

## TECHNICAL NOTE **TNPC17**

**Title: Enhanced Modular Controller communication with Mitsubishi Q PLC over RS232**

**Product(s): Enhanced Modular controller (CSMSTRSX)  
Mitsubishi PLC QJ71C24-R2**

This technical note presents how to connect a Modular Controller Enhanced Master with a Mitsubishi Q series PLC. The same setup can be used to program a Red Lion G3 HMI.

Programming of the Enhanced master is done using Crimson 2.0 software, build 230 or higher, while Mitsubishi GX device software programs the Q series PLC.

### **SYSTEM SETUP:**

The communication setup is as follow:

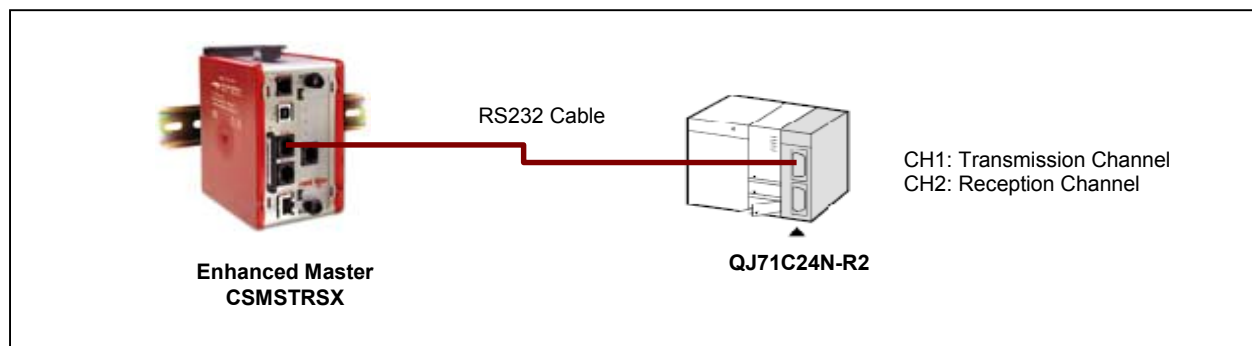
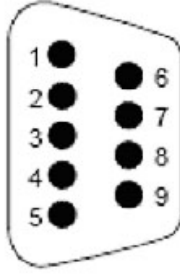


Fig. 1: Communication Setup

## CABLE INFORMATION:

RS232 Communication port information for the Mitsubishi QJ71C24N-R2 module:



Pin number	Signal abbreviation	Signal name	Signal direction C24 (*1) ↔ External device
1	CD	Receive carrier	←
2	RD(RXD)	Reception data	←
3	SD(TXD)	Transmission	→
4	DTR(ER)	Data terminal ready	→
5	SG	Signal ground	↔
6	DSR(DR)	Data set ready	←
7	RS(RTS)	Transmission request	→
8	CS(CTS)	Transmission possible	←
9	RI(CI)	Called status display	←

Communication cable CBLMIT03 from Red Lion Controls can be used to connect an Enhanced Master (or G3 HMI or Data Station) RS232 port to the Mitsubishi QJ71C24N-R2 communication card.

The table below presents the communication cable pin out between the Enhanced master and the QJ71C24N-R2 Communication card:

Connections			
FROM RLC UNIT	Name	CONNECTER PINOUT	
		RJ12	DB9 MALE
1	CTS	1	-
2	Rx	2	3
3	COMM	3	5
4	COMM	4	-
5	Tx	5	2
6	RTS	6	1, 6, 8

The above table denotes the pin names of the RS232 port.  
When connecting, the pin name at the RS232 port is connected to the opposite of that pin name at the destination device.

Information on the cable is available here: <http://www.redlion.net/Support/Cable/CBLMIT03.pdf>

## ENHANCED MASTER COMMUNICATION SETUP:

### COMMUNICATION SETUP IN THE ENHANCED MASTER MUST BE AS FOLLOWS:

#### ON THE RS232 COMMUNICATION PORT

- Driver on RS232: Mitsubishi A/Q/FX Series PLC – MELSEC
- Frame Validation: No
- Baud Rate: 9600
- Data Bits: 8 bits
- Stop Bits: One
- Parity: Odd

#### ON THE PLC BELOW THE RS232 COMMUNICATION PORT

- Drop Number: 0
- Melsec Control Format: Melsec1

Screen Shots Fig. 2 and Fig. 3 are from Crimson 2.0 in the communication Module.

