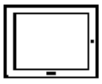
# Connecting Rockwell (Allen-Bradley)

# ControlLogix 5000 Series - Ethernet

## GP

| Model  | Product | Remark |
|---|---|---|
| GP | GP-2300L<br>GP-2300T<br>GP-2400T<br>GP-2500T<br>GP-2600T | Optional Ethernet I/F Unit cannot be used. |
| GLC | GLC2600T<br>GLC2500T<br>GLC2400T<br>GLC2300T<br>GLC2300L | Optional Ethernet I/F Unit cannot be used. |

* 77R Series cannot be used.
* 2X01 Series cannot be used.

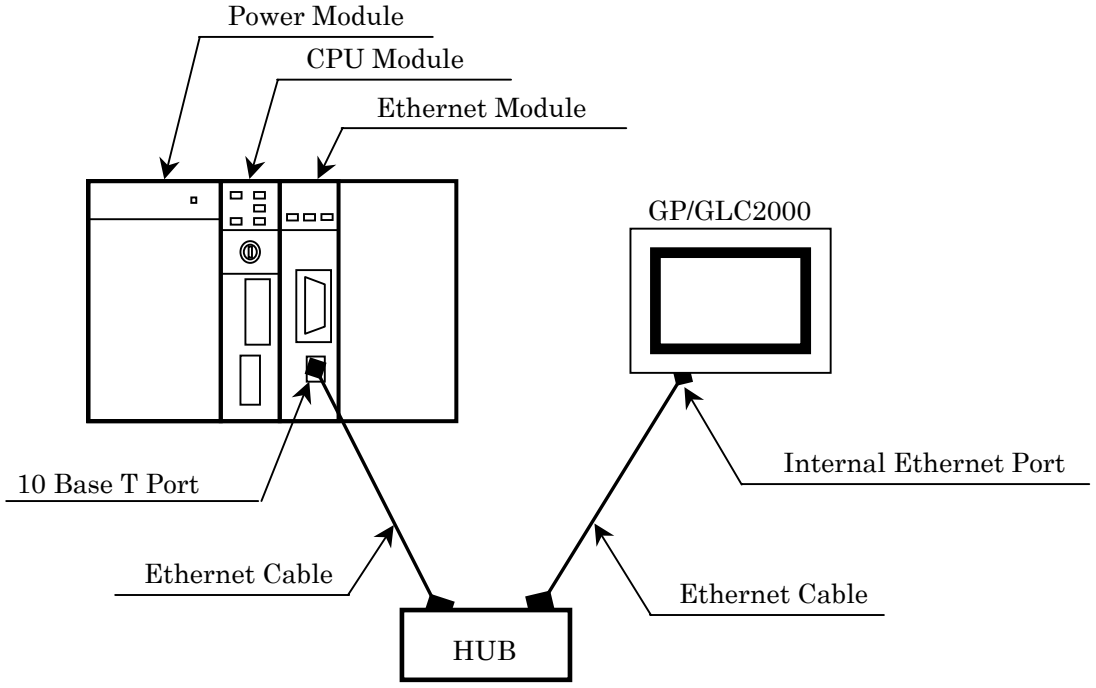
## PLC

| CPU | Link I/F | Communication Method | GP |
|---|---|---|---|
| ControlLogix5000 Series<br>1756-L1<br>1756-L1M1<br>1756-L1M2<br>1756-L1M3<br>1756-L55M13<br>1756-L55M14<br>1756-L55M16 | 1756-ENET<br>1756-ENBT | Ethernet Cable<br>IEEE802.3 Compliant | |

* 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.

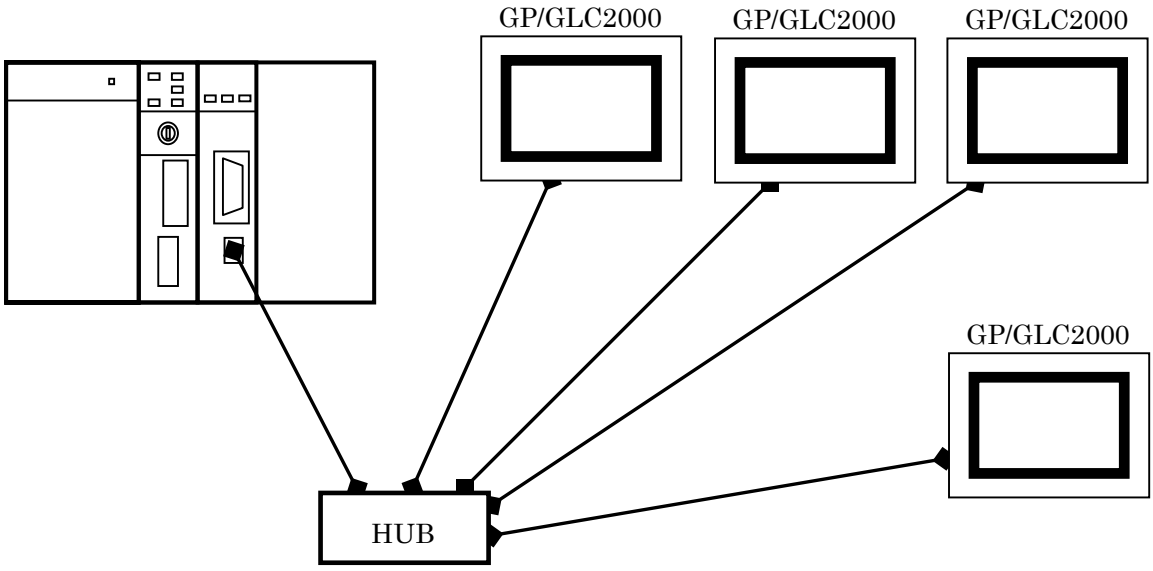
## Connection Structure PLC

### 1 to 1 Connection



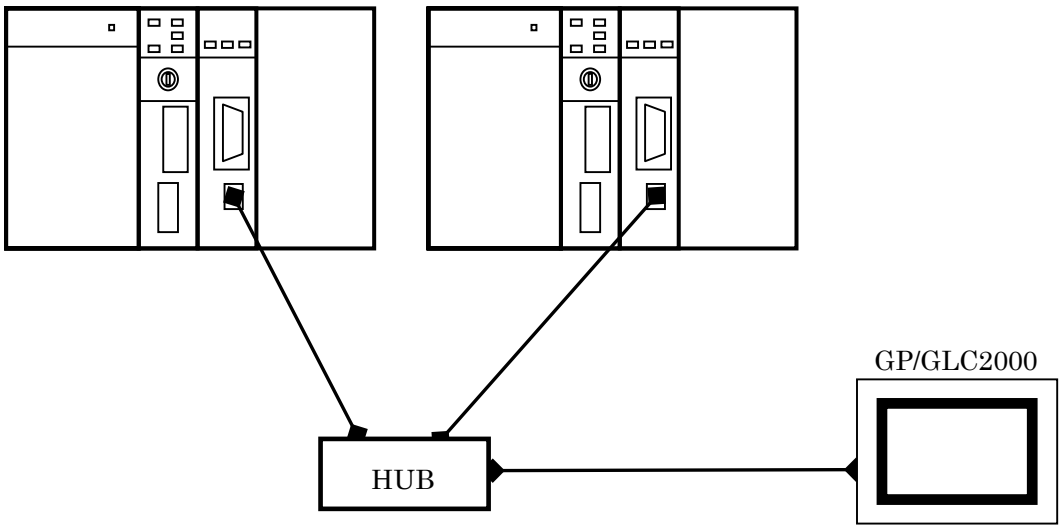
## 1 to n Connection

* Up to 64 slave devices including GPs can be connected to the master PLC. This is a theoretical value, but not an evaluated value.



