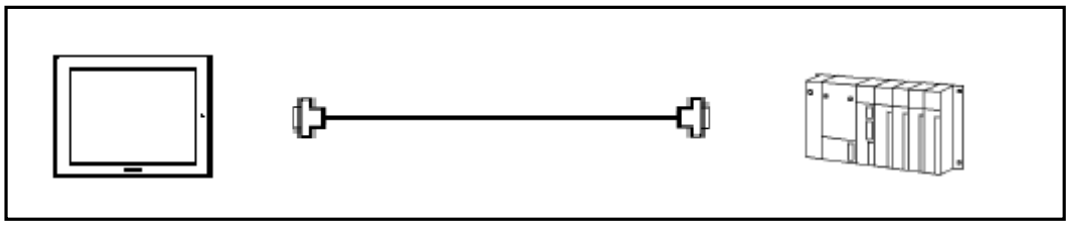
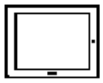
Connecting Rockwell (Allen-Bradley) PLC

Controllogix 5000 Series - DF1 Serial

System Structure

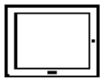


GP

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 1756-L1M2 1756-L1M3 1756-L55M13 1756-L55M14 1756-L55M16	Link I/F on the CPU Unit	RS-232C	**Connection Method**	GP 

* 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.

Procedure to Connect PLC

Set the GP and PLC settings as the communication setting sample.

Refer to **Communication Setting Sample**

↓

Set PLC communication.

Refer to **Communication Settings [PLC]**

↓

Allocate addresses to PLC.

Refer to **Assigning Devices**

↓

Select PLC Type on GP-PRO/PBⅢ C-Package.

Refer to **Selecting PLC Type**

↓

Set GP communication.
There are 2 ways.

- Setting on GP-PRO/PBⅢ C-Package and transfer the data
- Setting on the Offline of the GP main unit.

Refer to **Communication Settings**

Map addresses.

Refer to
How to see Addresses of Controllogix and GP-PRO/PBIII
&
Mapping

Connect PLC to GP.
Please check the connection method according to the connection type, or distance.

Refer to
Communication Method
& **Recommended Products**

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 *1	1 bit
Parity	Even	Parity *1	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 *2	3000
		EOT Suppression *2	Not Checked
		Error Detection *2	BCC
		Enable Duplicate Detection *2	Not Checked (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.

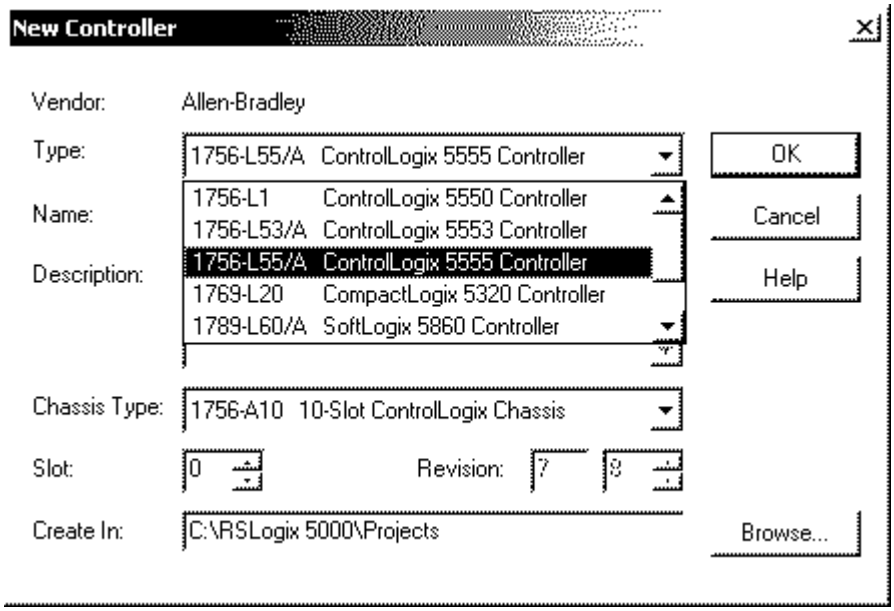
1. RSLinx – Software to connect PLC and PC with RSLogix5000 installed
   (Ver.2.41.00 is used in this sample.)
2. RSLogix5000 – Ladder Software (Ver.7.00.00 is used in this sample.)

* Communication Settings on RSLogix5000

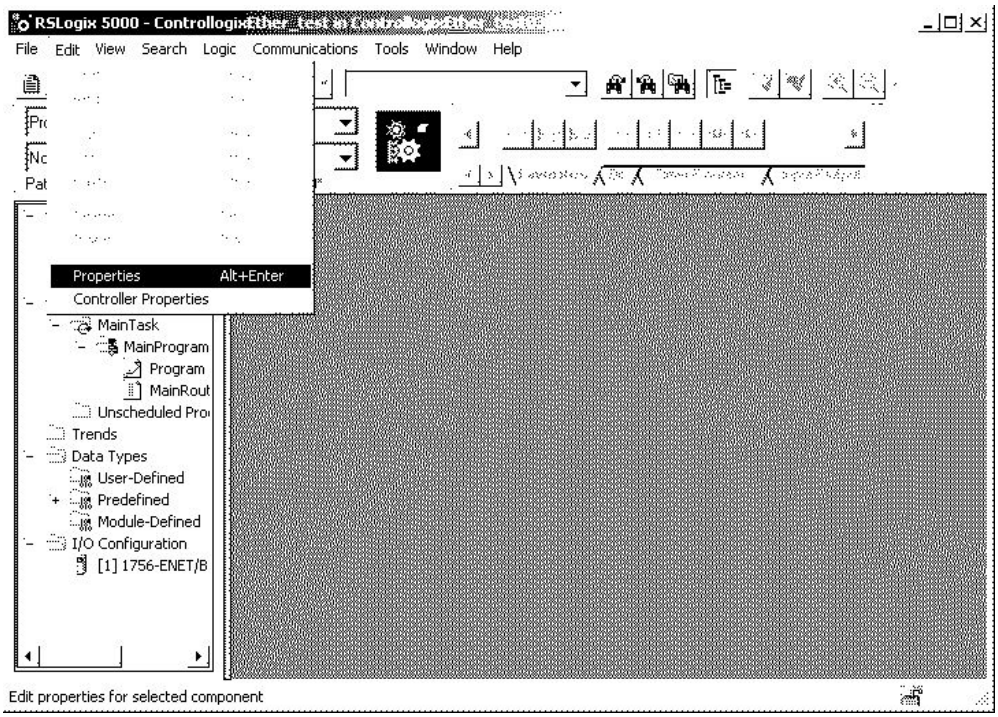
Please connect PLC and PC with RSLinx before creating a ladder. (Contact Rockwell Automation, Inc. for more details.)

