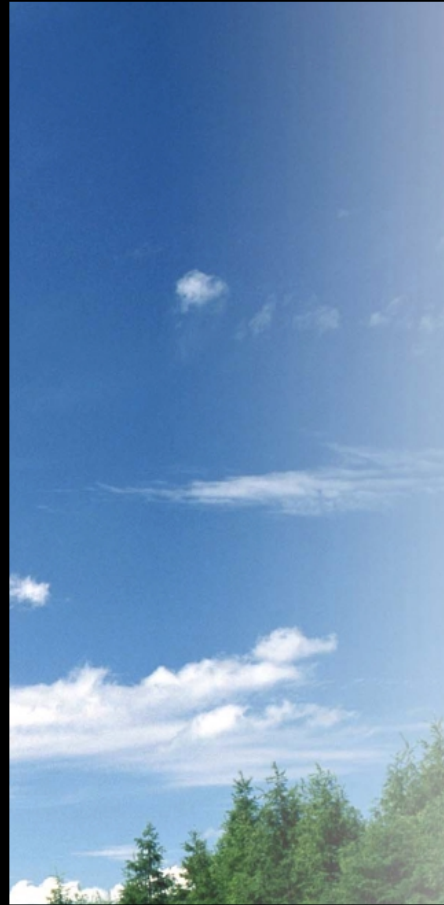# MITSUBISHI

Mitsubishi Programmable Logic Controller

MELSEC-Q

Qseries

MELSOFT

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

ISO 14001
JACO
JAPAN AUDIT AND QUALITY CERTIFICATION ORGANIZATION FOR ENVIRONMENT AND QUALITY
UKAS
ENVIRONMENTAL
MANAGEMENT
051

BVQi
ISO 9001
UKAS
QUALITY
MANAGEMENT
008

Evolution and Inheritance

SPACE SAVING AND WIRING SAVING

To save machinery and equipment space and to reduce costs by decreased wiring processes, the Q series has a smaller mounting area and greater freedom of installation.

FLEXIBLE SYSTEM CONFIGURATION

Max. 252k-step program capacity, 8192 points of I/O control, and standard RAM memory capacity increased up to 128k words, allowing optimal configuration of small to large scale systems.

COMPACT CONTROL SYSTEM

The basic model designed for small-scale applications realizes a cost-effective, compact system.

HIGHLY DEVELOPED CONTROL

By using multiple CPUs loaded on the same main base, a fast, high performance multiple PLC system can be achieved.

ENHANCED INFORMATION COMMUNICATION OF FACTORY AUTOMATION (1)(2)

Versatile networks and rapid data transmission. You can realize advanced information systems ranging from a dedicated network to an open network. The Internet functions such as E-mail, FTP server and automatic notification ensure the transmission of production information.

INCREASED PERFORMANCE AND ACCURACY OF FACILITIES

The sequence-dedicated processor, high-speed bus transmission function and event interrupt function ensures flexible response to systems requiring high performance and high speed.

IMPROVEMENT IN PROGRAM PRODUCTIVITY (1) TO (3)

Productivity is further increased by the industry's cutting-edge program structuring, standardization and program execution system.

INCREASED NEW POSSIBILITIES OF FACTORY AUTOMATION (1) TO (5)

A wide variety of intelligent function modules increase the application range. Also, using together with partner products, they further increase the new possibilities of the Q series.

WIDE ASSORTMENT OF HIGH-PERFORMANCE MODULES

Wide selection of various intelligent function and network modules which are user-friendly, faster and more accurate.

## PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (1) TO (3)

The integration of simulation and utility tools into development environment improves user design and development efficiency.

EASY MAINTENANCE

Providing seamless remote/online program maintenance.

UTILIZATION OF EXISTING ASSETS

We offer the means to utilize the assets of the A/QnA series and effectively use the excellent functions and performance capabilities of the Q series.
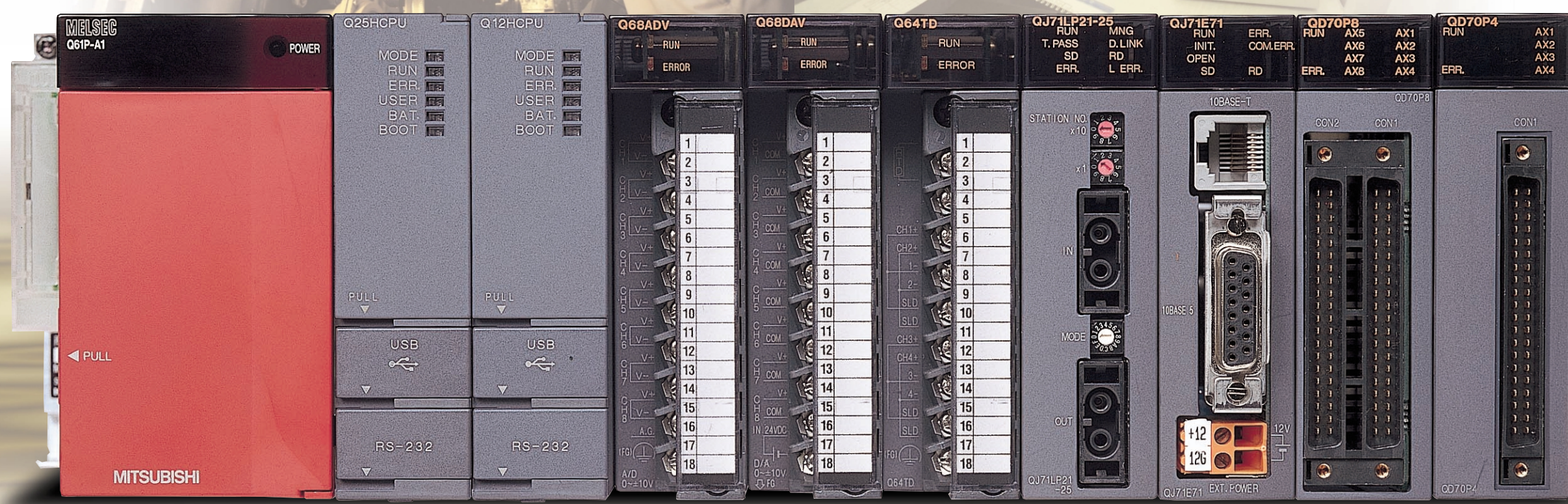
Actual-size image of Q38B base unit

The Q series is available in high-performance models designed for mid- and large-scale control applications and basic models designed for small-scale control applications. When choosing the products, always check the specifications in the Q series data book.
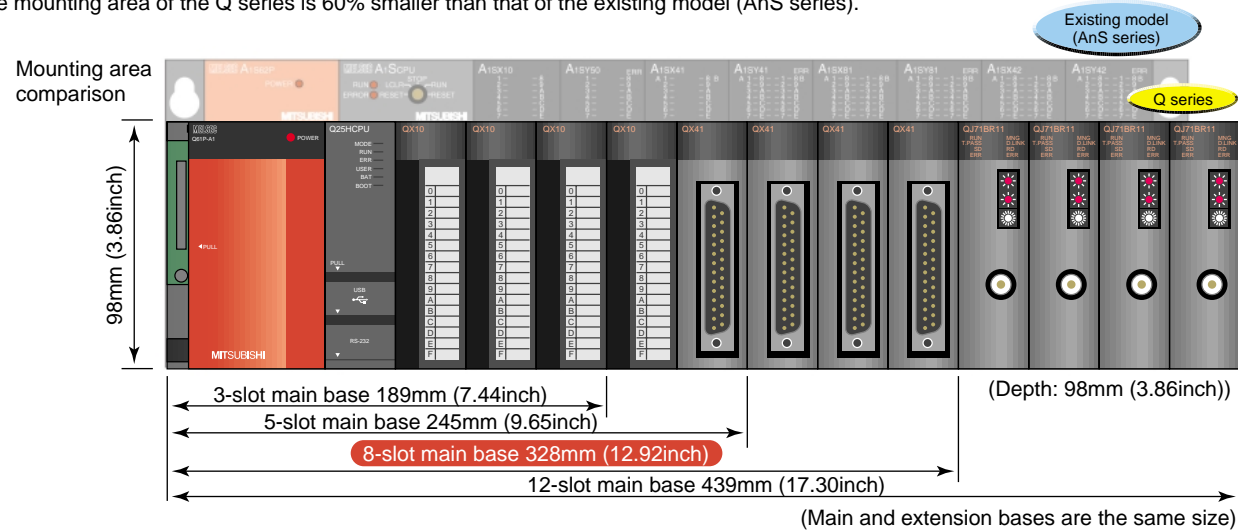
SPACE SAVING AND WIRING SAVING

FLEXIBLE SYSTEM CONFIGURATION

■ Mounting Area

The mounting area of the Q series is 60% smaller than that of the existing model (AnS series).

Existing model (AnS series)

Q series

Mounting area comparison

98mm (3.86inch)

3-slot main base 189mm (7.44inch)
5-slot main base 245mm (9.65inch)
8-slot main base 328mm (12.92inch)
12-slot main base 439mm (17.30inch)

(Depth: 98mm (3.86inch))

(Main and extension bases are the same size)

■ Mounting Freedom

The Q series has a wide assortment of 2, 3, 5, 8 and 12-slot bases. The freedom of mounting space ensures the optimum configuration. Extension bases can be connected directly by extension cables without extension base connecting modules. Extension bases that do not require a power supply module save space and costs.
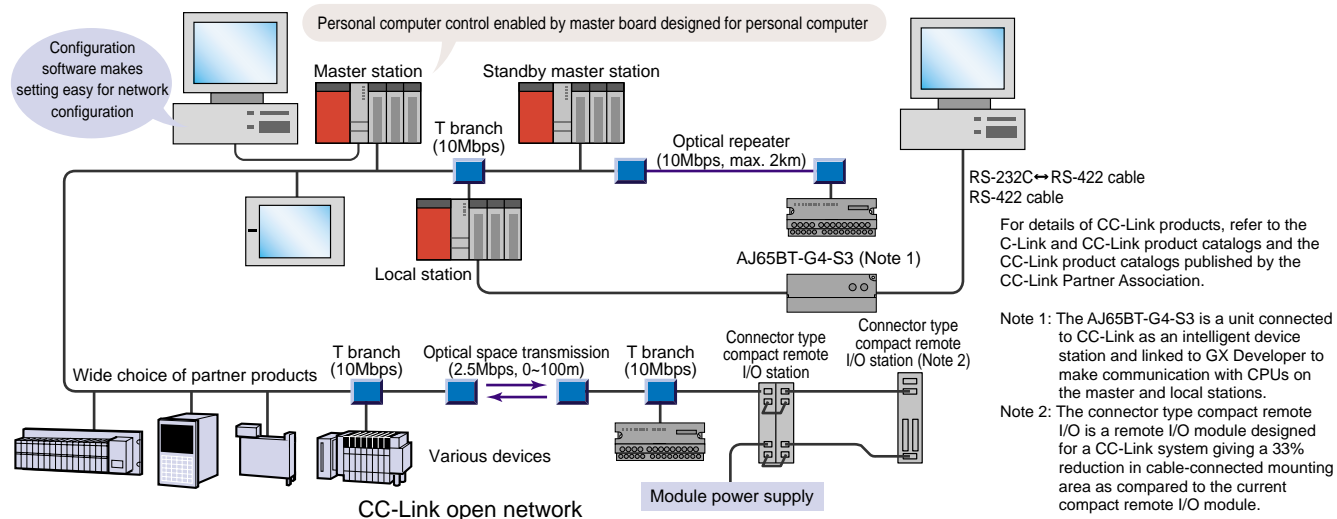
AnS series

Q series

Base unit types (Requiring power supply module)

Number of I/O Slots	Main Base	Extension Base	Mounting Size (mm(inch))
3	Q33B	Q63B	189(7.44)×98(3.86)
5	Q35B	Q65B	245(9.65)×98(3.86)
8	Q38B	Q68B	328(12.92)×98(3.86)
12	Q312B	Q612B	439(17.30)×98(3.86)

Base unit types (Requiring no power supply module)

Number of I/O Slots	Main Base	Mounting Size (mm(inch))
2	Q52B NEW	106(4.17)×98(3.86)
5	Q55B NEW	189(7.44)×98(3.86)

*The base units are designed for the Q series I/O, intelligent function and network modules. The A and AnS series modules cannot be loaded on the base units given in the above table.

■ CC-Link Open Network for Wiring Saving

The Q series uses CC-Link open network to reduce wiring, achieving the reduction in the number of wiring processes.

Personal computer control enabled by master board designed for personal computer

Configuration software makes setting easy for network configuration

Master station   Standby master station

T branch (10Mbps)

Optical repeater (10Mbps, max. 2km)

RS-232C⟷RS-422 cable
RS-422 cable

Local station

AJ65BT-G4-S3 (Note 1)

For details of CC-Link products, refer to the C-Link and CC-Link product catalogs and the CC-Link product catalogs published by the CC-Link Partner Association.

Note 1: The AJ65BT-G4-S3 is a unit connected to CC-Link as an intelligent device station and linked to GX Developer to make communication with CPUs on the master and local stations.

Wide choice of partner products

T branch (10Mbps)   Optical space transmission (2.5Mbps, 0~100m)   T branch (10Mbps)   Connector type compact remote I/O station   Connector type compact remote I/O station (Note 2)

Various devices

Module power supply

CC-Link open network

Note 2: The connector type compact remote I/O is a remote I/O module designed for a CC-Link system giving a 33% reduction in cable-connected mounting area as compared to the current compact remote I/O module.

■ Program Capacities and Large Standard RAM Capacities NEW

To construct small to large scaled systems, the Q series has a wide assortment of CPU modules (Note 3) having 8k to 252k step program capacities and up to 128k words, large-capacity standard RAMs (Note 4), enabling a selection of the CPU modules which matches the machinery/equipment control capabilities.
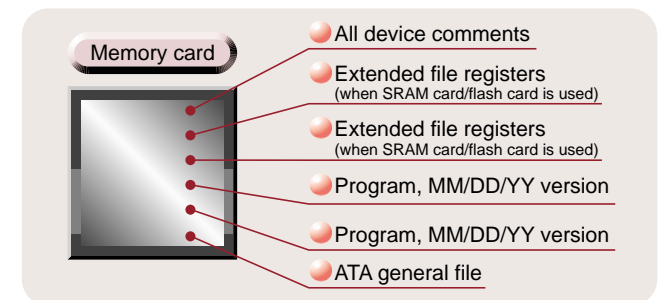
	CPU	Program Capacities (Steps)	Device Memory (Words)	Standard RAM (Words)	Memory Card (Number of slots)
Basic model	Q00JCPU NEW	8k	18k	No	No
	Q00CPU NEW				
	Q01CPU NEW	14k			
High-performance model	Q02CPU	28k	29k	32k	1
	Q02HCPU				
	Q06HCPU	60k			
	Q12HCPU	124k		128k	
	Q25HCPU	252k			

Note 3: Memory that stores the data used in sequence programs such as file registers and local devices (with the exception of the Q00J/Q00/Q01CPU). 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.
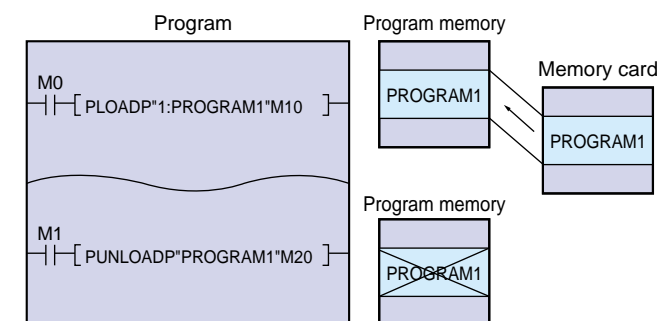
Note 4: Memory which stores the data used in sequence programs such as file registers, local devices etc. As a built-in type RAM, the sequence program having a lot of file registers and local devices stored in standard RAM can run rapidly.

■ Extended Memory

The high-performance model QCPU is equipped with a small PC card slot to insert up to 32MB (when using the ATA card) extended memory card. By loading large-capacity extended memory, not only large-capacity file management is possible, but also comment settings for all data devices and old programs for correction history can be stored in memory.

Memory card

All device comments
Extended file registers (when SRAM card/flash card is used)
Extended file registers (when SRAM card/flash card is used)
Program, MM/DD/YY version
Program, MM/DD/YY version
ATA general file

Programs can also be stored in the memory card, and can be uploaded from the memory card by the dedicated instruction (PLOAD) and executed. This allows the program memory to be virtually extended.

Program   Program memory

```
M0
├┤├─[PLOADP"1:PROGRAM1"M10]
```

Memory card

PROGRAM1

PROGRAM1

Program memory

```
M1
├┤├─[PUNLOADP"PROGRAM1"M20]
```

PROGRAM1

■ 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.

CPU	Number of I/O Points (Note 7)	Number of I/O Device Points (Note 6) (Including remote I/O points)
Q00JCPU	256	2048
Q00CPU	1024	
Q01CPU		
Q02CPU	4096	8192
Q02HCPU		
Q06HCPU		
Q12HCPU		
Q25HCPU		

Note 6: 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.

Note 7: Number of I/O points on main and extension bases directly controllable by a CPU module

■ 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 of extension base layout.

