



TECHNICAL BULLETIN

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Differences Between MELSEC iQ-R Series And MELSEC MX Controller MX-R Model

■Date of Issue

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■Relevant Models

MXR300-16, MXR300-32, MXR300-64, MXR500-128, MXR500-256

Thank you for your continued support of Mitsubishi Electric FA Integrated Controller, MELSEC MX controller MX-R model.

This bulletin provides differences between the MELSEC iQ-R series and MELSEC MX controller MX-R model.

Note that the descriptions in this bulletin provide information as of May 2025.

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1 GENERIC TERMS

Generic term	Details
MXR300	A generic term for the MXR300-16, MXR300-32, and MXR300-64
MXR500	A generic term for the MXR500-128 and MXR500-256
RnCPU	A generic term for the R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU
RD77MS	A generic term for the RD77MS2, RD77MS4, RD77MS8, and RD77MS16
RD78G	A generic term for the RD78G4, RD78G8, RD78G16, RD78G32, and RD78G64
RD78GH	A generic term for the RD78GHV and RD78GHW
RnMTCPU	A generic term for the R16MTCPU, R32MTCPU, and R64MTCPU

2 SYSTEM CONFIGURATION

2.1 Differences In System

Overall system configuration

This section summarizes the differences in the overall system configuration between the MELSEC iQ-R series and the MELSEC MX controller MX-R model.

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item		MELSEC iQ-R	MX controller MX-R model
Overall system configuration	Single CPU system	○	○
	Multiple CPU system	○	×
	Redundant system	○	×
Available modules	MELSEC iQ-R series	○	○
	MELSEC-Q series	○	×
GOT		○	○ ^{*1}
Available network	Ethernet	○	○
	CC-Link IE TSN	○	○
	CC-Link IE Controller Network	○	○
	CC-Link IE Field Network	○	○
	CC-Link IE Field Network Basic	○	×
	CC-Link	○	○
	MELSECNET/H	○	×
	AnyWire	○	○
Engineering software	GX Works3	○	○

^{*1} For the connectable GOTs with the MX Controller MX-R model, refer to the MELSEC MX Controller (MX-R Model) User's Manual.

Installation environment

There is no difference in the precautions on the general specifications and installation environment for the entire system. The system including an MX controller MX-R model can be installed in the same environment as the system including a MELSEC iQ-R series model.

Item		MELSEC iQ-R	MX controller MX-R model
General specifications		There is no difference in the general specifications of the entire system.	
Restriction of installation position		There is no difference in the general specifications of the entire system. ^{*1}	
DIN rail	DIN rail model	There is no difference.	
	DIN rail adapter		

^{*1} Note that the MX controller MX-R model is 21mm longer than the MELSEC iQ-R series model in external depth. For more details in external dimensions, refer to the section 3.1 Hardware.

2.2 List of Configuration Devices

The following tables show the differences in available devices/models between the MELSEC iQ-R series and MX controller MX-R model system configurations.

Base units and extension cables

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Main base unit	R33B	○	○
	R35B	○	○
	R38B	○	○
	R312B	○	○
Slim type main base unit	R32SB	○	×
	R33SB	○	×
	R35SB	○	×
Redundant power supply main base unit	R310RB	○	×
Extended temperature range main base unit	R310B-HT	○	×
Extended temperature range redundant power supply main base unit	R38RB-HT	○	×
Extension base unit	R65B	○	○
	R68B	○	○
	R612B	○	○
Extended temperature range extension base unit	R610B-HT	○	△: Operating temperature range is 0 to 55°C according to the combination with a main base unit.
Redundant power supply extension base unit	R610RB	○	×
Extended temperature range redundant power supply extension base unit	R68RB-HT	○	×
Extension cable	RC06B	○	○
	RC12B	○	○
	RC30B	○	○
	RC50B	○	○
	RC100B	○	○
DIN rail adapter	R6DIN1	○	○

Power supply module

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Power supply module	R61P	○	○
	R62P	○	△*1
	R63P	○	○
	R64P	○	○
	R69P	○	○
Slim type power supply module	R61SP	○	×
Redundant power supply module	R63RP	○	○
	R64RP	○	○
	R69RP	○	○

*1 The model is available in the following cases.

- MXR500-□: Available with extension base units
- MXR300-□: Available with the R33B, R35B and extension base units

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External memory media

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	MELSEC iQ-R	MX controller MX-R model
SD memory card	There is no difference in the SD memory cards that can be used.	
Extended SRAM cassette	○	×

I/O module

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Input module	AC input module	RX10	○
		RX10-TS	○
	200VAC input module	RX28	○
	DC input module (positive/negative common shared type)	RX40C7	○
		RX40C7-TS	○
		RX41C4	○
		RX41C4-TS	○
		RX42C4	○
	5/12VDC input module	RX70C4	○
		RX71C4	○
		RX72C4	○
	DC high-speed input module (positive common)	RX40PC6H	○
	DC high-speed input module (positive/negative common shared type)	RX41C6HS	○
		RX61C6HS	○
	DC high-speed input module (negative common)	RX40NC6H	○
	Input module with diagnostic functions (DC input)	RX40NC6B	○ △ ^{*1}
Output module	Transistor output module (sink type)	RY40NT5P	○
		RY40NT5P-TS	○
		RY41NT2P	○
		RY41NT2P-TS	○
		RY42NT2P	○
	Contact output module	RY10R2	○
		RY10R2-TS	○
	Contact output module (all points independent contact)	RY18R2A	○
	Transistor output module (source type)	RY40PT5P	○
		RY40PT5P-TS	○
		RY41PT1P	○
		RY41PT1P-TS	○
		RY42PT1P	○
	Transistor high-speed output module (sink type)	RY41NT2H	○
	Transistor high-speed output module (source type)	RY41PT2H	○
	Triac output module	RY20S6	○
	Output with diagnostic function	RY40PT5B	○ △ ^{*1}
I/O combined module	I/O combined module	RH42C4NT2P	○

*1 The SIL2 mode is not available.

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Analog modules

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item		Model	MELSEC iQ-R	MX controller MX-R model
Analog input module	Voltage/current input	R60AD4	○	○
	Voltage input	R60ADV8	○	○
	Current input	R60ADI8	○	○
		R60ADI8-HA	○	×
High speed analog input module		R60ADH4	○	○
Channel isolated analog input module	Voltage/current input	R60AD8-G	○	△ ^{*1}
	Current input	R60AD16-G	○	○
Channel isolated distributor		R60AD6-DG	○	○
Analog output module	Voltage/current input	R60DA4	○	○
	Voltage input	R60DAV8	○	○
	Current input	R60DAI8	○	○
High speed analog output module		R60DAH4	○	○
Channel isolated analog output module	Voltage/current input	R60DA8-G	○	△ ^{*1}
		R60DA16-G	○	○
Temperature input module	Thermocouple, 8 channels	R60TD8-G	○	○
	RDT, 8 channels	R60RD8-G	○	○
Temperature control module	RTD	R60TCRT4	○	○
		R60TCRT4-TS	○	○
	RTD (disconnection detection function)	R60TCRT4BW	○	○
	Thermocouple	R60TCRT2TT2	○	○
		R60TCRT2TT2-TS	○	○
	Thermocouple (disconnection detection function)	R60TCRT2TT2BW	○	○

*1 The SIL2 mode is not available.

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Motion modules, positioning modules, counter modules

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item		Model	MELSEC iQ-R	MX controller MX-R model
Simple motion module	Compliant with SSCNETⅢ(/H)	RD77MS2	○	×
		RD77MS4	○	×
		RD77MS8	○	×
		RD77MS16	○	×
	Compliant with CC-Link IE Field Network	RD77GF4	○	×
		RD77GF8	○	×
		RD77GF16	○	×
		RD77GF32	○	×
Motion module	Compliant with CC-Link IE TSN	RD78G4	○	×
		RD78G8	○	×
		RD78G16	○	×
		RD78G32	○	×
		RD78G64	○	×
		RD78GHV	○	×
		RD78GHW	○	×
High-speed counter module	DC input sink output type	RD62P2	○	○
	Differential input sink output type	RD62D2	○	○
	DC input source output type	RD62P2E	○	○
Positioning module	Open collector output	RD75P2	○	○
		RD75P4	○	○
	Differential output	RD75D2	○	○
		RD75D4	○	○
Channel isolated pulse input module		RD60P8-G	○	○
Flexible high-speed I/O control module		RD40PD01	○	○

Network modules

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
CC-Link IE Controller Network module	RJ71GP21-SX	○	○
	RJ71GP21S-SX	○	○
CC-Link IE Field Network module	RJ71GF11-T2	○	○
PROFIBUS-DP module	RJ71PB91V	○	×
CC-Link module	RJ61BT11	○	○
AnyWireASLINK master module	RJ51AW12AL	○	○
DeviceNet module	RJ71DN91	○	○
CANopen module	RJ71CN91	○	×
BACnet module	RJ71BAC96	○	○
EtherNet/IP module	RJ71EIP91	○	×
CC-Link IE TSN module	RJ71GN11-T2	○	○
CC-Link IE TSN module (compliant with optical fiber cables)	RJ71GN11-SX	○	○
CC-Link IE TSN module (compliant with EtherNet/IP)	RJ71GN11-EIP	○	○
MELSECNET/H module	RJ71LP21-25	○	×
	RJ71BR11	○	×

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Information modules

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Ethernet interface module with built-in CC-Link IE	RJ71EN71	○	○
Serial communication module	RJ71C24	○	○
	RJ71C24-R2	○	○
	RJ71C24-R4	○	○
MES interface module	RD81MES96	○	×
	RD81MES96N	○	×
High speed data logger module	RD81DL96	○	×
C intelligent function module	RD55UP06-V	○	×
	RD55UP12-V	○	×
OPC UA server module	RD81OPC96	○	×
High speed data communication module	RD81DC96	○	×
Recorder module	RD81RC96	○	×
Camera recorder module	RD81RC96-CA	○	×
GP-IB interface module	RJ71GB91	○	○

Sensor control modules

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Laser displacement sensor control module	R60MH112	○	×
	R60MH112NA	○	×

Energy measuring module

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Energy measuring module	RE81WH	○	○

B/NET interface module

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
B/NET interface module	B-RIF	○	×

Blank cover

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Blank cover	RG60	○	○

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Batteries

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Model	MELSEC iQ-R	MX controller MX-R model
Battery	Q6BAT	○	×
	Q7BATN	○	×
	Q7BATN-SET	○	×
	FX3U-32BL	×	○*1

*1 A battery for holding data is not required. The battery (FX3U-32BL) should be installed to save clock data in the event of a long-term (10 days or more) power failure.

3 DIFFERENCES IN SPECIFICATIONS AND FUNCTIONS BETWEEN MELSEC IQ- R SERIES AND MELSEC MX CONTROLLER MX-R MODEL

This chapter describes the differences in specifications and functions between the MELSEC IQ- R series and the MELSEC MX controller MX-R model.

The newly added functions for the MX controller MX-R Model are described as well.

3.1 Hardware

Comparison with the MELSEC IQ-R series

This section describes the differences in hardware specifications between the MELSEC IQ- R series programmable controller CPU modules and the MELSEC MX controller MX-R model.

Item			R04CPU	R08CPU	R16CPU	R32CPU	R120CPU	MXR300	MXR500
Operation control method			Stored program cyclic operation					Stored program cyclic operation	
I/O control mode			Refresh mode (The direct access input/output is available by specifying the direct access input/output (DX, DY).)					Refresh mode (The direct access input/output is available by specifying the direct access input/output (DX, DY).)	
Processing speed	Instruction processing time	LD instruction	0.98ns					0.38ns minimum	0.28ns minimum
Memory capacity	Program memory		160K bytes	320K bytes	640K bytes	1280K bytes	4800K bytes	100M bytes	150M bytes
	Program cache memory		160K bytes	320K bytes	640K bytes	1280K bytes	4800K bytes	40M bytes	80M bytes
	SD memory card ^{*1}		Differs depending on the SD memory card used. (SD/SDHC memory card)					Differs depending on the SD memory card used. (SD/SDHC memory card)	
	Device/label memory		400K bytes	1188K bytes	1720K bytes	2316K bytes	3380K bytes	131072K bytes	262144K bytes
	Signal flow memory	Area for programs	5K bytes	10K bytes	20K bytes	40K bytes	150K bytes	512K bytes (fixed)	
		Area for function blocks	256K bytes						
	Data memory		2M bytes	5M bytes	10M bytes	20M bytes	40M bytes	30M bytes	60M bytes
	Function memory		20480K bytes					172032K bytes	
	Buffer memory		1072K bytes (536K words)					36864K bytes (18432K words)	
	Refresh memory		2048K bytes					8M bytes	
Motion data memory		—					512K bytes	1024K bytes	
Maximum number of storable files	Program memory	Number of program area files	124	252				252	380
		Number of FB files	64	128				128	192
	SD memory card ^{*2}		• NZ1MEM-2GBSD: 256 • NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD: 32767					• NZ1MEM-2GBSD: 511/65534 ^{*4} • NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD: 65535/65534 ^{*4}	
	Device/label memory		324 (with or without an extended SRAM cassette)					324	
	Data memory ^{*3}		256	512				7616	15244
	Function memory		512					LOGGING: 10172, motion: 8129, others: 8129	
	Motion data memory		—					512	1024
USB port			USB2.0 High Speed (miniB) × 1					USB2.0 High Speed (Type-C) × 1	
Ethernet port	Number of ports		1					3	
	Interface		RJ45 connector (Auto MDI/MDI-X)					RJ45 connector (Auto MDI/MDI-X)	
Number of occupied I/O points			—					64 (CC-Link IE TSN function part: 32, motion function part: 32)	

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Item		R04CPU	R08CPU	R16CPU	R32CPU	R120CPU	MXR300	MXR500
Clock function	Display	Year, month, day, hour, minute, second, and day of the week (automatic leap year adjustment)					Year, month, day, hour, minute, second, and day of the week (automatic leap year adjustment)	
	Accuracy	-1.00 to +1.00s/d at 0 to 55°C					-1.00 to +1.00s/d at 0 to 55°C	
Backup power	Save destination	Capacitor					Capacitor	
	Hold time ^{*5}	3 minutes					10 days	
	Data to be saved	Device/label memory, clock data					Clock data	
Allowable momentary power failure time		Depends on the power supply module used.					Depends on the power supply module used.	
Internal current consumption (5VDC)		0.67A					2.83A	3.22A
External dimensions	Height	106mm (base unit mounting side: 98mm)					110mm (base unit mounting side: 98mm)	
	Width	27.8mm (single-slot width)					84.2mm (triple-slot width)	
	Depth	110mm					131mm	
Weight		0.20kg					0.72kg	
Available SD memory card		SD/SDHC memory card					SD/SDHC memory card	
Available cassettes		Extended SRAM cassette and battery-less option cassette					—	
Available batteries		Q6BAT, Q7BATN, and Q7BATN-SET					FX3U-32BL	

*1 The memory capacity of an SD memory card used for the system may be additionally consumed by the file operation processing speed enhancement. (The consumed capacity varies depending on the usage environment.) To free up the consumed capacity, turn on the controller power while the SD memory card is inserted, or eject and insert the SD memory card.

