MITSUBISHI ELECTRIC

TECHNICAL BULLETIN

FA-A-0302-C

Replacement of MELSEC-QS Series Safety Programmable Controller with MELSEC iQ-R Series Safety Programmable Controller

■Date of Issue

June 2020 (Ver. C: May 2025)

■Relevant Models

QS001CPU, QS001CPU-K, QS061P-A1, QS061P-A1-K, QS061P-A2, QS061P-A2-K, QS034B, QS034B-K, QS0J61BT12, QS0J61BT12-K, QS0J71GF11-T2, QS0J65BTB2-12DT, QS0J65BTB2-12DT-K, QS0J65BTS2-8D, QS0J65BTS2-4T

Thank you for your continued support of Mitsubishi Electric safety programmable controllers, MELSEC-QS series.
This bulletin describes the replacement of the MELSEC-QS series modules with the MELSEC iQ-R series modules. Note that the manuals or references described in this bulletin provide information of May 2025.
Before replacement, check the replacement procedure, installation location, specifications comparison of models between before and after replacement, and replacement of network beforehand.

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1 GENERIC TERM

Generic term	Description
MELSEC-QS safety programmable controller	MELSEC-QS series: Safety CPU module, safety power supply module, safety main base unit, CC-Link Safety system master module, CC-Link Safety system remote I/O module, and CC-Link IE Field Network master/local module
MELSEC iQ-R safety programmable controller	MELSEC iQ-R series modules for the safety control (safety CPU, safety function module, CC-Link IE TSN master/local module)
MELSEC-QS series	Abbreviation for MELSEC-QS series Mitsubishi Electric safety programmable controllers
MELSEC iQ-R series	Abbreviation for MELSEC iQ-R series Mitsubishi Electric programmable controllers
QSCPU	QS001CPU and QS001CPU-K
RnSFCPU	R08SFCPU, R16SFCPU, R32SFCPU, and R120SFCPU A safety CPU is a CPU module that utilizes a safety function module to execute standard and safety control.

2 REPLACING MELSEC-QS SERIES SAFETY PROGRAMMABLE CONTROLLERS WITH MELSEC iQ-R SERIES

Advantages

■Reduced cost of integrated standard and safety control

The MELSEC iQ-R safety programmable controller enables execution of both standard and safety control in a single module. Integrating these features greatly reduces equipment cost.

■Improved performance (reduced takt time)

Performance is improved through faster operation processing and bus speed.

■Improved maintainability

- Expanded communication method (via Ethernet port, USB-miniB port, and other network modules) increases the ways programs can be read/written, improving on-site maintainability.
- The program memory of the MELSEC iQ-R safety programmable controller CPU is stored in a flash ROM, so ROM operation is not required.

■Steamlined information processing

Using additional MES interfaces, high speed data loggers, and other modules streamlines the information processing required at factories, such as remote equipment monitoring/operation, quality control data collection, and traceability data acquisition.

Precautions for replacement

- Before replacement, check the manuals of modules to confirm functions, specifications, grounding procedures, and handling of the new modules in the manual of the module.
- Before actual operation, check the operation of the entire system.

Point

Before replacement, confirm that the FG of programmable controller system is grounded. The programmable controller uses EMC noise suppression to release sound into the ground via the FG. If the FG is not sufficiently grounded, it may alter the configuration system, allowing the programmable controller to be affected by noise. Perform the following provisional procedures if checking grounding is difficult.

- Ground the programmable controller system independently.
- Add a ferrite core between the ground cable and FG terminal of the module.

3 REPLACEMENT OF CPU MODULE

3.1 List of Alternative Models

The following table lists MELSEC iQ-R series alternative models by program capacity, number of I/O points, and function of the MELSEC-QS series CPU module.
Select the appropriate module depending on current control details of the MELSEC-QS series CPU module, specifications and expansion potential after replacement, and cost.

Item	MELSEC-QS series	MELSEC iQ-R series alternative models			
	QS001CPU QS001CPU-K*1	R08SFCPU-SET	R16SFCPU-SET	R32SFCPU-SET	R120SFCPU-SET
Combination	—	Package of R08SFCPU and R6SFM	Package of R16SFCPU and R6SFM	Package of R32SFCPU and R6SFM	Package of R120SFCPU and R6SFM
Processing speed (LD instruction)	0.10μs	0.98ns			
Program capacity	14K steps	80K steps (safety program: 40K steps)	160K steps (safety program: 40K steps)	320K steps (safety program: 40K steps)	1200K steps (safety program: 40K steps)
Additional steps	0 steps	7 steps			

*1 Alternative models with S mark are planned for future support. For details, please consult our specified representative.

3.2 Specifications Comparison of CPU Module

Functions		MELSEC-QS series	MELSEC iQ-R series			
		QS001CPU	R08SFCPU-SET	R16SFCPU-SET	R32SFCPU-SET	R120SFCPU-SET
Processing speed (sequence instruction)	LD X0	0.10μs	0.98ns (LD: SA\X0)			
	MOV D0 D1	0.35μs	1.96ns (MOV: SA\D0, SA\D1)			
Program capacity		14K steps (56K bytes)	80K steps (320K bytes) (for safety program: 40K steps (160K bytes))	160K steps (640K bytes) (for safety program: 40K steps (160K bytes))	320K steps (1280K bytes) (for safety program: 40K steps (160K bytes))	1200K steps (4800K bytes) (for safety program: 40K steps (160K bytes))
Memory capacity	Program memory	128K bytes	320K bytes (for safety program: 160K bytes)	640K bytes (for safety program: 160K bytes)	1280K bytes (for safety program: 160K bytes)	4800K bytes (for safety program: 160K bytes)
	Standard ROM/data memory	128K bytes	5M bytes	10M bytes	20M bytes	40M bytes
Number of I/O device points		6144 points	12288 points			
Number of I/O points		1024 points	4096 points			
Battery		Q6BAT	Q6BAT			
Memory card		Not available	SD memory card: Not available			
Extended SRAM cassette		Not available	Available			
USB port		Type B	miniB			
Ethernet port		Not changed	100Mbps/10Mbps (full-duplex/half-duplex)			

3.3 Precautions for the Replacement of CPU Module

Operation/error history

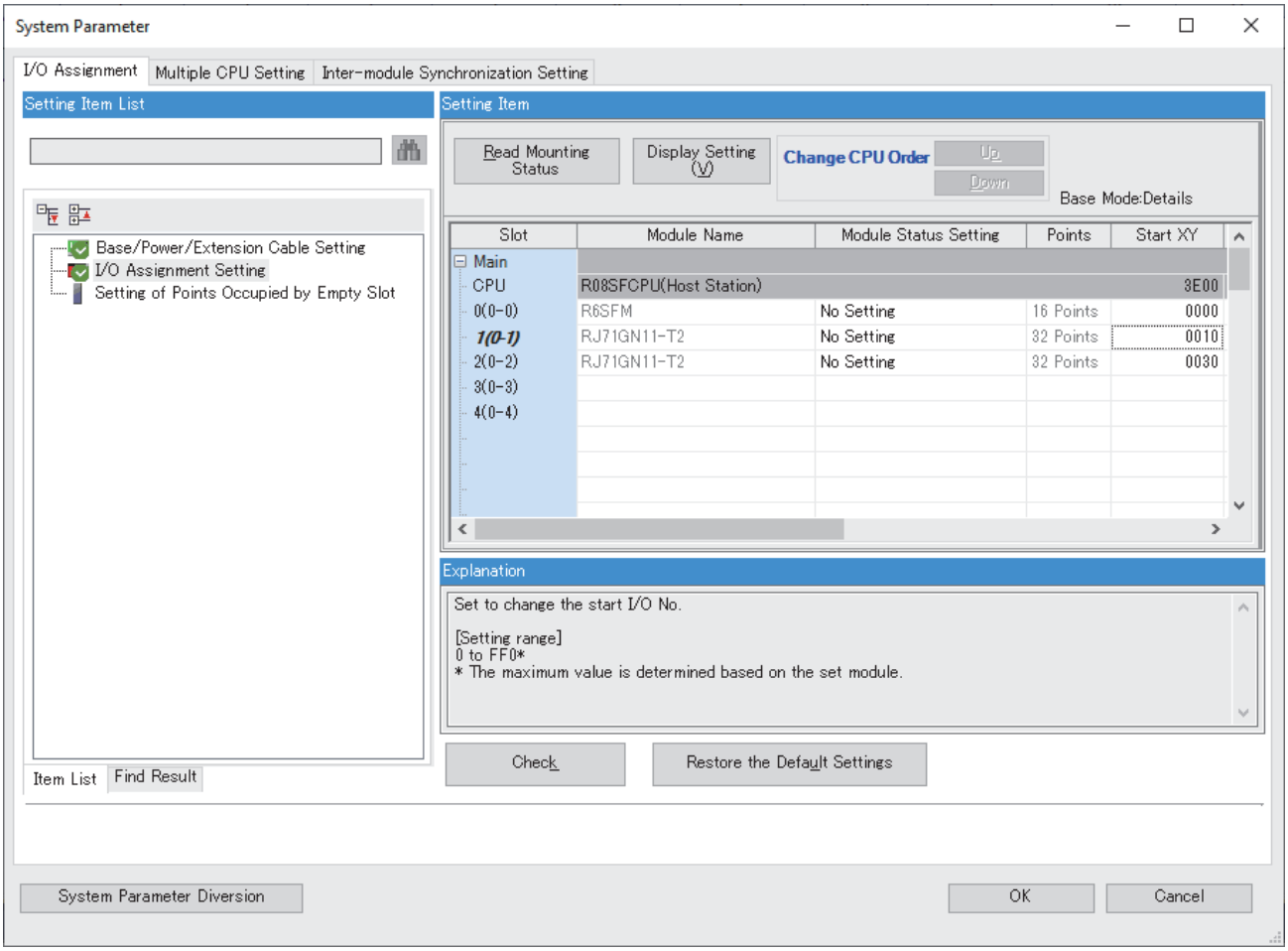
The operation/error history is stored as event history for the MELSEC iQ-R series.

I/O assignment

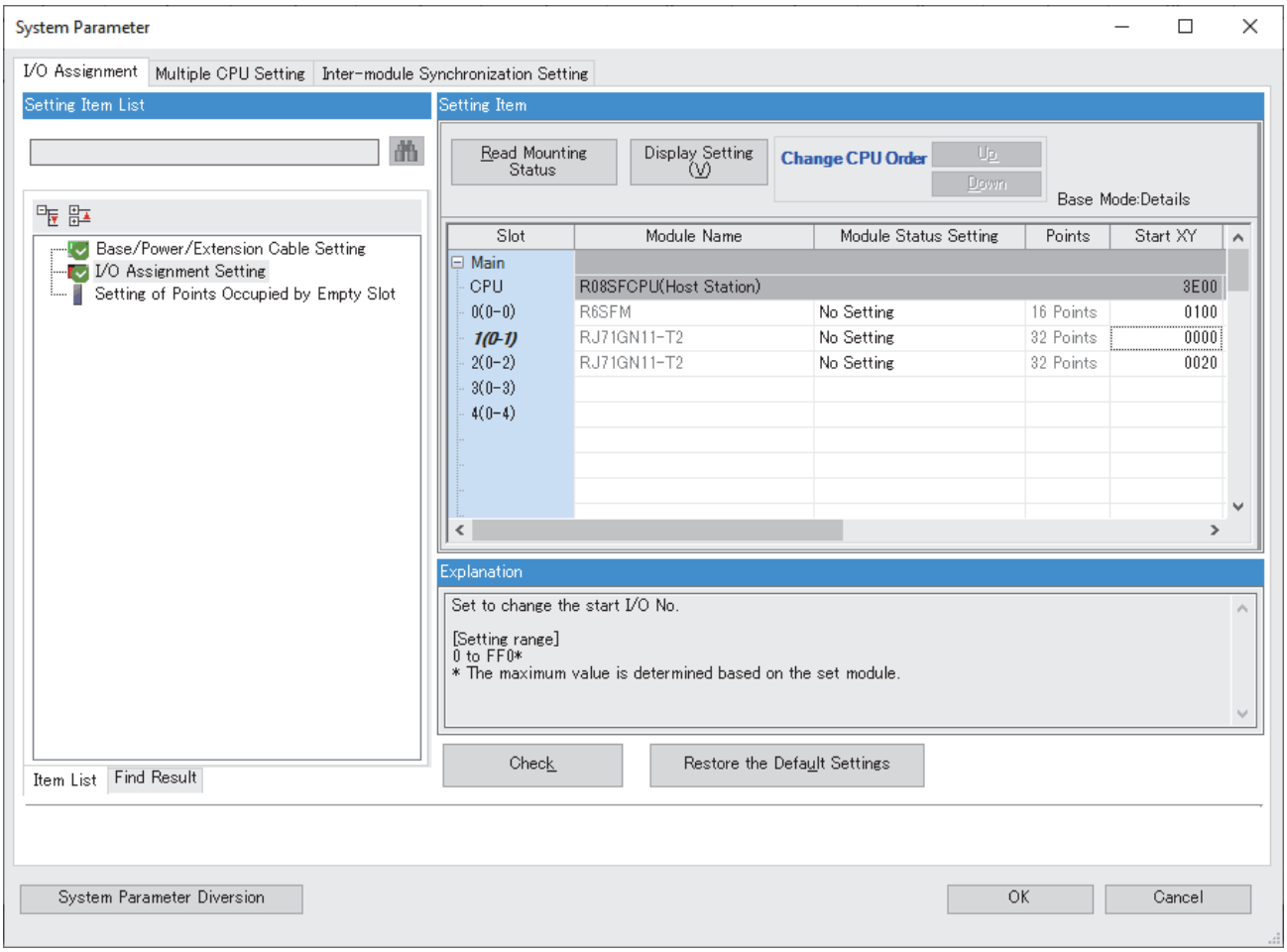
A MELSEC-QS series CPU occupies 0 points, but a MELSEC iQ-R series R6SFM occupies 16 points.

When using the same start XY as the MELSEC-QS series, assign an unused number to the start XY of R6SFM.

• I/O assignment for the MELSEC iQ-R series (default)



• I/O assignment for the MELSEC iQ-R series (at setting change)



4 REPLACEMENT OF POWER SUPPLY MODULE

4.1 List of Alternative Models

Discontinued MELSEC-QS series models		MELSEC iQ-R series alternative models	
Product	**Model**	**Model**	**Remarks (restrictions)**
Power supply module	QS061P-A1	R61P	• External wiring: Changed • Slot: Not changed • Change of specifications: No restrictions
	QS061P-A2		
	QS061P-A1-K	—	Alternative models with S mark are planned for future support. For details, please consult our specified representative.
	QS061P-A2-K		

4.2 Specifications Comparison of the Power Supply Module

• Specifications comparison between QS061P-A1 and R61P

Item	Model			Precautions for replacement
	MELSEC-QS series		MELSEC iQ-R series	
	QS061P-A1	QS061P-A1-K*1	R61P	
Input power supply voltage	AC100 to 120V +10%/-15% (85 to 132VAC)		100 to 240VAC +10%/-15% (85 to 264VAC)	R61P supports a wide range, 100 to 240VAC.
Input frequency	50/60Hz±5%		50/60Hz±5%	—
Input voltage distortion factor	5% or lower		5% or lower	—
Maximum input apparent power	125VA		130VA	—
Inrush current	20A, 8ms or lower		20A, 8ms or lower	—
Rated output current	6A		6.5A	—
Overcurrent protection	6.6A or higher		7.1A or higher	—
Overvoltage protection	5.5 to 6.5V		5.5 to 6.5V	—
Efficiency	70% or higher		76% or higher	—
Allowable momentary power failure time	20ms or lower		20ms or lower	—
Withstand voltage	1780VACrms/3 cycles (elevation: 2000m) Between all input terminals and LG and all output terminals and FG		2300VACrms/1 min. (elevation: 0 to 2000m) Between all input terminals and LG and all output terminals and FG	—
Insulation resistance	Between all input terminals and LG and all output terminals and FG Between all input terminals and LG Between all output terminals and FG 10MΩ or higher with a 500VDC insulation resistance tester		Between all input terminals and LG and all output terminals and FG Between all input terminals and LG Between all output terminals and FG 10MΩ or higher with a 500VDC insulation resistance tester	—
Noise immunity	• Noise voltage: 1500Vp-p, noise width: 1μs, noise frequency: 25 to 60Hz (noise simulator condition) • Noise voltage IEC61000-4-4: 2kV		• Noise voltage: 1500Vp-p, noise width: 1μs, noise frequency: 25 to 60Hz (noise simulator condition) • Noise voltage IEC61000-4-4: 2kV	—
Fuse	Built-in (user-unchangeable)		Built-in (user-unchangeable)	—
Terminal screw size	M3.5		M4	Change the wiring.
Applicable wire size	0.75 to 2mm²		0.75 to 2mm²	—
Applicable solderless terminal	RAV1.25-3.5, RAV2-3.5 Thickness: 0.8mm or less		RAV1.25-4, RAV2-4 Thickness: 0.8mm or less	Change the wiring.
Applicable tightening torque	0.66 to 0.89N·m		1.02 to 1.38N·m	Tighten screws with the applicable tightening torque.
External dimensions	98 (H) × 55.2 (W) × 115 (D) mm		106 (H) × 54.6 (W) × 110 (D) mm	—
Weight (kg)	0.40		0.41	—

*1 QS061P-A1-K is an S-mark certified power supply module for safety and for 100VAC.

