



TECHNICAL BULLETIN

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

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■Relevant Models

MXF100-8-N32, MXF100-8-P32, MXF100-16-N32, and MXF100-16-P32

Thank you for your continued support of Mitsubishi Electric programmable automation controllers, MELSEC MX controller MX-F model.

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

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

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1 GENERIC TERMS

Generic term	Description
FX5U CPU module	A generic term for the FX5U-32MR/ES, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/ES, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/ES, FX5U-80MT/ES, FX5U-80MT/ESS, FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-80MR/DS, FX5U-80MT/DS, and FX5U-80MT/DSS.
MX controller MX-F model	A generic term for the MXF100-8-N32, MXF100-8-P32, MXF100-16-N32, and MXF100-16-P32.

2 SYSTEM CONFIGURATION

This section shows the differences in the system configuration between an FX5U CPU module and MX controller MX-F model.

2.1 Differences In System

○: Available, △: Partially available, ×: Not available

Item		FX5U CPU module	MX controller MX-F model
Available modules	MX-F model modules	×	○
	MELSEC iQ-F series modules	○	△ ( Page 2 Lists of Configuration Devices)
	FX3 series modules	○	×
Available expansion adapter	MELSEC iQ-F series expansion adapters	○	○
Available expansion board	MELSEC iQ-F series expansion boards	○	×
Available network	Ethernet	○	○
	EtherNet/IP	○	○
	CC-Link IE TSN	○	○
	CC-Link IE Field Network	○	×
	CC-Link IE Field Network Basic	○	×
	CC-Link	○	○
	AnyWireASLINK	○	×
Engineering software	GX Works3	○	○

Installation environment

There are differences in operating ambient temperature.

( Page 6 General Specifications

2.2 Lists of Configuration Devices

The following tables show the differences in available devices (available modules) between the FX5U CPU module and MX controller MX-F model.

○: Available, ×: Not available

I/O modules for MX-F models

Item	Model	FX5U CPU module	MX controller MX-F model
Extension connector type	MXF100-X32	×	○
	MXF100-Y16R	×	○
	MXF100-Y32N	×	○
	MXF100-Y32P	×	○
	MXF100-H32N	×	○
	MXF100-H32P	×	○

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Input modules

Item	Model	FX5U CPU module	MX controller MX-F model
Extension cable type	FX5-8EX/ES	○	○
	FX5-16EX/ES	○	○
Extension connector type	FX5-C16EX/D	○	×
	FX5-C16EX/DS	○	×
	FX5-C32EX/D	○	×
	FX5-C32EX/DS	○	×
	FX5-C32EX/DS-TS	○	×

Output modules

Item	Model	FX5U CPU module	MX controller MX-F model
Extension cable type	FX5-8EYR/ES	○	○
	FX5-16EYR/ES	○	○
	FX5-8EYT/ES	○	○
	FX5-16EYT/ES	○	○
	FX5-8EYT/ESS	○	○
	FX5-16EYT/ESS	○	○
Extension connector type	FX5-C16EYR/D-TS	○	×
	FX5-C16EYT/D	○	×
	FX5-C32EYT/D	○	×
	FX5-C32EYT/D-TS	○	×
	FX5-C16EYT/DSS	○	×
	FX5-C32EYT/DSS	○	×
	FX5-C32EYT/DSS-TS	○	×

I/O modules

Item	Model	FX5U CPU module	MX controller MX-F model
Extension cable type	FX5-16ER/ES	○	○
	FX5-16ET/ES	○	○
	FX5-16ET/ESS	○	○
Extension connector type	FX5-C32ET/D	○	×
	FX5-C32ET/DS-TS	○	×
	FX5-C32ET/DSS	○	×
	FX5-C32ET/DSS-TS	○	×

Powered input/output modules

Item	Model	FX5U CPU module	MX controller MX-F model
Extension cable type	FX5-32ER/ES	○	×
	FX5-32ET/ES	○	×
	FX5-32ET/ESS	○	×
	FX5-32ER/DS	○	○
	FX5-32ET/DS	○	○
	FX5-32ET/DSS	○	○

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Analog modules

Item	Model	FX5U CPU module	MX controller MX-F model
Analog input module	FX5-4AD	○	○
Analog output module	FX5-4DA	○	○
Multiple input module	FX5-8AD	○	○
Temperature control module	FX5-4LC	○	○

Motion modules/positioning modules/counter modules

Item	Model	FX5U CPU module	MX controller MX-F model
Simple motion module	FX5-40SSC-S	○	×
	FX5-80SSC-S	○	×
Motion module	FX5-40SSC-G	○	×
	FX5-80SSC-G	○	×
High-speed pulse input/output module	FX5-16ET/ES-H	○	×
	FX5-16ET/ESS-H	○	×
Positioning module	FX5-20PG-P	○	×
	FX5-20PG-D	○	×
High-speed counter module	FX5-2HC/ES	○	○

Communication modules

Item	Model	FX5U CPU module	MX controller MX-F model
Ethernet module	FX5-ENET	○	×
EtherNet/IP module	FX5-ENET/IP	○	○
OPC UA module	FX5-OPC	○	×

Network modules

Item	Model	FX5U CPU module	MX controller MX-F model
CC-Link IE TSN master/local module	FX5-CCLGN-MS	○	○
CC-Link IE Field Network module	FX5-CCLIEF	○	×
CC-Link system master intelligent device module	FX5-CCL-MS	○	○
AnyWireASLINK system master module	FX5-ASL-M	○	×
PROFIBUS-DP master module	FX5-DP-M	○	×

Safety extension modules

Item	Model	FX5U CPU module	MX controller MX-F model
Safety main module	FX5-SF-MU4T5	○	×
Safety input expansion module	FX5-SF-8DI4	○	×

Connector conversion modules

Item	Model	FX5U CPU module	MX controller MX-F model
FX5 extension cable type → FX5 extension connector type	FX5-CNV-IF	○	×
FX5 extension connector type → FX5 extension cable type	FX5-CNV-IFC	○	○

Extension power supply modules

Item	Model	FX5U CPU module	MX controller MX-F model
Extension cable type	FX5-1PSU-5V	○	×
Extension connector type	FX5-C1PS-5V	○	○

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Extended extension cables, connector conversion adapters

Item	Model	FX5U CPU module	MX controller MX-F model
Extended extension cable	FX5-30EC	○	○
	FX5-65EC	○	○
Connector conversion adapter	FX5-CNV-BC	○	○

Expansion adapters

Item	Model	FX5U CPU module	MX controller MX-F model
Analog adapter	FX5-4A-ADP	○	○
	FX5-4AD-ADP	○	○
	FX5-4DA-ADP	○	○
	FX5-4AD-PT-ADP	○	○
	FX5-4AD-TC-ADP	○	○
Communication adapter	FX5-232ADP	○	○
	FX5-485ADP	○	○

Expansion boards

Item	Model	FX5U CPU module	MX controller MX-F model
Expansion communication board	FX5-232-BD	○	×
	FX5-485-BD	○	×
	FX5-422-BD-GOT	○	×

SD memory cards

Item	Model	FX5U CPU module	MX controller MX-F model
SD memory card	NZ1MEM-2GBSD	○	○
	NZ1MEM-4GBSD	○	○
	NZ1MEM-8GBSD	○	○
	NZ1MEM-16GBSD	○	○

Batteries

Item	Model	FX5U CPU module	MX controller MX-F model
Battery	FX3U-32BL	○	○

3 DIFFERENCES IN SPECIFICATIONS

This section shows the differences in specifications between the FX5U CPU module and MX controller MX-F model.

3.1 General Specifications

The following table shows the differences in general specifications.

Item	FX5U CPU module	MX controller MX-F model
Operating ambient temperature	-20 to 55°C, non-condensing ^{*1}	0 to 55°C, non-condensing

^{*1} 0 to 55°C for the products manufactured before June 2016

3.2 Hardware

This section shows the differences in hardware specifications between the FX5U CPU module and MX controller MX-F model.

○: Available, ×: Not available, —: N/A

Item			FX5U CPU module (FX5U-32M□)	MX controller MX-F model
Operation control method			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).)	
Processing speed	Instruction processing time	LD instruction	34ns	1.25ns
Memory capacity	Program memory		5M bytes (shared with data memory)	30M bytes
	Program cache memory		256K bytes	12M bytes
	SD memory card		The capacity differs depending on the memory card used. (SD/SDHC memory card: 16G bytes maximum)	
	Device/label memory		120K bytes/150K bytes	8192K bytes
	Signal flow memory	Area for programs	16000 bytes	512K bytes (fixed)
		Area for function blocks	32K bytes	
	Data memory		—	15M bytes
	Function memory		—	172032K bytes
	Buffer memory		320K bytes	36864K bytes
	Refresh memory		—	256K words
	Motion data memory		—	256K bytes
Maximum number of storable files	Program memory	Number of program area files	32	252
		Number of FB files	16	128
	SD memory card		NZ1MEM-2GBSD: 511 NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD: 65534	
	Device/label memory		1	324
	Data memory		208	3750
	Function memory		—	logging: 10172 motion: 8129 other: 8129
	Motion data memory		—	256
	USB port		—	USB2.0 High Speed (Type-C)
Ethernet port	Number of effective ports		1	2
	Interface		RJ45 connector	
Number of I/O points	Input		16 points	16 points
	Output		16 points	16 points

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Item			FX5U CPU module (FX5U-32M□)	MX controller MX-F model
Number of I/O points (including the number of occupied I/O points)			384 points maximum	512 points maximum
Clock function	Display data		Year, month, day, hour, minute, second, and day of the week (automatic leap year adjustment)	
	Accuracy		Difference per month: ±45 sec./25°C (TYP)	
Power failure retention	Retention method		Large-capacity capacitor	
	Retention time		10 days	
	Amount of data to be saved		12K words maximum	168K words
Allowable instantaneous power failure time			AC power supply type: 10ms or less DC power supply type: 5ms or less	DC power supply type: 5ms or less
External dimensions	Height		90mm	90mm
	Width		150mm	91mm
	Depth		83mm	105mm
Weight			Approximately 0.7kg	Approximately 0.45kg
LED indicator			○	○
Switch specifications	RUN/STOP/RESET switch		Toggle switch (RESET side: Momentary)	
	SD memory card disable switch		Push switch (no latch)	
Available SD memory card			SD/SDHC memory card	
Available battery			FX3U-32BL	
Extension modules			16 (excluding extension power supply modules and connector conversion modules)	
Expansion adapters			6 (2 communication adapters and 4 analog adapters)	
Serial communications	Maximum number of channels		4	2
	Protocol		MELSOFT Connection Nonprocedural communications MC protocol Modbus RTU Predefined protocol support Inverter communications N:N network/parallel link	Nonprocedural communications MC protocol Modbus RTU
Built-in high-speed I/O module	Positioning	Single axis control	4 axes	4 axes
		Linear interpolation	○	×
	High-speed counter	Number of channels	8	
		Maximum input frequency	200kHz	

3.3 Programming

This section shows the differences in programming.

