

Changes for the Better

Programmable Controllers
Real Time Operating System C Controller



Dear C language programmers,

Invitation to programmable controllers

MELSEC  series

Introducing CW Workbench:

**The engineering tool for C Controllers that allows
for easier implementation and reduced cost.**

for a greener tomorrow



Introducing a revolutionary platform for C language development!

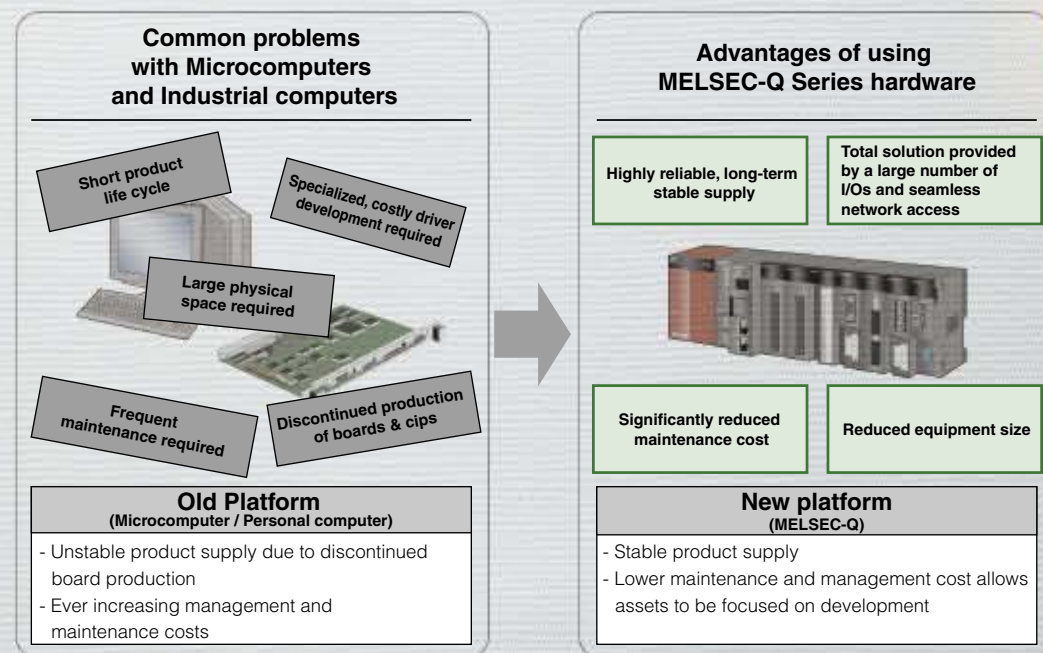
Dear C language programmers,

One of the first things that may come to mind when discussing the use of programmable controllers is ladder logic programming.

However, using the MELSEC C Controller it is possible to continue to use the same skilled workforce to gain the advantages of using a proven, quality platform.

Mitsubishi Electric is proud to announce the iQ Platform compatible, high-speed, large capacity, C Controller CPU and the CW Workbench engineering tool for C Controllers.

MELSEC's growing integrated system aims to deliver reassurance and competitiveness to you.



Tougher, smaller, and faster than the competition:
The C Controller for the integrated Q systems platform.

Systems once controlled by industrial PCs and microcontrollers can be replaced with the C-language controller. It boasts a best-in-class real-time OS (as of October 2010), VxWorks®, is immediately compatible with a vast array of Q Series hardware, and a long-term stable supply of hardware is available.

A flexible, easily expandable system incorporating ultra high-speed motion control can easily be created. Utilize a wide range of certified, proven Q Series I/O and networking modules and the new CW Workbench engineering tool for straightforward application development.



iQ Platform compatible	Standard OS + CW Workbench	Highly reliable MELSEC				
<p>Achieve high-precision control</p> <p>Typical control curve: coarse</p> <p>Control curve using iQ Platform: smooth</p>	<p>Quick start</p> <p>Only the user application needs to be created</p>	<p>Greatly improved system reliability</p> <table border="1"> <tr> <th>Personal computer system</th> <th>C Controller system</th> </tr> <tr> <td> <ul style="list-style-type: none"> Hard disk/fan can fail OS must be updated Anti-virus measures are required Susceptible to working environment </td> <td> <ul style="list-style-type: none"> Highly reliable real-time OS VxWorks® Diskless and fan-less OS updates not required Anti-virus measures not required Strong environmental resistance </td> </tr> </table>	Personal computer system	C Controller system	<ul style="list-style-type: none"> Hard disk/fan can fail OS must be updated Anti-virus measures are required Susceptible to working environment 	<ul style="list-style-type: none"> Highly reliable real-time OS VxWorks® Diskless and fan-less OS updates not required Anti-virus measures not required Strong environmental resistance
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iQ Platform ready CPU module with high-speed performance and capable handling large volumes of data communication

Q12DCCPU-V

- Highly reliable
- Compact size
- Pre-installed operating system
- iQ Platform compatible
- 7-segment LED display
- Ethernet (2 channels), USB, RS-232

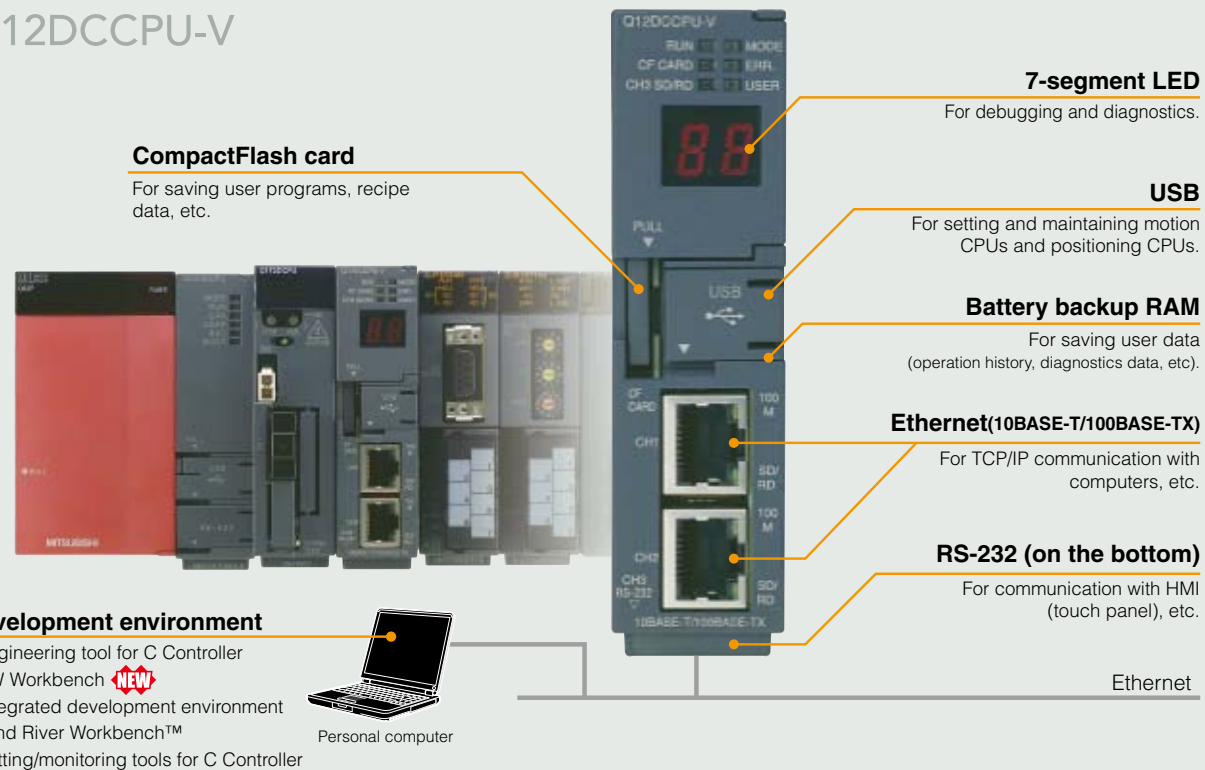


Q06CCPU-V

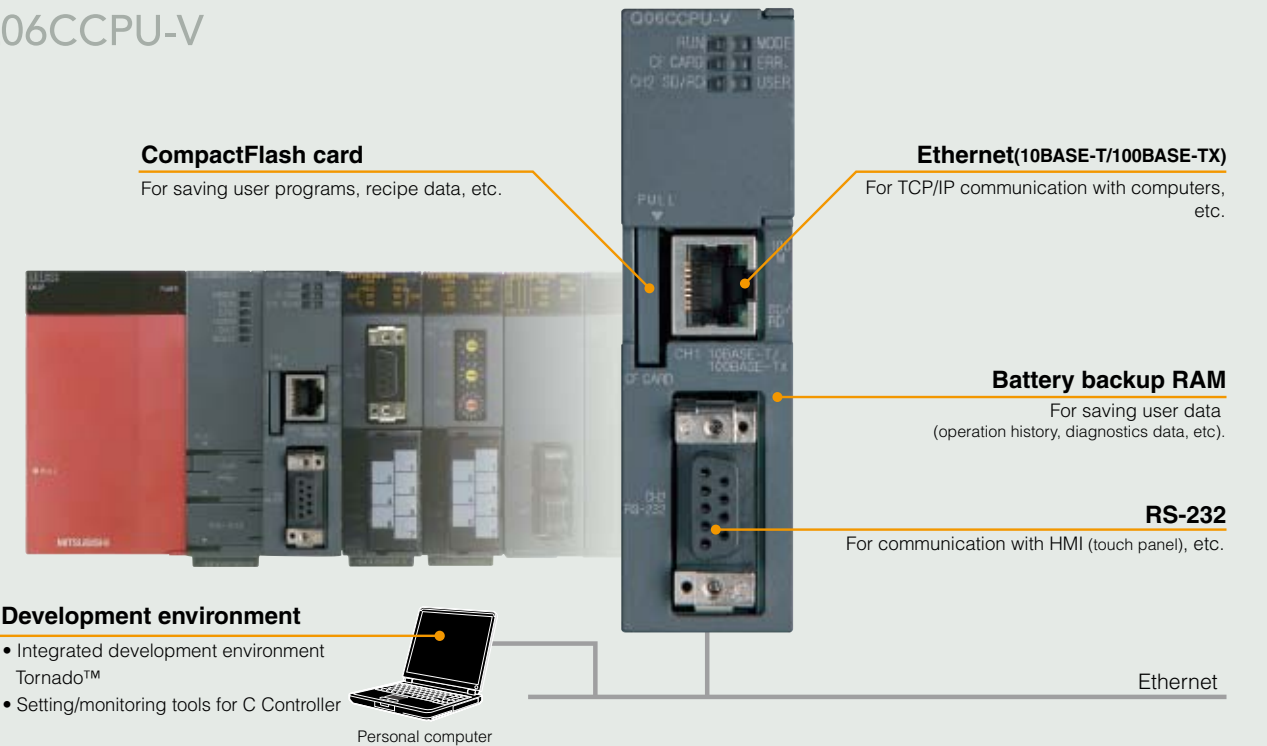
- Highly reliable
- Compact size
- Pre-installed operating system
- Ethernet (1 channel), RS-232



Q12DCCPU-V



Q06CCPU-V



Providing a development environment for embedded systems that is priced affordably

Engineering tool for C Controller module

CW Workbench **NEW**

Supported for Q12DCCPU-V only

Reduce instillation costs and develop applications easily

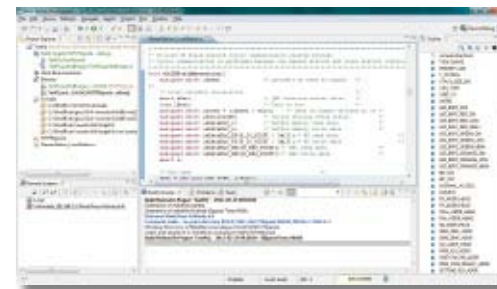
Traditionally, development environments for embedded systems have been very expensive, but now they are affordable. This allows full-scale embedded systems development at low cost. CW Workbench has all of the basic functionality expected such as a code editor, compiler, and debugger. More importantly, the application empowers developers to be able to easily create applications for the C Controller.

Support for multiple languages using plug-ins

Eclipse based CW Workbench supports multiple languages and its functionality can be expanded using third-party plug-ins for things like source code management.

Windows® 7 compatible

CW Workbench is compatible with Windows® 7, Windows Vista® and Windows® XP operation systems.

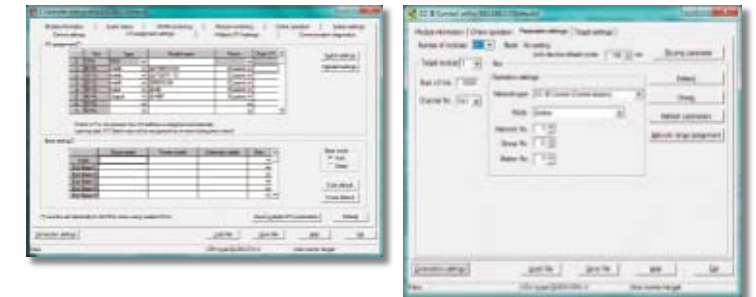


Reduce TCO with simple settings, diagnostics, and monitoring capabilities!

Setting/monitoring tools for C Controller module

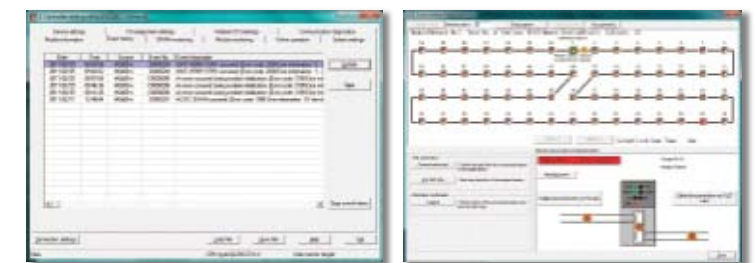
Program-free Parameter Settings

Easily configure C Controller systems, CC-Link IE controller networks (for managing the C Controllers), and the parameters for network devices such as CC-Link, all without using any programs.



Program-free Diagnostics

Quickly troubleshoot the system by confirming the history of events that have occurred in the C Controller and examine the status of connected networks using network diagnostics.



Perform monitoring and testing using convenient tools

Monitor the status (input, output, buffer memory, shared memory between multi-CPU) of connected modules, and easily perform simple debugging and check module operation with data input.



CW Workbench

“Project Explorer” window

Manage projects and settings

“Remote Systems” window

Manage connections to hardware

“Build Console” window

Display the build process history

“Editor” window

Edit programs

“Debug” window

Perform debugging

“Breakpoints” window

Manage break points

“Variables” window

View the current local variable values

“Expressions” window

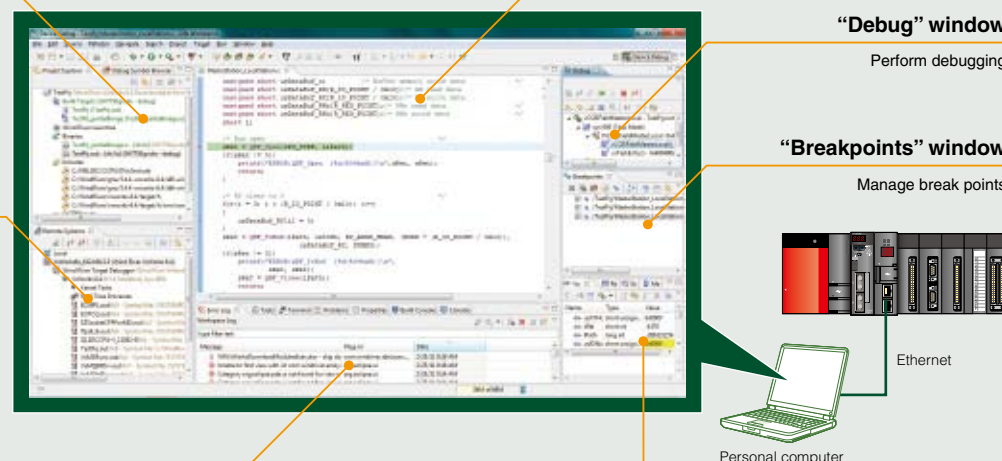
View the current variable values registered to be watched

“Registers” window

View the current register values

“Memory Browse” window

View C Controller’s memory dump



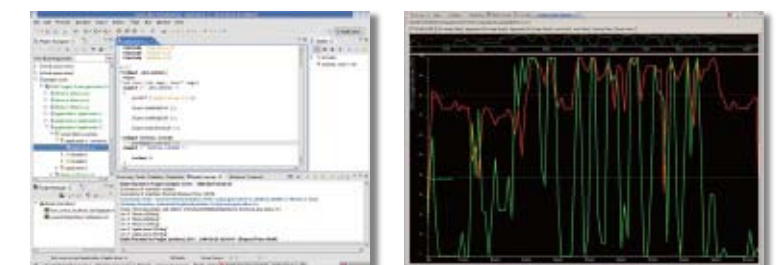
Support for all phases of application development

Wind River Workbench™ 2.6.1

Developed by Wind River | Supported for Q12DCCPU-V only

Incorporate advanced runtime diagnostic tools

In addition to basic functions for program editing, compiling and source debugging, Wind River Workbench™ incorporates advanced runtime diagnostic tools. When advanced diagnostics are required, use these diagnostic tools to analyze the execution order of tasks and interruption processes and confirm and debug application operations in fine detail.



WIND RIVER

CASE 1

Reduce total cost of ownership and increase the stability of equipment operation.