• Specifications comparison between QS061P-A2 and R61P

Item	Model			Precautions for replacement
	MELSEC-QS series		MELSEC iQ-R series	
	QS061P-A2	QS061P-A2-K*1	R61P	
Input power supply voltage	200 to 240VAC +10%/-15% (170 to 264VAC)		100 to 240VAC +10%/-15% (85 to 264VAC)	R61P supports a wide range, 100 to 240VAC.
Input frequency	50/60Hz±5%		50/60Hz±5%	—
Input voltage distortion factor	5% or lower		5% or lower	—
Maximum input apparent power	125VA		130VA	—
Inrush current	20A, 8ms or lower		20A, 8ms or lower	—
Rated output current	6A		6.5A	—
Overcurrent protection	6.6A or higher		7.1A or higher	—
Overvoltage protection	5.5 to 6.5V		5.5 to 6.5V	—
Efficiency	70% or higher		76% or higher	—
Allowable momentary power failure time	20ms or lower		20ms or lower	—
Withstand voltage	2830VACrms/3 cycles (elevation: 2000m) Between all input terminals and LG and all output terminals and FG		2300VACrms/1 min. (elevation: 0 to 2000m) Between all input terminals and LG and all output terminals and FG	—
Insulation resistance	Between all input terminals and LG and all output terminals and FG Between all input terminals and LG Between all output terminals and FG 10MΩ or higher with a 500VDC insulation resistance tester		Between all input terminals and LG and all output terminals and FG Between all input terminals and LG Between all output terminals and FG 10MΩ or higher with a 500VDC insulation resistance tester	—
Noise immunity	• Noise voltage: 1500Vp-p, noise width: 1μs, noise frequency: 25 to 60Hz (noise simulator condition) • Noise voltage IEC61000-4-4: 2kV		• Noise voltage: 1500Vp-p, noise width: 1μs, noise frequency: 25 to 60Hz (noise simulator condition) • Noise voltage IEC61000-4-4: 2kV	—
Fuse	Built-in (user-unchangeable)		Built-in (user-unchangeable)	—
Terminal screw size	M3.5		M4	Change the wiring.
Applicable wire size	0.75 to 2mm²		0.75 to 2mm²	—
Applicable solderless terminal	RAV1.25-3.5, RAV2-3.5 Thickness: 0.8mm or less		RAV1.25-4, RAV2-4 Thickness: 0.8mm or less	Change the wiring.
Applicable tightening torque	0.66 to 0.89N·m		1.02 to 1.38N·m	Tighten screws with the applicable tightening torque.
External dimensions	98 (H) × 55.2 (W) × 115 (D) mm		106 (H) × 54.6 (W) × 110 (D) mm	—
Weight (kg)	0.40		0.41	—

*1 QS061P-A2-K is an S-mark certified power supply module for safety and for 100VAC.

4.3 Precautions for the Replacement of Power Supply Module

• The solderless terminals for the terminal block of the MELSEC iQ-R series differ from the terminals for the MELSEC-QS series. Use the solderless terminals that meet the specifications.

• The input power supply of R61P supports a wide range, 100 to 240VAC. The input power supply is available for both 100 and 200VAC.

5 REPLACEMENT OF NETWORK MODULE

When replacing the MELSEC-QS series with the MELSEC iQ-R series, replace the CC-Link Safety system and CC-Link IE Field Network with the CC-Link IE TSN.

5.1 List of Alternative Models

The following table lists the alternative models of the MELSEC iQ-R series network module by supported network and safety communication specifications of the MELSEC-QS series network module.

• CC-Link Safety system master module

Item	Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
	QS0J61BT12 (CC-Link Safety system master module)	**RJ71GN11-T2*1 (CC-Link IE TSN master/local module)**
Network	CC-Link Safety system	CC-Link IE TSN
Maximum number of connectable stations (standard station)*2	65 (master station: 1, remote station: 64)	121 (master station: 1, device station: 120)
Maximum number of connectable stations (safety station)*2	43 (master station: 1, remote station: 42)	121 (master station: 1, device station: 120)
Communication cable	Ver.1.10-compatible CC-Link dedicated cable	Ethernet cable (straight cable of the category 5e or higher (shielded STP))

*1 The firmware version must be "10" or later.
*2 One master station is included.

• CC-Link IE Field Network master/local module

Item	Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
	QS0J71GF11-T2 (CC-Link IE Field Network master/local module)	**RJ71GN11-T2*1 (CC-Link IE TSN master/local module)**
Network	CC-Link IE Field Network	CC-Link IE TSN
Maximum number of connectable stations (standard station)*2	121 (master station: 1, device station: 120)	121 (master station: 1, device station: 120)
Maximum number of connectable stations (safety station)*2	32 (master station: 1, device station: 31)	121 (master station: 1, device station: 120)

*1 The firmware version must be "10" or later.
*2 One master station is included.

Precautions

• The MELSEC iQ-R series does not include the CC-Link Safety module.
• The safety communications of the MELSEC iQ-R series CC-Link IE Field Network master/local module (RJ71GF11-T2) are not compatible with the safety communications of the MELSEC-QS series CC-Link IE Field Network master/local module (QS0J71GF11-T2). Use the CC-Link IE TSN.

5.2 Replacement of the CC-Link Safety System with the CC-Link IE TSN

5.2.1 Specifications comparison between the CC-Link Safety system and CC-Link IE TSN

Item			Specifications		Precautions for replacement
			CC-Link Safety system	CC-Link IE TSN	
Transmission speed			156kbps/625kbps/ 2.5Mbps/5Mbps/10Mbps	1Gbps/100Mbps	—
Maximum connectable modules (other than the master station)			64 modules	120 modules	—
Maximum number of link points per network		Remote I/O (RX, RY)	2048 points each	16K points each (16384 points)	—
		Remote register (RWr)	256 points	8K points (8192 points)	—
		Remote register (RWw)	256 points	8K points (8192 points)	—
Maximum number of link points per station	Master station	Remote I/O (RX, RY)	2048 points each[*1]	16K points each (16384 points)[*1]	—
		Remote register (RWr)	256 points[*1]	8K points (8192 points)[*2]	—
		Remote register (RWw)	256 points[*1]	8K points (8192 points)[*2]	—
	Remote station		☞ Page 31 REPLACEMENT OF REMOTE I/O MODULE		—
Safety communication function	Safety level		SIL3	SIL3	—
	Maximum number of connected safety stations		42 modules	120 modules	—
	One station: Maximum number of link points in communications of one station	Master station <-> Remote station	☞ Page 31 REPLACEMENT OF REMOTE I/O MODULE		—
Network topology			Bus (RS-485)	Line topology and star topology (Coexistence of line topology and star topology is also available.)	Lay new cables.
Recommended connection cable			Ver.1.10-compatible CC-Link dedicated cable	1Gbps: Straight cable of the category 5e or higher (shielded STP) 100Mbps: Straight cable of the category 5 or higher (shielded STP)	
Maximum overall cable length			1200m (when the transmission speed is 156kbps)	Line topology: 12000m (when 121 stations are connected) Others: Depends on the system configuration	
Station-to-station distance			1200m maximum (when the transmission speed is 156kbps)	100m max.	

*1 The number of I/O points for the safety communication function (RX, RY) is included. Depending on the system configuration, the number of link points may be fewer.

*2 The number of I/O points for the safety communication function (safety device) is not included. Depending on the system configuration, the number of link points may be fewer.

5.2.2 Wiring of the CC-Link IE TSN

Lay new cables. For details, refer to the following.

📖 MELSEC iQ-R CC-Link IE TSN User's Manual (Startup) (SH-082127ENG)

5.2.3 Replacement of the master station

The following table lists the alternative model of the master module.

Discontinued MELSEC-QS series models		MELSEC iQ-R series alternative models	
Network and station type	**Model**	**Network and station type**	**Remarks**
CC-Link Safety system master station	QS0J61BT12	CC-Link IE TSN master station	RJ71GN11-T2

Comparison of specifications

Item	Specifications		Precautions for replacement
	QS0J61BT12	RJ71GN11-T2	Remarks
Number of mountable modules per CPU module	2	8	—
Number of occupied I/O points	32 points	32 points	—
Internal current consumption (5VDC)	0.46A	0.81A	—
Weight	0.12kg	0.2kg	—

Comparison of functions

○: Compatible or functions to be added, △: Some changes, ×: Not available

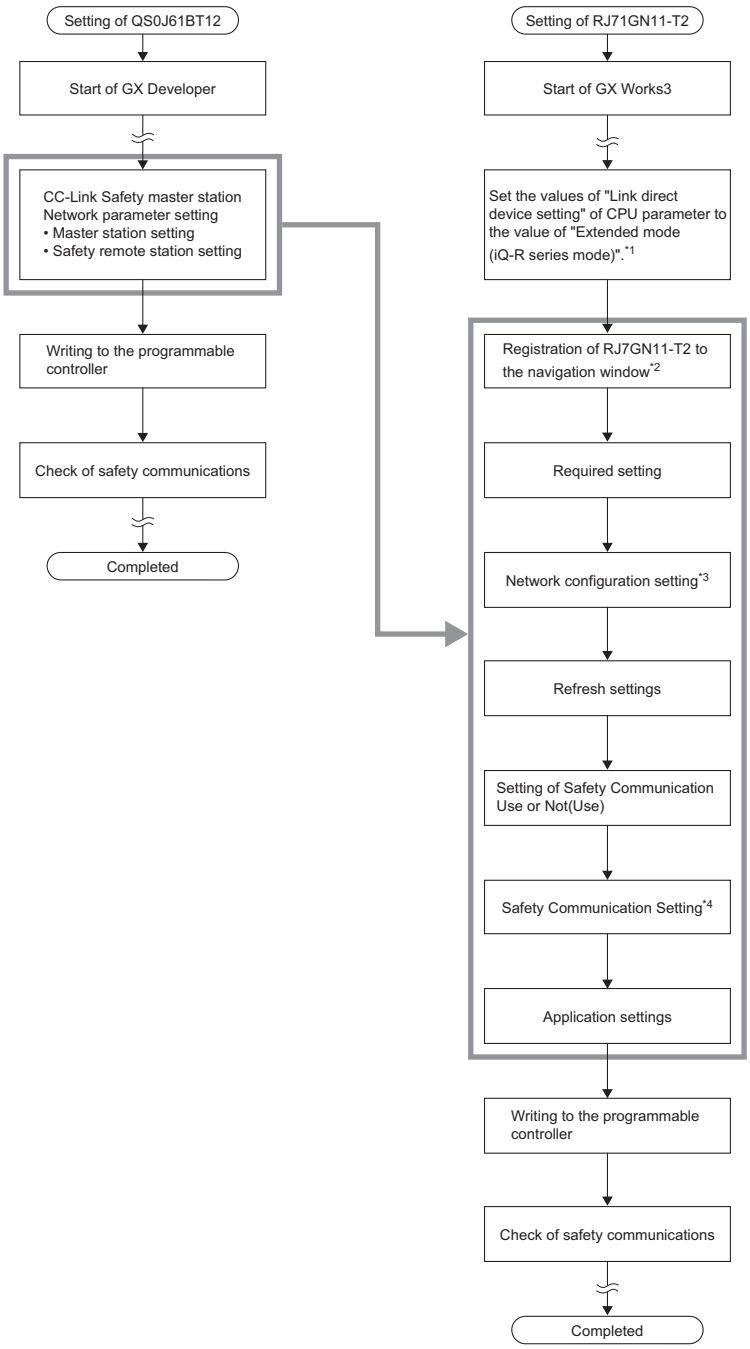
QS0J61BT12	RJ71GN11-T2	
Function	**Compatibility**	**Precautions for replacement**
Communications with the safety station	△	For the safety communications, the safety devices (SA\ or later) are required. Therefore, change the devices for safety communications in the program to the safety devices.
Communications when both safety station and standard station are used	○	—
Auto refresh function	○	—
Identifying the communication target station of safety station	△	"Link ID", "Module technical version", and "Production information" cannot be used. Specify the communication station using "IP address", "Model name", "Safety approval code".
Check of the station number overlap	○	—
Slave station cut-off	△	When using the line topology, the disconnected station and the sequence stations are detected as data link faulty stations. As required, change the topology to the star topology or change the connection order.
Automatic return	○	—
Data link stop at CPU error	△	Select whether to clear or hold the output in "Output Mode upon CPU Error". The data link continues regardless of the setting.
Clearing inputs from data link faulty stations	△	Select whether to clear or hold the input in "Data Link Faulty Station Setting".
Slave station forced clear at safety CPU stop	△	Select whether to hold or clear the output in "Output Hold/Clear Setting during CPU STOP". When the safety CPU is in SAFETY MODE, the output is cleared regardless of the setting.
Error history registration	△	Check the events that occurred in the own station or network using the event history of the CPU module.
Reserved station	○	—
Scan synchronization	×	The link scan is not synchronized with the sequence scan.
Safety remote station interlock function	△	The detection specifications of the safety monitoring timeout error is different. Check the specifications in the manual and calculate the monitoring time.
Line test	△	The "Line test" mode is not available. Execute the diagnostics and communication test on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window in the GX Works3.

Comparison of parameters

When replacing the CC-Link Safety system master module with the CC-Link IE TSN master module, set the parameters for the CC-Link IE TSN.

The differences of the parameter setting procedure are shown in the following flowchart.

• Differences of the parameter setting procedure



*1 The setting is required when the module parameter of RJ71GN11-T2 is written.

*2 For details of the parameter settings for RJ71GN11-T2, refer to the following.
MELSEC iQ-R CC-Link IE TSN User's Manual (Application) (SH-082129ENG)

*3 The parameter shall be written to the safety remote station on the network map display area. For details of the setting method, refer to the user's manual of the safety remote station to be used or the following.
MELSEC iQ-R CC-Link IE TSN User's Manual (Application) (SH-082129ENG)

*4 Set the safety device (SA\) to the device to transfer the safety data. The remote input (RX), remote output (RY), and remote register (RWr/RWw) are used only for standard communication.

The following table lists the parameters of RJ71GN11-T2 and the parameters to be added after replacement. For other parameters of RJ71GN11-T2, refer to the following.
MELSEC iQ-R CC-Link IE TSN User's Manual (Application) (SH-082129ENG)

QS0J61BT12	RJ71GN11-T2			
Parameter setting item	**Parameter setting item**			**Precautions for replacement**
Number of modules	—			There are no compatible setting items.
Start I/O No.	Set the number when adding the module in GX Works3.			Set the number according to the configuration of RJ71GN11-T2.
Type	Required setting	Station Type		Select "Master Station".
Operation setting / Case of safety CPU STOP setting	Application setting	Output Hold/Clear Setting during CPU STOP		Some specifications are different. Check the specifications before setting.
Station number	—			There are no compatible setting items.*1
Mode setting	Application setting	Module operation mode setting		The "Line test" mode is not available.
Transmission speed	Application setting	Communication Speed		Set the speed according to the network configuration.
Safety refresh monitoring time	Basic setting	Safety Communication Setting	Safety refresh monitoring time	Calculate the time.
Safety data monitoring time	—			There are no compatible setting items. Use the "transmission interval monitoring time".
Link ID	—			There are no compatible setting items.
Total number of connected stations	—			There are no compatible setting items.
Remote input (RX)	Basic setting	Refresh settings		Set the refresh device for the standard communications.
		Safety Communication Setting	Safety data transfer device setting	Set the refresh device for the safety communications.
Remote output (RY)	Basic setting	Refresh settings		Set the refresh device for the standard communications.
		Safety Communication Setting	Set the refresh device for the safety communications.	Set the refresh device for the safety communications.
Remote register (RWr)	Basic setting	Refresh settings		Set the refresh device for the standard communications.
Remote register (RWw)				
Special relay (SB)				
Special register (SW)				
Retry count	—			There are no compatible setting items.
Automatic reconnection station count	—			There are no compatible setting items.
Scan mode setting	—			The link scan is not synchronized with the sequence scan.
Station information setting	Basic setting	Network configuration setting		Set the configuration according to the configuration of the CC-Link IE TSN remote I/O module.
Safety station information	Basic setting	Network configuration setting	Model	The "module technical version" and "production information" cannot be used. Use the "safety approval code".
		Safety Communication Setting	Safety approval code	
Safety remote station setting	☞ Page 43 Precautions for the Remote I/O Module			—
—	Basic setting	Setting of Safety Communication Use or Not		Select "Use".

*1 The setting item is different from "Station No." of setting item in RJ71GN11-T2.

Replacement of the link special relay (SB)

When replacing the master station, change the link special relay (SB) used in the program. The following table lists the alternative devices. The network specifications are different. Before changing, check the specifications of the alternative device in the manual.

QS0J61BT12		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SB0008	Line test request	—	—	—
SB0020	Module status	—	—	—
SB004C	Line test acceptance status	—	—	—
SB004D	Loop test completion status	—	—	—
SB0050	Offline test status	—	—	—
SB0060	Mode (own station)	SB0043	Module operation mode of own station	—
SB0061	Host type	SB0044	Station setting 1 of own station	The value for devices is different.
SB006A	Switch setting status	—	—	—
SB006D	Parameter setting status	SB004D	Received parameter error	—
SB006E	Host station operation status	SB0049	Data link error status of own station	—
SB0074	Reserved station specification status	SB0074	Reserved station specification status	—
SB007C	Slave station refresh/forced clear setting status for PLC CPU STOP	SB007D	Hold/clear status setting for CPU STOP	The value for devices is different.
SB0080	Other station data link status	SB00B0	Data link error status of each station	—
SB0081	Other station watchdog timer error status	—	—	—
SB0082	Other station fuse blown status	—	—	—
SB0083	Other station switch change status	—	—	—

Replacement of the link special register (SW)

When replacing the master station, replace the link special register (SW) used in the program. The following table lists the alternative devices. The network specifications are different. Before changing, check the specifications of the alternative device in the manual.

QS0J61BT12		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SW0008	Line test station setting	—	—	—
SW0020	Module status	—	—	—
SW004D	Loop test result	—	—	—
SW0058	Detailed LED status	—	—	—
SW0059	Transmission rate setting	—	—	—
SW0060	Mode setting status	SB0043	Mode status of own station	The value for devices is different.
SW0062.b0	Module operating status -> Station type	SB0044	Station setting 1 of own station	The value for devices is different.
SW0062.b3	Module operating status -> Input status from the data link faulty station	SB007B	Input data status of data link faulty station	—
SW0062.b9	Module operating status -> Slave station refresh/forced clear setting in case of PLC CPU STOP	SB007D	Hold/clear status setting for CPU STOP	The value for devices is different.
SW0064	No. of retries information	—	—	—
SW0065	No. of automatic return stations	—	—	—
SW0066	Delay timer information	—	—	—
SW0067	Parameter information	—	—	—
SW0068	Host parameter status	SW004C	Parameter setting status	The error code to be stored in the device is different.
SW0069	Installation status	SB00E8	Station type match status of each station	The CC-Link IE TSN does not have error codes and the number of occupied points.
SW006A	Switch setting status	—	—	—
SW006D	Maximum link scan time	—	—	—
SW006E	Current link scan time	SW0062	Cyclic transmission time	There are no link scan for the CC-Link IE TSN.
SW006F	Minimum link scan time	—	—	—
SW0070	Total number of stations	SW0058	Total number of slave stations setting value	—
SW0071	Max. connected station number	SW005B	Maximum data link station number	—
SW0072	Number of connected modules	SW0059	Total number of slave stations present value	—
SW0074 to SW0077	Reserved station specification status	SW00C0 to SW00C7	Reserved station setting status	The reserved station can be changed after starting the CC-Link IE TSN.
SW0080 to SW0083	Other station data link status	SW00B0 to SW00B7	Data link error status of each station	—
SW0084 to SW0087	Other station watchdog timer error occurrence status	—	—	—
SW0088 to SW008B	Other station fuse blown status	—	—	—
SW008C to SW008F	Other station switch change status	—	—	—
SW0098 to SW009B	Station number overlap status	—	—	—
SW009C to SW009F	Installation status	SW00E8 to SW00EF	Station type match status	The CC-Link IE TSN does not have the number of occupied stations.

