

# <u>Mitsubishi <14></u> <u>Mitsubishi Electric Corporation</u> <u>Q Series (Q01 / Q00 / Q00J) CPU Direct + Link Unit Connection</u>

## System Structure





# GP

Machine	Model	Remark			
GP	GP70 Series GP77/77R Series GP2000 Series	Excepting for handy types. The internal 2-Port feature is supported by only GP77/77R Series and GP2000 Series.			
GLC	GLC2000 Series	<ul><li>2-Port Adapter and the internal</li><li>2-Port feature are not supported.</li></ul>			



## PLC

[Connecting Directly]

CPU	Communication Method		GP	
Q00	RS-232C	Connection Method		
Q01		[1]		



[Using Serial Communication Unit]

CPU	Serial Communication		Connection	
	Unit	Communication	Cable	GP
		Method	<sup>2</sup>	· ·
Q00	QJ71C24-R2	RS-232C	Connection	
Q01	QJ71C24	RS-232C	[2]	
Q00J		RS-422	Connection Method [3]	





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### Selecting PLC Type

Start up GP-PRO /PBIII.

Select the following PLC Type when creating the project file.



### **Communication Setting Sample**

[Connecting Directly]

GP S	Setup	PLC Settings
Baud Rate	19200 bps	
Data Length	8bit (fixed)	
Stop Bit	1bit (fixed)	
Parity Bit	Odd (fixed)	
Data Flow Control	ER Control (fixed)	
Communication Format	RS-232C (fixed)	
Unit No.	0 (fixed)	

## NOTE

The range of data transmission speed is from 9,600bps to 15,200bps. However, the maximum speed available with GP70 series units (except for GP series) is 38,400bps.



### [Using Serial Communication Unit]

GP S	etup	Serial Communication Unit Settings			
Baud Rate	19200bps	Baud Rate 19200 bps			
Data Length	7 bits	Data Bit 7 bits			
Stop Bit	2 bits	Stop Bit 2 bits			
Parity Bit	Even	Parity Check Yes Parity setting even/odd Even			
Data Flow Control	ER Control	-	-		
Communication Format (RS- 232C)	RS-232C	Mode Setup (RS-232C) 4 (Format 4 Pro Mode)			
Communication Format (RS- 422)	4-wire type	Mode Setup (RS-422) 4 (Format 4 Protoco Mode)			
		Sum Check	Yes		
Unit No. 0		Station Number	0		



## Communication Settings [GP]

1 [GP-PRO/PB C-Package Setting]

Select [GP Setup] on Project Manager.

1) Communication Settings	1) Communication Settings
GP Settings - nonaeno.text       VO Settings       Mode Settings         GP Settings       I/O Settings       Communication Settings         RS-222C / RS-422       Transmission Speed       1920         P Settings       Parky BR       Stop BR         C 7 Bats       C None       C 2 BR         Buxy Ready Control       C 0.dd       C 1 BR         Buxy Ready Control       C None       C 2 BR         MADE       BRE       Advanced         RIACC       RIACC       Mode Settings         DK       Cancel       Defaults	[Direct] / [Link] Transmission Speed: 19200bps / 19200bps Data Length: 8Bits / 7Bits Stop Bit: 1Bit / 2Bits Parity Bit: Odd / Even Busy Ready Control : DTR / ER / DTR / ER RS-232C/ RS-422: RS-232C / RS-232C or 4 Line * Select one for each in
2) Mode Settings	2) Mode Settings
GP Settings       Extended Settings       Communication Settings         GP Settings       L/O Settings       Mode Settings         PLC Type       MITSUBISHI MELSEC QuA(LINK)         System Start Address       DOCODE         Machine Number       Image: Plant Address         Cirk Protocol Type       Image: Plant Address         Node Setup       Image: Plant Address         Node Setup       Image: Plant Address         Transmission Status       DOCODE         OK       Cancel         Defaults       Help	System Start Address: Arbitrary Address Machine Number: 0 Link Protocol Type: 1:1 (Only when using Serial Communication Unit)