Issue

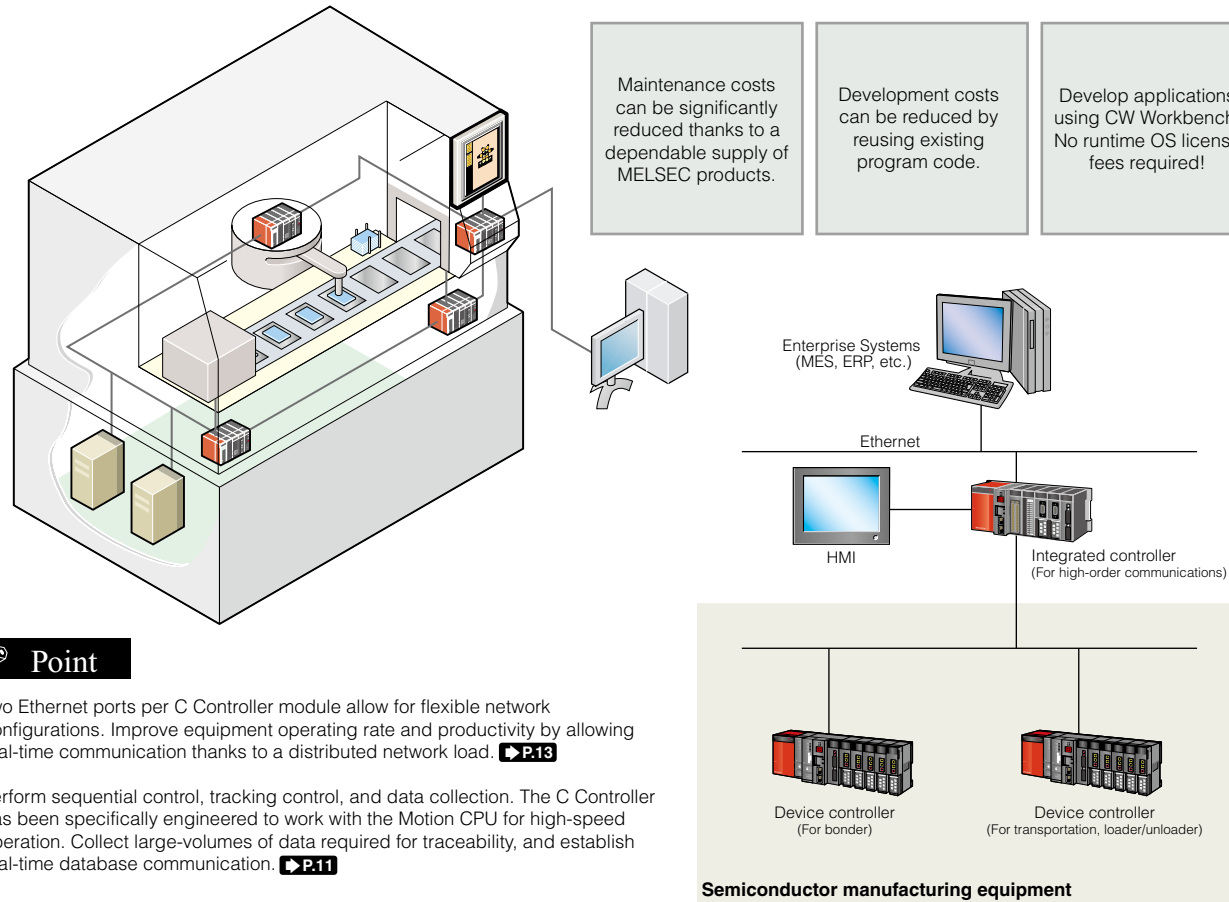
Concerns about discontinuation of products, boards, and chips.

Programs developed in-house are difficult to replace.

Development software and OS runtime licences are expensive.

Solution

Semiconductor manufacturing equipment



CASE 2

Programmable controllers allow integrated control and reduce costs by decreasing equipment size.

Issue

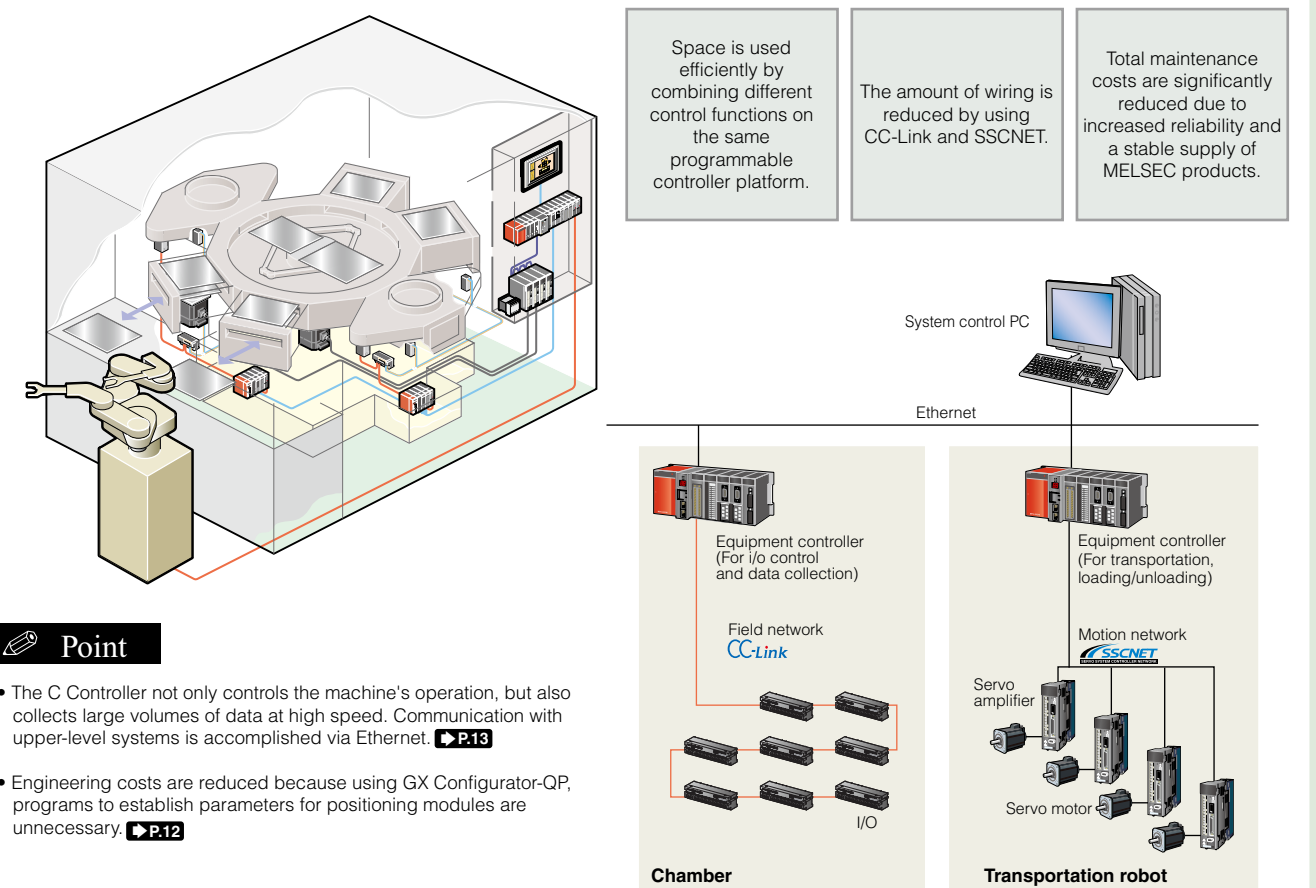
A large amount of space is required for computers, VME crates, and boards.

Complicated wiring increases maintenance costs.

Systems developed in-house (personal computers / boards) are complicated to maintain.

Solution

FPD manufacturing equipment



CASE 3

Increase system life-span by upgrading to MELSEC hardware.

Issue

Personal computers used in locations without environmental controls are vulnerable to harsh conditions.

Personal computers have many maintenance concerns including frequent updates, virus infection, failure of moving parts, etc.

Can I utilize them somehow?

Dedicated communication protocols and programs written in C language cannot be used by typical PLC systems.

Solution

Remote monitoring/control of public infrastructure

- MELSEC products are built to industrial specifications to handle harsh environments.
- Eliminate maintenance concerns by switching to MELSEC hardware.
- The cost of upgrading to more reliable hardware is reduced because the same communication protocols and programs can be used without further development.

Water purification plant

Valve sensor, Pressure/flow meter, Control valve, Pump

CASE 4

Equipment can be automated easily using SECS communication and program-free settings.

Issue

<Equipment manufacturer>
Significant amount of time and cost are required for developing SECS communication interface.

<Device/panel manufacturer>
SECS communication interfaces are available from many different equipment manufacturers. Even though they are standardized, there are still many inconsistencies that can cause trouble in the fabrication plant or the factory.

What a mess.

Solution

C Controller + CIMOPERATOR® P19

- Standardized SECS communication interface
- Construction and commissioning of lines can proceed smoothly.
- No need for a personal computer gateway. Cost is reduced as neither programs or personal computers are needed.
- Flexible to changes in SECS communication specification after operation.

Communication with MES server is standardized by CIMOPERATOR®

MES server

Ethernet <SECS communication>

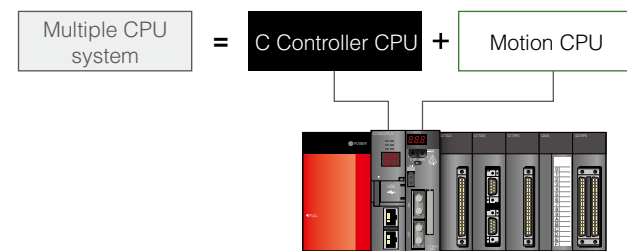
C Controller + CIMOPERATOR®

Enhanced motion integration

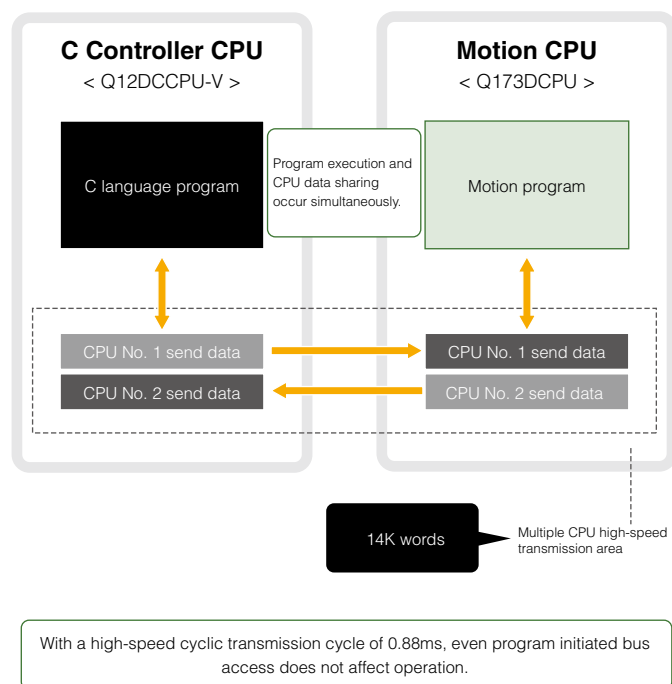
Only supported by Q12DCCPU-V

Shorten system takt time

In a multiple CPU system large volumes of data can quickly be shared between CPUs (14K words/0.88ms), independently of the programs, resulting in quicker takt times.



Achieve highly accurate control and shorten takt time.

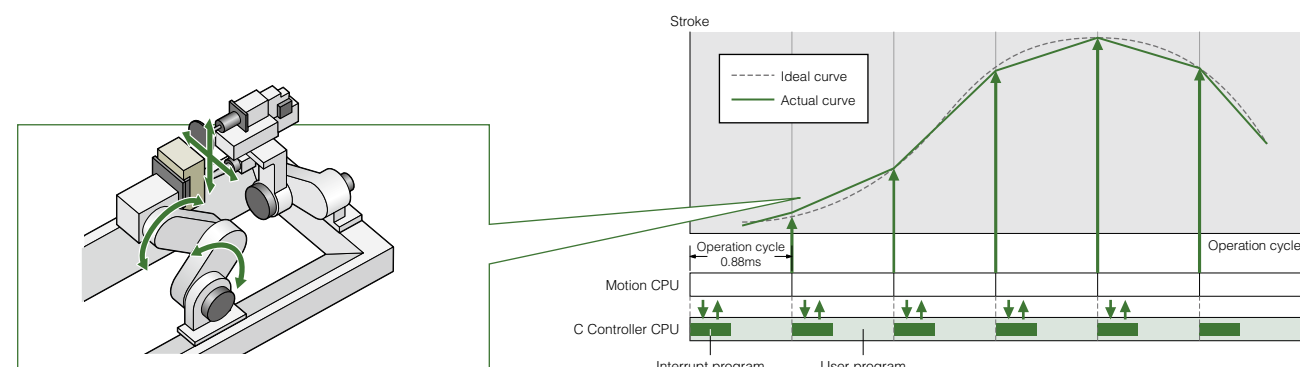


Motion synchronization function

Only supported by Q12DCCPU-V

High-performance, high-precision sequential control and tracking control

The C Controller CPU can synchronize interrupt program execution with the Motion CPU's operation cycle and the multiple CPU high-speed transmission function. This synchronization ensures a high speed response time because data is constantly refreshed every 0.88ms. In addition, interrupt programs are not delayed by program execution cycle or priority levels for multiple tasks, allowing real-time sequential control to synchronize with motion control, and tracking control to keep up with the constant changes in target value.



Real-time interrupt function

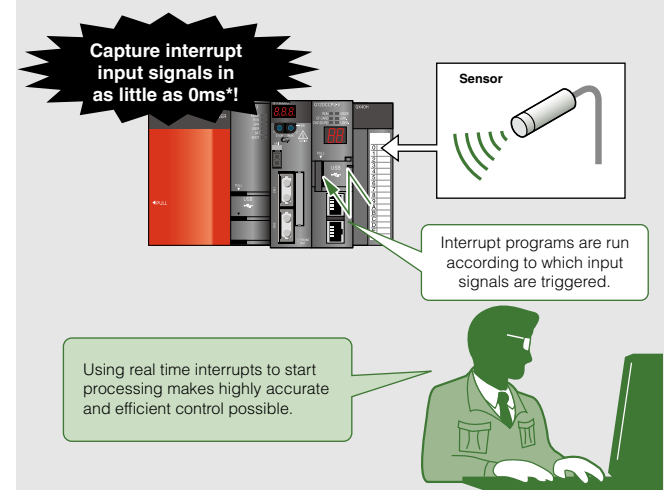
Only supported by Q12DCCPU-V

Get real-time responses to interrupts from intelligent function modules and interrupt input modules

When interrupt signals are issued from intelligent function modules or interrupt modules, the appropriate interrupt program is run immediately, without delays resulting from things like the the execution cycle of a user program. This real-time response to interrupt signals is just one more way the C Controller can help to push the performance and accuracy of control to the limits.

Application example: Use a high-speed DC input module to start an interrupt program

Capture inputs and start interrupt programs in less than 1ms. Even without customized microcomputer boards and personal computer control systems, it is possible to achieve tremendous performance and accuracy thanks to the ability to quickly respond to interrupt program requests.



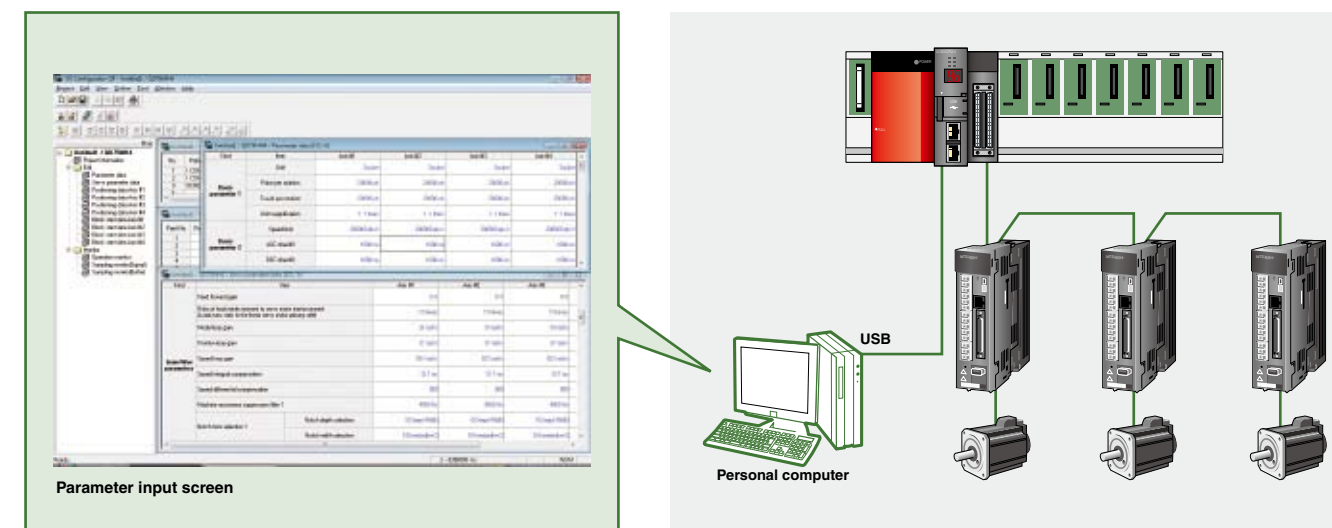
* The response time can be changed via settings.

Positioning module setting/monitoring tool

Only supported by Q12DCCPU-V

Easy positioning module configuration and start-up

Reduce engineering costs by eliminating the need for parameters to be set by a user program. Instead, parameters can be configured quickly using the user-friendly interface of GX Configurator-QP. In addition to configuring settings, GX Configurator-QP helps to speed up the start-up and commissioning process by providing advanced monitoring and debugging capabilities.