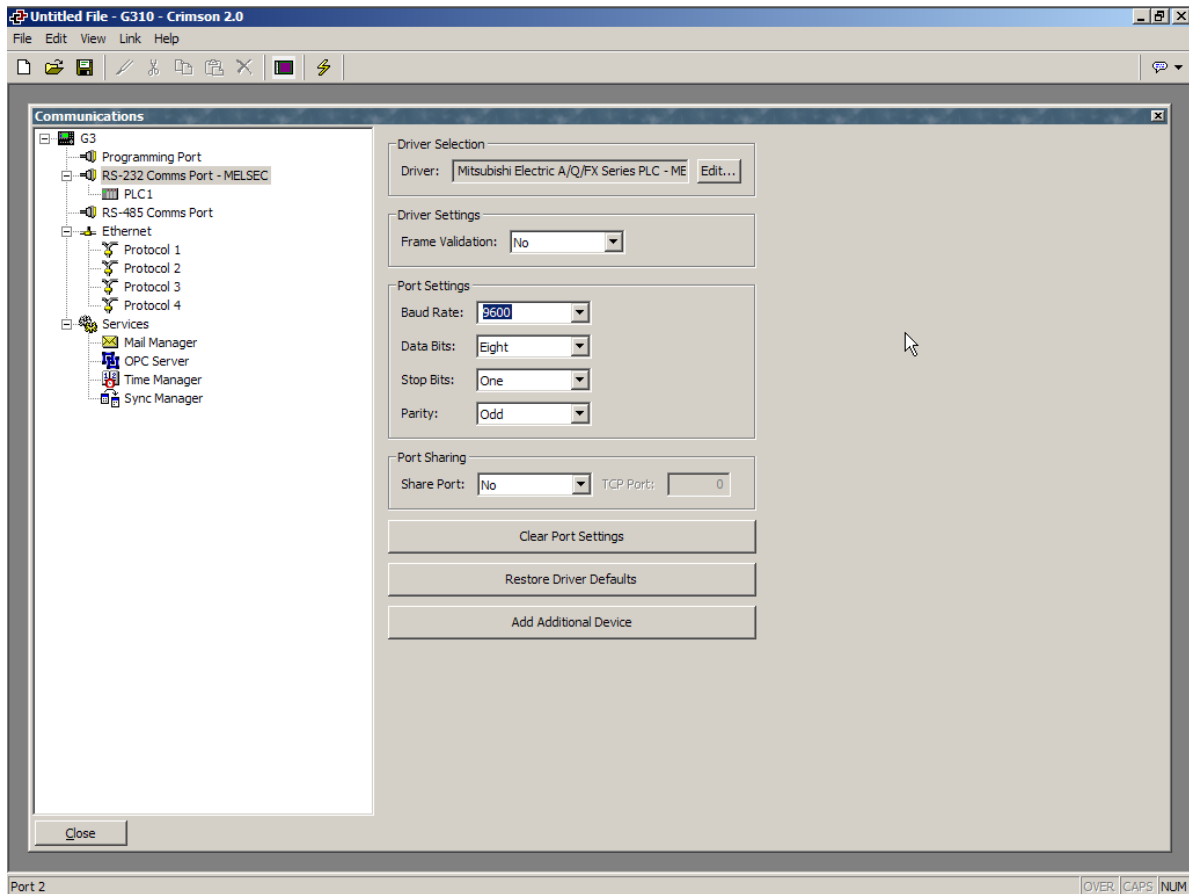


Fig. 2 – RS232 communication port setup in Crimson 2.0 software.

