

**MITSUBISHI
ELECTRIC**

Changes for the Better

for a greener tomorrow



Ethernet-based Open Network
CC-Link IE Product Catalog

CC-Link **IE** **F**ield

CC-Link **IE** **C**ontrol

[CC-Link + Industrial Ethernet = **CC-Link IE**]

**CC-Link IE Control Network now
supports twisted pair cables!**

A major innovation in industrial networks providing
reliable, flexible, and seamless communication

CC-Link + Industrial Ethernet

**CC-Link IE Control Network can be
configured with optical fiber cables
or twisted pair cables.**

**Inexpensive and flexible wiring with
twisted pair cables makes CC-Link
IE Control Network more available.**

CC-Link IE Control Network now supports twisted pair cables, which
realize flexible wiring topology supporting star, line, and ring
configurations.

This means cables can be flexibly laid out in accordance with the
production line, equipment, and devices.

= CC-Línk IE

CC-Línk IE **Field**

All-round & Flexible Network Topology

The network is designed to simultaneously handle distributed control, I/O control, safety control and motion control.

The network wiring layout is highly flexible to best fit the needs of the application.

Choose from line, star, line and star mixed, or ring topology.

Communication speed 1 Gbps	Maximum link registers 16K words	Maximum link relays 32,768 bits	Star topology
Line topology	Ring topology	Easy to configure parameters	Network diagnosis at-a-glance
Seamless networking	Twisted pair cable	Ethernet-based	Safety Communication Function
Motion control	Synchronous communication		

CC-Línk IE **Control**

High speed, large capacity, and highly reliable

Highly-reliable network is realized with an external power supply and duplex loop using optical fiber cables. Furthermore, twisted pair cables realize flexible layout of wiring. CC-Línk IE Control Network is a highly-reliable network that integrates operations of various controllers with its versatile features. Up to 128K words of link registers can be shared among controllers providing ample bandwidth for ever increasing amounts of recipe and traceability data.

Communication speed 1 Gbps	Maximum link registers 128K words	Maximum link relays 32,768 bits	Star topology
Line topology	Ring topology	Dual optical loop	External power supply
Easy to configure parameters	Network diagnosis at-a-glance	Seamless networking	Twisted pair cable
Multi-mode optical fiber cable	Ethernet-based		

Ethernet-based open network

CC-Link IE

Seamless communication between upper-level information systems and lower-level field systems!

Choose the optimal network to meet your needs

CC-Link IE Field

Gigabit Ethernet

This Ethernet network with highly flexible wiring to match your device layout can perform high-speed controller distributed control, I/O control, safety control and motion control.

CC-Link IE Control

Gigabit Ethernet

This "core" network is intended for high-speed, large bandwidth controller level distributed control. Reliability is ensured through dual fiber optic loop connections and extensive RAS functions. Twisted pair cables realize flexible wiring of the CC-Link IE Control Network.

CC-Link CC-Link Safety CC-Link/LT

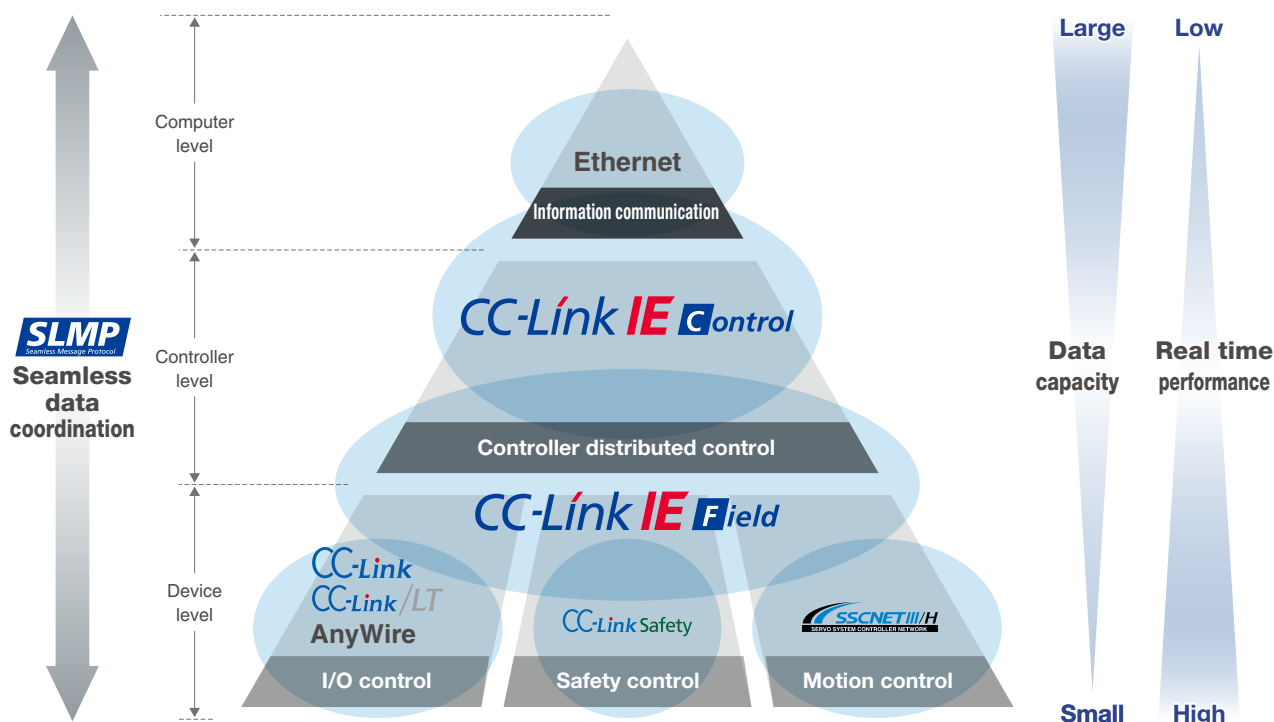
Released in 1996, CC-Link has become a global leader in open fieldbus networks. CC-Link Safety achieves the same outstanding performance of CC-Link while meeting strict safety requirements. CC-Link/LT is a cost saving network for small I/O applications.

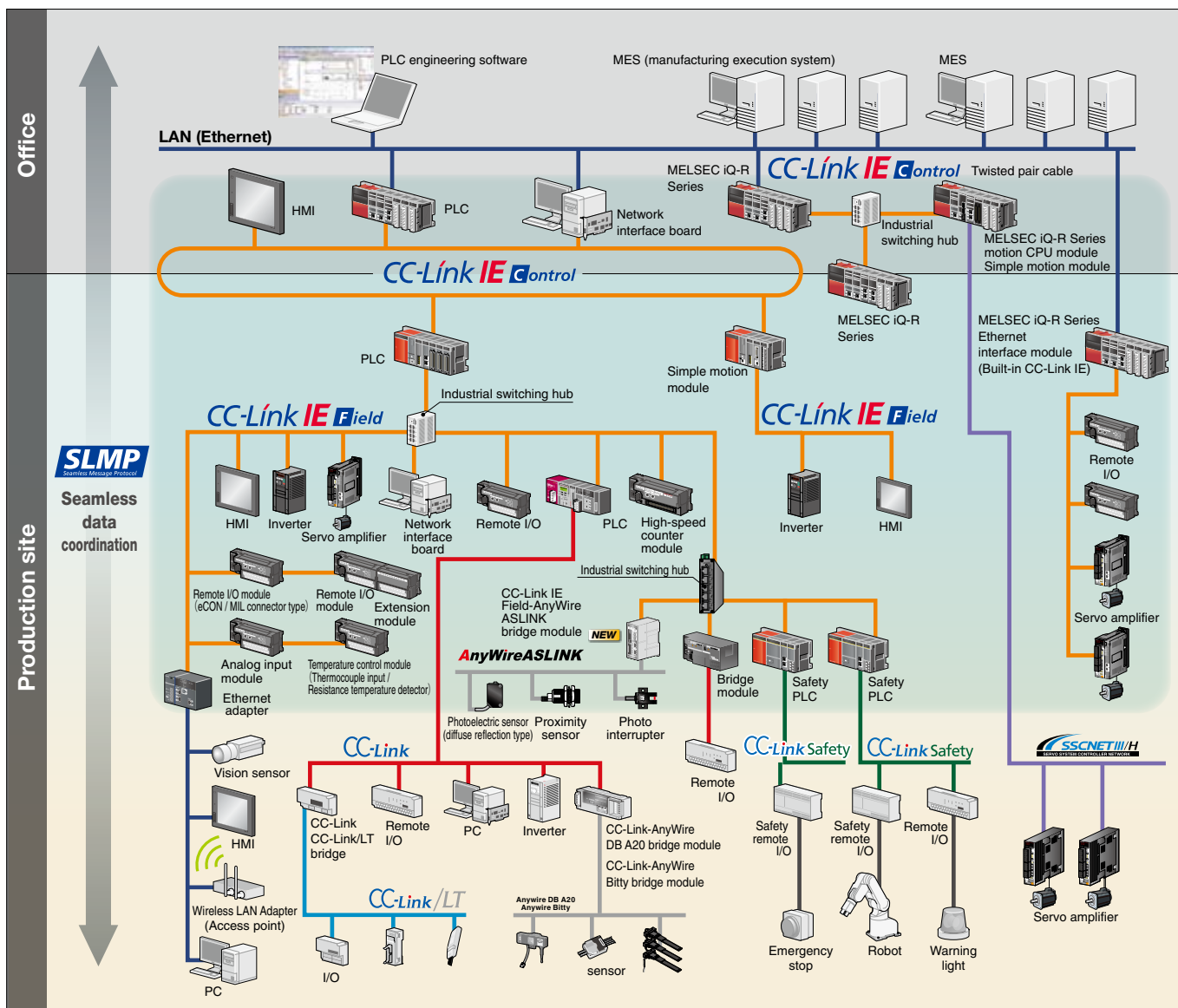
AnyWire

Anywire network with general-purpose electrical wires or robot cables enables to distribute control of sensors or actuators.

SSCNET III/H

This is a Mitsubishi original servo system network designed for reliability. It utilizes an optical network for smooth, fast-response, and high-accuracy operation under all circumstances.





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CC-Link IE Field

This versatile field network integrates distributed control, I/O control, safety control and motion control. Its flexible wiring design allows for star, line, star and line mixed, or ring topology to ensure the network can meet the needs of any production line or equipment layout.



CASE 1 High-speed communication reduces operating cycle and stabilizes the control interval for higher performance P.7

- Shorten operating cycles
- Increase the number of control applications and associated data without changing the operating cycle
- Achieve a stable communication cycle for better control stability

CASE 2 Flexibility allows easy addition of nodes and changes to the network layout P.8

- Connections can be easily moved to fit a rearrangement of production lines
- The arrangement of equipment is highly flexible

CASE 3 Simplified network settings make configuring the network easy P.9

- Configure all network parameters from a central location

CASE 4 Engineering tools make wiring problems and errors easy to diagnose P.10

- The network can automatically detect problems and suggest solutions
- Minimize downtime with the ability to respond quickly to problems

CASE 5 Ease of connectivity means other stations can be accessed from anywhere, even across multiple networks..... P.11

- Observe the entire factory from a single office PC
- Access any point on the network from the nearest station or hub
- Perform maintenance duties without having to physically go to each machine

CASE 6 Cut costs by using commercially available Ethernet equipment..... P.12

- Regardless of geographical location, network cables and equipment are easy to purchase
- Network cables and equipment are comparatively inexpensive

CASE 7 Networked safety control signals allow cooperation between processes P.13

- Connect the safety controllers using a network
- Enable to use the same network to connect safety/standard programmable controllers

CASE 8 Realize the combined use of field devices and motion control devices in a single network P.14

- Communicate with Servo amplifier and Field devices (remote I/O, sensor, etc.)
- Simple wiring to the facility placement

CASE 9 Seamlessly connect to TCP/IP communication compatible devices..... P.15

- Suppress wiring costs
- Easily extend Ethernet devices

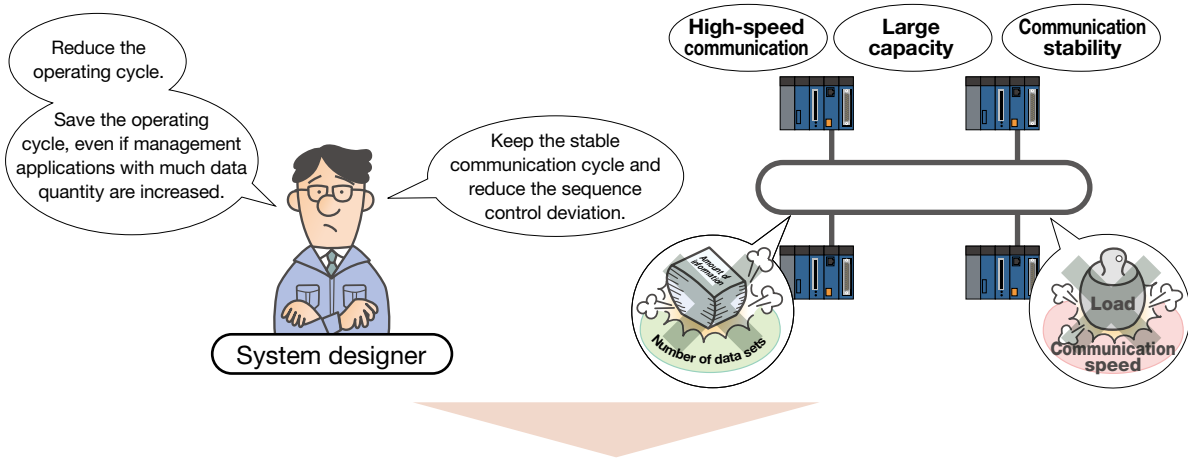
CASE 10 Avoiding failure of the entire network P.16

- Prevent system failure
- Continue network communication even when an error occurs

Benefits of CC-Link IE Field Network

CASE 1

High-speed communication reduces operating cycle and stabilizes the control interval for higher performance



CC-Link IE Field makes it possible

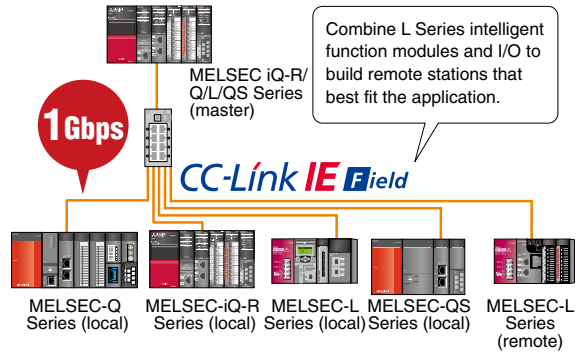
Communication speed	Maximum link registers
1Gbps	16K _{words}

High-speed 1 Gbps communication

High-speed communication reduces operating cycle

The unprecedented data transfer speed provided by CC-Link IE Field Network increases the effectiveness of controller-to-controller and controller-to-field device communications, thus reducing operating cycle. It is now simple to establish high-speed I/O control and powerful distributed control systems.

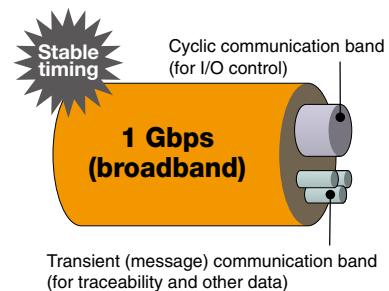
The ability to transfer large volumes of data enables high performance field devices to reach their full potential. With the ability to transfer large amounts of traceability data, systems capable of highly-detailed diagnostics can be constructed.



Cyclic communication is stable and reliable

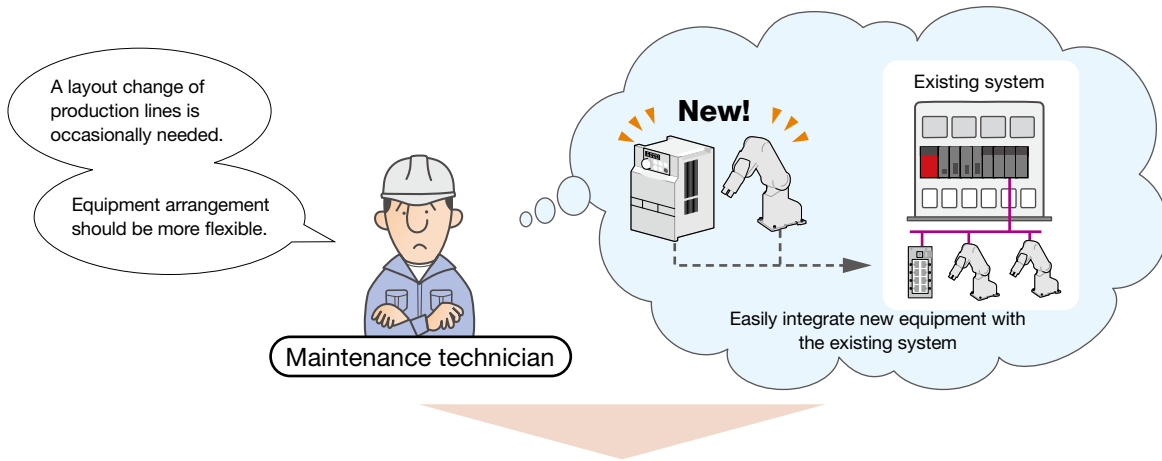
Improved quality of communication is achieved using a stable control period

The total bandwidth is divided between deterministic (cyclic) communication and transient (message) communication. The cyclic communication band, intended for I/O control, is fixed and will not suffer from degraded performance even when large volumes of traceability and diagnostic data are transferred via transient communication.



CASE 2

Flexibility allows easy addition of nodes and changes to the network layout



CC-Link IE Field makes it possible

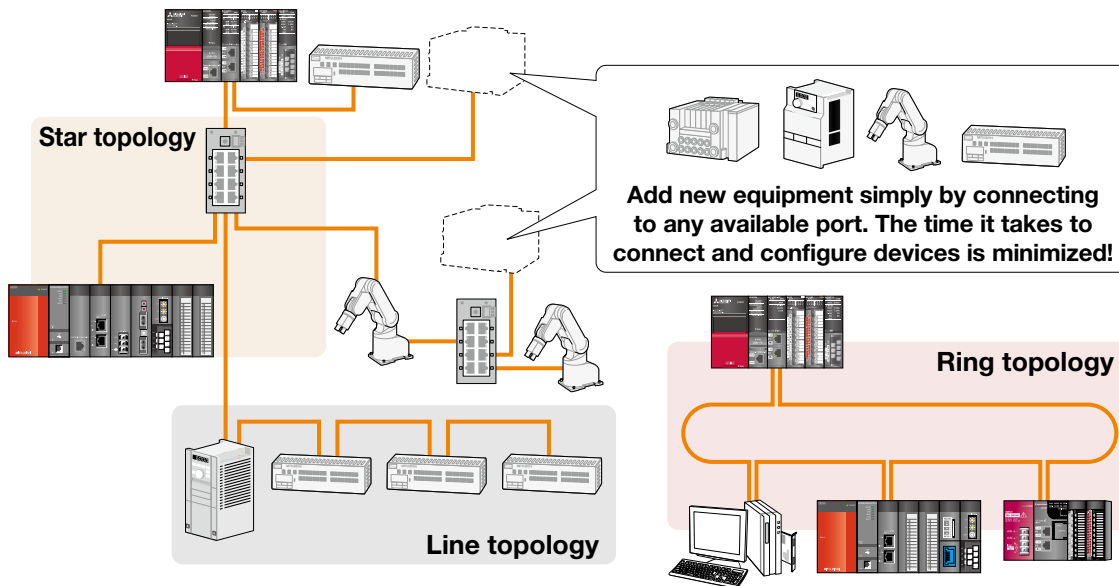
- Star topology
- Line topology
- Ring topology

Flexible network topology

Add nodes or change the network layout entirely
The system is highly flexible

Various network topologies may be used including star, line, star and line combination. This flexibility allows additional equipment to be simply connected to any available port, with little concern for restrictions.

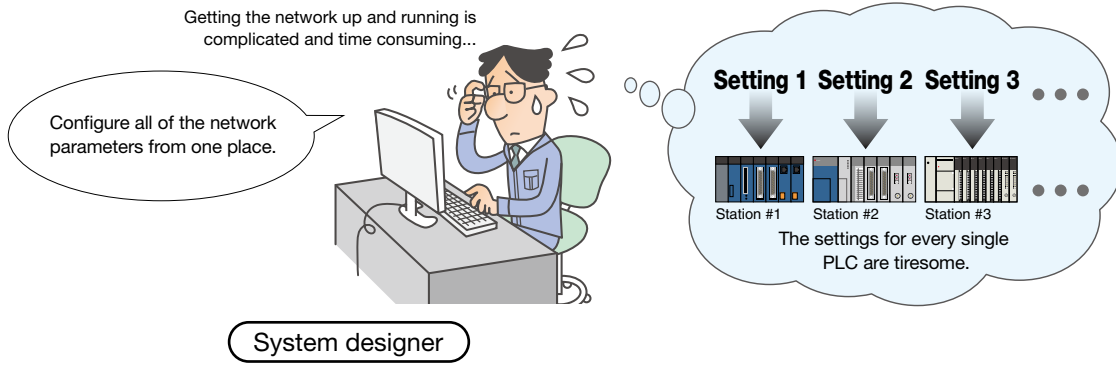
Ring topology can be used also. (Star or line topology cannot be mixed with ring.)



Benefits of CC-Link IE Field Network

CASE 3

Simplified network settings make configuring the network easy



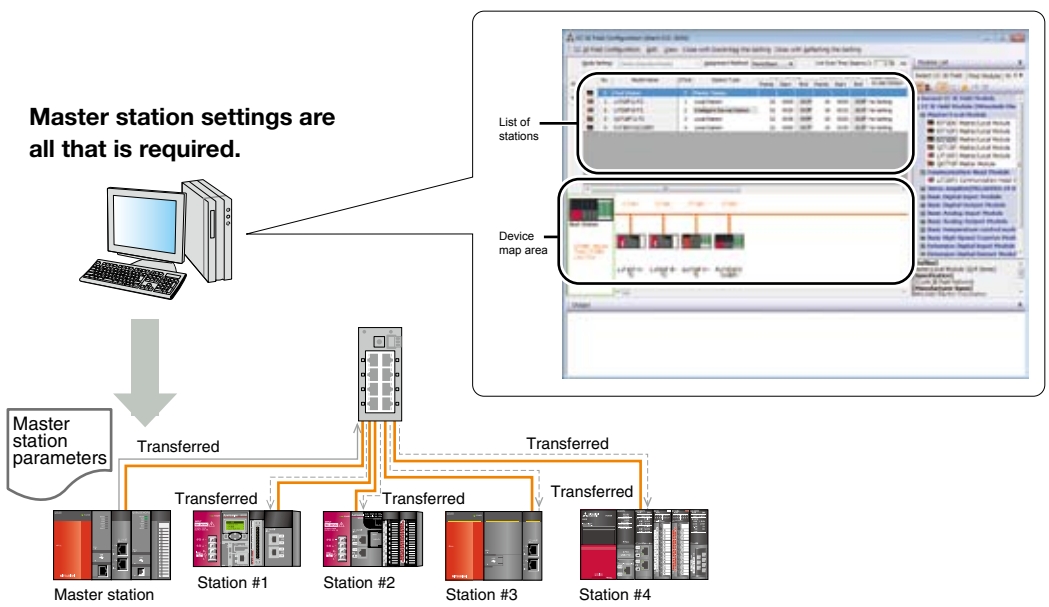
CC-Link IE Field makes it possible

Easy to configure parameters

Easy to configure settings

Just configure the master station to begin communications It's that easy!