*2 If the number of characters in a file name is 12 or less (including single-byte alphanumeric characters and the extension), the total number of files and folders shown in the above table can be stored in the root directory and each subdirectory. If a file name exceeds 12 characters, or if lower-case characters are included in the file name, the number of files that can actually be stored may be reduced compared to the values shown in the above table. When the temporary file creation setting at file transfer is set to 0: Create by the GP.FTPCGET and SP.FTPGET instructions, the extension .TMP (4 characters) is automatically provided for the file name of the temporary file to be created. Therefore, if a file name exceeding 8 characters (including the extension) is specified, the maximum number of the files can actually be stored may be reduced.

*3 This is a total number of files and folders that can be stored in the root directory when the number of characters in a file name is 9 (including the extension). Note that the number of files that can actually be stored may increase or decrease depending on the usage status.

*4 These numbers indicate the "number of files that can be stored in the root directory" and the "number of files that can be stored in the subdirectory".

*5 These backup power times apply under the ambient temperature of 25°C.

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Comparison with motion CPU module

Item		Differences in hardware specifications	
		RnMTCPU	MXR300
External dimensions	Height	106.0mm	110.0mm
	Width	27.8mm (single-slot width)	84.2mm (triple-slot width)
	Depth	110.0mm	131.0mm
Weight		0.28kg	0.72kg
Internal current consumption (5VDC)		1.20A	2.83A
Maximum number of mountable modules		○: 3	△: 1
Interface to external devices	Serial absolute synchronous encoder input	○: MR-J4-□B + Q171ENC-W8	○: MR-J5-G-RJ + HK-KT motor ○: EZA-MACTS-02C ^{*1}
	ABZ encoder	○: ABZ synchronous encoder via MR-J5-□B	○: ABZ synchronous encoder via MR-J5-G
	Incremental synchronous encoder input	○: Input via a high-speed counter module ^{*2}	○: Input via a high-speed counter module ^{*2}
	Manual pulse generator input	○: Input via a high-speed counter module ^{*3}	○: Input via a high-speed counter module ^{*4}
	Branch module	○: MR-MX200	○: NZ2MHG-TSNT4/8F2
	Slice I/O	○: Available ^{*5}	×: Not available
	External signal input	○: iQ-R series input, input via I/O module	○: iQ-R series input, input via I/O module
Available driving device	Servo amplifier	○: MR-J5-□B ○: MR-J4-□B	○: MR-J5-G
	Inverter	○: FR-A800	○: FR-A800 ^{*6} ○: FR-E800 (CC-Link IE TSN Class A) ^{*6}

*1 Rotary encoder supplied by NSD Corporation

*2 RD62D2 (differential input, 2 channels)

*3 RD62P2 (DC input, 2 channels)
RD62P2E (DC input, 2 channels)
RD62D2 (differential input, 2 channels)

*4 RD62P2 (DC input, 2 channels)
RD62P2E (DC input, 2 channels)

*5 Sensing module MR-MT2000 series

*6 It is not available as an axis.

Comparison with motion module

Item		Differences in hardware specifications			
		RD78G	RD78GH	MXR300	MXR500
External dimensions	Height	106.0mm	106.0mm	110.0mm	
	Width	27.8mm (single-slot width)	56.0mm (double-slot width)	84.2mm (triple-slot width)	
	Depth	110.0mm	110.0mm	131.0mm	
Weight		0.26kg	0.44kg	0.72kg	
Internal current consumption (5VDC)		1.93A	2.33A	2.83A	3.22A
Maximum number of mountable modules		○: 32 (8: programmable controller CPU)		△: 1	
Interface to external devices	Serial absolute synchronous encoder input	○: MR-J5-G-RJ + HK-KT motor ○: EZA-MACTS-02C ^{*1}		○: MR-J5-G-RJ + HK-KT motor ○: EZA-MACTS-02C ^{*1}	
	ABZ encoder	○: ABZ synchronous encoder via MR-J5-G-RJ		○: ABZ synchronous encoder via MR-J5-G-RJ	
	Incremental synchronous encoder input	○: Input via a high-speed counter module ^{*2}		○: Input via a high-speed counter module ^{*2}	
	Manual pulse generator input	○: Input via a high-speed counter module ^{*3}		○: Input via a high-speed counter module ^{*3}	
	Branch module	○: NZ2MHG-TSNT4/8F2		○: NZ2MHG-TSNT4/8F2	
	Slice I/O	×: Not supported		×: Not supported	
	External signal input	○: iQ-R series input, input via I/O module		○: iQ-R series input, input via I/O module	
Available driving device	Servo amplifier	○: MR-J5-G		○: MR-J5-G	
	Inverter	○: FR-A800 ^{*4} ○: FR-E800 (CC-Link IE TSN Class A) ^{*4}		○: FR-A800 ^{*4} ○: FR-E800 (CC-Link IE TSN Class A) ^{*4}	
	Drives of other companies	○: Available		○: Available	

*1 Rotary encoder supplied by NSD Corporation

*2 RD62D2 (differential input, 2 channels)

*3 RD62P2 (DC input, 2 channels)
RD62P2E (DC input, 2 channels)

*4 It is not available as an axis.

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Comparison with Simple motion module

Item		Differences in hardware specifications	
		RD77MS	MXR300
External dimensions	Height	106.0mm	110.0mm
	Width	27.8mm (single-slot width)	84.2mm (triple-slot width)
	Depth	110.0mm	131.0mm
Weight		0.23kg	0.72kg
Internal current consumption (5VDC)		1.0A	2.83A
Maximum number of mountable modules		○: 64	△: 1
Interface to external devices	Serial absolute synchronous encoder input	○: MR-J4-□B + Q171ENC-W8	○: MR-J5-G-RJ + HK-KT motor ○: EZA-MACTS-02C ^{*1}
	ABZ encoder	○: Directly input to the main body	△: ABZ synchronous encoder via MR-J5-G
	Incremental synchronous encoder input	○: Directly input to the main body	△: Input via a high-speed counter module ^{*2}
	Manual pulse generator input	○: Directly input to the main body	△: Input via a high-speed counter module ^{*3}
	Branch module	○: MR-MV200	△: NZ2MHG-TSNT4/8F2
	Slice I/O	×: Not available	×: Not available
	External signal input	○: Directly input to the main body	△: iQ-R series input, input via I/O module or servo amplifier
Available driving device	Servo amplifier	○: MR-J5-□B ○: MR-J4-□B	△: MR-J5-G
	Inverter	○: FR-A800	△: FR-A800 ^{*4} △: FR-E800 (CC-Link IE TSN Class A) ^{*4}

*1 Rotary encoder supplied by NSD Corporation

*2 RD62D2 (differential input, 2 channels)

*3 RD62P2 (DC input, 2 channels)
RD62P2E (DC input, 2 channels)

*4 It is not available as an axis.

Precautions on hardware specifications

When a MELSEC iQ-R series model is replaced with a MELSEC MX controller MX-R model, the internal current consumption of the system may increase depending on the model combination. Configure the system so that the internal current consumption does not exceed the rated output current of the power supply module.

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3.2 Programmable Controller Functions

Specifications

This section describes the programming system differences between the MELSEC iQ-R series and the MELSEC MX controller MX-R model.

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item			Differences in specifications	
			MELSEC iQ-R	MX controller MX-R model
System configuration	Number of mountable modules	Other than the following modules	○: RnCPU: 64 maximum	○: 62 maximum
		CC-Link IE Controller Network module	○: 8 maximum /32 maximum (in a multiple CPU system)	○: 8 maximum
		CC-Link IE Field/CC-Link IE TSN Network module	○: 8 maximum /32 maximum (in a multiple CPU system)	○: 8 maximum (including one built-in network (CC-Link IE TSN))
		CC-Link module	○: 8 maximum /32 maximum (in a multiple CPU system)	○: 8 maximum
	Number of mountable modules (Q series)	Interrupt module (no setting by the engineering tool)	○: 1 maximum /4 maximum (in a multiple CPU system)	×
	Mountable module	MELSEC iQ-R series module	○	○
		MELSEC-Q series module	○: Some modules have restrictions.	×
	Extension level		○: 7 maximum (auto-negotiation)	○: 7 maximum (auto-negotiation)
	Extension cable length		○: 20m maximum	○: 20m maximum
Programming	Programming language	Ladder diagram (LD)	○	○
		Sequential function chart (SFC)	○	×
		Structured text (ST)	○	○
		Function block diagram (FBD)/ Structured ladder	○	○
	Function block (FB)		○	△: Only subroutine type function blocks can be created.
	Program execution type	Initial execution type	○	○
		Scan execution type	○	○
		Fixed scan execution type	○	○
		Standby type	○	○
		Event execution type	○	○
	Number of I/O points [X/Y] [point]		○: 4096	○: 4096
	User device [point]	Input relay [X]	○: 12288	○: 12288
		Output relay [Y]	○: 12288	○: 12288
		Internal relay [M]	○: 14065664 (Without an extended SRAM)	◎: 167747584
		Latch relay [L]	○: 32768	○: 32768
		Link relay [B]	○: 14065664 (Without an extended SRAM)	◎: 167747584
		Link special relay [SB]	○: 14065664 (Without an extended SRAM)	◎: 167747584
		Annunciator [F]	○: 32768	○: 32768
		Edge relay [V]	○: 32768	○: 32768
		Step relay [S]	○: 16384	×

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Item			Differences in specifications	
			MELSEC iQ-R	MX controller MX-R model
Programming	User device [point]	Timer [T]	○: 781408 (Without an extended SRAM)	◎: 9319296
		Long timer [LT]	○: 219776 (Without an extended SRAM)	◎: 2621056
		Retentive timer [ST]	○: 781408 (Without an extended SRAM)	◎: 9319296
		Long retentive timer [LST]	○: 219776 (Without an extended SRAM)	◎: 2621056
		Counter [C]	○: 781408 (Without an extended SRAM)	◎: 9391296
		Long counter [LC]	○: 413697 (Without an extended SRAM)	◎: 4933728
		Data register [D]	○: 879104 (Without an extended SRAM)	◎: 10484224
		Link register [W]	○: 879104 (Without an extended SRAM)	◎: 10484224
		Link special register [SW]	○: 879104 (Without an extended SRAM)	◎: 10484224
	File register		○: Can be set in increments of 1K.	○: Can be set in increments of 32K.
	System device		○	○: Some SM/SD number assignments differ.
	Constant scan [ms]		○: 0.2 to 2000 (in increments of 0.1ms)	○: 0.2 to 2000 (in increments of 0.1ms)
	Synchronous interrupt	I44	○	×
		I45	○	×
	Fixed scan interrupt	I28 to I31 [ms]	○: 0.5 to 1000 (in increments of 0.5ms)	○: 0.5 to 1000 (in increments of 0.5ms)
		I48, I49 [ms]	○: 0.05 to 1000 (in increments of 0.05ms)	○: 0.05 to 1000 (in increments of 0.05ms)
Memory capacity	Program capacity [step]		○: 40K/80K/160K/320K/1200K	◎: 480K or more/1800K or more

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Instruction

This section describes the differences in programming system instructions between the MELSEC iQ-R series and the MELSEC MX controller MX-R model.

For details on instructions for the MX controller MX-R model, refer to the following.

 MELSEC MX Controller (MX-R Model) Programming Manual

For more detail information including functions and devices for the MX controller MX-R model, refer to the following.