Program, number of device points, and memory capacity

○: Available, ×: Not available

Item		FX5U CPU module (FX5U-32M□)	MX controller MX-F model
Programming language	Ladder diagram (LD)	○	○
	Structured text (ST)	○	○
	Function block diagram/ladder language (FBD/LD)	○	○
	Sequential function chart (SFC)	○	×
Function block (FB)		○	○
Program execution type	Initial execution type	○	○
	Scan execution type	○	○
	Fixed scan execution type	○	○
	Standby type	○	○
	Event execution type	○	○
I/O	Built-in proximal I/O	32 points [X: 16 points, Y: 16 points]	32 points [X: 16 points, Y: 16 points]
	Maximum proximal I/O	384 points	512 points
	I/O positional notation system	Octal	Hexadecimal
Device area capacity		150k bytes	8M bytes
Device type	Local device	×	○
	Link direct device	×	○ (Link relay (B) is not available.)
User device	Input relay (X)	1024 points (fixed)	12288 points (fixed)
	Output relay (Y)	1024 points (fixed)	12288 points (fixed)
	Internal relay (M)	32768 points ^{*1}	65536 points ^{*1}
	Latch relay (L)	32768 points ^{*1}	8192 points ^{*1}
	Link relay (B)	32768 points ^{*1}	32768 points ^{*1}
	Link special relay (SB)	32768 points ^{*1}	2048 points ^{*1}
	Annunciator (F)	32768 points ^{*1}	2048 points ^{*1}
	Edge relay (V)	×	2048 points ^{*1}
	Step relay (S)	4096 points (fixed)	×
	Timer (T)	1024 points ^{*1}	1024 points ^{*1}
	Long timer (LT)	×	4096 points ^{*1}
	Retentive timer (ST)	1024 points ^{*1}	0 points ^{*1}
	Long retentive timer (LST)	—	0 points ^{*1}
	Counter (C)	1024 points ^{*1}	512 points ^{*1}
	Long counter (LC)	1024 points ^{*1}	512 points ^{*1}
	Data register (D)	8000 points ^{*1}	65536 points ^{*1}
	Link register (W)	32768 points ^{*1}	32768 points ^{*1}
	Link special register (SW)	32768 points ^{*1}	2048 points ^{*1}
System device	Special relay (SM)	10000 points (fixed)	10000 points (fixed)
	Special register (SD)	12000 points (fixed)	10000 points (fixed)
File register		32K words	32K to 4064K words (Can be set in increments of 32K.)
Constant scan		0.2 to 2000ms (Can be set in increments of 0.1ms.)	0.5 to 2000ms (Can be set in increments of 0.1ms.)

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Item		FX5U CPU module (FX5U-32M□)	MX controller MX-F model
Interrupt program	Interrupt priority setting	3	32
	Fixed scan interrupt	1 to 60000ms (Can be set in increments of 1ms.)	0.5 to 60000ms (Can be set in increments of 0.5ms.)
	Network communication cycle synchronous interrupt	×	○
	High-speed input interrupt/counter match interrupt	○	○
	Interrupt by a module	○	○
Memory capacity	Program capacity	64K steps/128K steps	200K steps or more

*1 The points can be changed by using parameters within the CPU built-in memory capacity.

3.4 Instructions

This section shows the instructions with different contents for the FX5U CPU module and MX controller MX-F model.

Sequence instructions

○: Available, △: There are alternative instructions, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Output instruction	Timer/retentive timer	OUT T/ST	○ (100ms timer)	○ (100ms timer* ¹)	
	High-speed timer/high-speed retentive timer	OUTH T/ST	○ (10ms timer)	○ (10ms timer* ¹)	
		OUTH S T/ST	○ (1ms timer)	×	
	Bit device output inversion	ALT	○	×	
		ALTP	○	×	
	Annunciator setting (with judgment time)	ANS	○	×	
	Annunciator reset (low-number reset)	ANR	○	×	
		ANRP	○	×	
Shift instruction	Shifting n-bit data to the right by n bits	SFTR	○	△	SFTBR
		SFTRP	○	△	SFTBRP
	Shifting n-bit data to the left by n bits	SFTL	○	△	SFTBL
		SFTLP	○	△	SFTBLP
	Shifting n-word data to the right by n words	WSFR	○	△	SFTWR
		WSFRP	○	△	SFTWRP
	Shifting n-word data to the left by n words	WSFL	○	△	SFTWL
		WSFLP	○	△	SFTWLP
No operation instruction		NOP	○	△	NOPLF

- *1 The MX controller MX-F model allows timer limit setting. Timer limit settings are made in the parameter settings of the engineering tool.
- Timer/retentive timer: 1 to 10000ms (default: 100ms, setting unit: 1ms)
 - High-speed timer/high-speed retentive timer: 0.01 to 100.0ms (default: 10.0ms, setting unit: 0.01ms)

Basic instructions

○: Available, ●: There are differences in operand, △: There are alternative instructions, ×: Not available

Instruction	Instruction symbol	FX5U CPU module	MX controller MX-F model
Comparison operation instruction	BIN 16-bit data comparison output	CMP	×
		CMPP	×
		CMP_U	×
		CMPP_U	×
	BIN 32-bit data comparison output	DCMP	×
		DCMPP	×
		DCMP_U	×
		DCMPP_U	×
	BIN 16-bit data band comparison	ZCP	×
		ZCPP	×
		ZCP_U	×
		ZCPP_U	×
	BIN 32-bit data band comparison	DZCP	×
		DZCPP	×
		DZCP_U	×
		DZCPP_U	×
	BIN 32-bit block data comparison	DBKCMP=	● *1
		DBKCMP=P	● *1
		DBKCMP=_U	● *1
		DBKCMP=P_U	● *1
		DBKCMP<>	● *1
		DBKCMP<>P	● *1
		DBKCMP<>_U	● *1
		DBKCMP<>P_U	● *1
		DBKCMP>	● *1
		DBKCMP>P	● *1
		DBKCMP>_U	● *1
		DBKCMP>P_U	● *1
		DBKCMP<=	● *1
		DBKCMP<=P	● *1
		DBKCMP<=_U	● *1
		DBKCMP<=P_U	● *1
		DBKCMP<	● *1
		DBKCMP<P	● *1
		DBKCMP<_U	● *1
		DBKCMP<P_U	● *1
		DBKCMP>=	● *1
		DBKCMP>=P	● *1
		DBKCMP>=_U	● *1
		DBKCMP>=P_U	● *1

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Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Arithmetic operation instruction	BIN 16-bit addition	ADD	○	△	+
		ADDP	○	△	+P
		ADD_U	○	△	+_U
		ADDP_U	○	△	+P_U
	BIN 32-bit addition	DADD	○	△	D+
		DADDP	○	△	D+P
		DADD_U	○	△	D+_U
		DADDP_U	○	△	D+P_U
	BIN 16-bit subtraction	SUB	○	△	-
		SUBP	○	△	-P
		SUB_U	○	△	-_U
		SUBP_U	○	△	-P_U
	BIN 32-bit subtraction	DSUB	○	△	D-
		DSUBP	○	△	D-P
		DSUB_U	○	△	D-_U
		DSUBP_U	○	△	D-P_U
	BIN 16-bit multiplication	MUL	○	△	*
		MULP	○	△	*P
		MUL_U	○	△	*_U
		MULP_U	○	△	*P_U
	BIN 32-bit multiplication	DMUL	○	△	D*
		DMULP	○	△	D*P
		DMUL_U	○	△	D*_U
		DMULP_U	○	△	D*P_U
	BIN 16-bit division	DIV	○	△	/
		DIVP	○	△	/P
		DIV_U	○	△	/_U
		DIVP_U	○	△	/P_U
	BIN 32-bit division	DDIV	○	△	D/
		DDIVP	○	△	D/P
		DDIV_U	○	△	D/_U
		DDIVP_U	○	△	D/P_U
Bit processing instruction	Data batch reset	ZRST	○	×	
		ZRSTP	○	×	
Data conversion instruction	ASCII to hexadecimal conversion	HEXA	○	×	
		HEXAP	○	×	
	Seven segment decoder	SEGD	○	×	
		SEGDP	○	×	
Digital switch	Seven segment with latch	SEGL	○	×	
Data transfer instruction	Character string transfer	DSW	○	×	
		SMOV	○	×	
	Octal bit transfer (16-bit data)	SMOVP	○	×	
		PRUN	○	×	
	Octal bit transfer (32-bit data)	PRUNP	○	×	
		DPRUN	○	×	

*1 FX5U CPU module: Double-word LC device can be set to the first and second operand.

MX controller MX-F model: Double-word LC device cannot be set to the first and second operand.

Application instructions

○: Available, ●: There are differences in operand, △: There are alternative instructions, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Program branch instruction	Pointer branch	CJP	○	×	
		SCJ	×	○	
Structure creation instruction	FOR to NEXT forced termination	BREAK	○	● ^{*1}	
		BREAKP	○	● ^{*1}	
	Return from subroutine program	SRET	○	△	RET
Data table operation instruction	First-in data reading from data tables	SFRD	○	△	FIFR
		SFRDP	○	△	FIFRP
	Post-in data reading from data tables	POP	○	△	FPOP
		POPP	○	△	FPOPP
	Data write to data tables	SFWR	○	△	FIFW
		SFWRP	○	△	FIFWP
Extended file register operation instruction	Extended file register read	ERREAD	○	×	
	Extended file register write	ERWRITE	○	×	
	Extended file register batch initialization	ERINIT	○	×	
Data processing instruction	BIN 16-bit data search	SERDATA	×	○	
		SERDATAP	×	○	
	BIN 32-bit data search	DSERDATA	×	○	
		DSERDATAP	×	○	
Debugging and failure diagnostic instruction	Error display or annunciator reset	LEDR	×	○	
Character string processing instruction	Hexadecimal to ASCII conversion	ASCI	○	△	INT2ASC
		ASCIP	○	△	INT2ASCP
	Single-precision real number to string conversion	DESTR	○ ^{*2}	△ ^{*2}	ESTR
		DESTRP	○ ^{*2}	△ ^{*2}	ESTRP

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Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Real number instruction (1/3)	Single-precision real number comparison	DECMP	○	×	
		DECMPP	○	×	
	Binary floating point band comparison	DEZCP	○	×	
		DEZCPP	○	×	
	Single-precision real number addition	DEADD	○	△	Ladder diagram: E+ Structured text language: EPLUS
		DEADDP	○	△	Ladder diagram: E+P Structured text language: EPLUSP
	Single-precision real number subtraction	DESUB	○	△	Ladder diagram: E- Structured text language: EMINUS
		DESUBP	○	△	Ladder diagram: E-P Structured text language: EMINUSP
	Single-precision real number multiplication	DEMUL	○	△	Ladder diagram: E* Structured text language: EMULTI
		DEMULP	○	△	Ladder diagram: E*P Structured text language: EMULTIP
	Single-precision real number division	DEDIV	○	△	Ladder diagram: E/ Structured text language: EDIVISION
		DEDIVP	○	△	Ladder diagram: E/P Structured text language: EDIVISIONP
	String to single-precision real number conversion	DEVAL	○	△	EVAL
		DEVALP	○	△	EVALP
	Binary floating point to decimal floating point conversion	DEBCD	○	×	
		DEBCDP	○	×	
	Decimal floating point to binary floating point conversion	DEBIN	○	×	
		DEBINP	○	×	
	Single-precision real number sign inversion	DENEG	○	△	ENEG
		DENEGP	○	△	ENEGP
	Single-precision real number data transfer	DEMOV	○	△	EMOV
		DEMOVP	○	△	EMOVP
Real number instruction (2/3)	Single-precision real number sine operation	DSIN	○	△	SIN
		DSINP	○	△	SINP
	Single-precision real number cosine operation	DCOS	○	△	COS
		DCOSP	○	△	COSP
	Single-precision real number tangent operation	DTAN	○	△	TAN
		DTANP	○	△	TANP
	Single-precision real number $\sin^{-1}$ operation	DASIN	○	△	ASIN
		DASINP	○	△	ASINP
	Single-precision real number $\cos^{-1}$ operation	DACOS	○	△	ACOS
		DACOSP	○	△	ACOSP
	Single-precision real number $\tan^{-1}$ operation	DATAN	○	△	ATAN
		DATANP	○	△	ATANP

