

Mitsubishi FX2N Driver Configuration Manual

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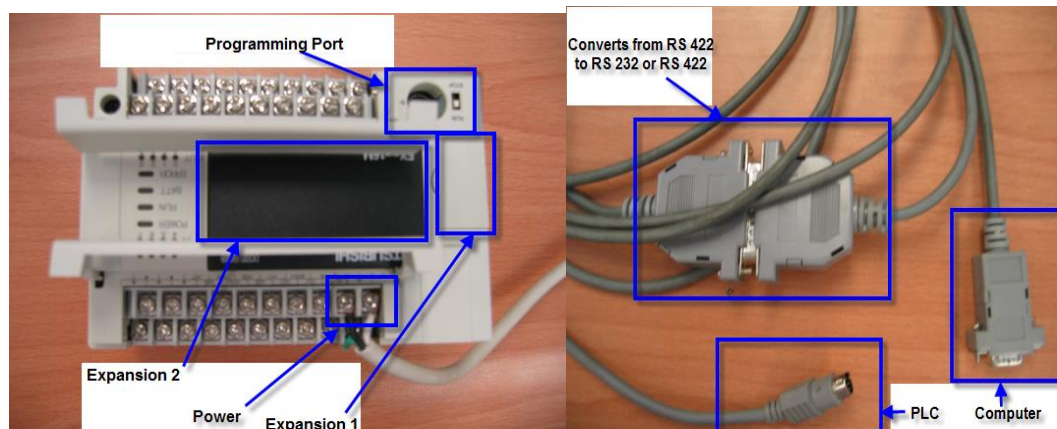
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1. Mitsubishi FX2N Configuration

1.1 Mitsubishi FX2N

Mitsubishi FX series are compact PLC. They connect to the computer through serial link. As the FX protocol evolved through versions WebAccess has 3 different drivers to connect to the different Models.

The FX PLC contain 3 potential connection ports. The programming port is the only one that can communicate with the configuration software so you should connect this one first. It is a RS-422 port but Mitsubishi usually sells a 422 to 232 converting cable with the PLC.



The two expansion boards can also be used to read the variable with WebAccess, we will explain their usage later in this document.

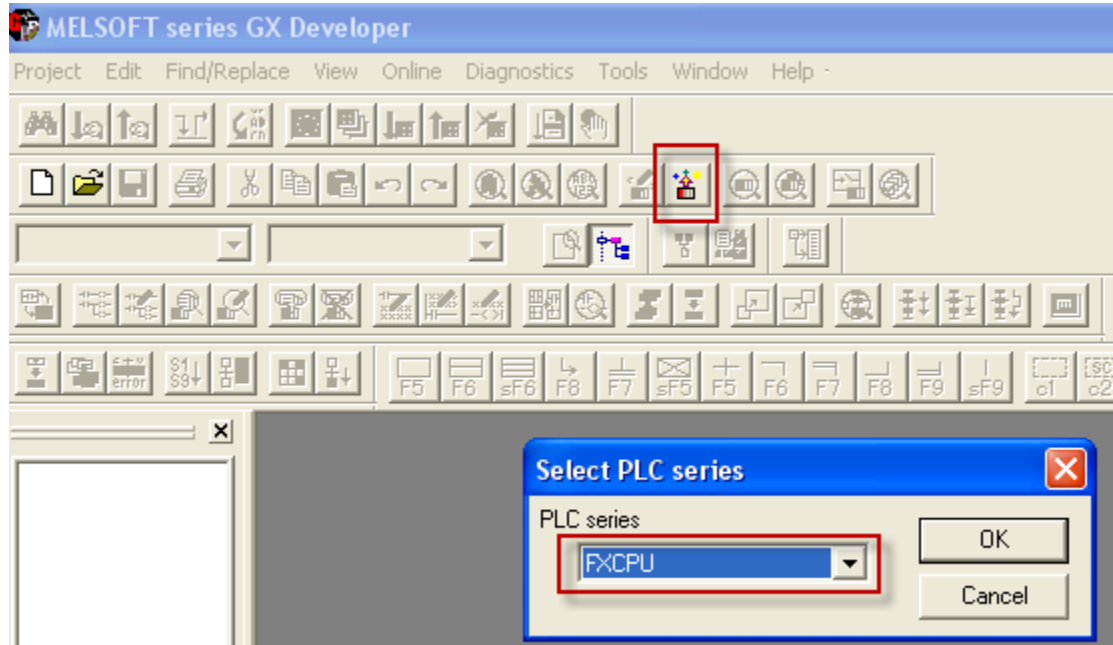
For FX2N series please use the FX2 driver in WebAccess. FX2 and FX2C PLC should use FX driver.

