TECHNICAL NOTE TNOI24

Title: G3 Operator Interface communication with Mitsubishi Q PLC over RS232

Product(s): G3 Operator Interfaces
Mitsubishi PLC QJ71C24-R2

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

Programming of the G3 is done using Crimson 2.0 software, build 230 or higher, while Mitsubishi GX device software programs the Q series PLC.
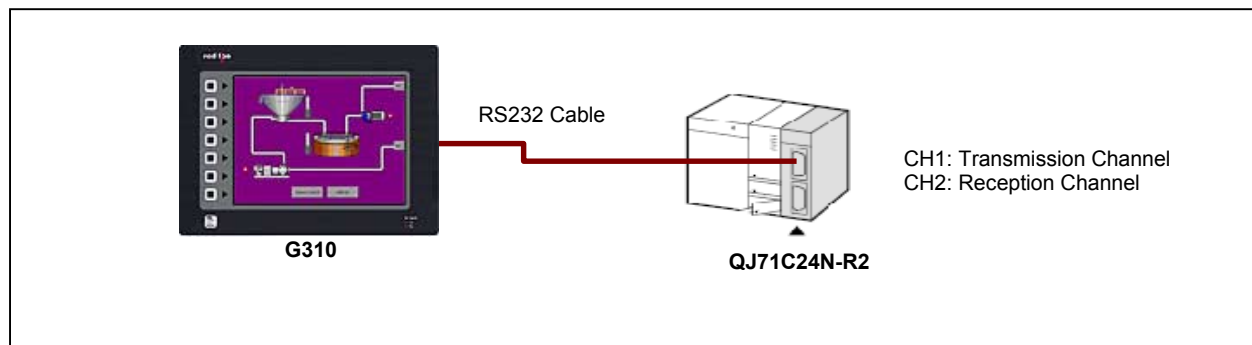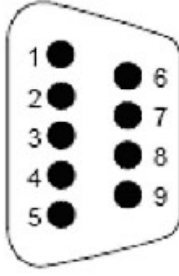
SYSTEM SETUP:

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 a G3 (or Enhanced Master 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

G3 COMMUNICATION SETUP:

COMMUNICATION SETUP IN THE G3 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

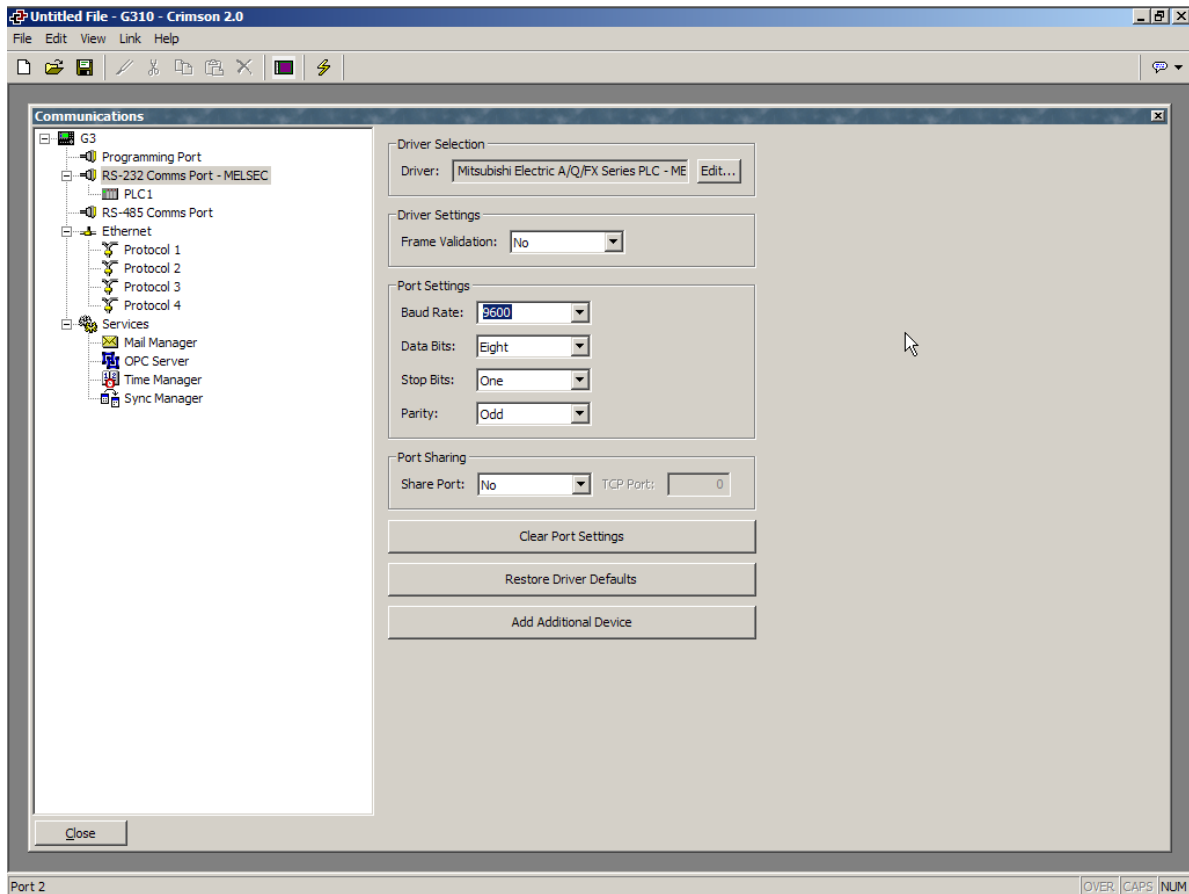Screen Shots Fig. 2 and Fig. 3 are from Crimson 2.0 in the communication Module.