 MELSEC MX Controller (MX-R Model) User's Manual

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Category		MELSEC iQ-R	MX controller MX-R model
Sequence instruction	Phase processing instruction	○: PHASE	×
		○: PHASECHG	×
		○: PHASEEND	×
Basic instruction	Comparison operation instruction	○: CMP	×
		○: CMP_U	×
		○: DCMPL	×
		○: DCMPL_U	×
		○: ZCP	×
		○: ZCP_U	×
		○: DZCP	×
		○: DZCP_U	×
	Data shift instruction	○: DDSFR	×
		○: DDSFL	×
		○: ESFR	×
		○: ESFL	×
		○: EDSFR	×
		○: EDSFL	×
		○: SFTR	×
		○: SFTL	×
		○: WSFR	×
		○: WSFL	×
		○: SFTDWR	×
		○: DWSFTR	×
		○: SFTDWL	×
		○: DWSFTL	×
		○: SFTER	×
		○: ESFTR	×
		○: SFTEL	×
		○: ESFTL	×
		○: SFTEDR	×
		○: EDSFTR	×
		○: SFTEDL	×
		○: EDSFTL	×
	Data transfer instruction	○: SMOV	×

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Category		MELSEC iQ-R	MX controller MX-R model
Application instruction	Program branch instruction	○: GOEND (If the GOEND instruction is executed from FOR to NEXT, the 3340 error will be occurred.)	○: GOEND (The GOEND instruction can be executed from FOR to NEXT.)
	Program execution control instruction	○: DI (The range of the settable interrupt priority is from 1 to 8. Interrupt is disabled when reset or shifted to RUN.)	○: DI (The range of the settable interrupt priority is from 1 to 32. Interrupt is available when reset or shifted to RUN.)
		○: EI (Interrupt is disabled when reset or shifted to RUN.)	○: EI (Interrupt is available when reset or shifted to RUN.)
		○: IRET (When the IRET instruction is executed before executing the interrupt program, the 33A2h error will be occurred.)	○: IRET (When the IRET instruction is set before the interrupt program, the conversion error will be occurred.)
	Structure creation instruction	○: FOR (When the NEXT instruction is executed before executing the FOR instruction, the 3341 error will be occurred.)	○: FOR (When the NEXT instruction is set before the FOR instruction, the conversion error will be occurred.)
		○: BREAK (argument 2)	○: BREAK (argument 1)
	Character string processing instruction	×	◎: SPF
	Floating-point instruction	○: ECOMP	×
		○: EDCMP	×
		○: EZCP	×
		○: EDZCP	×
		○: EVAL	○: EVAL (The conversion is made after characters after the 7th digit of the specified string is rounded down.)
	Shortcut control instruction	○: ROTC	×
	Ramp signal instruction	○: RAMPQ	×
	Pulse related instruction	○: SPD	×
		○: PLSY	×
		○: PWM	×
	Matrix input instruction	○: MTR	×
	Check code	○: CCD	×
	Data processing instruction	○: BON	×
		○: DBON	×
		○: SORTTBL	×
		○: SORTTBL_U	×
		○: SORTTBL2	×
		○: SORTTBL2_U	×
		○: DSORTTBL2	×
		○: DSORTTBL2_U	×
	Database access instruction	○: DBOPEN	×
		○: DBCLOSE	×
		○: DBINSERT	×
		○: DBUPDATE	×
		○: DBSELECT	×
		○: DBDELETE	×
		○: DBIMPORT	×
		○: DBEXPORT	×
		○: DBTRANS	×
		○: DBCOMMIT	×
		○: DBROLBAK	×

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Category		MELSEC iQ-R	MX controller MX-R model
Application instruction	File register operation instruction	○: QDRSET	×
	Clock instruction	○: TZCP	×
	Timing check instruction	○: HOURM	×
		○: DHOURLM	×
	Routing information instruction	○: S.RTREAD	×
		○: S.RTWRITE	×
	Logging instruction	○: LOGTRG	×
	Data collection instruction	○: DATATRG	×
	Instructions for Ethernet function	○: SP.SOCOPEN	○: GP.SOCOPEN
		○: SP.SOCCLOSE	○: GP.SOCCLOSE
		○: SP.SOCRCV	○: GP.SOCRCV
		○: S.SOCRCVS	○: G.SOCRCVS
		○: SP.SOCSND	○: GP.SOCSND
		○: SP.SOCCINF	○: GP.SOCCINF
		○: SP.SOCCSET	○: GP.SOCCSET
		○: SP.SOCCMODE	○: GP.SOCCMODE
		○: S.SOCCDATA	○: G.SOCCDATA
		○: SP.ECPRTCL	○: GP.ECPRTCL
		○: SP.SLMPSND	○: GP.SLMPSND
		×	◎: GP.SLMPSNDC
		○: SP.FTPCPUT	○: GP.FTPCPUT
		○: SP.FTPCGET	○: GP.FTPCGET
	Program control instruction	○: PSTOP	×
		○: POFF	×
		○: PSCAN	×
		○: PLOW	×
	SFC control instruction	○: LD Sn	×
		○: LD BLm\Sn	×
		○: LDI Sn	×
		○: LDI BLm\Sn	×
		○: AND Sn	×
		○: AND BLm\Sn	×
		○: ANI Sn	×
		○: ANI BLm\Sn	×
		○: OR Sn	×
		○: OR BLm\Sn	×
		○: ORI Sn	×
		○: ORI BLm\Sn	×
		○: LD BLm	×
		○: LDI BLm	×
		○: AND BLm	×
		○: ANI BLm	×
		○: OR BLm	×
		○: ORI BLm	×
		○: MOV K4Sn	×
		○: MOV BLm\K4Sn	×
		○: MOVP K4Sn	×
		○: MOVP BLm\K4Sn	×

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Category		MELSEC iQ-R	MX controller MX-R model
Application instruction	SFC control instruction	○: DMOV K8Sn	×
		○: DMOV BLm\K8Sn	×
		○: DMOV P K8Sn	×
		○: DMOV P BLm\K8Sn	×
		○: BMOV K4Sn	×
		○: BMOV BLm\K4Sn	×
		○: BMOV P K4Sn	×
		○: BMOV P BLm\K4Sn	×
		○: SET BLm	×
		○: RST BLm	×
		○: PAUSE BLm	×
		○: RSTART BLm	×
	SFC control instruction	○: SET Sn	×
		○: SET BLm\Sn	×
		○: RST Sn	×
		○: RST BLm\Sn	×
		○: BRSET	×
		○: S.SFCSCOMR	×
		○: SP.SFCSCOMR	×
		○: S.SFCTCOMR	×
		○: SP.SFCTCOMR	×
	SFC dedicated instruction	○: TRAN	×
	Multiple CPU dedicated instruction (for built-in programmable controller CPU)	○: D.DDRD	×
		○: D.DDWR	×
		○: M.DDRD	×
		○: M.DDWR	×
	Add-on instruction	×	◎: ADDONEXE

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Special relay (SM) and special register (SD)

Some of the SM/SD number assignments and functions differ between the MELSEC iQ-R series and the MX controller MX-R model. If SM/SD is used in the MELSEC iQ-R series program, the program needs to be reviewed.

The following table shows the differences in SM/SD.

1. Special relay (SM)

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	MELSEC iQ-R	MX controller MX-R model
Latest self-diagnostic error (not including annunciator ON and network/motion function errors)	×	◎: SM2
Power-off/power supply voltage drop detection	○: SM150	×
Power supply failure detection	○: SM151	×
Momentary power failure detection for power supply 1	○: SM152	×
Momentary power failure detection for power supply 2	○: SM153	×
Invalid power supply module	○: SM154	×
CPU No.2 preparation completed	○: SM221	×
CPU No.3 preparation completed	○: SM222	×
CPU No.4 preparation completed	○: SM223	×
CPU No.2 error flag	○: SM231	×
CPU No.3 error flag	○: SM232	×
CPU No.4 error flag	○: SM233	×
CPU No.2 reset flag	○: SM241	×
CPU No.3 reset flag	○: SM242	×
CPU No.4 reset flag	○: SM243	×
Presence/absence of SFC program	○: SM320	×
Start/stop SFC program	○: SM321	×
SFC program start status	○: SM322	×
Presence/absence of continuous transition for entire block	○: SM323	×
Continuous transition prevention flag	○: SM324	×
Output mode at block stop	○: SM325	×
SFC device/label clear mode	○: SM326	×
Output mode at execution of the END step	○: SM327	×
Clear processing mode when the sequence reaches the END step	○: SM328	×
Online change (SFC block) status flag	○: SM329	×
System operation setting request	○: SM384	×
System operation setting error	○: SM385	×
Program restoration information write status LED control setting mode	○: SM386	×
File batch online change operation setting status	○: SM388	×
On only initial I44 execution after RUN	○: SM440	×
On only initial I45 execution after RUN	○: SM441	×
Cycle overrun flag for inter-module synchronization program (I44)	○: SM480	×
Cycle overrun flag for multiple CPU synchronization program (I45)	○: SM481	×
Execution section excess error flag for multiple CPU synchronization interrupt program	○: SM484	×
Inter-module synchronization error (Out-of-synchronization was detected on the CPU module.)	○: SM488	×
Network communication cycle synchronization error (Out-of-synchronization was detected on the CPU module.)	×	◎: SM489
Cycle overrun flag for network communication cycle synchronization interrupt program (basic cycle)	×	◎: SM492
Cycle overrun flag for network communication cycle synchronization interrupt program (medium-speed cycle)	×	◎: SM493
Cycle overrun flag for network communication cycle synchronization interrupt program (low-speed cycle)	×	◎: SM494
Scan time clear request	○: SM522	×

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Item		MELSEC iQ-R	MX controller MX-R model
Battery-less option cassette insertion flag		○: SM624	×
Battery-less function execution flag		○: SM625	×
Extended SRAM cassette insertion flag		○: SM626	×
Program memory overwrite count error flag		○: SM630	△: SM630 and SM634 were merged into SM4124.
Number of rewriting operations error to data memory flag		○: SM634	
Function memory clear request		○: SM652	×
File transfer to data memory request		○: SM653	×
SMOV instruction BCD conversion prohibit flag		○: SM773	×
Data table sort instruction sort order		○: SM774	×
Local device setting in interrupt programs		○: SM777	×
Number of used blocks information for the multiple CPU dedicated instruction (for CPU No.1)		○: SM796	×
Number of used blocks information for the multiple CPU dedicated instruction (for CPU No.2)		○: SM797	×
Number of used blocks information for the multiple CPU dedicated instruction (for CPU No.3)		○: SM798	×
Number of used blocks information for the multiple CPU dedicated instruction (for CPU No.4)		○: SM799	×
Firmware update completion with/without an error		○: SM922	×
Operation setting of the device test with execution conditions		○: SM940	×
Controller data backup/restoration	Controller data backup error check flag	○: SM953	○: SM953
	Controller data restoration error check flag	○: SM959	○: SM959
	Upper limit setting flag for the number of controller backup data	○: SM960	○: SM960
	Automatic backup retry failure flag	○: SM961	○: SM961
	Backup multiple request error check flag	×	◎: SM968
	Controller data backup status flag	○: SM1350	○: SM1350
	Controller data backup execution request	○: SM1351	○: SM1351
	Controller data restoration status flag	○: SM1353	×
	Controller data restoration execution request	○: SM1354	×
	Retry status flag for controller data automatic backup	○: SM1356	○: SM1356
	Backup interruption request	×	◎: SM1357
Communication cycle interval measurement setting request		×	◎: SM972
Communication cycle interval measurement setting status		×	◎: SM973
System clock (SM400 to SM403) every end update setting request		○: SM1184	×
System clock (SM400 to SM403) every end update setting error		○: SM1185	×
System clock (SM400 to SM403) every end update setting status		○: SM1186	×
Auto logging setting file and registration status		○: SM1200	○: SM1200
SD memory card setting file in use flag		○: SM1201	○: SM1201
Data memory setting file in use flag		○: SM1202	○: SM1202
Data logging file transfer stop request		○: SM1203	×
Data logging setting No.1	Data logging preparation	○: SM1210	○: SM1210
	Data logging start	○: SM1211	○: SM1211
	Data logging collection	○: SM1212	○: SM1212
	Data logging end	○: SM1213	○: SM1213
	Data logging trigger	○: SM1214	○: SM1214
	After data logging trigger	○: SM1215	○: SM1215
	Data logging error	○: SM1216	○: SM1216
	Data logging data saving in progress	○: SM1217	○: SM1217
	Data logging data storage file switching in progress	○: SM1218	○: SM1218
	Data logging file transfer execution status flag	○: SM1219	○: SM1219
	Data logging suspend/resume	○: SM1312	○: SM1312

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Item	MELSEC iQ-R	MX controller MX-R model
Data logging setting No.2 to No.10 (same as Data logging setting No.1)	○: SM1220 to SM1309 SM1313 to SM1321	○: SM1220 to SM1309 SM1313 to SM1321
Memory dump in progress	○: SM1472	×
Memory dump completed	○: SM1473	×
Memory card free space flag for controller database	○: SM1497	×
Controller database start-up flag	○: SM1498	×
Controller database start-up failure flag	○: SM1499	×
FTP server function file path name switching setting error	○: SM1513	×
Cyclic transmission status	○: SM1536	×
Data link status	○: SM1540	×
Event history clear execution request	×	◎: SM2376
In add-on safe mode	×	◎: SM2392
AC/DC DOWN flag	×	◎: SM2400
QCPU program compatible device	○: SM4095	×
Latch saving completed flag after latch setting change	×	◎: SM4098
Max latch interval time clear request	×	◎: SM4102
Built-in memory rewrite count error flag	×	◎: SM4124

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2. Special register (SD)

