User's Manual

IMO Programmable Logic Controller

GMWIN for Windows

[G Series]

IMO Precision Controls., Ltd.

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Chapter 1 Introduction

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Chapter 1. Introduction

1.1. Characteristics of GMWIN

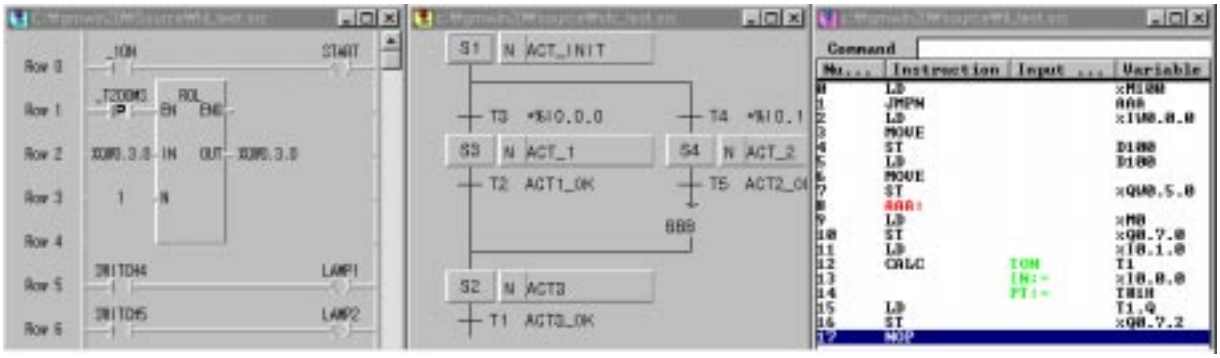
GMWIN is a programming and debugging tool for the full range of G Series PLC's.
GMWIN software has the following features.

1) Comfortable Interface

It is possible to compile and debug several programs at the same time maximizing the user's efficiency, and time

2) Supporting Various Languages

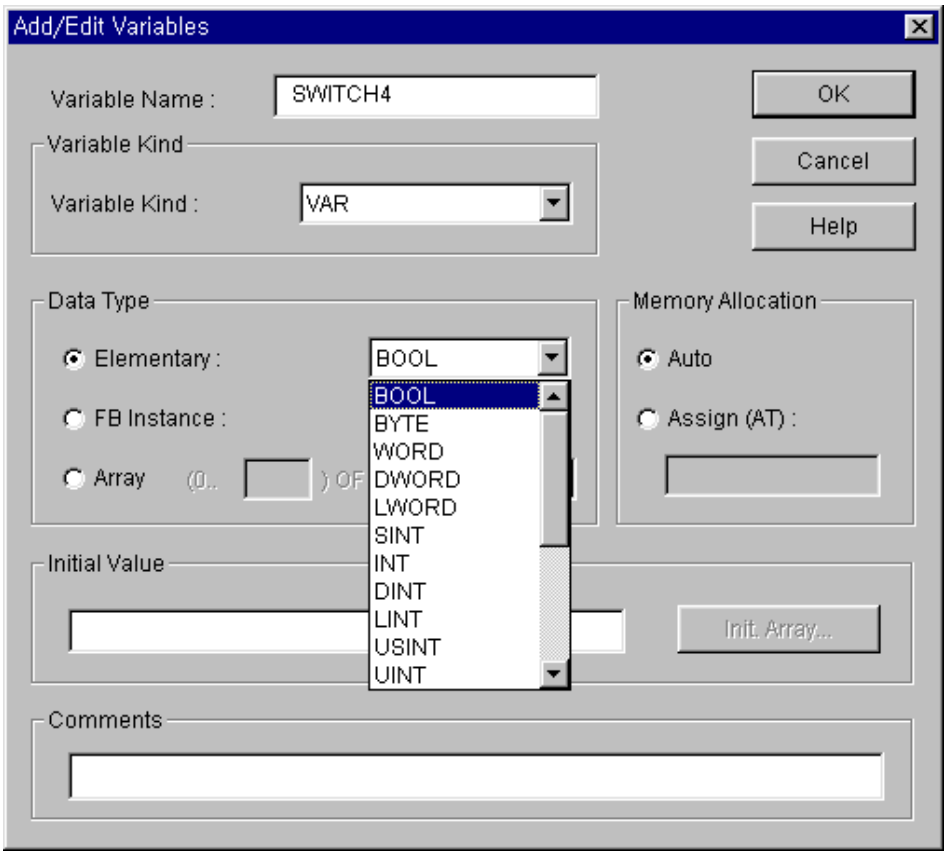
It supports various languages like LD, SFC, IL. So you can select and use applicable language to a system.



LD SFC IL

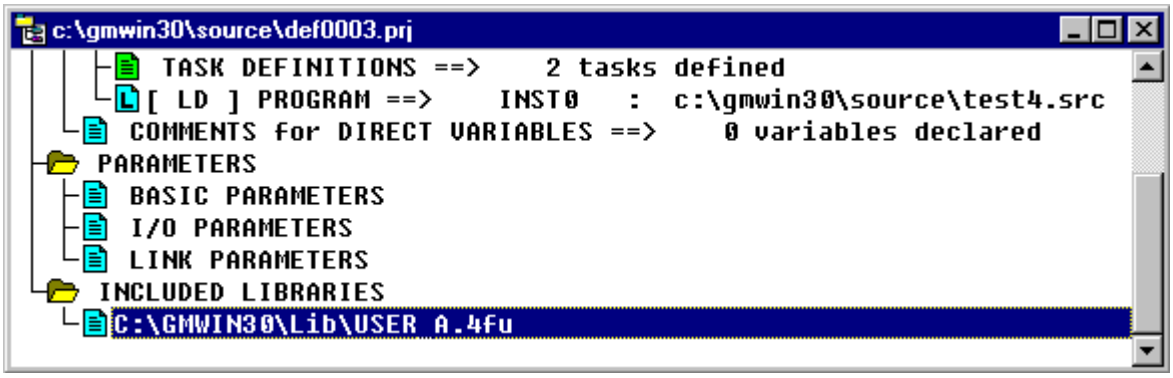
3) Using Variables by Symbol

You can create a program using symbols to ease understanding. Memory can be assigned automatically or implicitly it supports a wide range of data types. So you can create high-leveled programs.



4) PLC System using Project Unit

It is very easy to create and test a program because you can include several programs in one PLC system.



5) Connecting GMWIN to PLC by Easy Network

You can download and monitor programs not only in directly connected PLC but also in a local PLC connected by network.

6) Various PLC Information

It is available to monitor various PLC states and to use this function in the program mode.

7) User-Defined Libraries

Besides standard functions and function blocks, you can define a frequently used program as one of functions or function blocks for your convenience.

1.2. How to Connect GMWIN to PLC

In connection GMWIN to PLC, you must previously define two options – □Method of Connection□and □Depth of Connection□in Connect Option.

There are four kinds of methods of connection, using RS-232C, MODEM, Communication module (GLOFA Fnet/Mnet for PC) and Network (Ethernet), and three kinds of depth of connections such as Local, Remote 1 and remote 2.

When using Windows 3.x for operating system, the connections using Communication module and Network are not supported.

Select □***Connect option***□in ***Project - Option*** menu.

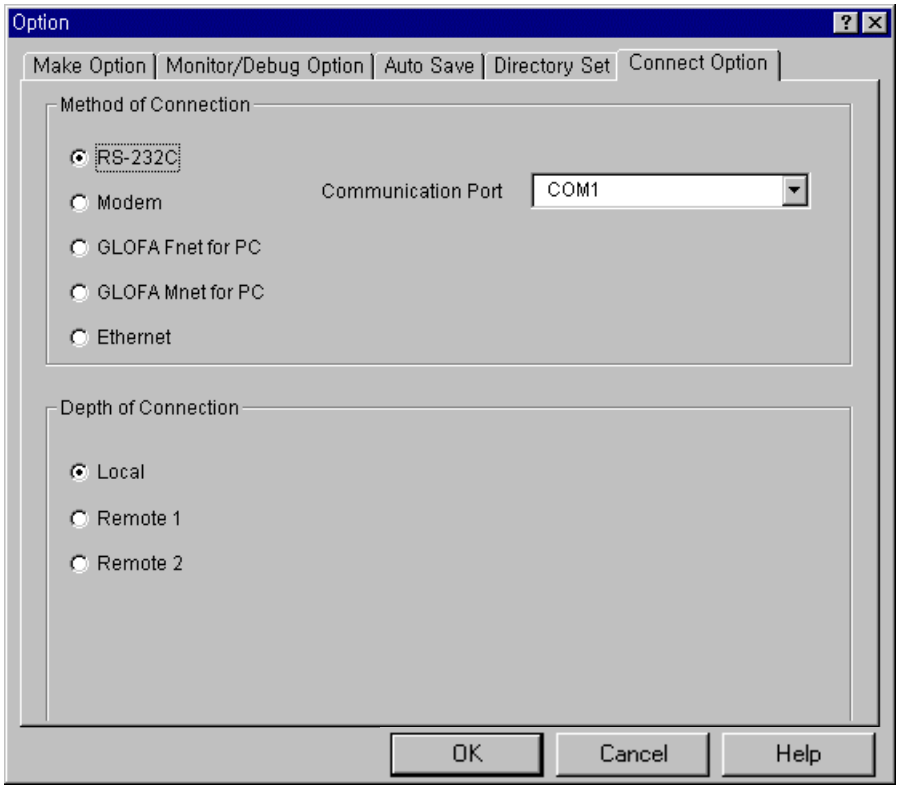
1.2.1. Method of Connection

1.2.1.1. Connection using RS-232C

To use RS-232C connection, connect the RS-232C cable with the serial port in PC and serial port in PLC

□ From the Project Menu, choose ***Option***.

□ Choose ***Connect Option*** tab in the ***Option*** dialog box.



□ Select ***RS-232C*** in Method of Connection.

□ Select Communication Port.

□ Select ***Depth of Connection*** and click ***OK*** button.

Local Connection

□ Select ***Local*** in Depth of Connection and click ***OK*** button.

□ Choose ***Connect*** from the Online Menu

Remote Connection (See GLOFA Fnet/Mnet user's manual for more details),

□ Open Network Type List and select a network type.

□ Type a station number in Station No. Box.

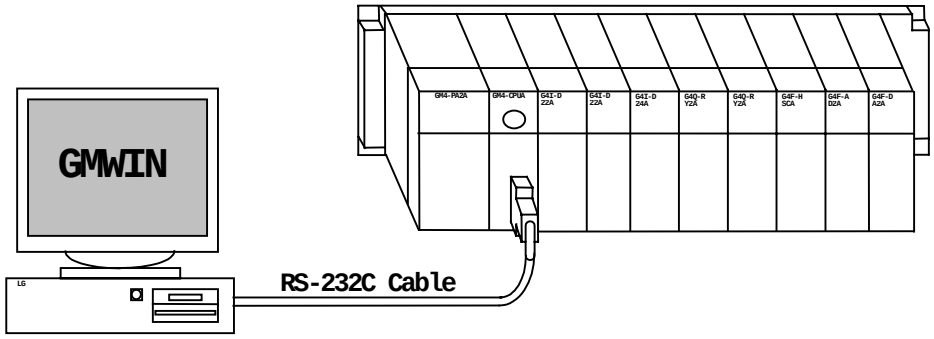
□ Select slot number.

□ Click ***OK*** button.

□ Choose ***Connect*** from the Online Menu.

Note

The specification of RS-232C cable connection



Pin No.	GMWIN(IBM PC)	GLOFA PLC	Pin No.
1	DCD/CD	DCD/CD	1
2	RXD	RXD	2
3	TXD	TXD	3
4	DTR	DTR	4
5	COM/SG	COM/SG	5
6	DSR	DSR	6
7	RTS	RTS	7
8	CTS	CTS	8
9	RI	RI	9
9 Pins			9 Pins

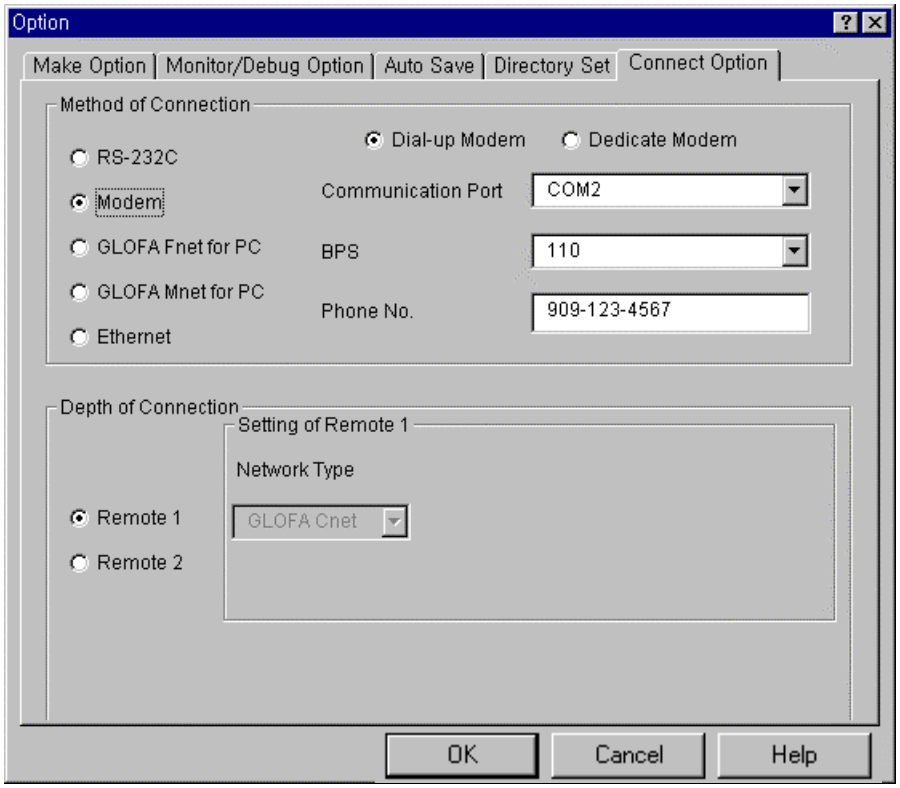
1.2.1.2. Connection using Modem

The long distance connection using modem is only available by Remote Connection.

To be connected with PLC, the computer link board(G□L – CUEA) must be mounted on the computer.

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.



□ Select ***Modem*** in Method of Connection.

□ Select Dial-Up Modem or Dedicate Modem.

□ Setup ***Communication Port(COM1□COM4), BPS and Phone No***.

□ Click ***OK*** button.

1.2.1.3. Connection using Communication Module

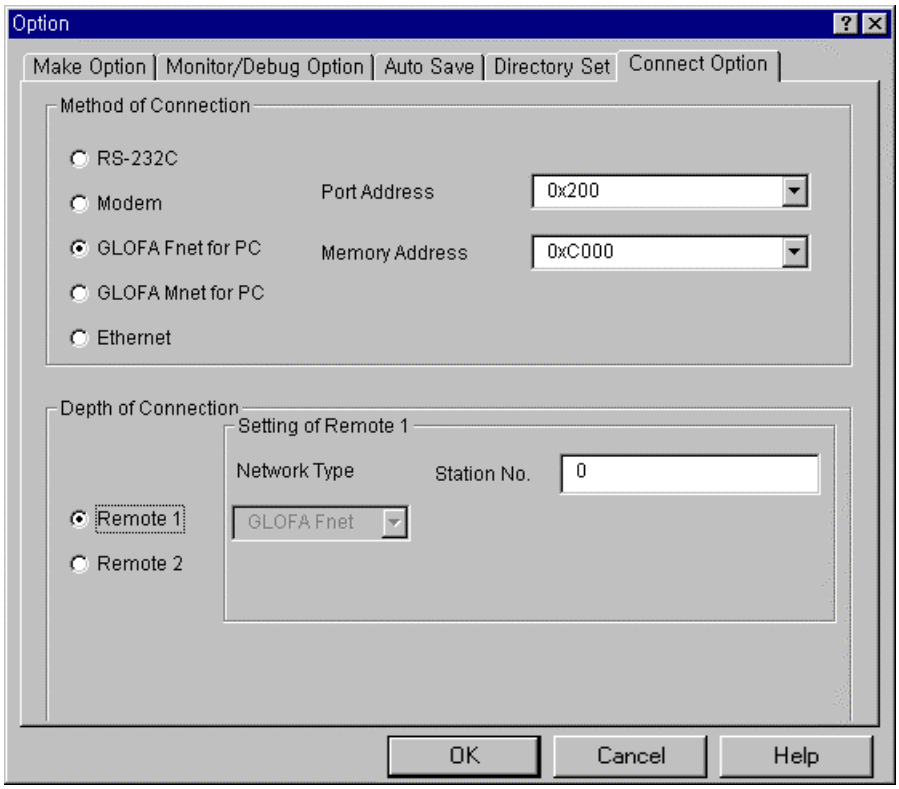
To use Communication module connection (GLOFA Fnet for PC or GLOFA Mnet for PC), Fnet(Fieldbus) or Mnet(Mini-MAP) module for PLC and boards for PC.

After installing communication board for PC in PC, you must setup the address to be used by communication module for PC with changing config.sys file in Windows folder of PC (See GLOFA Fnet/Mnet user's manual for detail comment).

Example) device = c:\windows\emm386.exe noems x=d000-d4000

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.



□ Select ***GLOFA Fnet for PC*** or ***GLOFA Mnet for PC*** in Method of Connection.

□ Setup ***Port Address*** and ***Memory Address***.

Remote Connection (See GLOFA Fnet/Mnet user's manual for detail comment information)

□ Select ***Station No***.

□ Select ***Online-Connection*** in menu and click ***OK*** button.

□ Choose ***Connect*** from the Online Menu.