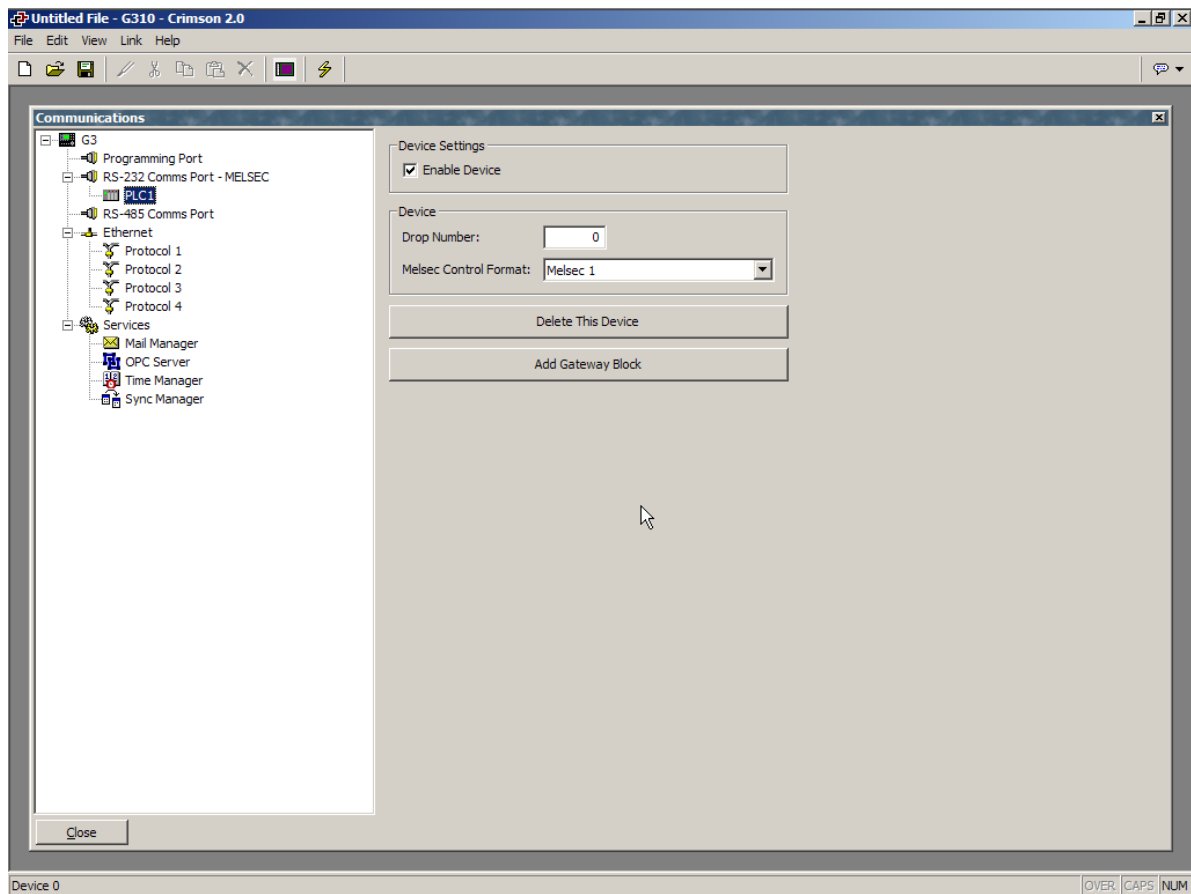Fig. 2 – RS232 communication port setup in Crimson 2.0 software.

