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PROGRAMMABLE CONTROLLERS
MELSEC-F

Programming Peripheral Support for FX2N, FX2NC, FX1N, FX1S Supplementary Manual

This manual explains the new features added to peripheral units to enable programming to be compatible with the FX2N, FX2NC, FX1N, FX1S Series Programmable Controller.

Relevant Products: FX-10P-E(-SET0)   Ver. 4.10 or more

FX-20P-E(-SET0)   Ver. 4.10 or more

FX-20P-MFXD-E   Ver. 4.10 or more

(-SET0 includes an FX-20P-CAB0 cable for use with FX0, FX0N, FX2N, FX2NC, FX1S or FX1N)

1. New Features

Table 1.1 :

	New Feature	Supported by Peripheral	
1	Addition of FX2N, FX1N, FX1S as selectable model	O	
2	Addition of basic and applied instructions	O	described in section 2 below
3	Expansion of device range	O	described in section 2 below
4	Addition of 16K-step program memory	O	parameter setting
	Setting of external RUN input	O	parameter setting
5	Writing of EPROM cassette	O	Up to 16K steps with FX-20P-RWM
6	Remote RUN/STOP function	X	
7	Specification of batteryless operation mode	X	
8	Setting communication Parameters	X	
9	Specification of modem initialization	X	

O: Already compatible   X: Not yet compatible

2. List of Additional Devices and Instructions

• For details of each instruction and devices, refer to the FX programming manual.

Table 2.1 :

Devices		
Auxiliary relays	M0 to M3071	3072 points
Data registers	D0 to D7999	8000 points
Index registers	V0 to V7, Z0 to Z7	16 points

Basic Instructions	
LDP	ORP
LDF	ORF
ANDP	INV
ANDF	

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Applied Instructions	
FNC No.	Instruction
59	PLSR
110	ECMP
111	EZCP
118	EBCD
119	EBIN
120	EADD
121	ESUB
122	EMUL
123	EDIV

Applied Instructions	
FNC No.	Instruction
127	ESQR
129	INT
130	SIN
131	COS
132	TAN
147	SWAP
155	DABS
156	ZRN
157	PLSV

Applied Instructions	
FNC No.	Instruction
158	DRVI
159	DRVA
160	TCMP
161	TZCP
162	TADD
163	TSUB
166	TRD
167	TWR
169	HOUR

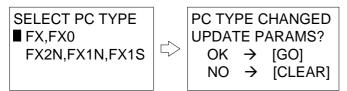| Applied Instructions	
FNC No.	Instruction
170	GRY
171	GBIN
176	RD3A
177	WR3A
180	EXTR
224 to 246	In line Compare

3. New Operations for FX2N, FX2NC, FX1N, FX1S Support

3.1 "FX2N, FX1N, FX1S" added as a selectable model

In OFFLINE mode for the FX-20P-E a model selection menu has been added.
This prompts the user to select either "FX, FX0" or "FX2N, FX1N, FX1S" series programmable controller.
"FX, FX0" is applicable for all FX type units except FX2N, FX2NC, FX1N, FX1S when "FX2N, FX1N, FX1S" should be selected.

```
SELECT PC TYPE
■ FX,FX0
   FX2N,FX1N,FX1S
```
⇨
```
PC TYPE CHANGED
UPDATE PARAMS?
   OK   →   [GO]
   NO   →   [CLEAR]
```

Change selection with ↓ or ↑

then press GO

If the PC type is different from the previous use then select GO

to reset the parameters or CLEAR to return to the start

FX

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3.2 Basic and Applied instructions are added

Symbol and input operation of additional basic instructions

Table 3.1 :

Instruction	Description	Mnemonic	Key Operations
LDP	Initial leading edge pulse contact	LDP	LD P/I Device Number GO
LDF	Initial trainling edge pulse contact	LDF	LD F Device Number GO
ANDP	Serial connection leading edge pulse contact	ANP	AND P/I Device Number GO
ANDF	Serial connection trainling edge pulse contact	ANF	AND F Device Number GO
ORP	Parallel connection leading edge pulse contact	ORP	OR P/I Device Number GO
ORF	Parallel connection trainling edge pulse contact	ORF	OR F Device Number GO
INV	Invert current logical status	INV	NOP P/I GO

Applied instruction input operation

FNC Applied Instruction No. SP Operand 1 SP Operand 2 ..... GO

The number of operands vary
depending on the instruction.