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	MELSEC iQ-R	MX controller MX-R model
Error detection invalidation setting	○: SD49	×
Power-off/power supply voltage drop detection status	○: SD150	×
Power supply module failure detection status	○: SD151	×
Momentary power failure detection count (power supply module 1)	○: SD152	×
Momentary power failure detection count (power supply module 2)	○: SD153	×
Invalid power supply module state	○: SD154	×
Production information	○: SD164 to SD171	×
Multiple CPU system information	○: SD228 to SD233	×
Number of extension base units	○: SD241	×
Identification for whether or not Q series module can be mounted	○: SD242	×
Number of S device points	○: SD276 and SD277	×
Online change (SFC block) target block number	○: SD329	×
System operation setting	○: SD384	×
System operation setting error cause	○: SD385	×
Number of cycle overrun events for inter-module synchronization interrupt program (I44)	○: SD480	×
Number of cycle overrun events for multiple CPU synchronization interrupt program (I45)	○: SD481	×
Number of execution section excess errors for multiple CPU synchronization interrupt program	○: SD484	×
Number of cycle overrun events for network communication cycle synchronization interrupt program (basic cycle)	×	◎: SD492
Number of cycle overrun events for network communication cycle synchronization interrupt program (medium-speed cycle)	×	◎: SD493
Number of cycle overrun events for network communication cycle synchronization interrupt program (low-speed cycle)	×	◎: SD494
Device/label memory (file storage area) free space (Drive 3 free space)	×	◎: SD612 and SD613
Extended SRAM cassette capacity identification information	○: SD626	×
Program memory write count index	○: SD630 and SD631	△: SD630 and SD631 were merged into SD4124. SD634 and SD635 were merged into SD4125.
Data memory write count index	○: SD634 and SD635	
Internal buffer empty area usage status	○: SD640	×
Internal buffer capacity	○: SD642 and SD643	×
Internal buffer free area space	○: SD644 and SD645	×
Function memory clear error cause	○: SD652	×
File transfer to data memory error cause	○: SD653	×
Motion data memory (Drive 6) capacity	×	◎: SD660 and SD661
Motion data memory (Drive 6) free space	×	◎: SD662 and SD663
Motion data memory (Drive 6) usage status	×	◎: SD664
Program cache memory capacity	×	◎: SD666 and SD667
Program cache memory free space	×	◎: SD668 and SD669
Dedicated instruction skip flag	×	◎: SD699
Unicode text file faulty area in the DBIMPORT instruction	○: SD760 and SD761	×
Execution status of data table sort instructions	○: SD774	×
Selection of refresh processing during the COM instruction execution	○: SD775	△: Multiple CPU refresh and CC-Link IE Field Network Basic refresh are not available.
Maximum number of blocks used for the multiple CPU dedicated instruction (for CPU No.1)	○: SD796	×
Maximum number of blocks used for the multiple CPU dedicated instruction (for CPU No.2)	○: SD797	×
Maximum number of blocks used for the multiple CPU dedicated instruction (for CPU No.3)	○: SD798	×

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Item		MELSEC iQ-R	MX controller MX-R model
Maximum number of blocks used for the multiple CPU dedicated instruction (for CPU No.4)		○: SD799	×
Latest firmware update information (network)		○: SD904 and SD905	×
Previous firmware update information (network)		○: SD906 and SD907	×
Latest firmware update information		○: SD912 to SD920	×
Latest firmware update result		○: SD921 and SD922	×
Previous firmware update information		○: SD923 to SD931	×
Previous firmware update result		○: SD932 and SD933	×
Controller data backup/restoration	Backup function setting	○: SD944	○: SD944
	Day and time setting for automatic backup (day)	○: SD947	○: SD947
	Day and time setting for automatic backup (hour)	○: SD948	○: SD948
	Day and time setting for automatic backup (minute)	○: SD949	○: SD949
	Time and day of the week setting for automatic backup (hour)	○: SD950	○: SD950
	Time and day of the week setting for automatic backup (minute)	○: SD951	○: SD951
	Time and day of the week setting for automatic backup (day of the week)	○: SD952	○: SD952
	Backup error cause	○: SD953	○: SD953
	Restoration target data setting	○: SD954	○: SD954
	Restoration function setting	○: SD955	△: Not available for continuous operation from backup
	Restoration target date folder setting	○: SD956 and SD957	○: SD956 and SD957
	Restoration target number folder setting	○: SD958	○: SD958
	Restoration error cause	○: SD959	○: SD959
	Upper limit status for the number of CPU module backup data	○: SD960	○: SD960
	Backup destination specification setting	×	◎: SD963
	Automatic backup destination specification setting	×	◎: SD964
	Restoration source specification setting	×	◎: SD965
	Backup target data setting	×	◎: SD966
	Automatic backup target data setting	×	◎: SD967
	Duplicated backup request error cause	×	◎: SD968
Controller data backup/restoration Number of uncompleted folders/files of controller data backup/restoration		○: SD1350	○: SD1350
Progression status of controller data backup/restoration		○: SD1351	○: SD1351
Setting of the upper limit value for the number of controller backup data		○: SD1353	○: SD1353
Communication cycle intervals measure setting		×	◎: SD972
Event history filter count		×	◎: SD974 and SD975
Motion event history filter count		×	◎: SD976 and SD977
Event history save limit mode setting		×	◎: SD1084
Event history logging restriction mode setting value		×	◎: SD1085
Data logging function memory use condition		○: SD1200	○: SD1200
Data logging file transfer stop information		○: SD1203	×

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Item		MELSEC iQ-R	MX controller MX-R model
Data logging setting No.1	Latest storage file number	○: SD1210 and SD1211	○: SD1210 and SD1211
	Oldest storage file number	○: SD1212 and SD1213	○: SD1212 and SD1213
	Internal buffer free space	○: SD1214	○: SD1214
	Number of processing overflow occurrences	○: SD1215	○: SD1215
	Data logging error cause	○: SD1216	○: SD1216
	Data logging file transfer error cause	○: SD1217	○: SD1217
	Logging type	×	◎: SD2210
	Number of trigger occurrences	×	◎: SD2211
	Number of ignored triggers	×	◎: SD2212
	Details of trigger condition satisfied	×	◎: SD2213 and SD2214
Data logging setting No.2 to No.10 (same as Data logging setting No.1)		○: SD1220 to SD1307	○: SD1220 to SD1307 SD2220 to SD2304
Event history file use ratio		×	◎: SD1396
Motion event history file use ratio		×	◎: SD1397
Logoff judgment time current value		×	◎: SD1469
Memory dump error cause		○: SD1472	×
Communication enable setting		×	◎: SD1480 to SD1483
FUNCTION LED indication setting		×	◎: SD1486
FUNCTION LED indication setting status		×	◎: SD1487
Debug function usage status		○: SD1488	×
Start-up status of controller database		○: SD1498	×
FTP server function file path name switching setting		○: SD1512	×
FTP server function file path name switching setting error cause		○: SD1513	×
FTP server function file path name switching setting status		○: SD1514	×
Target port setting		×	◎: SD1516
IP address setting (network number, station number)		○: SD1518 and SD1519	×
Cyclic transmission status of each station		○: SD1536 to SD1539	×
Data link status of each station		○: SD1540 to SD1543	×
Firmware version (monitor)		○: SD2000	×
Production information (monitor)		○: SD2001 to SD2008	×
IP address (monitor)		○: SD2009 and SD2010	×
Subnet mask pattern (monitor)		○: SD2011 and SD2012	×
Default gateway IP address (monitor)		○: SD2013 and SD2014	×
MAC address (monitor)		○: SD2015 to SD2017	×
Network number (monitor)		○: SD2018	×
Station number (monitor)		○: SD2019	×
Firmware hash value (monitor)		○: SD2020 and SD2021	×
Parameter file(s) hash value (monitor)		○: SD2022 and SD2032	×
Program file(s) and global label setting file hash value (monitor)		○: SD2024 and SD2025	×
CPU operating status (monitor)		○: SD2026	×
Initial scan time (monitor)		○: SD2027 and SD2028	×
Current scan time (monitor)		○: SD2029 and SD2030	×
Minimum scan time (monitor)		○: SD2031 and SD2032	×
Maximum scan time (monitor)		○: SD2033 and SD2034	×
Scan program execution time (monitor)		○: SD2035 and SD2036	×
Open completion signal		○: SD1504	◎: SD2100 to SD2103
Open request signal		○: SD1505	◎: SD2116 to SD2119
Socket communications receive status signal		○: SD1506	◎: SD2132 to SD2135
Event history clear target specification		×	◎: SD2376
Event history clear execution status		×	◎: SD2377

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Item	MELSEC iQ-R	MX controller MX-R model
Label allocating information manage area capacity	×	◎: SD2404 and SD2405
Label allocating information manage area free space capacity	×	◎: SD2406 and SD2407
QCPU program compatible device	○: SD4088 to SD4091, SD4095	×
Current latch interval time	×	◎: SD4100 and SD4101
Max latch interval time	×	◎: SD4102 and SD4103
Model name	×	◎: SD4104 to SD4112
Model code	×	◎: SD4114
Number of axes	×	◎: SD4115
Built-in memory write count index	×	◎: SD4124 and SD4125

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Functions

This section describes the differences in programming system functions between the MELSEC iQ-R series and the MELSEC MX MX-R model.

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item			Differences in specifications	
			MELSEC iQ-R	MX controller MX-R model
Clock function			○	◎: Change/write of clock data using labels are available.
LED indication			○: Set using parameters.	○: Set using special register.
Scan monitoring function (WDT setting)			○	○
Interrupt function	Synchronous interrupt (I44, I45)		○	×
	High-speed interrupt (I48, I49)		○	○
	Interrupt priority setting		○: 8 maximum	◎: 32 maximum
Database function			○	×
Device	Local device		○	○
	Device initial value		○	○
Label	Local label		○	○
	Label initial value (global label/local label)		○	○
	Label access setting from external device		○	○
File register setting			○: Can be set in increments of 1K.	○: Can be set in increments of 32K.
Refresh memory setting			○: 1024K points (Total of refresh data register area and network label/module label area)	◎: 4096K points (Total of refresh data register area and network label/module label area)
Internal buffer capacity setting			○: 3M bytes maximum	◎: 24M bytes maximum
Timer device limit setting			○: Setting range of low-speed timer: 1 to 1000ms	◎: Setting range of low-speed timer: 1 to 10000ms
SFC program			○	×
Boot function			○	○
Service processing setting			○	○
iQ Sensor Solution function			○	○
Multiple CPU function	I/O sharing when using multiple CPUs		○	×
	Error time output mode		○	×
	Multiple CPU synchronized startup		○	×
	Multiple CPU clock synchronization		○	×
	Communications by refresh		○	×
	Access method to multiple CPU shared memory/CPU buffer memory		○	×
	Multiple CPU high-speed transmission/fixed scan transmission	Multiple CPU synchronous interrupt (I45) [ms]	○: 0.10 to 10.00 (variable)	×
		Communications by refresh	○: Communications in I45 execution	×
		Area access method	○: CPU buffer memory access device (U3En\HGn)	×
Multiple CPU dedicated instruction		○	×	
Data logging function	Trigger logging and continuous logging		○	△: LOGTRG instruction is not available.
	Storage file format		○: Unicode, binary, CSV (Shift-JIS)	◎: Unicode, binary, CSV (Unicode, Shift-JIS), JSON
	Data collection condition setting		○: 1 to 32767 (ms)	◎: 1 to 86400 (ms)
	File transfer function		○	×
	Number of storable files setting		○: 1 to 65535	◎: No setting, 1 to 65535
	Number of records setting when switching storage file		○: 1 to 65500	◎: 1 to 100000
Memory dump function			○	×

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Item		Differences in specifications	
		MELSEC iQ-R	MX controller MX-R model
Scan time measurement		○	×
Diagnostic function	Self-diagnostic function	○	○
	Error clear	○	○
History function	Event history	○: 1000 (upper limit) to 100 (lower limit)	◎: 1500 (upper limit) to 100 (lower limit)
Monitor function	Monitor	○: Program list monitor	○: Performance monitor
	External input/output forced on/off function	○	×
	Executorial conditioned device test	○	×
	Realtime monitor function	○: One trigger condition can be set.	◎: 32 trigger conditions can be set.
Online change	Online change (ladder mode)	○	○
	Online change (files)	○	○
Backup/restoration function of CPU module/controller		○	◎: Engineering tool can be used for setting.
Security	File password	○: 6 to 32 characters (variable)	×
	Remote password	○: 6 to 32 characters (variable)	×
	File tampering check function	×	◎
	Encrypted communication function	×	◎
	Default open port usage setting function	×	◎
	Band limit function against DoS-attacks	×	◎
	User authentication	○	○
	Access control/program execution control by security authentication	○	×
Ethernet function	Connection with MELSOFT products and a GOT	○	△: Network number and station number are not available.
	Communications using MC protocol/SLMP	○	○
	Socket communications	○	○
	Communications using the predefined protocol	○	○
	Time setting function (SNTP client)	○	○
	File transfer function (FTP server)	○	○
	File transfer function (FTP client)	○: FTP	◎: FTP, FTPS
	IP address change function	○	○: Network setting change function
	Number of connections	○: 16	◎: 64
	Protocol setting	○: TCP, UDP	◎: TCP, UDP, TLS, DTLS
	OPC UA server function	×	◎