QS0J61BT12		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SW00B4 to SW00B7	Line test 1 result	—	—	—
SW00B8	Loop test result	—	—	—
SW0140 to SW0143	Compatible CC-Link ver. information	—	—	—
SW0144 to SW0147	CC-Link ver. installation status	—	—	—
SW0148	Parameter mode	—	—	—
SW0149	Host parameter mode	—	—	—

5.2.4 Precautions when changing the network

- When replacing the CC-Link Safety system with the CC-Link IE TSN, check the functions, specifications, and usage of the module in the manuals.
- When replacing the CC-Link Safety system with the CC-Link IE TSN, lay new cables.
- The detection specifications of the safety station interlock function are different between the CC-Link Safety system and CC-Link IE TSN. Check the "safety refresh monitoring time" and "transmission interval monitoring time" of each station, and calculate the values depending on the system and safety distance.
- Some functions are different between the CC-Link Safety system and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 11 Comparison of functions

- Some parameters are different between the CC-Link Safety system and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 12 Comparison of parameters

- Some link special relays and link special registers are different between the CC-Link Safety system and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 14 Replacement of the link special relay (SB)
☞ Page 15 Replacement of the link special register (SW)

- Before actual operation, check the operation of the entire system.

5.3 Replacement of the CC-Link IE Field Network with the CC-Link IE TSN

5.3.1 Specifications comparison between the CC-Link IE Field Network and CC-Link IE TSN

Item			Specifications		Precautions for replacement
			CC-Link IE Field Network	CC-Link IE TSN	
Transmission speed			1Gbps	1Gbps/100Mbps	—
Number of connectable stations per network		Master station (safety station)	1 modules	1 modules	—
		Local station (standard station)	120 modules	120 modules	—
Maximum number of networks			239	239	—
Maximum number of link points per network		Remote I/O (RX, RY)	16K points each (16384 points)	16K points each (16384 points)	—
		Remote register (RWr)	8K points (8192 points)	8K points (8192 points)	—
		Remote register (RWw)	8K points (8192 points)	8K points (8192 points)	—
Maximum number of link points per station[*1]	Master station (safety station)	Remote I/O (RX, RY)	16K points each (16384 points)	16K points each (16384 points)	—
		Remote register (RWr)	8K points (8192 points)	8K points (8192 points)	—
		Remote register (RWw)	8K points (8192 points)	8K points (8192 points)	—
	Local station	Remote I/O (RX, RY)	2048 points each	16K points each (16384 points)	—
		Remote register (RWr)	1,024 points	8K points (8192 points)	—
		Remote register (RWw)	1,024 points	8K points (8192 points)	—
Safety communication function	Safety level		SIL3	SIL3	—
	Maximum number of connectable safety stations per network		32 modules	121 modules	—
	Maximum number of safety connections per station	Asynchronous mode	31	Master station: 120 Local station: 1	The safety communications between the local stations are not supported.
		Synchronous mode	8	—	The link scan does not synchronize with the sequence scan.
	Number of safety inputs/outputs per safety connection	Input	8 words	8 words	—
		Output	8 words	8 words	—
Network topology			Line topology, star topology (Coexistence of line topology and star topology is also available.), and ring topology	Line topology and star topology (Coexistence of line topology and star topology is also available.)	The ring topology is not available.
Recommended connection cable			An Ethernet cable that meets the 1000BASE-T standard: Straight cable of the category 5e or higher (double shielded STP)	Ethernet cable 1Gbps: Straight cable of the category 5e or higher (shielded STP) 100Mbps: 100Mbps: Straight cable of the category 5 or higher (shielded STP)	—

Item	Specifications		Precautions for replacement
	CC-Link IE Field Network	CC-Link IE TSN	
Maximum overall cable length	Line topology: 12000m (when 121 stations are connected) Star topology: Depends on the system configuration Ring topology: 12100m (when 121 stations are connected)	Line topology: 12000m (when 121 stations are connected) Others: Depends on the system configuration	The ring topology is not available.
Maximum station-to-station distance	100m max.	100m max.	—
Number of cascade connections	Up to 20	Consult the manufacturer of the HUB used.	Replace HUB with TSN HUB*2.

*1 Depending on the system configuration, the number of link points may be fewer.
*2 The HUB is a Class B switching HUB certified by the CC-Link Partner Association. Check the model name and usage of available switching HUBs on the homepage of the CC-Link Partner Association (www.cc-link.org).

5.3.2 Wiring of the CC-Link IE TSN

Replace HUB with TSN HUB*1. For details, refer to the following.

MELSEC iQ-R CC-Link IE TSN User's Manual (Startup) (SH-082127ENG)

*1 The HUB is a Class B switching HUB certified by the CC-Link Partner Association. Check the model name and usage of available switching HUBs on the homepage of the CC-Link Partner Association (www.cc-link.org).

5.3.3 Replacement of the master/local station

The following table lists the alternative models of the master/local station.

Discontinued MELSEC-QS series models		MELSEC iQ-R series alternative models	
Network and station type	**Model**	**Network and station type**	**Remarks**
CC-Link IE Field Network master station	QS0J71GF11-T2	CC-Link IE TSN master station	RJ71GN11-T2
CC-Link IE Field Network local station	QS0J71GF11-T2	CC-Link IE TSN local station	RJ71GN11-T2

Comparison of specifications

Item	Specifications		Precautions for replacement
	QS0J71GF11-T2	RJ71GN11-T2	
Number of mountable modules per CPU module	1	8	—
Number of occupied I/O points	32 points	32 points	—
Internal current consumption (5VDC)	0.85A	0.81A	—
Weight	0.18kg	0.2kg	—

Comparison of functions

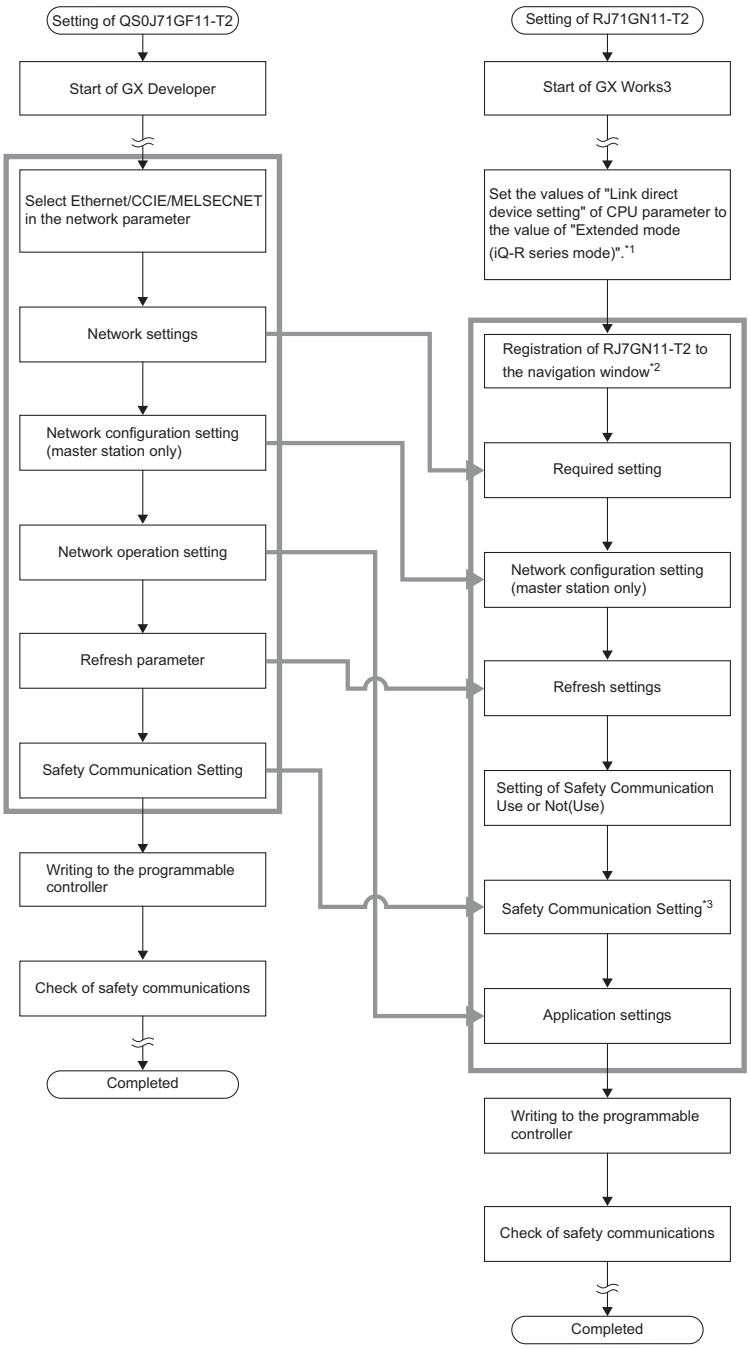
○: Compatible or functions to be added, △: Some changes, ×: Not available

QS0J61BT12		RJ71GN11-T2	
Function		**Compatibility**	**Precautions for replacement**
Communications with the safety station		△	The safety communications between the local stations are not supported.
Error history registration		△	Check the events that occurred in the own station or network using the event history of the CPU module.
Safety remote station interlock function		○	—
Communications with other stations	Communications using RX and RY	○	—
	Communications using RWr and RWw	○	—
Access to devices and link devices	Link refresh	○	—
Mode selection for cyclic transmission		△	The communications can be performed at high speed equivalent to the "online (high-speed mode)" speed by setting the appropriate communication cycle interval.
Cyclic data integrity assurance		○	—
Scan synchronization specification		×	The link scan is not synchronized with the sequence scan.
Input status setting for data link faulty station		○	—
Output status setting for CPU STOP		○	—
Cyclic transmission stop and restart		×	The function of Cyclic transmission stop and restart is not available.
Transient transmission	Communications within the same network	○	—
	Communications with different networks	○	—
Remote station disconnection		○	—
Automatic return		○	—
Loopback function		×	The loopback function (ring topology) is not supported.
CC-Link IE Field Network diagnostics		○	Execute the diagnostics on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window in the GX Works3.
Diagnostics of the module	Hardware test	○	Execute the diagnostics in "Module Communication Test" of the module.
	Self-loopback test	○	
Diagnostics of own network	Loop test	△	Execute the diagnostics on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window in the GX Works3.
	Cable test	△	
Diagnostics of other network	Communication test	○	Execute the test on the "CC-Link IE TSN/CC-Link IE Field Diagnostics" window in the GX Works3.
Reserved station specification		○	—
Temporary cancel of the reserved station setting		○	—
Error invalid station, temporary error invalid station setting		○	—

Comparison of parameters

When replacing the CC-Link IE Field Network master station (local station) with the CC-Link IE TSN master station (local station), set the parameters for the CC-Link IE TSN. The differences of the parameter setting procedure are shown in the following flowchart.

• Differences of the parameter setting procedure



*1 The setting is required when the module parameter of RJ71GN11-T2 is written.

*2 For details of the parameter settings for RJ71GN11-T2, refer to the following.
MELSEC iQ-R CC-Link IE TSN User's Manual (Application) (SH-082129ENG)

*3 Set the safety device (SA\) to the device to transfer the safety data. The remote input (RX), remote output (RY), and remote register (RWr/RWw) are used only for standard communication.

The following table lists the parameters of RJ71GN11-T2 and the parameters to be added after replacement. For other parameters of RJ71GN11-T2, refer to the following.
📖 MELSEC iQ-R CC-Link IE TSN User's Manual (Application) (SH-082129ENG)

QS0J61BT12			RJ71GN11-T2			
Parameter setting item			**Parameter setting item**			**Precautions for replacement**
Network type			Required setting	Station Type		—
Start I/O No.			Set the number when adding the module in GX Works3.			Set the number according to the configuration of RJ71GN11-T2.
Network No.			Required setting	Network No.		—
Station number			Required setting	Station number		—
Total number of (slave) stations			—			There are no compatible setting items.
Mode			Application setting	Module operation mode setting		The online mode (high-speed mode) is not available. Set the offline mode.
Network configuration setting	Station number		Basic setting	Network configuration setting	Station number	—
	Station Type				Station Type	—
	RX/RY setting				RX/RY setting	—
	RWw/RWr setting				RWw/RWr setting	—
	Reserved/Error Invalid Station				Reserved/Error Invalid Station	—
	Device				Device	—
	Comment				Comment	—
	Application settings	Link Scan Mode	—			There are no compatible setting items.
		Loopback function setting	—			There are no compatible setting items.
		Station-based block data assurance	Application setting	Station-based block data assurance		—
Network operation setting	Parameter name		—			There are no compatible setting items.
	Data Link Faulty Station Setting		Application setting	Data Link Faulty Station Setting		—
	Output setting error during CPU STOP			Output Hold/Clear Setting during CPU STOP		—
Refresh parameter			Basic setting	Refresh settings		—
Safety Communication Setting	Communication destination station number		Basic setting	Safety Communication Setting	Station number	—
	Open system				Open system	—
	Transmission interval monitoring time				Transmission interval monitoring time	Calculate the time.
	Safety refresh monitoring time				Safety refresh monitoring time	Calculate the time.
	Safety data transfer device setting				Safety data transfer device setting	—
Routing parameter			"Routing Setting" of CPU parameter			—
—			Basic setting	Setting of Safety Communication Use or Not		Select "Use".

Replacement of the link special relay (SB)

When replacing the master/local station, change the link special relay (SB) used in the program. The following table lists the alternative devices. The network specifications are different. Before changing, check the specifications of the alternative device in the manual.

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SB0000	Link start (own station)	—	—	—
SB0001	Link stop (own station)	—	—	—
SB0002	System link start	—	—	—
SB0003	System link stop	—	—	—
SB0006	Clear communication error count	SB0006	Clear communication error count	The register to be cleared is different.
SB0009	Event count clear	—	—	—
SB0010	Temporary error invalid request	—	—	—
SB0011	Temporary error invalid setting cancel request	—	—	—
SB0012	Reserved station function disable request	—	—	—
SB0013	Reserved station specification enable request	—	—	—
SB0040	Network type (own station)	SB0040	Network type of own station	—
SB0043	Mode (own station)	SB0043	Module operation mode of own station	—
SB0044	Station setting (own station) (1)	SB0044	Station setting 1 of own station	—
SB0047	Baton pass status (own station)	—	—	—
SB0049	Data link status (own station)	SB0049	Data link error status of own station	—
SB004A	Own station's CPU status (1)	SB004A	CPU minor error status of own station	—
SB004B	Own station's CPU status (2)	SB004B	CPU moderate/major error status of own station	—
SB004C	CPU RUN status (own station)	SB004C	CPU operating status of own station	—
SB004D	Received parameter error	SB004D	Received parameter error	—
SB0050	Link start request accept status (own station)	—	—	—
SB0051	Link start completion status (own station)	—	—	—
SB0052	Link stop request accept status (own station)	—	—	—
SB0053	Link stop completion status (own station)	—	—	—
SB0054	System link start request accept status	—	—	—
SB0055	System link start completion status	—	—	—
SB0056	System link stop request accept status	—	—	—
SB0057	System link stop completion status	—	—	—
SB0058	Temporary error invalid request accept status	—	—	—
SB0059	Temporary error invalid setting completion status	—	—	—
SB005A	Temporary error invalid setting cancel request accept status	—	—	—
SB005B	Temporary error invalid setting cancel completion status	—	—	—
SB005C	Reserved station function disable request accept status	—	—	—
SB005D	Reserved station function disable completion status	—	—	—
SB005E	Reserved station specification enable request accept status	—	—	—

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SB005F	Reserved station specification enabled status	—	—	—
SB0060	Constant link scan status	—	—	—
SB0061	Event history clear acceptance status	—	—	—
SB0062	Event history clear completion status	—	—	—
SB0065	Loopback status	—	—	—
SB006A	PORT1 linkup status (own station)	SB006A	PORT1 link-down status of own station	—
SB006B	PORT2 linkup status (own station)	SB006B	PORT2 link-down status of own station	—
SB006C	PORT1 error frame reception status (own station)	—	—	—
SB006D	PORT2 error frame reception status (own station)	—	—	—
SB006E	PORT1 error frame detection (own station)	—	—	—
SB006F	PORT2 error frame detection (own station)	—	—	—
SB0072	Scan mode setting information	—	—	—
SB0074	Reserved station specification status	SB0074	Reserved station specification status	—
SB0075	Error invalid station setting status	SB0075	Error invalid station setting status	—
SB0078	Loopback function setting status	—	—	—
SB007A	Event history status	—	—	—
SB007B	Input data status of data link faulty station	SB007B	Input data status of data link faulty station	—
SB007D	Hold/clear status setting for CPU STOP	SB007D	Hold/clear status setting for CPU STOP	—
SB0090	Hardware test completion status	—	—	—
SB0091	Hardware test normal/abnormal end	—	—	—
SB0092	Self-loopback test completion status	—	—	—
SB0093	Self-loopback test normal/abnormal end	—	—	—
SB0094	Loop test completion status	—	—	—
SB0095	Loop test normal/abnormal end	—	—	—
SB009A	Loop test request accept status	—	—	—
SB00A0	Baton pass status (each station)	—	—	—
SB00A1	Baton pass status (master station)	—	—	—
SB00B0	Data link status (each station)	SB00B0	Data link error status of each station	—
SB00B1	Data link status (master station)	SB00B1	Data link error status of master station	—
SB00C0	Reserved station setting status	SB00C0	Reserved station setting status	—
SB00D0	Error invalid station setting	SB00D0	Error invalid station setting current status	—
SB00E0	Temporary error invalid station status	—	—	—
SB00F0	CPU RUN status (each station)	SB00F0	CPU operating status of each station	—
SB00F1	CPU RUN status (master station)	SB00F1	CPU operating status of master station	—
SB0100	CPU operation status (each station) (1)	SB0100	CPU moderate/major error status of each station	—
SB0101	CPU operation status (master station) (1)	SB0101	CPU moderate/major error status of master station	—
SB0110	CPU operation status (each station) (2)	SB0110	CPU minor error status of each station	—
SB0111	CPU operation status (master station) (2)	SB0111	CPU minor error status of master station	—
SB0120	PORT1 error frame reception status (each station)	—	—	—
SB0121	PORT1 error frame reception status (master station)	—	—	—
SB0130	PORT2 error frame reception status (each station)	—	—	—
SB0131	PORT2 error frame reception status (master station)	—	—	—

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SB0140	PORT1 error frame detection (each station)	—	—	—
SB0141	PORT1 error frame detection (master station)	—	—	—
SB0150	PORT2 error frame detection (each station)	—	—	—
SB0151	PORT2 error frame detection (master station)	—	—	—
SB0170	Parameter error status (each station)	—	—	—
SB0180	Reserved station function disable status	—	—	—

Replacement of the link special register (SW)

When replacing the master station, replace the link special register (SW) used in the program. The following table lists the alternative devices. The network specifications are different. Before changing, check the specifications of the alternative device in the manual.

