MITSUBISHI ELECTRIC

**TECHNICAL BULLETIN** 

[Issue No.] FAM-A-0027-A
[Title] Replacement of micro programmable controllers from $FX_{2C}$ to $FX_{3UC}$
[Date of Issue] September 2021
[Relevant Models] MELSEC-F $FX_{2C}$

Thank you for your continued support of Mitsubishi micro programmable controller, MELSEC-F series.
This technical bulletin explains standard alternatives to the models that have already been discontinued and useful references for examining the details.

The alternative models are listed in the following tables based on the number of I/O points, program capacity, and shapes of product and I/O terminals (terminal blocks, connectors, etc.). Note that, depending on your application and usage conditions, anyone other than listed model may be suitable.
Also, suitable models may change due to the release of new models or function improvement.
For details, please consult your local Mitsubishi representative.

## 1 Relevant models (series name)

| Discontinued model | Alternative model | Remarks (Be sure to check differences using references.) |
|---|---|---|
| $FX_{2C}$ | $FX_{3UC}$ | • The program capacity of $FX_{3UC}$ series is larger than that of $FX_{2C}$ series.<br>• The specifications of power supply differ.<br>($FX_{2C}$: 100 to 240VAC, $FX_{3UC}$: 24VDC)<br>• Device assignment, supported version of programming tool, etc. are different. |

## 2 Date of discontinuation
June 30, 2002

## 3 Repair support
Until June 30, 2009

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## 4 Discontinued models and alternative models

It is recommended to replace an $FX_{2C}$ series model to an $FX_{3UC}$ series model.
In this technical bulletin, standard alternative models are listed based on the number of I/O points, program capacity, shapes of product and I/O terminals (terminal blocks, connectors, etc.). Note that, depending on your application and usage conditions, anyone other than listed model may be suitable.
Refer to [Points to consider] described below and select a suitable model for your application and usage.

**[Points to consider]**

(a) The following tables list alternative models which can be used in a stand-alone application for $FX_{2C}$ series models or available models. Depending on the usage status and system configuration (usage status of extension modules or extension blocks) or smaller number of I/O points used, you can select other models or series than the listed models.

(b) For extension blocks, extension modules, function extension boards, and built-in batteries, alternative models that can be connected to the $FX_{3UC}$ series main unit are listed.

(c) Some special points to be checked are described in the column of "Special notes". However, most alternative models have specification differences other than those mentioned in "Special notes", such as smaller dimensions than the current model. When considering, be sure to check the details of various specifications in the reference manuals as well as "Special notes".

(d) Based on the above mentioned, if there is no standard alternative model, "No alternative model" is described. In this case, check the required functions and performances and select suitable alternative models for your application and system configuration from the $FX_3$ series.

## ■List of recommended alternative models (main unit)

| Discontinued model | | Alternative model | Special notes |
|---|---|---|---|
| **Product** | **Model** | **Model** | |
| Main unit | $FX_{2C}$-64MT | $FX_{3UC}$-64MT/D | The power supply voltage for the $FX_{3UC}$ series is 24VDC. Prepare a separate power supply. |
| Main unit | $FX_{2C}$-96MT | $FX_{3UC}$-96MT/D | The power supply voltage for the $FX_{3UC}$ series is 24VDC. Prepare a separate power supply. |
| Main unit | $FX_{2C}$-128MT | $FX_{3UC}$-96MT/D + $FX_{2NC}$-16EX + $FX_{2NC}$-16EYT | The power supply voltage for the $FX_{3UC}$ series is 24VDC. Prepare a separate power supply. |
| Main unit | $FX_{2C}$-160MT | $FX_{3UC}$-96MT/D + $FX_{2NC}$-32EX + $FX_{2NC}$-32EYT | The power supply voltage for the $FX_{3UC}$ series is 24VDC. Prepare a separate power supply. |