3.3 Motion Functions

Comparison of specifications between the RnMTCPU and MX300

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Differences in motion control	
	RnMTCPU	MX300
Network	○: SSCNETⅢ/H	◎: CC-Link IE TSN
Number of control axes	○: 16, 32, 64	○: 16, 32, 64
Operation cycle	○: 0.222 to 7.111ms (Can be set in increments of $0.222\text{ms} \times 2^n$.)	◎: 0.125ms, 0.25ms, 0.5 to 8ms (Can be set in increments of 0.5ms.)
Operation cycle coexistence	○: 2 groups	◎: 3 groups
Interpolation functions	○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation ○: 3-axis helical interpolation	○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation ×: 3-axis helical interpolation
Control method	○: PTP control ○: Speed control ○: Speed-position switching control ○: Position-speed switching control ○: Speed-torque control, tightening & press-fit control ○: Speed control with fixed position stop ○: Position follow-up control ○: Advanced synchronous control ○: Constant speed control ○: high-speed oscillation control ○: Pressure control ○: Machine control ○: G-code control	○: PTP control ○: Speed control ○: Speed-position switching control ^{*1} △: Position-speed switching control ^{*1} ○: Speed-torque control, tightening & press-fit control △: Speed control with fixed position stop ^{*1} ○: Position follow-up control ○: Advanced synchronous control ×: Constant speed control ×: high-speed oscillation control ×: Pressure control ×: Machine control ×: G-code control ◎: Multiple axes positioning data operation ◎: Motion cyclic positioning control ◎: Motion cyclic velocity control ◎: Motion cyclic torque control
Functions to change the control details	○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override	○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override
Correction functions	○: Backlash compensation ○: Electronic gear ○: Phase compensation	○: Backlash compensation ○: Electronic gear ×: Phase compensation
Limit functions	○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ○: Emergency stop	○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ×: Emergency stop ◎: Speed limit filter ◎: Travel direction restriction filter ◎: Acceleration/deceleration speed limit ◎: Jerk limit
M code function	○: Supported	○: Supported
Vibration control command filter	○: Smoothing filter ○: FIR filter ○: IIR filter	○: Smoothing filter ×: FIR filter ×: IIR filter
Skip function	○: Supported	○: Supported ^{*2}
Control unit	○: mm, inch, degree, PLS Fixed decimal place	◎: Any unit and decimal place can be set. (Choice from mm, inch, degree, or PLS when presetting.)
Acceleration/deceleration process	○: Trapezoidal acceleration/deceleration ○: S-curve acceleration/deceleration ○: Advanced S-curve acceleration/deceleration	○: Trapezoidal acceleration/deceleration ◎: Jerk acceleration/deceleration ×: S-curve acceleration/deceleration ×: Advanced S-curve acceleration/deceleration

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Item	Differences in motion control	
	RnMTCPU	MX300
Acceleration/deceleration process at speed/torque control	○: Trapezoidal acceleration/deceleration	○: Trapezoidal acceleration/deceleration ◎: Jerk acceleration/deceleration
Acceleration/deceleration time setting range	○: 1 to 8388608ms (32-bit integer)	○: One operation cycle to 8400000ms
Manual operation	○: JOG operation ○: Manual pulse generator operation (high-speed counter module required) ○: Speed control with fixed position stop	○: JOG operation ○: Manual pulse generator operation with ABZ encoder via high-speed counter module/J5-RJ and virtual synchronous encoder ×: Speed control with fixed position stop
External command signal	○: Amplifier DI ○: Motion CPU internal device	○: CANopen object ^{*3} ○: Link device ◎: Label ◎: Device (included buffer memory area)
Zero point return function	△: Driver homing method (only stepping driver) ○: Data setting method ○: Near-point dog signal method ○: Count method ○: Dogcradle method ○: Stopper method ○: Limit switch combined method ○: Scale home position signal detection method ○: Dogless home position signal reference method	○: Driver homing method ○: Data setting method ×: Near-point dog signal method ×: Count method ×: Dogcradle method ×: Stopper method ×: Limit switch combined method ×: Scale home position signal detection method ×: Dogless home position signal reference method
High-speed zero point return control	×: Not supported	×: Not supported
Forced stop function	○: All axes batch	◎: Each axis/All axes batch
Servo ON/OFF	○: Ready ON/OFF: All axes batch ○: Servo ON/OFF: Each axis	◎: Ready ON/OFF: Each axis/All axes batch ◎: Servo ON/OFF: Each axis/All axes batch
Limit switch output function	○: Supported	○: Supported ^{*4}
Absolute position system	○: Battery-less	○: Battery-less
Test mode	○: Supported	×: Not supported
Teaching operation	×: Not supported	◎: Supported in application
Amplifier-less operation function	○: All axes batch setting Validation after module start-up is available.	○: Setting for each axis Validation after module start-up is not available.
Virtual servo amplifier function	○: Supported	○: Supported
Driver communication function	○: Supported	×: Not supported
Optional data monitoring function	○: Supported	○: Supported
Servo data monitoring	○: Supported	○: Supported
Gain/PI-PID switching command	○: Supported	○: Supported
Servo parameter maintenance	○: Servo parameters are held in a motion CPU. After connection is completed, the parameters will be copied in a servo amplifier.	○: Servo parameters are held in a servo amplifier. After connection is completed, the parameters will be copied in a motion CPU.
Servo parameter change function	○: Supported	○: Supported
Multiple axes adjustment	○: Supported	×: Not supported

*1 It is realized by using the buffer mode.

*2 It is included in the multiple axes positioning data operation.

*3 It is equivalent to the amplifier DI.

*4 A digital cam switch is required.

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Item	Differences in general functions	
	RnMTCPU	MX300
Mark detection function	○: Supported	○: Supported
Inter-module synchronization function	○: Supported	×: Not supported
Event history	○: Supported	○: Supported (filter settings available)
Position data history	○: Supported	○: Supported
Security function	○: IP filter ○: File password ○: Security key	○: IP filter △: User authentication function
All clear function	○: Supported	○: Supported
Remote operation	○: Supported	○: Supported
File transfer	△: Supported (in the boot operation)	×: Not supported
Backup restoration	○: Supported	△: Supported (with some restrictions)
FTP file transfer	△: Supported (via the RJ71EN71)	◎: Supported
SLMP communications	×: Not supported	◎: Supported
Change of controller parameters	○: Supported	×: Not supported
Data storage memory	○: Built-in ROM ○: SD memory card	○: Built-in ROM ○: SD memory card
Logging (digital oscilloscope) function	○: Realtime monitor ○: Offline sampling	○: Realtime monitor ◎: Data logging function
Servo system recorder	○: Supported	△: Not supported ^{*1}
Error reset	×: Not supported	○: Supported (entire system)
Add-on function	○: Supported	○: Supported
Module extension parameter	×: Not supported	×: Not supported
Firmware update	○: Supported in tools and SD memory card	△: Supported in tools ^{*2}
Boot area update	○: Supported in tools and SD memory card	×: Not supported
Safety function	○: Hardware wiring safety with the J4 + MR-D30 + WS controller	○: Hardware wiring safety with the J5/JET-HS + WS controller
Vision linkage	○: Supported	×: Not supported
Online module change function	○: Supported	×: Not supported
Execution time monitoring	○: Supported	○: Supported ◎: Performance monitor

*1 The logging function can be substituted.

*2 SD cards are not available.

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Item	Differences in synchronous control function	
	RnMTCPU	MX300
Servo input axis	○: 64/module maximum	○: 64/module maximum
Command generation axis	○: 64/module maximum	◎: 1024 maximum ^{*1}
Synchronous encoder axis	○: 12/module	
Composite main shaft gear	○: 1/output axis	○: 1/output axis
Main shaft gear	○: 1/output axis	○: 1/output axis
Main shaft clutch	○: 1/output axis	○: 1/output axis
Composite auxiliary shaft gear	○: 1/output axis	○: 1/output axis
Auxiliary shaft gear	○: 1/output axis	○: 1/output axis
Auxiliary shaft clutch	○: 1/output axis	○: 1/output axis
Speed change gear	○: 2/output axis	◎: 3/output axis
Output axis	○: 64/module maximum	○: 64/module maximum
Smoothing processing	○: Supported	○: Supported
Rotational direction control	○: Supported	○: Supported
Synchronization control between multiple modules	△: Multiple CPU advanced synchronous control is available.	×: Not supported

*1 It varies depending on system memory capacity setting.

Item	Differences in electronic cam specifications	
	RnMTCPU	MX300
Number of registrations	○: 1024 maximum	◎: 60000 maximum
Cam resolution	○: 256 to 32768 (Can be set in increments of 256×2^n .)	◎: 8 to 65535
Stroke ratio	○: -214.7483648 to 214.7483647 [%] Fixed decimal point	○: -214.7483648 to 214.7483647 [%] Floating point
Coordinate number	○: 2 to 65535	○: 2 to 65535
Coordinate data	○: -2147483648 to 2147483647	◎: -10000000000.0 to 10000000000.0 Floating point
Storage format	○: csv	○: csv
Cam area sizes available	○: 16M bytes	○: Parameter setting
Cam auto generation	○: Rotary cutter cam ○: Detail stroke ratio cam ○: Simple stroke ratio cam	○: Rotary cutter cam ○: Detail stroke ratio cam ×: Simple stroke ratio cam

Item			Differences in program/tool specifications		
			RnMTCPU	MX300	
Program	Default programming style	Language	○: Motion SFC program, dedicated instructions	◎: Ladder diagram/FBD/LD/ST*1*2	
		Variable	○: Device	◎: Label	
	PLCopen®		×: Non-compliant	◎: Compliant	
	Program type		○: Motion SFC program	◎: LD, FB, FBD, ST	
	FB call		×: Not supported	◎: Supported	
	Number of programs		○: Number of servo program files: 8192 ○: Number of SFC program files: 512	△: Number of program files: 252 △: Number of function block files: 128	
	Number of steps/bytes		○: Servo program rile: 64K steps ○: Number of SFC program files: 8192K bytes	◎: Equivalent to 320K steps	
	Number of programs executed simultaneously		○: 512	△: 252	
	Executing task	Normal task		○: Executed according to the main cycle	○: Executed according to the scan time
		Event task	Fixed cycle	○: Executed according to the fixed cycle*3 0.222ms, 0.444ms, 0.888ms, 1.777ms, 3.555ms, 7.111ms, 14.222m	○: Executed according to the network communication cycle synchronization*4 0.125 to 8.0ms (Can be set in increments of 0.03125ms × 2 ⁿ .)
				Interrupt	○: • Executed by turning on the specified input points for the event task cause among the 16 input points of the input module for motion CPU control. • Executed according to the interrupt instruction from the programmable controller.
			NMI task		○: Executed by turning on the specified input points for the NMI task cause among the 16 input points of the input module for motion CPU control.
		Initial execution		×: Not supported	◎: Supported
		Standby		×: Not supported	◎: Supported
		Number of continuous transitions setting		○: Supported	×: Not supported
	Startup method		○: Automatic startup Startup by motion SFC programs Startup by dedicated instructions of another CPU module	○: Automatic startup Execution type change by dedicated instructions	
	END operation		○: End/Continue	△: Only continue	
	In-execution flag		○: Available in devices	○: Available in special devices	
	Online change		○: Supported	○: Supported	
	Module label		×: Not supported	◎: Supported	
	Module FB		×: Not supported	◎: Supported	
	Number of actual I/O points (PX/PY)		○: 4096 (I/O module)	○: 4096 (I/O module)	
	Number of I/O points (X/Y)		○: 12288	○: 12288	
	Label area (variable area)		×: Not supported	◎: Allocatable within a total of 65536K words	
	Internal relay (M)		○: Within a capacity of 128K points built-in memory		
	Link relay (B)				
	Annunciator (F)				
	Data register (D)				
	Link register (W)				
	Motion register (#)				
	Special relay (SM)				×: Not supported
	Special register (SD)		○: 4096	○: 4096	
	Buffer memory (U□\G)		○: 2097152 points (2M words) maximum	◎: 36864K bytes (18432K words) maximum	

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Item		Differences in program/tool specifications	
		RnMTCPU	MX300
Program	Fixed scan communication area (U3E□\HG) in the CPU buffer memory	○: 12288 points (12K words) maximum	×: Not supported
	Device/Label latch	○: Supported	○: Supported
	Maximum number of motion instruction settings	○: 8192	◎: 8192 ^{*5}
	Initial value setting for the structure/array	○: Not supported	◎: Supported
Tools	Programming tool	○: MT Developer2	○: GX Works3
	Monitoring tool	○: Digital oscilloscope function	◎: GX LogViewer/realtime monitor
	MELSOFT Mirror	×: Not supported	×: Not supported
	MELSOFT Gemini	△: Supported in a programmable controller CPU	×: Not supported
	Simulator	○: Supported	×: Not supported
	C language programming	△: Supported ^{*6}	×: Not supported

*1 Executed only from an MX controller MX-R model.

*2 Coexistence of motion programs and sequence programs is available.

*3 Choice from two cycle types: Normal or low-speed

*4 Choice from three cycle types: High-speed, middle-speed, or low-speed

*5 The upper limit value varies depending on the FB type.