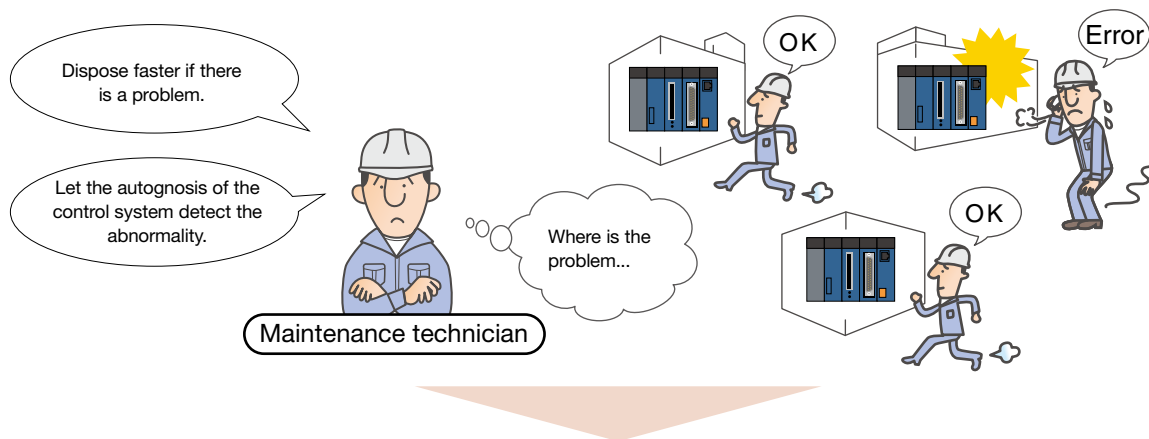
Using the engineering tool*1, only the master station's network parameter settings need to be configured, which greatly simplifies setup. Additionally, updating the system configuration is a breeze.



*1) MELSEC iQ-R Series requires GX Works3.
MELSEC-Q Series and L Series are supported by GX Works2.
MELSEC-QS Series requires GX Developer.

CASE 4

Engineering tools make wiring problems and errors easy to diagnose



CC-Link IE Field makes it possible

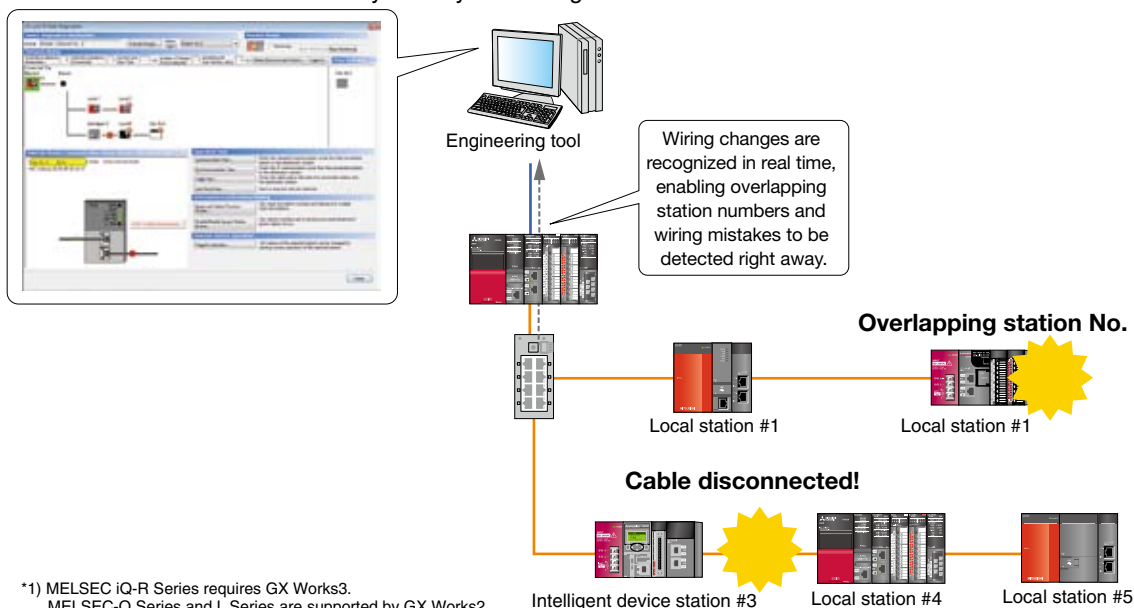
Network diagnosis at-a-glance

Easy diagnosis functions

Perform diagnostics and troubleshoot effectively regardless of experience

The engineering tool*1 enables you to identify network errors at a glance. You can quickly identify the cause of a problem and implement the suggested remedy to minimize down time. The network diagnostics tool automatically creates a graphical representation of the network. Using this diagram, cable problems and PLC errors are clearly visible allowing for fast response.

The condition of the entire network can also be monitored, detecting overlapping station numbers and miswiring right away at the time of wiring changes. Additionally, the condition of any remote station on the network can be monitored by directly accessing it from the same screen.

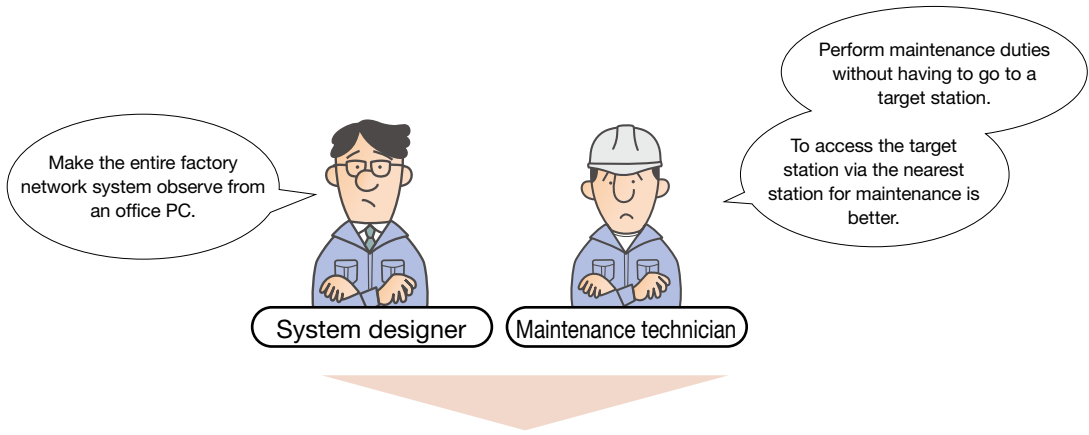


*1) MELSEC iQ-R Series requires GX Works3.
MELSEC-Q Series and L Series are supported by GX Works2.
MELSEC-QS Series requires GX Developer.

Benefits of CC-Link IE Field Network

CASE 5

Ease of connectivity means other stations can be accessed from anywhere, even across multiple networks!



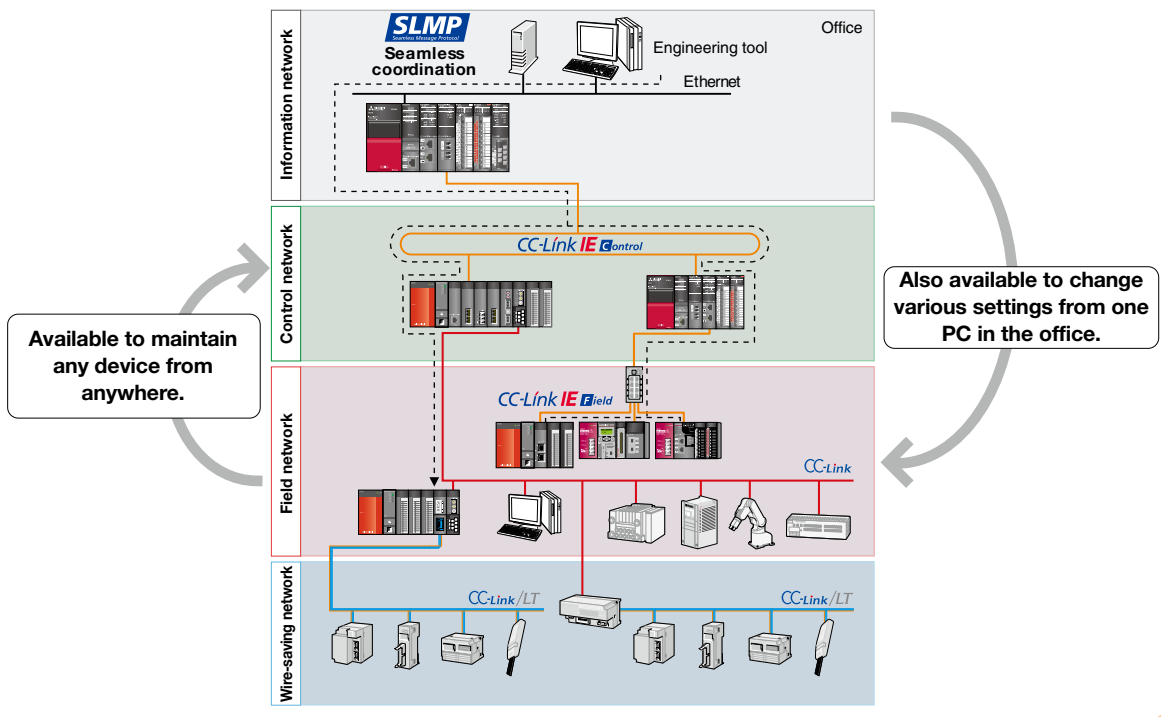
CC-Link IE Field makes it possible

Seamless networking

Seamless communication

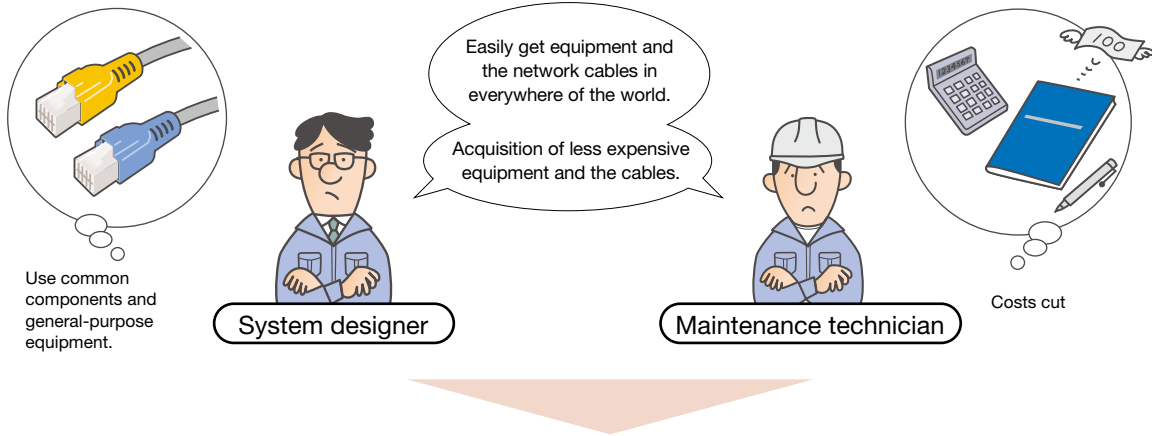
Remotely collect information and perform maintenance operations from anywhere

When joined together, different CC-Link networks operate seamlessly as one network so there is no need to pay attention to the network hierarchy. Once communication is established, data can be collected from field devices and maintenance duties can be performed. Everything from the field equipment to the upper level information system is accessible from any point on the network.



CASE 6

Cut costs by using commercially available Ethernet equipment



CC-Link IE Field makes it possible

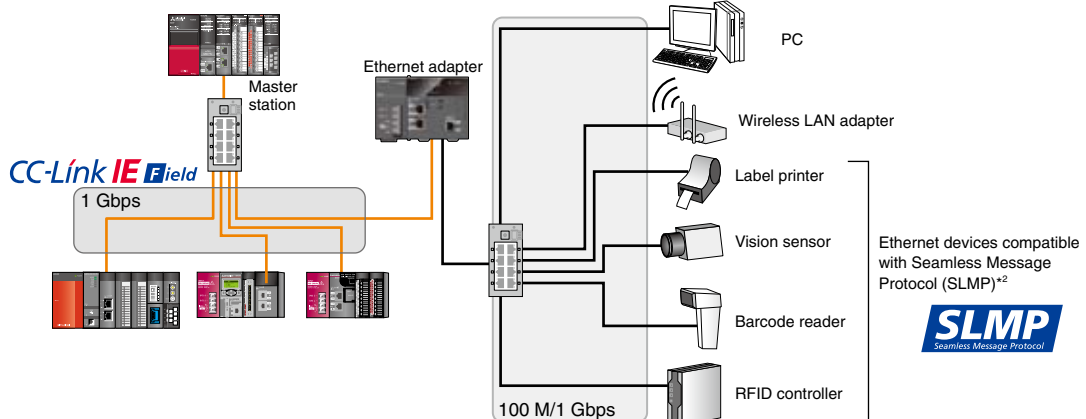
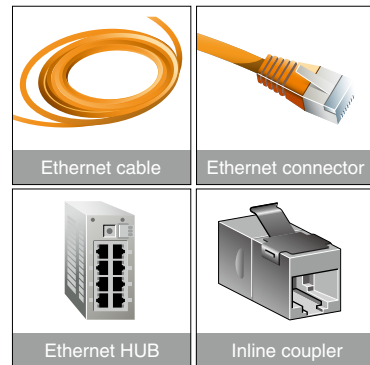
Ethernet-based

Ethernet-based network

Built on global standards

CC-Link IE Field Network has been designed to make use of commercially available Ethernet components including cables and hubs. Thanks to the common availability of these components, significant cost savings over alternative networks can be achieved.*1

Using the Ethernet adapter unit, Seamless Message Protocol (SLMP)*2 compatible Ethernet devices can be connected to CC-Link IE Field Network. A wide range of devices can be connected such as vision sensors and RFID controllers.

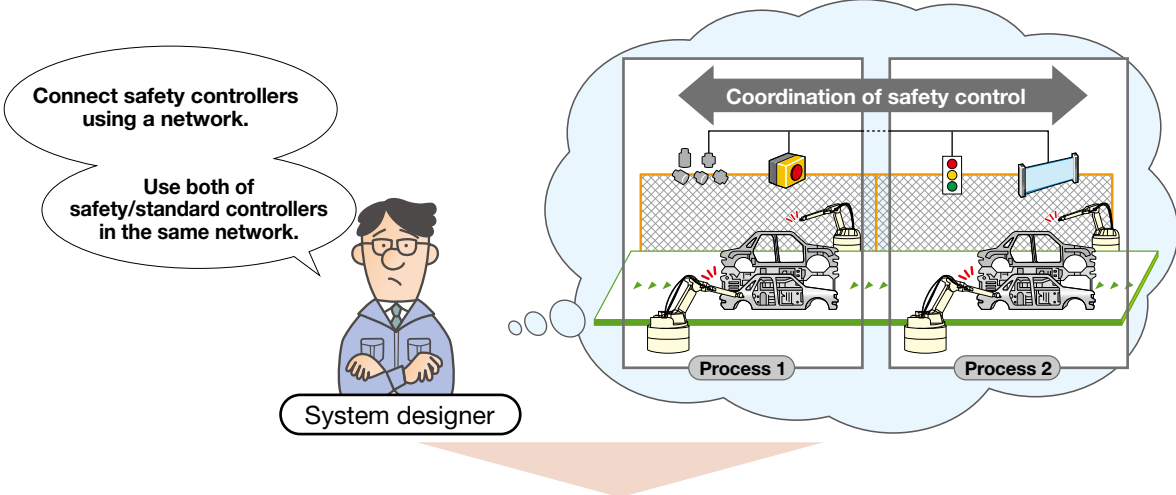


*1) Use the cables recommended by CC-Link Partner Association for CC-Link IE Field Network.

*2) Seamless message protocol (SLMP) is an integral part of CC-Link IE Field Network that supports transient communications.

CASE 7

Networked safety control signals allow cooperation between processes



CC-Link IE Field makes it possible

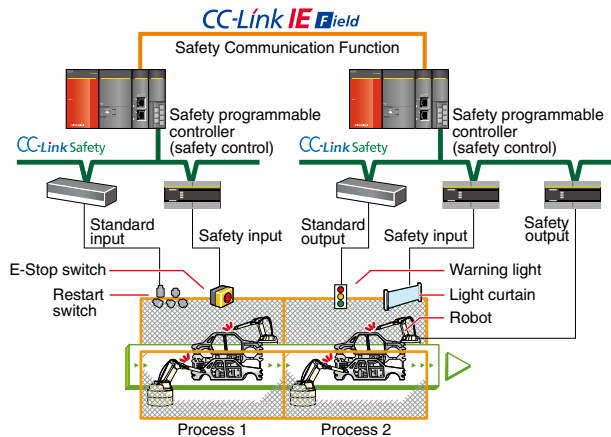
Safety Communication Function

Safety Communication Function

Networked safety controllers allow cooperation between processes

In order to share safety information between two or more safety CPUs, Safety Communication Function has been added to CC-Link IE Field Network.

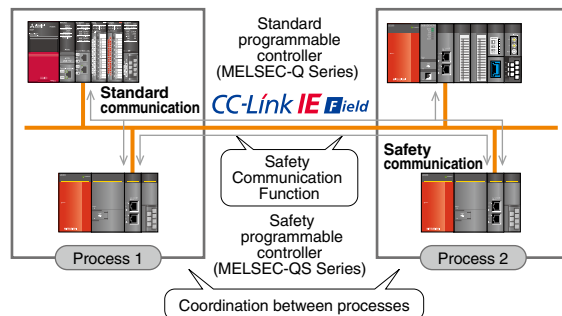
By using Safety Communication Function, networked safety programmable controllers in each process of a production line may be safely shut-down in specific order during an emergency stop, for example.



Safety Communication Function

Safety and standard communication on the same network

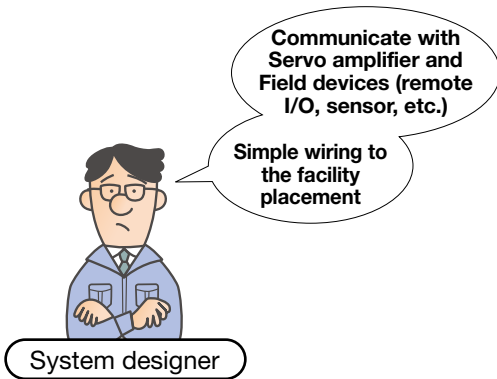
CC-Link IE Field Network can simultaneously perform standard communications and handle safety traffic. Safety signals such as an Emergency stop, green signal, etc. can be shared between programmable controllers at the same time as general signals like reset display, etc.



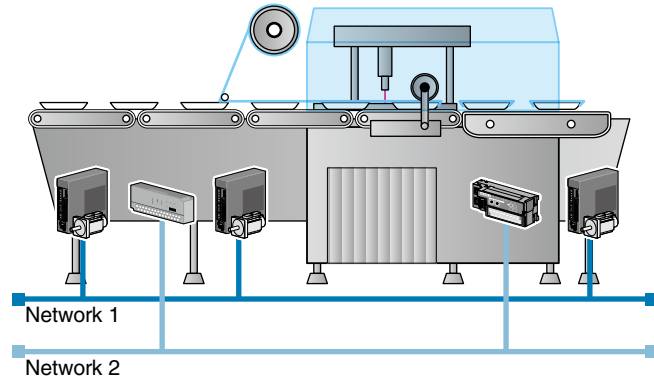
*1) MELSEC-Q Series and L Series are supported by GX Works2.
MELSEC-QS Series requires GX Developer.
The safety communication function and submaster function cannot be used together.

CASE 8

Realize the combination use of field devices and motion control devices in a single network



Traverse pillow packaging system



CC-Link IE Field makes it possible

Motion control
Synchronous communication

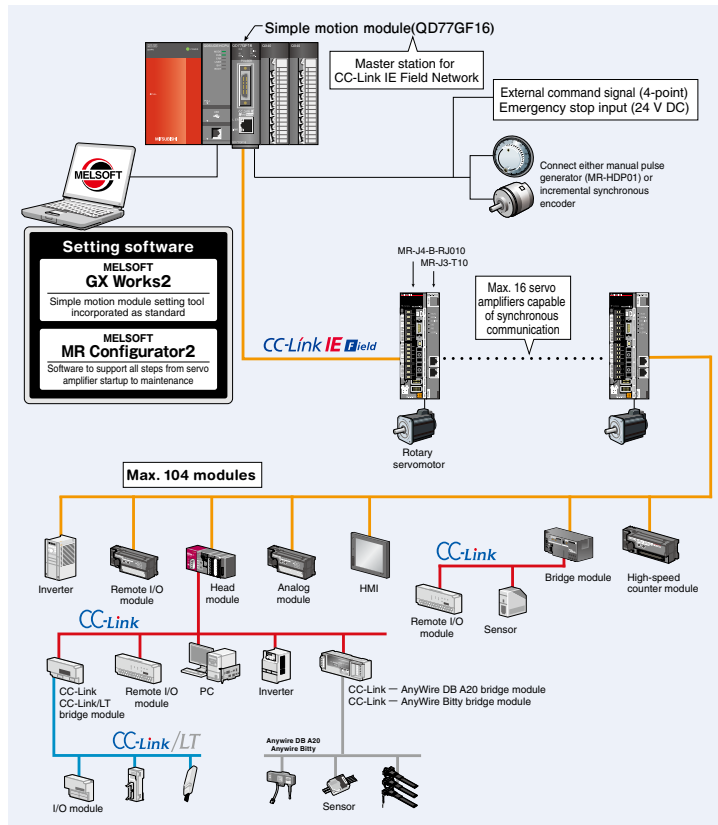
Synchronous control function for Simple motion module

Enable to mix the synchronous communication for motion control and standard communication on the same network

Simple motion module enables to mix Servo amplifiers and Field devices(remote I/O, sensor, etc.) in a single network.

Performs interpolation control and synchronous control with simple parameter settings and starting from a sequence program.

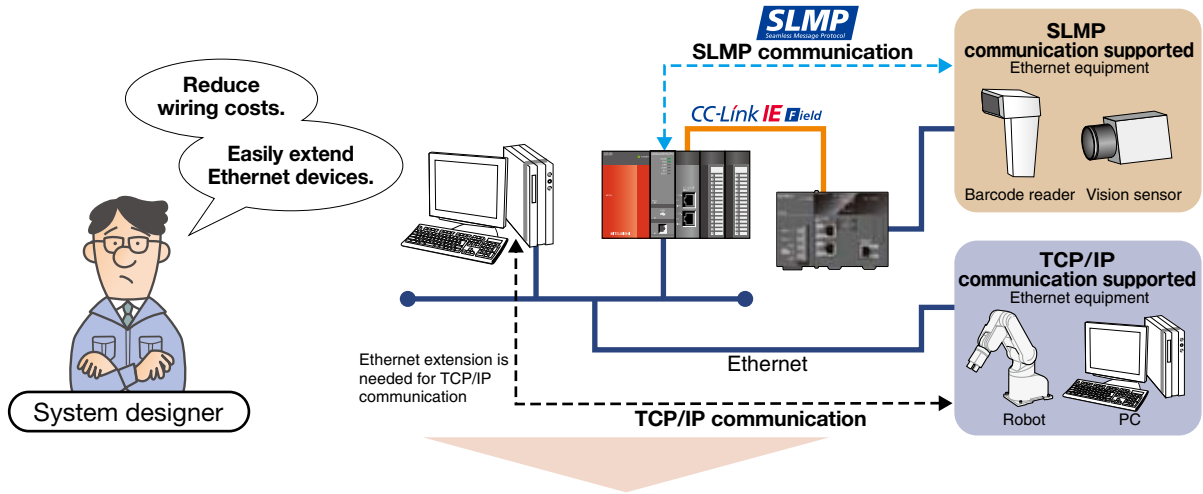
Up to 16 axes can be controlled with this motion control. It supports food processing systems and processing machines that require synchronous control.



Note: Use the DT135TX industrial switching hub (CC-Link IE Field Network compatible) by Mitsubishi Electric System & Service Co., Ltd.