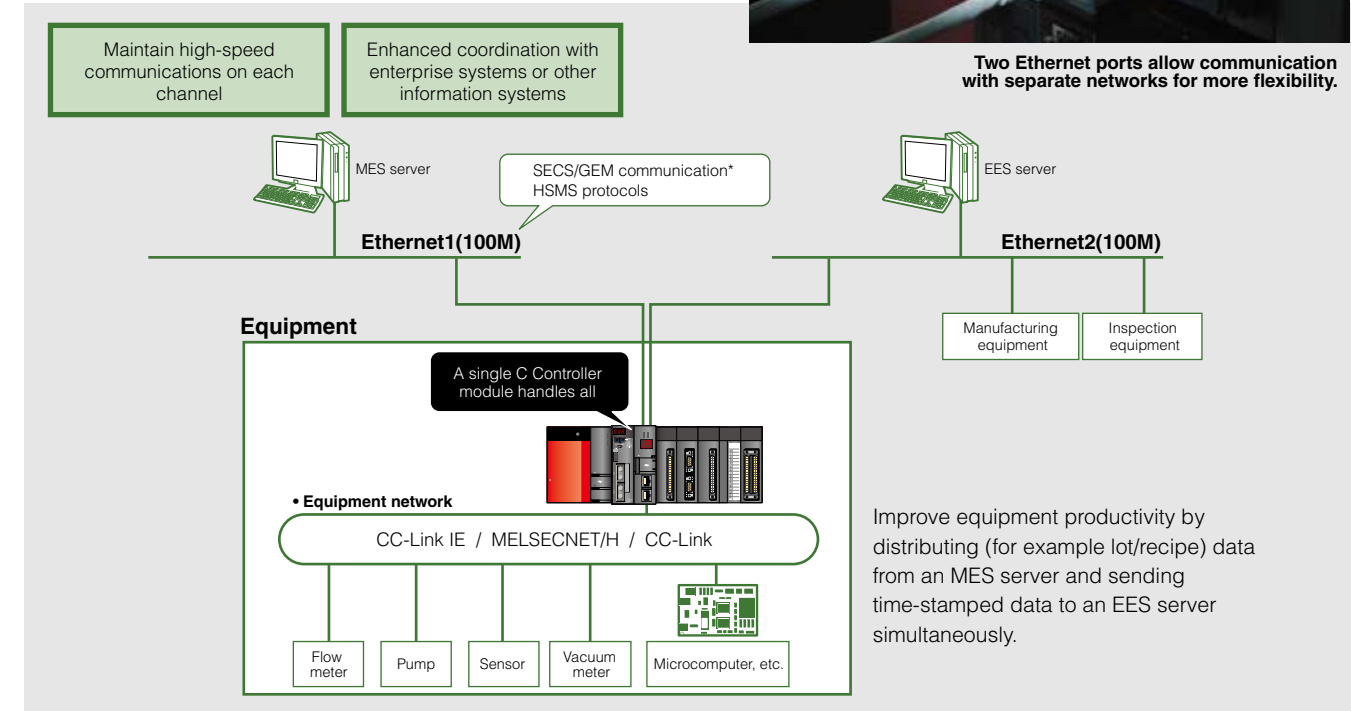
Information system function

Only supported by Q12DCCPU-V

Flexible network structure

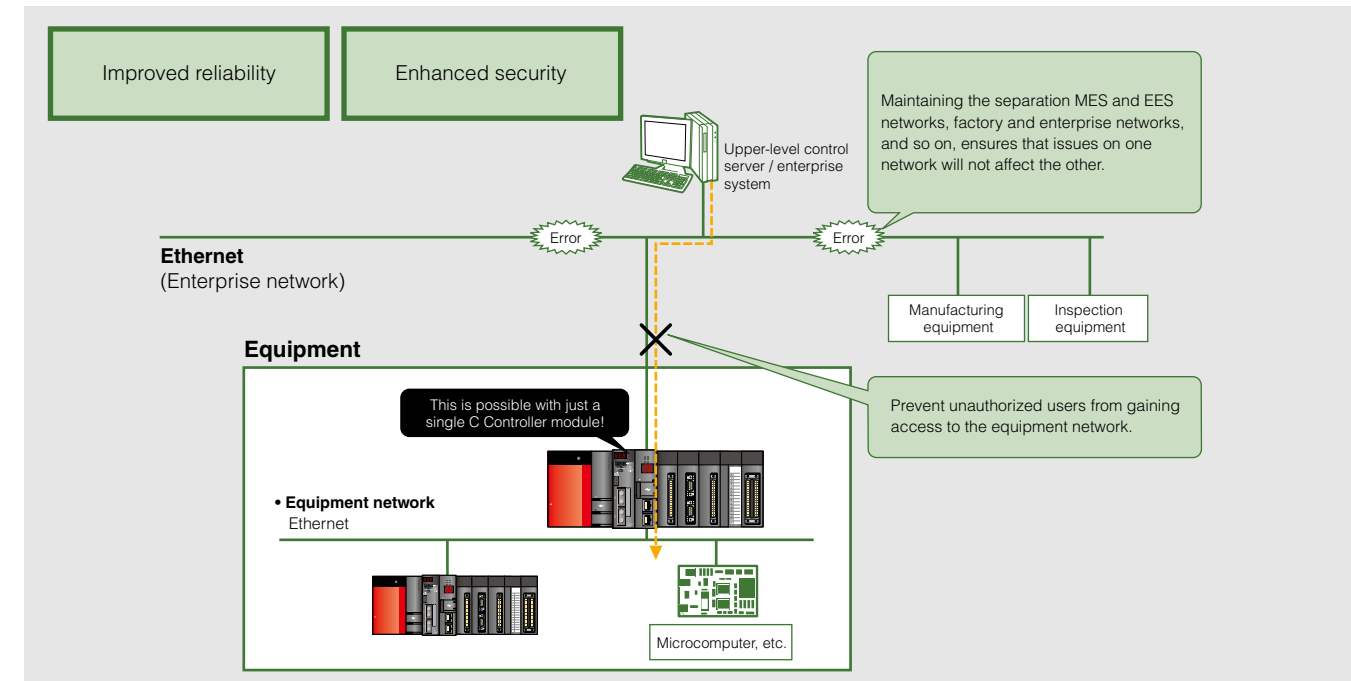
Improve equipment operation rate and productivity by leveraging separate networks to ensure real-time communication.

Application example 1: Real-time communication with MES and EES servers



* Implement SECS communication easily, without user programs, by using "CIMOPERATOR® SECS+" by NIPPON DENNO Co., LTD.

Application example 2: Enhanced network security



Device function

Only supported by Q12DCCPU-V

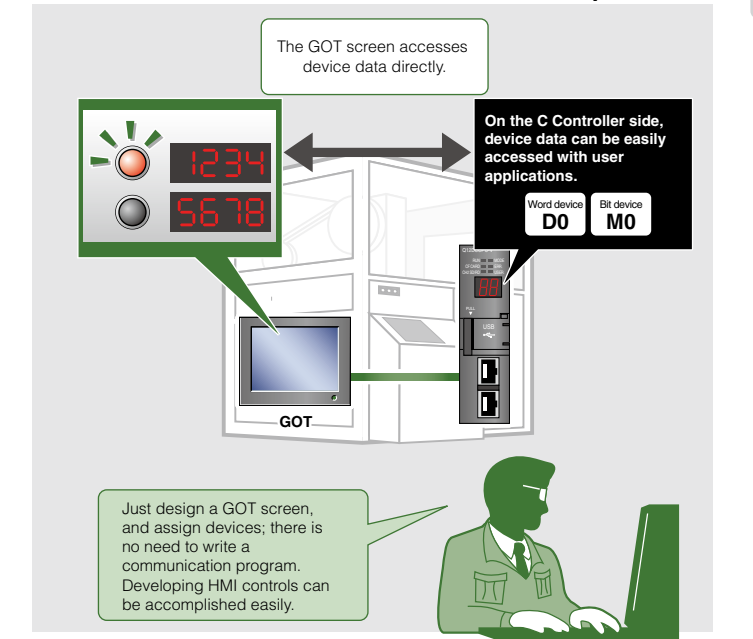
Quickly and easily establish communications without a program using the device function.

Create virtual devices, similar to those used by MELSEC programmable controllers, in the memory of the C Controller CPU using the device function. These devices can be accessed without the need for a user program by Mitsubishi GOTs or PCs running MX Component programs. Reduce engineering costs by simplifying the implementation of HMIs and other devices by removing the need to write communication programs.



For more information about compatible HMIs, refer to the Mitsubishi Graphic Operation Terminal GOT1000 General Catalog [L(NA)08054].

Application example: Easily create a GOT screen to display device values and control operations.

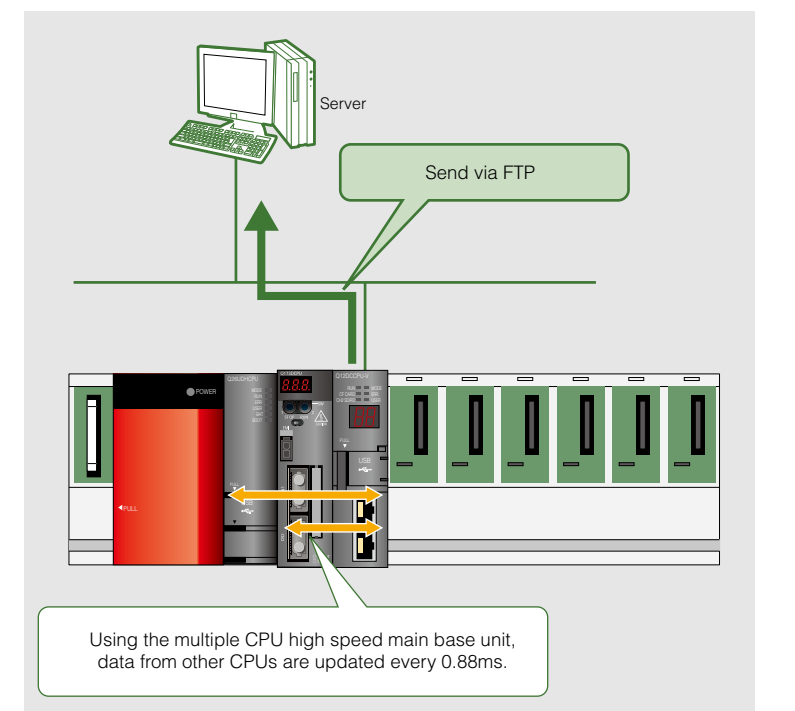


Traceability function

Only supported by Q12DCCPU-V

Collect and forward large amounts of data at high speed for comprehensive traceability.

The C Controller module can collect various types data of including device values from sequence CPUs and detailed servo information like current position and rotational velocity from motion CPUs. These data can be updated every 0.88ms using the multiple CPU high speed transmission auto refresh function. The C Controller module can then compile the desired data to a log file and send it to a separate system for storage and analysis.



High Speed Data Logger Module compatibility

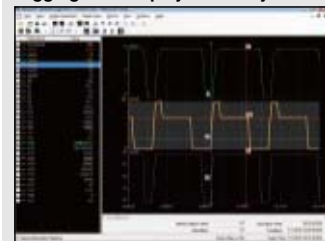
High speed data logging with no personal computer

C Controller CPUs are now compatible with the High Speed Data Logger Module. Just by making some simple settings, device values from the C Controller module can be captured and saved in Excel, CSV, or binary format. Additionally, the system can be monitored using a real-time view mode. To allow for ease of preventive maintenance or hasten the response to machine trouble, e-mail messages can be sent automatically when user defined conditions are met.

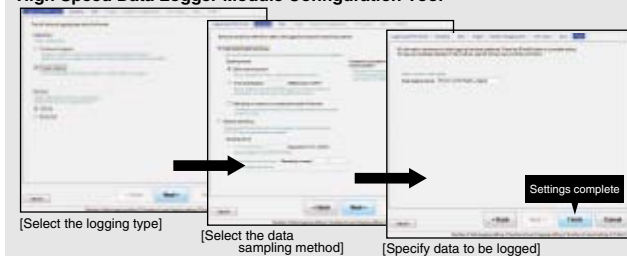
GX LogViewer & High Speed Data Logger Module setting tool

Logging data display and analysis tool "GX LogViewer"

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



High Speed Data Logger Module Configuration Tool

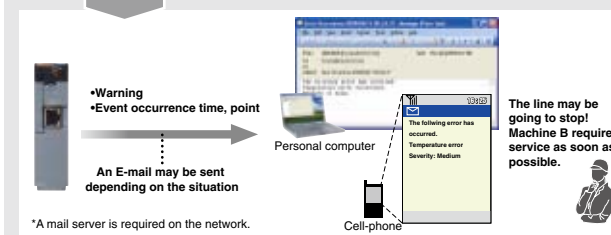
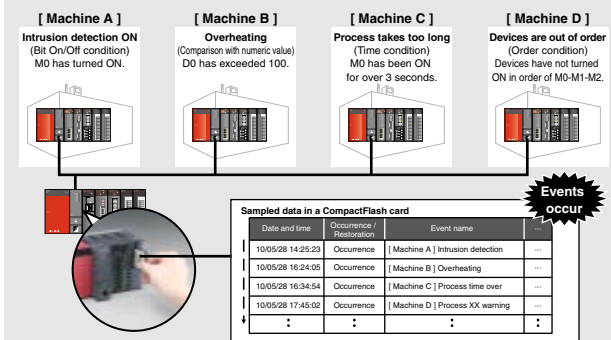


Even making sophisticated data collection rules is easy to do using the intuitive step-by-step configuration process.

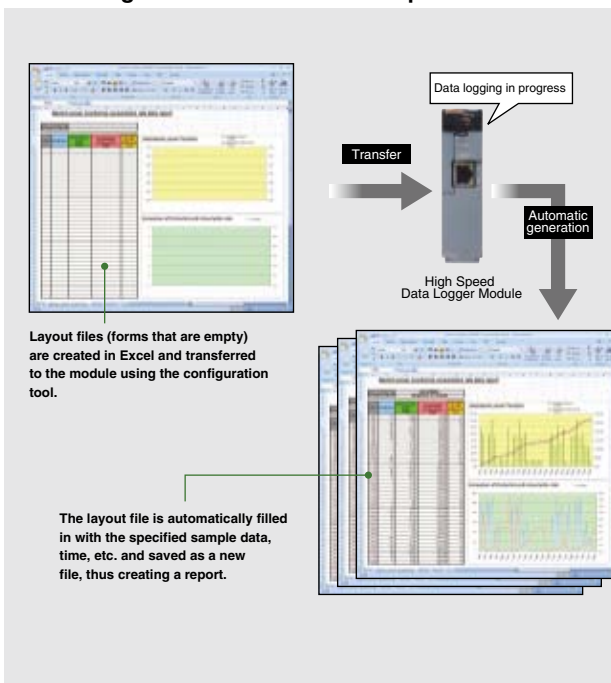
* GX LogViewer and the High Speed Data Logger Module Configuration Tool are available at no additional cost. Please contact your nearest Mitsubishi Electric representative for details.

Event logging function

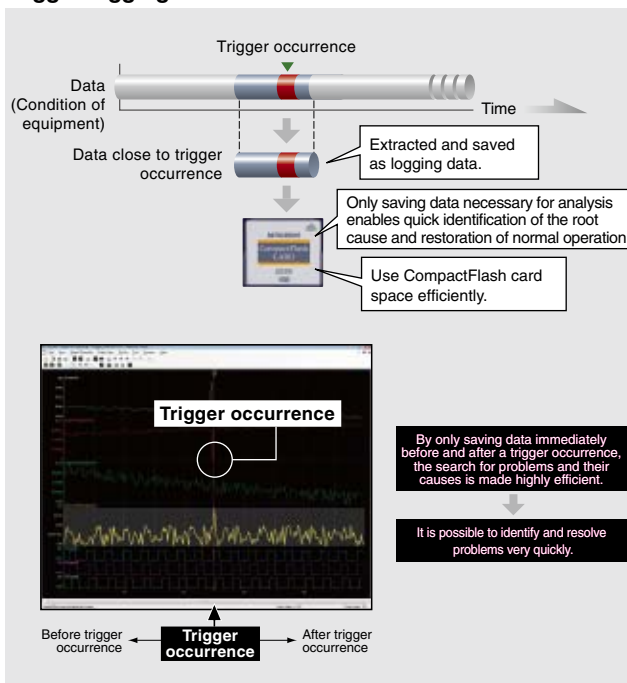
Superior event condition detection and time-line of events facilitates the detection of failures before they happen



Automatic generation of forms and reports as Excel files



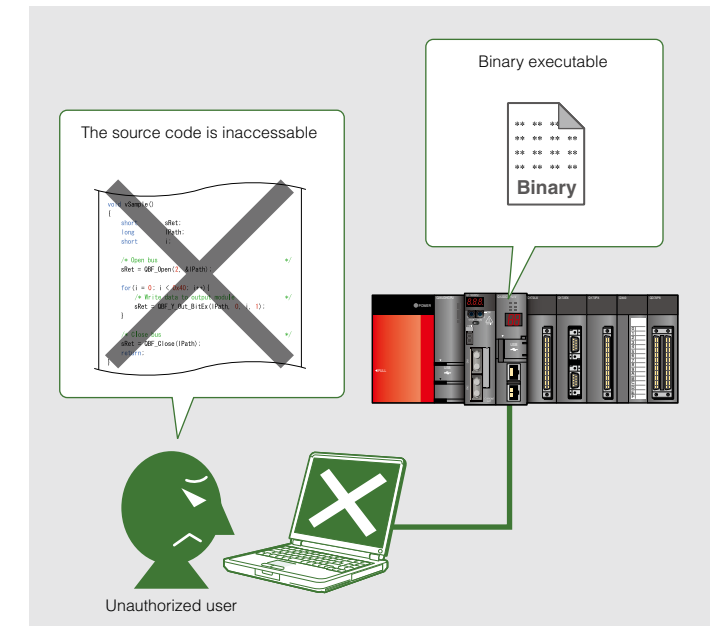
Trigger logging function



Intellectual property protection

Prevent the theft of source code and other files

Only the compiled, executable, binary data is stored in the C Controller CPU which prevents the original source code being obtained from the module. Additionally, FTP access is password protected to keep out unauthorized users.

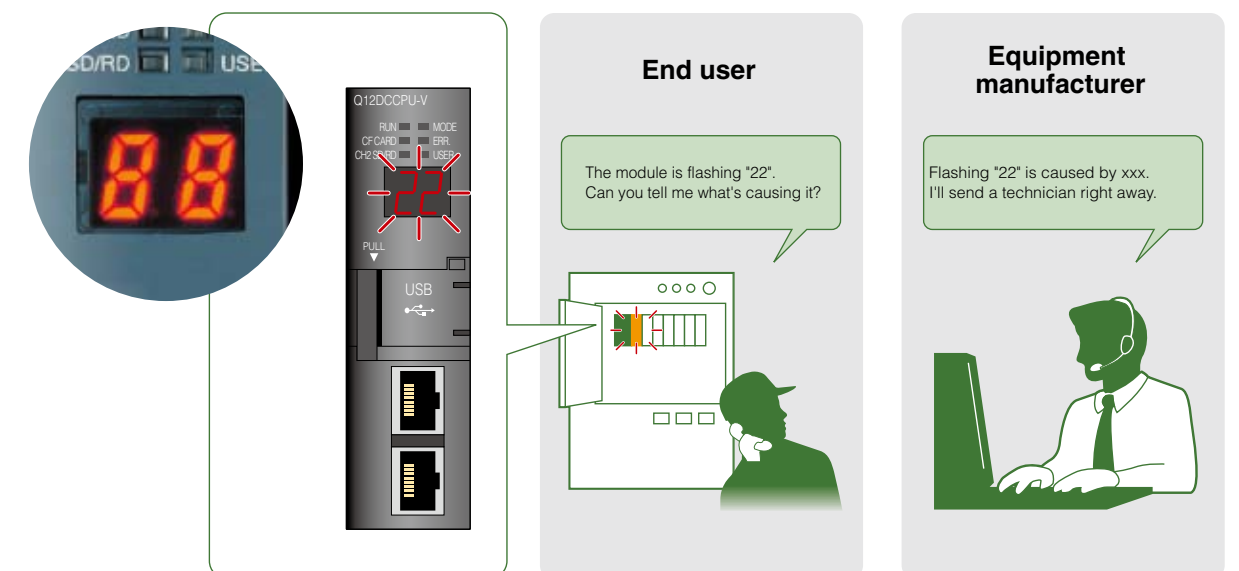


User programmable display

Only supported by Q12DCCPU-V

The built-in double-digit 7-segment display allows the equipment status to be identified at a glance.