Select [Transfer]> [Setup]>	[Transfer Settings].					
3) Transfer Settings						
Transfer Settings	×					
Send Information	Communications Port					
GP System Screen	Comm Port COM1 Retry Count 5					
<ul> <li>Filing Data[LF card]</li> <li>Data Trans Func CSV Data[CF card]</li> </ul>	Baud Rate 115.2K V (bps)					
	C Ethernet					
Transfer Method     Send All Screens	IP Address 0. 0. 0. Port 8000					
Automatically Send Ehanged Screens     Send User Selected Screens	C Ethemet: Auto Acquistion					
	C Memory Loader					
I ransfer Mode     Ereparation for a transfer and a transfer are made	e simultaneous.					
O It is transferred after preparation for a transfer is f	nished.					
Setup C Automatic Setup Us C Eorce System Setup F C Do NOT Perform Setup	e Extended Program : 7 Si <u>m</u> ulation					
	System Screen					
Setup CFG file : © English						
C         Japanese           C         Selection	BWin\protocol\ <u>Browse</u>					
OK	Cancel Help					
<u>3) Transfer Settings</u> GP System Set	ettings: Checked					

Transfer to GP after settings completed.



2 [GP Settings]

1) Checking GP Type	1) Checking GP Type
MAIN MENJ       *03/00/00       00:00         1       INITIALIZE       2         2       SCREEN DATA TRANSFER       3         3       SELF-DIAGNOSIS       4         4       RUN       2         2       SIMULTAR VS-24       4         2       SELF-DIAGNOSIS       4         4       RUN       8         2       SIMULTAR VS-24       4         2       SUBLEC-OnA       4	If you have selected Mitsubishi MELSEC-QnA (LINK), the following will be shown. "MELSEC-QnA"
2) Communication Settings	2) Communication Settings
MAIN MENU INITIALIZE SET UP SIO 2 SET UP PRINTER 3 SET UP PRINTER 4 COMMNICATION SETUP 5 SOUND SETTINGS	$[MAIN MENU]  \downarrow  [INITIALIZE]  \downarrow  [SET UP I/O]  \downarrow  [SET UP SIO]$
SET UP SIO       SET       CANCEL         OOMMUNICATION RATE       2400       4800       960       19200       38400       57600       115200         DATA LENGTH       2       9       9       960       19200       38400       57600       115200         DATA LENGTH       2       9       9       100       15200       15200         DATA LENGTH       2       9       9       15200       15200       15200         ONTROL       X-CNTRI       2       100       100       15200       15200         OOMINICATION FORM       RS232C       4       LINE       2       LINE         1       2       3       4       5       6       7       8       0       1       4       BS	[Direct] / [Link] Communication Rate: 19200bps / 19200bps Data Length: 8Bits / 7Bits Stop Bit: 1Bit / 2Bits Parity: Odd / Even Control: ER Cntrl/ER Cntrl Communication Format: RS-232C/RS-232C or 4 Line * Select one in



3) Setting up Operation Surroundings	3) Setting up Operation Surroundings
57 Setting up operation burroundings	57 Setting up Operation Surroundings
	[MAIN MENU]
MAIN MENU	
INITIALIZE	[INITIALIZE]
1 SYSTEM ENVIRONMENT SETUP	
	[PLC SETUP]
4 INITIALIZE MEMORY	
5 SET UP TIME	
6 SET UP SOREEN	
	SET LID ODED ATION SUDDOUNDINGS MENU
	1:1
1 SET UP OPERATION SURROUNDINGS	(Only when using Serial Communication Unit)
SET UP OPERATION SURROUNDINGS	Starting Address of System Data Area:
	Arbitrary Address
STARTING ADDRESS OF SYSTEM DATA AREA [ 000000 ]	Unit No.: 0
SYSTEM AREA READING AREA SIZE (0-256) [0 ]	
RESET GP ON DATA WRITE ERROR ON OFF	



### **Communication Settings [PLC]**

[Connecting Directly]

1. Start up the ladder tool "GX Developer". Double-click [PC Parameter] under [Parameter] to execute.



A dialog box below opens.

Q	n(H) Parameter									×
	PLC name PLC system	PLC file	PLC RAS	Device	Program	Boot file	SFC	I/O assignmen	Serial	
									$\sim$	

2. Select the [Serial] tab.

- 1) Check [Use serial communication].
- 2) Set [Transmission speed] and click [End].