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Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Real number instruction (3/3)	Single-precision real number angle to radian conversion	DRAD	○	△	RAD
		DRADP	○	△	RADP
	Single-precision real number radian to angle conversion	DDEG	○	△	DEG
		DDEGP	○	△	DEGP
	Single-precision real number square root	DESQR	○	△	ESQRT
		DESQRP	○	△	ESQRTP
	Single-precision real number exponential operation	DEXP	○	△	EXP
		DEXPP	○	△	EXPP
	Single-precision real number natural logarithm operation	DLOGE	○	△	LOG
		DLOGEP	○	△	LOGP
Special counter instruction	Signed 32-bit data up/down counter	UDCNTF	○	×	
		UDCNT1	×	○	
	Two-phase input data up/down counter	UDCNT2	×	○	
Ramp signal instruction	Control ramp signal	RAMPF	○	×	
Pulse related instruction	BIN 16-bit pulse density measurement	SPD	○	△	SPDH
	BIN 32-bit pulse density measurement	DSPD	○	△	DSPDH
	BIN 16-bit pulse output	PLSY	○	×	
	BIN 32-bit pulse output	DPLSY	○	×	
	BIN 16-bit pulse width modulation	PWM	○	△	PWMH
	BIN 32-bit pulse width modulation	DPWM	○	△	DPWMH
Initial state	Initial state	IST	○	×	
Drum sequence	BIN 16-bit data absolute drum sequence	ABSD	○	×	
	BIN 32-bit data absolute drum sequence	DABSD	○	×	
	Incremental drum sequence	INCD	○	×	
Check code	Check code	CCD	○	×	
		CCDP	○	×	
Data processing instruction	Check specified 16-bit data status	BON	○	×	
		BONP	○	×	
	Check specified 32-bit data status	DBON	○	×	
		DBONP	○	×	
	16-bit data sort	SORTTBL	○	×	
		SORTTBL_U	○	×	
	16-bit data sort 2	SORTTBL2	○	×	
		SORTTBL2_U	○	×	
	32-bit data sort 2	DSORTTBL2	○	×	
		DSORTTBL2_U	○	×	

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Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Clock instruction	Read RTC data	TRD	○	△	DATERD
		TRDP	○	△	DATERDP
	Set RTC data	TWR	○	△	DATEWR
		TWRP	○	△	DATEWRP
	RTC data addition	TADD	○	△	Ladder diagram: DATE+ Structured text language: DATEPLUS
		TADDP	○	△	Ladder diagram: DATE+P Structured text language: DATEPLUSP
	RTC data subtraction	TSUB	○	△	Ladder diagram: DATE- Structured text language: DATEMINUS
		TSUBP	○	△	Ladder diagram: DATE-P Structured text language: DATEMINUSP
	Time data to 16-bit data conversion (hour, minute, and second → second)	HTOS	○	△	TIME2SEC
		HTOSP	○	△	TIME2SECP
	Time data to 32-bit data conversion (hour, minute, and second → second)	DHTOS	○	△	TIME2SEC
		DHTOSP	○	△	TIME2SECP
	Time data to 16-bit data conversion (second → hour, minute, and second)	STOH	○	△	SEC2TIME
		STOHP	○	△	SEC2TIMEP
	Time data to 32-bit data conversion (second → hour, minute, and second)	DSTOH	○	△	SEC2TIME
		DSTOHP	○	△	SEC2TIMEP
	RTC data zone comparison	TZCP	○	×	
		TZCPP	○	×	
	Expansion clock data reading	S.DATERD	×	○	
		SP.DATERD	×	○	
	Expansion clock data addition	S.DATE+	×	○	
		SP.DATE+	×	○	
	Expansion clock data subtraction	S.DATE-	×	○	
		SP.DATE-	×	○	
Timing check instruction	Timing pulse generation	DUTY	○ ^{*3}	● ^{*3}	
	Specified data time check	TIMCHK	×	○	
	Hour meter	HOURLM	○	×	
		DHOURLM	○	×	
Module access instruction	I/O refresh	REF	○	△	RFS
		REFP	○	△	RFSP
	Module inherent information reading	UNIINFRD	×	○	
		UNIINFRDP	×	○	
Logging instruction	Trigger logging set	LOGTRG	○	×	
	Trigger logging reset	LOGTRGR	○	×	
Realtime monitor function instruction	Realtime monitor function instruction	RTM	○	×	

*1 The second operand is removed.

*2 FX5U CPU module: U□\G □ can be set to the second operand.
MX controller MX-F model: U□\G □ cannot be set to the second operand.

*3 There are differences in the setting range between the first operand and second operand.

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Step ladder diagram instructions

○: Available, ×: Not available

Instruction	Instruction symbol	FX5U CPU module	MX controller MX-F model
Step ladder diagram start	STL	○	×
Step ladder diagram end	RETSTL	○	×

PID control instruction

○: Available, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model
PID control instruction	PID operation	PID	○	×
PID control instruction (inexact differential)	Data setting for PID control	S.PIDINIT	×	○
		SP.PIDINIT	×	○
	PID operation	S.PIDCONT	×	○
		SP.PIDCONT	×	○
	Specified loop number operation stop/start	S.PIDSTOP	×	○
		SP.PIDSTOP	×	○
		S.PIDRUN	×	○
		SP.PIDRUN	×	○
	Specified loop number parameter change	S.PIDPRMW	×	○
		SP.PIDPRMW	×	○
PID control instruction (exact differential)	Data setting for PID control	PIDINIT	×	○
		PIDINITP	×	○
	PID operation	PIDCONT	×	○
		PIDCONT P	×	○
	Specified loop number operation stop/start	PIDSTOP	×	○
		PIDSTOPP	×	○
		PIDRUN	×	○
		PIDRUNP	×	○
	Specified loop number parameter change	PIDPRMW	×	○
		PIDPRMWP	×	○

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Module dedicated instructions

Network common instructions

○: Available, ×: Not available

Instruction	Instruction symbol	FX5U CPU module	MX controller MX-F model
Reading data of another station programmable controller	GP.READ	○	×
Reading data of another station programmable controller (with read notification)	GP.SREAD	○	×
Writing data to another station programmable controller	GP.WRITE	○	×
Writing data to another station program controller (with write notification)	GP.SWRITE	○	×
Sending data to another station programmable controller	GP.SEND	○	×
Receiving data of another station programmable controller (for interrupt program)	G.RECVS	○	×

Ethernet instructions

○: Available, ×: Not available

Instruction	Instruction symbol	FX5U CPU module	MX controller MX-F model
Built-in Ethernet function instruction	Connection established		
	GP.SOCOPEN	×	○
	SP.SOCOPEN	○	○
	Connection disconnected		
	GP.SOCCLOSE	×	○
	SP.SOCCLOSE	○	○
Socket communications function instruction	Received data reading at END processing		
	GP.SOCRCV	×	○
	SP.SOCRCV	○	○
	Received data reading at instruction executing		
	G.SOCRCVS	×	○
	S.SOCRCVS	×	○
	Data send		
	GP.SOCSND	×	○
	SP.SOCSND	○	○
	Connection information read		
	GP.SOCCINF	×	○
	SP.SOCCINF	○	○
	Connection destination change (UDP/IP)		
	GP.SOCCSET	×	○
	SP.SOCCSET	×	○
	Connection receive mode change		
	GP.SOCRMODE	×	○
	SP.SOCRMODE	×	○
	Socket communications receive data read		
	G.SOCRDATA	×	○
	GP.SOCRDATA	×	○
	S.SOCRDATA	○	○
Predefined protocol support function instruction	Execution of registration protocol for predefined protocol support function		
	GP.ECPRTCL	×	○
	SP.ECPRTCL	○	○
SLMP frame send instruction	SLMP frame send		
	G.SLMPSND	×	○
	GP.SLMPSND	×	○
	J.SLMPSND	×	○
	JP.SLMPSND	×	○
	SP.SLMPSND	○	○
File transfer function instruction	FTP client file send		
	GP.FTPCPUT	×	○
	SP.FTPPUT	○	○
	FTP client file receive		
	GP.FTPCGET	×	○
	SP.FTPGET	○	○

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Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model
Ethernet module	Connection established	GP.OPEN	○	×
	Connection disconnected	GP.CLOSE	○	×
	Received data read	GP.SOCRCV	○	×
	Data send	GP.SOCSND	○	×

High-speed counter instructions

○: Available, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model
High-speed processing instruction	32-bit data comparison set	DHSCS	○	×
	32-bit data comparison reset	DHSCR	○	×
	32-bit data band comparison	DHSZ	○	×
	16-bit data high-speed I/O function start/stop	HIOEN	○	○
		HIOENP	○	○
	32-bit data high-speed I/O function start/stop	DHIOEN	○	○
		DHIOENP	○	○
High-speed current value transfer instruction	16-bit data high-speed current value transfer	HCMOV	○	○
		HCMOVP	○	○
	32-bit data high-speed current value transfer	DHCMOV	○	○
		DHCMOVP	○	○

External device communication instructions

○: Available, ●: There are differences in operand, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model
Serial data transfer 2		RS2	○	○
Inverter communication instruction	Inverter status check	IVCK	○	×
	Inverter drive control	IVDR	○	×
	Inverter parameter read	IVRD	○	×
	Inverter parameter write	IVWR	○	×
	Inverter parameter block write	IVBWR	○	×
	Inverter multi command	IVMC	○	×
Special adapter instruction		ADPRW	○	●*1
Execution of registration protocol for predefined protocol support function		S.CPRTCL	○	×
		SP.CPRTCL	○	×

*1 For six operands, the instruction is not available.