CASE 9

Seamlessly connect to TCP/IP communication compatible devices



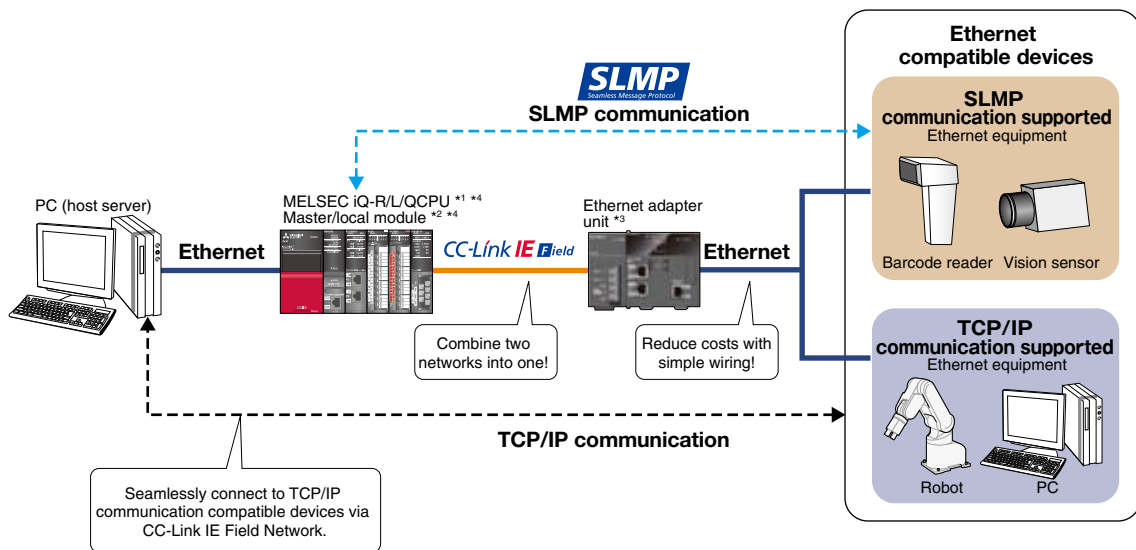
CC-Link IE Field makes it possible

Seamless collaboration

IP packet relay function

Perform TCP/IP communication via CC-Link IE Field Network

Communication with a designated IP address is possible over CC-Link IE Field Network. Wiring costs can be reduced since there's no need to lay Ethernet along CC-Link IE Field Network.



Versions supporting IP packet relay function

*1) The MELSEC-Q Series module of which first 5-digit serial number is 14022 or later.

The MELSEC-L Series module of which first 5-digit serial number is 14112 or later.

*2) The MELSEC-Q Series module of which first 5-digit serial number is 14023 or later.

The MELSEC-L Series module of which first 5-digit serial number is 14112 or later.

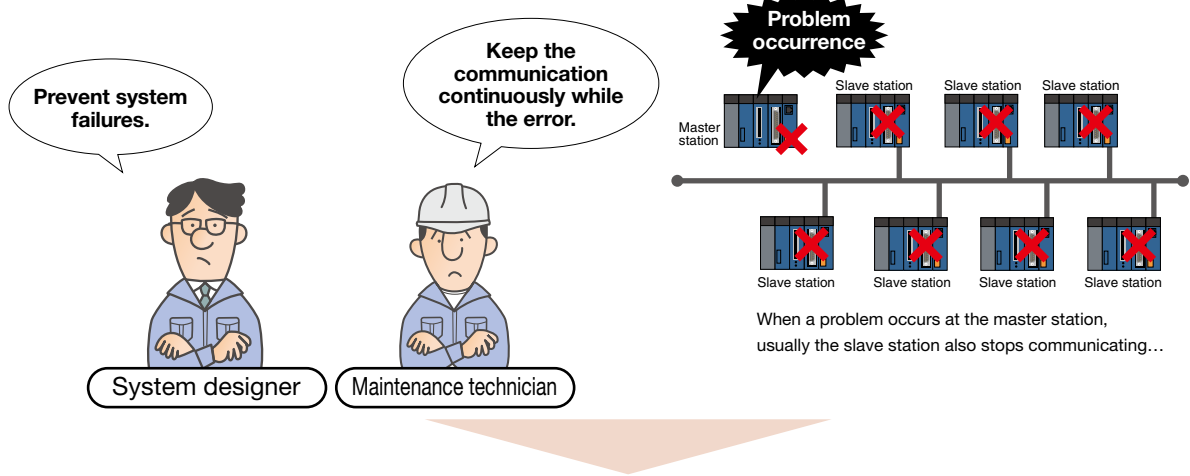
*3) The first 5-digit serial 14022 with version A or later.

*4) For parameter setting of the MELSEC-Q Series modules, GX Works2 with Version 1.77F or later is required.

For the parameter setting of the MELSEC-L Series modules, GX Works2 with Version 1.95Z or later is required.

CASE 10

Avoiding failure of the entire network

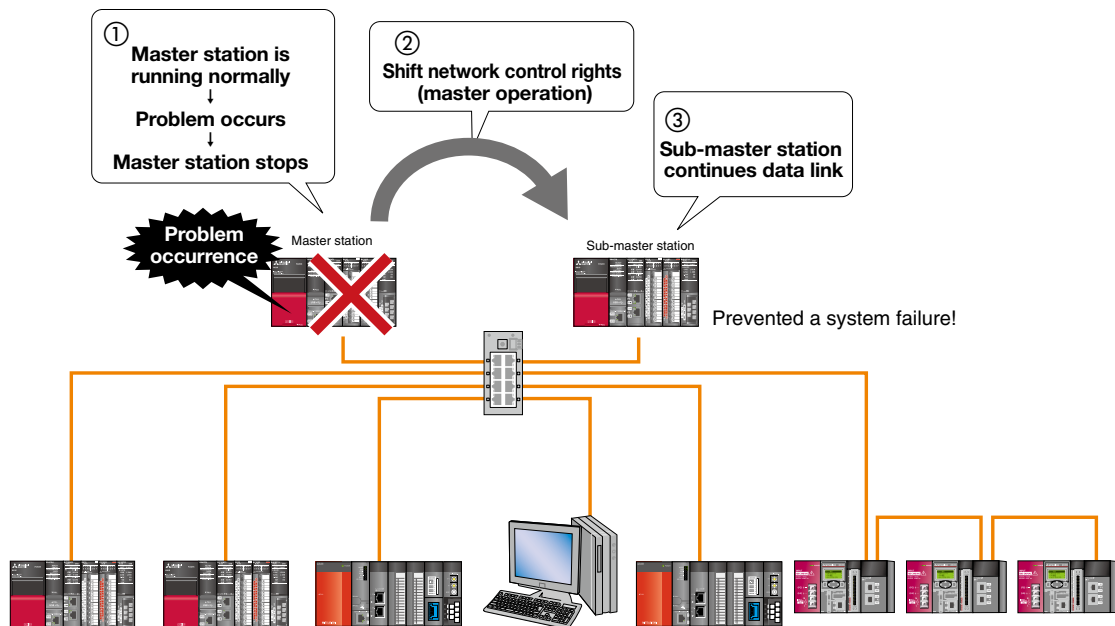


CC-Link IE Field makes it possible

Sub-master function

Continue data link even if master station stops

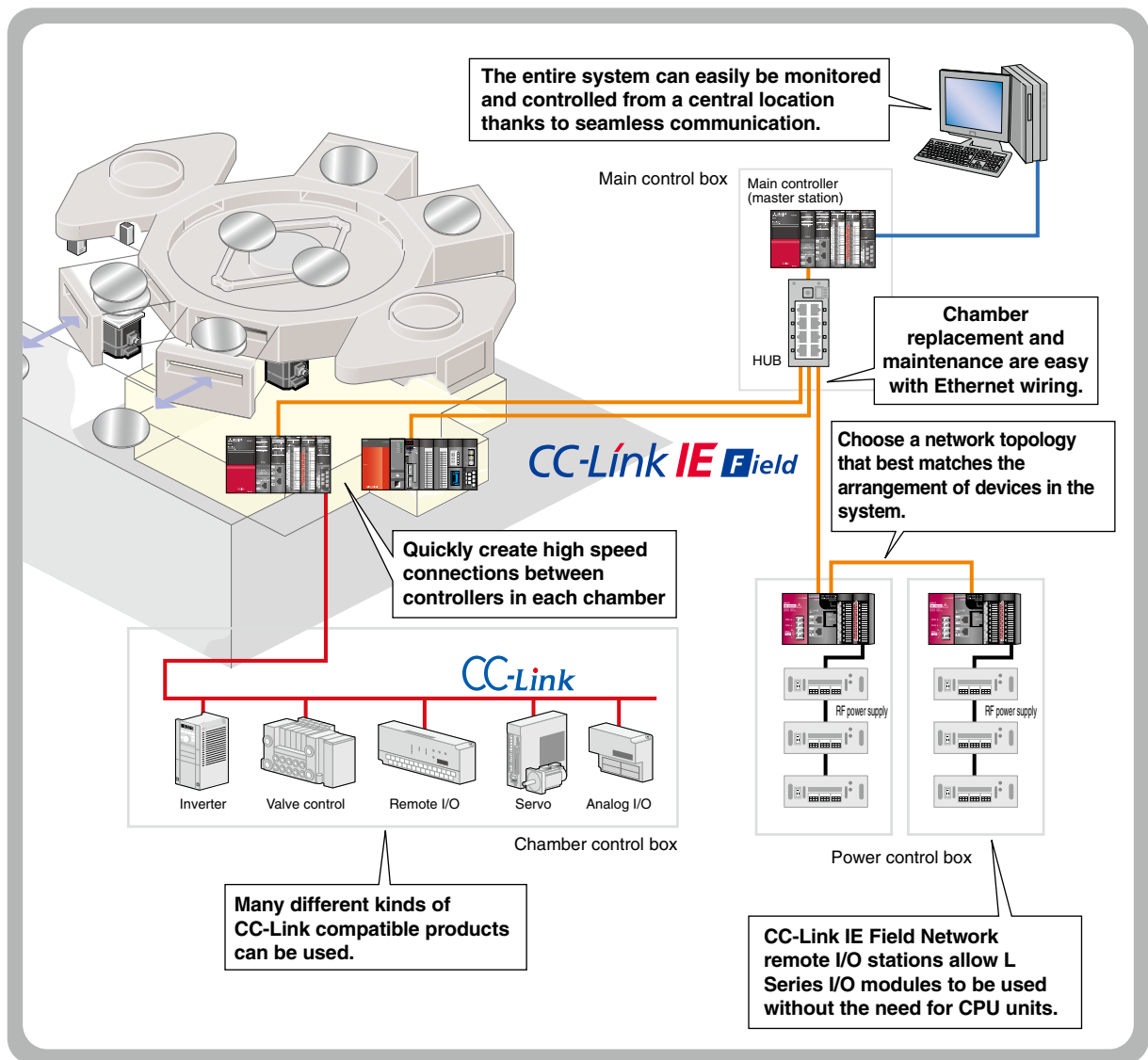
By connecting the master station and sub-master station in the same network, even if a problem occurs in the master station, the sub-master station step in for the master station and continue to control the slave station. Failure of the entire network because of a master station stop can be avoided.



Network examples

Semiconductor production system

- Seamless communication** The entire system is operated and monitored from one place.
- Flexible wiring** Star and line topologies can be mixed.
- CC-Link integration** Incorporating CC-Link allows a wide variety of devices to be connected.





Automotive production process

Seamless communication

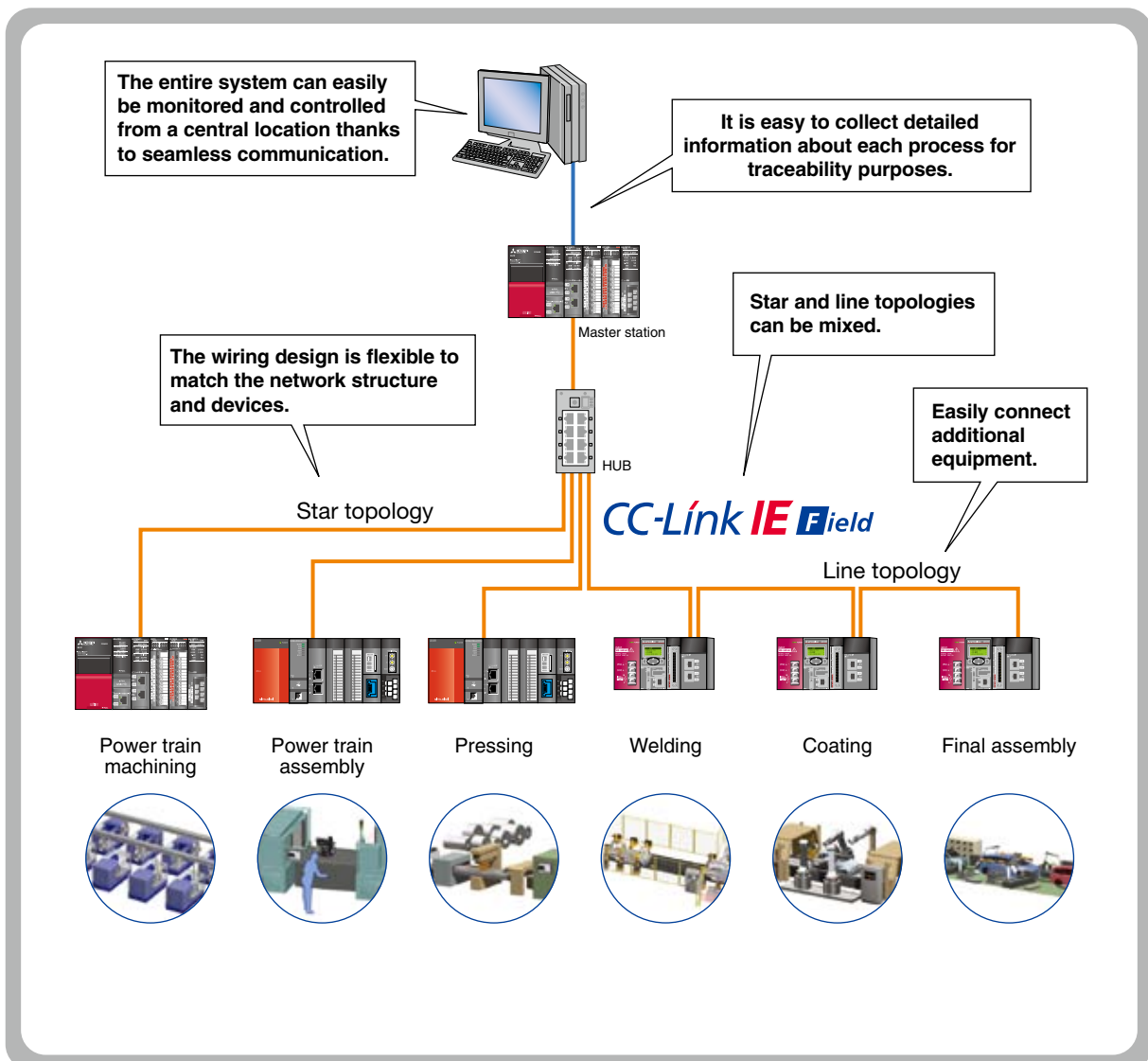
The entire system is operated and monitored from one place.

Flexible wiring

Star and line topologies can be mixed.

Distributed control

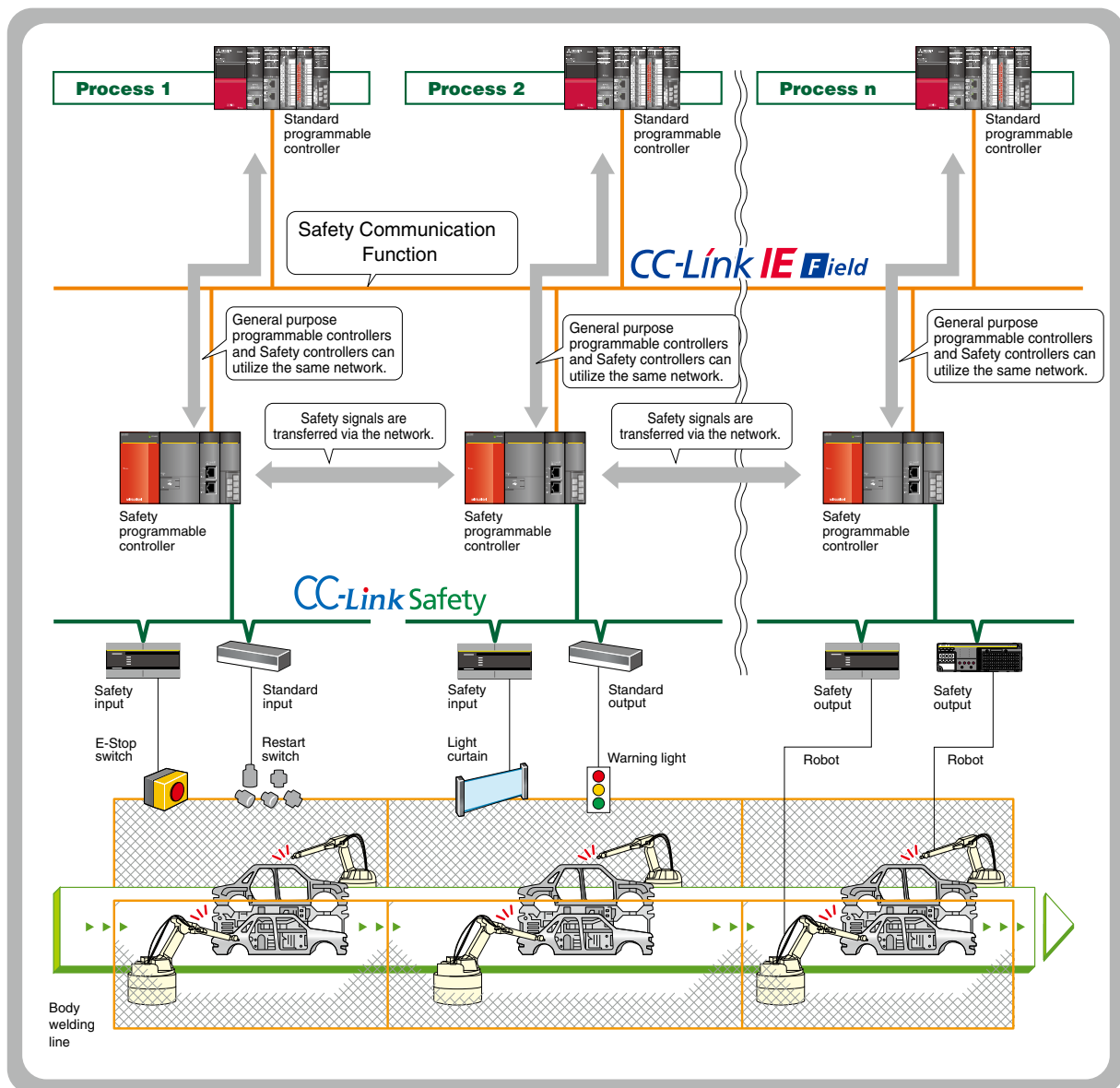
With the ability to share large amounts of data at high speed, controllers can work together in unison.



Network examples



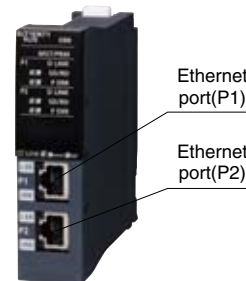
- Coordination between safety processes** Control safety applications that require coordination between processes.
- Simultaneously perform general communications** General information transfer and control and safety control can be performed using the same network.
- Compatibility with CC-Link Safety** A wide range of equipment supporting CC-Link Safety can be used.



CC-Link IE Field Network master/local module(multi-network compatible)

RJ71EN71 **NEW**

- Can operate as either a master or local station. Perfect for managing remote I/O control and distributed control.
- The two Ethernet ports can be used as Ethernet, CC-Link IE Control Network, or CC-Link IE Field Network communication ports.(multi-network compatible)
- The two Ethernet ports can be used for respective networks.



RJ71EN71

■ Network combination*1

P1	C	F	E	E	E
P2	C	F	C	F	E

- C** : CC-Link IE Control Network
- F** : CC-Link IE Field Network
- E** : Ethernet

*1) Any network combination can be used except CC-Link IE Field with CC-Link IE Control.

CC-Link IE Field Network master/local module

RJ71GF11-T2 **NEW** /QJ71GF11-T2 / LJ71GF11-T2 / QS0J71GF11-T2*2

- Can operate as either a master or local station. Perfect for managing remote I/O control and distributed control.
- Devices from other stations can easily be accessed through transient communication using dedicated instructions.
- Function blocks for transient communication are available to further simplify messaging.
- The network can ensure 32bit data integrity using the station-based block data assurance function. (This ensures that pairs of word data are updated together during link refresh.)
- Safety Communication is available between MELSEC-QS Series controllers.



RJ71GF11-T2

QJ71GF11-T2

LJ71GF11-T2

QS0J71GF11-T2

*2) GX Developer (Version 8.98C or later) is required with network parameters settings of the master/local module.

Compatible PLC CPUs

- MELSEC iQ-R Series CPUs
- MELSEC-Q Series Universal model QCPUs(High-speed Universal model QCPUs included), C Controller modules
- MELSEC-L Series CPUs
- MELSEC-QS Series Safety CPUs

For further details of compatible CPUs, refer to relevant product manuals.

CC-Link IE Field Network simple motion module

QD77GF16

- This module is used for the motion control. High-speed positioning control, synchronous control and cam control can be performed easily at a control cycle of 0.88 ms, 1.77 ms or 3.55 ms just with simple parameter settings and startup from the sequence control.
- This module functions as the CC-Link IE Field Network's master station.*3 Communicate with servo amplifiers and field devices (remote I/O, sensors, etc.) with a single network. Up to 16 servo amplifier axes, and up to 104 field devices can be connected.



*3) Local station function, sub-master station function and safety communication function are not supported.

Compatible PLC CPUs

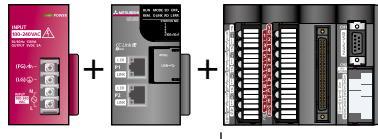
- MELSEC-Q Series Universal model QCPUs(High-speed Universal model QCPUs included)

For further details of compatible CPUs, refer to relevant product manuals.

CC-Link IE Field Network head module for MELSEC-L Series*1

LJ72GF15-T2

- Using the head module, remote stations can be created from MELSEC-L Series I/O modules and intelligent function modules. Money can be saved on spare parts because the modules are the same as used with the CPU modules.
- Create remote I/O stations that just fit the application while maintaining the flexibility to grow. Save on wiring costs by condensing remote I/O to a single station.
- Access to other stations by way of remote I/O stations is possible, thus increasing the effectiveness of Engineering tools.
- Troubleshooting, even after a power failure, is simple. Error information from remote I/O stations is automatically preserved by the master station.



Mix and match up to 10 L Series I/O modules and intelligent function modules per station.



*1) For details of applicable modules, refer to the product manual.

CC-Link IE Field Network Block type remote module*2

- Easily disperse and layout the remote input/output modules to match your equipment.
- Connect with the extension module to the remote I/O or analog module to extend the number of I/O points.
- Compatible with the Synchronous communication function.*3

The modules synchronize with a simple motion module(master station), then highly accurate synchronous operation for the slave stations is realized.

*2) RJ71GF11-T2 can operate as the master station.

The CC-Link IE Field Network master/local module (QJ71GF11-T2 or LJ71GF11-T2), of which first 5-digit serial number is 14102 or later, can operate as the master station. QD77GF16 can also operate as the master station.

*3) NZ2GF2B1N-16D, NZ2GFCE3-16D, NZ2GFCE3-16DE, NZ2GFCM1-16D, NZ2GFCM1-16DE, NZ2GF2B1N-16T, NZ2GF2B1N-16TE, NZ2GFCE3-16T, NZ2GFCE3-16TE, NZ2GFCM1-16T, NZ2GFCM1-16TE, NZ2GF2BN-60AD4, NZ2GF2BN-60DA4, NZ2GFCF-D62PD2

DC input module

- Response time can be set at 0 ms, 0.2 ms, 1 ms, 1.5 ms, 5 ms, 10 ms, 20 ms and 70 ms.
- Enables a high-speed input/output control with the Fast logic function.