*6 Reading of the C intelligent function module

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Item		Differences in network functions (motion control)	
		RnMTCPU	MX300
Network specifications	Communication method	Optical communications	Time sharing/time-managed polling method
	Communication speed	○: 150Mbps	◎: 1Gbps/100Mbps
	Maximum number of connectable stations	○: 32	◎: 253
	Connection cable	SSCNETⅢ cable	1000BASE-T category 5e or higher, STP straight/crossover cable
	Maximum station-to-station distance	○: 50m	◎: 100m
	Maximum number of networks	○: 64	◎: 239
	Network topology	Line topology Star topology Cascade connection	Line topology Star topology
	Overall cable distance	—	Line topology: 25300m (when 254 stations are connected) Star topology: Depends on the system configuration.
	Number of cascade connections	Depends on switching hub specifications.	Depends on switching hub specifications.
Cyclic transmission	Maximum number of link points	—	18K bytes per network or station in a total of RWw, RWr, RX, and RY devices
	Communications using RX and RY	—	Supported
	Communications using RWr and RWw	—	Supported
	Link refresh	—	Supported
	Direct access to link devices	—	Supported
	Cyclic data assurance	—	Supported
	Interlink transmission	—	Not supported
	Mode selection for cyclic transmission (Normal/high speed)	—	Not supported
	Sequence scan synchronization specification	—	Not supported
	Cyclic transmission punctuality assurance	—	Supported
	I/O maintenance settings	Data link faulty station setting	Supported (Only HOLD can be set in synchronous stations. CLEAR cannot be set.)
		Output status setting for CPU STOP	Supported
		Output status setting for CPU stop error	Supported
	Cyclic transmission stop and restart (Disconnection/reconnection, disconnection/return)	—	Supported
Transient transmission	Communications using dedicated instructions	—	Supported
	Communications using the SLMP	—	Supported
	Communications using an engineering tool	—	Supported
Synchronization	Inter-module synchronization cycle	○: 0.222ms, 0.444ms, 0.888ms, 1.777ms	◎: 0.125ms, 0.25ms, 0.5 to 8.00ms
	Network communication cycle synchronization	3.555ms, 7.111ms (Choice from two types of low-speed and normal)	(Can be set in increments of 0.5ms for 0.5ms or more.) ^{*1}
	CC-Link IE Field/TSN synchronous communication function	—	Supported
	Time synchronous (synchronization timestamp)	—	Supported
RAS	Device station disconnection	—	Supported
	Automatic return	—	Supported
	Loopback function	—	Not supported

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Item		Differences in network functions (motion control)	
		RnMTCPU	MX300
Diagnostic function	CC-Link IE Field/TSN diagnostics	—	Supported
	Module communication test	—	Supported
	Cable test	—	Not supported
	Communication test	—	Supported
	IP communication test	—	Not supported
Others	Reserved station setting	—	Supported
	Error invalid station setting	—	Supported

*1 Choice from three cycle types: High-speed, middle-speed, or low-speed

Specifications comparison between with RD78G/GH and MX300/500

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Differences in motion control			
	RD78G	RD78GH	MX300	MX500
Network	○: CC-Link IE TSN		○: CC-Link IE TSN	
Number of control axes	○: 4, 8, 16, 32, 64	○: 128, 256	△: 16, 32, 64* ¹	○: 128, 256
Operation cycle	○: 0.0625 to 8.0ms (in increments of 0.0625 × 2 ⁿ)	○: 0.03125 to 8.0ms (in increments of 0.03125 × 2 ⁿ)	△: 0.125ms, 0.25ms, 0.5 to 8ms (Can be set in increments of 0.5ms.)	
Operation cycle coexistence	×: Not supported		◎: 3 groups	
Interpolation functions	○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation		○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation	
Control method	○: PTP control ○: Speed control ○: Speed-position switching control* ² ○: Position-speed switching control* ² ○: Speed-torque control, tightening & press-fit control ○: Speed control with fixed position stop* ² ○: Advanced synchronous control ○: Multiple axes positioning data operation		○: PTP control ○: Speed control △: Speed-position switching control* ² △: Position-speed switching control* ² ○: Speed-torque control, tightening & press-fit control △: Speed control with fixed position stop* ² ○: Advanced synchronous control ○: Multiple axes positioning data operation ◎: Position follow-up control ◎: Motion cyclic positioning control ◎: Motion cyclic velocity control ◎: Motion cyclic torque control	
Functions to change the control details	○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override		○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override	
Correction functions	○: Backlash compensation ○: Electronic gear		○: Backlash compensation ○: Electronic gear	
Limit functions	○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ○: Speed limit filter ○: Travel direction restriction filter ○: Acceleration/deceleration speed limit ○: Jerk limit		○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ○: Speed limit filter ○: Travel direction restriction filter ○: Acceleration/deceleration speed limit ○: Jerk limit	
M code function	○: Supported		○: Supported	
Vibration control command filter	○: Smoothing filter		○: Smoothing filter	
Skip function	○: Supported* ³		○: Supported* ³	
Control unit	○: Any unit and decimal place can be set. (Choice from mm, inch, degree, or PLS when presetting.)		○: Any unit and decimal place can be set. (Choice from mm, inch, degree, or PLS when presetting.)	
Acceleration/deceleration process	○: Trapezoidal acceleration/deceleration ○: Jerk acceleration/deceleration		○: Trapezoidal acceleration/deceleration ○: Jerk acceleration/deceleration	
Acceleration/deceleration process at speed/torque control	○: Trapezoidal acceleration/deceleration ○: Jerk acceleration/deceleration		○: Trapezoidal acceleration/deceleration ○: Jerk acceleration/deceleration	
Acceleration/deceleration time setting range	○: One operation cycle to 8400000ms		○: One operation cycle to 8400000ms	
Manual operation	○: JOG operation ○: Manual pulse generator operation with ABZ encoder via high-speed counter module/J5-RJ and virtual synchronous encoder		○: JOG operation ○: Manual pulse generator operation with ABZ encoder via high-speed counter module/J5-RJ and virtual synchronous encoder	
External command signal	○: CANopen object* ⁴ ○: Link device ○: Label		○: CANopen object* ⁴ ○: Link device ○: Label ◎: Device (included buffer memory area)	

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Item	Differences in motion control			
	RD78G	RD78GH	MX300	MX500
Zero point return function	○: Driver homing method ○: Data setting method		○: Driver homing method ○: Data setting method	
High-speed zero point return control	○: Not supported		○: Not supported	
Forced stop function	○: Each axis/All axes batch		○: Each axis/All axes batch	
Servo ON/OFF	○: Ready ON/OFF: Each axis/All axes batch ○: Servo ON/OFF: Each axis/All axes batch		○: Ready ON/OFF: Each axis/All axes batch ○: Servo ON/OFF: Each axis/All axes batch	
Limit switch output function	×: Not supported		◎: Supported* ⁵	
Absolute position system	○: Battery-less		○: Battery-less	
Test mode	×: Not supported		×: Not supported	
Teaching operation	○: Supported in application		○: Supported in application	
Amplifier-less operation function	○: Each axis requires a specific setting. Validation after module start-up is not allowed.		○: Each axis requires a specific setting. Validation after module start-up is not allowed.	
Virtual servo amplifier function	○: Supported		○: Supported	
Driver communication	○: Supported		×: Not supported	
Optional data monitoring function	○: Supported		○: Supported	
Servo data monitoring	○: Supported		○: Supported	
Gain/PI-PID switching command	○: Supported		○: Supported	
Servo parameter maintenance	○: Servo parameters are held in a servo amplifier. After connection is completed, the parameters will be copied in a motion CPU.		○: Servo parameters are held in a servo amplifier. After connection is completed, the parameters will be copied in a motion CPU.	
Servo parameter change function	○: Supported		○: Supported	
Multiple axes adjustment	×: Not supported		×: Not supported	

*1 There are no models with 4 or 8 axes.

*2 It is realized by using the buffer mode.

*3 It is included in the multiple axes positioning data operation.

*4 It is equivalent to the amplifier DI.

*5 A digital cam switch is required.

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Item	Differences in general functions			
	RD78G	RD78GH	MX300	MX500
Mark detection function	○: Supported		○: Supported	
Inter-module synchronization function	○: Supported		×: Not supported	
Event history	○: Supported (filter settings available)		○: Supported (filter settings available)	
Position data history	○: Supported		○: Supported	
Security function	○: IP filter ○: File password ○: Security key		○: IP filter △: User authentication function	
All clear function	○: Supported		○: Supported	
Remote operation	○: Supported		○: Supported	
File transfer	○: Supported (online)		×: Not supported	
Backup restoration	○: Supported		○: Supported (with some restrictions)	
FTP file transfer	×: Not supported		◎: Supported	
SLMP file transfer	○: Supported		○: Supported	
Controller parameters change function	○: Supported		×: Not supported	
Data storage memory	○: Built-in ROM ○: SD memory card		○: Built-in ROM ○: SD memory card	
Logging (digital oscilloscope) function	○: Realtime monitor ○: Data logging function		○: Realtime monitor ○: Data logging function	
Servo system recorder	○: Supported (Shared with logging settings)		△: Not supported ^{*1}	
Error reset	○: Supported		○: Supported (entire system)	
Add-on function	○: Supported		○: Supported	
Module extension parameter	○: Supported		×: Not required	
Firmware update	○: Supported in tools and SD memory card		△: Supported in tools ×: SD memory cards are not supported.	
Boot area update	○: Supported in SD memory card		○: Not supported	
Safety function	○: Hardware wiring safety with the J5/JET-HS + WS controller ○: CC-Link IE TSN safety communications		○: Hardware wiring safety with the J5/JET-HS + WS controller ×: CC-Link IE TSN safety communications	
Vision linkage	×: Not supported		×: Not supported	
Online module change function	×: Not supported		×: Not supported	
Execution time monitoring	○: Supported		○: Supported ◎: Performance monitor	

^{*1} The logging function can be substituted.

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Item	Differences in synchronous control function			
	RD78G	RD78GH	MX300	MX500
Servo input axis	○: 64 maximum	○: 256 maximum	○: 64 maximum	○: 256 maximum
Command generation axis	○: 1024 maximum ^{*1}		○: 1024 maximum ^{*1}	
Synchronous encoder axis				
Composite main shaft gear	○: 1/output axis		○: 1/output axis	
Main shaft gear	○: 1/output axis		○: 1/output axis	
Main shaft clutch	○: 1/output axis		○: 1/output axis	
Composite auxiliary shaft gear	○: 1/output axis		○: 1/output axis	
Auxiliary shaft gear	○: 1/output axis		○: 1/output axis	
Auxiliary shaft clutch	○: 1/output axis		○: 1/output axis	
Speed change gear	○: 3/output axis		○: 3/output axis	
Output axis	○: 64 maximum	○: 256 maximum	○: 64 maximum	○: 256 maximum
Smoothing	○: Supported		○: Supported	
Rotational direction control	○: Supported		○: Supported	
Synchronization control between multiple modules	○: Inter-module synchronization control		×: Not supported	

*1 It varies depending on system memory capacity setting.

Item	Differences in electronic cam specifications			
	RD78G	RD78GH	MX300	MX500
Number of registrations	○: 60000 maximum		○: 60000 maximum	
Cam resolution	○: 8 to 65535		○: 8 to 65535	
Stroke ratio	○: -214.7483648 to 214.7483647 [%] Floating point		○: -214.7483648 to 214.7483647 [%] Floating point	
Coordinate number	○: 2 to 65535		○: 2 to 65535	
Coordinate data	○: -10000000000.0 to 10000000000.0 Floating point		○: -10000000000.0 to 10000000000.0 Floating point	
Storage format	○: csv		○: csv	
Cam area sizes available	○: Parameter setting		○: Parameter setting	
Cam auto generation	○: Rotary cutter cam ○: Detail stroke ratio cam		○: Rotary cutter cam ○: Detail stroke ratio cam	

Item			Differences in program/tool specifications				
			RD78G		RD78GH	MX300	MX500
Program	Default programming style	Language	○: ST language (execution of the RD78)		◎: LD/FBD/LD/ST (execution of the MX controller MX-R model)		
		Variable	○: Label ^{*1*2}		◎: Label ^{*3}		
	PLCopen®		○: Compliant		○: Compliant		
	Program type		○: ST (execution of the RD78) ○: LD/FBD/LD/SFC (when read from the RCPU)		◎: LD, FB, FBD, ST (execution of the MX controller MX-R model)		
	FB call		○: Supported		◎: Supported ^{*4}		
	Number of programs		○: 512		△: Number of program files: 252	△: Number of program files: 380	
	Number of steps/bytes		○: The maximum number of steps/bytes is set in parameters.		△: 480K or more	○: 1800K or more	
	Number of programs executed simultaneously		○: 512		△: 252	△: 380	
	Executing task	Normal task		Executed according to the scan time		Executed according to the scan time	
		Event task	Fixed cycle	○: Executed according to the fixed cycle 0.0625 to 60000ms (in increments of an integer multiple of the operation cycle)		◎: Executed in sync with the network communication cycle ^{*5} 0.125 to 8.0ms (Can be set in increments of 0.03125ms × 2 ⁿ .) △: Fixed scan execution type program 0.5 to 60000 [ms]	
			Interrupt	Not supported		◎: Internal timer interrupt 0.05 to 1000ms (in increments of 0.05ms) ◎: Occurrence of interrupt due to interrupt pointer (I) ◎: Turning bit data ON (TRUE)	
		NMI task		×: Not supported		×: Not supported	
		Initial execution		○: Supported		○: Supported	
		Standby		○: Supported		○: Supported	
		Number of continuous transitions setting		×: Not supported		×: Not supported	
	Startup method		○: Automatic startup		○: Automatic startup		
	Execution type change		○: Available using instructions ^{*6}		×: Not supported		
	END operation selection		×: Not supported		×: Not supported		
	In-execution flag		○: Available in PROGRAM_INFO structure ^{*7}		△: Available in special devices		
	Online change		×: Not supported		◎: Supported		
	Module label access		○: Supported		○: Supported		
	Module FB		○: Supported ^{*8}		△: Supported ^{*9}		
	Number of actual I/O points		×: Not supported		○: 4096		
	Number of I/O points (X/Y)		×: Not supported		○: 12288		
	Label area (variable area)		○: Depends on parameter settings.		◎: Allocatable within a total of 65536K words		
	Internal relay (M)		×: Not supported				
	Link relay (B)						
	Annunciator (F)						
	Data register (D)						
	Link register (W)						
	Motion register (#)						
	Special relay (SM)						
	Special register (SD)						
Buffer memory (U□\G)		○: 16M words maximum ^{*10}					
		○: 36864K bytes (18432K words) maximum					

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Item		Differences in program/tool specifications			
		RD78G	RD78GH	MX300	MX500
Program	Fixed scan communication area (U3EQ\HG) in the CPU buffer memory	× : Not supported		× : Not supported	
	Device/Label latch	× : Not supported		◎ : Supported	
	Maximum number of motion instruction settings	○ : 2048		◎ : 8192 ^{*11}	
	Initial value setting for the structure/array	○ : Supported ^{*12}		◎ : Supported ^{*13}	
Tools	Programming tool	○ : GX Works3 ○ : Motion control setting tool		◎ : GX Works3 ^{*14}	
	Monitoring tool	○ : GX LogViewer/realtime monitor		○ : GX LogViewer/realtime monitor	
	MELSOFT Mirror	× : Not supported		× : Not supported	
	MELSOFT Gemini	○ : Supported in a programmable controller CPU		× : Not supported	
	Simulator	○ : Supported		× : Not supported	
	C language programming	○ : Reading from C intelligent function module		× : Not supported	

*1 The RD78 labels differ from the RCPUs labels.