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SW0000	Link stop/start direction	—	—	—
SW0001 to SW0008		—	—	—
SW00010 to SW00017	Reserved station function disable/temporary error invalid station setting	—	—	—
SW0030	Send/receive instruction (1) processing result	SW0030	Link dedicated instructions processing result CH1	The error code to be stored is different.
SW0031	Send/receive instruction (2) processing result	SW0031	Link dedicated instructions processing result CH2	The error code to be stored is different.
SW0040	Network No.	SW0040	Network No.	—
SW0042	Station No.	SW0042	Station number	—
SW0043	Mode status	SW0043	Mode status of own station	The value for devices is different.
SW0047	Baton pass status (own station)	—	—	—
SW0048	Cause of baton pass interruption	—	—	—
SW0049	Cause of data link stop	SW0049	Cause of data link stop	The value for devices is different.
SB004A	Data link stop request station	—	—	—
SB004B	Own station's CPU status	SB004B	Own station's CPU status	The value for devices is different.
SB004C	Parameter setting status	SW004C	Parameter setting status	The error code to be stored is different.
SB0050	Data link start status (own station)	—	—	—
SB0051	Data link stop status (own station)	—	—	—
SB0052	Data link start status (entire system)	—	—	—
SB0053	Data link stop status (entire system)	—	—	—
SB0054	Temporary error invalid station setting result	—	—	—
SB0055	Temporary error invalid station setting cancel result	—	—	—
SB0056	Result of reserved station function disable	—	—	—
SB0057	Result of reserved station function enable	—	—	—
SB0058	Number of total slave stations (setting)	SW0058	Total number of slave stations setting value	—
SB0059	Number of total slave stations (current value)	SW0059	Total number of slave stations present value	—
SB005A	Maximum baton pass station	—	—	—
SB005B	Maximum cyclic transmission station	SW005B	Maximum data link station number	—
SW0060	Maximum link scan time	—	—	—
SW0061	Minimum link scan time	—	—	—
SW0062	Current link scan time	SW0060	Communication cycle intervals	The value for devices is different.
SW0063	Constant link scan set value	—	—	—
SW0064	Connection status (own station)	SW0066	Connection status (own station)	The value for devices is different.

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SW0066	Actual link scan time (lower 1 word)	—	—	—
SW0067	Actual link scan time (upper 1 word)	—	—	—
SW0068	PORT1 line error occurrence rate (max.)	—	—	—
SW0069	PORT1 line error occurrence rate (present)	—	—	—
SW006A	PORT2 line error occurrence rate (max.)	—	—	—
SW006B	PORT2 line error occurrence rate (present)	—	—	—
SW0070	Loopback station number 1	—	—	—
SW0071	Loopback station number 2	—	—	—
SW0074	PORT1 cable disconnection detection count	SW0074	PORT1 cable disconnection detection count	—
SW0075	PORT1 receive error detection count	SW0075	PORT1 receive error detection count	—
SW0076	PORT1 total no. of received data (lower 1 word)	SW0076	PORT1 total no. of received data (lower 1 word)	—
SW0077	PORT1 total no. of received data (upper 1 word)	SW0077	PORT1 total no. of received data (upper 1 word)	—
SW007A	Event count	—	—	—
SW007C	PORT2 cable disconnection detection count	SW007C	PORT2 cable disconnection detection count	—
SW007D	PORT2 receive error detection count	SW007D	PORT2 receive error detection count	—
SW007E	PORT2 total no. of received data (lower 1 word)	SW007E	PORT2 total no. of received data (lower 1 word)	—
SW007F	PORT2 total no. of received data (upper 1 word)	SW007F	PORT2 total no. of received data (upper 1 word)	—
SW00A0 to SW00A7	Baton pass status (each station)	—	—	—
SW00B0 to SW00B7	Data link status (each station)	SW00B0 to SW00B7	Data link error status of each station	—
SW00C0 to SW00C7	Reserved station setting status	SW00C0 to SW00C7	Reserved station setting status	—
SW00D0 to SW00D7	Error invalid station setting status	SW00D0 to SW00D7	Error invalid station setting status	—
SW00E0 to SW00E7	Temporary error invalid station setting status	—	—	—
SW00F0 to SW00F7	CPU RUN status (each station)	SW00F0 to SW00F7	CPU operating status of each station	The value for devices is different.
SW0100 to SW0107	Operation status (each station) (1)	SW0100 to SW0107	CPU moderate/major error status of each station	The value for devices is different.
SW0110 to SW0117	Operation status (each station) (2)	SW0110 to SW0117	CPU minor error status of each station	The value for devices is different.
SW0120 to SW0127	PORT1 error frame reception status (each station)	—	—	—
SW0130 to SW0137	PORT2 error frame reception status (each station)	—	—	—
SW0140 to SW0147	PORT1 error frame detection (each station)	—	—	—
SW0150 to SW0157	PORT2 error frame detection (each station)	—	—	—

Q0J71GF11-T2		RJ71GN11-T2		
Number	**Name**	**Device number**	**Name**	**Precautions for replacement**
SW0170 to SW0177	Parameter error status (each station)	—	—	—
SW0180 to SW0187	Reserved station function disable status	—	—	—

5.3.4 Precautions when replacing the network module

- After replacing the CC-Link IE Field Network with the CC-Link IE TSN, read the manuals for the CC-Link IE TSN and check the functions, specifications, and methods of use before using.
- When replacing the CC-Link IE Field Network with the CC-Link IE TSN, change the HUB to the TSN HUB[*1].
- Check the "safety refresh monitoring time" and "transmission interval monitoring time" of each station, and calculate the values depending on the system and safety distance.
- The safety communications between the local stations are not available for the CC-Link IE TSN. Some functions are different between the CC-Link IE Field Network and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 21 Comparison of functions

- Some parameters are different between the CC-Link IE Field Network and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 22 Comparison of parameters

- Some link special relays and link special registers are different between the CC-Link IE Field Network and CC-Link IE TSN. Before replacement, check the manuals of each module and the following.

☞ Page 24 Replacement of the link special relay (SB)
☞ Page 27 Replacement of the link special register (SW)

- Before actual operation, check the operation of the entire system.

*1 The HUB is a Class B switching HUB certified by the CC-Link Partner Association. Check the model name and usage of available switching HUBs on the homepage of the CC-Link Partner Association (www.cc-link.org).

6 REPLACEMENT OF REMOTE I/O MODULE

Use a CC-Link IE TSN remote I/O module (with safety function).

6.1 List of Alternative Models

Discontinued MELSEC-QS series models			MELSEC iQ-R series alternative models			Number of required modules
Product (model)	Number of points	Input type	Product (model)	Number of points	Input type	
CC-Link Safety system remote I/O module I/O combined module (QS0J65BTB2-12DT)*1	Input	16 points (single input) Negative common (source type)	CC-Link IE TSN remote I/O module with safety functions Input module (NZ2GNSS2-8D)	Input	8 points (single input) Negative common (source type)	2 modules (input module and I/O combined module)
			CC-Link IE TSN remote I/O module with safety functions I/O combined module (NZ2GNSS2-16DTE)	Input	8 points (single input) Negative common (source type)	
	Output	4 points (source + sink type)*2 2 points (source + source type)		Output	4 points (source + source type)	
CC-Link Safety system remote I/O module Input module (QS0J65BTS2-8D)	Input	16 points (single input) Negative common (source type)	CC-Link IE TSN remote I/O module with safety functions Input module (NZ2GNSS2-8D)	Input	8 points (single input) Negative common (source type)	2 modules
CC-Link Safety system remote I/O module Output module (QS0J65BTS2-4T)	Output	4 points (source + sink type)*2 2 points (source + source type)	CC-Link IE TSN remote I/O module with safety functions Output module (NZ2GNSS2-8TE)	Output	4 points (source + source type)	1 modules

*1 The alternative models for the module with the S mark will be supported in the future. For details, please consult our specified representative.

*2 The alternative models are not available for the output type of source + sink. Change the wiring to the output type of source + source.

6.2 Specifications Comparison of the Remote I/O Module

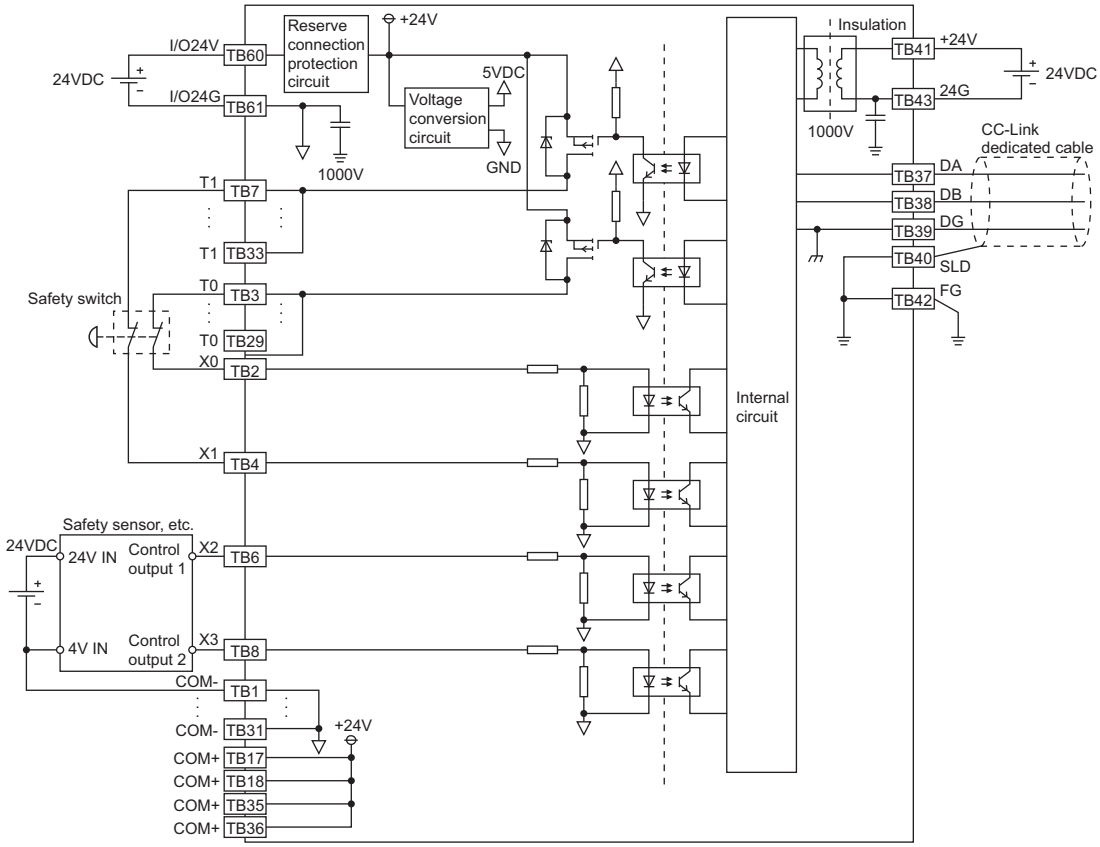
I/O combined module

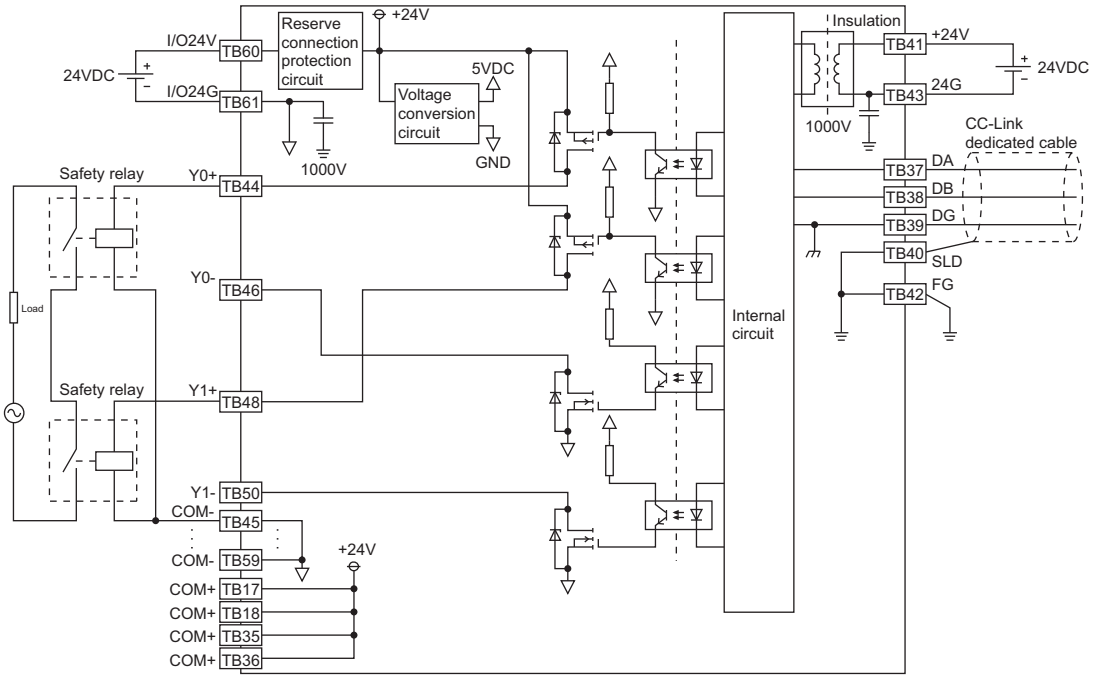
Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models	
		QS0J65BTB2-12DT	NZ2GNSS2-16DTE	NZ2GNSS2-8D
Number of input points		Single wiring: 16 points, double wiring: 8 points	Single wiring: 8 points, double wiring: 4 points	
Rated input voltage		24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	
Rated input current		4.6mA TYP. (for 24VDC)	7.3mA TYP. (for 24VDC)	
ON voltage/ON current		15VDC or higher/2mA or higher	12VDC or higher/3mA or higher	
OFF voltage/OFF current		5VDC or lower/0.5mA or lower	5VDC or lower/1.3mA or lower	
Input circuit response time	OFF → ON	0.4ms or less (at 24VDC)		
	ON → OFF	0.4ms or less (at 24VDC)		
Safety remote station refresh response processing time		9.6ms (module technical version A: 38ms)	2.3ms Safety remote station safety cycle time + communication path response time Safety remote station safety cycle time: 2.0mm Communication path response time: 0.3mm	
Safety remote station input response time		11.2ms or less (module technical version A: 32ms) + time of noise filter (1ms, 5ms, 10ms, 20ms, 50ms)	Input circuit response time + input response time (1.0ms, 1.5ms, 5ms, 10ms, 20ms, 50ms, 70ms)	
Input type		Negative common	Negative common	
Wiring method for common		Input: 16 points per common	Input: 8 points per common	
Number of output points		Double wiring (source + source): 2 points Double wiring (source + sink): 4 points	Single wiring: 8 points, double wiring: 4 points	—
Rated load voltage		24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	—
Maximum load current		0.5A/1 point		—
Maximum inrush current		1.0A, 10ms or lower		—
Leakage current at OFF		0.5mA or lower	0.1mA or lower	—
Maximum voltage drop at ON		1.0VDC or lower	0.5A at 0.5VDC (TYP.), 0.5A at 0.8VDC (MAX.)	—
Output circuit response time	OFF → ON	0.4ms or less (at 24VDC)		—
	ON → OFF	0.4ms or less (at 24VDC)		—
Safety remote station output response time		10.4ms or less (ON → OFF) 11.2ms or less (OFF → ON) (module technical version A: 32ms)	Output circuit response time	—
Surge suppressor		Zener diode		—
External power supply for output part	Voltage	Same as external power supply for input part		—
	Current			—
	Protection function			—
	Fuse			—
Output type		Source + source Source + sink	Source + source	—
Wiring method for common		Output: 4 points per common	Output: 8 points per common	—
Common current		4A maximum		—
Protection function		Output overload protection function		—

Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models	
		QS0J65BTB2-12DT	NZ2GNSS2-16DTE	NZ2GNSS2-8D
External power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	
	Current	60mA	160mA	100mA
	Protection function	External power supply overvoltage protection function, external power supply overcurrent protection function	External power supply overvoltage protection function	
	Fuse	8A (user-unchangeable)	Not changed	
External interface	Communication part	Screw terminal block	RJ45 connector	
	Module power supply part		Spring clamp terminal block (push-in)	
	I/O part, external power supply part	Screw terminal block	Spring clamp terminal block (push-in)	
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (compliant with JIS C 2812)		
Applicable wire size	Terminal block for the module power supply and FG	Core: 0.3 to 2.0mm² (22 to 14 AWG)	Core: 0.3 to 1.5mm² (22 to 16 AWG)	
	I/O terminal block		Core: 0.5 to 1.5mm² (20 to 16 AWG)	
Applicable solderless terminal	Terminal block for the module power supply and FG	• RAV1.25-3 (compliant with JIS C 2805) [Applicable wire size: 0.3 to 1.25mm²] • V2-MS3 (JST Mfg. Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.), TGV2-3N (NICHIFU Co., Ltd.) [Applicable wire size: 1.25 to 2.0mm²]	• AI0.34-8TQ (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.34mm²] • AI0.5-8WH, AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-8GY, AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • AI1-8RD, AI1-10RD (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • AI1.5-8BK, AI1.5-10BK (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]	
	I/O terminal block		• AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • A1.0-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • A1.5-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]	
Number of points	RX/RY	32 points	16 points	
	RWr/RWw	0 points	4 points	
	SA\X/SA\Y	—	SA\X: 32 points, SA\Y: 16 points	SA\X: 16 points
Communication cable		CC-Link dedicated cable	An Ethernet cable that meets the 1000BASE-T standard: Straight cable of the category 5e or higher (double shielded STP)	
Module power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	
	Current	140mA	170mA	160mA
	Protection function	Module power supply overvoltage protection function, module power supply overcurrent protection function		
	Fuse	0.8A (user-unchangeable)	1.6A (user-unchangeable)	

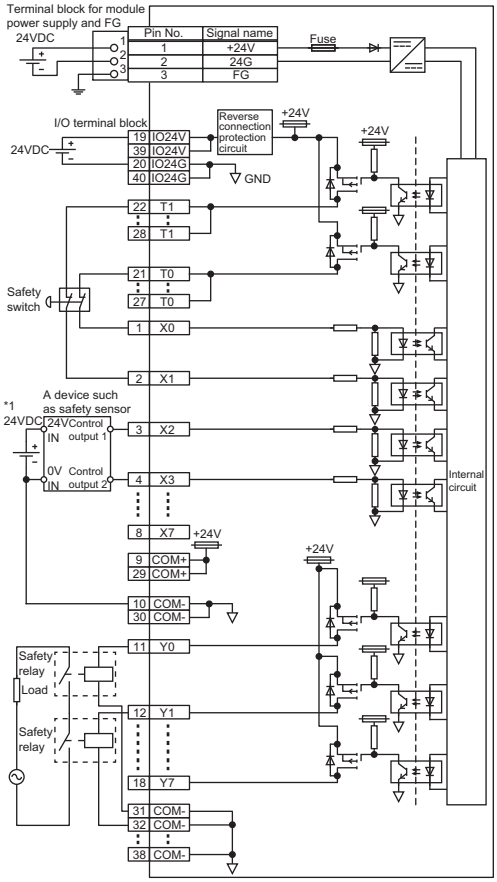
Wiring

■QS0J65BTB2-12DT



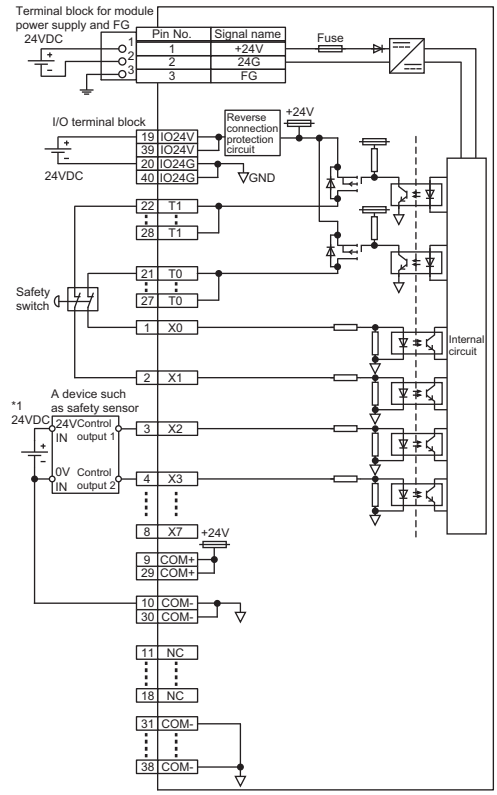


■NZ2GNSS2-16DTE



*1 The power supply of 24VDC can be applied from the COM+ terminal.