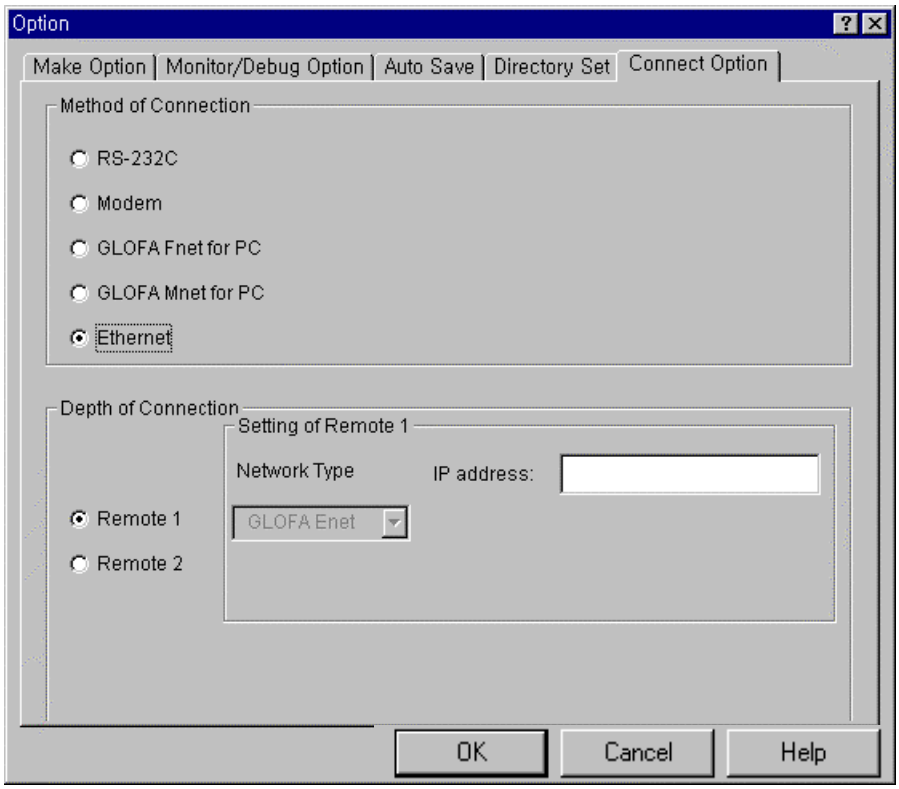
Port Address and ***Memory Address*** must be identified with the ones set in the communication board mounted on PC.

1.2.1.4. Connection using Network

Network connection is only available for Remote connection. To use this connection, Enet(Ethernet) module and the network system must be installed.

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.



□ Select ***Ethernet*** in Method of Connection.

Remote Connection (See GLOFA Fnet/Mnet user's manual for more detail information)

□ Setup ***IP address***.

□ Click ***OK*** button.

□ Choose ***Connect*** from the Online Menu.

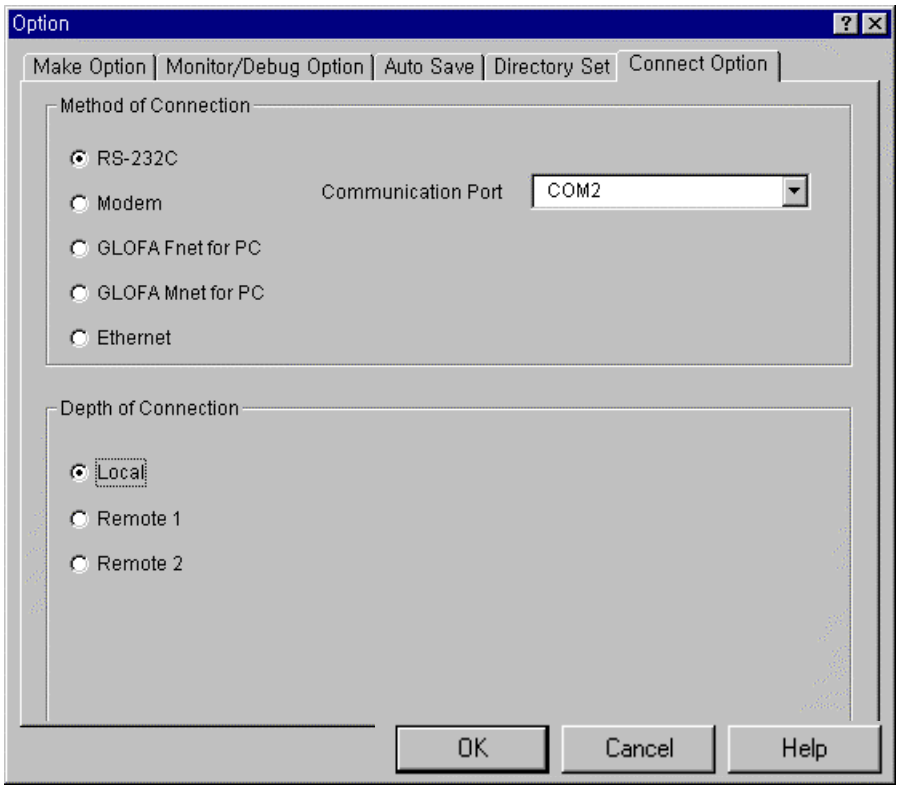
1.2.2. Depth of Connection

1.2.2.1. Local Connection

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.

□ Select ***Local*** in Depth of Connection.

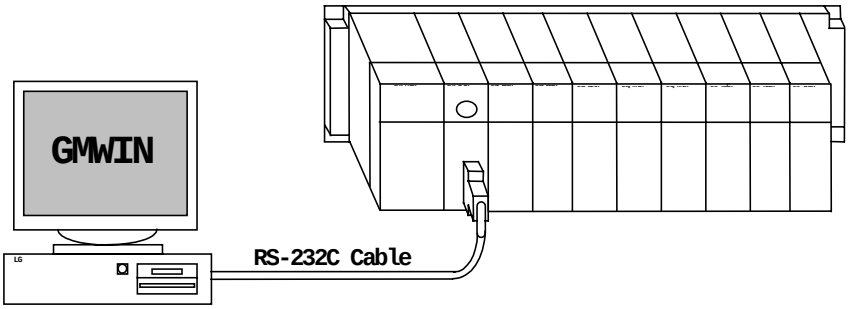


□ Click ***OK*** button.

□ Choose ***Connect*** from the Online Menu.

Note

Local Connection for GMWIN and PLC

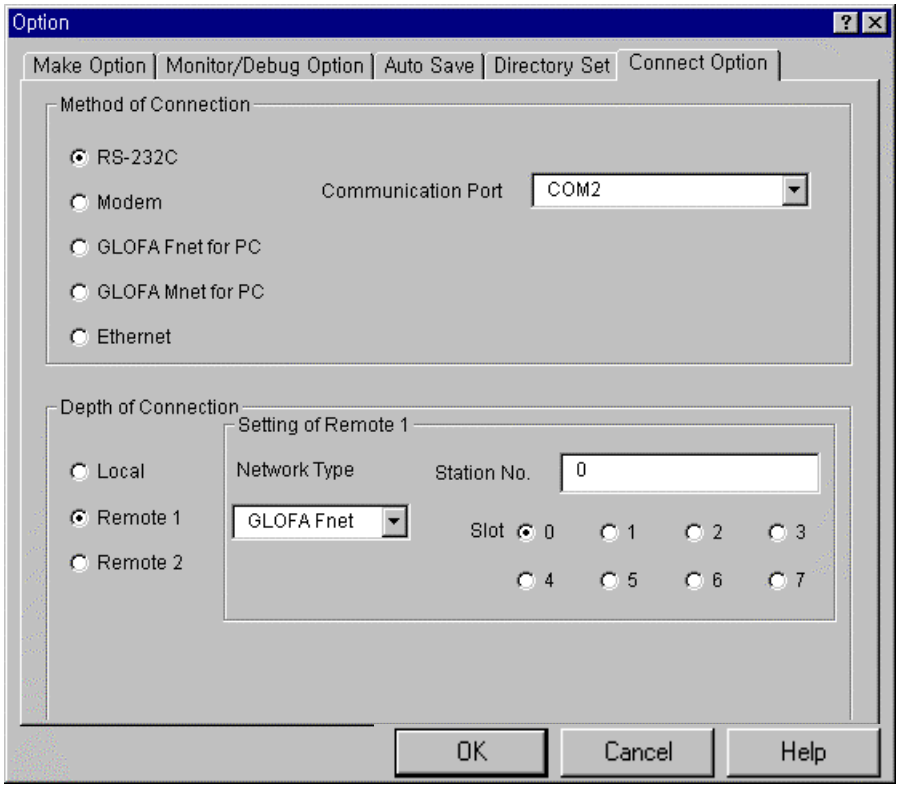


1.2.2.2. Remote 1 Connection

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.

□ Select ***Remote 1*** in Depth of Connection.



□ Select ***Network Type*** and ***Slot*** in Depth of Connection.

□ Select ***Station No.*** (only available in GLOFA Fnet, Fdnet and Mnet) or IP address(GLOFA-Enet). decimal or hexadecimal numbers are all available for ***Station No***.

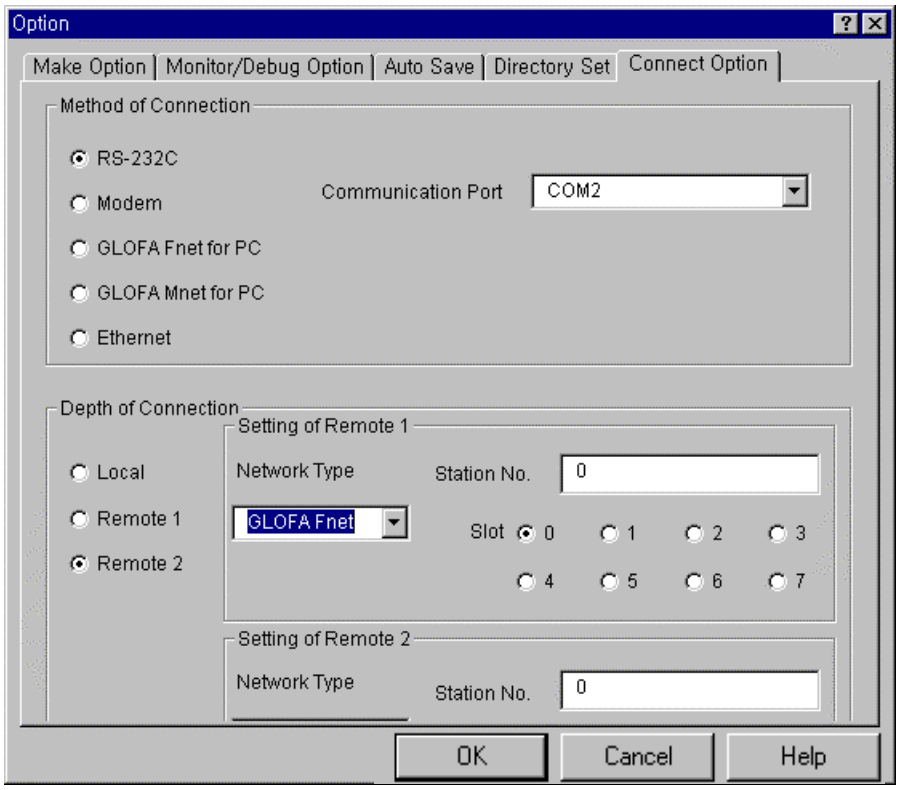
□ Click ***OK*** button.

1.2.2.3. Remote 2 Connection

□ From the Project Menu, choose ***Option***.

□ Select ***Connect Option*** in ***Option***.

□ Select ***Remote 2*** in Depth of Connection.



Setup Remote 1 Box

□ Select ***Network Type*** in Depth of Connection.

□ Select ***Slot*** and ***Station No***.

Decimal and hexadecimal numbers are all available for the Station No.

Setup Remote 2 Box

□ Select ***Network Type*** in Depth of Connection.

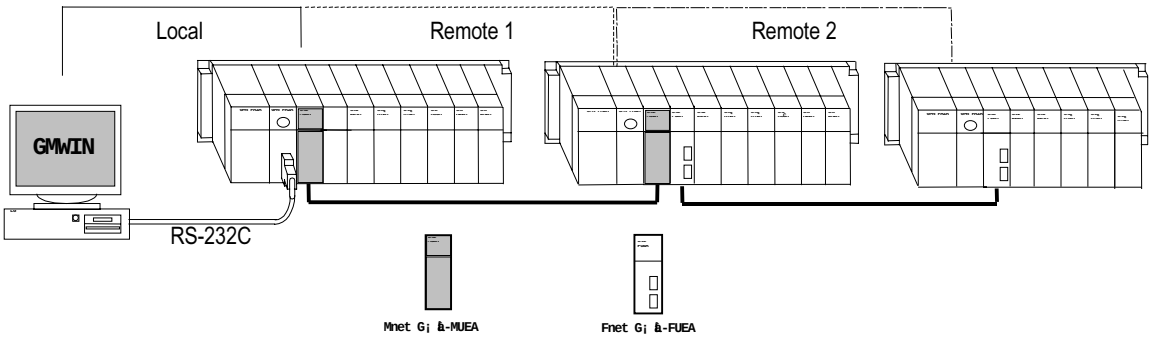
□ Select ***Slot*** and ***Station No***.

Decimal and hexadecimal numbers are all available for the Station No.

□ Click ***OK*** button.

Note

Local Connection, remote 1connection and remote 2 connection are as below.



Chapter 2 Installation

2.1 System Requirements for GMWIN 2-1
2.2 GMWIN Installation 2-2

Chapter 2 Installation

2.1 System Requirements for GMWIN

Hardware and Software requirements for GMWIN are as below.

1) Personal computer and its memory capacity
- Personal computer (80386 / 80486 CPU or above)
- A minimum of 4 MB memory including extended memory.

2) Serial Port
- More than 2 serial port.

3) Hard disk
- 20 Mb Hard disk space

4) Resolution for Graphic Card
- Minimum 800 x 600 pixels or above

5) Floppy disk
- One floppy disk driver.

6) Mouse
- A windows 3.1/95 compatible mouse.

7) Printer
- A windows 3.1/95 compatible printer.

8) MS-DOS
- An MS-DOS operating system for operating Windows 3.1.

9) Windows 3.1/95

2.2 GMWIN Installation

Note

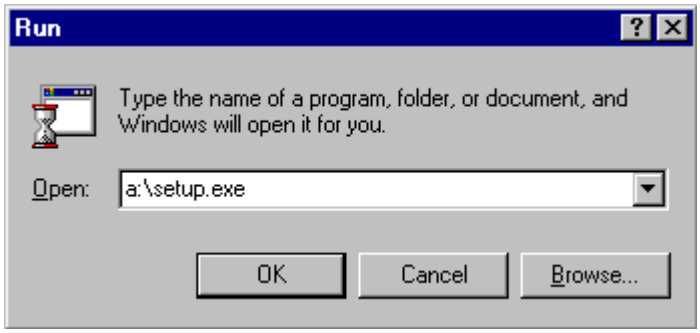
Installation program for GMWIN is compressed in floppy diskettes. So if you just copy all the programs in each floppy diskettes onto your hard disk, you cannot run GMWIN.

To install GMWIN in your computer, Use installation program (SETUP.EXE) in "disk 1".

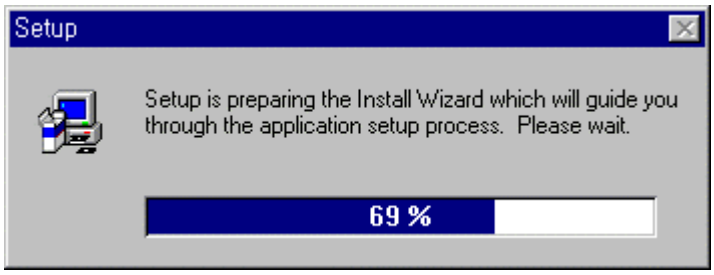
2.2.1 Installing Program

To install GMWIN for Windows, you must run an installation program(SETUP.EXE) in "disk 1" on Windows 3.1/95.

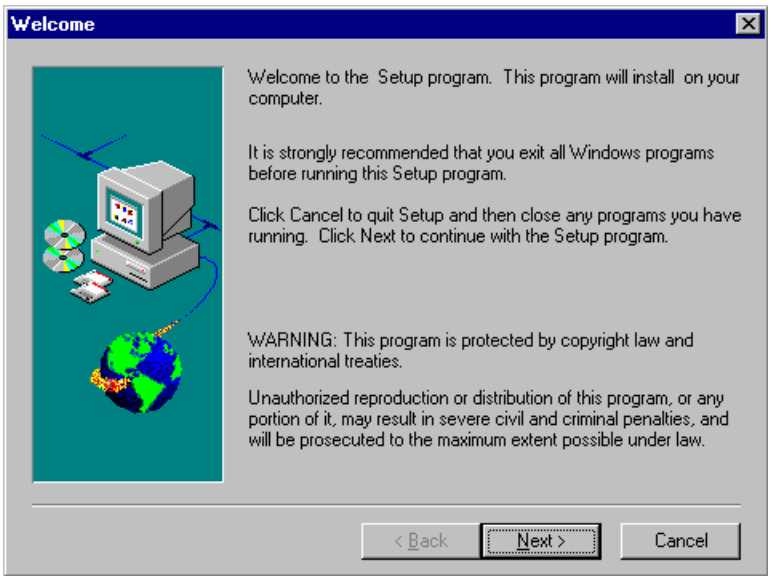
- Confirm that "disk 1" is inserted into your floppy disk driver.
- Click on the ***File menu*** in Program Manager.



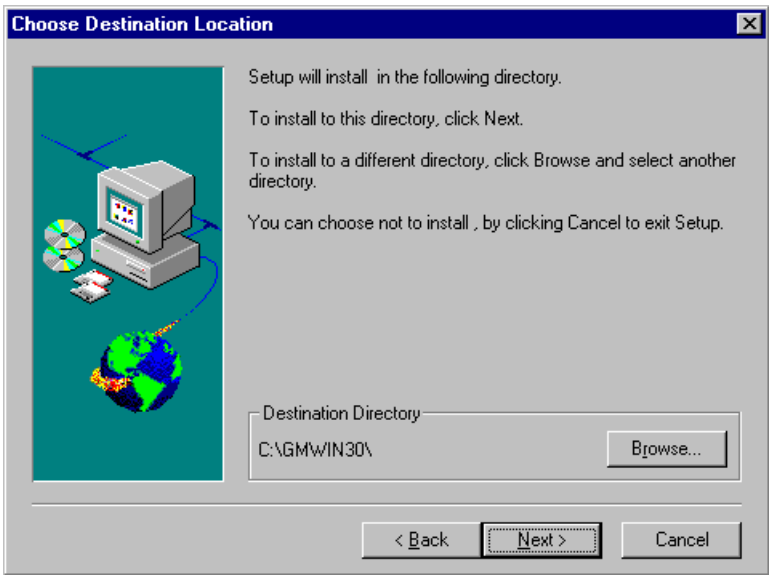
- Select the ***Run*** command and run the ***setup.exe*** in disk 1.
- Click ***OK*** button. Then the setup wizard will guide you to install the program.



