MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow
eco Changes

Ethernet-based Open Network
CC-Link IE Product Catalog

CC-Link IE Field
CC-Link IE Control

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

More block type remote modules for CC-Link IE Field Network

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

CC-Link + Industrial Ethernet

Versatile CC-Link IE Field Network is reaching further with additional block type remote modules

More block type remote modules have joined the diverse group of CC-Link IE Field Network supporting products, connecting to more applications.
CC-Link IE Field is a versatile network integrating different controls.

CC-Link IE

CC-Link 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	Maximum link registers	Maximum link relays	
1Gbps	16Kwords	32,768bits	Star topology
Line topology	Ring topology	Easy to configure parameters	Network diagnosis at-a-glance
Seamless connectivity	Twisted pair cable	Ethernet-based	Safety communication function
Motion control Synchronized communication			

CC-Link 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-Link 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	Maximum link registers	Maximum link relays	
1Gbps	128Kwords	32,768bits	Star topology
Line topology	Ring topology	Dual optical loop	External power supply
Easy to configure parameters	Network diagnosis at-a-glance	Seamless connectivity	Twisted pair cable
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`

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

CC-Link IE Control `Gigabit Ethernet`

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

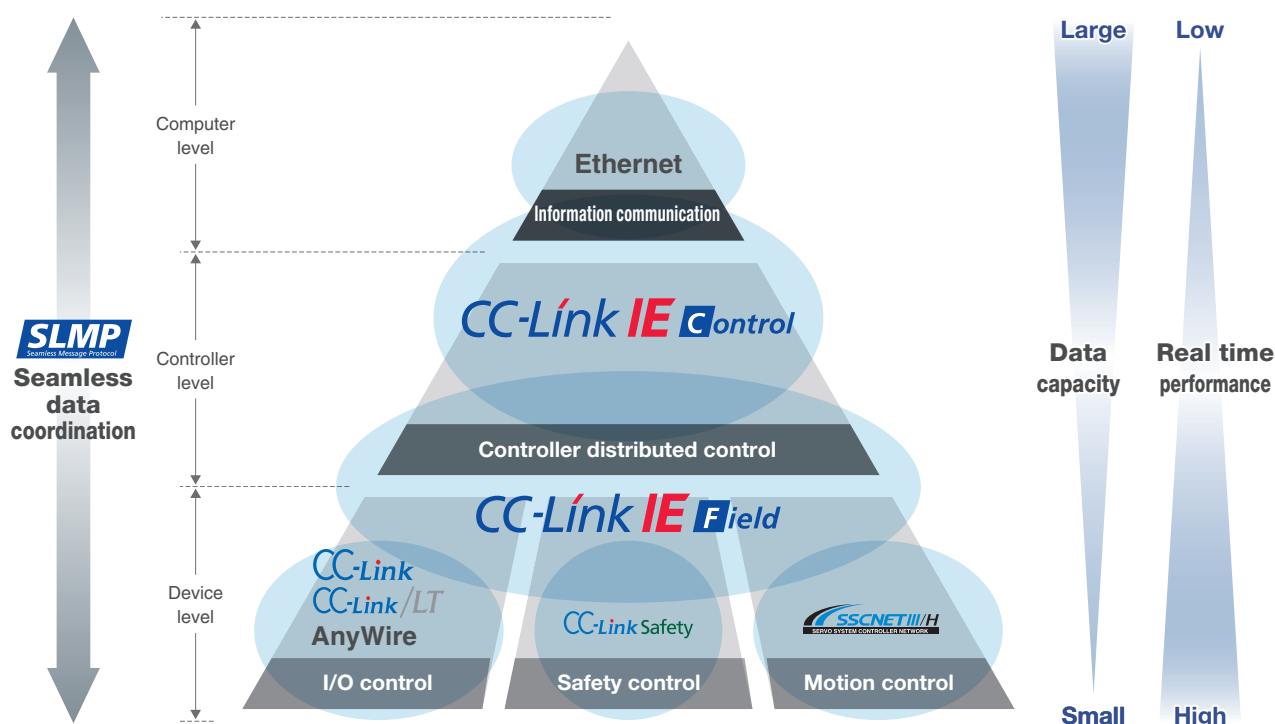## CC-Link   CC-Link Safety   CC-Link/LT

CC-Link is a high-speed and highly reliable deterministic I/O control network that realizes reduced wiring while offering multi-vendor compatible products. This open field network is a global standard, originating from Japan and Asia. In addition, CC-Link Safety, is a dedicated fail-safe network that is used as a safety risk management solution. CC-Link/LT is a sensor-level network that is ideal for compact and complicated wiring installations.
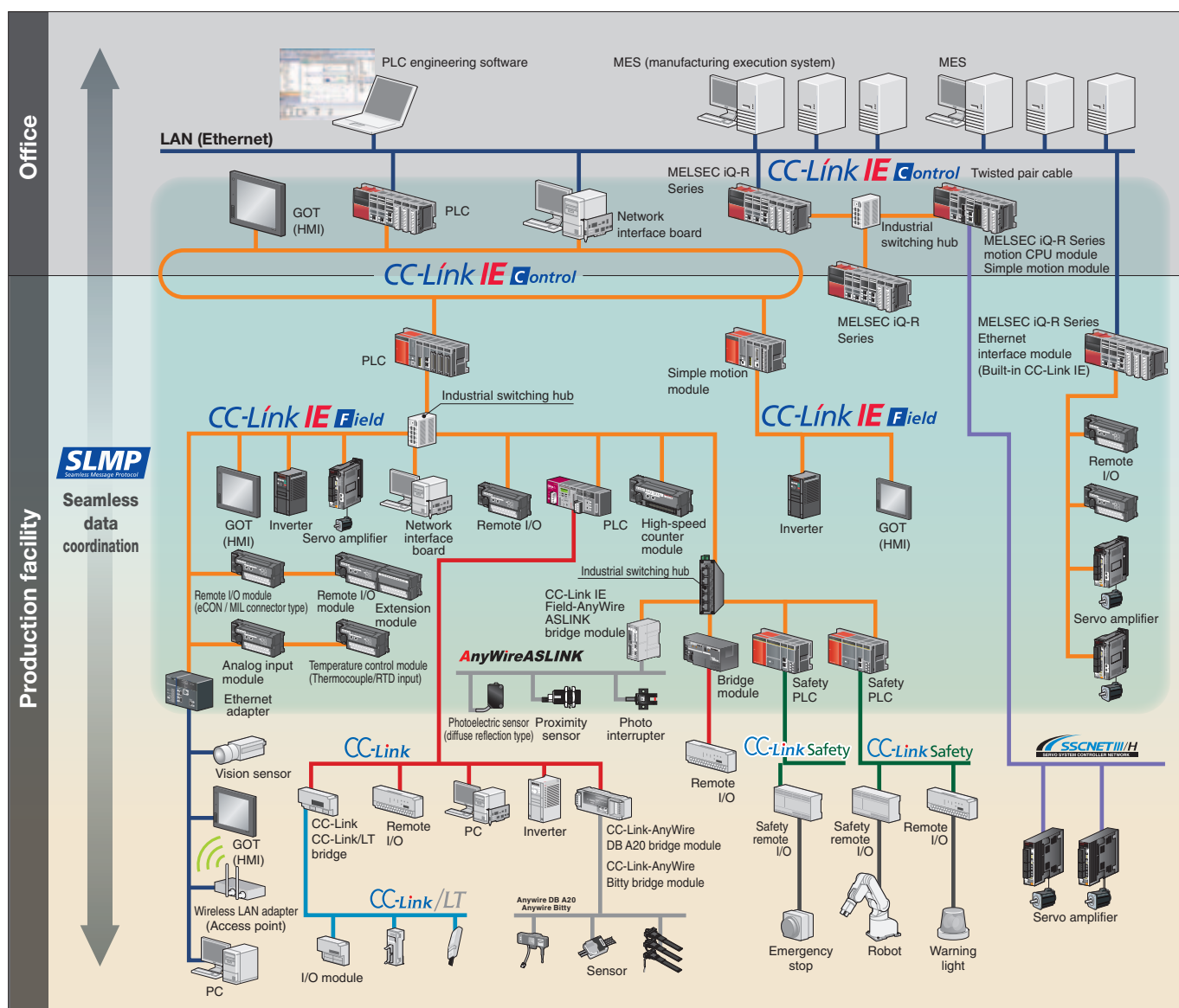
AnyWire

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

SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK

SSCNET 3/H is a dedicated high-speed, high-performance, highly reliable servo system control network that offers flexible long-distance wiring capabilities based on optical-fiber cable topology.

Office

Production facility

Office

PLC engineering software   MES (manufacturing execution system)   MES

LAN (Ethernet)

GOT (HMI)   PLC   Network interface board

MELSEC iQ-R Series   **CC-Link IE Control**   Twisted pair cable

Industrial switching hub

MELSEC iQ-R Series motion CPU module Simple motion module

MELSEC iQ-R Series

CC-Link IE Control

PLC

Simple motion module

MELSEC iQ-R Series Ethernet interface module (Built-in CC-Link IE)

SLMP Seamless Message Protocol

Seamless data coordination

CC-Link IE Field

Industrial switching hub

CC-Link IE Field

GOT (HMI)   Inverter   Servo amplifier   Network interface board   Remote I/O   PLC   High-speed counter module

Inverter   GOT (HMI)

Remote I/O

Remote I/O module (eCON / MIL connector type)   Remote I/O module   Extension module

Analog input module   Temperature control module (Thermocouple/RTD input)

Ethernet adapter

Industrial switching hub

CC-Link IE Field-AnyWire ASLINK bridge module

Servo amplifier

AnyWireASLINK

Bridge module   Safety PLC   Safety PLC

Vision sensor

Photoelectric sensor (diffuse reflection type)   Proximity sensor   Photo interrupter

Remote I/O

CC-Link Safety   **CC-Link Safety**

SSCNET III/H SERVO SYSTEM CONTROLLER NETWORK

CC-Link

GOT (HMI)

CC-Link CC-Link/LT bridge   Remote I/O   PC   Inverter   CC-Link-AnyWire DB A20 bridge module

CC-Link-AnyWire Bitty bridge module

Remote I/O

Safety remote I/O   Safety remote I/O   Remote I/O

Servo amplifier

Wireless LAN adapter (Access point)

CC-Link/LT

Anywire DB A20 Anywire Bitty

Emergency stop   Robot   Warning light

PC   I/O module   Sensor

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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.
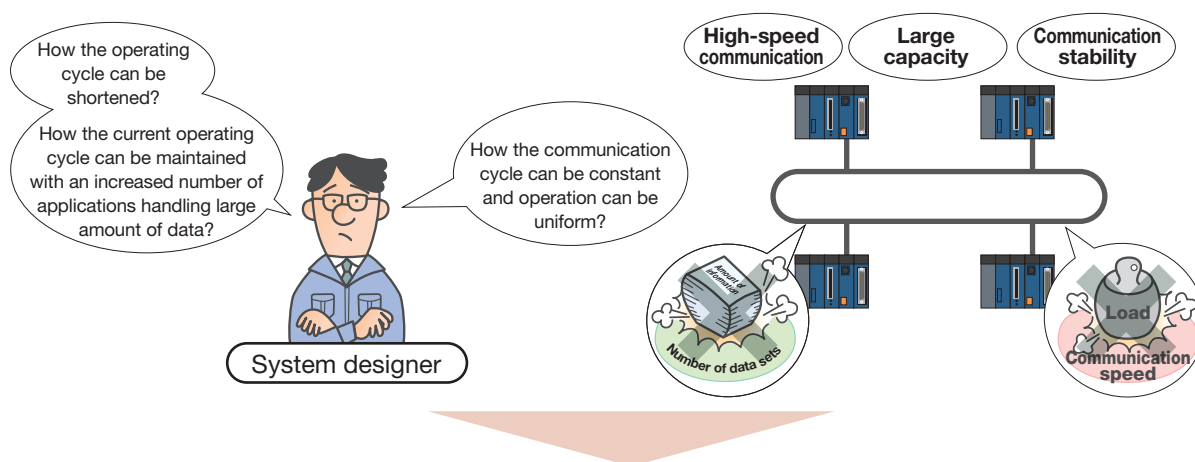
CASE 1

High-speed communication realizes short and stable operating cycles, leading to higher production quality

How the operating cycle can be shortened?

How the current operating cycle can be maintained with an increased number of applications handling large amount of data?

How the communication cycle can be constant and operation can be uniform?

System designer

High-speed communication

Large capacity

Communication stability

Amount of handling

Number of data sets

Load

Communication speed

CC-Link IE Field makes it possible

Communication speed	Maximum link registers
1Gbps	16Kwords

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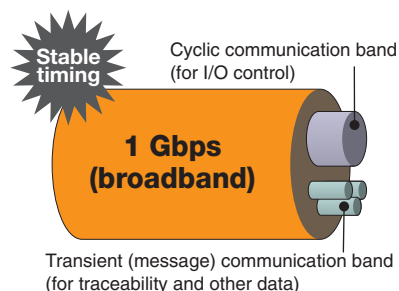
The ability to transfer large volumes of data enables high performance field devices to reach their full potential. With the ability to transfer large amounts of traceability data, systems capable of highly-detailed diagnostics can be constructed.

1Gbps

MELSEC iQ-R/ Q/L/QS Series (master)

Combine L Series intelligent function modules and I/O to build remote stations that best fit the application.

CC-Link IE Field

MELSEC-Q Series (local)

MELSEC iQ-R Series (local)

MELSEC-L Series (local)

MELSEC-QS Series (local)

MELSEC-L Series (remote)
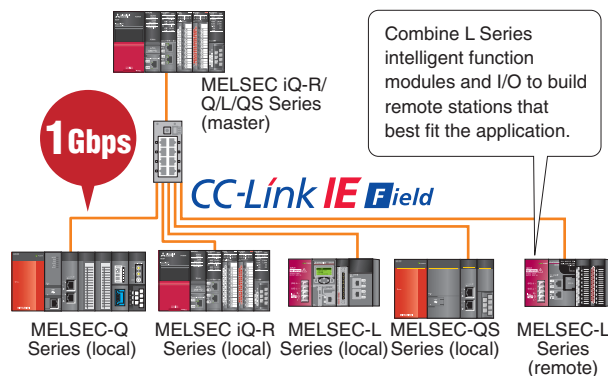
Cyclic communication is stable and reliable
Improved quality is achieved through a stable operating cycle

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.