18-point two-piece terminal block type

Synchronous communication available

Model	Input type	Input points	Rated input voltage/current	Wiring method	Connect Extended module
NZ2GF2B1N-16D NEW	DC input Positive/negative common shared	16 points	24 V DC(4 mA)	1-wire	Available



NZ2GF2B1N-16D

Sensor connector(e-CON) type

Synchronous communication available

Model	Input type	Input points	Rated input voltage/current	Wiring method	Connect Extended module
NZ2GFCE3-16D	DC input Positive common	16 points	24 V DC(4 mA)	3-wire	Available
NZ2GFCE3-16DE	DC input Negative common	16 points	24 V DC(4 mA)	3-wire	Available



NZ2GFCE3-16D

MIL connector type

Synchronous communication available

Model	Input type	Input points	Rated input voltage/current	Wiring method	Connect Extended module
NZ2GFCM1-16D	DC input Positive common	16 points	24 V DC(4 mA)	1-wire	Available
NZ2GFCM1-16DE	DC input Negative common	16 points	24 V DC(4 mA)	1-wire	Available



NZ2GFCM1-16D

Transistor output module

- The Number of ON times integration function easily accumulates the ON count of the connected output module.
- Enables a high-speed input/output control with the Fast logic function.

18-point two-piece terminal block type

Synchronous communication available

Model	Output type	Output type	Output points	Rated load voltage/Max. load current	Wiring method	Connect Extended module
NZ2GF2B1N-16T NEW	Transistor output	Sink type	16 points	12/24 V DC(0.5 A)	1-wire	Available
NZ2GF2B1N-16TE NEW	Transistor output	Source type	16 points	12/24 V DC(0.5 A)	1-wire	Available



NZ2GF2B1N-16T



NZ2GFCE3-16T



NZ2GFCM1-16T

Sensor connector(e-CON) type

Synchronous communication available

Model	Output type	Output type	Output points	Rated load voltage/Max. load current	Wiring method	Connect Extended module
NZ2GFCE3-16T	Transistor output	Sink type	16 points	12/24 V DC(0.5 A)	3-wire	Available
NZ2GFCE3-16TE	Transistor output	Source type	16 points	12/24 V DC(0.5 A)	3-wire	Available

MIL connector type

Synchronous communication available

Model	Output type	Output type	Output points	Rated load voltage/Max. load current	Wiring method	Connect Extended module
NZ2GFCM1-16T	Transistor output	Sink type	16 points	12/24 V DC(0.5 A)	1-wire	Available
NZ2GFCM1-16TE	Transistor output	Source type	16 points	12/24 V DC(0.5 A)	1-wire	Available

Analog input/output module

- The conversion speed of the analog input module is selectable from 100 μ s/channel, 400 μ s/channel, and 1 μ s/channel.
- The conversion speed of the analog output module is 100 μ s/channel.
- By connecting an extension DC input module to the analog input module, it enables more precise A/D conversion speed control.(with the Trigger Conversion Function)

18-point two-piece terminal block type

Synchronous communication available

Model	Input/Output type	Occupied station	Number of channels	Connect Extended module
NZ2GF2BN-60AD4 NEW	Voltage/current analog input	1 station	4 channels	Available
NZ2GF2BN-60DA4 NEW	Voltage/current analog output	1 station	4 channels	Available



NZ2GF2BN-60AD4

Temperature control module

- Operates at the sampling cycle of 250 ms/4 channels. Mixed control mode of standard control and heating-cooling control is equipped.
- The Simultaneous temperature rise, Peak current suppression, Self-tuning, and Heating-cooling control functions are available.

18-point two-piece terminal block type

Model	Input/Output type	Occupied station	Number of channels	Connect Extended module
NZ2GF2B-60TCTT4	Thermocouple input, transistor output, isolation between input channels	1 station	4 channels	Unavailable
NZ2GF2B-60TCRT4	Resistance thermometer input, transistor output, isolation between input channels	1 station	4 channels	Unavailable



NZ2GF2B-60TCTT4

High-speed counter module

- Operates the counting speed of input pulse at 8 Mpps max. The duty ratio of the PWM output function can be set by 0.1 μ s and this enables precise output control.
- The Pulse measurement function with 100 ns measurement resolution enables highly accurate pulse width measurement.

40 pins connector type

Synchronous communication available

Model	Input/Output type	Number of channels	Connect Extended module
NZ2GFCF-D62PD2	Differential input, DC input, coincidence output, transistor output(sink type)	2 channels	Available



NZ2GFCF-D62PD2

Extension module

Input/output module

- 16-point inputs/outputs can be extended for the remote I/O, analog, and high-speed counter modules.
- Extend the analog input module, the input signal from an external source with the Trigger conversion function controls the analog-digital conversion value's sampling timing.
- Extend to the high-speed counter module, the Cam switch function provides ON/OFF control at an accurate cycle.

18-point two-piece terminal block type

Model	Input type	Input points	Rated input voltage/current	Wiring method	
NZ2EX2B1-16D	DC input	Positive/negative common shared	16 points	24 V DC(6 mA)	1-wire
Model	Output type	Output points	Rated load voltage/Max. load current	Wiring method	
NZ2EX2B1-16T	Transistor output	Sink type	16 points	12/24 V DC(0.5 A)	1-wire
NZ2EX2B1-16TE	Transistor output	Source type	16 points	12/24 V DC(0.5 A)	1-wire



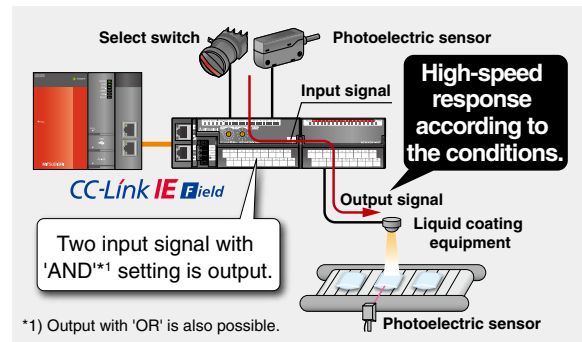
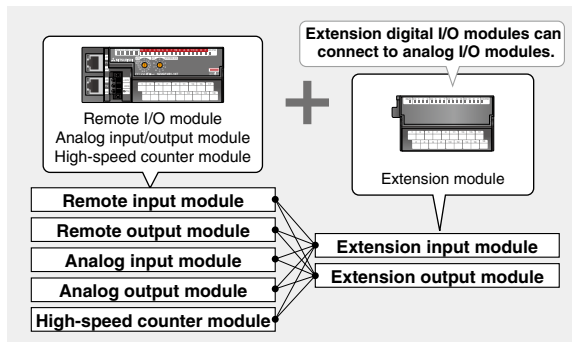
NZ2EX2B1-16D

• Extension function

The input/output can be extended with an extension module for the remote I/O, analog or high-speed counter modules.

• Fast logic function

Output is controlled according to the input status of I/O module without going through the master station.



Analog input/output module

- The number of analog channels can be increased without adding/changing the network configuration.
- Analog input module's conversion speed can be selected from 100 μ s/channel, 400 μ s/channel, or 1 ms/channel. (Conversion speed switch function)
- The conversion speed of the analog output module is 100 μ s/channel.
- This can be connected to the analog I/O modules (NZ2GF2BN-60AD4, NZ2GF2BN-60DA4).

18-point two-piece terminal block type

Synchronous communication available

Model	Input/Output type	Number of channels
NZ2EX2B-60AD4 NEW	Voltage/current analog input	4 channels
NZ2EX2B-60DA4 NEW	Voltage/current analog output	4 channels



NZ2EX2B-60AD4

CC-Link IE Field Network interface board

PCI Express® bus

Q81BD-J71GF11-T2

- Q80BD-J71GF11-T2 is compatible with PCI Express® bus. It allows the connection of a personal computer to CC-Link IE Field Network.
- This interface board can be used as either a master station or local stations of CC-Link IE Field Network *1.

*1) The sub-master function and motion function are not supported.



CC-Link IE Field Network interface board

PCI bus

Q80BD-J71GF11-T2

- Q80BD-J71GF11-T2 is compatible with PCI bus. It allows the connection of a personal computer to CC-Link IE Field Network.
- This interface board can be used as either a master station or local stations of CC-Link IE Field Network *2.

*2) The sub-master function and motion function are not supported.



Network interface board operation environment

Item	Q80BD-J71GF11-T2 / Q81BD-J71GF11-T2	
Personal computer	CPU	Windows® supported personal computer
	Required memory	System requirements of the operating system must be met
	PCI bus (Q80BD-J71GF11-T2)	Compliant with PCI standard Rev.2.2 (3.3 V DC/5 V DC, 32-bit bus, 33 MHz frequency)
	PCI Express® bus (Q81BD-J71GF11-T2)	Compliant with PCI Express® bus standard 1.1 (Support 3.3 V DC, maximum data bandwidth of 250 MB/s, 100 MHz frequency)
Operating system (English Version)*3*4	Microsoft® Windows XP® Professional Operating System, Service Pack 3 or later Microsoft® Windows XP® Home Edition Operating System, Service Pack 3 or later Microsoft® Windows Server® 2003 R2, Standard Edition Operating System, Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Enterprise Edition Operating System, Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Standard x64 Edition Operating System, Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition Operating System, Service Pack 2 or later Microsoft® Windows Vista® Home Basic Operating System, Service Pack 2 or later Microsoft® Windows Vista® Home Premium Operating System, Service Pack 2 or later Microsoft® Windows Vista® Business Operating System, Service Pack 2 or later Microsoft® Windows Vista® Ultimate Operating System, Service Pack 2 or later Microsoft® Windows Vista® Enterprise Operating System, Service Pack 2 or later Microsoft® Windows Server® 2008 Standard Operating System, Service Pack 2 or later Microsoft® Windows Server® 2008 Enterprise Operating System, Service Pack 2 or later Microsoft® Windows Server® 2008 Standard x64 Edition Operating System, Service Pack 2 or later Microsoft® Windows Server® 2008 Enterprise x64 Edition Operating System, Service Pack 2 or later Microsoft® Windows Server® 2008 R2, Standard Operating System Microsoft® Windows Server® 2008 R2, Enterprise Operating System Microsoft® Windows® 7 Home Premium (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Professional (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Ultimate (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows Server® 2012 Standard Operating System Microsoft® Windows Server® 2012 R2 Standard Operating System Microsoft® Windows® 8 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Enterprise (32-bit version / 64-bit version) Operating System	
Monitor	Resolution: ≥ 1024 x 768 dots	
Hard disk space	≥ 1 GB	
Removable media drive	CD-ROM disk drive	
Programming language (English Version)*4	Microsoft® Visual Studio® .NET 2003 Visual Basic®*5 Microsoft® Visual Studio® 2005 Visual Basic®*5 Microsoft® Visual Studio® 2008 Visual Basic®*5	Microsoft® Visual Studio® 2010 Visual Basic® Microsoft® Visual Studio® 2012 Visual Basic®
	Microsoft® Visual Studio® .NET 2003 Visual C++® Microsoft® Visual Studio® 2005 Visual C++® Microsoft® Visual Studio® 2008 Visual C++®	Microsoft® Visual Studio® 2010 Visual C++® Microsoft® Visual Studio® 2012 Visual C++®

*3) Windows® XP (64-bit version) and Windows Vista® (64-bit version) are not supported.

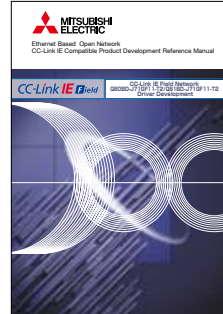
*4) For a combination of the operation system and the programming language, refer to the Microsoft® Knowledge Base.

*5) 64-bit version user programs cannot be created using MELSEC data link library. Please use Visual Studio® 2010 or later.

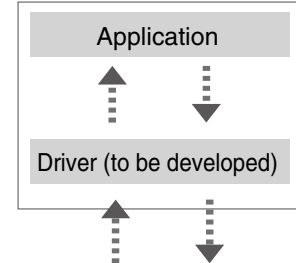
Reference manual for the development of the network interface board driver

This reference manual (used to develop hardware drivers) is provided for customers who wish to use the CC-Link IE Field Network interface board with an operating system other than Windows®. This reference manual contains the following information that is required for driver development.

- Hardware information (PCI configuration, dual-port memory, register area memory map)
- Software information (Initial setting and parameter setting procedures for the driver)
- Sample code in C language with documentation (on the included CD-ROM)



OS other than Windows®



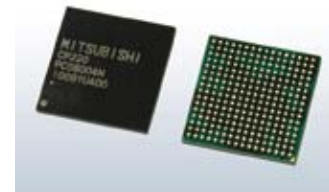
CC-Link IE Field Network interface board Q81BD-J71GF11-T2

Type	Manual number	Inquiries
Driver Development Reference Manual for CC-Link IE Field Network Q80BD-J71GF11-T2 / Q81BD-J71GF11-T2	SH(NA)-081155ENG	Open System Center, Mitsubishi Electric Corporation, Nagoya Works E-mail: OSC@rj.MitsubishiElectric.co.jp

Dedicated Communication LSI

CP220

- CP220 is a dedicated communication LSI for intelligent device stations of CC-Link IE Field Network.
- CP220 allows you to simply develop CC-Link IE Field Network products without concern about communication protocol.
- CP220 allows you to perform cyclic transmission (RX/Ry: 2048 bits each; RWr/RWw: 1024 words each) and transient transmission.
- CP220 automatically performs a major portion of the communication functions, thereby reducing the MPU (microcomputer) load and enabling designs that employ low-performing MPUs as well.
- The CD-ROM that comes with the reference manual includes C-language sample codes and circuit examples (PDF), making it possible to reduce development costs and shorten the development process.



Dedicated Communication LSI



Reference manual (CD-ROM)

Type	Model	Packaging Unit	Outline
Dedicated communication LSICP220	NZ2GACP220-60	60 pieces	CC-Link IE Field Network Intelligent Device Station Communication LSI CP220 Plastic BGA (ball grid array), 17x17 mm, 256 pins (16x16)
	NZ2GACP220-300	300 pieces	

Type	Manual No.	Manual Name	Inquiries
Reference manual	SH(NA)-081017ENG	CC-Link IE Field Network Intelligent Device Station Communication LSI CP220 Reference Manual	Open System Center, Mitsubishi Electric Corporation, Nagoya Works E-mail: OSC@rj.MitsubishiElectric.co.jp

Mitsubishi Electric Open System Center supports development of products incorporating CP220.
Contact: Open System Center, Mitsubishi Electric Corporation, Nagoya Works
E-mail: OSC@rj.MitsubishiElectric.co.jp

CC-Link IE Field Network Ethernet adapter module

NZ2GF-ETB

- Using Seamless Message Protocol (SLMP), a variety of Ethernet devices such as vision sensors and RFID controllers can be connected to CC-Link IE Field Network.
- Use a web browser to set station numbers, Ethernet options, and view error history.
- Compatible with 100 Mbps/1 Gbps transmission rates.



CC-Link IE Field Network CC-Link bridge module

NZ2GF-CCB

- The CC-Link Version 1 Remote I/O station and Remote device station connect to CC-Link IE Field Network via this module.
- Set the CC-Link parameters with simple switch operations.
- Link devices assigned to the bridge module are assigned as the CC-Link remote station's link devices on the original station No. order.
- CC-Link IE Field Network and CC-Link cycle transmission are independent.
- The remote buffer memory*1 of this module can check the status of CC-Link.



*1) To acquire the remote buffer memory, a sequence program for accessing the buffer memory is required. This program is provided by FB(Function Block) of MELSOFT Library. For the acquisition of FB, please contact your local Mitsubishi Electric sales office or sales representative.

CC-Link IE Field Network - AnyWireASLINK bridge module

NZ2AW1GFAL **NEW**

- AnyWireASLINK products can be seamlessly connected to CC-Link IE Field Network.



GOT2000/1000 Series CC-Link IE Field Network communication unit

GT15-J71GF13-T2

- GOT communication unit for CC-Link IE Field Network.
- The unit can be used as an intelligent device station in CC-Link IE Field Network when you build a system that includes HMI display(GOT).

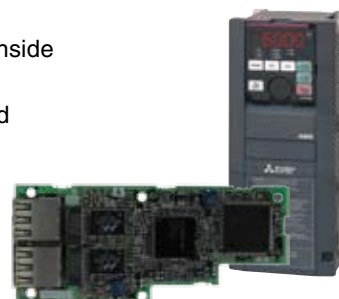
Supported modelsGT27, GT16, GT15



CC-Link IE Field Network option card for FREQROL-A800 Series Inverter

FR-A8NCE

- The CC-Link IE Field Network plug-in option card could be installed inside a FREQROL-A800 Series inverter module.
- With ultra high-speed communication, various inverter functions could be monitored at faster rates. In addition, multiple monitor functions and multiple parameter read/write could be executed simultaneously for improved maintenance capabilities.
- Due to the nature of this seamless network, monitoring and configuration of the inverter is made simple even from an advanced information system.



CC-Link IE Field Network interface module for general-purpose AC Servo MELSERVO-J3/J4 Series MR-J3-T10

- The MR-J4-B-RHJ010 servo amplifier mounting the MR-J3-T10 interface module is compatible with the motion control of the QD77GF16 simple motion module in CC-Link IE Field Network.
The servo amplifier can be synchronized with the synchronous axes control and the interpolation axes control via the simple motion module.
- The MR-J3-T type servo amplifier is equipped with the positioning control function.
The amplifier via the MR-J3-T10 interface can set the position data and the speed data in CC-Link IE Field Network.



MR-J3-T10



MR-J4-B-RJ010
MR-J3-T10

Cable and accessory

Ethernet cable

Produced by Mitsubishi Electric System & Service

SC-E5EW Series

- 1000BASE-T Standard compliant.
This Ethernet cable with double shield has an outstanding shield performance.
- Available in lengths from 0.5 m, and 1 m increments from 1 m to 100 m. Available in lengths from 1 m to 45 m for indoor movable cables.



Item	SC-E5EW-S□M*1	SC-E5EW-S□M-MV*2	SC-E5EW-S□M-L*1
Cable type	Category 5e or higher, (Double shielded/STP) Straight cable		
Number of wires in core	8 wires (4 twisted pairs)		
Double shield	Aluminum/polyester tape, Tin-plated annealed copper wire braid		
Installation environment	Indoor	Indoor movable	Indoor/Outdoor
Finished outside diameter	flame retardant PVC, 6.8 mm	flame retardant PVC, 6.5 mm	LAP sheath, 10 mm
Connector	RJ-45 connector with shield, Straight connection		
Conforming standards	IEEE802.3 1000BASE-T ANSI/TIA/EIA-568-B (Category 5e) ISO/IEC 11801		

*1) □: Cable length (up to 100 m in 1 meter increments.)

*2) □: Cable length (up to 45 m in 1 meter increments.)

Inline coupler

Produced by Mitsubishi Electric System & Service

SPAD-RJ45S-E5E

- 8 conductor RJ-45 female to female, shielded, fits standard type Keystone Wall Plate.
- Can be used in patch panels, wall jacks, or to extend cable lengths.

Item	Specifications
Adaptable connector	RJ-45 connector with shield
Operable temperature	-10°C to +60°C
Conforming standards	IEEE 802.3 1000BASE-T ANSI/TIA/EIA-568-B (Category 5e) ISO/IEC 11801



Industrial switching hub

Powered by CONTEC

NZ2EHG-T8 / NZ2EHF-T8*1

- NZ2EHG-T8 is compatible with 10 Mbps/100 Mbps/1 Gbps transmission rates.
- NZ2EHF-T8 is compatible with 10 Mbps/100 Mbps transmission rates.
- Equipped with Auto MDI/MDI-X and auto-negotiation functions.
- The automatic power adjustment function can reduce power consumption by up to 80 percent.*2
- Enables the unit to be used in ambient temperatures of 0 to 50°C, with fan less configuration.
- The DIN rail mounting mechanism provides the various types of module installation.



NZ2EHG-T8

NZ2EHF-T8

*1) NZ2EHF-T8 is unable to directly connect to CC-Link IE Field Network (for 1 Gbps) ; therefore an Ethernet adapter module NZ2GF-ETB is required with the indirect connection for CC-Link IE Field Network.
NZ2EHG-T8 supports the direct connection.

*2) For comparison, power consumption was measured when all 8 ports were used and when none of them were used. This function is only available for NZ2EHG-T8.

NZ2EHG-T8 and NZ2EHF-T8 have a rated input supply voltage of 12 to 24 V DC.

These products were developed and are produced with Contec Co. Ltd.

Please note that the specifications and guarantee conditions of the products are different from the MELSEC Series products and the same Contec manufacturing products.

Industrial switching hub

Produced by Mitsubishi Electric System & Service

DT135TX

- Compatible with 10 Mbps/100 Mbps/1000 Mbps transmission rates, 5 ports. and the compact size unit with 12 V DC up to 24 V DC wide voltage-range.
- Passed the recommendation product examination of CC-Link Association.
- Equipped with Auto MDI/MDI-X and auto-negotiation functions.
- Possible to input 2 systematic power supplies by the constitution of redundant power supply.
- Supports the line, star, line and star combination network topologies.
- Complies with UL/CE standards, and supports export for Europe and North America.



Please note that the specifications and guarantee conditions of the product is different from the MELSEC Series products.

Wireless LAN Adapter*3*4

Powered by CONTEC

NZ2WL-US(U.S.A)/NZ2WL-EU(Europe)/NZ2WL-CN(China)/NZ2WL-KR(Korea)/NZ2WL-TW(Taiwan)

- Wireless LAN (Ethernet) in the factory provides flexibility in installing new line or alteration layouts. Wireless saves your wiring costs.
- Simply installing wireless LAN adapters makes existing FA equipment wireless.
- Compatible with the latest security standards of WPA2/WPA. The security prevents unauthorized access from outside.

*3) Each product can be used only in the respective countries. Supported both Access point and Station.

*4) These LAN adapters cannot directly connect to CC-Link IE Field Network at 1 Gbps. Please use an Ethernet adapter module(NZ2GF-ETB) for the indirect connection.

Please note that the general specifications and guarantee conditions of these products are different from those of programmable controllers (such as MELSEC Series) and CONTEC products. For further details, refer to the product manual.