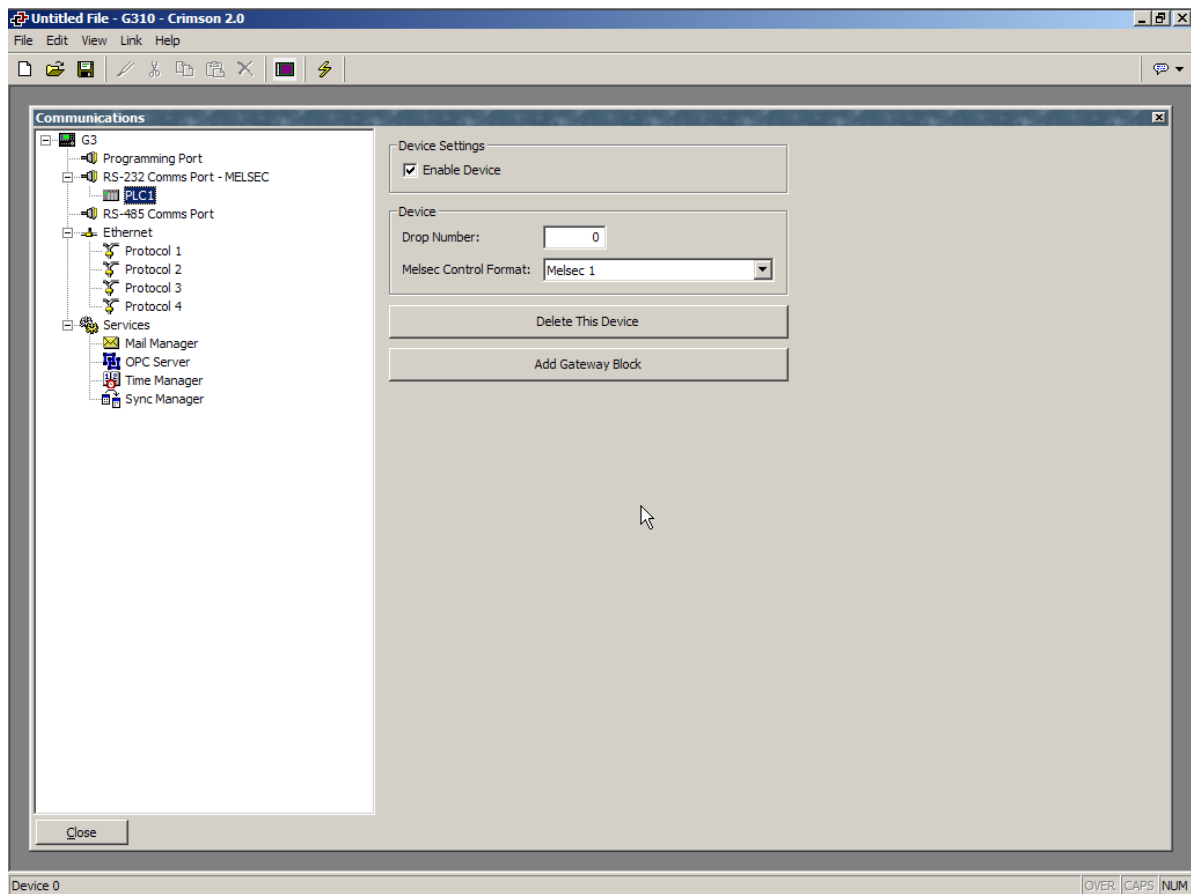


Fig. 3 – PLC1 (i.e. Mitsubishi Q) communication setup in Crimson 2.0 software.

## MITSUBISHI GX\_DEV. SETTINGS

The screen shot Fig.4 shows the communication settings in Gx Developer environment. Fig.5 and 6 are part of Fig.4 showing the windows to access the QJ71C24-R2 settings. In this example, the communication card is available in slot 9.

### TO ACCESS THE SETTINGS,

- Go in the “PLC Parameter” from the side menu,
- Choose the “I/O Assignment” tab,
- Check if the communication module is present in the slot you want,
- Click on “Switch Setting” to setup the module.

