

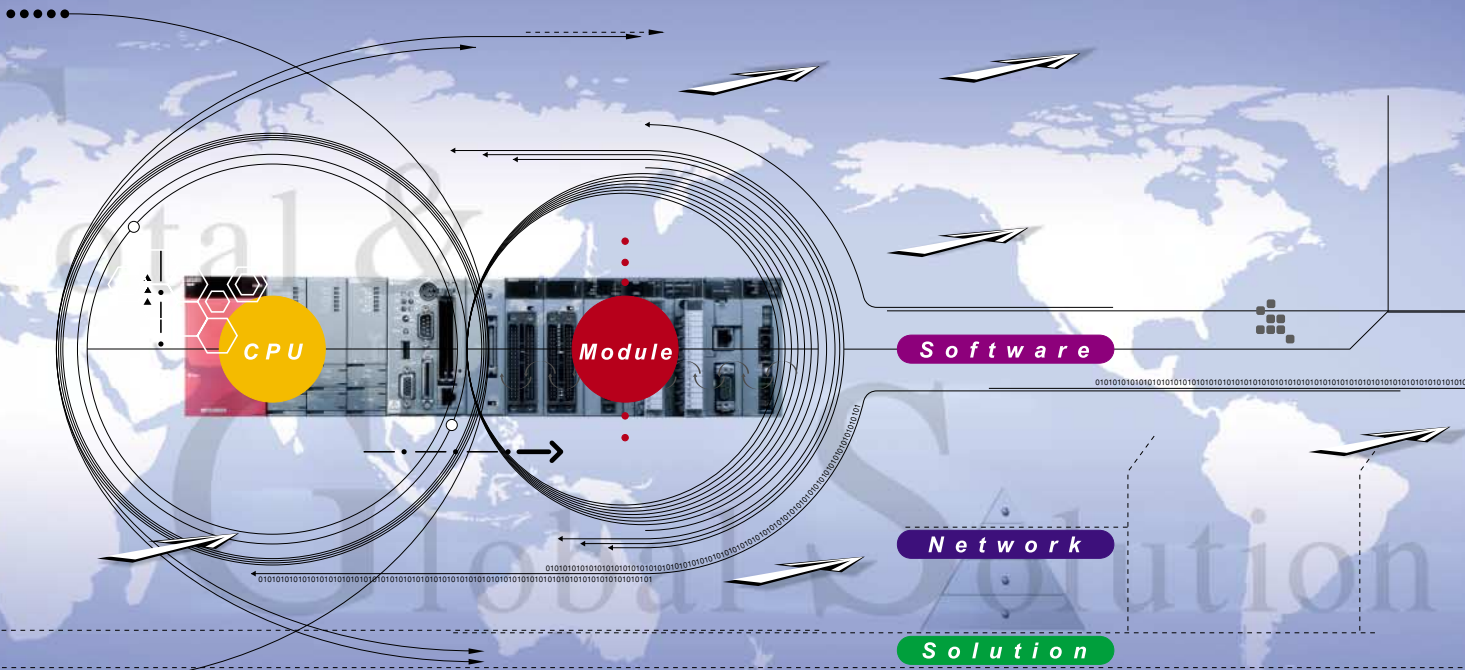


MITSUBISHI ELECTRIC

Mitsubishi Programmable Controllers

Changes for the Better

MELSEC Q Series



Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems).

Empowering Industries



CC-Link



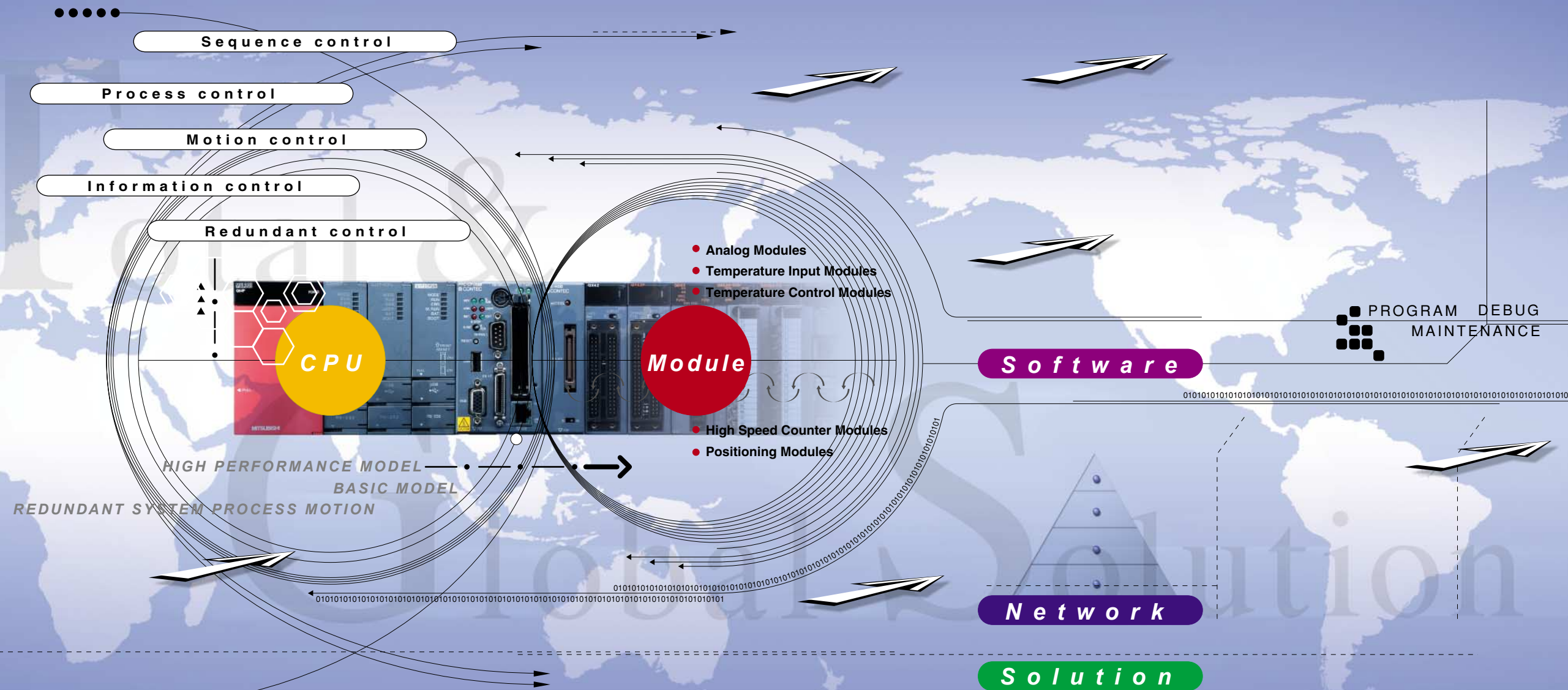
The automation solution specific to your needs

The MELSEC-Q Series offers 'total and global' solutions for a diverse range of applications.

The MELSEC-Q Series continues to advance the state of the art in automation control.

The Q Series is an enhancement of Mitsubishi Electric's vast automation system expertise, while inheriting the technical assets from the MELSEC-A and QnA Series.

This unique series is able to integrate four types of automation control, sequence, motion, process, and information (PC based) onto a single system. Therefore, offering significant benefits for the user in terms of development, functionality, performance, and maintenance.



Total & Global Solution MELSEC Q Series

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I N D E X



LineUp 3



C P U 5



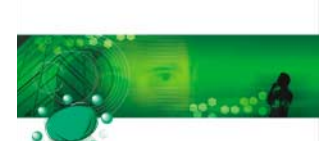
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Q Series lineup

CPU Modules

Programmable Controller CPU

Basic Model QCPU

CPU type	Program capacity	Number of I/O points
Q00JCPU	8k steps	256 points
Q00CPU	8k steps	1024 points
Q01CPU	14k steps	1024 points

High Performance Model QCPU

CPU type	Program capacity	Number of I/O points
Q02CPU	28k steps	4096 points
Q02HCPU	28k steps	4096 points
Q06HCPU	60k steps	4096 points
Q12HCPU	124k steps	4096 points
Q25HCPU	252k steps	4096 points

Process CPU

CPU type	Program capacity	Number of I/O points
Q12PHCPU	124k steps	4096 points
Q25PHCPU	252k steps	4096 points

Redundant CPU

CPU type	Program capacity	Number of I/O points
Q12PRHCPU	124k steps	4096 points
Q25PRHCPU	252k steps	4096 points

Motion CPU

CPU type	Number of control axes
Q172HCPU (-T)	8 axes
Q173HCPU (-T)	32 axes
Q172CPUN (-T)	8 axes
Q173CPUN (-T)	32 axes

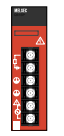
Network/Information Processing Modules

- **MES Interface Module**
QJ71MES96
- **Ethernet Modules**
QJ71E71-100
QJ71E71-B5
QJ71E71-B2
- **MELSECNET/H Modules**
QJ71LP21-25 QJ72LP25-25
QJ71LP21S-25 QJ72LP25G(E)
QJ71LP21G(E) QJ72BR15
QJ71BR11
MELSECNET/H PC I/F Boards
Q80BD-J71LP21-25
Q80BD-J71LP21S-25
Q80BD-J71LP21G(E)
Q80BD-J71BR11
- **CC-Link Module**
QJ61BT11N
CC-Link PC I/F Board
Q80BD-J61BT11N
- **CC-Link/LT Module**
QJ61CL12
- **Serial Communication Modules**
QJ71C24N
QJ71C24N-R2
QJ71C24N-R4
- **FL-net (OPCN-2) Interface Modules**
QJ71FL71-T-F01
QJ71FL71-B5-F01
QJ71FL71-B2-F01
- **AS-i Master Module**
QJ71AS92
- **Intelligent Communication Modules**
QD51
QD51-R24


Intelligent Function Modules

- **Analog Modules**
A/D Converter Modules
Q64AD-GH Q68AD-G
Q62AD-DGH Q66AD-DG
Q64AD
Q68ADV
Q68ADI
D/A Converter Modules
Q62DA-FG Q68DAVN
Q62DAN Q68DAIN
Q64DAN Q66DA-G
- **Loop Control Module**
Q62HLC
- **Positioning Modules**
QD75P1 QD75MH1
QD75P2 QD75MH2
QD75P4 QD75MH4
QD75D1 QD75M1
QD75D2 QD75M2
QD75D4 QD75M4
QD70P4 QD72P3C3
QD70P8
QD70D4
QD70D8
- **Temperature Control Modules**
Q64TCTT
Q64TCTTBW
Q64TCRT
Q64TCRTBW
- **Channel Isolated Pulse Input Module**
QD60P8-G
- **Temperature Input Modules**
Q64TDV-GH
Q64TD
Q68TD-G-H01
Q64RD-G
Q64RD
- **High Speed Counter Modules**
QD62
QD62D
QD62E
QD63P6
QD64D2


Power Supply Modules




Q61SP
[Slim type]
100 to 240V AC input
5V DC, 2A output




Q61P
100 to 240V AC input
5V DC, 6A output




Q62P
100 to 240V AC input
5V DC, 3A output
24V DC, 0.6A output




Q63P
24V DC input
5V DC, 6A output



Q64PN
100 to 240V AC input
5V DC, 8.5A output




Q63RP
24V DC input
5V DC, 8.5A output

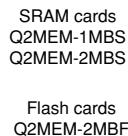


Q64RP
100 to 120/ 200 to 240V AC input
5V DC, 8.5A output

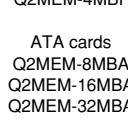
Memory Cards



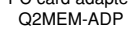
SRAM cards
Q2MEM-1MBS
Q2MEM-2MBS



Flash cards
Q2MEM-2MBF
Q2MEM-4MBF



ATA cards
Q2MEM-8MBA
Q2MEM-16MBA
Q2MEM-32MBA



PC card adapter
Q2MEM-ADP



Accessories

- **Batteries**
Q6BAT
Q7BAT (-SE1)
Q8BAT (-SE1)
Q2MEM-BAT (for SRAM memory card)
- **Connectors for I/O Modules**
40-pin connector type
A6CON1 (soldering type)
A6CON2 (crimp-contact type)
A6CON3 (IDC type)
A6CON4 (soldering and inclined insertion combination type)
- **37-pin D-sub connector type**
A6CON1E (soldering type)
A6CON2E (crimp-contact type)
A6CON3E (IDC type)
- **DIN Rail Adapter**
Q6DIN1
Q6DIN2
Q6DIN3
- **Spring Clamp Terminal Block**
Q6TE-18S
- **IDC Terminal Block Adapter, Dedicated Tool**
Q6TA32
Q6TA32-TOL
- **Connection Cable**
QC30R2
- **Connector Disconnection Prevention Holder**
Q6HLD-R2

Input Modules

Points	100 to 120V AC	100 to 240V AC	24V DC (positive common)	48V AC/DC (positive/negative common)	5/12V DC (positive/negative common)	24V DC (negative common)
8 points		QX28	QX48Y57 ^{*1}			
16 points	QX10		QX40 QX40-S1 QX41 QX41-S1 QH42P ^{*1} QX41Y41P ^{*1}	QX50	QX70	QX80
32 points					QX71	QX81
64 points			QX42 QX42-S1		QX72	QX82 QX82-S1

*1: Input specifications for I/O composite module

Output Modules

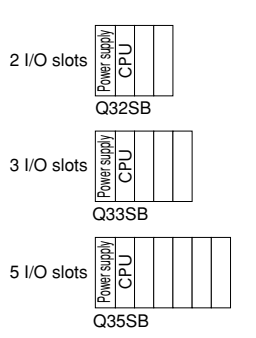
Points	Relay 24V DC, 240V AC	Triac 100 to 240V AC	Transistor 12 to 24V DC (sink)	Transistor 5 to 24V DC (sink/source)	Transistor 5 to 12V DC (sink)	Transistor 12 to 24V DC (source)
7 points			QX48Y57 ^{*2}			
8 points	QY18A			QY68A		
16 points	QY10	QY22	QY40P QY50		QY70	QY80
32 points			QY41P QH42P ^{*2} QX41Y41P ^{*2}		QY71	QY81P
64 points			QY42P			

*2: Output specifications for I/O composite module

Base Units, Extension Cables

● **Slim Type Main Base Unit**

Main base unit
(Power supply module required; cannot be extended)



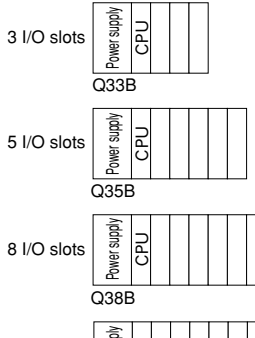
2 I/O slots: Q32SB

3 I/O slots: Q33SB

5 I/O slots: Q35SB

● **Main Base Unit**

Main base unit
(Power supply module required; can be extended)



3 I/O slots: Q33B

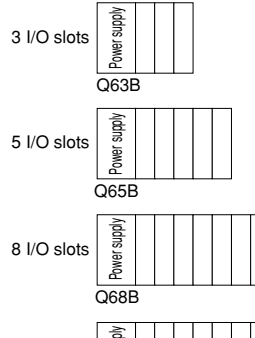
5 I/O slots: Q35B

8 I/O slots: Q38B

12 I/O slots: Q312B

8 I/O slots: Q38RB (Redundant power main base)

Extension base unit
(Power supply module required; can be extended)



3 I/O slots: Q63B

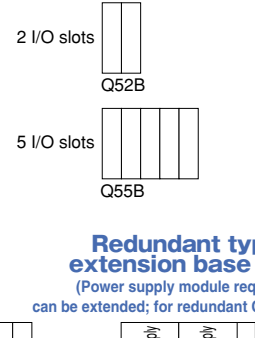
5 I/O slots: Q65B

8 I/O slots: Q68B

12 I/O slots: Q612B

8 I/O slots: Q68RB (Redundant type extension base)


Extension base unit
(Power supply module not required; can be extended)



2 I/O slots: Q52B

5 I/O slots: Q55B

Redundant type extension base unit
(Power supply module required; can be extended; for redundant CPU system)



5 I/O slots: Q65WRB

* Only the slim type power supply module (Q61SP) cannot be mounted.
* This does not support the process CPU or redundant CPU.
* Only Q68RB or Q5□B can be used as a redundant power extension base unit.
* The redundant CPU occupies two slots (CPU slot + I/O slot).
* The slim type power supply module (Q61SP) cannot be mounted.
* Q65WRB for the first extension base stage and Q68RB for the second to seventh extension base stage only.

Other Modules

- **Interrupt Module**
QI60
- **Blank Cover**
QG60

MELSOFT

GX Developer
MELSEC programmable controller programming software

GX Simulator
MELSEC programmable controller simulation software

GX Explorer
Maintenance tool

GX Converter
Excel/text data converter

GX Configurator
Intelligent function module setting/monitoring tool

GX Remote Service-I
Remote access tool

PX Developer
Process control FBD software package

MT Developer
Q-motion integrated startup support software

MR Configurator
Servo setup software

MX Component
ActiveX® library for communication

MX Sheet
Excel communication support tool

CPU

C P U

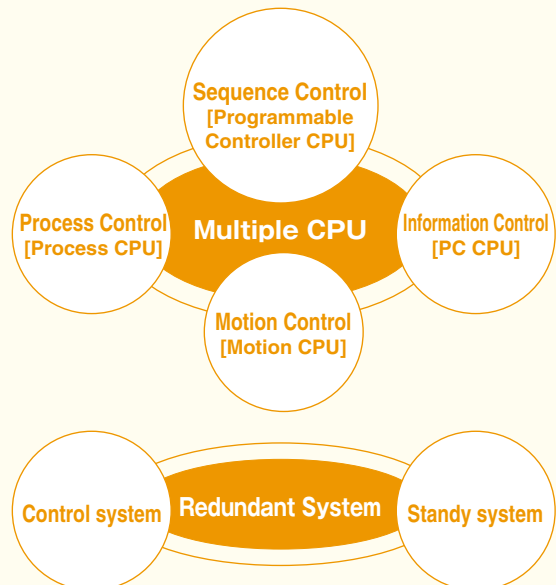


Combine the CPUs to fit specific application requirements, from basic sequence control to advanced multiple CPU control.



Q Series CPU lineup provides answers for a vast range of application requirements.

The Q Series lineup covers a various range of applications be it, programmable controller, process, motion, or information control. The basic model QCPU range is designed ideally for small scale applications. With the unique Multiple CPU functionality, each process area of the application can be selectively controlled by different CPUs situated on the same main base unit. Therefore, this lineup provides an ideal solution for each required application. The redundant CPU system ensures robust operation in the event of trouble.



Combine up to 4 CPUs on a single Q Series system to provide the ideal solution for your application.

Programmable Controller CPU

Basic Model QCPU

- Q00JCPU** • Program capacity: 8k steps • Number of I/O points: 256 points • Number of I/O device points: 2048 points • Integrated CPU with power supply and 5 slots
- Q00CPU** • Program capacity: 8k steps • Number of I/O points: 1024 points • Number of I/O device points: 2048 points
- Q01CPU** • Program capacity: 14k steps • Number of I/O points: 1024 points • Number of I/O device points: 2048 points

High Performance Model QCPU

- Q02CPU** • Program capacity: 28k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q02HCPU** • Program capacity: 28k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q06HCPU** • Program capacity: 60k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q12HCPU** • Program capacity: 124k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q25HCPU** • Program capacity: 252k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points

High performance CPUs with a diverse and powerful process control instruction set.

Process CPU (MELSEC Process Control)

- Q12PHCPU** • Program capacity: 124k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q25PHCPU** • Program capacity: 252k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points

Redundant CPUs with robustness

Redundant CPU

- Q12PRHCPU** • Program capacity: 124k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points
- Q25PRHCPU** • Program capacity: 252k steps • Number of I/O points: 4096 points • Number of I/O device points: 8192 points

Designed for next generation's high-speed motion and multi-axis control.

Motion CPU

- Q172HCPU** • SSCNET III compatible • For 8-axis control
- Q173HCPU** • SSCNET III compatible • For 32-axis control
- Q172HCPU-T** • SSCNET III compatible • For 8-axis control • Teaching module compatible
- Q173HCPU-T** • SSCNET III compatible • For 32-axis control • Teaching module compatible
- Q172CPUN** • For 8-axis control
- Q173CPUN** • For 32-axis control
- Q172CPUN-T** • For 8-axis control • Teaching module compatible
- Q173CPUN-T** • For 32-axis control • Teaching module compatible

A fully featured Microsoft™ Windows™ personal computer directly on the Q Series base unit.

Personal Computer CPU

[Partner product] Offers unlimited open control opportunities while maintaining tight integration with other Q Series system components.

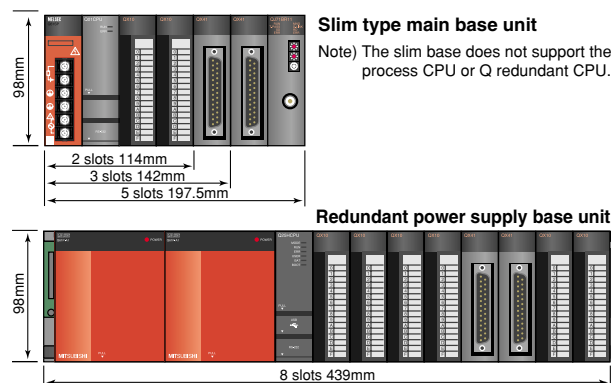
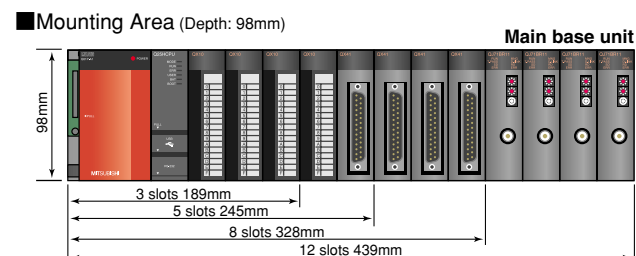
Refer to page 45 for details on the partner product.



High performance and flexibility on a small footprint

Mounting Area

In the Q Series, 2, 3, 5, 8 and 12 I/O slot main base units are available. The mounting area can be further reduced by using the slim type base unit.



Mounting Freedom

Choose from 2, 3, 5, 8 and 12 I/O slot bases to design the best system for the required application. Connect extension bases directly by using cables alone. Therefore, no need for network modules, adapters, or configuration software to distribute base units over an extended distance. Extension bases that do not require a power supply module are available to further reduce space and costs.

Types of slim type main base units (power supply module required)

Number of I/O Slots	Main Base	Mounting Dimensions (mm)
2	Q32SB	114 x 98
3	Q33SB	142 x 98
5	Q35SB	197.5 x 98

Note) The slim type main base unit cannot be connected with an extension base. This does not support the process CPU or redundant CPU.

Base unit types (power supply module required)

Number of I/O Slots	Main Base	Extension Base	Mounting Dimensions (mm)
3	Q33B	Q63B	189 x 98
5	Q35B	Q65B	245 x 98
8	Q38B	Q68B	328 x 98
12	Q312B	Q612B	439 x 98

Power supply redundant base unit

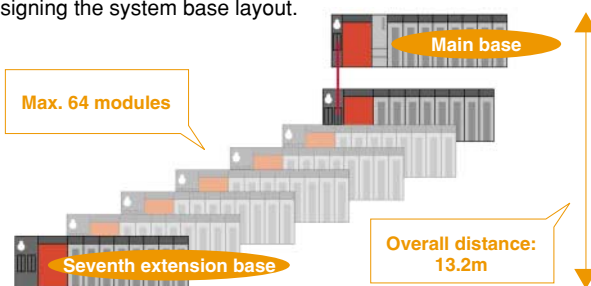
Number of I/O Slots	Redundant Main Base	Redundant Extension Base	Mounting Dimensions (mm)
8	Q38RB	Q68RB	439 x 98

Base unit types (Requires no power supply module)

Number of I/O Slots	Extension Base	Mounting Dimensions (mm)
2	Q52B	106 x 98
5	Q55B	189 x 98

Up to 7 Extension Bases Connectable

Up to seven extension bases (eight when counting the main base) can be connected to accept up to 64 modules. Also, the overall distance of extension cables is max. 13.2m, enabling high freedom for designing the system base layout.



CPU	Number of Extension Base Units	Number of Loaded Modules	Overall Extension Cable Length (m)
Basic Model	Q00JCPU	2 (max.)	16 (max.) (Note 3)
	Q00CPU	4 (max.)	24 (max.) (Note 3)
	Q01CPU	4 (max.)	24 (max.) (Note 3)
High Performance Model	Q02CPU	7 (max.)	64 (max.) (Note 3)
	Q02HCPU		
	Q06HCPU		
	Q12HCPU		
Process CPU	Q12PHCPU	7 (max.)	64 (max.) (Note 3)
	Q25PHCPU		
Redundant CPU	Q12PRHCPU	0 (Note 1)	11 (max.) (Note 2)
	Q25PRHCPU	0 (Note 1)	11 (max.) (Note 2)

Note 1) Non-redundant modules are all mounted on the remote station side. (Up to 64 modules can be mounted on one remote station.)
 Note 2) Up to seven power supply redundant modules can be mounted.
 Note 3) If a 12-slot base is used, the maximum number of I/O, intelligent function and network modules mounted is 16/24/64 respectively.

Number of Control I/O Points

The Q Series can control a maximum of 8192 points (input device points) in a remote I/O network such as CC-Link, or a maximum of 4096 points (I/O points) for direct I/O only.