1.2 Module Settings

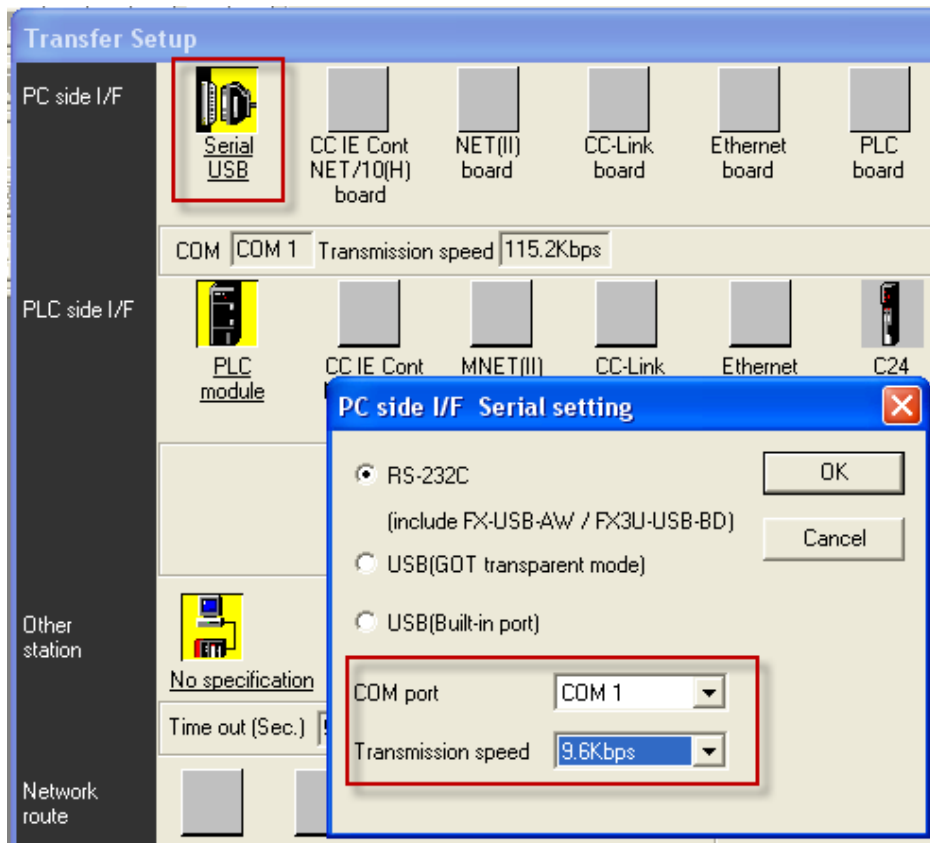
To configure the PLC you will have to install the GX Developer software.