CPU	Number of Extension Base Units	Number of Loaded Modules	Overall Extension Cable Length (m)
Q00JCPU	2 (max.)	16 (max.)	13.2 (max.)
Q00CPU	4 (max.)	24 (max.)	
Q01CPU			
Q02CPU	7 (max.)	64 (max.)	
Q02HCPU			
Q06HCPU			
Q12HCPU			
Q25HCPU			

*If a 12-slot base is used, the maximum number of I/O, intelligent function and network modules loaded is 16/24/64.

Main base

Max. 64 modules

Overall distance :13.2m (43.28feet)

Seventh extension base
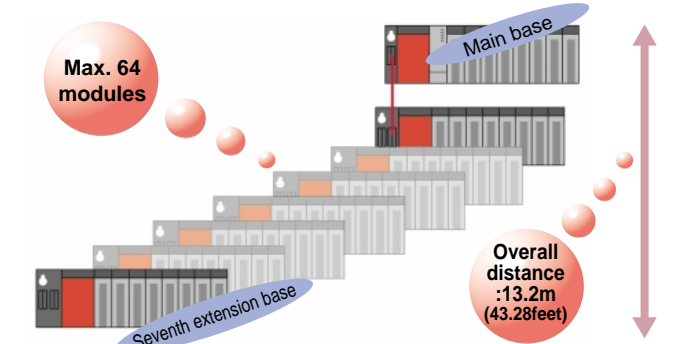
■ Variable Time Constant of Input Module

The DC input module's input response time can be changed. The response time can be selected according to your application, e.g. response time of 0.1ms (Note 8) for fast response or 70ms for a reliable response (in consideration of noise margin, etc.). (Note 9).

Note 8: When using the QX40-S1
Note 9: QX40-S1: Select from 0.1, 0.2, 0.4, 0.6 and 1ms.
QX4*, QX7*, QX8*: Select from 1, 5, 10, 20 and 70ms.

COMPACT CONTROL SYSTEM

HIGHLY DEVELOPED CONTROL (1)

■ Basic Models (Q00J, Q00, Q01CPUs)

NEW

● Used with the Q series I/O and intelligent function modules, the QCPU basic model achieves a compact system of high performance, high functions and excellent cost performance. For example, a compact system can be configured by connecting the power supply-free Q5 B extension base to the Q00JCPU, a combination of a power supply, a CPU and a base. A network system can also be configured by loading an Ethernet, MELSECNET/H or CC-Link network module.

● The Q00JCPU is a CPU unit consisting of a CPU module, a power supply module and a main base unit (5 slots). (The power supply module is designed for 100 to 240V.) The Q00 and Q01CPUs are discrete CPU modules.

● Though the program capacity of the Q00J/Q00CPU is 8k steps and that of the Q01CPU is 14k steps, the small code size used for the program instructions allows creation of control programs about twice larger than those of the conventional A series.

● The device memory is 18k words, about five times greater than that of the AnSCPU. Also, it permits device assignment to be changed within 16k words. Further, the Q00/Q01CPU incorporates RAM as standard for use as file registers. The file registers have 32k words, about four times greater than those of the AnSHCPU. They allow a compact system to handle large volumes of data.

● The QCPU basic models contain flash ROMs. The standard CPU can perform ROM operation without using a memory card. (Unlike the AnSHCPU, you need not prepare a memory cassette.)
You can perform write to flash ROM easily using GX Developer (Ver. 7 or later). (Such troublesome operation as to create a ROM with a ROM writer is unnecessary.)

● The Q00/Q01CPU basic models have a serial communication function. The RS-232 interface of the CPU can make communication with an external device that can communicate using the MC protocol. This function eliminates the need for a serial communication module, reducing costs.
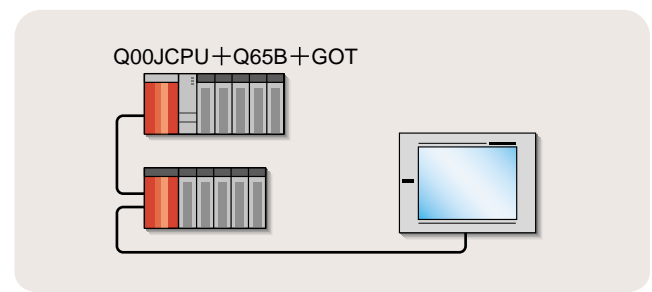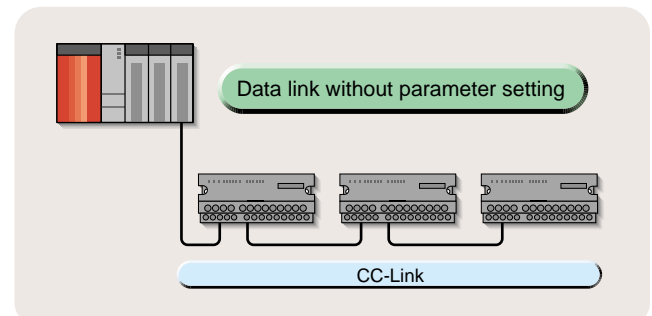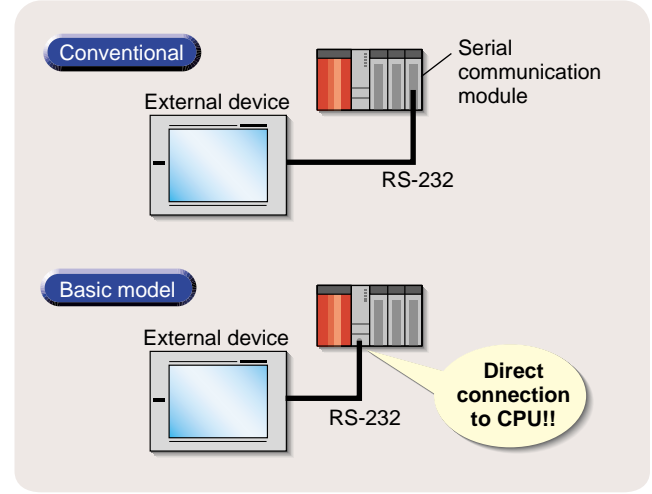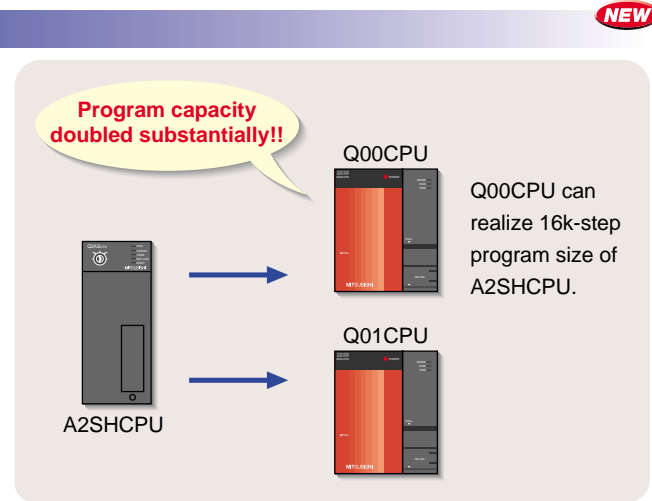
● With an automatic CC-Link start, you can start CC-Link and refresh data without setting parameters, reducing the man-hours of parameter setting.

● The Q00JCPU can be used to configure a system consisting of a main base, an extension base and a GOT (bus connection) to be ready for system expansion.

Note: You cannot mount the bus extension connector box (A9GT-QCNB) to the main base of the Q00JCPU. The QCPU basic model does not accept the A/AnS series modules for extension.
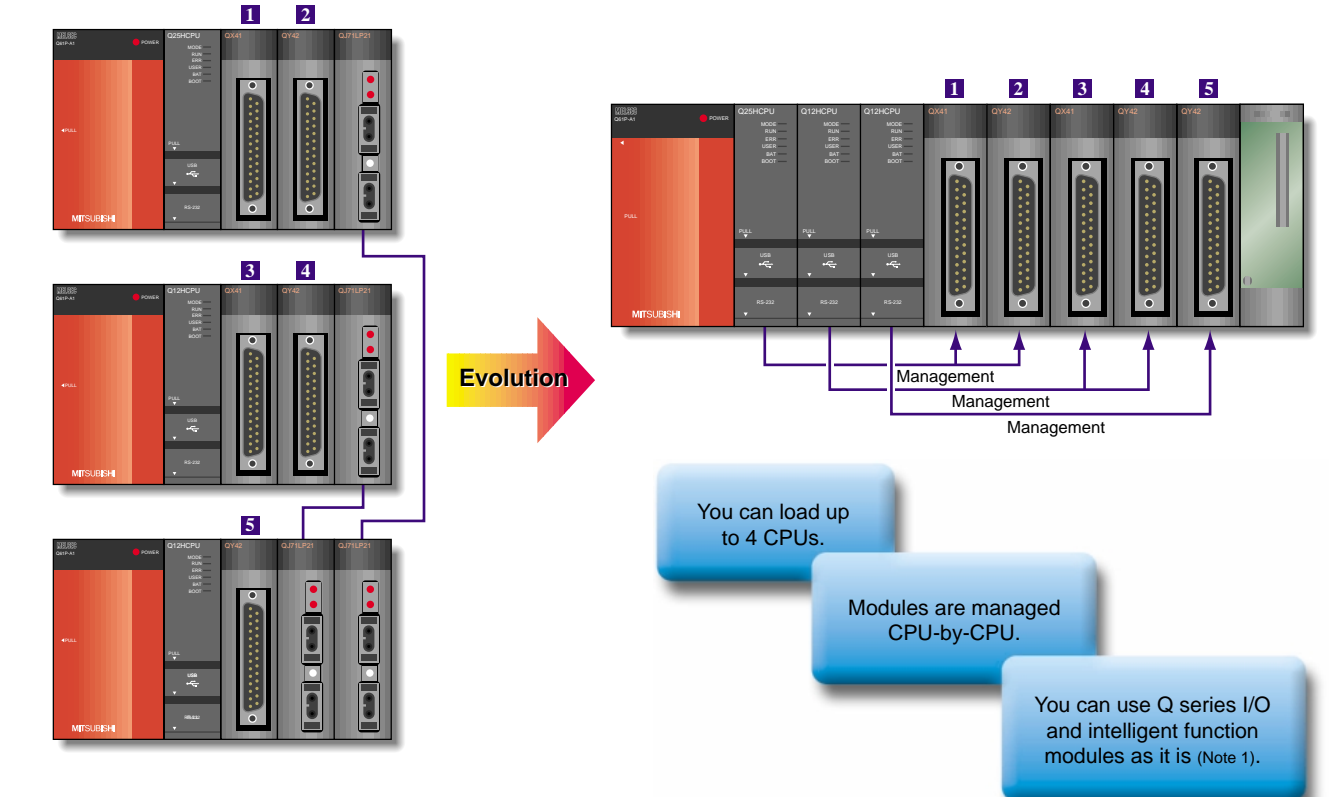
Program capacity doubled substantially!!

Q00CPU

Q00CPU can realize 16k-step program size of A2SHCPU.

Q01CPU

A2SHCPU

Conventional

External device

Serial communication module

RS-232

Basic model

External device

Direct connection to CPU!!

RS-232

Data link without parameter setting

CC-Link

Q00JCPU＋Q65B＋GOT

■ Multiple PLC System Configuration

The Q series can utilize a multiple PLC system where multiple high-performance CPUs are loaded on the same main base to manage I/O and intelligent function modules CPU-by-CPU in a control system. In the multiple PLC system, you can choose CPUs according to your application. With the multi-CPU system, inter-CPU communication uses two methods, cyclic communication, which uses automatic refreshing for periodic communication, and transient communication, which uses dedicated instructions for communications. This system allows the sequence control and data processing that were conventionally performed by a single CPU to be shared by multiple dedicated CPUs, improving speed and performance in the whole system and expanding its application range.

Evolution

Management
Management
Management

You can load up to 4 CPUs.

Modules are managed CPU-by-CPU.

You can use Q series I/O and intelligent function modules as it is (Note 1).

Note 1: There are restrictions on the number and versions for intelligent function modules. Check details in the Q series data book.

■ Access to Multiple CPUs with GX Developer

Setting parameters with GX Developer makes multiple PLC system construction easy. (Note 2)
By merely linking GX Developer to one CPU, you can execute programming/monitoring function on other CPUs without swapping cables. (Note 3)

No need to reconnect cables.
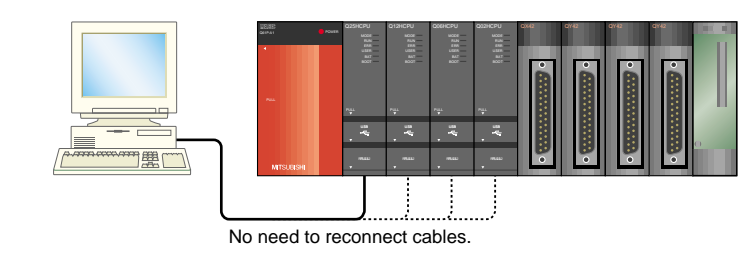
Note 2: You must set the parameters which define the multiple PLC system configuration. Check details in the Q series data book.
Note 3: For the Q series motion controllers, check the Q series motion controller manuals.
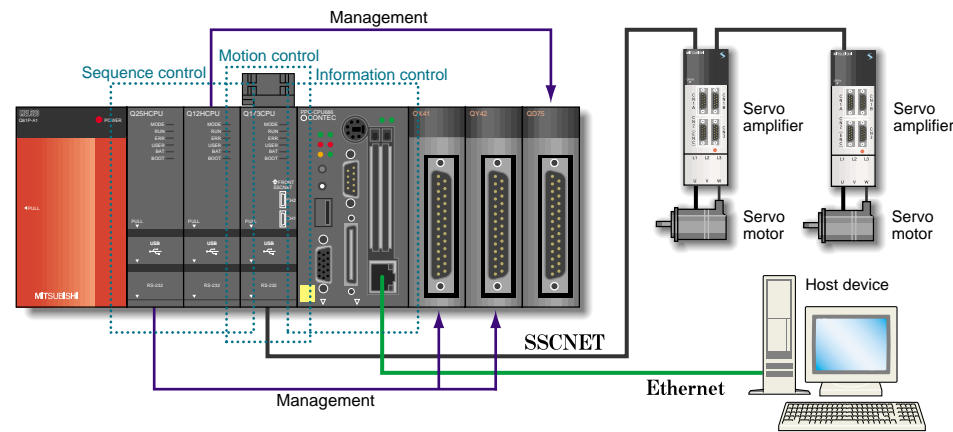
HIGHLY DEVELOPED CONTROL (2)

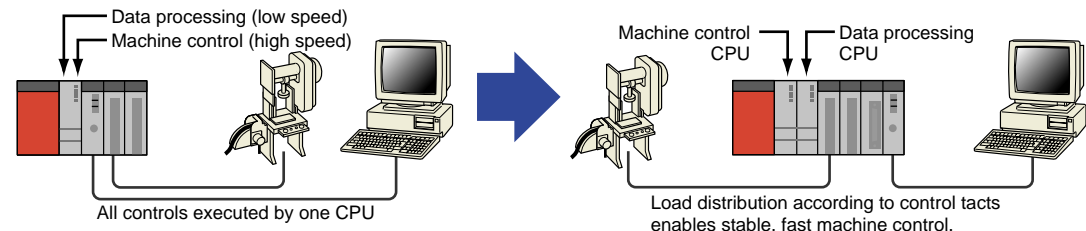## ■ Integration of Motion CPU and Personal Computer CPU *NEW*

The Q series has the multiple cpu system function which also permits PLC CPUs and motion CPUs to be loaded together, enabling utilization of their respective strong points and construction of an optimal system. A motion CPU can use SSCNET that rapidly controls up to 96 axes in a single system and saves wiring. A personal computer CPU can access I/O and intelligent function modules from a C-written application program. It can also communicate with higher level devices from an Ethernet communication port.

Management
Motion control
Sequence control
Information control
Servo amplifier
Servo amplifier
Servo motor
Servo motor
SSCNET
Management
Host device
Ethernet

● A motion CPU is good at high-leveled, complex motion control. It can speed up motion operation cycles and control up to 32-axis per CPU. The Q173CPU (32-axis) and Q172CPU (8-axis) are available. (For details, refer to the Q series motion controller manual.)
● The operation cycle is 0.8ms/8 axes, 1.7ms/16 axes or 3.5ms/32 axes.
● SSCNET is a network where the motion CPU and servo amplifiers are connected with minimum wiring by high-speed serial communication.
SSCNET:Servo System Controller NETwork

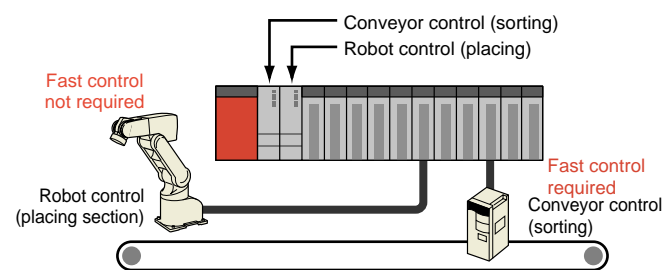## ■ Combined Use of multiple PLC CPUs (Load distribution)

Multiple Q series PLC CPUs can be used together to allow a single system to exercise controls different in tact time, e.g. sequence control and data processing.

Data processing (low speed)
Machine control (high speed)
All controls executed by one CPU

Machine control CPU
Data processing CPU
Load distribution according to control tacts enables stable, fast machine control.

● If load in excess of a CPU's processing capability is applied to a large scaled system due to a large program size, using multiple CPUs to distribute the load improves the overall performance of the system.