□The above dialog box of welcoming message appears in your screen.



□ Click the ***Next*** button to continue the installation.

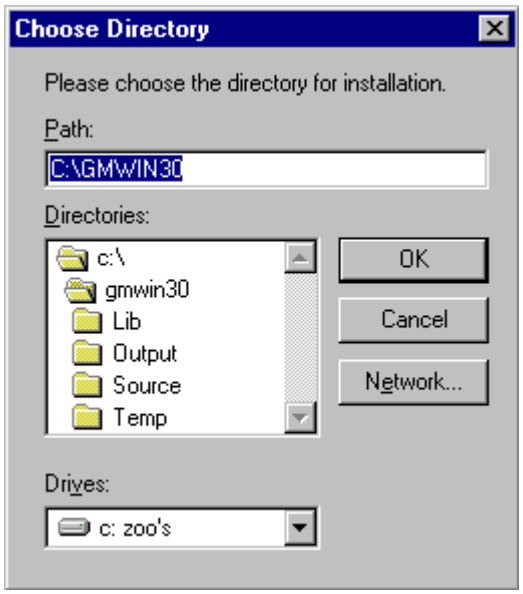


□ ***Select Destination Directory***.

If you want to change the installing directory, click the ***Browse…*** button.

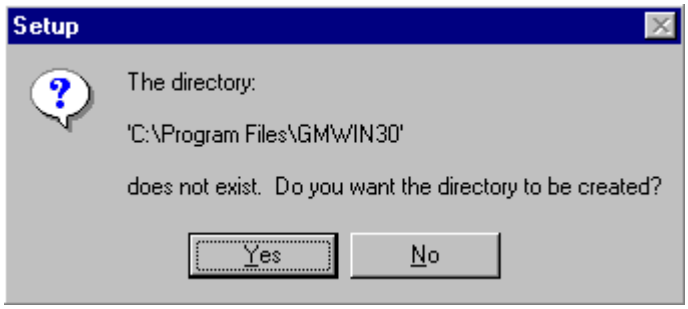
You may cancel the installation by clicking the ***Cancel*** button in dialog box at anytime.

□ If you click the ***Browse…*** button in the dialog box, ***Choose Directory*** dialog box appears.



□ Choose the destination path in the dialog box or enter the path name in the text box and click ***OK*** button.

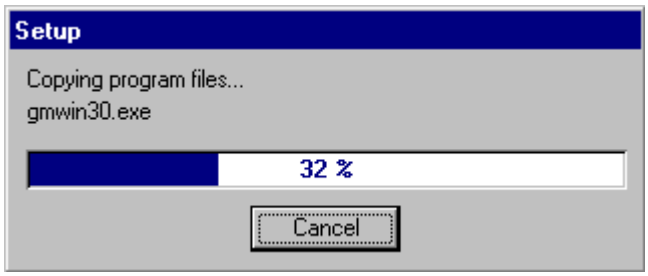
□ If the entered path name does not exist, the dialog box appears as below.



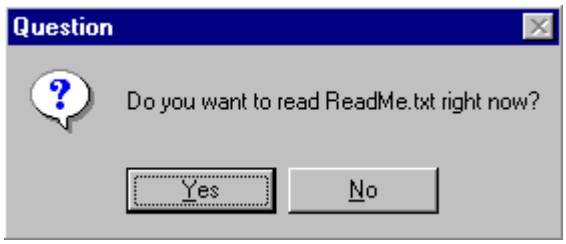
If you would like to create the path, click ***Yes*** button.

□ If you finish selecting installation path, click the ***Next*** button.

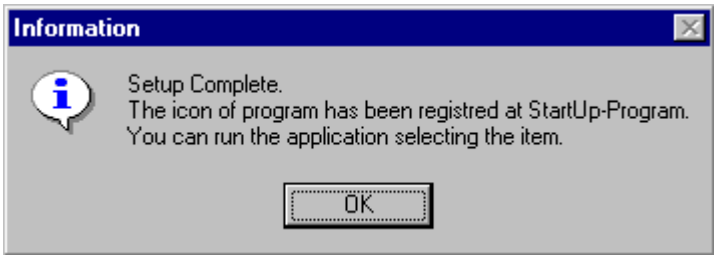
□ Files in the floppy disk will be copied onto your hard disk.



□ When copy is completed, the setup wizard asks whether you read ReadMe.txt file or not.



□ The icon for GMWIN will be registered at the ***Start-Up Program***.
Click ***OK*** button to finish the installation.



Note

Installation at windows 3.1 is exactly same as the above process.
When GMWIN is completely installed, WIN32s will be installed automatically.
Find the GMWIN folder in the windows and run GMWIN.

Chapter 3 Getting Started

3.1. Create a Program 3-1
3.2. Configuration of Screen 3-13
3.3. How to use a Dialog Box 3-21
3.4. Files being created in GMWIN 3-21
3.5. Open a File 3-22
3.6. Save a File 3-23
3.7. Close a File 3-24

Chapter 3. Getting Started

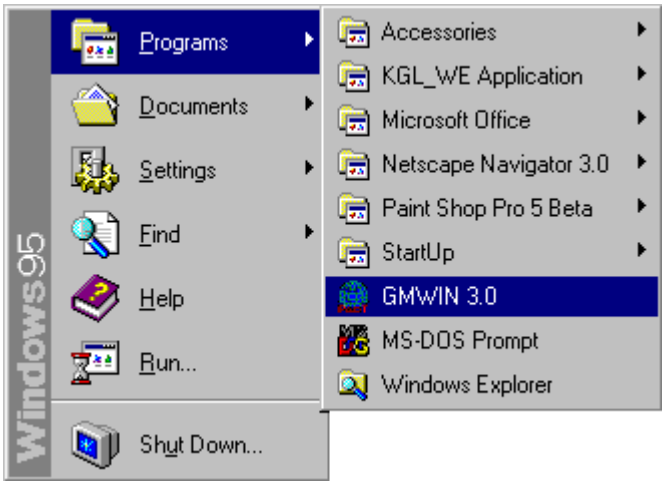
GMWIN is a programming tool that compiles a program, makes an execution file, transfers a file to the PLC, monitors and debugs the PLC program.

GMWIN uses the multiple document interface (MDI) method, so that it is possible to compile and debug several programs at the same time.

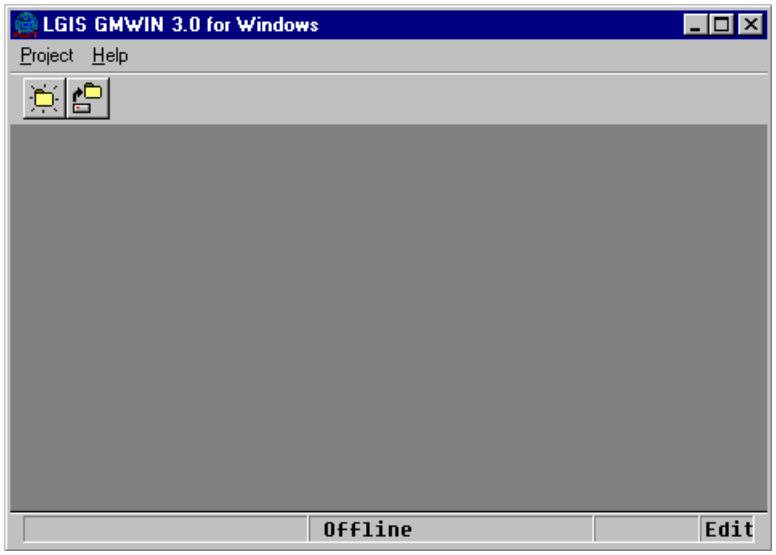
3.1. Create a Program



- Click Start button.
- Click ***Programs - GMWIN3.0***.

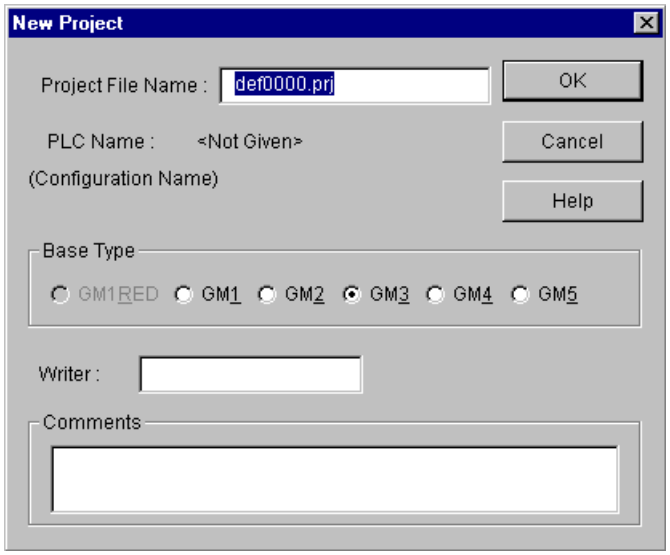


Then the initial window is shown as below.



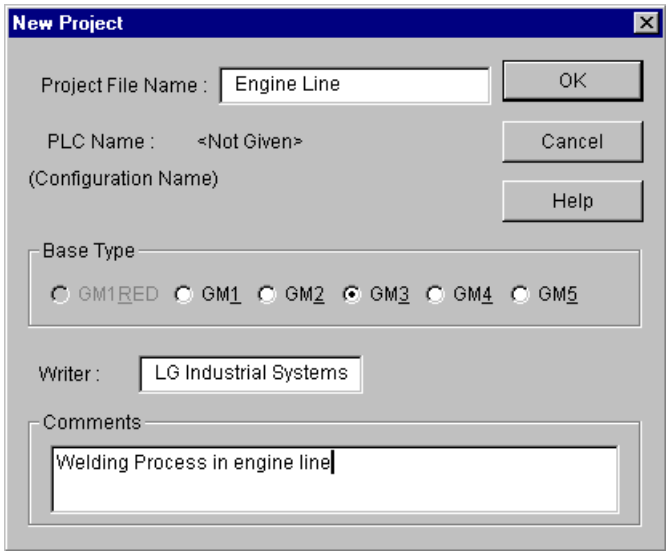
Step 1 : Create a Project

□ Click ***New Project*** ( ) icon or select the dialog box by clicking ***Project - New…***.



□ Enter the information to the text boxes on ***New Project*** dialog box.

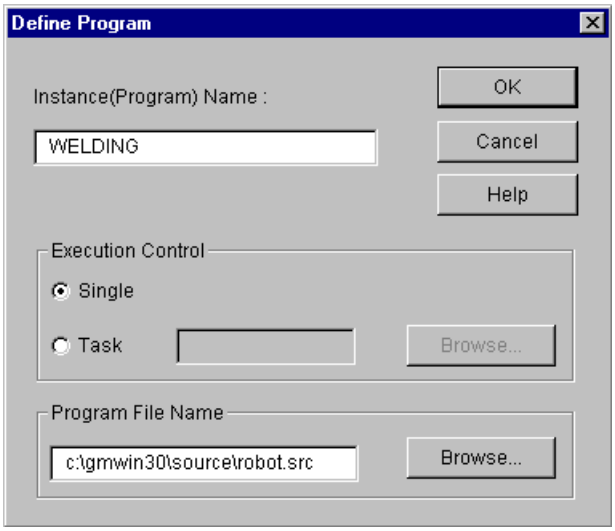
Project File Name	Engine Line
Base Type	GM3
Writer	LG Industrial Systems
Comments	Welding Process in engine line



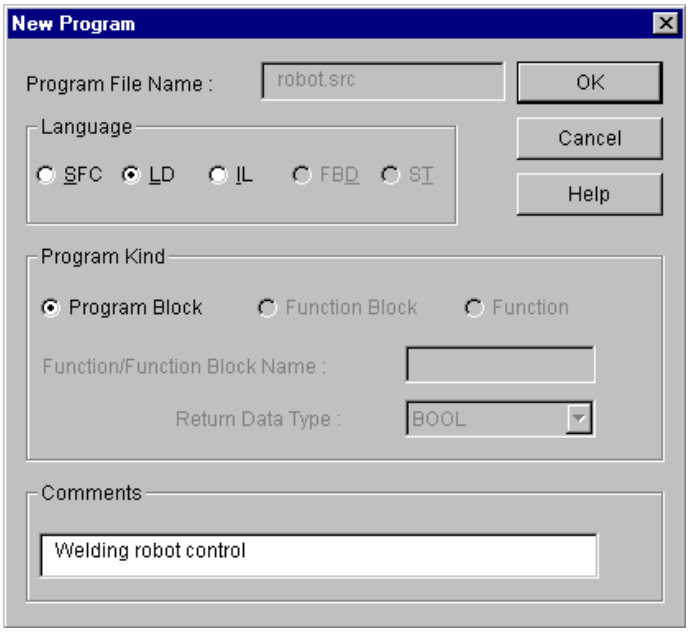
□ Click ***OK*** button.

Step 2 : Define a Program

□ Enter the information on the ***Define Program*** dialog box.



□ Enter an instance(program) name in ***Instance Name*** text box.
□ Enter 'robot.src' for Program File Name and click ***OK*** button.
□ Open ***New Program*** dialog box.



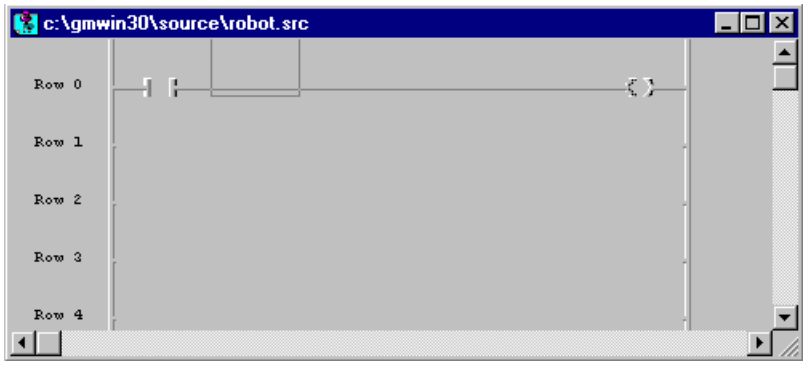
□ Select kind of language to use for the new program.
□ Type Comments for the description of the program in ***Comments*** box.
□ Press ***Enter*** or ***OK*** button.

Step 3 : Editing a Program

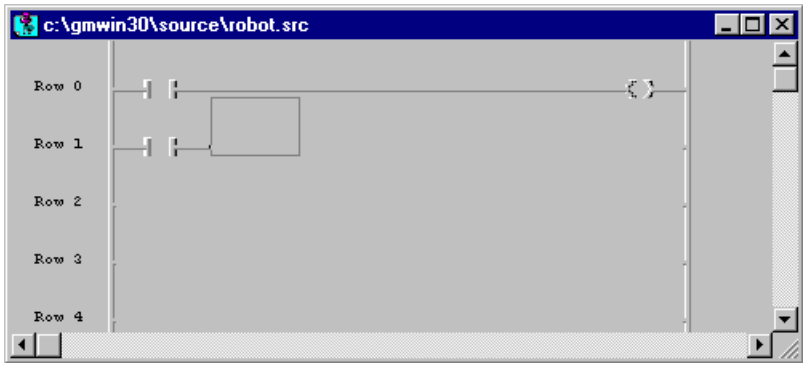
1) Input a contact and output coil

□ Click the left button of the mouse on the position of Row '0' and Column '1' in the LD window after selecting(┤├) icon in the toolbox.

□ Click the mouse on the right side of contact of ┤├ after selecting { } in the toolbox as below.



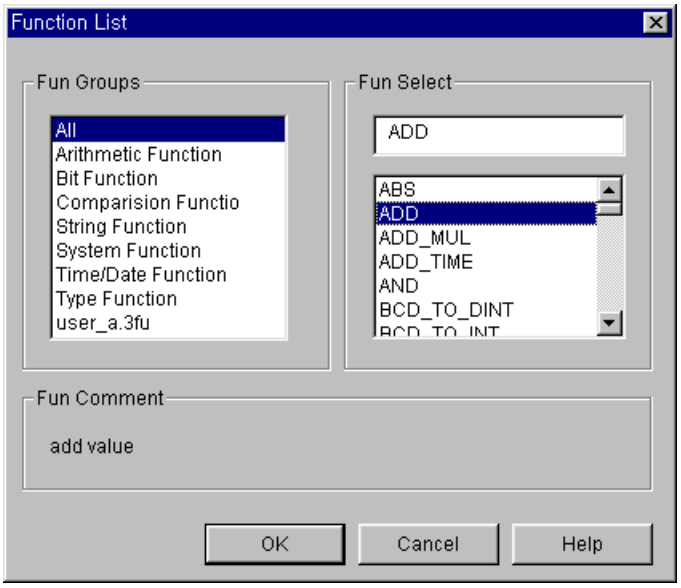
□ Select in the toolbox and click the left button on the location of Row '1' and Column '1'.



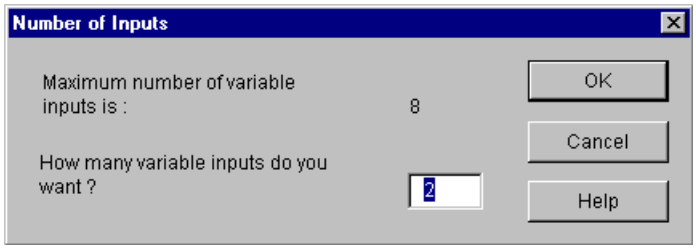
2) Insert a Function

□ Select {F} in the toolbox using a mouse.

□ Click the left button of mouse on the position of Row '1' and Column '2'.