## ■Extension devices and option devices to be replaced when replacing a main unit from $FX_{2C}$ series with $FX_{3UC}$ series

| Discontinued model | | Alternative model | Special notes |
|---|---|---|---|
| **Product** | **Model** | **Model** | |
| Extension module | FX-32ER | $FX_{2NC}$-16EX-T + $FX_{2NC}$-16EYR-T | The shape of terminal block differs. |
| Extension module | FX-48ER | Two units of $FX_{2NC}$-16EX-T + two units of $FX_{2NC}$-16EYR-T | The shape of terminal block differs. |
| Extension module | FX-48ET | $FX_{2NC}$-64ET | Connector terminals are used for the $FX_{2NC}$-64ET. |
| Extension module (24VDC power supply) | FX-48ER-D | Two units of $FX_{2NC}$-16EX-T + two units of $FX_{2NC}$-16EYR-T | The shape of terminal block differs. |
| Extension module (24VDC power supply) | FX-48ET-D | No alternative model | When using the $FX_{3U}$ series, the $FX_{2N}$-48ET-D can be used. Configure a system using $FX_{3U}$ series. |
| Extension module (100VAC input) | FX-48ER-A1 | No alternative model | When using the $FX_{3U}$ series, the $FX_{2N}$-48ER-UA1/UL can be used. Configure a system using $FX_{3U}$ series. |
| Extension block | FX-8ER | $FX_{2N}$-8ER* | |
| Extension block | FX-8ET | No alternative model | |
| Extension block | FX-8EX | $FX_{2N}$-8EX* | |
| Extension block | FX-8EYR | $FX_{2N}$-8EYR* | |
| Extension block | FX-8EYS | $FX_{2N}$-16EYS* | |
| Extension block | FX-8EYT | $FX_{2N}$-8EYT* | |
| Extension block | FX-16EX | $FX_{2N}$-16EX* | |
| Extension block | FX-16EYR | $FX_{2N}$-16EYR* | |
| Extension block | FX-16EYS | $FX_{2N}$-16EYS* | |
| Extension block | FX-16EYT | $FX_{2N}$-16EYT* | |
| Extension block (large current type) | FX-4EYS-H | No alternative model | |
| Extension block (large current type) | FX-4EYT-H | $FX_{2N}$-8EYT-H* | Large capacity, 1A/1 point (2A/4 points), 5 to 30VDC |
| Extension block (large current type) | FX-8EYS-H | No alternative model | |
| Extension block (large current type) | FX-8EYT-H | $FX_{2N}$-8EYT-H* | Large capacity, 1A/1 point (2A/4 points), 5 to 30VDC |