CPU for process 1
CPU for process 2
CPU for process 3
Process 1 Process 2 Process 3
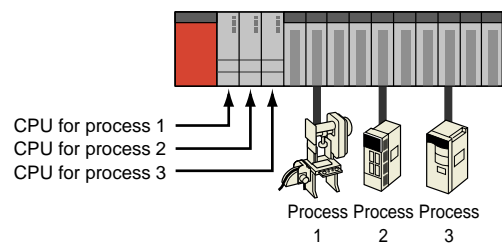
● When one process requires fast processing and the other does not, they can be handled respectively by two CPUs, providing stable (unaffected by the other process) and rapid control.

Conveyor control (sorting)
Robot control (placing)
Fast control not required
Robot control (placing section)
Fast control required
Conveyor control (sorting)

■ GOT Connection

The GOT-A900/F900 series can be connected by the CPU RS-232 port. Connected with a serial communication module, Ethernet or further a Q series high-speed bus, the GOT-A900 series can achieve fast response. The GOT-A900 series is also compatible with a multiple PLC system. By specifying the CPU No. at the time of monitor device setting, you can monitor the data of each CPU on a single screen. You can also monitor the ladder of each CPU.
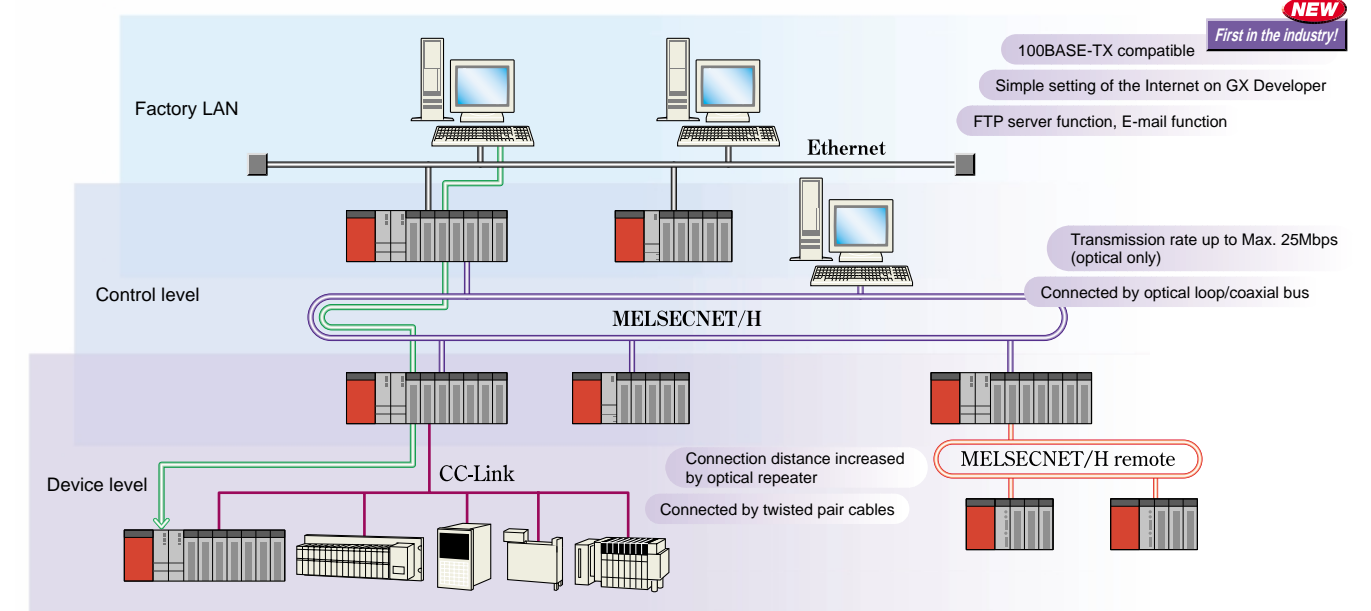
ENHANCED INFORMATION OF FACTORY AUTOMATION (1)

■ Seamless Communication

The Q series Ethernet, MELSECNET/H and CC-Link have achieved seamless access beyond the differences in network type and network hierarchy. Data can be transferred between any networked PLCs and monitored/programmed with GX Developer. (Note 1)

NEW First in the industry!
100BASE-TX compatible
Simple setting of the Internet on GX Developer
FTP server function, E-mail function

Factory LAN
Ethernet
Control level
Transmission rate up to Max. 25Mbps (optical only)
Connected by optical loop/coaxial bus
MELSECNET/H
Device level
CC-Link
Connection distance increased by optical repeater
Connected by twisted pair cables
MELSECNET/H remote

Note 1: Accessible to a PLC on a network located beyond max. 7 PLCs serving as gateways connected to two networks.

■ Fast, Reliable Network

In addition to 10Mbps compatible with the conventional MELSECNET/10, the MELSECNET/H has a choice of two operation modes: the MELSECNET/H mode having Max. 25Mbps transmission rate; and the MELSECNET/10 mode compatible with the conventional A/QnA series.
In the MELSECNET/H mode, link scans are as fast as 10ms on a network of 8 stations having 2k link relay points and 2k link register points.

Number of link relay (LB)/link register (LW) points per network

MELSECNET/H	16k points each
MELSECNET/10	8k points each

Fast transmission (link scan time) (1) (Note 2)

|	
MELSECNET/H (At 25Mbps)	10ms
MELSECNET/10	15ms

Note 2: When 2k points of link relays (LB) and registers (LW) are assigned to 8 stations, respectively

Fast transmission (link scan time) (2) (Note 3)

MELSECNET/H (At 25Mbps)	34ms
MELSECNET/10	60ms

Note 3: When 2k points of link relays (LB) and registers (LW) are assigned to 64 stations, respectively

■ MELSECNET/H Boards for Personal Computer

The Q series has a wide assortment of personal computer boards compatible with the MELSECNET/H network system. These boards maintain the upward compatibility of the conventional MELSECNET/10 board, and use the dedicated software package for board setting to simplify troublesome work. Furthermore, the RAS functions installed ensure ease of error detection.

MELSECNET/H board (PCI BUS)
QJ71LP21-25
QJ71LP21-25
QJ71LP21-25
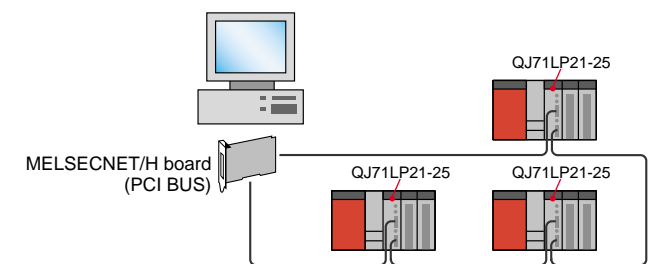
■ MELSECNET/H Remote

The high-performance model QCPU can configure a remote I/O network using the Q series I/O for large-scale, large-capacity centralized management and distributed control.
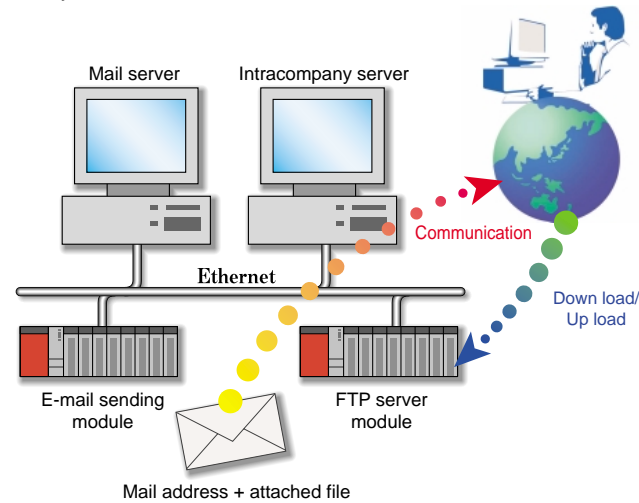
QJ71LP21-25
QJ72LP25-25
Remote master
QJ72LP25-25
QJ72LP25-25
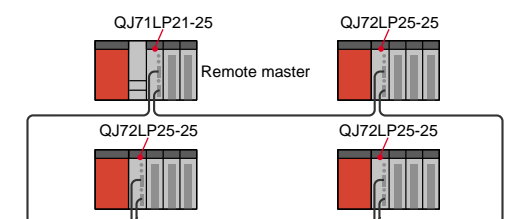
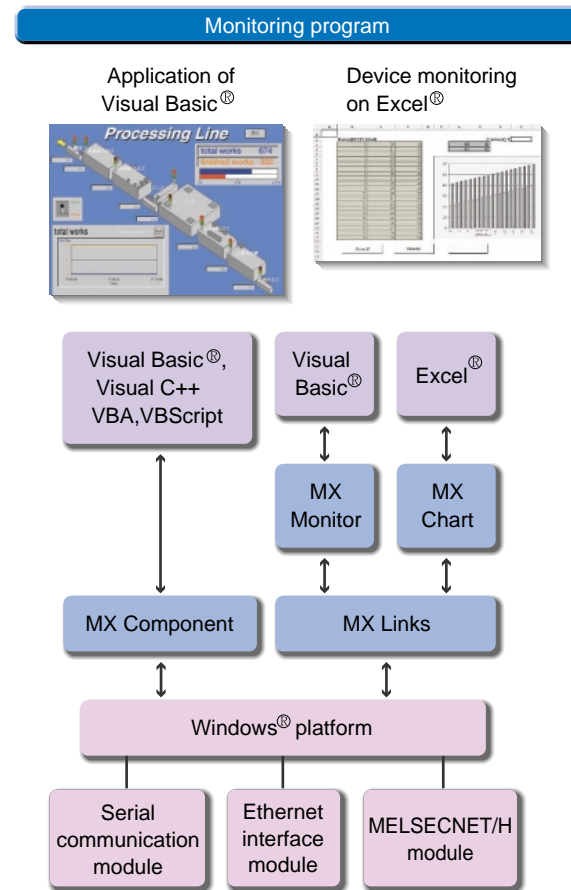# ENHANCED INFORMATION OF FACTORY AUTOMATION (2)

■ Utilization of the Internet and Intranet

The Q series Ethernet modules include the E-mail communication function as standard. You can transfer production information to/from anywhere in the world and configure a remote monitoring/controlling system easily. For the Intranet, the FTP server function and MC protocol perform program download/upload easily.

Mail server Intracompany server

Communication

Ethernet

Down load/
Up load

E-mail sending
module FTP server
module

Mail address + attached file

■ Security Function

The high-performance model QCPU has introduced a remote password function to provide security for remote operations. A remote password is changed/deleted from a local CPU.

Enter a
password.
****

Higher-level
network

Ethernet

Modem

■ Automatic Notice

A serial communication module (RS-232/422) connected to a personal computer has a function to automatically send data from the PLC to the personal computer when a given condition holds. Also, on Ethernet, this function can be used for E-mail transmission. Use of this function permits rapid transmission of alarm occurrence information, etc., without waiting for polling from the personal computer.

Automatic notice
of alarm information
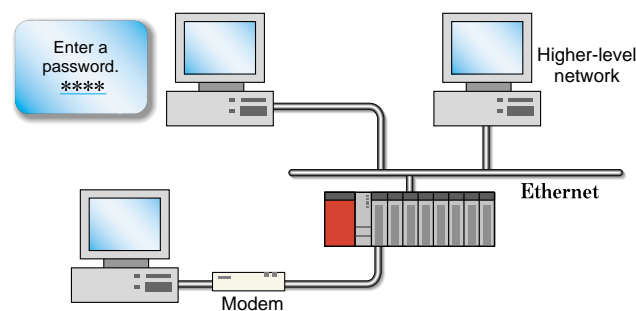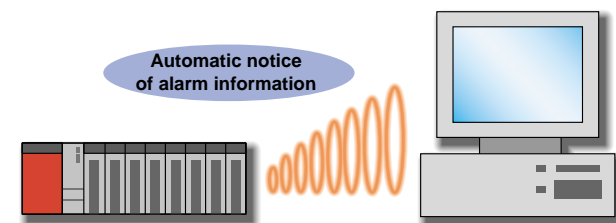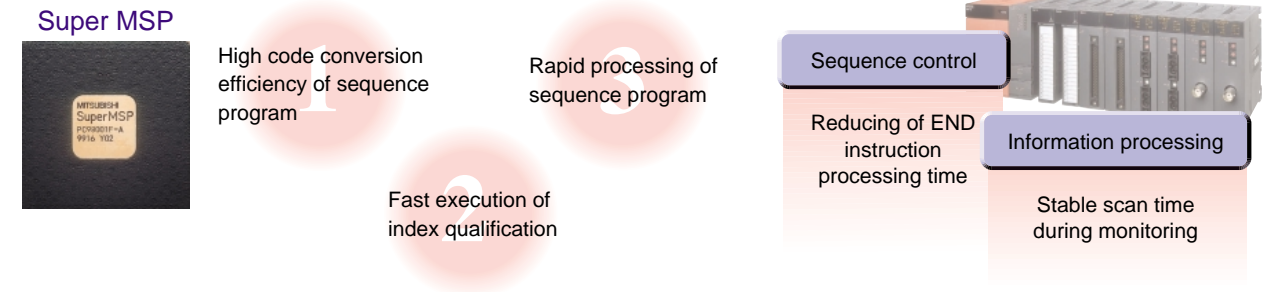
■ Communication Support Software Packages

The MX series communication support software packages are software tools for Windows® for easy connection of a host monitoring/controlling personal computer to the Q series (connection to QnA, A or FX series also possible). You can easily create a monitoring/control application on Visual Basic®, Visual C++® or Excel®, without being conscious of the different complicated communication protocols of Ethernet, MELSECNET/H, CC-Link, RS-232 serial communication or CPU programming port (RS-232 or USB).
Supporting the VBScript language, MX Component (Ver. 2 or later) can configure a remote monitoring/operating system via the Internet/intranet using Internet Explorer®. For example, when the Web pages using VBScript are made available by a factory, specifying the URL of that factory from a remote location enables remote monitoring/operation to be performed to the factory via the Internet/intranet.

Monitoring program

Application of
Visual Basic®

Device monitoring
on Excel®

Processing Line

Visual Basic®,
Visual C++®
VBA, VBScript

Visual
Basic®

Excel®

MX
Monitor

MX
Chart

MX Component

MX Links

Windows® platform

Serial
communication
module

Ethernet
interface
module

MELSECNET/H
module

Note: VBA (Excel® 2000/Access® 2000) and VBScript are supported by MX Component Ver. 2 or later.

INCREASED PERFORMANCE AND ACCURACY OF FACILITIES

■ Concurrent Processing of CPU and Sequence-Dedicated Processor

Having a built-in Super MSP (MELSEC Sequence Processor) processor which exercises optimal sequence control, high-performance model QCPUs have been improved substantially in sequence program code conversion efficiency and processing speed. For example, index qualification (useful for program structuring) will not cause a delay of processing time and in a large-scaled system, the CPU can rapidly run a structured program which uses index qualification many times. Also, concurrent execution of information communication processing and control ensures fast and stable control.

Super MSP

High code conversion
efficiency of sequence
program

Rapid processing of
sequence program

Fast execution of
index qualification

Sequence control

Reducing of END
instruction
processing time

Information processing

Stable scan time
during monitoring

■ Operation Processing Speeds

The high-speed type CPU in Q series family has high processing speed: basic instruction processing time is 34ns and PC MIX value is 10.3 (Note 1). It is about 5 times faster than A2USHCPU-S1CPU and about 2.7 times faster than the Q2ASHCPU. The CPU has dramatically increased floating-point operation speeds for PID and other arithmetic functions.

CPU operation processing speeds

Instruction \ CPU	Basic Model			High-performance Model	
	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU Q06HCPU Q12HCPU Q25HCPU
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+)	—	—	—	1815ns	782ns
PC MIX value (Instruction/μs)	1.6	2.0	2.7	4.4	10.3

PC MIX value comparison

Q25HCPU	10.3
Q2ASHCPU	3.8
A2USHCPU-S1	2.0

5 times faster

PC MIX value (instruction/μs)

Q01CPU	2.7
Q00CPU	2.0
Q00JCPU	1.6
A2SHCPU	0.5

5 times faster

PC MIX value (instruction/μs)

Note 1: The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1μs. A larger value indicates a higher processing speed.
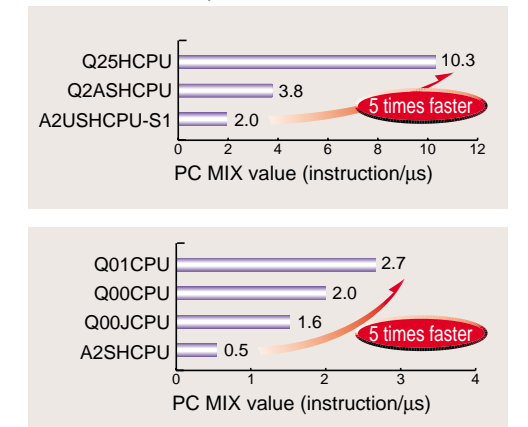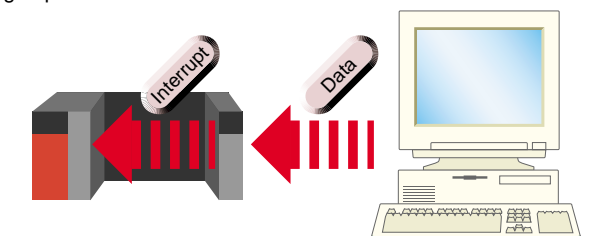
■ Improved Bus Performance

The system bus speed has been increased to shorten the total transmission time even while communication data capacity increases. The data transfer speed between CPU and network modules is about 4 to 8 times higher than that of the conventional QnA series. This increased speed can minimize the influence of large-capacity data communication on the CPU scan time.

