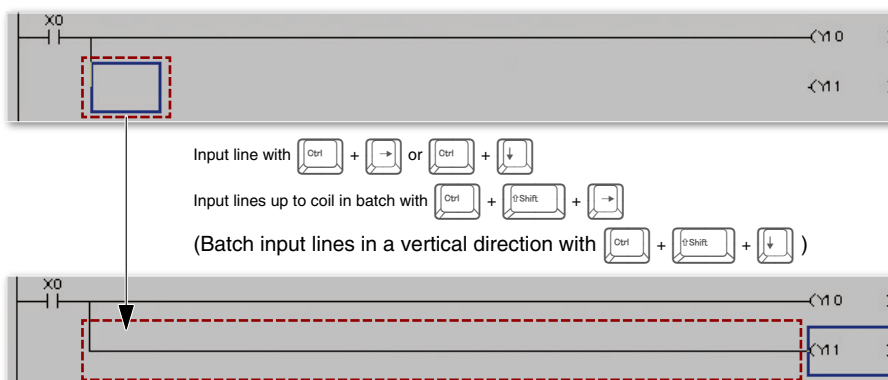


The device number is automatically incremented when repeatedly pasting a cut/copied ladder rung.



## ● Efficiently edit lines with keyboard

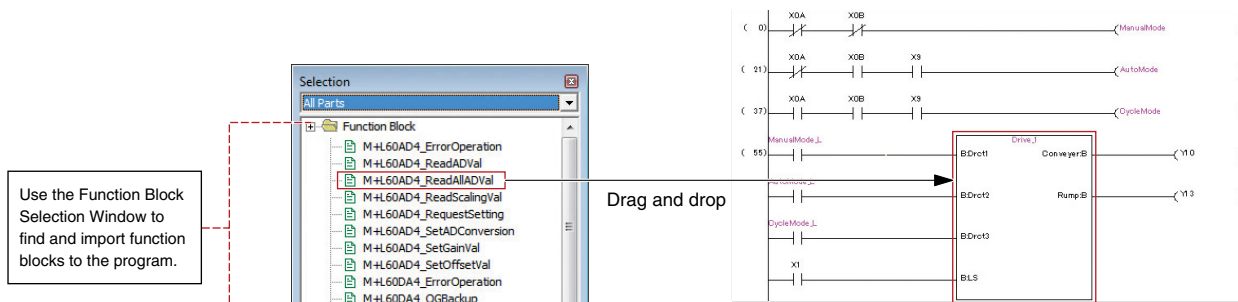
Ladder rungs can be easily modified just by using the various keyboard shortcut keys, eliminating the need to switch to editing mode.



■ How to input a line  
Press [ Ctrl ] + [ → ] or [ Ctrl ] + [ ↓ ] at an empty spot.  
Press [ Ctrl ] + [ → ] or [ Ctrl ] + [ ↓ ] on top of a line to delete it.

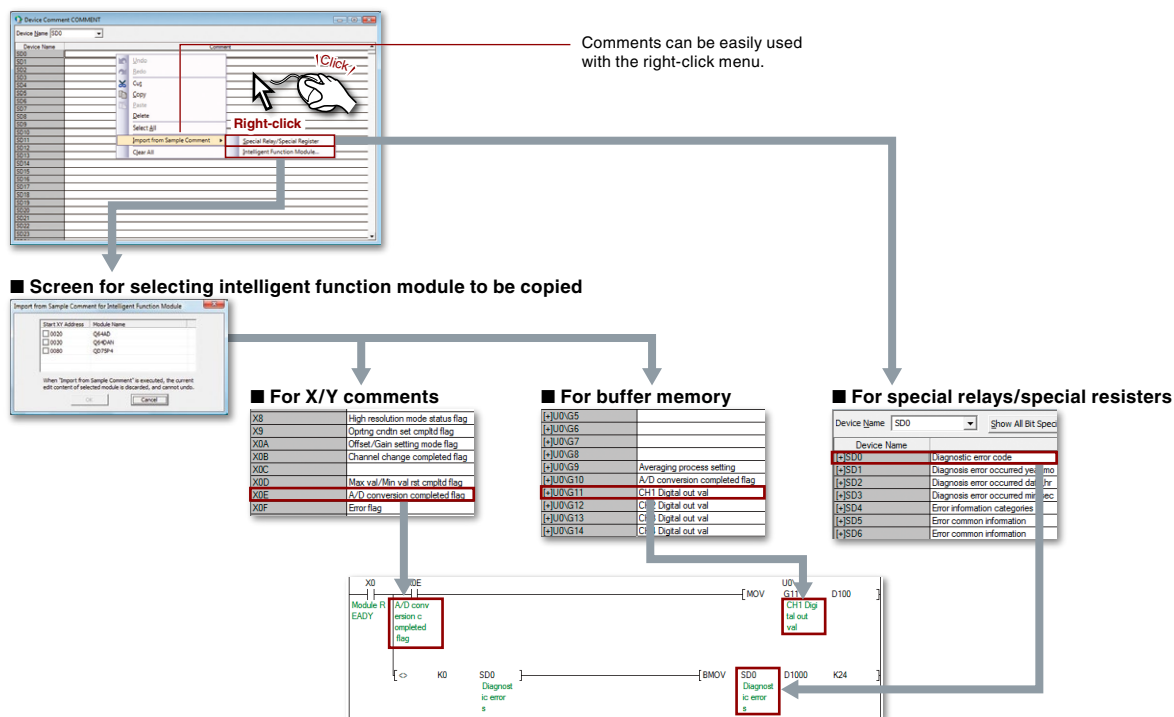
## ● Use function blocks for common operations

Function blocks allow selections of commonly used code to be easily reused and shared among projects. Shared or created function blocks can be added to a program using simple drag and drop operation. Using function blocks effectively results in faster development times with fewer programming mistakes.



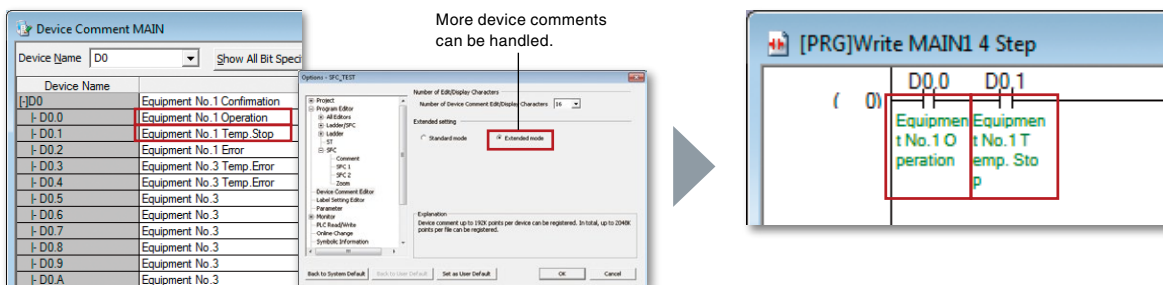
## ● Use sample comments to eliminate the need to input comments

Sample comments are provided for the CPU's special relays/registers and the intelligent function module's buffer memory/XY signals. These can be copied into the project's comments thus greatly reducing the time required for entering device comments.



## ● Quickly identify similar devices

Word device comments can be registered per bit with the contents displayed directly on the ladder rung.



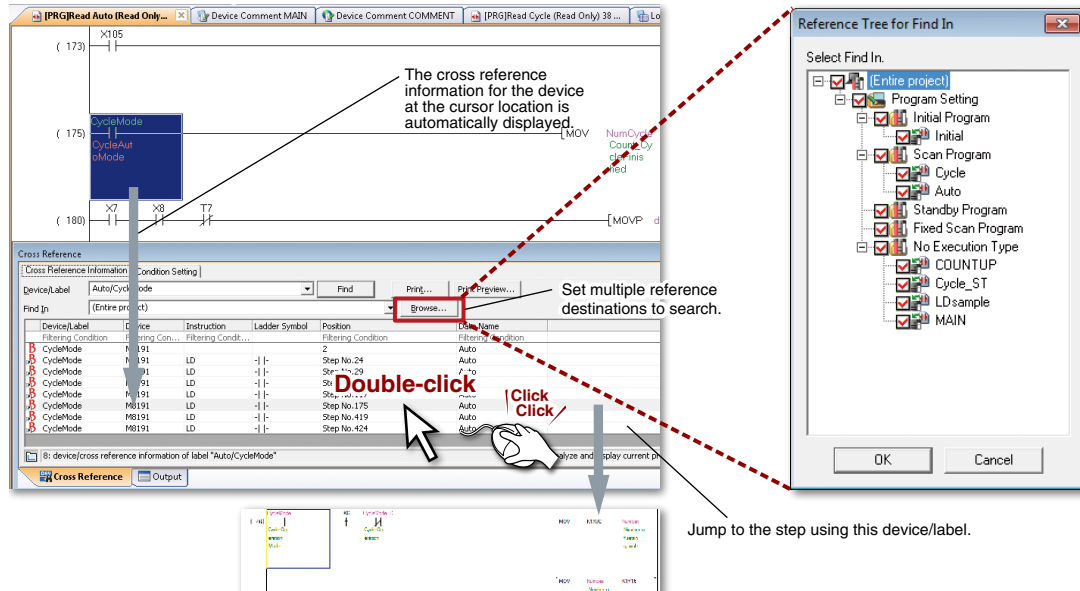


## ● Cross referencing interlinked with circuit displays

Relevant devices and labels can be searched within the contents of the program by using the cross reference tool.

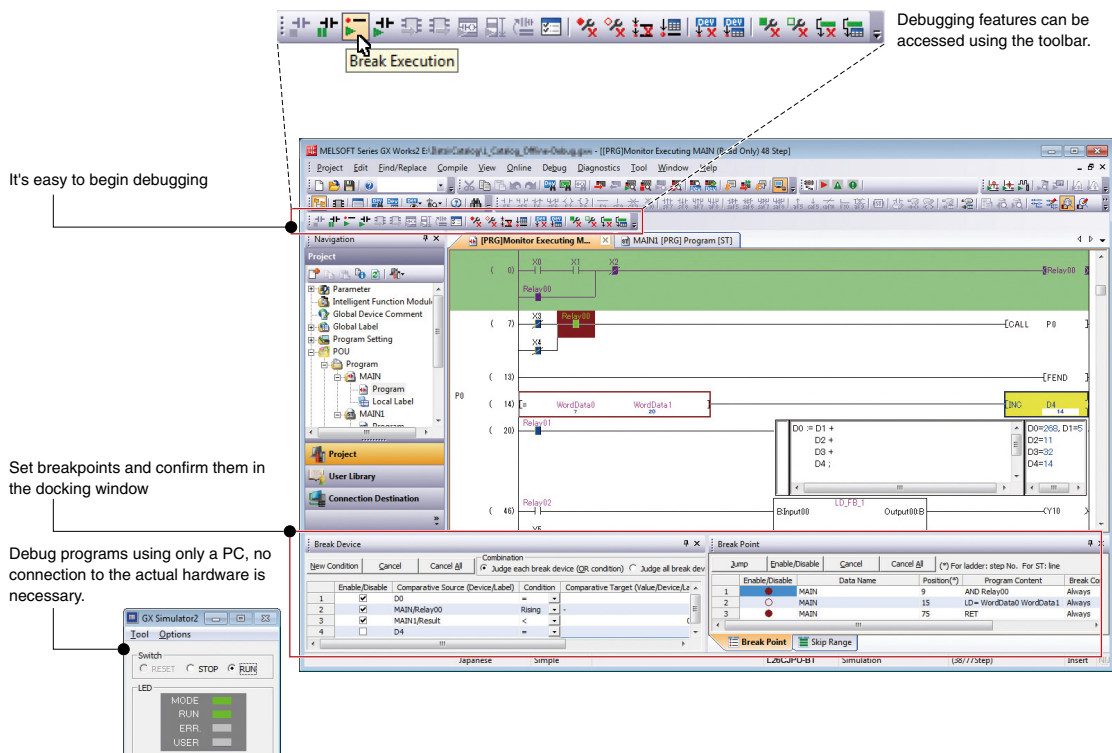
The results are immediately displayed in the cross reference dialog box conveniently besides the actual program view screen.

It is then very easy to check where the relevant device is actually used within the program, just by double clicking on the target device.



## ● Offline debug without physical hardware

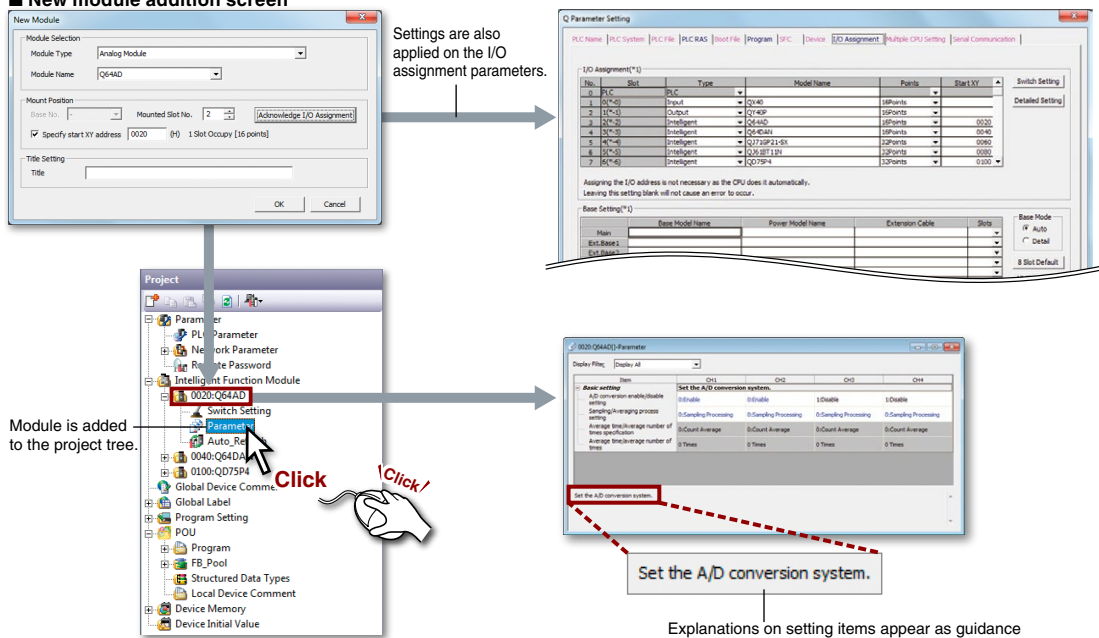
The simulation function is now integrated. The program can be executed in a step-by-step method, finding program errors more easily.



## ● Intelligent function module setting

Manage the intelligent function module's setting with a GX Works2 project.

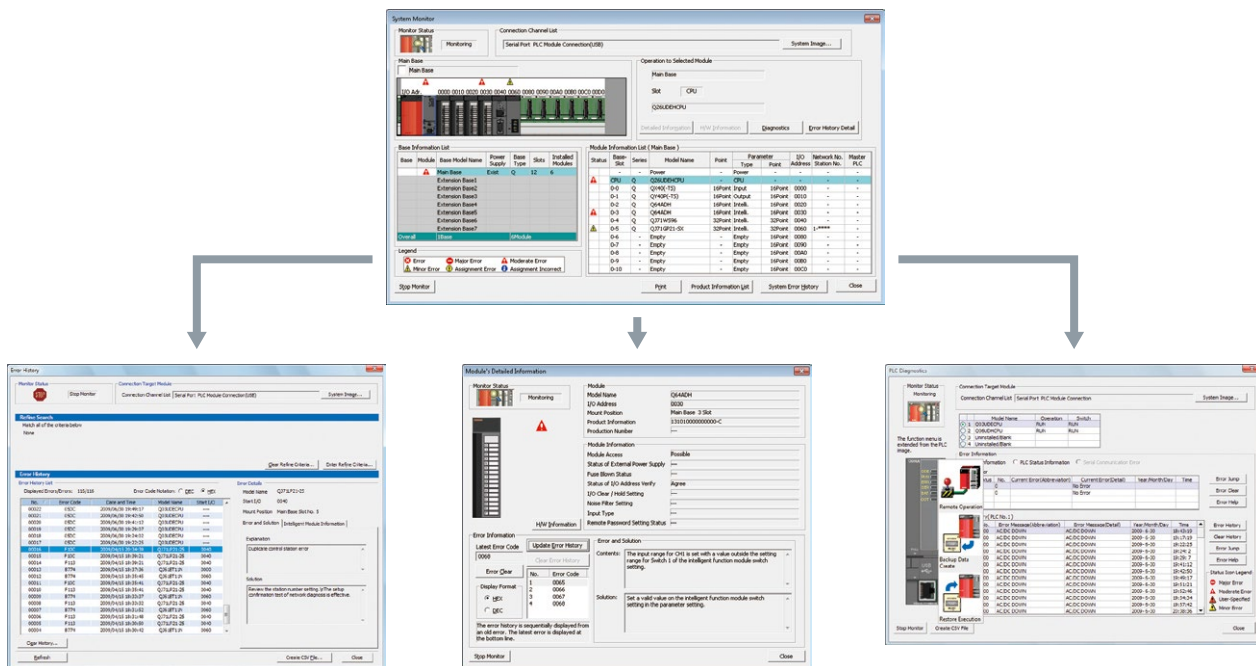
### ■ New module addition screen



## ● Visible System monitor function and PLC diagnostics

Operation status of the entire programmable controller system is clearly displayed.

Each module's diagnosis and detailed information is displayed on the monitor for the entire system allowing the problem point to be confirmed quickly.



### ■ System error history

Simplify troubleshooting with a combined, time-stamped, error history list for CPUs and intelligent function modules. The details section provides explanations of error codes and suggested solutions.

### ■ Detailed module information

Resolve intelligent function module issues quickly by clicking on a module to open this function. All of the information relevant to the module is displayed here including error codes, their description, and possible solutions.

## ■ PLC diagnostics

From one central window quickly read error and status information, export log files to CSV, perform remote CPU operations like reset, stop, CPU memory format, and more.





## ● Time-stamped error history list

Simplify troubleshooting with a combined, time-stamped, error history list for the CPU and all expansion modules. The details section provides explanations of error codes and suggested solutions.

**Error History List**

Displayed Errors/Errors: 123/123

Error Code Notation: ☐ DEC ☒ HEX

| No.   | Error Code | Date and Time       | Model Name  | Start I/O |
|-------|------------|---------------------|-------------|-----------|
| 00050 | 8782       | 2009/10/08 18:14:17 | QJ61BT11N   | 0110      |
| 00059 | 7D13       | 2009/10/08 17:53:06 | QJ71C24N-R2 | 00F0      |
| 00058 | 7D16       | 2009/10/08 17:52:32 | QJ71C24N-R2 | 00F0      |
| 00057 | 05DC       | 2009/10/08 16:14:09 | Q26UDEHCPU  | ----      |
| 00056 | 7D12       | 2009/10/08 16:00:53 | QJ71C24N-R2 | 00F0      |
| 00055 | 7D16       | 2009/10/08 15:56:40 | QJ71C24N-R2 | 00F0      |
| 00054 | 7D16       | 2009/10/08 15:50:24 | QJ71C24N-R2 | 00F0      |
| 00053 | 7D16       | 2009/10/08 14:59:03 | QJ71C24N-R2 | 00F0      |
| 00052 | 7D12       | 2009/10/08 14:43:27 | QJ71C24N-R2 | 00F0      |
| 00051 | 7D12       | 2009/10/08 14:35:53 | QJ71C24N-R2 | 00F0      |
| 00050 | 7FF2       | 2009/10/08 14:35:02 | QJ71C24N-R2 | 00F0      |
| 00049 | 1005       | 2009/10/08 14:03:44 | Q26UDEHCPU  | ----      |
| 00048 | 7F42       | 2009/10/08 13:37:00 | QJ71C24N-R2 | 00F0      |
| 00047 | 0C21       | 2009/10/08 13:13:56 | Q26UDEHCPU  | ----      |
| 00046 | 0834       | 2009/10/08 13:12:40 | Q26UDEHCPU  | ----      |
| 00045 | 05DC       | 2009/10/08 13:11:51 | Q26UDEHCPU  | ----      |
| 00044 | 7F42       | 2009/10/08 12:04:52 | QJ71C24N-R2 | 00F0      |
| 00043 | 0840       | 2009/10/08 11:43:17 | Q26UDEHCPU  | ----      |
| 00042 | 0840       | 2009/10/08 11:42:01 | Q26UDEHCPU  | ----      |

**Explanation**

Station number specification error. The transmission destination and source stations were the same when other station connection was specified.