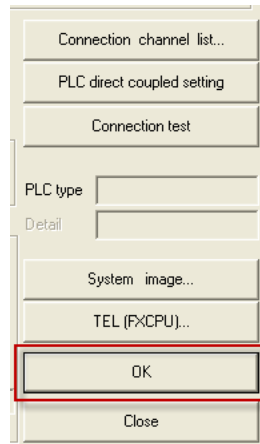
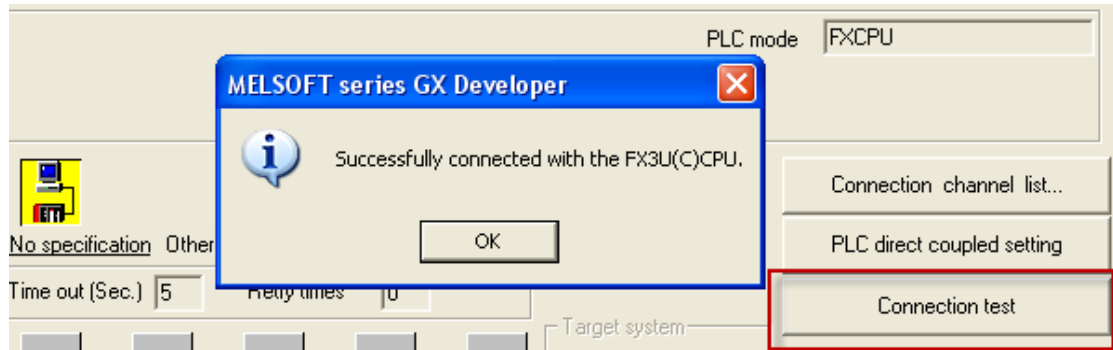


The first step is to upload the program currently on the PLC, this will also allow you to check that the PLC is connected properly.

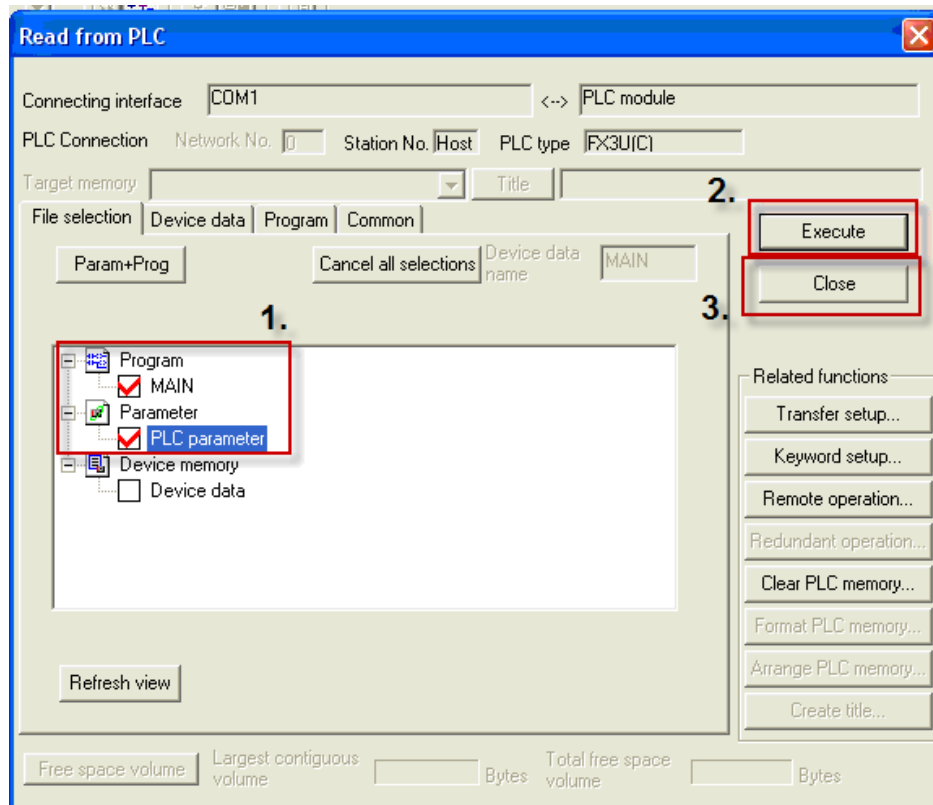


Choose the Comport and select 9.6Kbps speed.