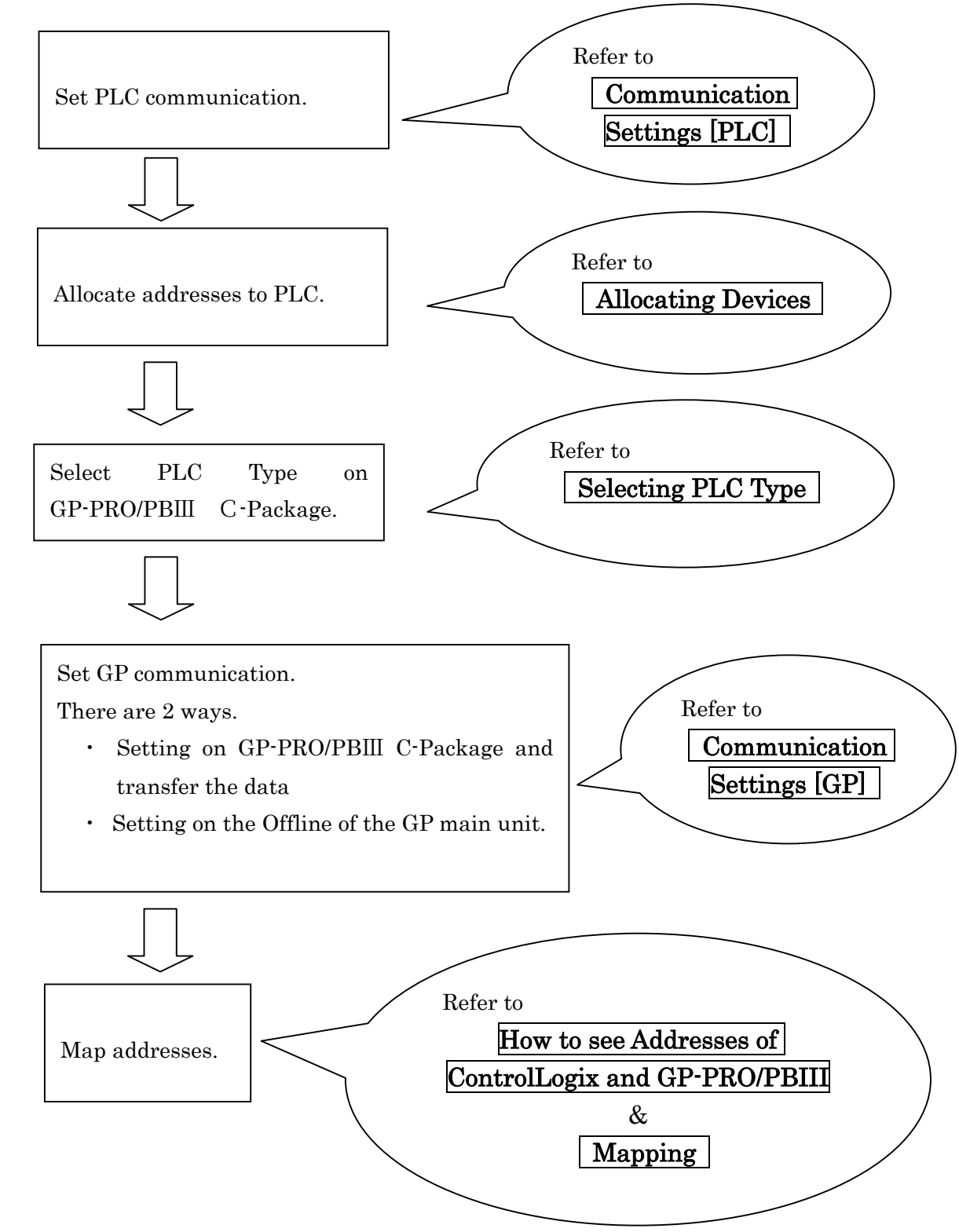

## n to 1 Connection

* Up to 2 PLCs can be connected.




* There are 2 communication types for the Ethernet communication; full duplex and half duplex. The type of GP/GLC is half duplex communication, and if PLC has full duplex communication type, communication may be failed. This problem will be solved by using HUB. We recommend you to use HUB to avoid the problem.

## Procedure to Connect PLC



## 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.)

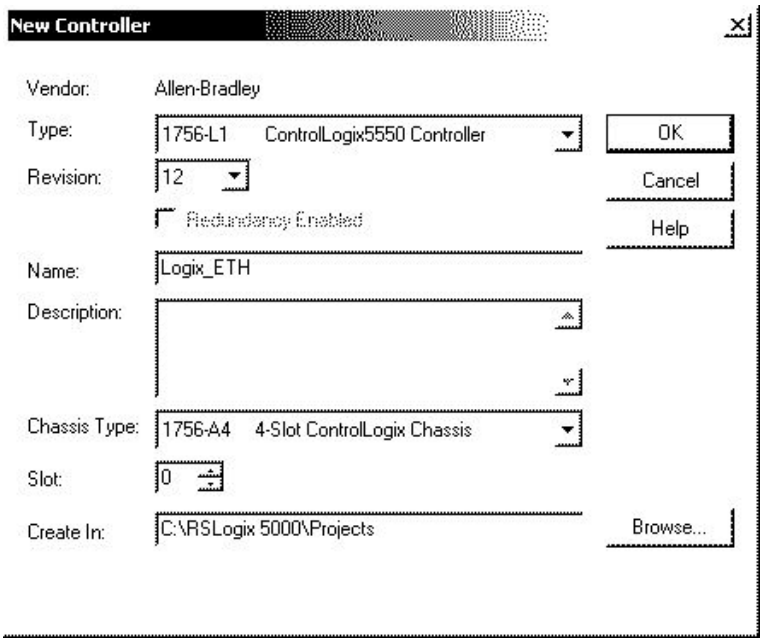
* Communication Settings on RSLogix5000

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

1) Start up RSLogix5000.

Select [File] --> [New…].

Set the new project name, CPU type, base, and slot number.



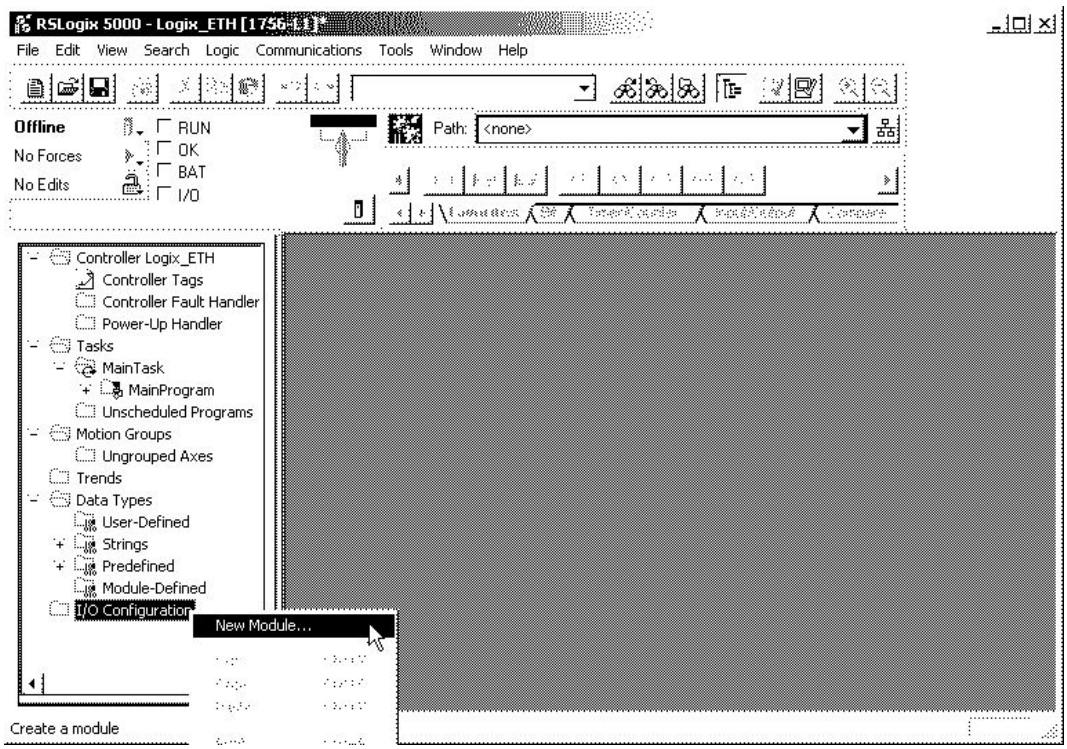

Setting Example)

| Setting Item | Setting Detail | Remark |
|---|---|---|
| Type | 1756-L1<br>ControlLogix5550 Controller | CPU Type |
| Name | Logix_ETH | Project Name (Arbitrary) |
| Description | (Blank) | Project Description (Arbitrary) |
| Chassis Type | 1756-A4<br>4 Slot ControlLogix Chassis | Base Type |
| Slot | 0 | Slot with CPU set |
| Create In | D:/RSLogix 5000/Projects | Where Project saved in |

2) Follow the procedures to set the Ethernet unit.

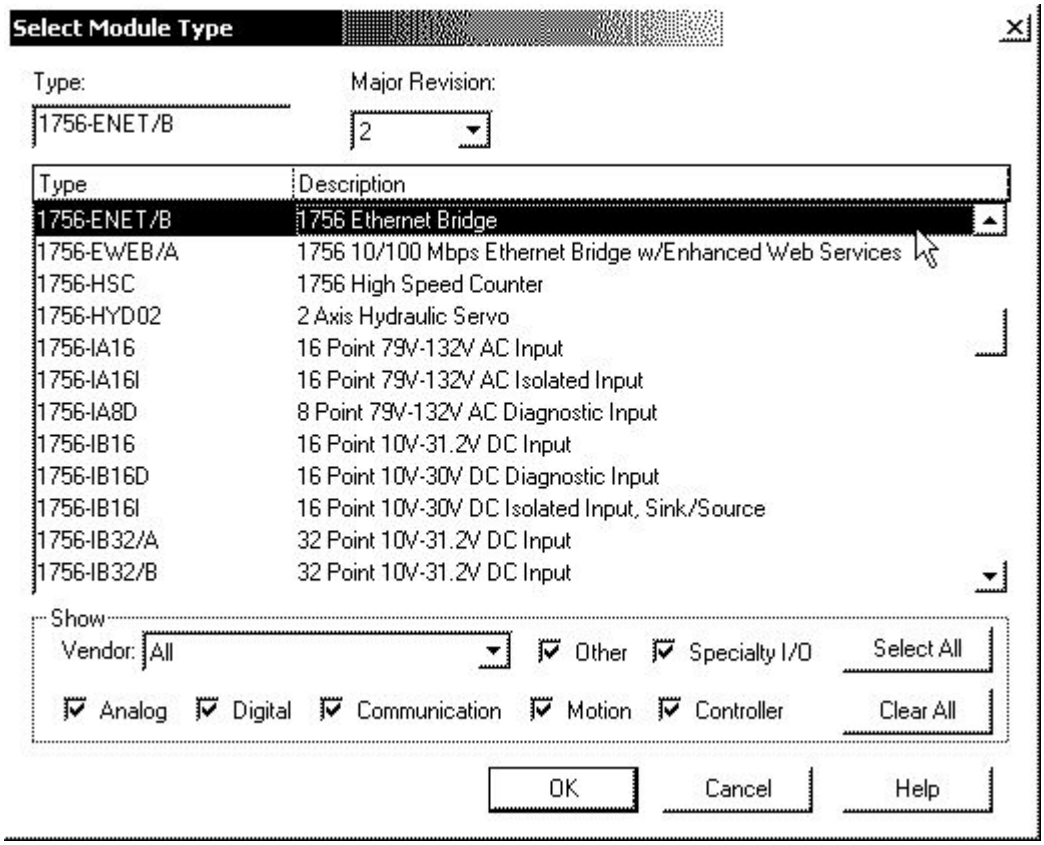
Set I/O configuration.