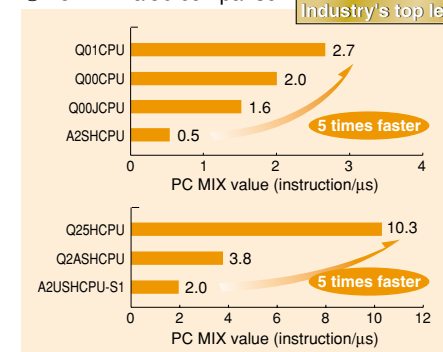
Note 1) Number of I/O points on main and extension bases directly controllable by a CPU module.
 Note 2) Total number of I/O points on main and extension bases directly controllable by a CPU module and I/O points that can be controlled as remote I/O by a remote I/O network.

CPU	Number of I/O Points (Note 1)	Number of I/O Device Points (Including remote I/O points) (Note 2)
Basic Model	Q00JCPU	256
	Q00CPU	1024
	Q01CPU	1024
High Performance Model	Q02CPU	4096
	Q02HCPU	
	Q06HCPU	
	Q12HCPU	
Process CPU	Q12PHCPU	4096
	Q25PHCPU	
Redundant CPU	Q12PRHCPU	4096
	Q25PRHCPU	

Increased Operation Processing Speeds

Q Series offers some of the highest processing performance on the market today; basic operation processing speed is 34ns and PC MIX value is 10.3. By Mitsubishi's own "PC-MIX" performance metric, it is about 5 times faster than the A2USHCPU-S1 and about 2.7 times faster than the Q2ASHCPU. The CPU has dramatically increased floating-point operation speeds for PID and other arithmetic functions. The PC-MIX aims to replicate real-world application performance by executing a mixed instruction set.

PC MIX value comparison



CPU operation processing speeds

Instruction	Basic Model				High Performance Model	Process CPU	Redundant CPU
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q12PHCPU Q25PHCPU	Q12PRHCPU Q25PRHCPU
LD (LD X0)	200ns	160ns	100ns	79ns		34ns	
OUT (OUT Y0)	200ns	160ns	100ns	158ns		68ns	
Timer (OUT T0 K5)	1100ns	880ns	550ns	632ns		272ns	
Transfer (MOV D0 D1)	700ns	560ns	350ns	237ns		102ns	
Addition (+D0 D1)	1000ns	800ns	500ns	395ns		170ns	
Floating-point addition (E+)	65.5μs	60.5μs	49.5μs	1815ns		782ns	
PC MIX value (Instruction/μs)	1.6	2.0	2.7	4.4		10.3	

* 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.

Program Capacities and Large Standard RAM Capacities

To construct small to large scale systems, the Q Series has a wide variation of CPU modules having 8k to 252k step program capacities and up to 256KB, large-capacity standard RAMs, to meet the application requirements from basic sequence control up to complex multi-discipline applications. A standard ROM (flash ROM) is built-in to enable ROM operation without a memory card. The efficient use of memory space allows the Q Series CPU to contain substantially more the program than the A Series CPU. (Example: the basic model CPUs contain twice the program of A Series.)

CPU	Program Capacity (Steps)	Device Memory (Words)	Standard RAM (Bytes) (Note)	Standard ROM (Bytes)	Memory Card (Number of slots)
Basic Model	Q00JCPU	18k	128k	58k	No
	Q00CPU			94k	
	Q01CPU			14k	
High Performance Model	Q02CPU	29k	256k	112k	1
	Q02HCPU			240k	
	Q06HCPU			496k	
	Q12HCPU			1008k	
Process CPU	Q12PHCPU	29k	256k	496k	1
	Q25PHCPU			1008k	
Redundant CPU	Q12PRHCPU	29k	256k	496k	1
	Q25PRHCPU			1008k	

Note) Memory that stores the data used in sequence programs such as file registers and local devices (with the exception of Basic Model CPU). As a built-in type RAM, the sequence program having a lot of file registers and local devices stored in standard RAM can run rapidly.

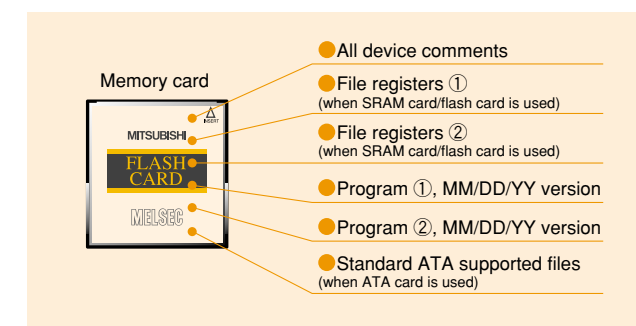
Extended Memory

The high performance model QCPU, process CPU and redundant CPU are equipped with a small PC card I/F into which the following extension memory can be mounted: SRAM card: 1M/2MB, Flash card: 2M/4MB, ATA card: 8M/16M/32MB. This large capacity extension memory facilitates management of large files. The extension memory allows massive system documentation to reside in the controllers. Storage for file register data, device comments and program histories is also possible.

Memory capacity

Type	Model	Capacity	Number of Storable Files
SRAM card	Q2MEM-1MBS	1011.5KB (Note)	256
	Q2MEM-2MBS	2034KB (Note)	
FLASH card	Q2MEM-2MBF	2035KB	288
	Q2MEM-4MBF	4079KB	
ATA card	Q2MEM-8MBA	7940KB (Note)	512
	Q2MEM-16MBA	15932KB (Note)	
	Q2MEM-32MBA	31854KB (Note)	

Note) The SRAM card and ATA card memory capacity is the value after formatting.



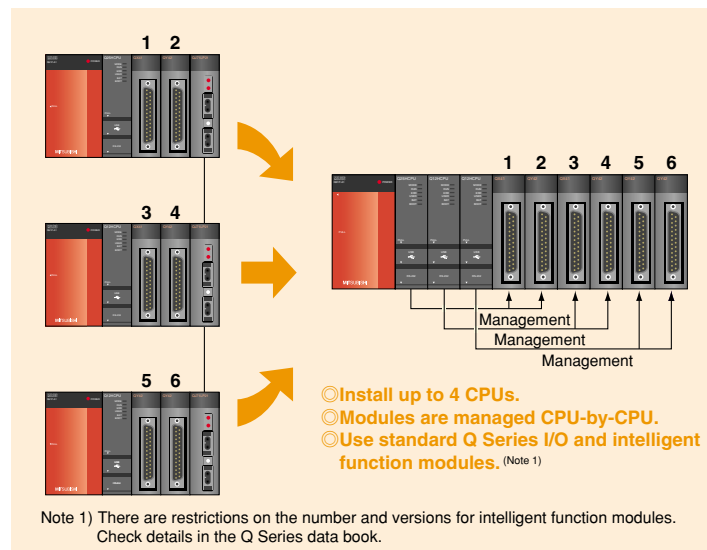


Multi CPUs break through the limitation of programmable controller.

Multiple CPU System Configuration

The Q Series can combine multiple CPUs together on the same system to build the required application configuration. Control of I/O modules can be segmented between different CPUs. CPUs communicate with each other via shared memory, and can increase system performance by distributing tasks between different CPUs. A variety of methods exist for controlling the methods by which CPUs communicate, but in each case the development effort is simplified by available software tools.

* The redundant CPU does not support the multiple CPU.



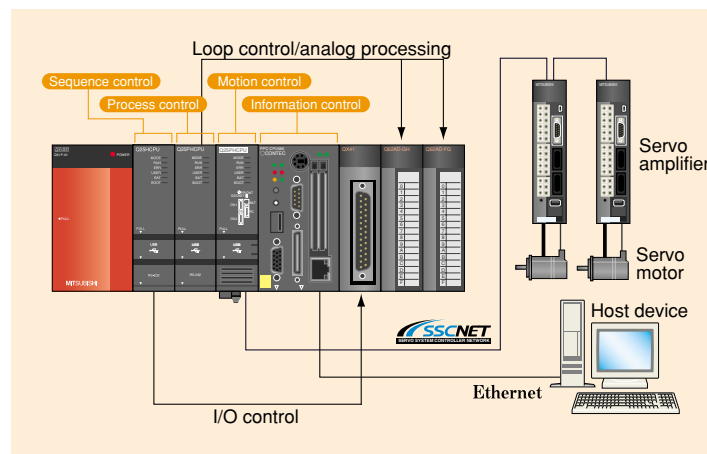
Integration of Process CPU, Motion CPU, and PC CPU

The Q Series multiple CPU system function allows programmable controller CPU, process, motion, and personal computer CPUs to be mounted together, enabling utilization of their respective strong points and design of an optimal system.

Note) Only the following combinations can be used with the Basic Model.

- Basic Model CPU + Motion CPU
- Basic Model CPU + PC CPU
- Basic Model CPU + Motion CPU + PC CPU

* SSCNET is a high-speed serial communication network that links motion CPUs and servo amplifiers with less wiring. SSCNET & SSCNETII are metal cable types, and SSCNETIII is a fiber optic cable type.



The broader line-up of CPU provide solution for diverse area of control.

Process Control

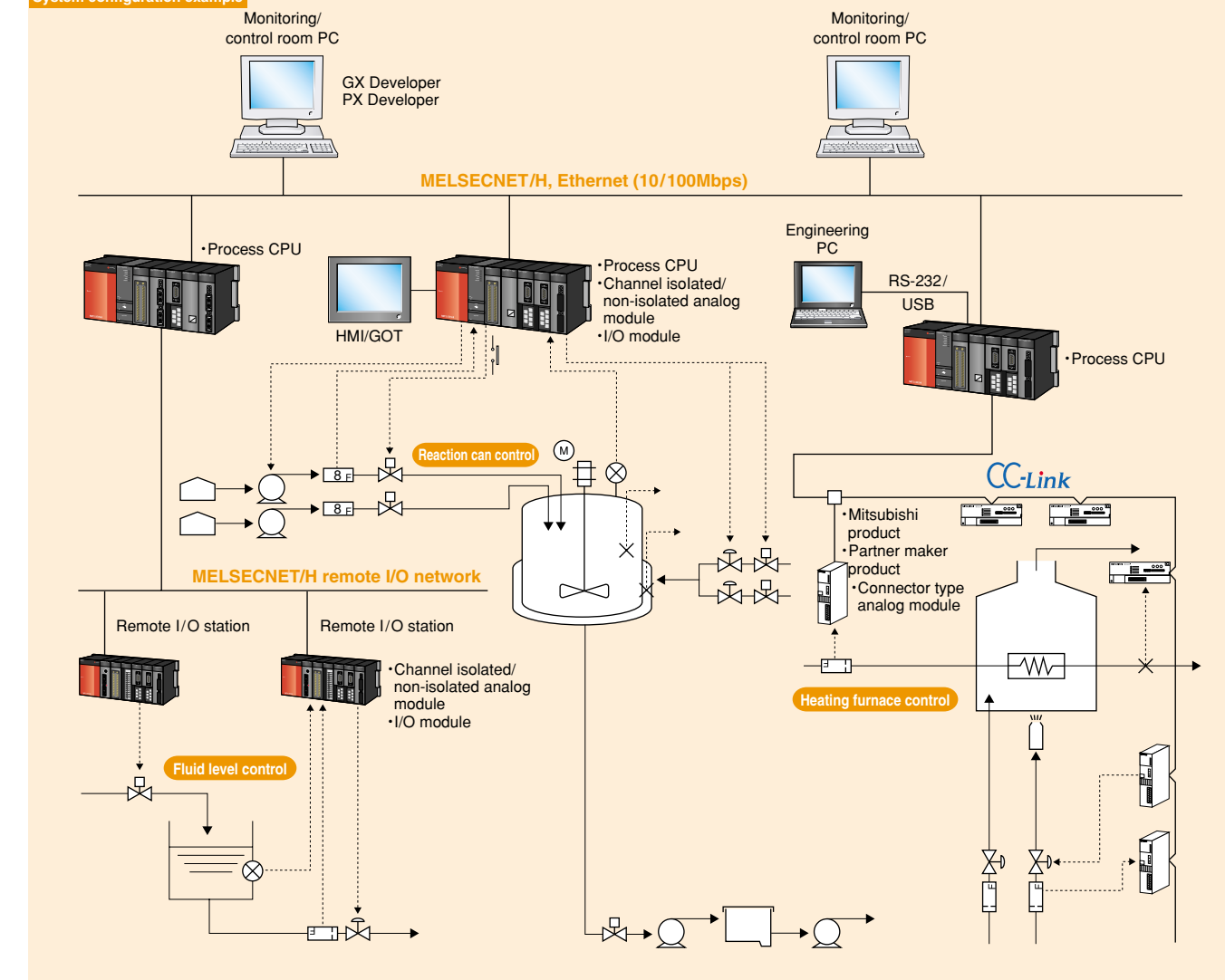
Process CPU

Q Series offers a feature that rivals those of costly DCS systems at a fraction of the cost. Q Series is adept at the automation of process systems with the simple addition of one or more process CPUs to the controller. The process CPUs are complemented by a range of channel isolated high resolution analog I/O modules with online change (hot-swap) capability, and the PX Developer function block programming software environment. (Refer to the "MELSEC PROCESS CONTROL/REDUNDANT SYSTEM" brochure for more information on the process CPU.)

- The "Process CPU" builds on the capability of the equivalent sequence CPU with the addition of an array of powerful process instructions.
- "Channel isolated high resolution analog module" further enhances process control using the programmable controller.
- A highly specialized process control system can be easily built using the engineering environment provided by the PX Developer process control software.
- Easy maintenance and high reliability are possible due to features which permit online module changes, etc.
- Combine the Process CPUs with the redundant network capabilities of the MELSECNET/H control level network. This offers high performance, robust, and deterministic communications between multiple Q Series systems, regardless of their assigned control tasks.



System configuration example





Redundant CPU system

Redundant CPU

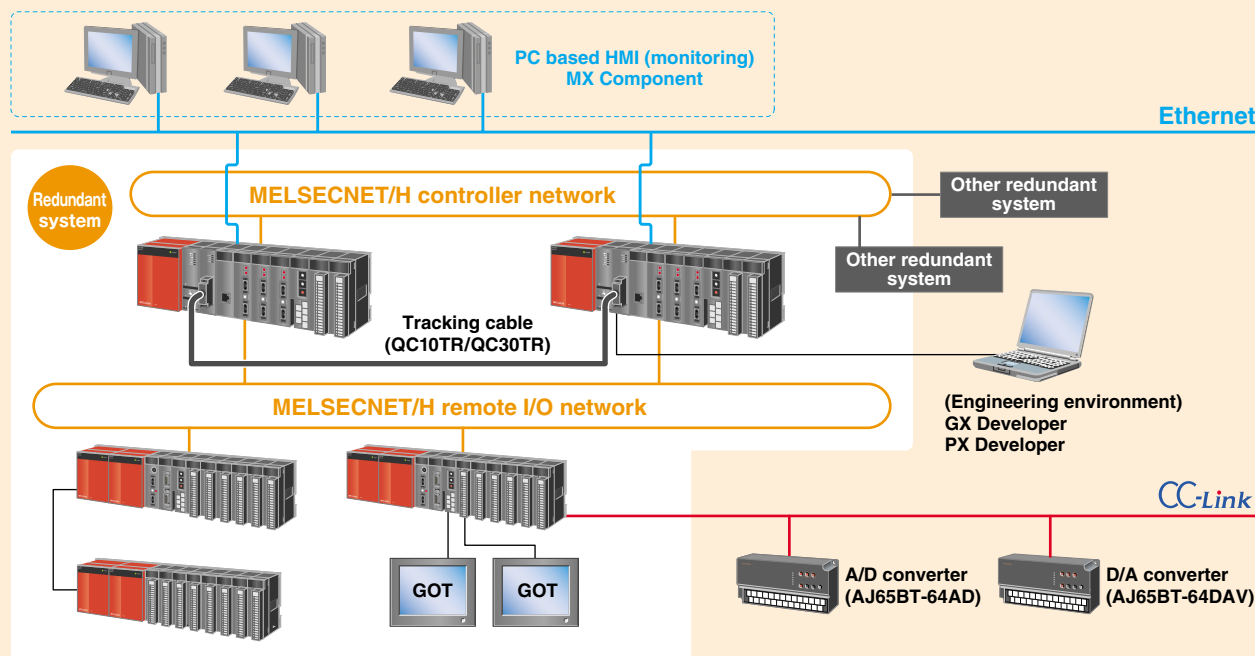
The redundant system prevents the sudden fault. An entire system including the power supply module, CPU and base unit is designed with redundancy. It provides the suitable system for diverse area of automation.

- Even if a failure occurs in the control system, the standby system takes over the control to continue the system operation.
- The Q Series products, such as I/O, intelligent and network modules, can be used without any changes (except for some modules*).
- The remote I/O reduces risks with decentralized control.
- GX Developer and PX Developer offer simple engineering environment for redundant system settings with the original operability.

*There are restrictions on the usable version when configuring a redundant system.

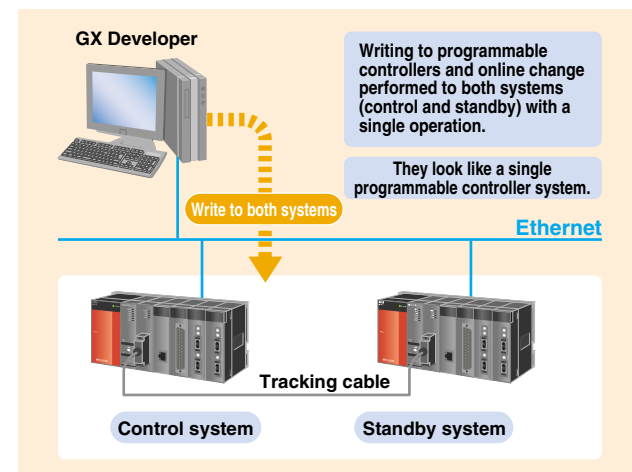


System configuration example



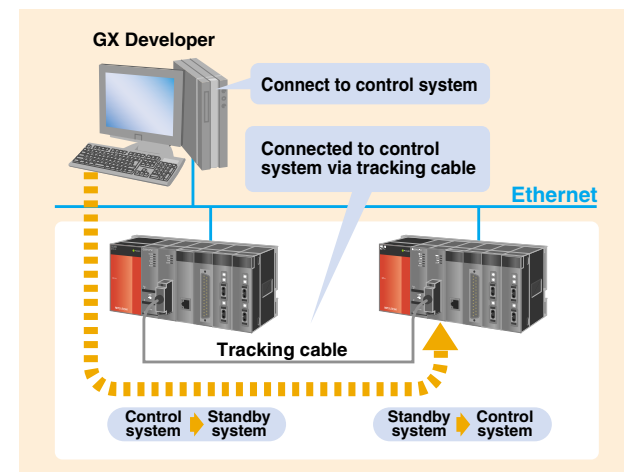
Easy program modification for both control and standby systems

- Write programs and parameter files to programmable controllers
- Online change while editing a program



Continue operations even at system switching

If system switching occurs due to a stop error inside the CPU, the access target is automatically switched to the other system via the network. This enables continuous operation so that the user need not pay attention to system switching.



Motion Control

Motion CPU

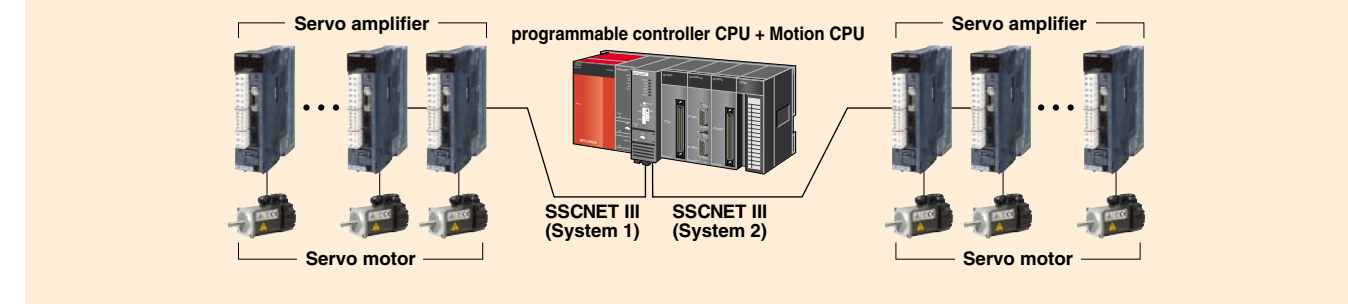
Mitsubishi Electric motion controller realizes high-speed control of up to 32 axes (96 axes when using the maximum three multiple CPUs) with one CPU having the same size as the Q Series programmable controller. This offers large cost savings, especially when complex wiring is eliminated due to the "daisy-chain" connection of Mitsubishi intelligent digital servos. (Refer to the "Motion Controller Catalog" for more information on the Motion CPU.)

- Offers a minimum motion operation cycle time of 0.44ms (when using Q172HCPU/Q173HCPU), faster cam operation, and a shorter operation tact.
- Together with the shortened communication cycle time (0.44ms), the synchronization performance and speed/positioning control accuracy is substantially improved.
- Motion CPU can be used together with any type of Q Series CPU as required.
- Via Mitsubishi's high performance SSCNET motion network technology, Q Series offers significant engineering and operation benefits for motion control.

* SSCNET is a high-speed serial communication network that connects the motion CPU and servo amplifier. SSCNET is available with a metal cable (SSCNET/SSCNET II) or a fiber optic cable (SSCNET III).



System configuration example



Information Control

PC CPU

Q Series is unique in being able to mount a full-featured Windows™ PC in a robust industrial format directly on the Q Series base unit. This offers the potential to combine it with other Q Series CPU types, therefore fully integrating it into the Q I/O system to give complete access to all I/O modules and networking, allowing maximum design flexibility.

- Industrial specification level environmental and noise performance specifications.
- Choose HDD or silicon disk mass storage depending on the operating environment.
- Utilize third party PC applications available for Microsoft™ Windows™, offering a virtually unlimited application scope.
- Includes a wide variety of ports and connections to add third party hardware devices.

Note) The PC CPU is manufactured by CONTEC, Co., Ltd. Refer to the "Partner Products" on pages 45 and 46 for more information.

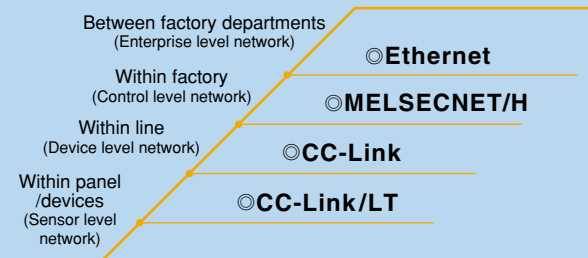




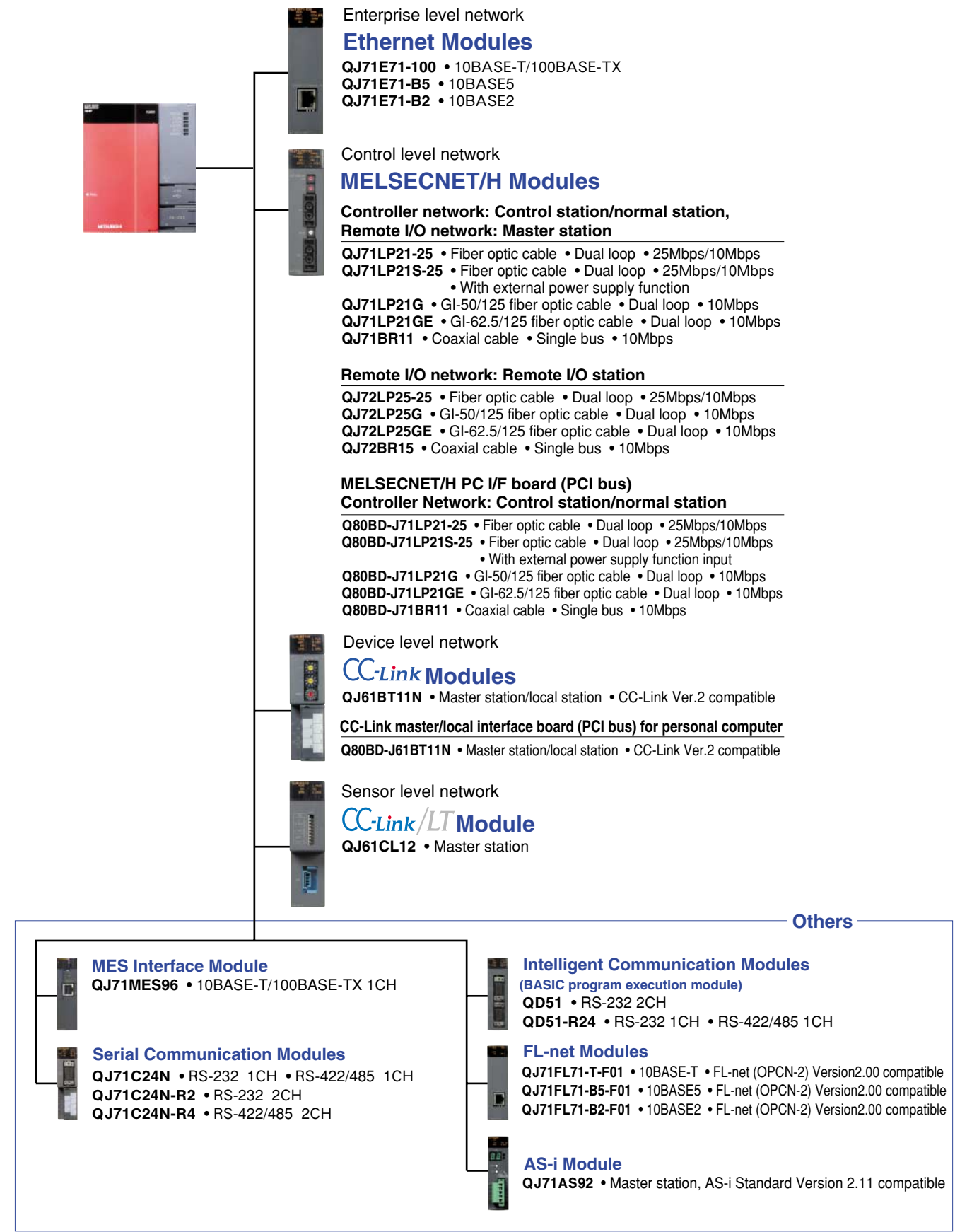
Seamless development with full range of networking hierarchy.

