

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
10	1	CD	Receive carrier	•
2	2	RD(RXD)	Reception data	+
3 7	3	SD(TXD)	Transmission	\rightarrow
8	4	DTR(ER)	Data terminal ready	
4 9	5	SG	Signal ground	\rightarrow
5	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	FROM CONNECTER PIN							
RLC UNIT	name	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.

🔁 Untitled File - G310 - Crimson 2.0		
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Communications Programming Port Programming Port Protocol 1 Protocol 2 Protocol 4 Services Mail Manager Sync Manager Sync Manager	Driver Selection Driver: Mitsubishi Electric A/Q/FX Series PLC - ME Edit Driver Settings Frame Validation: No Port Settings Baud Rate: Baud Rate: Bable: Data Bits: Eight Party: Odd Port Sharing Share Port: Clear Port Settings Clear Port Settings Add Additional Device	
Close		
Port 2		OVER CAPS NUT

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.

MELSOFT series GX Developer	r.2:\al\gubson as of April 7th 2006(chbab\6167-alden merrell\6167-{L0(rdit mode) MAUI 1980 Step] onriert Vew Online Diagnostics Tools Window Help-	_ 8 ×
1 2 3 4 5 6 7	(5) (1) <td>*</td>	*
E 20 6167 E 20 Program E 20 Program	PLC name PLC system PLC RA Device Program Boot Reg SPC V/D assignment Setial Switch setting for 1/0 and intelligent function module X	
Parameter PLC parameter Setwork parameter	Input format	
Remote pass End Device memory	U PLC PLC PLC Switch 3 Switch 4 Switch 5 1 100-00 Input * 15points * Detailed setting 0 PLC PLC 100-00 * 100-00 <td></td>	
Device int	3 20/2 Input * 16points * 4 30/3 Input * 16points * 5 40/4 Output * 16points *	
	6 \$\file\$005\) Output \$\file\$1 \$\file\$6080 \$\file\$1 <	
	Assigning the UV address in for Recessary as the UPU does it automatically. 7 [[066] [Intellic [[0650] [0000] <th[]< th=""> [0000]</th[]<>	
	Base model name Power model name Extension cable Stots Base mode 10 (90-9) trivelic QJS1BT11N Image: Comparison cable Image: Comparison cable Stots Image: Comparison cable Image:	
	Man 12 Ext Base • Ext Base •	
	Lext Base 1 1 Stot Default	
	AcknowledgeXY assignment Hullple CPU sellings Default Check End Cancel ALM3	
	x0E x0	
	1283 (M733) HIGH ESTOP LIMH1	
	1 HILM 1 ALARM	
	XOF XO	
	1286 (M736) ZONE1 ESTOP ZONE1	
Project	P HILIM	
PLC parameter	Q01 Host station Ovnivrte	

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	2		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.

Qon(H)	Paramet	er	111.4	8					X	
PLC r	ame	PLC system	1	PLC file PLI	RAS	Device		Piogram	Boot file	
SFC			k	0 assignment			19	erial	i	
- 1/D Assignment(*)										
	Slot	Type		Model nam	e	Points		StarkY -		
0	PLC	PLC	•				•		Switch setting	
1	0000	Input	٠			16points	٠			
2	1(0-1)	Input	×			16points			Detailed setting	
3	2(0-2)	Input	٠			16points	٠			
4	3(0-3)	Input	۲			16points	٠			
5	4(0-4)	Output	×			16points				
6	5(0-5)	Output	٠			16points	٠			
7	6(0-6)	Intelli	۲	Q68DAI		16points	•	. I		
Bas	e setting[*])					_			
	Ba	ise model name	Р	ower model name	Exter	sion cable	ę	ilots 🔺	Base mode -	
M	ain		۲		_		1	2 -	C Detail	
Ext	Rave		F				F			
Ext	Base		F				F			
Ext	Base		F					-	8 Slot Delault	
Ext	Base		F					1		
							-		12 Slot Delault	
();	(*)Settings should be set as same when Import Multiple CPU Parameter Read PLC data									
Ackn	ucknowledge XY assignment Multiple CPU settings Default Check End Cancel									

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

Swit	Switch setting for I/O and intelligent function module										
Input Iomat											
								_			
	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)	Dutput									
6	5(0-5)	Dutput									
7	6(0-6)	Inteli.	Q68DAI		0000	000	0000	000			
8	7(0-7)	Inteli.	US8DAI	0000	0000	0000	0000				
9	8(0-8)	Inteli.	QU/TUZ4N-RZ	0505	ໜາ	0506	ໜາ				
10	3(0-9)	linitelli.	QUEIRITIN	_							
11	10(0-10))			
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13								<u> </u>			
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Fig. 6 – Switch Setting window for I/O. Communication module in slot 9.