Keep [Sum check] checked. If you check it off, an error of receiving data will be occurred when communicating with the GP.



 Select [Offline]--> [Write to PLC] to open the [Write to PLC] dialog box. Check [PC/Network] under [Parameter]. Click [Execute] to start downloading the parameter file to the PLC.

After downloading completed, power off and on the PLC to restart up.



[Using Link Unit]

1. Start up the ladder tool "GX Developer". Double-click [PC Parameter] under [Parameter] to execute.



A dialog box below opens.

Ųn	(H) Parameter							
P	LC name PLC system	PLC file	PLC RAS	Device	Program	Boot file	SF	1/0 assignment

2. Select the [I/O assignment] tab.

Qn(H) Parameter				×
PLC name PLC system PLC	O file   PLO RAS   D	Device Program B	oot file SFC	I/O assignment
Slot         Type           0         PLC         PLS           1         0(**0)         Intelli.           2         1(**1)         3           3         2(**2)         4           4         3(**3)         5           5         4(**4)         6           6         5(**5)         7           7         Assigning the I/O address           Leaving this setting blank	Model name UD71C24 UD7	e Points 32points • • • • • • • • • • • • • • • • • • •	StarkY	Switch setting Detailed setting (2)
Base setting (*) Base model name	Power model name	Extension cable	Slots	Base mode • Auto
Main Ext.Base1 Ext.Base2 Ext.Base3 Ext.Base4 Ext.Dase5			* * Re	C Detail ference 8 Slot Default 12 Slot Default
(*)Settings should be set as same when using multiple CPU.         Import Multiple CPU Parameter         Read PLC data           Acknowledge XY assignment         Multiple CPU settings         Default         Check         End         Cancel				

1) Click [Type] to select [Intelli.]

\* By clicking the [Read PLC data] button, the type(s) and points of the unit(s) inserted currently into the base unit can be read automatically. (The PC needs to be connected to the CPU via ladder cable.)



#### 2) Click [Switch setting].

Swit	witch setting for I/O and intelligent function module 🛛 🛛 🗙									
						Inpu	t format	HEX		
	Slot	Туре	Model name	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5		
0	PLC	PLC								
1	0(*-0)	Intelli.	QJ71C24							
2	1(*-1)									
3	2(*-2)									
4	3(*-3)									
5	4(*-4)									
6	5(*-5)									
7	6(*-6)									
8	7(*-7)									
9	8(*-8)			-					_	
10	9(*-9)			-					-	
11	10(*-10)									
12	11(*-11)								-	
13	12(*-12)								-	
14	13(*-13)			_						
15	[14[*-14]								<b>•</b>	
	End Cancel									

A dialog box above opens.

Set [Switch setting] as below.

Settings Switch1 and Switch2 are for the RS-232C interface on CH1. Settings Switch3 and Switch4 are for the RS-422/485 interface on CH2. Settings Switch5 are for the machine number on both CH1 and CH2.

In this sample here, a sample setting only for CH1 is introduced, but set CH2 in a same way as CH1.

	Slot	Туре	Model name	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
0	PLC	PLC						
1	0(*-0)	Intelli.	QJ71C24	07FC	0004			0000
2	1(*-1)							



Switch	Set Value	Setting Description			
No.					
Switch 1	07FC	07> Transmission Speed 19,200bps			
		Bit	Settings	Item / Content	
		Bit0	OFF	Operation Setting /	
				Independent	
		Bit1	OFF	Data Bit / 7 bits	
		Bit2	ON	Parity Bit / Yes	
		Bit3	ON	Even/Odd Parity / Even	
		Bit4	ON	Stop Bit / 2 bits	
		Bit5	ON	Sum Check Code / Yes	
		Bit6	ON	Write during RUN / Enabled	
		Bit7	ON	Change Setting / Enabled	
Switch 2	0004	Commur	nication Proto	ocol Setting>	
		MC Prot	ocol Type 4		
Switch 3		Same as Switch 1			
Switch 4		Same as Switch 2			
Switch 5	0000	Machine Number : 0			
Note: When communicating CH1 and CH2 at the same time, set 115200 bps for the					
total	total of the transmission speed of both interfaces.				