**Solution**

Check the transmission destination station number, or change to host connection.

Quickly identify the error, its cause, and solution without the need to reference a manual.

## ● Save, edit labels and parameters with Microsoft® Excel®

Various program data can be exported in CSV file format.

Exporting to CSV format has various advantages, as shown below:

- Data can be utilized on a personal computer even if GX Works2 is not installed
- Data can be saved directly on the personal computer
- Data can be sent and utilized off-site
- Utilization of data for creating documents and graphs are possible using Excel®
- Can use in other software that support CSV format

### ■ Example of I/O assignment setting CSV file

I/O assignment setting

**I/O Assignment Setting**

| No. | Slot  | PLC         | Type  | Model Name | Points | Start XY |
|-----|-------|-------------|-------|------------|--------|----------|
| 0   | PLC   | Intelligent | Q64AD | 16Points   | 0000   |          |
| 1   | (0-0) | Intelligent | Q64AD | 16Points   | 0010   |          |
| 2   | (1-1) | Intelligent | Q64AD | 16Points   | 0020   |          |
| 3   | (2-2) | Intelligent | Q64AD | 16Points   | 0030   |          |
| 4   | (3-3) | Intelligent | Q64AD | 16Points   | 0040   |          |
| 5   | (4-4) | Intelligent | Q64AD | 16Points   | 0050   |          |
| 6   |       |             |       |            |        |          |
| 7   |       |             |       |            |        |          |

**Base Setting**

| Base Model Name | Power Model Name | Extension Cable | Slots |
|-----------------|------------------|-----------------|-------|
| Main: Q312B     | Q61P             |                 | 5     |
| Ext. Base1      |                  |                 |       |
| Ext. Base2      |                  |                 |       |
| Ext. Base3      |                  |                 |       |
| Ext. Base4      |                  |                 |       |
| Ext. Base5      |                  |                 |       |
| Ext. Base6      |                  |                 |       |
| Ext. Base7      |                  |                 |       |

- » Ladder program..... Write/Read
- » Label setting..... Write/Read
- » Parameter (I/O assignment setting, X/Y assignment confirmation) ... Write
- » Verification results..... Write
- » Sampling trace function..... Read (CSV file format that can be read with GX LogViewer)
- » Watch window device/label list..... Write/Read
- » System monitor diagnostics, product information, PLC diagnostics, module error history..... Write
- » Device memory..... Write/Read

CSV file

|    | A      | B           | C  | D  | E      | F     | G    | H    | I     | J    | K    | L    | M    | N    | O                |
|----|--------|-------------|----|----|--------|-------|------|------|-------|------|------|------|------|------|------------------|
| 4  | 0(0-0) | Intelligent | 16 | 0  | Q64AD  | Clear | Stop | ---- | 34616 | ---- | 598  | ---- | ---- | ---- | Base Model Name  |
| 5  | 1(0-1) | Intelligent | 16 | 16 | Q64AD  | Clear | Stop | ---- | 52    | ---- | ---- | ---- | ---- | ---- | Q312B            |
| 6  | 2(0-2) | Intelligent | 16 | 32 | Q64AD  | Clear | Stop | ---- | ----  | ---- | ---- | ---- | ---- | ---- | Power Model Name |
| 7  | 3(0-3) | Intelligent | 16 | 48 | Q64AD  | Clear | Stop | ---- | ----  | ---- | ---- | ---- | ---- | ---- | Q61P             |
| 8  | 4(0-4) | Intelligent | 16 | 64 | QD75P4 | Clear | Stop | ---- | ----  | ---- | ---- | ---- | ---- | ---- | Extension Cable  |
| 9  |        |             |    |    |        |       |      |      |       |      |      |      |      |      | Slots            |
| 10 |        |             |    |    |        |       |      |      |       |      |      |      |      |      | 5                |
| 11 |        |             |    |    |        |       |      |      |       |      |      |      |      |      |                  |
| 12 |        |             |    |    |        |       |      |      |       |      |      |      |      |      |                  |

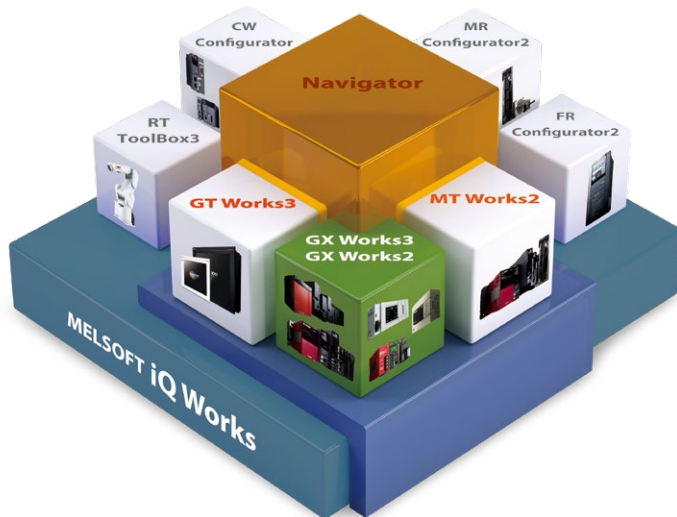
I/O assignment

Advanced setting

Switch setting

Basic setting

## iQ Works



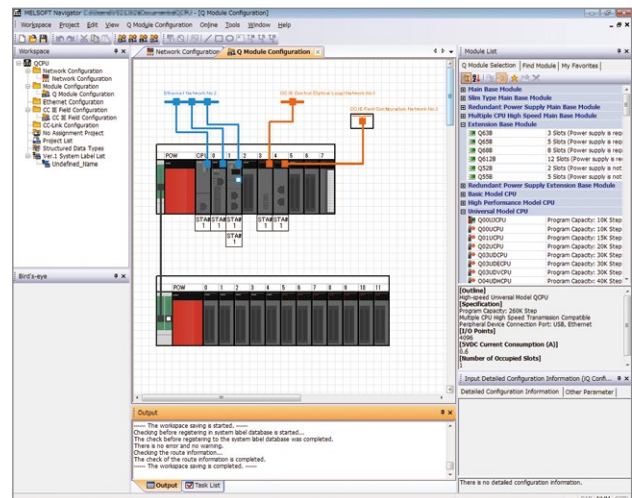
## MELSOFT iQ Works

### Next Generation Integrated Engineering Environment

MELSOFT iQ Works is an integrated software suite consisting of GX Works3, GX Works2, MT Works2, GT Works3, RT ToolBox3, FR Configurator2, CW Configurator and MR Configurator2. 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.

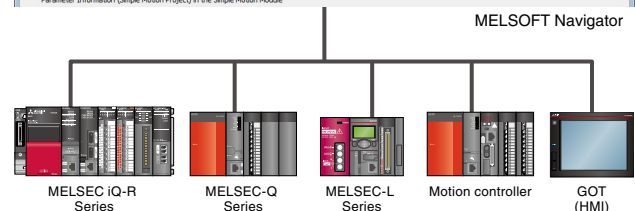
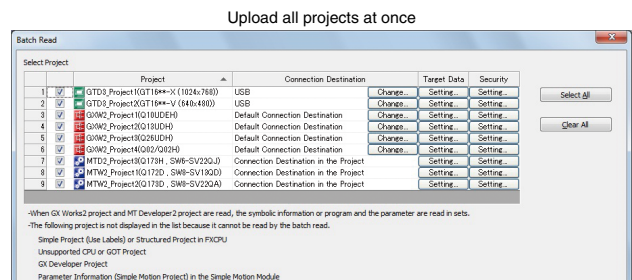
#### Graphical project management

The entire control system is represented using the “Network Configuration”, “Module Configuration” and field network configuration windows. System components are easily added using a drag & drop interface, and the validity of the system can be confirmed using the check function to ensure parameters are configured correctly, the power supply is sufficient, etc. Different programmable controller and GOT (HMI) projects can be grouped together (for example by factory, line, and cell) for central management.



#### Read project data for multiple devices in a batch

Multiple projects can be read as a block just by having one connection to the programmable controller. If there are multiple devices such as other CPU or GOT (HMI) on the same network as the target master programmable controller, it is possible to upload all projects to each target device without having to individually connect to each device.

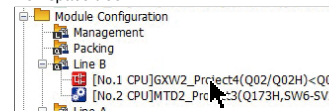




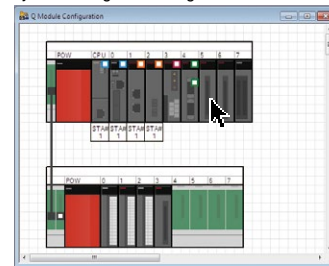
### ● Automatically start up the relevant maintenance software with a single click

Just double-click on the corresponding project in the system configuration diagram or workspace tree to automatically startup the software relevant for that device. Maintenance can be efficiently performed without having to know and startup each relevant software manually.

Double-click on corresponding project in workspace tree



Double-click on corresponding device in system configuration diagram



Software for corresponding device automatically starts up

GX Works3  
GX Works2  
MT Works2  
GT Works3  
RT ToolBox3  
FR Configurator2  
CW Configurator  
MR Configurator2

### ● Set up field network device stations

There's no need to prepare a dedicated tool to check or change the parameter settings of a device station on-site. The latest version of iQ Works includes device station setting utility. Inverter parameters, for example, can be confirmed or changed for speed adjustment directly from the field network configuration window. In addition, error information can be read easily.

CC-Link IE

CC-Link

Ethernet

AnyWireASLINK

USB, etc. Field network master station Device station

Right-click the device station illustration and select the "device station parameter process"

Open the device station setting screen from the field network configuration window.

Device station's parameter setting window opens

Set device station parameters with GX Works3, GX Works2 and Navigator.

Get error information.

### ● Prepare a device from the system configuration diagram with no manual inputs

A list of modules used can be exported as a CSV file from the system configuration diagram.

This is particularly useful when utilizing data for creating a bill of materials (BOM) in Excel®, etc.

Export CSV file from list of modules

Create device list with Excel®

Print list of devices

## GX LogViewer



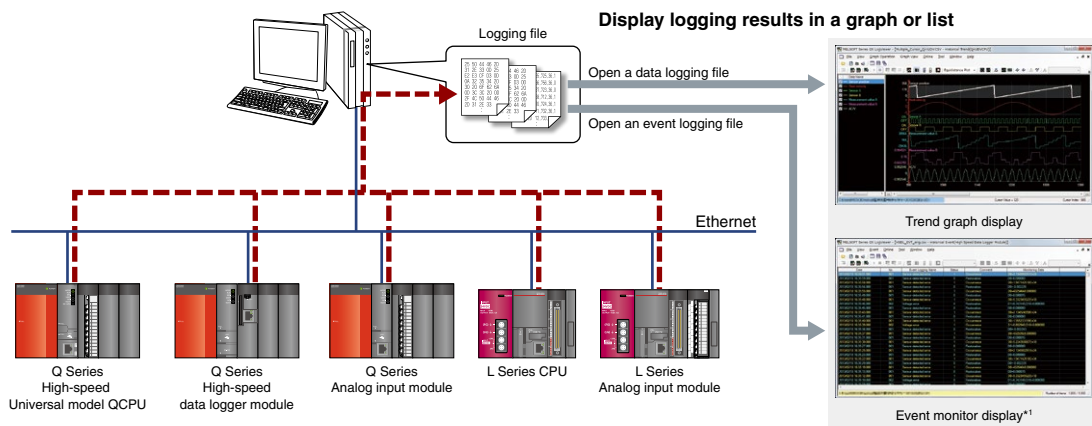
## GX LogViewer

### Visualizing the production process

Within modern manufacturing needs, data collection has become more important for fully optimizing the production process. GX LogViewer is a software tool that realizes visualization of large amounts of production data in a simple to use format. Utilizing this functionality to identify root error causes and improving the production rate.

#### ● Easily display and analyze large amounts of collected logging data

This tool is used when large amounts of data need to be visualized and collected from the MELSEC-Q Series or MELSEC-L Series. The connection settings and checking of log files are the same as GX Works2 enabling individual connections to each module.

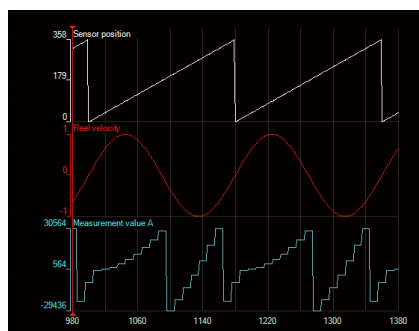


\*1: The event monitor display is supported only with the Q Series high-speed logger module.

#### ● Easily adjust graphs without referring to the setup manual

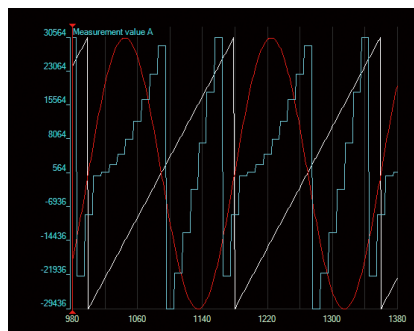
##### Arranging graphs

Able to arrange each graph so as not to overlap each other. It is easier to display the graphs as each graph is evenly spaced out.



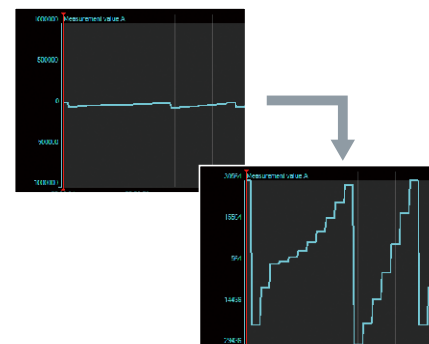
##### Overlapping graphs

With this it is possible to overlap each graph over one another. Multiple graphs can be compared enabling easier data analysis and comparison.



##### Automatically adjusting graphs

Various attributes of the graph are automatically adjusted (max/min values) as to display the upper and lower limit values better.

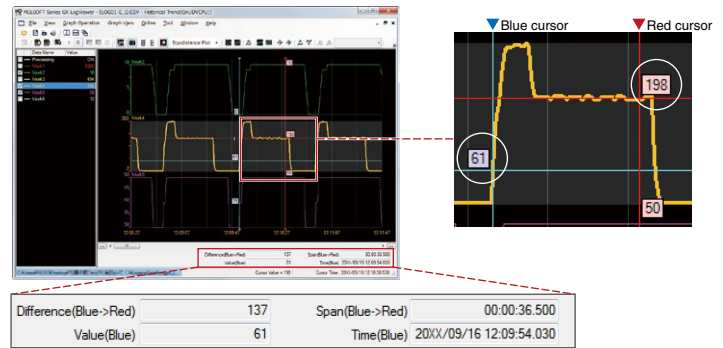






### ● Easily confirm changes in data with dual cursors

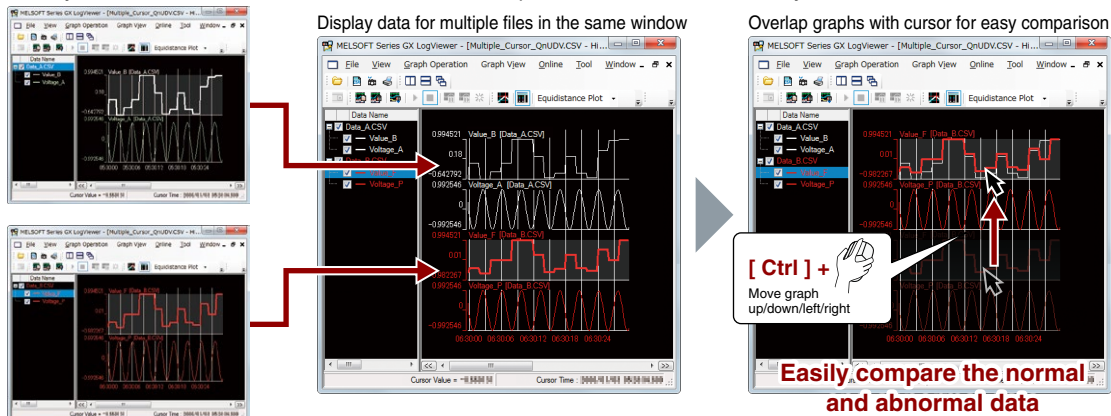
Data changes within a designated time frame can be quickly checked with user-friendly dual cursors (multi-cursors). When the cursors are moved to the point at which changes are to be confirmed, the difference in time and value between those points will appear.



The difference in time and value between the cursors is automatically calculated and displayed.

### ● Display data for multiple files within one graph area for easy comparison

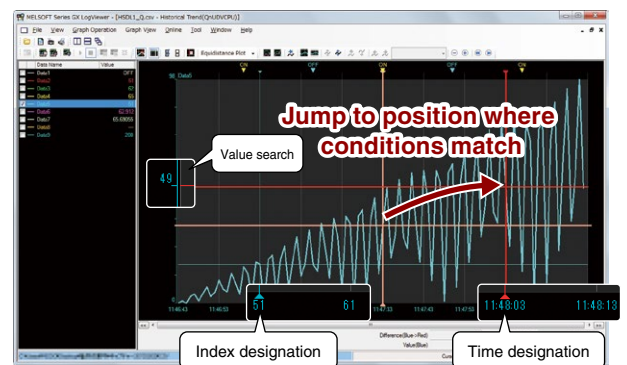
Data for multiple files are displayed with the same time units in the same graph area. The display position within a file can be moved easily. This allows the differences of data within multiple files to be confirmed easily.



### ● Quickly jump cursor to designated position

Cursor jump

Confirm data values by quickly moving the cursor to a designated value, time or index position in the trend graph.



**Jump Cursor**

Select conditions for jump cursor:

Value | Time | Index

File Name: HSD1\_1\_Q.csv

Data Name: Data5

Classification: Conditional

Search the selecting data in specified condition:

Value Range: 0 to 4294967295

Select a cursor that jumps:

☒ Red Cursor ☐ Blue Cursor

Jump Previous Jump Next Close

Value search

Values are searched, and the cursor jumps to the position where the conditions match.

**Jump Cursor**

Select conditions for jump cursor:

Value | Time | Index

File Name: HSD1\_1\_Q.csv

Time Range: 2011/03/31 11:46:43 to 2011/03/31 11:48:22

Date and time to which the cursor jumps

☒ Date

2011/03/31

☒ Hour ☒ Minute ☒ Second

11 47 33

Select a cursor that jumps:

☒ Red Cursor ☐ Blue Cursor

Jump Previous Jump Next Close

Time designation

The cursor jumps to the designated time.

**Jump Cursor**

Select conditions for jump cursor:

Value | Time | Index

File Name: HSD1\_1\_Q.csv

Index Range: 1 to 100

Index to which the cursor jumps: 51

Select a cursor that jumps:

☒ Red Cursor ☐ Blue Cursor

Jump Previous Jump Next Close

Index designation

The cursor jumps to the designated index.