Performance specifications

Item		MELSEC iQ-R Series master/local module RJ71EN71	MELSEC iQ-R Series master/local module RJ71GF11-T2	MELSEC-Q Series master/local module QJ71GF11-T2	MELSEC-L Series master/local module LJ71GF11-T2	MELSEC-QS Series master/local module QS0J71GF11-T2	Network interface board Q80BD-J71GF11-T2 Q81BD-J71GF11-T2	MELSEC-Q Series simple motion module QD77GF16
Maximum link points per network	RX	16384 points, 2K bytes						8192 points, 1K bytes
	RY	16384 points, 2K bytes						8192 points, 1K bytes
	RWr	8192 points, 16K bytes						1024 points, 2K bytes
	RWw	8192 points, 16K bytes						1024 points, 2K bytes
Maximum link points per station	Master station	RX	16384 points, 2K bytes					8192 points, 1K bytes
		RY	16384 points, 2K bytes					8192 points, 1K bytes
		RWr	8192 points, 16K bytes					1024 points, 2K bytes
		RWw	8192 points, 16K bytes					1024 points, 2K bytes
	Local station ^{*1}	RX	2048 points, 256 bytes					–
		RY	2048 points, 256 bytes					–
		RWr	1024 points, 2048 bytes					–
		RWw	1024 points, 2048 bytes					–
	Sub-master station ^{*1}	RX	2048 points, 256 bytes			–	–	–
		RY	2048 points, 256 bytes			–	–	–
		RWr	1024 points, 2048 bytes			–	–	–
		RWw	1024 points, 2048 bytes			–	–	–
Intelligent device station	RX	2048 points, 256 bytes			–	2048 points, 256 bytes		
	RY	2048 points, 256 bytes			–	2048 points, 256 bytes		
	RWr	1024 points, 2048 bytes			–	1024 points, 2048 bytes		
	RWw	1024 points, 2048 bytes			–	1024 points, 2048 bytes		
Remote device station	RX	128 points, 16 bytes			–	128 points, 16 bytes		
	RY	128 points, 16 bytes			–	128 points, 16 bytes		
	RWr	64 points, 128 bytes			–	64 points, 128 bytes		
	RWw	64 points, 128 bytes			–	64 points, 128 bytes		
Ethernet	Communication speed	1 Gbps						
	Connection cable	1000BASE-T Ethernet cable (Category 5e or higher), (Double shielded/STP) Straight cable						
	Station-to-station distance (max.)	100 m (conforms to ANSI/TIA/EIA-568-(Category 5e))						
	Topology	Line type, star type, line/star composite type, ring type ^{*2}						Line type, star type, line/star composite type
Overall cable distance (max.)	Line type	12000 m (When 1 master station and 120 slave stations are connected)						
	Star type	Depends on system configuration ^{*3}						
	Ring type	12100 m(When 1 master station and 120 slave stations are connected)						–
Maximum stations per network	121 stations (1 master station, 120 slave stations (including sub-master station))				121 stations ^{*4} (1 master station (general or safety station), 120 slave stations)	121 stations (1 master station, 120 slave stations)	121 stations (1 master station, 120 slave stations (16 servo amplifiers, 104 I/O stations))	
Maximum number of networks	239							

*1) : The maximum number of points for one master station is listed. A sub-master station and a local station can receive data from other stations in addition to this number of points

*2) : The ring type requires a master/local module (QJ71GF11-T2) whose first five serial number digits are "12072" or higher.

*3) : A hub is required to use the star type wiring. Up to 20 hubs can be connected.

*4) : 32 safety stations can be connected.

For further details, please refer to the relevant product manuals.

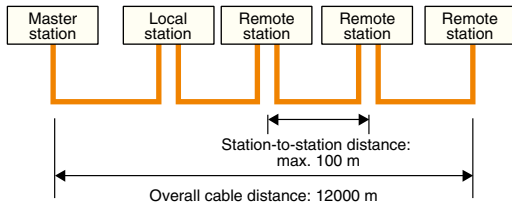
Cable specifications

Item	Specifications
Ethernet cable	Category 5e or higher, (Double shielded/STP) Straight cable
	The following conditioning cables: • IEEE802.3 (1000BASE-T) • ANSI/TIA/EIA-568-B (Category 5e)
	RJ-45 connector with shield

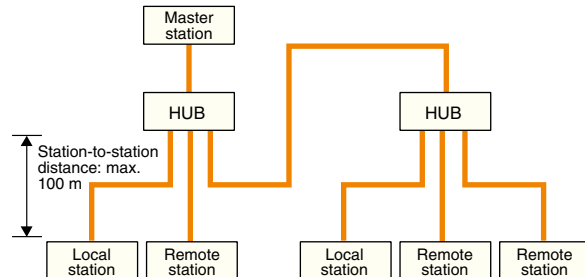
Use the cables recommended by CC-Link Partner Association for CC-Link IE Field Network.

Network topology examples

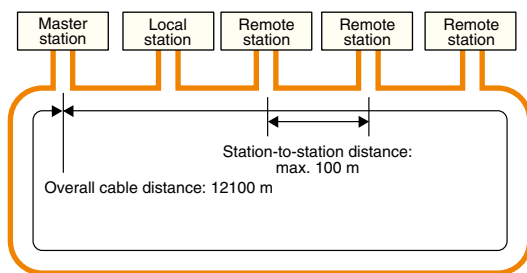
Line topology



Star topology



Ring topology



General specifications

The general specifications listed here are the environmental specification in which the product is to be installed and operated. The general specifications are applicable to all products of the MELSEC iQ-R Series, MELSEC-Q Series, and MELSEC-L Series unless otherwise indicated.

The MELSEC iQ-R Series, MELSEC-Q Series, and MELSEC-L Series products are designed to be installed and operated within the environment specified by the general specifications.

For the general specifications of products other than the MELSEC iQ-R Series, Q Series and L Series, please refer to the relevant product manuals.

For the general specifications of products provided by other manufacturers, contact the relevant manufacturer or distributor.

Item	Specifications					
Operating ambient temperature	0 ... 55°C					
Storage ambient temperature	-25 ... 75°C*1					
Operating ambient humidity	5 ... 95%RH*2, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Acceleration	Half amplitude	10 times each in X, Y, Z directions
			5 ... 8.4 Hz	–	3.5 mm	
		Under continuous vibration	8.4 ... 150 Hz	9.8 m/s ²	–	–
			5 ... 8.4 Hz	–	1.75 mm	
8.4 ... 150 Hz	4.9 m/s ²	–	–			
Shock resistance	Compliant with JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions X, Y, Z)					
Operating ambient (humidity/temperature)	MELSEC iQ-R: No corrosive gases*6, flammable gases, less conductive dust MELSEC-Q/L: No corrosive gases					
Operating altitude*3	2000 m max. *7					
Installation location	Inside control panel					
Overvoltage category*4	MELSEC iQ-R: II max. MELSEC-Q/L: I max.					
Pollution level*5	2 max.					
Equipment class	MELSEC iQ-R: Class II *8 MELSEC-Q/L: Class I					

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

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

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

Doing so can cause a malfunction.

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

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

*5) This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.

Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

*6) Use the special coated products which comply with the IEC 60721-3-3 3C2 in the environment with the corrosive gases.

For details on the special coated products, please contact your sales representative.

*7) When the programmable controller is used at altitude above 2000 m, the withstand voltage performance and the upper limit of the operating ambient temperature decrease. When using the programmable controller under pressure, please contact your sales representative.

*8) When the RQ extension base unit is used, the equipment class is Class I.

CC-Link IE Control

This highly-reliable control network is designed to transfer large amounts of data at real-time speeds between PLCs.

By supporting twisted pair cables, CC-Link IE Control Network can have flexible wiring.

CC-Link IE Control Network includes a variety of functions and allows seamless communications among other CC-Link networks.



CASE 1 High speed communication enables the sharing of large amounts of data in real time P.33

- Increase equipment and production line productivity
- Transfer large amounts of traceability data without slowing down the network

CASE 2 The dual-loop optical fiber cabling design is exceptionally fault-tolerant P.34

- No cause for worry about the noise influence from the manufacturing environments
- Maintain communication even in the event of cable breaks, PLC errors, or power loss

CASE 3 Flexibility allows easy addition of nodes and changes to the network layout P.35

- Connections can be easily moved to fit a rearrangement of production lines
- The arrangement of equipment is highly flexible

CASE 4 Engineering tools make wiring problems and errors easy to diagnose P.36

- Minimize downtime with the ability to respond quickly to problems
- Diagnose errors without having to physically go to each machine

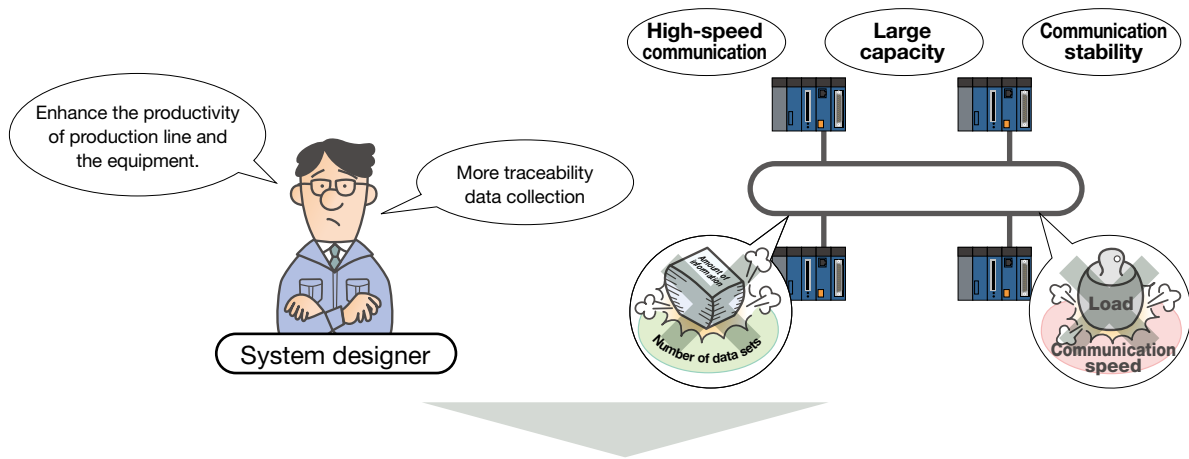
CASE 5 Cut costs by using commercially available Ethernet equipment P.37

- Regardless of geographical location, network cables and equipment are easy to purchase
- Network cables and equipment are comparatively inexpensive

Benefits of CC-Link IE Control Network

CASE 1

High speed communication enables the sharing of large amounts of data in real time



CC-Link IE Control makes it possible

1 Gbps high-speed communication

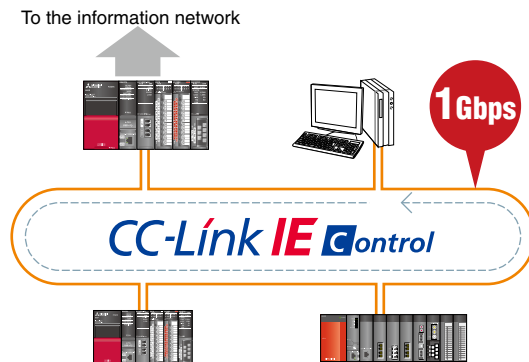
Communication speed	Maximum link registers
1 Gbps	128K _{words}

Deterministic, reliable performance helps to reduce operating cycle

CC-Link IE Control Network is based on gigabit Ethernet technology but uses an open, deterministic protocol to maintain a constant link scan time. The master/local module is compatible with nearly every Q Series CPU module, allows large amounts of data to be shared among controllers at high speed and enables large scale distributed control systems.

The maximum number of link registers per station has been increased 8 fold!
Transfer large amounts of recipe or other data in a single link scan!

16 K words ➔ 128 K words*¹

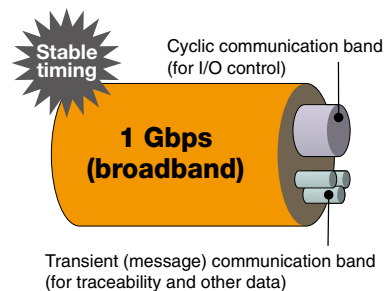


*1) To perform diagnostics or configure a network that uses more than 16 K link points per station, please use GX Works2 (Version 1.31H or later).

Cyclic communication is stable and reliable

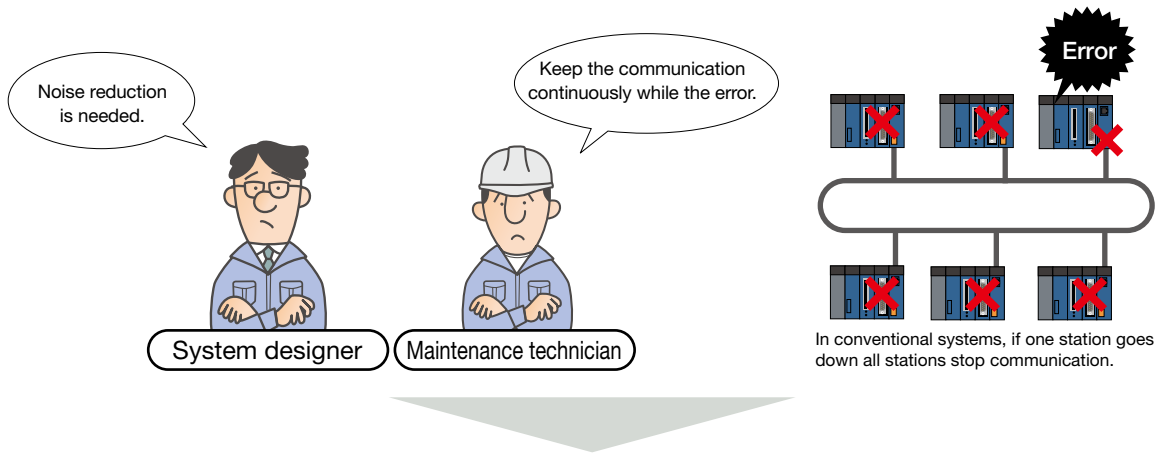
Improved quality of communication is achieved using a stable control period

The total bandwidth is divided between deterministic (cyclic) communication and transient (message) communication. The cyclic communication band, intended for I/O control, is fixed and will not suffer from degraded performance even when large volumes of traceability and diagnostic data are transferred via transient communication.



CASE 2

The dual-loop optical fiber cabling design is exceptionally fault-tolerant



CC-Link IE Control makes it possible

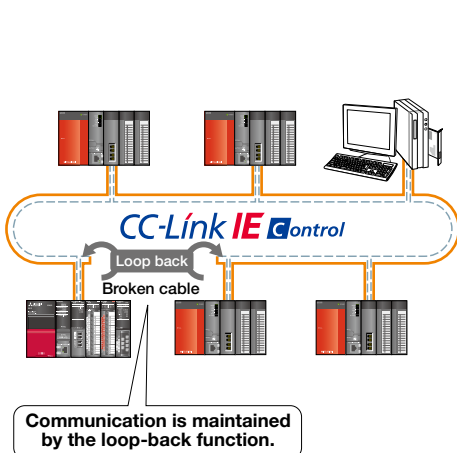
Multi-mode optical fiber cable
External power supply

Ultra-reliable ring topology network

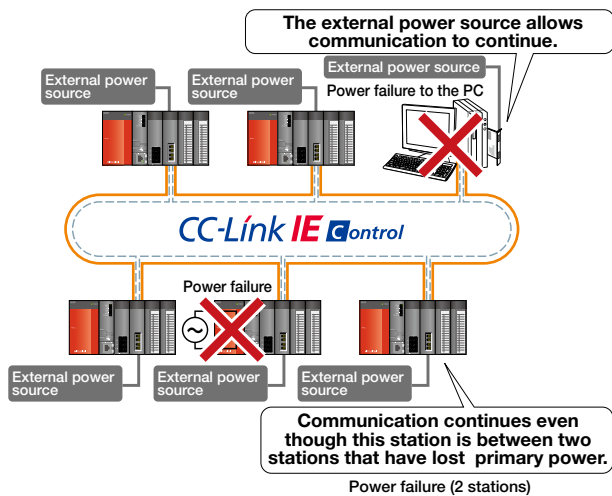
Designed to continue functioning even in the worst possible scenarios

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

Loop-back function



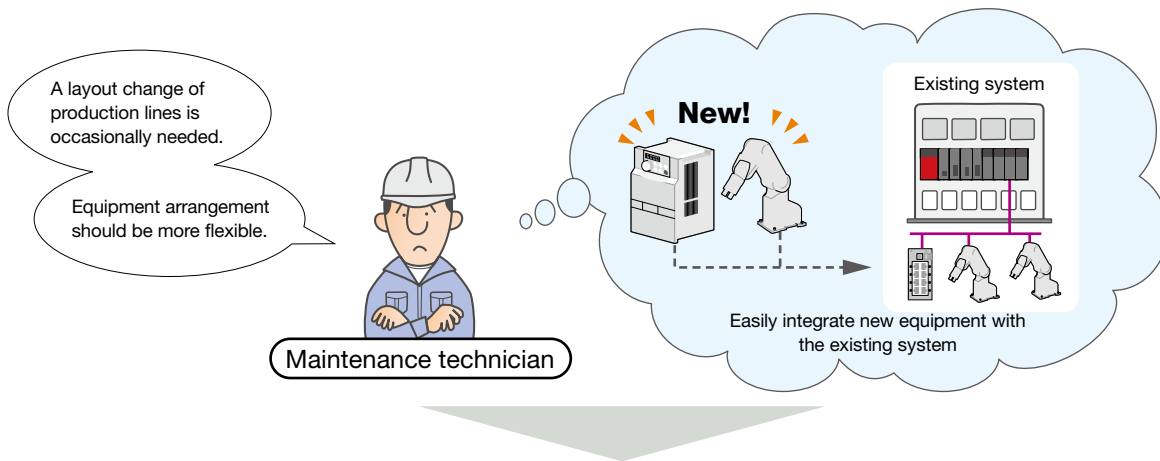
External power supply



Benefits of CC-Link IE Control Network

CASE 3

Flexibility allows easy addition of nodes and changes to the network layout



CC-Link IE Control makes it possible

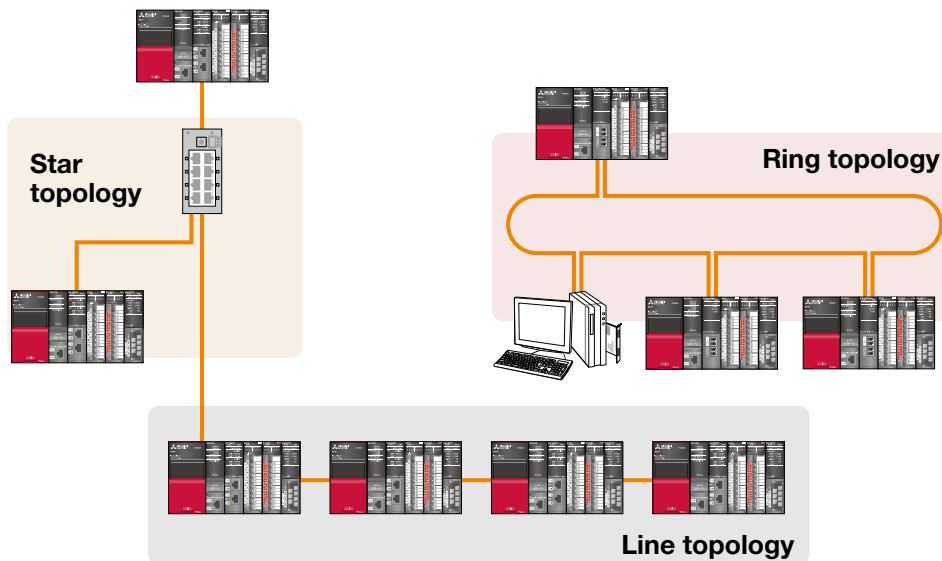
- Twisted pair cable
- Star topology
- Line topology
- Ring topology

Flexible network topology

Add nodes or change the network layout entirely
The system is highly flexible

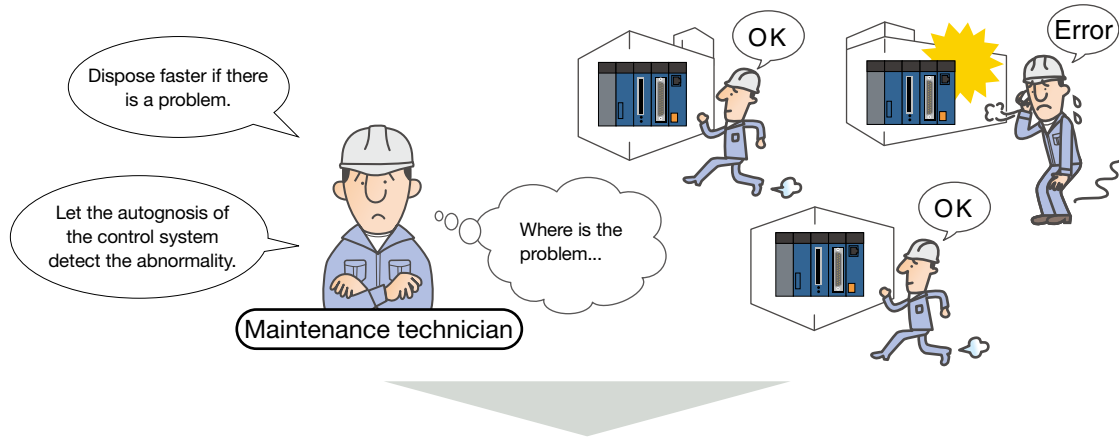
Various network topologies may be used including star, line, star and line combination. This flexibility allows additional equipment to be simply connected to any available port, with little concern for restrictions.

Ring topology can be used also. (Star or line topology cannot be mixed with ring.)



CASE 4

Engineering tools make wiring problems and errors easy to diagnose



CC-Link IE Control makes it possible

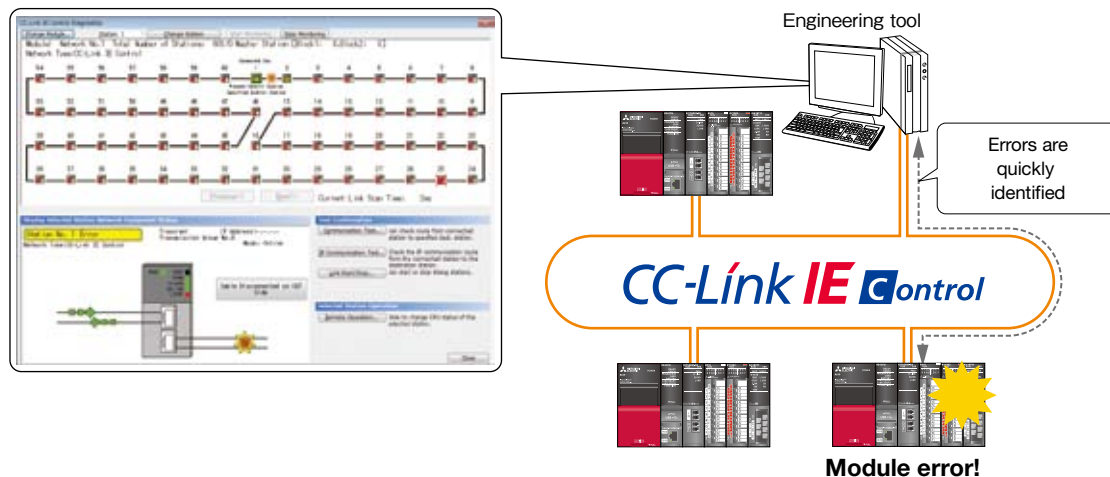
Network diagnosis at-a-glance

Easy diagnosis functions

Perform diagnostics and troubleshoot effectively regardless of experience

Engineering tools enables you to identify network errors at a glance. You can quickly identify the cause of a problem and implement the suggested remedy to minimize down time.

The network diagnostics tool automatically creates a graphical representation of the network. Using this diagram, cable problems and PLC errors are clearly visible allowing for fast response. Additionally, the condition of any remote station on the network can be monitored by directly accessing it from the same screen. The system can be monitored in real-time while the wiring is being changed with overlapping station numbers and miswiring being detected.

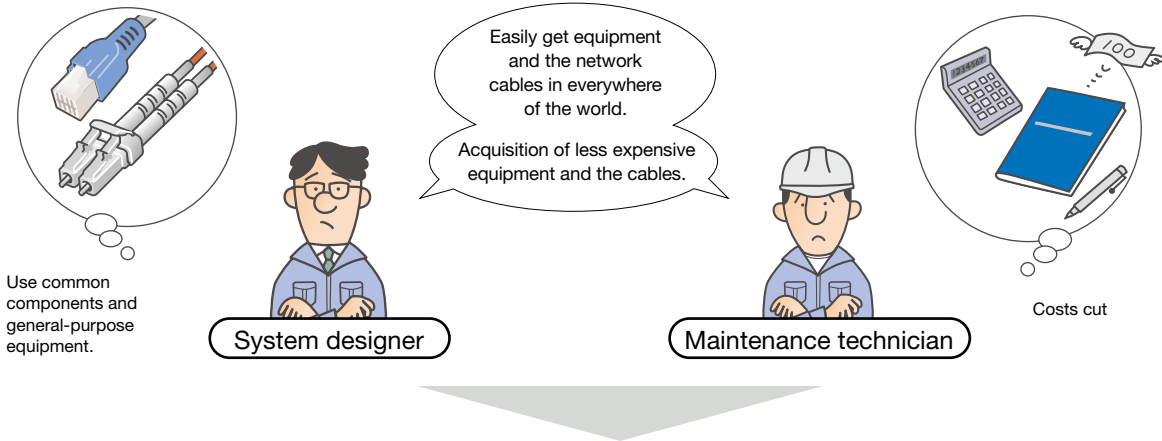


*1) MELSEC iQ-R Series requires GX Works3. MELSEC-Q Series requires GX Works2.