■NZ2GNSS2-8D



*1 The power supply of 24VDC can be applied from the COM+ terminal.

Terminal block

■QS0J65BTB2-12DT

I/O part

COM-	T0	COM-	T1	COM-	T0	COM-	T1	COM+
X0	X1	X2	X3	X4	X5	X6	X7	COM+

I/O part

COM-	T0	COM-	T1	COM-	T0	COM-	T1	COM+
X8	X9	XA	XB	XC	XD	XE	XF	COM+

Communication part, external power supply part

DA	DG	+24V	24G
DB	SLD	FG	

I/O part, external power supply part

Y0+	Y0-	Y1+	Y1-	Y2+	Y2-	Y3+	Y3-	I/O 24V
COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	I/O 24G

■NZ2GNSS2-16DTE

Module power supply part

+24V	24G	FG

I/O part, external power supply part

X0	X1	X2	X3	X4	X5	X6	X7	COM+	COM-	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	I/O 24V	I/O 24G
T0	T1	T0	T1	T0	T1	T0	T1	COM+	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	I/O 24V	I/O 24G

■NZ2GNSS2-8D

Module power supply part

+24V	24G	FG

I/O part, external power supply part

X0	X1	X2	X3	X4	X5	X6	X7	COM+	COM-	NC	NC	NC	NC	NC	NC	NC	NC	I/O 24V	I/O 24G
T0	T1	T0	T1	T0	T1	T0	T1	COM+	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	I/O 24V	I/O 24G

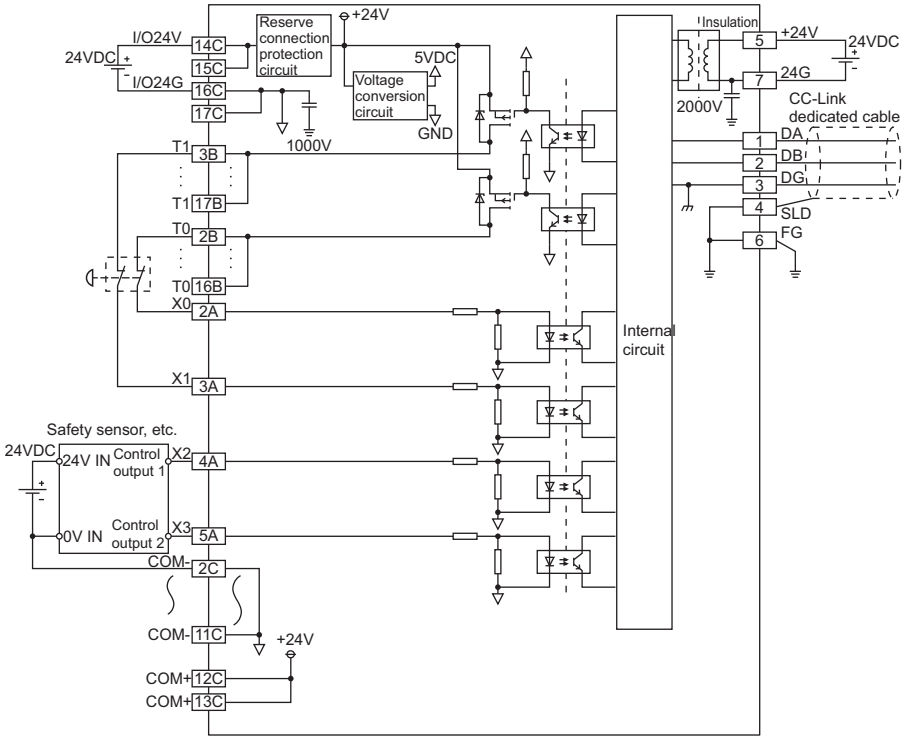
Input module

Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
		QS0J65BTS2-8D	NZ2GNSS2-8D
Number of input points		Single wiring: 16 points, double wiring: 8 points	Single wiring: 8 points, double wiring: 4 points
Rated input voltage		24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
Rated input current		5.9mA TYP. (for 24VDC)	7.3mA TYP. (for 24VDC)
ON voltage/ON current		15VDC or higher/2mA or higher	12VDC or higher/3mA or higher
OFF voltage/OFF current		5VDC or lower/0.5mA or lower	5VDC or lower/1.3mA or lower
Input circuit response time	OFF → ON	0.4ms or less (at 24VDC)	
	ON → OFF	0.4ms or less (at 24VDC)	
Safety remote station refresh response processing time		9.6ms	2.3ms Safety remote station safety cycle time + communication path response time Safety remote station safety cycle time: 2.0mm Communication path response time: 0.3mm
Safety remote station input response time		11.2ms or less (module technical version A: 32ms) + time of noise filter (1ms, 5ms, 10ms, 20ms, 50ms)	Input circuit response time + input response time (1.0ms, 1.5ms, 5ms, 10ms, 20ms, 50ms, 70ms)
Input type		Negative common	Negative common
Wiring method for common		Input: 16 points per common	Input: 8 points per common
External power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	40mA	100mA
	Protection function	External power supply overvoltage protection function, external power supply overcurrent protection function	External power supply overvoltage protection function
	Fuse	8A (user-unchangeable)	Not changed
External interface	Communication part	Screw terminal block	RJ45 connector
	Module power supply part		Spring clamp terminal block (push-in)
	I/O part, external power supply part	Spring clamp terminal block	Spring clamp terminal block (push-in)
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (compliant with JIS C 2812)	
Applicable wire size	Terminal block for the module power supply and FG	Core: 0.3 to 2.0mm² (22 to 14 AWG)	Core: 0.3 to 1.5mm² (22 to 16 AWG)
	I/O terminal block	Stranded wire: 0.08 to 1.5mm² (28 to 16 AWG) Wire strip length for the applicable wire: 8 to 11mm	Core: 0.5 to 1.5mm² (20 to 16 AWG)
Applicable solderless terminal	Terminal block for the module power supply and FG	• RAV1.25-3 (compliant with JIS C 2805) [Applicable wire size: 0.3 to 1.25mm²] • V2-MS3 (JST Mfg. Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.), TGV2-3N (NICHIFU Co., Ltd.) [Applicable wire size: 1.25 to 2.0mm²]	• AI0.34-8TQ (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.34mm²] • AI0.5-8WH, AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-8GY, AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • AI1-8RD, AI1-10RD (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • AI1.5-8BK, AI1.5-10BK (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]
	I/O terminal block	• TE0.5 (NICHIFU Co., Ltd.) [Applicable wire size: 0.5mm²] • TE0.75 (NICHIFU Co., Ltd.) [Applicable wire size: 0.75mm²] • TE1 (NICHIFU Co., Ltd.) [Applicable wire size: 0.9 to 1.0mm²] • TE1.5 (NICHIFU Co., Ltd.) [Applicable wire size: 1.25 to 1.5mm²] • FA-VTC125T9 (Mitsubishi Electric Engineering Co., Ltd.) [Applicable wire size: 0.3 to 1.65mm²] • FA-VTCW125T9 (Mitsubishi Electric Engineering Co., Ltd.) [Applicable wire size: 0.3 to 1.65mm²]	• AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • A1.0-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • A1.5-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]

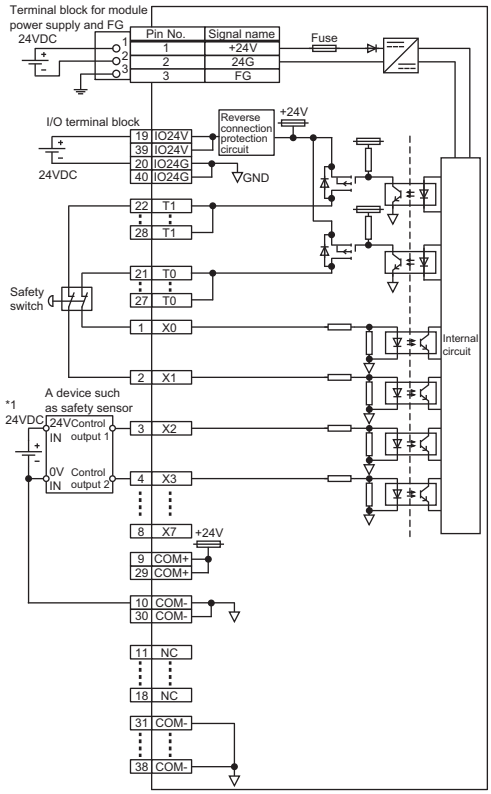
Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
		QS0J65BTS2-8D	NZ2GNSS2-8D
Number of points	RX/RY	32 points	16 points
	RWr/RWw	0 points	4 points
	SA\X/SA\Y	—	SA\X: 16 points
Communication cable		CC-Link dedicated cable	An Ethernet cable that meets the 1000BASE-T standard: Straight cable of the category 5e or higher (double shielded STP)
Module power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	120mA	160mA
	Protection function	Module power supply overvoltage protection function, module power supply overcurrent protection function	
	Fuse	0.8A (user-unchangeable)	1.6A (user-unchangeable)

Connection diagram

■QS0J65BTS2-8D



■NZ2GNSS2-8D



*1 The power supply of 24VDC can be applied from the COM+ terminal.

Terminal block

■QS0J65BTS2-8D

Communication part, external power supply part

DA	DG	+24V	24G
DB	SLD	FG	

I/O part, external power supply part

NC	X0	X1	X2	X3	X4	X5	X6	X7	X8	X9	XA	XB	XC	XD	XE	XF
NC	T0	T1	T0	T1	T0	T1	T0	T1	T0	T1	T0	T1	T0	T1	T0	T1
NC	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM+	COM+	I/O 24V	I/O 24V	I/O 24G	I/O 24G

■NZ2GNSS2-8D

Module power supply part

+24V	24G	FG

I/O part, external power supply part

X0	X1	X2	X3	X4	X5	X6	X7	COM+	COM-	NC	NC	NC	NC	NC	NC	NC	NC	I/O 24V	I/O 24G
T0	T1	T0	T1	T0	T1	T0	T1	COM+	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	I/O 24V	I/O 24G

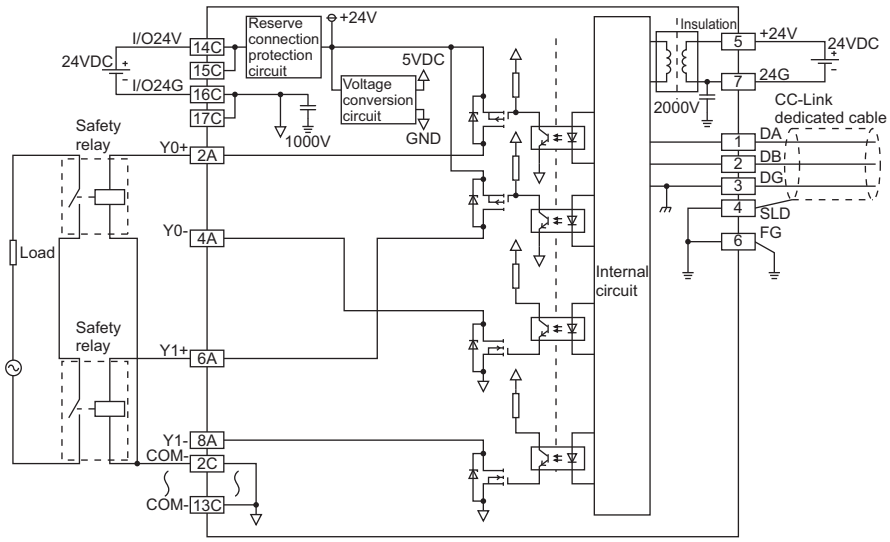
Output module

Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
		QS0J65BTS2-4T	NZ2GNSS2-8TE
Safety remote station refresh response processing time		9.6ms	2.3ms Safety remote station safety cycle time + communication path response time Safety remote station safety cycle time: 2.0mm Communication path response time: 0.3mm
Number of output points		Double wiring (source + source): 2 points Double wiring (source + sink): 4 points	Single wiring: 8 points, double wiring: 4 points
Rated load voltage		24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
Maximum load current		0.5A/1 point	
Maximum inrush current		1.0A, 10ms or lower	
Leakage current at OFF		0.5mA or lower	0.1mA or lower
Maximum voltage drop at ON		1.0VDC or lower	0.5A at 0.5VDC (TYP.) 0.5A at 0.8VDC (MAX.)
Output circuit response time	OFF → ON	0.4ms or less (at 24VDC)	
	ON → OFF	0.4ms or less (at 24VDC)	
Safety remote station output response time		10.4ms or less (ON → OFF) 11.2ms or less (OFF → ON)	Output circuit response time
Surge suppressor		Zener diode	
Output type		Source + source Source + sink	Source + source
Wiring method for common		Output: 4 points per common	Output: 8 points per common
Common current		2A maximum	4A maximum
Protection function		Output overload protection function	
External power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 19.2 to 28.8VDC)	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)
	Current	45mA	70mA
	Protection function	External power supply overvoltage protection function, external power supply overcurrent protection function	External power supply overvoltage protection function
	Fuse	8A (user-unchangeable)	Not changed
External interface	Communication part	Screw terminal block	RJ45 connector
	Module power supply part		Spring clamp terminal block (push-in)
	I/O part, external power supply part	Spring clamp terminal block	Spring clamp terminal block (push-in)
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (compliant with JIS C 2812)	
Applicable wire size	Terminal block for the module power supply and FG	Core: 0.3 to 2.0mm² (22 to 14 AWG)	Core: 0.3 to 1.5mm² (22 to 16 AWG)
	I/O terminal block	Stranded wire: 0.08 to 1.5mm² (28 to 16 AWG) Wire strip length for the applicable wire: 8 to 11mm	Core: 0.5 to 1.5mm² (20 to 16 AWG)

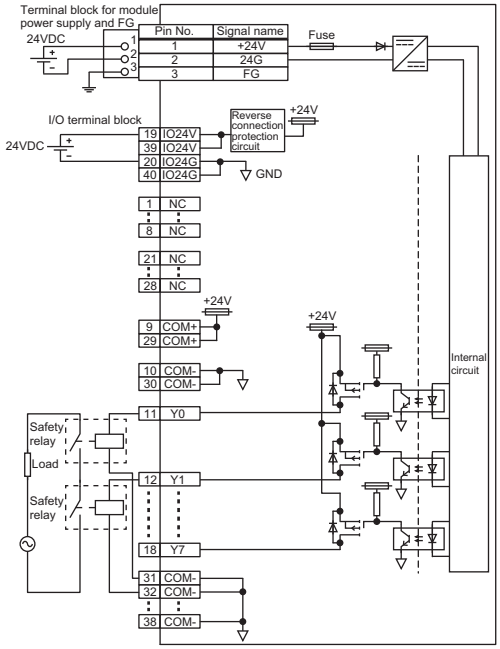
Item		Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models
		QS0J65BTS2-4T	NZ2GNSS2-8TE
Applicable solderless terminal	Terminal block for the module power supply and FG	• RAV1.25-3 (compliant with JIS C 2805) [Applicable wire size: 0.3 to 1.25mm²] • V2-MS3 (JST Mfg. Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.), TGV2-3N (NICHIFU Co., Ltd.) [Applicable wire size: 1.25 to 2.0mm²]	• AI0.34-8TQ (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.34mm²] • AI0.5-8WH, AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-8GY, AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • AI1-8RD, AI1-10RD (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • AI1.5-8BK, AI1.5-10BK (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]
	I/O terminal block	• TE0.5 (NICHIFU Co., Ltd.) [Applicable wire size: 0.5mm²] • TE0.75 (NICHIFU Co., Ltd.) [Applicable wire size: 0.75mm²] • TE1 (NICHIFU Co., Ltd.) [Applicable wire size: 0.9 to 1.0mm²] • TE1.5 (NICHIFU Co., Ltd.) [Applicable wire size: 1.25 to 1.5mm²] • FA-VTC125T9 (Mitsubishi Electric Engineering Co., Ltd.) [Applicable wire size: 0.3 to 1.65mm²] • FA-VTCW125T9 (Mitsubishi Electric Engineering Co., Ltd.) [Applicable wire size: 0.3 to 1.65mm²]	• AI0.5-10WH (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.5mm²] • AI0.75-10GY (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 0.75mm²] • A1.0-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.0mm²] • A1.5-10 (PHOENIX CONTACT GmbH & Co. KG) [Applicable wire size: 1.5mm²]
Number of points	RX/RY	32 points	16 points
	RWr/RWw	0 points	4 points
	SA\X/SA\Y	—	SA\Y: 16 points
Communication cable		CC-Link dedicated cable	An Ethernet cable that meets the 1000BASE-T standard: Straight cable of the category 5e or higher (double shielded STP)
Module power supply	Voltage	24VDC (ripple ratio: within 5%) (allowable voltage range: 20.4 to 28.8VDC)	
	Current	140mA	170mA
	Protection function	Module power supply overvoltage protection function, module power supply overcurrent protection function	
	Fuse	0.8A (user-unchangeable)	1.6A (user-unchangeable)

Wiring

■QS0J65BTS2-4T



■NZ2GNSS2-8TE



Terminal block

■QS0J65BTS2-4T

Communication part, external power supply part

DA	DG	+24V	24G
DB	SLD	FG	

I/O part, external power supply part

NC	Y0+	NC	Y0-	NC	Y1+	NC	Y1-	NC	Y2+	NC	Y2-	NC	Y3+	NC	Y3-	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
NC	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM+	COM+	I/O 24V	I/O 24V	I/O 24G	I/O 24G

■NZ2GNSS2-8TE

Module power supply part

+24V	24G	FG

I/O part, external power supply part

NC	NC	NC	NC	NC	NC	NC	NC	COM+	COM-	X0	X1	X2	X3	X4	X5	X6	X7	I/O 24V	I/O 24G
NC	NC	NC	NC	NC	NC	NC	NC	COM+	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	COM-	I/O 24V	I/O 24G

6.3 Precautions for the Remote I/O Module

For details on the replacement of an alternative model, refer to the following:

CC-Link IE TSN Remote I/O Module (With Safety Functions) User's Manual

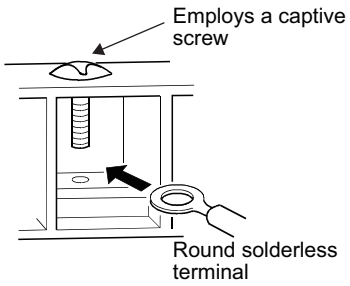
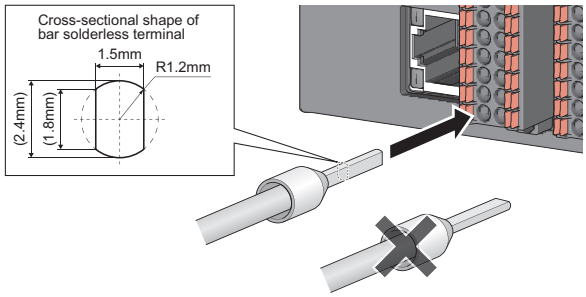
6.3.1 Replacement of the terminal block

When replacing the MELSEC-QS series I/O module with the CC-Link IE TSN remote I/O module with safety functions, change the solderless terminals to be connected because the power supply terminals and I/O terminals are different.