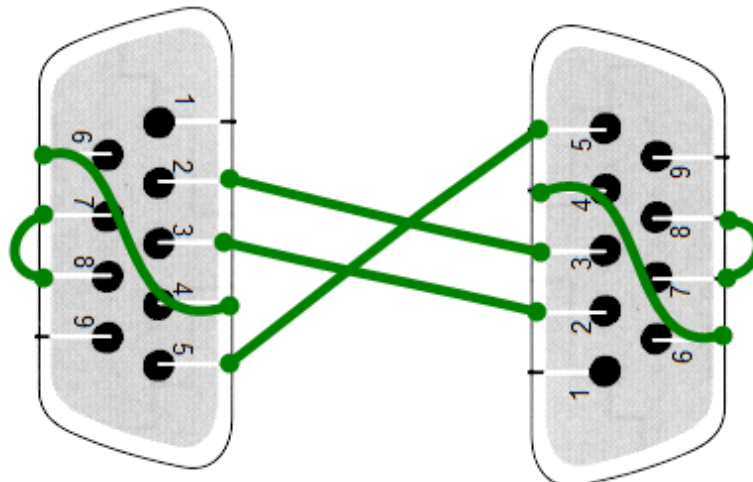
Upload the data from the PLC:



D8120				
Description		Bit (bn)status		
		0 (OFF)		1 (ON)
b0	Data length	7 bits		8 bits
b1 b2	Parity (b2, b1)	(00) : No parity (01) : Odd parity (11) : Even parity		
b3	Stop bits	1 bit		2bits
b4 b5 b6 b7	Baud rate - bps	(b7, b6, b5, b4) (0011): 300 bps (0100): 600 bps (0101): 1200 bps (0110): 2400 bps		(b7, b6, b5, b4) (0111): 4800 bps (1000): 9600 bps (1001): 19200 bps
b8	Header character	None		D8124, Default : STX (02H)
b9	Terminator character	None		D8125, Default : ETX (03H)
b10 b11 b12	Communication Control (see timing diagrams page 10-20 onwards)	No Protocol (b12, b11, b10) (0, 0, 0) : RS Instruction is not being used (RS232C interface) (0, 0, 1) : Terminal mode -RS232C interface (0, 1, 0) : Interlink mode - RS232C interface (FX2N V2.00 or above) (0, 1, 1) : Normal mode 1- RS232C, RS485(422) interfaces (RS485 FX2N(C) only) (1, 0, 1) : Normal Mode 2 - RS232C interface (FX only)		
		Computer Link (b12, b11, b10) (0, 0, 0) : RS485(422) interface (0, 1, 0) : RS232C interface		
b13	FX-485 Network	Sum Check	No Check	Added automatically
b14		Protocol	No protocol	Dedicated Protocol
b15		Protocol	Format 1	Format 4

After building your ladder or changing the settings please download the program again and restart the PLC (unplug and re-plug).

If you are using an RS-232 expansion board here is the recommended wiring for the cable:



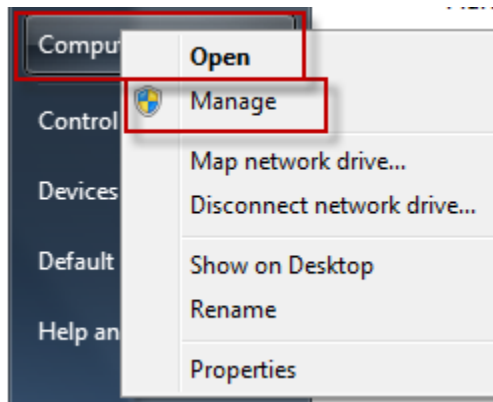
2. WebAccess Configuration

2.1 Port

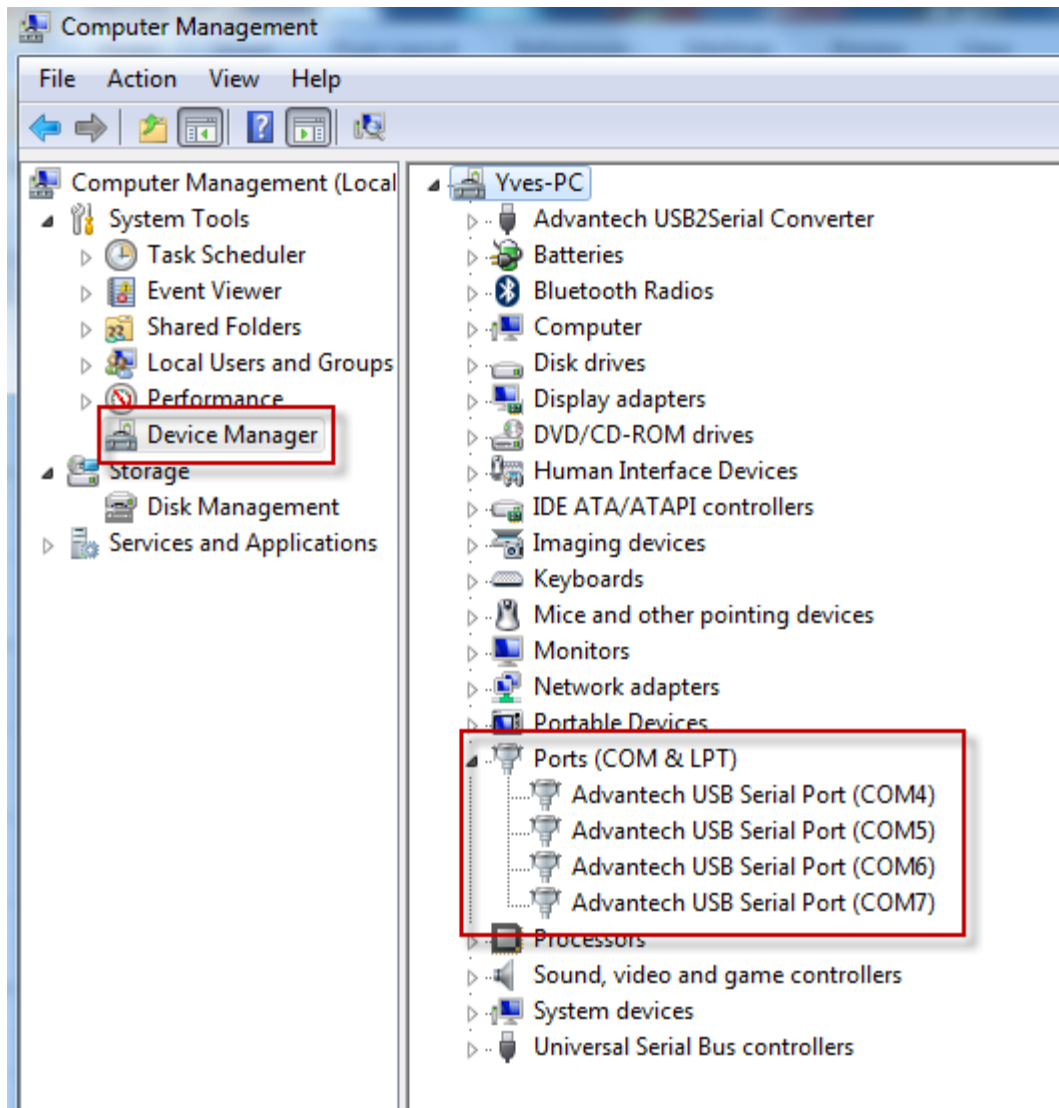
The Mitsubishi FX protocol uses a serial port. Even if you use a serial port server or a USB to serial converter the apparent port in your computer (and therefore the port to select in WebAccess) is a serial port.