Networking support at all levels of the automation hierarchy, scalable to fit any application size

Modern plant systems require networking at many different levels. With Q Series, Mitsubishi offers a networking solution that matches these specific requirements. The Mitsubishi solution ranges from top level factory LAN 100Mbit Ethernet, mid-level shop floor control MELSECNET/H, down to device level CC-Link, and CC-Link/LT. The open network CC-Link, which originated from Japan, is a SEMI certified wire saving network, providing the seamless networking required with modern applications. Therefore, the Q Series provides a range of network types within each level of the hierarchy to ensure the right solution is provided.



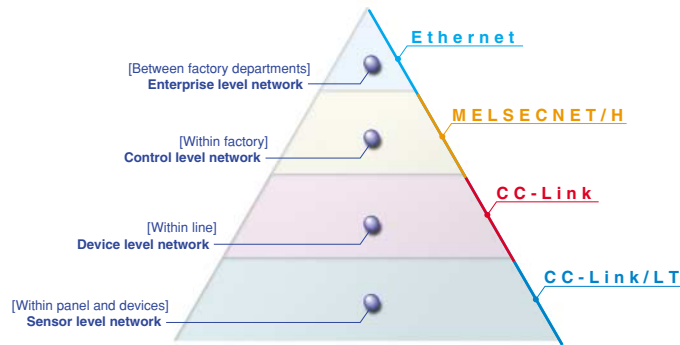
Network modules overview





Q Series network environment connecting to the future for more freedom.

Seamless integration of the network over all layers



Q Series support for open networking.

Q Series provides extensive support for applications requiring a diverse range of 3rd party devices on the same network. An example is the open CC-Link device network, which originated from Japan through Mitsubishi, and is now administered by the CC-Link Partner Association (CLPA). CC-Link is a SEMI certified network, with many products available from over 950 different partner companies, with over 5.2 million installed nodes.

Seamless communication

Q Series combines enterprise, control, and device level networks together through Ethernet, MELSECNET/H, and CC-Link to allow easy information access, no matter what level it resides on the network hierarchy. It is possible to "drill down" from a high level Ethernet down through multiple network layers, to program the programmable controller just by having GX Developer installed on the PC.

Event interrupt

Some network and intelligent function modules include an event interrupt function that can interrupt the high performance QCPU program. With this function, the CPU can rapidly respond to an event that occurs asynchronously with the program scan of the programmable controller, e.g. data receiving from a network or value compare of a high-speed counter.

Remote password

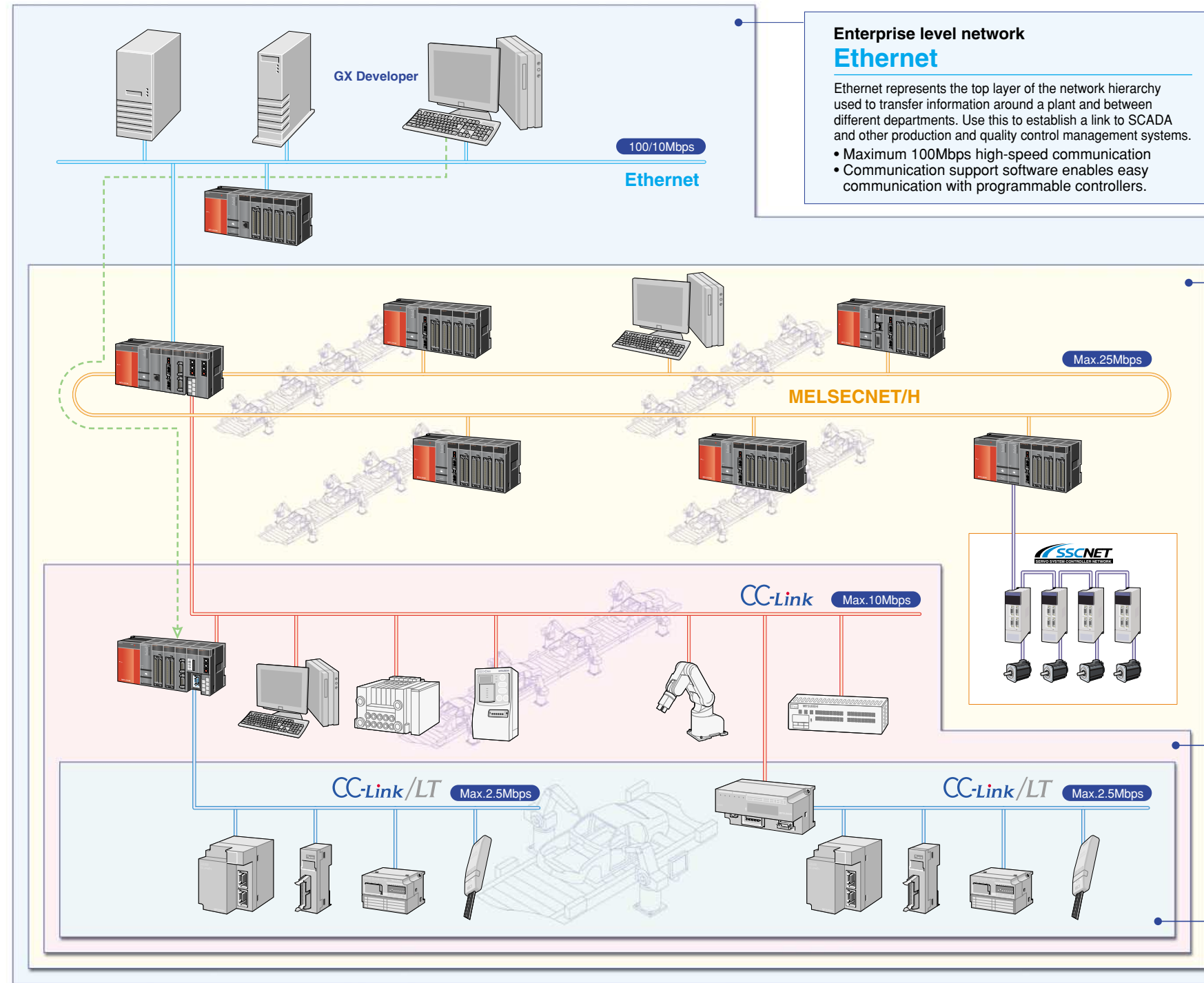
The High Performance Model QCPU includes a remote password function to provide additional security over remote access. The remote password can be changed or deleted as from within the parameters.

External power supply input capability

Data link can be maintained even if the programmable controller power fails by using the QJ71LP21S-25 module with external power supply input for MELSECNET/H.

Network diagnostics

GX Developer includes extensive built-in diagnostic tools for Ethernet, MELSECNET/H, CC-Link, and CC-Link/LT. Refer to page 29 for details.



Enterprise level network Ethernet

Ethernet represents the top layer of the network hierarchy used to transfer information around a plant and between different departments. Use this to establish a link to SCADA and other production and quality control management systems.

- Maximum 100Mbps high-speed communication
- Communication support software enables easy communication with programmable controllers.

Control level network MELSECNET/H

MELSECNET/H is one step down from Ethernet and allows communication between controllers on a line within a plant department. MELSECNET/H offers high performance, fault tolerant, deterministic communications for line interlocking and synchronization between different processes.

- Maximum 25Mbps high-speed communication
- Large capacity link device: 16,384 points each for bits and words
- Improved reliability using dual fiber optic loop
- No "per station" transmission data amount restrictions.

Device level network CC-Link

The primary reason for a device level network is to link a controller to numerous different devices to reduce wiring costs while adding additional benefits such as improved diagnostic capability. Together with SEMI certification, CC-Link provides an open device level network with enhanced flexibility in system design and configuration.

- Maximum 10Mbps high-speed communication
- Link device remote I/O points: 8192 points
- Remote register: 2048+2048 points
- Integrate other 3rd party manufacturers into the Q Series system

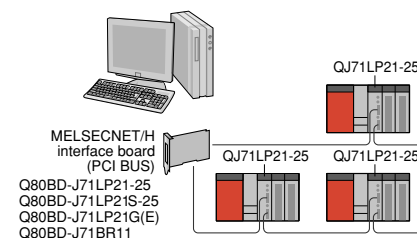
Sensor level network CC-Link/LT

At the lowest hierarchical network level, sensor level networks can still reduce wiring costs inside panels between simple discrete devices such as push-buttons and some sensors. Q Series fully supports this with the sensor level version of CC-Link, CC-Link/LT. This new addition to the CC-Link family includes tremendous flexibility and cost savings through its innovative connection technology, which does not require cutting/stripping of the network cable to make connections.

- Easy connections with dedicated connectors
- Use I/O points effectively by incorporating number of points mode (4 points, 8 points, 16 points).
- The maximum number of link points is 1024 points in the 16-point mode.

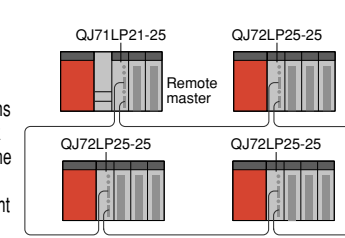
MELSECNET/H PC interface boards

Q Series provides the capability to include generic PC on the MELSECNET/H network via a wide range of PC interface boards. The software drivers included with these boards allow system integration of 3rd party systems, while also maintaining compatibility with existing MELSECNET/10 installations. Including extensive RAS functions for error detection. An external power supply board is also available.



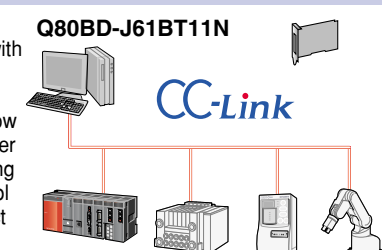
MELSECNET/H remote I/O network

MELSECNET/H offers the capability to locate remote I/O modules on a 25Mbit control level network. The key benefit of this is that complex distributed I/O systems can be built using the same I/O modules as the controller itself. Hence systems that need more than distributed I/O blocks on a network can be addressed with Q Series. Any other station on the network can be accessed from each remote I/O station. In addition, by incorporating the process CPU, redundant remote I/O systems can be realized by using MELSECNET/H master and sub-master stations.



CC-Link master/local interface board for PC

Personal computer master/local interface boards are available with CC-Link. Previously, the master and local boards were separate items, but a single board can now be set to serve as either a master or local board, thereby increasing the range of field network control applications with regard to direct control, monitoring, and management, etc.



Ensures optimal information collection in any environment.

A variety of communication modules supporting from external network connection to serial communication between devices.

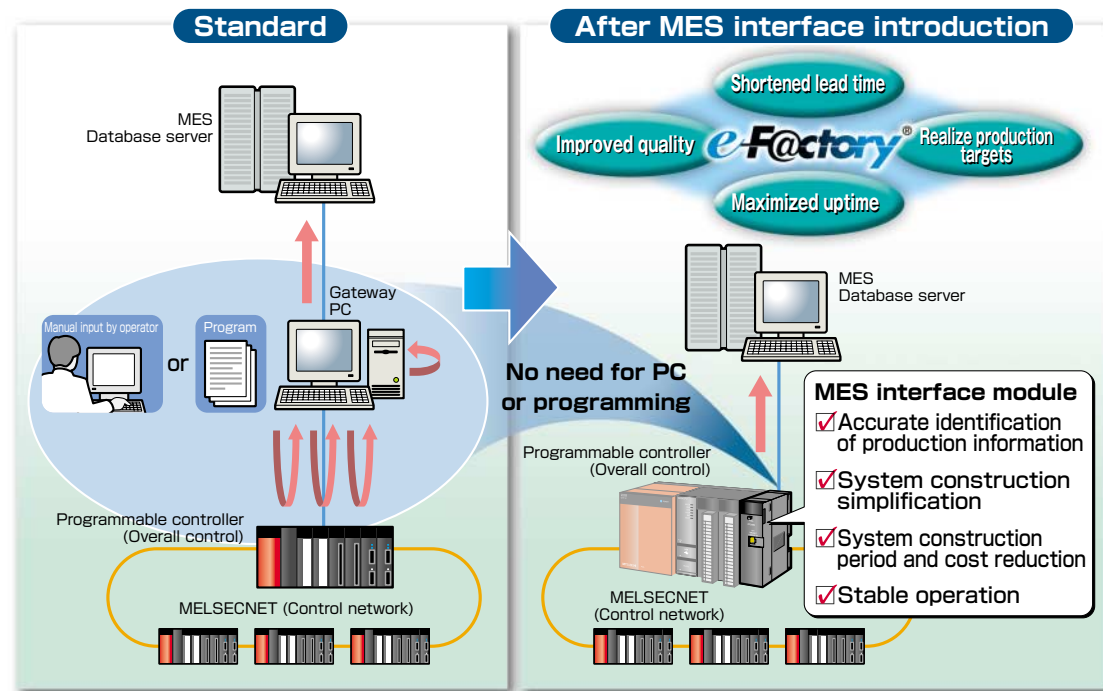
Direct connection between enterprise systems and shop floor with minimum cost

● MES interface module... QJ71MES96

Features

1. Simplifies system implementation by directly connecting to enterprise system database such as MES*. Program-less simple settings are realized with the configuration software.
2. Monitors and transfers data via SQL texts when user-defined trigger conditions occur. This event-driven communication method reduces network loading when compared to conventional solutions, which are based on polling architecture.
3. Executes pre-registered SQL jobs. Also receives production instructions from MES and downloads production information from the database.
4. Eliminates the need for programs. Setup of the MES interface module is menu-driven and requires no knowledge of communications programs.

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



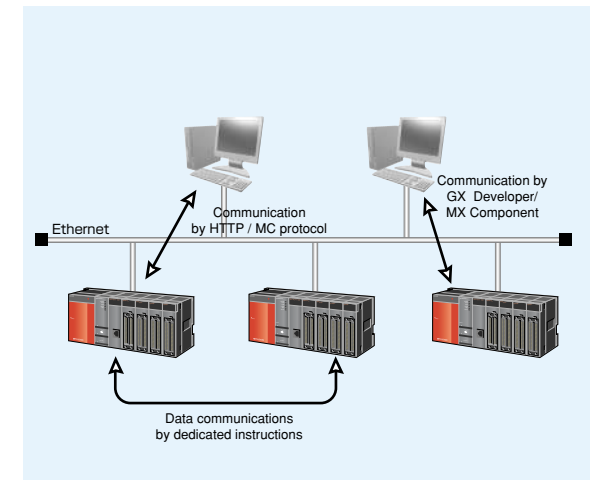
e-Factory A visual real-time platform that effectively optimizes production by connecting shop floor equipment with MES database.

The optimal Ethernet interface module can be selected for the system and other devices in question

- Ethernet interface module for 10BASE-T/100BASE-TX... QJ71E71-100
- Ethernet interface module for 10BASE-5... QJ71E71-B5
- Ethernet interface module for 10BASE-2... QJ71E71-B2

Features

1. 100BASE-TX support enables faster transmission speeds. (QJ71E71-100)
2. Uses dedicated instructions for communication between programmable controller CPUs.
3. Programmable controller devices can be accessed from the web browser of a personal computer, using the HTTP protocol. The communication library and sample screens that run on the personal computer (web) can be obtained from the download service.
4. Multiple modules can be connected to GX Developer for better debugging efficiency.
5. E-mail texts (ASCII format) and attached files (binary / ASCII / CSV formats) can be transmitted.
6. KeepAlive can be used to perform existence checks (existence confirmation function) versus other devices in order to detect closed connections due to other-device errors, etc.

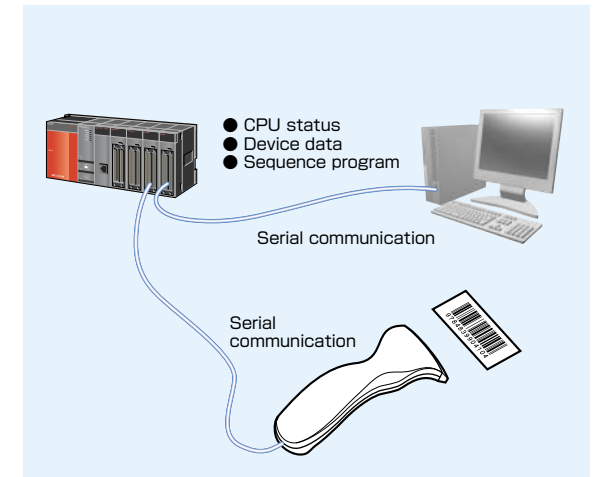


Communication module for programmable controller data collection/editing, monitoring/managing, and measurement data collection

- Serial communication module... QJ71C24N (RS-232 1ch, RS-422/485 1ch)
QJ71C24N-R2 (RS-232 2ch)
QJ71C24N-R4 (RS422/485 2ch)

Features

1. High-speed and high-capacity communication: baud rates up to 230.4kbps, with a capacity of 960 words (when using MC communication protocol).
2. Reading and writing of programmable controller data can be performed from an external device (personal computer, display device, etc.), using the MC protocol.
3. Communication by non-procedural protocol is possible to permit data exchanges between the programmable controller and an external device (barcode reader, measurement device, etc.) using a communication protocol specified by the external device. (Requires a communication sequence program.)
4. Programmable controller programming and monitoring can be performed from GX Developer, using the QJ71C24N(-R2) RS-232 serial communication function.
5. QJ71C24N(-R2) supports public telephone line modems, allowing it to initialize the employed modem and connect to other devices in order to communicate with remote devices or GX Developer by way of the modem and public telephone line. A remote password function prevents unauthorized access to the Q Series programmable controllers via the modem being used by QJ71C24N(-R2).





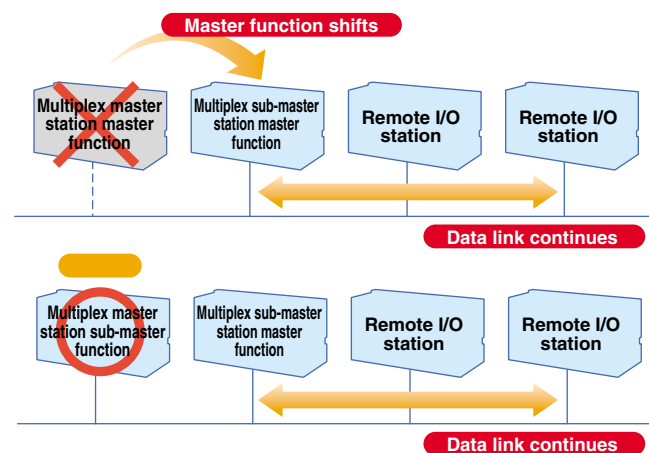
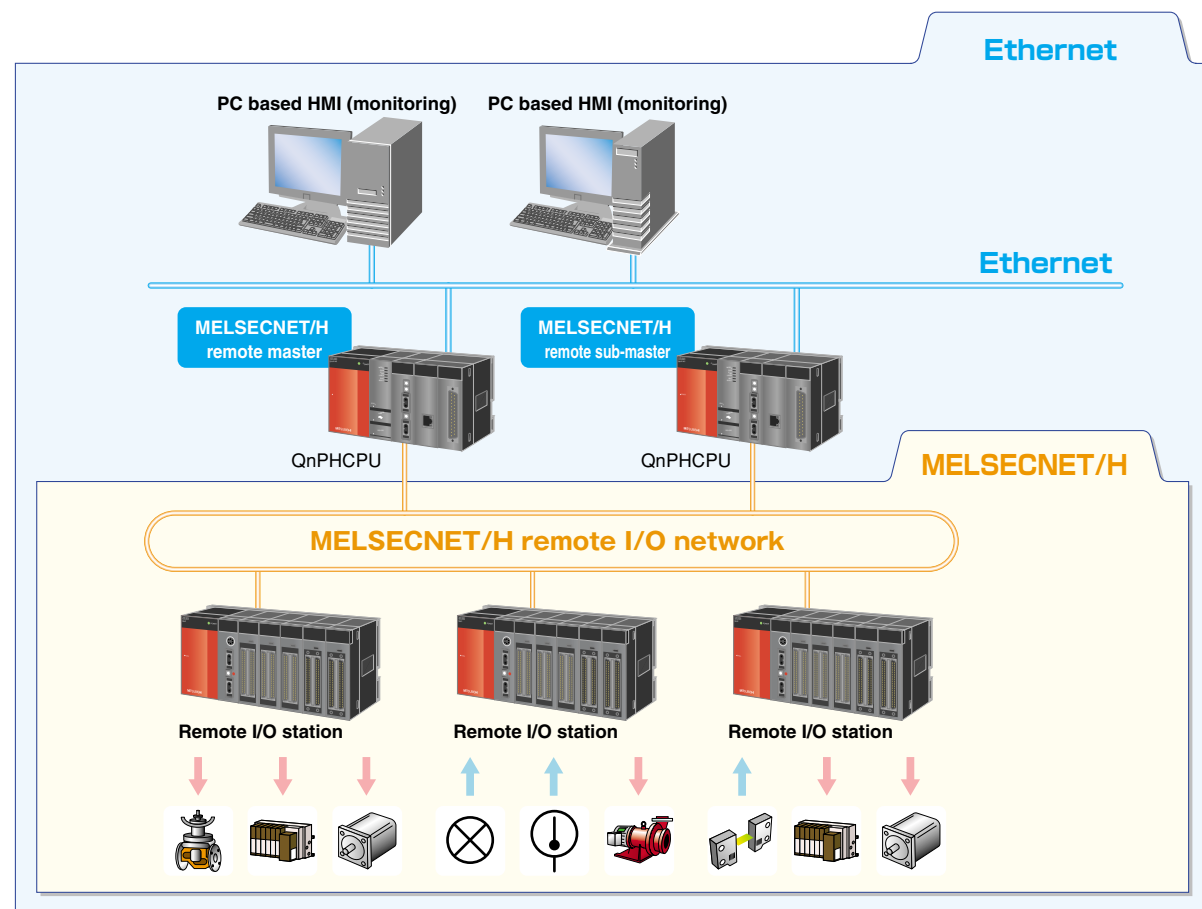
Constructing a highly-reliable network with redundant master stations

Multiplex remote station

By providing a multiplex remote master station and multiplex remote sub-master station on one remote I/O network, the remote I/O network can be controlled by the multiplex remote sub-master station even if the multiplex remote master station's programmable controller CPU fails. Provisions for failure of the multiplex remote sub-master station can also be taken by returning the multiplex remote master station during control of the remote I/O network with the multiplex remote sub-master station.

System configuration

- Redundant system comprised of QnPHCPU and MELSECNET/H remote I/O network.
- Even if the multiplex remote master station fails due to a system error, such as cutoff of the remote master station's power, the multiplex remote sub-master station continues I/O operation with the multiplex remote function.