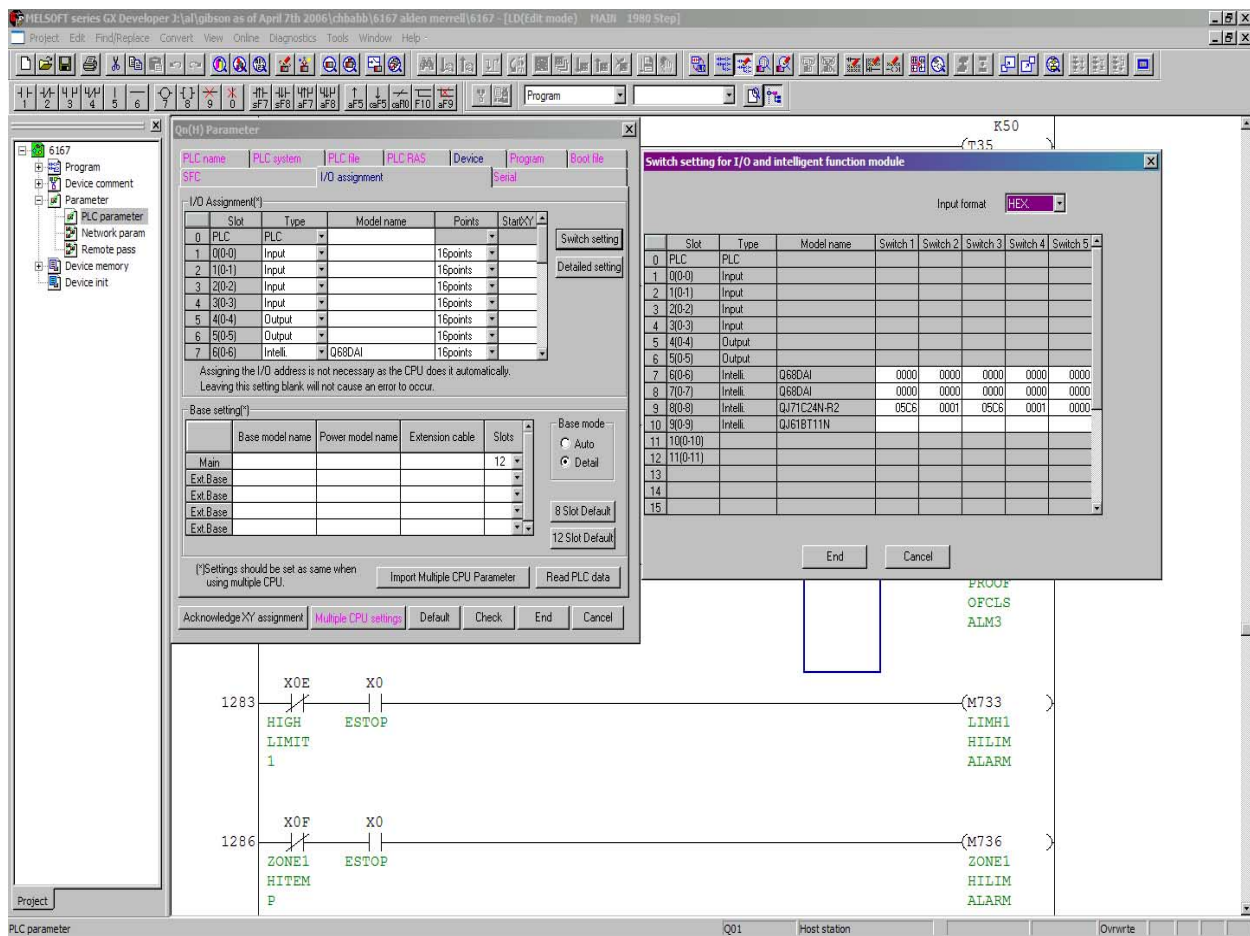


Fig. 4 –GX. Developer environment with PLC parameter windows open.

## SWITCH SETTING EXPLANATIONS IN GX. DEVELOPER

Switch 1 and 2 are configuring Com port 1 settings. Therefore, Switch 3 and 4 refer to Com port 2 settings. In this example, the switch settings are:

- Switch 1 - 05C6
- Switch 2 - 0001

Explanation for switch 1:

- 05 means 9600 baud rate.
- C6 is explained in the table below.

HEX	C				6			
Binary	1	1	0	0	0	1	1	0
Bit Number	7	6	5	4	3	2	1	0

Bit 0 = Independent Control of the port

Bit 1 = 8 data bits

Bit 2 = yes to parity

Bit 3 = Odd parity

Bit 4 = 1 stop bit

Bit 5 = no checksum

Bit 6 = Write during run enabled

Bit 7 = Change setting enabled

**Note:** Frame Validation (Red Lion) and Checksum (Mitsubishi) are the same. Please set accordingly.

The screenshot shows the 'Qn(H) Parameter' window with the 'I/O assignment' tab selected. The 'I/O Assignment(\*)' section contains a table with the following data:

Slot	Type	Model name	Points	Start/XY
0	PLC			
1	Q(0-0)	Input	16points	
2	I(0-1)	Input	16points	
3	Q(2-2)	Input	16points	
4	I(3-3)	Input	16points	
5	Q(4-4)	Output	16points	
6	I(5-5)	Output	16points	
7	Q(6-6)	Intelk	Q68DAI	16points

Below the table, a note states: 'Assigning the I/O address is not necessary as the CPU does it automatically. Leaving this setting blank will not cause an error to occur.'

The 'Base setting(\*)' section includes a table for Base model name, Power model name, Extension cable, and Slots. The 'Main' row shows 12 slots. To the right, there are radio buttons for 'Auto' and 'Detail' (selected), and buttons for '8 Slot Default' and '12 Slot Default'.

At the bottom, there are buttons for 'Import Multiple CPU Parameter', 'Read PLC data', 'Acknowledge XY assignment', 'Multiple CPU settings', 'Default', 'Check', 'End', and 'Cancel'.

Fig. 5 – PLC parameter window showing I/O assignment.

Switch setting for I/O and intelligent function module

Input format: **HEX**

	Slot	Type	Model name	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
0	PLC	PLC						
1	0(0-0)	Input						
2	1(0-1)	Input						
3	2(0-2)	Input						
4	3(0-3)	Input						
5	4(0-4)	Output						
6	5(0-5)	Output						
7	6(0-6)	Intelli.	Q68DAI	0000	0000	0000	0000	0000
8	7(0-7)	Intelli.	Q68DAI	0000	0000	0000	0000	0000
9	8(0-8)	Intelli.	QJ71C24N-R2	05C6	0001	05C6	0001	0000
10	9(0-9)	Intelli.	QJ61BT11N					
11	10(0-10)							
12	11(0-11)							
13								
14								
15								

End Cancel

Fig. 6 – Switch Setting window for I/O. Communication module in slot 9.