| Discontinued model | | Alternative model | Special notes |
|---|---|---|---|
| **Product** | **Model** | **Model** | |
| Extension block (terminal block input type) | FX-16EX-V | $FX_{2N}$-16EX* | |
| Extension block (connector input) | FX-16EX-C | $FX_{2N}$-16EX-C* | |
| Extension block (output-only, high-density) | FX-16EYR-V | $FX_{2N}$-16EYR* | |
| Extension block (output-only, high-density) | FX-16EYT-V | $FX_{2N}$-16EYT* | |
| Extension block (connector output) | FX-16EYT-C | $FX_{2N}$-16EYT-C* | |
| Extension block (high-speed response input type) | FX-8EX-F | No alternative model | |
| Extension block (separate common at all points) | FX-8EYR-S | $FX_{2N}$-8EYR-S-ES/UL* | |
| Extension block (50VAC input) | FX-8EX-L | $FX_{2N}$-16EXL-C* | Connector terminals are used for the $FX_{2N}$-16EXL-C. |
| Extension block (100VAC input) | FX-8EX-A1 | $FX_{2N}$-8EX-UA1/UL* | |
| Special adapter (Analog volume) | FX-8AV | No alternative model | For the $FX_{3UC}$-32MT-LT(-2) or $FX_{3U}$ series module, the $FX_{3U}$-8AV-BD can be used. |
| Special adapter (for optical communication) (interface for M-NET/MINI) | FX-16NP | No alternative model | Configure a system using CC-Link. |
| Special adapter (for wired communication) (interface for M-NET/MINI) | FX-16NT | No alternative model | Configure a system using CC-Link. |
| Special block (for connection with $F_2$ special module) | $FX_2$-24EI | No alternative model | Configure a system using $FX_{3U}$ series. |
| Special adapter (for parallel link and wired communication) | $FX_2$-40AW | $FX_{3U}$-485ADP | |
| Special adapter (for parallel link and optical communication) | $FX_2$-40AP | No alternative model | Configure a system using parallel link through RS-485 communication. |
| Special adapter (for optical communication) (interface for M-NET/MINI-S3) | FX-16NP-S3 | No alternative model | Configure a system using CC-Link. |
| Special adapter (for wired communication) (interface for M-NET/MINI-S3) | FX-16NT-S3 | No alternative model | Configure a system using CC-Link. |
| Special block (high-speed counter) | FX-1HC | $FX_{2N}$-1HC* | |
| Special block (analog input) | FX-4AD | $FX_{3U}$-4AD* | |
| Special block (analog output) | FX-2DA | $FX_{3U}$-4DA* | When the analog output range is 0 to 10V and 4 to 20mA, the $FX_{2N}$-2DA can be used. |
| Special block (analog output) | FX-4DA | $FX_{3U}$-4DA* | |
| Special block (analog input, thermocouple sensor) | FX-4AD-TC | $FX_{2N}$-4AD-TC* | |
| Special block (analog input, platinum resistance thermometer) | FX-2AD-PT | $FX_{2N}$-4AD-PT* | |
| Special block (pulse output, positioning control) | FX-1PG | $FX_{2N}$-1PG* | |

| Discontinued model | | Alternative model | Special notes |
|---|---|---|---|
| **Product** | **Model** | **Model** | |
| Special module (pulse output, positioning control) | FX-1GM | $FX_{2N}$-10GM* | |
| Special module (pulse output, positioning control) | FX-10GM | $FX_{2N}$-10GM* | |
| Special module (pulse output, positioning control) | FX-20GM | $FX_{2N}$-20GM* | |
| Special block (ID system) | FX-1DIF | No alternative model | |
| Special adapter (for RS-232C) | FX-232ADP | $FX_{3U}$-232ADP | |
| Special adapter (for RS-485) | FX-485ADP | $FX_{3U}$-485ADP | |
| Email sending module | FX-232DOPA | No alternative model | Can be replaced with DMA-S (Ver.3) (manufactured by HANERON). |
| DC power supply module (1A/24VDC output) | FX-10PSU | $FX_{2N}$-20PSU | |
| DC power supply module (2A/24VDC output) | FX-20PSU | $FX_{2N}$-20PSU | |

*: To connect the module with the $FX_{3UC}$ series, the $FX_{3UC}$-1PS-5V or $FX_{2NC}$-CNV-IF is required.

## ■Programming tools to be required when replacing a main unit from $FX_{2C}$ series with $FX_{3UC}$ series

| Available model for $FX_{2C}$ series | | Alternative model available for $FX_{3UC}$ series | Special notes |
|---|---|---|---|
| **Product** | **Model** | **Model** | |
| Handy programming panel | FX-20P or FX-30P + FX-20P-CAB | FX-30P | FX-20P-CAB (sold separately) is required to connect FX-30P with $FX_{2C}$.<br>Connect FX-30P to $FX_{3UC}$ using FX-20P-CAB0 included. |
| Programming software | F-PCS/WIN | GX Developer Ver.8 | Connectable to $FX_{2C}$ |
| | | GX Works2 | Connectable to $FX_{2C}$ |
| Programming software | GX Developer | GX Developer Ver.8 | Connectable to $FX_{2C}$ |
| | | GX Works2 | Connectable to $FX_{2C}$ |

To connect a personal computer with an FX series model, cables and/or an interface are required as follows.