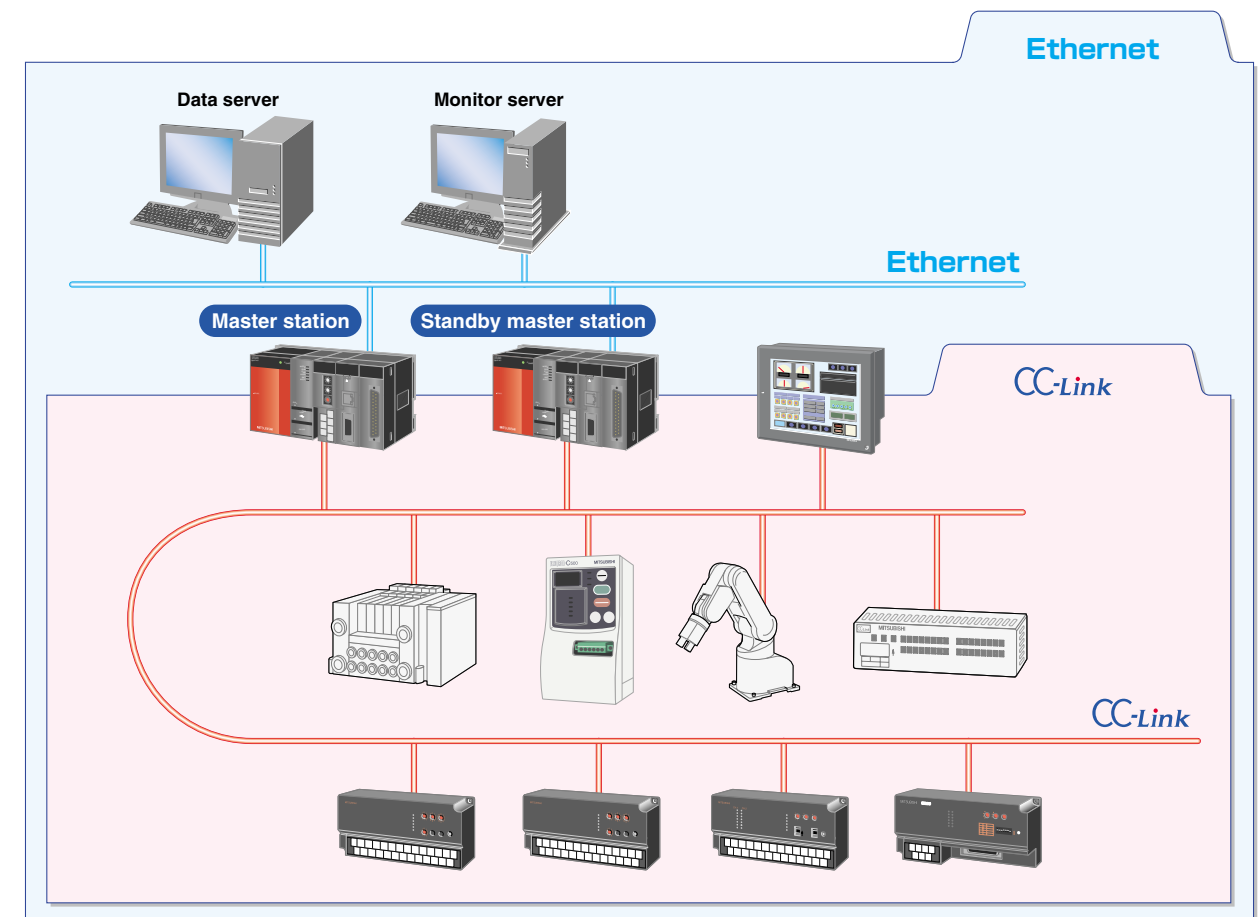


CC-Link redundant system

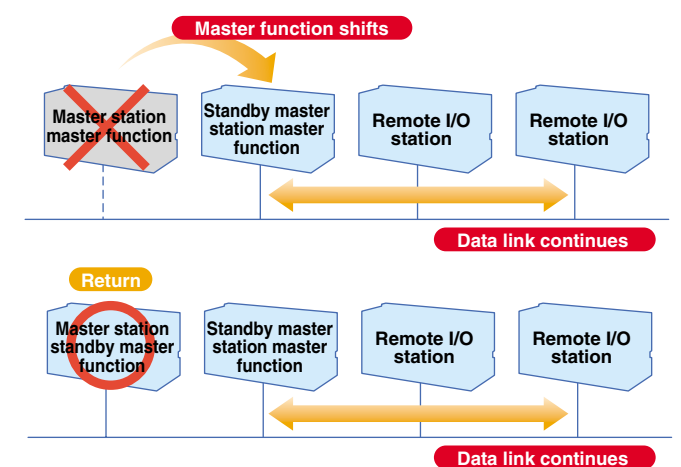
Data links are continued by automatically switching to the standby master station (station for master station backup) when a master station error occurs as the result of an error in the programmable controller CPU or power supply, etc. The master station can be returned even during data link control with the standby master station as a provision should the standby master station fail.

System configuration

Construct a redundant system with CC-Link network regardless of the master station or standby master station's CPU type.



By using the CC-Link master station redundant system, the standby master station continues the data link when the master station fails. If a data link is established for the standby master station, the master station can be returned as the standby master station.



M Modules

Modules



Assorted function modules to match every control application.

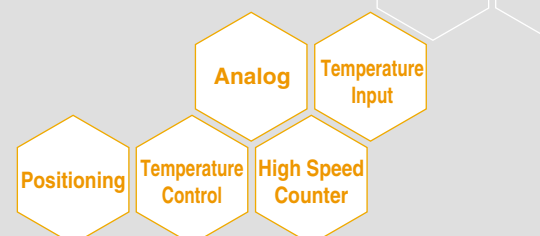


Intelligent & High Functionality

Intelligently handling advanced control functions

Comprehensive range of I/O and intelligent function modules.

Q Series includes a comprehensive range of I/O and intelligent function modules to meet the needs of a diverse range of applications. As well as standard digital and analog I/O types (including channel isolated analog), also available are motion control, serial communications, temperature controllers, temperature inputs, etc. Therefore realizing a solution ideal for the application, be it high speed positioning or highly accurate temperature control.



Analog Modules

Analog to Digital Converter Modules

- **Channel isolated type**
Q64AD-GH • 4ch • Voltage/current input, high resolution
Q62AD-DGH • 2ch • With signal conditioning function, high resolution
Q68AD-G • 8ch • Voltage/current input
Q66AD-DG • 6ch • With signal conditioning function
- **Channel non-isolated type**
Q64AD • 4ch • Voltage/current input
Q68ADV • 8ch • Voltage input
Q68ADI • 8ch • Current input

Digital to Analog Converter Modules

- **Channel isolated type**
Q62DA-FG • 2ch • Voltage/current output (With output monitor)
Q66DA-G • 6ch • Voltage/current output
- **Channel non-isolated type**
Q62DAN • 2ch • Voltage/current output
Q64DAN • 4ch • Voltage/current output
Q68DAVN • 8ch • Voltage output
Q68DAIN • 8ch • Current output

Temperature Control Modules

- Q64TCTT • 4ch • Thermocouple input
- Q64TCTTBW • 4ch • Thermocouple input
• With wire break detection function
- Q64TCRT • 4ch • Platinum RTD input (3-wire type)
- Q64TCRTBW • 4ch • Platinum RTD input (3-wire type)
• With wire break detection function

Temperature Input Modules

- **Channel isolated type**
Q64TDV-GH • 4ch • Thermocouple/micro voltage input
Q64TD • 4ch • Thermocouple input
Q68TD-G-H01 • 8ch • Thermocouple input **NEW**
Q64RD-G • 4ch • Platinum/nickel RTD input (3/4-wire type)
- **Channel non-isolated type**
Q64RD • 4ch • Platinum RTD input (3/4-wire type)

Loop Control Module

- Q62HLC • 2ch input • Thermocouple/micro voltage/voltage/current input, current output

Positioning Modules

- **Open collector output type**
QD70P4 • 4 axes • 200kpps • No. of positioning data: 10/axis
QD70P8 • 8 axes • 200kpps • No. of positioning data: 10/axis
QD75P1 • 1 axis • 200kpps • No. of positioning data: 600/axis
QD75P2 • 2 axes • 200kpps • No. of positioning data: 600/axis
QD75P4 • 4 axes • 200kpps • No. of positioning data: 600/axis
- **Differential driver output type**
QD70D4 • 4 axes • 4Mpps • No. of positioning data: 10/axis
QD70D8 • 8 axes • 4Mpps • No. of positioning data: 10/axis
QD75D1 • 1 axis • 1Mpps • No. of positioning data: 600/axis
QD75D2 • 2 axes • 1Mpps • No. of positioning data: 600/axis
QD75D4 • 4 axes • 1Mpps • No. of positioning data: 600/axis
- **SSCNET III connection type**
QD75MH1 • 1 axis • No. of positioning data: 600/axis
QD75MH2 • 2 axes • No. of positioning data: 600/axis
QD75MH4 • 4 axes • No. of positioning data: 600/axis
- **SSCNET connection type**
QD75M1 • 1 axis • No. of positioning data: 600/axis
QD75M2 • 2 axes • No. of positioning data: 600/axis
QD75M4 • 4 axes • No. of positioning data: 600/axis
- **Open collector output type with built-in counter function**
QD72P3C3 • 3 axes • 100kpps • No. of positioning data: 1/axis
• 3-channel counter, 100kpps

Channel Isolated Pulse Input Module

- QD60P8-G • 8ch • 30kpps • 5/12 to 24V DC input
• With pre-scale function

High Speed Counter Modules

- QD62 • 2ch • 200kpps • 5/12/24V DC input • Transistor output (sink)
- QD62D • 2ch • 500kpps • Differential driver input • Transistor output (sink)
- QD62E • 2ch • 200kpps • 5/12/24V DC input • Transistor output (source)
- QD63P6 • 6ch • 200kpps • 5V DC input
- QD64D2 • 2ch • 4Mpps • Differential driver input • Transistor output (sink) **NEW**

Interrupt Module

- QI60 • 24V DC input, 16 points

Input Module

- Selectable input response time for DC input module.
*This excludes QX50.

Output Module

- Some types of transistor output modules include short-circuit protection.

Partner product • Absolute position detection unit

Refer to page 46 for details on the partner product.



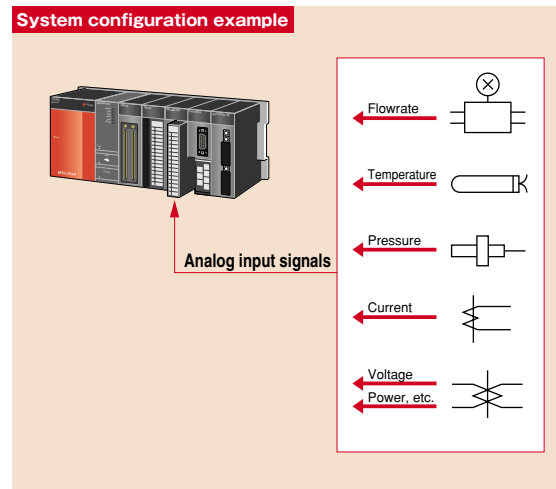
A wide range of application specific intelligent modules

A range of analog modules ideal for process control applications.

Optimum isolated analog modules 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**

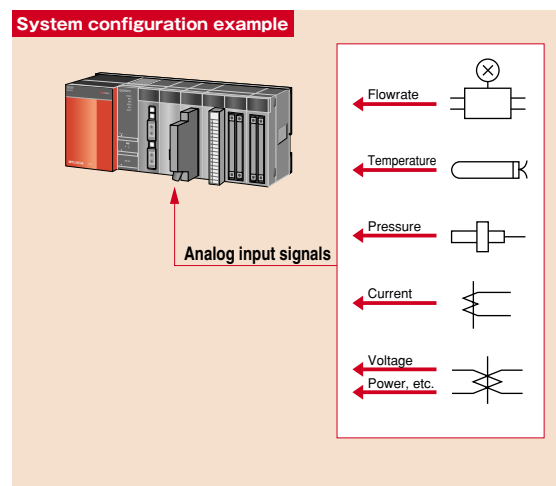
The channel isolated analog modules are specifically designed for process control applications by offering high accuracy conversion combined with high isolation voltage. Flowmeter, pressure gauge, etc. can be directly connected to the analog input, and control valve to the analog output. Also, hardware and installation costs are substantially reduced because an external isolation amplifier is no longer required. Used together with a general purpose controller, a low cost process control solution is easily realized.



Cost effective channel isolated analog modules

- 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**

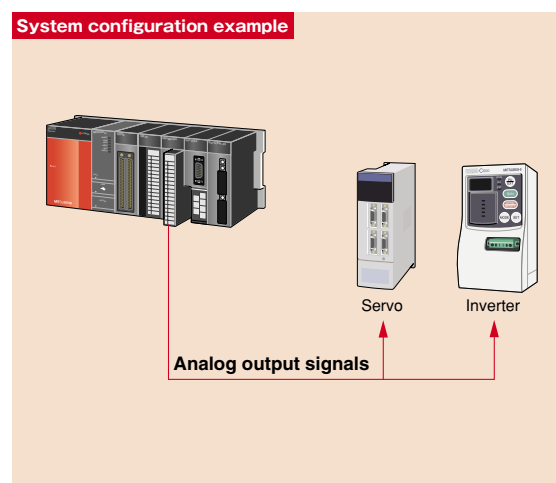
Either 6 or 8 channels available per module, realizing a more cost effective solution. Also, error detection such as upper/lower limit warning, and engineering value conversion are available without programs.



Analog modules for control applications that require high speed conversion

- Analog-digital converter module ... **Q64AD, Q68ADV, Q68ADI**
- Digital-analog converter module **Q62DAN, Q64DAN, Q68DAVN, Q68DAIN**

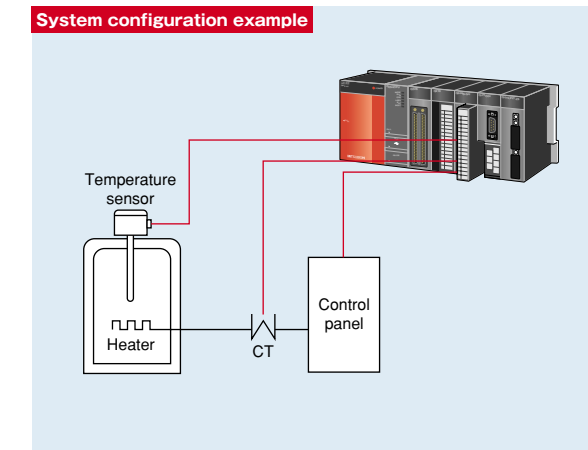
A diverse range of analog modules are available for both A/D and D/A conversion. These high-speed conversion modules are suited for connection to various automation products, such as servo amplifiers and inverters, therefore providing a highly accurate solution. For the Q62DAN, Q64DAN, Q68DAVN, and Q68DAIN modules, isolating the analog output channel from the external power supply will permit stable analog outputs even if noise occurs. This isolation will also improve operation stability and prevent module internal failures caused by incorrect wiring.



Temperature control modules that realize PID loop control

- Temperature control module **Q64TCTT (BW), Q64TCRT (BW)**

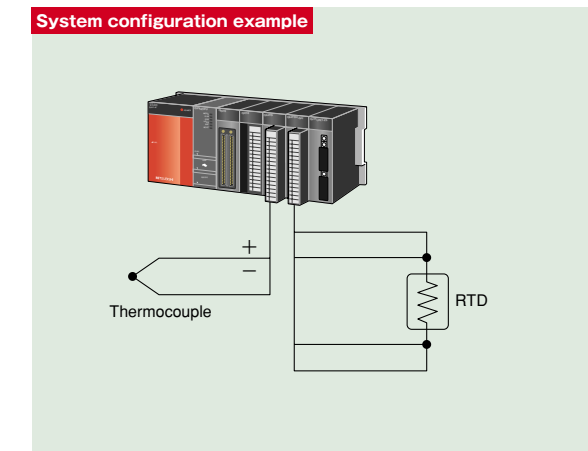
Q Series offers a range of dedicated PID temperature loop controllers. These modules include their own PID control loops that act independently of the main CPUs. This allows a system to realize higher performance by diverting some control tasks from the main processor(s), freeing them up to take care of other control tasks. The temperature control modules offer compatibility with thermocouples and RTDs. A broken wire detection feature is also available.



High accurate temperature input modules

- Channel isolated thermocouple input module **Q64TDV-GH** (Thermocouple input, micro voltage input)
- Channel isolated thermocouple input module **Q64TD** (Thermocouple input)
- Channel isolated thermocouple input module **Q68TD-G-H01** (Thermocouple input) **NEW**
- Channel isolated RTD input module **Q64RD-G** (Platinum/nickel RTD input)
- RTD input module **Q64RD** (Platinum RTD input)

Realize temperature data input by connecting a thermocouple, platinum RTD, or nickel RTD. Initial settings and the automatic refresh settings can be made using GX Configurator-TI (temperature input module setting/monitoring tool), reducing the program.

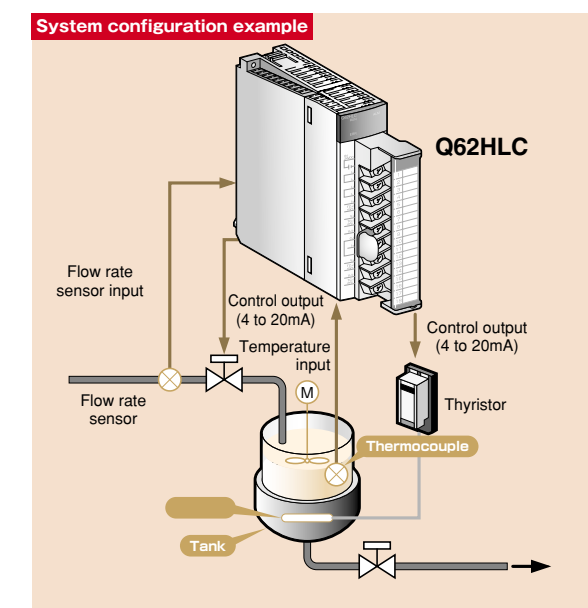


Loop control module ideal for temperature and flow rate control environments which require fast response

- Loop control module **Q62HLC**

With its speed-proportional PID control format and 25ms 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 CH1 as the master, and CH2 as the slave.





Diverse range of motion control solutions offering compatibility with any drive system.

High speed and accurate positioning control

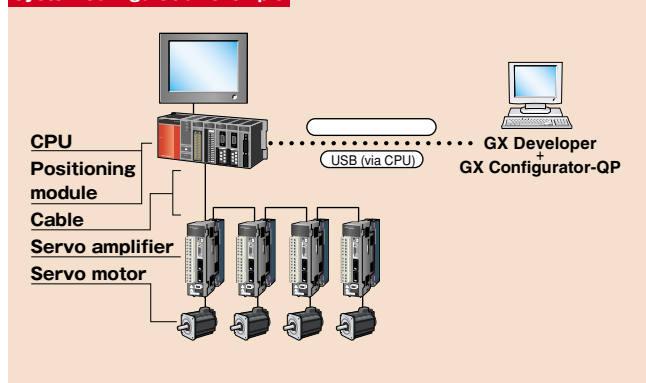
Various positioning control is supported including 2 to 4-axis linear interpolation, 2-axis circular interpolation, speed control, speed/position changeover, path control and constant speed control. Together with GX Configurator-QP setup software, setting the positioning data, monitoring, and debugging are easier. Also, Q Series leverages the benefits of SSCNET, Mitsubishi's high performance motion control network. This allows Mitsubishi's intelligent digital servos to be connected by a simple daisy chain cable, reducing costs and increasing performance.

◎SSCNET III connection type

- High-speed serial communication SSCNET III connection type ... **QD75MH**

An SSCNET III cable connection both minimizes the required wiring, and permits distances of up to 50m between stations. This format is also compatible with absolute position systems where the home position is established by a data setting type home position return operation. Inputs of upper/lower limit LS and proximity dog Nos. are also possible at the servo amplifier, greatly reducing the required wiring.

System configuration example

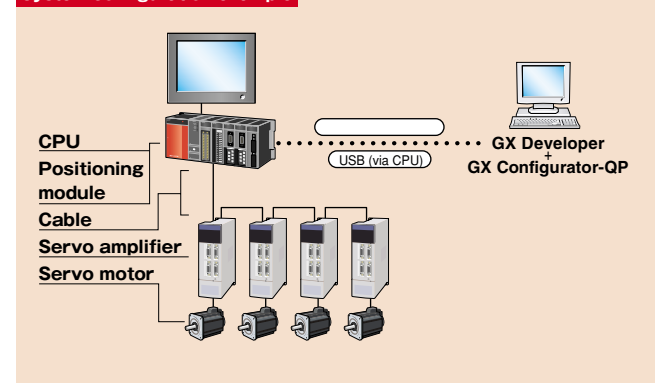


◎SSCNET connection type

- High-speed serial communication SSCNET connection type ... **QD75M**

Using the SSCNET cable connection, ensures wire saving with a maximum 30m cable length. This type is also compatible with the absolute position system which establishes the OP with the data set type OPR method. Wiring for the proximity dog, etc., is no longer required.

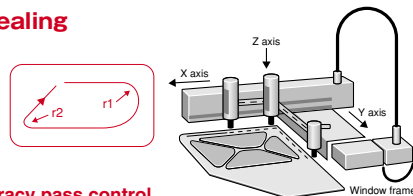
System configuration example



Application example 2 - Sealing

[Function]

- Constant speed pass control
- Linear, circular interpolation
- High-speed, high-accuracy pass control

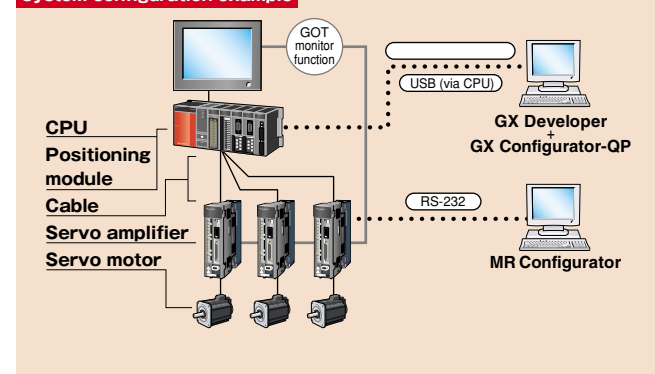


◎Pulse train output type

- Differential driver pulse train output type ... **QD75D**
- Open collector pulse train output type ... **QD75P**

Both open collector and differential driver type positioning modules are available. The distance to the servo amplifier can be extended to 10m using the differential type, with a 1Mpps high-speed communication speed. High-speed, high-accuracy control are realized. (The command pulse with the open collector type is max. 200kpps.)

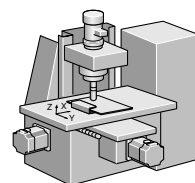
System configuration example



Application example - X-Y table control

[Function]

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



Ideal solution for simple multi-axis positioning systems

Satisfying requirements for simple positioning control applications, this module includes functions, such as positioning control, speed control and variable positioning control.

Here is the perfect positioning module for a multi-axis system that does not require complicated control.

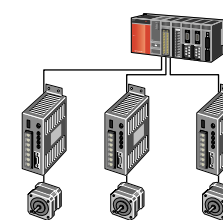
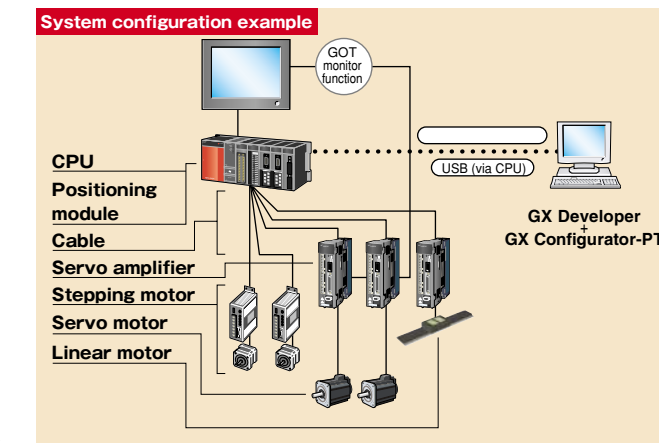
- Open collector pulse train output type ... **QD70P**
- Differential output type ... **QD70D**

Control up to 4/8 axes with one module. Acceleration/deceleration is performed smoothly with very little speed fluctuations, therefore ideal for connecting to stepping motors. High-speed processing is carried out at the start of position control.

Item	QD70P	QD70D
Pulse train output format	Open collector output	Differential output
Max. output pulses	200kpps	4Mpps
Max. connection distance between drive modules	2m	10m
Start time	1-axis start	0.1ms
	4-axis start *1	0.2ms
	8-axis start *1	0.4ms

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

Application example - Stepping motor



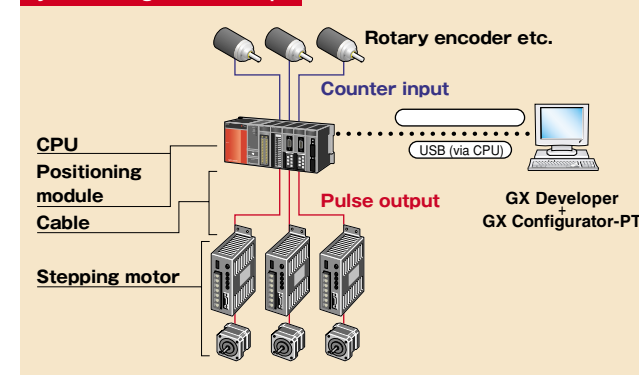
Suitable for conveyor systems and processing machines that require positioning control by confirming encoder inputs

• Open collector output type with built-in counter function

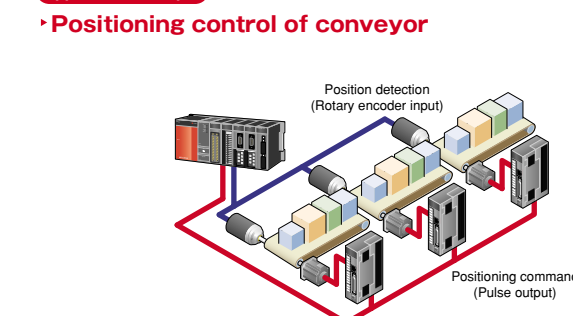
3-axis positioning and 3-channel counter functions are available in a single module. Extra slots can be used efficiently, allowing for more flexible configuration as well as saving space.

