

# **Mitsubishi FX Net Driver**

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## Mitsubishi FX Net Driver

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Help version 1.031

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### Overview

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The Mitsubishi FX Net Driver provides a reliable way to connect Mitsubishi FX Net devices to OPC client applications; including HMI, SCADA, Historian, MES, ERP, and countless custom applications. It is intended for use with Mitsubishi FX series devices.

## Device Setup

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### Supported Devices

FX  
FX2C  
FX0N  
FFX2N  
FFX3U

#### Notes:

1. FX3U is not supported in Windows CE.
2. FXOpen is a general model that supports the driver's maximum address range. It may be selected for models other than FX, FX2C, FX0N, FX2N, and FX3U. It should not be used if the device is one of the models specifically supported by this driver (such as FX, FX2C, FX0N, FX3U, and FX2N). For example, if the device is FX0N, choose the FX0N model. Selecting FXOpen as the model when the device is FX, FX2C, FX0N, FX2N, or FX3U may result in bad tag reads and incorrect values.

See Also: [FX3U PLC Parameter Settings](#)

### Communication Protocol

Format 1, Checksum

### Supported Communication Parameters

Programmable

### Ethernet Encapsulation

This driver supports Ethernet Encapsulation, which allows the driver to communicate with serial devices attached to an Ethernet network using a Serial-to-Ethernet server. It may be invoked through the Communications tab in Channel Properties. For more information, refer to the OPC server's help documentation.

**Note:** Ethernet Encapsulation is not supported for the FX3U model.

### Maximum Number of Channels and Devices

The maximum number of channels supported by this driver is 100. The maximum number of devices supported is 16.

### Device IDs

The valid range for Device IDs is 0 to 15.

### Flow Control

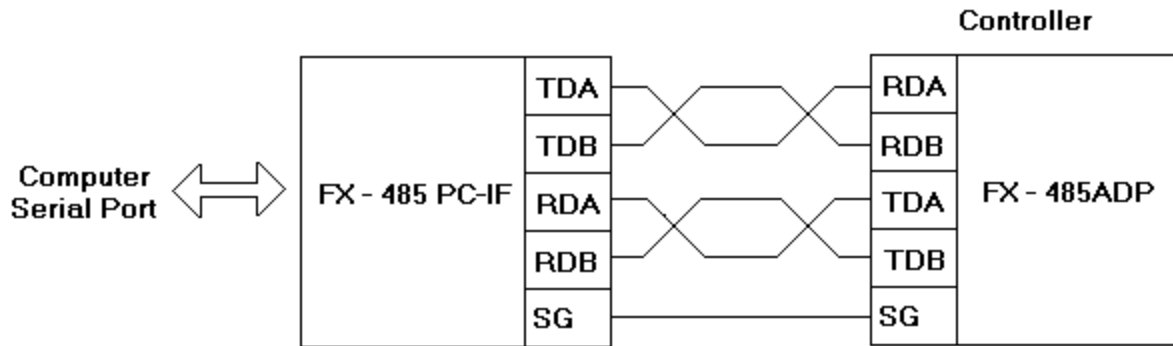
When using an RS232/RS485 converter, the type of flow control that is required depends on the needs of the converter. Some converters do not require any flow control whereas others require RTS flow. Consult the converter's documentation to determine its flow requirements. An RS485 converter that provides automatic flow control is recommended.

#### Notes:

1. When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control setting of **RTS** or **RTS Always** under the Channel Properties.
2. The FX-485PC-IF RS485 Interface Unit is configured via special memory locations within the FX PLC. Users should consult the FX-485PC-IF manual for memory locations and settings to properly configure the unit (and select matching settings for the Mitsubishi FX Net Driver).

### Cable Connections

A null modem cable is required when connecting the RS-232 port of the computer to the FX-485PC-IF.



### Modem Setup

This driver supports modem functionality. For more information, please refer to the topic "Modem Support" in the OPC server help documentation.

## FX3U PLC Parameter Settings

The FX3U PLC needs the following parameter settings to communicate with the Mitsubishi FX Net Driver.

1. To start, open the GX Developer-FX software application. Then, click **Parameter | PLC Parameter**.
2. Next, select the **PLC system(2)** tab. Change the settings as needed in order to match those shown in the image below.