Quicken the troubleshooting response to equipment issues by determining the system status at a glance. User programs can easily access the display, allowing for customized status codes. This feature can help in debugging operations or during commissioning. Also, the LED status can be seen remotely from a PC using the monitoring tool.



Dedicated library functions

Using dedicated function libraries for easy access to MELSEC hardware devices allows for simple programming, without all of the concerns associated with microcontrollers.

Use the QBF and MD functions to easily access devices in the C Controller, I/O modules, intelligent function modules, network modules, and other CPUs including sequence and motion CPUs.

QBF functions

These dedicated library functions enable the C Controller to access I/O modules and intelligent function modules.

Category	Function (some excerpts)	Feature
Open/close	QBF_Open	Open a bus.
	QBF_Close	Close a bus.
I/O access	QBF_X_In_BitEx	Reads a single point in the input signal (X).
	QBF_X_In_WordEx	Reads input signal (X) in 1-word units.
	QBF_Y_Out_BitEx	Outputs a single point in the output signal (Y).
	QBF_Y_Out_WordEx	Outputs output signal (Y) in 1-word units.
	QBF_Y_In_BitEx	Reads a single point in the output signal (Y).
	QBF_Y_In_WordEx	Reads output signal (Y) in 1-word units.
CPU shared memory/buffer memory access	QBF_ToBuf	Writes data to the CPU shared memory of the specified module and the buffer memory of the intelligent function module.
	QBF_FromBuf	Reads data from the CPU shared memory of the specified module and the buffer memory of the intelligent function module.
Acquisition of module status information	QBF_ReadStatusEx	Reads the status information (LED, error, etc.) of C Controller module.
User LED control	QBF_Control7SegLED ^(Note 1)	Controls the 7-segment LED of C Controller module.
CPU operating status control	QBF_Reset	Resets the bus master CPU (CPU No.1).
	QBF_ControlEx	Controls remote operations (RUN/STOP/PAUSE) for specified CPU.
Event registration	QBF_RegistEventLog	Registers event logs in the event history file.
Battery backed-up RAM access	QBF_WriteSRAM	Writes data to the battery-backed-up RAM.
	QBF_ReadSRAM	Reads data from the battery-backed-up RAM.
Interrupt event control	QBF_GINT	Issues an interrupt to another CPU.
	QBF_EntryMultiCPUSyncInt ^(Note 1)	Registers a routine so that it can be called when a multiple CPU synchronization interrupt occurs.
	QBF_EntryCpuInt ^(Note 2)	Registers an interrupt so that the routine can be called when the interrupt is issued from another CPU.
	QBF_EntryUnitInt ^(Note 2)	Registers an interrupt so that the routine can be called when the interrupt is issued from an intelligent function module or an interrupt module.
Motion CPU control	QBF_MotionSFCS	Requests to start the specified Motion SFC program.
	QBF_MotionSVST	Requests to start the specified servo program.
	QBF_MotionCHGA	Requests to change the current value of the specified axis.
	QBF_MotionCHGV	Requests to change the speed of the specified axis.
	QBF_MotionCHGT	Requests to change the torque limit value of the specified axis.
Motion device access	QBF_MotionDDWR	Writes data to the Motion CPU devices.
	QBF_MotionDDRD	Reads data from the Motion CPU devices.
C Controller module's internal user or system device access	QBF_WriteDevice ^(Note 2)	Writes data to the internal user or system devices of the C Controller module.
	QBF_ReadDevice ^(Note 2)	Reads data from the internal user or system devices of the C Controller module.
	QBF_SetDevice ^(Note 2)	Sets the internal user or system devices (bit devices) of the C Controller module.
	QBF_ResetDevice ^(Note 2)	Resets the internal user or system devices (bit devices) of the C Controller module.

QBF functions for ISR (Interrupt Service Routine) ^(note 1)

These QBF functions can be used in interrupt programs that are called by multiple CPU synchronous interrupts, interrupts from intelligent function modules/interrupt modules, or other programmable controller CPUs.

Category	Function (some excerpts)	Feature
I/O access	QBF_X_In_Word_ISR	Reads input signal (X) in 1-word units.
	QBF_Y_Out_Word_ISR	Outputs output signal (Y) in 1-word units.
CPU shared memory	QBF_ToBuf_ISR	Writes data to the CPU shared memory of the specified module.
	QBF_FromBuf_ISR	Reads data from the CPU shared memory of the specified module.
Battery-backedup RAM access	QBF_WriteSRAM_ISR	Writes data to the battery-backed-up RAM.
	QBF_ReadSRAM_ISR	Reads data from the battery-backed-up RAM.
C Controller's internal user or system device access	QBF_WriteDevice_ISR ^(Note 2)	Writes data to the internal user or system devices of the C Controller module.
	QBF_ReadDevice_ISR ^(Note 2)	Reads data from the internal user or system devices of the C Controller module.
	QBF_SetDevice_ISR ^(Note 2)	Sets the internal user or system devices (bit devices) of the C Controller module.
	QBF_ResetDevice_ISR ^(Note 2)	Resets the internal user or system devices (bit devices) of the C Controller module.

MD functions

These dedicated library functions are allow easy access other programmable controller CPUs.

Category	Function (some excerpts)	Feature
Open/close	mdOpen	Opens a communication line.
	mdClose	Closes a communication line.
Device access	mdSendEx	Batch writes devices. (Extended function)
	mdReceiveEx	Batch reads devices. (Extended function)
	mdDevSetEx	Sets bit devices.
	mdDevRstEx	Resets bit devices.
	mdRandREx	Reads devices randomly. (Extended function)
	mdRandWEx	Writes devices randomly. (Extended function)

Programming example: Y output

```

void vSample()
{
    short   sRet;
    long    lPath;
    short   i;

    /* Open bus */
    sRet = QBF_Open(2, &lPath);

    for (i = 0; i < 0x40; i++) {
        /* Write data to output module */
        sRet = QBF_Y_Out_BitEx(lPath, 0, i, 1);
    }

    /* Close bus */
    sRet = QBF_Close(lPath);
    return;
}
                    
```

Lamp

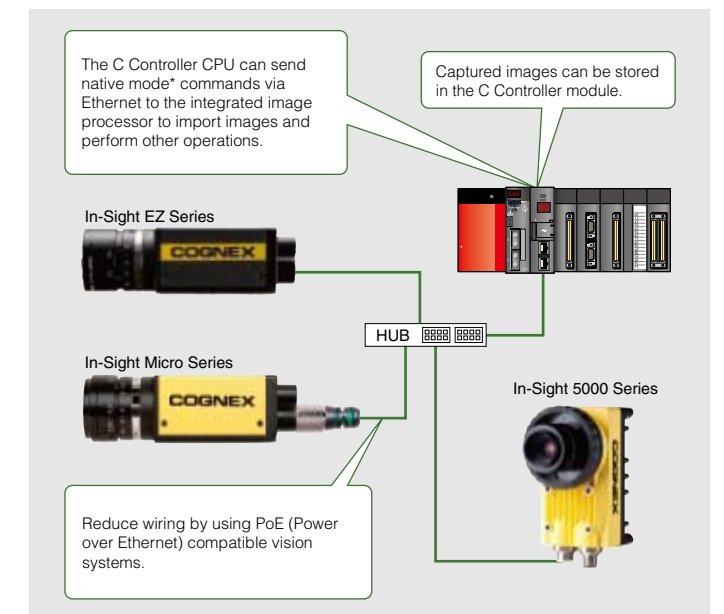
Note 1) Only supported by Q12DCCPU-V

Note 2) Only supported by Q12DCCPU-V CPUs where the first 5 digits of serial number are "12042" or later.

Collaboration with Cognex for machine vision

Build a complete machine vision solution using a Cognex In-Sight® series vision system and the C Controller CPU.

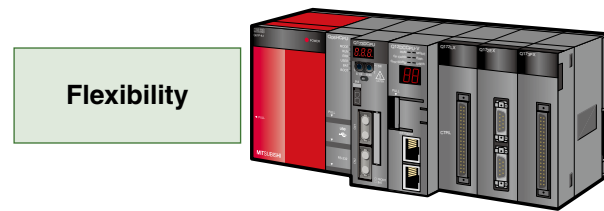
Collaboration with Cognex In-Sight® vision systems allows the C Controller to easily automate various product manufacturing steps including measurement, inspection and identification. These Cognex vision systems deliver world-class performance. When connected via Ethernet to a C Controller CPU, sending instructions using C language programs, capturing images, and importing images has never been easier.



* Native mode is a dedicated communication protocol for the COGNEX vision system.

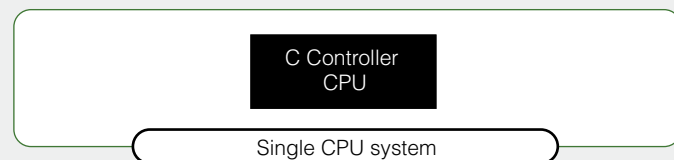
The Q series platform provides outstanding flexibility by scaling to match the needs of the system.

- A multiple CPU configuration can be used to divide control tasks among the CPU types best suited to the application. Perform information system and data processing tasks, sequence control, and motion control on the same high-speed main base unit using a C Controller CPU, Universal series CPU, and Motion CPU respectively.

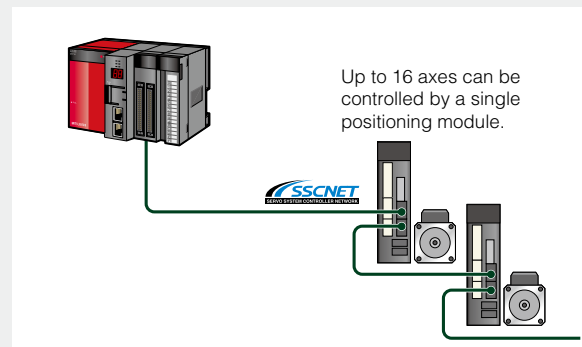


- Create the optimum configuration according to the control application and system scale.

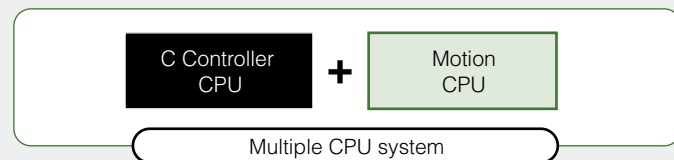
Simultaneously perform data processing tasks and simple positioning using a C Controller CPU.



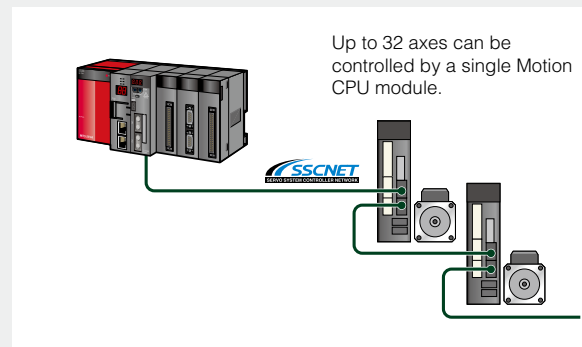
- Create a control system using only C language programming.



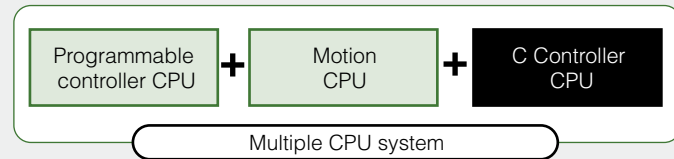
Implement high-speed precision control of multiple axes for medium/large applications.



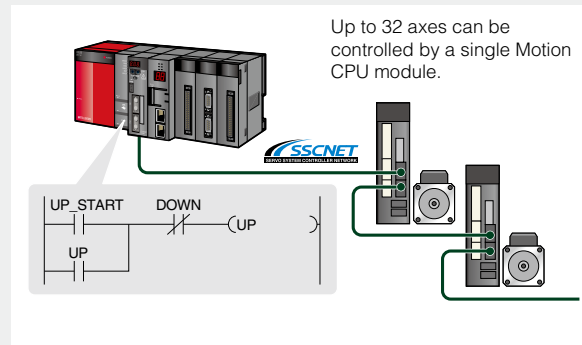
- Reduce takt time by using an operation cycle of 0.44ms (fastest possible).
- A wide array of motion functions can be implemented (interpolation control, speed control, electronic cam, excursion control, etc.)
- High-speed communication using SSCNETIII (50Mbps via fiber optic communication).



Simultaneous sequence control (machine interlock, etc)



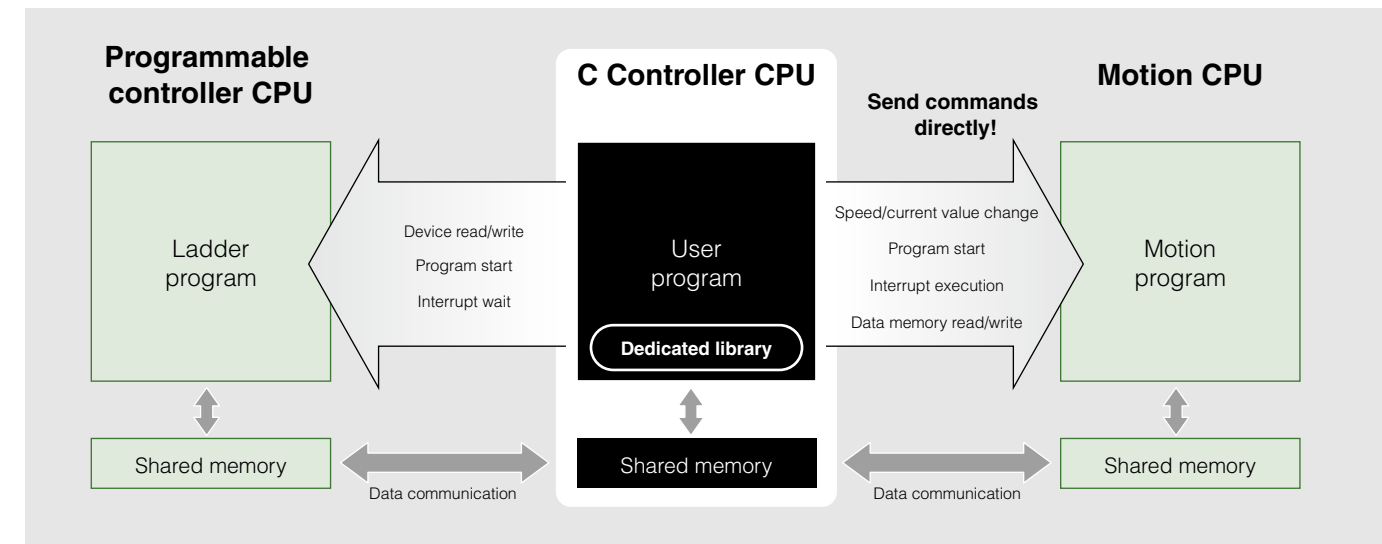
- A powerful system can be constructed by taking full advantage of each CPU's features.



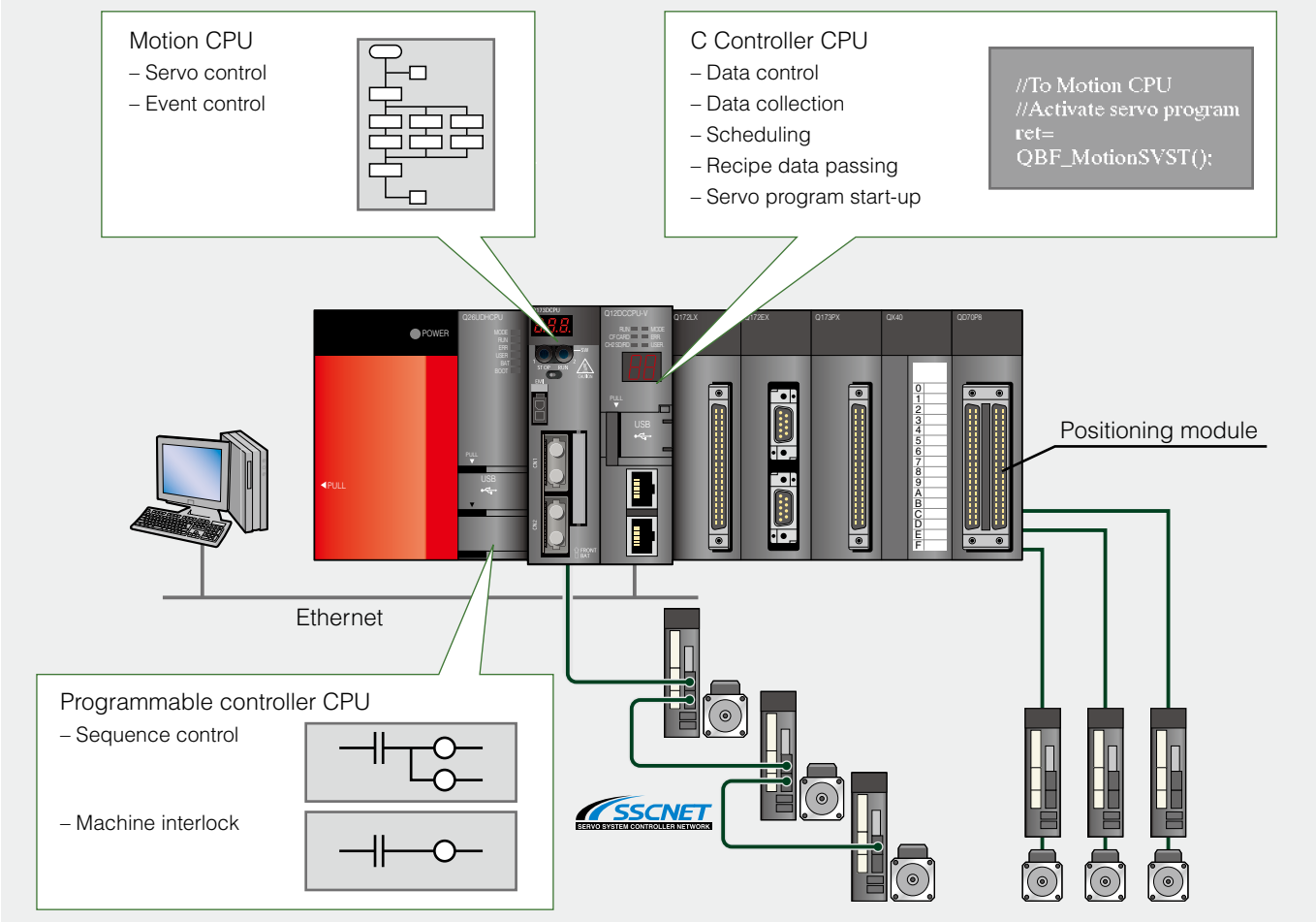
Easily communicate with Sequence and Motion CPUs using dedicated library functions.