1) Start up RSLogix5000.

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

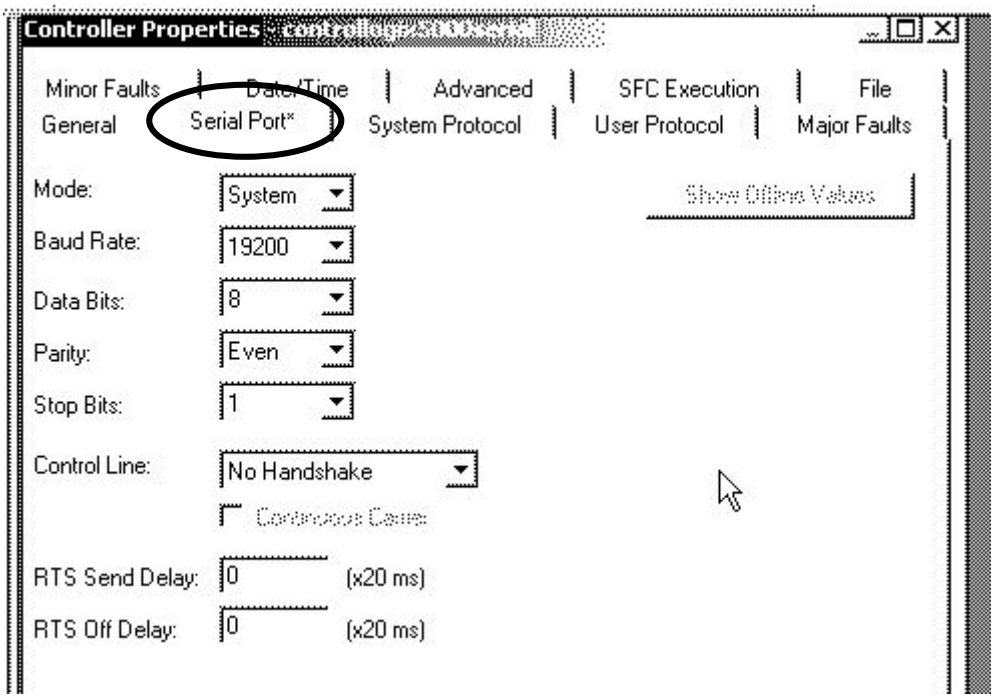


If it is an existing project, select [Edit] --> [Properties].



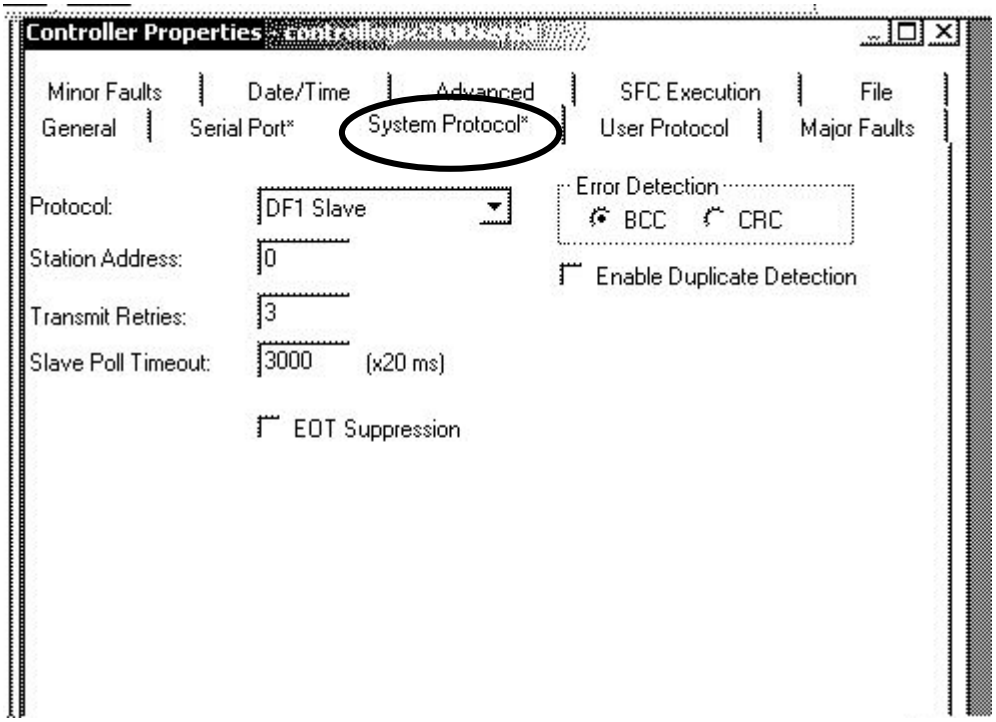
The [Controller Properties] window will appear.

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



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

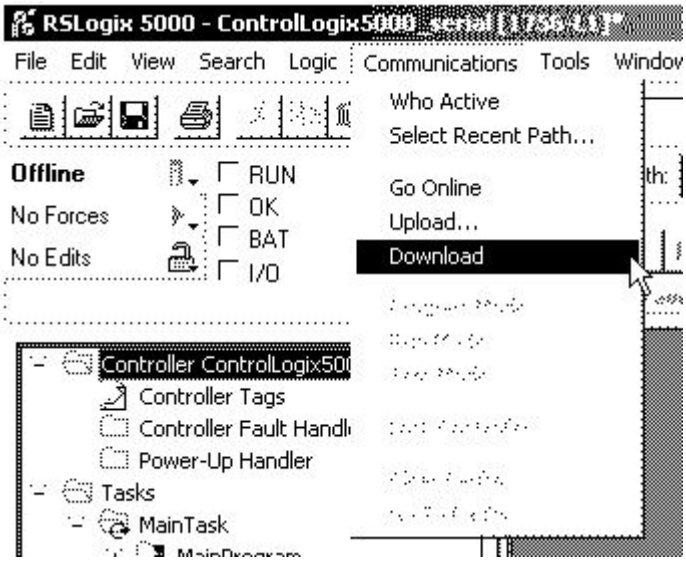
3) Select the [System Protocol] tab and set the communication settings as below.