Right-Click [I/O configuration] --> click [New Module].



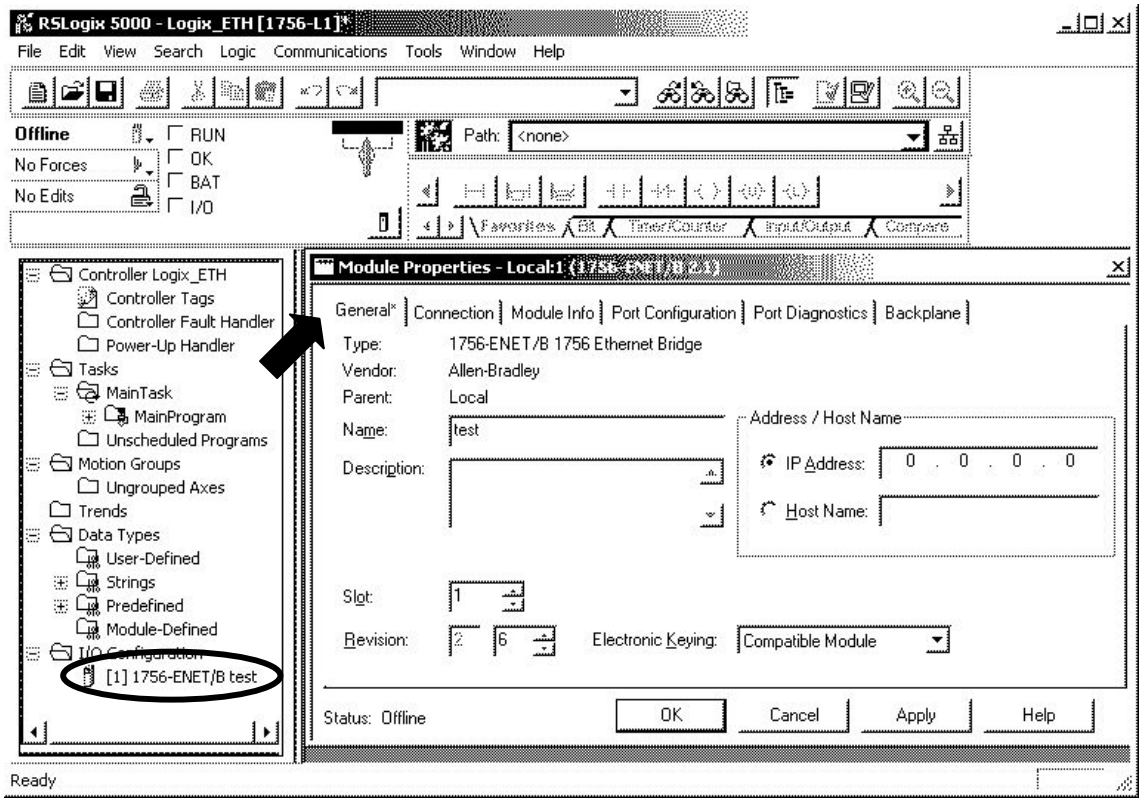
3) Set the Ethernet unit type. Select [Ethernet Bridge] and click [OK].

* [1756 Ether Bridge] has to be selected to communicate.



4) Set the details of the Ethernet unit.

Click the [General] tab. Set [IP Address].

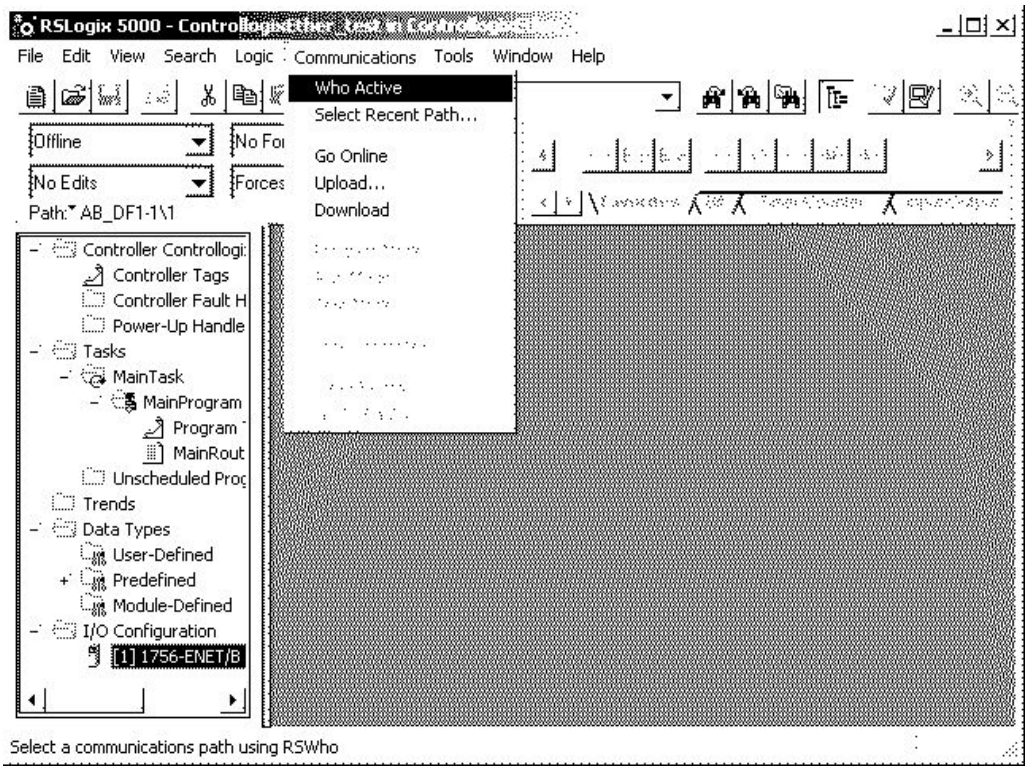



When the [Finish] button appears, click it.

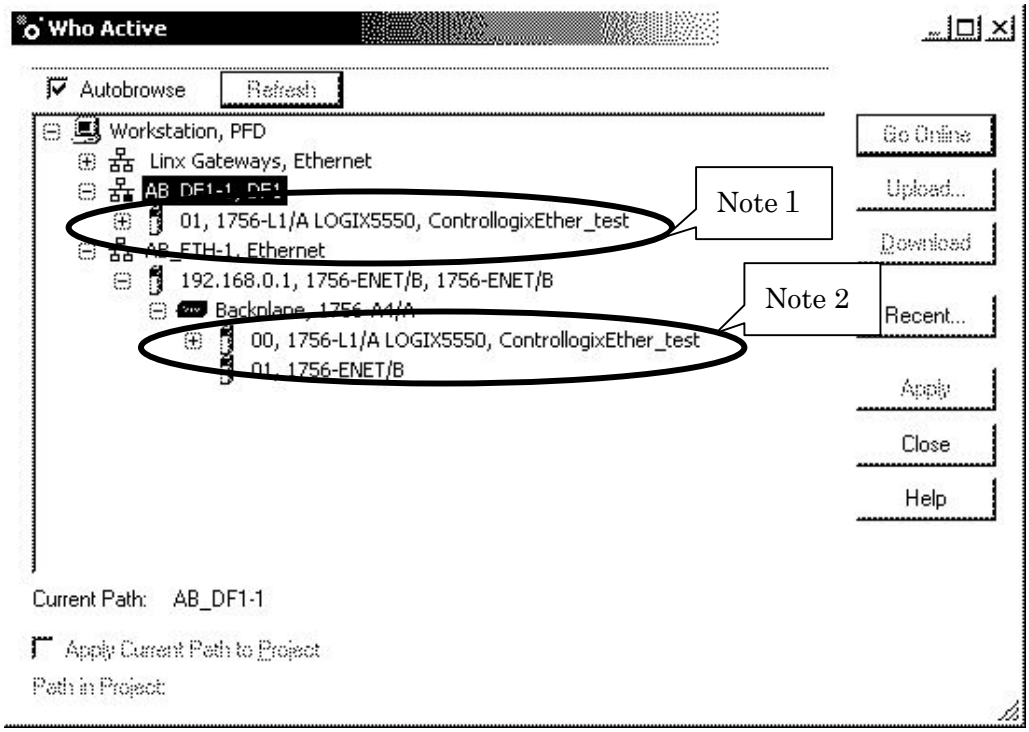
| Setting Item | Setting Detail | Remark |
|---|---|---|
| Name | Logix_ETH | Module Name (Arbitrary) |
| Description | (Blank) | Module Description (Arbitrary) |
| Slot | 1 | Match the number to the slot with the module set. |
| Revision | 6 | Match the number to the minor version of Module.<br>(side of the Ethernet module) |
| Address / Host Name | (Default Setting) | Set IP address of PLC. |
| Electronic Keying | Compatible Module | |

5) Transfer the set details to the Ethernet unit.

