

# Connecting Rockwell (Allen-Bradley) PLC

# <u> Controllogix 5000 Series - DF1 Serial</u>



GP

Model	Product	Remark
GP	GP77 / 77R Series GP2000 Series	
GLC	GLC2000 Series	

\* Information for connecting Handy Type is not on this instruction.

### PLC

CPU	Link I/F	Communication Method	Connection Cable	
1756-L1				
1756-L1M1				GP
1756-L1M2				
1756-L1M3	Link I/F on the CPU Unit	RS-232C	Method	
1756-L55M13	Onic		witchiou	
1756-L55M14				
1756-L55M16				

\* CompactLogix is not officially supported, however, connection performance has been confirmed. Please check the connection before using. We are not responsible for communication problem at all.











## Communication Setting Sample

GP Settings		PLC Settings	
Speed	19200 bps	Baud Rate *1	19200 bps
Data Length	8 bit	Data Bits *1	8 bit
Stop Bit	1 bit	Stop Bit <sup>*1</sup>	1 bit
Parity	Even	Parity <sup>*1</sup>	Even
Flow Control	ER (DTR/CTS)		
SIO Type	RS-232C		
Machine No.	0	Station Address *2	0
		Mode *1	System
		Control Line *1	No Handshake
		RTS Send Delay *1	0
		RTS Off Delay *1	0
		Protocol *2	DF1 Slave
		Transmit Retries *2	3
		Slave Poll Timeout	3000
		*2	
		EOT Suppression *2	Not Checked
		Error Detection *2	BCC
		Enable Duplicate	Not Checked
		Detection *2	(Disable )

\*1 Set in the [Serial Port] menu of the ladder software RSLogix5000 by Rockwell.

\*2 Set in the [System Protocol] menu of the ladder software RSLogix5000 by Rockwell.



#### Communication Settings [PLC]

Two programs are required for Controllogix PLC communication settings.

- 1. RSLinx Software to connect PLC and PC with RSLogix5000 installed (Ver.2.41.00 is used in this sample.)
- 2. RSLogix5000 Ladder Software (Ver.7.00.00 is used in this sample.)
  - \* Communication Settings on RSLogix5000

Please connect PLC and PC with RSLinx before creating a ladder. (Contact Rockwell Automation, Inc. for more details.)

1) Start up RSLogix5000.

If it is a new project, select [File] --> [New...] and set the CPU type.

New Controller		×
Vendor:	Allen-Bradley	
Туре:	1756-L55/A ControlLogix 5555 Controller 🗸	ОК
Name:	1756-L1 ControlLogix 5550 Controller 1756-L53/A ControlLogix 5553 Controller	Cancel
Description:	1756-L55/A ControlLogix 5555 Controller 1769-L20 CompactLogix 5320 Controller	Help
Chassis Type:	1756-A10 10-Slot ControlLogix Chassis	
Slot	0 🕂 Revision: 17 18 🕂	
Create In:	C:\RSLogix 5000\Projects	Browse



o RSLogix 5000 - ControllogixEther\_Lesit at a subrologizations (testive - OX File Edit View Search Logic Communications Tools Window Help 11 1 Pro • 0 .« \* No 1 ) i martin Ker & "martinean & spectration 1.41 Pat •\_\_\_ 1.29 Alt+Enter Properties **Controller Properties** 😋 MainTask – 🔅 MainProgram Program ..... Unscheduled Prov Trends Data Types ing User-Defined + R Predefined Module-Defined I/O Configuration Edit properties for selected component Ť

If it is an existing project, select [Edit] --> [Properties].

The [Controller Properties] window will appear.



2) Select the [Serial Port] tab and set as below.