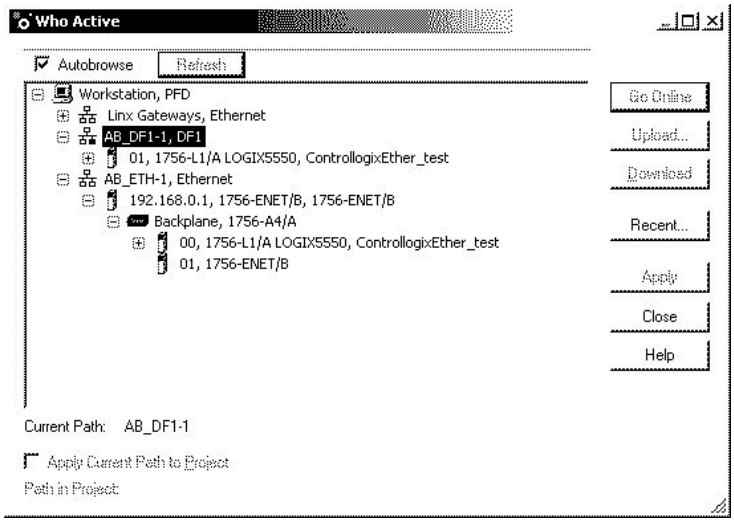
Protocol :DF1 Slave
Station Address :0
Transmit Retries :3
Slave Poll Timeout :3000
EOT Suppression :Not Checked
Error Detection :BCC

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.

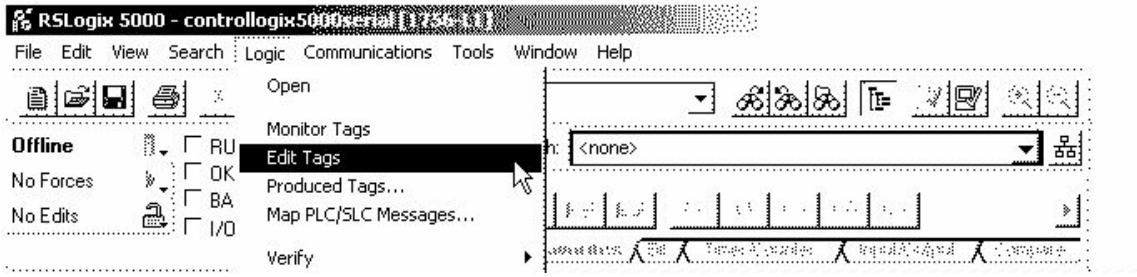


(Screen of RSLinx / Who Active)

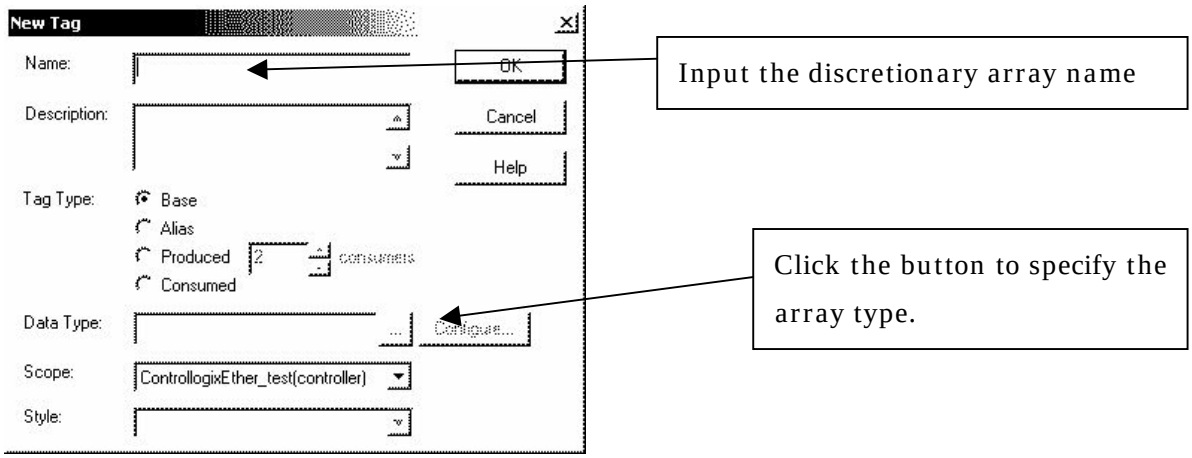
Assigning Devices

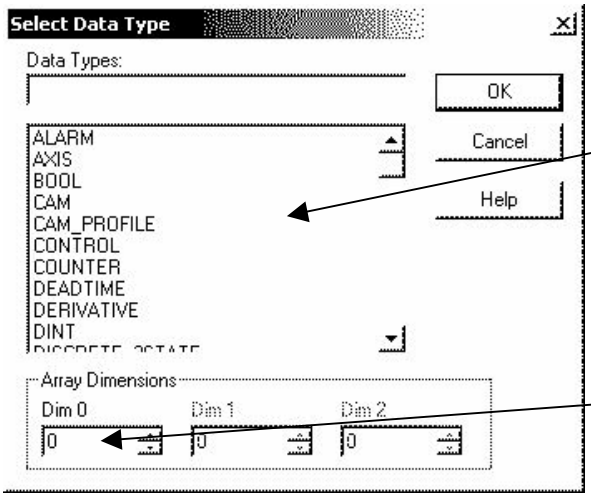
With Rockwell PLC, the required arrays and number of elements are assigned on RSLogix5000. If you connect it with GP/GLC without assigning here, a host communication error will occur.

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



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

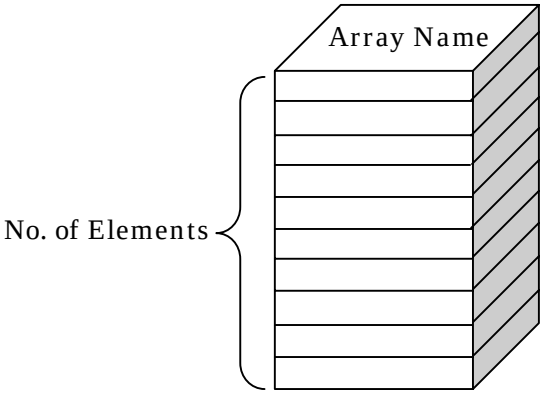




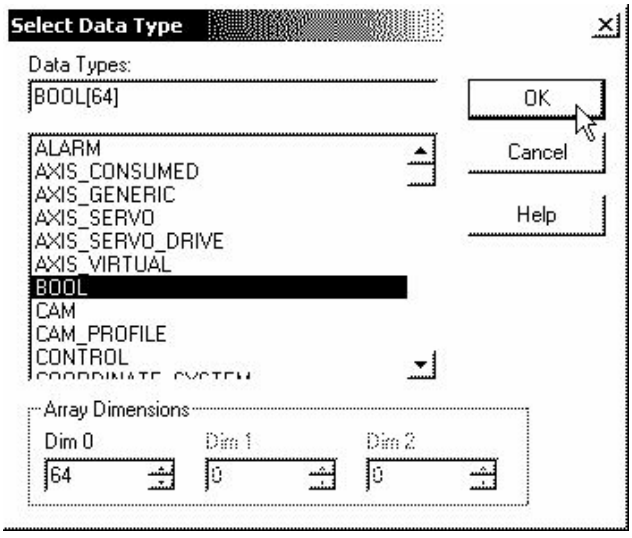
Select BOOL, SINT, INT, DINT, OR REAL for the array type.