High-speed bus
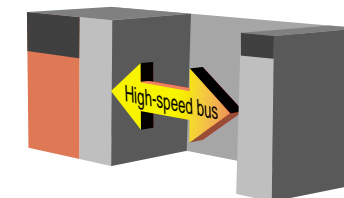
■ Event Interrupt

The high-performance model QCPU allows a CPU interrupt program to be started up from a network or intelligent function module. With this function, the CPU can rapidly respond to an event that occurs asynchronously with the program scan of the PLC, e.g. data receiving from a network or value compare of a high-speed counter.

Interrupt Data

# PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (1)

■ Program Structuring/Standardization

The high-performance model QCPU allows multiple programs designed for different machinery/equipment operating function basis to be created and executed, therefore making program's easy to be appropriated and understood. Those programs furthermore, can also be defined to multiple execution types, e.g. initial execution, slow execution, cyclic execution and scan execution. The variable execution type programs can be applied different on type operations. The GX Developer comprehensive programming tool enables SFC, Label or FB programming which is more suitable for structuring and standardization, in addition to ladder and list programming.
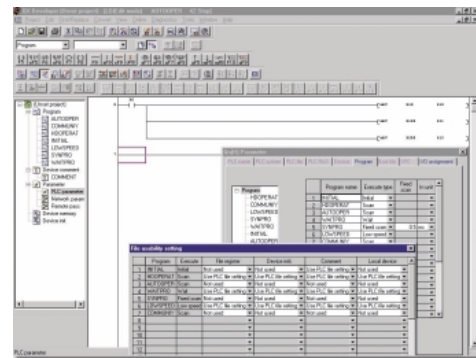
(Ladder (circuit representation))

Manual operation program
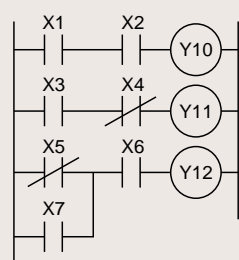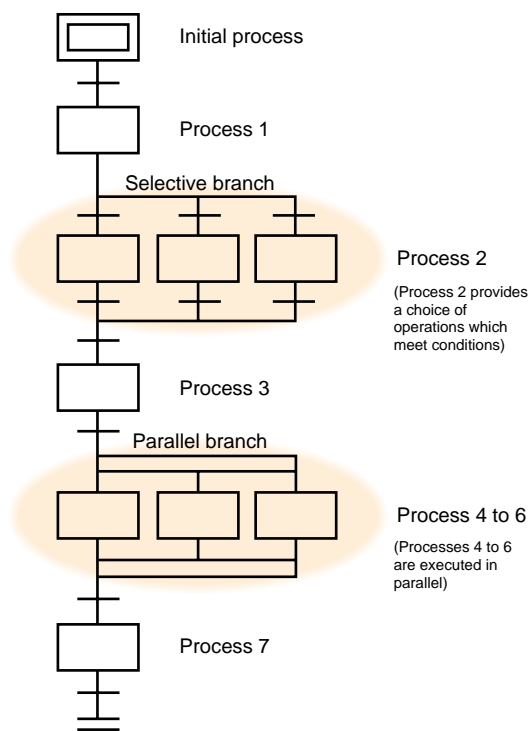

(Ladder (list representation))

Communication processing program

```
LD X50
MOVP K1 D0
MOVP K4 D3
MOVP H3412 D10
MOVP H0BC5A D11
MOVP H0F0DE D12
MOVP H0A0D D13
GP.BIDOUT U8 DO D10 M0
```


■ Compatibility with SFC (Sequential Function Chart)

The high-performance model QCPU exploits of SFC programs which are frequently used in process-based control. Representing automatic operation processes, an SFC program is structured, easy to create and excellent in descriptive performance. SFC-specific functions ensure ease of creating semi-automatic and manual programs.

Initial process

Process 1

Selective branch

Process 2
(Process 2 provides a choice of operations which meet conditions)

Process 3

Parallel branch

Process 4 to 6
(Processes 4 to 6 are executed in parallel)

Process 7

Process

■ Program-free Initial Settings

Data setting/monitoring software programs are available for various intelligent function modules of the Q series. These programs are designed to set the channels used by an analog module and the transmission control and others of a serial communication module, eliminating the need for initial setting sequence programs and reducing program development burdens. Making automatic refresh settings, refreshes the digital values of an analog module and the current feed values and others of a positioning module to the specified devices, eliminating the need for the FROM/TO instructions.
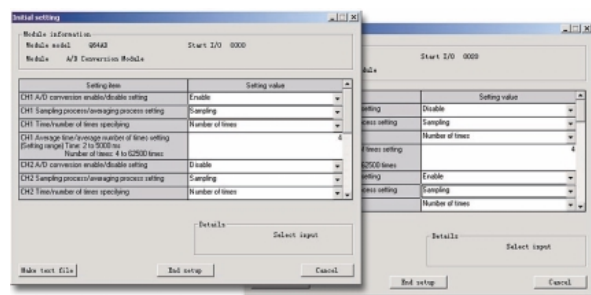
■ Cyclic Execution Program

A cyclic execution program is started and run at predetermined time intervals. High accuracy can be provided if you use this program in the processing of areas which will particularly influence machining accuracy. The cyclic time intervals can be set to 0.5ms-60s. (High-performance model QCPUs only)

Ordinary scan execution program

0   END

Cyclic execution program

0.5ms   0.5ms
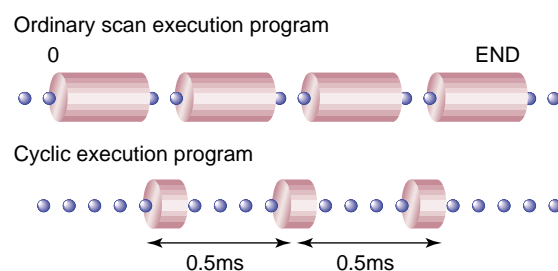
PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (2)
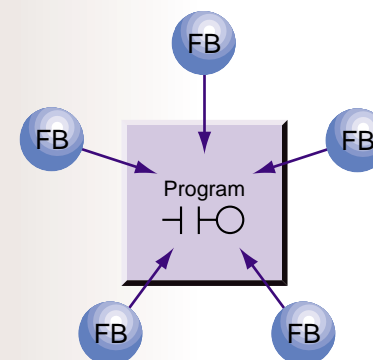
■ Label Programming/Function Block (FB)

NEW

You can do label programming.

Using labels

You can create function blocks.

Utilization of components

Incorporate FB's into sequence program

FB
FB   FB
Program
⊣ ⊢○
FB   FB

By labeling devices for programming, you can create programs before configuring a system without being conscious of device names and device numbers. (Note 1)
Using labeled programs as general programs allows you to assign devices according to the configuration, improving program development efficiency.

Labels can be used to convert programs into components as function blocks (FBs), such as a ladder program that is used frequently, i.e. a program for communication with an external device using a serial communication module, a positioning initialisation program, etc. (Note 2)

FB labels

FB ladder

You can incorporate a function block easily into a sequence program by simply "drag and drop". Function blocks can also be copied from one project to another project, thus preventing coding mistakes at the time of utilization.
A program displayed as a block on GX Developer, improves in readability, ensuring ease of editing and debugging.

Note 1: Supported by GX Developer Ver. 6 or later.
Note 2: Supported by GX Developer Ver. 7 or later.
Soon to be supported by QCPU basic models.

By creating application-based programs as function blocks to convert the programs into components, you can combine the components into a program of high readability, reducing program development time.

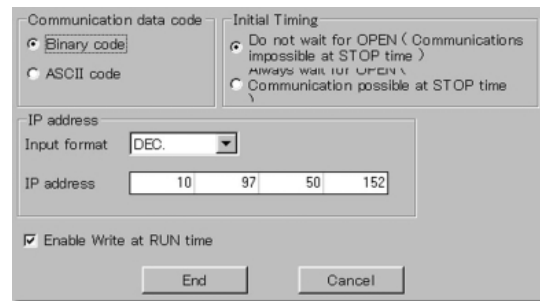# PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (3)

■ Network Parameter Setting

GX Developer includes Ethernet, MELSECNET/H and CC-Link network parameter setting screens. The Ethernet and CC-Link network settings, which previously had to be made in sequence programs, can now be done using the parameter set-up screen, leading to sharp program reduction and improved setting viewability.

● In the MELSECNET/H parameter set-up, you can set network range assignment and refresh parameters as previously.

● In the Ethernet parameter set-up, you can set the host IP address, TCP/IP communication timer, DNS server, connection opening processing, router-relayed communication, etc. easily on-screen. You can also set on the network parameter screen the mail server, other-end mail address and automatic notification function for sending and receiving E-mail.

● In the CC-Link parameters, you can set the number of connected remote stations, retry count, number of automatically returning stations, automatic refresh setting, station information and so on. Automatic refresh setting, which automatically refreshes the information of remote inputs/outputs/registers for the CPU devices, eliminates the need for the sequence program that uses the FROM/TO instructions.

● Station information can be set easily by clicking the mouse.

● In the initial setting of a remote device station, the initial setting that had been made in a sequence program can be registered in the parameters and executed.
(QCPU high-performance models only)

INCREASED NEW POSSIBILITIES OF FACTORY AUTOMATION (1)

■ Positioning Modules

■ SSCNET compatibility

Servo amplifiers are units that are connected by SSCNET to exercise high-speed, fast-response positioning control.
GX Configurator-QP (positioning module setting/monitoring tool designed for QD75P/D/M) facilitates positioning parameter setting, positioning data creation and monitoring.

Features

1. SSCNET can be used to connect the module with servo amplifiers and reduce wiring to the overall distance of 30m.
2. You can easily configure the absolute position system that eliminates the need for machine zeroing.
3. Linear interpolation control: up to 4-axis, circular interpolation control: up to 2-axis.
4. A wealth of control systems are available: PTP (Point To Point) control, fixed-pitch feed control, etc.

Type	QD75M1	QD75M2	QD75M4
Number of control axes	1	2	4
Positioning range	-2,147,483,648 to 2,147,483,647 (µm, inch or degree may also be used for setting)		
Speed command	1 to 10,000,000 pulses/s		
Control system	PTP control, track control, speed control, speed-position switching control, position-speed switching control		
Interpolation control	——	2-axis linear 2-axis circular	2-, 3-, 4-axis linear 2-axis circular
Absolute position system	Compatible		

QD75M4 — SSCNET — Servo amplifier / Servo motor
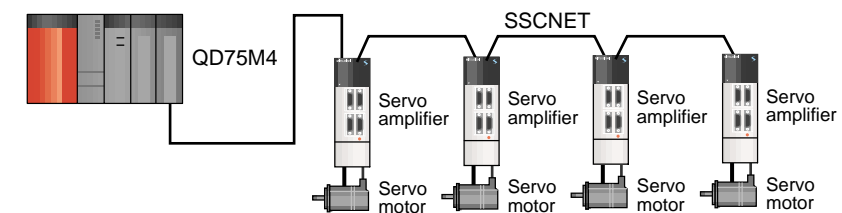
■ Open collector output/differential output

Open collector and differential driver systems are available as command outputs to enable selection according to applications.
Many functions, e.g. preread starting function for reduction of positioning starting time, are available to ensure fast, multi-application positioning.
GX Configurator-QP (positioning module setting/monitoring tool designed for QD75P/D/M) facilitates positioning parameter setting, positioning data creation and monitoring.

Type	QD75D1	QD75D2	QD75D4	QD75P1	QD75P2	QD75P4
Number of control axes	1	2	4	1	2	4
Pulse output system	Differential driver output			Open collector output		
Positioning range	-2,147,483,648 to 2,147,483,647 (µm, inch or degree may also be used for setting)					
Max. output pulses	1,000,000 pulses/s			200,000 pulses/s		
Control system	PTP control, track control, speed control, speed-position switching control, position-speed switching control					
Interpolation control	——	2-axis linear 2-axis circular	2-, 3-, 4-axis linear 2-axis circular	——	2-axis linear 2-axis circular	2-, 3-, 4-axis linear 2-axis circular

■ PLS output/multi-axis compatibility

The Q series PLS output/multi-axis compatible positioning modules are best-suited for multi-axis systems that do not need complicated control. They are effective for driving many motors at low costs.
There are 4- and 8-axis compatible modules, which can be selected to meet your system.

Features

1. 1-axis control starts as fast as 0.1ms.
2. Tact time is reduced because of high speed tracking control using stepping motors has reduced the chance of out-of-synchronization to occur.
3. GX Configurator-QP (positioning module setting/monitoring tool designed for QD70) facilitates positioning parameter setting, positioning data creation and monitoring.

*The QD70P4/P8 is not compatible with the A/A1SD70 (analog output).

Type	QD70P4	QD70P8
Number of control axes	4	8
Pulse output system	Open collector output	
Positioning range	-2,147,483,648 to 2,147,483,647 (only pulse may be used for setting)	
Max. output pulses	2,000,000 pulses/s	
Control system	PTP control, track control (linear only), speed control, speed-position switching control	
Interpolation control	No	
Starting time	For start of 1 axis	0.1ms
	For simultaneous start of 4 axes	0.2ms
	For simultaneous start of 8 axes	0.4ms
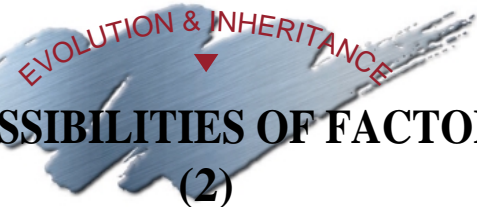
INCREASED NEW POSSIBILITIES OF FACTORY AUTOMATION (2)

■ Multi-channel Digital-to-analog Converter Modules **NEW**

A single Q series multi-channel analog output module allows eight channels to be connected rapidly and accurately in terms of voltage or current. Using GX Configurator-DA (D/A converter module setting/monitoring tool), you can make initial settings and automatic refresh settings on the screen, reducing programs.

Features
1. Resolutions are as high as ±1/16000 at ±10V and 1/2000 in other ranges.
2. Fast conversion of 80μs per channel.

Type	Q68DAV	Q68DAI
Analog output system	Voltage	Current
Analog output range	Voltage 0-5, 1-5, ±10V	Current 0-20, 4-20mA
Number of channels	8	8
Resolution	At 0-5, 1-5V: 0-12000 At ±10V: ±16000	0-12000
Accuracy — Ambient temperature	Within 25±5˚C 0.1% (Voltage: ±10mV, current: ±20μA) Within 0 to 55 0.3% (Voltage: ±30mV, current: ±60μA)	
Conversion speed	80μs/channel	

■ Temperature Input Modules **NEW**

Connected with thermocouples/platinum temperature measuring resistors, the Q series temperature input module can import temperature data. Using GX Configurator-TI (temperature input module setting/monitoring tool), you can make initial settings and automatic refresh settings on the screen, reducing programs.

Features
1. Detected temperature measurement values can be converted into scaling values (%).
2. Temperature sensors conforming to the JIS Standards are usable.
3. A wire break of a temperature sensor/conductor can be detected per channel.

Type	Q64TD	Q64RD
Usable thermocouple	B, R, S, K, E, J, T, N	———
Usable platinum temperature measuring resistor	———	Pt100, JPt100 4-wire type (3-wire type can be supported)
Number of channels	4 + Pt100 connection channel/module	4
Output — Temperature conversion value	-2700 to 18200 (First decimal place×10 times)	-2000 to 8500 (First decimal place×10 times) -20000 to 850000 (Third decimal place×1000 times)
Output — Scaling value	16-bit signed binary	
Wire break detection	Yes (channels independent)	
Resolution	B, R, S, N: 0.3˚C K, E, J, T: 0.1˚C	0.025˚C
Accuracy	Conversion accuracy + temperature characteristic * operating ambient temperature variation + cold junction guaranteed accuracy	Ambient temperature 25±5˚C Within ±0.08% 0 to 55˚C Within ±0.25%
Conversion speed	40ms/channel	

■ Temperature Control Modules

The Q series temperature control modules offer a choice of optimum temperature adjustment control. Using GX Configurator-TC (temperature control module setting/monitoring tool), you can make initial settings and automatic refresh settings on the screen therefore reducing the program.

Features
1. Direct connection of a thermocouple/platinum temperature-measuring resistor achieves the optimum temperature adjustment control (PID control).
2. Max. four loops temperature adjustment control can be exercised simultaneously.
3. The wire disconnection of the heater can be detected. (Note 1)
   Note1: Q64TCTTBW and Q64TCRTBW only.