# Ensuring safety between the operator and machine

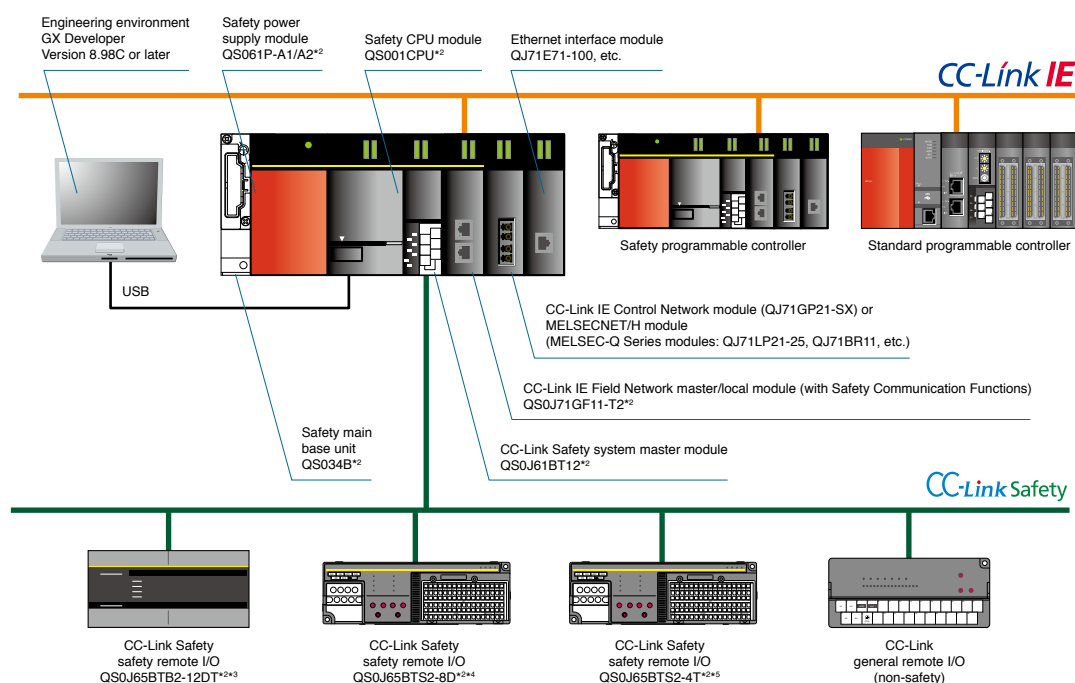
Based on a principle of separating machines from operators, safety protection measures were implemented on the basis of risk assessment and safety control such as implementation of an emergency stop. The advancement of technology realizes operations such as slowing down the operation speed when an operator approaches a machine and continuous operation without stopping when an operator is away from a machine. The concept of safety has shifted to a level where operators and machines can work in collaboration ensuring increased safety. Mitsubishi Electric offers a total safety solution which realizes "collaboration" of operators and machines with a large variety of products.

## Safety Programmable Controller MELSEC-QS Series

### ● Safety CPU\*1.....**QS001CPU\*2**

The safety programmable controller is a programmable controller dedicated to safety control, conforming to international standards such as ISO 13849-1 Category 4 PL e and IEC 61508 SIL 3. When connected with a safety device, such as an emergency stop switch or light curtain, this programmable controller executes safety control by turning the safety output OFF with a user-created sequence program to stop movement toward a source of hazard, such as a robot.

Machine control of the robot and conveyor, etc., is executed with a standard programmable controller in the conventional manner. The difference between the safety programmable controller and general-purpose programmable controller lies in that if the safety programmable controller itself fails, it performs a self-diagnosis to detect the failure and turn the safety output OFF forcibly. This CPU branches topology using the CC-Link Safety and CC-Link IE Field Network with safety communication function. This is ideal for large control systems requiring many safety I/O points.



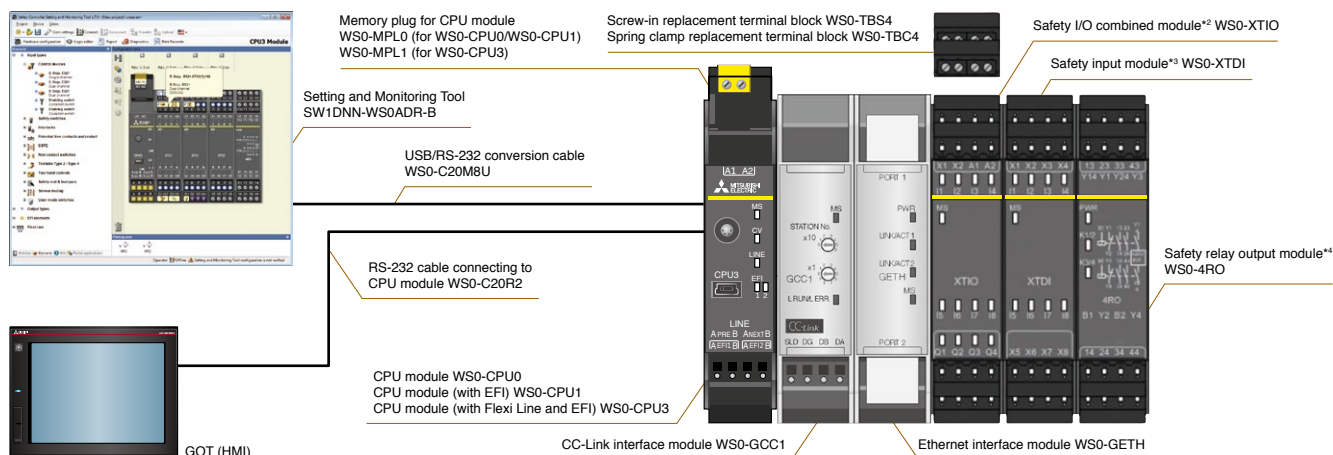
\*1: The CPU cannot be installed on the Q Series base unit.  
 \*2: Production will be discontinued in September 2023.  
 \*3: Number of input points: 8 points (double wiring), No. of output points: 4 points (source + sink type)  
 \*4: Number of input points: 8 points (double wiring)  
 \*5: Number of output points: 4 points (source + sink type)

## MELSEC-WS Series Safety Controller

### ● Safety controller CPU\*1 ..... **WS0-CPU0, WS0-CPU1, WS0-CPU3**

The safety controller is a controller dedicated to safety control, conforming to international standards such as ISO 13849-1 Category 4 PL e and IEC 61508 SIL 3. The MELSEC-WS is ideal for small to medium-size safety machines and systems. I/O points of up to 144 (no redundancy) and up to 2 network interfaces and the dedicated Setting and Monitoring Tool, which contains safety sensor/switch connections and function blocks, all support the configuration of a safety system.

\*1: The CPU cannot be installed on the Q Series base unit.



\*2: No. of input points: 8 points (single wiring), No. of output points: 4 points (single wiring)

\*3: No. of input points: 8 points (single wiring)

\*4: Safety relay output: 4 points



The MELSEC-WS Series was developed and manufactured by SICK AG. SICK is a German supplier of safety solutions. SICK designs and manufactures a broad range of safety products including industrial-use sensors and automatic identification systems.

\* 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/representative.

**SICK AG** <http://www.sick.com/>

## MELSEC-QS Series Safety Relay Modules

### ● Q Series safety relay module..... **QS90SR2SP-Q, QS90SR2SN-Q**

### ● CC-Link safety relay module ..... **QS90SR2SP-CC, QS90SR2SN-CC**

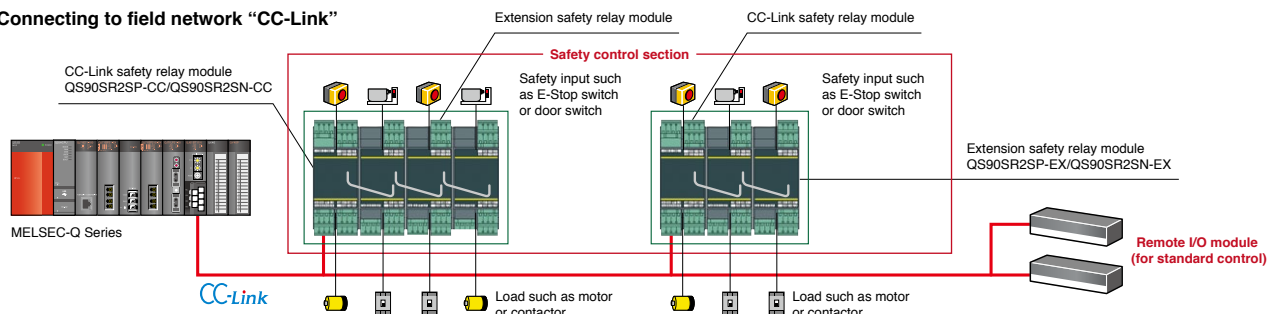
### ● Extension safety relay module ..... **QS90SR2SP-EX, QS90SR2SN-EX**

The safety relay module integrates the emergency stop circuit and the restart circuit with a double safety relay.

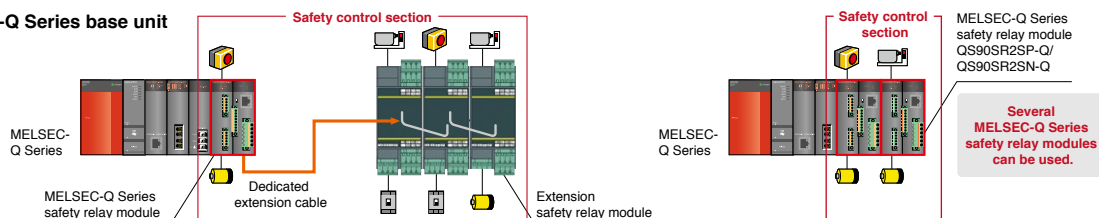
A basic safety function can be realized with just wiring, eliminating the need for programming and parameter settings.

Furthermore, the number of I/O points can be increased by adding extension modules.

#### ■ Connecting to field network “CC-Link”



#### ■ Installing on MELSEC-Q Series base unit





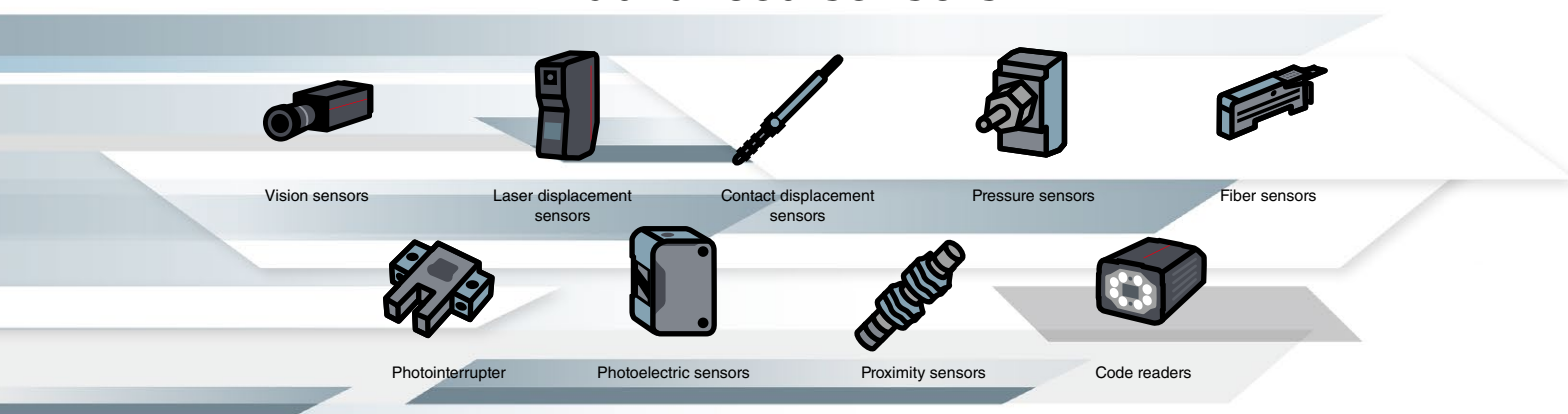
# A tool for connecting! Visualizing! For a more seamless sensor control

Sensors used on the manufacturing floor are becoming more intelligent and complex, requiring even more maintenance of equipment and the overall management of various configuration setup software. With iQSS, the intelligent sensor solution provided by Mitsubishi Electric, configuration and maintenance of sensors are further simplified with the enhanced connectivity to other components such as industrial computers, automation controllers, HMIs, and engineering software even further reducing the overall TCO\*.

\* Total Cost of Ownership

## iQ Sensor Solution

### iQSS covers all the sensors from general sensors to advanced sensors



**Panasonic**

**Anywire**

**OPTEX  
FR**

**Magnescale**  
SPEED X PRECISION

**NSD Corporation**

**SYSTEM & SERVICE**

**CKD**

**FLIR**

**MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED**

**IDEC**

**CITIZEN**

#### System design

Provide a workspace tree that enables projects to be managed in a single location and a system configuration chart that depicts the entire system graphically, enabling easier project management.

#### Programming

The labels used by programmable controllers can also be used by GOTs (HMIs) and sensors. This takes all the bother out of label setting. HMI (GOT) sample screen libraries, sample ladders and function blocks, etc. are supported.

#### Operation/ maintenance

To make backups less laborious, batch read and write functions are provided for programmable controller, HMI (GOT) and sensor settings.

#### Implementation

Functions are provided that allow monitoring from a single screen based on the system configuration chart so that the causes of problems can be identified quickly. This also shortens the time taken to adjust sections involving multiple devices.





# General Specifications

General specifications indicate the environmental specifications in which this product can be installed and operated. Unless otherwise specified, the general specifications apply to all products of the Q Series.

Install and operate the Q Series products in the environment indicated in the general specifications.

| Item                          | Specification                             |                              |                                                                                          |                       |                        |                                     |
|-------------------------------|-------------------------------------------|------------------------------|------------------------------------------------------------------------------------------|-----------------------|------------------------|-------------------------------------|
| Operating ambient temperature | 0...55°C                                  |                              |                                                                                          |                       |                        |                                     |
| Storage ambient temperature   | -25...75°C *1                             |                              |                                                                                          |                       |                        |                                     |
| Operating ambient humidity    | 5...95% RH*2, non-condensing              |                              |                                                                                          |                       |                        |                                     |
| Storage ambient humidity      | 5...95% RH*2, non-condensing              |                              |                                                                                          |                       |                        |                                     |
| 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 (0.14 inches)   | 10 times each in X, Y, Z directions |
|                               |                                           |                              | 8.4...150 Hz                                                                             | 9.8 m/s²              | -                      |                                     |
|                               |                                           | Under continuous vibration   | 5...8.4 Hz                                                                               | -                     | 1.75 mm (0.069 inches) | -                                   |
|                               |                                           |                              | 8.4...150 Hz                                                                             | 4.9 m/s²              | -                      |                                     |
|                               |                                           | Shock resistance             | Compliant with JIS B 3502 and IEC 61131-2 (147 m/s², 3 times each in directions X, Y, Z) |                       |                        |                                     |
| Operating atmosphere          | No corrosive gases                        |                              |                                                                                          |                       |                        |                                     |
| Operating altitude*3          | ≤ 2000 m (6562 feet)                      |                              |                                                                                          |                       |                        |                                     |
| Installation location         | Inside a control panel                    |                              |                                                                                          |                       |                        |                                     |
| Overvoltage category*4        | ≤ II                                      |                              |                                                                                          |                       |                        |                                     |
| Pollution level*5             | ≤ 2                                       |                              |                                                                                          |                       |                        |                                     |

\*1: The storage ambient temperature is -20 to 75°C if the system includes the AnS/A Series modules.

\*2: The operating ambient humidity and storage ambient humidity are 10 to 90% RH if the system includes the AnS/A Series modules.

\*3: Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0 m.

Doing so can cause a malfunction.

When using the programmable controller under pressure, please contact your sales representative.

\*4: 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.

\*5: 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.

# CPU Module Performance Specifications

## Universal model QCPU

| Item                                                                                               |                                                | Q03UDVCPU                                                                                                                                            | Q04UDVCPU                   | Q06UDVCPU                   | Q13UDVCPU                   | Q26UDVCPU                                               | Q00UJCPU     | Q00UCPU                                                         | Q01UCPU   |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------------------------------------|--------------|-----------------------------------------------------------------|-----------|
| Control method                                                                                     |                                                | Stored program cyclic operation                                                                                                                      |                             |                             |                             |                                                         |              |                                                                 |           |
| I/O control mode                                                                                   |                                                | Refresh                                                                                                                                              |                             |                             |                             |                                                         |              |                                                                 |           |
| Program language<br>(sequence control language)                                                    |                                                | ●<br>• Relay symbol language (ladder)<br>• Logic symbolic language (list)<br>• MELSAP3 (SFC), MELSAP-L<br>• Function block<br>• Structured text (ST) |                             |                             |                             |                                                         |              |                                                                 |           |
| Peripheral connection port                                                                         | USB <sup>*1</sup>                              | ●                                                                                                                                                    |                             |                             |                             |                                                         |              |                                                                 |           |
|                                                                                                    | Ethernet<br>(100BASE-TX/10BASE-T)              | ●                                                                                                                                                    |                             |                             |                             | -                                                       |              |                                                                 |           |
|                                                                                                    | RS-232                                         | -                                                                                                                                                    |                             |                             |                             | ●                                                       |              |                                                                 |           |
| Memory card interface                                                                              |                                                | ●<br>(SD Memory Card, SDHC Memory Card) <sup>*2</sup>                                                                                                |                             |                             |                             | -                                                       |              |                                                                 |           |
| Extended SRAM cassette port                                                                        |                                                | ●                                                                                                                                                    |                             |                             |                             | -                                                       |              |                                                                 |           |
| Processing speed <sup>*3</sup>                                                                     | LD instruction                                 | 1.9 ns                                                                                                                                               |                             |                             |                             | 120 ns                                                  |              | 80 ns                                                           | 60 ns     |
|                                                                                                    | MOV instruction                                | 3.9 ns                                                                                                                                               |                             |                             |                             | 240 ns                                                  |              | 160 ns                                                          | 120 ns    |
|                                                                                                    | PC MIX value <sup>*4</sup><br>(instruction/μs) | 227                                                                                                                                                  |                             |                             |                             | 4.92                                                    |              | 7.36                                                            | 9.79      |
|                                                                                                    | Floating point addition                        | 0.014 μs                                                                                                                                             |                             |                             |                             | 0.42 μs                                                 |              | 0.30 μs                                                         | 0.24 μs   |
| Total number of instructions <sup>*5</sup>                                                         |                                                | 859                                                                                                                                                  |                             |                             |                             | 821                                                     |              | 855                                                             |           |
| Floating point instruction                                                                         |                                                | ●                                                                                                                                                    |                             |                             |                             |                                                         |              |                                                                 |           |
| Character string processing instruction                                                            |                                                | ●                                                                                                                                                    |                             |                             |                             |                                                         |              |                                                                 |           |
| PID instruction                                                                                    |                                                | ●                                                                                                                                                    |                             |                             |                             |                                                         |              |                                                                 |           |
| Special function instruction<br>(Trigonometric function, square root, exponential operation, etc.) |                                                | ●                                                                                                                                                    |                             |                             |                             |                                                         |              |                                                                 |           |
| Constant scan<br>(Function for keeping regular scan time)                                          |                                                | 0.5...2000 ms<br>(setting available in units of 0.1 ms)                                                                                              |                             |                             |                             | 0.5...2000 ms<br>(setting available in units of 0.5 ms) |              |                                                                 |           |
| Program capacity <sup>*6</sup>                                                                     |                                                | 30K steps                                                                                                                                            | 40K steps                   | 60K steps                   | 130K steps                  | 260K steps                                              | 10K steps    |                                                                 | 15K steps |
| Number of I/O device points [X/Y]                                                                  |                                                | 8192 points                                                                                                                                          |                             |                             |                             |                                                         |              |                                                                 |           |
| Number of I/O points [X/Y]                                                                         |                                                | 4096 points                                                                                                                                          |                             |                             |                             | 256 points                                              |              | 1024 points                                                     |           |
| Internal relay [M] <sup>*7</sup>                                                                   |                                                | 9216 points                                                                                                                                          | 15360 points                |                             | 28672 points                |                                                         | 8192 points  |                                                                 |           |
| Latch relay [L] <sup>*7</sup>                                                                      |                                                |                                                                                                                                                      |                             |                             |                             | 8192 points                                             |              |                                                                 |           |
| Link relay [B] <sup>*7</sup>                                                                       |                                                |                                                                                                                                                      |                             |                             |                             | 8192 points                                             |              |                                                                 |           |
| Timer [T] <sup>*7</sup>                                                                            |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Retentive timer [ST] <sup>*7</sup>                                                                 |                                                |                                                                                                                                                      |                             |                             |                             | 0 point                                                 |              |                                                                 |           |
| Counter [C] <sup>*7</sup>                                                                          |                                                |                                                                                                                                                      |                             |                             |                             | 1024 points                                             |              |                                                                 |           |
| Data register [D] <sup>*7</sup>                                                                    |                                                | 13312 points                                                                                                                                         | 22528 points                |                             | 41984 points                |                                                         | 12288 points |                                                                 |           |
| Extended data register [D] <sup>*7</sup>                                                           |                                                | 0 point                                                                                                                                              |                             |                             |                             | -                                                       |              | 0 point                                                         |           |
| Link register [W]                                                                                  |                                                |                                                                                                                                                      |                             |                             |                             | 8192 points                                             |              |                                                                 |           |
| Extended link register [W] <sup>*7</sup>                                                           |                                                | 0 point                                                                                                                                              |                             |                             |                             | -                                                       |              | 0 point                                                         |           |
| Annunciator [F] <sup>*7</sup>                                                                      |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Edge relay [V] <sup>*7</sup>                                                                       |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Link special relay [SB] <sup>*7</sup>                                                              |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Link special register [SW] <sup>*7</sup>                                                           |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| File register [R, ZR]                                                                              |                                                | 98304 points <sup>*8</sup>                                                                                                                           | 131072 points <sup>*8</sup> | 393216 points <sup>*8</sup> | 524288 points <sup>*8</sup> | 655360 points <sup>*8</sup>                             | -            | 65536 points                                                    |           |
| Step relay [S] <sup>*7</sup>                                                                       |                                                |                                                                                                                                                      |                             |                             |                             | 8192 points                                             |              |                                                                 |           |
| Index register/standard device register [Z]                                                        |                                                |                                                                                                                                                      |                             |                             |                             | Max. 20 points                                          |              |                                                                 |           |
| Index register [Z]<br>(32-bit ZR indexing)                                                         |                                                | Max. 10 points<br>(Index register [Z] is used in double words.)                                                                                      |                             |                             |                             | -                                                       |              | Max. 10 points<br>(Index register [Z] is used in double words.) |           |
| Pointer [P]                                                                                        |                                                | 4096 points                                                                                                                                          |                             |                             |                             | 512 points                                              |              |                                                                 |           |
| Interrupt pointer [I]                                                                              |                                                | 256 points                                                                                                                                           |                             |                             |                             | 128 points                                              |              |                                                                 |           |
| Special relay [SM]                                                                                 |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Special register [SD]                                                                              |                                                |                                                                                                                                                      |                             |                             |                             | 2048 points                                             |              |                                                                 |           |
| Function input [FX]                                                                                |                                                |                                                                                                                                                      |                             |                             |                             | 16 points                                               |              |                                                                 |           |
| Function output [FY]                                                                               |                                                |                                                                                                                                                      |                             |                             |                             | 16 points                                               |              |                                                                 |           |
| Function register [FD]                                                                             |                                                |                                                                                                                                                      |                             |                             |                             | 5 points                                                |              |                                                                 |           |
| Local device                                                                                       |                                                | ●                                                                                                                                                    |                             |                             |                             | -                                                       |              | ●                                                               |           |
| Device initial values                                                                              |                                                | ●                                                                                                                                                    |                             |                             |                             | ●                                                       |              |                                                                 |           |