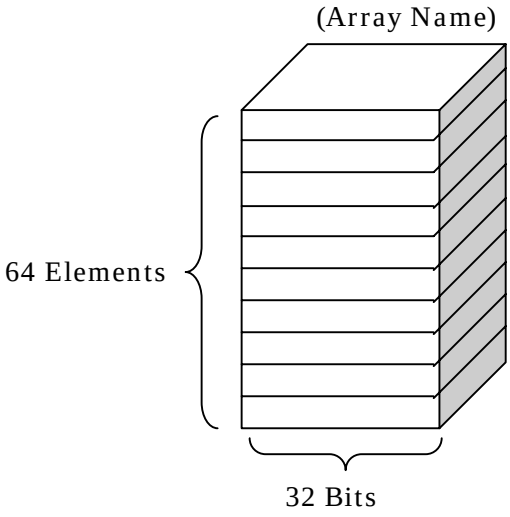
Specify the number of elements.
* Dimension 1 and Dimension 2 are not supported by GP-PRO PB/III. Do not use

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

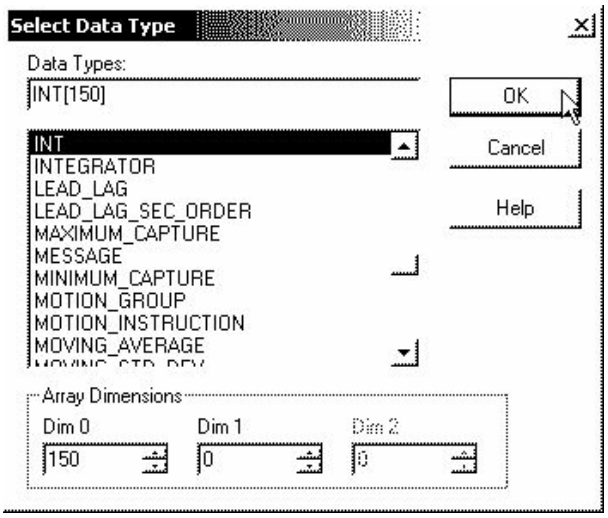


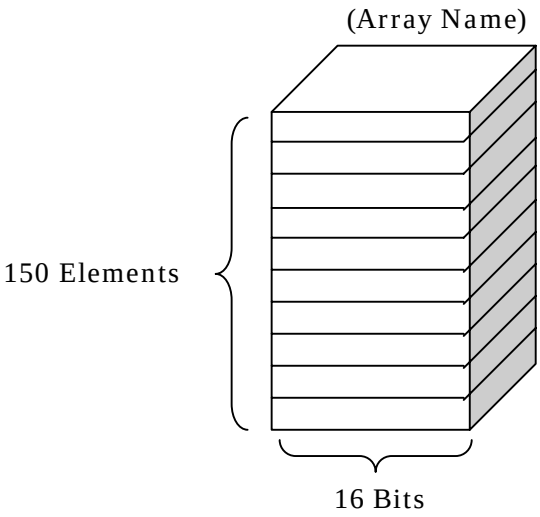
[e.g.; Specifying BOOL]



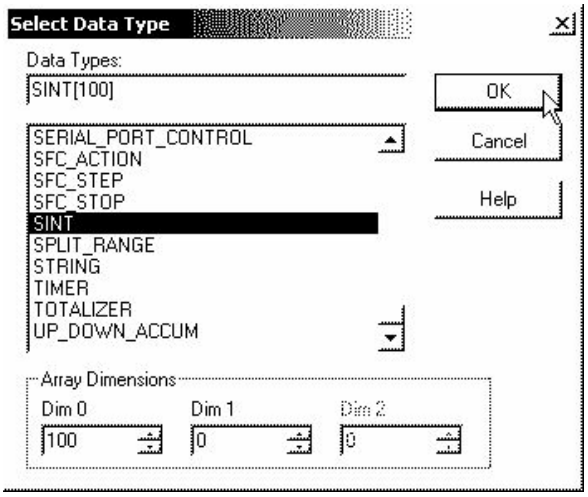


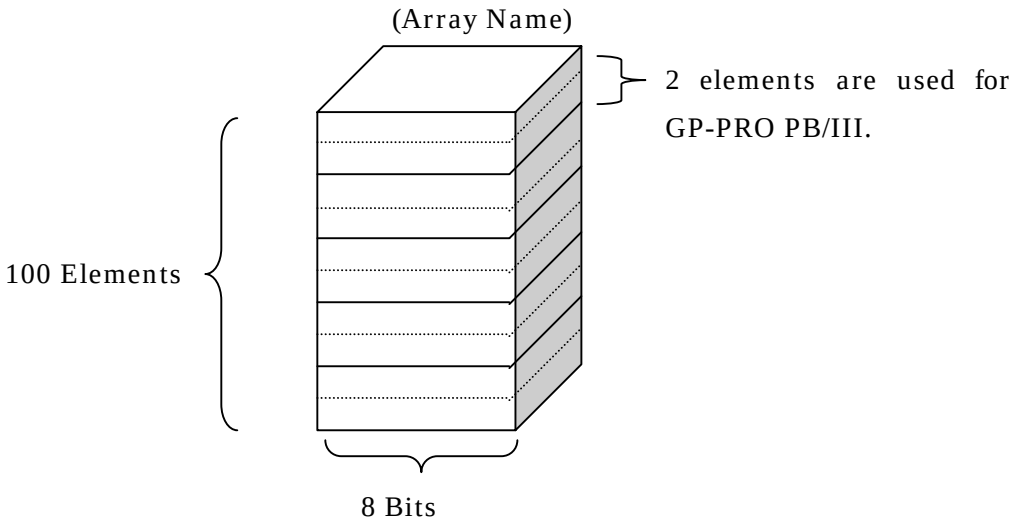
[e.g.; Specifying INT]