**FX parameter**

Memory capacity | Device | PLC name | I/O assignment | PLC system(1) | **PLC system(2)** | Positioning

CH1  If the box is not checked, the parameters will be cleared.  
(When the program is transferred to the communication board, parameters and D8120 values in the PLC must be cleared upon program transfer.)

Operate communication setting

Protocol:   Control line

Data length:  H/W type:

Parity:  Control mode:

Stop bit:   Sum check

Transmission speed:  (bps) Transmission control procedure:

Header Station number setting:  H (00H-0FH)

Terminator Time out judge time:  X10ms (1-255)

Default Check End Cancel

3. Next, click **End | Online | Write to PLC**.
4. Click the **Clear PLC** memory button.

**Note:** It is important to clear the PLC memory before writing the new settings to the PLC. If the PLC memory isn't cleared, the new settings will not take effect.

5. To write the settings to the PLC, click **Execute**.
6. Once finished, cycle the power on the PLC so that it will be ready to communicate with the Mitsubishi FX Net Driver.

## Data Types Description

---

The Mitsubishi FX Net Driver supports the following data types.

| Data Type | Description  |
|-----------|--|
| Boolean   | Single bit   |
| Word      | Unsigned 16-bit value<br>bit 0 is the low bit<br>bit 15 is the high bit  |
| Short     | Signed 16-bit value<br>bit 0 is the low bit<br>bit 14 is the high bit<br>bit 15 is the sign bit  |
| DWord     | Unsigned 32-bit value<br>bit 0 is the low bit<br>bit 31 is the high bit  |
| Long      | Signed 32-bit value<br>bit 0 is the low bit<br>bit 30 is the high bit<br>bit 31 is the sign bit  |
| Float     | 32-bit floating point value.<br><br>The driver interprets two consecutive registers as a floating point value by making the second register the high word and the first register the low word. |

## Address Descriptions

Address specifications vary depending on the model in use. Select a link from the following list to obtain specific address information for the model of interest.

[FX Addressing](#)

[FX2C Addressing](#)

[FX0N Addressing](#)

[FX2N Addressing](#)

[FX3U Addressing](#)

[FXOpen Addressing](#)

## FX Addressing

The default data types for dynamically defined tags are shown in **bold**.

| Device Type              | Range                      | Data Type                               | Access     |
|--------------------------|----------------------------|---|------------|
| Inputs                   | X000-X377*                 | <b>Boolean</b>                          | Read Only  |
| Outputs                  | Y000-Y377*                 | <b>Boolean</b>                          | Read/Write |
| Auxiliary Relays         | M0000-M1535                | <b>Boolean</b>                          | Read/Write |
| Special Aux. Relays      | M8000-M8255                | <b>Boolean</b>                          | Read/Write |
| States                   | S000-S999                  | <b>Boolean</b>                          | Read/Write |
| Timer Contacts           | TS000-TS255                | <b>Boolean</b>                          | Read Only  |
| Counter Contacts         | CS000-CS255                | <b>Boolean</b>                          | Read Only  |
| Timer Value              | T000-T255                  | Short, <b>Word</b>                      | Read/Write |
| Counter Value            | C000-C199                  | Short, <b>Word</b>                      | Read/Write |
| 32 Bit Counter Value**   | C200-C255                  | Long, <b>DWord</b>                      | Read/Write |
| Data Registers**         | D000-D999<br>D000-D998     | <b>Short</b> , Word, Long, DWord, Float | Read/Write |
| Special Data Registers** | D8000-D8255<br>D8000-D8254 | <b>Short</b> , Word, Long, DWord, Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.