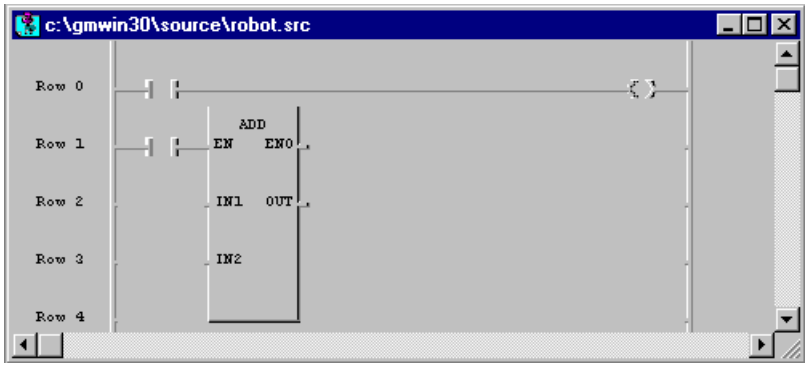


□ Select Arithmetic Function `ADD' in ***Fun Select*** box and click ***OK*** button.



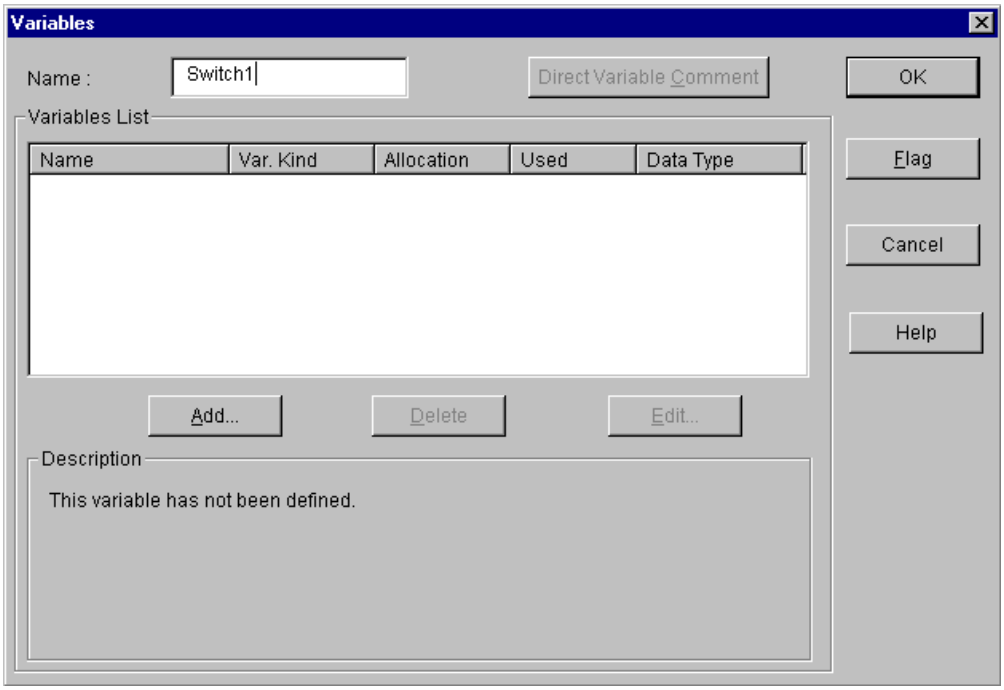
□ Enter '2' for the number of inputs.

□ Click ***OK*** button.



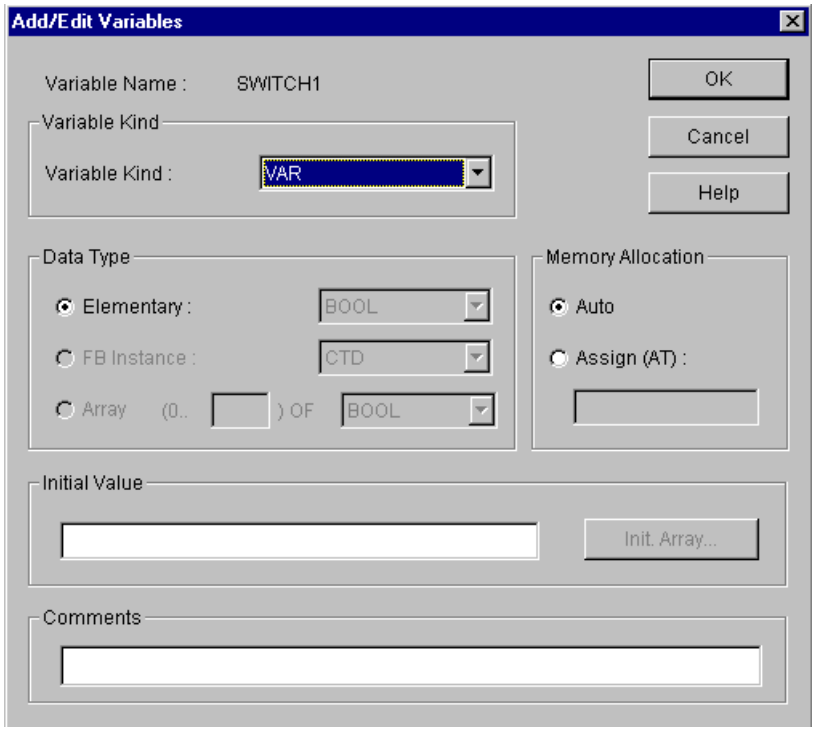
3) Variable Input

□ Select  in the toolbox and double-click the left button of mouse on the location  of Row '0' and Column '1'.

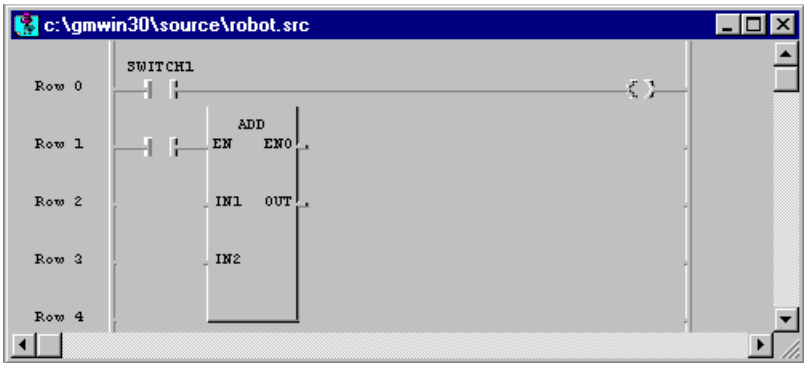


□ Enter 'SWITCH 1' in the ***Name*** edit control.

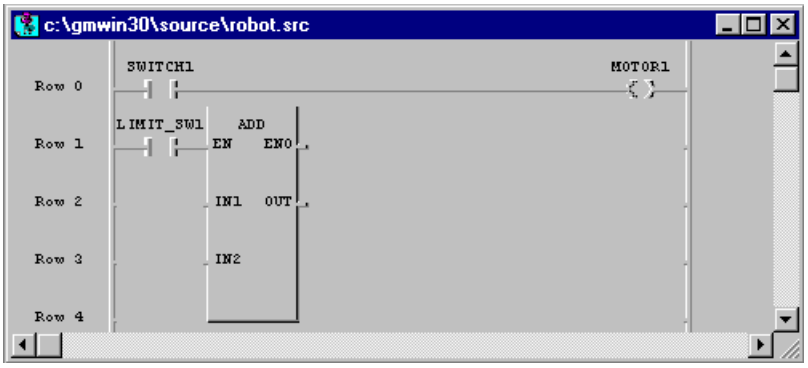
□ Click ***OK*** button.



□ Click ***OK*** button.

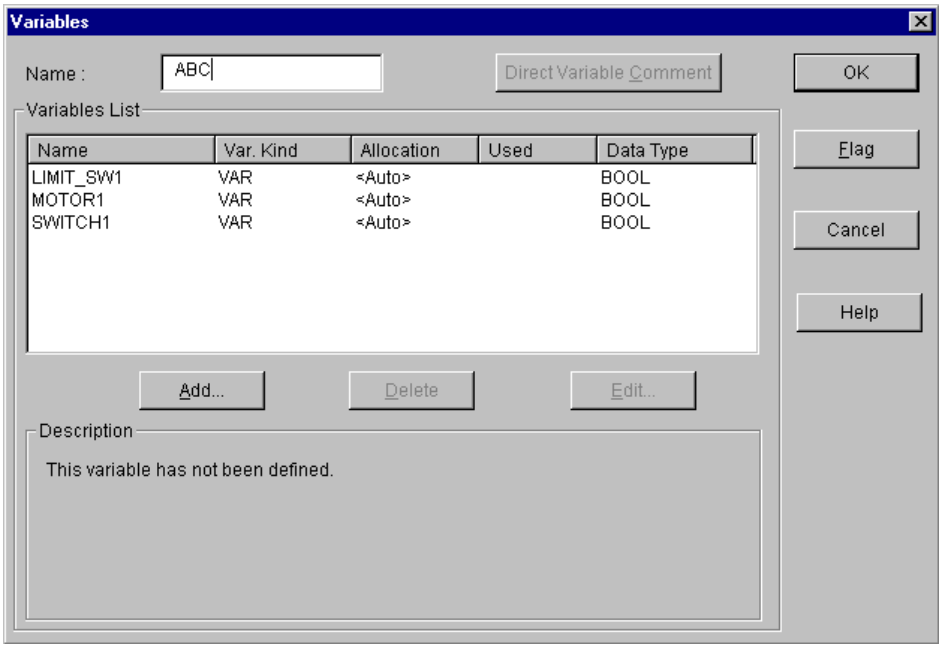


□ How to assign a variable to output coil and the input contact for ADD Function are same as the above one.

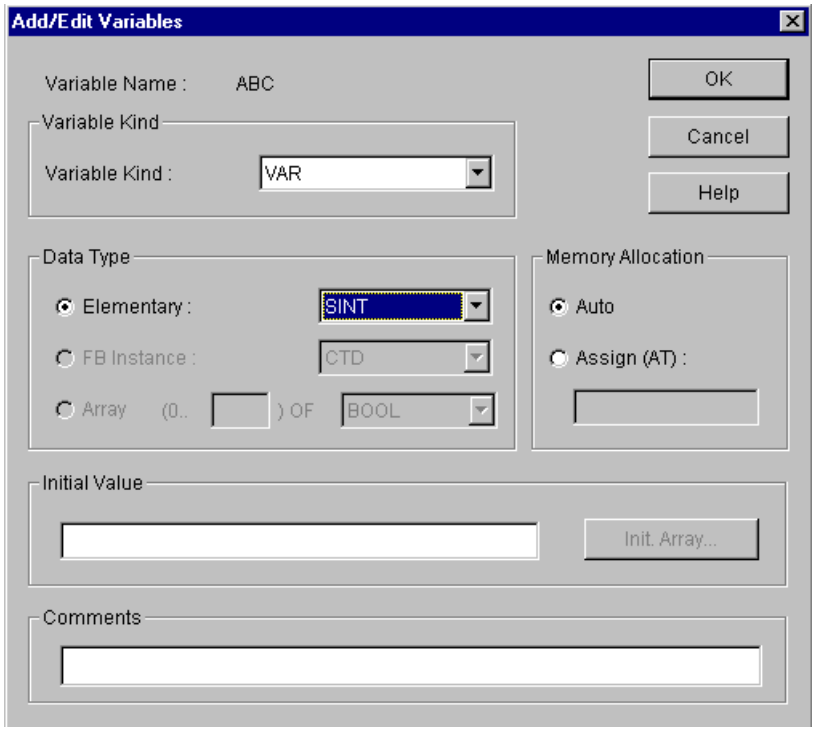


□ Double-click the left button of mouse on the left of 'IN1' position (row '2', column '1') in the function 'ADD'.

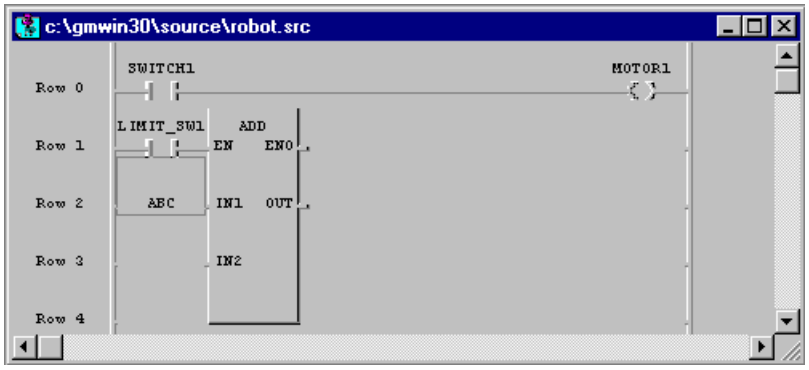
□ Enter the variable name 'ABC' on the ***Name*** edit control in ***Variables*** dialog box.



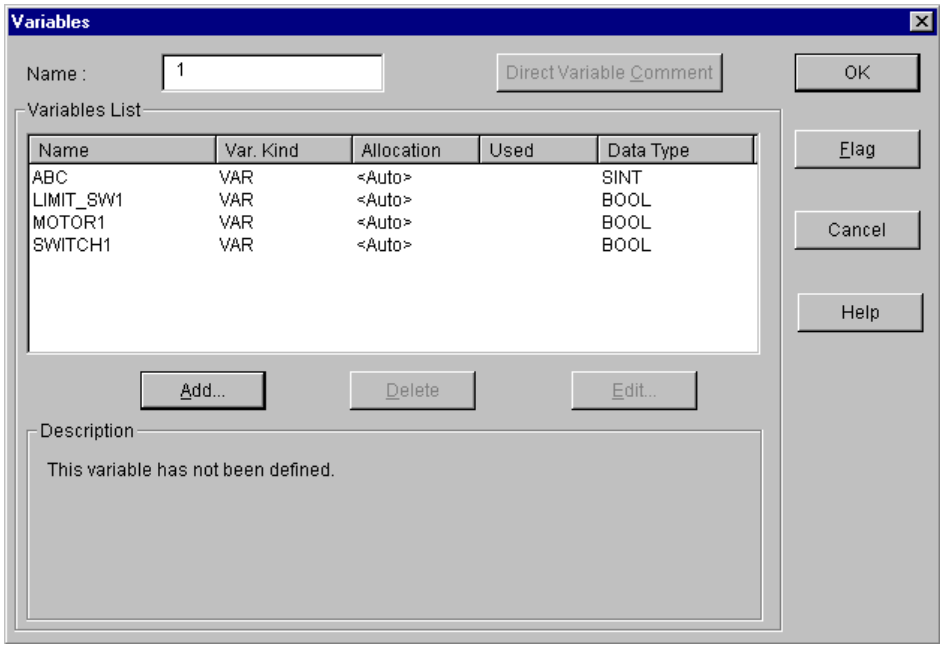
□ Click ***OK*** button. Then ***Add/Edit Variables*** dialog box appears.



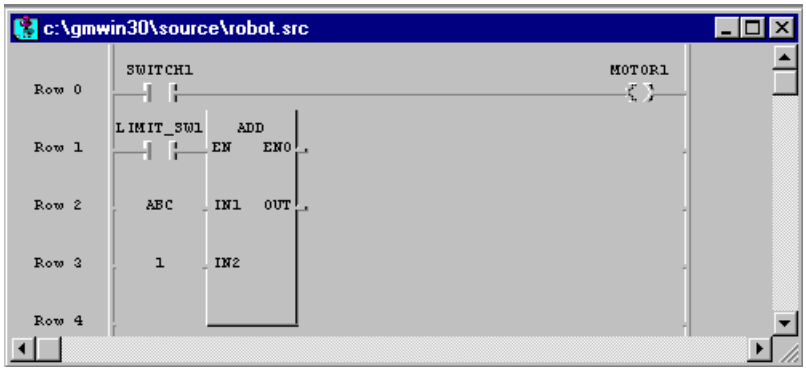
□ Click ***OK*** button. Then variable name 'ABC` is assigned as ‘IN1’ of the function ‘ADD’.



□ Double-click the left button of the mouse on ‘IN2’ position (Row ‘3’, Column ‘1’).
□ Then ***Variables*** dialog box appears.
□ Enter Constant ‘1’ in the edit control of ***Name***.

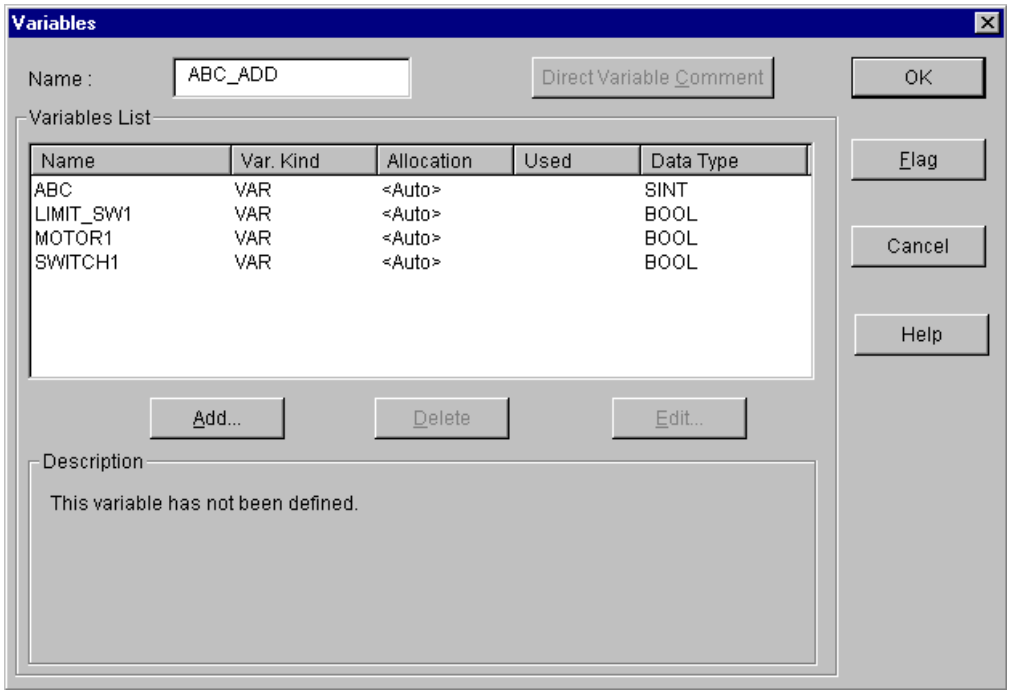


□ Click ***OK*** button. Then Constant '1' is assigned as 'IN2' of the function 'ADD'.

