



# Mitsubishi FX Series

## Overview

Maple Systems' MAP Family & OIT Family Operator Interface Terminals (Maple OITs) communicate with Mitsubishi MELSEC FX Series of Programmable Logic Controllers (PLCs) using the Monitor Interface protocol in a point-to-point single master, single slave format.

Compatible PLCs	
PLC Family	PLC Model
Mitsubishi MELSEC FX & FX2C Series	FX-24 through FX-64
Mitsubishi MELSEC FX0 Series	FX0-14 through FX0-30
Mitsubishi MELSEC FX0S Series	FX0S-10 through FX0S-24
Mitsubishi MELSEC FX0N Series	FX0N-24 through FX0N-60
Mitsubishi MELSEC FX2N Series	FX2N-16 through FX2N-128

## Communications Cable

The Maple OIT should be connected to the main programming port located on the programmable controller. Refer to Technical Note 1061 for information on communication cable part numbers and cable assembly instructions. If you will be assembling your own communications cable, cable assembly instructions are also available on our web site at [www.maple-systems.com](http://www.maple-systems.com).

**WARNING:** If your communications cable is not wired exactly as shown in our cable assembly instructions, damage to the Maple OIT or loss of communications can result.

## PLC Settings

The MELSEC FX Series port's Baud Rate, Parity, Data Bits and Stop Bits settings must match the settings in OITware-200.

# Accessible PLC Memory

## **PLC Register Memory**

The following table lists the PLC register memory ranges that Maple's OITs are able to access. Please note that your PLC's memory range may be *smaller* or *larger* than that supported by Maple's OITs. The following PLC register memory is displayable in 16-bit or 32-bit formats on the Maple OIT.

<b>PLC Register Address</b>	<b>PLC Register Description</b>	<b>Format</b>
X0 to X377	Input Relays	Octal
Y0 to Y377	Output Relays	Octal
M0 to M1535	Auxiliary Relays	Decimal
M8000 to M8255	Status and Special Relays	Decimal
S0 to S999	State Relays	Decimal
T0 to T255	Timer Registers (present values)	Decimal
C0 to C255	Counter Registers (present values)	Decimal
D0 to D999	Data Registers	Decimal
D8000 to D8255	Status and Special Data Register	Decimal

# OITware-200 Settings

The following table lists the communications settings that must be configured in OITware-200.

Please note:

- the Default column lists OITware-200's default setting; your PLC's default may be different
- the Options column lists OITware-200's options; your PLC may not support every option

Name	Default	Options	Important Notes
Baud Rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Use the fastest baud rate supported by both.
Parity	Even	Even, Odd, None, Mark, Space	Must match the PLC port settings.
Data Bits	7	7, 8	Must match the PLC port settings.
Stop Bits	1	1, 2	Must match the PLC port settings.
Status Coils	M960	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range.
Address, Source Address, Destination Address	N/A		
Password	N/A		
Message Request Register	D0	D0 to D999	Must be within the PLC's supported memory range.
Current Message Register (optional)	D2	D0 to D999	Must be within the PLC's supported memory range.
Function Key Coils (optional)	M976	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range.
Screen Dependent Function Key Coils (optional)	M944	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range. Applies to OITs with Screen Dependent Function Keys.
Control Key Coils (optional)	M1008	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range.
Status LED Coils (optional)	M0	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range. Applies to OITs with Status LEDs.
Function Key LED Coils (optional)	M992	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range. Applies to OITs with Function Key LEDs.

# MAPware-100 Settings

The following table lists the communications settings that must be configured in MAPware-100. Please note:

- the Default column lists MAPware-100's default setting; your PLC's default may be different
- the Options column lists MAPware-100's options; your PLC may not support every option

Name	Default	Options	Important Notes
Baud Rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Use the fastest baud rate supported by both.
Parity	Even	Even, Odd, None, Mark, Space	Must match the PLC port settings.
Data Bits	7	7, 8	Must match the PLC port settings.
Stop Bits	1	1, 2	Must match the PLC port settings.
Status Coils	M960	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range.
Address, Source Address, Destination Address	N/A		
Password	N/A		
Message Request Register	D0	D0 to D999	Must be within the PLC's supported memory range.
Function Key Coils (optional)	M976	M0 to M8248, incremented by 8s	Must be within the PLC's supported memory range.

# Important PLC Memory Considerations

If your PLC's memory range is smaller than the range supported by Maple's OITs, it is possible to configure the Maple OIT to monitor a PLC memory address which does not exist. Since this can cause unpredictable results, when you configure the Maple OIT please ensure that all selected PLC memory addresses are valid for your PLC model.

Do not configure the Maple OIT to write to any PLC memory address which should only be written to by the PLC.

The Mitsubishi FXo series has a reduced memory map range.

## Accessing the Counter (C) and Timer (T) Registers

Only the present or accumulated value of the register can be directly monitored by the OIT due to the Mitsubishi PLC protocol. The preset, or K values, cannot be read or written to by the OIT. To change the preset value of a timer or a counter using the OIT, use a data (D) register to store the preset value when configuring a timer or counter in the PLC's ladder logic.

Some models of the Mitsubishi MELSEC FX Series PLCs reserve 32-bit counters for the memory range of C200-C255. Therefore, if you wish to monitor a counter within this range using the OIT, then the long or 8-digit hex/BCD formats should be used.

## On using Bank 8 or Bank 16 formats

When using these formats, each PLC coil (bit) is individually displayed in terms of 1 and 0, with the lowest addressed coil displayed in the right-most position in the field. Therefore, if using coils M0-M15, the M0 is the least significant bit displayed in the right-most position and M15 is the most significant bit displayed in the left-most position. The address used must start on a byte boundary when using these formats. For M coils, this can be determined if the first coil's address divided by 8, leaves no remainder. For instance, coils M976 through M991 are a valid selection since  $976 \div 8 = 122$  with no remainder. Coils M277-M292 are not a valid bank, because  $277 \div 8$  leaves a remainder of 5. Therefore, if M277 were selected with a format of Bank 8 or Bank 16, then the OIT automatically corrects the address by using the address at the nearest byte boundary. Therefore, the OIT would actually monitor coils M272-M287. For the X and Y coils, which use octal addressing, the last digit of the address must always be 0, (ex. X0, X10, X20, Y370, etc.). Therefore, if X267 were selected with a format of Bank 16, then the OIT would actually monitor coils X260-X277.

Be advised that when you read a project from your OIT using the OITware-200 **Read From OIT** command, if an invalid address (i.e. not on a byte boundary for Bank 8 or Bank 16 formats) is selected for the M, X, and Y coils then the address received back from the OIT is readjusted to a byte boundary location. Example: Bank 16 format is selected for M277 and sent to the OIT. When the project data is read back from the OIT, the address is changed to M272.

## Accessing K constants

The Mitsubishi MELSEC FX Series PLCs can use constant numbers called K values for some of the ladder logic functions. These K values cannot be changed using the Maple OIT due to the Mitsubishi PLC protocol. If it is necessary to change a K value, use a data (D) register instead of a K value in the ladder logic of the PLC. The data (D) register can then be accessed by the OIT.