## FX2C Addressing

The default data types for dynamically defined tags are shown in **bold**.

| Device Type              | Range                      | Data Type                                 | Access     |
|--------------------------|----------------------------|---|------------|
| Inputs                   | X000-X377*                 | <b>Boolean</b>                            | Read Only  |
| Outputs                  | Y000-Y377*                 | <b>Boolean</b>                            | Read/Write |
| Auxiliary Relays         | M0000-M1535                | <b>Boolean</b>                            | Read/Write |
| Special Aux. Relays      | M8000-M8255                | <b>Boolean</b>                            | Read/Write |
| States                   | S000-S999                  | <b>Boolean</b>                            | Read/Write |
| Timer Contacts           | TS000-TS255                | <b>Boolean</b>                            | Read Only  |
| Counter Contacts         | CS000-CS255                | <b>Boolean</b>                            | Read Only  |
| Timer Value              | T000-T255                  | Short, <b>Word</b>                        | Read/Write |
| Counter Value            | C000-C199                  | Short, <b>Word</b>                        | Read/Write |
| 32 Bit Counter Value**   | C200-C255                  | Long, <b>DWord</b>                        | Read/Write |
| Data Registers**         | D000-D999<br>D000-D998     | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |
| Special Data Registers** | D8000-D8255<br>D8000-D8254 | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.



## FX0N Addressing

The default data types for dynamically defined tags are shown in **bold**.

| Device Type              | Range                      | Data Type                                 | Access     |
|--------------------------|----------------------------|---|------------|
| Inputs                   | X000-X177*                 | <b>Boolean</b>                            | Read Only  |
| Outputs                  | Y000-Y177*                 | <b>Boolean</b>                            | Read/Write |
| Auxiliary Relays         | M0000-M0511                | <b>Boolean</b>                            | Read/Write |
| Special Aux. Relays      | M8000-M8255                | <b>Boolean</b>                            | Read/Write |
| States                   | S000-S127                  | <b>Boolean</b>                            | Read/Write |
| Timer Contacts           | TS00-TS63                  | <b>Boolean</b>                            | Read Only  |
| Counter Contacts         | CS00-CS31<br>CS235-CS254   | <b>Boolean</b>                            | Read Only  |
| Timer Value              | T00-T63                    | Short, <b>Word</b>                        | Read/Write |
| Counter Value            | C00-C31                    | Short, <b>Word</b>                        | Read/Write |
| 32 Bit Counter Value**   | C235-C254                  | Long, <b>DWord</b>                        | Read/Write |
| Data Registers**         | D000-D255<br>D000-D254     | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |
| Special Data Registers** | D8000-D8255<br>D8000-D8254 | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.

## FX2N Addressing

The default data types for dynamically defined tags are shown in **bold**.

| Device Type              | Range                      | Data Type                                 | Access     |
|--------------------------|----------------------------|---|------------|
| Inputs                   | X000-X377*                 | <b>Boolean</b>                            | Read Only  |
| Outputs                  | Y000-Y377*                 | <b>Boolean</b>                            | Read/Write |
| Auxiliary Relays         | M0000-M3071                | <b>Boolean</b>                            | Read/Write |
| Special Aux. Relays      | M8000-M8255                | <b>Boolean</b>                            | Read/Write |
| States                   | S000-S999                  | <b>Boolean</b>                            | Read/Write |
| Timer Contacts           | TS000-TS255                | <b>Boolean</b>                            | Read Only  |
| Counter Contacts         | CS000-CS255                | <b>Boolean</b>                            | Read Only  |
| Timer Value              | T000-T255                  | Short, <b>Word</b>                        | Read/Write |
| Counter Value            | C000-C199                  | Short, <b>Word</b>                        | Read/Write |
| 32 Bit Counter Value**   | C200-C255                  | Long, <b>DWord</b>                        | Read/Write |
| Data Registers**         | D000-D7999<br>D000-D7998   | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |
| Special Data Registers** | D8000-D8255<br>D8000-D8254 | <b>Short</b> , Word<br>Long, DWord, Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.

## FX3U Addressing

The default data types for dynamically defined tags are shown in **bold**.

**Note:** The FX3U model is not supported in Windows CE. Also, note that the FX3U model does not support Ethernet Encapsulation.