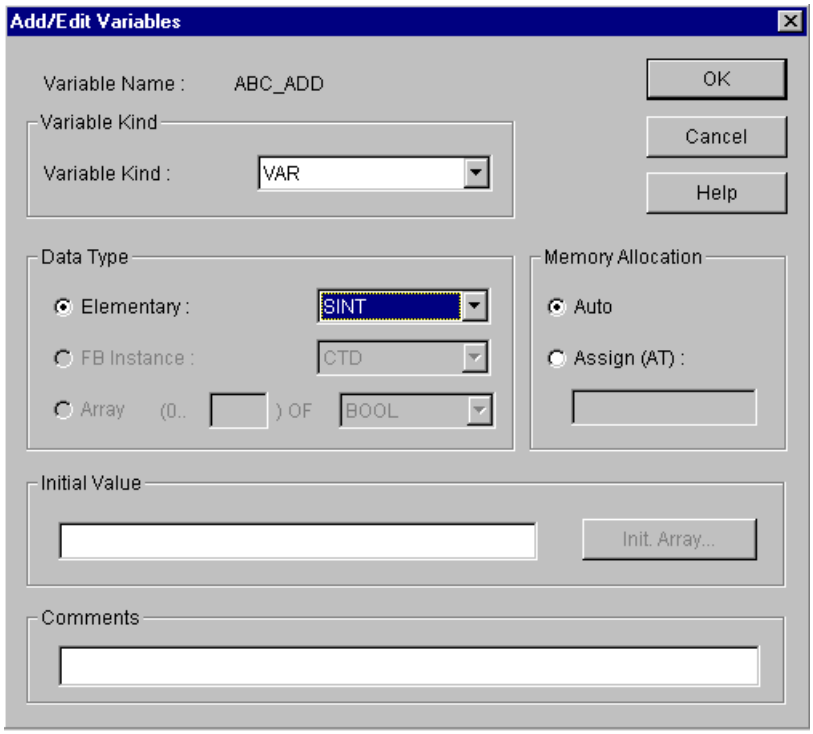


□ Double-click the left button of the mouse on 'OUT' position (Row '2', Column '3') in the function 'ADD'.

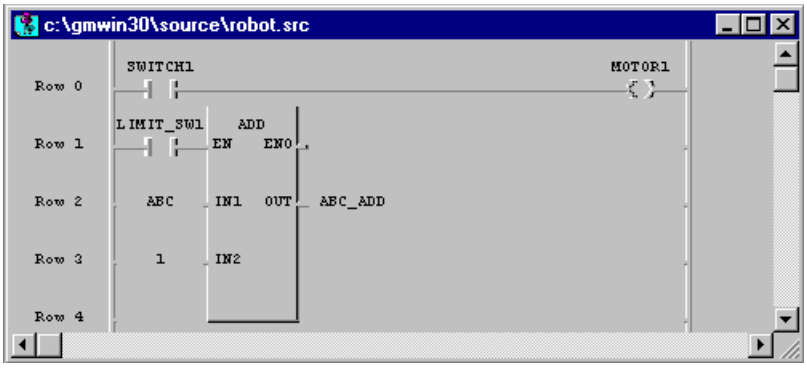
□ Enter the variable name 'ABC_ADD' in the edit control of ***Name*** in the Variables dialog box.



□ Click ***OK*** button.

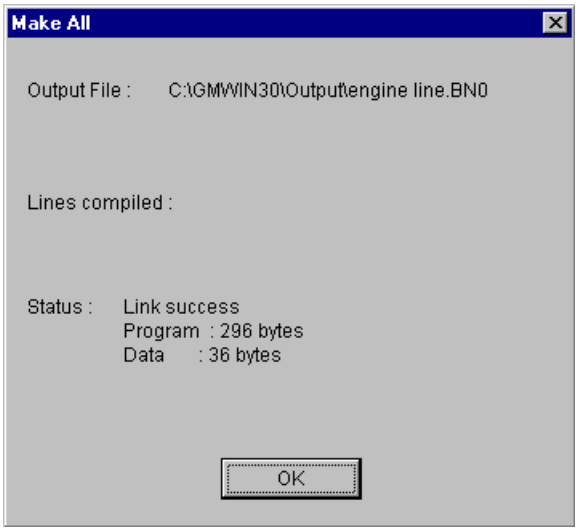


□ Click ***OK*** button. Then the variable name 'ABC_ADD' is assigned as 'OUT' in the function 'ADD'.



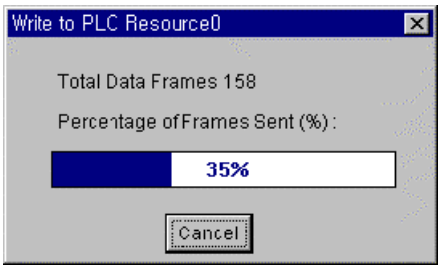
Step 4 : Compile a Program

- Select ***Compile - Make*** in the pull-down menu.
- Build the project file for the execution by running compiler.

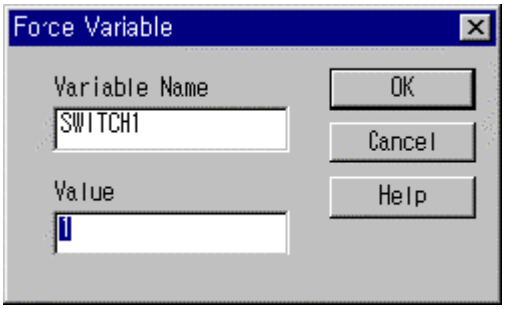


Step 5 : Download a Program

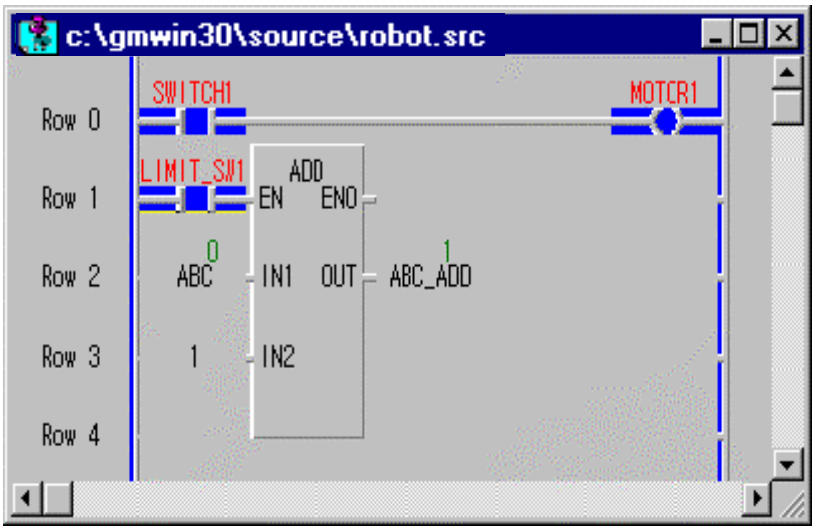
□ Be sure to connect the cable between PC and PLC before downloading the program.
□ Select ***Online - Connect*** + ***Write*** + ***Run*** + ***Monitor On***.



□ Then the execution file is downloaded to PLC.
□ After downloading the program, PLC must be 'Run' mode to enable monitoring.
□ In order to turn 'SWITCH1' On forcibly, double-click the left button of the mouse on the position of the contact. Then ***Force Variable*** dialog box appears.

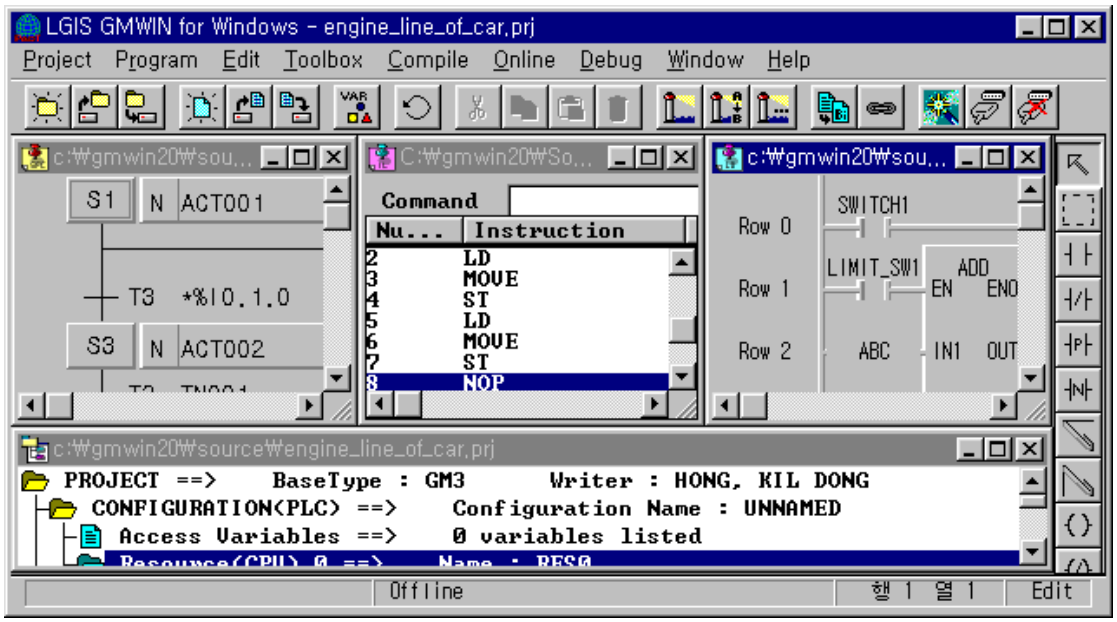


□ Enter the value of the contact as '1' in the edit control of ***Value*** and click ***OK*** button.
□ To turn 'LIMIT_SW1' On forcibly, execute the same order as the above.

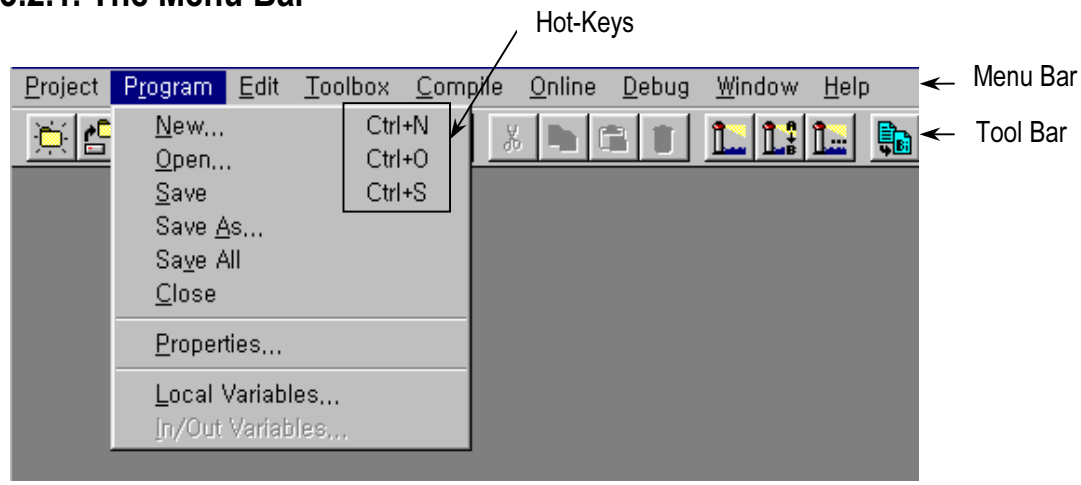


□ The output coil 'MOTOR1' gets On/Off according to the condition of the input 'SWITCH1'.
□ Variable 'ABC_ADD' is increased by 1 according to the result of variable 'ABC'.

3.2. Configuration of Screen



3.2.1. The Menu Bar



To access the pull-down menus, click on a menu using a mouse or key.

If menu item has the hot-key (Ctrl+X, Ctrl+C ...), you can select the menu directly by pressing hot-keys.

1) Project

Items		Description
New		Create a new project
Open		Open an existing project
Open From PLC		Up-load and open a project in PLC
Save		Save a project (Not program)
Save as		Save a program as another name
Close		Close a project
Add Project Item		Add new items (Program or Resource.: Resource can be added only in GM1.) to a project
Edit Project Item		Edit an item in a project
Delete Project Item		Delete items(Program, Resource) in a project
Up(Program)	Ctrl+U	Exchange a program order with the upper item in the project window
Down(Program)	Ctrl+W	Exchange a program order with the lower item in the project window
Print		Print all or part of the contents in the active window
Printer Setup		Select the printer and Setup the options of the printer
Options		Setup options in GMWIN Connect Option, Monitor/Debug Option…)
Library Manager		Create or edit library files
Insert Library		Insert a library file into the project
Start Simulation		Start or stop the simulation
Exit		Quit the application

2) Program

Items		Description
New	Ctrl+N	Make a new program
Open	Ctrl+O	Open an existing program
Save	Ctrl+S	Save a program
Save as		Save a program as another name
Close		Close a program
Properties		Change program properties
Local Variables		Show and edit local variable
In/Out Variables		Show and edit Input/Output variables for Function or Function block

In SFC Program Menu, more menus are added as below.

Items	Description
Action List	Show action lists
Transition List	Show transition lists

3) Edit

Items		Description
Undo	Ctrl+Z	Undo the last action
Cut	Ctrl+X	Cut the selection and move it to Clipboard
Copy	Ctrl+C	Copy the selection to Clipboard
Paste	Ctrl+V	Copy the selection to edit window from Clipboard
Delete	Del	Delete the selection
Find	Ctrl+F	Search for letter
Replace	Ctrl+H	Search for letter and replace with another letter
Find Again	Ctrl+F3	Run again 'Find' or 'Replace' command
Find-Move		Move a cursor to desired place

In SFC Program Menu, more menus are added as below.

Items		Description
Condense screen	Ctrl_P	Determine the rate of the screen size
Comments		Show comments of action and transition
Arrange Number		Readjust step and transition numbers

In LD Program Menu, more menus are added as below.

Items		Description
Condense screen	Ctrl+E	Determine the rate of the screen size
Variable Comments	Ctrl+M	Show comments of variable in LD window
Delete Line	Ctrl+D	Delete a line
Delete Cell	Del	Delete a cell
Insert Line	Ctrl+L	Insert a line
Insert Cell	Ctrl+I	Insert a cell

4) Toolbox

Item	Description
Toolbox Type	Open/close a toolbox and adjust a position of toolbox

In IL mode,

Items		Description
Function	F2	Insert a function
Function Block	F3	Insert a function block
Label	F4	Insert a label
Operator	F5	Insert an operator
Delete	F6	Delete one line of program
Variable Comment	F7	Show or hide comment column
Insert/Overwrite	F8	Change a mode (Toggled)

In LD mode,

Insert contact, coil, function, function block, jump, return and etc.

In SFC mode,

Items		Description
Step	F2	Insert a step or transition
Branch	F3	Insert a selective or simultaneous branch
Action/Transition	F4	Define a name of action or transition including Qualifier
Label	F5	Insert a label
Jump	F6	Insert a jump
Zoom	F7	Open action or transition window
Arrow Mode	Ctrl+A	Switch to Arrow mode

In monitoring mode for LD and IL,

Item	Description
Select Array Subscript	Specify array index for monitoring

In Variable monitoring mode,

Items		Description
Start/Stop	F2	Select start/stop mode for monitoring
View	F3	Select an information of the variable to monitor
Force	F4	Enter the specified value for variable forcibly
Select	F5	Select a variable to monitor
Display Form	F6	Show the variable to be monitored with hexadecimal or decimal format selectively
Array Number select	F7	Specify array range of variable for the type of Array

In Time Chart monitoring mode,

Items		Description
Start/Stop	F2	Select start/stop mode for monitoring
View	F3	Select an information of the variable to monitor
Force	F4	Enter the specified value for variable forcibly
Select	F5	Select a variable to monitor
Time	F6	Select the period to monitor

In case of monitoring I/O

Items		Description
Select Base	F2	Select a base board to monitor
Start/Stop	F3	Select start/stop mode for monitoring

5) Compile

Items	Description
Compile	Compile a program
Make	Build a PLC execution file after compiling an active program in a project
Build All	Make a PLC execution file after compiling all programs in a project
Message	Show an error message after compiling
Memory Reference	Show used global or direct variables

6) Online

Items		Description
Connect+Write+Run+Monitor On Ctrl+R		Connect GMWIN to PLC, write a program created by user, change the operation mode and monitor it
Connect		Connect GMWIN to PLC
Disconnect		Disconnect GMWIN from PLC
Read		Read PLC data
Write		Write to PLC
Monitor	Monitor On/Off	Start monitoring / Stop monitoring
	Variable Monitor	Monitor variables
	I/O Monitor	Monitor I/O's
	Time Chart Monitor	Monitor Boolean variables in time chart format
	Link Parameter Monitor	Monitor High speed link parameter
Mode Change		Change PLC operation mode
Clear Data		Clear PLC data to '0'
Reset		Reset CPU of PLC
Flash Memory		Show the type of the flash memory in CPU Write data on a flash memory
Link Enable		Enable or disable the execution of the high speed link
PLC Info		Show PLC information
I/O Info		Show the information of PLC I/O's
I/O Forcing		Setup the forced I/O
Link Info		Show the information of link module
Mnet Parameter		Show the information of Mnet parameter
Mnet Info		Show Mnet information
I/O Skip		Specify I/O to skip
Fault Mask		Set Fault Mask
Initialize Special Modules		Initialize Special Modules
Start Online Edit		Select a target source
Write for Online Edit		Compile and write for Online Edit
Cancel Online Edit		Cancel current Online Edit
Data Share		Share the data for monitoring

7) Debug

Items	Description
Debug Start/Stop	Start/stop debugging (Toggled)
Go Ctrl+F9	Start or continue the program execution
Step Over Ctrl+F8	Step over the next statement
Step Into	Step into the next statement
Step Out	Step out of the current function or function block
Pause	Pause the program execution
Run to Cursor Ctrl+F2	Run to cursor position
Add/Remove Breakpoint Ctrl+F5	Insert or remove a breakpoint
Breakpoint List/Condition	Show breakpoints and break conditions
Task Enable	Enable or disable the task execution

8) Window

Items	Description
Cascade	Arrange the windows as overlapping tiles
Tile Horizontally	Arrange the windows as horizontal, non- overlapping tiles
Tile Vertically	Arrange the windows as vertical, non-overlapping tiles
Arrange Icons	Arrange icons
Close All	Close all active windows

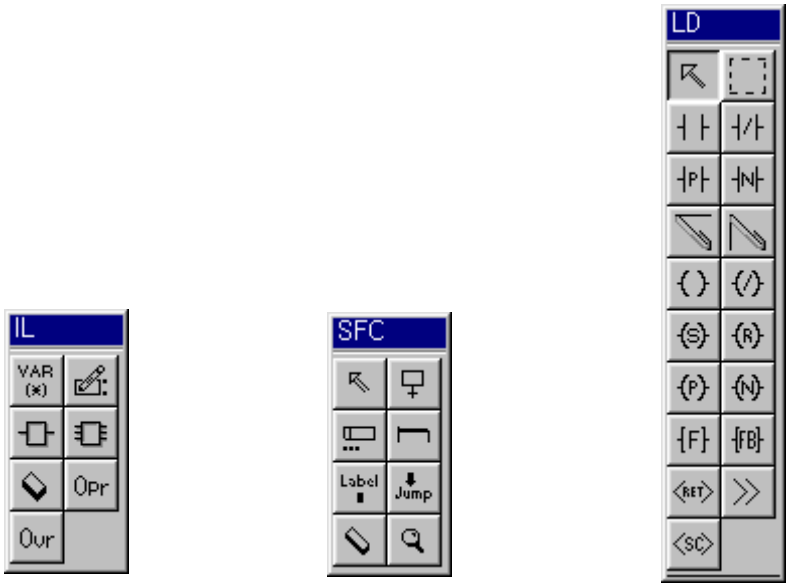
3.2.2. The Tool Bar



Tool Bar buttons represent single action functions that you can perform by simply clicking on the appropriate button.