Stable timing

Cyclic communication band (for I/O control)

1 Gbps (broadband)

Transient (message) communication band (for traceability and other data)

CASE 2

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

A layout change of production lines is occasionally needed.

Equipment arrangement should be more flexible.

Maintenance technician

New!

Existing system

Easily integrate new equipment with the existing system
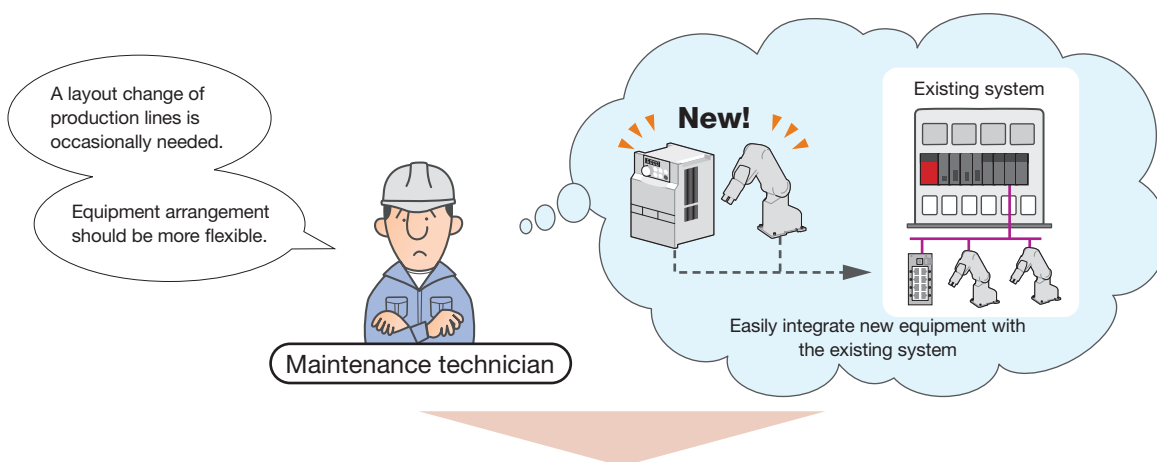
CC-Línk **IE** **F**ield **makes it possible**

| Star topology | Line topology | Ring topology |

Flexible network topology

Add nodes or flexibly change the network layout

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.)

Star topology

Add new equipment simply by connecting to any available port. The time it takes to connect and configure devices is minimized!

Line topology

Ring topology
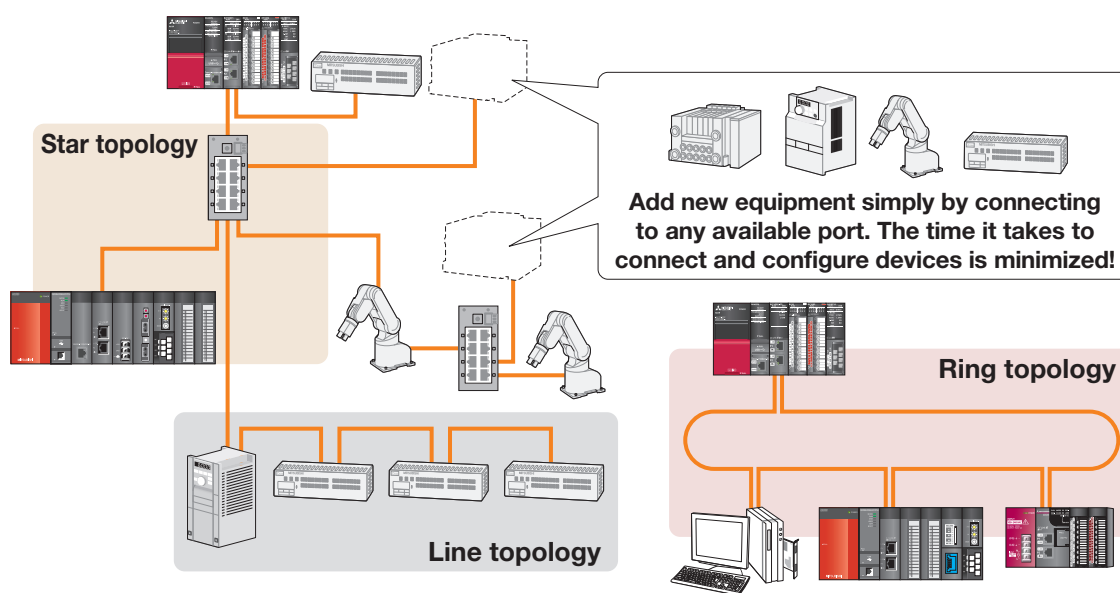
Benefits of CC-Link IE Field Network

CASE 3

Simplified network settings make the network configuration easy

Getting the network up and running is complicated and time consuming...

Can the network parameters be set up from one place at once?

System designer

Setting 1   Setting 2   Setting 3

Station #1   Station #2   Station #3

The settings for every single PLC are tiresome.
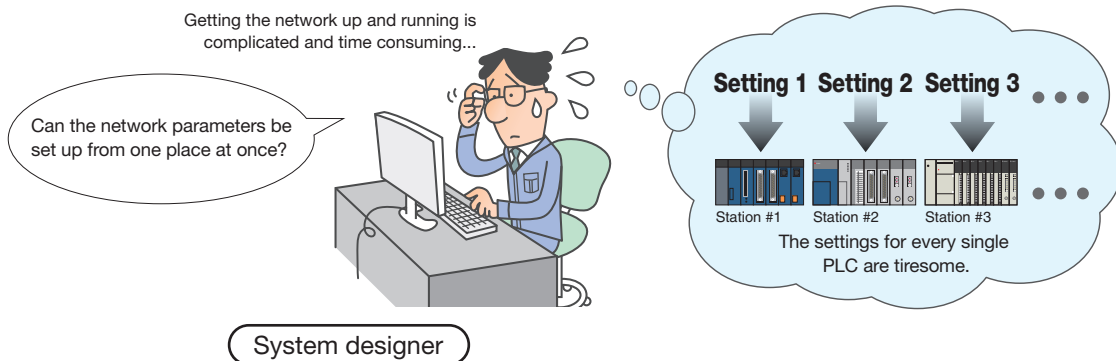
CC-Link IE Field makes it possible

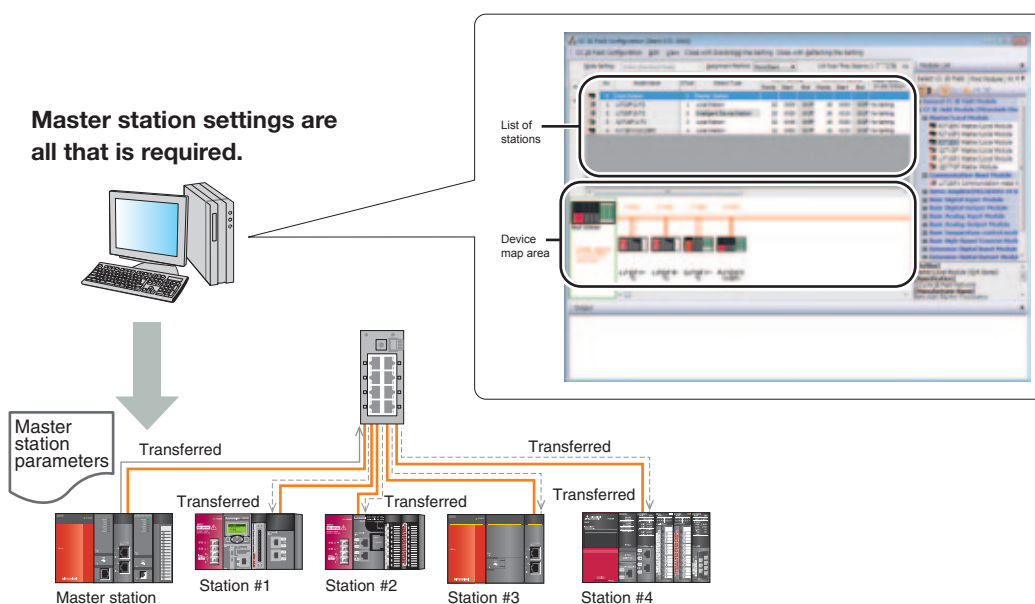**Easy to configure parameters**

Easy to configure settings
Just configure the master station to begin communications

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 easy.

Master station settings are all that is required.

List of stations

Device map area

Master station parameters

Transferred   Transferred   Transferred   Transferred   Transferred

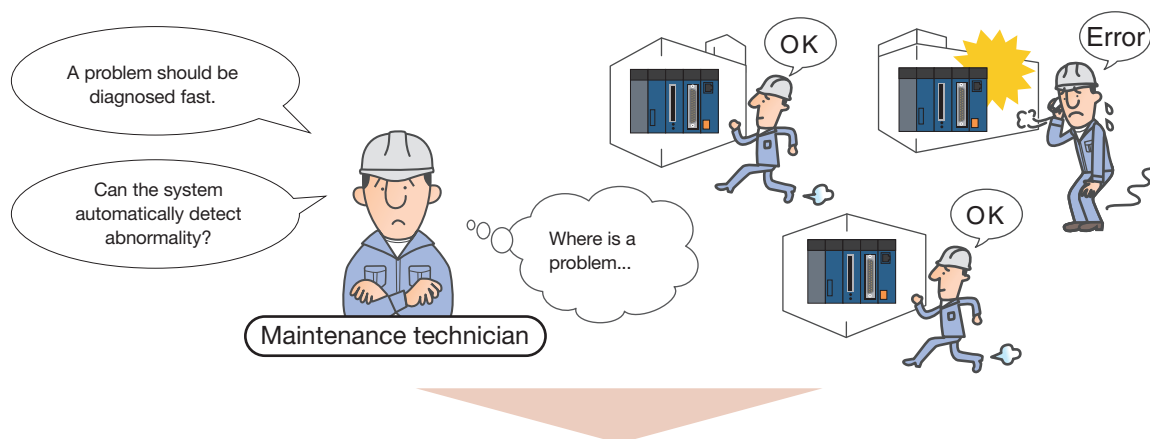Master station   Station #1   Station #2   Station #3   Station #4

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

CASE 4

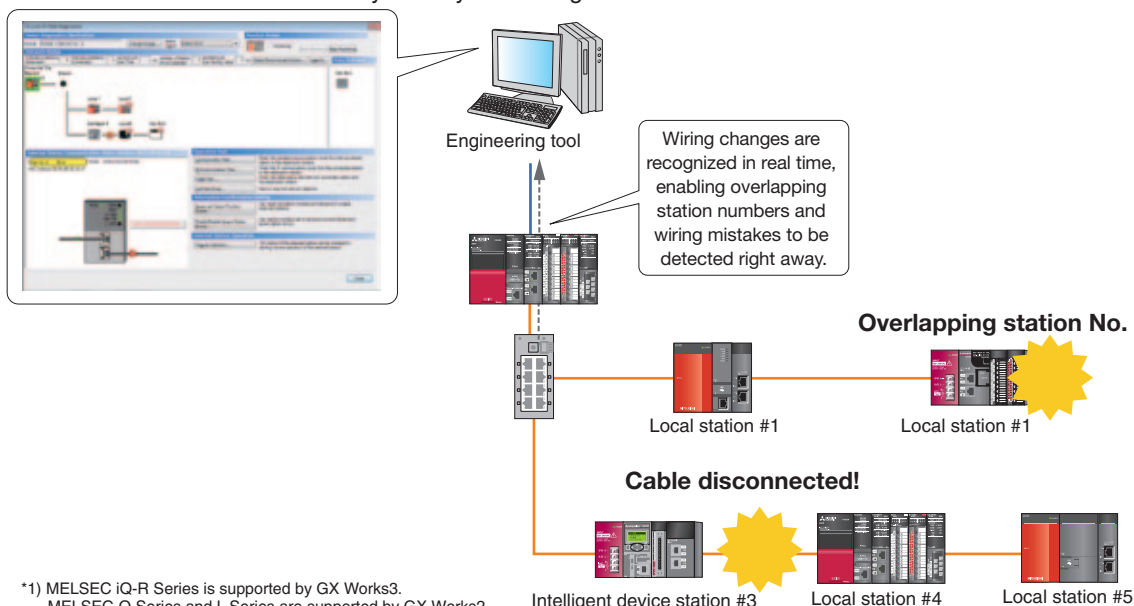# Wiring mistakes and errors are easily diagnosed with the engineering tool

A problem should be diagnosed fast.

Can the system automatically detect abnormality?

Maintenance technician

Where is a problem...

OK

Error

OK

CC-Link IE Field makes it possible

Network diagnosis at-a-glance

Easy diagnosis functions

Diagnose and troubleshoot even with little experience

The engineering tool[1] enables the user to identify network errors at a glance. The user 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.

Engineering tool

Wiring changes are recognized in real time, enabling overlapping station numbers and wiring mistakes to be detected right away.

Overlapping station No.

Local station #1   Local station #1

Cable disconnected!

Intelligent device station #3   Local station #4   Local station #5

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

CASE 5

Stations can be accessed from anywhere, even across multiple networks!

Can the entire factory system observed from an office computer?

System designer

Can the maintenance be performed without having to go to a target station?