Select [Communications] --> [Who Active].




6) Select the destination to download to.



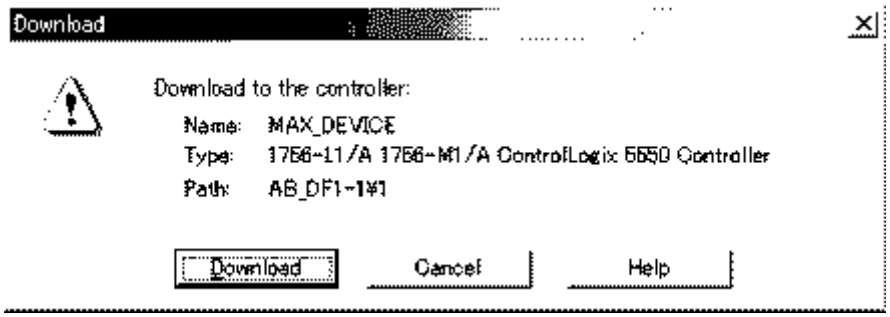

Select [Download] and transfer the settings.

Note 1)

If you download via serial port, select [AB_DF1-1,DF1] --> [1756-L1/A].

After selecting, the [Download] button will be available. Then click [Download].

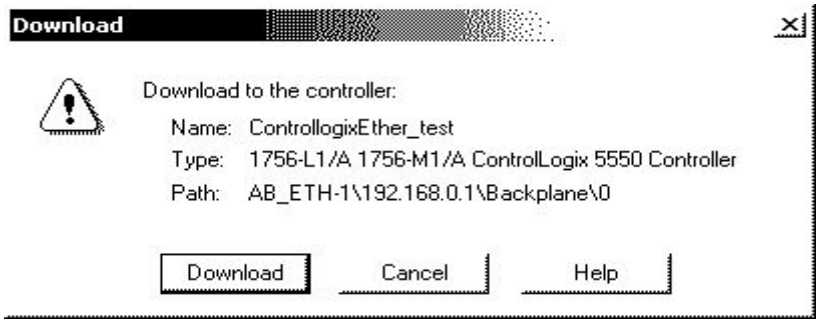
The following message box will appear when downloading via serial.




Note 2)

If you download via Ethernet port, select [AB_ETH-1,Ethernet] --> [1756-L1/A] in the tree view. After selecting, the [Download] button will be available. Then click [Download].

The following message box will appear when downloading via Ethernet.

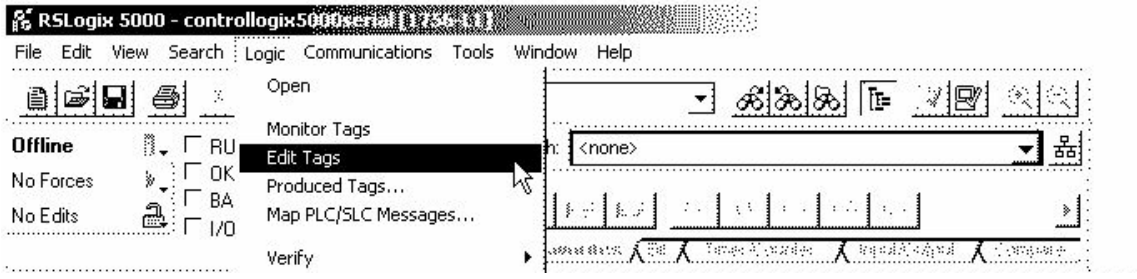



I/O Settings of PLC is completed.

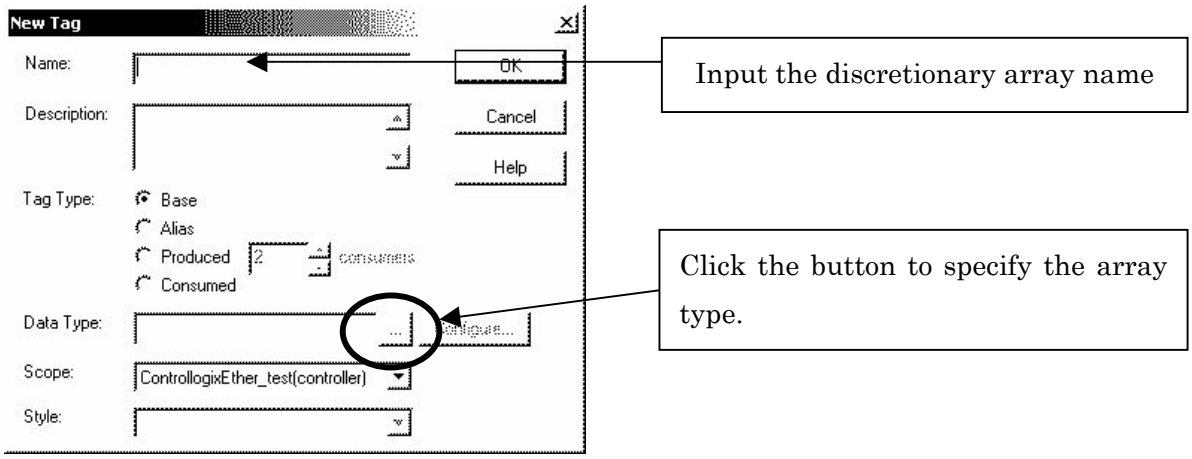
## Assigning Devices

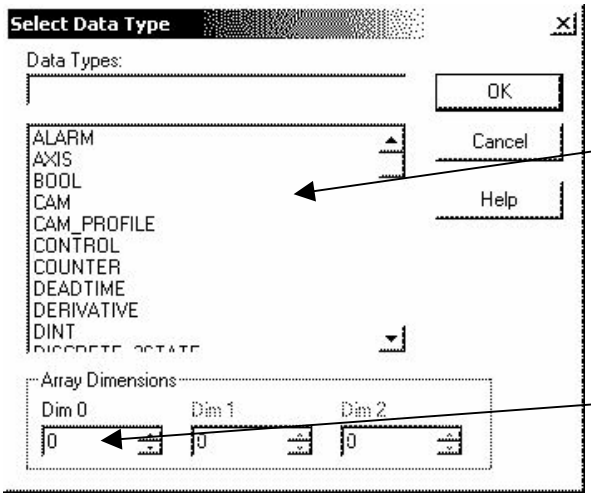
With Rockwell PLC, the required arrays and number of elements are assigned on RSLogix5000. If you connect it with GP/GLC without allocating here, a host communication error will occur.

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




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

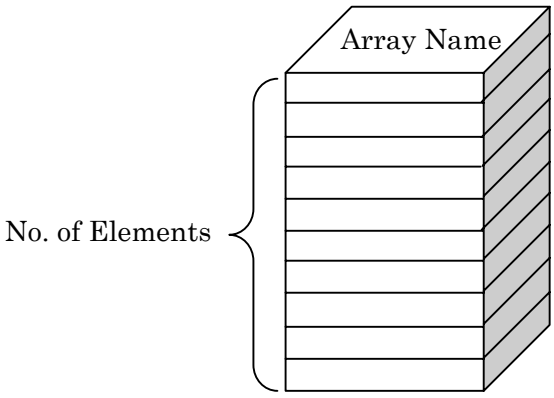




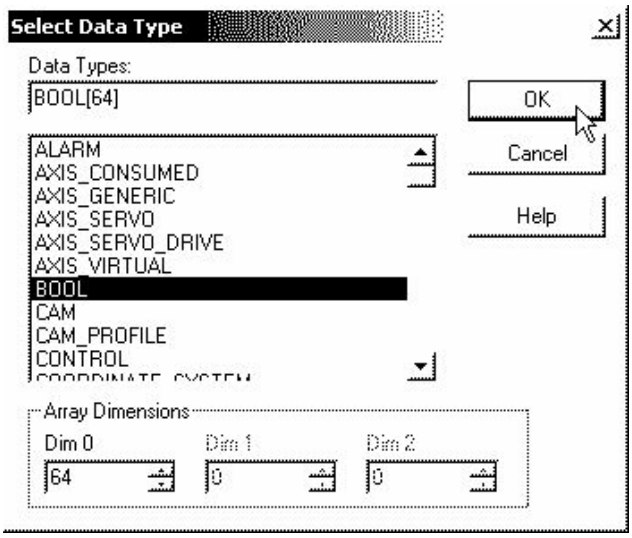

Select BOOL, SINT, INT, DINT, OR REAL for the array type.