- Function libraries are included with the C Controller CPU. By simply calling these functions, it is possible to execute instructions or issue interrupt requests directly from the C Controller CPU to sequence and motion CPUs.

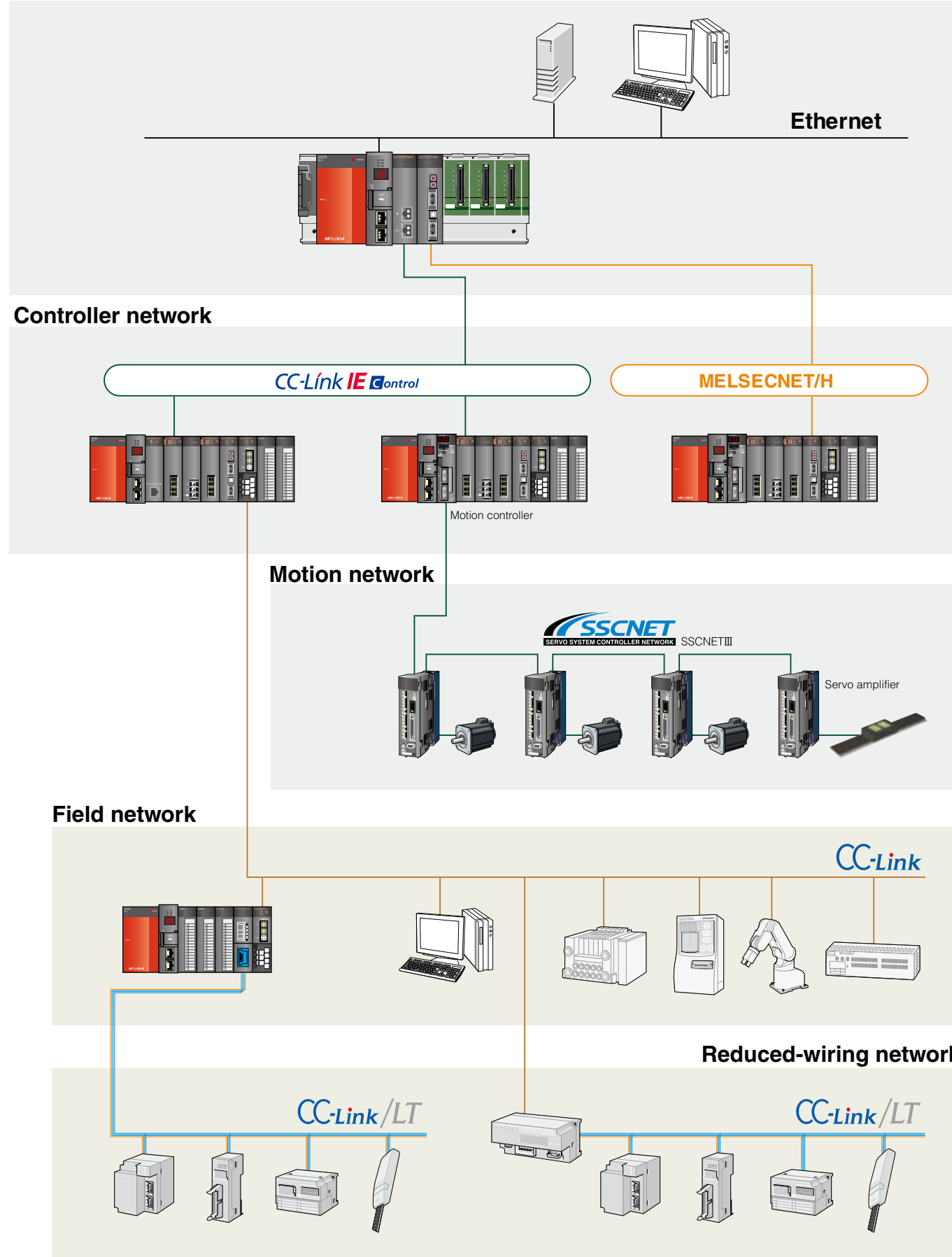
Easy to implement **Results in highly efficient control**



System configuration



Information network



Enterprise level network

Ethernet

Industrial Ethernet is typically the top layer of the manufacturing network hierarchy and is used to transfer information between factories and offices, and around the factory. These networks may be used for MES, ERP, SCADA, and other production and quality control management systems.

- C Controller CPU connection up to 100Mbps.
- Convenient connection path for programming, terminal access, and FTP services.

Controller level network

CC-Link IE Control, MELSECNET/H

These highly-reliable control networks are designed to transfer large amounts of data at real-time speeds between PLCs. The CC-Link IE Control network includes a variety of functions and allows seamless communications among other CC-Link networks.

- The CC-Link IE controller network and MELSECNET/H network have a maximum speed of 1Gbps and 25Mbps respectively.
- Programs using network shared memory (up to 128 K points per station) can be created without considering network operation. This helps to make modular, independent design and production easier to achieve.
- Reliability is ensured through dual fiber optic loop connections and extensive RAS functions.

Motion network

SSCNET
SERVO SYSTEM CONTROLLER NETWORK

Greatly improve machine performance using synchronous communication.

- In standard solutions using pulse train command, servo amplifiers and controllers are operated asynchronously. Synchronous start and high-precision two axes interpolation is difficult.
- The SSCNET motion network paves the path for accurate synchronization and has set the standard for performance improvement in machines such as those being used for printing, food, and processing for instance. Moreover, users find the motion controller's flexible software camming functionality not just intelligent but superior to use.

Advantages of centralized network management.

- Share large volumes of data between controllers and servo amplifiers in real time.
- Directly set servo parameters using the motion controller from a PC connected to the controller.
- Monitor and sample various axis data using the digital oscilloscope, such as rotational speed, current position, and current value of each axis.

Easy setup of an absolute positioning (ABS) system

- In constructing an ABS system with SSCNET, wiring to connect the I/O module to the servo amplifier is not required unlike an ABS system using pulse train control. This not only reduces system engineering time and complexity, but also diminishes stress and need for maintenance.
- Even multi-axis machines can begin operation quickly after power ON as a home positioning routine is made unnecessary.

Device level network

CC-Link

Field network is a high-speed network capable of controlling the system and simultaneously handle information.

The network's high-speed communication, steady input/output responses, and flexible expandability are recognized by SEMI. Originating in Japan, the steadfast achievements of this network has proven to be reliable as a world-standard open field network.

- Communication speeds up to 10 Mbps
- 8192 link device remote I/O points and 2048+2048 remote register points
- Connect with over 1,000 different 3rd party CC-Link compatible products

Sensor level network

CC-Link/LT

At the bottom of the network hierarchy, sensor level networks can reduce wiring costs inside panels between simple discrete devices such as push-buttons and sensors. CC-Link/LT accomplishes this and allows tremendous flexibility through innovative connection technology which does not require cutting/stripping of the network cable to make connections.

- General-purpose communication cable also supplies power so a separate cable is not required.
- Make connections quickly and easily using dedicated connectors.
- Use I/O points efficiently by using 'number of points mode' (4 points, 8 points, 16 points).
- Connect up to 1024 link points in 16-point mode.

NEW
Development environment
Solutions
Features
Total control
Networking
I/O Modules
iQ Platform
Specifications
Support
Product List

Input modules

Points	DC input					DC/AC input	AC input	
	DC5V		DC5/12V	DC24V		DC/AC 48V	AC100 to 120V	AC100 to 240V
	positive common	negative common	positive/negative common	positive common	negative common	positive/negative common		
8	—	—	—	QX48Y57 ^{*1}	—	—	—	QX28
16	QX70H	QX90H	QX70	QX40 QX40-TS QX40-S1 QX40H Q160	QX80 QX80H QX80-TS	QX50	QX10 QX10-TS	—
32	—	—	QX71	QX41 QX41-S1 QX41-S2 QH42P ^{*1} QX41Y41P ^{*1}	QX81 QX82-S2	—	—	—
64	—	—	QX72	QX42 QX42-S1	QX82 QX82-S1	—	—	—

*1: I/O combined module's input specification

Output modules

Points	Contact	TRIAC	Transistor			
	24VDC 240VAC	100 to 240VAC	5to12VDC Sink	5to24VDC Sink/Source	12to24VDC Sink Source	
	7	—	—	—	—	QX48Y57 ^{*2}
8	QY18A	—	—	QY68A	—	—
16	QY10 QY10-TS	QY22	QY70	—	QY40P QY40P-TS QY50	QY80 QY80-TS
32	—	—	QY71	—	QY41P QH42P ^{*2} QX41Y41P ^{*2}	QY81P
64	—	—	—	—	QY42P	QY82P

*2: I/O combined module's output specification

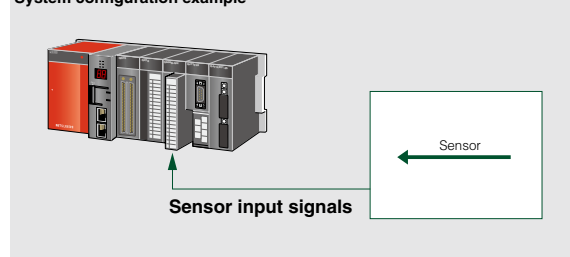
DC high-speed input modules

- DC high-speed input module (positive common type)..... QX40H
- DC high-speed input module (positive common type)..... QX70H
- DC high-speed input module (negative common type)..... QX80H
- DC high-speed input module (negative common type)..... QX90H

Reduce takt time by taking advantage of a 0ms* response time to input signals. More than one power supply can be used to simply connected devices thanks to the 8 points per common wiring layout. Input and interrupt functions are configurable via switch settings.

* The actual response time is 5 μs delay when turning ON, 10 μs delay when turning OFF, due to the hardware response time.

System configuration example

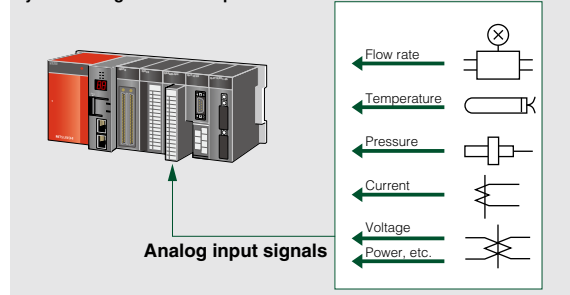


Isolated analog modules

- Channel-isolated high resolution A/D module Q64AD-GH
- Channel-isolated high resolution A/D module (with signal conditioning function)..... Q62AD-DGH
- Channel-isolated high resolution D/A module Q62DA-FG

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

System configuration example

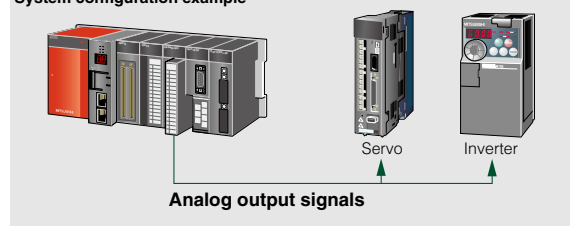


Analog modules

- A/D modules..... Q64AD, Q68ADV, Q68ADI
- D/A modules..... Q62DAN, Q64DAN, Q68DAVN, Q68DAIN
- A/D - D/A module Q64AD2DA

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

System configuration example

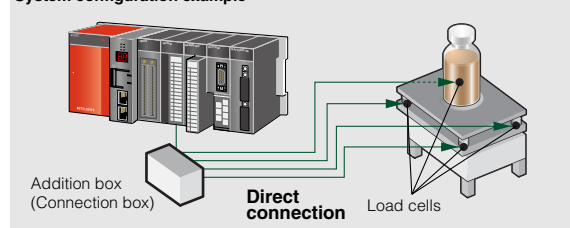


Load cell input module

- Load cell input module Q61LD

The need for a signal converter is eliminated when utilizing a direct connection to the load cell input module. The module achieves rock solid accuracy thanks to a steady data conversion speed that guarantees the accuracy of load cell measurements.

System configuration example

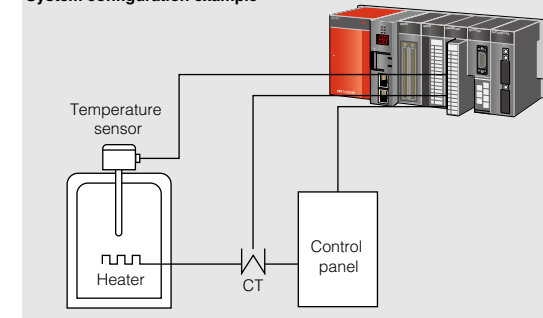


Temperature control modules

- Temperature control modules..... Q64TCTT(BW), Q64TCRT(BW)

Just by setting PID constants or SV values, these modules perform temperature control independent of any controller CPU. This leaves the controller CPU(s) free to process other tasks and increases performance. The auto-tuning feature allows PID constants to be set automatically. A wide range of thermocouple types can be used, including platinum RTDs (Pt100, JPt100) which are supported by the Q64TCRT(BW). These intelligent modules come packed with features like the ability to control 4 PID loops simultaneously, PID auto-tuning, online module change, and broken wire detection.

System configuration example

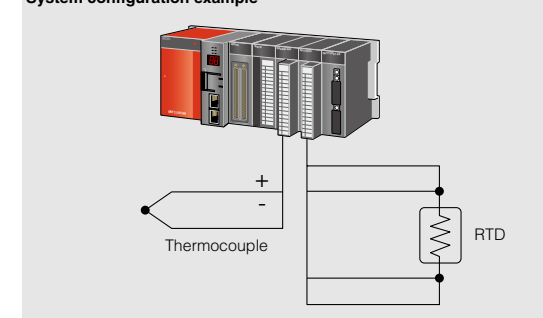


Temperature input modules

- Channel-isolated temperature input modules (Thermocouple input, micro voltage input) Q64TDV-GH (Thermocouple input)..... Q64TD, Q68TD-G-H01, Q68TD-G-H02
- Channel-isolated RTD input modules (Platinum RTD input, nickel RTD input)..... Q64RD-G, Q68RD3-G
- RTD input module (Platinum RTD input)..... Q64RD

Thermocouple, platinum RTD, and/or nickel RTD temperature sensors can be used.

System configuration example



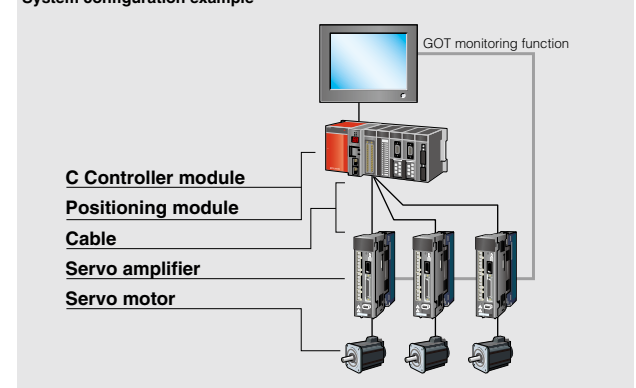
Positioning modules

Various types of motion control are supported including 2 to 4-axes linear interpolation, 2-axes circular interpolation, speed control, speed/position changeover, path control and constant speed control. For servo control, Q series leverages the benefits of SSCNET, a Mitsubishi high performance motion control network. This allows Mitsubishi intelligent digital servos to be connected by a simple daisy chain cable that reduces cost and increases performance.

Pulse train output types

- Differential driver pulse train output type QD75D□, QD70D□
- Open collector pulse train output type..... QD75P□, QD70P□

System configuration example

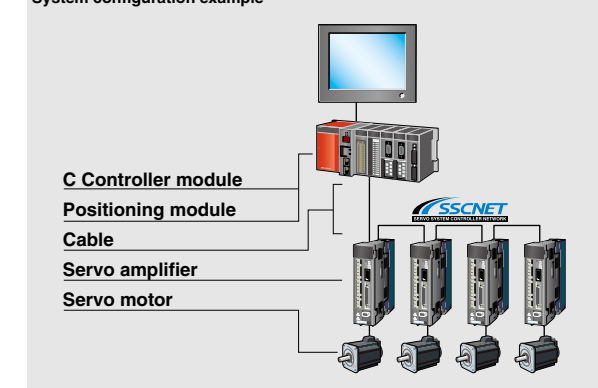


For compatibility with the widest range of motion hardware, both open collector and differential driver type positioning modules are available. Transmission of high-speed pulses, up to 1Mpps, to a servo amplifier can be made reliably up to 10 meters away. These pulse train output positioning modules can provide a high level of speed and accuracy for practically any application.

SSCNET connection types

- SSCNET connection type QD75M□, QD75MH□

System configuration example

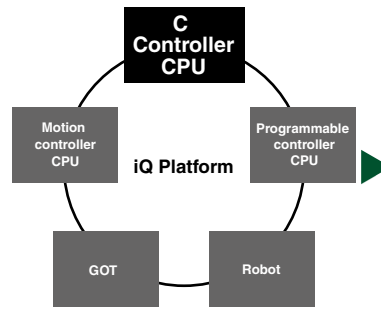


Using SSCNET optical cables minimizes the required wiring, permits distances of up to 50 m between stations, and is highly resistant to EMI/RFI. This format is also compatible with absolute position systems where the home position is established by a home position return data setting operation. Using the CN3 connection, limit switches and proximity DOG inputs can be made directly to the servo amplifier, greatly reducing the required wiring.