Accessing the target station via the nearest station for maintenance is better.
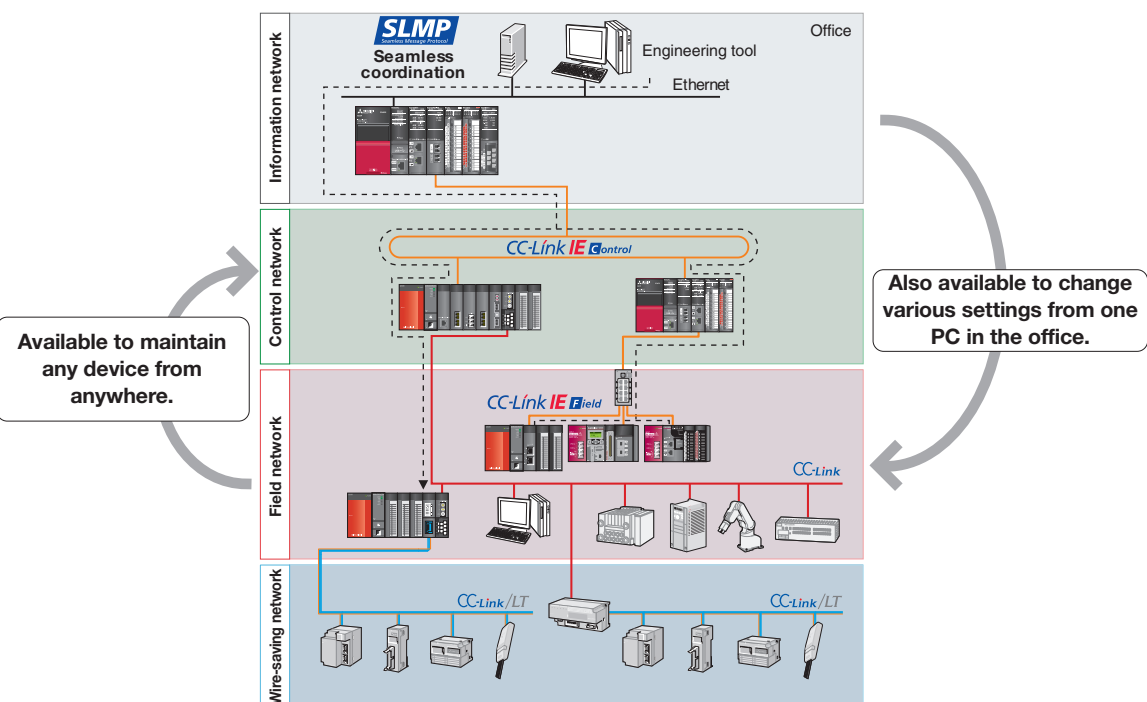
Maintenance technician
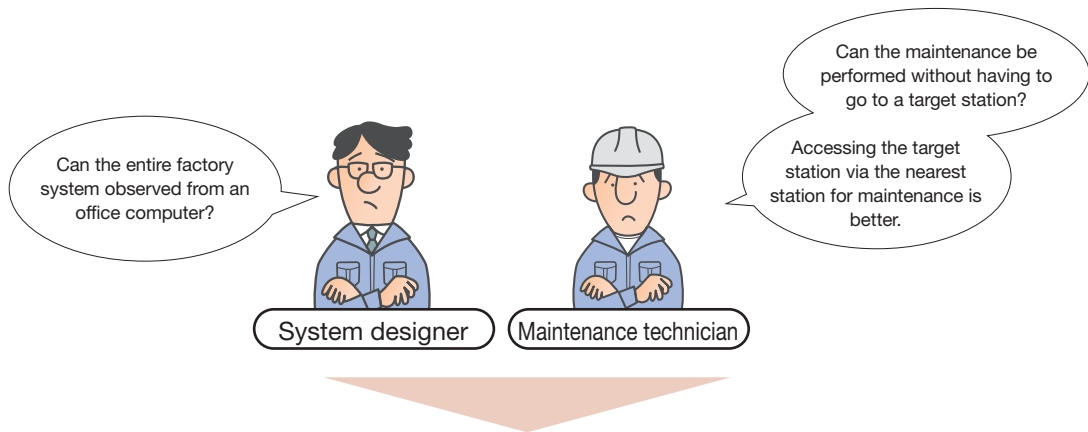
CC-Línk IE Field makes it possible
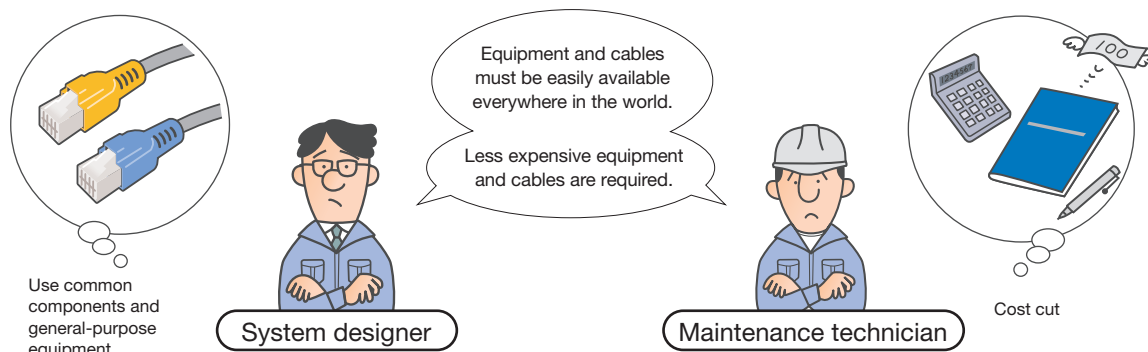
Seamless connectivity

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. Everything from the field equipment to the upper level information system is accessible from any point on the network.

Available to maintain any device from anywhere.

Also available to change various settings from one PC in the office.

CASE 6

Cut costs by using commercially available Ethernet equipment

Use common components and general-purpose equipment.

Equipment and cables must be easily available everywhere in the world.

Less expensive equipment and cables are required.

Cost cut

System designer

Maintenance technician

CC-Link IE Field makes it possible

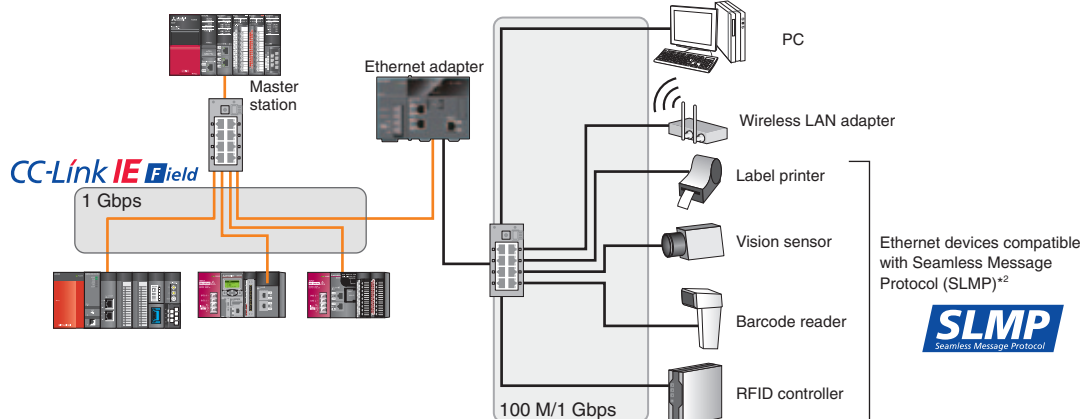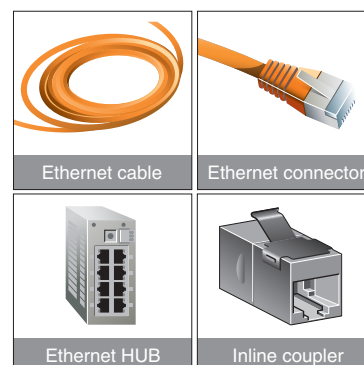Ethernet-based

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.

Ethernet cable

Ethernet connector

Ethernet HUB

Inline coupler

CC-Link IE Field

1 Gbps

Master station

Ethernet adapter

PC

Wireless LAN adapter

Label printer

Vision sensor

Barcode reader

RFID controller

Ethernet devices compatible with Seamless Message Protocol (SLMP)[2]
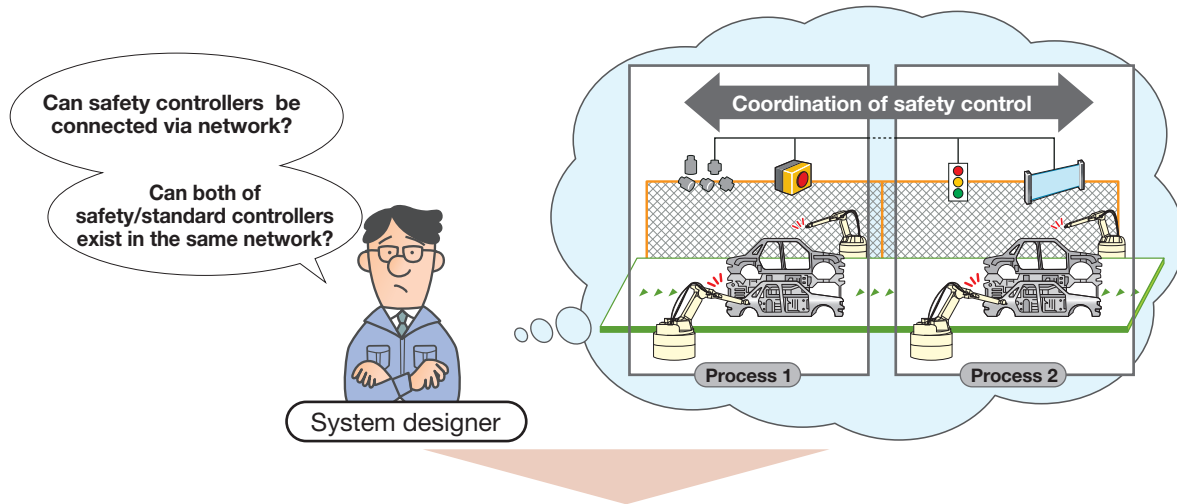
SLMP
Seamless Message Protocol

100 M/1 Gbps

*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.

CC-Link IE Field Network

CC-Link IE Control Network

Support

List of compatible products

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CASE 7

Process coordination is realized with safety control signals transmitted via network

Can safety controllers be connected via network?

Can both of safety/standard controllers exist in the same network?

System designer

Coordination of safety control

Process 1   Process 2

CC-Link IE Field makes it possible

Safety communication function

Safety communication function
Process coordination realized with safety control signals transmitted via network
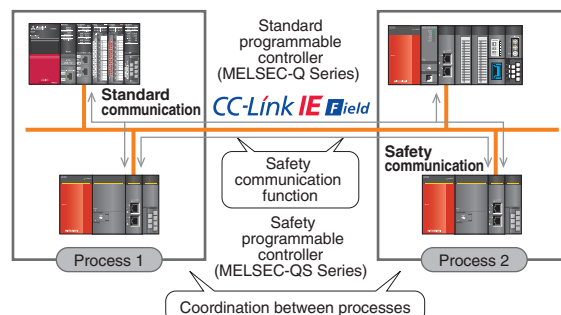
Safety communication function, which has been added to CC-Link IE Field Network, enables safety information to be shared between two or more safety programmable controllers.
By using this safety communication function, a safety stop of one safety programmable controller can trigger the proceeding and subsequent safety programmable controllers to be stopped.

CC-Link IE Field

Safety communication function

Safety programmable controller (safety control)

Safety programmable controller (safety control)

CC-Link Safety

CC-Link Safety

Standard input   Safety input   Standard output   Safety input   Safety output

E-Stop switch
Restart switch
Warning light
Light curtain
Robot

Process 1   Process 2
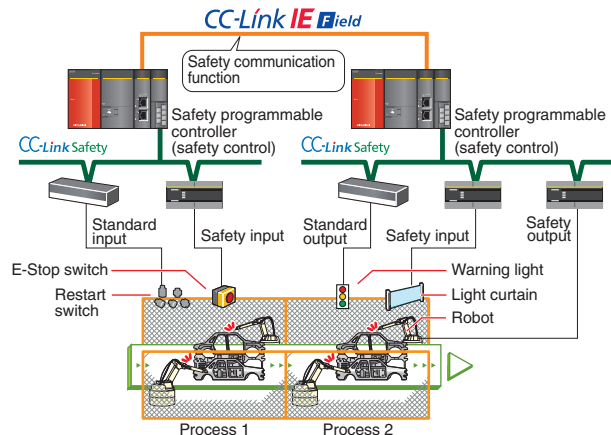
Safety communication function
Safety and standard communication on the same network

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.
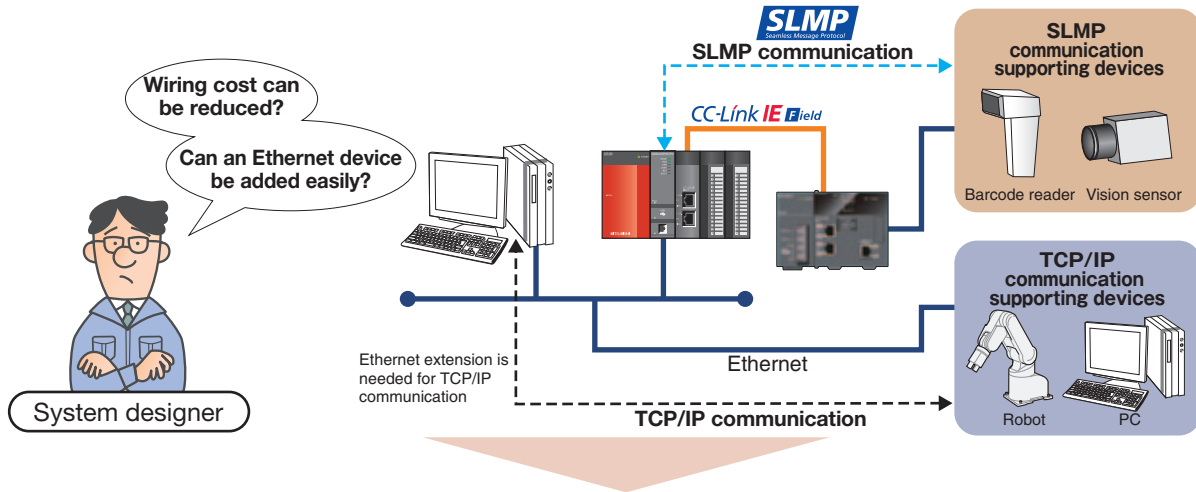
Standard programmable controller (MELSEC-Q Series)

Standard communication

CC-Link IE Field

Safety communication function

Safety communication

Safety programmable controller (MELSEC-QS Series)

Process 1   Process 2

Coordination between processes

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

CASE 8

Field devices and motion control devices connected to the same network

Traverse pillow packaging system

Can a servo amplifier be used in the same network with field devices (remote I/O, sensor, etc)?

Wiring should be simple and flexible in accordance with the facility layout.

System designer

Network 1

Network 2

CC-Línk IE Field makes it possible

Motion control
Synchronized communication

Synchronized communication function supporting Simple motion module

Synchronized communication for motion control and standard communication on the same network

Simple motion module can communicate with servo amplifiers and field devices (remote I/O, sensor, etc.) via a single network.

Interpolation control and synchronous control can be performed with simple parameter settings and startups using control programs.

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.