Item		QD72P3C3	
Positioning control	Number of axes	3 axes	
	Pulse train output format	Open collector output	
	Max. output pulses	100kpps	
Start time	1-axis start	1ms	
	3-axis start	1ms	
Counter function	Number of channels	3 channels	
	Count input signal	Phase	1-phase input, 2-phase input
		Signal level	18mA at 5V DC, 2 to 6mA at 24V DC
	Pulse input	1 multiple of 2 phases, 2 multiple of 2 phases, 4 multiple of 2 phases, CW/CCW	
Counting speed (max.)	100kpps		

System configuration example



Application example - Positioning control of conveyor





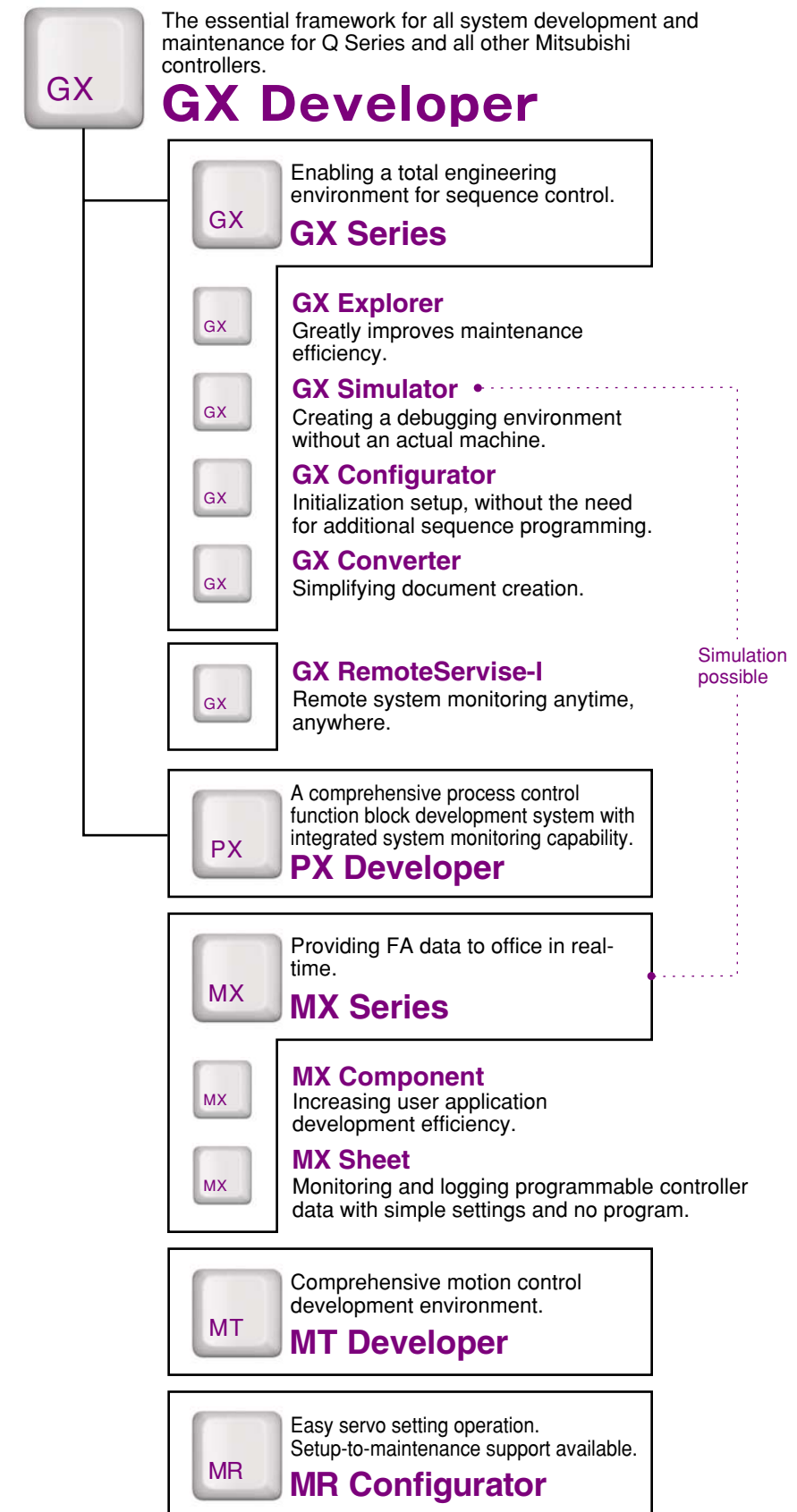
The MELSOFT Family - Dramatically improving the efficiency of development and maintenance activities



The integrated MELSOFT suite of software tools improves productivity, whether its for developing, debugging, operating, or maintaining Q Series systems.

Automation has brought tremendous productivity benefits to industrial and commercial applications. With the MELSOFT software product family, Mitsubishi aims to bring similar productivity benefits to system designers, automation engineers, operators and maintenance personnel. The MELSOFT family is undergoing continuous evolution in order to meet the demands of new technologies and applications.

- GX Series**
- PX Developer**
- MX Series**
- MT Developer**





Comfortable and Easy - That's the comprehensive engineering

environment provided by MELSOFT.

GX Series Totally supporting sequence control engineering.

The basic framework for GX Series and PX Developer GX Developer

Improving development efficiency by supporting a diverse range of programming languages

A comprehensive suite of development, debugging and maintenance tools contained in one easy to use, fully Windows® compliant software package. GX Developer fully supports all Mitsubishi controllers, and offers a range of tools unique to Q Series.

A variety of programming options

With GX Developer, Q Series supports a range of programming options, including ladder diagram (LD), sequential function chart (SFC), structured text (ST), function block (FB) and instruction list (IL).

System monitor

Online system configuration monitoring and error detection of each module reduces the time taken for restoring systems due to errors occurring.



Network parameter settings

Network set up, such as Ethernet, MELSECNET/H, and CC-Link are easily done from the built-in parameters of GX Developer. Therefore, no need to produce separate network set up sequence programs.



Diagnostics

Built-in diagnostics tools for Ethernet, MELSECNET/H, CC-Link, and CC-Link/LT as standard in GX Developer. These tools greatly improve the task of debugging and maintenance of the network.

Ethernet diagnostics Monitor the Ethernet parameters, such as the IP address, error history, status per connection, LED status and e-mail information.

Network diagnostics Monitor the MELSECNET/H network information, link information and communication information. Diagnostics for network and loop tests are also included.



CC-Link diagnostics Monitor the local station's data link status, operation status, link scan time, etc.

CC-Link/LT diagnostics Monitor the local station's data link status, operation status, etc.

GX Simulator

System simulation for offline development

GX Simulator acts as a controller within your PC that duplicates the actual hardware your application will run on. It allows you to develop and verify the operation of your programs without needing actual hardware. Hence, development of new systems can be carried out independently of actual plant equipment, and operation can be assured before commissioning on the shop floor. Operation is transparent, and duplicates the operation of the actual controller. GX Simulator also includes tools for analysis of system operation, such as a built-in chart recorder for capturing system events.

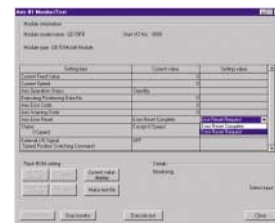
GX Configurator / GX Converter

Add-on software to enhance GX Developer functionality

GX Configurator

Configure and monitor without a program

This software sets and monitors the data for various intelligent function modules. Initialization can be carried out without a program by adding this onto GX Developer.



GX Converter

Simplifying document creation

GX Converter data conversion software package for Windows is a software designed to convert other format data (text format data, CSV format data) to GX Developer format data (instruction list, device comment). It allows CAD data to be utilized on GX Developer for equipment design or GX Developer data to be utilized for design on CAD, increasing design efficiency.

GX Explorer

Centralized, remote maintenance

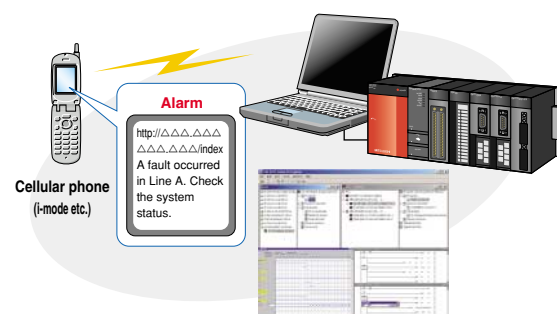
GX Explorer allows multiple networked systems to be monitored and remotely maintained from a central location, using an intuitive Windows™ Explorer™ like interface. Network structures are represented, and programs can be uploaded and downloaded across the network links. Full access to all controller diagnostics is also available.



GX RemoteService-I

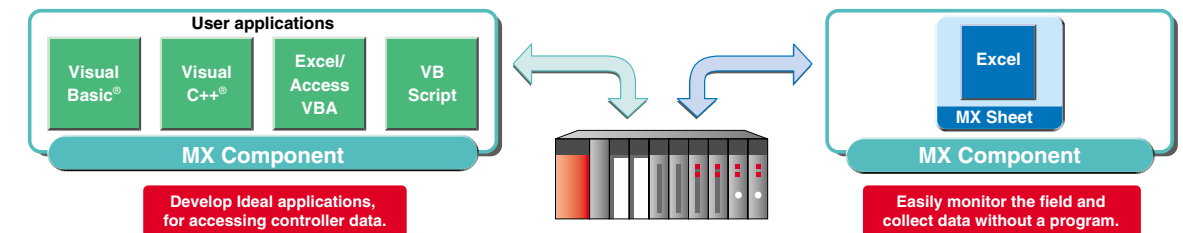
Remote maintenance made easy, incorporated into MELSOFT

When used together with GX Explorer, the various GX Explorer maintenance functions can be used via the Internet or intranet. Therefore, used on a Windows® PC or the PC CPU, remote maintenance is realized easily and efficiently, providing another useful tool specific for the Q Series.



MX Series Access to shop floor information in real-time.

MX Series provides a suite of middleware tools that abstract the different Mitsubishi hardware level protocols into a form that is easily integrated into third party applications. This allows you to build your own applications to work with the shop floor hardware without needing detailed knowledge of the internal functions of the controllers themselves. MX Series supports a variety of communication methods for maximum flexibility.



MX Component

ActiveX® based communications between a PC and the controller.

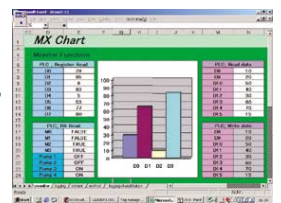
MX Component's ActiveX® based library frees the system programmer from having to consider low-level hardware based protocol communication issues when designing third party applications to interface with shop floor equipment. This shortens the design cycle, as development can leverage standard tools and concentrate on the system design itself.



MX Sheet

Collect data without programs.

A fully featured add-on software that easily integrates into Microsoft™ Excel™. Using together with this software, simple logging, monitoring, etc., functions can be realized as an alternative for a costly data acquisition software.



PX Developer A comprehensive process control system design tool with control and monitoring capabilities

PX Developer is dedicated to the Q process control CPUs. It provides a function block programming environment that meets the demands of process related applications. Built-in monitoring tools allow real time loop tuning and control.

Standard FB and dedicated process functions

- All Q Series process control related functions are represented by function blocks
- Custom FB can be created from standard blocks
- FB for accessing analog modules and input/output modules

Reuse program code on future projects

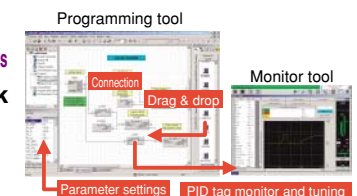
FBs make all programs modular, allowing immediate reuse in future projects requiring similar capabilities. This allows development time to be progressively shortened through the design lifetime.

Integration with sequence control programs

Using label based programming allows data from process control programs to be easily integrated into sequence control programs, further enhancing the integration of multiple processor systems.

Comprehensive system monitoring and control capability

The PX Developer Monitor Tool provides in-depth capabilities to provide real-time monitoring of loop functions combined with autotuning, cascade, automatic, and manual loop control options.

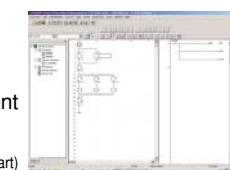


MT Developer Comprehensively supporting system structuring based on Motion controller.

A fully integrated program design software for the motion controller. This software includes many tools imperative for configuring and maintaining motion control systems, improving the overall design system.

Application specific programming environment

A diverse range of main OS software, ensures a flexible programming environment corresponding to the specific application requirements.



Maintenance and operation

Monitoring and diagnostics are further enhanced with the built-in parameter monitoring function, SFC monitoring and digital oscilloscope, errors can be resolved quickly and efficiently.



System test and debug

System startup time can be reduced with extensive system tests and program debugging tools.

MR Configurator General setting assistance for system servos.

This software offers servo setup-to-maintenance assistance. Monitoring, diagnosis, parameter writing/reading, and test operations can easily be performed from MR Configurator.



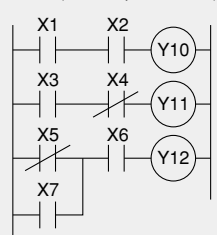
The ideal programming technique for the required application

Sequence Program Environment

Q Series supports all major sequence control programming methods in use today. These include Ladder Diagram (LD), Instruction List (IL), Sequential Function Chart (SFC), Function Blocks (FB) and Structured Text (ST). Additionally, the high performance Q Series CPUs allow multiple programs to co-exist in the processor, and can be executed in variable ways, further improving the performance of the controller.

Manual operation program

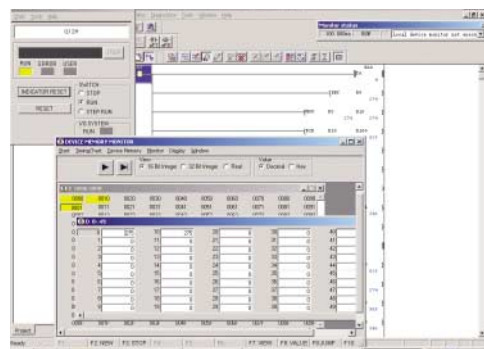
Ladder (circuit representation)



Communication processing program

Instruction list (list representation)

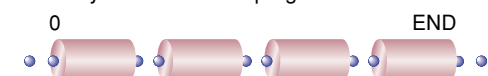
```
LD X50
MOVP K1 D0
MOVP K4 D3
MOVP H3412 D10
MOVP HBC5A D11
MOVP HF0DE D12
MOVP HOA0D D13
GP.BIDOUT U8 DO D10 M0
```



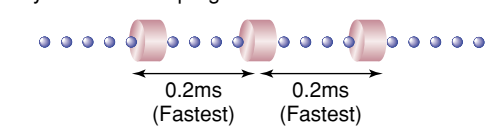
Fixed Scan Program

Q Series offers the ability to fix the program execution scan at a predetermined interval between 0.5ms-60s (High performance model QCPU, process CPU and redundant CPU). This allows the determinism of a system's execution to be improved for applications where execution timing is critical. To further improve response to brief events, a 0.2ms interrupt function is also available.

Ordinary scan execution program

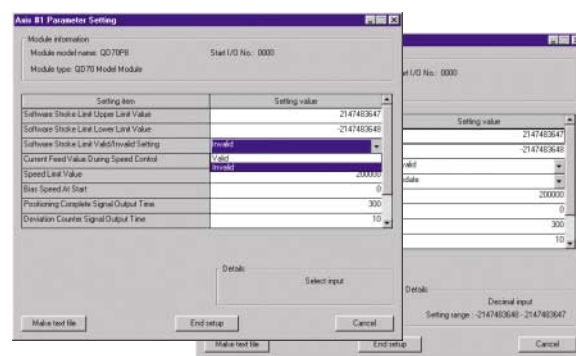


Cyclic execution program



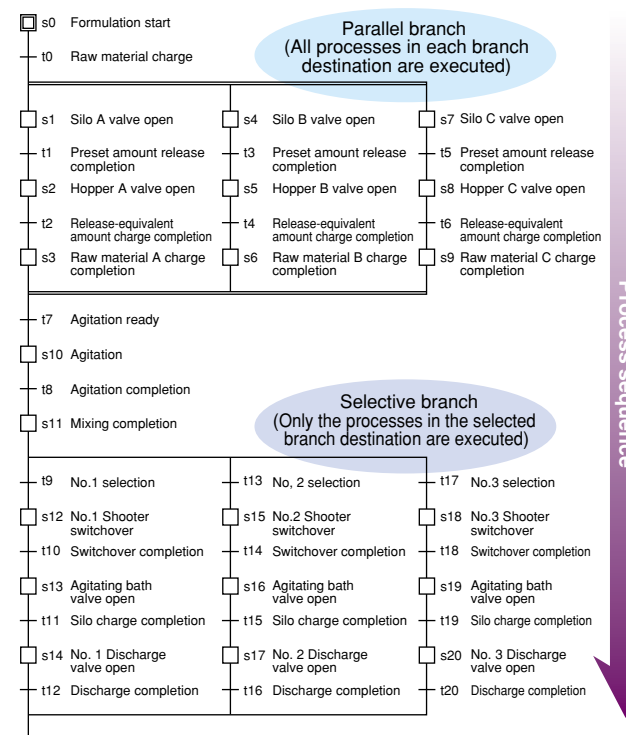
Program-free Initial Settings

GX Configurator frees the system designer from having to waste engineering time on writing and debugging code just to configure the controller's intelligent function modules. All modules such as analog and serial communications have GX Configurator tools associated with them that reduce configuration to a simple menu based system. Further, the automatic refresh capability of the Q Series insures that using GX Configurator to monitor system configuration during maintenance always shows real time system data.



Sequential Function Chart Programming

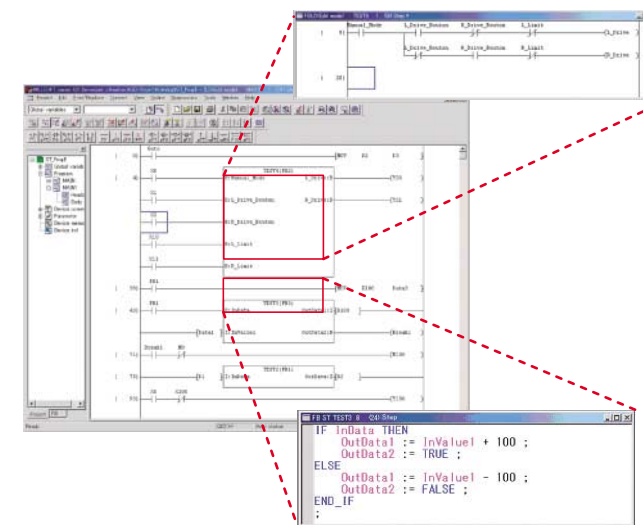
Sequential Function Chart (SFC) is an industry standard programming method that improves the readability of a program via a graphical representation similar to a flowchart. Q Series fully supports SFC, offering you the chance to simplify the organization of your programming by using multiple program states to control and sequence the operation of your application. During maintenance, SFC can also be used to follow the operation of a system graphically, improving the productivity of maintenance personnel.



Function Blocks (FB)

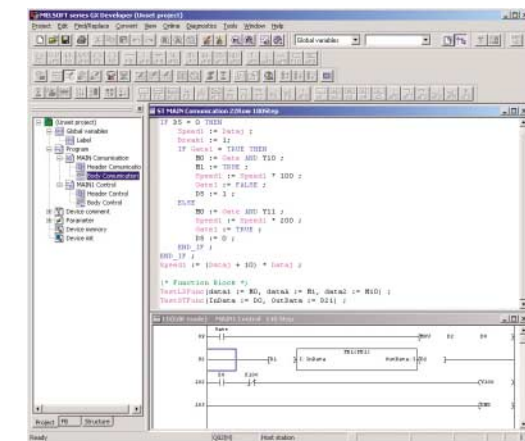
Function blocks (FB) allow sections of programs to be represented as a single function block.

- Complex ladder programs can be made easier to read, simplifying debugging and troubleshooting on the shop floor.
- Program code can easily be reused by cutting and pasting function blocks.
- Use ladder diagram or structured text to create function block code.



Structured Text (ST)

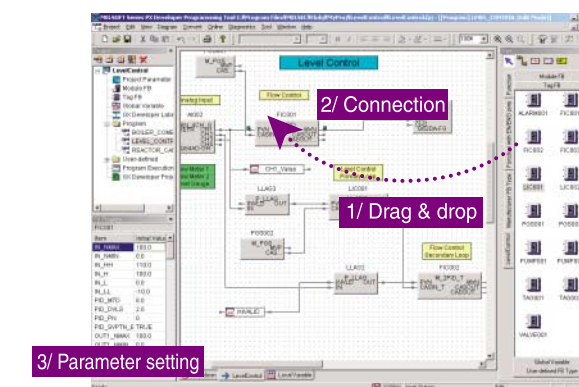
Structured text allows the Q Series to offer a new dimension in automation programming. ST breaks with the traditional methods of sequence programming by using a format similar to conventional computer programming languages. This offers the benefit of giving programmers a tool to describe processes that are not readily described using other languages. Additionally, ST offers newer programmers who are not familiar with automation in general an immediate opportunity to become productive based on their existing experience.



Process Control Function Block Diagram Programming

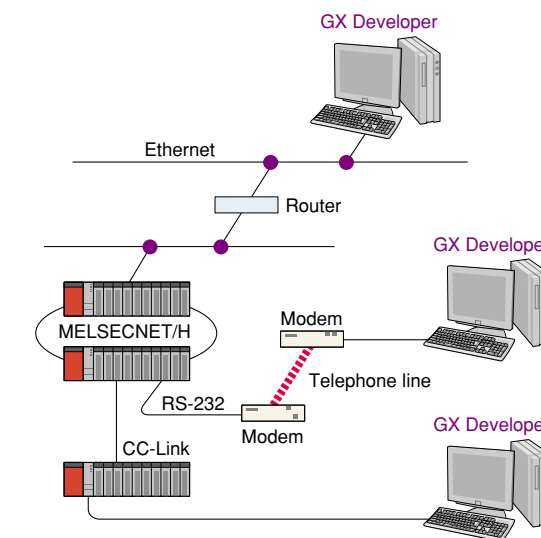
With the process CPU and redundant CPU, Q Series Process Control Function Block programs can be created by PX Developer. This allows easy creation and editing of loop control programs simply by dragging and dropping the required function blocks and connecting them together in the desired way. Loop parameters and other essential process properties can be easily configured. Process control programs can share data with sequence control program if label programming is used.

* GX Developer Ver. 7.20W or later must be installed in the same personal computer to run PX Developer.



Remote Programming

GX Developer fully supports the remote maintenance of distant installations, whether via dial-up access or through the Internet to systems on the other side of the world. Once connected to a system, and security requirements are met, this type of connection allows full access to all aspects of the Q Series in the same way as a local connection via a programming cable.





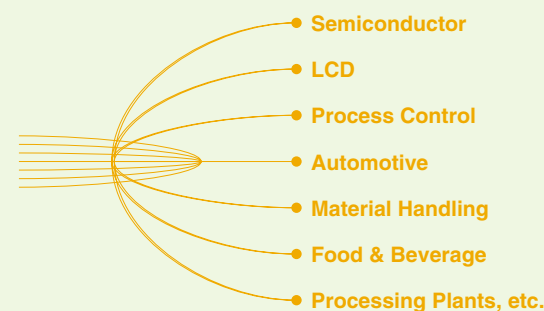
Working with the customer to provide the right solution



Realizing solutions for a diverse range of applications

A vast range of solutions available tackling the various challenges required in present and future applications.

The general trend of the manufacturing industry is requiring greater productivity with minimum cost, but still maintaining very high production quality. Such as the LCD and semiconductor industries, which requires larger sizes and greater diameter wafer sizes, whilst keeping the cost to a minimum. These trends are recognized and understood by Mitsubishi Electric, that is why the solutions provided are more than capable of reaching the stringent requirements. Therefore, together with Q Series and other Mitsubishi Electric automation products, productivity and quality can be kept high, while keeping down costs.