*2 Public labels are used for data communication between the RCPUs and RD78.

*3 Data communication is not required because there is only one CPU.

*4 Some specifications have been improved, such as FB array and FB initial values setting window.

*5 Choice from three cycle types: High-speed, middle-speed, or low-speed

*6 PSCAN/PSTOP

*7 Monitoring with an engineering tool is required.

*8 Can be read from libraries.

*9 Can be read from program element lists.

*10 User setting area 500K words are included.

*11 The upper limit value varies depending on the FB type.

*12 Individual initial value cannot be set.

*13 Individual Initial value can be set.

*14 All in one tool

Item			Differences in network functions					
			RD78G		RD78GH		MX300	MX500
			Standard station	Motion control station	Standard station	Motion control station		
Network	Communication method		○: Time sharing/time-managed polling method				○: Time sharing/time-managed polling method	
	Communication speed		○: 1Gbps/100Mbps				○: 1Gbps/100Mbps	
	Maximum number of connectable stations		○: 120				◎: 253	
	Connection cable		○: 1000BASE-T category 5e or higher STP straight/crossover cable				○: 1000BASE-T category 5e or higher STP straight/crossover cable	
	Maximum station-to-station distance		○: 100m				○: 100m	
	Maximum number of networks		○: 239				○: 239	
	Network topology		○: Line topology ○: Star topology ○: Ring topology* ¹				○: Line topology ○: Star topology ×: Ring topology	
	Overall cable distance		○: Line topology: 25300m (when 254 stations are connected) ○: Star topology: Depends on the system configuration.				○: Line topology: 25300m (when 254 stations are connected) ○: Star topology: Depends on the system configuration.	
	Number of cascade connections		Depends on switching hub specifications.				Depends on switching hub specifications.	
Cyclic transmission	Maximum number of link points		◎: RWw and RWr: 16K bytes ◎: RX and RY: 2K bytes				◎: RWw and RWr: 16K bytes ◎: RX and RY: 2K bytes	
	Communications using RX and RY		×: Not supported	○: Available with slave labels	×: Not supported	○: Available with slave labels	○: Available with network labels	
	Communications using RWr and RWw		○: Supported	○: Available with slave labels	○: Supported	○: Available with slave labels	○: Available with network labels	
	Link refresh		○: Supported	×: Not supported	○: Supported	×: Not supported	○: Supported	
	Direct access to link devices		○: Supported	×: Not supported	○: Supported	×: Not supported	◎: Supported* ²	
	Cyclic data assurance		○: Supported	○: Supported	○: Supported	○: Supported	○: Supported	
	Interlink transmission		○: Supported	×: Not supported	○: Supported	×: Not supported	×: Not supported	
	Station-specific mode (normal/high speed)		—	○: Supported	—	○: Supported	○: Supported	
	Sequence scan synchronization specification		×: Not supported	×: Not supported	×: Not supported	×: Not supported	×: Not supported	
	Cyclic transmission punctuality assurance		○: Supported	○: Supported	○: Supported	○: Supported	○: Supported	
	I/O maintenance settings	Data link faulty station setting	○: Supported	×: Not supported (always Hold)	○: Supported	×: Not supported (always Hold)	◎: Supported	
		Output status setting for CPU STOP	○: Supported	×: Not supported (always Hold)	○: Supported	×: Not supported (always Hold)	◎: Supported	
		Output status setting for CPU stop error	○: Supported	×: Not supported (always Hold)	○: Supported	×: Not supported (always Hold)	◎: Supported	
	Cyclic transmission stop and restart (Disconnection/reconnection, disconnection/return)		○: Supported	○: Supported	○: Supported	○: Supported	○: Supported	

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Item		Differences in network functions					
		RD78G		RD78GH		MX300	MX500
		Standard station	Motion control station	Standard station	Motion control station		
Transient transmission	Communications using dedicated instructions	○: Supported				○: Supported	
	Communications using the SLMP	○: Supported				○: Supported	
	Communications using engineering tools	○: Supported				○: Supported	
Synchronization	Synchronous with inter-module synchronization cycle	○: 0.25 to 8ms (Can be set in increments of 0.25ms × 2 ⁿ .) ^{*3}				×: Not supported	
	Network communication cycle synchronization	○: 0.03125 to 8.0ms (0.03125 × 2 ⁿ .) ^{*4}				◎: 0.125ms, 0.25ms, 0.5 to 8.00ms (Can be set in increments of 0.5ms for 0.5ms or more.) ^{*5}	
	TSN synchronous communication function	○: Supported				○: Supported	
	Time synchronous (synchronization timestamp)	○: Supported				○: Supported	
RAS	Device station disconnection	○: Supported				○: Supported	
	Automatic return	○: Supported				○: Supported	
	Loopback function (ring topology)	○: Supported				×: Not supported	
Diagnostics	CC-Link IE Field/TSN diagnostics	○: Supported				○: Supported	
	Module communication test	×: Not supported				○: Supported	
	Cable test	×: Not supported				×: Not supported	
	Communication test	×: Not supported				○: Supported	
	IP communication test	×: Not supported				×: Not supported	
Others	Reserved station setting	○: Supported				○: Supported	
	Error invalid station setting	○: Supported				○: Supported	

*1 The RD78G does not support the ring topology.

*2 Equivalent to RJ71GN11-T2.

*3 Synchronization between network and module is available.

*4 In increments of 0.0625×2^n for the RD78G

*5 Choice from three cycle types: High-speed, middle-speed, or low-speed

Specifications comparison between RD77MS and MX300

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item	Differences in motion control	
	RD77MS	MX300
Network	○: SSCNETⅢ/H	◎: CC-Link IE TSN
Number of control axes	○: 4, 8, 16	△: 16, 32, 64 ^{*1}
Operation cycle	○: 0.444ms, 0.888ms, 1.777ms, 3.555ms	△: 0.125ms, 0.25ms, 0.5 to 8ms (Can be set in increments of 0.5ms.)
Operation cycle coexistence	×: Not supported	◎: 3 groups
Interpolation functions	○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation ○: 3-axis helical interpolation	○: 2-axis, 3-axis, and 4-axis linear interpolation ○: 2-axis circular interpolation ×: 3-axis helical interpolation
Control method	○: PTP control ○: Speed control ○: Speed-position switching control ○: Position-speed switching control ○: Speed-torque control, tightening & press-fit control ○: Advanced synchronous control ○: Constant speed control	○: PTP control ○: Speed control ○: Speed-position switching control ^{*2} ○: Position-speed switching control ^{*2} ○: Speed-torque control, tightening & press-fit control ○: Advanced synchronous control △: Continuous path control (multiple axes positioning data operation) ○: Speed control with fixed position stop ^{*2} ◎: Position follow-up control ◎: Motion cyclic positioning control ◎: Motion cyclic velocity control ◎: Motion cyclic torque control
Functions to change the control details	○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override	○: Current value change ○: New speed value ○: Target position change ○: Acceleration/deceleration process ○: Torque limit change ○: Override
Correction functions	○: Backlash compensation ○: Electronic gear ○: Phase compensation	○: Backlash compensation ○: Electronic gear ×: Phase compensation
Limit functions	○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ○: Emergency stop	○: SW stroke limit ○: HW stroke limit ○: Speed limit ○: Torque limit ×: Emergency stop ○: Speed limit filter ○: Travel direction restriction filter ○: Acceleration/deceleration speed limit ○: Jerk limit
M code function	○: Supported	○: Supported
Vibration control command filter	×: Not supported	○: Smoothing filter
Skip function	○: Supported	○: Supported ^{*3}
Control unit	○: mm, inch, degree, PLS Fixed decimal place	◎: Any unit and decimal place can be set. (Choice from mm, inch, degree, or PLS when presetting.)
Acceleration/deceleration process	○: Trapezoidal acceleration/deceleration ○: S-curve acceleration/deceleration	○: Trapezoidal acceleration/deceleration ○: Jerk acceleration/deceleration
Acceleration/deceleration process at speed/torque control	○: Trapezoidal acceleration/deceleration	○: Trapezoidal acceleration/deceleration ◎: Jerk acceleration/deceleration
Acceleration/deceleration time setting range	○: 1 to 8388608ms (32-bit integer)	○: One operation cycle to 8400000ms
Manual operation	○: JOG operation ○: Manual pulse generator operation (high-speed counter module required) ○: Speed control with fixed position stop	○: JOG operation ○: Manual pulse generator operation with ABZ encoder via high-speed counter module/J5-RJ and virtual synchronous encoder ×: Speed control with fixed position stop

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Item	Differences in motion control	
	RD77MS	MX300
External command signal	○: Module DI ○: Amplifier DI ○: Buffer memory	○: CANopen object ^{*4} ○: Link device ◎: Label ◎: Device (included buffer memory area)
Zero point return function	△: Driver homing method (only stepping driver) ○: Data setting method ○: Near-point dog signal method ○: Count method ○: Scale home position signal detection method	○: Driver homing method ○: Data setting method
High-speed zero point return control	○: Supported	×: Not supported
Forced stop function	○: All axes batch	◎: Each axis/All axes batch
Servo ON/OFF	○: Ready ON/OFF: All axes batch ○: Servo ON/OFF: Each axis	◎: Ready ON/OFF: Each axis/All axes batch ◎: Servo ON/OFF: Each axis/All axes batch
Limit switch output function	×: Not supported	◎: Supported ^{*5}
Absolute position system	○: Battery-less	○: Battery-less
Test mode	○: Supported	×: Not supported
Teaching operation	○: Supported	○: Supported in application
Amplifier-less operation function	○: All axes batch setting Validation after module start-up is available.	○: Setting for each axis Validation after module start-up is not available.
Virtual servo amplifier function	○: Supported	○: Supported
Driver communication function	○: Supported	×: Not supported
Optional data monitoring function	○: Supported	○: Supported
Servo data monitoring	○: Supported	○: Supported
Gain/PI-PID switching command	○: Supported	○: Supported
Servo parameter maintenance	○: Servo parameters are held in a motion CPU. After connection is completed, the parameters will be copied in a servo amplifier.	○: Servo parameters are held in a servo amplifier. After connection is completed, the parameters will be copied in a motion CPU.
Servo parameter change function	○: Supported	○: Supported
Multiple axes adjustment	○: Supported	×: Not supported

*1 There are no models with 4 or 8 axes.

*2 It is realized by using the buffer mode.

*3 It is included in the multiple axes positioning data operation.

*4 It is equivalent to the amplifier DI.

*5 A digital cam switch is required.

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Item	Differences in general functions	
	RD77MS	MX300
Mark detection function	○: Supported	○: Supported
Inter-module synchronization function	○: Supported	×: Not supported
Event history	○: Supported	○: Supported (filter settings available)
Position data history	○: Supported	○: Supported
Security function	△: Cam data password	○: IP filter △: User authentication function
All clear function	○: Supported	○: Supported
Remote operation	×: Not supported	◎: Supported
File transfer	×: Not supported	×: Not supported
Backup restoration	○: Supported	△: Supported (with some restrictions)
FTP file transfer	×: Not supported	◎: Supported
SLMP communications	×: Not supported	◎: Supported
Parameter change	○: Supported	×: Not supported
Data storage memory	○: Built-in ROM	○: Built-in ROM ◎: SD memory card
Logging (digital oscilloscope) function	○: Realtime monitor ○: Offline sampling	○: Realtime monitor ◎: Data logging function
Servo system recorder	×: Not supported	△: Not supported ^{*1}
Error reset	×: Not supported	○: Supported (entire system)
Add-on function	×: Not supported	◎: Supported
Module extension parameter	○: Supported	×: Not supported
Firmware update	○: Supported	○: Supported
Boot area update	○: Supported	×: Not supported
Safety function	○: Hardware wiring safety with the J4 + MR-D30 + WS controller	○: Hardware wiring safety with the J5/JET-HS + WS controller
Vision linkage	×: Not supported	×: Not supported
Online module change function	○: Supported	×: Not supported
Execution time monitoring	△: Supported (only operation cycle)	○: Supported ◎: Performance monitor

^{*1} The logging function can be substituted.

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Item	Differences in synchronous control function	
	RD77MS	MX300
Servo input axis	○: 16/module maximum	◎: 64/module maximum
Command generation axis	×: Not supported	◎: 1024 maximum ^{*1}
Synchronous encoder axis	○: 16/module maximum	
Composite main shaft gear	○: 1/output axis	○: 1/output axis
Main shaft gear	○: 1/output axis	○: 1/output axis
Main shaft clutch	○: 1/output axis	○: 1/output axis
Composite auxiliary shaft gear	○: 1/output axis	○: 1/output axis
Auxiliary shaft gear	○: 1/output axis	○: 1/output axis
Auxiliary shaft clutch	○: 1/output axis	○: 1/output axis
Speed change gear	○: 2/output axis	◎: 3/output axis
Output axis	○: 16/module maximum	◎: 64/module maximum
Smoothing processing	○: Supported	○: Supported
Rotational direction control	○: Supported	○: Supported
Synchronization control between multiple modules	○: Inter-module synchronization function	×: Not supported

*1 It varies depending on system memory capacity setting.