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Positioning instructions

○: Available, △: There are alternative instructions, ×: Not available

Instruction		Instruction symbol	FX5U CPU module	MX controller MX-F model	
Positioning instruction	16-bit data DOG search homing	DSZR	○	○	
	32-bit data DOG search homing	DDSZR	○	○	
	16-bit data interrupt positioning	DVIT	○	○	
	32-bit data interrupt positioning	DDVIT	○	○	
	1-table operation positioning	TBL	○	×	
	Multiple-table operation positioning	DRV TBL	○	○	
	Multiple axes concurrent start positioning	DRVMUL	○	×	
	32-bit data absolute current value read	DABS	○	△	DABRST ^{*1}
	16-bit data variable speed pulse	PLSV	○	○	
	32-bit data variable speed pulse	DPLSV	○	○	
	16-bit data relative positioning	DRVI	○	○	
	32-bit data relative positioning	DDRVI	○	○	
	16-bit data absolute positioning	DRVA	○	○	
	32-bit data absolute positioning	DDRVA	○	○	
	Interrupt input 1 trigger	DITRG	×	○	
Positioning module	Absolute position restoration	G.ABRST1	○	×	
		G.ABRST2	○	×	
	Positioning start	GP.PSTR1	○	×	
		GP.PSTR2	○	×	
	Teaching	GP.TEACH1	○	×	
		GP.TEACH2	○	×	
	Module backup (flash ROM write)	GP.PFWRT	○	×	
	Module initialization	GP.PINIT	○	×	

*1 Addition of the fourth operand

Divided BFM read/write instructions

○: Available, ×: Not available

Instruction	Instruction symbol	FX5U CPU module	MX controller MX-F model
Divided BFM read	RBFM	○	×
Divided BFM write	WBFM	○	×

3.5 Special relay (SM)

The following table shows the differences in special relay (SM).

◎: Available (functional enhancement), ○: Available, ×: Not available, △: There is alternative SM.

Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
Diagnostic information	SM2	Latest self-diagnostic error (not including annunciator ON and CC-Link IE TSN/motion function errors)	×	◎
	SM2400	DC DOWN flag	×	◎
System information	SM217	Daylight saving time status flag	×	◎
	SM387	Program restoration information write status	×	◎
SFC information	SM320	Presence/absence of SFC program	○	×
	SM321	Start/stop SFC program	○	×
	SM322	SFC program start status	○	×
	SM323	Presence/absence of continuous transition for entire block	○	×
	SM324	Continuous transition prevention flag	○	×
	SM325	Output mode at block stop	○	×
	SM327	Output mode at execution of the END step	○	×
	SM328	Clear processing mode when the sequence reaches the END step	○	×
	SM329	Online change (SFC block) status flag	○	×
	SM4301	FX3 compatibility transition operation mode setting state	○	×
Fixed scan function information	SM489	Network communication period synchronization error	×	◎
	SM492	Network communication cycle synchronization interrupt program cycle error occurrence flag (basic period)	×	◎
	SM493	Network communication cycle synchronization interrupt program cycle error occurrence flag (medium-speed period)	×	◎
	SM494	Network communication cycle synchronization interrupt program cycle error occurrence flag (low-speed period)	×	◎
Scan information	SM522	Scan time clear request	○	×
Drive information	SM604	Memory card in-use flag	×	◎
	SM628	Program memory write error	×	◎
	SM629	Program memory write flag	×	◎
	SM634	Number of rewriting operations error to data memory flag	○	×
	SM4124	Built-in memory rewrite count error flag	×	◎
Instruction related	SM702	Search method	×	◎
	SM752	Dedicated instruction End bit control flag	×	◎
	SM754	BIN/DBIN instruction error control flag	×	◎
	SM755	Scaling data check settings	×	◎
	SM772	CRC instruction conversion mode (16-bit/8-bit) selection	×	◎
	SM792	PID bumpless processing (for the complete differentiation PIDCONT instruction)	×	◎
	SM794	PID bumpless processing (for the inexact differential S.PIDCONT instruction)	×	◎
Firmware update function	SM912	Firmware update prohibited state	○	×

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
Latch area	SM953	Backup error check flag	○	×
	SM959	Restoration error check flag	○	×
	SM9353	Latch label clear/keep at PC write	○	×
	SM972	Communication cycle intervals measure setting request	×	◎
	SM973	Communication cycle intervals measure setting status	×	◎
	SM4098	Latch save completion flag after latch setting change	×	◎
	SM4102	Max latch interval time clear request	×	◎
Data logging function	SM1200	Auto logging setting file and registration status	×	◎
	SM1250 - SM1259	Data logging setting No.5	×	◎
	SM1260 - SM1269	Data logging setting No.6	×	◎
	SM1270 - SM1279	Data logging setting No.7	×	◎
	SM1280 - SM1289	Data logging setting No.8	×	◎
	SM1290 - SM1299	Data logging setting No.9	×	◎
	SM1300 - SM1309	Data logging setting No.10	×	◎
	SM1316 - SM1321	Data logging setting No.5 to 10, Data logging suspend/resume flag	×	◎
	SM9300 - SM9303	Data logging setting No.1 to 4, Data logging register/clear flag	○	×
Data backup/restoration function	SM1350	Backup status flag	○	×
	SM1351	Backup execution request	○	×
	SM1353	Restoration status flag	○	×
	SM1354	Restoration execution request	○	×
	SM9350	CPU module automatic change function allow/prohibit flag	○	×
Event history function	SM1464	Event history logging restriction status	×	◎
	SM1466	Event history logging restriction status of controller (minor error)	×	◎
	SM1467	Event history logging restriction status of controller (information, warning)	×	◎
	SM2376	Event history clear execution request	×	◎
User authentication function	SM1469	User authentication inapplicable operation enable setting	×	◎
Memory dump function	SM1472	Memory dump in progress	○	×
	SM1473	Memory dump completed	○	×
Ethernet function	SM1512	FTP server function file path name switching setting enable	×	◎
	SM1520	Network setting storage area write request	×	◎
	SM1521	Network setting storage area write error	×	◎
	SM1522	Network setting storage area clear request	×	◎
	SM1523	Network setting storage area clear error	×	◎
	SM1524	Initial processing successful completion state	×	◎
	SM1525	Initial processing error completion state	×	◎

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model	
CC-Link IE Field Network Basic function	SM1536	Cyclic transmission status	○	×	
	SM1540	Data link status	○	×	
	SM9400	CC-Link IE Field Network Basic communication cycle setting enable/disable flag (setting value)	○	×	
	SM9401	CC-Link IE Field Network Basic communication cycle setting enable/disable flag (current value)	○	×	
High-speed input/output function	SM4210	All modules reset command	○	△	Changed to SM5999
	SM4300	Event execution type program operation timing switch setting	○	×	
	SM4493	File access control setting	○	×	
	SM4496	Intelligent module latest error clear request	○	△	Changed to SM9959
	SM5000	High-speed counter multiple points output high-speed comparison table operating	○	×	
	SM5001	High-speed counter multiple points output high-speed comparison table completed	○	×	
High-speed pulse input/output module (high-speed counter CH9 to CH16)	SM4508 - SM4515	High-speed counter operating	○	×	
	SM4540 - SM4547	High-speed counter overflow occurrence	○	×	
	SM4556 - SM4563	High-speed counter underflow occurrence	○	×	
	SM4572 - SM4579	High-speed counter counting direction monitoring	○	×	
	SM4588 - SM4595	High-speed counter (1-phase/1-input switch) counting direction switching	○	×	
	SM4604 - SM4611	High-speed counter preset input logic	○	×	
	SM4620 - SM4627	High-speed counter preset input comparison valid	○	×	
	SM4636 - SM4643	High speed counter enabled input logic	○	×	
	SM4652 - SM4659	High-speed counter ring length setting	○	×	
	SM4984, SM4988, SM4992, SM4996	High-speed counter high-speed comparison table operating	○	×	
	SM4986, SM4990, SM4994, SM4998	High-speed counter high-speed comparison table error occurrence	○	×	
High-speed pulse input/output module (pulse width measurement CH5 to CH12)	SM5024 - SM5031	Pulse width measurement operating	○	×	
	SM5040 - SM5047	Cycle measurement completed	○	×	
	SM5056 - SM5063	Pulse width measurement completed	○	×	
	SM5072 - SM5079	Pulse width measurement mode	○	×	
High-speed pulse input/output module (PWM CH5 to CH12)	SM5304 - SM5311	PWM pulse output monitoring	○	×	
	SM5320 - SM5327	PWM output normal completion flag	○	×	
	SM5336 - SM5343	PWM output failure completion flag	○	×	

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
High-speed pulse input/output module (positioning axis 5 to 12)	SM5504 - SM5511	Positioning instruction running	○	×
	SM5520 - SM5527	Positioning pulse output monitoring	○	×
	SM5536 - SM5543	Positioning error occurrence	○	×
	SM5584 - SM5591	Positioning table transfer command	○	×
	SM5600 - SM5607	Positioning remaining distance drive enabled	○	×
	SM5616 - SM5623	Positioning remaining distance drive command	○	×
	SM5632 - SM5639	Positioning pulse stop command	○	×
	SM5648 - SM5655	Positioning pulse deceleration stop command (with remaining distance drive)	○	×
	SM5664 - SM5671	Positioning forward limit	○	×
	SM5680 - SM5687	Positioning reverse limit	○	×
	SM5776 - SM5783	Positioning rotation direction specification	○	×
	SM5808 - SM5815	Positioning homing direction specification	○	×
	SM5824 - SM5831	Positioning clear signal output enabled	○	×
	SM5872 - SM5879	Positioning zero-point signal count start timing	○	×
	SM5920 - SM5927	Positioning table data initialization disabled	○	×

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
Analog function built in CPU module (analog input CH1 and CH2)	SM6020, SM6060	A/D conversion complete flag	○	×
	SM6021, SM6061	A/D conversion enable/disable setting	○	×
	SM6022, SM6062	Scaleover upper limit detection flag	○	×
	SM6023, SM6063	Scaleover lower limit detection flag	○	×
	SM6024, SM6064	Scaleover detection setting	○	×
	SM6025, SM6065	Maximum/minimum value reset complete flag	○	×
	SM6026, SM6066	Maximum value reset request	○	×
	SM6027, SM6067	Minimum value reset request	○	×
	SM6028, SM6068	Scaling enable/disable setting	○	×
	SM6029, SM6069	Digital clip enable/disable setting	○	×
	SM6031, SM6071	Warning output flag: process alarm upper limit	○	×
	SM6032, SM6072	Warning output flag: process alarm lower limit	○	×
	SM6033, SM6073	Warning output setting (process alarm)	○	×
	SM6057, SM6097	A/D alarm clear request	○	×
	SM6058, SM6098	A/D alarm occurrence flag	○	×
	SM6059, SM6099	A/D error occurrence flag	○	×
Analog function built in CPU module (analog output)	SM6180	D/A conversion enable/disable setting	○	×
	SM6181	D/A output enable/disable setting	○	×
	SM6188	Scaling enable/disable setting	○	×
	SM6191	Warning output upper limit flag	○	×
	SM6192	Warning output lower limit flag	○	×
	SM6193	Warning output setting	○	×
	SM6217	D/A alarm clear request	○	×
	SM6218	D/A alarm occurrence flag	○	×
	SM6219	D/A error occurrence flag	○	×