Semiconductor, LCD

LED material packing machine ·PCB manufacturing line ·LCD manufacturing line ·Molding machine ·Mask device ·Spin coater ·Washer ·Inspection device ·Chemical supply unit ·Hard disk manufacturing ·Bump plating device ·CMP device ·Hard disk polisher ·Wafer polisher ·Exposure device ·Pure water processing device ·Splattering device ·Coating device ·CD inspection device ·Liquid crystal injection device ·Bonding

Process Control

Food & Beverage (brewing, sterilization, drying) ·Chemicals (polymerization, distillation, drying) ·Fine chemicals (blending, mixing) ·Steel metals (ingredient mixing, sintering, reduction, separation) ·Non-ferrous metals (electric furnace, melting furnace) ·Water and sewage (dehydration, desulfurization, chemical injection) ·Paper manufacturing (paper machine) ·Environment (garbage incineration, ash treatment, drain, sludge treatment, pulverization, fuel cells) ·Semiconductors (heating furnace, diffusion furnace, ion injection) ·Ships (boiler) ·Plastic/rubber (winding) ·Buildings (air-conditioning, drainage, boiler)

Automotive

Painting system ·Production specifications instruction system ·Engine conveyance device ·Vehicle assembly line ·Welding process ·Electric furnace heating device for crankshafts ·Disk brake machining ·Screw tightening error prevention system ·Automotive electronic part manufacturing

Material Handling

Parcel sorting device ·PET bottle manufacturing and transfer line ·Household appliance distribution warehouse transfer line ·CRT transfer ·Woodworking machine conveyor ·NC loader ·Printed material transfer system ·Airport baggage handling system

Electric Devices

Refrigerator manufacturing line ·Air conditioner manufacturing line ·Inverter manufacturing line

Chemicals

Detergent packing line ·Rubber measurement ·Tire manufacturing device ·Synthetic leather manufacturing line ·Pre-processing for ceramics ·Polishing material measurement ·Concrete automatic measuring system

Food & Beverage

Soft drink manufacturing line ·Food packaging machine

Printing

Postcard printer ·Rotary press (offset/newspaper) ·Printer manufacturing line

Processing Plants

Hydrogen booster ·Cardboard production facility ·Concrete manufacturing, filling device for tunnels

Press/Moulding Machines

Injection moulding machine-Extrusion machine

Buildings, Factories, Utility Control

Building air conditioning system ·Power monitoring system ·Building security system-Building management system

Pharmaceutical

Tablet manufacturing system

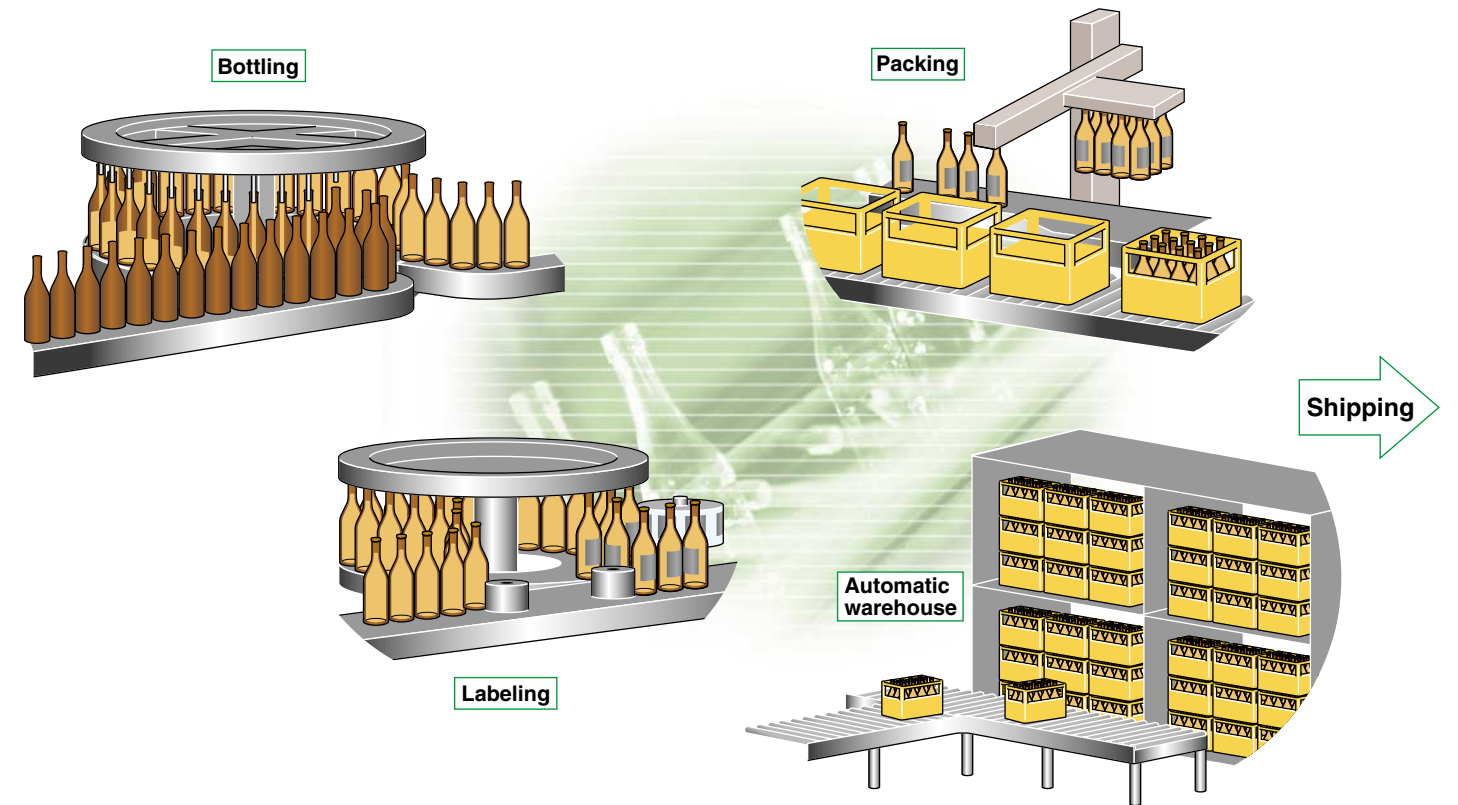
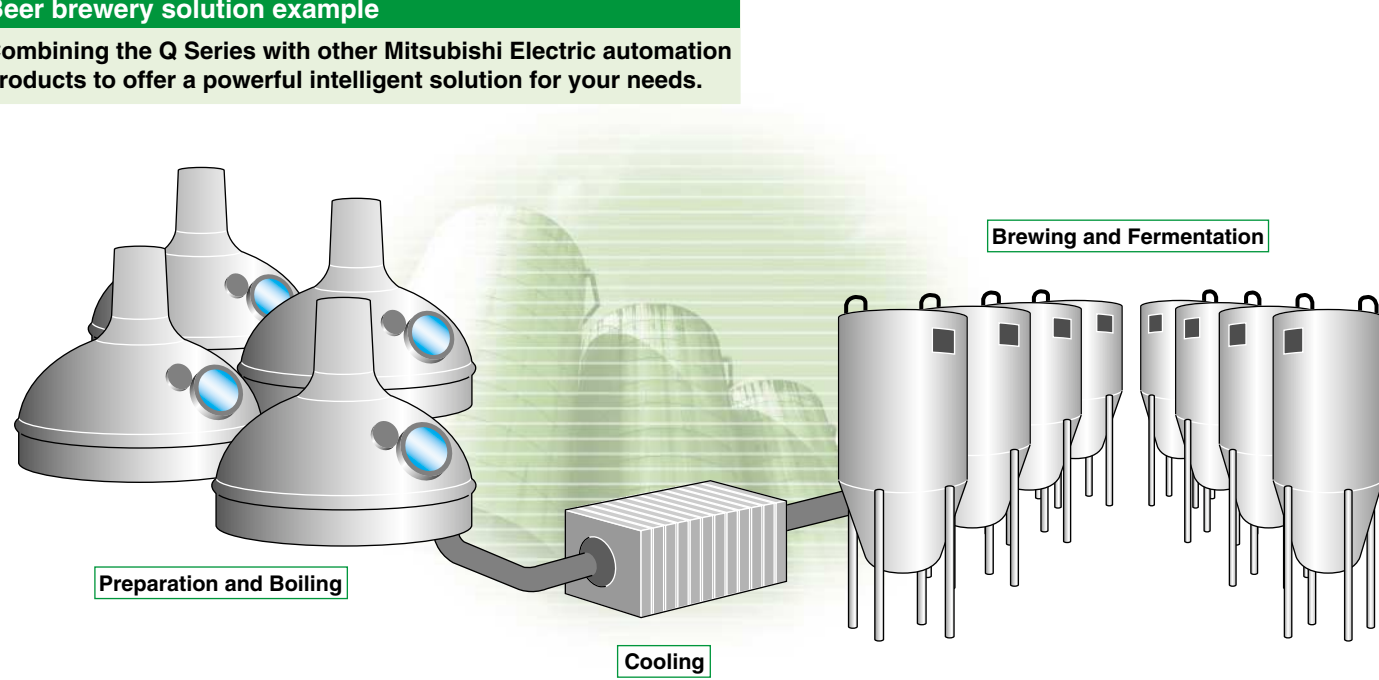
Various Devices and Systems

Bearing manufacture ·Train car wheel inspection ·Microwave heating system

Providing the right solution for various applications

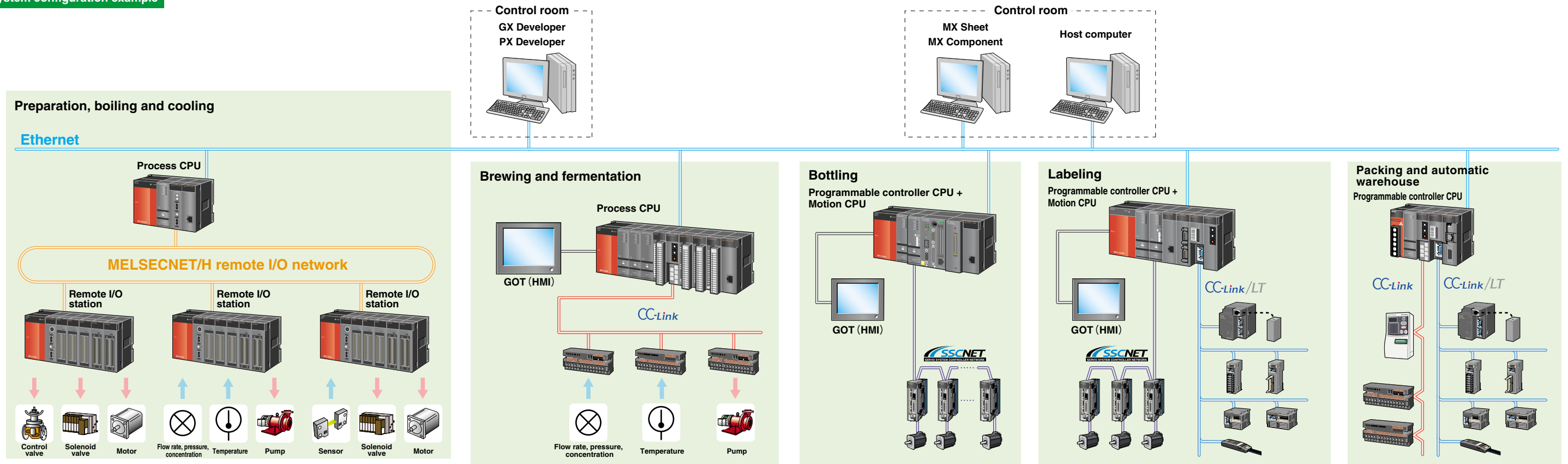
Beer brewery solution example

Combining the Q Series with other Mitsubishi Electric automation products to offer a powerful intelligent solution for your needs.



Temperature, flow rate and fluid level control

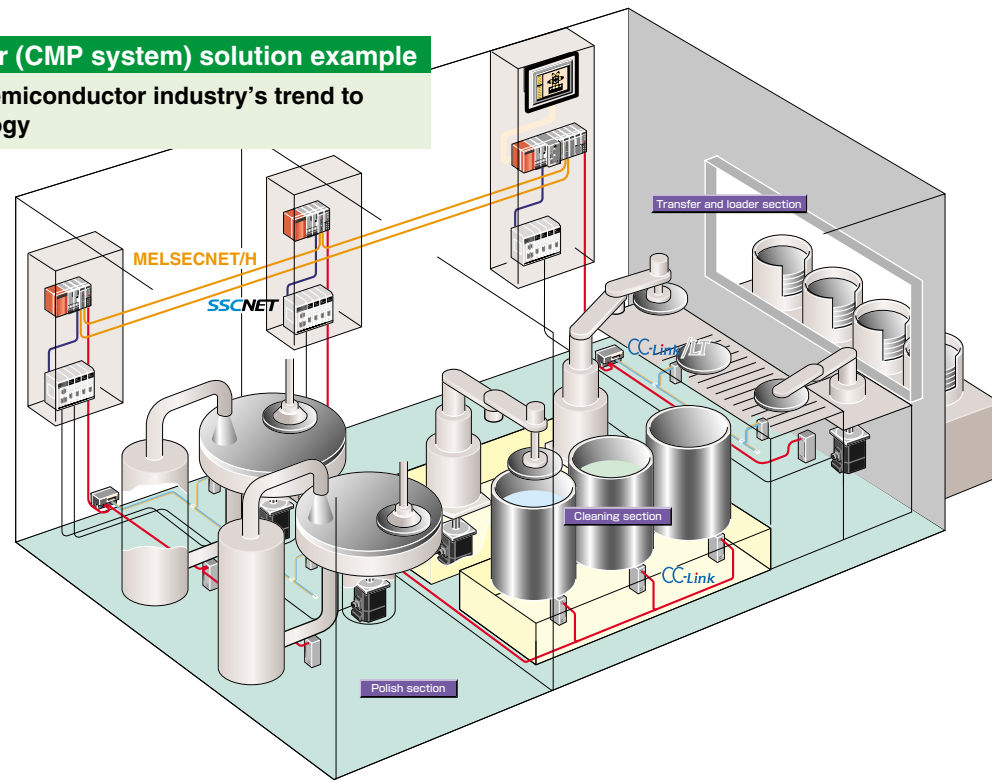
System configuration example



Providing solutions specific to the IT industry

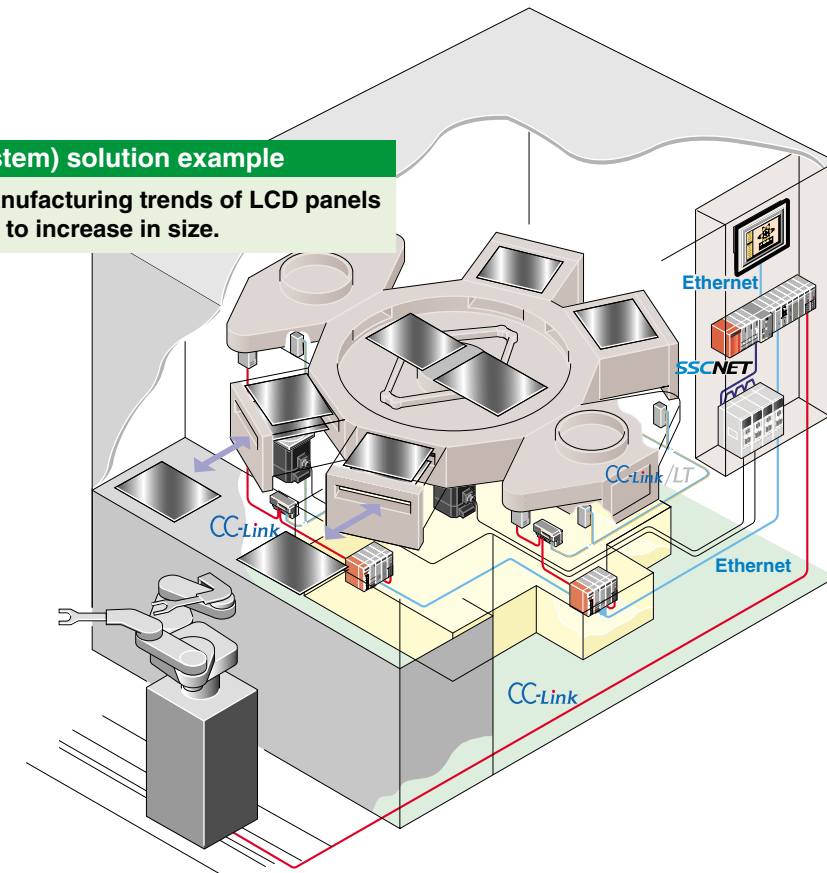
Semiconductor (CMP system) solution example

Following the semiconductor industry's trend to 300mm technology



LCD (CVD system) solution example

Leading the manufacturing trends of LCD panels which continue to increase in size.



CMP system configuration example

Host computer

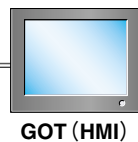


Ethernet

Transfer/loader controller



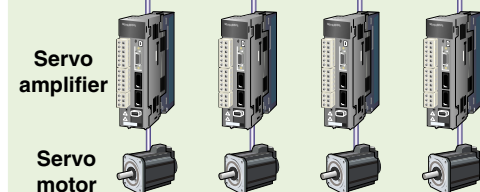
Bus connection



GOT (HMI)

MELSECNET/H

Servo for wafer transfer mechanism

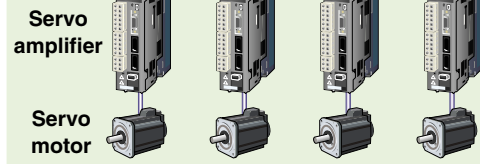
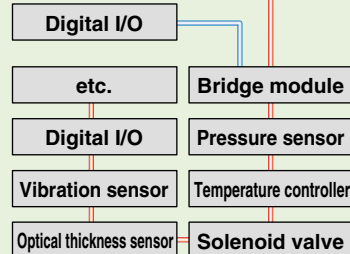


Polish controller



CC-Link

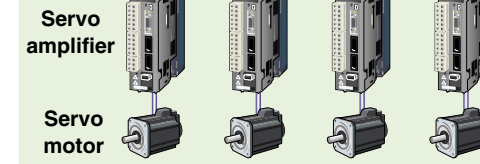
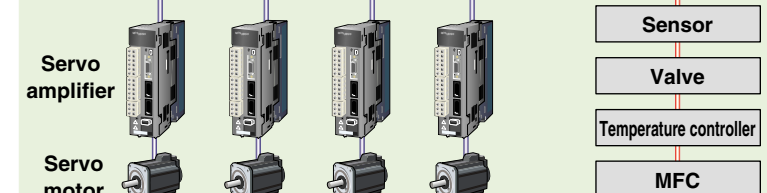
CC-Link/LT



Washing controller



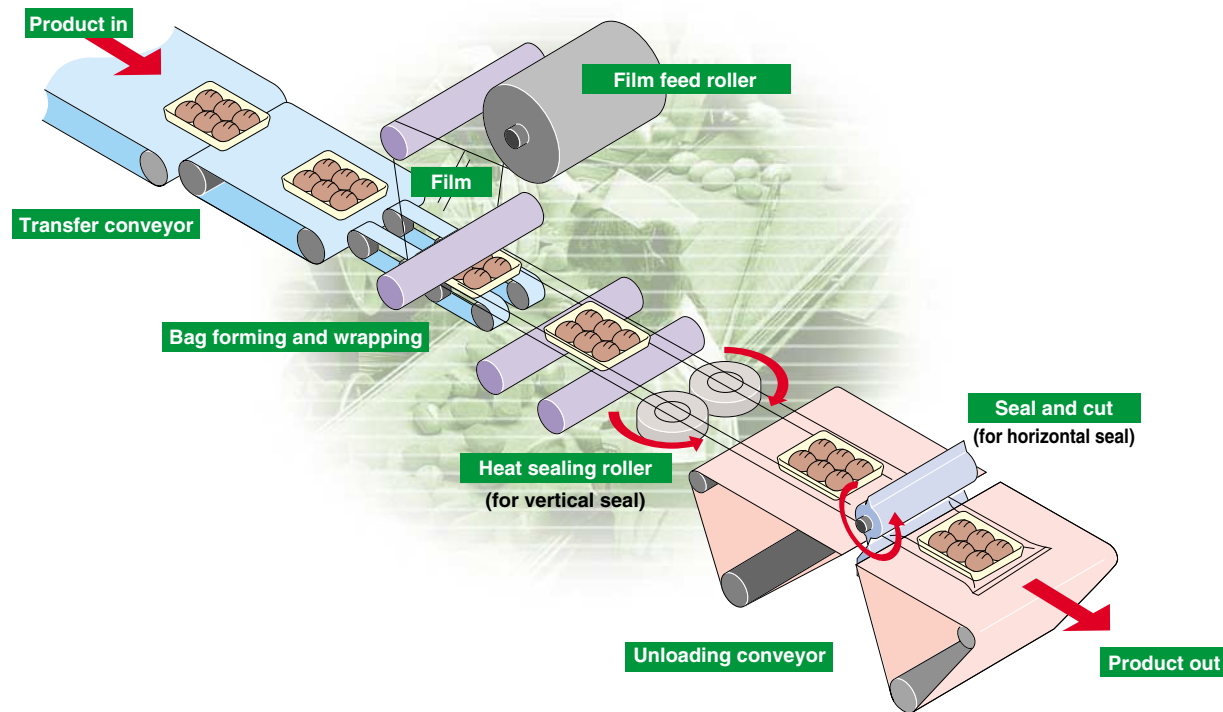
CC-Link



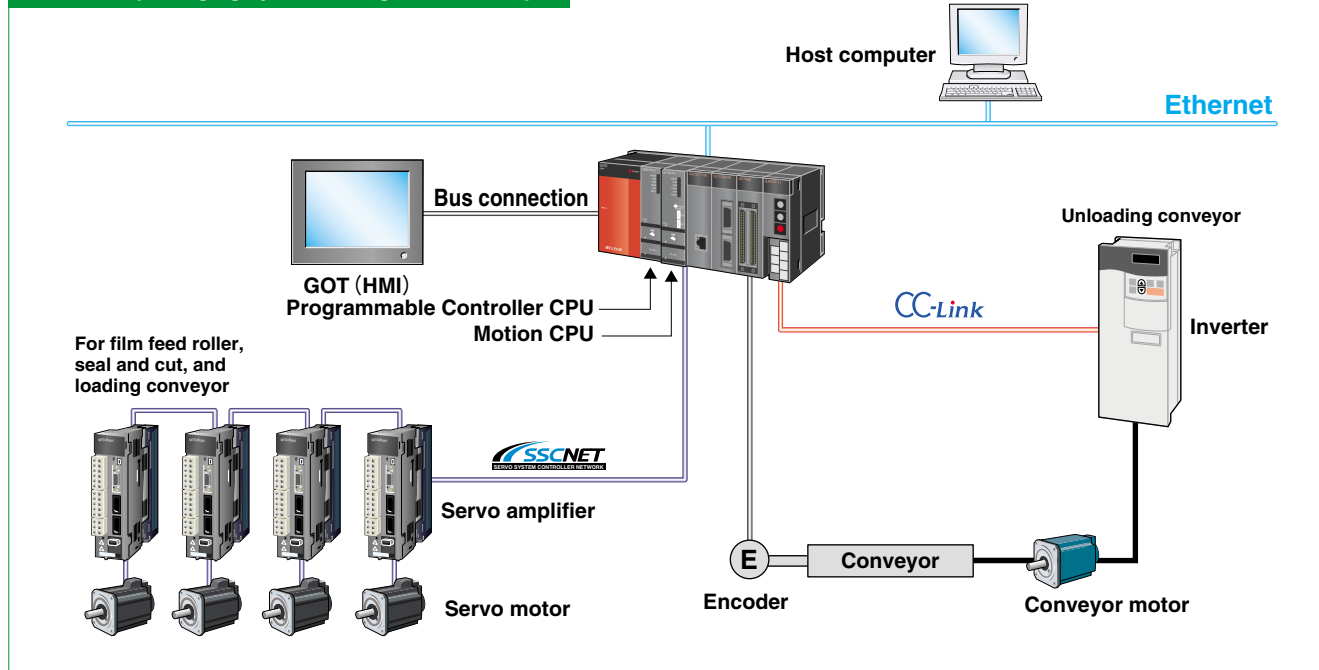
Powerfully supporting packaging solutions with accurate motion control

Horizontal packaging solution example

High feed rates with superior accuracy are realized.