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,
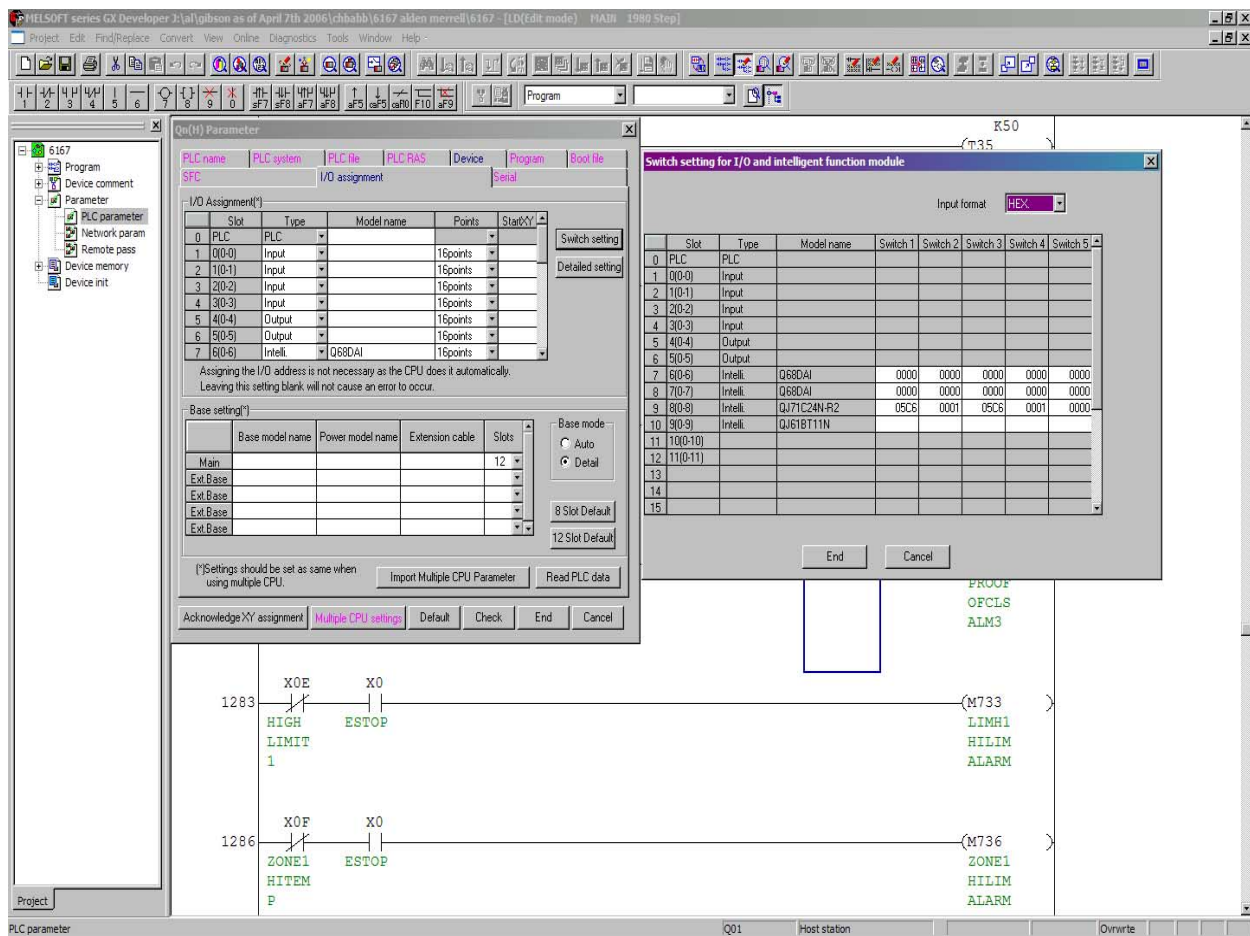- Click on "Switch Setting" to setup the module.

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.

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.