| Device Type      | Range       | Data Type      | Access     |
|------------------|-------------|----------------|------------|
| Inputs           | X000-X377*  | <b>Boolean</b> | Read Only  |
| Outputs          | Y000-Y377*  | <b>Boolean</b> | Read/Write |
| Auxiliary Relays | M0000-M7679 | <b>Boolean</b> | Read/Write |

| Device Type              | Range                      | Data Type   | Access     |
|--------------------------|----------------------------|---|------------|
| Special Aux. Relays      | M8000-M8511                | <b>Boolean</b>                                    | Read/Write |
| States                   | S0000-S4095                | <b>Boolean</b>                                    | Read/Write |
| Timer Contacts           | TS000-TS511                | <b>Boolean</b>                                    | Read Only  |
| Counter Contacts         | CS000-CS255                | <b>Boolean</b>                                    | Read Only  |
| Timer Value              | T000-T511                  | Short, <b>Word</b>                                | Read/Write |
| Counter Value            | C000-C199                  | Short, <b>Word</b>                                | Read/Write |
| 32 Bit Counter Value**   | C200-C255                  | Long, <b>DWord</b>                                | Read/Write |
| Data Registers**         | D000-D7999<br>D000-D7998   | <b>Short</b> , Word<br>Long, <b>DWord</b> , Float | Read/Write |
| Special Data Registers** | D8000-D8511<br>D8000-D8510 | <b>Short</b> , Word<br>Long, <b>DWord</b> , Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.

### FXOpen Addressing

The default data types for dynamically defined tags are shown in **bold**.

**Note:** When adding a device to the OPC server project, do not select FXOpen if the device is one of the models that is specifically supported by this driver (such as FX, FX2C, FX0N, and FX2N). For example, if the device is FX0N, select the FX0N model. Selecting FXOpen as the model when the device is FX, FX2C, FX0N, or FX2N may result in bad tag reads and incorrect values.

| Device Type              | Range                              | Data Type   | Access     |
|--------------------------|------------------------------------|---|------------|
| Inputs                   | X000-X777*                         | <b>Boolean</b>                                    | Read Only  |
| Outputs                  | Y000-Y777*                         | <b>Boolean</b>                                    | Read/Write |
| Auxiliary Relays         | M0000-M9999***                     | <b>Boolean</b>                                    | Read/Write |
| Special Aux. Relays      | M0000-M9999***                     | <b>Boolean</b>                                    | Read/Write |
| States                   | S000-S999                          | <b>Boolean</b>                                    | Read/Write |
| Timer Contacts           | TS000-TS999                        | <b>Boolean</b>                                    | Read Only  |
| Counter Contacts         | CS000-CS999                        | <b>Boolean</b>                                    | Read Only  |
| Timer Value              | T000-T999                          | Short, <b>Word</b>                                | Read/Write |
| Counter Value            | C000-C999****                      | Short, <b>Word</b>                                | Read/Write |
| 32 Bit Counter Value**   | C000-C998****                      | Long, <b>DWord</b>                                | Read/Write |
| Data Registers**         | D000-D9999<br>D000-D9998           | <b>Short</b> , Word<br>Long, <b>DWord</b> , Float | Read/Write |
| Special Data Registers** | Please refer to the device manual. | <b>Short</b> , Word<br>Long, <b>DWord</b> , Float | Read/Write |

\*Octal.

\*\*Users can specify a Long data type by appending a space and an "L" to the address. For example, "D000" would be entered as "D000 L". This does not apply to arrays or bit accessed registers.

\*\*\*For Auxiliary Relays and Special Aux. Relays, the driver can accommodate the fullest range. For information on the model to determine the separation between Auxiliary Relays and Special Aux. Relays, refer to the manual.

\*\*\*\*For Counter Value and 32 Bit Counter Value, the driver can accommodate the fullest range. For information on the model to determine the separation between Counter Value and 32 Bit Counter Value, refer to the manual.

## Error Descriptions

---

The following messages may be generated. Click on the link for a description of the message.

### Address Validation

#### [Missing address.](#)

[Device address <address> contains a syntax error.](#)

[Address <address> is out of range for the specified device or register.](#)

[Device address <address> is not supported by model <model name>.](#)

[Data type <type> is not valid for device address <address>.](#)

[Device address <address> is read only.](#)

### Serial Communications

[COMn does not exist.](#)

[Error opening COMn.](#)

[COMn is in use by another application.](#)

[Unable to set comm parameters on COMn.](#)

[Communications error on <channel name> \[<error mask>\].](#)

### Device-Status Messages

[Device <device name> is not responding.](#)

[Unable to write to <address> on device <device name>.](#)

### Device-Specific Messages

[Device <device name> reported an invalid address in the range <start address> to <end address>.](#)

## Missing address.

---

### Error Type:

Warning

### Possible Cause:

A tag address that has been specified dynamically has no length.