Type	Q64TCTT	Q64TCRT	Q64TCTTBW	Q64TCRTBW
Control output	Transistor output			
Number of temperature inputs	4 channels/module			
Accuracy	Ambient temperature 25˚C ±5˚C, input range width X (±0.3%) Ambient temperature 0˚C to 55˚C, input range width X (±0.7%)			
Sampling period	0.5s (constant regardless of the number of channels used)			
Number of I/O points occupied	16 points, 1 slot (I/O assignment: 16 intelligent points)		32 points, 2 slots (Default I/O assignment: 16 free points + 16 intelligent points)	

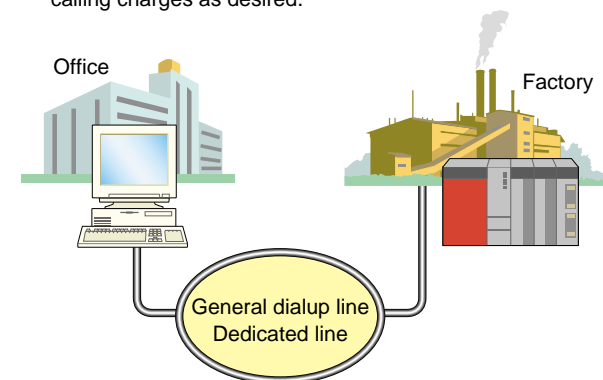# INCREASED NEW POSSIBILITIES OF FACTORY AUTOMATION (3)

■ Modem Interface Module **NEW**

Having a built-in, analog line-ready modem, the modem interface module enables data communication equivalent to that of the serial communication module (QJ71C24) to be made via a telephone line. Using GX Configurator-SC (serial communication module setting/monitoring tool), you can make initial settings and automatic refresh settings on the screen, reducing programs.

Features
1. With the modem built-in, you can make a line connection without being conscious of initialization commands.
2. The dedicated protocol communication of serial communications enables data to be transferred between a personal computer and a PLC CPU or between PLC CPUs. No-procedure mode communication enables the transfer of any data.
3. The built-in modem is also compatible with a dedicated line.
4. With the callback function, you can select who will bear calling charges as desired.

Office   Factory

General dialup line
Dedicated line

Type		QJ71CMO
Number of channels		2 (CH1: Modem built-in channel, CH2: RS-232 interface)
CH1 side	Number of lines connected	1
CH1 side	Applicable lines	Public switched line/PBX analog line 2-wire type/4-wire type analog dedicated line
CH1 side	Communication system	Full duplex asynchronous communication system ITU-T recommendation V.21, V.22, V.22bis, V.32, V.32bis, V.42, V.42bis MNP class 3 to 5
CH1 side	Connection structure	1 : 1 (between external device and PLC CPU /between PLC CPU and PLC CPU)
CH2 side	Transmission path	RS232
CH2 side	Transmission speed	50/300/600/1200/2400/4800/9600 14.4K/19.2K/28.8K/38.4K/57.6K/115.2K
CH2 side	Synchronous system	Asynchronous system
Common to CH1 and CH2	Protocol	Dedicated, no procedure, bi-directional
Common to CH1 and CH2	CPU interrupt function	Yes (high-performance model QCPU only)
Common to CH1 and CH2	Compatibility	A1SJ71UC24/A1SJ71QC24N Compatible with communication protocol

■ Ethernet Interface Modules (100BASE-TX Compatible) *First in the industry!*

A 100Mbps-compatible Ethernet interface module is available for the first time in the industry. You can make selection according to the system and the device on the other end.

Features (QJ71E71-100 only)
1. The module is compatible with 100BASE-TX to increase the transmission speed.
2. HTTP communication enables communication to be made using a commercially available Web browser on a personal computer.
   You can download the communication library and sample screens that will operate on the personal computer (Web).
3. Multiple GX Developers can be connected to improve debugging efficiency.
4. Using FTP, you can make file access to a multiple PLC system.

Type	QJ71E71-100 **NEW**	QJ71E71	QJ71E71-B2
Communication speed	100Mbp *First in the industry!*	10Mbps	
Transmission path	100BASE-TX 10BASE-T	10BASE-5 10BASE-T	10BASE-2
Number of logical ports	16		
Send/receive buffer	Fixed: 1kW Random: 6kW E-mail: 6kW		
Event interrupt	Yes (high-performance model QCPU only)		
Remote password function	Remote password registration for prevention of illegal access		
Compatibility	Compatible with A1SJ71E71/A1SJ71QE71 communication protocol		

■ B/NET Interface Module

The B/NET is a network designed to perform centralized management or control of power distribution equipment dispersed in a building, plant or the like. This module enables connection of the Q series to the B/NET.

Type	B-QIF
Number of stations connected	63 stations per module
Transmission distance	Max. wiring length = 1km, overall wiring length = 2km
Used cable	CPEV-S *1.2 (twisted pair cable) or equivalent
Compatible address range	1 to 255 addresses

EVOLUTION & INHERITANCE
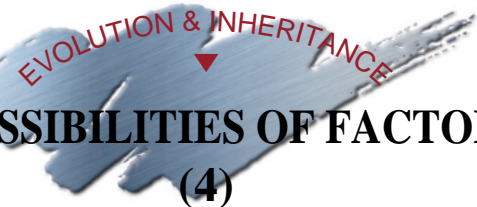
Partner Products

■Personal Computer CPU Modules

NEW

A personal computer CPU module can be loaded on a Q series PLC base (2 slots occupied) to achieve the PC/AT compatible functions.

Features

1. The module can achieve the personal computer functions on a PLC base, downsizing a device/control box.
2. Environmental resistance and noise resistance are on Factory Automation levels. The use of an ATA flash card and silicon disk drive has resolved the problems of HDD life and vibration resistance. You can replace your FA personal computer or personal computer worry-free.
3. Sequence control can be exercised by the PLC CPU and information processing performed by the personal computer CPU to achieve integration of control and information processing, configuring an optimum system.
4. The introduction of MX Component, Soft GOT, Windows® compatible commercially available software and user application software configures a highly free system.
5. The built-in Ethernet communication port helps you configure a system that utilizes the Internet/intranet technology such as E-mail and Web access.
6. A PC card available on the market can be used for flexible system expansion.
7. The built-in USB port allows you to connect a commercially available USB device easily.
8. Using the bus interface driver software enables access to almost all I/O and intelligent function modules from a C-written application program.
9. The personal computer CPU module can not only operate in a multiple PLC configuration with PLC CPU and motion CPU, but can also run alone.
10. Because of its fan-free structure, the module has improved in maintenance performance, eliminating such problems as whirled dust particles. You can use the module worry-free in a clean room.

Type	PPC-CPU686(MS)-64	PPC-CPU686(MS)-128
MPU	Mobile Celeron Processor _LP 400MHz	
Memory	64MB	128MB
Video memory	2MB	
IF — USB	2 channels (1 channel as extra connector)	
IF — Serial	2 channels (D-SUB 9P) (1 channel as extra connector)	
IF — Parallel	1 channel (extra connector)	
IF — PS2 mouse/keyboard	Mini DIN 6P / Can be used simultaneously by conversion cable.	
IF — LAN	100BASE-TX/10BASE-T	
IF — Display	Analog RGB H-Dsub 15P	
IF — FDD	26P half connector (for connection of Contec make FDD)	
IF — PC card	PCMCIA, CardBus Type I, II ×2 or Type II ×1	
Silicon disk module	Separate module (PCC-SDD(MS)-32/64/128/192/320/500/1000) 1 slot occupied	
Hard disk module	Separate module (PCC-HDD(MS)-5) 5GB 1 slot occupied	
OS	Windows® NT4.0 / Windows® 2000 / Windows® NT4.0Embedded	

Partner Products

■ID System Interface Module

The BIS C-488-00 ID controller is a control module loaded onto a Q series base directly to access ID tags using PLC instructions.

Features

1. Two ID antennas can be connected and further two channels can be processed concurrently.
2. All ID tags of the BIS C series are usable.

The Balluff ID system/BIS series is an ID system designed for Factory Automation to read/write data in an electromagnetic coupling system.
A wide assortment of ID tags are available in size and memory capacity.
(Memory capacity: 512 bytes to 8k bytes)

Type	BIS C-488-00
Power supply voltage	DC24V ±10%
Current consumption	0.8A
Number of I/O points occupied	32 points
Number of ID antennas connected	Up to two antennas
ID antenna connection method	Terminal block

Partner Products

■Factory Automation Goods

The Q series has a wide assortment of useful goods to further expand PLC applications.

● Programming unit (EPU01): Connected directly with the PLC CPU, the EPU01 can edit programs stored in the CPU or test/monitor devices. (High-performance model QCPU only)
● EQGPIB GP-IB module: By loading a GP-IB module on a Q series I/O slot, data can be communicated with a measuring instrument. (High-performance model QCPU only)
 ● Text length that can be communicated once: 63422 bytes when those for sending and receiving combined
 ● The module can send a command or universal command to a function address as a controller/talker or listener.
● Other product list

Programming unit (EPU01)

Class	Product	Type	Outline
CPU module-compatible communication module, intelligent module compatible	Connection cable	FA-CBLQC***R2	RS-232C cable for connection of personal computer and CPU (Mini-DIN 6P male)-(D-Sub 9P female) (3, 5, 15m)
		FA-CBL30USB	USB cable for connection of personal computer and CPU (3m)
		FA-CBL25P6P***	RS-232C cable for connection of personal computer, display or like and CPU (Mini-DIN 6P male)-(D-Sub 25P male) (3, 5, 14m)
		FA-CBL9S9P***	RS-232C cable for connection of personal computer and intelligent module (D-Sub 9P male)-(D-Sub 9P female) (3, 5, 15m)
	Optical converter	FA-OPT232**	Optical converter for connection of RS-232 device
	Conversion cable	FA-CBL25S***	Conversion cable for connection of optical converter (0.2m)
	Conversion adaptor	FA-A25S***	Conversion adaptor for connection of optical converter
	Fiber-optic cable	FA-FB****M	Fiber-optic cable for connection of optical converter (within enclosure, indoors, portable, outdoors)
DC: Input, output module (connector type) compatible	Quick connector type distributed module	FA-CB**XY*	Quick connector type 8- or 16-point distributed module for DC
	Connector/terminal block conversion module	FA-TB**XY*	Terminal block type 8- or 16-point distributed module or 32-point terminal block module for DC
	Connection cable	FA-CBL***FMV	Cable for connection of input or output module and quick connector type distributed module or connector/terminal block conversion module
		FA-(F)CBL***MMH	Cable for connection of quick connector type distributed modules or terminal block type distributed modules
AC/DC: Input, output module (terminal block type) compatible	PLC/terminal block conversion module	FA-TB161AC**	Terminal block conversion module for AC/DC, 16 points/common, 1- or 2-wire type
	Connection cable	FA-CBL**TD	Cable for connection of input or output module and PLC/terminal block conversion module
Positioning module compatible	Connection cable	FA-CBLQ75****	Cable for connection of positioning module and servo amplifier

WIDE ASSORTMENT OF HIGH-PERFORMANCE MODULES

■ Interrupt Module

Type	QI60
Input type	DC input positive common
Number of input points	16 points (interrupt processing condition setting in units of 1 point)
Rated input voltage/current	24VDC/approx. 6mA
Max. number of simultaneous input points	100% simultaneously ON
ON voltage/ON current	19V or more/4mA or more
OFF voltage/OFF current	11V or more/1.7mA or more
Response time	OFF→ON 0.2ms or less, ON→OFF 0.3ms or less
Common system	16 points/common

Note 1: Supported by CPU module product information "021120000000000-B" or later and GX Developer Ver. 6 or later.

■ High-Speed, Precision Analog-to-Digital Converter Modules

Type		Q64AD	Q68ADV	Q68ADI
Analog input system		Voltage/current	Voltage	Current
Analog input range		Voltage: 0-5, 1-5, 0-10,±10V Current: 0-20, 4-20mA		
Number of channels		4	8	8
Resolution		1/16,000 (0~10V) (Note 2)		
Accuracy	Temperature drift compensation	Ambient temperature 25±5°C	0~55°C	
	Yes	±0.1%	±0.3%	
	No		±0.4%	
Conversion speed		80µs/channel (+160µs when temperature drift compensation is made)		

Note 2: ±1/16,000 in the input range of ±10V, 1/12,000 in other input ranges.

■ High-Speed, Precision Digital-to-Analog Converter Modules

Type		Q62DA	Q64DA
Analog output system		Voltage/current	Voltage/current
Analog output range		Voltage: 0-5, 1-5±10V Current: 0-20, 4-20mA	
Number of channels		2	4
Resolution		1/12,000 (Note 3)	
Accuracy	Ambient temperature 25±5°C	Within 0.1% (voltage:±10mV, voltage:±20µA)	
	0~55°C	Within 0.3% (voltage:±30mV, voltage:±60µA)	
Conversion speed		80µs/ch	

Note 3: ±1/16,000 in the input range of ±10V

■ High-Speed Counter Modules

Type	QD62	QD62D	QD62E
Number of channels		2	
Input system	5/12/24VDC	Differential	5/12/24VDC
Input type		Single phase, two phases, CW/CCW	
Max. counting speed	200kpps	500kpps	200kpps
Counting range		32bit (-2,147,483,648~2,147,483,647)	
Number of output points		2 points/channel	
Output system	Tr. sink 12/24VDC	Tr. sink 12/24VDC	Tr. source 12/24VDC
Event interrupt function		Yes (high-performance model QCPU only)	

■ MELSECNET/H Interface Modules

Type	QJ71LP21-25	QJ71BR11
Communication speed	25Mbps/10Mbps	10Mbps
Transmission path	Optical SI/QSI-200/250, duplex loop	Coaxial 75Ω, simplex bus
Transmission distance	At 25Mbps: Interstation 1km (QSI) /200m (SI) At 10Mbps: Interstation 1km (QSI) /500m (SI)	Overall distance 500m (5C-2V)
Number of stations connected	64	32
Compatible mode	MELSECNET/H mode, MELSECNET/10 mode	
Number of cyclic points per network	MELSECNET/H mode: LB:16k bit, LW:16kw, LX/LY:8k bit MELSECNET/10 mode: LB:8k bit, LW:8kw, LX/LY:8k bit	
Event interrupt function	Yes (high-performance model QCPU only)	
Compatibility	Connectable with Q/QnA/AnU series NET/10 in MELSECNET/10 mode; Connectable with Qn series NET/10 in MELSECNET/H mode.	

■ CC-Link Interface Module

Type	QJ61BT11
Transmission speed /distance (Ver.1.10)	10Mbps/100m, 5Mbps/160m, 2.5Mbps/400m, 625kbps/900m, 156kbps/1200m
Number of modules connected	64 modules
Number of cyclic points per network	Remote I/O: 2048 points Remote register: 256+256 points
Event interrupt function	Yes (high-performance model QCPU only)
2 or 3 occupied local stations setting function	Any number of local stations occupied can be set between 1 and 4 stations.

■ Serial communication modules

Type	QJ71C24	QJ71C24-R2
Transmission path	RS-232 1Ch. RS422/485 1Ch. (Note 4)	RS-232 2Ch. (Note 4)
Transmission speed	50/300/600/1200/4800/9600/ 14.4k/19.2k/38.4k/57.6k/115.2kbps	
Synchronous system	Asynchronous mode	
Protocol	Dedicated, TTY, bidirectional	
CPU interrupt function	Yes (high-performance model QCPU only)	
Compatibility	Compatible with A1SJ71UC24/A1SJ71QC24 communication protocol	
Callback function	Enabled for modem communication Updated Version up	

Note 4: 2 channels of peripheral devices can be connected together.

■ BASIC Language Programming Modules

Type		QD51	QD51-R24
Programming language		AD51H-BASIC	
Memory	Program memory	64k bytes/2 tasks	
	Common memory	8k bytes	
	Extended registers	1k words	
	Extended relays	1k points	
	Buffer memory	3k words	
	Communication specifications	Conforming to RS-232, D-Sub 9 pin, 2 channels	Conforming to RS-232, D-Sub 9 pin, 1 channel Conforming to RS-422/485, terminal block, 1 channel
General I/O		27 input points:17 output points	
Max. baudrate		Total baudrates of 2 channels: 38400bps	

# PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (1)

■ Overall Factory Automatic Development/Debugging Environment

Advanced machinery/equipment and increased programs lead to an increased number of program development processes. The Q series not only provides user-friendly, software products which support programming, monitoring, maintenance, system design, etc. but also enhance their connections, to offer user-friendly, integrated development and debugging environments.
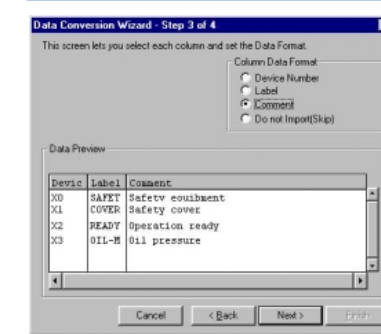
MELSOFT is a generic name for Mitsubishi Electric co.'s integrated Factory Automation software products which take active parts in every scene of design, operation and maintenance.
The MELSOFT products include the GX series programming tools designed to improve the productivity of PLC design and maintenance work and the MX series middleware which directly links FA data to your office to accelerate daily operations.