Benefits of CC-Link IE Control Network

CASE 5

Cut costs by using commercially available Ethernet equipment



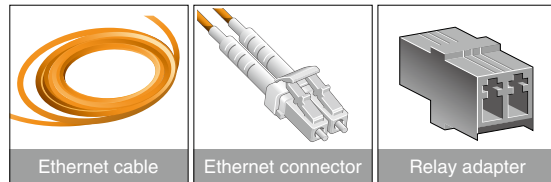
CC-Link IE Control makes it possible

Ethernet-based network

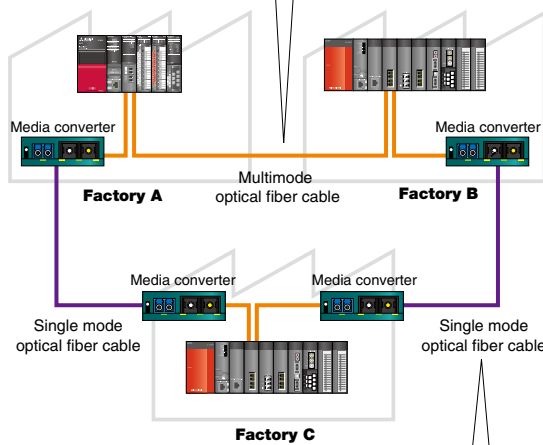
Built on global standards

CC-Link IE has been designed to make use of commercially available Ethernet components including cables, connectors, and adapters. Thanks to the common availability of these components, significant cost savings over alternative networks can be achieved.

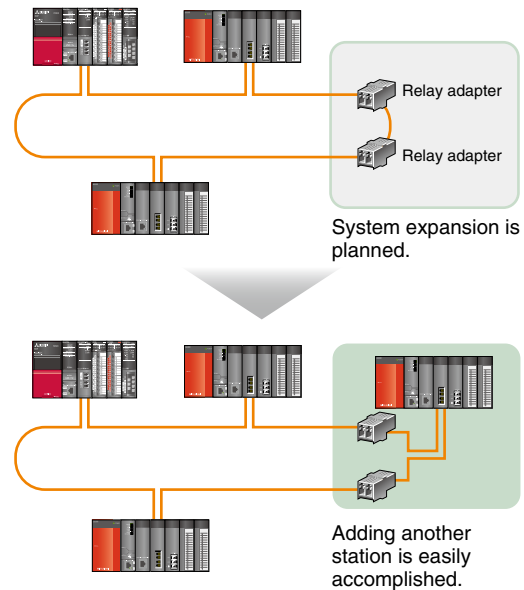
Ethernet-based Multi-mode optical fiber cable



Connections can use cable lengths up to 550 meters.



Using media converters, cable lengths up to 15 km can be used.

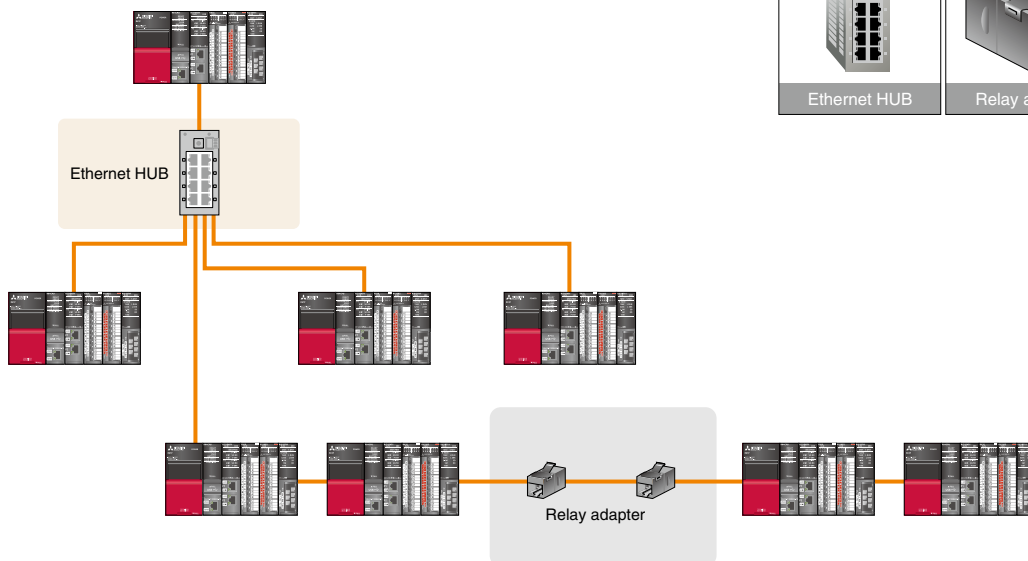
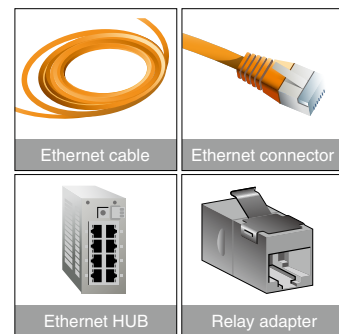


Ethernet-based Twisted pair cable

Ethernet-based network

Built on global standards

CC-Link IE Control Network is a network based on Ethernet, which is widely used across the world. Ethernet cables and connectors are easy to obtain^{*1}, meaning a network can be configured at a relatively low cost.



^{*1}) For CC-Link IE Control Network wiring, please use the products recommended by CC-Link Partner Association.

Network examples



Liquid-crystal production process

Super high speed

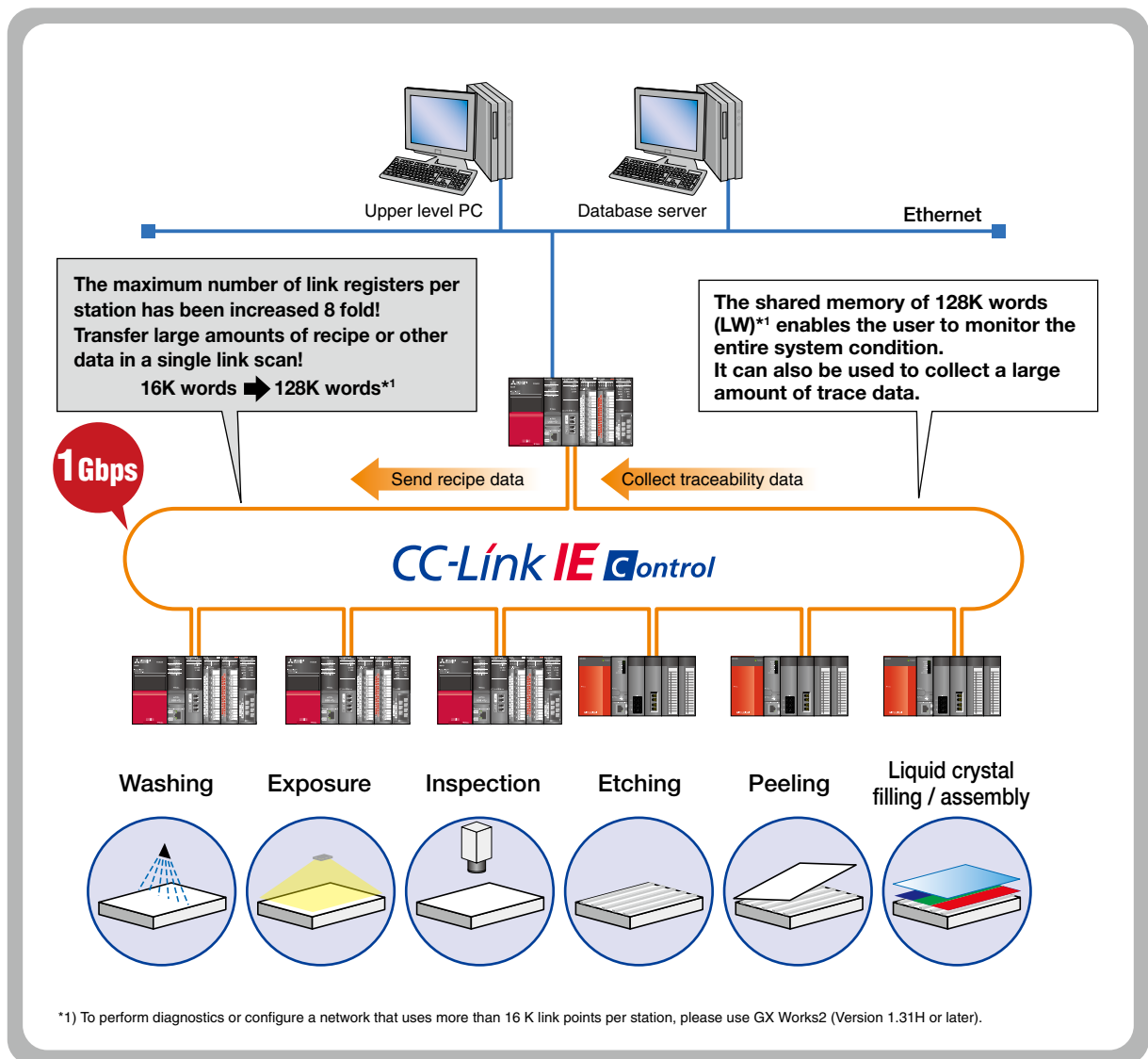
A 1 Gigabit per second communication speed allows data to be transferred between controllers quickly.

Large capacity

Every link scan, the bandwidth available for cyclic communication can share 16 K physical I/O signals, 32 K bit registers, and 128 K words of register data. Add to that the bandwidth available for transient communication, and it is more than enough for recipe information and traceability data.

Stable timing

Cyclic communication bandwidth is fixed and will not suffer from degraded performance even when transient communications are saturated.





Steel production process

Large capacity

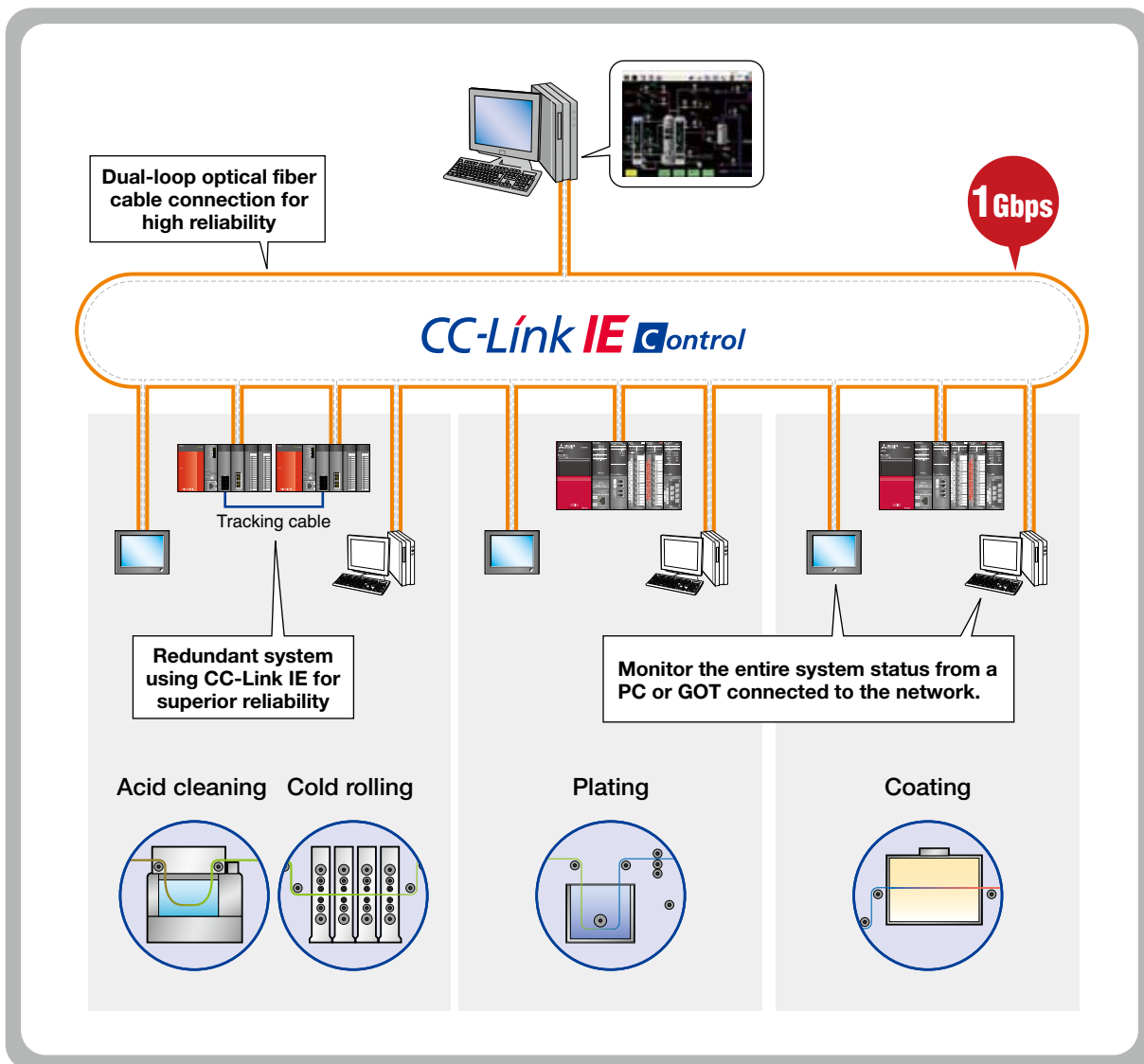
Transfer 16 K physical I/O signals, 32 K bit registers, and 128 K words of register data via cyclic communication every link scan. Add to that the bandwidth available for transient communication, and it is more than enough for recipe information and traceability data.

Large scale

Station-to-station distance up to 15 km using media converters (550 m using standard cable).
Up to 120 stations per network. Maximum total distance using standard cable: 66 km Maximum number of networks: 239

Highly reliable

Create a highly reliable system using redundant CPUs, a dual-loop optical network, and external power supplies.



Product lineup

CC-Link IE Control Network module for MELSEC iQ-R Series(multi-network compatible)

Twisted pair cable

RJ71EN71 **NEW**

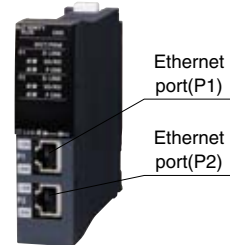
- Use the same module as a control station or normal station.
- Equipped with two Ethernet ports, which can be used as Ethernet, CC-Link IE Control Network, or CC-Link IE Field Network communication ports.(multi-network compatible)
- The two Ethernet ports can be used for respective networks.

■ Network combination*1

P1	C	F	E	E	E
P2	C	F	C	F	E

C : CC-Link IE Control Network
F : CC-Link IE Field Network
E : Ethernet

*1) Any network combination can be used except CC-Link IE Field with CC-Link IE Control.



RJ71EN71

CC-Link IE Control Network module for MELSEC-Q Series

Optical fiber cable

RJ71GP21-SX **NEW** / QJ71GP21-SX / QJ71GP21S-SX

- Use the same module as a control station or normal station (configure via parameters).
- Choose the module with the external power supply function (QJ71GP21S-SX) to maintain communication even if power from the base unit is lost.
- Several special instructions are available to easily perform transient communications via sequence program.
- The network can ensure 32bit data integrity using the station-based block data assurance function.
- The maximum link points per station has been increased to 128 K words using 'extended mode'. *2



RJ71GP21-SX QJ71GP21-SX QJ71GP21S-SX

*2) Extended mode requires the following modules and software.

- CC-Link IE Control Network modules(QJ71GP21-SX/QJ71GP21S-SX) whose first five serial number digits are 12052 or later.
 - Universal model QCPU whose first five serial number digits are 12052 or later.
 - GX Works2 Version 1.40 S or later.
- Also, all stations must be compatible with extended mode.

Compatible PLC CPUs

- MELSEC iQ-R Series CPUs
- MELSEC-Q Series Universal model QCPUs(High-speed Universal model QCPUs included), Basic model QCPUs, High Performance model QCPUs, Process CPUs, Redundant CPUs, C Controller modules
- MELSEC-QS Series Safety CPUs

For further details of compatible CPUs, refer to relevant product manuals.

CC-Link IE Control Network communication unit for GOT2000-1000 Series

GT15-J71GP23-SX*3

- Connect Mitsubishi Graphic Operator Terminals directly to CC-Link IE Control Network.
- Functions as a normal station on CC-Link IE Control Network.

*3) Not compatible with Extended mode.

Compliant model..... GT27, GT16, GT15

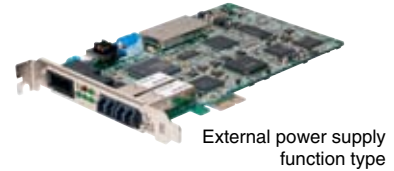


CC-Link IE Control Network interface board

PCI Express® bus

Q81BD-J71GP21-SX / Q81BD-J71GP21S-SX

- Using these PCI Express interface boards, PC control systems can be directly connected to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- Choose the interface board with the external power supply function (Q81BD-J71GP21S-SX) to maintain communication even if power from the PCI Express interface is lost.

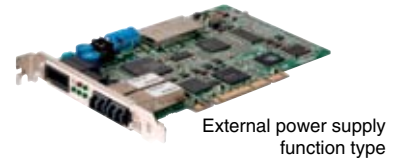


CC-Link IE Control Network interface board

PCI/PCI-X bus

Q80BD-J71GP21-SX*1 / Q80BD-J71GP21S-SX*1

- Using these PCI/PCI-X interface boards, PC control systems can be directly connected to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- Choose the interface board with the external power supply function (Q80BD-J71GP21S-SX) to maintain communication even if power from the PCI interface is lost.



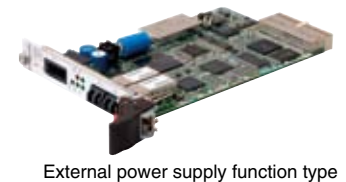
*1) Extended mode is supported by interface boards whose first five serial number digits are 12052 or later.

CC-Link IE Control Network interface board compatible with Compact PCI

Produced by Mitsubishi Electric Engineering

ECP-CLECBD / ECP-CLECBDS

- Using these Compact PCI bus interface boards, PC control systems can be directly connected to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- Choose the interface board with the external power supply function (ECP-CLECBDS) to maintain communication even if power from the cPCI interface is lost.



Network interface board operation environment

Item	Q81BD-J71GP21-SX Q81BD-J71GP21S-SX	Q80BD-J71GP21-SX Q80BD-J71GP21S-SX	ECP-CLECBD ECP-CLECBDS	
	Windows® supported personal computer			
PC/ Industrial computer	CPU	System requirements of the operating system must be met		
	Required memory			
	Installation slot	PCI Express® x1, x2, x4, x8, x16 bus slot (Half size)	PCI bus slot (Half size) PCI-X bus slot (Half size)	Compliant with Compact PCI bus slot (3U size)
	bus specifications	Compliant with PCI Express standard Rev.1.1 (3.3 V DC, Link width 1lane, Basic clock 100 MHz)	Compliant with PCI standard Rev.2.2 (3.3 V/5 V DC, 32-bit bus, Basic clock 33 MHz)	Compact PCI PICMG 2.0 Rev 3.0 (5 V or 3.3 V DC: Universal PCI compliance)
Operating system (English Version)*1*2	Microsoft® Windows® 2000 Professional Operating System Service Pack 4 or later*3 Microsoft® Windows® XP Home Edition Operating System Service Pack 2 or later Microsoft® Windows® XP Professional Operating System Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Standard Edition Operating System Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Enterprise Edition Operating System Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Standard x64 Edition Operating System Service Pack 2 or later Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition Operating System Service Pack 2 or later Microsoft® Windows Vista® Home Basic Operating System Microsoft® Windows Vista® Home Premium Operating System Microsoft® Windows Vista® Business Operating System Microsoft® Windows Vista® Ultimate Operating System Microsoft® Windows Vista® Enterprise Operating System Microsoft® Windows Server® 2008 Standard Operating System Microsoft® Windows Server® 2008 Enterprise Operating System Microsoft® Windows Server® 2008 Standard x64 Edition Operating System Microsoft® Windows Server® 2008 Enterprise x64 Edition Operating System Microsoft® Windows Server® 2008 R2 Standard Operating System Microsoft® Windows Server® 2008 R2 Enterprise Operating System Microsoft® Windows® 7 Home Premium (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Professional (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Ultimate (32-bit version / 64-bit version) Operating System Microsoft® Windows® 7 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows Server® 2012 Standard Operating System Microsoft® Windows Server® 2012 R2 Standard Operating System Microsoft® Windows® 8 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8 Enterprise (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Pro (32-bit version / 64-bit version) Operating System Microsoft® Windows® 8.1 Enterprise (32-bit version / 64-bit version) Operating System		Microsoft® Windows® 2000 Professional Operating System Service Pack 4 or later Microsoft® Windows® XP Home Edition Operating System Service Pack 2 or later Microsoft® Windows® XP Professional Operating System Service Pack 2 or later Microsoft® Windows® XP Professional Operating System Service Pack 2 or later	
Monitor	Resolution: 1024x768 dots or higher			
Hard disk space	≥1 GB			
Disk drive	CD-ROM disk drive			
Programming language (English Version)*2	Microsoft® Visual Basic® 6.0*4 Microsoft® Visual Basic® .NET 2003*4 Microsoft® Visual Studio® 2005 Visual Basic®*4 Microsoft® Visual Studio® 2008 Visual Basic®*4 Microsoft® Visual Studio® 2010 Visual Basic® Microsoft® Visual Studio® 2012 Visual Basic®		Microsoft® Visual Basic® 6.0 Microsoft® Visual Basic®.NET 2003 Microsoft® Visual Studio 2005 Visual Basic®	
	Microsoft® Visual C++® 6.0 Microsoft® Visual C++® .NET 2003 Microsoft® Visual Studio® 2005 Visual C++® Microsoft® Visual Studio® 2008 Visual C++® Microsoft® Visual Studio® 2010 Visual C++® Microsoft® Visual Studio® 2012 Visual C++®		Microsoft® Visual C++® 6.0 Microsoft® Visual C++®.NET 2003 Microsoft® Visual Studio® 2005 Visual C++®	

*1) Windows® XP (64-bit version) and Windows Vista® (64-bit version) are not supported.

*2) For a combination of the operation system and the programming language, refer to the Microsoft® Knowledge Base.

*3) Applicable to Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX only.

*4) 64-bit version user programs cannot be created using MELSEC data link library. Please use Visual Studio® 2010 or later.

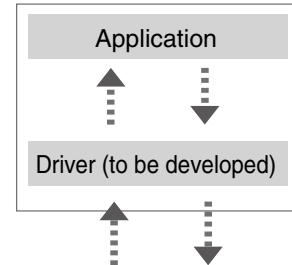
Reference manual for the development of the network interface board driver

This reference manual (used to develop hardware drivers) is provided for customers who wish to use the CC-Link IE Control Network interface board with an operating system other than Windows®. This reference manual contains the following information that is required for driver development.

- Hardware information (PCI configuration, dual-port memory, I/O port memory map)
- Software information (Initial setting and parameter setting procedures for the driver)
- Sample code in C language with documentation (on the included CD-ROM)



OS other than Windows®



CC-Link IE Control Network interface board Q80BD-J71GP21-SX

Type	Manual number	Inquiries
Driver Development Reference Manual for CC-Link IE Control Network Q80BD-J71GP21-SX	SH(NA)-080819ENG	Open System Center, Mitsubishi Electric Corporation, Nagoya Works E-mail: OSC@rj.MitsubishiElectric.co.jp

Cable and accessory

* For the twisted pair cables and hubs used for CC-Link IE Control Network, please refer to the "Cable and accessory" of CC-Link IE Field Network.