System optimization and integration through advanced technologies effectively reduce the total cost of operation. The iQ Platform is key to achieving effective communication between controllers and HMIs in the production environment

Advanced high-speed control using multiple CPU high-speed transmission

iQ Platform compatible controllers include the high-speed and large capacity programmable controller CPUs, high-speed and high-precision Motion CPUs, and C Controller CPUs. By using a multiple CPU high speed main base unit, it is possible to drastically improve CPU-to-CPU data transfer speed and capacity. The combination of sequence and motion controllers enables complex machine control to be performed easily and at high speed. Additionally, feature rich graphic operation terminals are available for interfacing with iQ Platform compatible controllers and assembly line robots.



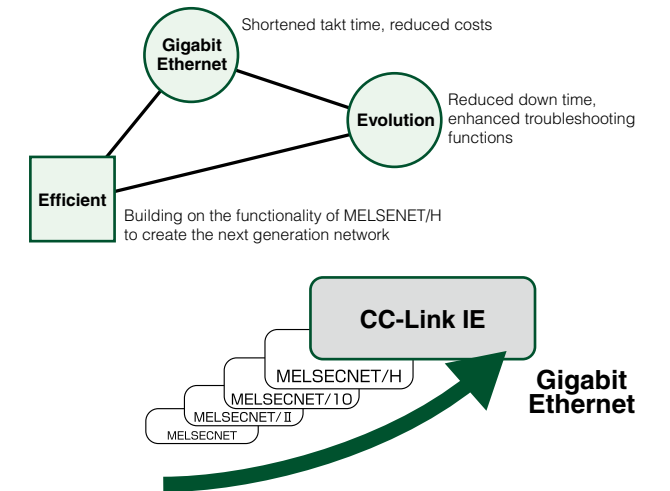
The iQ revolution is in the collection of high-performance controllers.

- Reduced development cost**
Designing equipment is faster and easier
More efficient start-up and debugging
- Reduced production cost**
Takt time is minimized
Enterprise database connectivity
- Reduced maintenance cost**
Using the advantages of MELSEC-Q
Down time is minimized

Create a state-of-the-art system using building blocks.

iQ Platform compatible network

- Gigabit Ethernet connectivity ensures high-speed, high-bandwidth communication.
- Cost can be significantly reduced by utilizing standard Ethernet cables and connectors.
- The cyclic update performance of shared network memory has been improved.



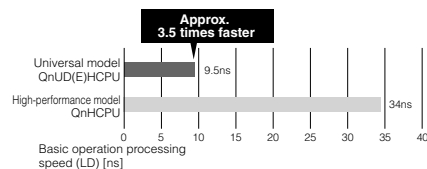
iQ Platform compatible programmable controllers

Advancing the state-of-the-art in high speed, precision control.

QnU

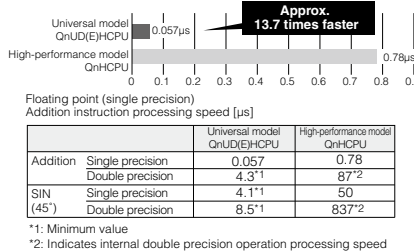
Improve the accuracy of calculations and shorten takt time

Basic operation processing speed (LD instruction) of 9.5ns.



Perform calculations with high-precision real number data at high speed.

The processing speed of real number (floating point) operations has been increased significantly to 0.05µs (addition instruction).



Handle large volumes of data

Store large amounts of data with an increased standard RAM memory size.

Standard RAM memory capacity (file register capacity)

Q03UDECPU, Q03UDCPU	192KB(96 k words)
Q04UDEHCPU, Q04UDHCPU	256KB(128 k words)
Q06UDEHCPU, Q06UDHCPU	768KB(384 k words)
Q10UDEHCPU, Q10UDHCPU	1024KB(512 k words)
Q13UDEHCPU, Q13UDHCPU	1280KB(640 k words)
Q20UDEHCPU, Q20UDHCPU	1280KB(640 k words)
Q26UDEHCPU, Q26UDHCPU	1536KB(768 k words)
Q50UDEHCPU	1792KB(896 k words)
Q100UDEHCPU	1792KB(896 k words)

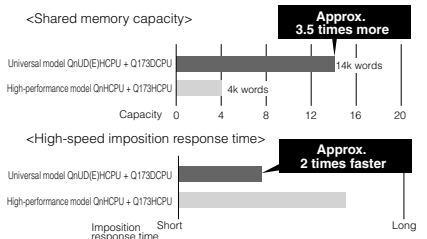
iQ Platform compatible motion controllers

New algorithms have been implemented for greater speed and accuracy

MOTION CONTROLLER
Qseries

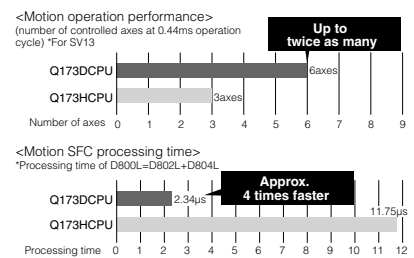
Multiple CPU high-speed bus

Continuously share up to 14k words of data with a transfer period of 0.88ms. The Multiple CPU high speed transmission cycle can be synchronized with the motion control cycle, thus optimizing the entire control system.



Improved motion control performance

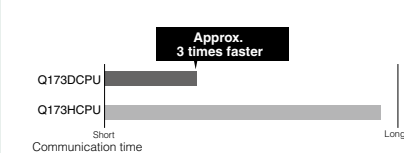
Motion operation performance is 2 times more than before, resulting in shorter system takt time. Also, motion SFC processing now takes only one quarter the time.



Shortened read/write communication time

Program data read/write time is shortened by one third, substantially improving debugging efficiency.

<Motion communication performance> (Servo program read time)



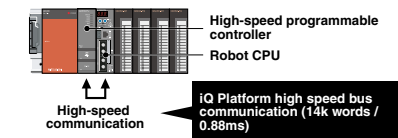
iQ Platform compatible robot controller

Directly connect programmable controllers and robot controllers

MELFA

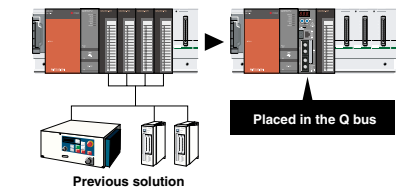
Improved control performance

I/O processing time is shortened significantly by the high-speed communication function between the programmable controller and robot controller.



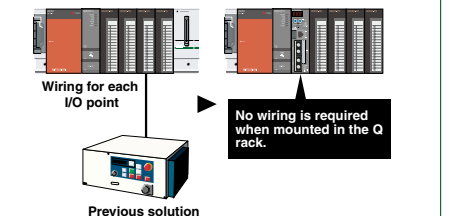
Reduced system cost

1024 words of I/O points are shared between the programmable controller and robot controller, reducing the need for additional peripheral devices.



Reduced wiring through direct connection

The amount of wiring and I/O modules necessary are reduced by placing the robot controller directly on the Q bus.



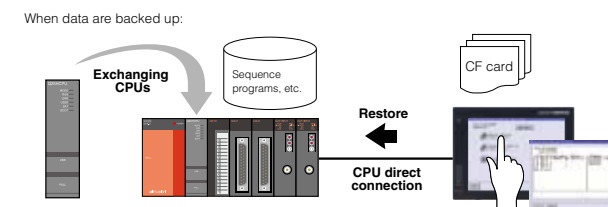
iQ Platform compatible HMI

Improve production efficiency using iQ Platform compatible products.

GOT1000

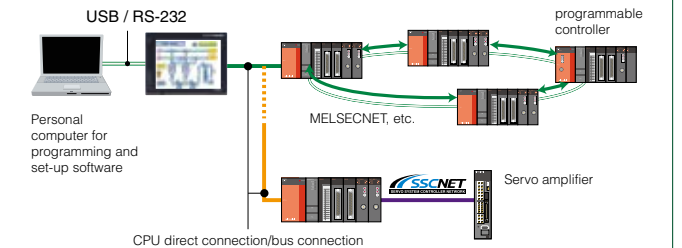
Deal with unexpected issues using the backup and restore functions.

Backup programs, parameters, and other data from the programmable controller CPU to the GOT's CF card.



The FA transparent function allows for easy on-site adjustments

Programming, start-up, and maintenance duties are made easier by using a GOT in the system.



NEW Development environment Solutions Features Total control Networking I/O Modules iQ Platform Specifications Support Product List

Performance specifications^(Note 1)

Item	Specification			
	Q12DCCPU-V	Q06CCPU-V		
Endian format (memory assignment)	Little endian			
Microprocessor	SH4A	SH4		
User file capacity (For user file storage)	Standard RAM	3MB		
	Standard ROM	-		
	CompactFlash card	Depends on the CompactFlash card used. (Maximum 8GB)		
Working RAM (For OS, driver, user program execution)	128MB	64MB		
Battery backed-up RAM	512KB ^(Note 2)	128KB		
Standard ROM write limit	-	Maximum of 100,000 times to the same area		
Operating system	VxWorks [®] 6.4 ^(Note 3) (Installed at product shipment)			
	VxWorks [®] 5.4 ^(Note 3) (Installed at product shipment)			
Development environment	CW Workbench Wind River Workbench [™] 2.6.1 ^(Note 3)	Tornado [™] 2.1 ^(Note 3)		
	C language (C/C++)			
Ethernet/RS-232/USB	2CH/1CH/1CH	1CH/1CH/ -		
Ethernet	Interface	10BASE-T/100BASE-TX		
	Communication method	Full-duplex/half-duplex		
	Data transmission speed	10Mbps/100Mbps		
	Transmission method	Base band		
	Number of cascade stages	Up to 4 (10BASE-T)/Up to 2 (100BASE-TX)		
	Maximum segment length	100m		
	Connector applicable to external wiring	RJ45		
	Supported function	Auto negotiation function (Automatically recognizes 10BASE-T/100BASE-TX)		
		Auto MDIX function (Automatically recognizes straight cable/cross cable)	-	
	Transmission speed	12Mbps (FULL Speed Mode: FS)	-	
Power supply	Self powered function	-		
Connector	USB series miniB connector	-		
Other electrical characteristics	Compliance with USB Specification Revision 2.0 Hub cannot be used.	-		
RS-232	Compliance with RS-232			
	Interface	Full-duplex/half-duplex communication method		
	Communication method	Start-stop synchronization method		
	Synchronization method	9600, 14400, 19200, 28800, 38400, 57600, 115200bps		
	Transmission speed	Maximum 15m		
	Transmission distance	1		
	Data format	Start bit	7/8	
		Data bit	1/None	
		Parity bit	1/2	
		Stop bit	Parity check performed (odd/even)	
	Parity check	Sum check performed/Not performed		
	Sum check code	Flow control (RS/CS control) performed/Not performed		
	Transmission control	Round type miniature connector (10-pin plug) ^{(Note 4) (Note 5)}	9-pin D-sub (male) fixing type	
Connector applicable to external wiring	3.3V±5%			
Supply power voltage	Maximum 150mA			
Supply power capacity	TYPE I card ^(Note 6)			
Card size	1			
Number of loadable cards	4096 points (X/Y0 to FFF)			
Number of I/O points (Number of points accessible to actual I/O modules)	Year, month, day, hour, minute, second, day of week (Automatic leap year detection) Clock accuracy: Daily error -10.89 to +8.64 seconds (0 to 55 degrees) ^(Note 7) Daily error -4.32 to +5.25 seconds (25 degrees) ^(Note 7)			
Clock function				

Performance specifications^(Note 1)

Item	Specification		
	Q12DCCPU-V	Q06CCPU-V	Q06CCPU-V-B
Permissible momentary stop time	Depends on the power supply module		
5VDC internal current consumption	0.93A	0.71A	
External dimensions	98(H)×27.4(W)×115(D)[mm]	98(H)×27.4(W)×89.3(D)[mm]	
Weight	0.24Kg	0.17Kg	

Note 1) The performance specifications may be modified without notice.
 Note 2) 128KB for Q12DCCPU-V C Controllers whose first five serial number digits are 12041 or later.
 Note 3) VxWorks[®] 6.4, VxWorks[®] 5.4, Wind River Workbench[™] 2.6.1 and Tornado[™] 2.1 are products of Wind River Systems, Inc. Refer to the Wind River Systems, Inc. product manuals or contact Wind River Co., Ltd. (Japan office) for service and specifications of Wind River Systems products. Refer to the following web site for contact information of Wind River Co., Ltd. <http://www.windriver.com>
 Note 4) Attach the RS232 connector cable (Q12DCCPU-CBL) [option], and connect the 9-pin D-sub (male) type RS232 connector.
 Note 5) Use a round type miniature connector (10-pin plug) TCP8938, when creating a cable to connect directly to the RS232 connector of Q12DCCPU-V body.
 Note 6) A TYPE II card cannot be used. I/O cards such as modem cards cannot be used.
 Note 7) An additional error between -0.5 to +0.5 seconds may occur when the module is powered ON.

General specifications

General specifications refer to the specifications of the environment in which this product can be installed and used. Unless exceptional specifications are provided, these specifications apply to all Q Series products. Install and use the Q Series products within the environment given in the general specifications.
 * The general specifications for double brand products will differ. Contact the respective company or refer to the respective product manual.

Item	Specification					
Operating ambient temperature	0 to 55 degrees					
Storage ambient temperature	-25 to 75 degrees ^(Note 3)					
Operating ambient humidity	5 to 95%RH ^(Note 4) , non-condensing					
Storage ambient humidity	5 to 95%RH ^(Note 4) , non-condensing					
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2	Under intermittent vibration	Frequency	Acceleration	Amplitude	Sweep count
			5 to 9Hz	-	3.5mm	
		Under continuous vibration	9 to 150Hz	9.8m/s ²	-	10 times each in X, Y, Z directions
			5 to 9Hz	-	1.75mm	
Shock resistance	Conforming to JIS B 3502, IEC 61131-2 (147m/s ² , 3 times in each of X, Y, Z directions)					
Operating ambience	No corrosive gases					
Operating altitude ^(Note 5)	2000m (6562ft) max.					
Installation location	Inside control panel					
Overvoltage category ^(Note 1)	Category II max.					
Pollution level ^(Note 2)	Level 2 max.					

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 terms of the environment in which the equipment is used.
 Pollution level 2 is rated when only non-conductive pollution occurs. A temporary conductivity caused by condensing can be expected occasionally.
 Note 3) The storage ambient temperature is -20 to 75°C if the system includes the AnS series modules.
 Note 4) The operating ambient humidity and storage ambient humidity are 10 to 90%RH if the system includes the AnS series modules.
 Note 5) Do not use or store the C Controller module under pressure higher than the atmospheric pressure of altitude 0m.
 Doing so can cause a malfunction.
 For use in a pressurized environment, please contact your sales representative.
 Note 6) When installing a commercially available CompactFlash card into the C Controller module, follow the lower specifications of either the C Controller module or CompactFlash card.

List of C Controller CPU functions

Item		Q12DCCPU-V	Q06CCPU-V	
Applicable modules	General I/O modules	Input	Yes	Yes
		Output	Yes	Yes
		Input/Output	Yes	Yes
		Interrupt input	Yes	Yes
	Analog I/O modules	Analog input	Yes	Yes
		Analog output	Yes	Yes
		Analog input/output	Yes	Yes
		Load cell input	Yes	Yes
		Temperature input	Yes	Yes
		Temperature control	Yes	Yes
		Loop control	Yes	Yes
	Pulse I/O and positioning modules	Channel isolated pulse input	Yes	Yes
		High-speed counter	Yes	Yes
		Positioning	Yes	Yes
	Information modules	MES interface ^(Note 1)	Yes	No
		High-speed data logger ^(Note 2)	Yes	No
		Serial communication	Yes	Yes
	Network modules	CC-Link IE controller network	Yes	Yes ^(Note 3)
		MELSECNET/H	Yes	Yes
		CC-Link IE field network ^(Note 4)	Yes ^(Note 5)	Yes ^(Note 6)
		CC-Link	Yes	Yes
		CC-Link/LT	Yes	Yes
		AnyWire DB A20	Yes	Yes
		FL-net (OCPN-2)	Yes	Yes
	AS-i	Yes	Yes	
	Multiple control system can be configured by combining C Controller module with Motion CPUs and programmable controller CPUs.			
	Multiple CPU function	Communications by dedicated library functions	Data access and control command can be performed from user programs on the C Controller module to Motion CPUs and programmable controller CPUs using dedicated library functions.	Yes
Control command to Motion CPU		Programs on the Motion CPU can be activated, or servo setting value/current value can be read and changed from the C Controller module.	Yes	Yes
Interrupt issue to Motion CPU		Interruption can be issued to Motion CPU from C Controller module.	Yes	Yes
Data communications by CPU shared memory		Data can be transmitted through CPU shared memory between C Controller module and other CPUs (programmable controller CPU, Motion CPU).	Yes	Yes
Programmable controller control		Execution status of programmable controller CPU or execution type of sequence (ladder) program can be controlled from user programs on the C controller module.	Yes	Yes
Synchronized event notification		By registering processes as synchronized events, programs to be executed in synchrony with the iQ platform compatible Motion CPU module can be created.	Yes	No
Multiple CPU high speed transmission		Multiple CPU high speed transmission can be performed by using the multiple CPU high speed main base unit (Q38DB, Q312DB).	Yes	No
Interrupt from intelligent function module		Issues an interrupt event in response to an interrupt request from the intelligent function module.	Yes	Yes
Device function		Devices similar to those used in MELSEC Sequence CPUs are created in the RAM of the C Controller.	Yes ^(Note 7)	No
HMI access function	CPU direct connection (microcomputer connection)	Connect to GOT using the C Controller's RS-232 interface. Data can be exchanged with a user serial communication program.	Yes	Yes
	Connection with device function	Data can be exchanged with the GOT by reading and writing C Controller devices via the bus or other network connections.	Yes ^(Note 7) / ^(Note 8)	No
Self-diagnostic function	Self-diagnostic function	Operating status of each module controlled by the C Controller is monitored and error status are detected.	Yes	Yes
	H/W self-diagnostic function	H/W diagnostic of C Controller module is performed according to the diagnostic items.	Yes	Yes
Watchdog timer (WDT) function		An internal timer to detect errors on a C Controller module, H/W and user program errors are detected by the watchdog timer.	Yes	Yes

Note 1) Use in combination with a Q12DCCPU-V (first five serial number digits 12042 or later), or QJ71MES96 (first five serial number digits 12092 or later).
 Note 2) Use in combination with a Q12DCCPU-V (first five serial number digits 12042 or later), or QD81DL96 (first five serial number digits 12062 or later).
 Note 3) Use in combination with a Q06CCPU-V (first five serial number digits 10012 or later), or QJ71GP21-SX (first five serial number digits 09042 or later).
 Note 4) Parameters are set using program. Only cyclic transmission supported, transient transmission is not.
 Note 5) Use in combination with a Q12DCCPU-V (first five serial number digits 12042 or later), or QJ71GF11-T2 (first five serial number digits 12072 or later).
 Note 6) Use in combination with a Q06CCPU-V (first five serial number digits 12082 or later), or QJ71GF11-T2 (first five serial number digits 12072 or later).
 Note 7) Use a product whose first five serial number digits are 12042 or later.
 Note 8) For details about configuring the connection, refer to the GOT1000 Series Handbook and GOT1000 Series Connection Manual.