Simple motion module (QD77GF16)

Master station for CC-Link IE Field Network

External command signal (4-point) Emergency stop input (24 V DC)

Connect either manual pulse generator (MR-HDP01) or incremental synchronous encoder

Servo amplifier with Motion (MR-J4-B-RJ010)
Interface unit (MR-J3-T10)

Synchronized communication between up to 16 amplifiers.

Setting software

MELSOFT **GX Works2**
Simple motion module setting tool incorporated as standard

MELSOFT **MR Configurator2**
Software to support all steps from servo amplifier startup to maintenance

CC-Línk IE Field

Rotary servomotor

Max. 104 modules

Inverter | Remote I/O module | Head module | Analog module | HMI

CC-Link

Remote I/O module | Sensor

Bridge module | High-speed counter module

CC-Link

CC-Link CC-Link/LT bridge module | Remote I/O module | PC | Inverter | CC-Link—AnyWire DB A20 bridge module / CC-Link—AnyWire Bitty bridge module

CC-Link/LT

Anywire DB A20 Anywire Bitty

I/O module | Sensor

Seamlessly connect to TCP/IP communication supporting devices

SLMP
Seamless Message Protocol

SLMP communication

CC-Link IE Field

SLMP communication supporting devices

Barcode reader   Vision sensor

Wiring cost can be reduced?

Can an Ethernet device be added easily?

System designer

Ethernet extension is needed for TCP/IP communication

Ethernet

TCP/IP communication supporting devices

Robot   PC

TCP/IP communication

CC-Link IE Field makes it possible

Seamless connectivity

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.

SLMP
Seamless Message Protocol

SLMP communication

PC (host server)

MELSEC iQ-R/L/Q CPU *1 *4
Master/local module *2 *4

Ethernet adapter unit *3

Ethernet   CC-Link IE Field   **Ethernet**

Ethernet supporting devices

SLMP communication supporting devices

Barcode reader   Vision sensor

Combine two networks into one!

Reduce costs with simple wiring!

TCP/IP communication supporting devices

Robot   PC

TCP/IP communication

Seamlessly connect to TCP/IP devices via CC-Link IE Field Network.

Models 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.

CC-Línk IE Field

CASE 10

Avoiding failure of the entire network

Prevent system failures.

Keep the communication during error.

System designer

Maintenance technician

Problem occurrence

Master station · Slave station · Slave station · Slave station

Slave station · Slave station · Slave station · Slave station

When a problem occurs at the master station, usually the slave station also stops communicating…
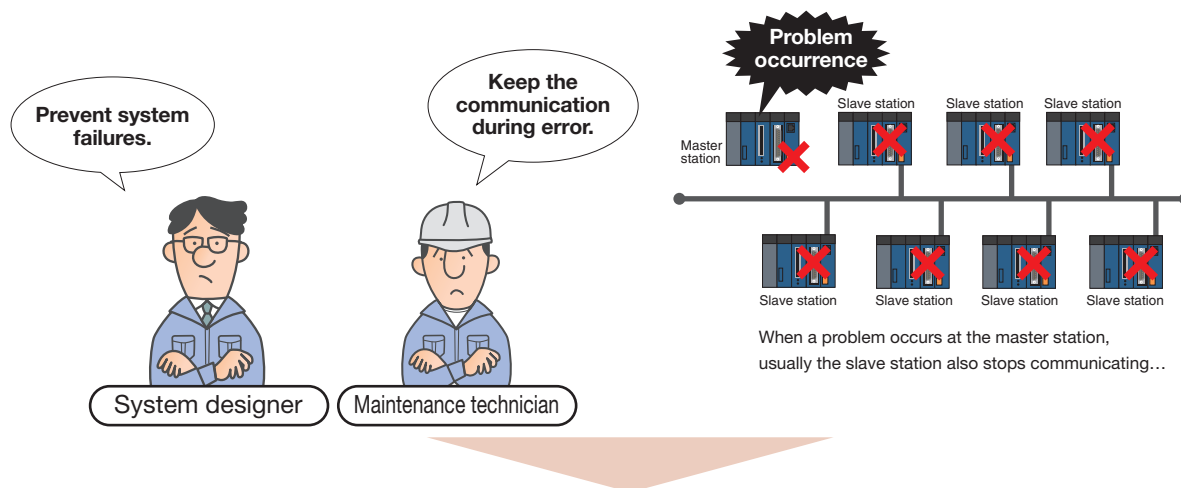
CC-Línk IE Field makes it possible

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.

① **Master station is running normally ↓ Problem occurs ↓ Master station stops**

② **Shift network control rights (master operation)**

③ **Sub-master station continues data link**

Problem occurrence Master station

Sub-master station

Prevent a system failure!

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Network examples
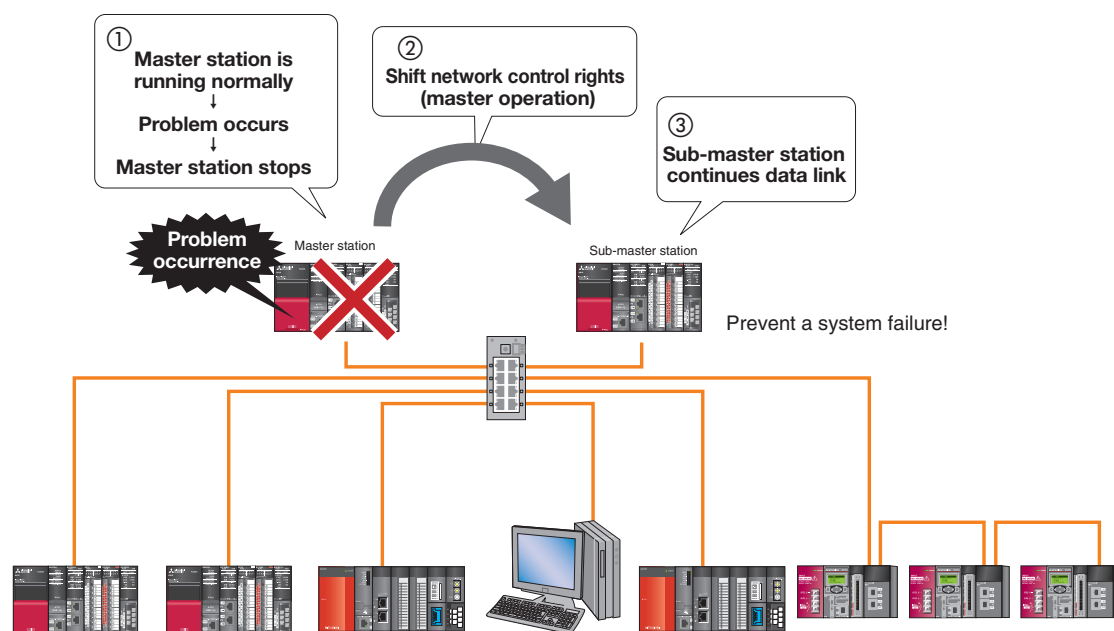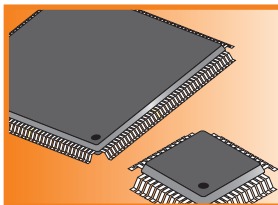
Semiconductor production system

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.

The entire system can easily be monitored and controlled from a central location thanks to seamless communication.

Main control box

Main controller (master station)

HUB

Chamber replacement and maintenance are easy with Ethernet wiring.

Choose a network topology that best matches the arrangement of devices in the system.

Quickly create high speed connections between controllers in each chamber

CC-Link IE Field

CC-Link

Inverter   Valve control   Remote I/O   Servo   Analog I/O

Chamber control box

RF power supply   RF power supply

Power control box

Many different kinds of CC-Link compatible products can be used.

CC-Link IE Field Network remote I/O stations allow L Series I/O modules to be used without the need for CPU modules.

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.

The entire system can easily be monitored and controlled from a central location thanks to seamless communication.

It is easy to collect detailed information about each process for traceability purposes.

The wiring design is flexible to match the network structure and devices.

Star and line topologies can be mixed.

Easily connect additional equipment.

Master station

HUB

CC-Link IE Field

Star topology

Line topology

| Power train machining | Power train assembly | Pressing | Welding | Coating | Final assembly |

Network examples

Support for production line safety (car welding line)

Coordination between safety processes — Control safety applications that require coordination between processes.

Simultaneously perform general communications — General information transfer and safety control can be performed on the same network.

Compatibility with CC-Link Safety — A wide range of equipment supporting CC-Link Safety.

Process 1
Standard programmable controller

Process 2
Standard programmable controller

Process n
Standard programmable controller

Safety communication function

CC-Link IE Field

Standard programmable controller and Safety programmable controller can utilize the same network.

Standard programmable controller and Safety programmable controller can utilize the same network.

Standard programmable controller and Safety programmable controller can utilize the same network.

Safety signals are transferred via the network.

Safety signals are transferred via the network.

Safety programmable controller

Safety programmable controller

Safety programmable controller

CC-Link Safety

Safety input — E-Stop switch

Standard input — Restart switch

Safety input — Light curtain

Standard output — Warning lamp

Safety output — Robot

Safety output — Robot

Body welding line

Product lineup

CC-Link IE Field Network master/local module (multi-network compatible)
RJ71EN71

- 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.

■ 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.

Ethernet port (P1)
Ethernet port (P2)
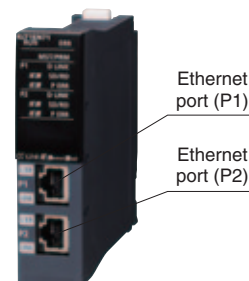
RJ71EN71

CC-Link IE Field Network master/local module
RJ71GF11-T2 / 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 programming.
- The network can ensure 32-bit 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.

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

QJ71GF11-T2   QS0J71GF11-T2
RJ71GF11-T2   LJ71GF11-T2

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

- 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[1]

LJ72GF15-T2

- A remote station can be configured by connecting MELSEC-L Series I/O or intelligent function module to this head module.
- Create remote I/O station appropriate to the application while maintaining the flexibility. Save on wiring costs by bringing several remote I/O modules together as a single station.
- Access to other stations by way of remote I/O stations is possible, thus increasing the effectiveness of Engineering tools.
- Errors in the I/O or intelligent function module can be saved in the history, making troubleshooting easy.
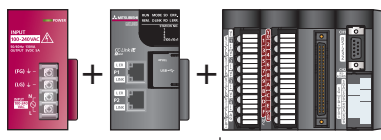
Mix and match up to 10 L Series I/O modules and intelligent function modules per station.

*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 extension module to extend the number of I/O points.
- Simple motion control is supported with the synchronized communication function.[3]
  By synchronizing with the master station (simple motion module), slave stations can perform highly-accurate synchronous operations.

*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) NZ2GF2B-60TCTT4 and NZ2GF2B-60TCRT4 are not supported.

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 terminal block type   Synchronized communication

Model		Input type	Input points	Rated input voltage/current	Wiring type	Extended module
NZ2GF2B1N-16D	DC	Positive/negative common shared	16 points	24 V DC (6 mA)	1-wire	Connectable
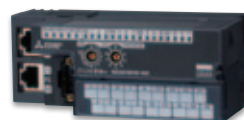
NZ2GF2B1N-16D

Sensor connector (e-CON) type   Synchronized communication

Model		Input type	Input points	Rated input voltage/current	Wiring type	Extended module
NZ2GFCE3-16D	DC	Positive common	16 points	24 V DC (4 mA)	3-wire	Connectable
NZ2GFCE3-16DE	DC	Negative common	16 points	24 V DC (4 mA)	3-wire	Connectable
NZ2GFCE3-32D NEW	DC	Positive common	32 points	24 V DC (4 mA)	3-wire	Connectable

NZ2GFCE3-16D

MIL connector type   Synchronized communication

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

NZ2GFCM1-16D

Spring clamp terminal block   Synchronized communication

Model		Input type	Input points	Rated input voltage/current	Wiring type	Extended module
NZ2GF2S1-16D NEW	DC	Positive/negative common shared	16 points	24 V DC (6 mA)	1-wire	Connectable
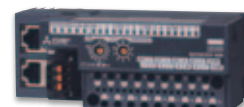
NZ2GF2S1-16D

Transistor output module

- Cumulative contact ON times can be easily confirmed with the dedicated function.
- High-speed I/O control is realized with the Fast logic function.

18-point terminal block type

Synchronized communication

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

NZ2GF2B1N-16T

Sensor connector(e-CON) type

Synchronized communication

Model	Output type		Output points	Rated load voltage/Max. load current	Wiring type	Extended module
NZ2GFCE3-16T	Transistor output	Sink type	16 points	12/24 V DC (0.5 A)	3-wire	Connectable
NZ2GFCE3-16TE	Transistor output	Source type	16 points	12/24 V DC (0.5 A)	3-wire	Connectable
NZ2GFCE3-32T NEW	Transistor output	Sink type	32 points	12/24 V DC (0.5 A)	3-wire	Connectable

NZ2GFCE3-16T

MIL connector type

Synchronized communication

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

NZ2GFCM1-16T

Spring clamp terminal block

Synchronized communication

Model	Output type		Output points	Rated load voltage/Max. load current	Wiring type	Extended module
NZ2GF2S1-16T NEW	Transistor output	Sink type	16 points	12/24 V DC (0.5 A)	1-wire	Connectable
NZ2GF2S1-16TE NEW	Transistor output	Source type	16 points	12/24 V DC (0.5 A)	1-wire	Connectable

NZ2GF2S1-16T

I/O combined modules

- The I/O combined module performs the control of input and output modules, all in one 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.
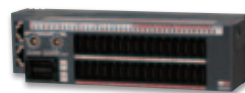
NZ2GFCE3-32DT

Sensor connector (e-CON) type

Synchronized communication

Model	Input type		Input points	Rated input voltage/current	Output type		Output points	Rated load voltage/Max. load current	Wiring type	Extended module
NZ2GFCE3-32DT NEW	DC input	Positive common	16 points	24 V DC (4 mA)	Transistor output	Sink type	16 points	12/24 V DC (0.5 A)	3-wire	Connectable

Analog input/output module

- The conversion speed of the analog input module is selectable from 100 µs/channel, 400 µs/channel, and 1ms/channel.
- The conversion speed of the analog output module is 100 µs/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 terminal block type

Synchronized communication

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

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 terminal block type

Model	Input/Output type	Occupied station	Number of channels	Extended module
NZ2GF2B-60TCTT4	Thermocouple input, transistor output, isolation between input channels	1 station	4 channels	Not connectable
NZ2GF2B-60TCRT4	Resistance thermometer input, transistor output, isolation between input channels	1 station	4 channels	Not connectable

NZ2GF2B-60TCTT4

High-speed counter module

- Counting speed of 8 Mpps max. The duty ratio of the PWM output function can be set by 0.1 μs unit, and this enables precise output control.
- The pulse measurement function with 100 ns measurement resolution enables highly accurate pulse width measurement.