Optical fiber cable

Produced by Mitsubishi Electric System & Service

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

- Several different types of cable are available. These include types for use inside panels, indoors, outdoors, and a reinforced type for outdoor use allowing placement in a variety environments.
- The newly developed thin cable (for indoor and outdoor use) incorporates a cord bundling structure, allowing safe use even in confined factory cable-conduits.
- The indoor and outdoor use cables are free of tension members, and have an allowable tension equivalent to the reinforced type for outdoor use that allows them to be pulled directly.
- The indoor use cable for movable using is good at flexibility. It can be used for movable parts such as Cableveyor.
- The UL certified cable QG-BU for indoor use supports the high flame resistant UL Listed (UL Type OFNR) compatible cable that has passed the UL1666 Riser Flame Test.
- The outdoor use cable is waterproof, and can be used even in flooded or temporarily submerged areas.



LCF connector
Duplex LC connector (IEC 61754-20)

Standard accessories: Protective holder*¹ (One protective holder is enclosed per cable.)

Features

- Protects the cable connector base prevents breakage
- Maintains minimum bending radius
- Saves space in control panel (60 mm or less from front of PLC to end of protective holder)



*1) The protective holder is unique to the Mitsubishi Electric System Service Co., Ltd. LCF connector and is not available as a single unit. It cannot be used with other LCF connector brands.

Splice adapter

Produced by Mitsubishi Electric System & Service

SPAD-LCF-G50/SPAD-SCF-G50/SPAD-FC-G50

- Extends optical fiber cable (Splice connection)
- Temporary connection for stations which may be extended later

Applicable connector

Type	Model	Specifications
Splice adapter for LCF Connector	SPAD-LCF-G50	Splice adapter for LCF connector Multimode 2 cores Connection loss: 0.3 dB (with master fiber)
Splice adapter for SC Connector	SPAD-SCF-G50	Splice adapter for SC connector Multimode 2 core Connection loss: 0.3 dB (with master fiber)
Splice adapter for FC Connector	SPAD-FC-G50	Splice adapter for FC connector Multimode 1 core Connection loss: 0.3 dB (with master fiber)



SPAD-LCF-G50

Connector insertion tool

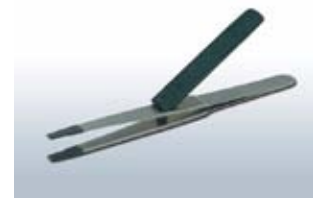
Produced by Mitsubishi Electric System & Service

SCT-SLM

- Insert or remove connectors easily, even in tight spaces such as crowded control panels.

Applicable connector

LCF/LC/SC/MU connector



Optical media converter

Produced by Mitsubishi Electric System & Service

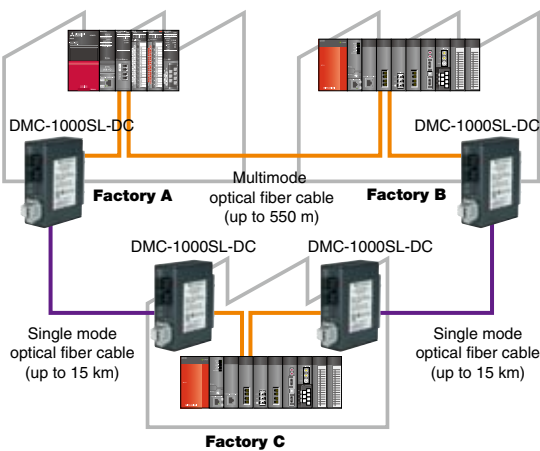
DMC-1000SL-DC (24 V DC)

- If more than the maximum segment length of 550 m is required, two of these units can be used to extend the total station to station distance to over 15 km.
- This converter is compatible with Link path-through. Therefore, the Loop-back function is available, even if the cables have damaged.



DMC-1000SL-DC

Application example



Performance specifications

Item	DMC1000SL-DC	
	OPT1 port	OPT2 port
Conforming standard	IEEE802.3z Gigabit Ethernet (1000BASE-LX)	IEEE802.3z Gigabit Ethernet (1000BASE-SX)
Transmission format	Full duplex system	
Compatible Cable	Optical fiber	1000BASE-LX compatible single-mode optical fiber cable / 1000BASE-SX compatible multi-mode optical fiber cable (Band: 500 MHz·km or higher, λ=850 nm)
	Connector	Duplex LC connector (IEC 61754-20)
	Polishing method of connector	PC, SPC, AdPC, UPC polish
	Method for connection	Crossing (A to B, B to A)
Luminescence center wavelength	1270...1360 nm	830...860 nm
Permissible loss	10 dB	7.5 dB
Target transmission distance	15 km (max.) ^{*2} 550 m (max.) ^{*3}	550 m (max.)
Working environment	Inside panel	
Storage temperature/ Operating & storage humidity	≤ -10°C...55°C/95%RH (no condensation)	
Installation method	DIN rail or screw	
Weight	250g (including DIN rail attachment and Power supply terminal block)	
Dimensions	W31 mm×H95 mm×D90 mm (including DIN rail attachment and Power supply terminal block)	
Power supply specification	20.4 V...26.4 V DC (Power supply terminal block)	
Standards	UL, CE, FCC Part15 Class B, VCCI Class B	
Series connection	4 (max.)	

*1) For DMC-1000SL-DC: Optical fiber cable with a LC duplex connectors on both side
 *2) 15 km (max.) are applicable between same products with single-mode optical fiber cable.
 In case connecting with 1000BASE-LX compatible unit, the distance is 5 km (max.).
 *3) In case connecting with multi-mode optical fiber cable

Connection terminal

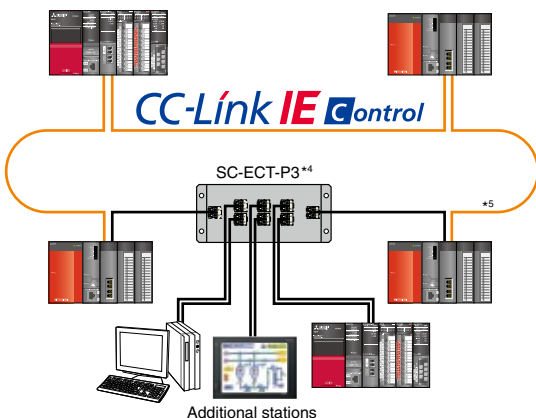
Produced by Mitsubishi Electric System & Service

SC-ECT-P3

- Add up to 3 stations between existing stations.
- Stations can easily be added or removed.
- Allow for expansion of the network without having to change the existing cabling.
- Can be mounted by DIN rail or screw bracket.



Communication configuration example



Specifications

Item	Specifications	
Applicable optical fiber	Standard	1000 BASE-SX (MMF)-compatible optical fiber cable
	Transmission loss (max.)	IEC60793-2-10 Types A1a.1 (50/125 μm multimode)
	Transmission band (min.)	≤ 3.5 dB/km (λ = 850 nm)
	Model	≥ 500 MHz·km (λ = 850 nm)
Applicable light connector	Standard	Duplex LC connector
	Connection loss	IEC61754-20: Type LC connector
	Polished face	≤ 0.3 dB
	Model	PC polish
Number of possible connections	DLCF-G50-D2 ^{*5}	
Operable environment	Max. 3 units	
Operable temperature/humidity range	In board	
Connection distance	0°C ... +55°C / 5 ... 95% RH (no condensation)	
Installation	Max. 150 m ^{*7}	
Weight	Screw or DIN rail	
External dimensions	Approx. 300 g	
	W151 × D64 × H65 (mm)	

*6) Parts provided by Mitsubishi Electric System & Service.
 *7) Cable length from SC-ECT-P3 to any other connection point.

*4) At least one unit should be connected to the connection terminal.
 *5) The solid black lines represent cables with a maximum distance of 150 meters.
 If any station goes down, the loop back function will still be operational.

Performance specifications

Item		MELSEC IQ-R Series RJ71EN71	MELSEC IQ-R Series RJ71GP21-SX	MELSEC-Q Series QJ71GP21-SX / QJ71GP21S-SX	Network interface board Q80BD-J71GP21-SX / Q80BD-J71GP21S-SX Q81BD-J71GP21-SX / Q81BD-J71GP21S-SX	Network interface board ECP-CLEOBD / ECP-CLECBDS
Maximum link points per network	LB	32768 points, 4K bytes		32768 points, 4K bytes (Basic model QCPU, Safety CPU: 16384 points, 2K bytes)	327682 points, 4K bytes	
	LW	131072 points, 256K bytes		131072 points, 256K bytes (Basic model QCPU, Safety CPU: 16384 points, 32K bytes)	131072 points, 256K bytes	
	LX	8192 points, 1K bytes			8192 points, 16K bytes	8192 points, 1K bytes
	LY	8192 points, 1K bytes			8192 points, 16K bytes	8192 points, 1K bytes
Communication speed	LB	Regular mode		16384 points, 2K bytes		
	LW	Regular mode		16384 points, 32K bytes		
	LX	Regular mode		8192 points, 1K bytes		
	LY	Regular mode		8192 points, 1K bytes		
	LB	Extended mode ^{*1}		32768 points, 4K bytes		
	LW	Extended mode ^{*1}		131072 points, 256K bytes		
LX	Extended mode ^{*1}		8192 points, 1K bytes			
LY	Extended mode ^{*1}		8192 points, 1K bytes			
Communication speed		1Gbps				
Maximum stations per network		120 (1 control station plus 119 normal stations) ^{*2}				
Connection cable		Ethernet cable (Category 5e or higher, Double shielded/STP)	Multi-mode optical fiber cable			
Laser Class(JIS C 6802, IEC 60825-1)		—	Class 1 laser product			—
Overall cable distance		Line type: 11900 m(when 120 stations are connected) Star type: Depends on system configuration Ring type: 12000 m(when 120 stations are connected)	66000 m(when 120 stations are connected and the outside diameter of the core is 50 μm) 33000 m(when 120 stations are connected and the outside diameter of the core is 62.5 μm)	66000 m (When 120 stations are connected, when the outside diameter of the core is 50 μm)		
Station-to-station distance (max.)		100 m(conforms to ANSI/TIA/EIA-568-B (Category 5e))	550 m(when the outside diameter of the core is 50 μm) 275 m(when the outside diameter of the core is 62.5 μm)	550 m (when the outside diameter of the core is 50 μm)		
Maximum number of networks		239				
Maximum number of groups		32				
Network topology		Line type, star type, line/star composite type, ring	Duplex loop ring			

*1) Extended mode requires the following modules and software.

- CC-Link IE Control Network modules(QJ71GP21-SX/QJ71GP21S-SX) whose first five serial number digits are 12052 or later.
- Universal model QCPU whose first five serial number digits are 12052 or later.
- GX Works2 Version 1.40S or later.

Also, all stations must be compatible with extended mode.

*2) The maximum number of points that a master station can assign to one station. A submaster station and a local station can receive the data from other stations in addition to this number of points.

Cable specifications

Twisted pair cable

Item	Specifications
Twisted pair specifications	Category 5e or higher, (Double shielded/STP) Straight cable
	The following conditioning cables: • IEEE802.3 (1000BASE-T) • ANSI/TIA/EIA-568-B (Category 5e)
Connector specifications	Standard RJ-45 connector with shield

For recommended cables and other information, contact CC-Link Partner Association.

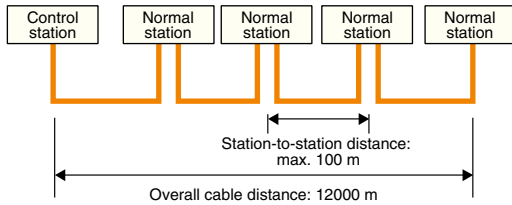
Optical fiber cable

Item	Specifications	
Optical fiber specifications	1000BASE-SX (MMF) optical fiber cable	
	Standard IEC 60793-2-10 Types A1a.1 (50/125μm multimode)	
	Transmission loss (max.)	≤ 3.5 dB/km(λ = 850 nm)
	Transmission band (min.)	≥ 500 MHz·km(λ = 850 nm)
Connector specifications	Duplex LC connector	
	Standard IEC 61754-20: Type LC connector	
	Connection loss	≤ 0.3 dB
	Polished face	PC (Physical Contact) polishing

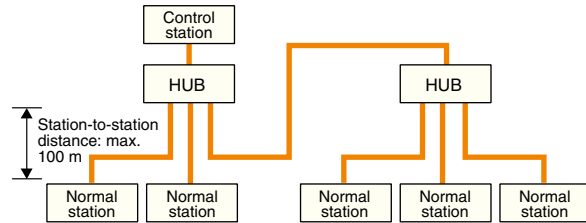
For recommended cables and other information, contact CC-Link Partner Association.

Network topology example

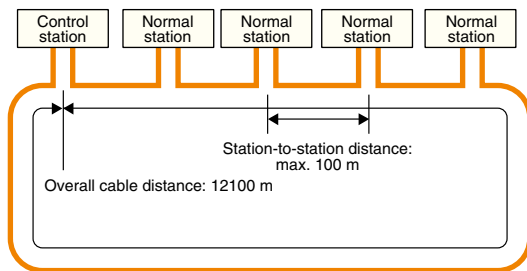
Line topology (Twisted pair cable)



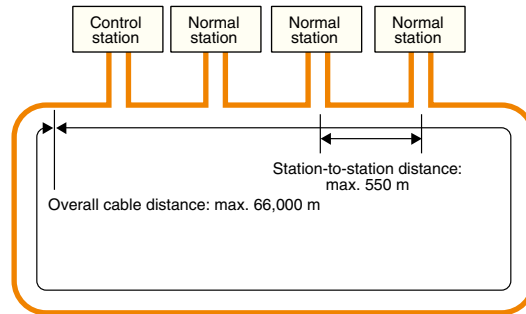
Star topology (Twisted pair cable)



Ring topology (Twisted pair cable)



Ring topology (Dual optical loop)



General specifications

The general specifications listed here are the environmental specification in which the product is to be installed and operated. The general specifications are applicable to all products of the MELSEC iQ-R Series and MELSEC-Q Series unless otherwise indicated.

The MELSEC iQ-R Series and MELSEC-Q Series products are designed to be installed and operated within the environment specified by the general specifications.

For the general specifications of products provided by other manufacturers, contact the relevant manufacturer or distributor.

Item	Specifications					
Operating ambient temperature	0 ... 55°C					
Storage ambient temperature	-25 ... 75°C ^{*1}					
Operating ambient humidity	5 ... 95%RH ^{*2} , non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Acceleration	Half amplitude	Sweep count
			5 ... 8.4 Hz	–	3.5 mm	10 times each in X, Y, Z directions
		Under continuous vibration	8.4 ... 150 Hz	9.8 m/s ²	–	
			5 ... 8.4 Hz	–	1.75 mm	–
8.4 ... 150 Hz	4.9 m/s ²	–	–			
Shock resistance	Compliant with JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions X, Y, Z)					
Operating ambient (humidity/temperature)	MELSEC iQ-R: No corrosive gases ^{*6} , flammable gases, less conductive dust MELSEC-Q/L: No corrosive gases					
Operating altitude ^{*3}	2000 m max. ^{*7}					
Installation location	Inside control panel					
Overvoltage category ^{*4}	MELSEC iQ-R: II max. MELSEC-Q/L: I max.					
Pollution level ^{*5}	2 max.					
Equipment class	MELSEC iQ-R: Class II ^{*8} MELSEC-Q/L: Class I					

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

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

^{*3} Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0 m. Doing so can cause a malfunction.

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

^{*4} This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

^{*5} This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.

Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

^{*6} Use the special coated products which comply with the IEC 60721-3-3 3C2 in the environment with the corrosive gases.

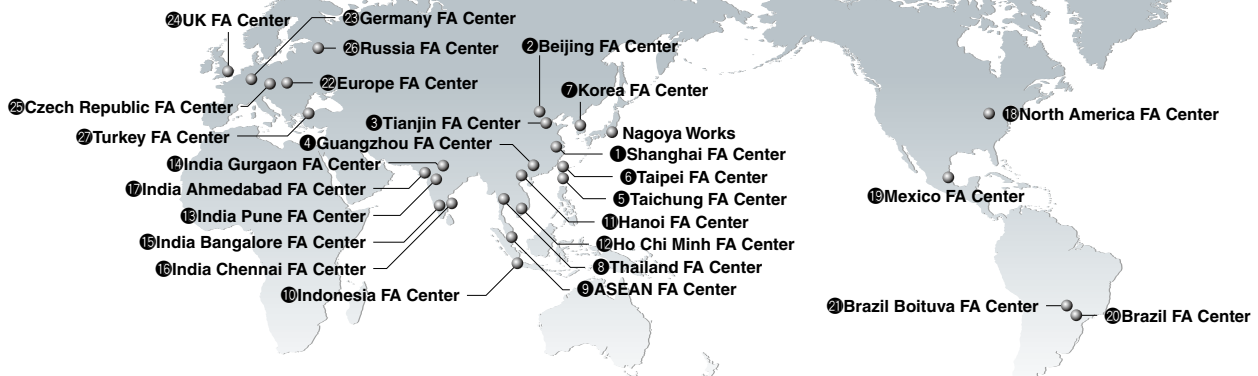
For details on the special coated products, please contact your sales representative.

^{*7} When the programmable controller is used at altitude above 2000 m, the withstand voltage performance and the upper limit of the operating ambient temperature decrease. When using the programmable controller under pressure, please contact your sales representative.

^{*8} When the RQ extension base unit is used, the equipment class is Class I.

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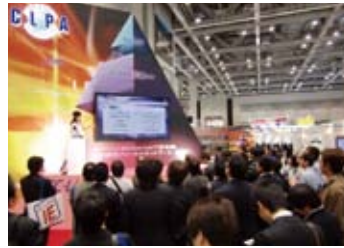
CC-Link Partner Association (CLPA) - Actively promoting worldwide adoption of CC-Link networks

Proactively supporting CC-Link, from promotion to specification development

The CC-Link Partner Association (CLPA) was established to promote the worldwide adoption of the CC-Link open-field network. By conducting promotional activities such as organizing trade shows and seminars, conducting conformance tests, and providing catalogs, brochures and website information, CLPA activities are successfully increasing the number of CC-Link partner manufacturers and CC-Link-compatible products. As such, CLPA is playing a major role in the globalization of CC-Link.



Seminar



Trade show



Conformance testing lab

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

URL : <http://www.cc-link.org>

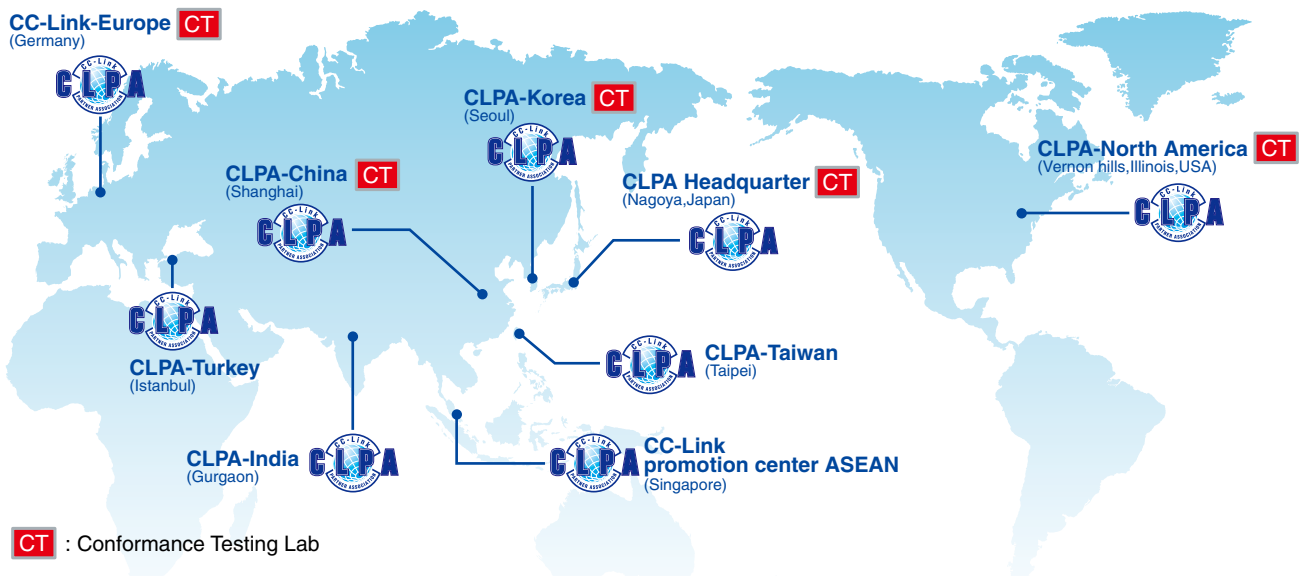
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Nagoya 462-0825 JAPAN
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E-mail : info@cc-link.org



CC-Link Partner Association

Global influence of CC-Link continues to spread

CC-Link is supported globally by CLPA. With offices throughout the world, support for partner companies can be found locally. Each regional CLPA office undertakes various support and promotional activities to further the influence of the network in that part of the world. For companies looking to increase their presence in Asia, CLPA is well placed to assist these efforts through offices in all major Asian regions.