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model	
FX compatible area (1/4)	SM8000	Always On	○	△	SM400 is an alternative.
	SM8001	Always Off	○	△	SM401 is an alternative.
	SM8002	After RUN, ON for 1 scan only	○	△	SM402 is an alternative.
	SM8003	After RUN, OFF for 1 scan only	○	△	SM403 is an alternative.
	SM8004	Error detection	○	△	SM0 is an alternative.
	SM8005	Battery voltage drop	○	×	
	SM8006	Battery voltage drop latch	○	×	
	SM8007	Momentary power failure detection	○	×	
	SM8008	Detecting power failure	○	×	
	SM8011	10ms clock	○	△	SM409 is an alternative.
	SM8012	100ms clock	○	△	SM410 is an alternative.
	SM8013	1s clock	○	△	SM412 is an alternative.
	SM8014	1-min. clock	○	×	
	SM8015	Clock stop and preset	○	×	
	SM8016	Time display stop	○	×	
	SM8017	±30 seconds correction	○	×	
	SM8019	RTC write data error	○	×	
	SM8020	Zero flag	○	×	
	SM8021	Borrow flag	○	×	
	SM8022	Carry flag	○	×	
	SM8023	RTC access error	○	×	
	SM8026	RAMP instruction operation stop mode	○	×	
	SM8029	Instruction execution end	○	×	
	SM8031	Non-latch memory all clear	○	×	
	SM8032	Latch memory all clear	○	×	
	SM8033	Memory hold function at RUN → STOP	○	×	
	SM8034	All output prohibited	○	△	SM9904 is an alternative.
	SM8039	Constant scan mode	○	×	
FX compatible area (2/4)	SM8040	STL: Transition disabled	○	×	
	SM8041	STL: Automatic operation start	○	×	
	SM8042	STL: Start pulse	○	×	
	SM8043	STL: Homing completed	○	×	
	SM8044	STL: Home position conditions	○	×	
	SM8045	STL: All output reset prohibited at mode switching	○	×	
	SM8046	STL: STL state ON existed	○	×	
	SM8047	STL: STL monitor (SD8040 to SD8047) enabled	○	×	
	SM8048	Annunciator behavior	○	×	
	SM8049	ON annunciator minimum number valid	○	×	
	SM8050 - SM8055	I0 to 5 interrupt prohibited (input interrupt)	○	×	
	SM8056 - SM8058	I28 to 30 interrupt prohibited (internal timer interrupt)	○	×	
	SM8059	I16 to I23 interrupt prohibited (high-speed comparison match interrupt)	○	×	
	SM8063	Serial communication error 1 (CH1)	○	×	
	SM8067	Operation error	○	×	
	SM8068	Operation error latch	○	×	
	SM8072	Parallel link operating	○	×	
	SM8090	BKCOMP instruction block comparison signal	○	×	
	SM8099	High-speed ring counter behavior	○	×	

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
FX compatible area (3/4)	SM8126	Global ON (CH1)	○	×
	SM8151	Inverter in communication (CH1)	○	×
	SM8152	Inverter communication error (CH1)	○	×
	SM8153	Inverter communication error latch (CH1)	○	×
	SM8154	IVBWR instruction error (CH1)	○	×
	SM8156	Inverter in communication (CH2)	○	×
	SM8157	Inverter communication error (CH2)	○	×
	SM8158	Inverter communication error latch (CH2)	○	×
	SM8159	IVBWR instruction error (CH2)	○	×
	SM8161	ASCII/HEXA/CRC/CCD instructions 8-bit processing mode	○	×
	SM8168	SMOV instruction hexadecimal shift function	○	×
	SM8170 ⋮ SM8177	X0 pulse catch ⋮ X7 pulse catch	○	×
	SM8183	N:N network data communication sequence error (master station)	○	×
	SM8184 - SM8190	N:N network data communication sequence error (station number 1 to 7)	○	×
	SM8191	N:N network data communication sequence in execution	○	×
	SM8200 ⋮ SM8234	LC0 count direction specification ⋮ LC34 count direction specification	○	×
	SM8246 ⋮ SM8255	LC46 count direction monitor ⋮ LC55 count direction monitor	○	×
	SM8304	Zero flag (for MUL and DIV instructions)	○	×
	SM8306	Carry flag (for MUL and DIV instructions)	○	×
	SM8312	RTC clock data loss error	○	×
	SM8328	RBFM (FNC278)/WBFM (FNC279) is not executed.	○	×
	SM8329	Instruction execution completed with an error	○	×

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Classification	SM No.	Description	FX5U CPU module	MX controller MX-F model
FX compatible area (4/4)	SM8330 - SM8334	Timing clock output: 1 to 5	○	×
	SM8340, SM8350, SM8360, SM8370	Axes 1 to 4 pulse output monitoring	○	×
	SM8348, SM8358, SM8368, SM8378	Axes 1 to 4 positioning instruction running	○	×
	SM8393	Delay time setting contact	○	×
	SM8401, SM8421	CH1, 2 transmission standby flag (RS2 instruction)/ CH1, 2 in MODBUS communications	○	×
	SM8402, SM8422	CH1, 2 MODBUS communication error	○	×
	SM8403, SM8423	CH1, 2 MODBUS communication error latch	○	×
	SM8404, SM8424	CH1, 2 carrier detection flag (RS2 instruction)/CH1, 2 MODBUS communication mode	○	×
	SM8405, SM8425	CH1, 2 DSR detection flag (RS2 instruction)	○	×
	SM8408, SM8428	CH1, 2 MODBUS communication retry occurrence	○	×
	SM8409, SM8429	CH1, 2 timeout determination flag (RS2 instruction)/ CH1, 2 MODBUS communication timeout occurrence	○	×
	SM8419, SM8439	MC protocol availability (CH1, 2)	○	×
	SM8426	Global ON (CH2)	○	×
	SM8438	Serial communication error 2 (CH2)	○	×
	SM8492	IP address storage area write request	○	×
	SM8493	IP address storage area write completed	○	×
	SM8494	IP address storage area write error	○	×
	SM8495	IP address storage area write clear request	○	×
	SM8496	IP address storage area write clear completed	○	×
	SM8497	IP address storage area write clear error	○	×
	SM8498	IP address change function operating flag	○	×
Extension file register function	SM9366	Extension file register (ER) accessing flag	○	×

3.6 Special Register (SD)

The following table shows the differences in special register (SD).

◎: Available (functional enhancement), ○: Available, ×: Not available, △: There is alternative SD.

Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Diagnostic information	SD49	Error detection disable setting	×	◎
System information	SD160	Firmware version	×	◎
	SD170	Booter firmware version	×	◎
	SD171	Hardware version	×	◎
	SD272	V assignment points (L)	×	◎
	SD273	V assignment points (H)	×	◎
	SD294	LT assignment points (L)	×	◎
	SD295	LT assignment points (H)	×	◎
	SD296	LST assignment points (L)	×	◎
	SD297	LST assignment points (H)	×	◎
	SD304	Word device assignment points (R assignment points [lower])	○	×
	SD305	Word device assignment points (R assignment points [upper])	○	×
	SD306	ZR assignment points (L)	×	◎
	SD307	ZR assignment points (H)	×	◎
	SD308	RD assignment points (L)	×	◎
	SD309	RD assignment points (H)	×	◎
	SD312	File register block number	×	◎
	SD4104 ⋮ SD4112	Model name (string)	×	◎
	SD4114	Model code	×	◎
	SD4115	Number of axes	×	◎
SFC information	SD329	Online change (SFC block) target block number	○	×
Fixed scan function information	SD492	Number of cycle overrun events for network communication cycle synchronization interrupt program (basic cycle)	×	◎
	SD493	Number of cycle overrun events for network communication cycle synchronization interrupt program (medium-speed cycle)	×	◎
	SD494	Number of cycle overrun events for network communication cycle synchronization interrupt program (low-speed cycle)	×	◎
	SD500	Execution program number	×	◎

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Drive information (1/2)	SD606	SD memory card capacity: Bottom level	○	○
	SD607	SD memory card capacity: Lower level	○	○
	SD608	SD memory card capacity: Upper level	○	×
	SD609	SD memory card capacity: Top level	○	×
	SD610	SD memory card free space: Bottom level	○	○
	SD611	SD memory card free space: Lower level	○	○
	SD612	SD memory card free space: Upper level	○	×
	SD613	SD memory card free space: Top level	○	×
	SD612	Device/label memory (file storage area) free space (drive 3): lower level (by kilobytes)	×	◎
	SD613	Device/label memory (file storage area) free space (drive 3): upper level (by kilobytes)	×	◎
	SD614	Device/label memory (file storage area) usage status (drive 3)	×	◎
	SD616	Device/label memory capacity: Lower level (in kilobytes)	×	◎
	SD617	Device/label memory capacity: Upper level (in kilobytes)	×	◎
	SD618	Device/label memory (file storage area) capacity (drive 3): lower level (by kilobytes)	×	◎
	SD619	Device/label memory (file storage area) capacity (drive 3): upper level (by kilobytes)	×	◎
	SD620	Data memory usage status (drive 4)	×	◎
	SD622	Data memory capacity (drive 4): lower level (by kilobytes)	×	◎
	SD623	Data memory capacity (drive 4): upper level (by kilobytes)	×	◎
	SD629	Program memory write (transfer) status	×	◎
	SD633	Data memory write (transfer) status	×	◎
	SD634	Data memory write count index	○	×
	SD635	Data memory write count index	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Drive information (2/2)	SD648	Function memory capacity lower level (by kilobytes)	×	◎
	SD649	Function memory capacity upper level (by kilobytes)	×	◎
	SD650	Function memory free area capacity lower level (by kilobytes)	×	◎
	SD651	Function memory free area capacity upper level (by kilobytes)	×	◎
	SD660	Motion data memory (drive 6) capacity lower level (by kilobytes)	×	◎
	SD661	Motion data memory (drive 6) capacity upper level (by kilobytes)	×	◎
	SD662	Motion data memory (drive 6) free space lower level (by kilobytes)	×	◎
	SD663	Motion data memory (drive 6) free space upper level (by kilobytes)	×	◎
	SD664	Motion data memory (drive 6) usage status	×	◎
	SD666	Program cache memory capacity lower level (by kilobytes)	×	◎
	SD667	Program cache memory capacity upper level (by kilobytes)	×	◎
	SD668	Program cache memory free space lower level (by kilobytes)	×	◎
	SD669	Program cache memory free space upper level (by kilobytes)	×	◎
	SD4124	Index of the number of write operations to the built-in memory up to now (lower)	×	◎
	SD4125	Index of the number of write operations to the built-in memory up to now (upper)	×	◎
Instruction related	SD699	Dedicated instruction skip flag	×	◎
	SD792, SD793	PID limit setting (for complete derivative)	×	◎
	SD794, SD795	PID limit setting (for incomplete derivative)	×	◎