Please see the setting description as below.

After completing the above settings, click [End].

The [Switch Setting] dialog box returns to the [Parameter Setting] dialog box. Click [End] again.

3) Select [Offline]--> [Write to PLC] to open the [Write to PLC] dialog box.

Check [PC/Network] under [Parameter]. Click [Execute] to start downloading the parameter file to the PLC.

After downloading completed, power off and on the PLC to restart up.



## **Connection Method**

[1] Connecting Directly

Туре	Conr	Distance	
Using QC30R2 by	GP Unit	PLC	
Mitsubishi Electric	25 pin Male	Mini DIN 9 pin	
Corporation			
*9-25pin Conversion Adapter is required.	Conversion Adapter QC30	Ferrite Core Ferrite Core Holder R2 by Mitsubishi	3 m
Using DQCABR2	GP Unit	PLC	
by Diatrend	25 pin Male	Mini DIN 9 pin	Range
	De	Ferrite Core Ferrite Core Holder	between 1.5 and 15m

## NOTE

- Attaching a Ferrite Core will reduce the amount of noise in your cable.
- Attach two Ferrite Cores to your cable, one at each end. Also, as shown in the drawing below, loop the cable once around the Ferrite Core.
- When using a data communication cable that is 3m (approx. 10 ft.) or longer, please use a cable made by Diatrend Corporation.

## **Recommended Products**





[- ···· 8 ··· · F	
Connecter/Cover	D-sub 25 pin Plug XM2A-2501 <omron co.=""></omron>
	Cover for D-sub 25 pin XM2S-2511 <omron co.=""></omron>
	Jack Screw XM2Z-0071 <omron co.=""></omron>
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45
Diagram	D-sub 25 pin Male D-sub 9 pin Male
	Lock-screw (mm) Lock nut (inch)
	Frame Frame Frame
	8 1
	3 2
	2 3
	20 4
	7 5
	<b>€</b>

### [Creating a 9-25 pin Conversion Adapter]



### [2] RS-232C Connection

Туре	Connection Method			
Using GP000-IS02-MS	C	<b>3</b> m		
Creating Cable	GP Unit (25p Male) PLC ( 1.FG 2.SD 3.RD 4.RS 5.CS 6.NC 7.SG 8.CD 20.ER Shield	9p Male) CD RD SD ER SG DR RS CS FG		



### \* If a communication cable is used, it must be connected to the SG.



The optional cable, GP000-IS02-MS is 3m long. If you need a longer cable or shorter, please use a User-Created cable to connect.

### **Recommended Products**

Connecter/Cover for GP	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>		
	Cover for D-sub 25 pin	XM2S-2511 <omron co.=""></omron>		
	Jack Screw	XM2Z-0071 <omron co.=""></omron>		
Cable	CO-MA-VV-SB5P × 28AWG <hitachi cable="" ltd.=""></hitachi>			
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45			



### [3] RS-422 Connection

Туре	Connection Method		
Using GP230-IS11-O	GP Unit (25p Male) PLC Terminal Block RDA O SDA RDB SDB SDA RDA SDB RDB SDB RDB SG SG FG FG Termination Resistance 330	5m	
Extending GP230-IS11-O	Cable with 6 wires GP Unit (25p Male) RDA O RDB O SDA O SDA O SDB	5 - 500m	
Using GP070-CN10-O	Conversion Adapter PLC Terminal Block Termination RDA SDA SDA Resistance SDA SDB SDB RDA SDA SDA RDA RDA SDB FG SG FG Termination Resistance S000 Shield 330	Within 500m	







\* If a communication cable is used, it must be connected to the SG.

\* Termination Resistance

PLC / between SDA and SDB, between RDA and RDB : 330 (with wattage specified on PLC)

GP Unit / as required (Refer to Cable Diagrams) : 330 (with wattage specified on PLC)

Connecter/Cover for GP	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>		
	Cover for D-sub 25 pin	XM2S-2511 <omron co.=""></omron>		
	Jack Screw	XM2Z-0071 <omron co.=""></omron>		
Cable	SPEV (SB) -MPC-0.2*3P <mitsubishi cable="" ind.=""></mitsubishi>			
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45			

### **Recommended Products**