Tool	Comment	Tool	Comment
	New Project		Connect + Write + Mode Change To Run + Start Monitor
	Open Project		Connect
	Save Project		Disconnect
	New Program		Write
	Open Program		Monitor Start/Stop
	Save Program		Run
	Local Variable		Stop
	Undo		Pause
	Cut		Debug Start
	Copy		Debug Run
	Paste		Step Over
	Delete		Step Into
	Find		Step Out
	Replace		Pause
	Find Again		Run to Cursor
	Compile		Add/Remove Breakpoint
	Make Execution File		

3.2.3. The Toolbox



SFC toolbox IL toolbox LD toolbox

You can create or edit a program using the toolboxes for each language.

You can also execute the same function as the toolboxes by clicking ***Toolbox*** in the pull-down menu.

You can change the position of the toolbox or the property by selecting ***Toolbox - Toolbox Type*** in the pull-down menu.

3.2.4. The Status Bar



3.2.4.1. Description Mode

Describes the function of the command or menu.

3.2.4.2. PLC Mode

Shows PLC type, PLC operating mode, Monitoring mode and more.

3.2.4.3. Cursor Position

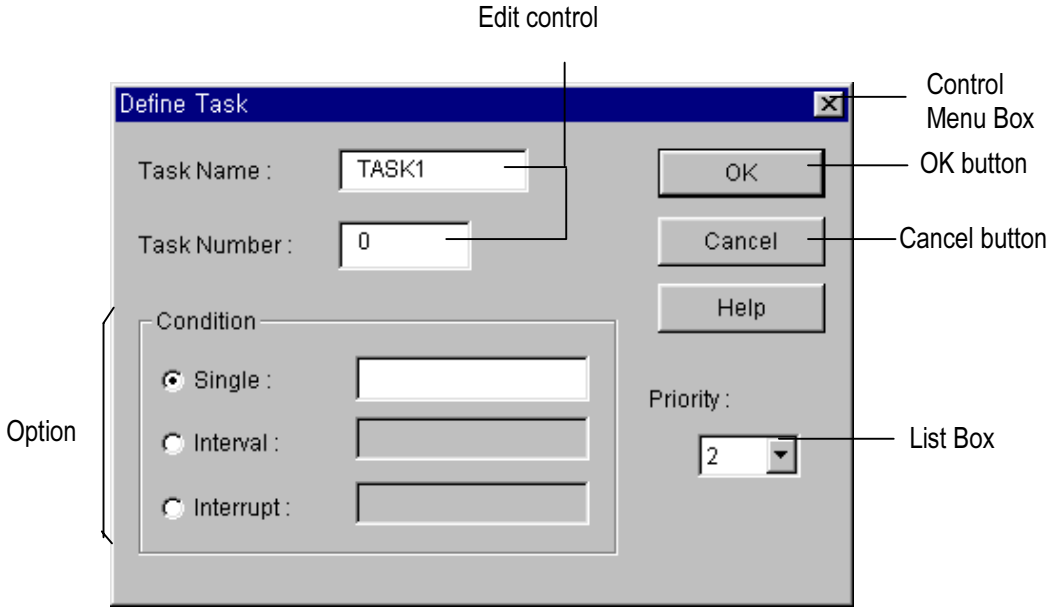
Shows the location of the cursor in the screen as Row/Column.

3.2.4.4. Status of GMWIN

Shows the status of GMWIN(Edit mode, Monitor mode and Debug mode).

3.3. How to use a Dialog Box

Edit control, OK/Cancel/Help button, Option and List Box are in dialog box so you can define a required value or input.



Edit control : Enter a required name or letter.
Option Radio Button : It is used to select only one in the same group.
: Click a mouse on a desired item.
List Box : Select one in the list.
: List is appeared by clicking a mouse on arrow in list box and you can select a list by clicking.
OK button : Click OK button to close a dialog box after entering a designated value.
Cancel button : Click Cancel button or double-click a mouse on adjustment menu box to cancel the setup and close the dialog box.

3.4. Files being created in GMWIN

If a user create a PLC execution file through building a project and editing a program, the following files are created.

<Project Name>.**PRJ** : Project file created by user.
<Project Name>.**BN0** : PLC execution file.
In GM1, files are created as many as resource.
<Project Name>.BN**0** □ <Project Name>.BN**i**,(**i** is resource number).
<Project Name>.**MON** : Information file for Monitoring.
<Project Name>.**CR0** : It is created when user builds a PLC execution file.
It is the text file that expresses the global or direct variable used in each program (Cross Reference).

<Program Name>.**SRC** : Program file created by user

<Program Name>.**ASV** : Program created by user is saved as this name periodically. To create this file, you must setup the time value by setting up the time cycle in ***Option - Auto Save*** in the pull-down menu. This file is deleted automatically by closing a program window normally.

<Program Name>.**OP?** : It is created as object file when user compiles a program. (in case of Program Block)

<Program Name>.**OB?** : It is created as object file when user compiles a program. (in case of Function Block)

<Program Name>.**OF?** : It is created as object file when user compiles a program. (in case of Function)

Example (OP3 : program block for GM3, OF4 : Function for GM4)

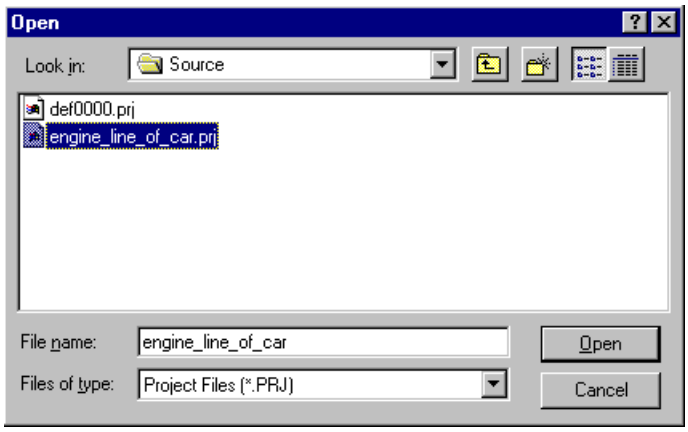
3.5. Open a File

To open a Project

□ Select ***Project - Open*** in the pull-down menu.

To open a Program

□ Select ***Program - Open*** in the pull-down menu.



□ Look in the folder to open and select the file to open
List box displays only files having an extension name selected in ***Files of type*** list box.
(Project File : *.PRJ, Program File : *.SRC)

□ Click ***Open*** button.

3.6. Save a File

3.6.1. Save a New File

Save a new file that is not ever saved.

To save a Project

□ Select ***Project - Save*** in the pull-down menu.

To save a Program

□ Select ***Program - Save*** in the pull-down menu.

□ Select a drive and folder to save the file.

□ Enter a file name in the ***File Name*** text box.

Input a ***PRJ*** extension for Project File and a ***SRC*** extension for Program File.

□ Click ***Save*** button.

3.6.2. Save a File on Working

To save a project

□ Select ***Project - Save*** in the pull-down menu.

To save a program

□ Select ***Program - Save*** in the pull-down menu.

3.6.3. Save as another name

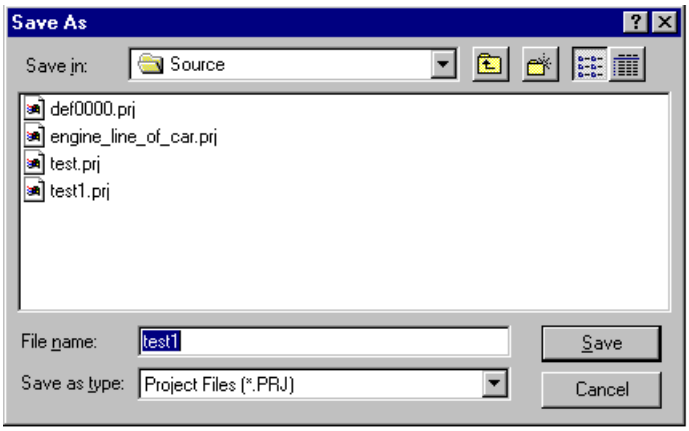
You can save a project or program as another file name.

To save a Project

□ Select ***Project-Save as…*** in the pull-down menu.

To save a Program

□ Select ***Program - Save as…*** in the pull-down menu.



□ Select a drive and folder to save the file.

□ Enter a file name in the ***File Name*** text box.

Input a ***PRJ*** extension for Project File and a ***SRC*** extension for Program File.

□ Click ***Save*** button.

3.7. Close a File

<Method 1>

Double-click a mouse on the Adjustment Menu Box on the right-upper corner of the active window.

<Method 2>

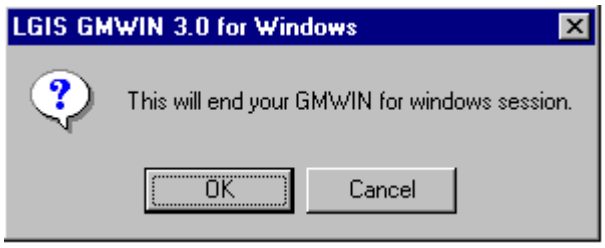
To close a Project

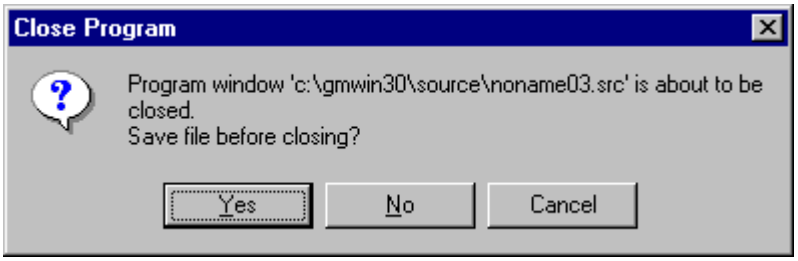
□ Select ***Project - Close*** in the pull-down menu.

To close a Program

□ Select ***Program - Close*** in the pull-down menu.

If the file was not saved, then following dialog box appears.





To save a file

□ Click ***Yes*** button.

Not to save a file

□ Click ***No*** button.

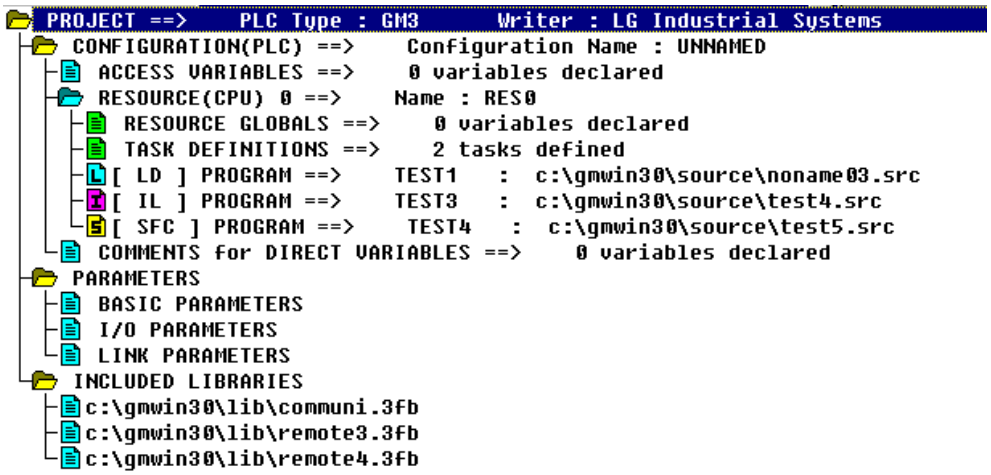
□ Click ***Cancel*** button to cancel

Chapter 4 Edit a Project

4.1 Create a Project 4-2
4.2 Open a Project 4-3
4.3 Save a Project 4-3
4.4 Edit Configuration 4-4
4.5 Edit a Parameter 4-15

Chap 4 Edit a Project

Project is a basic element of GLOFA PLC. Basically, one project can be created for each PLC system. Project consists of Configuration part, Parameter part and Included Library files. Configuration part is software part such as Global variables, Access variables, Resource contents and etc.. Parameter part is a hardware part such as basic parameters, I/O parameters, link parameters and etc. And Library files can be added or deleted in Included Library Files part.



Items	Descriptions
Project	Define all the PLC systems
Configuration	Set definition about PLC program
Configuration Global Variable	Variable which can be used in the configuration
Access Variable	Accessible variable list from other Configurations
Resource	CPU module
Resource Global Variable	Variable which can be used in all resources within a project
Task Definition	Definition of program executive conditions
Program Definition	Definition of each program and it's executive conditions
Direct Variable Comment	Comment list using in direct variable
Parameter	Defined content for the hardware in PLC system
Basic Parameter	Definition of basic hardware parameter
I/O Parameter	Described content on input/output module
High Speed Link Parameter	Described content on high speed link parameters
Included library files	File list for currently used libraries

Reference: How to use folder

You can use the tree list to see briefly or detail tree list by clicking a mouse or pressing the right/left arrow key.

: Opened folder. If you click this folder, it changes into closed folder and lower branch is disappeared.

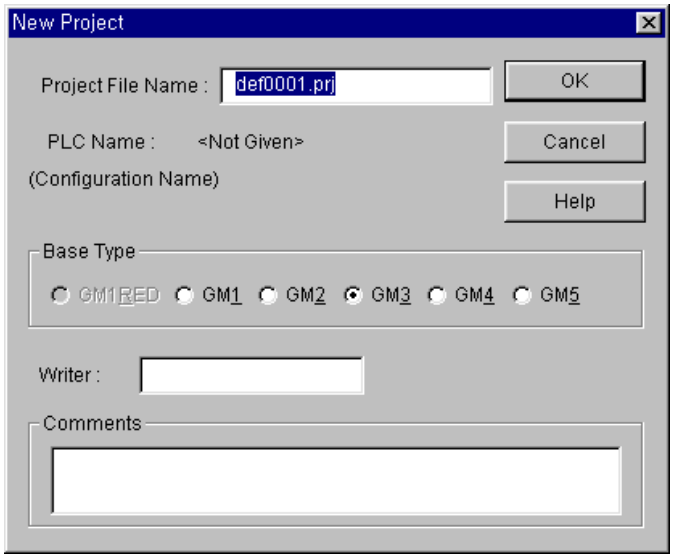
: Folder that can be opened. If you click this folder, it changes into opened folder and lower branch is appeared

: Unable to open folder (it describes an item).

: This folder means each item.

4.1 Create a Project

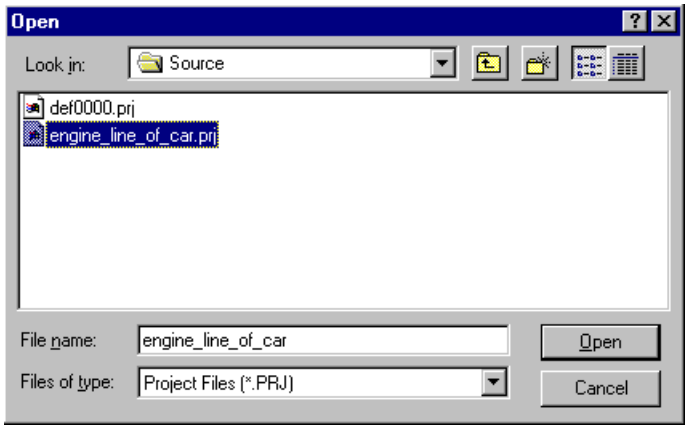
□ Select ***Project - New Project*** ( ).



□ Enter the Project File Name.
□ Select ***Base Type*** option radio button.
□ Input the writer name in the ***Writer*** text box.
□ Input the comment in the ***Comments*** text box.
□ Click ***OK*** button. Then ***Define Program*** dialog box appears.
(Refer to the section 5.1 for more information of ***Define Program*** dialog box)

4.2 Open a Project

□ Select ***Project - Open...*** ( ).