\*1: The USB port terminal is mini-B.

\*2: The operation of devices that are not manufactured or recommended as compatible products by Mitsubishi Electric cannot be guaranteed.

\*3: The processing speed is the same even when the device is indexed.

\*4: The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1μs. A larger value indicates a higher processing speed.

\*5: Intelligent function module dedicated instructions are not included.

\*6: When the QnUD(H)CPU or QnUDE(H)CPU is replaced with the QnUDVCPU, the number of steps in the program may change (increase or decrease). For more information, refer to the relevant manual.

\*7: Indicates the number of points in the default state. This can be changed with the parameter.

\*8: Indicates the number of points when using the built-in memory (standard RAM). This can be increased with the extended SRAM cassette.

When using together with the extended SRAM cassette, the value obtained by totaling the number of points in the following table is the number of file registers that can be used.

| With Q4MCA-1MBS (1 MB) | With Q4MCA-2MBS (2 MB) | With Q4MCA-4MBS (4 MB) | With Q4MCA-8MBS (8 MB) |
|------------------------|------------------------|------------------------|------------------------|
| 524288 points          | 1048576 points         | 2097152 points         | 4194304 points         |

\*9: Indicates the number of points when using the built-in memory (standard RAM). This can be expanded with the SRAM card or Flash card. (Writing from the program is not possible with the Flash card.)  
Up to 4184064 points can be used with the SRAM card.





| Q02UCPU                                                                                                                                         | Q03UDECPU                                        | Q04UDEHCPU      | Q06UDEHCPU      | Q10UDEHCPU      | Q13UDEHCPU | Q20UDEHCPU      | Q26UDEHCPU | Q50UDEHCPU      | Q100UDEHCPU     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------|-----------------|-----------------|------------|-----------------|------------|-----------------|-----------------|
| Stored program cyclic operation                                                                                                                 |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| Refresh                                                                                                                                         |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| • Relay symbol language (ladder)<br>• Logic symbolic language (list)<br>• MELSAP3 (SFC), MELSAP-L<br>• Function block<br>• Structured text (ST) |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| —                                                                                                                                               | Q03UDECPU                                        | Q04UDEHCPU      | Q06UDEHCPU      | Q10UDEHCPU      | Q13UDEHCPU | Q20UDEHCPU      | Q26UDEHCPU | ●               |                 |
| ●                                                                                                                                               | Q03UDCPU                                         | Q04UDHCPU       | Q06UDHCPU       | Q10UDHCPU       | Q13UDHCPU  | Q20UDHCPU       | Q26UDHCPU  | -               |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| (SRAM card, Flash card, ATA card)                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| -                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 40 ns                                                                                                                                           | 20 ns                                            | 9.5 ns          |                 |                 |            |                 |            |                 |                 |
| 80 ns                                                                                                                                           | 40 ns                                            | 19 ns           |                 |                 |            |                 |            |                 |                 |
| 14                                                                                                                                              | 28                                               | 60              |                 |                 |            |                 |            |                 |                 |
| 0.18 μs                                                                                                                                         | 0.12 μs                                          | 0.057 μs        |                 |                 |            |                 |            |                 |                 |
| 857                                                                                                                                             | Q03...Q26UDE(H)CPU: 865<br>Q03...26UD(H)CPU: 855 |                 |                 |                 |            |                 |            | 865             |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 0.5...2000 ms<br>(setting available in units of 0.5 ms)                                                                                         |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 20K steps                                                                                                                                       | 30K steps                                        | 40K steps       | 60K steps       | 100K steps      | 130K steps | 200K steps      | 260K steps | 500K steps      | 1000K steps     |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     | 4096 points                                      |                 |                 |                 |            |                 |            |                 |                 |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 0 point                                                                                                                                         |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 1024 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 12288 points                                                                                                                                    |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 0 point                                                                                                                                         |                                                  |                 |                 |                 |            |                 |            | 131072 points   |                 |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 0 point                                                                                                                                         |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 65536 points*9                                                                                                                                  | 98304 points*9                                   | 131072 points*9 | 393216 points*9 | 524288 points*9 |            | 655360 points*9 |            | 786432 points*9 | 917504 points*9 |
| 8192 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| Max. 20 points                                                                                                                                  |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| Max. 10 points<br>(Index register [Z] is used in double words.)                                                                                 |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 4096 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            | 8192 points     |                 |
| 256 points                                                                                                                                      |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 2048 points                                                                                                                                     |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 16 points                                                                                                                                       |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 16 points                                                                                                                                       |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| 5 points                                                                                                                                        |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |
| ●                                                                                                                                               |                                                  |                 |                 |                 |            |                 |            |                 |                 |

# CPU Module Performance Specifications

## Universal model process CPU

| Item                                                                                            |                                 | Q04UDPVCPU                                                                                                                                                                                                    | Q06UDPVCPU      | Q13UDPVCPU      | Q26UDPVCPU      |
|-------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|
| Control method                                                                                  |                                 | Stored program cyclic operation                                                                                                                                                                               |                 |                 |                 |
| I/O control mode                                                                                |                                 | Refresh                                                                                                                                                                                                       |                 |                 |                 |
| Program language                                                                                | Sequence control language       | <ul style="list-style-type: none"> <li>Relay symbol language (ladder)</li> <li>Logic symbolic language (list)</li> <li>MELSP3 (SFC), MELSP-L</li> <li>Function block</li> <li>Structured text (ST)</li> </ul> |                 |                 |                 |
|                                                                                                 | Process control language        | <ul style="list-style-type: none"> <li>Process control FBD*1</li> </ul>                                                                                                                                       |                 |                 |                 |
| Peripheral connection port                                                                      | USB*2                           | ●                                                                                                                                                                                                             |                 |                 |                 |
|                                                                                                 | Ethernet (100BASE-TX/10BASE-T)  | ●                                                                                                                                                                                                             |                 |                 |                 |
|                                                                                                 | RS-232                          | -                                                                                                                                                                                                             |                 |                 |                 |
| Memory card interface                                                                           |                                 | ●<br>(SD memory card, SDHC memory card)*3                                                                                                                                                                     |                 |                 |                 |
| Connector for extended SRAM cassette connection                                                 |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| Processing speed*4                                                                              | LD instruction                  | 1.9 ns                                                                                                                                                                                                        |                 |                 |                 |
|                                                                                                 | MOV instruction                 | 3.9 ns                                                                                                                                                                                                        |                 |                 |                 |
|                                                                                                 | PC MIX value (instruction/μs)*5 | 227                                                                                                                                                                                                           |                 |                 |                 |
|                                                                                                 | Floating point addition         | 0.014 μs                                                                                                                                                                                                      |                 |                 |                 |
| Total number of instructions*6                                                                  |                                 | 859                                                                                                                                                                                                           |                 |                 |                 |
| Floating point instruction                                                                      |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| Character string processing instruction                                                         |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| PID instruction                                                                                 |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| Special function instruction (Trigonometric function, square root, exponential operation, etc.) |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| Constant scan (Function for keeping regular scan time)                                          |                                 | 0.5...2000 ms (setting available in units of 0.1 ms)                                                                                                                                                          |                 |                 |                 |
| Program capacity*7                                                                              |                                 | 40K steps                                                                                                                                                                                                     | 60K steps       | 130K steps      | 260K steps      |
| Number of I/O device points [X/Y]                                                               |                                 | 8192 points                                                                                                                                                                                                   |                 |                 |                 |
| Number of I/O points [X/Y]                                                                      |                                 | 4096 points                                                                                                                                                                                                   |                 |                 |                 |
| Internal relay [M]*8                                                                            |                                 | 15360 points                                                                                                                                                                                                  |                 | 28672 points    |                 |
| Latch relay [L]*8                                                                               |                                 | 8192 points                                                                                                                                                                                                   |                 |                 |                 |
| Link relay [B]*8                                                                                |                                 | 8192 points                                                                                                                                                                                                   |                 |                 |                 |
| Timer [T]*8                                                                                     |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Retentive timer [ST]*8                                                                          |                                 | 0 point                                                                                                                                                                                                       |                 |                 |                 |
| Counter [C]*8                                                                                   |                                 | 1024 points                                                                                                                                                                                                   |                 |                 |                 |
| Data register [D]*8                                                                             |                                 | 22528 points                                                                                                                                                                                                  |                 | 41984 points    |                 |
| Extended data register [D]*8                                                                    |                                 | 0 point                                                                                                                                                                                                       |                 |                 |                 |
| Link register [W]*8                                                                             |                                 | 8192 points                                                                                                                                                                                                   |                 |                 |                 |
| Extended link register [W]*8                                                                    |                                 | 0 point                                                                                                                                                                                                       |                 |                 |                 |
| Annunciator [F]*8                                                                               |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Edge relay [V]*8                                                                                |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Link special relay [SB]*8                                                                       |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Link special register [SW]*8                                                                    |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| File register [R, ZR]                                                                           |                                 | 131072 points*9                                                                                                                                                                                               | 393216 points*9 | 524288 points*9 | 655360 points*9 |
| Step relay [S]*8                                                                                |                                 | 8192 points                                                                                                                                                                                                   |                 |                 |                 |
| Index register/standard device register [Z]                                                     |                                 | Max. 20 points                                                                                                                                                                                                |                 |                 |                 |
| Index register [Z] (32-bit modification specification of ZR device)                             |                                 | Max. 10 points<br>(Index register [Z] is used in double words.)                                                                                                                                               |                 |                 |                 |
| Pointer [P]                                                                                     |                                 | 4096 points                                                                                                                                                                                                   |                 |                 |                 |
| Interrupt pointer [I]                                                                           |                                 | 256 points                                                                                                                                                                                                    |                 |                 |                 |
| Special relay [SM]                                                                              |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Special register [SD]                                                                           |                                 | 2048 points                                                                                                                                                                                                   |                 |                 |                 |
| Function input [FX]                                                                             |                                 | 16 points                                                                                                                                                                                                     |                 |                 |                 |
| Function output [FY]                                                                            |                                 | 16 points                                                                                                                                                                                                     |                 |                 |                 |
| Function register [FD]                                                                          |                                 | 5 points                                                                                                                                                                                                      |                 |                 |                 |
| Local device                                                                                    |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |
| Device initial values                                                                           |                                 | ●                                                                                                                                                                                                             |                 |                 |                 |

\*1: PX Developer is required for programming by FBD.

\*2: USB port terminal is mini B.

\*3: Mitsubishi Electric shall not guarantee the operation of any third-party products.

\*4: The processing speed is the same even when the device is indexed.

\*5: The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1 μs. A larger value indicates a higher processing speed.

\*6: Intelligent function module dedicated instructions are not included.

\*7: When the QnUD(H)CPU or QnUDE(H)CPU is replaced with the QnUDVCPU, the number of steps in the program may change (increase or decrease). For details, please refer to the relevant manual.

\*8: Indicates the number of points in the default state. This can be changed with the parameter.

\*9: Points when using an internal memory (standard RAM). File register area can be extended with an extended SRAM cassette.

When used with an extended SRAM cassette, the total points in the table below can be used as file register.

| Q4MCA-1MBS (1M bytes) | Q4MCA-2MBS (2M bytes) | Q4MCA-4MBS (4M bytes) | Q4MCA-8MBS (8M bytes) |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 524288 points         | 1048576 points        | 2097152 points        | 4194304 points        |



## Redundant CPU

| Item                                                                                            |                                 | Q12PRHCPU*1                                                                                                                                                                                                             | Q25PRHCPU*1 |
|-------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Control method                                                                                  |                                 | Stored program cyclic operation                                                                                                                                                                                         |             |
| I/O control mode                                                                                |                                 | Refresh                                                                                                                                                                                                                 |             |
| Program language                                                                                | Sequence control language       | <ul style="list-style-type: none"> <li>• Relay symbol language (ladder)</li> <li>• Logic symbolic language (list)</li> <li>• MELSP3 (SFC), MELSP-L</li> <li>• Function block</li> <li>• Structured text (ST)</li> </ul> |             |
|                                                                                                 | Process control language        | <ul style="list-style-type: none"> <li>• Process control FBD*2</li> </ul>                                                                                                                                               |             |
| Peripheral connection port                                                                      | USB                             | ●                                                                                                                                                                                                                       |             |
|                                                                                                 | RS-232                          | ●                                                                                                                                                                                                                       |             |
| Memory card interface                                                                           |                                 | ●<br>(SRAM card, Flash card, ATA card)                                                                                                                                                                                  |             |
| Processing speed*3                                                                              | LD instruction                  | 34 ns                                                                                                                                                                                                                   |             |
|                                                                                                 | MOV instruction                 | 102 ns                                                                                                                                                                                                                  |             |
|                                                                                                 | PC MIX value (instruction/μs)*4 | 10.3                                                                                                                                                                                                                    |             |
|                                                                                                 | Floating point addition         | 0.78 μs                                                                                                                                                                                                                 |             |
| Total number of instructions*5                                                                  |                                 | 778                                                                                                                                                                                                                     |             |
| Floating point instruction                                                                      |                                 | ●                                                                                                                                                                                                                       |             |
| Character string processing instruction                                                         |                                 | ●                                                                                                                                                                                                                       |             |
| PID instruction                                                                                 |                                 | ●                                                                                                                                                                                                                       |             |
| Process control instruction                                                                     |                                 | ●                                                                                                                                                                                                                       |             |
| Special function instruction (Trigonometric function, square root, exponential operation, etc.) |                                 | ●                                                                                                                                                                                                                       |             |
| Constant scan (Function for keeping regular scan time)                                          |                                 | 0.5...2000 ms (setting available in units of 0.5 ms)                                                                                                                                                                    |             |
| Program capacity                                                                                |                                 | 124K steps                                                                                                                                                                                                              | 252K steps  |
| Number of I/O device points [X/Y]                                                               |                                 | 8192 points                                                                                                                                                                                                             |             |
| Number of I/O points [X/Y]                                                                      |                                 | 4096 points                                                                                                                                                                                                             |             |
| Internal relay [M]*6                                                                            |                                 | 8192 points                                                                                                                                                                                                             |             |
| Latch relay [L]*6                                                                               |                                 | 8192 points                                                                                                                                                                                                             |             |
| Link relay [B]*6                                                                                |                                 | 8192 points                                                                                                                                                                                                             |             |
| Timer [T]*6                                                                                     |                                 | 2048 points                                                                                                                                                                                                             |             |
| Retentive timer [ST]*6                                                                          |                                 | 0 point                                                                                                                                                                                                                 |             |
| Counter [C]*6                                                                                   |                                 | 1024 points                                                                                                                                                                                                             |             |
| Data register [D]*6                                                                             |                                 | 12288 points                                                                                                                                                                                                            |             |
| Link register [W]*6                                                                             |                                 | 8192 points                                                                                                                                                                                                             |             |
| Annunciator [F]*6                                                                               |                                 | 2048 points                                                                                                                                                                                                             |             |
| Edge relay [V]*6                                                                                |                                 | 2048 points                                                                                                                                                                                                             |             |
| Link special relay [SB]                                                                         |                                 | 2048 points                                                                                                                                                                                                             |             |
| Link special register [SW]                                                                      |                                 | 2048 points                                                                                                                                                                                                             |             |
| File register [R, ZR]                                                                           |                                 | 131072 points*7                                                                                                                                                                                                         |             |
| Step relay [S]                                                                                  |                                 | 8192 points                                                                                                                                                                                                             |             |
| Index register [Z]                                                                              |                                 | 16 points                                                                                                                                                                                                               |             |
| Pointer [P]                                                                                     |                                 | 4096 points                                                                                                                                                                                                             |             |
| Interrupt pointer [I]                                                                           |                                 | 256 points                                                                                                                                                                                                              |             |
| Special relay [SM]                                                                              |                                 | 2048 points                                                                                                                                                                                                             |             |
| Special register [SD]                                                                           |                                 | 2048 points                                                                                                                                                                                                             |             |
| Function input [FX]                                                                             |                                 | 16 points                                                                                                                                                                                                               |             |
| Function output [FY]                                                                            |                                 | 16 points                                                                                                                                                                                                               |             |
| Function register [FD]                                                                          |                                 | 5 points                                                                                                                                                                                                                |             |
| Local device                                                                                    |                                 | ●                                                                                                                                                                                                                       |             |
| Device initial values                                                                           |                                 | ●                                                                                                                                                                                                                       |             |

\*1: Production will be discontinued in September 2022.

\*2: PX Developer is required for programming by FBD.

\*3: The processing speed is the same even when the device is indexed.

\*4: The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1 μs. A larger value indicates a higher processing speed.

\*5: Intelligent function module dedicated instructions are not included.

\*6: Indicates the number of points in the default state. This can be changed with the parameter.

\*7: Indicates the number of points when the built-in memory (standard RAM) is used. Capacity can be expanded by using an SRAM card or a Flash card. (Writing from a program is not possible with a Flash card.) With an SRAM card, up to 1041408 points can be used.

# Module Combinations for Multiple CPU System

Restrictions apply depending on CPU type, the number that can be installed, and supported serial No. For more information, please refer to the relevant users manual for each CPU.