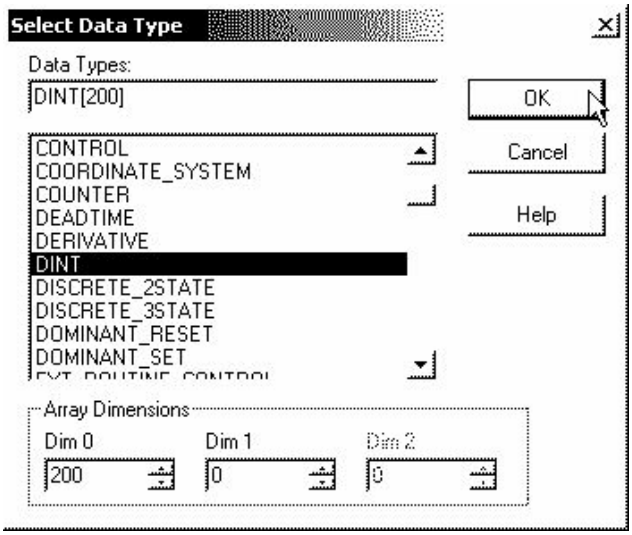


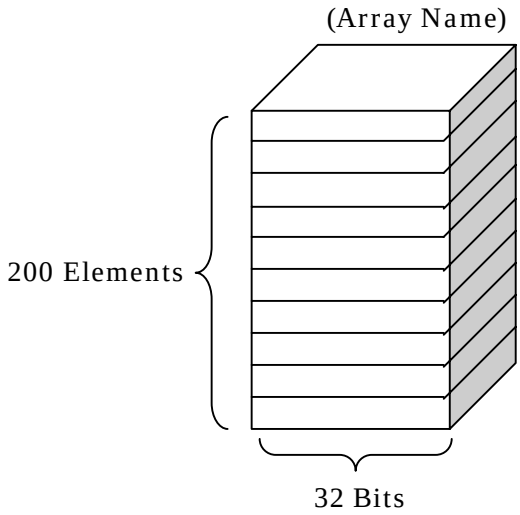
[e.g.; Specifying SINT]



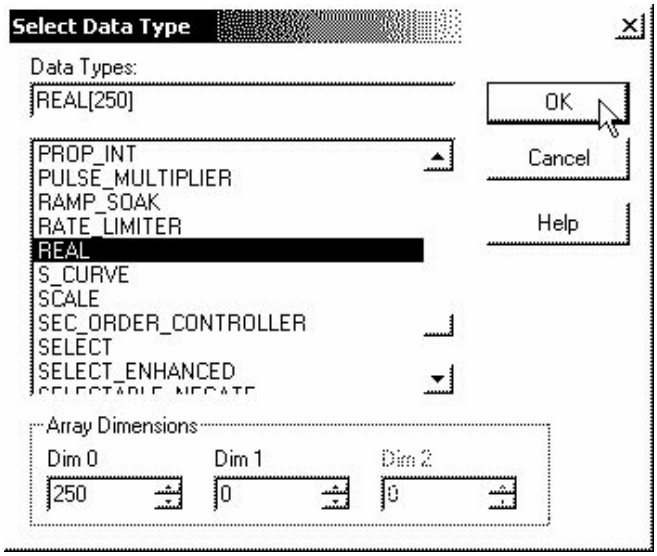


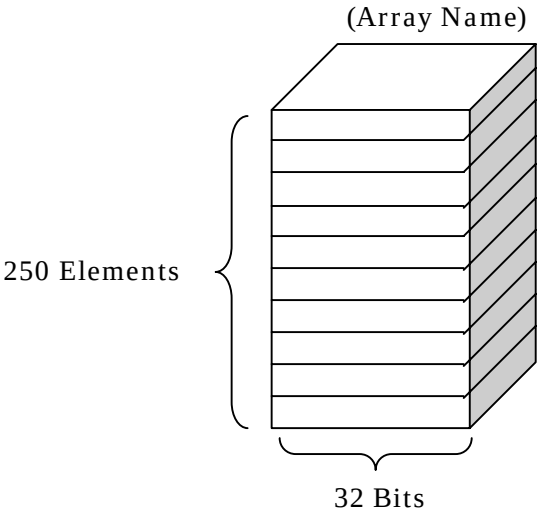
[e.g.; Specifying DINT]





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





Selecting PLC Type

Start up GP-PRO /PBIII.

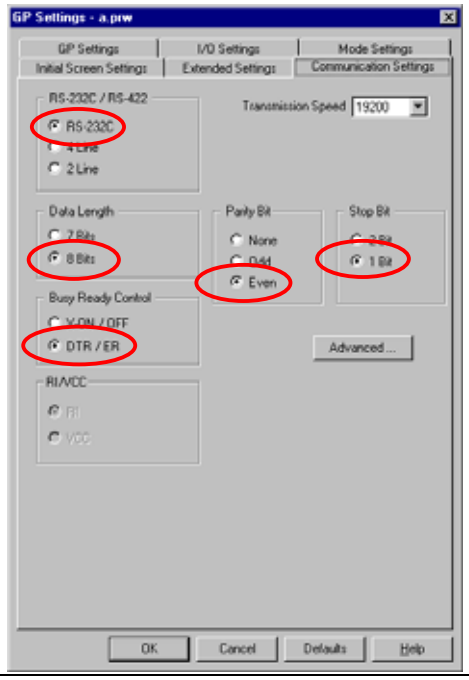
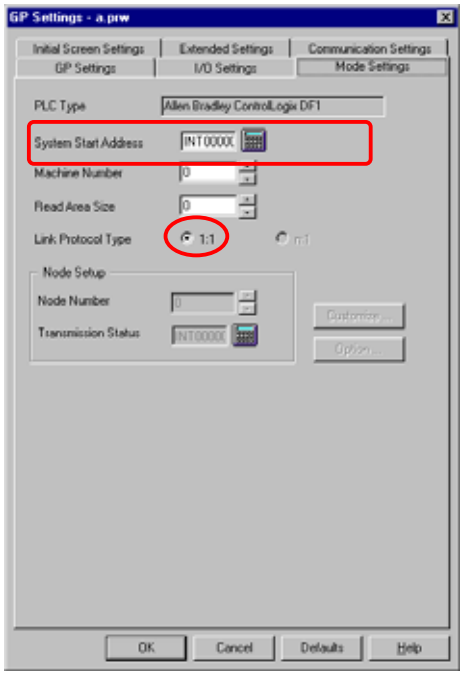
Select the following PLC Type when creating the project file.