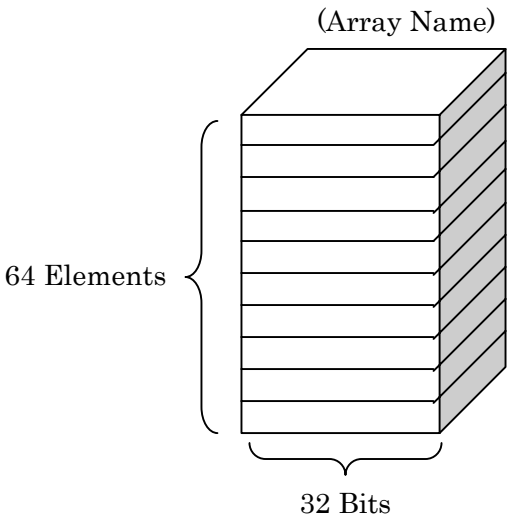
Specify the number of elements.
* Dimension 1 and Dimension 2 are not supported by GP-PRO PB/III. Do not use them.

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

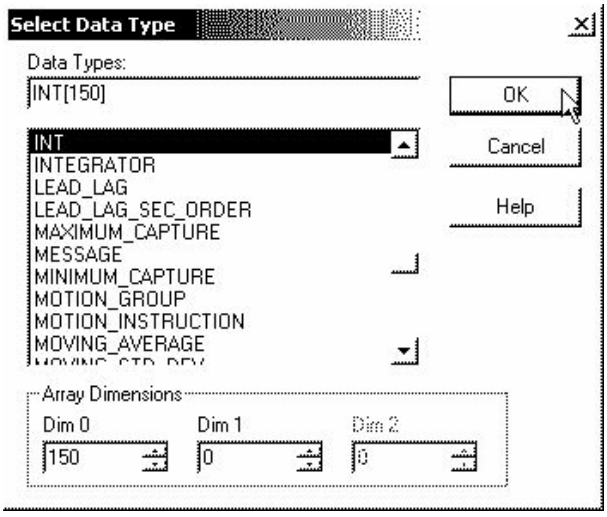


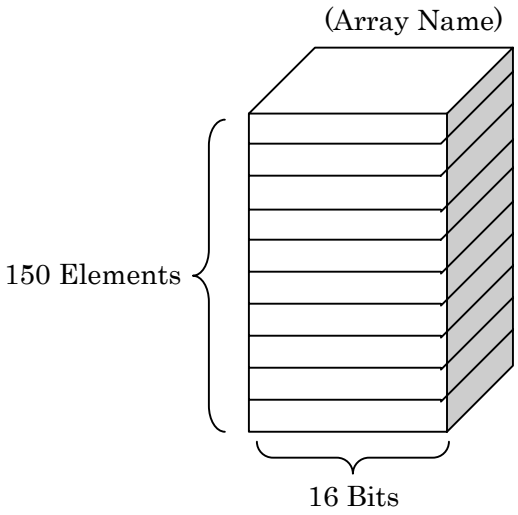

**[e.g.; Specifying BOOL]**



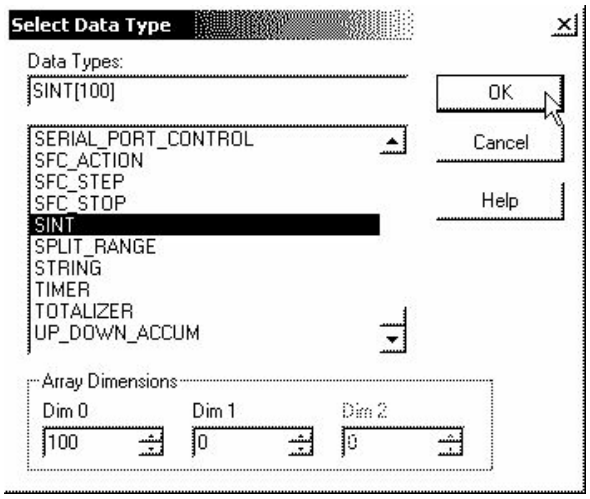



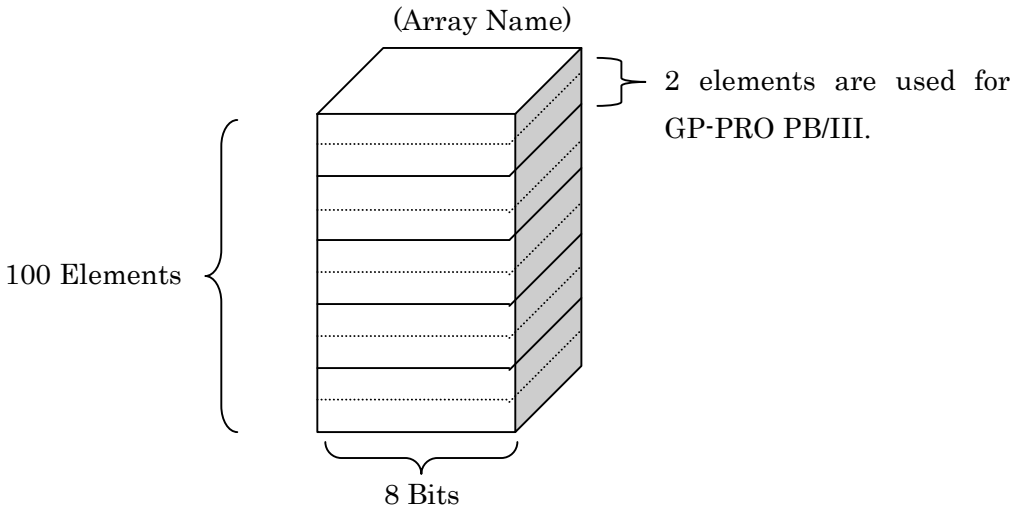
[e.g.; Specifying INT]



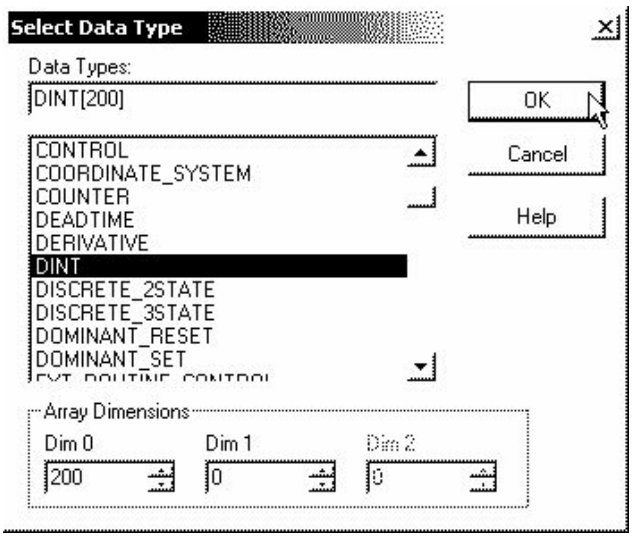



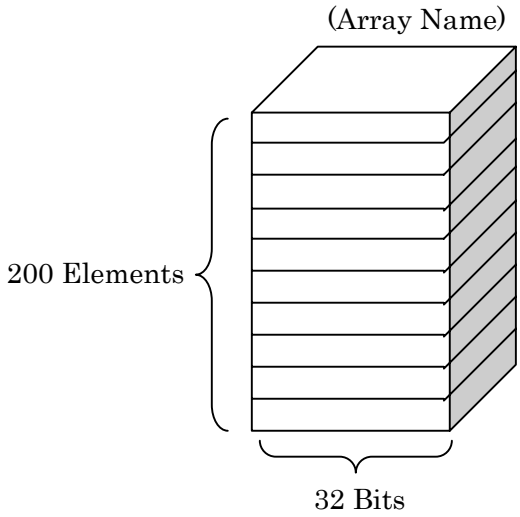

[e.g.; Specifying SINT]