2.1.1 Check the port number

If you are using a comport emulator and you do not know the port number then open the "Start Menu" and right click on "Computer" and select "Manage"



In the device manager section you can see the list of COM ports on your computer and recognize the virtual port by its driver name



2.1.2 WebAccess Comport Page

Open your WebAccess Configuration and select the SCADA node you want to add the device to. Then select "Add a new Comport"

All the settings in this page must match the settings in all the modules attached to the port. **So all the modules attached to the same comport must have the same settings.**

Update Comport		[Cancel]	<input type="button" value="Submit"/>
Interface Name	SERIAL ▼		
Comport Number	1		
Description	Mitsubishi FX		
Baud Rate	9600 ▼ bps		
Data bit	<input checked="" type="radio"/> 7 <input type="radio"/> 8 bits		
Stop bit	<input checked="" type="radio"/> 1 <input type="radio"/> 2 bits		
Parity	<input type="radio"/> None <input type="radio"/> Odd <input checked="" type="radio"/> Even		
Scan time	1 <input type="radio"/> MilliSecond <input checked="" type="radio"/> Second <input type="radio"/> Minute <input type="radio"/> Hour		
TimeOut	1000 <input type="radio"/> MilliSecond		
Retry count	3		
Auto Recover Time	60 <input type="radio"/> Second		
HandShakeRts	<input type="radio"/> Yes <input checked="" type="radio"/> No		
HandShakeDtr	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Backup Port Number	0		
		[Cancel]	<input type="button" value="Submit"/>

2.1.3 Comport Number

The Serial Comport requires the comport number to match that of the physical interface (e.g. COM1, COM2, COM3, etc) on the SCADA Node.

2.1.4 Description

This is an optional field used for user reference.

2.1.5 Baud Rate

For the Mitsubishi FX modules the typical baud rate is 9600.

This must match the baud rate configured in the module and the eventual RS-485 to RS-232 converter.

2.1.6 Data Bits

The packets can have 7 or 8 Data Bits. The typical setting for Mitsubishi FX is **7 bits**.

2.1.7 Stop Bits

The packets can have 1 or 2 Stop Bits. The typical setting for Mitsubishi FX is **1 Stop bit**.

2.1.8 Parity

The Parity can be None, Odd, Even or Disabled. The typical setting for Mitsubishi FX is **Parity = Even**.

2.1.9 Scan Time

This is the time in milliseconds to scan the Devices. This must match the ability of the device to respond. **A typical scan rate is 1 per second**.

If the Device cannot respond as fast as the SCAN Time entered, WebAccess will scan at a slower rate.

2.1.10 Timeout

With a 1 second scan rate, **a typical Time Out = 200 Milliseconds**.

Timeout is the time waited before re-sending a communications packet that did not have a reply.

Timeout specifies how long the software waits for a response to a data request, specifically to wait for a reply from one packet. A recommended value is one-fifth the scan rate, longer if the communication device is slow.

Combined with Retry count, Timeout also determines time to consider a device or port as BAD. Timeout is the time to wait since last communication packet sent without a reply. Time is in milliseconds. Slow or poor quality communications require longer timeout. The faster the communications, the shorter the timeout required. Shorter timeouts result in faster reconnects after communication failures.

2.1.11 Retry Count

A typical Retry count = 3.

Number of times to retry communications if no reply is received from a device. Combined with Timeout, also determines time to consider a device or port as BAD.

This is the number of times after the first attempt has failed that communication should be attempted before indicating a failure. (If Retry count is 3, a total of 4 failed requests have occurred before tags are marked bad). Specifically, this is how many times to send a single packet after the field device fails to respond to the first packet. After the retry count is exceeded, all the tags in the packet are marked with asterisks and the next packet of requests is sent. A reasonable value is 3 to 5 times. After this number of tries, the tags in this packet are marked as "fail to respond" (i.e. asterisks) and are disabled. In reality, increasing the number of retries hides failures on the part of the field device to respond to a request. Essentially, increasing the retries gives the field device more chances to reply.