Item	Differences in electronic cam specifications	
	RD77MS	MX300
Number of registrations	○: 256 maximum	◎: 60000 maximum
Cam resolution	○: 256 to 32768 (Can be set in increments of 256×2^n .)	◎: 8 to 65535
Stroke ratio	○: -214.7483648 to 214.7483647 [%] Fixed decimal point	○: -214.7483648 to 214.7483647 [%] Floating point
Coordinate number	○: 2 to 16384	◎: 2 to 65535
Coordinate data	○: -2147483648 to 2147483647	◎: -10000000000.0 to 10000000000.0 Floating point
Storage format	○: csv	○: csv
Cam area sizes available	○: 1M bytes	◎: Parameter setting
Cam auto generation	○: Rotary cutter cam	○: Rotary cutter cam ◎: Detail stroke ratio cam

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Item			Differences in program/tool specifications		
			RD77MS	MX300	
Program	Default programming style	Language	— (Created in CPU module.)	Ladder diagram/FBD/LD/ST ^{*1*2}	
		Variable	—	Label	
	PLCopen®		—	Complied	
	Program type		—	LD, FB, FBD, ST	
	FB call		—	Supported	
	Number of programs		—	Number of program files: 252 Number of FB files: 128	
	Number of steps/bytes		—	Equivalent to 320K steps	
	Number of programs executed simultaneously		—	252	
	Executing task	Normal task		—	Executed according to the scan time
		Event task	Fixed cycle	—	Executed in sync with the network communication cycle.*3 0.125 to 8.0ms (Can be set in increments of 0.03125ms × 2 ⁿ .) Fixed scan execution type program 0.5 to 60000 [ms]
				Interrupt	—
		NMI task		—	Not supported
		Initial execution		—	Supported
		Standby		—	Supported
		Number of continuous transitions setting		—	Not supported
	Startup method		—	Automatic startup	
	END operation		—	Only continue	
	In-execution flag		—	Available in special devices	
	Online change		—	Supported	
	Module label		Supported	Supported	
	Module FB		Supported	Supported	
	Number of actual I/O points		—	4096	
	Number of I/O points (X/Y)		—	12288	
	Label area (variable area)		—	Allocatable within a total of 65536K words	
	Internal relay (M)		—		
	Link relay (B)				
	Annunciator (F)				
	Data register (D)				
	Link register (W)				
	Motion register (#)				
	Special relay (SM)			—	Not supported
	Special register (SD)		—	4096	
	Buffer memory (U□\G)		—	36864K bytes (18432K words) maximum	
	Fixed scan communication area (U3E□\HG) in the CPU buffer memory		—	Not supported	
	Device/Label latch		—	Supported	
	Maximum number of motion instruction settings		—	8192 ^{*4}	
	Initial value setting for the structure/array		—	Supported	

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Item		Differences in program/tool specifications	
		RD77MS	MX300
Tools	Programming tool	GX Works3 Simple motion control setting tool	GX Works3
	Monitoring tool	Digital oscilloscope function	GX LogViewer/realtime monitor
	MELSOFT Mirror	Not supported	Not supported
	MELSOFT Gemini	Supported in a programmable controller CPU	Not supported
	Simulator	Supported	Not supported
	C language programming	Not supported	Not supported

*1 Executed only from an MX controller MX-R model.

*2 Coexistence of motion programs and sequence programs is available.

*3 Choice from three cycle types: High-speed, middle-speed, or low-speed

*4 The upper limit value varies depending on the FB type.

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Item		Differences in network functions (motion control)	
		RD77MS	MX300
Network specifications	Communication method	Optical communications	Time sharing/time-managed polling method
	Communication speed	150Mbps	1Gbps/100Mbps
	Maximum number of connectable stations	16	253
	Connection cable	SSCNETⅢ cable	1000BASE-T category 5e or higher, STP straight/crossover cable
	Maximum station-to-station distance	50m	100m
	Maximum number of networks	16	239
	Network topology	—	Line topology Star topology
	Overall cable distance	—	Line topology: 25300m (when 254 stations are connected) Star topology: Depends on the system configuration.
	Number of cascade connections	Depends on switching hub specifications.	Depends on switching hub specifications.
Cyclic transmission	Maximum number of link points	—	18K bytes per network or station in a total of RWw, RWr, RX, and RY devices
	Communications using RX and RY	—	Supported
	Communications using RWr and RWw	—	Supported
	Link refresh	—	Supported
	Direct access to link devices	—	Supported
	Cyclic data assurance	—	Supported
	Interlink transmission	—	Not supported
	Mode selection for cyclic transmission (Normal/high speed)	—	Not supported
	Sequence scan synchronization specification	—	Not supported
	Cyclic transmission punctuality assurance	—	Supported
	I/O maintenance settings	Data link faulty station setting	Supported (Only HOLD can be set in synchronous stations. CLEAR cannot be set.)
		Output status setting for CPU STOP	Supported
		Output status setting for CPU stop error	Supported
	Cyclic transmission stop and restart (Disconnection/reconnection, disconnection/return)	—	Supported
Transient transmission	Communications using dedicated instructions	—	Supported
	Communications using the SLMP	—	Supported
	Communications using an engineering tool	—	Supported
Synchronization	Inter-module synchronization cycle	0.444ms, 0.888ms, 1.777ms, 3.555ms	0.125ms, 0.25ms, 0.5 to 8.00ms (Can be set in increments of 0.5ms for 0.5ms or more.) ^{*1}
	Network communication cycle synchronization		
	CC-Link IE Field/TSN synchronous communication function	—	Supported
	Time synchronous (synchronization timestamp)	—	Supported
RAS	Device station disconnection	—	Supported
	Automatic return	—	Supported
	Loopback function	—	Not supported

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Item		Differences in network functions (motion control)	
		RD77MS	MX300
Diagnostic function	CC-Link IE Field/TSN diagnostics	—	Supported
	Module communication test	—	Supported
	Cable test	—	Not supported
	Communication test	—	Supported
	IP communication test	—	Not supported
Others	Reserved station setting	—	Supported
	Error invalid station setting	—	Supported

*1 Choice from three cycle types: High-speed, middle-speed, or low-speed

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3.4 CC-Link IE TSN function

◎: Available (functional enhancement), ○: Available, △: Available with restrictions, ×: Not available

Item			Availability		
			RJ71GN11-T2	MX controller MX-R model	
Performance specifications	Maximum number of link points per network	RX	○: 16K points (16384 points, 2K bytes)	○: 16K points (16384 points, 2K bytes)	
		RY	○: 16K points (16384 points, 2K bytes)	○: 16K points (16384 points, 2K bytes)	
		RWr	○: 8K points (8192 points, 16K bytes)	○: 8K points (8192 points, 16K bytes)	
		RWw	○: 8K points (8192 points, 16K bytes)	○: 8K points (8192 points, 16K bytes)	
		LB	○: 32K points (32768 points, 4K bytes)	×	
		LW	○: 16K points (16384 points, 32K bytes)	×	
	Maximum number of link points per module	Master station	RX	○: 16K points (16384 points, 2K bytes)	○: 16K points (16384 points, 2K bytes)
			RY	○: 16K points (16384 points, 2K bytes)	○: 16K points (16384 points, 2K bytes)
			RWr	○: 8K points (8192 points, 16K bytes)	○: 8K points (8192 points, 16K bytes)
			RWw	○: 8K points (8192 points, 16K bytes)	○: 8K points (8192 points, 16K bytes)
			LB	○: 32K points (32768 points, 4K bytes)	×
			LW	○: 16K points (16384 points, 32K bytes)	×
		Local station	RX	○: 16K points (16384 points, 2K bytes)	×
			RY	○: 16K points (16384 points, 2K bytes)	×
			RWr	○: 8K points (8192 points, 16K bytes)	×
			RWw	○: 8K points (8192 points, 16K bytes)	×
			LB	○: 32K points (32768 points, 4K bytes)	×
			LW	○: 16K points (16384 points, 32K bytes)	×
	Maximum number of send points per module	Master station	RY	○: 16K points (16384 points, 2K bytes)	○: 16K points (16384 points, 2K bytes)
			RWw	○: 8K points (8192 points, 16K bytes)	○: 8K points (8192 points, 16K bytes)
			LB	○: 32K points (32768 points, 4K bytes)	×
			LW	○: 16K points (16384 points, 32K bytes)	×
		Local station	RY	○: 16K points (16384 points, 2K bytes)	×
			RWw	○: 8K points (8192 points, 16K bytes)	×
			LB	○: 32K points (32768 points, 4K bytes)	×
			LW	○: 16K points (16384 points, 32K bytes)	×
Transient transmission capacity		○: 1920 bytes maximum	○: 1920 bytes maximum ^{*2}		
Communication speed		○: 1Gbps/100Mbps	○: 1Gbps/100Mbps		
Shortest communication cycle		○: 125.00us	○: 125.00us		
Network topology		○: Line topology ○: Star topology (Coexistence of line topology and star topology is also available.) ○: Ring topology	○: Line topology ○: Star topology (Coexistence of line topology and star topology is also available.) ×: Ring topology		
Communication cable	At 1Gbps	○: Ethernet cable (Category 5e or higher, double shielded STP or STP straight cable)	○: Ethernet cable (Category 5e or higher, double shielded STP or STP straight cable)		
	At 100Mbps	○: Ethernet cable (Category 5 or higher, double shielded STP or STP straight cable)	○: Ethernet cable (Category 5 or higher, double shielded STP or STP straight cable)		
Maximum station-to-station distance		○: 100m	○: 100m		

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Item		Availability	
		RJ71GN11-T2	MX controller MX-R model
Performance specifications	Overall cable distance	○: Line topology: 12000m (when 121 stations are connected)	◎: Line topology: 25300m (when 254 stations are connected)
		○: Star topology: Depends on the system configuration.	○: Star topology: Depends on the system configuration.
		○: Ring topology: 12100m (when 121 stations are connected)	×: Ring topology
	Maximum number of connectable stations	○: 121 (1 master station and 120 device stations (120 modules))	◎: 254 (1 master station and 253 device stations (256 modules))
	Maximum number of networks	○: 239	○: 239
	Communication method	○: Time sharing method	○: Time sharing method
Instruction	Authentication Class	B	B
	Link dedicated instruction	○: READ	×: READ
		○: SREAD	×: SREAD
		○: WRITE	×: WRITE
		○: SWRITE	×: SWRITE
		○: SEND	×: SEND
		○: RECV	×: RECV
		○: REQ	×: REQ
	Remote operation instruction	○: REMFR	×: REMFR
		○: REMFRD	×: REMFRD
		○: REMFRIP	×: REMFRIP
		○: REMFRDIP	×: REMFRDIP
		○: REMTO	×: REMTO
		○: REMTOD	×: REMTOD
		○: REMTOIP	×: REMTOIP
		○: REMTODIP	×: REMTODIP
	SLMP communication instruction	○: SLMPSEND	○: SLMPSEND
	Others	○: CCPASET	×: CCPASET
		○: CCPASETX	×: CCPASETX
		○: UINI	×: UINI

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Item			Availability	
			RJ71GN11-T2	MX controller MX-R model
Functions	Station type	Master station	○	○
		Local station	○	×
	Cyclic transmission	Communication mode	Unicast mode	○
			Multicast mode	×
		Communications with other stations	Communications using RX and RY	○
			Communications using RWr and RWw	○
			Communications using LB and LW	×
			Link points extension	×
		Access to devices and link devices	Link refresh	○
			Direct access to link devices	○
		Cyclic data assurance		○
		Communication cycle coexistence		○
		Interlink transmission		×
		I/O maintenance settings		○
		Remote device test		×
		CANopen communications		○
		Time-managed polling method		○
	Transient transmission	Communications using dedicated instructions		△: Only the SLMPSEND instruction is supported for the dedicated instructions.*2
		Communications using the SLMP		△*1*2
		Communications using engineering tools		×
	Ethernet connection	Connection with MELSOFT products and a GOT		×
		Searching modules on the network		×
		Connection with SLMP-compatible devices		△*2
		Socket communications		×
	Security	IP filter		○
		Remote password		×
		Default open port usage setting function		◎

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Item			Availability	
			RJ71GN11-T2	MX controller MX-R model
Functions	RAS	Device station disconnection	○	○
		Automatic return	○	○
		Loopback function	○	×
		Master station duplication detection	○	○
		IP address duplication detection	○	○
		Time synchronization	○	○
		Master station switch function	○	×
		ERR LED control	○	×
	CC-Link IE TSN Network synchronous communication function	Inter-module synchronization	○	×
		Network communication cycle synchronization	×	◎
	Safety communications		○	×
	CC-Link IE TSN configuration window	Device station parameter setting	○	○
		Detection of connected/disconnected devices	○	○
		Device station parameter processing	○	○
		Command execution to device station	○	○
		Device station IP address setting	○	×
	Others	Reserved station setting	○	○
		Error invalid station setting	○	○
		Parameter automatic setting in device station	○	○
		Data collection using the CC-Link IE TSN communication software	○	×
		Co-recording function	○	×
		Firmware update	○	○
		Local station connection	○	×
		Label access to remote device	×	◎

*1 In the MX controller MX-R model, the following SLMP commands are not supported.

- 0613H: Reading data from buffer memory of the host station (SLMP-compatible device)
- 1613H: Writing data to buffer memory of the host station (SLMP-compatible device)
- 0601H: Reading data from buffer memory of the intelligent function module
- 1601H: Writing data to buffer memory of the intelligent function module
- 1631H: Specifying the remote password changes the unlocked state to the locked state.
- 1630H: Specifying the remote password changes the locked state to the unlocked state.

*2 The maximum send data size is 259 bytes.

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REVISIONS

Version	Date of Issue	Revision
A	May 2025	First edition

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