Programming development environment

Item			Q12DCCPU-V	Q06CCPU-V
Engineering tool for C Controller CW Workbench	Program development/debugging function	C Controller dedicated development environment based on Wind River Workbench™ 3.2 and limited to basic functions required for application development. Various activities, from program editing to debugging (step/break execution, variables, memory watch) via Ethernet can be performed with the CW Workbench engineering tool for C Controller.	Yes	No
		C Controller setting utility	Yes	Yes
Setting and monitoring tool for C Controller (settings/diagnostics/monitoring) SW□PVC-CCPU-E ^(Note 1)	CC-Link utility	CC-Link module that is controlled by the C Controller module can be set and diagnosed. Communication status of CC-Link, cables, and H/W status are diagnosed.	Yes	Yes
		MELSECNET/H utility	Yes	Yes
		MELSECNET/H utility ^(Note 2)	Yes	Yes
		Device monitor utility	Yes	Yes
Wind River Systems, Inc. product Wind River Workbench™ ^(Note 3)	Programming development/debugging function	All development activities, starting from editing to debugging of programs (step/break execution, variables, memory watch, etc.), can be performed via Ethernet by using the integrated development environment Workbench™. Real-time monitoring of the task transition, memory usage state, variables and data structure, etc., is possible using a runtime analysis tool such as System Viewer.	Yes	No
		Wind River Systems, Inc. product Tornado™ ^(Note 4)	Yes	Yes
Wind River Systems, Inc. product Tornado™ ^(Note 4)	Programming development/debugging function	All development activities, starting from editing to debugging of programs (step/break execution, variables, memory watch, etc.), can be performed via Ethernet by using the integrated development environment Tornado™. Task transition, source code analysis, and source code browsing can also be checked by the development supporting tools (Wind View, SNIFF+).	No	Yes

Note 1) Volume license product (SW□PVC-CCPU-EA) and additional license product (SW□PVC-CCPU-EAZ) are available.
 Note 2) Can be used for Version 3.02C or later.
 Note 3) Wind River Workbench™ 2.6 (Purchased separately from Wind River Systems, Inc.)
 Note 4) Tornado™ 2.1 (Purchased separately from Wind River Systems, Inc.)

Compatible operating systems

	Engineering tool for C Controller CW Workbench ^(Note 2)	Setting/monitoring tools for C Controller SW□PVC-CCPU-E	Wind River Workbench 2.6.1 ^(Note 2)
Windows® XP Professional Operating System SP3 or higher	Yes	Yes	Yes
Windows Vista® Business Operating System	Yes	Yes	No
Windows Vista® Enterprise Operating System	Yes	Yes	No
Windows Vista® Ultimate Operating System	Yes	Yes	No
Windows® 7 Professional Operating System	Yes	Yes	No
Windows® 7 Enterprise Operating System	Yes	Yes	No
Windows® 7 Ultimate Operating System	Yes	Yes	No

Comparison of CW Workbench / Wind River Workbench™ 2.6.1 specifications and functions

Item		CW Workbench	Wind River Workbench 2.6.1	Overview
Compiler	SH7750gnu (GCC for SH-4A Little Endian compiler)	Yes	Yes	A compiler for the C Controller module Q12DCCPU-V
	SIMNTgnu (GCC for VxWorks Simulator Windows compiler)	No	Yes	A compiler for VxSim
Framework		Eclipse ver.3.5	Eclipse ver.3.2	Basic functions of Workbench
Extended functions		Yes	Yes	Extending functions by installing plug-in software provided by the third parties
Debugger	Agent for target connections	Yes	Yes	Functions to establish connections with the C Controller module to be debugged
	Debug operation	Yes	Yes	Functions to debug source codes with operations such as debug session start/termination and step-through execution
	Download	Yes	Yes	Functions to download a file to be debugged on the C Controller module and to start a debug session
	Wind River VxWorks Simulator	No	Yes	Simulation functions to enable a debug function by operating Wind River VxWorks applications on the operating system of a computer without the C Controller module
Runtime analysis tool	System Viewer	No	Yes	A tool for analyzing task execution orders and a deadlock by monitoring information such as an interrupting task situation and CPU utilization
	MemScope	No	Yes	A tool for specifying memory leak locations by monitoring memories
	ProfileScope	No	Yes	A tool for analyzing a bottleneck part of a task by analyzing code executing situation statistically
	StethoScope	No	Yes	A tool for analyzing memory leaks by monitoring variables and data structures in real time

NEW Development environment Solutions Features Total control Networking I/O Modules iQ Platform Specifications Support Product List

Support Guide

1. Technical support assistance service regarding the C Controller module

For technical support assistance service regarding the C Controller module, refer to the table below.

If you are not sure which type the inquiry belongs to, please contact us. Please note that inquiries other than MELSEC-related inquiries may not be able to be answered.

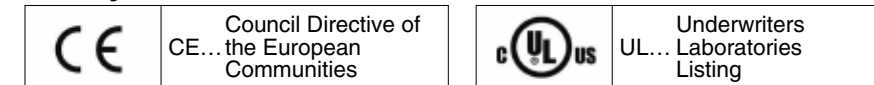
Category	Type of inquiry	Place to contact
MELSEC-related	<ul style="list-style-type: none"> Functions and specifications of the C Controller module Specifications and usage of the library functions (QBF function, MD function) provided by Mitsubishi Electric Corporation VxWorks-based setting and monitoring tool (SW□PVCCCPU-E) and functions and specifications of CW Workbench Functions and specifications of the Mitsubishi products to be used with the C Controller module (such as units and MELSOFT) 	Mitsubishi Electric Corporation MITSUBISHI ELECTRIC FA NETWORK SERVICE MELFANSweb website URL : http://www.MitsubishiElectric.co.jp/melfansweb In regions other than Japan, please contact your local Mitsubishi representative.
Operating system-related	<ul style="list-style-type: none"> Functions and specifications of VxWorks®, API functions provided by VxWorks®, and general inquiries regarding programming related to VxWorks® Functions and specifications of Wind River Workbench™ and Tornado™ 	Wind River Systems, Inc. URL: http://www.windriver.com
Plug-in software-related	<ul style="list-style-type: none"> Inquiries regarding the plug-in software to be used with CW Workbench or Wind River Workbench™ 	Plug-in software manufacturer

Ensuring an extensive global support network to provide diverse support for today's needs

Complying with international quality assurance standards

All of Mitsubishi Electric's FA component products have acquired the international quality assurance "ISO9001" and environment management system standard "ISO14001" certification.

Safety Standards



Global FA Centers

"Mitsubishi Global FA Centers" are located throughout North America, Europe, and Asia to develop products complying with international standards and to provide attentive services.

<p>North American FA Center MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, USA Tel: +1-847-478-2100 / Fax: +1-847-478-0327 Area covered: North America, Mexico, Chile, Brazil</p>	<p>Korean FA Center MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 1480-6, Gayang-Dong, Gangseo-Ku, Seoul, 157-200, Korea Tel: +82-2-3660-9607 / Fax: +82-2-3664-0475 Area covered: Korea</p>	<p>Taiwan FA Center SETSUYO ENTERPRISE CO., LTD. 6F, No. 105 Wu-Kung 3rd RD, Wu-Ku Hsiang, Taipei Hsien, 248, Taiwan Tel: +886-2-2299-2499 / Fax: +886-2-2299-2509 Area covered: Taiwan</p>
<p>Brazil FA Center MELCO-TEC REPRESENTACAO COMERCIAL E ASSESSORIA TECNICA LTDA. Av. Paulista 1439, Conj.74, Bela Vista CEP:01311-200 Sao Paulo-SP-Brazil Tel: +55-11-3146-2202 / Fax: +55-11-3146-2217 Area covered: Brazil</p>	<p>Hong Kong FA Center MITSUBISHI ELECTRIC AUTOMATION (HONG KONG) LTD. 10/F, Manulife Tower, 169 Electric Road, North Point, Hong Kong Tel: +852-2887-8870 / Fax: +852-2887-7984 Area covered: China</p>	<p>ASEAN FA Center MITSUBISHI ELECTRIC ASIA PTE, LTD. 307 Alexandra Road #05-01/02 Mitsubishi Electric Building, Singapore 159943 Tel: +65-6470-2480 / Fax: +65-6476-7439 Area covered: Southeast Asia, India</p>
<p>European FA Center MITSUBISHI ELECTRIC EUROPE B.V. GERMAN BRANCH (Industrial Automation Division) Gothaer Strasse 8, D-40880 Ratingen, Germany Tel: +49-2102-486-0 / Fax: +49-2102-486-1120 Area Covered: Europe</p>	<p>Shanghai FA Center MITSUBISHI ELECTRIC AUTOMATION (SHANGHAI) LTD. 4/F Zhi Fu Plaza, No. 80 Xin Chang Road, Shanghai 200003, China Tel: +86-21-2322-2862 / Fax: +86-21-2322-2868 Area covered: China</p>	<p>India FA Center MITSUBISHI ELECTRIC ASIA PVT. LTD. GURGAON BRANCH 2nd Floor, DLF Building No. 9B, DLF Cyber City Phase-III, Gurgaon-122002, Haryana, India Tel: +91-124-4630300 / Fax: +91-124-4630399 Area covered: India</p>
<p>UK FA Center MITSUBISHI ELECTRIC EUROPE B.V. UK BRANCH (Customer Technology Center) Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, UK Tel: +44-1707-276100 / Fax: +44-1707-278992 Area covered: UK, Ireland</p>	<p>Tianjin FA Center MITSUBISHI ELECTRIC AUTOMATION (SHANGHAI) LTD. TIANJIN OFFICE B-2-801/802, Youyi Building, No. 50 Youyi Road, Hexi District, Tianjin 300061, China Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017 Area covered: China</p>	<p>Thailand FA Center MITSUBISHI ELECTRIC AUTOMATION (THAILAND) CO., LTD. Bang-Chan Industrial Estate No. 111, Soi Serithai 54, T.Kannayao, A.Kannayao, Bangkok 10230, Thailand Tel: +66-02-906-3238 / Fax: +66-02-906-3239 Area covered: Thailand</p>
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Product List

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

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

CPU, power supply

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

Product	Model	Outline	
C Controller CPU	Q12DCCPU-V	No. of I/O points: 4096 points, endian format: little endian, removable storage: CF card, OS:VxWorks Version 6.4	
	Q06CCPU-V	No. of I/O points: 4096 points, endian format: little endian, removable storage: CF card, OS:VxWorks Version 5.4	
	Q12DCCPU-CBL ^(Note 1)	RS-232 connection converter cable (custom mini-DIN to 9-pin D-sub connector)	
	Option	GT05-MEM-128MC ^(Note 2)	128 MB CompactFlash card
		GT05-MEM-256MC ^(Note 2)	256 MB CompactFlash card
		QD81MEM-512MBC	512 MB CompactFlash card
		QD81MEM-1GBC	1 GB CompactFlash card
		QD81MEM-2GBC ^(Note 1)	2 GB CompactFlash card
		QD81MEM-4GBC ^(Note 1)	4 GB CompactFlash card
QD81MEM-8GBC ^(Note 1)	8 GB CompactFlash card		
Universal model QCPU	Q00UCPU	No. of I/O points: 1024 points, no. of I/O device points: 8192 points, program capacity: 10 k steps, basic operation processing speed (LD instruction): 0.08 μs, program memory capacity: 40 KB, peripheral connection ports: USB and RS232, no memory card I/F	
	Q01UCPU	No. of I/O points: 1024 points, no. of I/O device points: 8192 points, program capacity: 15 k steps, basic operation processing speed (LD instruction): 0.06 μs, program memory capacity: 60 KB, peripheral connection ports: USB and RS232, no memory card I/F	
	Q02UCPU	No. of I/O points: 2048 points, no. of I/O device points: 8192 points, program capacity: 20 k steps, basic operation processing speed (LD instruction): 0.04 μs, program memory capacity: 80 KB, peripheral connection ports: USB and RS232, with memory card I/F	
	Q03UDCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 30 k steps, basic operation processing speed (LD instruction): 0.02 μs, program memory capacity: 120 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q04UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 160 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q06UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 240 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q10UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 100 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 400 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q13UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 520 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q20UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 200 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 800 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Q26UDHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 1040 KB, multiple CPU high-speed communication, peripheral connection ports: USB and RS232, with memory card I/F	
	Built-in Ethernet type	Q03UDECPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 30 k steps, basic operation processing speed (LD instruction): 0.02 μs, program memory capacity: 120 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q04UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 40 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 160 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q06UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 240 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q10UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 100 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 400 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q13UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 130 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 520 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q20UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 200 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 800 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q26UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 260 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 1040 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q50UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 500 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 2000 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F
		Q100UDEHCPU ^(Note 3)	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 1000 k steps, basic operation processing speed (LD instruction): 0.0095 μs, program memory capacity: 4000 KB, multiple CPU high-speed communication, peripheral connection ports: USB and Ethernet, with memory card I/F

Note: Jointly developed products are manufactured by and receive the name of our company, however the general specifications and content of product guarantees are different. Please refer to the product manuals or contact your local Mitsubishi representative for details.

CPU, power supply

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

Product	Model	Outline
High Performance model QCPU	Q02CPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic operation processing speed (LD instruction): 0.079 μs, program memory capacity: 112 KB, peripheral connection ports: RS232, with memory card I/F
	Q02HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 28 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB, peripheral connection ports: USB and RS232, with memory card I/F
	Q06HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB, peripheral connection ports: USB and RS232, with memory card I/F
	Q12HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB, peripheral connection ports: USB and RS232, with memory card I/F
	Q25HCPU	No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB, peripheral connection ports: USB and RS232, with memory card I/F
	Process CPU	Q02PHCPU
Q06PHCPU		No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 60 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 240 KB, peripheral connection ports: USB and RS232, with memory card I/F
Q12PHCPU		No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 124 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 496 KB, peripheral connection ports: USB and RS232, with memory card I/F
Q25PHCPU		No. of I/O points: 4096 points, no. of I/O device points: 8192 points, program capacity: 252 k steps, basic operation processing speed (LD instruction): 0.034 μs, program memory capacity: 1008 KB, peripheral connection ports: USB and RS232, with memory card I/F
Motion CPU	Q172CPUN ^(Note 2)	For 8-axis control
	Q172CPUN-T ^(Note 2)	For 8-axis control, teaching module supported
	Q172HCPU ^(Note 2)	For 8-axis control, SSCNET III connectivity
	Q172HCPU-T ^(Note 2)	For 8-axis control, SSCNET III connectivity, teaching module supported
	Q173CPUN ^(Note 2)	For 32-axis control
	Q173CPUN-T ^(Note 2)	For 32-axis control, teaching module supported
	Q173HCPU ^(Note 2)	For 32-axis control, SSCNET III connectivity
	Q173HCPU-T ^(Note 2)	For 32-axis control, SSCNET III connectivity, teaching module supported
Q172DCPU ^(Note 1)	For 8-axis control, operation cycle: 0.44ms, SSCNET III: 1ch, iQ Platform compatible	
Q173DCPU ^(Note 1)	For 32-axis control, operation cycle: 0.44ms, SSCNET III: 2ch, iQ Platform compatible	

Note 1) For use with Q12DCCPU-V

Note 2) For use with Q06CCPU-V

Note 3) For Multiple CPU high speed bus communication, please combine with the Q12DCCPU-V CPU module.

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

Product	Model	Outline
Main base	Q33B	3 slots, 1 power supply module required, for Q Series modules
	Q35B	5 slots, 1 power supply module required, for Q Series modules
	Q38B	8 slots, 1 power supply module required, for Q Series modules
	Q312B	12 slots, 1 power supply module required, for Q Series modules
Multiple CPU high speed main base	Q38DB	8 slots, 1 power supply module required, for Q Series modules
	Q312DB	12 slots, 1 power supply module required, for Q Series modules
Slim type main base	Q32SB	2 slots, 1 slim type power supply module required, for Q Series modules
	Q33SB	3 slots, 1 slim type power supply module required, for Q Series modules
	Q35SB	5 slots, 1 slim type power supply module required, for Q Series modules
Extension base	Q63B	3 slots, 1 power supply module required, for Q Series modules
	Q65B	5 slots, 1 power supply module required, for Q Series modules
	Q68B	8 slots, 1 power supply module required, for Q Series modules
	Q612B	12 slots, 1 power supply module required, for Q Series modules
	Q52B	2 slots, power supply module not required, for Q Series modules
Extension cable	QC05B	0.45 m cable for connecting extension base unit
	QC06B	0.6 m cable for connecting extension base unit
	QC12B	1.2 m cable for connecting extension base unit
	QC30B	3 m cable for connecting extension base unit
Extension cable	QC50B	5 m cable for connecting extension base unit
	QC100B	10 m cable for connecting extension base unit

Power supply

Power supply	Q61P	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 6 A
	Q62P	Input voltage: 100 to 240 V AC, output voltage: 5/24 V DC, output current: 3/0.6 A
	Q63P	Input voltage: 24 V DC, output voltage: 5 V DC, output current: 6 A
	Q64PN	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 8.5 A
Power Supply with Life Detection	Q61P-D	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 6A
Slim type power supply	Q61SP	Input voltage: 100 to 240 V AC, output voltage: 5 V DC, output current: 2 A

I/O module [Legend] **DB** : Double brand product **NEW** : Recently released product **SOON** : Product available soon

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

Note 1) "Positive common" indicates that the positive lead of a DC power supply must be connected to the common terminal. Accordingly, "Negative common" indicates that the negative lead must be connected to the common terminal.