40-pin connector type

Synchronized communication

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

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.
- When connected to an analog input module, it can be used to receive external signals for A-D conversion sampling timing control (sampling trigger adjustment).
- Extend to the high-speed counter module, the Cam switch function provides ON/OFF control at an accurate cycle.

18-point terminal block type

Model	Input type		Input points	Rated input voltage/current	Wiring type
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 type
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

Spring clamp terminal block

Model	Input type		Input points	Rated input voltage/current	Wiring type
NZ2EX2S1-16D NEW	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 type
NZ2EX2S1-16T NEW	Transistor output	Sink type	16 points	12/24 V DC (0.5 A)	1-wire
NZ2EX2S1-16TE NEW	Transistor output	Source type	16 points	12/24 V DC (0.5 A)	1-wire
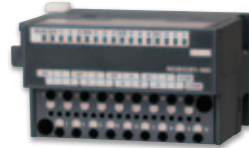
NZ2EX2S1-16D

- 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.

Extension digital I/O modules can connect to analog I/O modules.

Remote I/O module
Analog input/output module
High-speed counter module

Extension module

Remote input module
Remote output module
Analog input module
Analog output module
High-speed counter module

Extension input module
Extension output module

Select switch — Photoelectric sensor
Input signal

High-speed response according to the conditions.

CC-Link IE Field

Two input signal with 'AND'[*1] setting is output.

Output signal
Liquid coating equipment
Photoelectric sensor

*1) Output with 'OR' is also possible.

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 μs/channel, 400 μs/channel, or 1 ms/channel. (Conversion speed switch function)
- The conversion speed of the analog output module is 100 μs/channel.
- This can be connected to the analog I/O modules (NZ2GF2BN-60AD4, NZ2GF2BN-60DA4).

18-point terminal block type

Model	Input/Output type	Number of channels
NZ2EX2B-60AD4	Voltage/current analog input	4 channels
NZ2EX2B-60DA4	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 PCI Express® supporting 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.
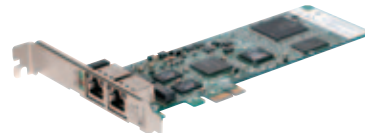
CC-Link IE Field Network interface board

PCI bus

Q80BD-J71GF11-T2

- Q80BD-J71GF11-T2 is compatible with PCI bus. It allows the connection of a PCI supporting 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		Windows® supported personal computer
	CPU	System requirements of the operating system must be met
	Required memory	
	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® 2010 Visual Basic® Microsoft® Visual Studio® 2005 Visual Basic®*5 Microsoft® Visual Studio® 2012 Visual Basic® Microsoft® Visual Studio® 2008 Visual Basic®*5
		Microsoft® Visual Studio® .NET 2003 Visual C++® Microsoft® Visual Studio® 2010 Visual C++® Microsoft® Visual Studio® 2005 Visual C++® Microsoft® Visual Studio® 2012 Visual C++® Microsoft® Visual Studio® 2008 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.
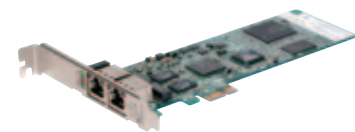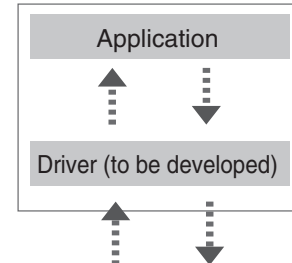
Reference manual for the development of the network interface board driver

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®

Application

↕

Driver (to be developed)

↕

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

Source code development for CC-Link IE Field Network

- The items shown on the right support development of CC-Link IE Field Network master stations without considering protocol.*1
- CP210 is a communication LSI dedicated to CC-Link IE Field Network master stations.
- CP210 supports cyclic transmission of up to 16384 bits (per RX/RY) and up to 8192 words (per RWr/RWw) in addition to transient transmission. CP210 supports line, star, and line and star mixed topologies.*2
- Other parts can be freely selected with the source code customizable according to the PCB hardware specifications and applications.
- The source code CD-ROM contains C language source codes and circuit diagram examples (PDF format) useful in reducing the program development time and cost.

*1) Does not support local station development.
*2) Does not support the ring topology.

Source code

Manual
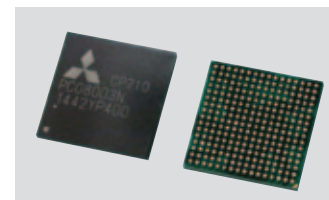
Dedicated Communication LSI

Type	Model
Source code development CD-ROM	SW1DNC-EFI210SRC

Type	Model	Packaging Unit	Outline
Dedicated communication LSI CP210	NZ2GACP210-60	60 pieces	CC-Link IE Field Network Master Station Communication LSI CP210 Plastic BGA (ball grid array), 17x17 mm, 256 pins (16x16)
	NZ2GACP210-300	300 pieces	

Type	Manual No.	Manual Name
Reference manual	SH(NA)-081455ENG	CC-Link IE Field Network Source Code Development Master Station Communication LSI CP210 Reference Manual

For price and other details, please contact your sales representative. Membership to CC-Link Partner Association (CLPA) is required for the purchase. (Regular, executive, or board membership)
CC-Link Partner Association URL: http://www.cc-link.org

The license agreement must be signed prior to using this product.
For hardware/software development, a referral to a partner is available on request.
Mitsubishi Electric Open System Center supports product development involving source code development.
Contact: Open System Center, Mitsubishi Electric Corporation, Nagoya Works
E-mail: OSC@rj.MitsubishiElectric.co.jp

CC-Línk IE Field

Dedicated Communication LSI
CP220

- The items shown on the right support development of CC-Link IE Field Network products without considering protocol.
- CP220 is a dedicated communication LSI for intelligent device stations of CC-Link IE Field Network.
- CP220 supports 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-performance MPUs as well.
- The CD-ROM that comes with the reference manual includes C-language sample codes and circuit examples (PDF), helping to reduce development time and costs.
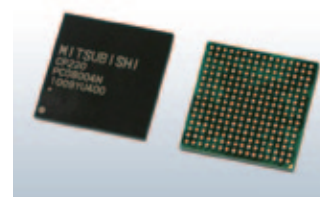
Dedicated Communication LSI

Reference manual (CD-ROM)

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

Type	Manual No.	Manual Name
Reference manual	SH(NA)-081017ENG	CC-Link IE Field Network Intelligent Device Station Communication LSI CP220 Reference Manual

For price and other details, please contact your sales representative. Membership to CC-Link Partner Association (CLPA) is required for the purchase. (Regular, executive, or board membership)
CC-Link Partner Association URL: http://www.cc-link.org

For hardware/software development, a referral to a partner is available on request.
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.
- The remote buffer memory[3] of this module can check the status of CC-Link.

*3) 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

- 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 models GT27, GT16, GT15

CC-Link IE Field Network option card for FR-A800 Series Inverter
FR-A8NCE

- The CC-Link IE Field Network plug-in option card could be installed inside a FR-A800 Series inverter module.
- With ultra high-speed communication, various inverter functions could be monitored at a fast rate. 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 the host IT system.
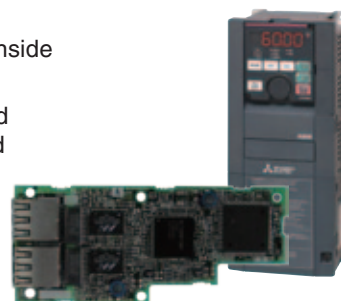
CC-Link IE Field Network interface module for general-purpose AC Servo MELSERVO-J3/J4 Series
MR-J3-T10

- The MR-J4-B-RHJ010 servo amplifier coupled with MR-J3-T10 interface module supports motion control from the QD77GF16 simple motion module via 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

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 0.2 m, and 1 m increments from 1 m to 45 m.

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 core wires	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) "□" in the model name denotes a cable length (up to 100 m in 1 meter increments).

*2) "□" in the model name denotes a 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
- Operates in an ambient temperatures of 0 to 50°C, with fan less configuration.
- By being compatible with DIN rail, the hub can be installed in multiple orientations.
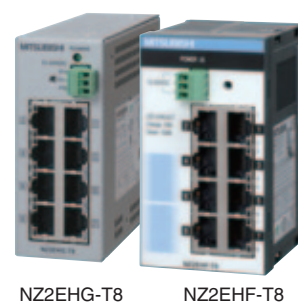
NZ2EHG-T8   NZ2EHF-T8

*1) NZ2EHF-T8 cannot be directly connected to CC-Link IE Field Network (for 1 Gbps). An Ethernet adapter module NZ2GF-ETB is separately required.
    NZ2EHG-T8 supports the direct connection to CC-Link IE Field Network.
*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.
- Can receive 2 systematic power supplies when there is redundant power supply.
- Supports the line, star, line and star combination network topologies.
- Complies with UL/CE standards enabling export to 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 wiring costs.
- Simply installing wireless LAN adapters makes existing FA equipment wireless.
- Being compatible with the latest security standards of WPA2/WPA, unauthorized access from outside is prevented.

*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 combination type, ring type[2]						Line type, star type, line/star combination 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 is supported by 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.

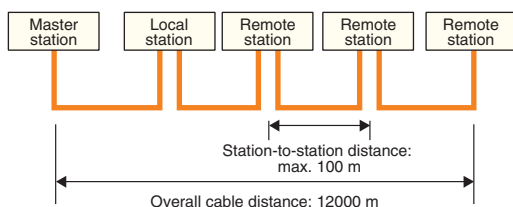For further details, please refer to the relevant product manuals.

Cable specifications

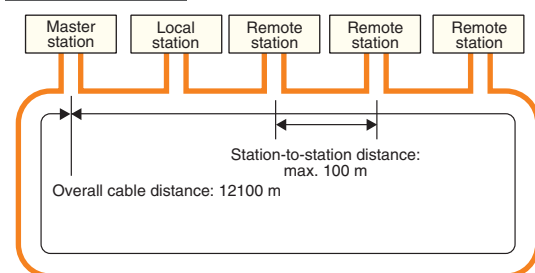| Item		Specifications
Ethernet cable		Category 5e or higher, (Double shielded/STP) Straight cable
	Standard	The cables satisfying the conditions below: • IEEE802.3 (10000BASE-T) • ANSI/TIA/EIA-568-B (Category 5e)
	Connector	RJ-45 connector with shield

Please use the cables recommended by CC-Link Partner Association for CC-Link IE Field Network.
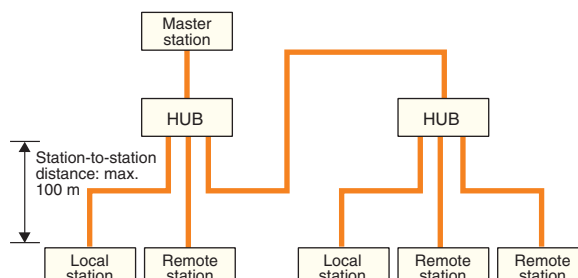
Network topology examples

Line topology

| Master station | Local station | Remote station | Remote station | Remote station |

Station-to-station distance: max. 100 m

Overall cable distance: 12000 m

Star topology

| Master station |

| HUB | | HUB |

Station-to-station distance: max. 100 m

| Local station | Remote station | | Local station | Remote station | Remote station |

Ring topology

| Master station | Local station | Remote station | Remote station | Remote station |

Station-to-station distance: max. 100 m

Overall cable distance: 12100 m

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 distributer.

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		Frequency	Acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5…8.4 Hz	–	3.5 mm	10 times each in X, Y, Z directions
			8.4…150 Hz	9.8 m/s^2	–	
		Under continuous vibration	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]	0...2000 m[*7]				
Installation location	Inside a control panel				
Overvoltage category[*4]	MELSEC iQ-R: ≤ II MELSEC-Q/L: ≤ I				
Pollution level[*5]	≤ 2				
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.

For optical fiber cables

For twisted pair cables
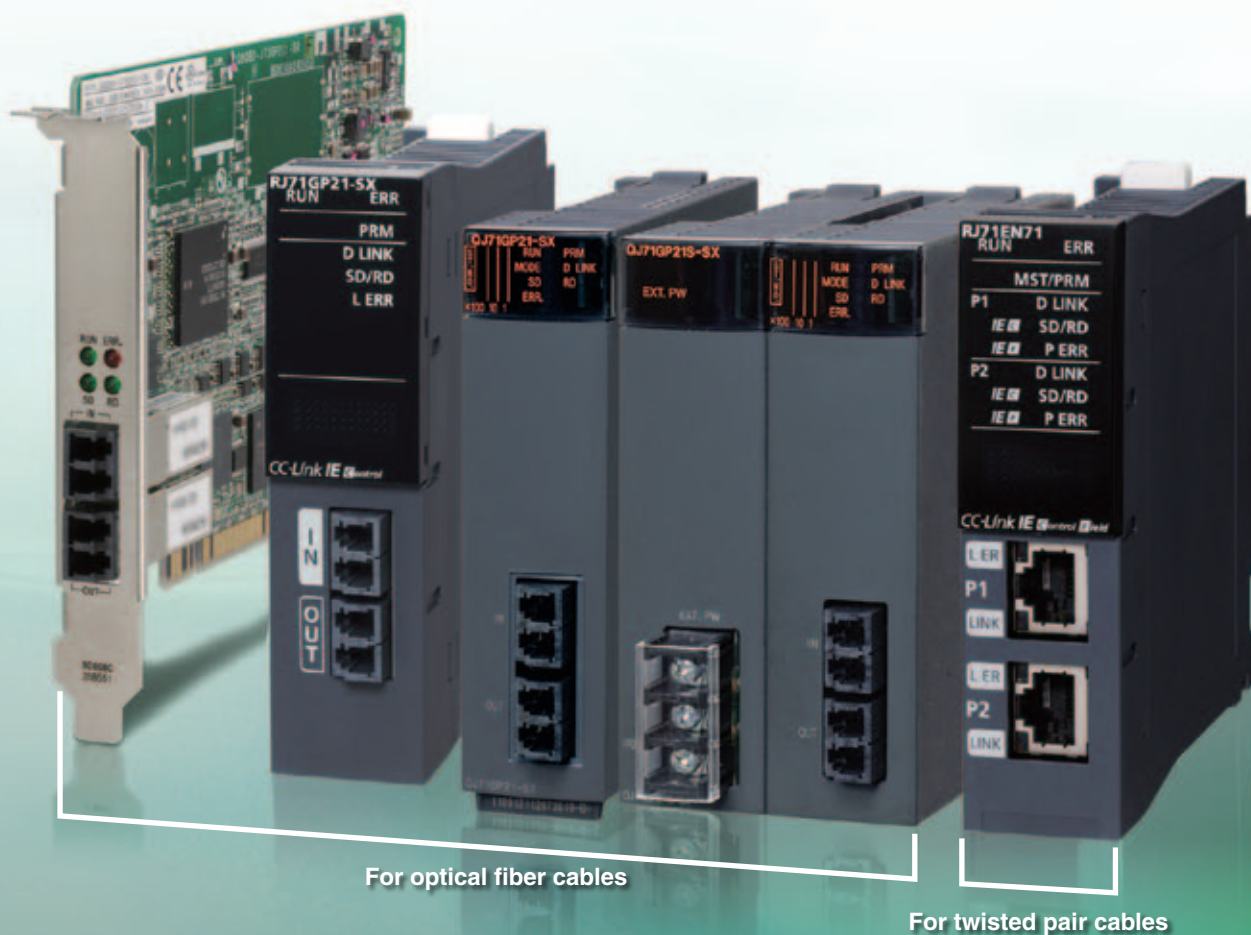
CASE 1

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

High-speed communication   Large capacity   Communication stability

Productivity of the production line and equipment must be enhanced.