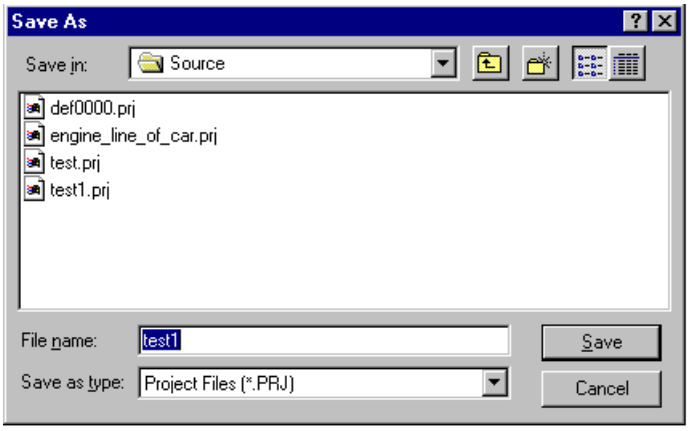


□ Select a desired project and click ***Open*** button.

4.3 Save a Project

□ Select ***Project – Save***( ). If you save already existing project file, no message will be displayed.

□ If you save a new file or save by selecting ***Project - Save As…***, a dialog box will be displayed as below.



□ Enter the file name that you want to save and click ***Save*** button.

4.4 Edit Configuration

To edit configuration, double-click on the each list of tree list or select ***Project - Edit Project Item***.

4.4.1 Edit a Project

PROJECT ==> PLC Type : GM3

- Select ***Project*** in the lists of Project window(or double-click Project in the Project window)
- Select ***Project - Edit Project Item*** in the pull-down menu.
- Edit the project with the same way used in section 4.1.
- Click ***OK*** button.

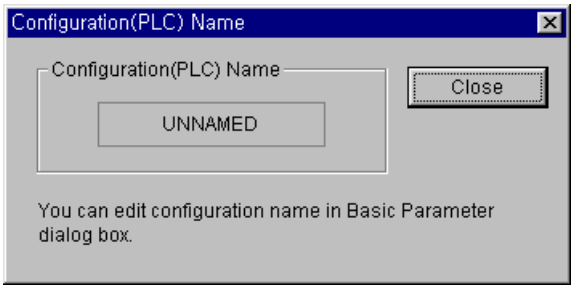
Note

If you change PLC type, you must reload library (besides standard library) selectively.
(Refer to detail comment in "10.2 load Library ")

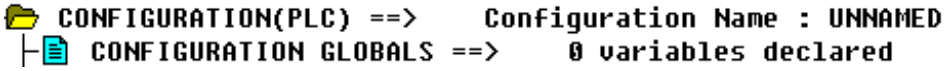
4.4.2 Edit Configuration Item

CONFIGURATION(PLC) ==> Configuration Name : UNNAMED

The ***Configuration Item*** in Project window shows the name of configuration that you selected. Configuration name can be edited in ***Basic Parameters*** (refer to the section 4.5.1).



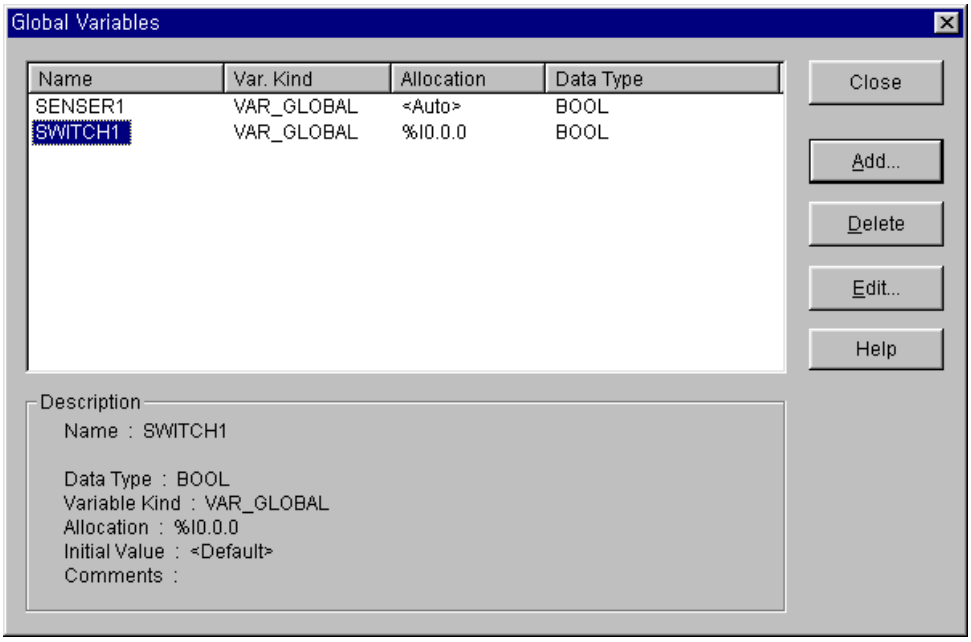
4.4.3 Edit a Configuration Global Variable



Configuration Global Variable can be used commonly for all programs in several resources.

So, it can be used only in GM1 that several resources can exist in.

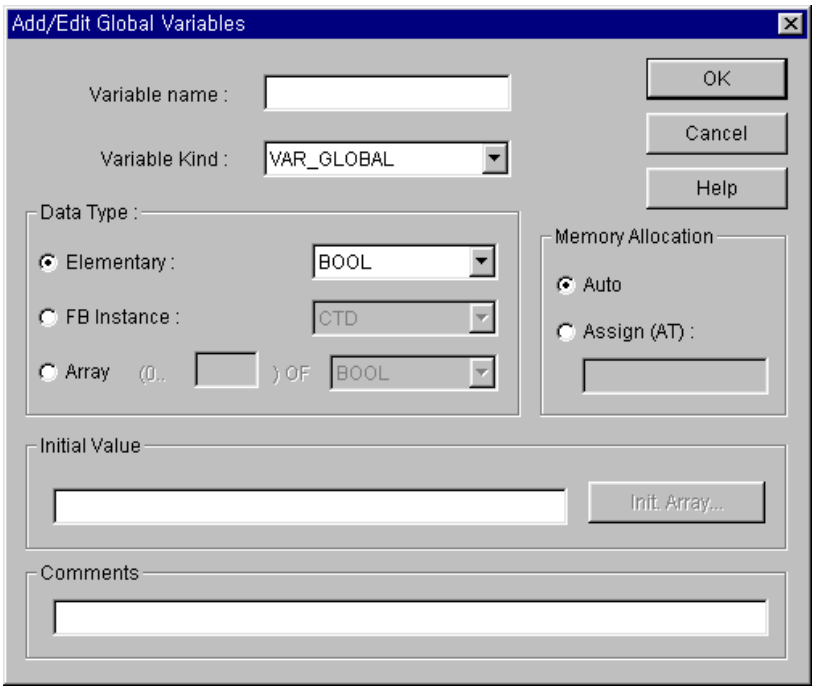
- Select ***Configuration Globals*** in the Project window list.
- Select ***Project - Edit Project Item***(or double-click the Configuration Globals in the Project window).



Description item in the above dialog box shows the content of the selected global variable in detail.

1) Add a Configuration Global variable

□ Click the ***Add...*** button in the above dialog box.
□ Enter the Variable name in the ***Add/Edit Global Variables*** text box.



□ Select Variable type in the ***Variable Kind*** list box.
□ Select Data Type for Variable at list box or option radio button.
□ Select Memory Allocation for Variable by option radio button in ***Memory Allocation.***
□ If you want to set an initial value, type it in the ***Initial Value*** text box.
□ Enter the comment in the ***Comments*** text box.
□ Click ***OK*** button.

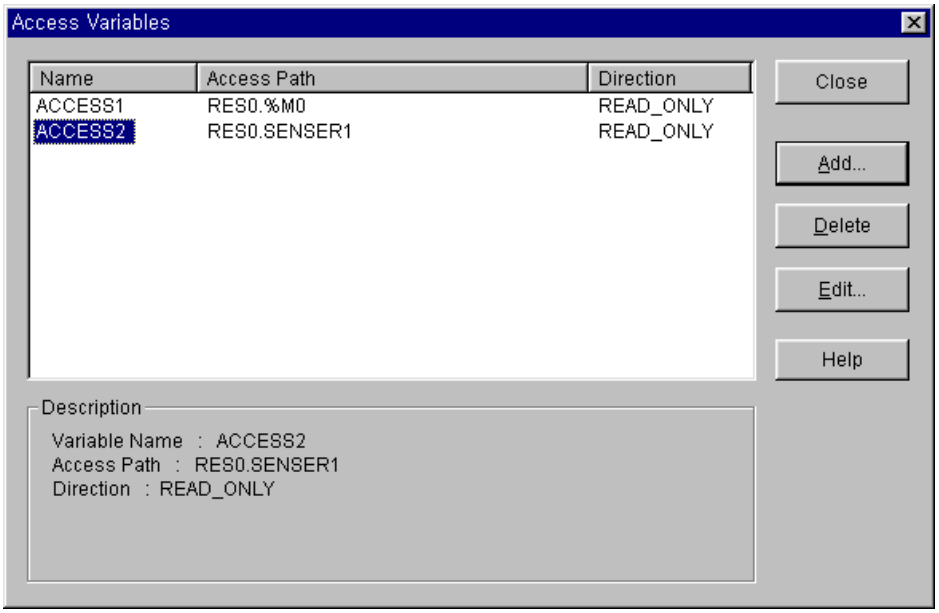
2) Delete Configuration of Global Variable
□ Select item to delete in the ***Global Variable List*** box .
□ Click ***Delete*** button.

3) Edit Configuration of Global Variable
□ Select item to edit in the ***Global Variable List*** box.
□ Click ***Edit*** button.
□ Enter the data in the same way to insert.

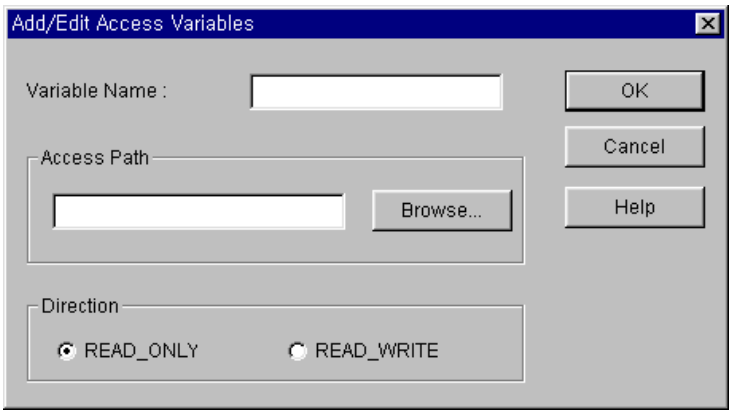
4.4.4. Edit Access Variable

An access variable is used to protect the data besides declared as access variable,
when other PLC(i.e. other configuration) read or write to it's own PLC, it allows you to constrain read/write access authority.

□ Select ***Access Variable*** at the list in Project window.
□ Select menu ***Project - Edit Project item***(or double-click ***Access Variable*** in the Project window).



1) Insert Access Variable
□ Click the ***Add...***. button.



□ Type the Variable Name in the ***Access Variable Name*** text box.
The name is available only Capital Letter.

□ Select or enter the Access Path in the ***Access Path*** text box.

For example,

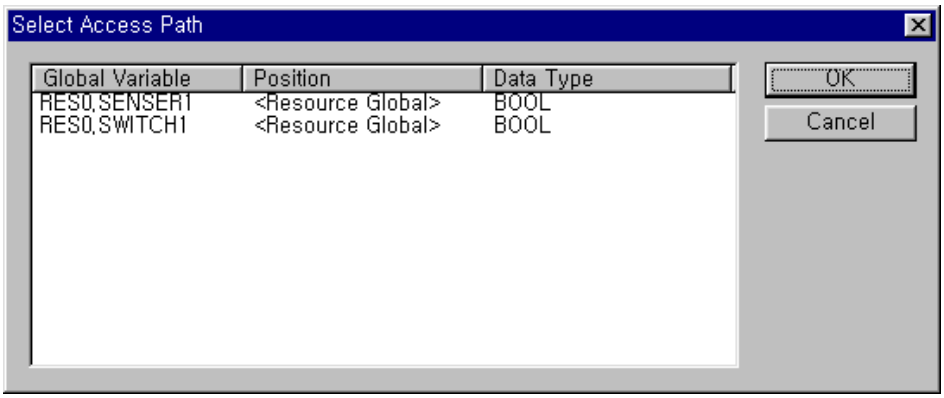
In GM1

Available Input for Access path	Example
Configuration Global Variable	A, VALVE1
Resource Global Variable	Resource Name. Global Variable name --> RES1.a
Direct Variable	Resource Name. Direct Variable --> RES1. %10.0.0

In GM2□5

Available Input for Access path	Example
Resource Global Variable	Use only Global variable name ---> A
Direct Variable(excluding GM1)	Use only Direct Variable --> %10.0.0

□ You can also select the ***Access Path*** by clicking ***Browse*** button.



□ Select the ***Access Authority*** option button. (Choose one of the Read or Read/Write)
□ Click ***OK*** button.

2) Delete Access Variable
□ Select an item to delete in ***Access Variable List*** box.
□ Click ***Delete*** button.

3) Edit Access Variable
□ Select an item to edit in ***Access Variable List*** box.
□ Click ***Edit*** button.
□ Enter in the same way to insert access variable, and click ***OK*** button.

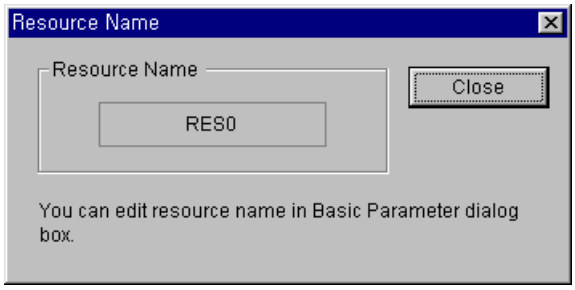
4.4.5. Edit Resource

Resource is a CPU for PLC. So, you can use maximum 4 resources in GM1 when you configure a multi-CPU.(for others, only one resource is available.)

1) View Resource Name

You can see the Resource name defined by user at ***Resource*** item of the Project window.

You can edit a resource name in the "***Edit Basic Parameter***".



2) Add Resource (only available for GM1)

- Select ***Configuration*** in Project window.
- Select ***Project - Add Project Item - Resource*** .
- Enter a resource name in the ***Resource Name*** text box .
- Click ***OK*** button
- Now, new resource is added to the Project Window and ***Define Program*** dialog box appears as like creating a new project.

3) Delete Resource (only available for GM1)

- Select Resource to delete.
- Select ***Project - Delete Project Item***.

4.4.6. Edit Resource Global Variable

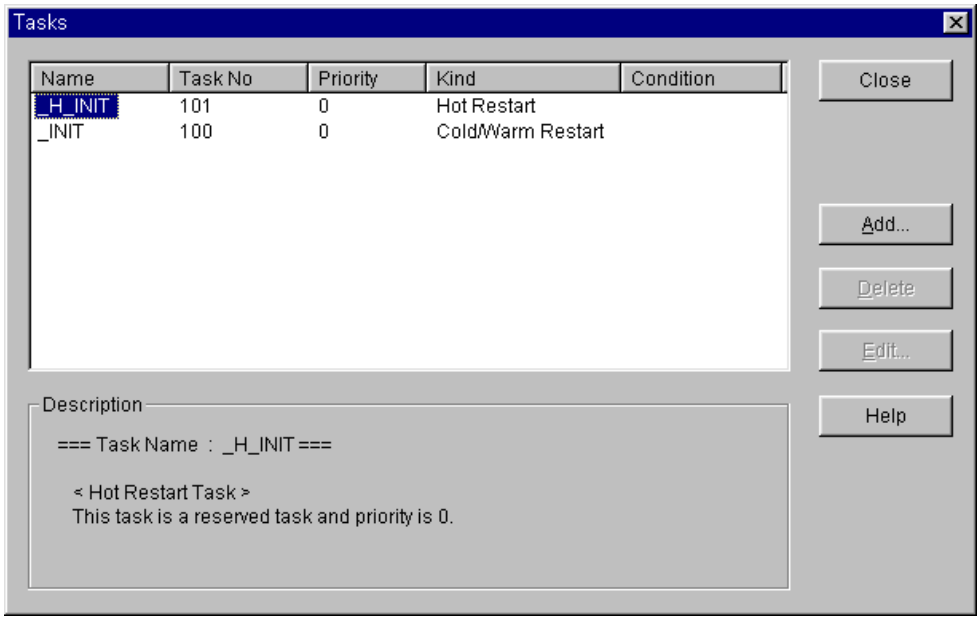
Resource Global Variable can be used for the all programs in the resource.

The process for editing is same as Global Variable.

4.4.7. Define Task

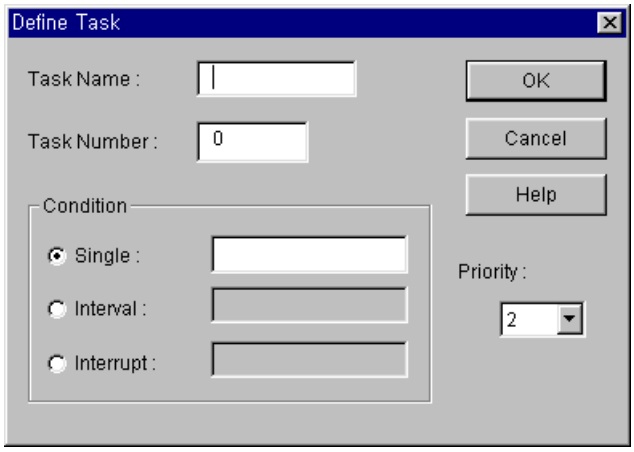
Task defines the executive condition of a program. Its types are single, Interval, interrupt and etc.

- Select ***Define Task*** in Project window.
- Select ***Project - Edit Project Item***.



1) Add Task

□ Click the ***Add...***. button.



□ Type the task name in the ***Task Name*** text box.

□ Enter following number for the executive condition in the Task Number text box.

Executive Condition	Task Number
Interval	0 □ 31
Interrupt	32 □ 47 (GM4, 5 : 32 □ 39)
Single	48 □ 63

In case of interrupt, interrupt number and the designated task number is fixed automatically.