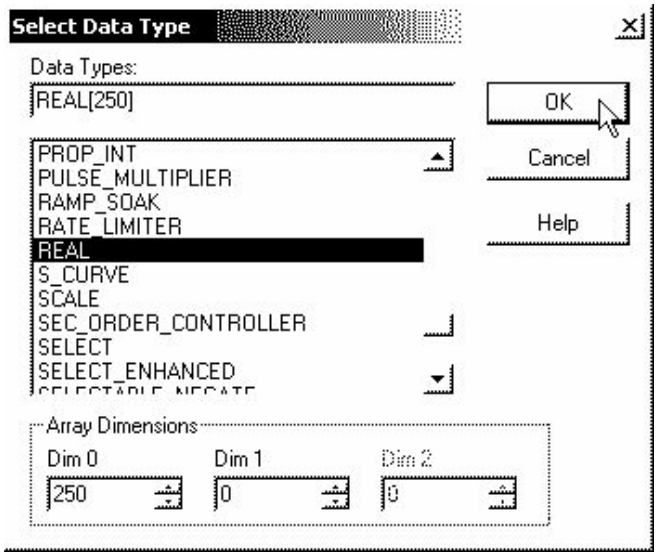



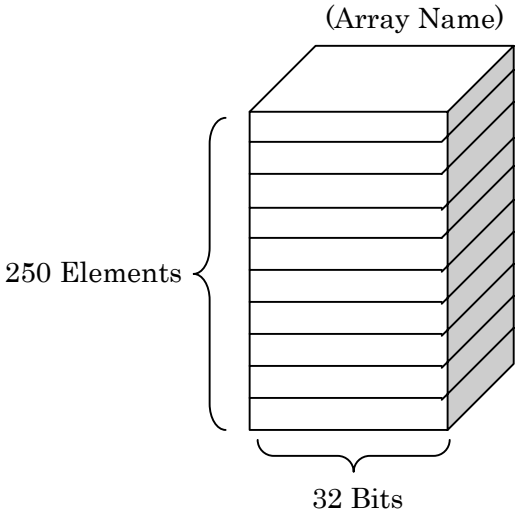
[e.g.; Specifying DINT]




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



## Selecting PLC Type

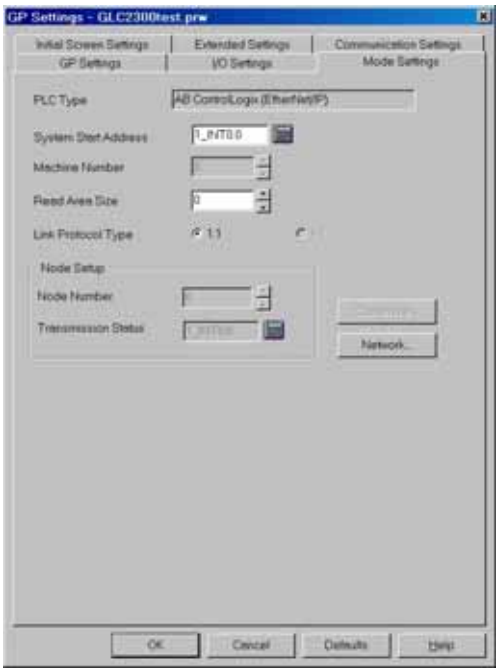
Start up GP-PRO /PBIII.

Select the following PLC Type when creating the project file.

## Communication Settings [GP]

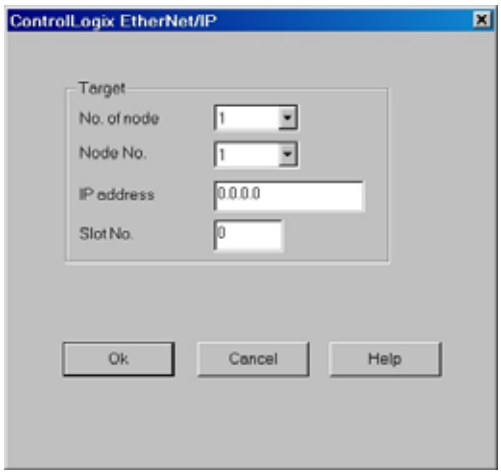
1 [GP-PRO/PBIII C-Package Setting]

Select [GP Setup] on Project Manager.

| | |
|---|---|
| 1) Communication Settings<br>  | 1) Communication Settings<br>・Source IP Address（0 to 255）<br>Check the IP address to input with the network administrator.<br>・Source IP Port No.（1024 to 65535）<br>Enter the GP's port number.<br>* Please do not use the numbers from 8000 to 8999 because they are the port numbers used for Pro-Server.<br>・Destination IP Address<br>This setting cannot be used.<br>・Destination IP Port No.<br>This setting cannot be used.<br>・Protocol Type<br>This setting cannot be used. |
| 2) Mode Settings<br>  | 2) Mode Settings<br>・ System Start Address<br>The INT device is fixed.<br>Array No. and Element No. are set arbitrarily.<br><br>The system start address is assigned to the PLC node designated here.<br><br>* The system start address cannot be set on the offline. Please set it on this setting screen. |

Select [Mode Settings] --> [Network…].

3) Setting network Information




3) Setting Network Information

・Target No. of node

Designate the number of PLCs connected to one GP unit. You can connect up to 2 PLCs.

・Target Node No.

Designate the PLC's node number for the IP address. This node number is used when allocating addresses on the edit screen.

・Target IP address

Enter your PLC's IP address

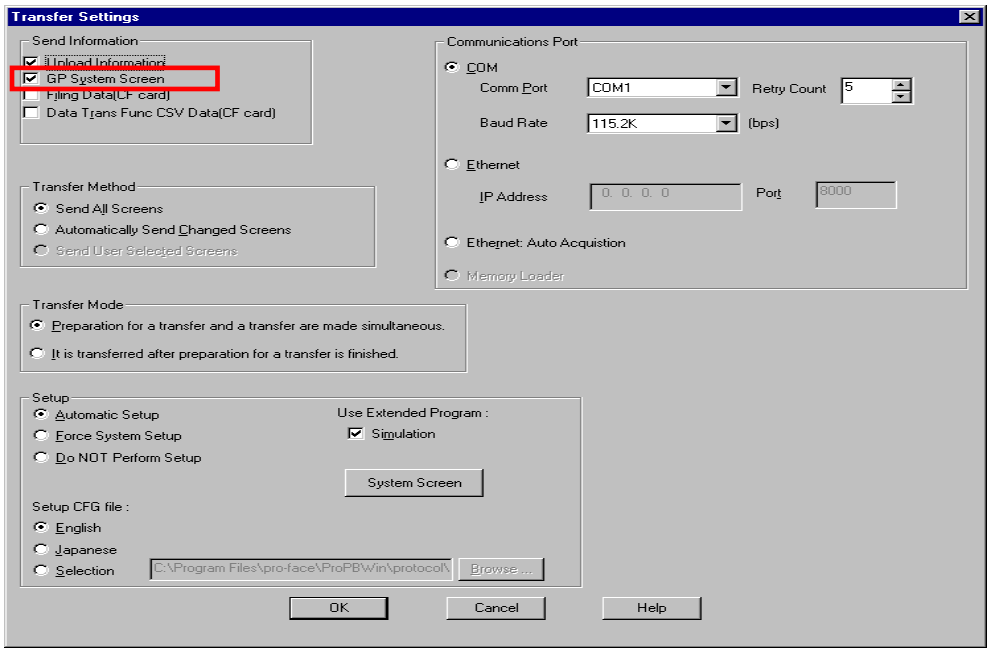
・Target Slot No.

Enter the PLC slot No. used for installing the CPU unit.

* Host Communication Error (02:D0: **) will appear if any slot number other than that of CPU.

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

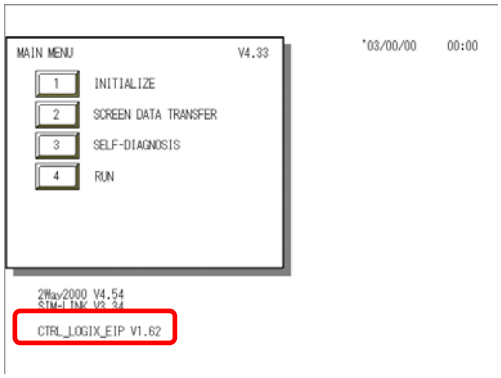
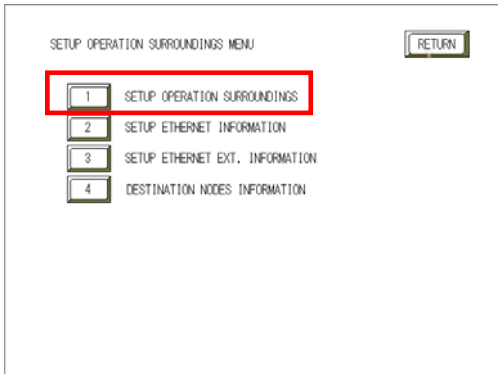
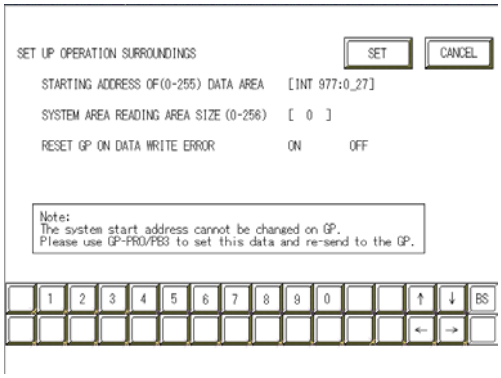
4) Transfer Settings

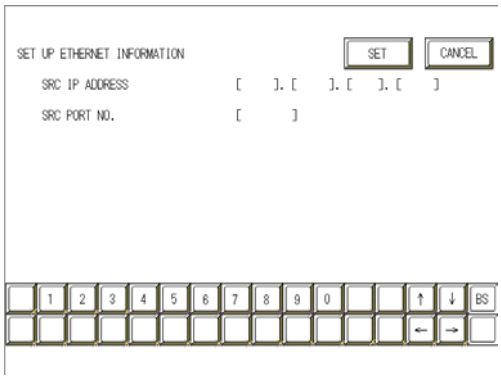
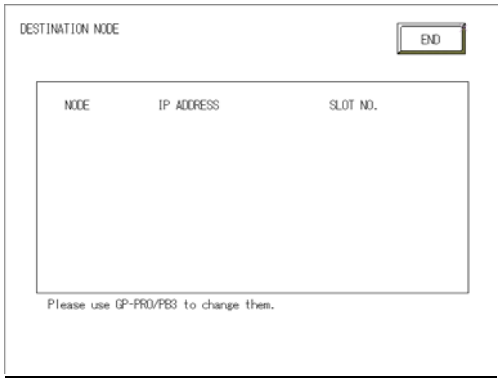



4) Transfer Settings　　GP System Settings: Checked

Transfer to GP after settings completed.