## Multiple CPU high speed main base unit (Q3□DB)

- Possible
- Possible (multiple CPU high-speed communication not available)
- Impossible

| CPU 1 \ CPU 2 to 4              |                                                                                                               | High-speed Universal model QCPU                | Universal model QCPU |                                                                                                               | Universal model process CPU              | Motion CPU/ Robot CPU*/CNC CPU                          | C Controller CPU                                                          |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------|
|                                 |                                                                                                               | Q03UDV<br>Q04UDV<br>Q06UDV<br>Q13UDV<br>Q26UDV | Q00U<br>Q01U<br>Q02U | Q03UD(E)<br>Q04UD(E)H<br>Q06UD(E)H<br>Q10UD(E)H<br>Q13UD(E)H<br>Q20UD(E)H<br>Q26UD(E)H<br>Q50UDEH<br>Q100UDEH | Q04UDPV<br>Q06UDPV<br>Q13UDPV<br>Q26UDPV | Q172D<br>Q173D<br>Q172DS<br>Q173DS<br>CR800-Q<br>Q173NC | Q24DHCCPU-V<br>Q24DHCCPU-VG<br>Q24DHCCPU-LS<br>Q26DHCCPU-LS<br>Q12DCCPU-V |
| High-speed Universal model QCPU | Q03UDV<br>Q04UDV<br>Q06UDV<br>Q13UDV<br>Q26UDV                                                                | ●                                              | -                    | ●                                                                                                             | ●                                        | ●                                                       | ●                                                                         |
| Universal model QCPU            | Q00U<br>Q01U<br>Q02U                                                                                          | -                                              | -                    | -                                                                                                             | -                                        | -                                                       | ○                                                                         |
|                                 | Q03UD(E)<br>Q04UD(E)H<br>Q06UD(E)H<br>Q10UD(E)H<br>Q13UD(E)H<br>Q20UD(E)H<br>Q26UD(E)H<br>Q50UDEH<br>Q100UDEH | ●                                              | -                    | ●                                                                                                             | ●                                        | ●                                                       | ●                                                                         |

\*1: The robot CPU includes CR800-Q.

## Main base unit other than Q3□DB

- Possible (multiple CPU high-speed communication not available)
- Impossible

| CPU 1 \ CPU 2 to 4              |                                                                                                               | High-speed Universal model QCPU                | Universal model QCPU |                                                                                                               | Universal model process CPU              | Motion CPU/ Robot CPU*/CNC CPU                          | C Controller CPU                                                          |
|---------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------|
|                                 |                                                                                                               | Q03UDV<br>Q04UDV<br>Q06UDV<br>Q13UDV<br>Q26UDV | Q00U<br>Q01U<br>Q02U | Q03UD(E)<br>Q04UD(E)H<br>Q06UD(E)H<br>Q10UD(E)H<br>Q13UD(E)H<br>Q20UD(E)H<br>Q26UD(E)H<br>Q50UDEH<br>Q100UDEH | Q04UDPV<br>Q06UDPV<br>Q13UDPV<br>Q26UDPV | Q172D<br>Q173D<br>Q172DS<br>Q173DS<br>CR800-Q<br>Q173NC | Q24DHCCPU-V<br>Q24DHCCPU-VG<br>Q24DHCCPU-LS<br>Q26DHCCPU-LS<br>Q12DCCPU-V |
| High-speed Universal model QCPU | Q03UDV<br>Q04UDV<br>Q06UDV<br>Q13UDV<br>Q26UDV                                                                | ○                                              | -                    | ○                                                                                                             | ○                                        | -                                                       | ○*3                                                                       |
| Universal model QCPU            | Q00U<br>Q01U<br>Q02U                                                                                          | -                                              | -                    | -                                                                                                             | -                                        | -                                                       | ○*3                                                                       |
|                                 | Q03UD(E)<br>Q04UD(E)H<br>Q06UD(E)H<br>Q10UD(E)H<br>Q13UD(E)H<br>Q20UD(E)H<br>Q26UD(E)H<br>Q50UDEH<br>Q100UDEH | ○                                              | -                    | ○                                                                                                             | ○                                        | -                                                       | ○*3                                                                       |

\*2: The robot CPU includes CR800-Q.

\*3: In case of using Q12DCCPU-V, the redundant power main base unit (Q3□RB) cannot be used.



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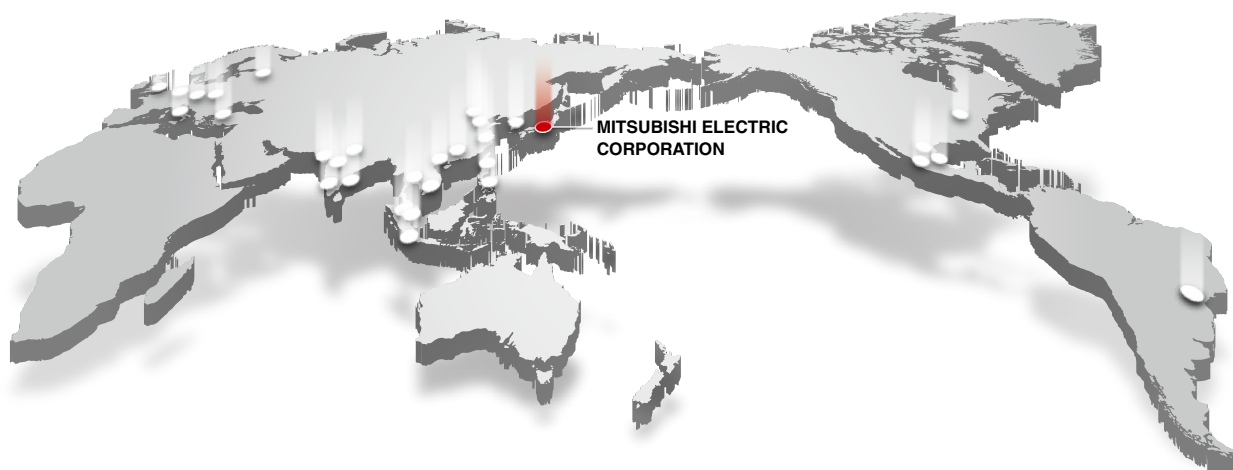
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##### Brazil FA Center

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# 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](http://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.

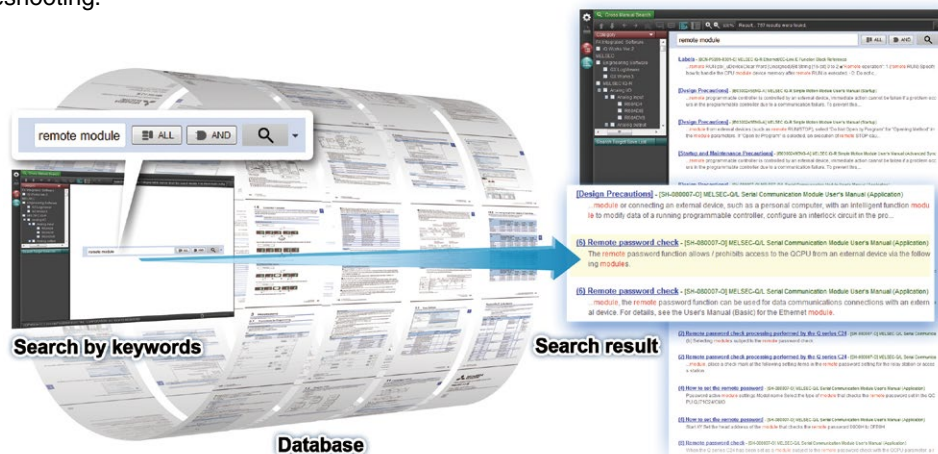
### ■ Basic to Advanced levels

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.

# 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®



iOS

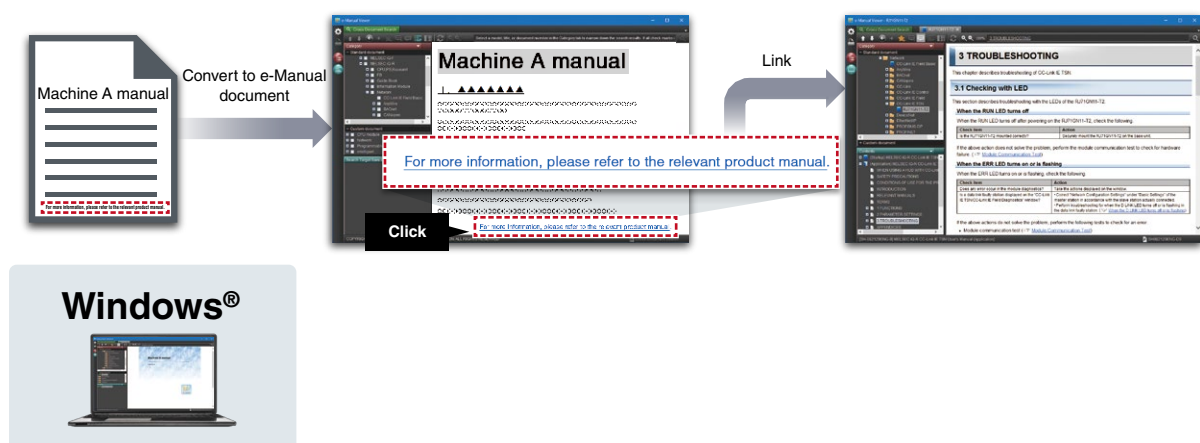


Android™



## 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®



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

# Product List

\*Please check the compatibility and restrictions of the product in the related manual before purchasing.

[ Legend ] **DB** : Double brand product (Note) **NEW** : Recently released product **SOON** : Product available soon

## CPU module

| Type                            | Model                  | Outline                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High-speed Universal model QCPU | Q03UDVCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 30K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 120 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible   |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q04UDVCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 160 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible   |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q06UDVCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 240 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible   |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q13UDVCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 520 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible  |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q26UDVCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 1040 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible |                                                                                                                                                                                                                                                                                                                                             |
| Universal model QCPU            | Q00UJCPU               | No. of I/O points: 256 points, no. of I/O device points: 8192 points, program capacity: 10K steps, basic operation processing speed (LD instruction): 120 ns, program memory capacity: 40 KB, peripheral connection ports: USB and RS-232, no memory card I/F, 5-slot base, with 100...240 V AC input/5 V DC/3 A output power supply                                                         |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q00UCPU                | No. of I/O points: 1024 points, no. of I/O device points: 8192 points, program capacity: 10K steps, basic operation processing speed (LD instruction): 80 ns, program memory capacity: 40 KB, peripheral connection ports: USB and RS-232, no memory card I/F                                                                                                                                |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q01UCPU                | No. of I/O points: 1024 points, no. of I/O device points: 8192 points, program capacity: 15K steps, basic operation processing speed (LD instruction): 60 ns, program memory capacity: 60 KB, peripheral connection ports: USB and RS-232, no memory card I/F                                                                                                                                |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q02UCPU                | No. of I/O points: 2048 points, no. of I/O device points: 8192 points, program capacity: 20K steps, basic operation processing speed (LD instruction): 40 ns, program memory capacity: 80 KB, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                                                              |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q03UDCPU               | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 30K steps, basic operation processing speed (LD instruction): 20 ns, program memory capacity: 120 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                      |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q04UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 160 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                     |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q06UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 240 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                     |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q10UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 100K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 400 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                    |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q13UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 520 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                    |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q20UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 200K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 800 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                    |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Q26UDHCPU              | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 1040 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                   |                                                                                                                                                                                                                                                                                                                                             |
|                                 | Built-in Ethernet type | Q03UDECPU                                                                                                                                                                                                                                                                                                                                                                                    | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 30K steps, basic operation processing speed (LD instruction): 20 ns, program memory capacity: 120 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card   |
|                                 |                        | Q04UDEHCPU                                                                                                                                                                                                                                                                                                                                                                                   | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 160 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card  |
|                                 |                        | Q06UDEHCPU                                                                                                                                                                                                                                                                                                                                                                                   | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 240 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card  |
|                                 |                        | Q10UDEHCPU                                                                                                                                                                                                                                                                                                                                                                                   | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 100K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 400 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card |
| Q13UDEHCPU                      |                        | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 520 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card                                                  |                                                                                                                                                                                                                                                                                                                                             |
| Q20UDEHCPU                      |                        | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 200K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 800 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card                                                  |                                                                                                                                                                                                                                                                                                                                             |
| Q26UDEHCPU                      |                        | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 1040 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card                                                 |                                                                                                                                                                                                                                                                                                                                             |
| Q50UDEHCPU                      |                        | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 500K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 2000 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card                                                 |                                                                                                                                                                                                                                                                                                                                             |
| Q100UDEHCPU                     |                        | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 1000K steps, basic operation processing speed (LD instruction): 9.5 ns, program memory capacity: 4000 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, memory card I/F: SRAM card, FLASH card, and ATA card                                                |                                                                                                                                                                                                                                                                                                                                             |

Note: General specifications and product guarantee conditions of jointly developed products are different from those of MELSEC products.  
For more information, please refer to the product manuals or contact your local Mitsubishi representative for details.



## CPU module

| Type                        | Model                            | Outline                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Universal model process CPU | Q04UDPVCPU                       | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 160 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible   |
|                             | Q06UDPVCPU                       | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 240 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible   |
|                             | Q13UDPVCPU                       | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 520 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible  |
|                             | Q26UDPVCPU                       | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260K steps, basic operation processing speed (LD instruction): 1.9 ns, program memory capacity: 1040 KB, peripheral connection ports: USB, Ethernet (predefined protocol support function), memory card I/F: SD memory card and extended SRAM cassette<br>CC-Link IE Field Network Basic compatible |
| Redundant CPU               | Q12PRHCPU*1                      | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124K steps, basic operation processing speed (LD instruction): 34 ns, program memory capacity: 496 KB, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                                                            |
|                             | Q25PRHCPU*1                      | No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252K steps, basic operation processing speed (LD instruction): 34 ns, program memory capacity: 1008 KB, peripheral connection ports: USB and RS-232, memory card I/F: SRAM card, FLASH card, and ATA card                                                                                           |
|                             | Tracking cable                   | QC10TR*1                                                                                                                                                                                                                                                                                                                                                                                     |
|                             |                                  | QC30TR*1                                                                                                                                                                                                                                                                                                                                                                                     |
| C Controller CPU            | Q24DHCCPU-V                      | No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.8.1                                                                                                                                                                                                                                                                  |
|                             | Q26DHCCPU-LS                     | No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: No pre-installed operating system (Operating system installed by user)                                                                                                                                                                                                                  |
|                             | Q24DHCCPU-LS                     | No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: No pre-installed operating system (Operating system installed by user)                                                                                                                                                                                                                  |
|                             | Q12DCCPU-V                       | No. of I/O points: 4096 points, endian format: little endian, removable storage: CompactFlash card, OS: VxWorks® Version 6.4                                                                                                                                                                                                                                                                 |
|                             | Applications pre-installed model | Q12DCCPU-V-BZ11                                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                  | Q12DCCPU-V-BZ13                                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                  | Q12DCCPU-V-BZ15                                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                  | Q12DCCPU-V-BZ19                                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                  | Q12DCCPU-V-BZ1B                                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                  | Q24DHCCPU-VG-B000                                                                                                                                                                                                                                                                                                                                                                            |
|                             |                                  | Q24DHCCPU-VG-B002                                                                                                                                                                                                                                                                                                                                                                            |
|                             |                                  | Q26DHCCPU-LS-B031                                                                                                                                                                                                                                                                                                                                                                            |
|                             |                                  | Q24DHCCPU-LS-B030                                                                                                                                                                                                                                                                                                                                                                            |
|                             | Cable                            | Q12DCCPU-CBL *2*3*4                                                                                                                                                                                                                                                                                                                                                                          |
|                             |                                  | RS-232 connection converter cable (custom mini-DIN to 9-pin D-sub connector)                                                                                                                                                                                                                                                                                                                 |

\*1: Production will be discontinued in September 2022.

\*2: For use with Q24DHCCPU-V, Q24DHCCPU-VG.

\*3: For use with Q24DHCCPU-LS, Q26DHCCPU-LS.

\*4: For use with Q12DCCPU-V.

## CPU module

| Type                                  | Model                              | Outline                                                                                              |
|---------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------|
| Battery                               | Q6BAT                              | Replacement battery                                                                                  |
|                                       | Q7BATN                             | Replacement large-capacity battery                                                                   |
|                                       | Q7BATN-SET                         | Large-capacity battery with holder for installing CPU                                                |
|                                       | Q8BAT                              | Replacement large-capacity battery module                                                            |
|                                       | Q8BAT-SET                          | Large-capacity battery module with CPU connection cable                                              |
| Extended SRAM cassette                | Q4MCA-1MBS* <sup>1</sup>           | Extended SRAM cassette, capacity: 1 MB                                                               |
|                                       | Q4MCA-2MBS* <sup>1</sup>           | Extended SRAM cassette, capacity: 2 MB                                                               |
|                                       | Q4MCA-4MBS* <sup>1</sup>           | Extended SRAM cassette, capacity: 4 MB                                                               |
|                                       | Q4MCA-8MBS* <sup>1</sup>           | Extended SRAM cassette, capacity: 8 MB                                                               |
| SD memory card                        | NZ1MEM-2GBSD* <sup>1</sup> *2*3*4  | SD memory card, capacity: 2 GB                                                                       |
|                                       | NZ1MEM-4GBSD* <sup>1</sup> *2*3*4  | SDHC memory card, capacity: 4 GB                                                                     |
|                                       | NZ1MEM-8GBSD* <sup>1</sup> *2*3*4  | SDHC memory card, capacity: 8 GB                                                                     |
|                                       | NZ1MEM-16GBSD* <sup>1</sup> *2*3*4 | SDHC memory card, capacity: 16 GB                                                                    |
| Memory card                           | Q2MEM-1MBSN* <sup>5</sup>          | SRAM memory card, capacity: 1 MB                                                                     |
|                                       | Q2MEM-2MBSN* <sup>5</sup>          | SRAM memory card, capacity: 2 MB                                                                     |
|                                       | Q3MEM-4MBS* <sup>5</sup>           | SRAM memory card, capacity: 4 MB                                                                     |
|                                       | Q3MEM-4MBS-SET* <sup>5</sup>       | SRAM memory card with cover, capacity: 4 MB                                                          |
|                                       | Q3MEM-8MBS* <sup>5</sup>           | SRAM memory card, capacity: 8 MB                                                                     |
|                                       | Q3MEM-8MBS-SET* <sup>6</sup>       | SRAM memory card with cover, capacity: 8 MB                                                          |
|                                       | Q3MEM-CV                           | Memory card protective cover for the Universal model QCPU (comes with Q3MEM-4MBS-SET/Q3MEM-8MBS-SET) |
| CompactFlash card                     | Q3MEM-CV-H                         | Memory card protective cover for the Process, and Redundant CPUs (comes with Q3MEM-4MBS-SET)         |
|                                       | GT05-MEM-128MC* <sup>4</sup>       | CompactFlash card, capacity: 128 MB                                                                  |
|                                       | GT05-MEM-256MC* <sup>4</sup>       | CompactFlash card, capacity: 256 MB                                                                  |
|                                       | QD81MEM-512MBC* <sup>4</sup> *7    | CompactFlash card, capacity: 512 MB                                                                  |
|                                       | QD81MEM-1GBC* <sup>4</sup> *7      | CompactFlash card, capacity: 1 GB                                                                    |
|                                       | QD81MEM-2GBC* <sup>4</sup> *7      | CompactFlash card, capacity: 2 GB                                                                    |
|                                       | QD81MEM-4GBC* <sup>4</sup> *7      | CompactFlash card, capacity: 4 GB                                                                    |
| SRAM card battery                     | QD81MEM-8GBC* <sup>4</sup> *7      | CompactFlash card, capacity: 8 GB                                                                    |
|                                       | Q2MEM-BAT                          | Replacement battery for Q2MEM-1MBSN and Q2MEM-2MBSN                                                  |
| Connection cable                      | Q3MEM-BAT                          | Replacement battery for Q3MEM-4MBS and Q3MEM-8MBS                                                    |
|                                       | QC30R2                             | RS-232 cable for connecting PC and CPU, 3 m (between mini-DIN6P and Dsub9P)                          |
| Cable disconnection prevention holder | Q6HLD-R2                           | Holder for preventing RS-232 cable (Programmable Controller CPU connection) disconnection            |

\*1: For use with QnUDVCPU.