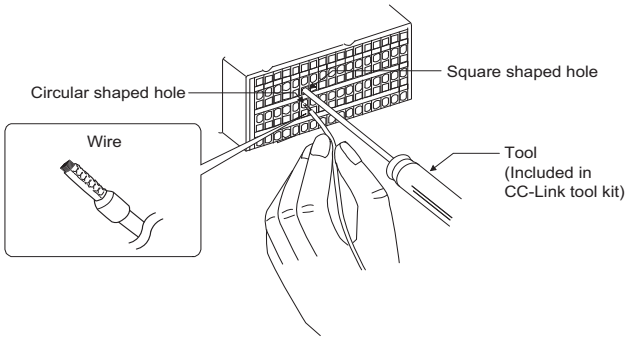
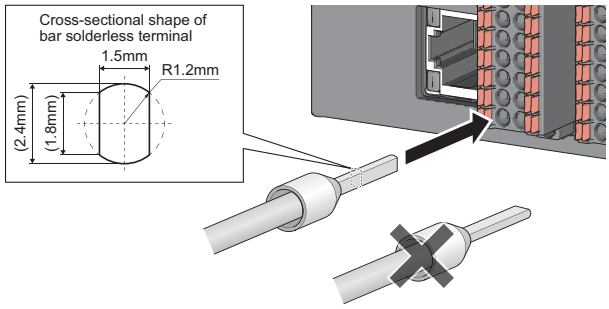
For the recommended terminals and applicable wire size, refer to the following.

☞ Page 31 List of Alternative Models
☞ Page 32 Specifications Comparison of the Remote I/O Module

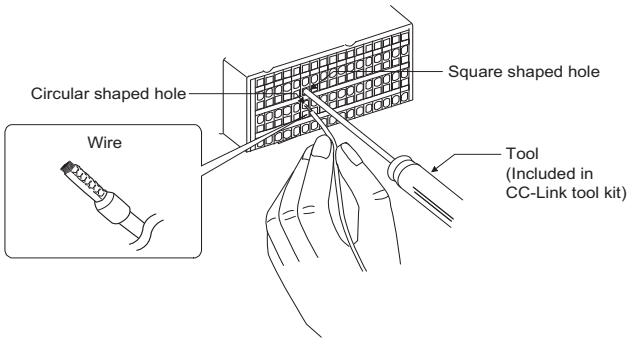
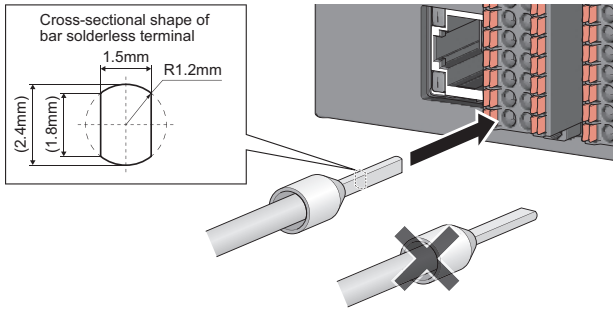
When QS0J65BTB2-12DT is replaced

QS0J65BTB2-12DT	NZ2GNSS2-16DTE + NZ2GNSS2-8D
Screw terminal block A screw terminal block is used for the input/output terminals. Note that the terminals of the alternative model differ.  The round solderless terminal used for the existing model cannot be used for the CC-Link IE TSN remote I/O module with safety functions of the alternative model.	Spring clamp terminal block (push-in) A spring clamp terminal block (push-in) is used for the alternative model. Use the recommended bar solderless terminals depending on the wire diameter. 

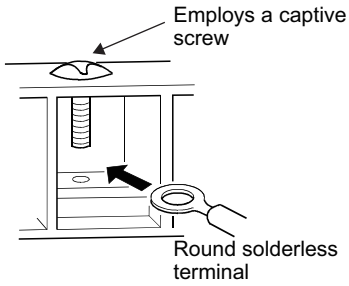
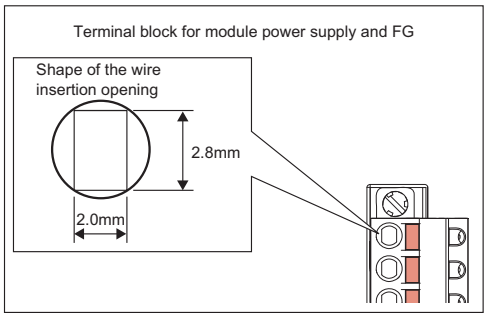
When QS0J65BTS2-8D is replaced

QS0J65BTS2-8D	NZ2GNSS2-8D + NZ2GNSS2-8D
Spring clamp terminal block A spring clamp terminal block is used for the input terminals. The different terminal block is used for the alternative model. Reconnect the terminals.  The bar solderless terminals used for the existing model cannot be used for the CC-Link IE TSN remote I/O module with safety functions of the alternative model.	Spring clamp terminal block (push-in) A spring clamp terminal block (push-in) is used for the alternative model.  Use the recommended bar solderless terminals depending on the wire diameter.

When QS0J65BTS2-4T is replaced

QS0J65BTS2-4T	NZ2GNSS2-8TE
Spring clamp terminal block A spring clamp terminal block is used for output terminals. The different terminal block is used for the alternative model. Reconnect the terminals.  The bar solderless terminals used for the existing model cannot be used for the CC-Link IE TSN remote I/O module with safety functions of the alternative model.	Spring clamp terminal block (push-in) A spring clamp terminal block (push-in) is used for the alternative model.  Use the recommended bar solderless terminals depending on the wire diameter.

When a module power supply is changed (common to all modules, terminal block)

Terminal block for the MELSEC-QS series module power supply and transmission signal	Alternative models
Screw terminal block A screw terminal block is used for the module power supply.*1  The round solderless terminal used for the existing model cannot be used for the CC-Link IE TSN remote I/O module with safety functions of the alternative model.	Spring clamp terminal block (push-in) A spring clamp terminal block (push-in) is used for the alternative model. Use the recommended bar solderless terminals depending on the wire diameter. 

*1 The module power supply terminals are connected to the terminal block for the module power supply and transmission path.

6.3.2 Reconnection of the I/O terminals

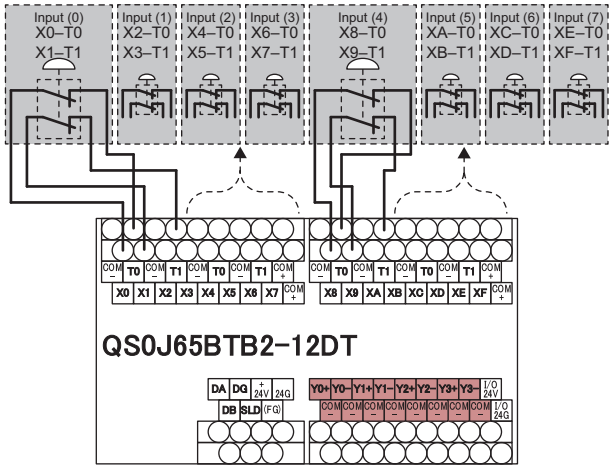
When replacing the MELSEC-QS series module with the CC-Link IE TSN remote I/O module with safety functions, reconnect the I/O terminals. For connecting details, refer to "Wiring of External Device and I/O Terminal Block" in the following manual.

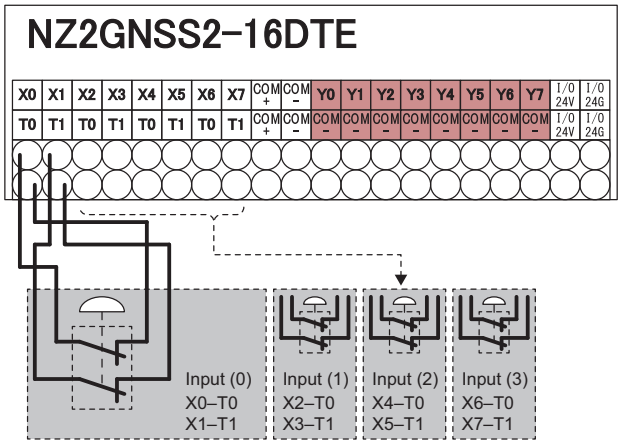
📖 CC-Link IE TSN Remote I/O Module (With Safety Functions) User's Manual (SH-082227ENG)

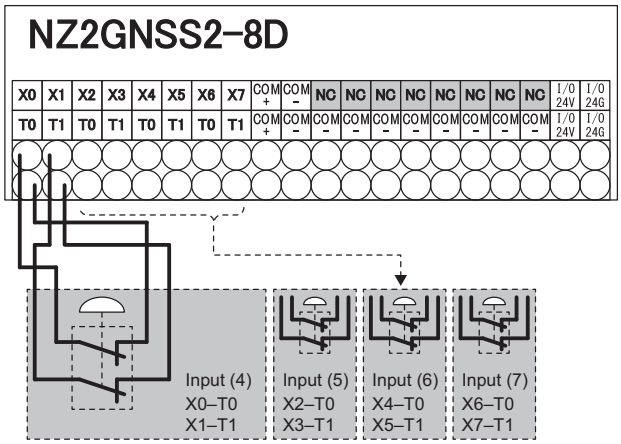
QS0J65BTB2-12DT

• Input part

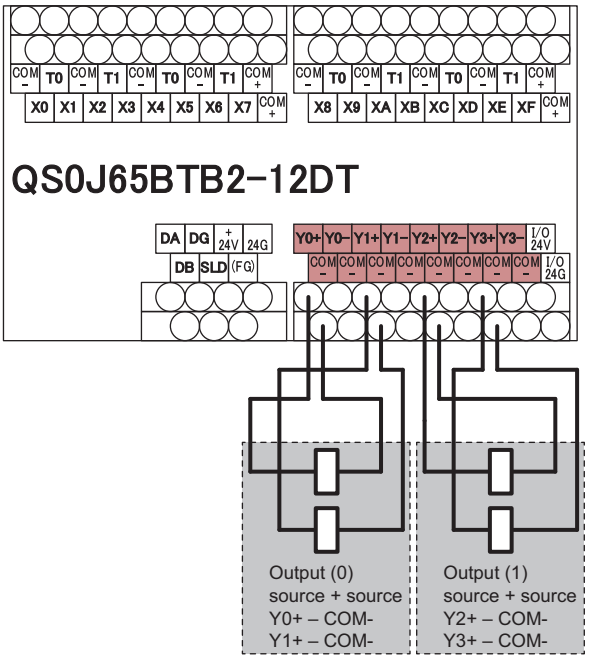
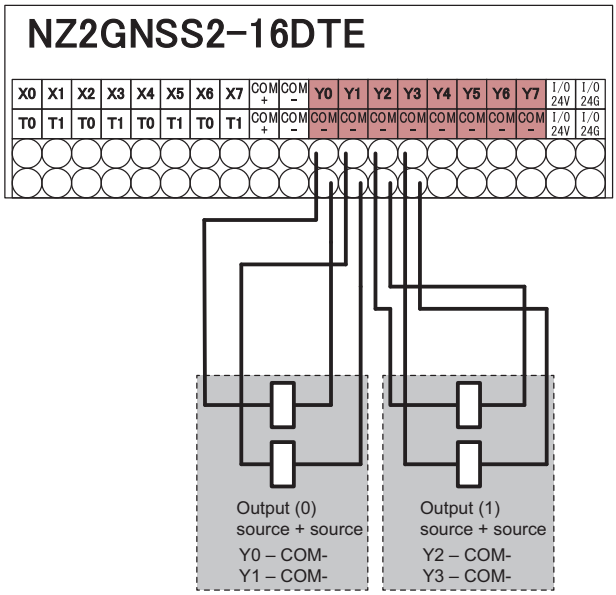
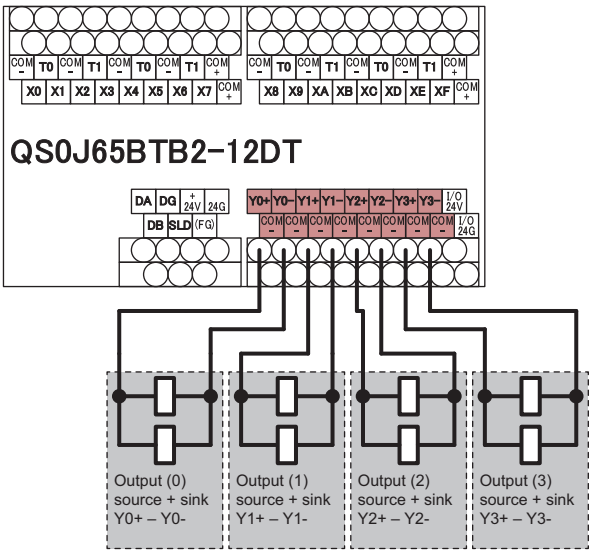
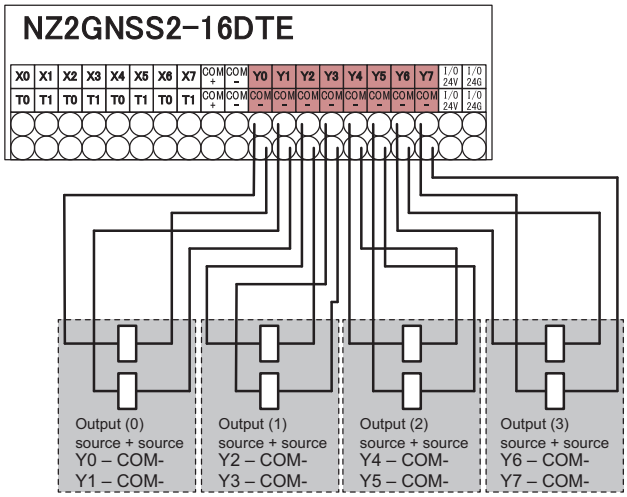
Discontinued MELSEC-QS series models	Alternative models
QS0J65BTB2-12DT	**NZ2GNSS2-16DTE + NZ2GNSS2-8D**
Double input: 8 points maximum, single input: 16 points can be used. (Example) When the double input is used	Double input: 4 points maximum, single input: 8 points can be used. (Example) When the double input is used Divide the terminal for 16 input points into two, and connect the terminals to two stations by 8 points each. (Connect the terminals in order.) The 8 points in the first half are connected to NZ2GNSS2-16DTE of the first station. The 8 points in the latter half are connected to NZ2GNSS2-8D of the second station.