- It is the responsibility of the operator to ensure that the instruction entered is valid for the current unit.

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Application instruction input operation (by using the HELP function)

[FX-20P-E]

Main menu

| 0 PROGRAM FLOW |
| 1 TRANSFERS, COMP |
| 2 +-×÷, LOGICS |
| 3 ROTATION, SHIFT |

| 8 EXT FX DEVICES |
| 9 F2 UNITS |
| 10 ------ |
| 11 FLOAT POINT 1 |

Sub menu

| 080 RS |
| 081:PRUN |
| 082.ASCI |
| 083.HEX |

Change screen with

⟦↓⟧ or ⟦↑⟧

Enter the first **two** digits of the instruction

Example : ⟦0⟧⟦8⟧

Enter the last digit

Example : ⟦0⟧ for RS instruction.

| 0 PROGRAM FLOW |
| 1 TRANSFERS, COMP |

Example : ⟦0⟧⟦1⟧

| 10 CMP | 12 MOV |
| 11 ZCP | 14 CML |

[FX-10P-E]

> • When using the HELP function with a model other than FX2N be careful not to select an invalid instruction.

3.3 Expansion of Device Range

> • For a list of the new device ranges see section 2.

Handling index registers

"V0" and "Z0" index registers are equivalent to registers "V" and "Z" respectively, so either one can be used for programming.

When entering "V1" to "V7" or "Z1" to "Z7" add a numeral 1 to 7 to the "V" or "Z" before pressing ⟦SP⟧ or ⟦GO⟧ .

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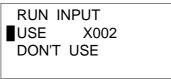© Mitsubishi Electric

3.4 Parameter setting

> • **NOTE:** The screen layout of the FX-10P-E is a little different because the display is only 2 lines.

Addition of 16K steps   **Setting of external RUN input**

```
MEMORY SETTING
  2K  STEP
  4K  STEP
  8K  STEP
■16K  STEP
```

```
 RUN  INPUT
■USE      X002
 DON'T  USE
```

When a RUN terminal is needed on the PC, select "USE", and specify an input number from X000 to X017 (X000 to X007 only for FX2N-16M☆ and FX2NC-16M☆).

Number of blocks of file register

0 to 14 blocks can be specified for file registers. These occupy program space, 1 block = 500 steps, and are stored with the program. File registers start at D1000.

3.5 Writing of the EPROM cassette

A 16K-step program can be written to memory cassettes FX-EPROM-8 and FX-EEPROM-16 using the FX-20P-RWM.

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3.6 Others

Device conversion

Device number conversion is not possible between the following devices because the number of program steps required is different.

- M0 to M1535 → M1536 to M3071 (FX2N and FX2NC only)
- 16-bit counter → 32-bit counter (all FX models)

Writing of the program to the FX-EEPROM-16

- It takes 3 to 4 minutes to transfer a 16K-step program to the FX-EEPROM-16 with the FX-20P-E in offline mode.

- When an instruction is inserted to a 16K-step program saved in the FX-EEPROM-16 in online mode, it may take 5 to 50 seconds depending on the total program size and the instruction insertion position.

Compatibility between the FX-20P-E main unit and the system cassette (FX-20P-MFXD-E)

Depending upon the version of the FX-20P-E main unit the use of the new FX-20P-MFXD-E system cassettes (version 4.00 or over) is limited.

Table 3.1 :

FX-20P-E Serial No.	Limitation with FX-20P-MFXD-E V4.00
7263001 or later	O None.
4Y9501 or later	O Only 8K program in offline mode.
4Y9499 or earlier	✗ Can not be used.

Serial No. Indication

Serial No. 4Y□□□□
- Batch Number
- Production Month : 1(Jan.) to 9(sep.), X(Oct.), Y(Nov.), Z(Dec.)
- Production Year : E.g. 1994