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Latch area	SD940	Stop direction at file change on label specification	×	◎
	SD953	Backup error cause	○	×
	SD954	Restoration target data setting	○	×
	SD955	Restoration function setting	○	×
	SD956, SD957	Restoration target date folder setting	○	×
	SD958	Restoration target number folder setting	○	×
	SD959	Restoration error cause	○	×
	SD972	Communication cycle intervals measure setting	×	◎
	SD974, SD975	Event history filter count	×	◎
	SD976, SD977	Motion event history filter count	×	◎
	SD1084	Event history logging restriction mode change setting	×	◎
	SD1085	Event history logging restriction mode operation mode change setting value	×	◎
	SD4100, SD4101	Current latch interval time	×	◎
	SD4102, SD4103	Maximum latch interval time	×	◎
	SD9350	Operation mode setting	○	×
	SD9351	CPU module automatic change function restoration target data setting	○	×
	SD9352	CPU module automatic change function setting	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Data logging function	SD1200	Data logging function memory usage status	×	◎
	SD1203	Data logging file transfer stop information	○	×
	SD1210	Data logging setting No.1 latest storage file No. (lower)	○	○
	SD1211	Data logging setting No.1 latest storage file No. (upper)	○	○
	SD1212	Data logging setting No.1 earliest storage file No. (lower)	○	○
	SD1213	Data logging setting No.1 earliest storage file No. (upper)	○	○
	SD1214	Data logging setting No.1 free internal buffer space	○	○
	SD1215	Data logging setting No.1 processing overflow count	○	○
	SD1216	Data logging setting No.1 data logging error cause	○	○
	SD1217	Data logging setting No.1 data logging file transfer error cause	×	◎
	SD1227	Data logging setting No.2 data logging file transfer error cause	×	◎
	SD1237	Data logging setting No.3 data logging file transfer error cause	×	◎
	SD1247	Data logging setting No.4 data logging file transfer error cause	×	◎
	SD1250 - SD1257	Data logging setting No.5	×	◎
	SD1260 - SD1267	Data logging setting No.6	×	◎
	SD1270 - SD1277	Data logging setting No.7	×	◎
	SD1280 - SD1287	Data logging setting No.8	×	◎
	SD1290 - SD1297	Data logging setting No.9	×	◎
	SD1300 - SD1307	Data logging setting No.10	×	◎
	SD9300 - SD9303	Data logging setting No.1 to 4 data logging register/clear error code	○	×
Data backup/restoration function	SD1350	Number of folders/files uncompleted backup/restoration of CPU module	○	×
	SD1351	CPU module backup/restoration progression status	○	×
Interrupt pointer mask pattern	SD1400 - SD1411	Interrupt pointer mask pattern (I0 to I191)	○	○
	SD1412 - SD1415	Interrupt pointer mask pattern (I192 to I255)	×	◎
Event history function	SD1396	Event history file use ratio	×	◎
	SD1397	Motion event history file use ratio	×	◎
	SD1464 - SD1465	Module information on event history logging restriction	×	◎
	SD2376	Event history clear target specification	×	◎
	SD2377	Event history clear execution status	×	◎
User authentication function	SD1468	Number of login users	×	◎
	SD1469	Logoff judgment time current value	×	◎
Memory dump function	SD1472	Memory dump error cause	○	×
Communication enable setting function	SD1480, SD1481	Communication enable setting	×	◎

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
FUNCTION LED indication function	SD1486	FUNCTION LED indication setting	×	◎
	SD1487	FUNCTION LED indication setting status	×	◎
Debug function	SD1488	Debug function usage status	○	○
Ethernet function	SD1504	Open completion signal	×	◎
	SD1505	Open request signal	×	◎
	SD1506	Socket communications receive status signal	×	◎
	SD1516	Target port setting	×	◎
	SD1520	IP address (lower)	×	◎
	SD1521	IP Address (upper)	×	◎
	SD1522	Subnet mask pattern (lower)	×	◎
	SD1523	Subnet mask pattern (upper)	×	◎
	SD1524	Default gateway IP address (lower)	×	◎
	SD1525	Default gateway IP address (upper)	×	◎
	SD1526	Network setting storage area write error cause	×	◎
	SD1527	Network setting storage area clear error cause	×	◎
Ethernet port open completion signal function	SD2100 ⋮ SD2103	Open completion signal	×	◎
	SD2116 ⋮ SD2119	Open request signal	×	◎
Ethernet port socket communications receive status signal function	SD2132 ⋮ SD2135	Socket communications receive status signal	×	◎
CC-Link IE Field Network Basic function	SD1536	Cyclic transmission status of each station	○	×
	SD1540	Data link status (each station)	○	×
	SD9400	CC-Link IE Field Network Basic communication interval setting	○	×
	SD11100	Total number of connected modules	○	×
	SD11101	Reserved station specification status	○	×
	SD11102	Reserved station specification status (each station)	○	×
	SD11106	Maximum link scan (unit: ms)	○	×
	SD11107	Minimum link scan (unit: ms)	○	×
	SD11108	Current link scan (unit: ms)	○	×
	SD11126	Diagnostic information display request	○	×
	SD11127	Diagnostic request information	○	×
	SD11128	Diagnostics information valid/invalid flag	○	×
	SD11129 ⋮ SD11140	Diagnostic information 1	○	×
	SD11144 ⋮ SD11153	Diagnostic information 2	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Data logging setting function	SD2210	Data logging setting No.1 logging type	×	◎
	SD2211	Data logging setting No.1 trigger occurrence count	×	◎
	SD2212	Data logging setting No.1 ignored trigger count	×	◎
	SD2213	Data logging setting No.1 details of trigger condition satisfied	×	◎
	SD2214	Data logging setting No.1 details of trigger condition satisfied	×	◎
	SD2220 ⋮ SD2224	Data logging setting No.2	×	◎
	SD2230 ⋮ SD2234	Data logging setting No.3	×	◎
	SD2240 ⋮ SD2244	Data logging setting No.4	×	◎
	SD2250 ⋮ SD2254	Data logging setting No.5	×	◎
	SD2260 ⋮ SD2264	Data logging setting No.6	×	◎
	SD2270 ⋮ SD2274	Data logging setting No.7	×	◎
	SD2280 ⋮ SD2284	Data logging setting No.8	×	◎
	SD2290 ⋮ SD2294	Data logging setting No.9	×	◎
	SD2300 ⋮ SD2304	Data logging setting No.10	×	◎
Label assignment information management function	SD2404	Label assignment information management area capacity	×	◎
	SD2405	Label assignment information management area capacity	×	◎
	SD2406	Label assignment information management area free space capacity	×	◎
	SD2407	Label assignment information management area free space capacity	×	◎

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model	
FX dedicated	SD4110 ⋮ SD4125	Error code [0] details ⋮ Error code [15] details	○	△	Changed to SD9900 to SD9915.
	SD4150, SD4152, SD4154, SD4156, SD4158, SD4160, SD4162, SD4164, SD4166, SD4168, SD4170, SD4172, SD4174, SD4176, SD4178, SD4180	Module 1 status information, Module 2 status information, Module 3 status information, Module 4 status information, Module 5 status information, Module 6 status information, Module 7 status information, Module 8 status information, Module 9 status information, Module 10 status information, Module 11 status information, Module 12 status information, Module 13 status information, Module 14 status information, Module 15 status information, Module 16 status information	○	△	Changed to SD9920, SD9922, SD9924, SD9926, SD9928, SD9930, SD9932, SD9934, SD9936, SD9938, SD9940, SD9942, SD9944, SD9946, SD9948, SD9950.
	SD4151, SD4153, SD4155, SD4157, SD4159, SD4161, SD4163, SD4165, SD4167, SD4169, SD4171, SD4173, SD4175, SD4177, SD4179, SD4181	Module 1 error information, Module 2 error information, Module 3 error information, Module 4 error information, Module 5 error information, Module 6 error information, Module 7 error information, Module 8 error information, Module 9 error information, Module 10 error information, Module 11 error information, Module 12 error information, Module 13 error information, Module 14 error information, Module 15 error information, Module 16 error information	○	△	Changed to SD9921, SD9923, SD9925, SD9927, SD9929, SD9931, SD9933, SD9935, SD9937, SD9939, SD9941, SD9943, SD9945, SD9947, SD9949, SD9951.
	SD4210	All modules reset allowed code	○	△	Changed to SD5999.
	SD4462	Accumulated operating time (lower)	○	△	Changed to SD9972.
	SD4463	Accumulated operating time (upper)	○	△	Changed to SD9973.
	SD5000	Table No. in high-speed counter multiple points output high-speed comparison	○	×	
High-speed input/ output function					

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model	
FX compatible area (1/4)	SD8000	Watchdog timer	○	×	
	SD8001	CPU version	○	△	SD160 is an alternative.
	SD8005	Battery voltage	○	×	
	SD8006	Battery voltage drop detection level	○	×	
	SD8007	Momentary power failure count	○	×	
	SD8008	Power failure detected time	○	×	
	SD8010	Current scan time (100 microseconds)	○	△	SD520 and SD521 are alternatives.
	SD8011	Minimum scan time (100 microseconds)	○	△	SD522 and SD523 are alternatives.
	SD8012	Maximum scan time (100 microseconds)	○	△	SD524 and SD525 are alternatives.
	SD8013	RTC: Second	○	×	
	SD8014	RTC: Minute	○	×	
	SD8015	RTC: Hour	○	×	
	SD8016	RTC: Day	○	×	
	SD8017	RTC: Month	○	×	
	SD8018	RTC: Year	○	×	
	SD8019	RTC: Day of week	○	×	
	SD8039	Constant scan time	○	×	
	SD8040 ⋮ SD8047	STL: ON state No.1 ⋮ STL: ON state No.8	○	×	
	SD8049	ON annunciator minimum number	○	×	
	SD8063	Serial communication error code (CH1)	○	×	
	SD8067	Operation error code	○	×	
	SD8099	High-speed ring counter	○	×	