More data needs to be traceable.

System designer

Amount of handling

Number of data sets

Load

Communication speed

CC-Link IE Control makes it possible

Communication speed	Maximum link registers
1Gbps	128Kwords
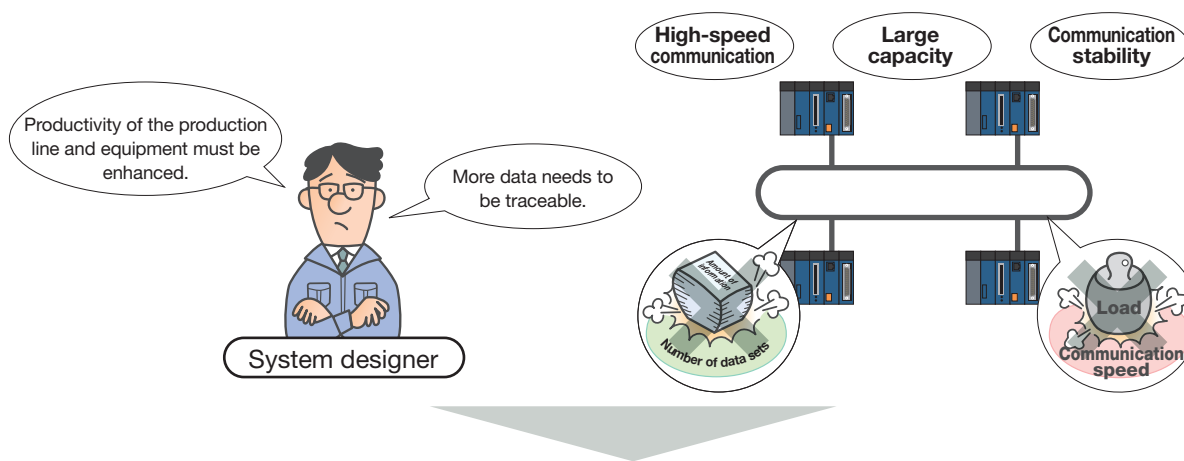
1 Gbps high-speed communication

Deterministic, reliable performance helps to reduce operating cycle

CC-Link IE Control Network is based on gigabit Ethernet technology and 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.

To the information network

1Gbps

CC-Link IE Control

> **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 16K link points per station, please use GX Works2 (Version 1.31H or later).

Cyclic communication is stable and reliable

Improved communication is achieved through a stable operating cycle

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.

Stable timing

Cyclic communication band (for I/O control)

1 Gbps (broadband)

Transient (message) communication band (for traceability and other data)
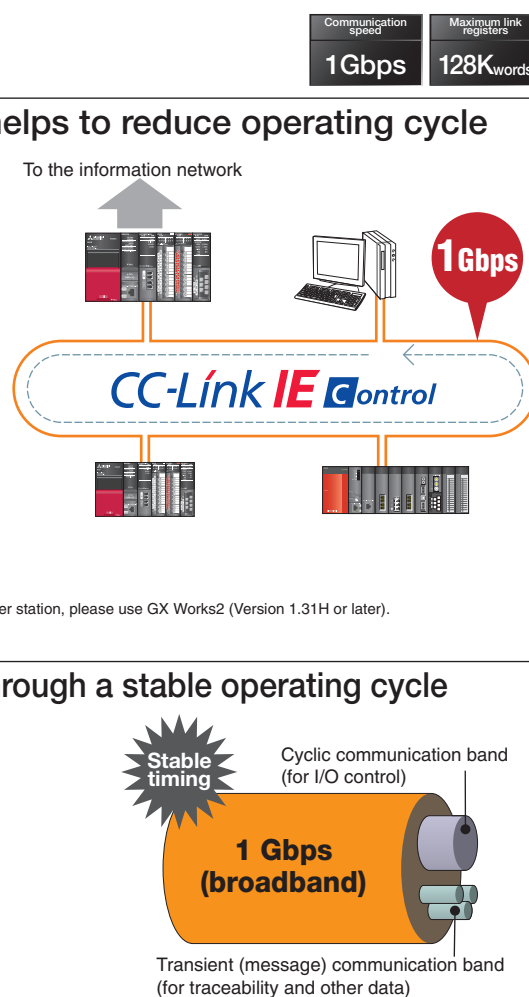
CASE 2

Dual-loop optical fiber cabling is exceptionally fault-tolerant

Noise reduction is needed.

The communication can be kept during an error?

Error

System designer | Maintenance technician

In conventional systems, if one station goes down all stations stop communication.

CC-Link IE Control makes it possible

Optical fiber cable **External power supply**
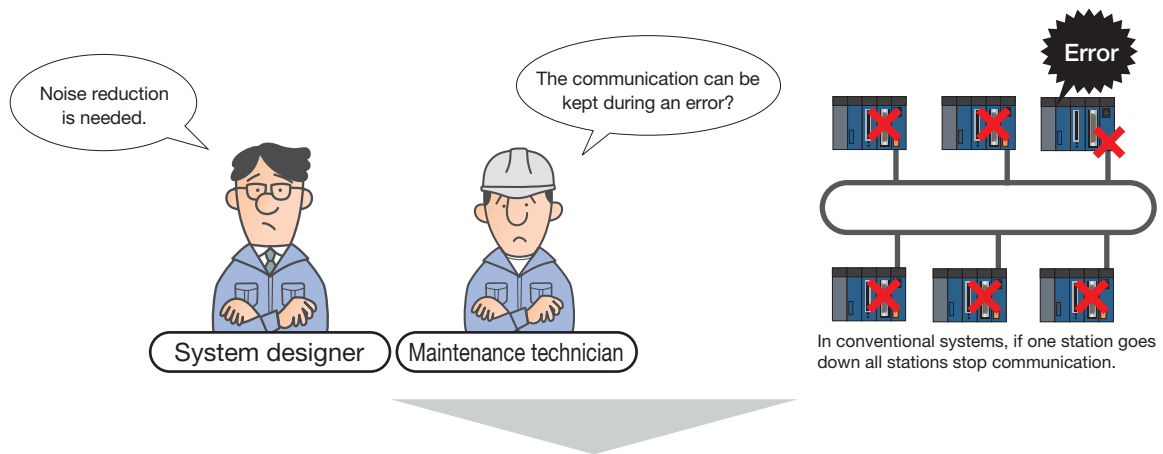
Ultra-reliable ring topology network

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

CC-Link IE Control

Loop back
Broken cable

Communication is maintained by the loop-back function.

External power supply

The external power source allows communication to continue.

External power source | External power source | External power source

Power failure of the PC

CC-Link IE Control

Power failure

External power source | External power source | External power source

Communication continues even if side stations lose power.

Power failure (2 stations)

34

CASE 3

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

A layout change of production lines is occasionally needed.

Equipment arrangement should be more flexible.

Maintenance technician

New!

Existing system

Easily integrate new equipment with the existing system

CC-Link IE Control makes it possible

Twisted pair cable | Star topology | Line topology | Ring topology

Flexible network topology

Add nodes or flexibly change the network layout

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.)

Star topology

Ring topology

Line topology

CASE 4

Wiring mistakes and errors are easily diagnosed with the engineering tool

A problem should be diagnosed fast.

Can the system automatically detect an abnormality?

Maintenance technician

Where is a problem...

OK

Error

OK

CC-Línk IE Control makes it possible

Network diagnosis at-a-glance

Easy diagnosis functions

Diagnose and troubleshoot even with little experience

Engineering tools[1] enables the user to identify network errors at a glance. The user 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.

Engineering tool

Errors are quickly identified

CC-Línk IE Control

Module error!
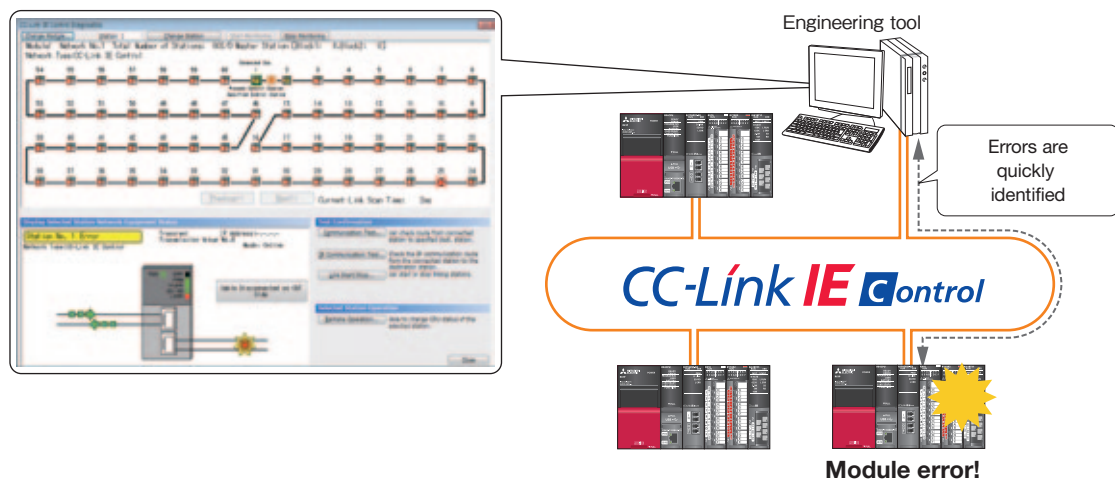
*1) MELSEC iQ-R Series is supported by GX Works3.
MELSEC-Q Series is supported by GX Works2.

Benefits of CC-Link IE Control Network

CASE 5

Cut costs by using commercially available Ethernet equipment

Equipment and cables must be easily available everywhere in the world.

Less expensive equipment and cables are required.

Use common components and general-purpose equipment.

System designer

Maintenance technician

Cost cut

CC-Link IE Control makes it possible
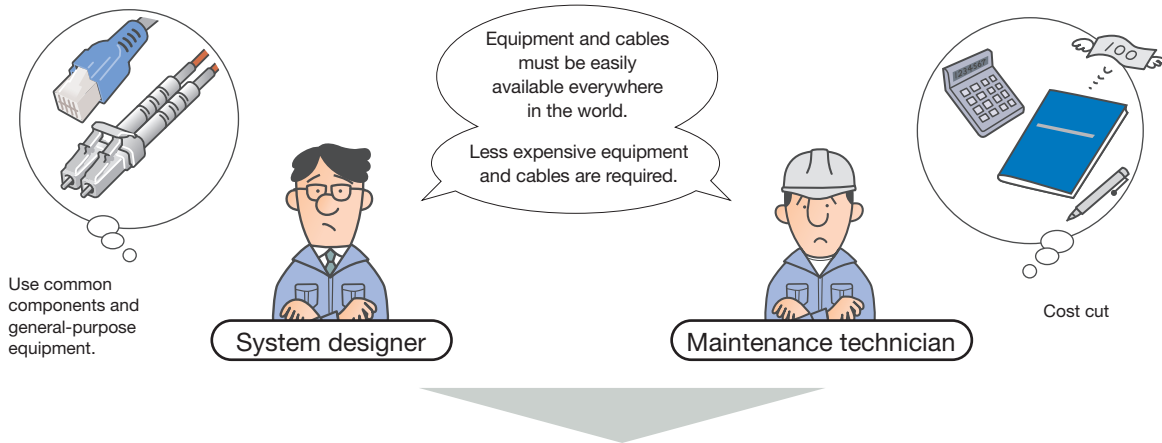
Ethernet-based

Optical fiber cable

Ethernet-based network
Built on global standards

CC-Link IE Control Network 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 cable   Ethernet connector   Relay adapter

Connections can use cable lengths up to 550 meters.

Media converter

Media converter

Multimode optical fiber cable

Factory A   **Factory B**

Media converter   Media converter

Single mode optical fiber cable

Single mode optical fiber cable

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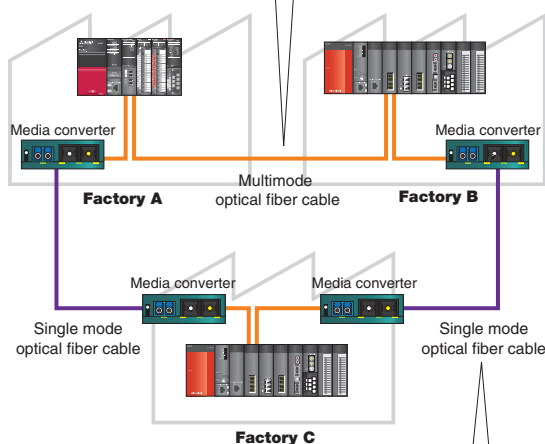
Using media converters, cable lengths up to 15 km can be used.