Minor Faults General So	Date/Tim erial Port*	ne   Syster	Advanced n Protocol	SFC E User Pro	xecution tocol	 Major	File Faults
Mode:	System	-			Show Off	ina Vat	885
Baud Rate:	19200	-		(			
Data Bits:	8	-					
Parity:	Even	-					
Stop Bits:	1	-					
Control Line:	No Handsł	nake	-		Ν		
	T Contenda	sus Cæires			И		
RTS Send Delay:	0	(x20 ms)					
RTS Off Delay:	0	(x20 ms)					

Mode	:System
Baud Rate	:19200 bps
Data Bits	:8 bit
Parity	:Even
Stop Bit	:1 bit
Control Line	:No Handshake
RTS Send Dela	ay :0
RTS Off Delay	:0



3) Select the [System Protocol] tab and set the communication settings as below.

Minor Faults   General   Seria	Date/Time Advance	ed   SFC Execution   	File )
Protocol: Station Address: Transmit Retries: Slave Poll Timeout:	DF1 Slave	Error Detection	ion

Protocol:DF1 SlaveStation Address:0Transmit Retries:3Slave Poll Timeout:3000EOT Suppression:Not CheckedError Detection:BCC



4) Download the serial port communication settings.

Select [Communications] --> [Download] to download the communication settings.



The PLC communication settings are here completed. Please confirm that CPU is recognized on RSLogix before downloading the project.

) 🖳 Workstation, PFD		Go Online
응 윪 Linx Gateways, 응 윪 AB_DF1-1, DF1	, Ethernet	Upload
은 🖞 01, 1756-L1 은 윪 AB_ETH-1, Ethe	/A LOGIX5550, ControllogixEther_test ernet	Download
<ul> <li>□ 192.168.0.:</li> <li>□ 192.1</li></ul>	1, 1756-ENET/B, 1756-ENET/B ne, 1756-A4/A 1756-L1/A LOGIX5550, ControllogixEther test	Recent
<b>j</b> 01,	1756-ENET/B	Apply
		Close
		Help
rrent Path: AB DF1.1		

(Screen of RSLinx / Who Active)



#### Assigning Devices

With Rockwell PLC, the required arrays and number of elements are assigned on RSLogix5000. If you connect it with GP/GLC without assigning here, a host communication error will occur.

Select [Logic] to create arrays and the number of elements.

<b>S RSLogix 5000 - control</b> File Edit View Search	llogix50003451al()/344()) Logic Communications Tools Wir	ndow Help
	Open	- <u>&amp;&amp;&amp;</u>
Offline	Monitor Tags Edit Tags	h. <none></none>
No Forces	Produced Tags が	
No Edits	Map PLC/SLC Messages	
	Verify 🕨 🕨	www.asta Via V jarah fi made V haday fi and i fi maden to

A bar to set arrays will appear. Then right- click [Edit Tag Properties].

New Tag		×	
Name:		ок	Input the discretionary array name
Description:	<u>م</u> ۲	Cancel	
Тад Туре:	Base     Alias     Produced     2     1     consumers     Consumers		Click the button to specify the
Data Type:		Contigue	array type.
Scope:	ControllogixEther_test(controller)		
Style:	<u></u>		



Select Data Type	<u>×</u>	
Data Types:		
	OK	Select BOOL, SINT, INT,
ALARM AXIS	Cancel	DINT, OR REAL for the array
BOOL CAM	Help	type.
CONTROL CONTROL COUNTEB		
DEADTIME DERIVATIVE		Specify the number of
	<u> </u>	elements.
Dim 0 Dim 1	Dim 2	* Dimension 1 and Dimension
	0 🚊	2 are not supported by
		GP-PRO PB/III. Do not use

By the above settings, the following array will be made.



#### [e.g.; Specifying BOOL]





#### [e.g.; Specifying INT]



#### [e.g.; Specifying SINT]







#### [e.g.; Specifying DINT]



#### [e.g.; Specifying REAL (Floating Point)]







## Selecting PLC Type

Start up GP-PRO /PBIII.

Select the following PLC Type when creating the project file.