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

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

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

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

NEW
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Analog I/O module

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

Product	Model	Outline
Analog input	Voltage input	Q68ADV 8 channels, input: -10 to 10 V DC, output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000, conversion speed: 80 μs/channel, 18-point terminal block
	Current input	Q62AD-DGH 2 channels; input, 4 to 20 mA DC, output (resolution): 0 to 32000, 0 to 64000, conversion speed: 10 ms/2 channels, 18-point terminal block, channel isolated, supplies power to 2-wire transmitter
		Q66AD-DG (Note 1) 6 channels, input: 4 to 20 mA DC (when 2-wire transmitter is connected), 0 to 20 mA DC, output (resolution): 0 to 4000, 0 to 12000, conversion speed: 10 ms/channel, 40-pin connector, channel isolated, supplies power to 2-wire transmitter
		Q68ADI 8 channels, input: 0 to 20 mA DC, output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000, conversion speed: 80 μs/channel, 18-point terminal block
	Voltage/current input	Q64AD 4 channels; input -10 to 10 V DC, 0 to 20 mA DC, output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000, conversion speed: 80 μs/channel, 18-point terminal block
		Q68AD-G (Note 1) 8 channels, input: -10 to 10 V DC, 0 to 20 mA DC, output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000, conversion speed: 10 ms/channel, 40-pin connector, channel isolated
Analog output	Voltage output	Q68DAVN 8 channels, input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000, output: -10 to 10 V DC, conversion speed: 80 μs/channel, 18-point terminal block, transformer isolation between power supply and output
	Current output	Q68DAIN 8 channels, input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000; output: 0 to 20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block, transformer isolation between power supply and output
	Voltage/current output	Q62DAN 2 channels, input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000, output: -10 to 10 V DC, 0 to 20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block, transformer isolation between power supply and output
		Q62DA-FG 2 channels, input (resolution): 0 to 12000, -12000 to 12000, -16000 to 16000, output: -12 to 12 V DC, 0 to 22 mA DC, conversion speed: 10 ms/2 channels, 18-point terminal block, channel isolated
		Q64DAN 4 channels, input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000, output: -10 to 10 V DC, 0 to 20 mA DC, conversion speed: 80 μs/channel, 18-point terminal block, transformer isolation between power supply and output
		Q66DA-G (Note 1) 6 channels, input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, -16000 to 16000, output: -12 to 12 V DC, 0 to 22 mA DC, conversion speed: 6 ms/channel, 40-pin connector, channel isolated
Analog input/output	Voltage and current input/output Q64AD2DA Input: 4 channels Input: -10 to 10 V DC, 0 to 20 mA DC Output (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -12000 to 12000, 0 to 16000, -16000 to 16000 Conversion speed: 500 μs/channel Output: 2 channels Input (resolution): 0 to 4000, -4000 to 4000, 0 to 12000, -16000 to 16000 Output: -10 to 10 V DC, 0 to 20 mA DC Conversion speed: 500 μs/channel 18-point terminal block	
Load cell input	Q61LD 1 channel, input (load cell output): 0.0 to 3.3 mV/V, output (resolution): 0 to 10000, conversion speed: 10 ms, 18-point terminal block	
Temperature input	RTD	Q64RD 4 channels, platinum RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981]), conversion speed: 40 ms/channel, 18-point terminal block
		Q64RD-G 4 channels, RTD (Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981], Ni100 Ω [DIN43760 1987]), conversion speed: 40 ms/channel, 18-point terminal block, channel isolated
		Q68RD3-G (Note 1) 8 channels, RTD (3-wire type, Pt100 [JIS C1604-1997, IEC 751 1983], JPt100 [JIS C1604-1981]), Ni100 Ω [DIN43760 1987]), conversion speed: 320 ms/8 channels, 40-pin connector, channel isolated
	Thermocouple	Q64TD 4 channels, thermocouple (JIS C1602-1995), conversion speed: 40 ms/channel, 18-point terminal block
		Q64TDV-GH 4 channels, thermocouple (JIS C1602-1995), micro voltage (-100 to 100 mV), conversion speed: sampling cycle x 3, sampling cycle: 20 ms/channel, 18-point terminal block
		Q68TD-G-H01 (Note 1) (Note 2) 8 channels, thermocouple (JIS C1602-1995, IEC 60584-1 [1995], IEC 60584-2 [1982]), conversion speed: 320 ms/8 channels, 40-pin connector
		Q68TD-G-H02 (Note 1) 8 channels, thermocouple (JIS C1602-1995, IEC 60584-1 [1995], IEC 60584-2 [1982]), conversion speed: 640 ms/8 channels, 40-pin connector
		Q64TCRT 4 channels, platinum RTD (Pt100, JPt100), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
Temperature control	Platinum RTD	Q64TCRTBW 4 channels, platinum RTD (Pt100, JPt100), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, two 18-point terminal blocks
	Thermocouple	Q64TCTT 4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PL II, W5Re/W26Re), no heater disconnection detection, sampling cycle: 0.5 s/4 channels, 18-point terminal block
Loop control	Thermocouple	Q64TCTTBW 4 channels, thermocouple (K, J, T, B, S, E, R, N, U, L, PL II, W5Re/W26Re), with heater disconnection detection, sampling cycle: 0.5 s/4 channels, two 18-point terminal blocks
		Q62HLC 2 channels, input: thermocouple/micro voltage/voltage/current, conversion speed (input): 25 ms/2 channels, sampling cycle: 25 ms/2 channels; output: 4 to 20 mA DC, conversion speed (output): 25 ms/2 channels; 18-point terminal block, with 5 PID control modes

Note 1) A connector is not provided. The A6CON1/A6CON2/A6CON3/A6CON4 connector must be ordered separately.

Note 2) A connector is not provided. The A6CON1/A6CON2/A6CON4 connector must be ordered separately.

Pulse I/O and positioning module

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

Product	Model	Outline
Channel isolated pulse input	QD60P8-G	8 channels, 30 kpps/10 kpps/1 kpps/100 pps/50 pps/10 pps/1 pps/0.1 pps, count input signal: 5/12 to 24 V DC
High-Speed Counter	QD62 (Note 1)	2 channels, 200/100/10 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector
	QD62E (Note 1)	2 channels, 200/100/10 kpps, count input signal: 5/12/24 V DC, external input: 5/12/24 V DC, coincidence output: transistor (source), 12/24 V DC, 0.1 A/point, 0.4 A/common, 40-pin connector
	QD62D (Note 1)	2 channels, 500/200/100/10 kpps, count input signal: EIA standards RS-422-A (differential line driver), external input: 5/12/24 V DC; coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector
	QD63P6 (Note 2)	6 channels, 200/100/10 kpps, count input signal: 5 V DC, 40-pin connector
	QD64D2 (Note 2)	2 channels, 4 Mpps, count input signal: EIA standards RS-422-A (differential line driver), external input: 24 V DC, coincidence output: transistor (sink), 12/24 V DC, 0.5 A/point, 2 A/common, 40-pin connector
	QD65PD2 (Note 2) NEW	Two channels Differential motion input speed: 40kpps/400kpps/800kpps/2Mpps/4Mpps/8Mpps Count input signal: EIA standard RS-422-A (differential type line driver) When DC is input 10kpps/100kpps/200kpps Count input signal: DC5/12/24V 7-10mA External input: DC24V coincidence output: transistor (sink type), 12/24VDC 0.1A/point, 0.8A/common, 40 pin connector
Positioning	Open collector output	QD75P1 (Note 2) 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector
		QD75P2 (Note 2) 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector
		QD75P4 (Note 2) 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 200 kpps, 40-pin connector
		QD70P4 (Note 2) 4-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
	Differential output	QD70P8 (Note 2) 8-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 200 kpps, 40-pin connector
		QD75D1 (Note 2) 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 1 Mpps, 40-pin connector
		QD75D2 (Note 2) 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 1 Mpps, 40-pin connector
		QD75D4 (Note 2) 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, max. output pulse: 1 Mpps, 40-pin connector
With SSCNET III connectivity	QD70D4 (Note 2) 4-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector	
	QD70D8 (Note 2) 8-axes, control unit: pulse, no. of positioning data: 10/axis, max. output pulse: 4 Mpps, 40-pin connector	
	QD75M1 (Note 1) 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector	
	QD75M2 (Note 1) 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector	
	QD75M4 (Note 1) 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector	
	QD75MH1 (Note 1) 1-axis, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III connectivity	
	QD75MH2 (Note 1) 2-axes, 2-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III connectivity	
	QD75MH4 (Note 1) 4-axes, 2-/3-/4-axis linear interpolation, 2-axis circular interpolation, control unit: mm, inch, degree, pulse, no. of positioning data: 600/axis, 40-pin connector, with SSCNET III connectivity	
Open collector output with built-in counter function	QD74MH8 8-axes, control unit: pulse, no. of positioning data: 32/axis, with SSCNET III connectivity	
	QD74MH16 16-axes, control unit: pulse, no. of positioning data: 32/axis, with SSCNET III connectivity	
	QD72P3C3 (Note 2)	Positioning: 3-axes, control unit: pulse, no. of positioning data: 1/axis, max. output pulse: 100 kpps, counter: 3 channels, 100 kpps, count input signal: 5/24 V DC, 40-pin connector

Note 1) A connector is not provided. The A6CON1/A6CON2/A6CON3/A6CON4 connector must be ordered separately.

Note 2) A connector is not provided. The A6CON1/A6CON2/A6CON4 connector must be ordered separately.

Information module

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

Product	Model	Outline	
MES interface	QJ71MES96 ^(Note 1)	MES interface module *MX MESInterface and CompactFlash card are required.	
	Option	GT05-MEM-128MC	128 MB CompactFlash card
		GT05-MEM-256MC	256 MB CompactFlash card
		QD81MEM-512MBC	512 MB CompactFlash card
		QD81MEM-1GBC	1 GB CompactFlash card
High-Speed Data Logger	QD81DL96 ^(Note 1)	High-Speed Data Logger module *CompactFlash card are required	
	Option	QD81MEM-512MBC	512 MB CompactFlash card
		QD81MEM-1GBC	1 GB CompactFlash card
		QD81MEM-2GBC	2 GB CompactFlash card
		QD81MEM-4GBC	4 GB CompactFlash card
QD81MEM-8GBC	8 GB CompactFlash card		
Serial communication	QJ71C24N	RS-232: 1 channel, RS-422/485: 1 channel, total transmission speed of 2 channels: 230.4 kbps	
	QJ71C24N-R2	RS-232: 2 channels, total transmission speed of 2 channels: 230.4 kbps	
	QJ71C24N-R4	RS-422/485: 2 channels, total transmission speed of 2 channels: 230.4 kbps	

Note 1) Only supported by Q12DCCPU-V

Control network module

CC-Link IE Controller Network	QJ71GP21-SX	Multi-mode fiber optic cable, dual loop, controller network (control/normal station)	
	QJ71GP21S-SX	Multi-mode fiber optic cable, dual loop, controller network (control/normal station), with external power supply function	
MELSECNET/H	Optical loop (SI)	QJ71LP21-25	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote mater station)
		QJ71LP21S-25	SI/QSI/H-PCF/ broadband H-PCF fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote mater station), with external power supply function
	Optical loop (GI)	QJ71LP21G	GI-50/125 fiber optic cable, dual loop, controller network (control/normal station) or remote I/O network (remote master station)
	Coaxial bus	QJ71BR11	3C-2V/5C-2V coaxial cable, single bus, controller network (control/normal station) or remote I/O network (remote master station)
CC-Link IE Field Network	QJ71GF11-T2 ^(Note 1) NEW	Master/local station, CC-Link IE Field Network compatible	
CC-Link	QJ61BT11N	Master/local station, CC-Link Ver. 2 compatible	
CC-Link/LT	QJ61CL12	Master station	
FL-net (OPCN-2)	Ver. 2.00	QJ71FL71-T-F01	10BASE-T, 100BASE-TX
		QJ71FL71-B2-F01	10BASE2
		QJ71FL71-B5-F01	10BASE5
	Ver. 1.00	QJ71FL71-T	10BASE-T
		QJ71FL71-B2	10BASE2
AS-i	QJ71AS92	Master station, AS-Interface Specification Version 2.11 compatible	

Note 1) Parameters are set by user program. Only cyclic transmission is supported.

Ethernet related products

Industrial switching hub	NZ2EHG-T8 DB NEW	10/100/1000M AUTO-MDIX DIN rail, 8 ports
	NZ2EHF-T8 DB NEW	10/100M AUTO-MDIX DIN rail, 8 ports

Engineering tool for C Controller module

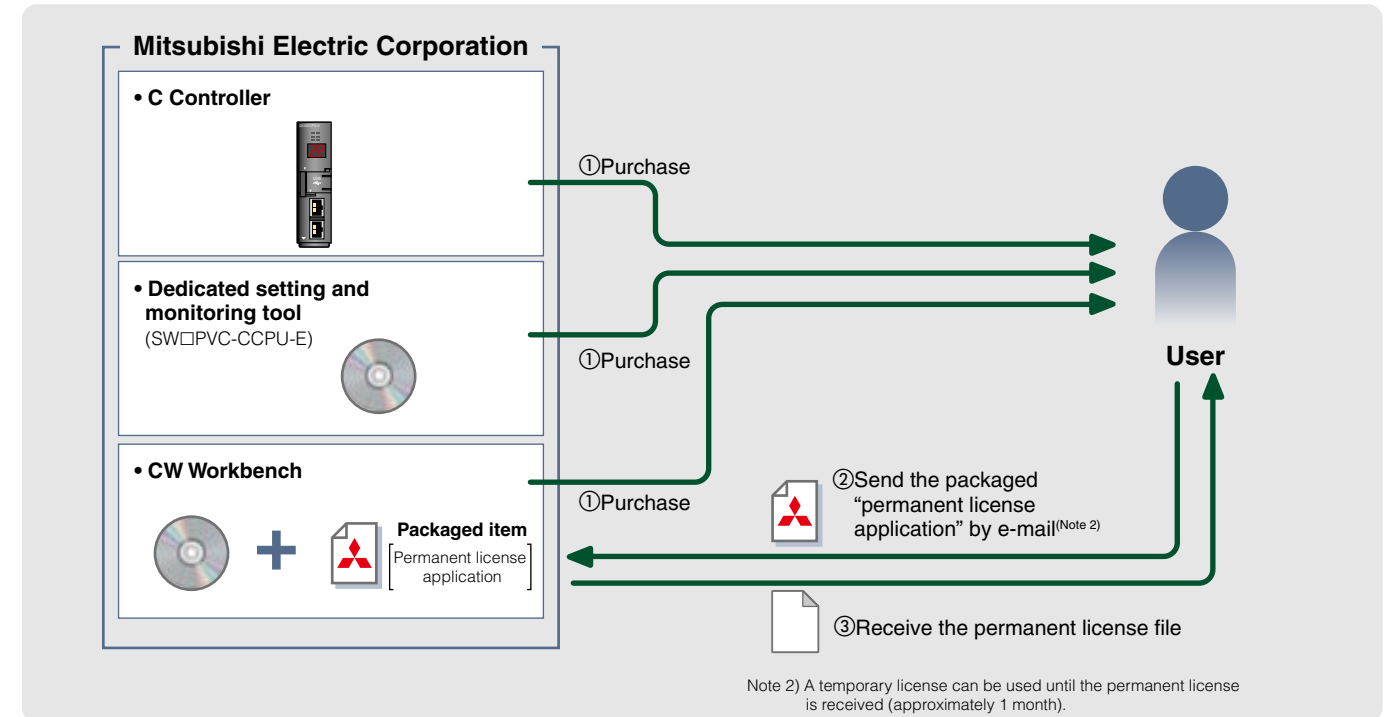
CW Workbench	SW1DND-CWWLQ12-E NEW	Product with license
	SW1DND-CWWLQ12-EZ NEW	Additional license product

Setting/monitoring tools for C Controller module

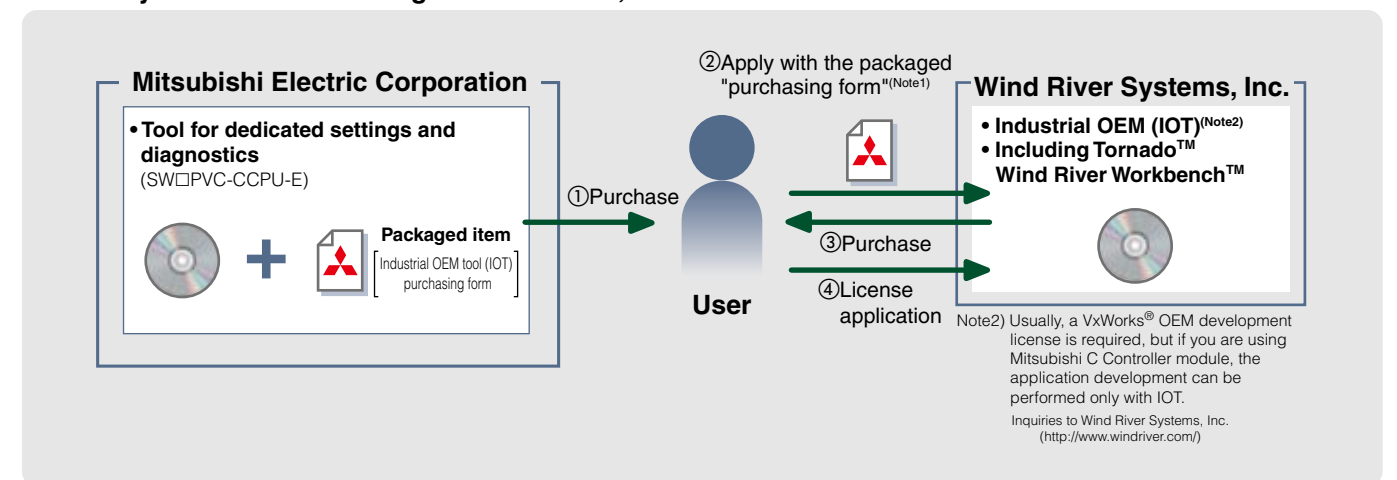
Setting/monitoring tools for C Controller module	SW□PVC-CCPU-E	A tool for setting/monitoring C Controller module, CC-Link, MELSECNET/H, CC-Link IE Controller network
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Product purchasing information

Necessary interactions for using CW Workbench



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Mitsubishi Electric Programmable Controllers

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