Allen Bradley ControlLogixDF1

Communication Settings [GP]

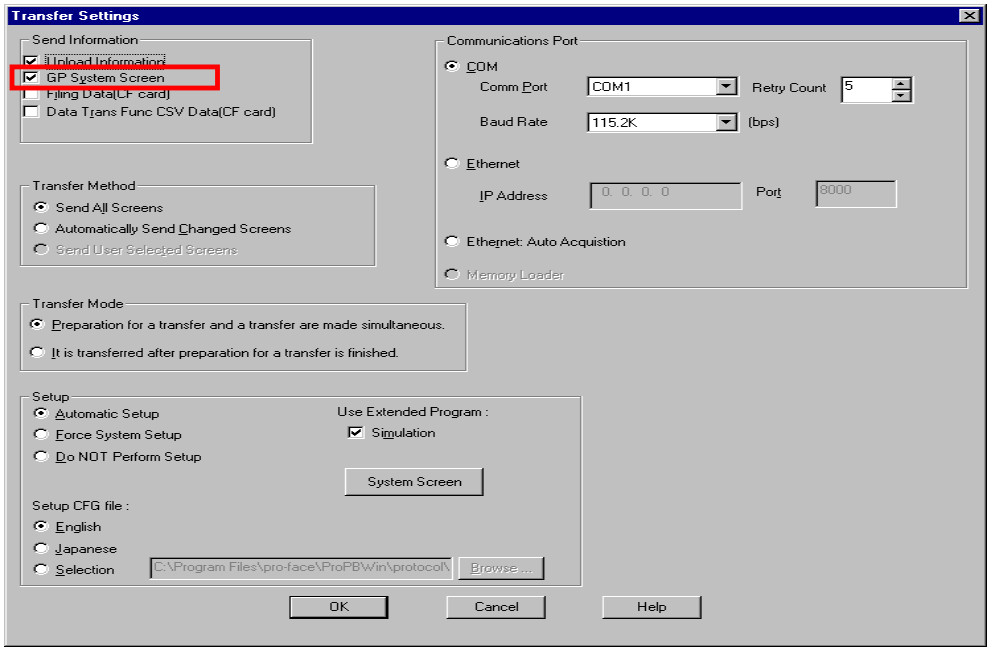
1 [GP-PRO/PBIII C-Package Setting]

Select [GP Setup] on Project Manager.

1) Communication Settings 	1) Communication Settings Transmission Speed : 19200bps Data Length : 8 Bits Stop Bit : 1 Bit Parity Bit : Even Busy Ready Control : DTR / ER RS-232C/ RS-422 : RS-232C
2) Mode Settings 	2) Mode Settings System Start Address: The INT device is fixed. Array No. and Element No. are set arbitrarily. Machine Number : 0 Link Protocol Type : 1:1

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

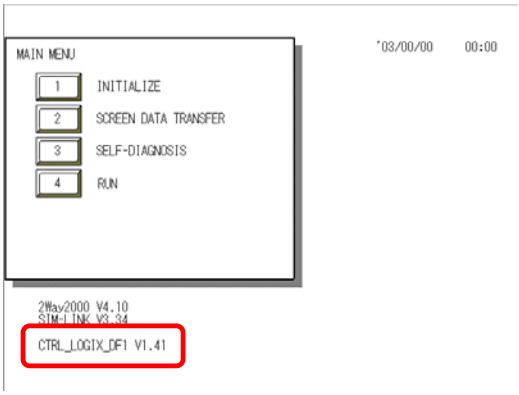
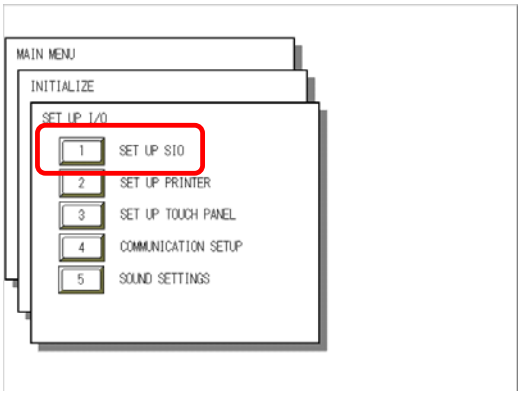
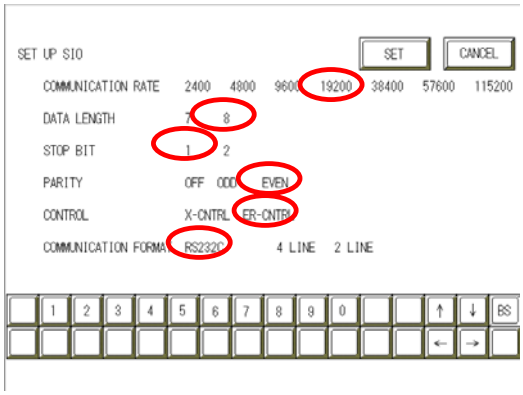
3) Transfer Settings

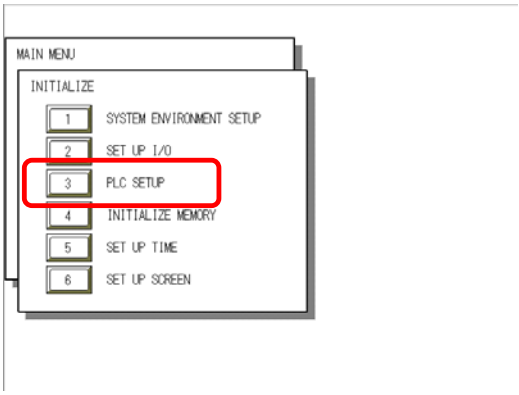
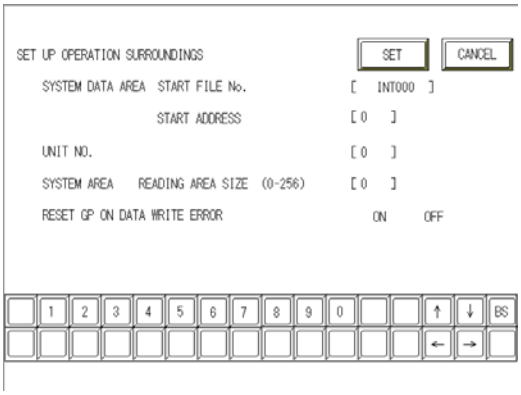


3) Transfer Settings　　GP System Settings: Checked

Transfer to GP after settings completed.

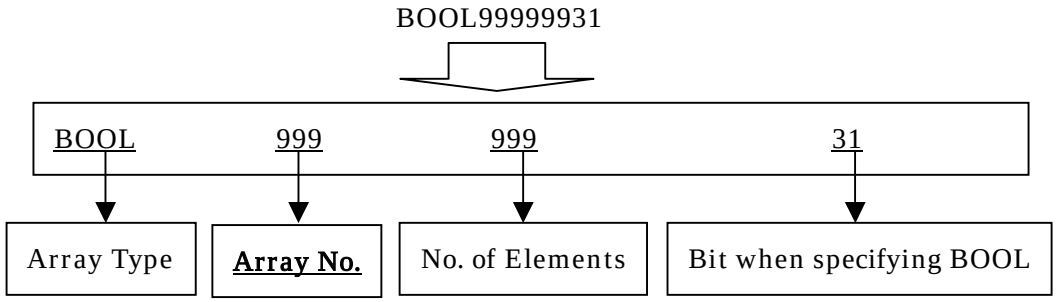
2 [GP Settings]

1) Checking GP Type 	1) Checking GP Type 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] ↓ [SET UP SIO]
	Communication Rate :19200bps Data Length : 8 Bit Stop Bit :1 Bit Parity :Even Control :ER Communication Format:RS-232C