\*2: For use with Q24DHCCPU-V, Q24DHCCPU-VG.

\*3: For use with Q24DHCCPU-LS, Q26DHCCPU-LS.

\*4: Mitsubishi Electric shall not guarantee the operation of any non-Mitsubishi Electric products.

\*5: For use with the Universal model QCPUs (except QnUDV) and redundant CPUs that are equipped with the memory card interface.

\*6: For use with the Universal model QCPUs (except QnUDV) that are equipped with the memory card interface.

\*7: For use with Q12DCCPU-V.





### Base unit

| Type                              | Model                | Outline                                                                                                                      |
|-----------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------|
| Main base                         | Q33B                 | 3 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q35B                 | 5 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q38B                 | 8 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q312B                | 12 slots, 1 power supply module required, for Q Series modules                                                               |
| Multiple CPU high speed main base | Q35DB                | 5 slots, power supply module required, for Q Series modules                                                                  |
|                                   | Q38DB                | 8 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q312DB               | 12 slots, 1 power supply module required, for Q Series modules                                                               |
| Slim type main base               | Q32SB                | 2 slots, 1 slim type power supply module required, for Q Series modules                                                      |
|                                   | Q33SB                | 3 slots, 1 slim type power supply module required, for Q Series modules                                                      |
|                                   | Q35SB                | 5 slots, 1 slim type power supply module required, for Q Series modules                                                      |
| Redundant power main base         | Q38RB                | 8 slots, 2 redundant power supply modules required, for Q Series modules                                                     |
| Extension base                    | Q63B                 | 3 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q65B                 | 5 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q68B                 | 8 slots, 1 power supply module required, for Q Series modules                                                                |
|                                   | Q612B                | 12 slots, 1 power supply module required, for Q Series modules                                                               |
|                                   | Q52B                 | 2 slots, power supply module not required, for Q Series modules                                                              |
|                                   | Q55B                 | 5 slots, power supply module not required, for Q Series modules                                                              |
| Redundant power extension base    | Q68RB                | 8 slots, 2 redundant power supply modules required, for Q Series modules                                                     |
| Redundant type extension base     | Q65WRB* <sup>1</sup> | 5 slots, 2 redundant power supply modules required, for Q Series modules                                                     |
| Extension cable                   | QC05B                | 0.45 m cable for connecting extension base unit                                                                              |
|                                   | QC06B                | 0.6 m cable for connecting extension base unit                                                                               |
|                                   | QC12B                | 1.2 m cable for connecting extension base unit                                                                               |
|                                   | QC30B                | 3 m cable for connecting extension base unit                                                                                 |
|                                   | QC50B                | 5 m cable for connecting extension base unit                                                                                 |
|                                   | QC100B               | 10 m cable for connecting extension base unit                                                                                |
| DIN rail mounting adapter         | Q6DIN1               | DIN rail mounting adapter for Q38B, Q312B, Q68B, Q612B, Q38RB, Q68RB, Q65WRB* <sup>1</sup> , Q38DB, and Q312DB               |
|                                   | Q6DIN2               | DIN rail mounting adapter for Q35B, Q65B, and Q00UJCPU                                                                       |
|                                   | Q6DIN3               | DIN rail mounting adapter for Q32SB, Q33SB, Q35SB, Q33B, Q52B, Q55B, and Q63B                                                |
|                                   | Q6DIN1A              | DIN rail mounting adapter (with vibration-proofing bracket set) for Q3□B, Q5□B, Q6□B, Q38RB, Q68RB, and Q65WRB* <sup>1</sup> |
| Blank cover                       | QG60                 | Blank cover for I/O slot                                                                                                     |

\*1: Only compatible with redundant CPU system. Production will be discontinued in September 2022.

### Power supply module

|                                  |        |                                                                                   |
|----------------------------------|--------|-----------------------------------------------------------------------------------|
| Power supply                     | Q61P   | Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 6 A        |
|                                  | Q62P   | Input voltage: 100...240 V AC, output voltage: 5/24 V DC, output current: 3/0.6 A |
|                                  | Q63P   | Input voltage: 24 V DC, output voltage: 5 V DC, output current: 6 A               |
|                                  | Q64PN  | Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 8.5 A      |
| Power supply with life detection | Q61P-D | Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 6 A        |
| Slim type power supply           | Q61SP  | Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 2 A        |
| Redundant power supply           | Q63RP  | Input voltage: 24 V DC, output voltage: 5 V DC, output current: 8.5 A             |
|                                  | Q64RPN | Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 8.5 A      |

## I/O module

| Type             |                                | Model        | Outline                                                                                                                                                                                                                                                                                                   |
|------------------|--------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input            | AC                             | QX10         | 16 points, 100...120 V AC, response time: 20 ms, 16 points/common, 18-point terminal block                                                                                                                                                                                                                |
|                  |                                | QX10-TS      | 16 points, 100...120 V AC, response time: 20 ms, 16 points/common, 18-point spring clamp terminal block                                                                                                                                                                                                   |
|                  |                                | QX28         | 8 points, 100...240 V AC, response time: 20 ms, 8 points/common, 18-point terminal block                                                                                                                                                                                                                  |
|                  | DC<br>(Positive common)*1      | QX40         | 16 points, 24 V DC, response time: 1/5/10/20/70 ms, 16 points/common, positive common, 18-point terminal block                                                                                                                                                                                            |
|                  |                                | QX40-TS      | 16 points, 24 V DC, response time: 1/5/10/20/70 ms, 16 points/common, positive common, 18-point spring clamp terminal block                                                                                                                                                                               |
|                  |                                | QX40-S1      | 16 points, 24 V DC, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, positive common, 18-point terminal block                                                                                                                                                                                       |
|                  |                                | QX40H        | 16 points, 24 V DC, response time: 0/0.1/0.2/0.4/0.6/1 ms, 8 points/common, positive common, 18-point terminal block                                                                                                                                                                                      |
|                  |                                | QX41*2*3     | 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector                                                                                                                                                                                                   |
|                  |                                | QX41-S1*2    | 32 points, 24 V DC, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector                                                                                                                                                                                              |
|                  |                                | QX41-S2*2*3  | 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector                                                                                                                                                                                                   |
|                  |                                | QX42*2       | 64 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector                                                                                                                                                                                                   |
|                  |                                | QX42-S1*2    | 64 points, 24 V DC, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector                                                                                                                                                                                              |
|                  | AC/DC                          | QX50         | 16 points, 48 V AC/DC, response time: 20 ms, 16 points/common, positive/negative common, 18-point terminal block                                                                                                                                                                                          |
|                  | DC sensor                      | QX70         | 16 points, 5/12 V DC, response time: 1/5/10/20/70 ms, 16 points/common, positive/negative common, 18-point terminal block                                                                                                                                                                                 |
|                  |                                | QX70H        | 16 points, 5 V DC, response time: 0/0.1/0.2/0.4/0.6/1 ms, 8 points/common, positive common, 18-point terminal block                                                                                                                                                                                       |
|                  |                                | QX71*2       | 32 points, 5/12 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector                                                                                                                                                                                        |
|                  |                                | QX72*2       | 64 points, 5/12 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector                                                                                                                                                                                        |
|                  | DC<br>(Negative common)*1      | QX80         | 16 points, 24 V DC, response time: 1/5/10/20/70 ms, 16 points/common, negative common, 18-point terminal block                                                                                                                                                                                            |
|                  |                                | QX80-TS      | 16 points, 24 V DC, response time: 1/5/10/20/70 ms, 16 points/common, negative common, 18-point spring clamp terminal block                                                                                                                                                                               |
|                  |                                | QX80H        | 16 points, 24 V DC, response time: 0/0.1/0.2/0.4/0.6/1 ms, 8 points/common, negative common, 18-point terminal block                                                                                                                                                                                      |
|                  |                                | QX81*3*4     | 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 37-pin D-sub connector                                                                                                                                                                                             |
|                  |                                | QX81-S2*3*4  | 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 37-pin D-sub connector                                                                                                                                                                                             |
|                  |                                | QX82*2       | 64 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 40-pin connector                                                                                                                                                                                                   |
|                  |                                | QX82-S1*2    | 64 points, 24 V DC, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, negative common, 40-pin connector                                                                                                                                                                                              |
|                  |                                | QX90H        | 16 points, 5 V DC, response time: 0/0.1/0.2/0.4/0.6/1 ms, 8 points/common, negative common, 18-point terminal block                                                                                                                                                                                       |
| Output           | Relay                          | QY10         | 16 points, 24 V DC/240 V AC, 2 A/point, 8 A/common, response time: 12 ms, 16 points/common, 18-point terminal block                                                                                                                                                                                       |
|                  |                                | QY10-TS      | 16 points, 24 V DC/240 V AC, 2 A/point, 8 A/common, response time: 12 ms, 16 points/common, 18-point spring clamp terminal block                                                                                                                                                                          |
|                  |                                | QY18A        | 8 points, 24 V DC/240 V AC, 2 A/point, response time: 12 ms, 18-point terminal block, all points independent                                                                                                                                                                                              |
|                  | Triac                          | QY22         | 16 points, 100...240 V AC, 0.6 A/point, 4.8 A/common, response time: 1 ms + 0.5 cycle, 16 points/common, 18-point terminal block, with surge suppression                                                                                                                                                  |
|                  | Transistor<br>(Sink)           | QY40P        | 16 points, 12...24 V DC, 0.1 A/point, 1.6 A/common, response time: 1 ms, 16 points/common, sink type, 18-point terminal block, overload protection function, overheat protection function, surge suppression                                                                                              |
|                  |                                | QY40P-TS     | 16 points, 12...24 V DC, 0.1 A/point, 1.6 A/common, response time: 1 ms, 16 points/common, sink type, 18-point spring clamp terminal block, overload protection function, overheat protection function, surge suppression                                                                                 |
|                  |                                | QY41H        | 32 points, 5...24 V DC, 0.2 A/point, 2 A/common, response time: 2 us, 32 points/common, sink type, 40-pin connector, with surge suppression                                                                                                                                                               |
|                  |                                | QY41P*2      | 32 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression                                                                                                       |
|                  |                                | QY42P*2      | 64 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression                                                                                                       |
|                  |                                | QY50         | 16 points, 12...24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, sink type, 18-point terminal block, with surge suppression and fuse                                                                                                                                              |
|                  | Transistor<br>(Independent)    | QY68A        | 8 points, 5...24 V DC, 2 A/point, 8 A/module, response time: 10 ms, sink/source type, 18-point terminal block, with surge suppression, all points independent                                                                                                                                             |
|                  | TTL CMOS                       | QY70         | 16 points, 5...12 V DC, 16 mA/point, 256 mA/common, response time: 0.5 ms, 16 points/common, sink type, 18-point terminal block, with fuse                                                                                                                                                                |
|                  |                                | QY71*2       | 32 points, 5...12 V DC, 16 mA/point, 512 mA/common, response time: 0.5 ms, 32 points/common, sink type, 40-pin connector, with fuse                                                                                                                                                                       |
|                  | Transistor<br>(Source)         | QY80         | 16 points, 12...24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, source type, 18-point terminal block, with surge suppression and fuse                                                                                                                                            |
|                  |                                | QY80-TS      | 16 points, 12...24 V DC, 0.5 A/point, 4 A/common, response time: 1 ms, 16 points/common, source type, 18-point spring clamp terminal block, with surge suppression and fuse                                                                                                                               |
|                  |                                | QY81P*4      | 32 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, source type, 37-pin D-sub connector, overload protection function, overheat protection function, surge suppression                                                                                               |
|                  |                                | QY82P*2      | 64 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, source type, 40-pin connector, overload protection function, overheat protection function, surge suppression                                                                                                     |
| I/O              | DC input/<br>transistor output | QH42P*2*5    | Input: 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive common, output: 32 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression |
|                  |                                | QX48Y57      | Input: 8 points, 24 V DC, response time: 1/5/10/20/70 ms, 8 points/common, positive common, output: 7 points, 12...24 V DC, 0.5 A/point, 2 A/common, response time: 1 ms, 7 points/common, sink type, 18-point terminal block, with surge suppression and fuse                                            |
|                  |                                | QX41Y41P*2*5 | Input: 32 points, 24 V DC, response time: 1/5/10/20/70 ms, 32 points/common, positive common, output: 32 points, 12...24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, overload protection function, overheat protection function, surge suppression |
| Interrupt module |                                | QI60         | 16 points, 24 V DC, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, 18-point terminal block                                                                                                                                                                                                        |

\*1: "Positive common" indicates that the positive lead of a DC power supply must be connected to the common terminal.

Accordingly, "Negative common" indicates that the negative lead must be connected to the common terminal.

\*2: Connector is not provided. Separately order one of the following: A6CON1/A6CON2/A6CON3/A6CON4.

\*3: The rated input currents are different. [QX41: approx. 4 mA, QX41-S2: approx. 6 mA, QX81: approx. 4 mA, QX81-S2: approx. 6 mA]

\*4: Connector is not provided. Separately order one of the following: A6CON1E/A6CON2E/A6CON3E.

\*5: The number of occupied input/output points is different. [QH42P: 32 points; QX41Y41P: 64 points (first 32 points: input/second 32 points: output)]



## I/O module

| Type                                       | Model                 | Outline                                                                                 |                                                                                                      |
|--------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Connector                                  | A6CON1                | 32-point connector soldering type (40-pin connector)                                    |                                                                                                      |
|                                            | A6CON2                | 32-point connector crimp-contact type (40-pin connector)                                |                                                                                                      |
|                                            | A6CON3                | 32-point connector pressure-displacement (flat cable) type (40-pin connector)           |                                                                                                      |
|                                            | A6CON4                | 32-point connector soldering type (40-pin connector, cable connectable bidirectionally) |                                                                                                      |
|                                            | A6CON1E               | 32-point connector soldering type (37-pin D-sub connector)                              |                                                                                                      |
|                                            | A6CON2E               | 32-point connector crimp-contact type (37-pin D-sub connector)                          |                                                                                                      |
|                                            | A6CON3E               | 32-point connector pressure-displacement (flat cable) type (37-pin D-sub connector)     |                                                                                                      |
| Spring clamp terminal block                | Q6TE-18SN             | For 16-point I/O modules, 0.3...1.5 mm² (22...16 AWG)                                   |                                                                                                      |
| Terminal block adapter                     | Q6TA32                | For 32-point I/O modules, 0.5 mm² (20 AWG)                                              |                                                                                                      |
|                                            | Q6TA32-TOL            | Q6TA32 dedicated tool                                                                   |                                                                                                      |
| Connector/terminal block conversion module | A6TBXY36              | For positive common input modules and sink output modules (standard type)               |                                                                                                      |
|                                            | A6TBXY54              | For positive common input modules and sink output modules (2-wire type)                 |                                                                                                      |
|                                            | A6TBX70               | For positive common input modules (3-wire type)                                         |                                                                                                      |
|                                            | A6TBX36-E             | For negative common input modules (standard type)                                       |                                                                                                      |
|                                            | A6TBX54-E             | For negative common input modules (2-wire type)                                         |                                                                                                      |
|                                            | A6TBY36-E             | For source output modules (standard type)                                               |                                                                                                      |
|                                            | Cable                 | AC05TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 0.5 m                               |
|                                            |                       | AC10TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 1 m                                 |
|                                            |                       | AC20TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 2 m                                 |
|                                            |                       | AC30TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 3 m                                 |
|                                            |                       | AC50TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 5 m                                 |
|                                            |                       | AC80TB                                                                                  | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 8 m *Common current 0.5 A or lower  |
|                                            |                       | AC100TB                                                                                 | For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 10 m *Common current 0.5 A or lower |
|                                            |                       | AC05TB-E                                                                                | For A6TBX36-E, A6TBY36-E, and A6TBX54-E (negative common/source type), 0.5 m                         |
|                                            |                       | AC10TB-E                                                                                | For A6TBX36-E, A6TBY36-E, and A6TBX54-E (negative common/source type), 1 m                           |
|                                            |                       | AC20TB-E                                                                                | For A6TBX36-E, A6TBY36-E, and A6TBX54-E (negative common/source type), 2 m                           |
|                                            |                       | AC30TB-E                                                                                | For A6TBX36-E, A6TBY36-E, and A6TBX54-E (negative common/source type), 3 m                           |
|                                            |                       | AC50TB-E                                                                                | For A6TBX36-E, A6TBY36-E, and A6TBX54-E (negative common/source type), 5 m                           |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            |                       |                                                                                         |                                                                                                      |
|                                            | Relay terminal module | A6TE2-16SRN                                                                             | For 40-pin connector 24 V DC transistor output modules (sink type)                                   |
| Cable                                      |                       | AC06TE                                                                                  | For A6TE2-16SRN, 0.6 m                                                                               |
|                                            |                       | AC10TE                                                                                  | For A6TE2-16SRN, 1 m                                                                                 |
|                                            |                       | AC30TE                                                                                  | For A6TE2-16SRN, 3 m                                                                                 |
|                                            |                       | AC50TE                                                                                  | For A6TE2-16SRN, 5 m                                                                                 |
|                                            |                       | AC100TE                                                                                 | For A6TE2-16SRN, 10 m                                                                                |

## Analog I/O module

|              |                       |                        |                                                                                                                                                                                                                                                                                                                     |
|--------------|-----------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analog input | Voltage input         | Q68ADV                 | 8 channels, -10...10 V DC/-4000...4000 (normal resolution mode), -16000...16000 (high resolution mode), conversion speed: 80 µs/channel, 18-point terminal block                                                                                                                                                    |
|              | Current input         | Q62AD-DGH              | 2 channels, 4...20 mA DC/0...32000 (16 bits), 0...64000 (32 bits), conversion speed: 10 ms/2 channels, 18-point terminal block, channel isolated, supplies power to 2-wire transmitter                                                                                                                              |
|              |                       | Q66AD-DG <sup>*1</sup> | 6 channels, 4...20 mA DC (with 2-wire transmitter)/0...4000 (normal resolution mode), 0...12000 (high resolution mode), 0...20 mA DC/0...4000 (normal resolution mode), 0...12000 (high resolution mode), conversion speed: 10 ms/channel, 40-pin connector, channel isolated, supplies power to 2-wire transmitter |
|              |                       | Q68ADI                 | 8 channels, 0...20 mA DC/0...4000 (normal resolution mode), 0...12000 (high resolution mode), conversion speed: 80 µs/channel, 18-point terminal block                                                                                                                                                              |
|              | Voltage/current input | Q64ADH                 | 4 channels, -10...10 V DC/-20000...20000, 0...20 mA DC/0...20000, conversion speed: 20 µs/channel, 18-point terminal block                                                                                                                                                                                          |
|              |                       | Q64AD                  | 4 channels, -10...10 V DC/-4000...4000 (normal resolution mode), -16000...16000 (high resolution mode), 0...20 mA DC/0...4000 (normal resolution mode), 0...12000 (high resolution mode), conversion speed: 80 µs/channel, 18-point terminal block                                                                  |
|              |                       | Q64AD-GH               | 4 channels, -10...10 V DC/-32000...32000 (16 bits), -64000...64000 (32 bits), 0...20 mA DC/0...32000 (16 bits), 0...64000 (32 bits), conversion speed: 10 ms/4 channels, 18-point terminal block, channel isolated                                                                                                  |
|              |                       | Q68AD-G <sup>*1</sup>  | 8 channels, -10...10 V DC/-4000...4000 (normal resolution mode), -16000...16000 (high resolution mode), 0...20 mA DC/0...4000 (normal resolution mode), 0...12000 (high resolution mode), conversion speed: 10 ms/channel, 40-pin connector, channel isolated                                                       |

<sup>\*1</sup>: A connector is not provided. The A6CON1/A6CON2/A6CON4 connector must be ordered separately.