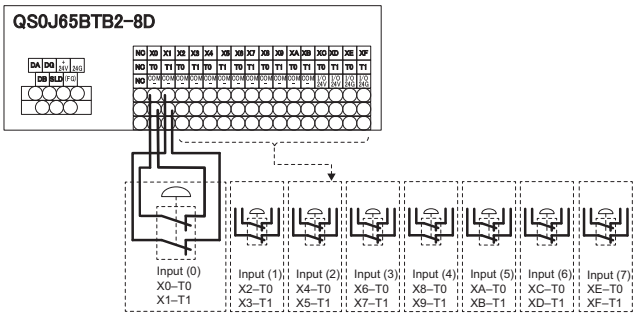
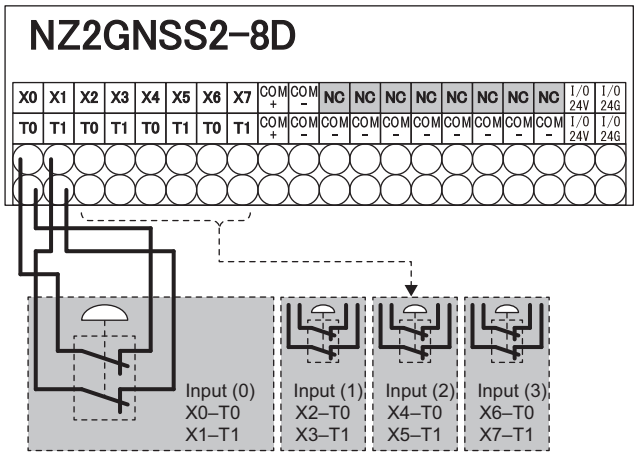
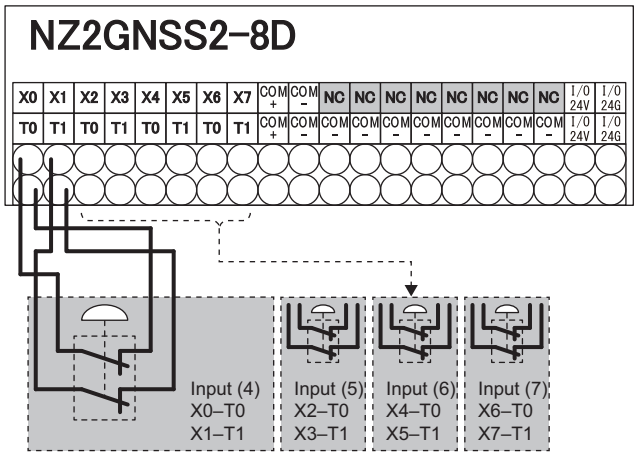


• Output part

Discontinued MELSEC-QS series models	Alternative models
QS0J65BTB2-12DT	**NZ2GNSS2-16DTE + NZ2GNSS2-8D**
When the double output of source and source is used, 2 points can be used. (Example) When the double output of source and source is used 	When the double output of source and source is used, 4 points can be connected. (Example) When the double output of source and source is used 
When the double output of source and sink is used, 4 points can be used. (Example) When the double output of source and sink is used 	Since the double output of source and sink is not available, use the double output of source and source. Since 4 points can be used when the double output is used, a module is not required to add. (Example) When the double output of source and source is used 

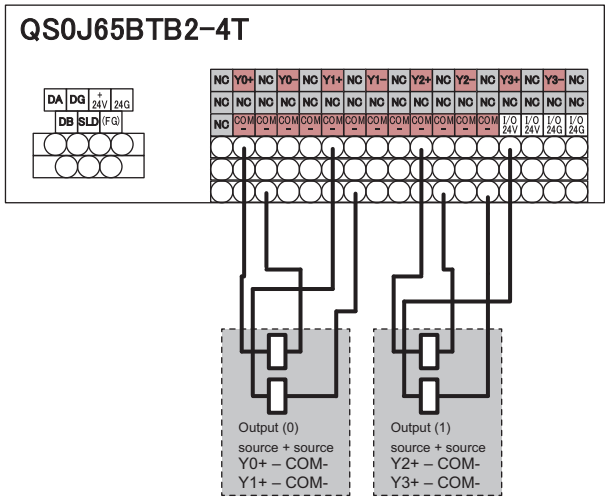
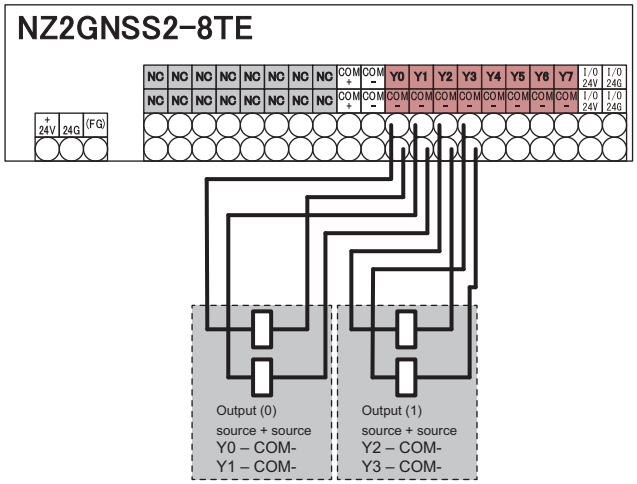
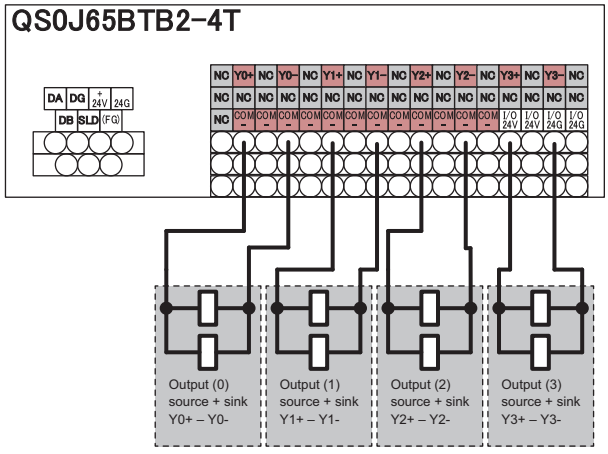
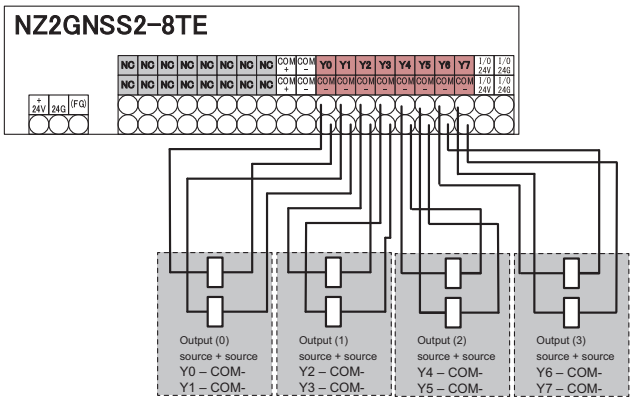
QS0J65BTS2-8D

• Input part

Discontinued MELSEC-QS series models	Alternative models
QS0J65BTS2-8D	**NZ2GNSS2-8D + NZ2GNSS2-8D**
Double input: 8 points maximum, single input: 16 points can be used. (Example) When the double input is used 	Double input: 4 points maximum, single input: 8 points can be used. (Example) When the double input is used Divide the terminal for 16 input points into two, and connect the terminals to two stations by 8 points each. (Connect the terminals in order.) The 4 points in the first half are connected to NZ2GNSS2-8D of the first station.  The 4 points in the latter half are connected to NZ2GNSS2-8D of the second station. 

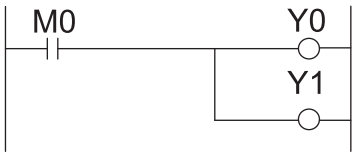
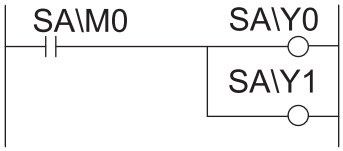
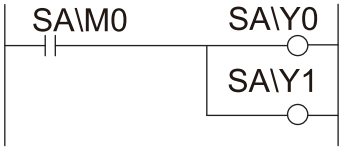
QS0J65BTS2-4T

• Output part

Discontinued MELSEC-QS series models	Alternative models
QS0J65BTS2-4T	**NZ2GNSS2-8TE**
When the double output of source and source is used, 2 points can be used. (Example) When the double output of source and source is used 	When the double output of source and source is used, 4 points can be connected. (Example) When the double output of source and source is used 
When the double output of source and sink is used, 4 points can be used. (Example) When the double output of source and sink is used 	Since the double output of source and sink is not available, use the double output of source and source. Since 4 points can be used when the double output is used, a module is not required to add. (Example) When the double output of source and source is used 

6.3.3 Change of the programs

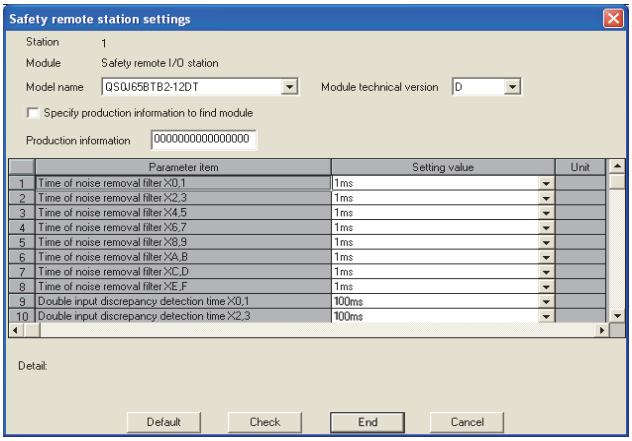
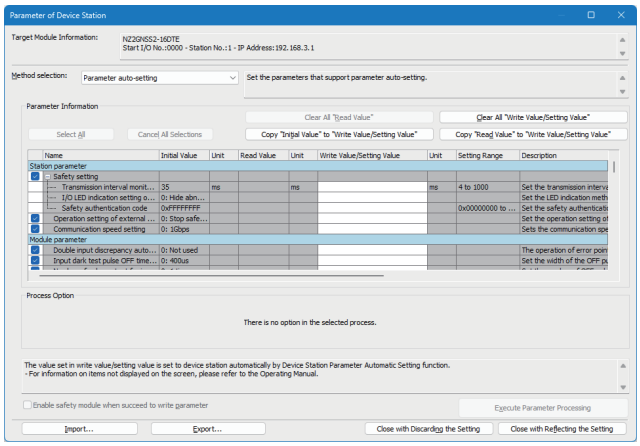
When replacing the MELSEC-QS series module with the CC-Link IE TSN remote I/O module with safety functions, change the programs.

Discontinued MELSEC-QS series models	Alternative models
QS0J65BTS2-12DT	**NZ2GNSS2-16DTE + NZ2GNSS2-8D**
GX Developer is used. When the double output of source and source is used When the safety outputs of Y0 and Y1 are turned on, Y0+ and Y1+ are turned on. 	GX Works3 is used. When the double output of source and source is used, no programs need to be changed. 
GX Developer is used. When the double output of source and sink is used When the safety output of Y0 is turned on, Y0+ and Y0- are turned on. 	GX Works3 is used. Change the double output of source and sink to the double output of source and source. Since the safety outputs of Y0 and Y1 are used in the double output of source and source, change the program so that both Y0 and Y1 are turned on. 

6.3.4 Change of the parameters

When replacing the MELSEC-QS series module with the CC-Link IE TSN remote I/O module with safety functions, change the parameters.

Set the values of safety remote station settings in GX Developer to those of parameter processing of device stations in GX Works3.

Discontinued MELSEC-QS series models	Alternative models
QS0J65BTS2-12DT	**NZ2GNSS2-16DTE + NZ2GNSS2-8D**
Set the parameters in the network parameters settings of GX Developer. Set the parameters in "Safety Remote Station Setting". 	Set the parameters of GX Developer to the parameters of GX Works3. Set the parameters in "Parameter of Device Station."  For the parameter settings, refer to the following. ☞ Page 54 Change of Program

7 REPLACEMENT OF BASE UNIT

When replacing the MELSEC-QS series with the MELSEC iQ-R series, replace the CC-Link Safety system and CC-Link IE Field Network with the CC-Link IE TSN.

7.1 List of Alternative Models

Item	Model			
	Discontinued MELSEC-QS series models	MELSEC iQ-R series alternative models		
	QS034B*1	R35B	R38B	R312B
Number of I/O slots	4 slots	5 slots	8 slots	12 slots
Extension	Not allowed	Allowed	Allowed	Allowed

*1 Alternative models with S mark are planned for future support. For details, please consult our specified representative.

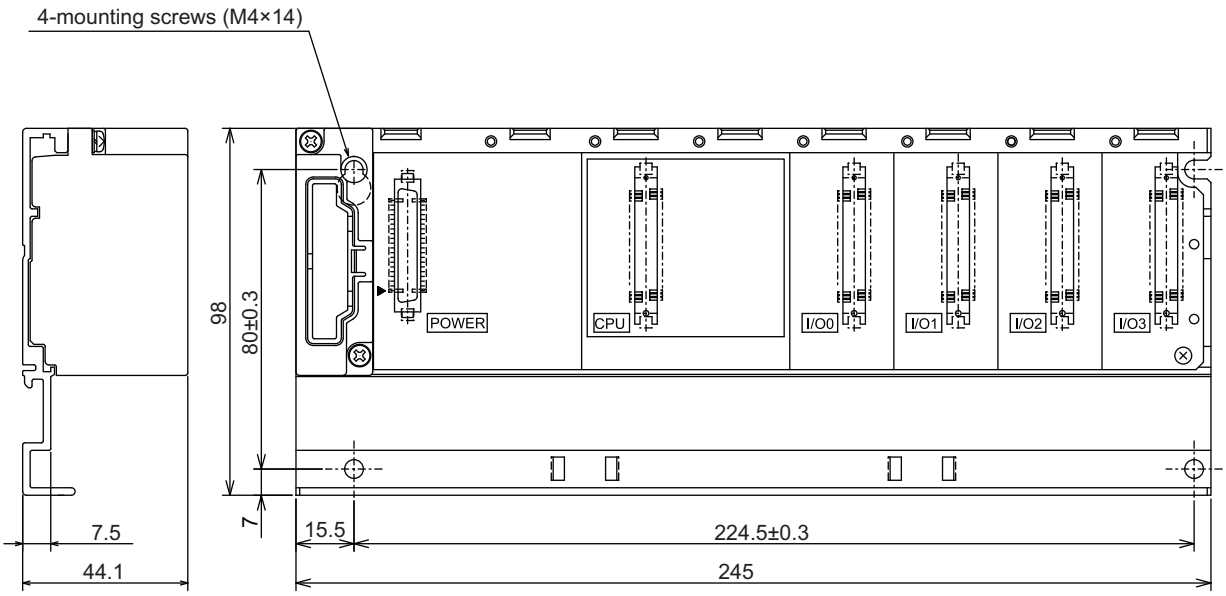
7.2 Specifications Comparison of Base Unit

Item	Model		Precautions for replacement
	MELSEC-QS series	MELSEC iQ-R series	
	QS034B	R35B	
Number of mountable I/O modules	4	5	R6SFM is equivalent to one module.
Extension	Not allowed	Allowed	—
Internal current consumption (5VDC)	0.10A	0.58A	—
DIN rail adapter	Q6DIN2	R6DIN1	—
Mounting hole	ϕ4.5mm or size for M4 screws (M4 screws are used.)	ϕ4.5mm or size for M4 screws (M4 screws are used.)	—
External dimensions	98 (H) × 245 (W) × 44.1 (D) mm	101 (H) × 245 (W) × 32.5 (D) mm	—
Weight	0.28kg	0.41kg	—

7.3 Precautions When the Base Unit is Replaced

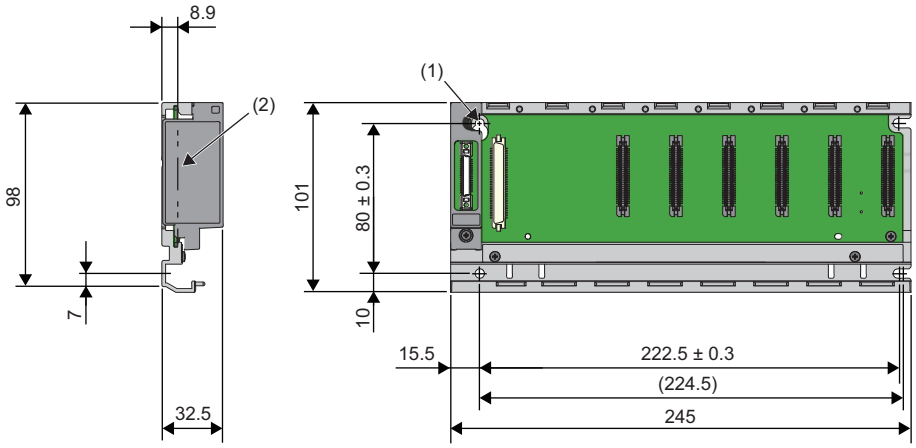
The size of the hole of the MELSEC iQ-R series base unit is the same as that of the QS series base unit.

- External dimensions of QS034B



(unit: mm)

- External dimensions of R35B



(1) Four mounting screws (M4×14)
(2) Module face to be mounted
(unit: mm)

8 REPLACEMENT OF PROJECT

A GX Developer format project can be used in GX Works3.
This function is available for the QSCPU project.
It is recommended to install the latest GX Works3.

8.1 Replacement Procedure

8.1.1 Procedure to read (use) the GX Developer files from (in) GX Works3

This chapter describes the procedure to use the QSCPU project in GX Developer for the RnSFCPU project in GX Works3.

Operating procedure

1. Select [Project] ⇨[Open Other Format File] ⇨ [GX Developer Format] ⇨ [Open QSCPU Series Project].
2. Select a project and click the [Open] button.
3. Enter the user name and password of a GX Developer format project in the "User Authentication (Project)" window, and click the [OK] button.
4. Read the displayed message, and click the [OK] button.
5. Register a new user in a GX Works3 format project.
6. Read the displayed message, and click the [OK] button. The changes in project data are displayed in the "Output" window.

Using the above procedure, a QSCPU project is opened as a R120SFCPU project. When using the module other than R120SFCPU, change the module type ([Project] ⇨ [Change Module Type/Operation Mode]).

Data to be changed

The following table shows data to be changed when opening a GX Developer format project.

Operation in opening	Setting item in GX Developer		Remarks
Changing in accordance with the target module type	PLC parameter	PLC name	Check the settings in GX Works3.
		PLC system	
		PLC RAS	
		Device	
		I/O assignment*1*2	
		Safety setting*3	
	Network parameter*1	Ethernet*3	
		CC IE Control (Normal station)	
		CC IE Field (Local station)	
	• Ladder program*4 • Device comments for devices other than SM/SD • Device memory*1 • User-defined FB*5 • Structure • Global variable • Local Label		
Changing the definition*6/deleting the definition*7	Safety FB		Redefine them in GX Works3.
Returning to the default/ deleting the data	PLC parameter	Boot file setting	Set them in GX Works3.
	Network parameter	CC IE Field (Master station [Safety])	
		CC IE Field (Local station [Safety])	
		CC-Link	
	• Options (other than "Reference/Reflection Target for Device Comment") • Device comments of SM/SD • Remote password • User information (user name/password/access level)		
Changing to the state in which a project was newly created	Connection destination		

*1 Some setting items return to the default or the data is deleted. Check and set them in GX Works3 after opening the project.
*2 When switch settings are configured without setting network parameters, the switch settings are deleted.
*3 The items which are not supported by GX Works3 are deleted.
*4 Replaced with a standard program.
*5 Replaced with a standard FB.
*6 When a safety FB library for MELSEC iQ-R series is already registered in GX Works3, safety FBs are replaced with the ones for MELSEC iQ-R series.
*7 When a safety FB library for the MELSEC iQ-R series is not registered in GX Works3, safety FBs are changed to undefined function blocks.
Data on a ladder program is not deleted.

8.2 Change of Program

8.2.1 Instruction conversion

This section describes the instructions to be changed when QSCPU is replaced with RnSFCPU.
Change the program for the following instructions.