Relay adapter

Relay adapter

System expansion is planned.

Adding another station is easily accomplished.
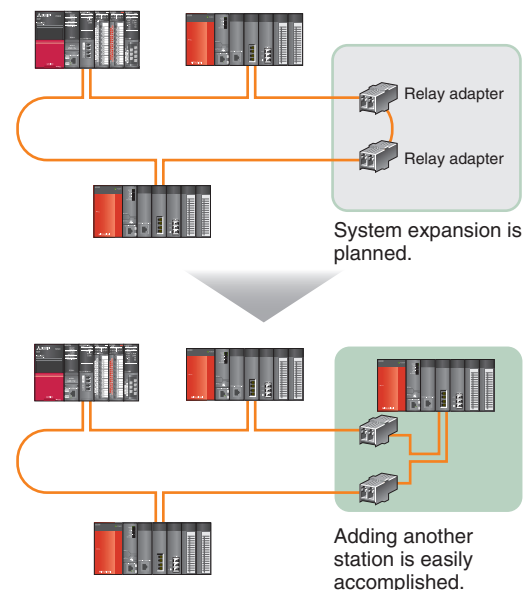
CC-Línk IE Control

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.
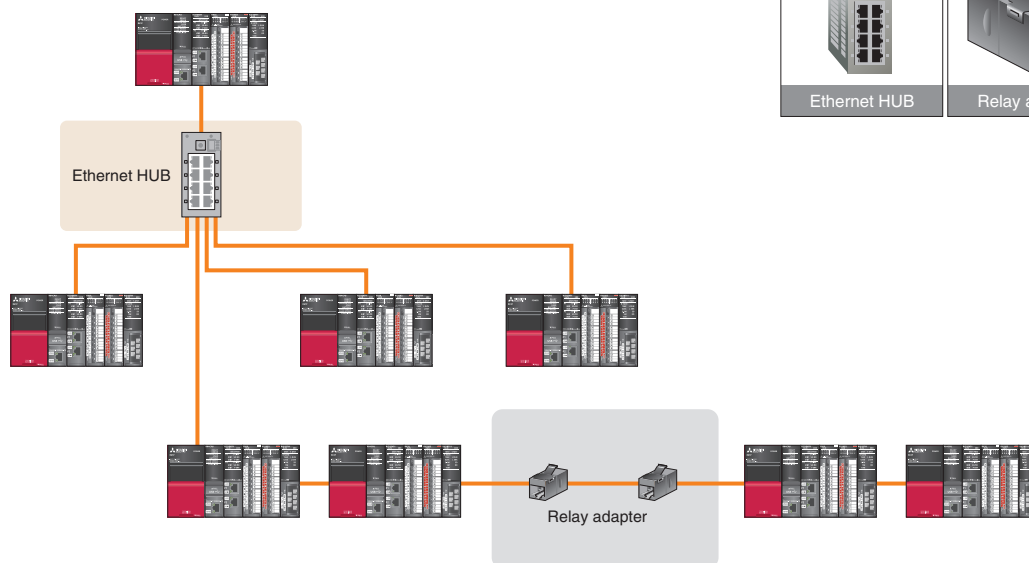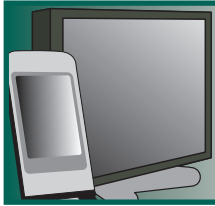
Ethernet-based | Twisted pair cable

| Ethernet cable | Ethernet connector |
| Ethernet HUB | Relay adapter |
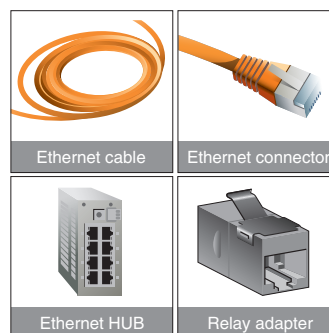
Ethernet HUB

Relay adapter

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

Large capacity
Large volume of recipe and traced data is transmitted at once with cyclic communication.

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

Upper level PC   Database server   Ethernet

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!
16K words ➡ 128K words*1

The shared memory of 128K words (LW)*1 enables the user to monitor the entire system condition.
It can also be used to collect a large amount of trace data.

1Gbps

Send recipe data   Collect traceability data

CC-Link IE Control

Washing   Exposure   Inspection   Etching   Peeling   Liquid crystal filling / assembly

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

Steel production process

Large capacity
Large volume of recipe and traced data is transmitted at once with cyclic communication (1 Gbps)

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.

Dual-loop optical fiber cable connection for high reliability

1Gbps

CC-Línk IE Control

Tracking cable

Redundant system using CC-Link IE for superior reliability

Monitor the entire system status from a PC or GOT connected to the network.

Acid cleaning   Cold rolling   Plating   Coating
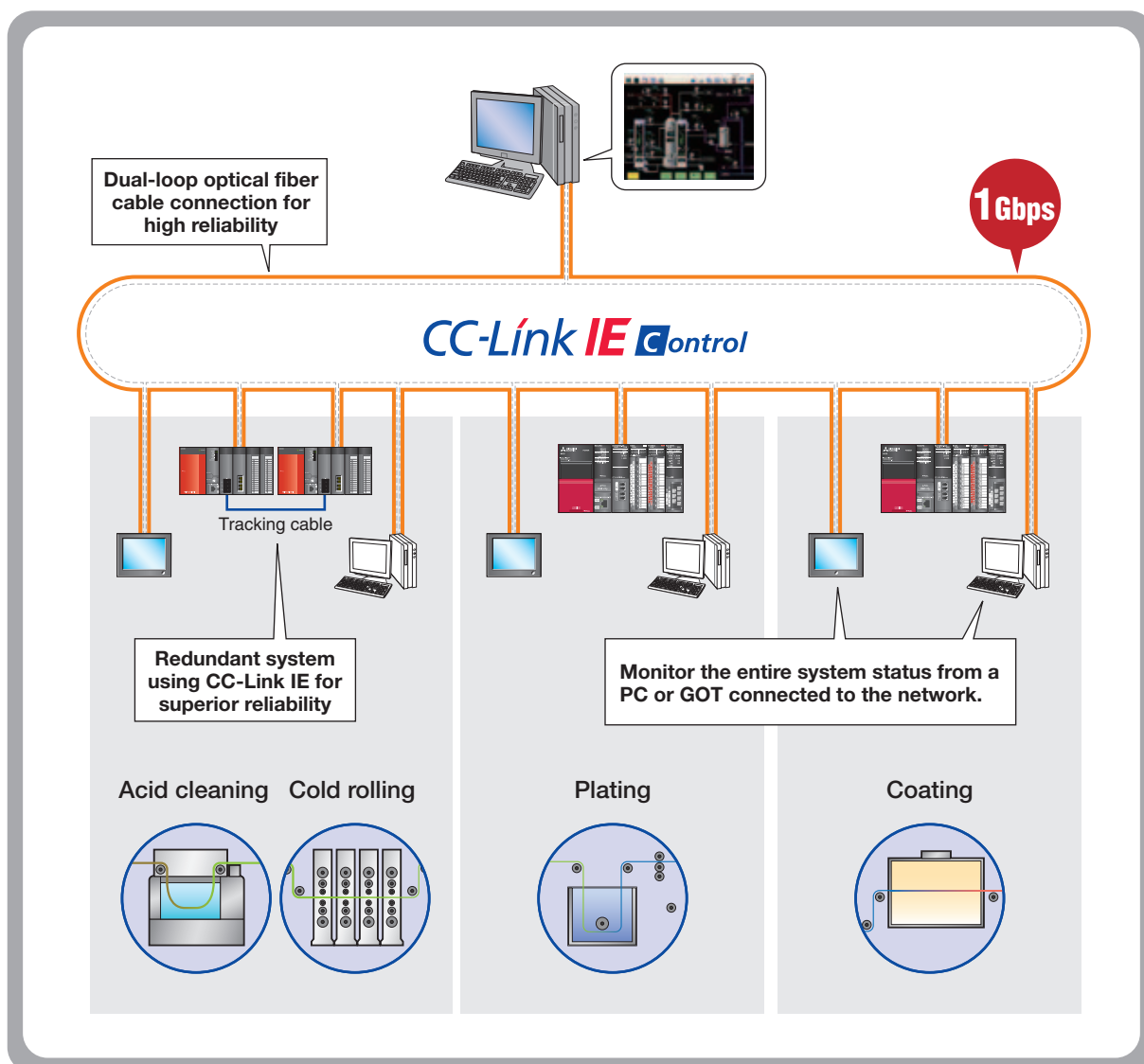
Product lineup

CC-Link IE Control Network module (multi-network compatible)

RJ71EN71

- 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.

Ethernet port (P1)
Ethernet port (P2)
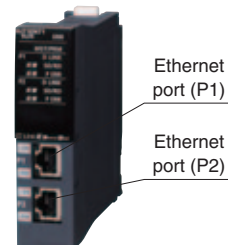
RJ71EN71

CC-Link IE Control Network module

RJ71GP21-SX / 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 32-bit data integrity using the station-based block data assurance function.
- The maximum link points per station has been increased to 128K 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]

- Connects Mitsubishi Graphic Operator Terminals to CC-Link IE Control Network.
- Operates as a normal station on CC-Link IE Control Network.

*3) Does not support Extended mode.

Compliant model·· GT27, GT16, GT15
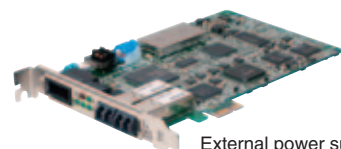
CC-Línk IE Control

CC-Link IE Control Network interface board

`PCI Express® bus`

Q81BD-J71GP21-SX / Q81BD-J71GP21S-SX

- These PCI Express® interface boards connect PC control systems to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- The interface board with the external power supply function (Q81BD-J71GP21S-SX) can continue communication while the personal computer is OFF.
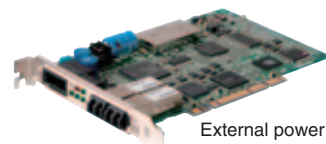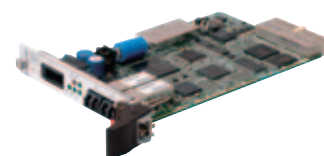
External power supply function type

CC-Link IE Control Network interface board

`PCI/PCI-X bus`

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

- These PCI/PCI-X interface boards connect PC control systems to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- The interface board with the external power supply function (Q80BD-J71GP21S-SX) can continue communication while the personal computer is OFF.

External power supply function type

*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

- These Compact PCI bus interface boards connect PC control systems to CC-Link IE Control Network.
- Can operate as the control station or a normal station.
- The interface board with the external power supply function (ECP-CLECBDS) can continue communication while the industrial computer is OFF.

External power supply function type

Network interface board operation environment

Item		Q81BD-J71GP21-SX Q81BD-J71GP21S-SX	Q80BD-J71GP21-SX Q80BD-J71GP21S-SX	ECP-CLECBD ECP-CLECBDS
Personal/ Industrial computer	CPU	Windows® supported personal computer		
	Required memory	System requirements of the operating system must be met		
	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
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.
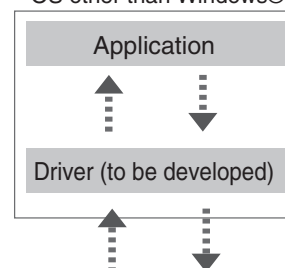
Reference manual for the development of the network interface board driver

This reference manual (used to develop hardware drivers) is provided to 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®

Application

Driver (to be developed)

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

Optical fiber cable

Produced by Mitsubishi Electric System & Service

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

- Cable types include ones to be used inside panels, indoors, outdoors, and a reinforced type for outdoor use, supporting versatile 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 the front of PLC to end of protective holder)

[1] The protective holder is dedicated 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 cores 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
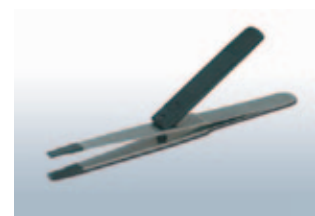

Connector insertion tool

Produced by Mitsubishi Electric System & Service

SCT-SLM

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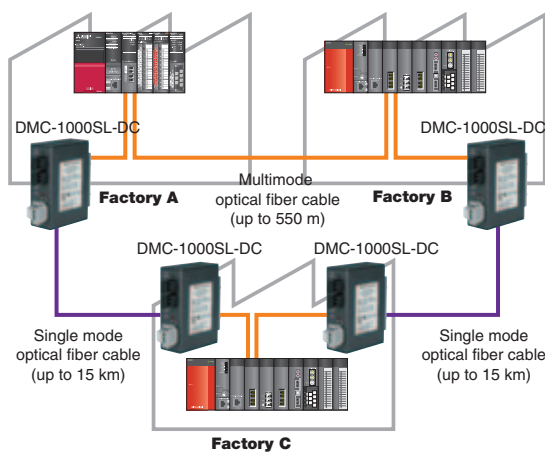
Applicable connector

LCF/LC/SC/MU connector

Optical media converter
DMC-1000SL-DC (24 V DC)

- When the station-to-station distance is greater than 550 m, two of these units with fiber-optic cables can extend the total station-to-station distance to over 15 km.
- Equipped with the link pass through function, this converter supports the network loop-back function in case of a cable disconnection.