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
FX compatible area (2/4)	SD8136	PLSY instruction output pulse count [lower]	○	×
	SD8137	PLSY instruction output pulse count [upper]	○	×
	SD8140	PLSY instruction total number of output pulses to axis 1 [lower]	○	×
	SD8141	PLSY instruction total number of output pulses to axis 1 [upper]	○	×
	SD8142	PLSY instruction total number of output pulses to axis 2 [lower]	○	×
	SD8143	PLSY instruction total number of output pulses to axis 2 [upper]	○	×
	SD8152, SD8157	Inverter communication error code (CH1, 2)	○	×
	SD8154, SD8159	IVBWR instruction error parameter No. (CH1, 2)	○	×
	SD8166	Module error status (module mounting position 1 to 15)	○	×
	SD8167	Module error status (module mounting position 16 to 18)	○	×
	SD8173	N:N network target station number setting status	○	×
	SD8174	N:N network communication slave station setting status	○	×
	SD8175	N:N network refresh range setting status	○	×
	SD8201	N:N network current link scan time	○	×
	SD8202	N:N network maximum link scan time	○	×
	SD8203	N:N network number of data transfer sequence error count (master station)	○	×
	SD8204 - SD8210	N:N network number of data transfer sequence error count (station No.1 to 7)	○	×
	SD8211	N:N network data transfer error code (master station)	○	×
	SD8212 - SD8218	N:N network data transfer error code (station No.1 to 7)	○	×
FX compatible area (3/4)	SD8310	Data for random value creation [lower]	○	×
	SD8311	Data for random value creation [upper]	○	×
	SD8330 - SD8334	Scan counter for timing clock output 1 to 5	○	×
	SD8340, SD8350, SD8360, SD8370	Current address (axis 1 to 4: by pulse) [lower]	○	×
	SD8341, SD8351, SD8361, SD8371	Current address (axis 1 to 4: by pulse) [upper]	○	×
	SD8393	Delay time	○	×
	SD8398	1msec ring counter [lower]	○	×
	SD8399	1msec ring counter [upper]	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
FX compatible area (4/4)	SD8402, SD8422	Number of data remaining to be sent (for RS2 instruction) (CH1, 2)/MODBUS communication error code (CH1, 2)	○	×
	SD8403, SD8423	Number of received data (for RS2 instruction) (CH1, 2)/MODBUS communication error details (CH1, 2)	○	×
	SD8405, SD8425	Communication parameter display (CH1, 2) (for RS2 instruction)/MODBUS communication format display (CH1, 2)	○	×
	SD8408, SD8428	Number of retries for MODBUS communications (CH1, 2)	○	×
	SD8414, SD8434	Received data sum (for RS2 instruction) (CH1, 2)	○	×
	SD8415, SD8435	Calculation result received sum (for RS2 instruction) (CH1, 2)	○	×
	SD8416, SD8436	Send sum (for RS2 instruction) (CH1, 2)	○	×
	SD8419, SD8439	Operation mode display (CH1, 2)	○	×
	SD8438	Serial communication error code (CH2)	○	×
	SD8492	IP address setting [lower]	○	×
	SD8493	IP address setting [upper]	○	×
	SD8494	Subnet mask setting [lower]	○	×
	SD8495	Subnet mask setting [upper]	○	×
	SD8496	Default gateway IP address setting [lower]	○	×
	SD8497	Default gateway IP address setting [upper]	○	×
	SD8498	IP address storage area write error code	○	×
	SD8499	IP address storage area clear error code	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Built-in Ethernet function (1/5)	SD10050	Own node IP address [lower]	○	×
	SD10051	Own node IP address [upper]	○	×
	SD10060	Subnet mask [lower]	○	×
	SD10061	Subnet mask [upper]	○	×
	SD10064	Default gateway IP address [lower]	○	×
	SD10065	Default gateway IP address [upper]	○	×
	SD10074	Own node MAC address	○	×
	SD10075	Own node MAC address	○	×
	SD10076	Own node MAC address	○	×
	SD10082	Communication speed setting	○	×
	SD10084	MELSOFT connection TCP port number	○	×
	SD10086	MELSOFT direct connection port number	○	×
	SD10130 ⋮ SD10137	Connection No.1 latest error code ⋮ Connection No.8 latest error code	○	×
	SD10147	MELSOFT direct connection latest error code	○	×
	SD10251	IP address duplication status storage area	○	×
	SD10252	Node MAC address that was connected first in case of IP address duplication	○	×
	SD10253	Node MAC address that was connected first in case of IP address duplication	○	×
	SD10254	Node MAC address that was connected first in case of IP address duplication	○	×
	SD10255	Node MAC address that was connected later in case of IP address duplication	○	×
	SD10256	Node MAC address that was connected later in case of IP address duplication	○	×
	SD10257	Node MAC address that was connected later in case of IP address duplication	○	×
	SD10270	Remote password lock status connection No.1 to 8	○	×
	SD10271	Remote password lock status system port	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Built-in Ethernet function (2/5)	SD10290	Time setting function operation result	○	×
	SD10291	Time setting function execution time (year)	○	×
	SD10292	Time setting function execution time (month)	○	×
	SD10293	Time setting function execution time (day)	○	×
	SD10294	Time setting function execution time (hour)	○	×
	SD10295	Time setting function execution time (minute)	○	×
	SD10296	Time setting function execution time (second)	○	×
	SD10297	Time setting function execution time (day of week)	○	×
	SD10298	Time setting function required response time	○	×
	SD10299	Time setting function execution	○	×
	SD10320 ⋮ SD10327	Connection 1 to 8 consecutive unlock failure count	○	×
	SD10337	MELSOFT transmission port (UDP/IP) consecutive unlock failure count	○	×
	SD10338	MELSOFT transmission port (TCP/IP) consecutive unlock failure count	○	×
	SD10339	FTP transmission port (TCP/IP) consecutive unlock failure count	○	×
	SD10340	MELSOFT direct connection consecutive unlock failure count	○	×
	SD10350	Communication start request setting No.1 to 16	○	×
	SD10351	Communication start request setting No.17 to 32	○	×
	SD10352	Communication stop request setting No.1 to 16	○	×
	SD10353	Communication stop request setting No.17 to 32	○	×
	SD10354	Communication restart request setting No.1 to 16	○	×
	SD10355	Communication restart request setting No.17 to 32	○	×
	SD10356	Execution status flag setting No.1 to 16	○	×
	SD10357	Execution status flag setting No.17 to 32	○	×
	SD10358	Ready flag setting No.1 to 16	○	×
	SD10359	Ready flag setting No.17 to 32	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Built-in Ethernet function (3/5)	SD10380 ⋮ SD10411	Simple CPU communication status setting No.1 ⋮ Simple CPU communication status setting No.32	○	×
	SD10412 ⋮ SD10443	Simple CPU communication error code setting No.1 ⋮ Simple CPU communication error code setting No.32	○	×
	SD10444 ⋮ SD10475	Simple CPU communication execution interval (current value) setting No.1 ⋮ Simple CPU communication execution interval (current value) setting No.32	○	×
	SD10476 ⋮ SD10507	Abnormal response code setting No.1 ⋮ Abnormal response code setting No.32	○	×
	SD10680	Open completion signal	○	×
	SD10681	Open request signal	○	×
	SD10682	Socket communications receive status signal	○	×
	SD10683	Initial status	○	×
	SD10692	Predefined protocol ready	○	×
	SD10710	Predefined protocol setting data error information protocol number	○	×
	SD10711	Predefined protocol setting data error information setting type	○	×
	SD10712	Predefined protocol setting data error information packet number	○	×
	SD10713	Predefined protocol setting data error information element number	○	×
	SD10714	Number of registered predefined protocols	○	×
	SD10722	Predefined protocol registration (1 to 16)	○	×
	SD10723	Predefined protocol registration (17 to 32)	○	×
	SD10724	Predefined protocol registration (33 to 48)	○	×
	SD10725	Predefined protocol registration (49 to 64)	○	×

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Classification	SD No.	Description	FX5U CPU module	MX controller MX-F model
Built-in Ethernet function (4/5)	SD10740	Connection No.1 protocol execution status	○	×
	SD10742 ⋮ SD10757	Connection No.1 received data verification result (receive packet 1 to 16)	○	×
	SD10758	Connection No.1 number of protocol execution	○	×
	SD10759	Connection No.1 protocol cancellation specification	○	×
	SD10760	Connection No.2 protocol execution status	○	×
	SD10762 ⋮ SD10777	Connection No.2 received data verification result (receive packet 1 to 16)	○	×
	SD10778	Connection No.2 number of protocol execution	○	×
	SD10779	Connection No.2 protocol cancellation specification	○	×
	SD10780	Connection No.3 protocol execution status	○	×
	SD10782 ⋮ SD10797	Connection No.3 received data verification result (receive packet 1 to 16)	○	×
	SD10798	Connection No.3 number of protocol execution	○	×
	SD10799	Connection No.3 protocol cancellation specification	○	×
	SD10800	Connection No.4 protocol execution status	○	×
	SD10802 ⋮ SD10817	Connection No.4 received data verification result (receive packet 1 to 16)	○	×
	SD10818	Connection No.4 number of protocol execution	○	×
	SD10819	Connection No.4 protocol cancellation specification	○	×
Built-in Ethernet function (5/5)	SD10820	Connection No.5 protocol execution status	○	×
	SD10822 ⋮ SD10837	Connection No.5 received data verification result (receive packet 1 to 16)	○	×
	SD10838	Connection No.5 number of protocol execution	○	×
	SD10839	Connection No.5 protocol cancellation specification	○	×
	SD10840	Connection No.6 protocol execution status	○	×
	SD10842 ⋮ SD10857	Connection No.6 received data verification result (receive packet 1 to 16)	○	×
	SD10858	Connection No.6 number of protocol execution	○	×
	SD10859	Connection No.6 protocol cancellation specification	○	×
	SD10860	Connection No.7 protocol execution status	○	×
	SD10862 ⋮ SD10877	Connection No.7 received data verification result (receive packet 1 to 16)	○	×
	SD10878	Connection No.7 number of protocol execution	○	×
	SD10879	Connection No.7 protocol cancellation specification	○	×
	SD10880	Connection No.8 protocol execution status	○	×
	SD10882 ⋮ SD10897	Connection No.8 received data verification result (receive packet 1 to 16)	○	×
	SD10898	Connection No.8 number of protocol execution	○	×
	SD10899	Connection No.8 protocol cancellation specification	○	×

4 DIFFERENCES IN FUNCTIONS

This section shows the differences in functions between the FX5U CPU module and MX-F model.

4.1 Programmable Controller Functions

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

Item			FX5U CPU module	MX controller MX-F model
Clock function	Daylight saving time		×	◎
	Retention time (battery-less)		○: 10 days	○: 10 days
LED indication			○	○
Scan monitoring function (WDT setting)			○	○
Interrupt function			○	○
Device	Local device		○	○
	Initial device value		○	○
Label	Local label		○	○
	Label initial value (global label/local label)		×	○
	Label access from external devices		×	◎
File register setting function			×	◎: Can be set in increments of 32K bytes.
Refresh memory setting function			×	◎: 256K words
Internal buffer capacity setting function			○: 320K bytes maximum	◎: 24576K bytes maximum
Timer device limit setting function			×	◎
Boot operation from a memory card			○	○
Service processing setting			○	○
iQ Sensor Solution function			○	×
Diagnostic function	Self-diagnostic function		○	○
	Error clear		○	○
Monitor function	Monitor		○	○
	Forced on/off function for external I/O		○	×
	Realtime monitor function		○	○
Online change	Online change		○	○
	File batch online change		×	◎
RAS function/maintenance function	Event history	Error history	○	○
		Operation history	×	◎
	Performance monitor		×	◎
	Logging		○	○
	Realtime monitor		○	○
	Memory dump		○	×
	Start I/O number change		×	◎
	Module reservation function		×	◎
	Backup restoration		○	×: To be supported in the future
	Firmware update		○: CPU/intelligent function module	○: MX controller MX-F model/ intelligent function module
Security	User authentication		×	◎
	Security key		○	×
	File password		○	×

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Item		FX5U CPU module	MX controller MX-F model
Built-in Ethernet	1Gbps	×	◎
	Connection with MELSOFT products and a GOT	○	○
	Communications using MC protocol/SLMP	○: Client server	○: Client server
	Socket communications	○	○
	Time setting function (SNTP client)	○	○
	File transfer function (FTP server)	○: FTP	◎: FTP/FTPS
	File transfer function (FTP client)	○: FTP	◎: FTP/FTPS
	Web server	○: HTTP	×: To be supported in the future
	IP address change function	○	○
	Simple CPU communication	○	×: To be supported in the future
	Predefined protocol support	○	○
	CC-Link IE Field Basic	○	×: To be supported in the future
	Modbus TCP server	○	×
	Encrypted communications	×	◎: TLS/DTLS
Serial communications	Number of channels	4 channels maximum	2 channels maximum
	MELSOFT Connection	○	×
	Nonprocedural communications	○	○
	MC protocol	○	○
	Modbus RTU	○	○
	Predefined protocol support	○	×
	Inverter communications	○	×
	N:N network/parallel link	○	×

4.2 Network Functions

This section shows the differences in network functions between FX5U CPU module with FX5 CC-Link IE TSN master/local module (FX5-CCLGN-MS) and the MX controller MX-F model.