🔐 a.prw : Untit	led - Project N	lanager			×
Project Screen/	Setup <u>C</u> ontrol	<u>U</u> tility <u>H</u> elp			
		000	GP,PRO/ -©-Packa	PB <u>III</u> Jge03	
GP Pro	Setup Dject Log New G Open G	ic Program Edit Monitor I/O Variable	Editor Screen C Alarm Print	Transfer Transfer Simulation	
GP2600	aarey controrcog		Cha Pr. /	inge Mngr Exit FO-Face	
Allen B	bradley Co	ntrolLogi	xDF1		11.



### Communication Settings [GP]

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

Select [GP Setup] on Project Manager.





Select [Transfer] --> [Setup] --> [Transfer Settings].

Send Information	Communications P	ort
Upload Information	⊙ <u>с</u> ом	
✓ GP System Screen Filmo DataICF cardi	Comm Port	COM1   Retry Count
Data Trans Func CSV Data(CF card)	Baud Rate	115.2K (bps)
	C <u>E</u> thernet	
Transfer Method • Send All Screens	<u>I</u> P Address	0. 0. 0. 0 Port 8000
Automatically Send Changed Screens     Send Liser Selected Screens	C Ethernet: Auto	Acquistion
	C Memory Loader	
C _ Eorce System Setup  C _ Do NOT Perform Setup Setup CFG file : C _ English C _ Japanese C _ Selection C\Program Files\pro-face\ProPBt	Simulation System Screen Win\protocol\ Browse	
OK	Cancel	Help

Transfer to GP after settings completed.



### 2 [GP Settings]

1) Checking GP Type	1) Checking GP Type
MAIN MENU I INITIALIZE 2 SCREEN DATA TRANSFER 3 SELF-DIAGNOSIS 4 RIN 2000 V4.10 SIM-I TAK. V3.34 CTRL_LOGIX_DFI V1.41	If you have selected Allen Bradley ControlLogix DF1, the following will be shown. "CTRL_LOGIX_DF1"
2) Communication Settings	2) Communication Settings
MAIN MENU INITIALIZE SET UP I/O 2 SET UP PRINTER 3 SET UP TOUCH PANEL 4 COMMUNICATION SETUP 5 SOUND SETTINGS	[MAIN MENU] [INITIALIZE] [SET UP I/O] [SET UP SIO]
SET UP SI0       SET       CANCEL         COMMUNICATION RATE       2400       4800       9600       19200       38400       57600       115200         DATA LENGTH       T       8       8       8       7       8       9       115200         DATA LENGTH       T       8       7       8       9       115200       115200         DATA LENGTH       T       8       7       8       9       1       115200         DATA LENGTH       T       2       8       7       8       9       1       1       1       1       2       1       1       2       1       1       2       3       4       1       1       1       1       1       2       3       4       5       6       7       8       9       1       4       5       1       1       1       1       2       3       4       1 <t< td=""><td>Communication Rate :19200bps Data Length : 8 Bit Stop Bit :1 Bit Parity :Even Control :ER Communication Format:RS-232C</td></t<>	Communication Rate :19200bps Data Length : 8 Bit Stop Bit :1 Bit Parity :Even Control :ER Communication Format:RS-232C



3) Setting up Operation Surroundings	3) Setting up Operation Surroundings
MAIN MENU INITIALIZE	[MAIN MENU] [INITIALIZE]
2 SET UP 1/0	[PLC SETUP]
4 INITIALIZE MEMORY 5 SET UP TIME	[PLC SETUP]
6 SET UP SOREEN	
SET UP OPERATION SURROUNDINGS SET CANCEL SYSTEM DATA AREA START FILE No. [ INTODO ] START ADDRESS [0]	SYSTEM DATA AREA START FILE No.: The INT device is fixed.
UNIT NO. [0]	Array Number (Arbitrary)
RESET OP ON DATA HRITE ERROR ON OFF	START ADDRESS: Element Number (Arbitrary)
	Unit No . :0



### How to see Addresses of Controllogix and GP-PRO/PBIII

#### [Seeing Address on GP-PRO]



!!! Now, let's recall the arrays assigned on ControlLogix !!!