GX Developer (Programming software)
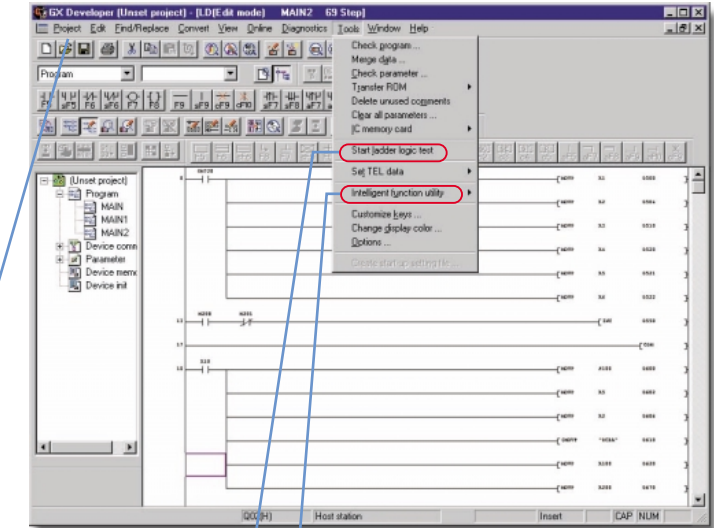
GX Converter (Note 1)
(Word/Excel/text data converter)

GX Simulator (Note 2)
(Simulation software)
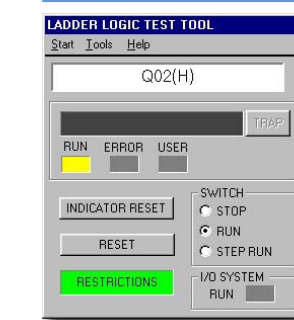
GX Configurator
(Data setting/monitoring software for various intelligent function modules)

Note 1: Named OLEX in previous versions.
Note 2: Named LLT in previous versions.
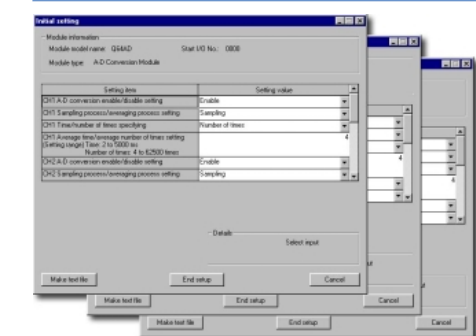
■ Management of Project Data

NEW

Using GX Explorer (project management tool), you can manage project data from both personal computer and PLC simultaneously, whereas before can only be managed separately, in a unified system. Similar to using Windows® Explorer, with GX Explorer you can, start GX Developer, read/write project data to the PLC and perform PLC diagnostics, resulting in improved work efficiency.

● To start GX Developer, double-click the target data.
● To perform read/write to PLC, drag and drop the target data.
● To make PLC or network diagnostics, right-click the target CPU.

MELSECNET/H

PLC side data list

PC side drive display
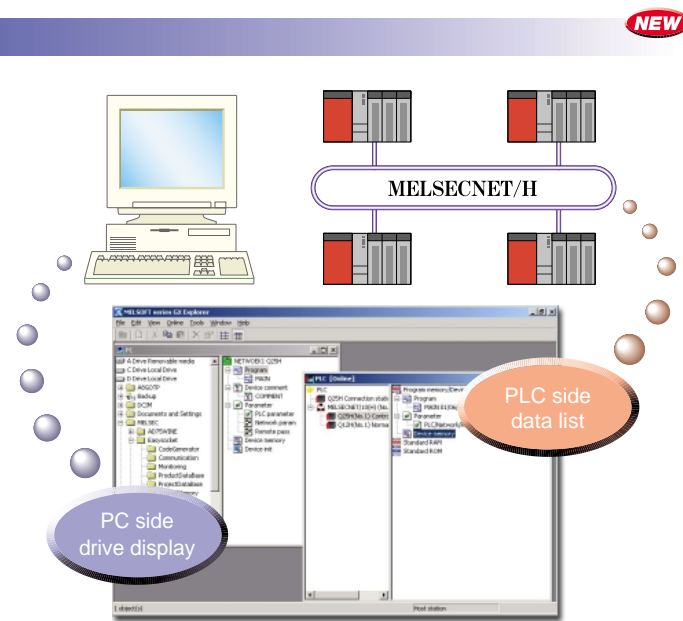
PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (2)

■Offline Debugging

GX Simulator (simulation software) is a software tool designed to start a virtual PLC on a personal computer and debug a created sequence program. You can perform debugging on the personal computer right after designing, without waiting for the completion of PLC I/O wiring. This improves design efficiency.

Virtual PLC

Program

Monitoring/debugging

■System Monitor

●Checking System Monitor gives you an at-a-glance picture of the PLC system configuration and the error detection status at each module. It supports your recovery operation at occurrence of trouble.

●By choosing the CPU and starting diagnostics on the System Monitor screen, you can check for the current error and error history.

●Module Detail Information allows you to check I/O and intelligent function modules for the latest error code and error history. You need not monitor the buffer memory's error code storage area to check for errors, ensuring efficient maintenance.

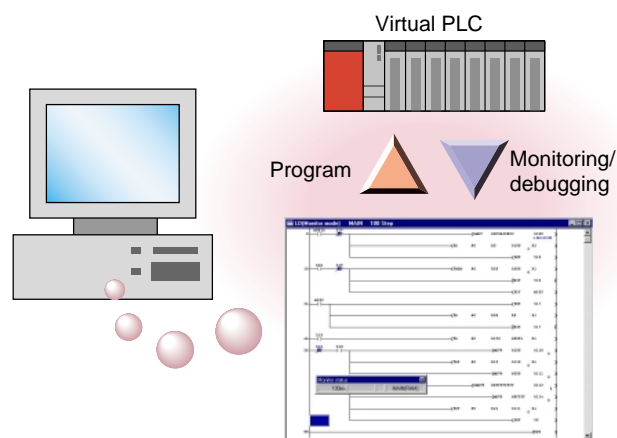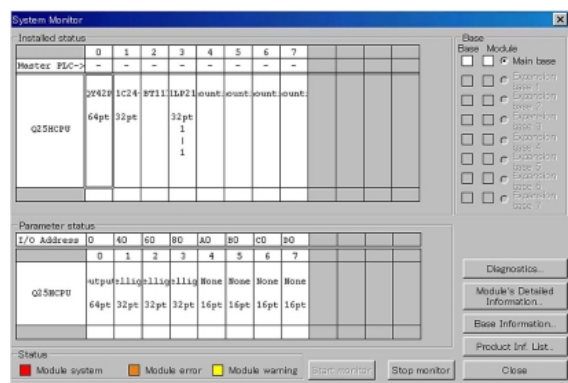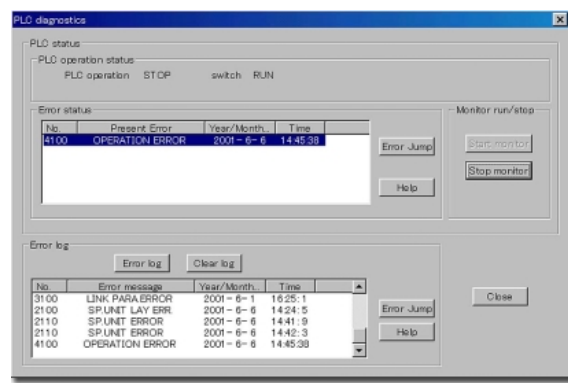●Hardware Information can be used to check the LED states and switch settings of an intelligent function module. Since you need not go to the worksite to check the LED states of modules, this function is useful for remote program maintenance.
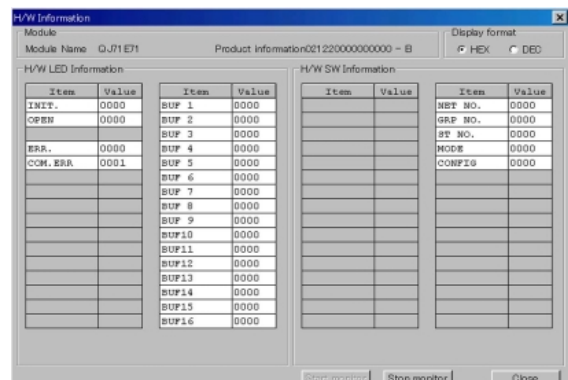
PROGRAM DEVELOPMENT/DEBUGGING EFFICIENCY IMPROVEMENT (3)

■Network Diagnostics

Using Network Diagnostics, you can monitor the network, link and communication information of the host. It also enables network diagnostics such as network and loop tests.
"Other Station Information" allows you to monitor the communication, data link and loop states of each station. "Line Monitor Detail" can be used to monitor the control station information, data link information and host's parameter states. "Error History Monitor" allows you to monitor error occurrence conditions.
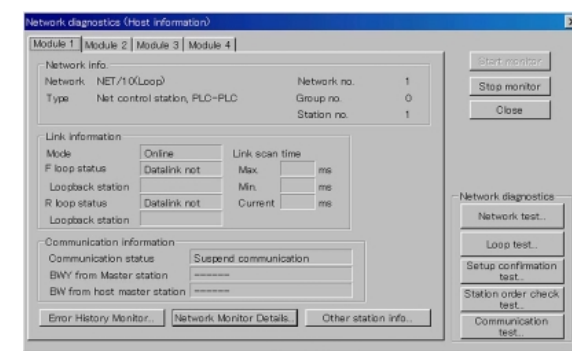
■Ethernet Diagnostics

Ethernet Diagnostics can be used to monitor the IP address and other parameter states, error history, connection status, LED states, E-mail information and others. This allows you to know the Ethernet module status and line status easily without monitoring the buffer memory, improving the efficiency of debugging and maintenance. By conducting a "PING Test", you can check for module presence on the Ethernet line from GX Developer. (You need not enter a command in DOS.)
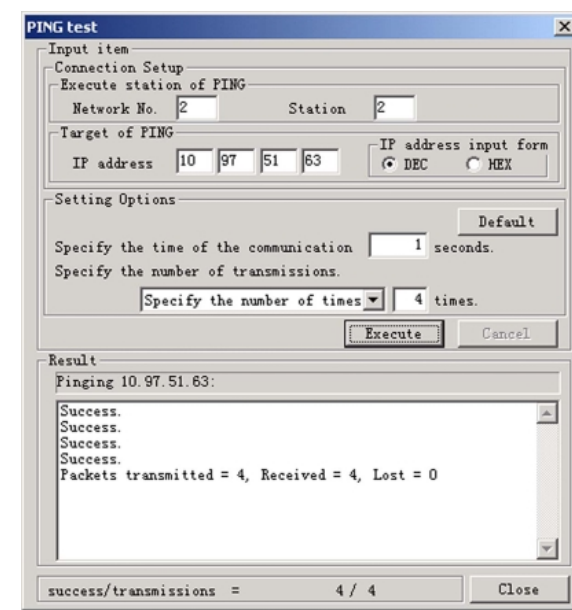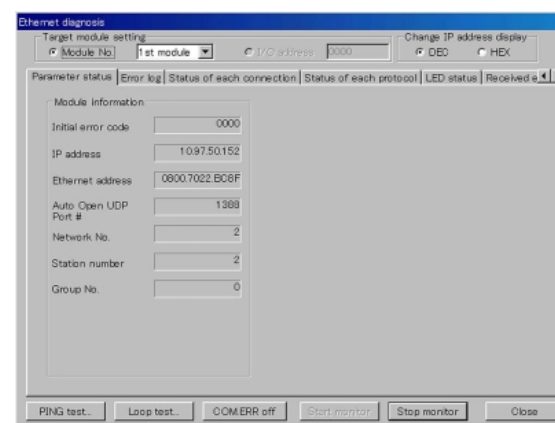
■CC-Link Diagnostics

By making CC-Link Diagnostics, you can monitor the data link status, operating status, link scan times and others of the host. "Other Station Monitor" can be used to monitor the data link status, etc. of the other station, and "Line Test" used to check the communication states of connected stations.
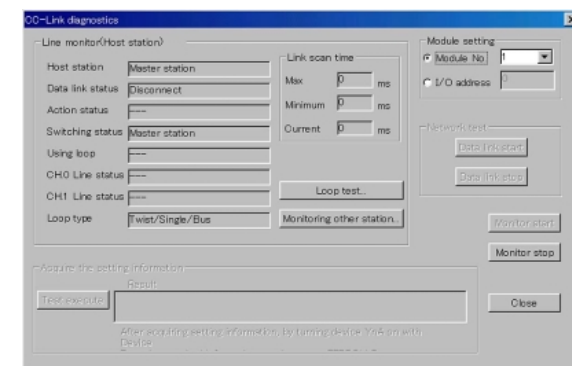
EASY OF MAINTENANCE

■Increased Speed of Programming Port

The Q series CPU modules include an RS-232 port operable at max.115.2kbps as standard. A USB port is also installed which is used with Windows 98®personal computers (Q00J/Q00/Q01/Q02CPU is equipped with RS-232 only). These high-speed programming ports have achieved much shorter program transfer time and faster monitoring, increasing the adjustment efficiency of machinery/equipment .

Note: USB is supported by Windows® 98/2000/Me only.
　　　 Windows® 2000/Me is supported by GX Developer Ver. 7 or later.

26k-step program and parameter write time (s)

Q25HCPU(USB)	12
Q25HCPU(RS-232)	30
Q3ACPU	86
A4UCPU	94

0　10　20　30　40　50　60　70　80　90　100
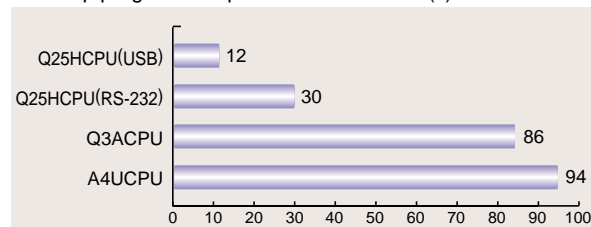
Note: The time may be longer than above depending on the performance of the personal computer and the conditions of communication with other devices.

■Automatic Writting to Standard ROM by PC Card

The high-performance QCPU allows program, parameter and other files stored in a PC card to be transferred automatically to the program memory of a CPU and its contents to be written automatically to the built-in standard ROM. You can send a memory card to a field site, where CPU programs can be modified without using programming software.

Program file
Parameter file

No necessity of special DIP switch settings

Memory card

CPU
Program memory
Standard ROM

MITSUBISHI
FLASH CARD
MELSEC

In the field

■Short-Circuit Protection

Some transistor output modules use transistors provided with short-circuit protection to protect the internal circuits of output modules from being burnt out due to a wiring mistake or external device failure.

■Built-In Standard ROM

To reduce the risk of program data erasure due to battery failure, built-in flash ROMs are built in all CPU types so there is no need to add a memory card to store programs into ROM.

■Online Program Correction

During adjustment of machinery/equipment, partial correction to a program must sometimes be made without stopping sequence processing. The Q series enables online correction to a program (write during RUN). Online program correction can be made to not only the CPU directly connected but also any CPU via a network system (Ethernet, MELSECNET/H, CC-Link). Online rewriting of a program file is also possible (high-performance model QCPUs only), exhibiting the high performance of program correction during adjustment.

■Remote Programming
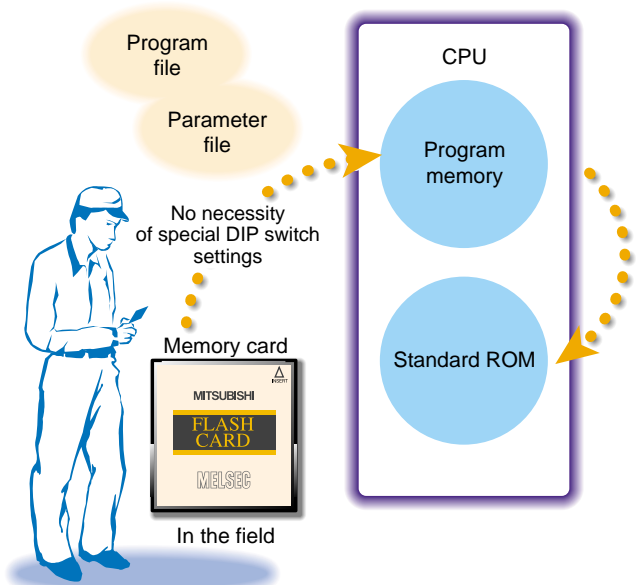
GX Developer allows online programming and monitoring and testing operations to be performed with the Q series PLCs installed at remote locations. Connections to the Q series PLCs connected to Ethernet can be made via Ethernet, and connections to the PLCs connected with modems can be made via the telephone line/ISDN line.

Ethernet
Router
MELSECNET/H
Modem
RS-232
Telephone line
Modem
CC-Link
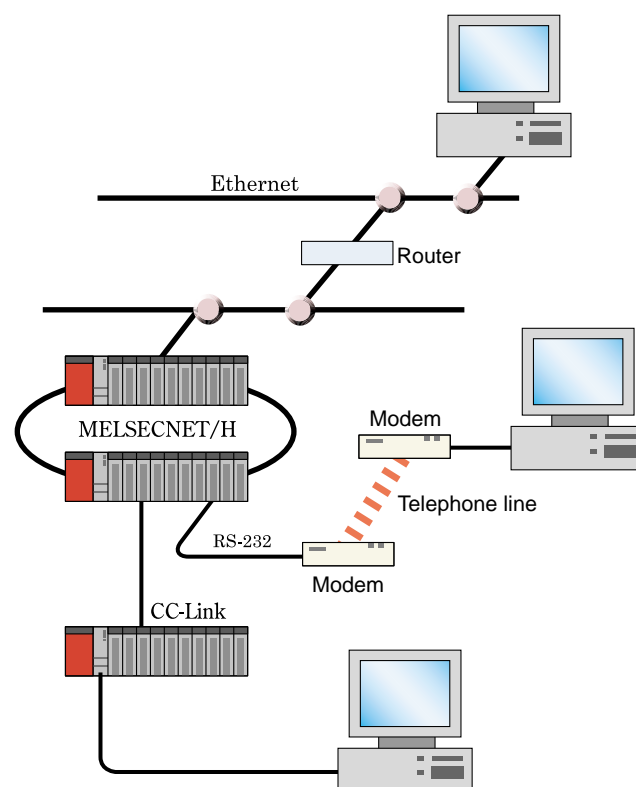
■Utilization of Hardware Assets

Here are the following two ways to utilize the conventional AnS series hardware.
1) Select the Q series CPU to make the most of the performance and functions of the Q series.
2) Select the A mode model to use the conventional AnS series hardware configuration in order to improve the performance of only the CPU.