## Analog I/O module

| Type                |                                  | Model                                                                                                                                                                                                                                                                                                                                                                                                                                              | Outline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analog output       | Voltage output                   | Q68DAVN                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8 channels, -4000...4000 (normal resolution mode), -16000...16000 (high resolution mode)/-10...10 V DC, conversion speed: 80 μs/channel, 18-point terminal block                                                                                                                                                                                                                                                                                                                               |
|                     | Current output                   | Q68DAIN                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8 channels, 0...4000 (normal resolution mode), 0...12000 (high resolution mode)/0...20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block                                                                                                                                                                                                                                                                                                                                         |
|                     | Voltage/current output           | Q64DAH                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4 channels, -20000...20000/-10...10V DC, 0...20000/0...20 mA DC, conversion speed: 20 μs/channel, 18-point terminal block                                                                                                                                                                                                                                                                                                                                                                      |
|                     |                                  | Q62DAN                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2 channels, -4000...4000 (normal resolution mode), -16000...16000 (high resolution mode)/-10...10 V DC, 0...4000 (normal resolution mode), 0...12000 (high resolution mode)/0...20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block                                                                                                                                                                                                                                             |
|                     |                                  | Q62DA-FG                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 channels, -16000...16000/-10...10 V DC, -12000...12000/-12...12 V DC, 0...12000/0...20 mA DC, -3000...13500/0...22 mA DC, conversion speed: 10 ms/2 channels, 18-point terminal block, channel isolated                                                                                                                                                                                                                                                                                      |
|                     |                                  | Q64DAN                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4 channels, -4000...4000 (normal resolution mode), -16000...16000 (high resolution mode)/-10...10 V DC, 0...4000 (normal resolution mode), 0...12000 (high resolution mode)/0...20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block                                                                                                                                                                                                                                             |
|                     | Q66DA-G*1                        | 6 channels, -4000...4000 (normal resolution mode), -16000...16000 (high resolution mode)/-10...10 V DC, -4000...4000 (normal resolution mode), -12000...12000 (high resolution mode)/-12...12 V DC, 0...4000 (normal resolution mode), 0...12000 (high resolution mode)/0...20 mA DC, -1000...4500 (normal resolution mode), -3000...13500 (high resolution mode)/0...22 mA DC, conversion speed: 6 ms/channel, 40-pin connector, channel isolated |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Analog input/output | Voltage and current input/output | Q64AD2DA                                                                                                                                                                                                                                                                                                                                                                                                                                           | Input: 4 channels, -10...10 V DC/-4000...4000 (normal resolution mode), -16000...16000 (high resolution mode), 0...20 mA DC/0...4000 (normal resolution mode), 0...12000 (high resolution mode), conversion speed: 500 μs/channel, output: 2 channels, -4000...4000 (normal resolution mode), -16000...16000 (high resolution mode)/-10...10 V DC, 0...4000 (normal resolution mode), 0...12000 (high resolution mode)/0...20 mA DC, conversion speed: 500 μs/channel, 18-point terminal block |
| Load cell input     |                                  | Q61LD                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1 channel, input (load cell output): 0.0...3.3 mV/V, output (resolution): 0...10000, conversion speed: 10 ms, 18-point terminal block                                                                                                                                                                                                                                                                                                                                                          |
| CT input module     |                                  | Q68CT                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8 channels, input: 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, 18-point terminal block                                                                                                                                                                                                                                                                                                                                              |
| Temperature input   | Thermocouple                     | Q64TD                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4 channels, thermocouple (B, R, S, K, E, J, T, N), disconnection detection function, conversion speed: 40 ms/channel, channel isolated, 18-point terminal block                                                                                                                                                                                                                                                                                                                                |
|                     |                                  | Q64TDV-GH                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4 channels, thermocouple (B, R, S, K, E, J, T, N), disconnection detection function, conversion speed: sampling cycle × 3, sampling cycle: 20 ms/channel, channel isolated, 18-point terminal block                                                                                                                                                                                                                                                                                            |
|                     |                                  | Q68TD-G-H01*1*2                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8 channels, thermocouple (B, R, S, K, E, J, T, N), disconnection detection function, conversion speed: 320 ms/8 channels, channel isolated, 40-pin connector                                                                                                                                                                                                                                                                                                                                   |
|                     |                                  | Q68TD-G-H02*1                                                                                                                                                                                                                                                                                                                                                                                                                                      | 8 channels, thermocouple (B, R, S, K, E, J, T, N), disconnection detection function, conversion speed: 640 ms/8 channels, channel isolated, 40-pin connector                                                                                                                                                                                                                                                                                                                                   |
|                     | RTD                              | Q64RD                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4 channels, platinum RTD (Pt100, JPt100), disconnection detection function, conversion speed: 40 ms/channel, 18-point terminal block                                                                                                                                                                                                                                                                                                                                                           |
|                     |                                  | Q64RD-G                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4 channels, platinum RTD (Pt100, JPt100), nickel RTD (Ni100), disconnection detection function, conversion speed: 40 ms/channel, channel isolated, 18-point terminal block                                                                                                                                                                                                                                                                                                                     |
|                     |                                  | Q68RD3-G*1                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8 channels, platinum RTD (Pt100, JPt100), nickel RTD (Ni100), disconnection detection function, conversion speed: 320 ms/8 channels, channel isolated, 40-pin connector                                                                                                                                                                                                                                                                                                                        |
| Temperature control | Thermocouple                     | Q64TCTTN                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PL II, W5Re/W26Re), heating control/cooling control/heating-cooling control, sampling cycle: 500 ms/4 channels, channel isolated, 18-point terminal block                                                                                                                                                                                                                                                                              |
|                     |                                  | Q64TCTTBWN                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PL II, W5Re/W26Re), heating control/cooling control/heating-cooling control, heater disconnection detection function, sampling cycle: 500 ms/4 channels, channel isolated, two 18-point terminal blocks                                                                                                                                                                                                                                |
|                     | RTD                              | Q64TCRTN                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4 channels, platinum RTD (Pt100, JPt100), heating control/cooling control/heating-cooling control, sampling cycle: 500 ms/4 channels, channel isolated, 18-point terminal block                                                                                                                                                                                                                                                                                                                |
|                     |                                  | Q64TCRTBWN                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4 channels, platinum RTD (Pt100, JPt100), heating control/cooling control/heating-cooling control, heater disconnection detection function, sampling cycle: 500 ms/4 channels, channel isolated, two 18-point terminal blocks                                                                                                                                                                                                                                                                  |
| Loop control        |                                  | Q62HLC                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2 channels, input: thermocouple/micro voltage/voltage/current, conversion speed (input): 25 ms/2 channels, sampling cycle: 25 ms/2 channels, output: 4...20 mA DC, conversion speed (output): 25 ms/2 channels, 18-point terminal block, with 5 PID control modes                                                                                                                                                                                                                              |

\*1: A connector is not provided. The A6CON1/A6CON2/A6CON4 connector must be ordered separately.

\*2: Depending on the combination of power source module and base unit, the installable slot position may be limited.



## Positioning module, pulse I/O module

| Type                         |                                            | Model      | Outline                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|--------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Simple motion                | With CC-Link IE Field Network connectivity | QD77GF4    | 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, advanced synchronous control, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 26-pin connector, with CC-Link IE Field Network connectivity                                                                                                                                                 |
|                              |                                            | QD77GF8    | 8-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, advanced synchronous control, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 26-pin connector, with CC-Link IE Field Network connectivity                                                                                                                                                 |
|                              |                                            | QD77GF16*1 | 16-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, advanced synchronous control, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 26-pin connector, with CC-Link IE Field Network connectivity                                                                                                                                                |
|                              | With SSCNET III/H connectivity             | QD77MS2*2  | 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III/H connectivity                                                                                                                                                                                                 |
|                              |                                            | QD77MS4*2  | 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III/H connectivity                                                                                                                                                                                           |
|                              |                                            | QD77MS16*2 | 16-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III/H connectivity                                                                                                                                                                                          |
| Positioning                  | Open collector output                      | QD75P1N*2  | 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector                                                                                                                                                                                                                                                                |
|                              |                                            | QD75P2N*2  | 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector                                                                                                                                                                                                    |
|                              |                                            | QD75P4N*2  | 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, 3-axis helical interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector                                                                                                                                                                |
|                              |                                            | QD70P4*2   | 4-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector                                                                                                                                                                                                                                                                                   |
|                              |                                            | QD70P8*2   | 8-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector                                                                                                                                                                                                                                                                                   |
|                              | Differential output                        | QD75D1N*2  | 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 4 Mpps, 40-pin connector                                                                                                                                                                                                                                                                  |
|                              |                                            | QD75D2N*2  | 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 4 Mpps, 40-pin connector                                                                                                                                                                                                      |
|                              |                                            | QD75D4N*2  | 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, 3-axis helical interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 4 Mpps, 40-pin connector                                                                                                                                                                  |
|                              |                                            | QD70D4*2   | 4-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector                                                                                                                                                                                                                                                                                     |
|                              |                                            | QD70D8*2   | 8-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector                                                                                                                                                                                                                                                                                     |
| High-speed counter           |                                            | QD62*3     | 2 channels, 200/100/10 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector                                                                                                                                                                                                      |
|                              |                                            | QD62E*3    | 2 channels, 200/100/10 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (source), 12/24 V DC, 0.1 A/point, 0.4 A/common, 40-pin connector                                                                                                                                                                                                  |
|                              |                                            | QD62D*3    | 2 channels, 500/200/100/10 kpps, count input signal: EIA standards RS-422-A (differential line driver), external input: 5/12/24 V DC, coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector                                                                                                                                                             |
|                              |                                            | QD63P6*2   | 6 channels, 200/100/10 kpps, count input signal: 5 V DC, 40-pin connector                                                                                                                                                                                                                                                                                                                      |
|                              |                                            | QD64D2*2   | 2 channels, 4 Mpps, count input signal: EIA standards RS-422-A (differential line driver), external input: 24 V DC, coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector                                                                                                                                                                               |
|                              |                                            | QD65PD2*2  | 2 channels<br>Differential input: 8 Mpps/4 Mpps/2 Mpps/1 Mpps/500 kpps/200 kpps/100 kpps/10 kpps<br>Count input signal: EIA Standards RS-422-A, differential line driver level<br>DC input: 200 kpps/100 kpps/10 kpps<br>Count input signal: 5/12/24 V DC, 7...10 mA<br>external input: 24 V DC, coincidence output: transistor (sink), 12/24 V DC 0.1 A/point, 0.8 A/common, 40-pin connector |
| 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                                                                                                                                                                                                                                                                                     |

\*1: A connector is not provided. The LD77MHIOCON connector must be ordered separately.

\*2: A connector is not provided. The A6CON1/A6CON2/A6CON4 connector must be ordered separately.

\*3: A connector is not provided. The A6CON1/A6CON2/A6CON3/A6CON4 connector must be ordered separately.



## Energy measuring module, insulation monitoring module

| Type                 | Model                      | Outline                                                                                                                                                                  |
|----------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy measuring     | QE81WH <sup>*1</sup>       | Three-phase 3-wire type, Number of measurement circuits: 1 circuit, Measured items: power rate (consumption, regenerative), current, voltage, power, power factor, etc.  |
|                      | QE84WH <sup>*1+2</sup>     | Three-phase 3-wire type, Number of measurement circuits: 4 circuits, Measured items: power rate (consumption, regenerative), current, voltage, power, power factor, etc. |
|                      | QE81WH4W <sup>*1+3</sup>   | Three-phase 4-wire type, Number of measurement circuits: 1 circuit, Measured items: power rate (consumption, regenerative), current, voltage, power, power factor, etc.  |
|                      | QE83WH4W <sup>*1+2+3</sup> | Three-phase 4-wire type, Number of measurement circuits: 3 circuits, Measured items: power rate (consumption, regenerative), current, voltage, power, power factor, etc. |
|                      | Option                     | QE8WH4VT                                                                                                                                                                 |
| Isolation monitoring | QE82LG <sup>*4</sup>       | Measured items: leakage current (Io), resistive component leakage current (Ior), number of measured circuits: 2 circuits                                                 |

\*1: Dedicated current sensors are required for operation.

\*2: Current measurement mode is provided. Up to eight circuits can be measured when measuring only the current value.

\*3: The separate voltage transformer (QE8WH4VT) is required for the three-phase 4-wire compatible products.

\*4: Dedicated residual current transformers are required for operation.

## Advanced information module

|                               |        |                |                                                                                          |
|-------------------------------|--------|----------------|------------------------------------------------------------------------------------------|
| MES interface                 | Option | QJ71MES96N     | MES interface module (MX MESInterface and CompactFlash card are required)                |
|                               |        | GT05-MEM-128MC | CompactFlash card, capacity: 128 MB                                                      |
|                               |        | GT05-MEM-256MC | CompactFlash card, capacity: 256 MB                                                      |
|                               |        | QD81MEM-512MBC | CompactFlash card, capacity: 512 MB                                                      |
|                               |        | QD81MEM-1GBC   | CompactFlash card, capacity: 1 GB                                                        |
| High-speed data logger        | Option | QD81DL96       | High-speed data logger module 10BASE-T/100BASE-TX (CompactFlash card is required)        |
|                               |        | QD81MEM-512MBC | CompactFlash card, capacity: 512 MB                                                      |
|                               |        | QD81MEM-1GBC   | CompactFlash card, capacity: 1 GB                                                        |
|                               |        | QD81MEM-2GBC   | CompactFlash card, capacity: 2 GB                                                        |
|                               |        | QD81MEM-4GBC   | CompactFlash card, capacity: 4 GB                                                        |
|                               |        | QD81MEM-8GBC   | CompactFlash card, capacity: 8 GB                                                        |
| High-speed data communication | Option | QJ71DC96       | High-speed data communication module 10BASE-T/100BASE-TX (CompactFlash card is required) |
|                               |        | QD81MEM-512MBC | CompactFlash card, capacity: 512 MB                                                      |
|                               |        | QD81MEM-1GBC   | CompactFlash card, capacity: 1 GB                                                        |
|                               |        | QD81MEM-2GBC   | CompactFlash card, capacity: 2 GB                                                        |
|                               |        | QD81MEM-4GBC   | CompactFlash card, capacity: 4 GB                                                        |
|                               |        | QD81MEM-8GBC   | CompactFlash card, capacity: 8 GB                                                        |



## Network module

| Type                       |                   | Model                       | Outline                                                                                                                                                                                                     |
|----------------------------|-------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet                   |                   | QJ71E71-100                 | 10BASE-T/100BASE-TX<br>BACnet® client function, MODBUS® TCP master function (using predefined protocol support function)                                                                                    |
| CC-Link IE Control Network |                   | QJ71GP21-SX<br>QJ71GP21S-SX | Multi-mode fiber optic cable, dual loop, control network (control/normal station)<br>Multi-mode fiber optic cable, dual loop, control network (control/normal station), with external power supply function |
| CC-Link IE Field Network   |                   | QJ71GF11-T2                 | Master/local station, CC-Link IE Field Network compatible                                                                                                                                                   |
| CC-Link                    |                   | QJ61BT11N                   | Master/local station, CC-Link Ver. 2 compatible                                                                                                                                                             |
| CC-Link/LT                 |                   | QJ61CL12                    | Master station, CC-Link/LT system compatible                                                                                                                                                                |
| AnyWireASLINK              |                   | QJ51AW12AL DB               | Master station, AnyWireASLINK system compatible                                                                                                                                                             |
| MELSECNET/H                | Optical loop (SI) | QJ71LP21-25                 | SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station) or remote I/O network (remote master station)                                                           |
|                            |                   | QJ71LP21S-25                | SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station) or remote I/O network (remote master station), with external power supply function                      |
|                            |                   | QJ72LP25-25                 | SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, remote I/O network (remote I/O station)                                                                                                          |
|                            | Optical loop (GI) | QJ71LP21G                   | GI-50/125 fiber optic cable, dual loop, control network (control/normal station) or remote I/O network (remote master station)                                                                              |
|                            |                   | QJ72LP25G                   | GI-50/125 fiber optic cable, dual loop, remote I/O network (remote I/O station)                                                                                                                             |
|                            | Coaxial bus       | QJ71BR11                    | 3C-2V/5C-2V coaxial cable, single bus, control network (control/normal station) or remote I/O network (remote master station)                                                                               |
|                            |                   | QJ72BR15                    | 3C-2V/5C-2V coaxial cable, single bus, remote I/O network (remote I/O station)                                                                                                                              |
|                            | Twist bus         | QJ71NT11B                   | Twisted pair cable, single bus, control network (control/normal station)                                                                                                                                    |
| FL-net (OPCN-2)            | Ver. 2.00         | QJ71FL71-T-F01              | 10BASE-T, 100BASE-TX                                                                                                                                                                                        |
|                            | Ver. 1.00         | QJ71FL71-T                  | 10BASE-T                                                                                                                                                                                                    |
| MODBUS®                    |                   | QJ71MB91                    | MODBUS® RTU/ASCII, RS-232, RS-422/485 configurable as master or slave                                                                                                                                       |
|                            |                   | QJ71MT91                    | MODBUS®/TCP 10BASE-T/100BASE-TX configurable as master or slave                                                                                                                                             |
| EtherNet/IP™               |                   | QJ71EIP71                   | EtherNet/IP™ tag communication compatible<br>*compatible with tag communication between programmable controllers only (not compatible with instance communication)                                          |
| PROFIBUS®-DP               |                   | QJ71PB92V<br>QJ71PB93D      | PROFIBUS® system compatible, DP master<br>PROFIBUS® system compatible, DP slave                                                                                                                             |
| DeviceNet®                 |                   | QJ71DN91                    | DeviceNet® system compatible, master/slave                                                                                                                                                                  |
| AS-i                       |                   | QJ71AS92                    | Master station, AS-Interface Specification Version 2.11 compatible                                                                                                                                          |
| Serial communication       |                   | QJ71C24N                    | RS-232: 1 channel, RS-422/485: 1 channel, total transmission speed of 2 channels: 230.4 kbps<br>MODBUS® RTU master function (using predefined protocol support function)                                    |
|                            |                   | QJ71C24N-R2                 | RS-232: 2 channels, total transmission speed of 2 channels: 230.4 kbps<br>MODBUS® RTU master function (using predefined protocol support function)                                                          |
|                            |                   | QJ71C24N-R4                 | RS-422/485: 2 channels, total transmission speed of 2 channels: 230.4 kbps<br>MODBUS® RTU master function (using predefined protocol support function)                                                      |

## Compatible module for each protocol

| Compatible protocol            | Compatible modules                                      | Model             | Outline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|---------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CC-Link IE Field Network Basic | High-speed Universal model QCPU (Built-in Ethernet)     | QnUDVCPUCPU       | CC-Link IE Field Network Basic master station function                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                | Universal model process CPU (Built-in Ethernet)         | QnUDPVCPU         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SLMP (MC protocol)             | Universal model QCPU (Built-in Ethernet)                | QnUDE(H)CPU       | SLMP server function (only MC protocol QnA compatible 3E frame)<br>SLMP client function (using predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                                                          |
|                                | High-speed Universal model (Built-in Ethernet)          | QnUDVCPUCPU       | SLMP server function (QnA compatible 3E and 4E frame of MC protocol)<br>SLMP client function (using SLMP frame send instruction, predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                        |
|                                | Universal model process CPU (Built-in Ethernet)         | QnUDPVCPU         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | Ethernet interface module                               | QJ71E71-100       | SLMP server function (QnA compatible 3E and 4E frame of MC protocol)<br>SLMP client function (using predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                                                     |
| BACnet®                        | High-speed Universal model (Built-in Ethernet)          | QnUDVCPUCPU       | Compatible BACnet® object: Analog Input (AI), Binary Input (BI), Binary Output (BO), Accumulator (AC) (using predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                                            |
|                                | Universal model process CPU (Built-in Ethernet)         | QnUDPVCPU         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | Ethernet interface module                               | QJ71E71-100       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | BACnet® interface module (Third-party partner products) | BAQ08V            | Compatible BACnet® object: Analog Input (AI), Analog Output (AO), Analog Value (AV), Binary Input (BI), Binary Output (BO), Binary Value (BV), Multi-state Input (MI), Multi-state Output (MO), Multi-state Value (MV), Accumulator (AC), Calendar (CA), EventEnrollment (EE), Group Object (GR), Notification Class (NC), Schedule (SC), TrendLog (TL), Device (DV), Measurement object (measure)*1, Power demand monitoring (monitor power)*2, Power demand control (control power)*2, Generator load control (generator)*2 |
| MODBUS®/TCP                    | High-speed Universal model (Built-in Ethernet)          | QnUDVCPUCPU       | MODBUS®/TCP communication master function (using predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                | Universal model process CPU (Built-in Ethernet)         | QnUDPVCPU         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | Ethernet interface module                               | QJ71E71-100       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | MODBUS®/TCP interface module                            | QJ71MT91          | MODBUS®/TCP communication master function/slave function                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| MODBUS®                        | Serial communication module                             | QJ71C24N (-R2/R4) | MODBUS®RTU communication master function (using predefined protocol support function)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                | MODBUS® interface module                                | QJ71MB91          | MODBUS® RTU/ASCII communication master function/slave function                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

\*1: ANSI/ASHRAE 2004 and IEC 60364 standards are not supported.