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

Function		FX5-CCLGN-MS	MX controller MX-F model
Cyclic transmission	Unicast mode	○	○
	Multicast mode	○	×
	Communications using RX, RY, RWr, and RWw	○	○
	Communications using LB and LW	×	×
	LB/LW points extension	×	×
	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	○	○
	Communications using the SLMP	○	△*1
	Communications using engineering tools	○	○
Ethernet connection	Connection with MELSOFT products and a GOT	△	○
	Searching modules on the network	○	○
	Connection with SLMP-compatible devices	○	○
	Socket communications	×	×
Security	IP filter	○	○
	Remote password	○	×
	Default open port usage setting function	×	◎
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		×	×
Topology	Line/star	○	○
	Ring	×	×
Online function	Device station parameter setting	○	○
	Detection of connected/disconnected devices	△*2	○
	Device station parameter processing	○	○
	Command execution to device station	○	○
	Device station IP address setting	×	×

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Function		FX5-CCLGN-MS	MX controller MX-F model
Others	Reserved station setting	△ ^{*3}	○
	Error invalid station setting	△ ^{*4}	○
	Parameter automatic setting in device station	○	○
	Data collection using the CC-Link IE TSN communication software	×	×
	Co-recording function	×	×
	Firmware update	○	○
	Extended station number	×	×
	Local station support	○	×
	Local station connection support	○	×
	Label access to remote device	×	◎

*1 In the MX controller MX-F models, 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 FX5-CCLGN-MS: The function is not available for the devices not data-linked.

*3 FX5-CCLGN-MS: The temporary cancel of the reserved station setting is not supported.

*4 FX5-CCLGN-MS: The temporary error invalid station setting is not supported.

4.3 Motion Functions

This section shows the differences in motion functions between FX5U CPU module with FX5 motion module (FX5-40SSC-G/FX5-80SSC-G) and the MX controller MX-F model.

Comparison of the motion control specifications

○: Supported, △: Partial supported, ×: Not supported

Item	FX5-40SSC-G/FX5-80SSC-G	MX controller MX-F model
Network	CC-Link IE TSN	CC-Link IE TSN
Number of controlled axes	- FX5-40SSC-G: 4 - FX5-80SSC-G: 8	- MXF100-8-N32, MXF100-8-P32: 8 - MXF100-16-N32, MXF100-16-P32: 16
Operation cycle	0.500ms/1.000ms/2.000ms/4.000ms	0.25ms, 0.5 to 8ms (Can be set in increments of 0.5ms.)
Operation cycle coexistence	1 group	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 changeover control - Position/speed changeover control - Speed-torque control, tightening & press-fit control - Continuous path control	- PTP control: MC_MoveAbsolute/MC_MoveRelative - Speed control: MC_MoveVelocity/MCv_SpeedControl - Speed/position changeover control: It can be realized pseudo in the buffer mode. - Position/speed changeover control: It can be realized pseudo in the buffer mode. - Torque control: MC_TorqueControl - Press-fit control: MC_TorqueControl
Control change function	- Current value change - Speed change - Target position change - Acceleration/deceleration time change - Override	- Current position change: MC_SetPosition - Speed change: (FB restart or continuous update can be used.) - Target position change: (FB restart or continuous update can be used.) - Acceleration/deceleration time change: (FB restart or continuous update can be used.) - Speed/acceleration speed/deceleration speed override: MC_SetOverride
Torque change function	Same forward/reverse specification, individual specification	Same forward/reverse specification, individual specification: MCv_SetTorqueLimit
Compensation function	Backlash compensation, electronic gear, phase compensation (time-based)	- Backlash compensation: MCv_BacklashCompensationFilter - Electronic gear - Phase compensation: (To be supported in the future)
Limit functions	- Software stroke limit - Hardware stroke limit - Speed limit - Torque limit - Moving direction restriction	- Software stroke limit - Hardware stroke limit - Speed limit, acceleration/deceleration speed limit, jerk limit - Speed limit filter: MCv_SpeedLimitFilter - Torque limit: MCv_SetTorqueLimit - Travel direction restriction filter: MCv_DirectionFilter
M code	○	×
Vibration control command filter	×	Smoothering: MCv_SmoothingFilter
Corner processing	Only near pass	Only near pass
Advanced synchronization	○	×: To be supported in the future
Direct control	×	Speed, torque
Pre-read start	○	○
Simultaneous start	○	○: Executed with axis control wait
Block start	○	×
Condition data, skip	○	×
Control unit	mm, inch, degree, PLS	Any unit and decimal place can be set. (Choice from mm, inch, degree, or PLS when presetting.)

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Item		FX5-40SSC-G/FX5-80SSC-G	MX controller MX-F model
Positioning range		■Absolute system -214647354.8 to 214748364.7 (μm) -21464.83648 to 21474.83647 (inch) 0 to 359.99999 (degree) -2147483648 to 2147483647 (PLS) ■Incremental system -214647354.8 to 214748364.7 (μm) -21464.83648 to 21474.83647 (inch) -21464.83648 to 21474.83647 (degree) -2147483648 to 2147483647 (PLS) ■Speed/position changeover mode (INC mode), position/speed changeover control 0 to 214748364.7 (μm) 0 to 21474.83647 (inch) 0 to 21474.83647 (degree) 0 to 2147483647 (PLS) ■Speed/position changeover mode (ABS mode) 0 to 359.99999 (degree)	• 64-bit floating-point format (LREAL type) • Any ring counter can be set.
Speed command		• 0.01 to 20000000.00 (mm/min) • 0.001 to 2000000.000 (inch/min) • 0.001 to 2000000.000 (degree/min) • 1 to 1000000000 (pulse/s)	• 64-bit floating-point format (LREAL type) • Any speed unit system can be selected.
Acceleration/ deceleration process	Acceleration/deceleration method	Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration	Jerk specification [compatible with PLCopen]
	Acceleration/deceleration at speed/torque control	Trapezoidal acceleration/deceleration	Jerk specification [compatible with PLCopen]
	Acceleration/deceleration time	32-bit integer 1 to 8388608 (ms)	64-bit floating-point format 1 operation cycle to 8400000 (ms)
	Acceleration/deceleration speed specification	• Time specification for the speed limit value (constant acceleration/ deceleration speed) • Time specification (fixed time)	• Acceleration/deceleration speed specification • Time specification (fixed time) Depends on the FB arguments.
Manual operation		JOG, inching, manual pulse generator operation	JOG: MCv_Jog Manual pulse generator operation is executed on the application (real encoder axis + some filter FBs).
Manual pulse generator	Signal input type	○: Via high-speed counter	○: Via high-speed counter
External command signal	Switching signal	○	○
Machine homing function (homing method)		Executed in servo amplifier (dog type, count type, data set type, stopper type, dog cradle type, dog type adjacent Z-phase reference, dog type front end reference, and dogless Z-phase reference)	Driver homing method/data set type: MC_Home
Fast homing		○	×
External signal selection function		○	○
Forced stop function		All axes batch	Each axis/all axes
Servo ON/OFF		Servo ON/OFF: All axes/each axis	• Ready ON/OFF: All axes/each axis • Servo ON/OFF: All axes/each axis Executed using FB MC_Power/MCv_AllPower
Limit switch output		×	×
Absolute position control		Battery-less	Battery-less
Absolute position data backup/restoration		○: With tools	×: To be supported in the future
Servo amplifier electronic gear		Numerator : Denominator = 16 : 1 (fixed)	Available (only multiple of 2 ⁿ)
Teaching		○	×
Amplifier-less operation function		×	Each axis
Virtual servo amplifier function		○	○
Master/slave operation function, driver communications		△	×

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Item	FX5-40SSC-G/FX5-80SSC-G	MX controller MX-F model
Optional data monitoring function	○: Only read for cyclic transmission. Available for transient transmission.	○: PDO variable mapping is required for cyclic transmission. Transient transmission is executed in MC_ReadParameter/MC_WriteParameter.
Servo monitor	○	○: It is not on axis labels. Slave labels are alternatives.
Control switching command (gain, PI-PID, control loop)	○	○: It is not on axis labels. Slave labels are alternatives.
Servo parameter maintenance	CPU module or servo amplifier	• Servo amplifier is the home registry. • Initial distribution at connection, mirroring with servo amplifier
Parameter access from slaves of other companies	○	○

Comparison of general function specifications

○: Supported, ×: Not supported

Item	FX5-40SS-G/FX5-80SSC-G	MX controller MX-F model
Mark detection function	○	○
Inter-module synchronization function	×	×
Event history	○	○: (Filter setting available, precision time, network-side event integration)
Current position history	○	○
Start history	○	○
Security function	×	○
All clear, initialization	○	○
Remote operation	○	○
File transfer	×	○ FTP, SLMP
Parameter change	Buffer memory	○
Data storage memory	×	○ Built-in ROM, SD memory card
Digital oscilloscope function	○	○ Data logging function
Error reset	×	○
System memory size	×	96M bytes
Size of built-in ROM for user data	×	15M bytes
Add-on function	×	○
User-created add-on	×	×
Firmware update	○	○
Boot area update	×	○
Vision linkage	×	×
Execution time monitoring	○: Operation time and maximum operation time can be checked on the system monitor.	○: Motion operation processing time monitoring

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Comparison of the synchronous control specifications

○: Supported, ×: Not supported

Item		FX5-40SS-G/FX5-80SSC-G	MX controller MX-F model
Input axis	Servo input axis	- FX5-40SSC-G: 4 axes - FX5-80SSC-G: 8 axes	- MXF100-8-N32, MXF100-8-P32: 8 axes - MXF100-16-N32, MXF100-16-P32: 16 axes
	Command generation axis	- FX5-40SSC-G: 4 axes - FX5-80SSC-G: 8 axes	Any number of axes ^{*1}
	Synchronous encoder axis	4 axes/module (via CPU, ABS/INC (via amplifier))	Any number of axes ^{*1} /module (ABS/INC (via amplifier))
Composite main shaft gear		○	○ MC_CombineAxes
Main shaft gear		○	○ MC_GearIn
Main shaft clutch		○	×
Composite auxiliary shaft gear		○	○ MC_CombineAxes
Auxiliary shaft gear		○	○ MC_GearIn
Auxiliary shaft clutch		○	×
Speed change gear		○	○ MC_GearIn
Output axis		- FX5-40SSC-G: 4 axes - FX5-80SSC-G: 8 axes	Any number of axes ^{*1}
Smoothing		○	○ MCv_SmoothingFilter (any numbers ^{*1})
Rotational direction control		○	○

^{*1} Instances can be created freely within the variable area size (set by memory assignment parameters).

Comparison of electronic cam specifications

Item			FX5-40SS-G/FX5-80SSC-G	MX controller MX-F model
Number of registrations			256	60000 maximum*1
Cam data	Stroke ratio data method	Cam resolution	256, 512, 1024, 2048, 4096, 8192, 16384	8 to 65535
		Stroke ratio	-214.7483648 to 214.7483647 [%]	Floating-point format
	Coordinate data method	Coordinate number	2 to 8192	2 to 65535
		Coordinate data	Integer value	Numerical value/floating-point format
Storage format			Binary	csv
Cam area sizes available			1024k bytes	Parameter settings*2
Cam auto generation			Rotary cutter cam auto generation	Rotary cutter cam

^{*1} Depends on memory capacity, cam resolution, and coordinate number.^{*2} Can be set using memory assignment parameters.

REVISIONS

Version	Date of Issue	Revision
A	June 2025	First edition