	Basic Model	High-performance Model	A Mode
Features	Designed to configure a compact system by combining the basic model QCPU and other Q series modules.	Designed to make the most of the inherent functions and performance capabilities of the Q series by combining the high-performance model QCPU and other Q series modules. If the appropriate module is not available from the Q series, you can use the AnS	Designed for the customer who is using the AnS series to improve only the processing performance of the CPU without changing its programs and hardware. Among the current AnS series hardware, you only need to change the CPU module, bases and extension cables to increase the processing speed.
CPU type	Q00JCPU, Q00CPU, Q01CPU	Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU	Q02CPU-A, Q02HCPU-A, Q06HCPU-A
Usable programs	Q series programs	Q series programs	A series programs
Usable functions	Various functions introduced in this catalog are all usable. (With the exception of the functions indicated "High-performance model")	Various functions introduced in this catalog are all usable.	Only the functions usable in the A series can be used, and various functions introduced in this catalog are not usable with the exception of some functions.
Usable base units	For Q series modules: Q3□B, Q6□B, Q5□B	For Q series modules: Q3□B, Q6□B, Q5□B For A series modules: QA65B, QA1S6□B	QA1S3□B, QA1S6□B
Usable power supply modules	For Q series modules: Q61P-A1/A2, Q6□P	For Q series modules: Q61P-A1/A2, Q6□P For A series modules: A6□P, A1S6□P	A1S6□P
Usable I/O, special, network and other modules	For Q series	For Q series and AnS series (Note 1)	For AnS series
Usable GOT (Note 2)	A900/F900 series GOT Connection method: CPU RS-232, serial communication module, MELSECNET/10, CC-Link, Ethernet, bus	A900/F900 series GOT Connection method: CPU RS-232, serial communication module, MELSECNET/10, CC-Link, Ethernet, bus	A800/900/F900 series GOT Connection method: CPU RS-232, computer link module, MELSECNET/Ⅰ/10/B, CC-Link,Ethernet (bus unconnectable)
Usable peripheral devices	For Q series	For Q series	For A series
System configuration example	Main base Q3□B is used (Not needed for Q00JCPU) Basic model QCPU and Q series modules Extension cable for Q series is used Extension base Q6□B /Q5□B is used. (QA65B or QA1S6□B is unusable.) Q series-compatible software is used on Windows® personal computer. (SW7D5C-GPPW or later is usable.)Use QC30R2 cable.	Main base Q3□B is used High-performance model QCPU and Q series modules Extension cable for Q series is used Q series-compatible software is used on Windows® personal computer. (SW4D5C-GPPW or later is usable.)Use QC30R2 cable. As required, Ans power supply, I/O, special and network modules may be used in extension base. Use QA1S6□B with AnS modules. As a matter of course, Q series modules can be added. Use Q6□B /Q5□Bwith Q series modules.	Main base QA1S3□B is used A mode CPU Power supply, I/O, special and network modules are all for Ans Extension cable for Q series is used Extension base QA1S6□B is used A series-compatible software is used on Windows® personal computer, or A6GPP or similar A series peripheral device, e.g. A8PUJ and the like may be used. Note that since peripheral port of A mode CPU is RS-232, RS-232/422 conversion cable is needed for use of A series-compatible device of RS-422 specifications.

Note 1: Some modules for the AnS series, e.g. MELSECNET/II and MELSECNET/B, are not usable or have operating restrictions. Check details in the Q series data book.
Note 2: Only the RS-232 port may be used for connection with the GOT-F900 series.

■Utilization of Software Assets

Q series programs are required to use the Q series. As the conversion tool is available to convert A/QnA series programs into Q series programs, transition to the Q series can be made easily without wasting your program assets. (Note 3)(Note 4)

Note 3: Since some instructions are unusable, refer to the Q series data book for details.
Note 4: The A mode model does not require programs to be converted.

Q series program
FX series program
A series program
QnA series program
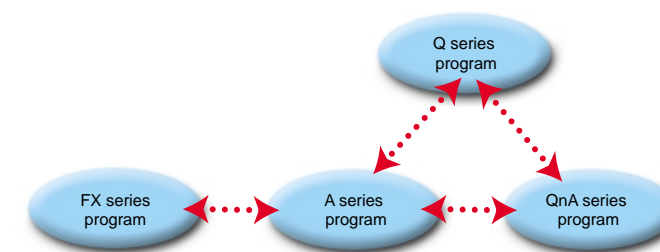
GERERAL SPECIFICATIONS

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	0~55˚C				
Storage ambient temperature	-25 to 75˚C (Note 5)				
Operating ambient humidity	5 to 95%RH, non-condensing (Note 4)				
Storage ambient humidity	5 to 95%RH, non-condensing (Note 4)				
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2	Under intermittent vibration			Sweep count
		Frequency	Acceleration	Amplitude	10 times each in X, Y, Z directions (for 80 min.)
		10~57Hz	—	0.075mm	
		57~150Hz	9.8m/s²	—	
		Under continuous vibration			
		Frequency	Acceleration	Amplitude	
		10~57Hz	—	0.035mm	
		57~150Hz	4.9m/s²	—	
Shock resistance	Conforming to JIS B 3501, IEC 61131-2 147 m/s², 3 times in each of 3 directions X, Y, Z				
Operating atmosphere	No corrosive gases				
Operating altitude	2000m max. (Note 3)				
Installation location	Inside control box				
Overvoltage category (Note 1)	II or less				
Pollution level (Note 2)	2 or less				

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 level 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensing.
Note 3: The PLC cannot be used under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a failure.
Note 4: When used with the AnS series modules, the Q series PLC should be operated within 10 to 90%RH.
Note 5: When used with the AnS series modules, the Q series PLC should be stored at -20 to 75˚C.

CPU MODULE PERFORMANCE SPECIFICATIONS

1 Basic Models, High-performance Models

Operation mode	Basic model			High performance model				
CPU type	Q00JCPU	Q00CPU	Q01CPU	Q02CPU	Q02HCPU	Q06CPU	Q12HCPU	Q25HCPU
Programming language	Ladder/list			Ladder/list/SFC				
I/O control	Refresh							
Number of I/O device points (Note 6)	2048 points			8192 points				
Number of I/O points (Note 7)	256 points	1024 points		4096 points				
Program capacity (step)	8k			14k	28k	60k	124k	252k
LD instruction	200ns	160ns	100ns	79ns	34ns			
MOV instruction	700ns	560ns	350ns	237ns	102ns			
Floating-point addition	—			1.8μs	782ns			
Index qualification	No delay time							
PC MIX value	1.6	2.0	2.7	4.4	10.3			
Bit device (points)	Internal relay M: 8k Link relay B: 2k Special relay SM: 1k Latch relay L: 2k Edge relay V: 1k Special link relay SB: 1k Annunciator F: 1k			Internal relay M: 8k Link relay B: 8k Special relay SM: 2k Latch relay L: 8k Edge relay V: 2k Special link relay SB: 2k Step relay S: 8k Annunciator F: 2k				
Timer/counter (points)	Timer (low/high speed) T: 512k (Low/high speed measuring increments are set in parameters) Retentive timer ST: 0k Counter C: 512			Timer (low/high speed) T: 2k (Low/high speed measuring increments are set in parameters) Retentive timer ST: 0k Counter C: 1k				
Word device (points)	Data register D: 11136 Link register W: 2k Special register SD: 1k Special link register SW: 1k Index register Z: 10 File register (built-in) R: 32k (Note 8)			Data register D: 12k File register (built-in) R: 128k (Note 9) Link register W: 8k Special register SD: 2k Index register Z: 16 Special link register SW: 2k				
Extended file R	No			Max. 500k points (memory card required)				
Pointer, nesting	Pointer P: 300, interrupt pointer I: 128, nesting N: 15			Pointer P: 4096, interrupt pointer I: 256, nesting N: 15				
Constant handled	16-bit integer, 32-bit integer			16-bit integer, 32-bit integer, single-precision real number, character string				
Communication port	RS-232:115.2kbps (Max.)			RS-232:115.2kbps (Max.), USB:12Mbps				
Max. number of I/O slots	16	24		64				

Note 6: Total number of I/O points on basic and extension bases directly controlled from a CPU module and I/O points controlled as remote I/O by a remote I/O network
Note 7: Number of I/O points on basic and extension bases directly controlled from a CPU module
Note 8: None for Q00JCPU, 32k for Q00/Q01CPU
Note 9: 32k for Q02/Q02H/Q06HCPU, 128k for Q12H/Q25HCPU

*The number of points of each device in the Q mode data memory can be changed as desired within the range of 16k words for the Q00J/Q00/Q01CPU or 29k words for the Q02/Q02H/Q06/Q12H/Q25HCPU.

2 A mode model

Operation mode	A mode		
CPU type	Q02CPU-A	Q02HCPU-A	Q06HCPU-A
Programming language	Ladder/list/SFC		
I/O control	Refresh		
Number of I/O device points (Note 10)	8192 points		
Number of I/O points (Note 11)	4096 points		
Program capacity (step)	28k		30k✕2
LD instruction	79ns	34ns	
MOV instruction	474ns	204ns	
Floating-point addition	250μs	108μs	
PC MIX value	2.6	5.6	
Bit device (points)	Internal/latch relay M/L: 8k Link relay B: 8k Annunciator F: 2k Special relay M: 256k		
Timer/counter (points)	Timer (low speed 100ms, high speed 10ms, retentive 100ms) T: 2k Counter C: 1k		
Word device (points)	Data register D: 8k Link register W: 8k Index register Z/V: 14 File register R: 8k Accumulator A: 2 Special register D: 256		
Extended file R	Max. 64k points (built-in) + 152k points (memory card required)		
Pointer, nesting	Pointer P: 256, interrupt pointer I: 32, nesting N: 8		
Constant handled	6-bit integer, 32-bit integer		
Communication port	RS-232:115.2kbps (Max.)		
Max. number of I/O slots	64		

Note 10: Total number of I/O points on basic and extension bases directly controlled from a CPU module and I/O points controlled as remote I/O by a remote I/O network
Note 11: Number of I/O points on basic and extension bases directly controlled from a CPU module

PRODUCT LIST

EVOLUTION & INHERITANCE

Q Mode Model List

Product		Type	Outline
CPU module for Q mode	Basic model	Q00JCPU (NEW)	Program step: 8k steps CPU integrated with power supply and base
		Q00CPU (NEW)	Program step: 8k steps
		Q01CPU (NEW)	Program step: 14k steps
	High-performance model	Q02CPU	Program step: 28k steps
		Q02HCPU	Program step: 28k steps
		Q06HCPU	Program step: 60k steps
		Q12HCPU	Program step: 124k steps
		Q25HCPU	Program step: 252k steps
Motion CPU module		Q172CPU (NEW)	For 8-axis control
		Q173CPU (NEW)	For 32-axis control
Battery		Q6BAT	Replacement battery for Q02/Q02H/Q06H/Q12H/Q25HCPU
IC memory card		Q2MEM-1MBS	SRAM card: 1M bytes
		Q2MEM-2MBF	Flash card: 2M bytes (Flash ROM)
		Q2MEM-4MBF	Flash card: 4M bytes (Flash ROM)
		Q2MEM-8MBA	ATA card: 8M bytes (ATA flash ROM)
		Q2MEM-16MBA	ATA card: 16M bytes (ATA flash ROM)
		Q2MEM-32MBA	ATA card: 32M bytes (ATA flash ROM)
SRAM card battery		Q2MEM-BAT	Replacement battery for Q2MEM-1MBS
Base unit	Main	Q33B	Power supply + CPU + 3 I/O slots for Q series modules
		Q35B	Power supply + CPU + 5 I/O slots for Q series modules
		Q38B	Power supply + CPU + 8 I/O slots for Q series modules
		Q312B	Power supply + CPU + 12 I/O slots for Q series modules
	Extension	Q63B	Power supply + 3 I/O slots for Q series modules
		Q65B	Power supply + 5 I/O slots for Q series modules
		Q68B	Power supply + 8 I/O slots for Q series modules
		Q612B	Power supply + 12 I/O slots for Q series modules
		Q52B (NEW)	2 I/O slots for Q series modules (power supply module unnecessary)
		Q55B (NEW)	5 I/O slots for Q series modules (power supply module unnecessary)
	Adaptor	Q6DIN1	DIN rail mounting adaptor for Q38B/Q312B/Q68B/Q612B
		Q6DIN2	DIN rail mounting adaptor for Q35B/Q65B
		Q6DIN3	DIN rail mounting adaptor for Q33B/Q63B
Extension cable		QC05B (NEW)	0.45m (1.48feet)
		QC06B	0.6m (1.96feet)
		QC12B	1.2m (3.93feet)
		QC30B	3m (9.84feet)
		QC50B	5m (16.4feet)
		QC100B	10m (32.8feet)
Power supply module		Q61P-A1	100-120VAC input/5VDC 6A output
		Q61P-A2	200-240VAC input/5VDC 6A output
		Q62P	100-240VAC input/5VDC 3A, 24VDC/0.6A output
		Q63P	24VDC input/5VDC 6A output
		Q64P (Soon to be released)	100-120/200-240VAC input/5VDC 8.5A output
Input module	AC	QX10	100-120VAC/7 to 8mA, 16 points, response time: 20ms, terminal block
		QX28	240VAC, 8 points, terminal block
	DC (Note 1)	QX40	24VDC/4mA, positive common, 16 points, response time: 1/5/10/20/70ms, terminal block
		QX40-S1	24VDC positive common input 16 points, terminal block for high-speed input (response time of 0.1ms can be specified)
		QX41	24VDC/4mA, positive common, 32 points, response time: 1/5/10/20/70ms, connector (Note 2)
		QX42	24VDC/4mA, positive common, 64 points, response time: 1/5/10/20/70ms, connector (Note 2)
	DC sensor (Note 1)	QX70	5-12VDC input shared between positive common and negative common, 16-point terminal block
		QX71	5-12VDC input shared between positive common and negative common, 32-point connector (Note 2)
		QX72	5-12VDC input shared between positive common and negative common, 64 connector (Note 2)
	DC (Note 1)	QX80	24VDC/4mA, negative common, 16 points, response time: 1/5/10/2070ms, terminal block
		QX81	24VDC/4mA, negative common, 32 points, response time: 1/5/10/2070ms, connector (Note 3)
Output module	Contact	QY10	240VAC/24VDC, 2A/point, 8A/common, 16 points (16 points/common), output delay: 12ms, without fuse, terminal block
		QY18A	240VAC/24VDC 2A, 8 independent contact output points, terminal block
	AC triac	QY22	240VAC/0.6A, 16 points, terminal block, without fuse
	Transistor (Sink)	QY40P	12/24VDC 0.1A/point, 1.6A/common, 16 points (16 points/common), output delay: 1ms, terminal block, with short-circuit protection function
		QY41P	12/24VDC 0.1A/point, 2A/common, 32 points (32 points/common), output delay: 1ms, connector, with short-circuit protection function (Note 2)
		QY42P	12/24VDC 0.1A/point, 2A/common, 64 points (32 points/common), output delay: 1ms, connector, with short-circuit protection function (Note 2)
		QY50	12/24VDC 0.5A/point, 4A/common, 16 points (16 points/common), output delay: 1ms, with fuse, terminal block
	Transistor	QY68A (NEW)	5-24VDC, 2A/point, 8A/module, 8 points, all points independent, sink/source, terminal block, without fuse
	TTL-CMOS (Sink)	QY70 (NEW)	5/12VDC, 16mA/point, 16 points (16 points/common), output delay: 0.3ms, with fuse, terminal block
		QY71 (NEW)	5/12VDC, 16mA/point, 32 points (32 points/common), output delay: 0.3ms, with fuse, connector (Note 2)
	Transistor (Source)	QY80	12/24VDC 0.5A/point, 4A/common, 16 points (16 points/common), output delay: 1ms, with fuse, terminal block
		QY81P	12/24VDC 0.1A/point, 2A/common, 32 points (32 points/common), output delay: 1ms, connector, with short-circuit protection function (Note 3)