### Solution:

Re-enter the address in the client application.

## Device address <address> contains a syntax error.

---

### Error Type:

Warning

### Possible Cause:

A tag address that has been specified dynamically contains one or more invalid characters.

### Solution:

Re-enter the address in the client application.

## Address <address> is out of range for the specified device or register.

---

### Error Type:

Warning

### Possible Cause:

A tag address that has been specified dynamically references a location that is beyond the range of supported locations for the device.

### Solution:

Verify that the address is correct; if it is not, re-enter it in the client application.

## Device address <address> is not supported by model <model name>

---

### Error Type:

Warning

**Possible Cause:**

A tag address that has been specified dynamically references a location that is valid for the communications protocol but not supported by the target device.

**Solution:**

Verify that the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model name for the device is correct.

**Data Type <type> is not valid for device address <address>.**

---

**Error Type:**

Warning

**Possible Cause:**

A tag address that has been specified dynamically has been assigned an invalid data type.

**Solution:**

Modify the requested data type in the client application.

**Device address <address> is read only.**

---

**Error Type:**

Warning

**Possible Cause:**

A tag address that has been specified dynamically has a requested access mode that is not compatible with what the device supports for that address.

**Solution:**

Change the access mode in the client application.

**COMn does not exist.**

---

**Error Type:**

Fatal

**Possible Cause:**

The specified COM port is not present on the target computer.

**Solution:**

Verify that the proper COM port has been selected.

**Error opening COMn.**

---

**Error Type:**

Fatal

**Possible Cause:**

The specified COM port could not be opened due an internal hardware or software problem on the target computer.

**Solution:**

Verify that the COM port is functional and may be accessed by other Windows applications.

**COMn is in use by another application.**

---

**Error Type:**

Fatal

**Possible Cause:**

The serial port assigned to a device is being used by another application.

**Solution:**

Verify that the correct port has been assigned to the channel.

---

**Unable to set comm parameters on COMn.**

---

**Error Type:**

Fatal

**Possible Cause:**

The serial parameters for the specified COM port are not valid.

**Solution:**

Verify the serial parameters and make any necessary changes.

---

**Communications error on <channel name> [<error mask>].**

---

**Error Type:**

Serious

**Possible Cause:**

1. The serial connection between the device and the host PC is bad.
2. The communications parameters for the serial connection are incorrect.

**Solution:**

1. Verify the cabling between the PC and the PLC device.
2. Verify that the specified communications parameters match those of the device.

**See Also:**[Error Mask Definitions](#)

---

**Error Mask Definitions**

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**B** = Hardware break detected**F** = Framing error**E** = I/O error**O** = Character buffer overrun**R** = RX buffer overrun**P** = Received byte parity error**T** = TX buffer full

---

**Device <device name> is not responding.**

---

**Error Type:**

Serious

**Possible Cause:**

1. The serial connection between the device and the Host PC is broken.
2. The communications parameters for the serial connection are incorrect.
3. The named device may have been assigned an incorrect Network ID.
4. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device setting.

**Solution:**

1. Verify the cabling between the PC and the PLC device.
2. Verify that the specified communications parameters match those of the device.

3. Verify that the Network ID given to the named device matches that of the actual device.
4. Increase the Request Timeout setting so that the entire response can be handled.

---

**Unable to write to <address> on device <device name>.**

---

**Error Type:**

Serious

**Possible Cause:**

1. The serial connection between the device and the host PC is broken.
2. The communications parameters for the serial connection are incorrect.
3. The named device may have been assigned an incorrect network ID.

**Solution:**

1. Verify the cabling between the PC and the PLC device.
2. Verify that the specified communications parameters match those of the device.
3. Verify that the network ID given to the named device matches that of the actual device.

---

**Device <device name> reported an invalid address in the range <start address> to <end address>.**

---

**Error Type:**

Serious

**Possible Cause:**

An attempt has been made to reference a nonexistent location in the specified device.

**Solution:**

Verify that the tags assigned to addresses in the specified range on the device and eliminate those that reference invalid locations.

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