Compatible products list

CC-Link IE Field Network

Mitsubishi Electric Corporation

Note: **DB** ... Double brand product* **NEW** ... New released **SOON** ... Available soon

Type	Model	Outline		
Master/local module	RJ71EN71 NEW	CC-Link IE Field Network master/local station for MELSEC iQ-R Series		
	RJ71GF11-T2 NEW	CC-Link IE Field Network master/local station for MELSEC iQ-R Series		
	QJ71GF11-T2	CC-Link IE Field Network master/local station for MELSEC-Q Series		
	LJ71GF11-T2	CC-Link IE Field Network master/local station for MELSEC-L Series		
	QS0J71GF11-T2	CC-Link IE Field Network master/local station (with the Safety function) for MELSEC-QS Series		
Simple motion module	QD77GF16	CC-Link IE Field Network master station for MELSEC-Q Series 16 axes 2-/3-/4-axis linear interpolation 2-axis circular interpolation synchronous control, Control unit: mm inch degree pulse, Number of positioning data: 600 data/axis		
Head module	LJ72GF15-T2	Head module(END cover equipped) compatible with MELSEC-L Series		
Block type remote module	DC input	NZ2GF2B1N-16D NEW	16 points, 24 V DC, Response time: 0 ... 70 ms, Positive/negative common shared, 18-point terminal block, 1-wire	
		NZ2GF2B1-16D	16 points, 24 V DC, Response time: 0 ... 70 ms, Positive/negative common shared, 18-point terminal block, 1-wire	
		NZ2GFCE3-16D**1,2	16 points, 24 V DC, Response time: 0 ... 70 ms, Positive common(sink type), Sensor connector(e-CON), 3-wire	
		NZ2GFCE3-16DE**1,2	16 points, 24 V DC, Response time: 0 ... 70 ms, Negative common(source type), Sensor connector(e-CON), 3-wire	
		NZ2GFCE3-16D**1	16 points, 24 V DC, Response time: 0 ... 70 ms, Positive common(sink type), MIL connector, 1-wire	
		NZ2GFCE3-16DE**1	16 points, 24 V DC, Response time: 0 ... 70 ms, Negative common(source type), MIL connector, 1-wire	
	Transistor output	NZ2GF2B1N-16T NEW	16 points, 12/24 V DC(0.5 A), Sink type, 18-point terminal block, 1-wire	
		NZ2GF2B1-16T	16 points, 12/24 V DC(0.5 A), Sink type, 18-point terminal block, 1-wire	
		NZ2GF2B1N-16TE NEW	16 points, 12/24 V DC(0.5 A), Source type, 18-point terminal block, 1-wire	
		NZ2GF2B1-16TE	16 points, 12/24 V DC(0.5 A), Source type, 18-point terminal block, 1-wire	
		NZ2GFCE3-16T**1,2	16 points, 12/24 V DC(0.5 A), Sink type, Sensor connector(e-CON), 3-wire	
		NZ2GFCE3-16TE**1,2	16 points, 12/24 V DC(0.5 A), Source type, Sensor connector(e-CON), 3-wire	
	Analog input	NZ2GFCE3-16T**1	16 points, 12/24 V DC(0.5 A), Sink type, MIL connector, 1-wire	
		NZ2GFCE3-16TE**1	16 points, 12/24 V DC(0.5 A), Source type, MIL connector, 1-wire	
		NZ2GF2BN-60AD4 NEW	4 channels, Input: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block	
		NZ2GF2B-60AD4	4 channels, Input: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 400 µs/ch, 18-point terminal block	
	Analog output	NZ2GF2BN-60DA4 NEW	4 channels, Output: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block	
		NZ2GF2B-60DA4	4 channels, Output: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block	
	Temperature control	NZ2GF2B-60TCTT4	4 channels, Thermocouple input, Transistor output, 18-point terminal block	
		NZ2GF2B-60TCRT4	4 channels, Resistance temperature detector, Transistor output, 18-point terminal block	
	High-speed counter	NZ2GFCF-D62PD2	2 channels Differential input Counting speed:10 kpps/100 kpps/200 kpps/500 kpps/1 Mpps/2 Mpps/4 Mpps/8 Mpps, Count input signal:EIA Standard RS-422-A (Differential line driver) DC input Counting speed:10 kpps/100 kpps/200 kpps, Count input signal:5/24 V DC 4 ... 8 mA Coincidence output:Transistor(sink type), 5 ... 24 V DC, 0.1 A/point, 0.4 A/common, 40 pin-connector	
	Block type extension remote module	DC input	NZ2EX2B1-16D	16 points, 24 V DC, Response time: 0 ... 70 ms, Positive/negative common shared, 18-point terminal block, 1-wire
		Transistor output	NZ2EX2B1-16T	16 points, 12/24 V DC(0.5 A), Sink type, 18-point terminal block, 1-wire
			NZ2EX2B1-16TE	16 points, 12/24 V DC(0.5 A), Source type, 18-point terminal block, 1-wire
		Analog input	NZ2EX2B-60AD4 NEW	4 channels, Input: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block
	Analog output	NZ2EX2B-60DA4 NEW	4 channels, Output: -10 ... 10 V DC, 0 ... 20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block	
Network interface board	Q81BD-J71GF11-T2	CC-Link IE Field Network master/local station, Compatible with PCI Express® bus		
	Q80BD-J71GF11-T2	CC-Link IE Field Network master/local station, Compatible with PCI bus		
Ethernet adapter module	NZ2GF-ETB	Compatible with Ethernet devices, Transmission rate: 100 Mbps/1 Gbps		
Network bridge module	NZ2AW1GFAL NEW	CC-Link IE Field Network - AnyWireASLINK bridge module		
	NZ2GF-CCB	CC-Link IE Field Network - CC-Link bridge module		
Industrial switching hub	NZ2EHG-T8 DB	10 Mbps/100 Mbps/1 Gbps, AUTO-MDIX, DIN rail, 8 ports		
	NZ2EHF-T8 DB	10 Mbps/100 Mbps, AUTO-MDIX, DIN rail, 8 ports		
Wireless LAN Adapter	NZ2WL-US/NZ2WL-EU/NZ2WL-CN/ NZ2WL-KR/ NZ2WL-TW DB	IEEE802.11a, IEEE802.11b, IEEE802.11g standards, 12 ... 24 V DC		
Communication unit for GOT2000/1000 Series	GT15-J71GF13-T2	CC-Link IE Field Network communication unit for GOT2000/1000 Series GT27/GT16/GT15 model		
Communication unit for FREQROL-A800 Series inverter	FR-A8NCE	CC-Link IE Field Network communication unit for FREQROL-A800 Series		
Interface module for MELSERVO-J3/J4 Series (AC servo)	MR-J3-T10	CC-Link IE Field Network interface module for MELSERVO-J3/J4 Series		

*1) A connector for Power supply and FG is required with e-CON and MIL connector type remote I/O module. Please refer to the sale parts list below.

*2) A sensor connector is required with e-CON connector type remote I/O module. Please refer to the products list(P.52) of Mitsubishi Electric system & Service Co., Ltd.

For further details, please refer to the relevant product manuals.

Separate sale parts

Type	Model	Outline
One touch connector plug for Power supply and FG	A6CON-PW5P (35505-6080-A00 GF*)	Core wire size of applicable cable: 0.75 mm ² (0.66 ... 0.98 mm ²)(18 AWG), 0.16 mm or larger for strand diameter, Insulating coating material PVC (heat resistant vinyl) Outer diameter of applicable cable:φ2.2 ... 3.0 mm Maximum rated current: 7A*, 10 pieces
	A6CON-PW5P-SOD (35505-6180-A00 GF*)	Core wire size of applicable cable: 0.75 mm ² (0.66 ... 0.98 mm ²)(18 AWG), 0.16 mm or larger for strand diameter, Insulating coating material PVC (heat resistant vinyl) Outer diameter of applicable cable:φ2.0 ... 2.3 mm Maximum rated current: 7A*, 10 pieces
Online connector plug for Power supply and FG	A6CON-PWJ5P (35720-L200-A00 AK*)	Online connector plug for Power supply and FG, 5 pieces

*3) Model name by plug manufacturer 3M Company.

*4) The allowable current value of the cable connected must be observed.

Mitsubishi Electric System & Service Co., Ltd.

Type	Model	Outline
Industrial switching hub	DT135TX	10 Mbps/100 Mbps/1000 Mbps, AUTO-MDIX, DIN rail, 5 ports
Cable/ accessory	SC-E5EW-S M	(Double shielded/STP) Straight cable, Category 5e, For indoor use
	SC-E5EW-S M-MV	(Double shielded/STP) Straight cable, Category 5e, For indoor movable part
	SC-E5EW-S M-L	(Double shielded/STP) Straight cable, Category 5e, For indoor/outdoor use
Option	SPAD-RJ45S-E5E	RJ-45 connector with shield
Sensor connector(e-CON)	ECN-M014R	Core wire size of applicable cable: 0.14 ... 0.30 mm ² (26 ... 24 AWG) Outer diameter of applicable cable:φ0.8 ... 1.0 mm Maximum rated current: 2.0 A, 20 pieces
	ECN-M024Y	Core wire size of applicable cable: 0.14 ... 0.30 mm ² (26 ... 24 AWG) Outer diameter of applicable cable:φ1.0 ... 1.2 mm Maximum rated current: 2.0 A, 20 pieces
	ECN-M034OR	Core wire size of applicable cable: 0.14 ... 0.30 mm ² (26 ... 24 AWG) Outer diameter of applicable cable:φ1.2 ... 1.6 mm Maximum rated current: 2.0 A, 20 pieces
	ECN-M044GN	Core wire size of applicable cable: 0.30 ... 0.50 mm ² (22 ... 20 AWG) Outer diameter of applicable cable:φ1.0 ... 1.2 mm Maximum rated current: 2.0 A, 20 pieces
	ECN-M054BL	Core wire size of applicable cable: 0.30 ... 0.50 mm ² (22 ... 20 AWG) Outer diameter of applicable cable:φ1.2 ... 1.6 mm Maximum rated current: 2.0 A, 20 pieces
	ECN-M064GY	Core wire size of applicable cable: 0.30 ... 0.50 mm ² (22 ... 20 AWG) Outer diameter of applicable cable:φ1.6 ... 2.0 mm Maximum rated current: 2.0 A, 20 pieces

For details of Mitsubishi Electric System & Service Co., Ltd. products, contact us by sending an e-mail to the following address.

<Sales office> FA PRODUCT DIVISION mail:osb.webmaster@melsc.jp

* General specifications and product guarantee conditions of jointly developed products are different from those of MELSEC products.
For further details, please refer to the product manuals, or contact your local Mitsubishi Electric sales representative.

Compatible products list

CC-Link IE Control Network

Mitsubishi Electric Corporation

Note: **DB** ...Double brand product* **NEW** ...Released product **SOON** ...Available soon

Type	Model	Outline	
Control network module	Twisted-pair cable	RJ71EN71 NEW	CC-Link IE Control Network control station/normal station for MELSEC iQ-R Series
	Optical fiber cable	RJ71GP21-SX NEW	CC-Link IE Control Network control station/normal station for MELSEC iQ-R Series
		QJ71GP21-SX	CC-Link IE Control Network control station/normal station for MELSEC-Q Series
		QJ71GP21S-SX	CC-Link IE Control Network control station/normal station(with the External power supply function) for MELSEC-Q Series
Communication unit for GOT2000/GOT1000 Series	Optical fiber cable	GT15-J71GP23-SX	CC-Link IE Control Network control station/normal station communication unit compatible for GOT2000/GOT1000 Series GT27, GT16, GT15 model
Network interface board	Optical fiber cable	Q81BD-J71GP21-SX	CC-Link IE Control Network control station/normal station, Compatible with PCI Express® bus
		Q81BD-J71GP21S-SX	CC-Link IE Control Network control station/normal station(with the External power supply function), Compatible with PCI Express® bus
		Q80BD-J71GP21-SX	CC-Link IE Control Network control station/normal station, Compatible with PCI bus/PCI X bus
		Q80BD-J71GP21S-SX	CC-Link IE Control Network control station/normal station(with the External power supply function), Compatible with PCI bus/PCI X bus

Mitsubishi Electric System & Service Co., Ltd.

Type	Model	Outline	
Cable and accessory*1	Optical fiber cable	QG-AW	Optical fiber cable compatible with CC-Link IE Control Network (in the control board)
		QG-B	Optical fiber cable compatible with CC-Link IE Control Network (indoor)
		QG-BU	UL optical fiber cable compatible with CC-Link IE Control Network (indoor)
		QG-C	Optical fiber cable compatible with CC-Link IE Control Network (outdoor)
		QG-DL	Optical fiber cable compatible with CC-Link IE Control Network (reinforced outdoor)
		QG-VCT	Optical fiber cable compatible with CC-Link IE Control Network (indoor, movable use)
	Option	SPAD-LCF-G50	Splice adapter for LCF connector Multimode 2 cores Connection loss: 0.3 dB (with master fiber)
		SPAD-SCF-G50	Splice adapter for SC connector Multimode 2 cores Connection loss: 0.3 dB (with master fiber)
		SPAD-FC-G50	Splice adapter for FC connector Multimode 1 core Connection loss: 0.3 dB (with master fiber)
		SCT-SLM	Connector insertion tool (applicable connector: LCF connector, LC connector, SC connector, MU connector)
		Optical media converter	DMC-1000SL-DC
Connection terminal	SC-ECT-P3	Cable bundling device compatible with CC-Link IE Control Network	

*1) For the details about twisted pair cables, please refer to SC-E5EW Series listed under the Cable and accessory section (page 54).

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Mitsubishi Electric Engineering Co., Ltd.

Type	Model	Outline
Interface board compatible with Compact PCI	ECP-CLECBD	For control master/local station of CC-Link IE Control Network compatible with Compact PCI bus Japanese/English OS
	ECP-CLECBDS	For control master/local station of CC-Link IE Control Network compatible with Compact PCI bus Japanese/English OS With external power supply function

* General specifications and product guarantee conditions of jointly developed products are different from those of MELSEC products. For further details, please refer to the product manuals, or contact your local Mitsubishi Electric sales representative.

Comparison of network specifications

		CC-Link IE Control		MELSECNET/H			CC-Link IE Field	CC-Link
		Twisted pair	Dual optical loop	Optical loop type	Coaxial bus type	Twist bus type		
Communication speed (bps)		1G		25 M	10 M	10 M (max.)	1G	10 M (max.)
Maximum number of link words (LW)	per network	128K		16K			16K* ¹	4K* ¹
	per station	128K		16K			2K* ¹	256* ¹ (with 4 stations)
Maximum number of connected stations per network		120		64	32	32	121	65
Distance	Total extension distance (km)	12	66	30	2.5* ²	0.1 (10 Mbps)	12	1.1* ² (10 Mbps)
	Maximum station-to-station distance (m)	100	550 (when the outside diameter of the core is 50 μm)	1000	500	100 (10 Mbps)	100	100 (10 Mbps)
Wiring	Topology	Star, line, star and line mixed, or ring	Ring	Ring	Bus	Bus	Star, line, star and line mixed, or ring	Bus, T-branch, or star
	Cable	General-purpose Ethernet cable (Category 5e or better, double shielded, twisted pair)	General-purpose Ethernet cable (multimode optical fiber)	Optic cable	Coaxial cable	Twisted cable	General-purpose Ethernet cable (Category 5e or better, double shielded, twisted pair)	Twisted cable (CC-Link-dedicated cable)

*1) Maximum number of link points (RWr+RWw).

*2) When using repeater.

[FA Products]

PLC

MELSEC iQ-R Series



Revolutionary, next generation controllers building a new era in automation

- ◎High-speed, high-accuracy multiple CPU control system based on the iQ Platform
- ◎New high-speed system bus and inter-module sync realizes improved productivity and reduced TCO*
- ◎Reducing development costs through intuitive engineering (GX Works3)
- ◎Robust security features (such as security key authentication, IP filter)

Product Specifications

Program capacity	40K steps to 1200K steps
LD instruction speed	0.98 ns
Available modules	I/O, analog, high-speed counter, positioning, simple motion, network module
Control system architecture	Rack-mounted modular based system
Supported networks	Ethernet, CC-Link IE Control Network, CC-Link IE Field Network, CC-Link, RS-232, RS-422/485

*Total Cost of Ownership

PLC

MELSEC-Q Series Universal Model



Introducing the high-speed QCPU (QnUDVCPU) for faster processing of large data volumes.

- ◎Realize high-speed, high-accuracy machine control with various iQ Platform compatible controllers and multiple CPUs.
- ◎Easily connect to GOTs and Programming tools using built-in Ethernet port.
- ◎25 models from 10K steps small capacity to 1000K steps large capacity, are available.
- ◎Seamless communication and flexible integration at any network level.

Product Specifications

Program capacity	10K steps to 1000K steps
Number of I/O points [X/Y], number of I/O device points [X/Y]	256 points to 4096 points/8192 points
Basic instruction processing speed (LD instruction)	120 ns to 1.9 ns
External connection interface	USB (all models equipped), Ethernet, RS-232, memory card, extended SRAM cassette
Function module	I/O, analog, high-speed counter, positioning, simple motion, temperature input, temperature control, network module
Module extension style	Building block type
Network	Ethernet, CC-Link IE controller network, CC-Link IE field network, CC-Link, CC-Link/LT, MELSECNET/H, SSCNETIII (/H), AnyWire, RS-232, RS-422

PLC

MELSEC-L Series



“Light & Flexible” condensing various functions easily and flexibly.

- ◎CPU equipped as a standard with various functions including counter, positioning and CC-Link.
- ◎The base-less structure with high degree of freedom saves space in the control panel.
- ◎Easily confirm the system status and change the settings with the display unit.
- ◎Ten models are available in program capacities from 20 k steps to 260 k steps.

Product specifications

Program capacity	20 k steps/60 k steps/260 k steps
Number of input/output points [X/Y]	1024 points/4096 points
Number of input/output device points [X/Y]	8192 points
Basic instruction processing speed (LD instruction)	60 ns/ 40 ns/ 9.5 ns
External connection interface	USB, Ethernet, RS-232, SD memory card, CC-Link (L26CPU-BT/PBT)
Function modules	I/O, analog, high-speed counter, positioning, simple motion, temperature control, network module
Unit expansion style	Base-less structure
Network	Ethernet, CC-Link IE Field network, CC-Link, CC-Link/LT, SSCNETIII(/H), RS-232, RS-422

HMI

Graphic Operation Terminal GOT2000 Series GT27 Model



To the top of HMIs with further user-friendly, satisfactory standard features.

- ◎ Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)
- ◎ Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.
- ◎ Multi-touch features, two-point press, and scroll operations for more user-friendliness.
- ◎ Outline font and PNG images for clear, beautiful screen display.

Product Specifications

Screen size	15", 12.1", 10.4", 8.4"
Resolution	XGA, SVGA, VGA
Intensity adjustment	32-step adjustment
Touch panel type	Analog resistive film
Built-in interface	RS-232, RS-422/485, Ethernet, USB, SD card
Applicable software	GT Works3
Input power supply voltage	100 to 240VAC (+10%, -15%), 24VDC (+25%, -20%)

Inverter

FR-A800 Series



High-functionality, high-performance inverter

- ◎ Realize even higher responsiveness during real sensor-less vector control or vector control, and achieve faster operating frequencies.
- ◎ The latest automatic tuning function supports various induction motors and also sensor-less PM motors.
- ◎ The standard model is compatible with EU Safety Standards STO (PLd, SIL2). Add options to support higher level safety standards.
- ◎ Control and monitor inverters via CC-Link/CC-Link IE Field Network (option interface).

Product Specifications

Inverter capacity	200V class: 0.4kW to 90kW, 400V class: 0.4kW to 500kW
Control method	High-carrier frequency PWM control (Select from V/F, advanced magnetic flux vector, real sensorless vector or PM sensorless vector control), vector control (when using options)
Output frequency range	0.2 to 590Hz (upper limit is 400Hz when using advanced magnetic flux vector control, real sensorless vector control, vector control or PM sensorless vector control)
Regenerative braking torque (Maximum allowable duty)	200V class: 0.4K to 1.5K (150% at 3%ED) 2.2K/3.7K (100% at 3%ED) 5.5K/7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous), 400V class: 0.4K to 7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous)
Starting torque	200% 0.3Hz (3.7K or less), 150% 0.3Hz (5.5K or more) (when using real sensorless vector, vector control)

AC Servo

Mitsubishi General-Purpose AC Servo MELSERVO-J4 Series



Industry-leading level of high performance servo

- ◎ Industry-leading level of basic performance: Speed frequency response (2.5kHz), 4,000,000 (4,194,304p/rev) encoder
- ◎ Advanced one-touch tuning function achieves the one-touch adjustment of advanced vibration suppression control II, etc.
- ◎ Equipped with large capacity drive recorder and machine diagnosis function for easy maintenance.
- ◎ 2-axis and 3-axis servo amplifiers are available for energy-conservative, space-saving, and low-cost machines.

Product Specifications

Power supply specifications	1-phase/3-phase 200V AC, 1-phase 100V AC, 3-phase 400V AC
Command interface	SSCNET III/H, SSCNET III (compatible in J3 compatibility mode), CC-Link IE Field Network interface with Motion, pulse train, analog
Control mode	Position/Speed/Torque/Positioning function/Fully closed loop
Speed frequency response	2.5kHz
Tuning function	Advanced one-touch tuning, advanced vibration suppression control II, robust filter, etc.
Functional safety	Conforms to functions of IEC/EN 61800-5-2, STO: Category 3 PL d, SIL 2 Conforms to Category 4 PL e, SIL 3 by a combination with MR-D30 functional safety unit
Compatible servo motor	Rotary servo motor (rated output: 0.05 to 55kW), linear servo motor (continuous thrust 50 to 3000N), direct drive motor (rated torque: 2 to 240N·m)

Sensor-less Servo

FR-E700EX Series, MM-GKR Series

Compact and high-function drive unit, low-inertial small capacity sensor-less PM motor



- ◎Use PM sensor-less vector control to control dedicated PM motors with high accuracy without an encoder.
- ◎High-accuracy speed control (speed fluctuation rate $\pm 0.05\%$) and positioning control are supported.
- ◎The dedicated PM motor (MM-GKR) is quiet as it has no cooling fan. The compact and lightweight unit also supports reduction gears.
- ◎The standard model supports RS-485 communication. CC-Link communication is supported with an additional option.

Product Specifications

Drive unit / motor capacity	200V class: 0.1kW to 0.75kW
Control method	PM sensor-less vector control (low speed range: high frequency superimposition control)
Rated speed	3000r/min
Speed fluctuation rate	$\pm 0.05\%$ (at 0 to 100% load fluctuation)
Position control	The point table method and zero point return enable position control with absolute position commands
Command input method	$\pm 1.8^\circ$ (machine angle: equivalent to 200 [pulses/rev] resolution, input voltage 200V, wiring length within 5m)
Positioning accuracy	
Starting torque	200% (default value)
Communication specifications	Built-in: RS-485 communication (Mitsubishi inverter protocol, Modbus-RTU protocol), option: CC-Link communication

Magnetic Starter

MS-T Series

Exceed your expectations.



- ◎10A frame model is over 16% smaller with a width of just 36mm!!
- ◎New integrated terminal covers.
- ◎Reduce your coil inventory by up to 50%.
- ◎Be certified to the highest international levels while work is ongoing to gain other country.

Product specifications

Frame	10 A to 32 A
Applicable standards	Certification to various standards including IEC, JIS, CE, UL, TÜV, CCC.
Terminal cover	Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
Improved wiring	Wiring and operability are improved with streamlining wiring terminal BC specifications.
Operation coil rating	Wide range of operation coil ratings reduces number of coil types from 14 (N Series) to 7 types and simplifies selection.
Option units	Diverse lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

Low Voltage Circuit Breakers

Mitsubishi WS-V Series Molded Case Circuit Breakers, Earth Leakage Circuit Breakers

Technologies based on long year experience realize more improved performance.



- ◎The new electronic circuit breakers can display various measurement items.
- ◎Improvement of breaking performance with new breaking technology "Expanded ISTAC".
- ◎Compliance with global standard for panel and machine export.
- ◎Commoditization of internal accessories for shorter delivery time and stock reduction.

Product Specifications.

Frame	32-250A Frame
Applicable standard	Applicable to IEC, GB, UL, CSA, JIS and etc.
Expansion of UL listed product line-up	New line-up of 480VAC type with high breaking performance for SCCR requirement
Commoditization of internal accessories	Reduction of internal accessory types from 3 to 1
Commoditization for AC and DC circuit use	Common use of 32/63A frame in both AC and DC circuit
Compact size for easy to use	Thermal adjustable and electronic circuit breakers are same size as 250AF fixed type
Measuring Display Unit (MDU) breakers	MDU breakers measure, display and transmit energy date to realize energy management.

Robot

MELFA F Series



High speed, high precision and high reliability industrial robot

- ◎ Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
- ◎ The fastest in its class using high performance motors and unique driver control technology.
- ◎ Improved flexibility for robot layout design considerations.
- ◎ Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6	Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount	
Maximum load capacity	Vertical:2-20kg	Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm	Horizontal:350-1,000mm

CNC

Mitsubishi Numerical Control Unit C70 Series

iQ Platform compatible CNC to provide TCO reduction effect.

- ◎ A CNC structured in building block method on iQ Platform.
- ◎ High performance CNC integrated with high-speed PLC offers high-speed control to reduce cycle time.
- ◎ A wide variety of FA products helps construct flexible lines.



Product specifications

Maximum number of control axes (NC axis + spindle + PLC axis)	16 axes
Maximum number of part system	Machining center system: 7 systems, Lathe system: 3 systems
Maximum number of NC axes per part system	8 axes
Maximum program capacity	2,000 KB (5,120 m)
Maximum number of files to store	124 files/252 files
Number of input/output points	4,096 points
Safety observation function	Safety signal comparison function, speed monitoring function, duplexed emergency stop

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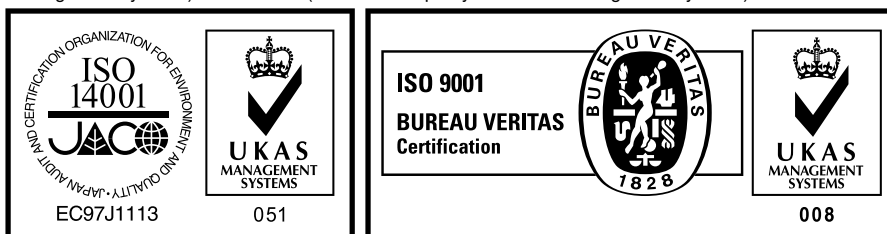
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