2.1.12 Auto Recover Time

A typical Auto Recover Time = 60 Seconds.

Auto Recover Time is the time to wait before attempting to re-establish communications with a BAD device or port.

If communications to the PLC is unusually slow due to hardware, communications or network issues, you might consider increasing this value. If communications to the PLC or RTU fails frequently, you may want to decrease this number in order to have WebAccess try to re-establish communications sooner.

If communications to the PLC, RTU or device Fails (i.e. exceeds Timeout) WebAccess will wait the Auto Recover Time before trying to re-establish communications.

2.1.13 Hand Shake RTS

The typical setting for Mitsubishi FX is **HandShakeRts = No.**

The RTS (Request To Send) signal is raised and lowered on the Serial Communications Port if this value set to Yes. RTS is determined by settings in the field device. *Refer to your device interface manual to determine the value for this field and the type of cable used.*

2.1.14 Hand Shake DTR

The typical setting for Mitsubishi FX is **HandShakeDtr = No.**

The DTR (Data Terminal Ready) signal raised and lowered on the Serial Communications Port if this value is set to Yes. DTR is determined by settings in the field device and the type of cable used.

2.1.15 Backup Port

The Backup Port has not been tested for Mitsubishi FX

2.2 Device

Then Go to the port page and select "Add a new device". Select the Mitsubishi FX device Type.

The screenshot shows a web-based configuration form titled "Device Property". The form has a header bar with "[Cancel]" and "Submit" buttons. Below the header, there are several input fields:

- Device Name: Text box containing "Mitsu1"
- Description: Empty text box
- Unit Number: Text box containing "1"
- Device Type: Dropdown menu showing "MitsuFx" with a downward arrow. This field is highlighted with a red box.
- Use RS-485 Port: Text box containing "0". This field is also highlighted with a red box.

At the bottom of the form, there are "[Cancel]" and "Submit" buttons.

2.2.1 Unit Number

The Unit number must match the "unit number" (or "address") set in the PLC.

2.2.2 Use RS-485 Port

If you are using the Programming port set Use RS-485 Port to 0, if you are using an expansion board set Use RS-485 to 1.

2.3 Tag

You can now access to the memory addresses of you PLC using "Add tag".

Create New Tag		[Cancel]	Submit
Parameter	M	Point (discrete)	
Alarm	No Alarm		
Tag Name			
Description	Description		
Scan Type	Constant Scan		
Address	M000		
Conversion Code	Unsigned Integer		
Start bit	0		
Length	1		

2.3.1 Parameter

The parameter gives the type of tag you want to import. Try to select a parameter as close to the tag type as possible because it will fill the other option with the default parameters.

In Mitsubishi FX we made a parameter for each type of data available in the PLC.

2.3.2 Address

For Mitsubishi FX the address starts with the data type (X for input, Y for output...) and is followed by the byte and bit position of the data (X000 to X007 then X010 to X017 and so on) for I/O and the position in the memory for memory types (type M).

2.3.3 Scaling Type

If the data sent by the module is not in a human readable unit you can use the scaling to change the unit and display a more convenient unit in the node. In most cases a linear scaling type will be sufficient.

2.4 Main Parameter List

Parameter	Description	Address	Start Bit	Length
X	Digital Input	X000	0	1
Y	Digital Output	Y000	0	1
M	Internal Relay	M0000	0	1
D	Data Register	D000	0	16
S	Internal Status	S0000	0	1
TEXT	Data Register String	D0000	0	12
CN	Current Counter Value	CN000	0	16
CR	Counter Reset	CR000	0	1
CS	Counter Contacts	CS000	0	1
TN	Current Timer Value	TN000	0	16
TR	Timer Reset	TR000	0	1
TS	Timer Contacts	TS000	0	1