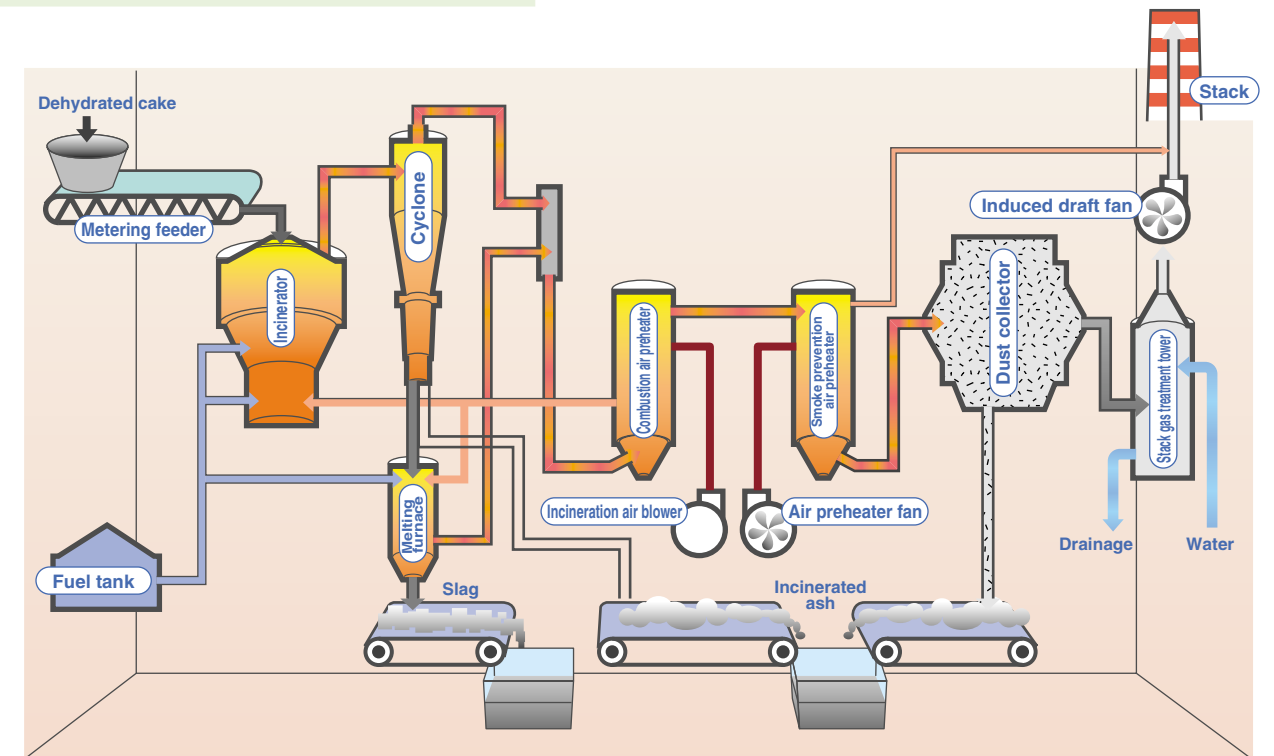
Horizontal packaging system configuration example



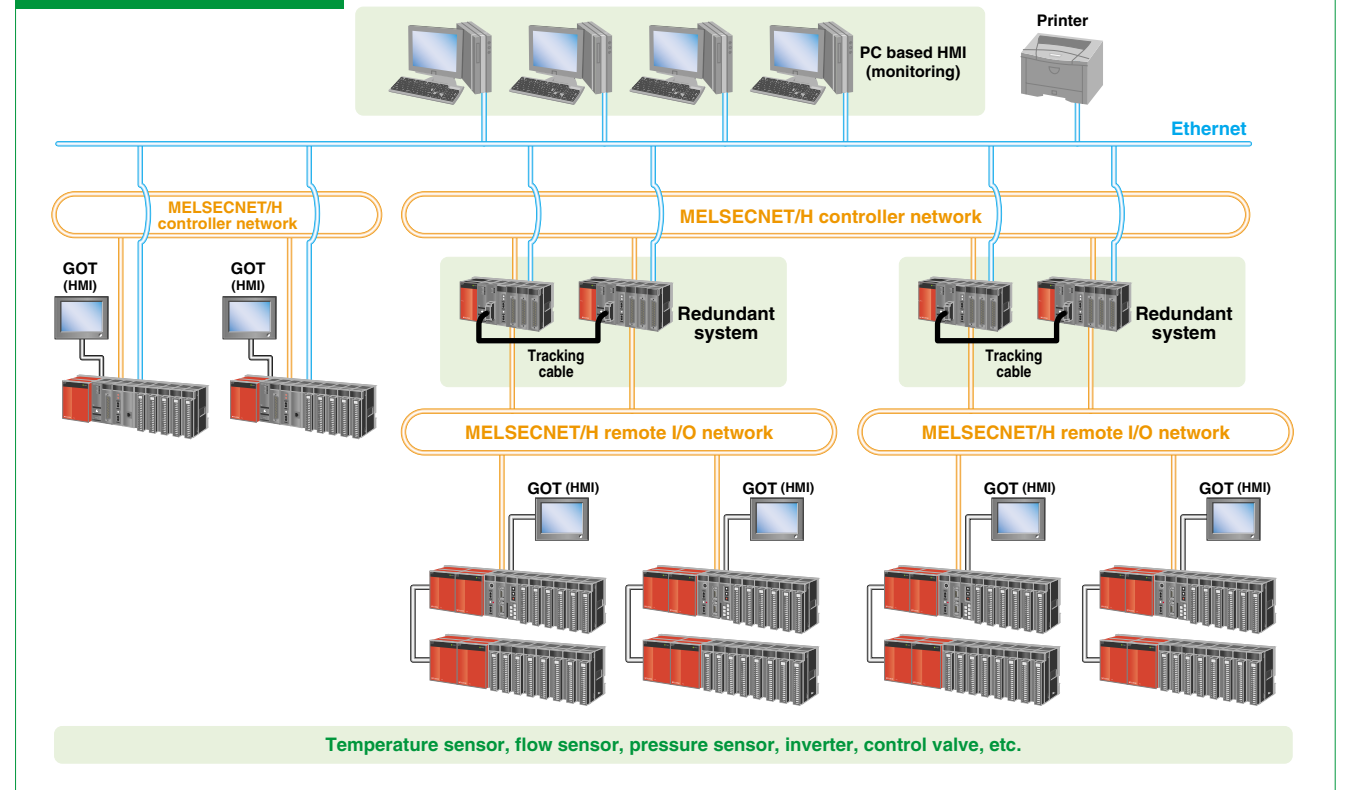
Providing worry-free solutions for continued operation even in the event of trouble.

Waste incineration solution example

System failure is prevented with the redundant CPU, power supply, base and network.



Incineration system configuration example





CPU module performance specifications

Programmable Controller CPU

Item	Basic Model			High Performance Model				
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Control method	Sequence program control method							
I/O control mode	Refresh							
Programming language (sequence control language)	* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)			* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)				
Processing speed (Sequence instruction) ^(Note 1)	LD instruction	200ns	160ns	100ns	79ns	34ns		
	MOV instruction	700s	560ns	350ns	237ns	102ns		
	PC MIX value (instruction/μs) ^(Note 2)	1.6	2.0	2.7	4.4	10.3		
	Floating-point addition	65.5μs	60.5μs	49.5μs	1815ns	782ns		
Total number of instructions ^(Note 3)	318	327			381			
Operation (floating point calculation) instruction	Yes			Yes				
Character string processing instruction	Yes ^(Note 6)			Yes				
PID instruction	Yes			Yes				
Special function instruction (Trigonometric function, square root, exponential operation, etc.)	Yes			Yes				
Constant scan (Function for keeping regular scan time)	1 to 2000ms (set in 1ms units)			0.5 to 2000ms (set in 0.5ms units)				
Program capacity	8k steps		14k steps	28k steps	60k steps	124k steps	252k steps	
Number of I/O device points [X/Y]	2048 points			8192 points				
Number of I/O points [X/Y]	256 points	1024 points		4096 points				
Internal relay [M]	8192 points			8192 points				
Latch relay [L]	2048 points			8192 points				
Link relay [B]	2048 points			8192 points				
Timer [T]	512 points			2048 points				
Retentive timer [ST]	0 points			0 points				
Counter [C]	512 points			1024 points				
Data register [D]	11136 points			12288 points				
Link register [W]	2048 points			8192 points				
Annunciator [F]	1024 points			2048 points				
Edge relay [V]	1024 points			2048 points				
File register [R, ZR]	No	65536 points		32768 points ^(Note 5)	65536 points ^(Note 5)		131072 points ^(Note 5)	
Special link relay [SB]	1024 points			2048 points				
Special link register [SW]	1024 points			2048 points				
Step relay [S]	2048 points			8192 points				
Index register [Z]	10 points			16 points				
Pointer [P]	300 points			4096 points				
Interrupt pointer [I]	128 points			256 points				
Special relay [SM]	1024 points			2048 points				
Special register [SD]	1024 points			2048 points				
Function input [FX]	16 points			16 points				
Function output [FY]	16 points			16 points				
Function register [FD]	5 points			5 points				
Local device	No			Yes				
Device initial values	Yes			Yes				

Note 1) The processing time will not be delayed if the devices are indexed.

Note 2) The PC MIX value is the average number of instructions, such as basic instructions or data processing instructions, which can be executed in 1μs. The processing speed will rise as the value increases.

Note 3) The intelligent function module dedicated instructions are not included.

Note 4) Indicates the number of points in the default state. This can be changed with the parameters.

Note 5) 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 when using the Flash card.)
Up to 1041408 points can be used when using the SRAM card.

Note 6) The character strings can be used only with the character string data transfer instruction (\$MOV).

Process CPU

Item	Process CPU	
	Q12PHCPU	Q25PHCPU
Control method	Sequence program control method	
I/O control mode	Refresh	
Programming language	Sequence control language	* Relay symbol language (ladder) * Logic symbolic language (list) * MELSAP3 (SFC), MELSAP-L * Structured text (ST)
	Language for process control	Process control FBD ^(Note 2)
Processing speed (Sequence instruction) ^(Note 1)	LD instruction	34ns
	MOV instruction	102ns
	PC MIX value (instruction/μs) ^(Note 3)	10.3
	Floating-point addition	782ns
Total number of instructions ^(Note 4)	415	
Operation (floating point calculation) instruction	Yes	
Character string processing instruction	Yes	
Processing instruction	Yes	
Special function instruction (Trigonometric function, square root, exponential operation, etc.)	Yes	
Constant scan (Function for keeping regular scan time)	0.5 to 2000ms (set in 0.5ms units)	
Program capacity	124k steps	252k steps
Loop control specifications	Instructions for process control	52 types
	Number of control loops	No limit ^(Note 4)
	Control cycle	10ms or more/control loop Setting available per loop
	Main functions	2-degree of freedom PID control, cascade control, auto-tuning function, feed forward control
Number of I/O device points [X/Y]	8192 points	
Number of I/O points [X/Y]	4096 points	
Internal relay [M]	8192 points	
Latch relay [L]	8192 points	
Link relay [B]	8192 points	
Time [T]	2048 points	
Retentive timer [ST]	0 points	
Counter [C]	1024 points	
Data register [D]	12288 points	
Link register [W]	8192 points	
Annunciator [F]	2048 points	
Edge relay [V]	2048 points	
File register [R, ZR]	131072 points ^(Note 7)	
Special link relay [SB]	2048 points	
Special link register [SW]	2048 points	
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	Yes	
Device default values	Yes	

Note 1) The processing time will not be delayed if the devices are indexed.

Note 2) PX Developer is required for programming by FBD.

Note 3) The PC MIX value is the average number of instructions, such as basic instructions or data processing instructions, which can be executed in 1μs. The processing speed will rise as the value increases.

Note 4) The intelligent function module dedicated instructions are not included.

Note 5) The number of control loops is restricted by the combination of the device memory capacity (128 words/loop used) and the control cycle.

Note 6) Indicates the number of points in the default state. This can be changed with the parameters.

Note 7) 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 when using the Flash card.)
Up to 1041408 points can be used when using the SRAM card.



Redundant CPU

Item		Redundant CPU	
		Q12PRHCPU	Q25PRHCPU
Control system		Sequence program control method	
I/O control		Refresh mode	
Programming language	Sequence control language	<ul style="list-style-type: none"> Relay symbol language (ladder) Logic symbolic language (list) MELSAP3 (SFC) Structured text (ST) 	
	Process control language	<ul style="list-style-type: none"> Process control FBD ^(Note 1) 	
Instruction types		Sequence, basic, application and process control instructions (Process control instruction types: Control/Operation instructions, I/O control instructions, compensation operation instructions, arithmetic operation instructions, comparison operation instructions, auto-tuning instructions)	
Loop control specifications	Control cycle	10ms or more/control loop (Setting available per loop)	
	Number of control loops	No limit ^(Note 2)	
Main functions		2 degree of freedom PID control, cascade control, auto-tuning function, feed forward control	
RAS	Online module replacement	The I/O, analog, temperature input, temperature control, and pulse input modules can be replaced (on a remote I/O station).	
	Output in case of error stop	Clear or output retention can be designated for each module.	
Functions compatible with redundant system		<ul style="list-style-type: none"> Redundant configuration of the entire system, including the CPU, the power supply, and the base unit Hot standby system for the control and standby systems online module change, selection of backup and separate modes available Large-capacity data tracking Large-capacity device data transfer (100k words) from the control system to the standby system Network system compatible with redundant system Switchover in case of MELSECNET/H or Ethernet module malfunction or network wire disconnection Engineering environment (GX Developer) Communication with programming tools The control or standby system can be designated by direct CPU connection or connection via a network Online program change function Programmable controller write, online program change, online multi-block change Memory copy function Copying memory data from the control system to the standby system ^(Note 4) Redundant system setting The tracking device and network pairing can be set with parameters. 	
Communication port		USB, RS-232	
Modules that can be mounted on the main base unit		Q Series network module (Ethernet, MELSECNET/H, CC-Link only), input/output module can be mounted.	
Programming software		GX Developer PX Developer	
Program capacity	Number of steps	124k steps	252k steps
	Number of programs	124	252 ^(Note 3)
Device memory capacity ^(Note 5)		Device memory: 29k words / File register (internal): 128k words (It can be expanded up to 1017k words by adding a memory card [2MB].)	
Number of I/O device points ^(Note 6)		8192 points	
Number of I/O points ^(Note 7)		4096 points	
Number of CPUs mounted		1 (Multiple CPU configuration is not available)	
Number of mountable modules		11 on the main base unit (7 when the power supply is redundant type)	
Number of extension base		0 (All non-redundant modules are mounted on the remote I/O station [the maximum number of modules that can be mounted on a remote station is 64].)	
Number of remote I/O points		8192 points (up to 2048 points per station)	

Note 1) PX Developer is required for programming by FBD.
 Note 2) The number of control loops is restricted by the combination of the device memory capacity (128k words/loop used) and the control cycle.
 Note 3) The maximum number of files that can be executed is 124. It is impossible to execute 125 or more files. Two SFC/MELSAP-Ls are available, one of which is a program execution control SFC.
 Note 4) The standard RAM, standard ROM and program memory can be copied from the control system to the standby system. The memory card cannot be copied.
 Note 5) Each number of device points in the data memory can be changed within 29k words, depending on the parameters.
 Note 6) Total number of the I/O points on the main base unit, which are directly controlled from the CPU module, and the I/O points controlled as remote I/O by the remote I/O network.
 Note 7) The number of I/O points on the main base unit, which are directly controlled from the CPU module.

Motion CPU

Item		Q173HCPU (-T)	Q172HCPU (-T)	Q173CPUN (-T)	Q172CPUN (-T)
Number of control axes	SV13/SV22/SV43	32 axes	8 axes	32 axes (Max. of 16 axes x 2 per system)	8 axes
	SV54	—	—	16 axes (Max. of 4 axes per machine)	8 axes (Max. of 4 axes per machine)
Operation cycle (default)	SV13	0.44ms / 1 to 3 axes	0.44ms / 1 to 3 axes	0.88ms / 1 to 8 axes	0.88ms / 1 to 8 axes
		0.88ms / 4 to 10 axes		1.77ms / 9 to 16 axes	
	SV22/SV43	1.77ms / 11 to 20 axes	0.88ms / 4 to 8 axes	1.77ms / 5 to 12 axes	1.77ms / 5 to 8 axes
		3.55ms / 21 to 32 axes		3.55ms / 13 to 24 axes	
SV54	0.88ms / 1 to 5 axes	—	7.11ms / 25 to 32 axes	3.55ms / 1 to 8 axes	
	1.77ms / 6 to 14 axes		7.11ms / 9 to 16 axes		
Interpolation functions		Linear interpolation (Up to 4 axes), Circular interpolation (2 axes), Helical interpolation (3 axes)			
Control method		PTP (Point To Point) control, Speed control, Speed/position switching control, Fixed-pitch feed, Constant-speed control, Position follow-up control, Prescribed position stop speed control (Q173HCPU(-T) / Q172HCPU(-T)), Speed switching control, High-speed oscillation control, Synchronous control (SV22)			
Acceleration/deceleration control		Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration, Post-interpolation acceleration/deceleration (SV54)			
Compensation function		Backlash compensation, Electronic gear, Phase compensation (SV22)		Backlash compensation, Electronic gear	
Programming tool	SV13/SV22	Motion SFC, Dedicated instruction, Mechanical support language (SV22)			
	SV43	EIA language (G-code)			
	SV54	Robot language (MELFA-BASIC IV [Lite])			
Servo program (dedicated instruction) capacity	SV13/SV22	14k steps			
	SV43	248KB			
	SV54	Capacity of 1 program file: Max. 64KB Total capacity of all program files: Max. 339KB			

Item	Q173HCPU (-T)	Q172HCPU (-T)	Q173CPUN (-T)	Q172CPUN (-T)	
Number of programs (SV54)	Max. 255				
Number of positioning points	SV13/SV22	3200 points (positioning data can be set indirectly)			
	SV43	Approx. 10600 points (indirect setting possible)			
	SV54	Internal variables: 1022 points / program External variables: 40 points (Indirect setting possible; position type [pose], or joint type [Joint] format)			
Programming tool	IBM PC/AT				
Peripheral I/F	USB / SSCNET		USB / RS-232 / SSCNET		
Teaching function	Provided (when using Q17□HCPU-T / Q17□CPUN-T, SV13/SV54)				
Home position return function	Proximity dog type (2 types), Count type (3 types), Data set type (2 types), Dog cradle type, Stopper type (2 types), Limit switch combined type				
Jog operation function	Function present (with incremental feed function [SV54])				
Manual pulse generator operation function	Possible to connect 3 modules				
Synchronous encoder operation function	Possible to connect 12 modules (SV22 use)	Possible to connect 8 modules (SV22 use)	Possible to connect 12 modules (SV22 use)	Possible to connect 8 modules (SV22 use)	
M-code function	M-code output function provided, M-code completion wait function provided				
Limit switch output function	Number of output points: 32 points Watch data: Motion control data/Word device				
ROM function	Yes		No		
Absolute position system	• Made compatible by setting battery to servo amplifier (Possible to select the absolute/incremental data method for each axis)				
Number of controlled machines (SV54)	Axis control machines	8 machines			
	Management machines	8 machines			
WAIT function (SV54)	With "Waiting for WAIT status" function, and "Device type/No. specific output during WAIT" function				
Number of Motion related modules	Q172LX: 4 modules	Q172LX: 1 module	Q172LX: 4 modules	Q172LX: 1 module	
	Q172EX-S2: 6 modules ^(Note 2)	Q172EX-S2: 4 modules ^(Note 1)	Q172EX: 6 modules ^(Note 1)	Q172EX: 4 modules ^(Note 1)	
	Q173PX: 4 modules ^(Note 3)	Q173PX: 3 modules ^(Note 2)	Q173PX: 4 modules ^(Note 2)	Q173PX: 3 modules ^(Note 2)	
Program capacity	Code total (Motion SFC diagram + Operation control + Transition)	543KB	287KB		
	Test total (Operation control + Transition)	484KB	224KB		
Number of I/O (X/Y) points				8192 points	
Number of real I/O (PX/PY) points				256 points	
Number of devices	Internal relays (M)				Total (M+L): 8192 points
	Latch relays (L)				
	Link relays (B)				
	Annunciators (F)				
	Special relay (M)				
	Data registers (D)				
	Link registers (W)				
	Special register (D)				
	Motion registers (#)				
	Coasting timers (FT)				

Note 1) SV43 is not used at Q172EX and Q172EX-S2.
 Note 2) The incremental synchronous encoder use (SV22). When connecting the manual pulse generator, you can use only one module.

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	Specifications			
Operating ambient temperature	0 to 55°C			
Storage ambient temperature	-25 to 75°C ^(Note 3)			
Operating ambient humidity	5 to 95%RH ^(Note 4) , non-condensing			
Storage ambient humidity	5 to 95%RH ^(Note 4) , non-condensing			
Vibration resistance	Under intermittent vibration	Sweep count 10 times each in X, Y, Z directions (for 80 min.)		
	Frequency		Acceleration	Amplitude
	5 to 9 Hz		—	3.5mm (0.14 in.)
	9 to 150 Hz		9.8m/s ²	—
	Under continuous vibration			
	Frequency		Acceleration	Amplitude
5 to 9 Hz	—	1.75mm (0.069 in.)		
9 to 150 Hz	4.9m/s ²	—		
Shock resistance	Conforms to JIS B 3502, IEC61131-2 (147m/s ² , 3 times in each of 3 directions X, Y, Z)			
Operating atmosphere ^(Note 5)	No corrosive gases			
Operating altitude	2000m (6565 ft.) or less			
Installation location	Inside control panel			
Overvoltage category ^(Note 1)	II or less			
Pollution degree ^(Note 2)	2 or less			
Equipment class	Class I			

Note 1) 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.
 Note 2) This index indicates the degree to which conductive material is generated in the environment where the equipment is used. In pollution degree 2, only non-conductive pollution occurs. However, a temporary conductivity caused by condensation is to be expected.
 Note 3) The storage ambient temperature is -20 to 75°C if the system includes the A/AnS Series modules.
 Note 4) The operating ambient humidity and storage ambient humidity are 10 to 90%RH if the system includes the A/AnS Series modules.
 Note 5) 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 consult your local Mitsubishi sales office or representative.



Increased new possibilities of automation applications



PC CPU module Partner Product

PC CPU module PPC-852 series provides PC/AT-compatible personal computer capability. It can be mounted on the Q Series base unit (2 slots are used).

- Features**
1. Since this product features personal computer functionality on the Q Series base unit, spaces for device and control board can be saved compared to the system cooperated with FA personal computer. With high-speed data transfer through the base unit, PPC-852 series secures significantly increasing throughput compared to serial communication.
 2. By incorporating the PC CPU and programmable controller CPU in the Q Series system, sequence control and information processing are seamlessly integrated.
 3. Equipped with power-saved, high-performance ultra low voltage Intel Celeron M processor 600 MHz (FSB400MHz) and 512MB (PC2100 DDR SDRAM) main memory. These specifications allow a remarkable high performance even though this is a FAN-less module as well as the former models.
 4. Standard interface includes 100BASE-TX LAN, PC card slot, USB2.0, CF card slot, etc.
 5. Supports not only "EZSocket", a communication middleware for FA, but also works well with other peripheral devices and application software.
 6. Windows 2000 Professional, Windows XP Professional pre-installed model (HDD) and Windows XP Embedded pre-installed model (1GB CF card) are available in both Japanese and English.
 7. With the bus I/F driver software, users can access I/O and intelligent function modules from C language application programs. (Some modules have restrictions.)
 8. Can be operated independently as well as in a multiple CPU configuration that consists of programmable controller CPU and motion CPU.



Model	PPC-CPU852 (MS) -512	
CPU	Ultra Low Voltage Intel® Celeron® M Processor 600MHz (FSB400MHz)	
Chipset	Intel® 852GM	
Memory	Cache memory	L1: 32KB x 2, L2: 512KB
	Main memory	512MB (PC2100 DDR SDRAM)
Video	Controller	Built in 852GM
	Supported Resolution (Max.)	SXGA (1280x1024) 16,777,215 colors
	Video RAM	Main memory shared (Max. 64MB)
	CRT I/F	Analog RGB 15-pin HD-SUB connector
I/F	IDE	40-pin half-pitch connector (Max. 2 units connectable) *
	Serial	RS-232C compliant: 2 channels (9-pin D-SUB connector and extension interface (EX.I/F))
	Parallel	1 channel (Extension interface (EX.I/F))
	LAN	Ethernet 100BASE-TX/10BASE-T RJ-45 connector
	PC Card	PCMCIA, CardBus-compliant Type I, II x 1
	CF card	Type I, II x 1 (For Memory card use)
	USB	USB2.0 compliant 3ch (Front:1ch, Bottom: 2ch) Transfer rate: 480Mbps USB1.1 compliant 1ch (Extension interface (EX.I/F))
	Keyboard/PS/2/mouse	6-pin mini-DIN connector (shared by keyboard and mouse)
Hard Disk Unit	PPC-HDD (MS) [1 slot is used.]	
Supported OS	Windows XP Professional, Windows XP Embedded, Windows 2000 Professional	

*Up to two IDE devices (HDD, CE card, CD-ROM/DVD-ROM) can be connected at the same time.

Absolute position detection unit Partner Product

The position detection unit "VS-Q62" provides absolute position data to programmable control unit and slots directly in the base of MELSEC-Q Series.

- Features**
1. Release from the replacement and adjustment of switches with eliminating the needs for limit switch and DOG of position detection.
 2. Full resistance of heavy duty "ABSOCODER" to any harsh environments, such as vibrations, shocks, temperatures, oils, dusts and so on.



Model	VS-Q62
Axes	1
Detection	Absolute position (by means of "ABSOCODER")
Resolution	4096-409.6 Counts Per Turn & 32-320 Revolutions (within multi-turn ABSOCODER)
Data rate	0.2ms
Auxiliary	Current position, Preset, Positioning, Switching outputs

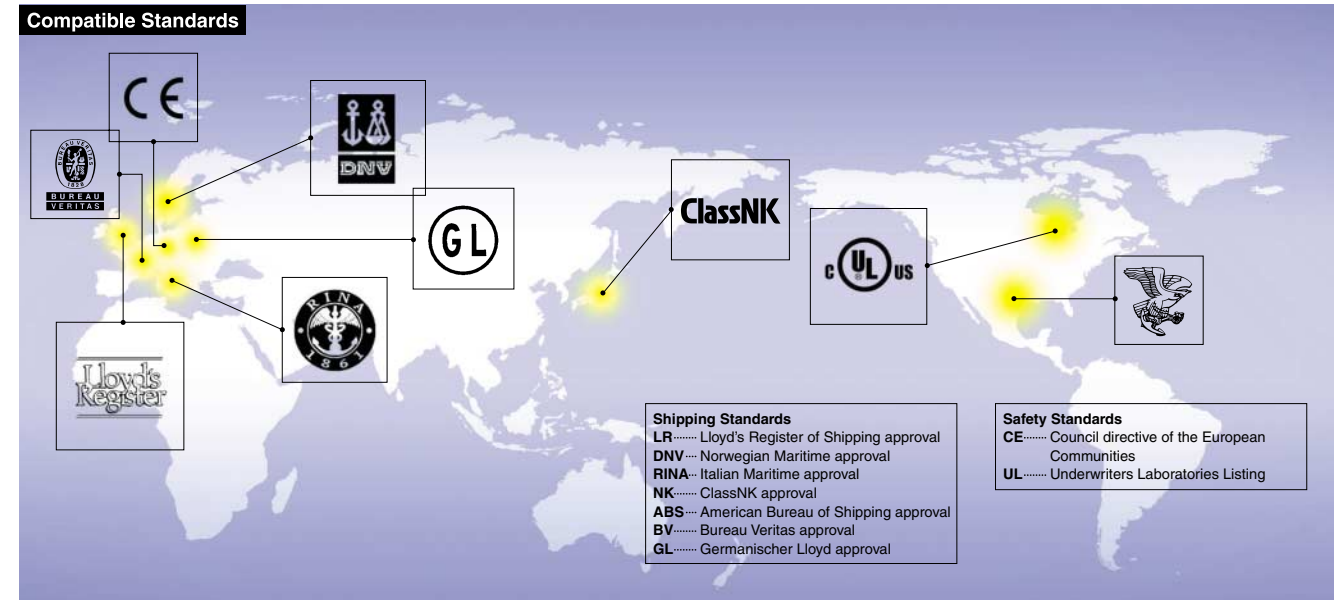
NSD provides various types of "ABSOCODER" (single-, multi-turn and linear type)

Contact: Suzuki-Haru (Sales Division)
SG Corporation (NSD Corporation Group)
Tel: +81-52-261-2352 Fax: +81-52-252-0522
NSD Corporation
URL: www.nsdcorp.co.jp E-mail: s-info@nsdcorp.co.jp

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*Always refer to user's manuals for information on usable modules, restrictions, etc. before using.