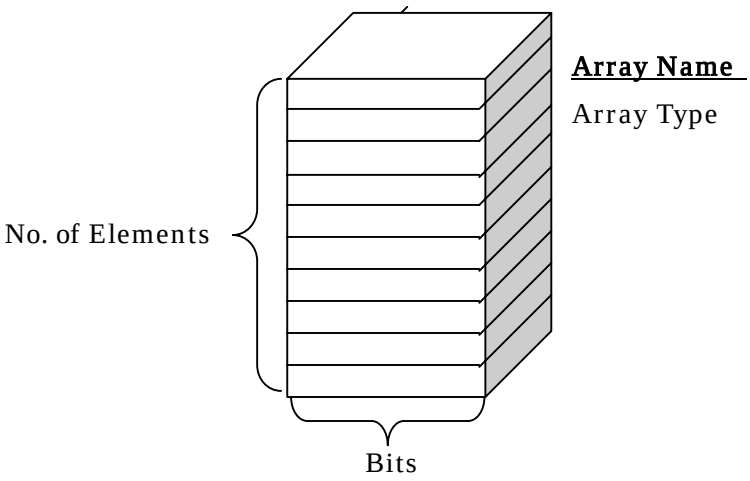
3) Setting up Operation Surroundings  	3) Setting up Operation Surroundings [MAIN MENU] ↓ [INITIALIZE] ↓ [PLC SETUP] ↓ [PLC SETUP]
 	SYSTEM DATA AREA START FILE No.: The INT device is fixed. Array Number (Arbitrary) START ADDRESS: Element Number (Arbitrary) Unit No. :0

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！！

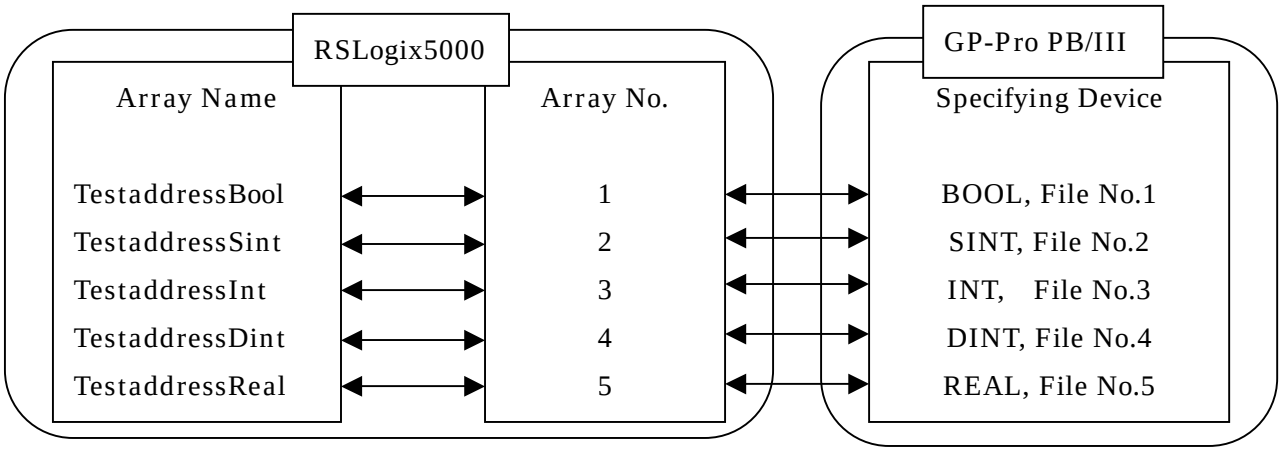
Now what you need to do is….
Mapping

Mapping

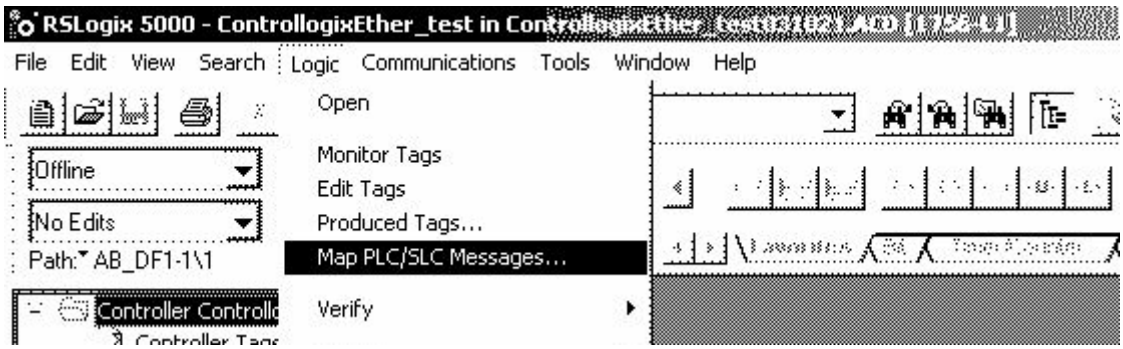
[What is mapping?]

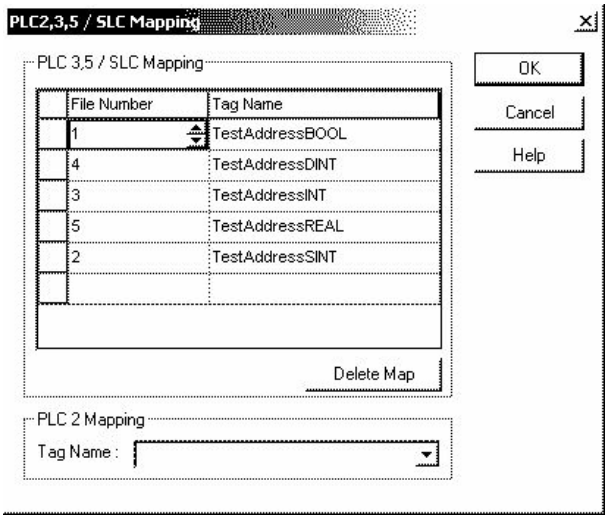
If you set addresses on GP-PRO PB/III, you cannot specify the array names (Tag Name). Instead of specifying the array names, select the array numbers. These file numbers are specified arbitrarily. You may need to map the array names and numbers on RSLogix5000. This procedure is called "Mapping".

E.g.)