# IMPORTANT ! ! Array No. (GP-PRO) = Array Name (ControlLogix) IS WRONG ! !

Now what you need to do is.... Mapping



## Mapping

### [What is mapping?]

If you set addresses on GP-PRO PB/III, you cannot specify the array names (Tag Name). Instead of specifying the array names, select the array numbers. These file numbers are specified arbitrarily. You may need to map the array names and numbers on RSLogix5000. This procedure is called "Mapping".

Εø	)
1.S.	)

Array Name	RSLogix5000	Array No.	$\left( \right)$	GP-Pro PB/III Specifying Device	
TestaddressBool TestaddressSint TestaddressInt TestaddressDint TestaddressReal		1 2 3 4 5		BOOL, File No.1 SINT, File No.2 INT, File No.3 DINT, File No.4 REAL, File No.5	

Slect [Logic] --> [Map PLC/SLC Messages...] to start mapping.

o RSLogix 5000 - Control	logixEther_test in Control		
File Edit View Search L	ogic Communications Tools	Win	dow Help
<u> </u>	Open		- <b>A A A D</b>
	Monitor Tags		
	Edit Tags		🔹 a 2 🖗 🖓 🖓 🖉 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
No Edits 🛛 🗸	Produced Tags		
Path:* AB_DF1-1\1	Map PLC/SLC Messages		A Manustre V 20 V post of resident V
Controller Controller	Verify	•	



File Number	Tag Name	Cance
1	TestAddressBOOL	
4	TestAddressDINT	Help
3	TestAddressINT	
5	TestAddressREAL	
2	TestAddressSINT	
	Delete Map	

Specify an array number for File Number, and select an array name for Tag Name. You can specify the array name from the pull-down menu on Tag Name.

By the above settings, file numbers are named toward each Tag Name as below.



\* Array numbers (File Number) cannot be duplicated in any array type.



#### [Precautions for Address]

\* Range of Accessible Address with GP-PRO PB/III

	Device	Bit Address	Word Address	Remark	
1	D:4	BOOL00000000 to			
	ы	BOOL99999931	ROOF000000 fo ROOF00000		
2	8 bit integer		SINT000000 to SINT999998	Bit7 ÷2	L/H
3	16 bit integer		INT000000 to INT999999	Bit15	
4	32 bit integer		DINT000000 to DINT999999	Bit32	
5	32 bit float		REAL000000 to REAL999999		H/L

\* Specify the INT device for the system start address. Also create the INT array on RSLogix. Without creating, an address error will occur.

\* In case to specify REAL (Floating Point), only 32-bit float settings of E tag and K tag can be used.

\* In case that BOOL is specified, the notations of RSLogix and that of GP-PRO PBIII are different.

GP-PRO/PB	00000000 to 00000031	00000100 to 00000131	00000200 to 00000231	-	00099900 o 00099931
RS-Logix	0 to 31	32 to 63	64 to 95	-	31968 to 31999



\* In case that SINT is specified, you cannot specify an odd number for elements with GP-Pro PB/III. Specify an even number.



\* With GP-PRO, up to 64 data can be read/written toward the arrays set with RSLogix. The array number to assign can be set with up to 999.



### **Connection Method**

#### **RS-232C** Connection

Туре	Connection Me	Distance	
Creating Cable	GP Unit (Dsub25p Male) 1.FG 2.SD 3.RD 4.RS 5.CS 6.NC 7.SG 8.CD 20.ER	PLC (Dsub9p Male) 1.CD 2.RXD 3.TXD 4.DTR 5.COMMON 6.DSR 7.RTS 8.CTS	Within 15m



\* Connect the shield to the GP's FG terminal.

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

### **Recommended Products**

Connector/	Dsub25 pin Plug	XM2A-2501 <omron co.=""></omron>
Cover for GP	Cover for Dsub25 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 Threads : M2.6 × 0.45	