Instruction type		Instruction of QSCPU	Action
Sequence instruction	Non-processing	PAGE	Delete the instruction or use the NOPLF instruction instead. When using the program as a program break, use a statement.
QSCPU dedicated instruction	Forced control stop	S.QSABORT	The function can be replaced by generating an operation error and stopping the program.*1

*1 When "Continuation Error" is set to the operation error in the parameter setting, the CPU does not stop. Set "Stop Error" to the operation error.

Point

The instructions to be changed are converted to OUT SM4095 when the project is read. After reading the project, search the instructions and correct the program as required.

8.2.2 Special relay

A special relay is an internal relay that has a special usage in a programmable controller.
Note that some special relays for QSCPU are not compatible with the relays for RnSFCPU. The incompatible special relays are converted to the dummy special relay (SM4095) when the project is read. After reading the project, search the dummy special relay (SM4095) and correct the program as required.
The following table lists the differences of specifications of special registers.

Category	Name	QSCPU	RnSFCPU
Diagnostics information	Error common information	SM5	Not available
	Error individual information	SM16	Not available
Safety CPU	Safety operation mode	SM560	SD205.0
Boot operation	Boot operation	SM660	Not available
CC-Link Safety	Safety refresh communication status of each safety remote station (Safety master module 1)	SM1004	SA\SM1008
	Safety refresh communication status of each safety remote station (Safety master module 2)	SM1204	SA\SM1016
CC-Link IE Field Network	Setting status of safety communication with master station	SM1400	SA\SD1090 to SA\SD1097
	Safety refresh communication status of each safety station	SM1420	SA\SM1008 (Safety master module 1) SA\SM1016 (Safety master module 2)
	Safety refresh communication status of safety master station	SM1421	
	Safety master station interlock status	SM1700	SA\SD1232 to SA\SD1239 (Safety master module 1) SA\SD1248 to SA\SD1255 (Safety master module 2)
	Safety master station interlock release request	SM1720	SA\SD1240 to SA\SD1247 (Safety master module 1) SA\SD1256 to SA\SD1263 (Safety master module 2)

8.2.3 Special register

A special register is an internal register that has a special usage in a programmable controller.
Note that some registers for QSCPU are not compatible with the registers for RnSFCPU. The incompatible special register is converted to the dummy special register (SD4095) when the project is read. After reading the project, search the dummy special register (SD4095) and correct the program as required.

The following table lists the differences of specifications of special registers.

Category	Name	QSCPU	RnSFCPU
Diagnostics information	Clock time for self diagnosis error occurrence (year, month)	SD1	SD1, 2
	Clock time for self diagnosis error occurrence (day, hour)	SD2	SD3, 4
	Clock time for self diagnosis error occurrence (minute, second)	SD3	SD5, 6
	Error information categories	SD4	SD80
	Error common information	SD5 to 15	SD81 to 111
	Error individual information	SD16 to 26	SD113 to 143
	Diagnostics error CPU identifier	SD27	Not available
	Error reset	SD50	SM50
	Battery low latch	SD51	SM51
	Battery low	SD52	SM52
	Cause of error	SD81	Not available
	I/O module verify error number	SD150 to 153	Not available
System information	Clock data	SD210 to 213	SD210 to 216
	Information of the CC-Link IE Controller Network and MELSECNET/H	SD254 to 258	Not available
	Ethernet information	SD340 to 344	
Safety CPU	Safety operation mode	SD560	SD205
memory	Drive 3/4 related	SD620	Not available
CC-Link Safety	Information of the CC-Link Safety	SD1000 to 1279	SA\SD1008 to SA\SD1663
CC-Link IE Field Network	Information of the CC-Link IE Field Network	SD1400 to 1727	

8.2.4 Division of safety programs and standard programs

A program in a GX Developer format project is replaced with a standard program.
Divide the programs to execute the safety control as safety programs.
This section describes the procedure to divide the safety program from the standard program. The procedure for the program, device, standard/safety shared label, safety label, safety FB, and User-defined FB are included.

Program

The following shows the procedure to change a standard program to a safety program. For details, refer to the following.
📖 GX Works3 Operating Manual(SH-081215ENG)

Operating procedure

1. Create safety program data in GX Works3.
2. Cut a ladder to be used in a safety program and paste the ladder in the safety program according to the execution order.
   [Example: Circuit including a safety device]
3. Change arbitrary devices to safety devices that can be edited in a GX Works3 format project.
4. Change the standard devices/labels used in both standard and safety programs to standard/safety shared labels.
5. Change the labels to be used in a safety program to the safety labels.
6. Redefine the function blocks.
7. Convert (reassign) all the programs.

Device

Change the following devices to safety devices (SA\□) that can be edited in a GX Works3 format project.

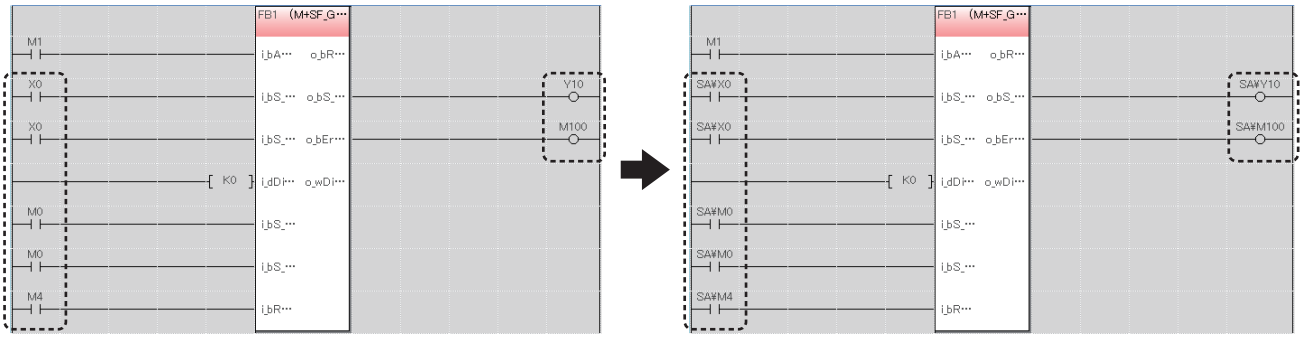
- Safety device used in a GX Developer format project
- Standard device used in a safety program of a GX Works3 format project

Check the corresponding devices in GX Developer, then change the devices to safety devices by following the procedure below.

Operating procedure

Add "SA\" at the beginning of the corresponding devices.

Ex.



M1 is used to communicate the data between a standard program and safety program. Change the device to a standard/ safety shared label.

■Devices that are not compatible with the MELSEC iQ-R series modules

- Devices which are not supported by MELSEC iQ-R series modules are replaced with SM4095/SD4095.

Some devices to be used as instruction arguments may be changed to character strings (SM4095 or SD4095).

■When device values are set in the device memory

When replacing a device to a safety device, set the value of the device set in the device memory again as the value of the safety device.

Standard/safety shared label

If a standard device/label is used to pass data between standard and safety programs, the device/label needs to be changed to a standard/safety shared label. Correct the standard device/label and the program by following the procedure below.

Operating procedure

■Standard devices

1. Create a new standard/safety shared label.*1
2. Register a label in the global editor for standard/safety shared labels.
3. Change the standard device used in a safety program to the registered label.
4. Add a ladder to pass data between the standard and safety programs in the standard program.

For the method to pass data between standard and safety programs, refer to the following:

📖MELSEC iQ-R Safety Application Guide(SH-081538ENG)

*1 Select "Standard/Safety Shared" for "Category" in the "New Data" screen.

■Labels

1. Create a new standard/safety shared label.*1
2. Cut the label in the label editor and paste it to the global label editor for standard/safety shared labels. *2
3. Define the global label that became undefined on the program editor.*3
4. Add a ladder to pass data between the standard and safety programs in the standard program.

For the method to pass data between standard and safety programs, refer to the following:

📖MELSEC iQ-R Safety Application Guide(SH-081538ENG)

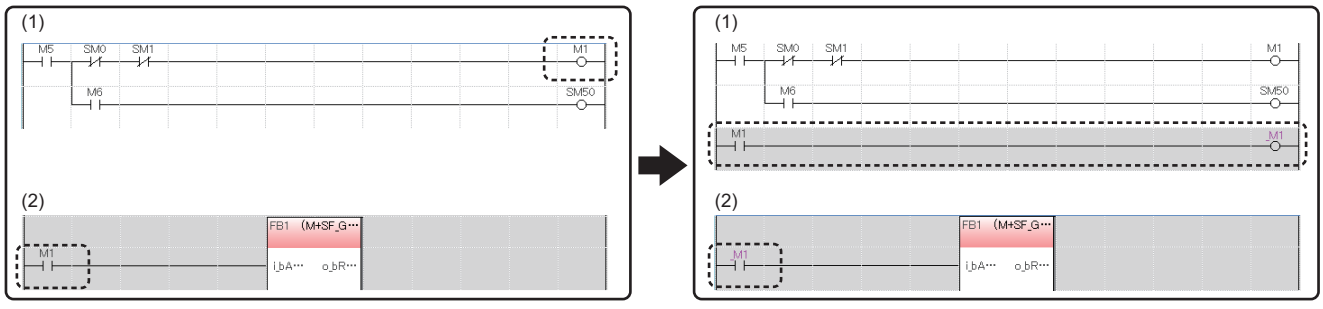
*1 Select "Standard/Safety Shared" for "Category" in the "New Data" screen.

*2 To change a local label to a standard/safety shared label, its class needs to be corrected. For details on the classes that can be set for standard/safety shared labels, refer to the following:
📖MELSEC iQ-R CPU Module User's Manual (Application)(SH-081264ENG)

*3 Labels are automatically defined if the following option is set to "Synchronize":
·[Tool] ⇨ [Options] ⇨ "Program Editor" ⇨ "Ladder Editor" ⇨ "Label Synchronization" ⇨ "Operational Setting" ⇨ "Operation on Editing Label Editor"

Ex.

When changing a standard device (M1) used in a standard program (1) and safety program (2) to a standard/safety shared label (_M1).



Safety labels

Labels to be used in a safety program needs to be changed to safety labels.
Change global labels and local labels to safety labels by the following procedure.

Operating procedure

■Global labels

1. Create a new safety global label.*1
2. Cut the label in the global label editor and paste it to the label editor for safety global labels.
3. Change the device assigned to the label to a safety device.
4. Define the global label that became undefined on the program editor.*2

*1 Select "Safety" for "Category" in the "New Data" screen.
*2 Labels are automatically defined if the following option is set to "Synchronize":
·[Tool] ⇨ [Options] ⇨ "Program Editor" ⇨ "Ladder Editor" ⇨ "Label Synchronization" ⇨ "Operational Setting" ⇨ "Operation on Editing Label Editor"

■Local labels

Cut a label in the local label editor of a standard program, and paste it to the local label editor of a safety program.

Safety FB

When a safety FB library for the MELSEC iQ-R series is not registered in GX Works3, safety FBs are changed to undefined function blocks. In addition, the function block name is changed to a function block name in a safety FB library of the MELSEC iQ-R series.
Redefine the undefined function block by following the procedure below.

Operating procedure

1. Register a safety FB library for the MELSEC iQ-R series in GX Works3.
2. Drag and drop the registered safety FB library to FB/FUN in the Navigation window.
3. Select and right-click the undefined function block in the program editor, and select [Edit] ⇨[Update FB/FUN] from the shortcut menu.
4. Read the displayed message, and click the [Yes] button.
5. When changing an FB instance name, select and right-click the name. Select [Edit] ⇨ [Edit FB Instance] from the shortcut menu, then change the name.

Point

When a safety FB library for MELSEC iQ-R series is already registered in GX Works3, safety FBs in a GX Developer format project are replaced with the corresponding ones for MELSEC iQ-R series.
To obtain the safety FB library, please contact your local Mitsubishi Electric sales office or representative.

User-defined FBs

To use user-defined FBs that are used in a standard program in a safety program, replace data by following the procedure below.

Operating procedure

1. Cut a user-defined FB to be used in a safety program, and paste it to the safety program according to the execution order.
2. Cut the FB instance of the user-defined FB in the local label editor of the standard program, and paste it to the local label editor of the safety program.
3. Create a safety FB.*1
4. Cut the program and all local labels of the user-defined FB and past them to the safety FB respectively.
5. Change the devices used in the program of the user-defined FB to safety devices.
6. Set the safety FB created in step 3 for the data type of the FB instance label in the local label editor of the safety program.

*1 Select "Safety" for "Category" in the "New Data" screen.

Precautions

To change a part of a program in a user-defined FB to a safety FB, create a safety FB, then divide the processing to the user-defined FB (standard FB) and to the safety FB.

8.3 Precautions when Changing the Programs

8.3.1 List of applicable devices

Item		Model	
		MELSEC-QS series	MELSEC iQ-R series
		Number of points (default)	Number of points (default)
Number of I/O points		1024	4096
Input device (X)		6144	12K
Output device (Y)		6144	12K
Internal relay (M)		6144	12K
Latch relay (L)		—	8K
Step relay (S)		—	0
Annunciator (F)		1024	2K
Edge relay (V)		1024	2K
Link relay (B)		2048	8K
Link special relay (SB)		1536	2K
Timer (T)		512	1K
Retentive timer (ST)		0	0
Long timer (LT)		—	1K
Long retentive timer (LST)		—	0
Counter (C)		512	512
Long counter (LC)		—	512
Data register (D)		6144	18K
Link register (W)		2048	8K
Link special register (SW)		1536	2K
Function input (FX)		—	16
Function output (FY)		—	16
Function register (FD)		—	5×4 words
Special relay (SM)		5120	4K
Special register (SD)		5120	4K
Nesting (N)		15	15
Link direct device	Link input (Jn\X)	—	160K maximum
	Link output (Jn\Y)	—	160K maximum
	Link relay (Jn\B)	—	640K maximum
	Link special relay (Jn\SB)	—	5120 maximum
	Link register (Jn\W)	—	2560K maximum
	Link special register (Jn\SW)	—	5120 maximum
Module access device (Un\G)		—	268435456 maximum
Index register (Z)		—	20
Long index register (LZ)		—	2
File register (R/ZR)		—	0
Refresh register (RD)		—	512K

8.3.2 I/O control mode

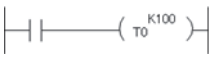
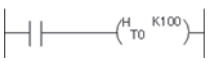
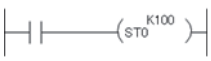
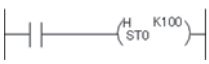
The following table lists the refresh mode of the I/O control mode.

I/O control mode	Model	
	MELSEC-QS series	MELSEC iQ-R series
Refresh mode	○	○
Partial refresh instruction	○	○
Direct access input	—	○
Direct access output	—	○

8.3.3 Data format to be used in instructions

Setting data		Model	
		MELSEC-QS series	MELSEC iQ-R series
Bit data		○	○
16-bit data (word data)	16-bit signed binary data	○	○
	16-bit unsigned binary data	○	○
32-bit data (double word data)	32-bit signed binary data	○	○
	32-bit unsigned binary data	○	○
Real number data (floating-point data)	Single-precision real number data	—	○
	Double-precision real number data	—	○
BCD data	BCD 4-digit data	○	○
	BCD 8-digit data	○	○
	BCD 16-digit data	—	○
String data	String	—	○
	Unicode string	—	○

8.3.4 Timer

Timer		Model	
		MELSEC-QS series	MELSEC iQ-R series
Low-speed timer	Measurement unit	• 100ms (default) Settable in the range of 1 to 1000ms (parameter)	• 100ms (default) Settable in the range of 1 to 1000ms (parameter)
	Specification method		
High-speed timer	Measurement unit	• 10ms (default) Settable in the range of 0.1 to 100ms (parameter)	• 10ms (default) Settable in the range of 0.1 to 100ms (parameter)
	Specification method		
Retentive timer	Measurement unit	Same as the low-speed timer	Same as the low-speed timer
	Specification method		
High-speed retentive timer	Measurement unit	Same as the high-speed timer	Same as the high-speed timer
	Specification method		
Setting range		1 to 32767	1 to 32767
Processing of setting value 0		Momentarily turning ON	Momentarily turning ON
Updating processing of current value		When the OUT Tn instruction is executed	When the OUT Tn instruction is executed
ON/OFF processing of contact			

8.3.5 Counter

Timer	Model	
	MELSEC-QS series	MELSEC iQ-R series
Specification method		
Updating processing of current value	When the OUT Tn instruction is executed	When the OUT Tn instruction is executed
ON/OFF processing of contact		

8.3.6 Boot operation

The program memory of MELSEC iQ-R Safety programmable controller CPU is stored in a flash ROM, so ROM operation is not required. (Even if a battery error occurs, the file data is not deleted.)

9 REFERENCE DOCUMENTS FOR REPLACEMENT

Refer to the following for replacement.

• When replacing the safety CPU module, safety power supply module, or safety main base unit

Document name	Document number
Mitsubishi Electric Safety Programmable Controller MELSEC iQ-R Series Machinery Directive (2006/42/EC) and UKCA Marking Compliance	BCN-P5999-0502
MELSEC iQ-R Module Configuration Manual	SH-081262ENG
MELSEC iQ-R CPU Module User's Manual (Startup)	SH-081263ENG
MELSEC iQ-R CPU Module User's Manual (Application)	SH-081264ENG

• When replacing the CC-Link Safety system master module

Document name	Document number
MELSEC iQ-R CC-Link IE TSN User's Manual (Startup)	SH-082127ENG
MELSEC iQ-R CC-Link IE TSN User's Manual (Application)	SH-082129ENG

• When replacing the CC-Link IE Field Network master/local module (with safety communication function)

Document name	Document number
MELSEC iQ-R CC-Link IE TSN User's Manual (Startup)	SH-082127ENG
MELSEC iQ-R CC-Link IE TSN User's Manual (Application)	SH-082129ENG
MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)	SH-081256ENG
MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)	SH-081259ENG

• When replacing the CC-Link Safety system remote I/O module

Document name	Document number
Before Using the Product (NZ2GNSS2-16DTE)	BCN-P5999-1256
Before Using the Product (NZ2GNSS2-8D)	BCN-P5999-1252
Before Using the Product (NZ2GNSS2-8TE)	BCN-P5999-1254
CC-Link IE TSN Remote I/O Module (With Safety Functions) User's Manual	SH-082227ENG

• When replacing the project

Document name	Document number
GX Works3 Operating Manual	SH-081215ENG
MELSEC iQ-R Safety Application Guide	SH-081538ENG
MELSEC iQ-R CPU Module User's Manual (Application)	SH-081264ENG

REVISIONS

Version	Date of issue	Revision
A	June 2020	First edition
B	May 2021	'REPLACEMENT OF PROJECT' has been revised according to the changes in functions of GX Works3 Version 1.075D.
C	May 2025	'REPLACEMENT OF PROJECT' has been revised according to the changes in functions of GX Works3 Version 1.115V. Network-related terms have been reviewed.

TRADEMARKS