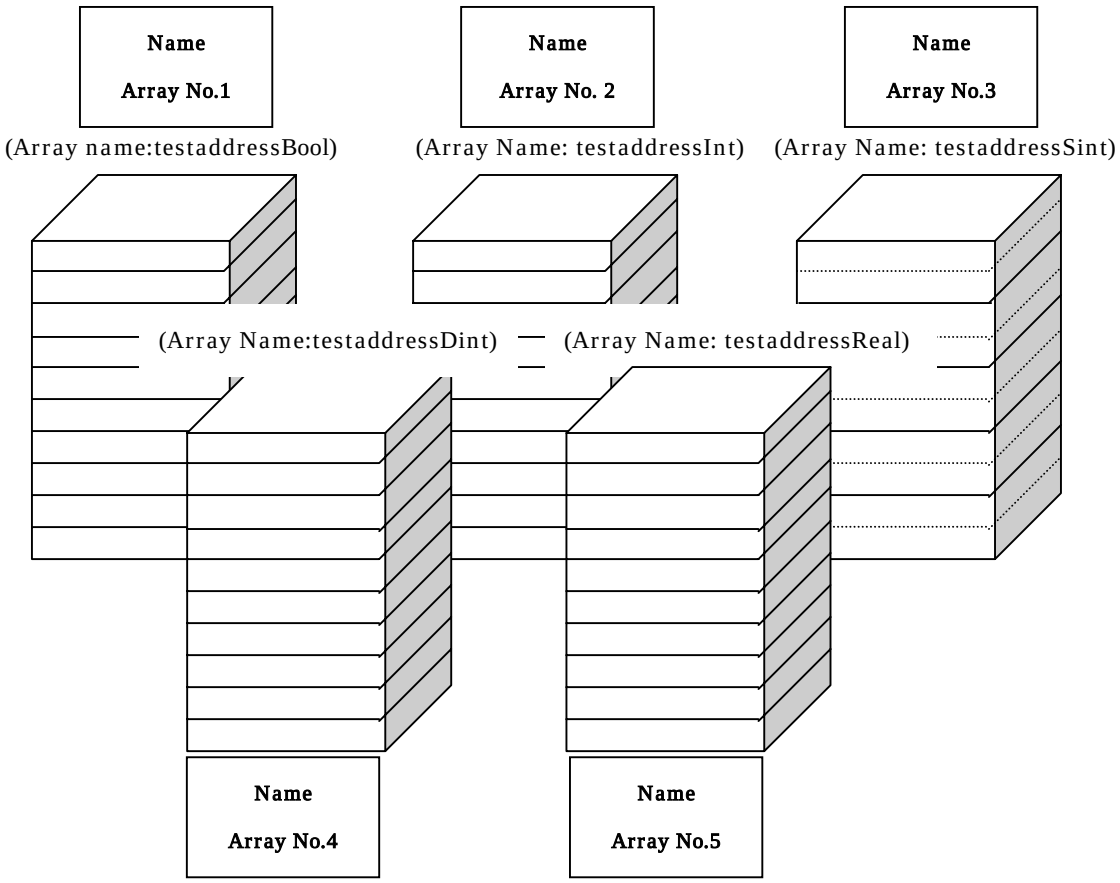
Slect [Logic] --> [Map PLC/SLC Messages...] to start mapping.





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	Bit	BOOL00000000 to BOOL99999931	BOOL000000 to BOOL999999		L/H
2	8 bit integer	----------	SINT000000 to SINT999998	Bit7 ÷2	
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

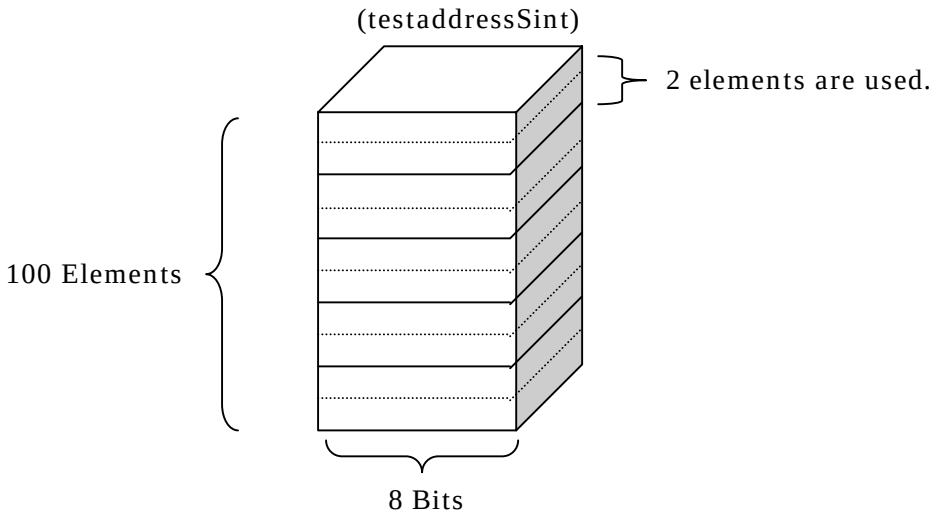
* Specify the INT device for the system start address. Also create the INT array on RSLogix. Without creating, an address error will occur.

* 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/PBIII	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

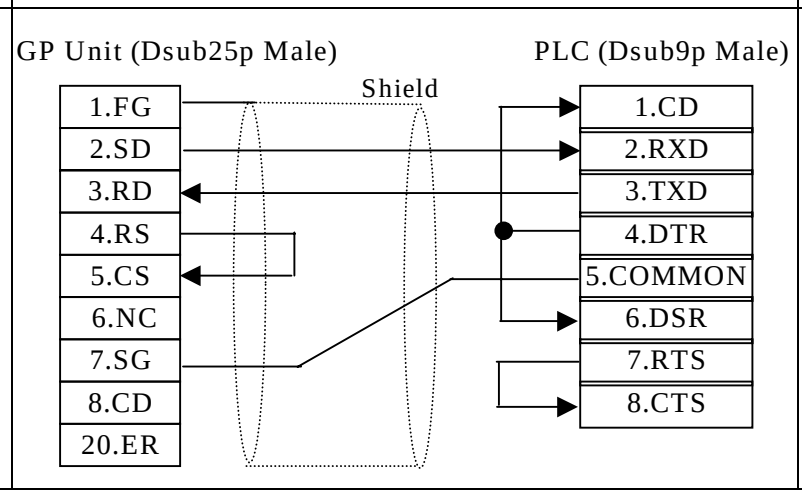
* In case that SINT is specified, you cannot specify an odd number for elements with GP-Pro PB/III. Specify an even number.



* 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

Type	Connection Method	Distance
Creating Cable		Within 15m

Important

* 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/ Cover for GP	Dsub25 pin Plug	XM2A-2501 <OMRON Co.>
	Cover for Dsub25 pin	XM2S-2511 <OMRON Co.>
	Jack Screw	XM2Z-0071 <OMRON Co.>
Cable	CO-MA-VV-SB5P × 28AWG <Hitachi Cable Ltd.>	
Setscrew	Metric Coarse Screw Threads : M2.6 × 0.45	