- For connection between an $FX_{2C}$ series model and a personal computer (RS-232C):
  FX-232-AWC(-H) converter for RS-232-C/RS422 + $F_2$-232CAB-1 cable + FX-422CAB cable or FX-422CAB-150 cable
- For connection between an $FX_{3UC}$ series model and a personal computer (USB):
  FX-USB-AW converter (included with cables) for USB/RS422

## 5 References to be checked for replacement

### ■References for $FX_{2C}$ series■

| References | | Description |
|---|---|---|
| **Category** | **Manual (No.)** | |
| Analog I/O | FX-4AD USER'S GUIDE (JY992D52601) | Describes the part names, external dimensions, specifications, and handling for the FX-4AD analog input block. |
| | FX-2DA USER'S GUIDE (JY992D52801) | Describes the part names, external dimensions, specifications, and handling for the FX-2DA analog output block. |
| | FX-4DA USER'S GUIDE (JY992D61001) | Describes the part names, external dimensions, specifications, and handling for the FX-4DA analog output block. |
| Analog input (Temperature control) | FX-2AD-PT USER'S GUIDE (JY992D55701) | Describes the part names, external dimensions, specifications, and handling for the FX-2AD-PT analog input block. |
| | FX-4AD-TC USER'S GUIDE (JY992D55901) | Describes the part names, external dimensions, specifications, and handling for the FX-4AD-TC analog input block. |
| High-speed counter | FX-1HC USER'S GUIDE (JY992D53001) | Describes the part names, external dimensions, specifications, and handling for the FX-1HC high-speed counter block. |
| Positioning module | FX-1PG/$FX_{2N}$-1PG USER'S MANUAL (JY992D65301) | Describes the part names, external dimensions, specifications, and handling for the FX-1PG pulse output block. |
| | FX-1GM HANDY MANUAL (JY992D36201) | Describes the part names, external dimensions, and program examples for the FX-1GM pulse output module and the operating procedure of the $F_2$-30TP. |
| | FX-10GM, FX(E)-20GM HARDWARE/PROGRAMMING MANUAL (JY992D60401) | Describes the part names, external dimensions, specifications, and positioning programs for the FX-10GM and FX(E)-20GM positioning module. |
| | E-20TP TEACHING PANEL OPERATION MANUAL (JY992D44901) | Describes the specifications and operating procedures for the E-20TP teaching panel. |
| | E-20TP-E SUPPLEMENTARY MANUAL [For JY992D44901A] (JY992D75501) | Describes the version upgrade items for the E-20TP teaching panel (Ver.1.30). |
| | FX-PCS-VPS/WIN-E SOFTWARE MANUAL (JY992D86801) | Describes the handling and operating procedures of software for the FX-PCS-VPS/WIN positioning module. |
| Communications | FX SERIES USER'S MANUAL - Data Communication Edition (JY997D16901) | Describes the system configuration, functions, and program examples for N:N network, parallel link, computer link, inverter communications, no protocol communication, programming communications, and remote maintenance. |
| | FX-232ADP USER'S GUIDE (JY992D48801) | Describes the part names, external dimensions, and specifications for the RS-232C communication adapter FX-232ADP. |
| | FX-485PC-IF HARDWARE MANUAL (JY992D81801) | Describes the part names, external dimensions, and specifications for the RS485 interface FX-485PC-IF. |
| Network | FX-16NP/NT USER'S GUIDE (JY992D56201) | Describes part names, external dimensions, handling, and specifications of interface blocks for FX-16NP/NT MELSECNET/MINI. |
| Program | THE FX SERIES OF PROGRAMMABLE CONTROLLER PROGRAMMING MANUAL ($FX_0$/$FX_{0S}$/$FX_{0N}$/FX/$FX_{2C}$/$FX_{2N}$/$FX_{2NC}$) (JY992D48301) | Describes matters related to programs, such as basic instructions, step ladder diagram instructions, application instructions, and descriptions of devices, for $FX_0$/$FX_{0S}$/$FX_{0N}$/$FX_1$/$FX_2$/$FX_{2C}$ series. |