Product		Type	Outline
I/O composite module	DC input /transistor output	QH42P	24VDC positive common input: 32 points (response time: 1/5/10/20/70ms)
			12-24VDC, 0.1A sink output: 32 points, connector, with short-circuit protection function
		QX48Y57	24VDC positive common input: 8 points
			12-24VDC/0.5A sink output: 7 points, with fuse, terminal block
I/O module connector		A6CON1	Soldering 32-point connector (for QX41/42, QY41P/42P)
		A6CON2	Solderless terminal connection 32-point connector (for QX41/42, QY41P/42P)
		A6CON3	Flat cable pressure-displacement 32-point connector (for QX41/42, QY41P/42P)
		A6CON1E	Soldering 32-point connector (for QX81, QY81P)
		A6CON2E	Crimp-contact connection 32-point connector (for QX81, QY81P)
		A6CON3E	Flat cable pressure-displacement 32-point connector (for QX81, QY81P)
Interrupt module (Note 6)		QI60	16 points, response time: OFF→ON 0.2ms or less, ON→OFF 0.3ms or less
Blank cover		QG60	Blank cover for I/O slot
Analog module (Note 5)		Q64AD	4 channels, analog-to-digital conversion: voltage/current input
		Q68ADV	8 channels, analog-to-digital conversion: voltage inpu
		Q68ADI	8 channels, analog-to-digital conversion: voltage input
		Q62DA	2 channels, digital-to-analog conversion: voltage/current output
		Q64DA	4 channels, digital-to-analog conversion: voltage/current output
		Q68DAV (NEW)	8 channels, digital-to-analog conversion: voltage output
		Q68DAI (NEW)	8 channels, digital-to-analog conversion: current output
Temperature input module		Q64TD (NEW)	4 channels, thermocouple input
		Q64RD (NEW)	4 channels, platinum temperature measuring resistor input (3/4-wire type)
Temperature control module (Note 5)		Q64TCTT	Thermocouple input-transistor output
		Q64TCTTBW	Thermocouple input-transistor output with wire breakage detection function
		Q64TCRT	Platinum resistance thermometer input-transistor output
		Q64TCRTBW	Platinum resistance thermometer input-transistor output with wire breakage detection function
High-speed counter		QD62	2 channels, 200kpps, 5/12/24VDC input, sink transistor output
		QD62D	2 channels, 500kpps, differential input, sink transistor output
		QD62E	2 channels, 200kpps, 5/12/24VDC input, source transistor output
Positioning module (Note 5)		QD75P1	1-axis, open collector output
		QD75P2	2-axis, open collector output
		QD75P4	4-axis, open collector output
		QD75D1	1-axis, differential output
		QD75D2	2-axis, differential output
		QD75D4	4-axis, differential output
		QD75M1 (NEW)	1-axis, SSCNET compatible
		QD75M2 (NEW)	2-axiss, SSCNET compatible
		QD75M4 (NEW)	4-axis, SSCNET compatible
		QD70P4 (NEW)	4-axis, pulse output (servo motor, stepping motor compatible)
		QD70P8 (NEW)	8-axis, pulse output (servo motor, stepping motor compatible)
Ethernet module		QJ71E71	For 10BASE-5/10BASE-T
		QJ71E71-B2	For 10BASE-2
		QJ71E71-100 (NEW)	For 10BASE-T/100BASE-TX
MELSECNET/H module		QJ71LP21-25	SI/QSI optical cable, duplex loop, for control, ordinary or master station
		QJ71LP21G (NEW)	GI optical cable, duplex loop, for control, ordinary or master station
		QJ72LP25-25	SI/QSI optical cable, duplex loop, for remote I/O station
		QJ72LP25G (NEW)	GI optical cable, duplex loop, for remote I/O station
		QJ71BR11	Coaxial 75Ω cable, simplex bus
		QJ72BR15	Coaxial 75Ω cable, simplex bus for remote I/O station
		Q80BD-J71LP21-25	MELSECNET/H board for personal computer, optical cable specifications, for control or ordinary station
		Q80BD-J71LP21G (NEW)	MELSEC/H board for personal computer, SI/QSI/H-PC optical cable specifications, for control or ordinary station
		Q80BD-J71BR11	MELSECNET/H board for personal computer, coaxial cable specifications, for control or ordinary station
CC-Link module (Note 5)		QJ61BT11	For master/local
Serial communication module (Note 6)		QJ71C24 (Updated)	RS-232 1 channel, RS-422/485 1 channel
		QJ71C24-R2 (Updated)	RS-232 2 channels
Modem interface module		QJ71CMO (NEW)	Built-in modem 1 channel/RS-232 1 channel
Intelligent communication module		QD51	RS232 2 channels
		QD51-R24	RS232 1 channel, RS422/485 1 channel
		SW1IDV-AD51HP (Note 4)	QD51 software package (shared between DOS/V personal computer and AD51H-S3/A1SD51S)
		SW1NX-AD51HP (Note 4)	QD51 software package (shared between NEC PC9800 series personal computer and AD51H-S3/A1SD51S)
FL-net module (Note 5)		QJ71FL71	For 10BASE-5/10BASE-T
		QJ71FL71-B2	For 10BASE-2
Extension base unit		QA1S65B	Power supply + 5 I/O slots for AnS series modules
		QA1S68B	Power supply + 8 I/O slots for AnS series modules
		QA65B (NEW)	Power supply + 5 I/O slots for large A series modules (high-performance model only)

Note 1: "Positive common" indicates that DC power + is connected and used with the common terminal. "Negative common" indicates that DC power - is connected and used with the common terminal.
Note 2: No connector is provided. Separately get the A6CON1/A6CON2/A6CON3.
Note 3: No connector is provided. Separately get the A6CON1E/A6CON2E/A6CON3E.
Note 4: This software is available in Japanese and English versions.
Note 5: This software package is designed for use in the MS-DOS mode only.
Note 6: Setting the response time on this module requires the CPU module's product information "0211220000000000-B" and GX Developer Version 6 or later.

*1 In addition to the above modules, the AnS series modules can be loaded and used on the QA1S65B/QA1S68B, the A series modules can be loaded and used on the Q65B. Since some modules are unusable or have restrictions on functions, check usable modules in the Q series data book.

A Mode Model List

√ : Compatible   – : Not compatible

Product	Type	Outline
CPU module	Q02CPU-A	Program : 28k steps
	Q02HCPU-A	Program : 28k steps
	Q06HCPU-A	Program : 60k steps
Battery	Q6BAT	Replacement battery for Q02/Q02H/Q06HCPU-A
Memory card	Q2MEM-1MBS	SRAM: 1M bytes
SRAM card battery	Q2MEM-BAT	Replacement battery for Q2MEM-1MBS
Base unit / Main	QA1S33B	Power supply + CPU + 3 I/O slots for AnS series modules
	QA1S35B	Power supply + CPU + 5 I/O slots for AnS series modules
	QA1S38B	Power supply + CPU + 8 I/O slots for AnS series modules
Base unit / Extension	QA1S65B	Power supply + 5 I/O slots for AnS series modules
	QA1S68B	Power supply + 8 I/O slots for AnS series modules
Extension cable	QC06B	0.6m
	QC12B	1.2m
	QC30B	3m
	QC50B	5m
	QC100B	10m

Use the power supply, I/O, special and network modules designed for the AnS series. You cannot use the power supply, I/O, special and network modules designed for the Q and Q2AS series. Note that you cannot use the AnS series base units, extension cables and A6SIM-X64Y64. Check details in the Q series data book.
The Q series I/O, intelligent function and network modules other than the above are unusable.

Software, Peripheral Devices

√ : Compatible   – : Not compatible

Product	Type	Outline	A	Q
GX Developer (Note 3)	SW☐D5C-GPPW	MELSEC PLC programming software	√	√
	SW☐D5C-GPPW-E	MELSEC PLC programming software (English version)	√	√
	SW☐D5C-GPPW-V	MELSEC PLC programming software (Updated)	√	√
	SW☐D5C-GPPW-EV	MELSEC PLC programming software (English version updated)	√	√
	SW☐D5C-GPPW-A	MELSEC PLC programming software (Multiple-license product)	√	√
	SW☐D5C-GPPW-EA	MELSEC PLC programming software (English version multiple-license product)	√	√
GX Convertor	SW☐D5C-CNVW	Excel©/text data converter	√	√
	SW☐D5C-CNVW-E	Excel©/text data converter (English version)	√	√
	SW☐D5C-CNVW-5	Excel©/text data converter (5-license product)	√	√
	SW☐D5C-CNVW-10	Excel©/text data converter (10-license product)	√	√
	SW☐D5C-CNVW-E5	Excel©/text data converter (English version 5-license product)	√	√
	SW☐D5C-CNVW-E10	Excel©/text data converter (English version 10-license product)	√	√
GX Configurator-AD	SW☐D5C-QADU	MELSEC-Q dedicated analog to digital module setting/monitoring tool	–	√
	SW☐D5C-QADU-E	MELSEC-Q dedicated analog to digital module setting/monitoring tool (English version)	–	√
GX Configurator-DA	SW☐D5C-QDAU	MELSEC-Q dedicated digital to analog module setting/monitoring tool	–	√
	SW☐D5C-QDAU-E	MELSEC-Q dedicated digital to analog module setting/monitoring tool (English version)	–	√
GX Configurator-SC	SW☐D5C-QSCU	MELSEC-Q dedicated serial communication module setting/monitoring tool	–	√
	SW☐D5C-QSCU-E	MELSEC-Q dedicated serial communication module setting/monitoring tool (English version)	–	√
GX Configurator-CT	SW☐D5C-QCTU	MELSEC-Q dedicated high-speed counter module setting/monitoring tool	–	√
	SW☐D5C-QCTU-E	MELSEC-Q dedicated high-speed counter module setting/monitoring tool (English version)	–	√
GX Configurator-TI NEW	SW☐D5C-QTIU	MELSEC-Q dedicated temperature input module setting/monitoring tool	–	√
	SW☐D5C-QTIU-E	MELSEC-Q dedicated temperature input module setting/monitoring tool (English version)	–	√
GX Configurator-TC	SW☐D5C-QTCU	MELSEC-Q dedicated temperature control module setting/monitoring tool	–	√
	SW☐D5C-QTCU-E	MELSEC-Q dedicated temperature control module setting/monitoring tool (English version)	–	√
GX Configurator-FL	SW☐D5C-QFLU	MELSEC-Q dedicated FL-NET module setting/monitoring tool	–	√
	SW☐D5C-QFLU-E	MELSEC-Q dedicated FL-NET module setting/monitoring tool (English version)	–	√
GX Configurator-PT NEW	SW☐D5C-QPTU	QD70P positioning module setting/monitoring tool	–	√
	SW☐D5C-QPTU-E	QD70P positioning module setting/monitoring tool (English version)	–	√
GX Configurator-QP	SW☐D5C-QD75P	QD75P/D/M positioning module setting/monitoring tool	–	√
	SW☐D5C-QD75P-E	QD75P/D/M positioning module setting/monitoring tool (English version)	–	√
GX Simulator	SW☐D5C-LLT	MELSEC PLC simulation software	√	√
	SW☐D5C-LLT-E	MELSEC PLC simulation software (English version)	√	√
	SW☐D5C-LLT-V	MELSEC PLC simulation software (Updated)	√	√
	SW☐D5C-LLT-EV	MELSEC PLC simulation software (English version updated)	√	√
	SW☐D5C-LLT-A	MELSEC PLC simulation software (Multiple-license product)	√	√
	SW☐D5C-LLT-EA	MELSEC PLC simulation software (English version multiple-license product)	√	√
GX Explorer NEW	SW☐D5C-EXP	MELSEC PLC project management software	√	√
	SW☐D5C-EXP-E	MELSEC PLC project management software (English version)	√	√
	SW☐D5C-EXP-A	MELSEC PLC project management software (Multiple-license product)	√	√
	SW☐D5C-EXP-EA	MELSEC PLC project management software (English version multiple-license product)	√	√
MX Component	SW☐D5C-ACT	Active X library for communication	√	√
	SW☐D5C-ACT-E	Active X library for communication (English version)	√	√
	SW☐D5C-ACT-A	Active X library for communication (Multiple-license product)	√	√
	SW☐D5C-ACT-EA	Active X library for communication (English version multiple-license product)	√	√

Compatible Mode: A / Q

√ : Compatible   – : Not compatible

Product	Type	Outline	A	Q
MX Links (Note 4) (Note 5)	SW☐D5F-CSKP	DDL library for communication	√	√
	SW☐D5F-CSKP-E	DDL library for communication (English version)	√	√
	SW☐D5F-CSKP-5	DDL library for communication (5-license product)	√	√
	SW☐D5F-CSKP-10	DDL library for communication (10-license product)	√	√
	SW☐D5F-CSKP-20	DDL library for communication (20-license product)	√	√
	SW☐D5F-CSKP-E5	DDL library for communication (English version 5-license product)	√	√
	SW☐D5F-CSKP-E10	DDL library for communication (English version 10-license product)	√	√
	SW☐D5F-CSKP-E20	DDL library for communication (English version 20-license product)	√	√
MX Chart (Note 4) (Note 5)	SW☐D5F-OLEX	Excel©communication OLE library	√	√
	SW☐D5F-OLEX-E	Excel©communication OLE library (English version)	√	√
	SW☐D5F-OLEX-5	Excel©communication OLE library (5-license product)	v	√
	SW☐D5F-OLEX-10	Excel©communication OLE library (10-license product)	√	√
	SW☐D5F-OLEX-E5	Excel©communication OLE library (English version 5-license product)	√	√
	SW☐D5F-OLEX-E10	Excel©communication OLE library (English version 10-license product)	√	√
MX Monitor (Note 4) (Note 5)	SW☐D5F-XMOP	Monitoring tool	√	√
	SW☐D5F-XMOP-E	Monitoring tool (English version)	√	√
	SW☐D5F-XMOP-5	Monitoring tool (5-license product)	√	√
	SW☐D5F-XMOP-10	Monitoring tool (10-license product)	√	√
	SW☐D5F-XMOP-E5	Monitoring tool (English version 5-license product)	√	√
	SW☐D5F-XMOP-E10	Monitoring tool (English version 10-license product)	√	√
MX Parts	SW☐D5C-PIC-B	Figure data package	√	√
GX Works	SW☐D5C-QSET	A set of seven products, GX Developer, GX Simulator, GX Explorer, GX Configurator-AD, DA, SC, CT	(Note 2)	√
	SW☐D5C-QSET-E	A set of seven products, GX Developer, GX Simulator, GX Explorer, GX Configurator-AD, DA, SC, CT (English version)	(Note 2)	√
	SW☐D5C-GPPLLT	A set of three products, GX Developer, GX Simulator, GX Explorer	√	√
	SW☐D5C-GPPLLT-E	A set of three products, GX Developer, GX Simulator, GX Explorer (English version)	√	√
MX Works (Note 5)	SW☐D5F-CSOLEX	A set of two products, MX Links, MX Chart	√	√
	SW☐D5F-CSOLEX-E	A set of two products, MX Links, MX Chart (English version)	√	√
	SW☐D5F-CSXMOP	A set of two products, MX Links, MX Chart	√	√
	SW☐D5F-CSXMOP-E	A set of two products, MX Links, MX Chart (English version)	√	√
Connection cable	QC30R2	RS-232 cable for connection of personal computer and CPU, 3m (mini-DIN 6P)-(Dsub 9P)	√	√
Peripheral device connection module	AJ65BT-G4-S3	Module for connection with master CPU or local station CPU of CC-Link system	√	√
PC card adapter	Q2MEM-ADP	Adaptor for standard PCMCIA slot of Q2MEM memory card	√	√
Cable disconnection prevention holder	Q6HLD-R2 NEW	Holder for prevention of RS-232 cable disconnection	√	√

Compatible Mode: A / Q

Note 1: Contact your sales representative for multiple-license products.
Note 2: GX Configurator-AD, DA, SC and CT are unusable with the A mode.
Note 3: Supported by SW4 or later, multiple PLC system supported by SW6 or later, Q00J/Q00/Q01CPU supported by SW7 or later.
Note 4: Supported by SW3 or later.
Note 5: Incompatible with the basic models.

*GX series and MX Component are compatible with Windows©95/98/Me/NT 4.0/2000 Professional.
MX series is compatible with Windows©95/98/Me/NT 4.0.

Mitsubishi Programmable Logic Controller

Precautions for Choosing the Products

This catalog explains the typical features and functions of the Q series PLCs and does not provide restrictions and other information on usage and module combinations. When choosing the products, always check the detailed specifications, restrictions, etc. of the products in the Q series data book. 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; machine damage 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.

Country/Region	Sales office	Tel/Fax
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061	Tel : 1-847-478-2100 Fax : 1-847-478-0328
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Av. Rio Branco, 123-15 ,and S/1507, Rio de Janeiro, RJ CEP 20040-005, Brazil	Tel : 55-21-221-8343 Fax : 55-21-221-9388
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, GERMANY	Tel : 49-2102-486-0 Fax : 49-2102-486-717
U.K	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Herts., AL10 8XB,UK	Tel : 44-1707-276100 Fax : 44-1707-278695
Italy	Mitsubishi Electric Europe B.V. Italian Branch Centro Dir. Colleoni, Pal. Perseo - Ingr.2 Via Paracelso 12, 20041 Agrate B., Milano, Italy	Tel : 39-039-6053301 Fax : 39-039-6053312
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi 76-80 08190 Sant Cugat del Valles, Barcelona, Spain	Tel : 34-935-653135 Fax : 34-935-891579
South Africa	Circuit Breaker Industries LTD. Private Bag 2016, Isando 1600, Johannesburg, South Africa	Tel : 27-11-928-2000 Fax : 27-11-392-2354
Hong Kong	Ryoden International Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, HongKong	Tel : 852-2887-8870 Fax : 852-2887-7984
China	Ryoden International Shanghai Ltd. 3F Block5 Building Automation Instrumentation Plaza 103 Cao Bao Rd. Shanghai 200233 China	Tel : 86-21-6475-3228 Fax : 86-21-6484-6996
Taiwan	Setsuyo Enterprise Co., Ltd. 6F., No.105 Wu-Kung 3rd.RD, Wu-Ku Hsiang, Taipei Hsine, Taiwan R.O.C.	Tel : 886-2-2299-2499 Fax : 886-2-2299-2509
Korea	HAN NEUNG TECHNO CO., LTD. 1F Dong Seo Game Channel Bldg., 660-11,Deungchon-dong Kangsec-ku, Seoul, Korea	Tel : 82-2-3668-6567 Fax : 82-2-3664-8335
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