2 [GP Settings]

| | |
|---|---|
| 1) Checking GP Type<br>  | 1) Checking GP Type<br><br>If you have selected Rockwell (Allen-Bradley) PLC Control Logix 5000Series Ethernet AB ControlLogix (Ethernet/IP), the following will be shown.<br><br>"CRTL_LOGIX_EIP" |
| 2) Setting up Operation Surroundings<br>  | 2) Setting up Operation Surroundings<br><br>[MAIN MENU]<br>↓<br>[INITIALIZE]<br>↓<br>[PLC SETUP]<br>↓<br>[PLC SETUP]<br>↓<br>[SETUP OPERATION SURROUNDINGS] |
| 3) Checking System Start Address<br>  | 3) Checking System Start Address<br><br>* The system start address cannot be changed on GP. Please use GP-PRO/PB3 to set this data and re-send to GP.<br><br>[GP SYSTEM SETUP]<br>↓<br>[MODE SETUP] |

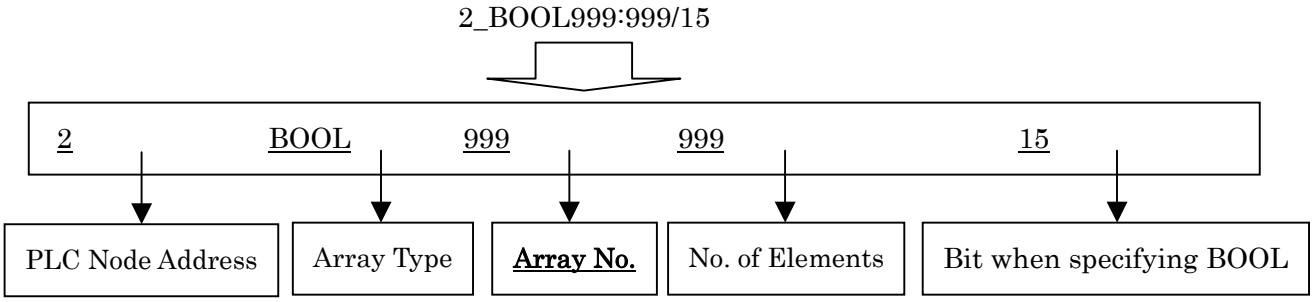
| 4) Setting Up Ethernet Information | 4) Setting Up Ethernet Information |
|---|---|
|  | Enter each item in the [SETUP ETHERNETINFORMATION] screen.<br>・SRC IP ADDRESS (0 to 255)<br>Enter the IP address for your station's GP unit. To do this, separate the 32 bits of the IP address into four segments of eight bits each, separate those segments with a dot and then enter them as decimal numbers.<br>・SRC PORT NO. (1024 to 65535)<br>Enter your GP's Port No.<br>* Please do not use the numbers from 8000 to 8999 because they are the port numbers used for Pro-Server. |
| 5) DESTINATION NODE INFORMATION | 5) Checking Destination Node Information |
|  | The destination (PLC) network address, the destination node address, and IP address are displayed here.<br>* The destination node information settings cannot be set or changed on GP. Please use GP-PRO PB3 to change them.<br>[GP SYSTEM SETTINGS]<br>↓<br>[MODE SETTINGS]<br>↓<br>NETWORK INFORMATION SETTINGS<br>*Refer to page 6. |

**NOTE**

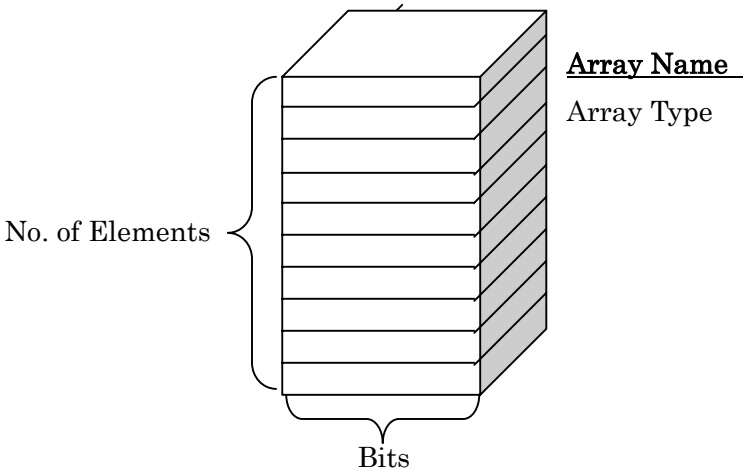
Protocol Type is TCP/IP Connection.

## 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 ! !**

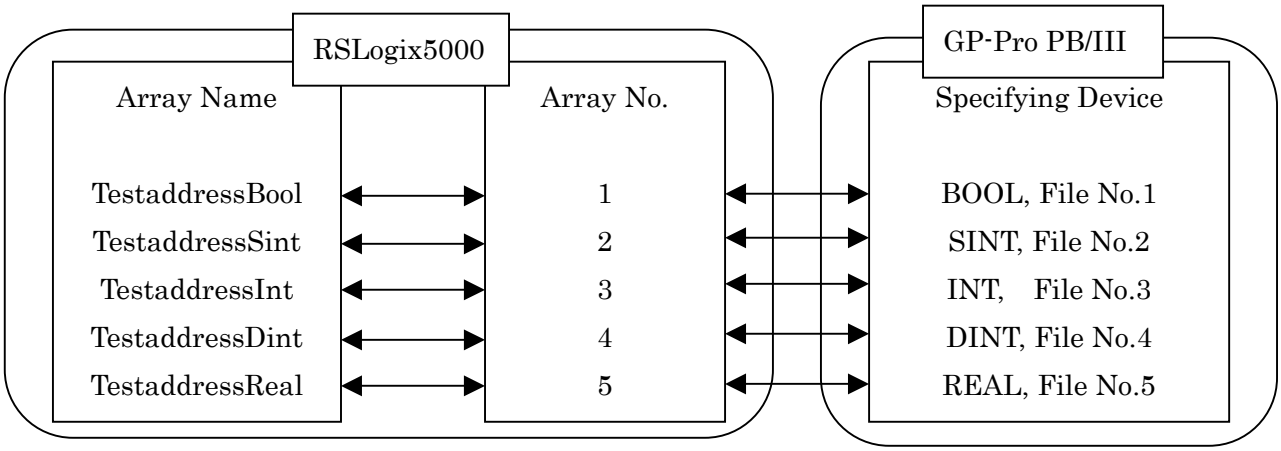
**Now what you need to do is....**
**Mapping**

## Mapping

### [What is mapping?]

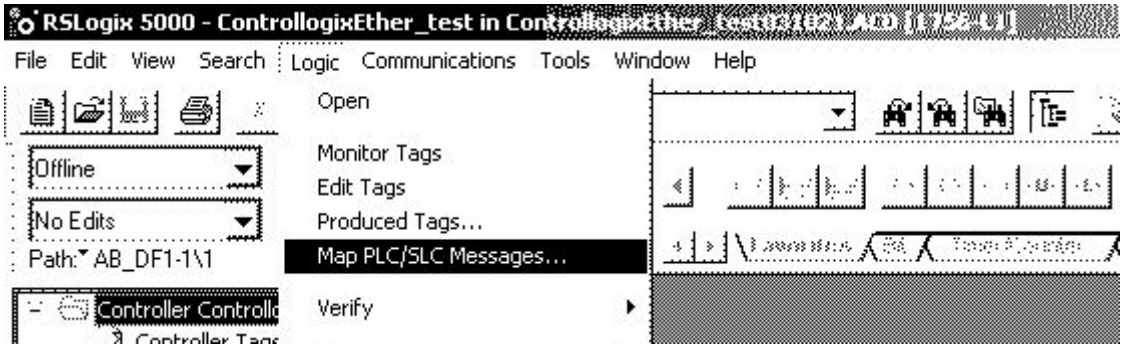
If you set addresses on GP-PRO PB/III, you cannot specify the array names (Tag Name). Instead of specifying the array names, select the array numbers. These file numbers are specified arbitrarily. You may need to map the array names and numbers on RSLogix5000. This procedure is called "Mapping".