*Contact your local Mitsubishi sales office or representative for the latest information on the MELSOFT versions and compatible OS.

Usable with basic model

Usable with process CPU

Usable with MELSECNET/H remote I/O

Usable with high performance model

Usable with redundant CPU

CPU, base, power supply

Product	Model	Outline	
Basic model	Q00JCPU	No. of I/O points: 256 points, no. of I/O device points: 2048 points, program capacity: 8 k steps, basic instruction processing speed (LD instruction): 0.20 μs, program memory capacity: 58 KB, 5 slots, 100 to 240 V AC input/5 V DC 3A output power supply	
	Q00CPU	No. of I/O points: 1024 points, no. of I/O device points: 2048 points, program capacity: 8 k steps, basic instruction processing speed (LD instruction): 0.16 μs, program memory capacity: 94 KB	
	Q01CPU	No. of I/O points: 1024 points, no. of I/O device points: 2048 points, program capacity: 14 k steps, basic instruction processing speed (LD instruction): 0.10 μs, program memory capacity: 94 KB	
	High performance model	Q02CPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.079 μs, program memory capacity: 112 KB
		Q02HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 112 KB
		Q06HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB
		Q12HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Process CPU	Q12PHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25PHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Redundant CPU	Q12PRHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB
		Q25PRHCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB
	Motion CPU	Q172CPUN	For 8-axis control
		Q172CPUN-T	For 8-axis control, teaching module supported
		Q173CPUN	For 32-axis control
Q173CPUN-T		For 32-axis control, teaching module supported	
Q172HCPU		For 8-axis control, SSCNET III connectivity	
Q172HCPU-T		For 8-axis control, SSCNET III connectivity, teaching module supported	
Q173HCPU		For 32-axis control, SSCNET III connectivity	
Q173HCPU-T		For 32-axis control, SSCNET III connectivity, teaching module supported	
Battery	Q6BAT	Replacement battery	
	Q7BAT	Replacement large-capacity battery	
	Q7BAT-SET	Large-capacity battery with battery holder for mounting CPU	
	Q8BAT	Replacement large-capacity battery module	
	Q8BAT-SET	Large-capacity battery module with CPU connection cable	
	Memory card	Q2MEM-1MBS	SRAM memory card, capacity: 1 MB
Q2MEM-2MBS		SRAM memory card, capacity: 2 MB	
Q2MEM-2MBF		Linear Flash memory card, capacity: 2 MB	
Q2MEM-4MBF		Linear Flash memory card, capacity: 4 MB	
Q2MEM-8MBA		ATA card, capacity: 8 MB	
Q2MEM-16MBA		ATA card, capacity: 16 MB	
Q2MEM-32MBA		ATA card, capacity: 32 MB	
Memory card adapter	Q2MEM-ADP	Adapter for Q2MEM memory card's standard PCMCIA slot	
SRAM card battery	Q2MEM-BAT	Replacement battery for Q2MEM-1MBS and Q2MEM-2MBS	
Connection cable	QC30R2	RS-232 cable for connecting personal computer and CPU, 3 m (between mini-DIN6P and Dsub9P)	
	QC10TR	1 m cable for tracking	
	QC30TR	3 m cable for tracking	
Cable disconnection prevention holder	Q6HLD-R2	Holder for preventing RS-232 cable (programmable controller CPU connection) disconnection	



CPU, base, power supply

Product	Model	Outline	
Base	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	
	Slim type 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	
		QA1S65B (Note 1) 5 slots, 1 AnS Series power supply module required, for AnS Series modules	
		QA1S68B (Note 1) 8 slots, 1 AnS Series power supply module required, for AnS Series modules	
		QA65B (Note 1) 5 slots, 1 A Series power supply module required, for A Series modules	
		QA68B (Note 1) 8 slots, 1 A Series power supply module required, for A Series modules	
		Redundant power extension base	Q68RB 8 slots, 2 redundant power supply modules required, for Q Series modules
		Redundant type extension base	Q65WRB 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		
	Adapter	Q6DIN1 DIN rail mounting adapter for Q38B, Q312B, Q68B, Q612B, Q38RB, Q68RB, Q65WRB, Q38DB, and Q312DB	
		Q6DIN2 DIN rail mounting adapter for Q35B, Q65B, and Q00JCPU	
		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	
	Blank cover	QG60 Blank cover for I/O slot	
	Power supply	Q61P Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 6 A	
Q61P-A1 Input voltage: 100 to 120 V AC, output voltage: 5 V DC, output current: 6 A			
Q61P-A2 Input voltage: 200 to 240 V AC, output voltage: 5 V DC, output current: 6 A			
Q62P Input voltage: 100 to 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 New Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 8.5 A			
Slim type power supply	Q61SP Input voltage range: 100 to 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		
	Q64RP Input voltage: 100 to 120/200 to 240 V AC, output voltage: 5 V DC, output current: 8.5 A		

Usable at the second to seventh extension base stage.

I/O module

Product	Model	Outline
Input	AC	QX10 16 points, 100 to 120 V AC, 8 mA (100 V AC, 60 Hz)/7 mA (100 V AC, 50 Hz), response time: 20 ms, 16 points/common, 18-point terminal block
		QX28 8 points, 100 to 240 V AC, 17 mA (200 V AC, 60 Hz)/14 mA (200 V AC, 50 Hz)/8 mA (100 V AC, 60 Hz)/ 7 mA (100 V AC, 50 Hz), response time: 20 ms, 8 points/common, 18-point terminal block
	DC (Positive common) (Note 2)	QX40 16 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 16 points/common, positive common, 18-point terminal block
		QX40-S1 16 points, 24 V DC, 6 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, positive common, 18-point terminal block
		QX41 (Note 3) 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector
		QX41-S1 (Note 3) 32 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector
		QX42 (Note 3) 64 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common, 40-pin connector
	QX42-S1 (Note 3) 64 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, positive common, 40-pin connector	
	AC/DC (Note 2)	QX50 16 points, 48 V AC/DC, 4 mA, response time: 20 ms, 16 points/common, positive/negative common, 18-point terminal block
	DC sensor (Note 2)	QX70 16 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 16 points/common, positive/negative common, 18-point terminal block
		QX71 (Note 3) 32 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector
		QX72 (Note 3) 64 points, 5/12 V DC, 1.2 mA (5 V DC)/3.3 mA (12 V DC), response time: 1/5/10/20/70 ms, 32 points/common, positive/negative common, 40-pin connector
	DC (Negative common) (Note 2)	QX80 16 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 16 points/common, negative common, 18-point terminal block
		QX81 (Note 4) 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 37-pin D-sub connector
QX82 (Note 3) 64 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, negative common, 40-pin connector		
QX82-S1 (Note 3) 64 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 32 points/common, negative common, 40-pin connector		
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	
	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 to 240 V AC; 0.6 A/point; 4.8 A/common; minimum load voltage/current: 24 V AC/100 mA, 100 to 240 V AC/25 mA; response time: 1 ms + 0.5 cycle, 16 points/common, 18-point terminal block, with surge suppressor	
Transistor (Sink)	QY40P 16 points, 12 to 24 V DC, 0.1 A/point, 1.6 A/common, response time: 1 ms, 16 points/common, sink type, 18-point terminal block, with thermal and short-circuit protection and surge suppressor	
	QY41P (Note 3) 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, with thermal and short-circuit protection and surge suppressor	
	QY42P (Note 3) 64 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type, 40-pin connector, with thermal and short-circuit protection and surge suppressor	
Transistor (Independent)	QY50 16 points, 12 to 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 suppressor and fuse	
	QY68A 8 points, 5 to 24 V DC, 2 A/point, 8 A/module, response time: 10 ms, sink/source type, 18-point terminal block, with surge suppressor, all points independent	
TTL CMOS	QY70 16 points, 5 to 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 (Note 3) 32 points, 5 to 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 (Source)	QY80 16 points, 12 to 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 suppressor and fuse	
	QY81P (Note 4) 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, source type, 37-pin D-sub connector, with thermal and short-circuit protection and surge suppressor	
I/O	DC input/transistor output	QH42P (Note 3) Input: 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common; output: 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type; 40-pin connector, with thermal and short-circuit protection and surge suppressor
		QX48Y57 Input: 8 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 8 points/common, positive common; output: 7 points, 12 to 24 V DC, 0.5 A/point, 2 A/common, response time: 1 ms, 7 points/common, sink type; 18 points terminal block, with surge suppressor and fuse
		QX41Y41P (Note 3) New Input: 32 points, 24 V DC, 4 mA, response time: 1/5/10/20/70 ms, 32 points/common, positive common; output: 32 points, 12 to 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms, 32 points/common, sink type; 40-pin connector, with thermal and short-circuit protection and surge suppressor
Interrupt module	QI60 16 points, 24 V DC, 4 mA, response time: 0.1/0.2/0.4/0.6/1 ms, 16 points/common, 18-point terminal block	
Connector	A6CON1 40-pin connector, soldering type	
	A6CON2 40-pin connector, crimp-contact type	
	A6CON3 40-pin connector, IDC for flat cables	
	A6CON4 40-pin connector, soldering type (cable connectable in bidirection)	
	A6CON1E 37-pin D-sub connector, soldering type	
	A6CON2E 37-pin D-sub connector, crimp-contact type	
	A6CON3E 37-pin D-sub connector, IDC for flat cables	



I/O module

Product	Model	Outline	
Spring clamp terminal block	Q6TE-18S	For 16-point I/O modules, 0.3 to 1.5 mm ² (22 to 16 AWG)	
Terminal block adapter	Q6TA32	For 32-point I/O modules, 0.5 mm ² (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)	
	A6TBX70-E	For negative common input modules (3-wire type)	
	A6TBY36-E	For source output modules (standard type)	
	A6TBY54-E	For source output modules (2-wire 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 power supply 0.5 A or lower	
AC100TB		For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type); 10 m *Common power supply 0.5 A or lower	
AC05TB-E		For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 0.5 m	
AC10TB-E		For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 1 m	
AC20TB-E		For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 2 m	
AC30TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-E (negative common/source type); 3 m		
AC50TB-E	For A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, and A6TBX70-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

Product	Model	Outline	
Analog input	Voltage input	Q68ADV	8 channels; input: -10 to 10 V DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
	Current input	Q62AD-DGH	2 channels; input: 4 to 20 mA DC; output (resolution): 0 to 32000, 0 to 64000; conversion speed: 10 ms/2 channels; 18-point terminal block; channel isolated; supplies power to 2-wire transmitter
		Q66AD-DG (Note 6)	6 channels; input: 4 to 20 mA DC (when 2-wire transmitter is connected), 0 to 20 mA DC; output (resolution): 0 to 4000, 0 to 12000; conversion speed: 10 ms/channel; 40-pin connector; channel isolated; supplies power to 2-wire transmitter
		Q68ADI	8 channels; input: 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
	Voltage/current input	Q64AD	4 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 80 μs/channel; 18-point terminal block
		Q64AD-GH	4 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 32000, -32000 to 32000, 0 to 64000, -64000 to 64000; conversion speed: 10 μs/4 channels; 18-point terminal block, channel isolated
Q68AD-G (Note 6)		8 channels; input: -10 to 10 V DC, 0 to 20 mA DC; output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000; conversion speed: 10 ms/channel; 40-pin connector, channel isolated	
Analog output	Voltage output	Q68DAVN	8 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
	Current output	Q68DAIN	8 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000; output: 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
	Voltage/current output	Q62DAN	2 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC, 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block, transformer isolation between power supply and output
		Q62DA-FG	2 channels; input (resolution): 0 to 12000, -12000 to 12000, -16000 to 16000; output: -12 to 12 V DC, 0 to 22 mA DC; conversion speed: 10 ms/2 channels; 18-point terminal block; channel isolated
		Q64DAN	4 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -10 to 10 V DC, 0 to 20 mA DC; conversion speed: 80 μs/channel; 18-point terminal block; transformer isolation between power supply and output
	Q66DA-G (Note 6)	6 channels; input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000; output: -12 to 12 V DC, 0 to 22 mA DC; conversion speed: 6 ms/channel; 40-pin connector; channel isolated	
Temperature input	RTD	Q64RD	4 channels, platinum RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981]), conversion speed: 40 ms/channel, 18-point terminal block
		Q64RD-G	4 channels, platinum RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981], Ni100Ω [DIN43760 1987]), conversion speed: 40 ms/channel, 18-point terminal block, channel isolated
	Thermocouple	Q64TD	4 channels, thermocouple (JIS C1602-1995), conversion speed: 40 ms/channel, 18-point terminal block
		Q64TDV-GH	4 channels, thermocouple (JIS C1602-1995), micro voltage (-100 to 100 mV), conversion speed: sampling cycle x 3, sampling cycle: 20 ms/channel, 18-point terminal block
Q68TD-G-H01 (Note 6, 10) New	8 channels, thermocouple (JIS C1602-1995, IEC 60584-1 [1995], IEC 60584-2 [1982]), conversion speed: 320 ms/8 channels, 40-pin connector		
Temperature control	Platinum RTD	Q64TCRT	4 channels, platinum RTD (Pt100, JPt100), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
		Q64TCRTBW	4 channels, platinum RTD (Pt100, JPt100), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, two 18-point terminal blocks
	Thermocouple	Q64TCTT	4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
		Q64TCTTBW	4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PLII, W5Re/W26Re), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, 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 to 20 mA DC, conversion speed (output): 25 ms/2 channels; 18-point terminal block with 5 PID control modes	

Interrupt pointer and intelligent function module dedicated instructions cannot be used.

Mountable on the extension base unit only.



Pulse I/O and positioning module

Product	Model	Outline	
Channel isolated pulse input 	QD60P8-G	8 channels, 30 kpps/10 kpps/1 kpps/ 100 pps/ 50 pps/ 10 pps/ 1 pps/0.1 pps, count input signal: 5/12 to 24 V DC	
High-speed counter 	QD62 (Note 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	
	QD62D (Note 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	
	QD62E (Note 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	
	QD63P6 (Note 5)	6 channels, 200/100/10 kpps, count input signal: 5 V DC, 40-pin connector	
	QD64D2 (Note 5) New	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	
Positioning	Open collector output (Note 5) 	QD75P1 	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 200 kpps; 40-pin connector
		QD75P2 	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
		QD75P4 	4 axes; 2-/3-/4-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
		QD70P4 	4 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
		QD70P8 	8 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
	Differential output (Note 5) 	QD75D1 	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 1 Mpps; 40-pin connector
		QD75D2 	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: 1 Mpps; 40-pin connector
		QD75D4 	4 axes; 2-/3-/4-axis linear interpolation, 2-axis circular interpolation; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; max. output pulse: 1 Mpps; 40-pin connector
		QD70D4 	4 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector
		QD70D8 	8 axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector
	With SSCNET connectivity (Note 3) 	QD75M1 	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector
		QD75M2 	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 connectivity (Note 3) 	QD75M4 	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
		QD75MH1 	1 axis; control unit: mm, inch, degree, pulse; no. of positioning data: 600/axis; 40-pin connector; with SSCNET III connectivity
		QD75MH2 	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 connectivity
	Open collector output with built-in counter function (Note 5) 	QD75MH4 	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 connectivity
		QD72P3C3 	Positioning: 3 axes, control unit: pulse, no. of positioning data: 1/axis, max. output pulse: 100 kpps, counter: 3 channels, 100 kpps, count input signal: 5/24 V DC, 40-pin connector

Interrupt pointer and intelligent function module dedicated instructions cannot be used.

Mountable on the extension base unit only.

Information module

Product	Model	Outline
MES interface 	QJ71MES96	MES interface module *MX MESInterface and CompactFlash card are required.
	Option	
	GT05-MEM-128MC	128 MB CompactFlash card
	GT05-MEM-256MC	256 MB CompactFlash card
Ethernet 	QJ71E71-100	10BASE-T/100BASE-TX
	QJ71E71-B2	10BASE2
	QJ71E71-B5	10BASE5
Serial communication 	QJ71C24N	RS-232: 1 channel, RS-422/485: 1 channel, total transmission speed of 2 channels: 230.4 kbps
	QJ71C24N-R2	RS-232: 2 channels, total transmission speed of 2 channels: 230.4 kbps
	QJ71C24N-R4	RS-422/485: 2 channels, total transmission speed of 2 channels: 230.4 kbps
Intelligent communication 	QD51 	BASIC program execution module, RS-232: 2 channels
	QD51-R24 	BASIC program execution module, RS-232: 1 channel, RS-422/485: 1 channel
	SW <input type="checkbox"/> IVD-AD51HP (Note 7) 	Software package for QD51, AD51H-S3, and A1SD51S

Control network module

MELSEC NET/H 	SI/QSI fiber optic cable	QJ71LP21-25 	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, controller 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, controller 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)
	GI-50/125 fiber optic cable	QJ71LP21G 	GI-50/125 fiber optic cable, dual loop, controller 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)
	GI-62.5/125 fiber optic cable	QJ71LP21GE 	GI-62.5/125 fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote master station)
QJ72LP25GE		GI-62.5/125 fiber optic cable, dual loop, remote I/O network (remote I/O station)	
Coaxial cable	QJ71BR11 	3C-2V/5C-2V coaxial cable, single bus, controller 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)	
CC-Link 	QJ61BT11N	Master/local station, CC-Link Ver. 2 compatible	
CC-Link/LT 	QJ61CL12	Master station	
FL-net (OPCN-2) 	Ver. 2	QJ71FL71-T-F01	10BASE-T
		QJ71FL71-B2-F01	10BASE-2
		QJ71FL71-B5-F01	10BASE-5
	Ver. 1	QJ71FL71-T	10BASE-T
		QJ71FL71-B2	10BASE-2
AS-i 	QJ71AS92	Master station, AS-Interface Specification Version 2.11 compatible	

Interrupt pointer and intelligent function module dedicated instructions cannot be used.

Interrupt pointer, intelligent function module dedicated instructions, and E-mail function cannot be used.

Mountable on the extension base unit only.

Mountable on the main base unit only.



A mode CPU, base

Product		Model	Outline
CPU		Q02CPU-A	For A mode, no. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.079 μs, program memory capacity: 144 KB
		Q02HCPU-A	For A mode, no. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 144 KB
		Q06HCPU-A	For A mode; no. of I/O points: 4096 points; no. of I/O device points: 8192 points; program capacity: 30 k steps (main), 30 k steps (sub); basic instruction processing speed (LD instruction): 0.034 μs, program memory capacity: 144 KB
Base	Main base	QA1S33B	3 slots, 1 AnS Series power supply module required, for AnS Series modules
		QA1S35B	5 slots, 1 AnS Series power supply module required, for AnS Series modules
		QA1S38B	8 slots, 1 AnS Series power supply module required, for AnS Series modules
	Extension base	QA1S65B	5 slots, 1 AnS Series power supply module required, for AnS Series modules
		QA1S68B	8 slots, 1 AnS Series power supply module required, for AnS Series modules

MELSOFT GX Series

GX Developer	SW□D5C-GPPW-E	MELSEC programmable controller programming software
	SW□D5C-GPPW-EV	MELSEC programmable controller programming software (upgrade)
GX Simulator	SW□D5C-LLT-E	MELSEC programmable controller simulation software
	SW□D5C-LLT-EV	MELSEC programmable controller simulation software (upgrade)
GX Explorer	SW□D5C-EXP-E	Maintenance tool
GX Converter	SW□D5C-CNVW-E	Excel/text data converter
GX Configurator-AD (Note 8)	SW□D5C-QADU-E	MELSEC-Q dedicated analog to digital conversion module setting/monitoring tool
GX Configurator-DA (Note 8)	SW□D5C-QDAU-E	MELSEC-Q dedicated digital to analog conversion module setting/monitoring tool
GX Configurator-SC (Note 8)	SW□D5C-QSCU-E	MELSEC-Q dedicated serial communication module setting/monitoring tool
GX Configurator-CT (Note 8)	SW□D5C-QCTU-E	MELSEC-Q dedicated high-speed counter module setting/monitoring tool
GX Configurator-TC (Note 8)	SW□D5C-QTCU-E	MELSEC-Q dedicated temperature control module setting/monitoring tool
GX Configurator-TI (Note 8)	SW□D5C-QTIU-E	MELSEC-Q dedicated temperature input module setting/monitoring tool
GX Configurator-FL (Note 8)	SW□D5C-QFLU-E	MELSEC-Q dedicated FL-net module setting/monitoring tool
GX Configurator-PT (Note 8)	SW□D5C-QPTU-E	MELSEC-Q dedicated positioning module QD70 setting/monitoring tool
GX Configurator-AS (Note 8)	SW□D5C-QASU-E	MELSEC-Q dedicated AS-i master module setting/monitoring tool
GX Configurator-QP (Note 8)	SW□D5C-QD75P-E	MELSEC-Q dedicated positioning module QD75P/D/M setting/monitoring tool
GX Configurator-CC	SW□D5C-J61P-E	CC-Link module setting/monitoring tool
GX RemoteService-I	SW□D5C-RAS-E	Remote access tool
GX Works	SW□D5C-QSET-E	A set of seven products: GX Developer, GX Simulator, GX Explorer, GX Configurator-AD, DA, SC, CT
	SW□D5C-GPPLT-E	A set of three products: GX Developer, GX Simulator, GX Explorer

MELSOFT PX Series

PX Developer (Note 8)	SW□D5C-FBDQ-E	Process control FBD software package
PX Works	SW□D5C-FBDGPP-E	A set of six products: PX Developer, GX Developer, GX Configurator-AD, DA, CT, TI

MELSOFT MX Series

MX Component	SW□D5C-ACT-E	ActiveX library for communication
MX Sheet	SW□D5C-SHEET-E	Excel communication support tool
MX MESInterface	SW1DNC-MESIF-E	MES interface module QJ71MES96 dedicated information linkage tool
MX Works	SW□D5C-SHEETSET-E	A set of two products: MX Component, MX Sheet

MELSOFT MT Series

MT Developer	SW□RNC-GSVPROE	Integrated start-up support software for Q Series motion controllers
	SW□RNC-GSVSETE	Integrated start-up support software for Q Series motion controllers, A30CD-PCF (SSC I/F card), Q170CDCBL03M cable

MELSOFT MR Series

MR Configurator (Note 9)	MRZJW3-SETUP221	Servo setup software for PC
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PC interface board

Product		Model	Outline
MELSEC NET/H (10)	SI/QSI fiber optic cable	Q80BD-J71LP21-25	PCI bus, Japanese/English OS compatible, SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, controller 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, controller network (control/normal station), with external power supply function
	GI-50/125 fiber optic cable	Q80BD-J71LP21G	PCI bus, Japanese/English OS compatible, GI-50/125 fiber optic cable, dual loop, controller network (control/normal station)
	GI-62.5/125 fiber optic cable	Q80BD-J71LP21GE	PCI bus, Japanese/English OS compatible, GI-62.5/125 fiber optic cable, dual loop, controller network (control/normal station)
	Coaxial cable	Q80BD-J71BR11	PCI bus, Japanese/English OS compatible, 3C-2V/5C-2V coaxial cable, single bus, controller network (control/normal station)
CC-Link	Q80BD-J61BT11N	PCI bus, Japanese/English OS compatible, master/local interface board, CC-Link Ver. 2 compatible	

Note 1) Compatible with the high performance model only.

Note 2) "Positive common" means using the module by connecting the common terminal to positive DC power; "negative common" means using the module by connecting the common terminal to negative DC power.

Note 3) The connector is not enclosed. Prepare A6CON1, A6CON2, A6CON3, or A6CON4 separately.

Note 4) The connector is not enclosed. Prepare A6CON1E, A6CON2E, or A6CON3E separately.

Note 5) The connector is not enclosed. Prepare A6CON1, A6CON2, or A6CON4 separately.

Note 6) The connector is not enclosed. Prepare A6CON4 separately.

Note 7) Runs in Windows command prompt.

Note 8) Not compatible with the A mode.

Note 9) MRZJW3-SETUP211 does not support MR-J3-500A or later and MR-J3-B. Use MRZJW3-SETUP221 or later.

Note 10) Depending on the combination of the power supply module and base unit, the mounting position (slot) of Q68TD-G-H01 is restricted. Refer to the manual for more details.

Mitsubishi Programmable Controllers

Precautions for Choosing the Products

This catalog explains the typical features and functions of the Q Series programmable controllers and does not provide restrictions and other information on usage and module combinations. When using the products, always read the user's manuals of the products.

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- To use the products given in this catalog properly, always read the "manuals" before starting to use them.
- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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