## ■References for $FX_{3UC}$ series■

| References | | Description |
|---|---|---|
| **Category** | **Manual (No.)** | |
| Main body | $FX_{3UC}$ SERIES USER'S MANUAL - Hardware Edition (JY997D28701) | Describes matters related to hardware, such as I/O specifications, wiring, and mounting method, for $FX_{3UC}$ series. |
| | $FX_{2N}$-CNV-BC USER'S GUIDE (JY992D66601) | Describes the connecting method of system using the connector conversion adapter $FX_{2N}$-CNV-BC. |
| Analog I/O | $FX_{3S}$/$FX_{3G}$/$FX_{3GC}$/$FX_{3U}$/$FX_{3UC}$ SERIES USER'S MANUAL - Analog Control Edition (JY997D16701) | Describes how to handle the analog control for the $FX_{3G}$/$FX_{3U}$/$FX_{3UC}$ series. |
| | $FX_{3U}$-8AV-BD USER'S MANUAL (JY997D40901) | Describes the part names, external dimensions, mounting method, and specifications for the $FX_{3U}$-8AV-BD analog volume extension board. |
| | $FX_{3U}$-3A-ADP USER'S MANUAL (JY997D35601) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-3A-ADP analog I/O adapter. |
| | $FX_{3U}$-4AD-ADP USER'S MANUAL (JY997D13901) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4AD-ADP analog input adapter. |
| | $FX_{3U}$-4DA-ADP USER'S MANUAL (JY997D14001) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4DA-ADP analog output adapter. |
| | $FX_{3U}$-4AD INSTALLATION MANUAL (JY997D14901) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4AD analog input block. |
| Analog input (Temperature control) | $FX_{3U}$-4AD-PT-ADP USER'S MANUAL (JY997D14701) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4AD-PT-ADP temperature sensor input adapter. |
| | $FX_{3U}$-4AD-PTW-ADP USER'S MANUAL (JY997D29101) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4AD-PTW-ADP temperature sensor input special adapter. |
| | $FX_{3U}$-4AD-TC-ADP USER'S MANUAL (JY997D14801) | Describes the part names, external dimensions, specifications, and handling for the $FX_{3U}$-4AD-TC-ADP thermocouple thermometer input special adapter. |
| Positioning module | $FX_{3S}$/$FX_{3G}$/$FX_{3GC}$/$FX_{3U}$/$FX_{3UC}$ SERIES USER'S MANUAL - Positioning Control Edition (JY997D16801) | Describes how to handle the positioning control for the $FX_{3G}$/$FX_{3U}$/$FX_{3UC}$ series. |
| Communications | FX SERIES USER'S MANUAL - Data Communication Edition (JY997D16901) | Describes the system configuration, functions, and program examples for N:N network, parallel link, computer link, inverter communications, no protocol communication, and programming communications. |
| | $FX_{3U}$-232ADP INSTALLATION MANUAL (JY997D13701) | Describes the part names, external dimensions, mounting method, and specifications for the RS-232C communication adapter $FX_{3U}$-232ADP. |
| | $FX_{3U}$-485ADP INSTALLATION MANUAL (JY997D13801) | Describes the part names, external dimensions, mounting method, and specifications for the RS-485 communication adapter $FX_{3U}$-485ADP. |
| Program | $FX_{3S}$/$FX_{3G}$/$FX_{3GC}$/$FX_{3U}$/$FX_{3UC}$ SERIES PROGRAMMING MANUAL - Basic & Applied Instructions Edition (JY997D16601) | Describes the matters related to sequence programs, such as basic instructions, step ladder instructions, application instructions, and descriptions of devices, for the $FX_{3G}$/$FX_{3U}$/$FX_{3UC}$ series. |
| | FX-30P OPERATION MANUAL (JY997D34401) | Describes the matters related to sequence programs, such as basic instructions, step ladder instructions, and application instructions using list editing, for the FX series. |

• For the specifications of $FX_{2N}$, $FX_{2NC}$, or $FX_{3U}$ series extension block, refer to each manual of models to be used.

REVISIONS

| Version | Date of Issue | Revision |
|---|---|---|
| A | September 2021 | First edition |