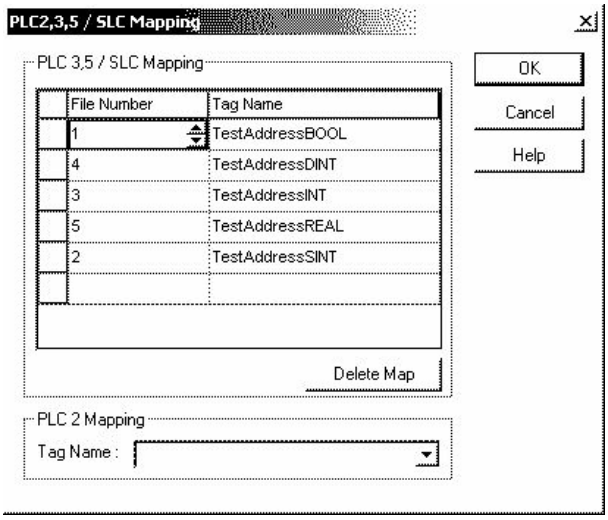
E.g.)




### [Mapping]

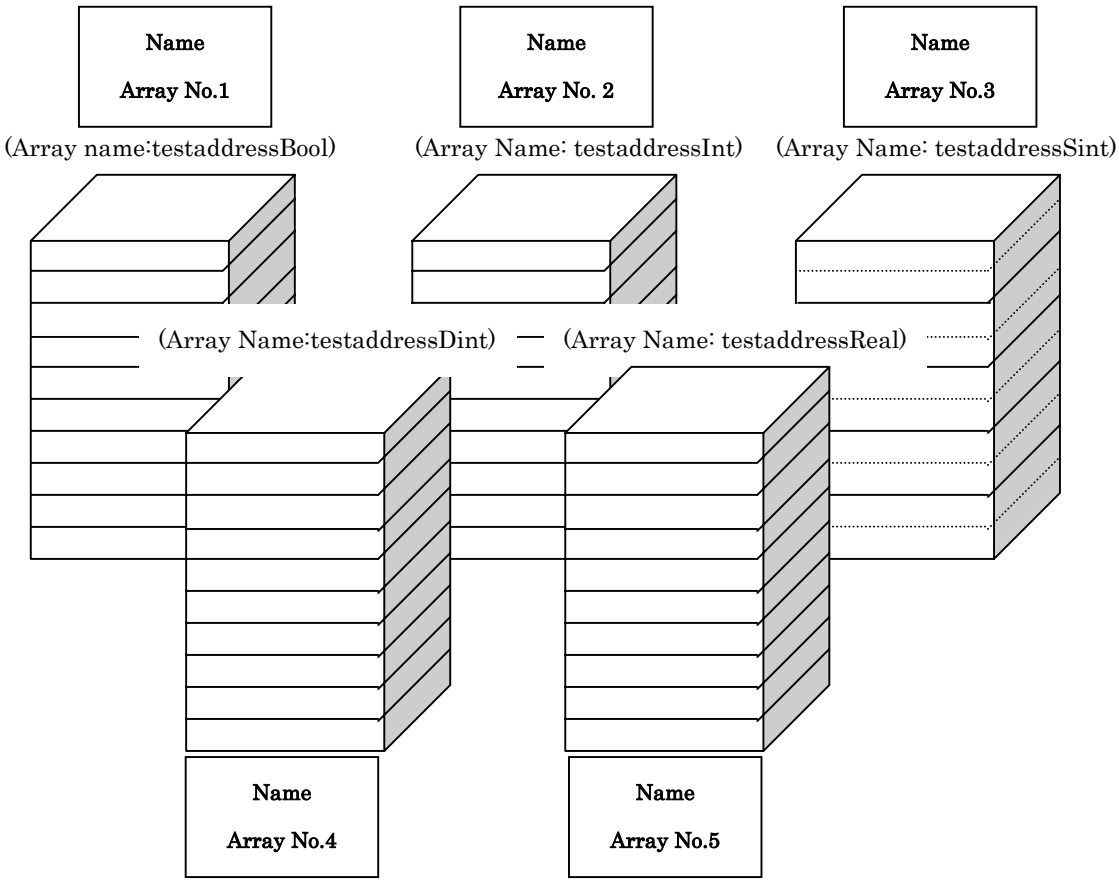
Select [Logic] --> [Map PLC/SLC Messages…] to start mapping.





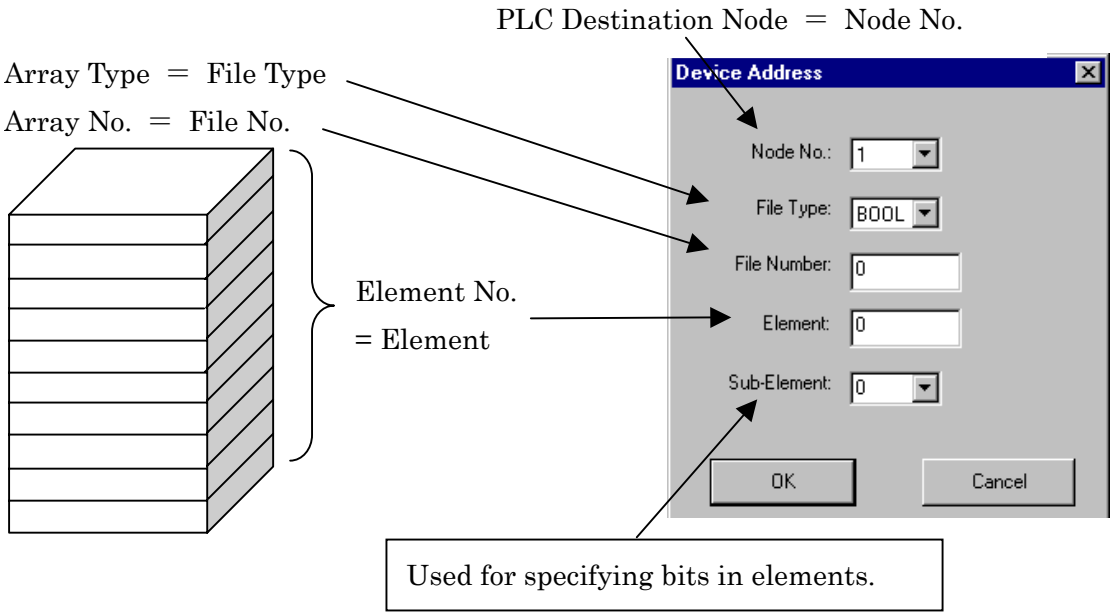

Specify an array number for File Number, and select an array name for Tag Name. You can specify the array name from the pull-down menu on Tag Name.

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.

[Specifying Addresses on GP-PRO PB/III]




[Precautions for Address]

* Range of Accessable Address with GP-PRO PB/III

| | Device | Bit Address | Word Address | Remark | |
|---|---|---|---|---|---|
| 1 | Bit | BOOL0:0/0 to BOOL999: 999/15 | BOOL0:0 to BOOL999: 999 | | L/H |
| 2 | 8 bit integer | ---------- | SINT0:0 to SINT999: 998 | Bit7 ÷2 | |
| 3 | 16 bit integer | ---------- | INT0:0 to INT999: 999 | Bit15 | |
| 4 | 32 bit integer | ---------- | DINT0:0 to DINT999: 999 | Bit32 | |
| 5 | 32 bit float | ---------- | REAL0:0 to REAL999: 999 | | H/L |

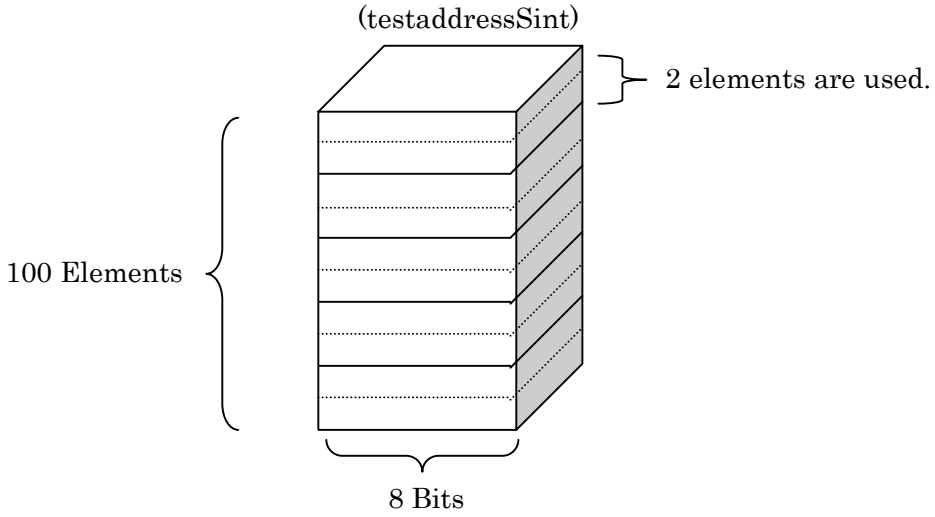
* Specify the INT device for the system start address. Also create the INT array on RSLogix. Without creating, an address error will occur.

* 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 device description on manual of RSLogix and that of GP-PRO PBIII are different.

| GP-PRO PBIII | 00000000 to 00000031 | 00000100 to 00000131 | 00000200 to 00000231 | - | 00099900 to 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.