Application example

DMC-1000SL-DC

DMC-1000SL-DC

Factory A

Multimode optical fiber cable (up to 550 m)

Factory B

DMC-1000SL-DC

DMC-1000SL-DC

DMC-1000SL-DC

Single mode optical fiber cable (up to 15 km)

Single mode optical fiber cable (up to 15 km)

Factory C

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)	1000BASE-SX compatible multi-mode optical fiber cable[1] (Band: 500 MHz·km or higher, λ=850 nm)
Compatible Cable — Connector	Duplex LC connector (IEC 61754-20)	Duplex LC connector (IEC 61754-20)
Compatible Cable — Polishing method of connector	PC, SPC, AdPC, UPC polish	PC, SPC polish
Compatible Cable — 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℃…55℃/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
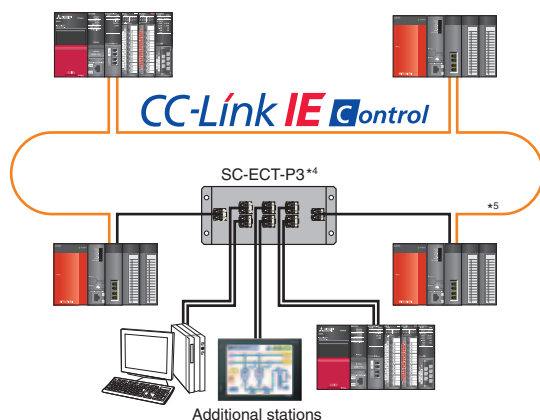
Connection terminal
SC-ECT-P3

- 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

CC-Línk IE Control

SC-ECT-P3[4]

[5]

Additional stations

Specifications

Item		Specifications
Applicable optical fiber		1000 BASE-SX (MMF)-compatible optical fiber cable
	Standard	IEC60793-2-10 Types A1a.1 (50/125 μm multimode)
	Transmission loss (max.)	≤ 3.5 dB/km (λ = 850 nm)
	Transmission band (min.)	≥ 500 MHz·km (λ = 850 nm)
	Model	QG Series[6]
Applicable optical connector		Duplex LC connector
	Standard	IEC61754-20: Type LC connector
	Connection loss	≤ 0.3 dB
	Polished face	PC polish
	Model	DLCF-G50-D2[6]
Number of possible connections		Max. 3 units
Operable environment		In board
Operable temperature/humidity range		0℃…+55℃ / 5…95% RH (no condensation)
Connection distance		Max. 150 m[7]
Installation		Screw or DIN rail
Weight		Approx. 300 g
External dimensions		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-CLECBD / 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				
	LY	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 combination 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
	Standard	The following conditioning cables: • IEEE802.3 (10000BASE-T) • ANSI/TIA/EIA-568-B (Category 5e)
Connector specifications	Standard	RJ-45 connector with shield

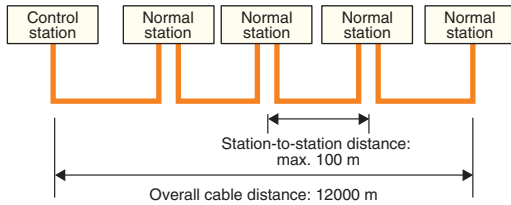For recommended cables and other information, contact CC-Link Partner Association.

Optical fiber cable

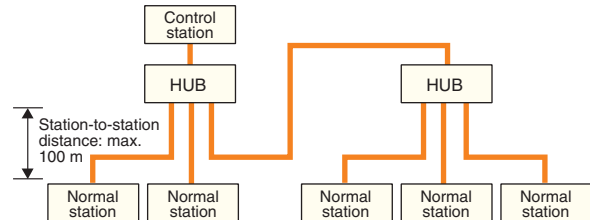| Item		Specifications
Optical fiber specifications		1000BASE-SX (MMF) optical fiber cable
	Standard	IEC 60793-2-10 Types A1a.1 (50/125µm multimode)
	Transmission loss (max.)	≤ 3.5 dB/km (λ = 850 nm)
	Transmission band (min.)	≥ 500 MHz·km (λ = 850 nm)
Connector specifications		Duplex LC connector
	Standard	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.
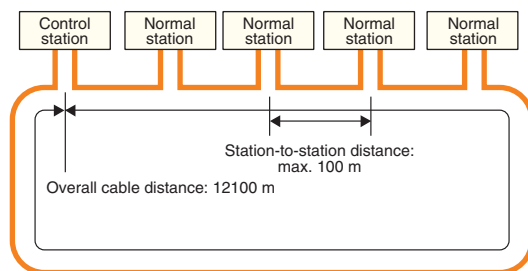
Network topology example
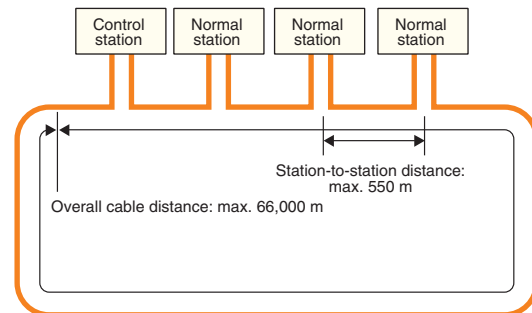
Line topology (Twisted pair cable)

Control station — Normal station — Normal station — Normal station — Normal station

Station-to-station distance: max. 100 m

Overall cable distance: 12000 m

Star topology (Twisted pair cable)

Control station

HUB   HUB

Station-to-station distance: max. 100 m

Normal station   Normal station   Normal station   Normal station   Normal station

Ring topology (Twisted pair cable)

Control station — Normal station — Normal station — Normal station — Normal station

Station-to-station distance: max. 100 m

Overall cable distance: 12100 m

Ring topology (Dual optical loop)

Control station — Normal station — Normal station — Normal station

Station-to-station distance: max. 550 m

Overall cable distance: max. 66,000 m

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 distributer.

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		Frequency	Acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5…8.4 Hz	–	3.5 mm	10 times each in X, Y, Z directions
			8.4…150 Hz	9.8 m/s^2	–	
		Under continuous vibration	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, no flammable gases, no excessive conductive dust MELSEC-Q: No corrosive gases				
Operating altitude*3	0...2000 m*7				
Installation location	Inside a control panel				
Overvoltage category*4	MELSEC iQ-R: ≤ Ⅱ MELSEC-Q: ≤ Ⅰ				
Pollution level*5	≤ 2				
Equipment class	MELSEC iQ-R: Class Ⅱ *8 MELSEC-Q: 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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㉑ Brazil Boituva FA Center
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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

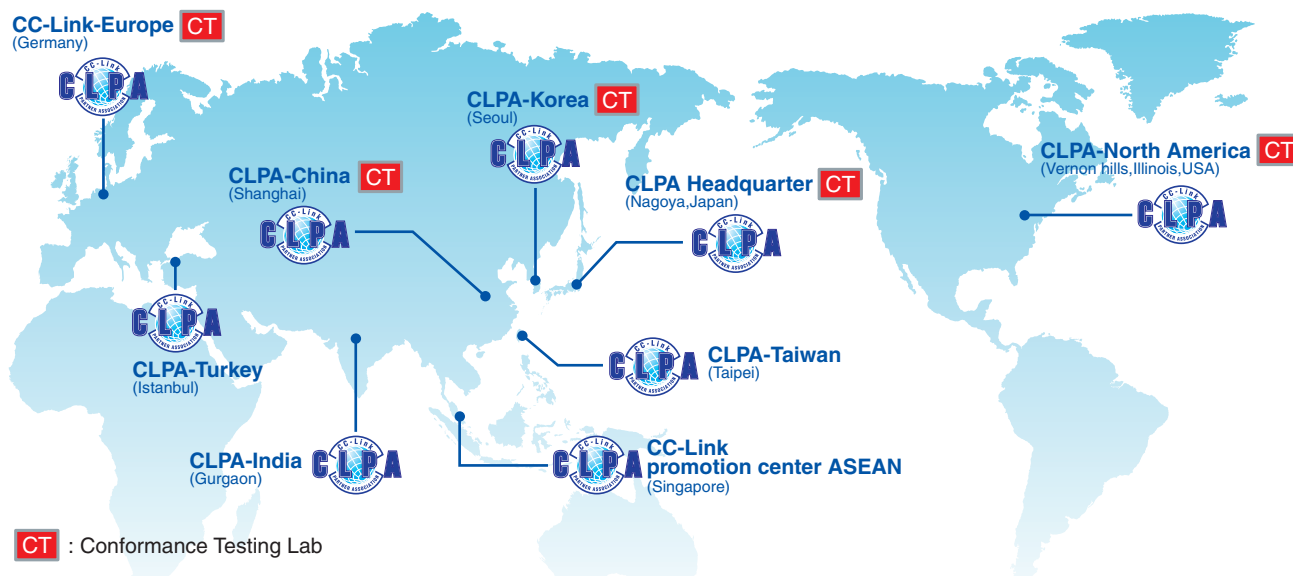### Visit the CLPA website for the latest CC-Link information.

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

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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.

CC-Link-Europe CT
(Germany)

CLPA-Korea CT
(Seoul)

CLPA-North America CT
(Vernon hills,Illinois,USA)

CLPA-China CT
(Shanghai)

CLPA Headquarter CT
(Nagoya,Japan)

CLPA-Turkey
(Istanbul)

CLPA-Taiwan
(Taipei)

CLPA-India
(Gurgaon)

CC-Link promotion center ASEAN
(Singapore)

CT : Conformance Testing Lab

Product List

CC-Link IE Field Network

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

Type		Model	Outline
Master/local module		RJ71EN71	CC-Link IE Field Network master/local station for MELSEC iQ-R Series
		RJ71GF11-T2	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	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
		NZ2GFCE3-32D **NEW**	32 points, 24 V DC, Response time: 0…70 ms, Positive common(sink type), Sensor connector (e-CON), 3-wire
		NZ2GFCM1-16D*1	16 points, 24 V DC, Response time: 0…70 ms, Positive common(sink type), MIL connector, 1-wire
		NZ2GFCM1-16DE*1	16 points, 24 V DC, Response time: 0…70 ms, Negative common(source type), MIL connector, 1-wire
		NZ2GF2S1-16D **NEW**	16 points, 24 V DC, Response time: 0…70 ms, Positive/negative common shared, 18-point spring clamp terminal block, 1-wire
	Transistor output	NZ2GF2B1N-16T	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	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
		NZ2GFCE3-32T **NEW**	32 points, 12/24 V DC (0.5 A), Sink type, Sensor connector (e-CON), 3-wire
		NZ2GFCM1-16T*1	16 points, 12/24 V DC (0.5 A), Sink type, MIL connector, 1-wire
		NZ2GFCM1-16TE*1	16 points, 12/24 V DC (0.5 A), Source type, MIL connector, 1-wire
		NZ2GF2S1-16T **NEW**	16 points, 12/24 V DC (0.5 A), Sink type, 18-point spring clamp terminal block, 1-wire
		NZ2GF2S1-16TE **NEW**	16 points, 12/24 V DC (0.5 A), Source type, 18-point spring clamp terminal block, 1-wire
	I/O combined	NZ2GFCE3-32DT **NEW**	Input 16 points, 24 V DC, Response time: 0…70 ms, Positive common (sink type) Output 16 points, 12/24 V DC (0.5 A), Sink type, Sensor connector (e-CON), 3-wire
	Analog input	NZ2GF2BN-60AD4	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	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, RTD input, 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
		NZ2EX2S1-16D **NEW**	16 points, 24 V DC, Response time: 0…70 ms, Positive/negative common shared, 18-point spring clamp 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
		NZ2EX2S1-16T **NEW**	16 points, 12/24 V DC (0.5 A), Sink type, 18-point spring clamp terminal block, 1-wire
		NZ2EX2S1-16TE **NEW**	16 points, 12/24 V DC (0.5 A), Source type, 18-point spring clamp terminal block, 1-wire
	Analog input	NZ2EX2B-60AD4	4 channels, Input: -10…10 V DC, 0…20 mA DC, Conversion speed: 100 µs/ch, 18-point terminal block
	Analog output	NZ2EX2B-60DA4	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	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 FR-A800 Series inverter		FR-A8NCE	CC-Link IE Field Network communication unit for FR-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.

Separately sold parts

Type		Model	Outline
One touch connector plug for Power supply and FG		A6CON-PW5P (35505-6080-A00 GF*3)	Core wire size of applicable cable: 0.75 mm² (0.66…0.98 mm²)(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*4, 10 pieces
		A6CON-PW5P-SOD (35505-6180-A00 GF*3)	Core wire size of applicable cable: 0.75 mm² (0.66…0.98 mm²)(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*4, 10 pieces
Online connector plug for Power supply and FG		A6CON-PWJ5P (35720-L200-A00 AK*3)	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
Cable/ accessory	Double shielded network cable	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
Industrial switching hub		DT135TX	10 Mbps/100 Mbps/1000 Mbps, AUTO-MDIX, DIN rail, 5 ports
Sensor connector (e-CON)		ECN-M014R	Core wire size of applicable cable: 0.14…0.30 mm² (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 mm² (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 mm² (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 mm² (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 mm² (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 mm² (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, please contact 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

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

Type		Model	Outline
Control network module	Twisted-pair cable	RJ71EN71	CC-Link IE Control Network control station/normal station for MELSEC iQ-R Series
	Optical fiber cable	RJ71GP21-SX	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 panel)
		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 (outdoor, reinforced)
		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	Optical media converter compatible with CC-Link IE Control Network (24 V 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 accessary section (page 54).

For details of Mitsubishi Electric System & Service Co., Ltd. products, please contact by sending an e-mail to the following address.
<Sales office> FA PRODUCT DIVISION mail:osb.webmaster@melsc.jp

Mitsubishi Electric Engineering Co., Ltd.

Type		Model	Outline
Interface board compatible with Compact PCI	Optical fiber cable	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.

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[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, 48V DC/24V DC
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: 0.01 to 55kW), linear servo motor (continuous thrust 50 to 3000N), direct drive motor (rated torque: 2 to 240N・m)

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 ±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		±0.05% (at 0 to 100% load fluctuation)
Position control	Command input method	The point table method and zero point return enable position control with absolute position commands
	Positioning accuracy	±1.8° (machine angle: equivalent to 200 [pulses/rev] resolution, input voltage 200V, wiring length within 5m)
Starting torque		200% (default value)
Communication specifications		Built-in: RS-485 communication (Mitsubishi inverter protocol, Modbus-RTU protocol), option: CC-Link communication

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.

Technologies based on long year experience realize more improved performance.
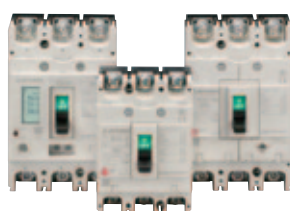
◎The new electronic circuit breakers can display various measurement items.

◎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

Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions and other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; and to other duties.
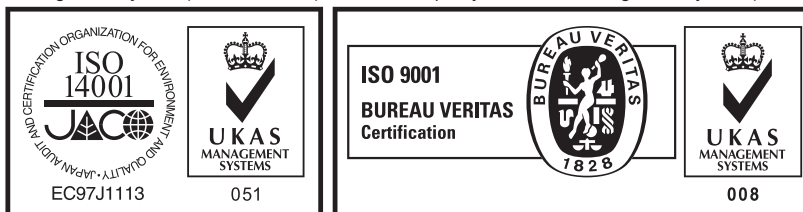
⚠ For safe use

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

CC-Link CC-Link IE MELSOFT

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