\*2: ANSI/ASHRAE 2004 standard is not supported.

## Replacement support MELSEC-A/AnS/QnA/QnAS transition products

| Type                               |                   | Model                  | Outline                                                                                                                                                                                                                     |
|------------------------------------|-------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q Large base                       | Main base         | Q35BL* <sup>1</sup>    | 5 slots. Power supply module installation required. For Q Series large input/output module installation                                                                                                                     |
|                                    |                   | Q38BL* <sup>1</sup>    | 8 slots. Power supply module installation required. For Q Series large input/output module installation                                                                                                                     |
|                                    | Extension base    | Q65BL* <sup>1</sup>    | 5 slots. Power supply module installation required. For Q Series large input/output module installation                                                                                                                     |
|                                    |                   | Q68BL* <sup>1</sup>    | 8 slots. Power supply module installation required. For Q Series large input/output module installation                                                                                                                     |
|                                    |                   | Q55BL* <sup>1</sup>    | 5 slots. Power supply module installation not required. For Q Series large input/output module installation                                                                                                                 |
|                                    | Large blank cover | QG69L* <sup>1</sup>    | For gap adjustment when a previous Q Series module is installed on the Q large base                                                                                                                                         |
| AnS-sized version<br>Q Large base  | Main base         | Q35BLS                 | 5 slots. Q Series module installation Attaches to board surface                                                                                                                                                             |
|                                    |                   | Q38BLS                 | 8 slots. Q Series module installation Attaches to board surface                                                                                                                                                             |
|                                    |                   | Q35BLS-D               | 5 slots. Q Series module installation Attaches to DIN rail                                                                                                                                                                  |
|                                    |                   | Q38BLS-D               | 8 slots. Q Series module installation Attaches to DIN rail                                                                                                                                                                  |
|                                    | Extension base    | Q65BLS                 | 5 slots. Q Series module installation Attaches to board surface                                                                                                                                                             |
|                                    |                   | Q68BLS                 | 8 slots. Q Series module installation Attaches to board surface                                                                                                                                                             |
|                                    |                   | Q65BLS-D               | 5 slots. Q Series module installation Attaches to DIN rail                                                                                                                                                                  |
|                                    |                   | Q68BLS-D               | 8 slots. Q Series module installation Attaches to DIN rail                                                                                                                                                                  |
|                                    |                   | Q55BLS                 | 5 slots. Q Series module installation Attaches to board surface, power supply module not required                                                                                                                           |
|                                    |                   | Q55BLS-D               | 5 slots. Q Series module installation Attaches to DIN rail, power supply module not required                                                                                                                                |
|                                    | Large blank cover | QG69LS                 | Use to adjust the gap when an existing Q Series unit is installed on the large base unit of the AnS-sized Q.                                                                                                                |
| Q Large I/O                        | Input             | QX11L* <sup>1</sup>    | For replacement of A-Series large type module "AX11".<br>32 points, 100...120 V AC, response time: 25 ms, 32 points/common, 38-point terminal block                                                                         |
|                                    |                   | QX21L* <sup>1</sup>    | For replacement of A-Series large type module "AX21".<br>32 points, 200...240 V AC, response time: 25 ms, 32 points/common, 38-point terminal block                                                                         |
|                                    | Output            | QY11AL* <sup>1</sup>   | For replacement of A-Series large type module "AY10A, AY11A".<br>16 points, contact, 24 V DC/240 V AC, 2 A/point; 16 A/all points, all-point independent contacts, response time: 12 ms, 38-point terminal block            |
|                                    |                   | QY13L* <sup>1</sup>    | For replacement of A-Series large type module "AY13".<br>32 points, contact, 24 V DC/240 V AC, 2 A/point; 5 A/common, 8 points/common, response time: 12 ms, 38-point terminal block                                        |
|                                    |                   | QY23L* <sup>1</sup>    | For replacement of A-Series large type module "AY23".<br>32 points, triac, 100...240 V AC; 0.6 A/point, 2.4 A/common, 8 points/common, response time: 1 ms + 0.5 cycle, 38-point terminal block                             |
|                                    |                   | QY51PL                 | For replacement of A-Series large type module "AY41, AY41P, AY51, AY51-S1".<br>32 points, transistor (sink), 12/24 V DC; 0.5 A/point; 4 A/common, 16 points/common, response time: 1 ms, 38-point terminal block            |
| High-speed counter                 |                   | QD62-H01* <sup>2</sup> | For replacement of A-Series large type module "AD61".<br>2 channels, 50 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (sync), 12/24 V DC, 0.5 A/point; 2 A/common    |
|                                    |                   | QD62-H02* <sup>2</sup> | For replacement of A-Series large type module "AD61-S1".<br>2 channels, 10 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (sync), 12/24 V DC, 0.5 A/point; 2 A/common |
| Positioning                        |                   | QD73A1                 | For replacement of "A1SD70".<br>1 axis. Number of positioning data items: 1 data/axis, analog output                                                                                                                        |
| Extension base (AnS Series)        |                   | QA1S51B* <sup>3</sup>  | 1 slot. Does not require installation of AnS Series power supply module. For AnS Series module installation                                                                                                                 |
|                                    |                   | QA1S65B* <sup>3</sup>  | 5 slots. Requires AnS Series power supply module installation. For AnS Series module installation                                                                                                                           |
|                                    |                   | QA1S68B* <sup>3</sup>  | 8 slots. Requires AnS Series power supply module installation. For AnS Series module installation                                                                                                                           |
| Q-AnS base unit conversion adapter |                   | QA1S6ADP               | Conversion adapter to connect an AnS/QnAS Series extension base unit to the Q Series system                                                                                                                                 |
|                                    |                   | QA1S6ADP-S1            | Conversion adapter to connect an AnS/QnAS Series extension base unit to the Q Series system (for up to 3 extension base units)                                                                                              |

\*1: Only supported only by Universal QCPU (Excluding Q00UJCPU).

\*2: A connector is not provided. Please order one of the following separately: A6CON1/A6CON2/A6CON3/A6CON4

\*3: Only supported only by Universal model QCPU.



## Network interface board

| Type                       |                   | Model             | Outline                                                                                                                                                                           |
|----------------------------|-------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CC-Link IE Control Network |                   | Q81BD-J71GP21-SX  | PCI Express® bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, control network (control/normal station)                                               |
|                            |                   | Q80BD-J71GP21-SX  | PCI bus/PCI-X bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, control network (control/normal station)                                              |
|                            |                   | Q81BD-J71GP21S-SX | PCI Express® bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, control network (control/normal station), with external power supply function          |
|                            |                   | Q80BD-J71GP21S-SX | PCI bus/PCI-X bus, Japanese/English OS compatible, multi-mode fiber optic cable, dual loop, control network (control/normal station), with external power supply function         |
| CC-Link IE Field Network   |                   | Q81BD-J71GF11-T2  | PCI Express® compatible, Japanese/English OS compatible, Ethernet connections in line, star, or line and star mixed, ring, field network (control/normal station)                 |
|                            |                   | Q80BD-J71GF11-T2  | PCI bus/PCI-X bus, Japanese/English OS compatible, Ethernet connections in line, star, or line and star mixed, ring, field network (control/normal station)                       |
| MELSECNET/H(10)            | Optical loop (SI) | Q81BD-J71LP21-25  | PCI Express® bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station)                             |
|                            |                   | Q80BD-J71LP21-25  | PCI bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station)                                      |
|                            |                   | Q80BD-J71LP21S-25 | PCI bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station), with external power supply function |
|                            | Optical loop (GI) | Q80BD-J71LP21G    | PCI bus, Japanese/English OS compatible, GI-50/125 fiber optic cable, dual loop, control network (control/normal station)                                                         |
|                            | Coaxial bus       | Q80BD-J71BR11     | PCI bus, Japanese/English OS compatible, 3C-2V/5C-2V coaxial cable, single bus, control network (control/normal station)                                                          |
| CC-Link                    |                   | Q81BD-J61BT11     | PCI Express® bus, Japanese/English OS compatible, master/local interface board, CC-Link Ver. 2 compatible                                                                         |
|                            |                   | Q80BD-J61BT11N    | PCI bus, Japanese/English OS compatible, master/local interface board, CC-Link Ver. 2 compatible                                                                                  |

## Ethernet related products

|                          |                      |                                                                                                                                                                                                        |
|--------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Industrial switching HUB | NZ2EHG-T8N <b>DB</b> | 10 Mbps/100 Mbps/1 Gbps Auto MDI/MDI-X, DIN rail supported, 8 ports                                                                                                                                    |
| Intelligent HUB          | NZ2MHG-T8F2          | 10 Mbps/100 Mbps/1 Gbps DIN rail mountable, 8 ports (2 ports support optical fiber cable), CC-Link IE and Ethernet devices are connectable, ERP- and LA- style topologies, VLAN and SNMP are supported |

»For details on the software versions compatible with each module, refer to the manual for each product.

Please contact your local Mitsubishi Electric sales office or representative for the latest information about MELSOFT software versions and compatible operating systems.

## Software MELSOFT GX Series

\* Refer to the "Compatible CPUs" table for individual model names.

| Type                            | Model            | Outline                                                                                                                                         | Compatible CPU*                                                                      |     |         |                                |                  |
|---------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----|---------|--------------------------------|------------------|
|                                 |                  |                                                                                                                                                 | Universal model                                                                      |     |         | Universal model<br>process CPU | Redundant<br>CPU |
|                                 |                  |                                                                                                                                                 | QnUDV                                                                                | QnU | QnUD(E) |                                |                  |
| MELSOFT<br>GX Works3            | SW1DND-GXW3-E    | Controller Programming Software: MELSOFT GX Works3*1<br>MITSUBISHI ELECTRIC FA Library<br>Comes with GX Works2, GX Developer and PX Developer*2 | Supported by GX Works2 or GX Developer or<br>PX Developer (both come with GX Works3) |     |         |                                |                  |
| MELSOFT<br>GX Works2            | SW1DND-GXW2-E    | Controller Programming Software<br>Comes with GX Developer                                                                                      | ●                                                                                    | ●   | ●       | ●                              | ●                |
| MELSOFT<br>GX Developer         | SW8D5C-GPPW-E*3  | MELSEC programmable controller programming software                                                                                             | -                                                                                    | ●   | ●*4     | -                              | ●                |
|                                 | SW8D5C-GPPW-EV   | MELSEC programmable controller programming software (upgrade)                                                                                   | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Simulator*5       | SW7D5C-LLT-E*3   | MELSEC programmable controller simulation software                                                                                              | -                                                                                    | ●   | ●*4     | -                              | ●                |
|                                 | SW7D5C-LLT-EV    | MELSEC programmable controller simulation software (upgrade)                                                                                    | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT GX Converter*5          | SW0D5C-CNVW-E*3  | Excel®/text data converter                                                                                                                      | -                                                                                    | -   | -       | -                              | ●                |
| MELSOFT<br>GX Configurator-AD*5 | SW2D5C-QADU-E*3  | Analog to digital conversion module setting/monitoring tool                                                                                     | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-DA*5 | SW2D5C-QDAU-E*3  | Digital to analog conversion module setting/monitoring tool                                                                                     | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-SC*5 | SW2D5C-QSCU-E*3  | MELSEC-Q dedicated serial communication module setting/monitoring<br>tool                                                                       | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-CT*5 | SW0D5C-QCTU-E*3  | MELSEC-Q dedicated high-speed counter module setting/monitoring tool                                                                            | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-TC*5 | SW0D5C-QTCU-E*3  | MELSEC-Q dedicated temperature control module setting/monitoring tool                                                                           | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-TI*5 | SW1D5C-QTIU-E*3  | MELSEC-Q dedicated temperature input module setting/monitoring tool                                                                             | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-FL*5 | SW0D5C-QFLU-E*3  | MELSEC-Q dedicated FL-net module setting/monitoring tool                                                                                        | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-PT*5 | SW1D5C-QPTU-E*3  | MELSEC-Q dedicated positioning module QD70 setting/monitoring tool                                                                              | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-MB*5 | SW1D5C-QMBU-E*3  | MODBUS® master module setting/monitoring tool                                                                                                   | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-AS*5 | SW1D5C-QASU-E*3  | AS-i master module setting/monitoring tool                                                                                                      | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Configurator-QP   | SW2D5C-QD75P-E*3 | Positioning module QD75P/D/M setting/monitoring tool                                                                                            | -                                                                                    | ●   | ●*4     | -                              | ●                |
| MELSOFT<br>GX Explorer          | SW2D5C-EXP-E*3   | Maintenance tool                                                                                                                                | -                                                                                    | -   | -       | -                              | -                |
| MELSOFT<br>GX RemoteService- I  | SW2D5C-RAS-E*3   | Remote access tool                                                                                                                              | -                                                                                    | -   | -       | -                              | -                |
| MELSOFT<br>GX Works             | SW4D5C-QSET-E*3  | Set type products (7 in total): GX Developer, GX Simulator, GX Explorer,<br>GX Configurator-AD, DA, SC, CT                                      | *6                                                                                   |     |         |                                |                  |
|                                 | SW8D5C-GPPLT-E*3 | Set type products (3 in total): GX Developer, GX Simulator, GX Explorer                                                                         | *6                                                                                   |     |         |                                |                  |

\*1: The MELSOFT GX Works3 menu is switchable between Japanese, English, and simplified Chinese.

\*2: Includes both programming tool and monitor tool for process control.

\*3: Production will be discontinued in September 2023.

\*4: Not compatible with Q50UDEHCPU, Q100UDEHCPU, and QJ71GF11-T2.

\*5: This operates as add-in software for GX Developer. GX Developer is required separately.

\*6: To determine which CPUs are supported, refer to the individual products above.





## Software MELSOFT PX Series

\* Refer to the "Compatible CPUs" table for individual model names.

| Type                 | Model             | Outline                                                                                       | Compatible CPU* |     |         |                                |                  |
|----------------------|-------------------|-----------------------------------------------------------------------------------------------|-----------------|-----|---------|--------------------------------|------------------|
|                      |                   |                                                                                               | Universal model |     |         | Universal model<br>process CPU | Redundant<br>CPU |
|                      |                   |                                                                                               | QnUDV           | QnU | QnUD(E) |                                |                  |
| MELSOFT PX Developer | SW1D5C-FBDQ-E     | Process control FBD software package                                                          | -               | -   | -       | ●                              | ●                |
|                      | SW1DNC-FBDQMON-E  | Process control FBD software package monitoring tool                                          | -               | -   | -       | ●                              | ●                |
| MELSOFT PX Works     | SW3D5C-FBDGPP-E*1 | Set type products (6 in total):<br>PX Developer, GX Developer, GX Configurator-AD, DA, CT, TI | *2              |     |         |                                |                  |

\*1: Production will be discontinued in September 2023.

\*2: To determine which CPUs are supported, refer to the individual products.

## Software MELSOFT MX Series

|                                       |                   |                                                                                            |    |   |   |   |
|---------------------------------------|-------------------|--------------------------------------------------------------------------------------------|----|---|---|---|
| MELSOFT MX Component                  | SW5DND-ACT-E      | ActiveX® library for communication                                                         | ●  | ● | ● | ● |
| MELSOFT MX Sheet                      | SW3DND-SHEET-E*3  | Excel® communication support tool                                                          | ●  | ● | ● | ● |
| MELSOFT MX Works                      | SW3DND-SHEETSET-E | A set of two products: MX Component, MX Sheet                                              | *4 |   |   |   |
| MELSOFT MX Component for iOS/Android™ | SW1DNC-ACTAND-B   | Library for communication (for Android application development) (Japanese/English version) | ●  | ● | ● | ● |
|                                       | SW1MIC-ACTIOS-B   | Library for communication (for iOS application development) (Japanese/English version)     | ●  | ● | ● | ● |
| MELSOFT MX MESInterface               | SW1DNC-MESIF-E    | MES interface module QJ71MES96N dedicated information linkage tool                         | *5 |   |   |   |

\*3: To use MX Sheet, MX Component is required.

\*4: To determine which CPUs are supported, refer to the individual products.

\*5: Required when using the MES interface module.

## Software MELSOFT iQ Works

|                  |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MELSOFT iQ Works | SW2DND-IQWK-E | FA engineering software*6<br><ul style="list-style-type: none"> <li>• System Management Software: MELSOFT Navigator</li> <li>• Controller Programming Software: MELSOFT GX Works3*7, GX Works2, GX Developer</li> <li>• Motion Programming Software: MELSOFT MT Works2</li> <li>• HMI Programming Software: MELSOFT GT Works3</li> <li>• Robot Programming Software: MELSOFT RT ToolBox3*8</li> <li>• Inverter Setup Software: MELSOFT FR Configurator2</li> <li>• Servo setup software: MELSOFT MR Configurator2</li> <li>• C Controller setting and monitoring tool: MELSOFT CW Configurator</li> <li>• MITSUBISHI ELECTRIC FA Library</li> </ul> |
|------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\*6: For detailed information about supported modules, refer to the manuals of the relevant software package.

\*7: The MELSOFT GX Works3 menu is switchable between Japanese, English, and simplified Chinese.

\*8: 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.

## Compatible CPUs

| Item                        | Model                                                                                                 |
|-----------------------------|-------------------------------------------------------------------------------------------------------|
| Universal model QCPU        | QnUDV Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV                                                          |
|                             | QnU Q00UJ, Q00U, Q01U, Q02U                                                                           |
|                             | QnUD(E) Q03UD(E), Q04UD(E)H, Q06UD(E)H, Q10UD(E)H, Q13UD(E)H, Q20UD(E)H, Q26UD(E)H, Q50UDEH, Q100UDEH |
| Universal model process CPU | Q04UDPV, Q06UDPV, Q13UDPV, Q26UDPV                                                                    |
| Redundant CPU               | Q12PRH, Q25PRH                                                                                        |

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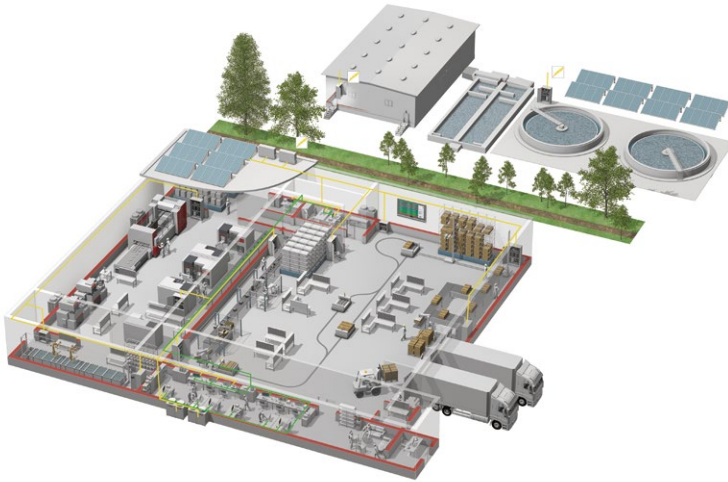
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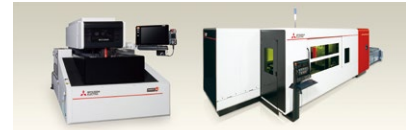
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