Variable name for single, duration time for interval and input position of interrupt card for interrupt are represented as a number.

a) In case of Single

Boolean in the Resource Global Variable	A, VALVE1, etc.
Boolean in the Direct Variable	%1X0.0.0, %QX0.1.1, %MX10, etc.

b) In case of Interval

A constant for the duration time	T#10S, T#1H10M10S10MS, etc.

c) In case of Interrupt

Interrupt Number (GM1□3: 0 □15, GM4□5: 0□7)	0, 1, 2 ... 15

□ Select priority in the ***Priority*** list box. You can select priority number from 0 to 7, and smaller number has higher priority.
□ Click ***OK*** button.

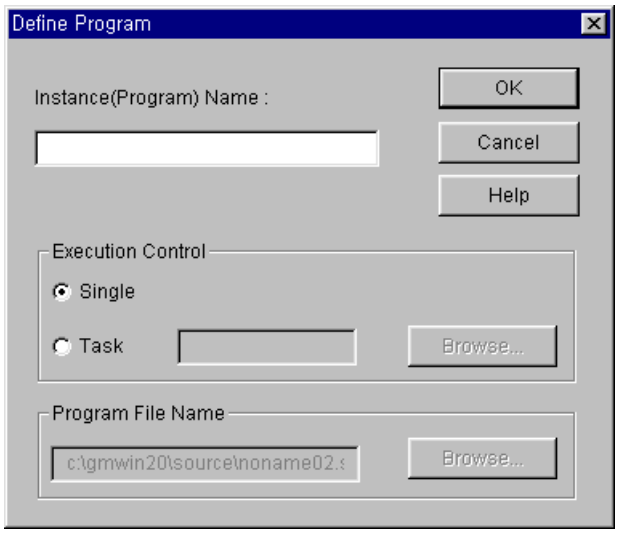
2) Delete Task
□ Select an item to delete in the ***Define Task*** list box.
□ Click ***Delete*** button.

3) Edit Task
□ Select an item to edit in the ***Define Task*** list box.
□ Click ***Edit*** button.
□ Enter in the same way to add a task, and click ***OK*** button.

4.4.8. Define a Program

The defined program in this process is the real program to be executed in PLC.
There are 2 kinds of program, one is scan program and the other is task-defined program.
When several scan programs exist, they execute the program in the defined order.
And the program defined as task is executed according to the condition of the task.

1) Add a Program
□ Select ***Project - Add Project Item - Program*** in the pull down menu.
□ And the dialog box appears as below.



□ Enter the instance(Program) name in ***Instance Name*** text box.
□ Choose one between scan program(***Single***) and define task program(***Task***) in the ***Execution Condition*** option.
□ In case of task-defined program, you can enter the task name directly in the ***Task*** text box. In other way, you can select one of the tasks already defined in the ***Task List*** dialog box by clicking Browse button, and click ***OK*** button.
□ Input the program name(□.SRC) in the ***Program File name*** text box. If there is a program already created, click ***Browse*** button and select file in the ***Task List*** dialog box.
□ Click ***OK*** button.
□ Then new program is added into the Project window.

2) Delete Program
□ Select a program to delete.
□ Select ***Project - Delete Project Item***.

3) Edit Program
□ Select ***Program*** in Project window.
□ Select ***Project - Edit Project Item***.
□ Edit data in the same way to add a program, and click ***OK*** button.

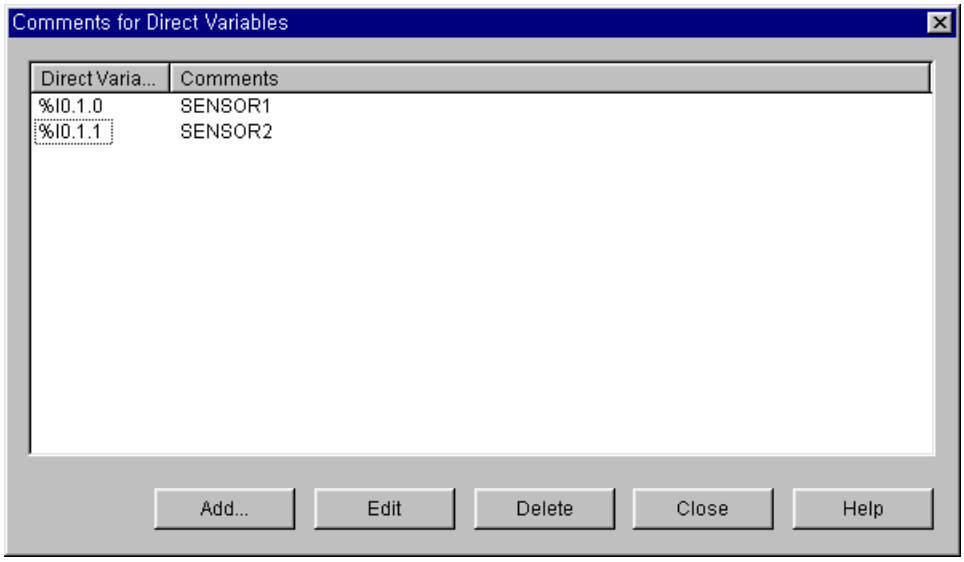
4) Change Program Order
□ A program execution order is set as the order(from up to down) in the project tree list.

To change the order,
□ Select a program item at the list in project window.
□ Change order step by step using ***Project - UP(Program)*** or ***Project - Down(Program)***.

4.4.9. Comment of Direct Variable

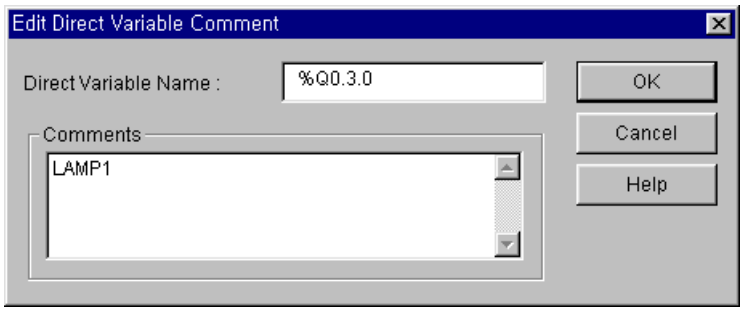
Comment of Direct Variable allows you to explain on Direct Variable, and it is exactly same as content in the program comments windows.

- Select ***Comments for Direct Variables*** at the list in Project window.
- Select ***Project - Edit Project item*** in the pull-down menu.



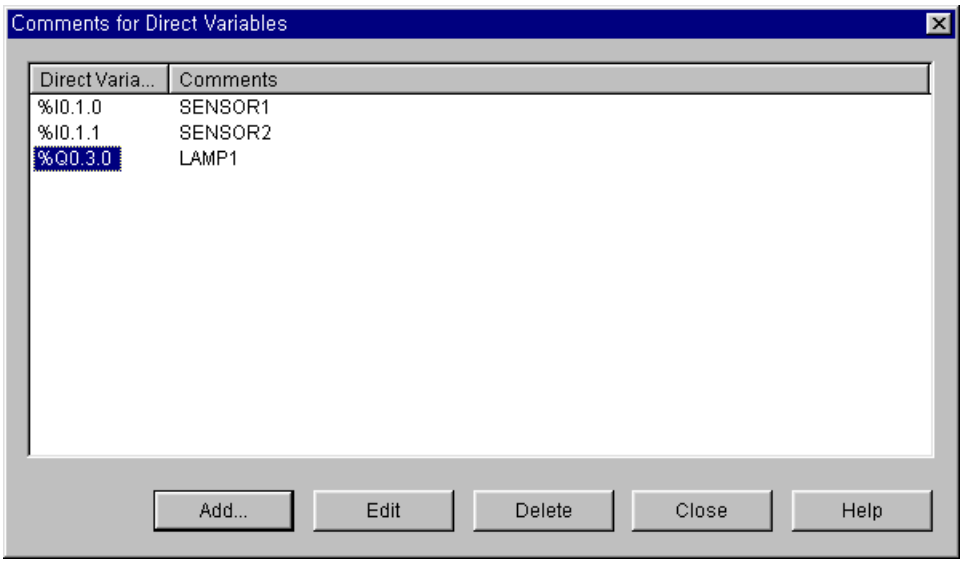
1) Add Direct Variable Comment

- Click the ***Add...***. button.



- Type the Direct Variable name in the ***Direct Variable name*** text box (%I0.3.0).
- Enter the comment in the ***Comment*** text box.(LAMP1).

□ Click ***OK*** button.



2) Delete Comment for Direct Variables

□ Select an item to delete in the ***Comment for Direct Variables*** list box.

□ Click ***Delete*** button.

3) Edit the Comment for Direct Variable

□ Select an item to edit in the ***Comment of Direct Variable*** list box.

□ Click ***Edit*** button.

□ Enter data in the same way to add a comment, and click ***OK*** button.

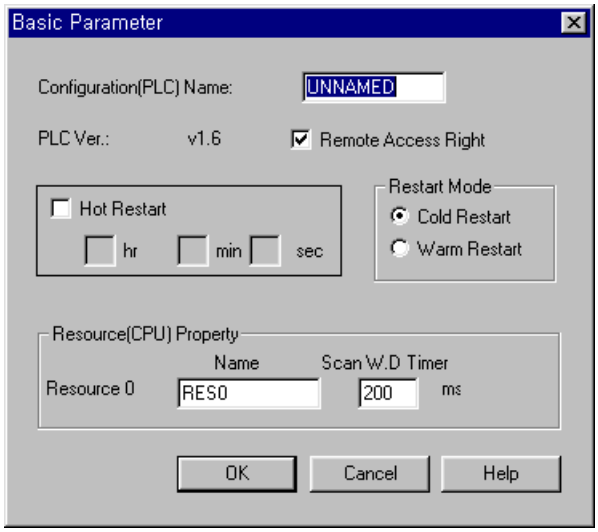
4.5. Edit a Parameter

Type of parameter : "Basic Parameter", "I/O Parameter" and "Link Parameter".

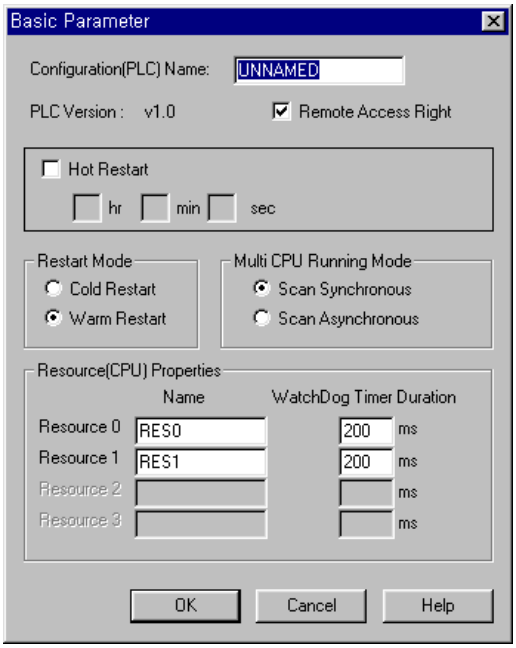
4.5.1. Edit Basic Parameter

To set Basic Parameter,

□ Double-click on the "***Parameters - Basic Parameters***" in Project window, or move a cursor to "***Parameters - Basic Parameters***" and Select "***Project - Edit Project Item***".



PLC type (GM2 □ GM5)



PLC type (GM1)

□ Enter the PLC name in the "***Configuration (PLC) Name***" text box.
You can form PLC name with maximum 8 characters of alphabet and digit.
And it becomes a configuration name.

□ "***Applied PLC Ver***" shows you available PLC version in the GMWIN Version.

□ Setup the permission of the remote access in "***Remote Access Right***" check box.
(Default : permission)

□ Set Hot Restart option. If the "***Hot Restart***" option is checked, hot restart will be operated.
Then you must set the hot restart time, and you can set it from " 1 second" to "23 hour 59 minute 59 second" with second scale.

□ Set Cold Restart or Warm Restart by clicking option radio box in ***Restart Mode***.

□ Choose one mode of scan synchronization and scan asynchronization in the GM1 Multi CPU system by clicking option radio button in the "***Multi- CPU Running Mode***". (available for only GM1)

□ Type the resource name in the text box of " ***Set Resource(CPU) Properties***".
Resource name is formed with 8 characters of alphabet and digit.

□ Set the watchdog time in the text box of "***Watchdog Timer Duration***".
Maximum time is "65535 ms" with "1 ms" scale.
(GM1,2 : 8□64k bytes, GM3 : 4□32k bytes, GM4 : 1□4k bytes, GM5 : 8□32k bytes)

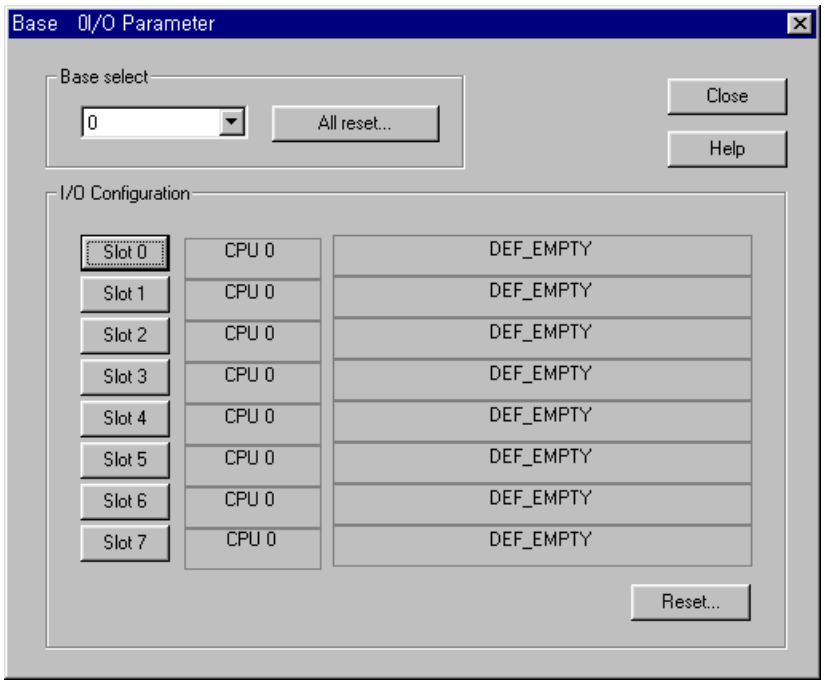
Note

1. Refer to the PLC User Manual about Remote Access Authority, Restart and %M area.
2. In case of GM1, it is available for resource 0 □ 3.
3. In case of GM1, it has Multi-CPU Running setting mode.
4. In case of GM5, it has RS-422 speed setting mode.

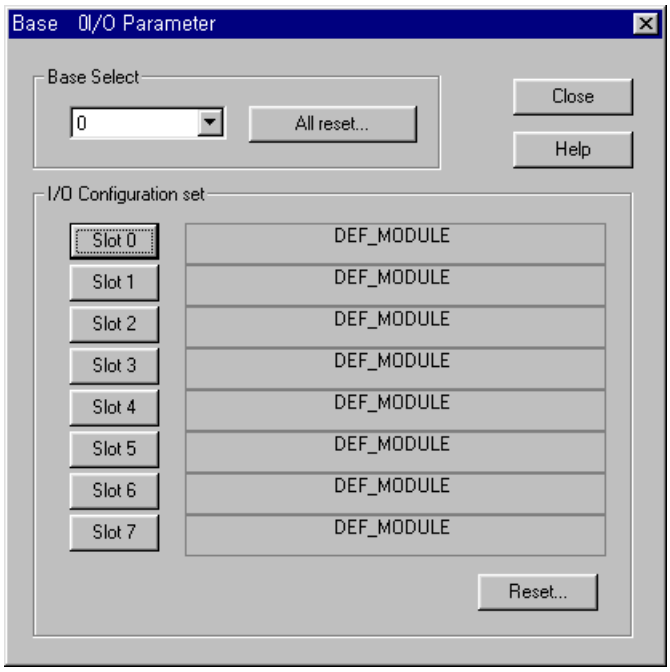
4.5.2. Set I/O Parameter

To set the I/O Parameter,

□ Double-click on the "***Parameters - I/O Parameters***" in Project window, or move a cursor to "***Parameters - I/O Parameters***" and select "***Project – Edit Project Item***".



GM1



GM2 □ GM5

Note

In case of GM1, CPU configuration item (see above figure) is added.
(I/O type is set as DEF_EMPTY)

□ Select the base number to set in the "***Base Select***", and the setting content of base you choose is displayed in the "***I/O configuration set***".

□ If you click "***All Reset***" in the "***Base Select***", then I/O parameters in all bases are changed into default value.

□ If you click the "***Reset***" in the "***I/O configuration set***", then I/O parameter in the selected base slot is changed into default value.

□ Base setting range with PLC type

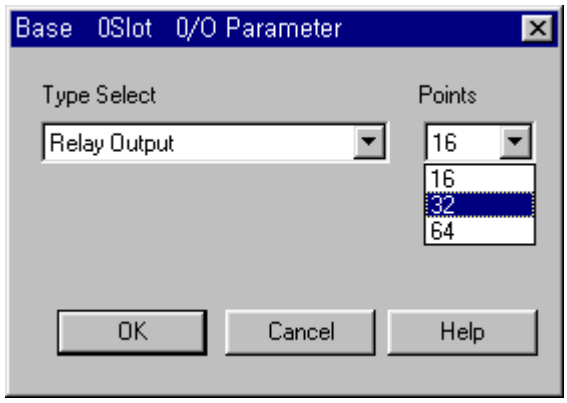
PLC type	Range
GM1	base 0 □ 31
GM2	base 0 □7
GM3,4	base 0 □ 3

□ If you want to set the I/O parameter of each slot, select the slot number in the "***I/O configuration set***" by clicking slot number button. Then "***Base Slot I/O Parameter***" dialog box is displayed as below.



GM1

Select an item at the "***Type Select***", and select the number of I/O in the "***Point***".
Click **OK** button.



GM2~5

Note

In case of GM1, the option of CPU select and Redundancy are added.

Reference

I/O type used as default value

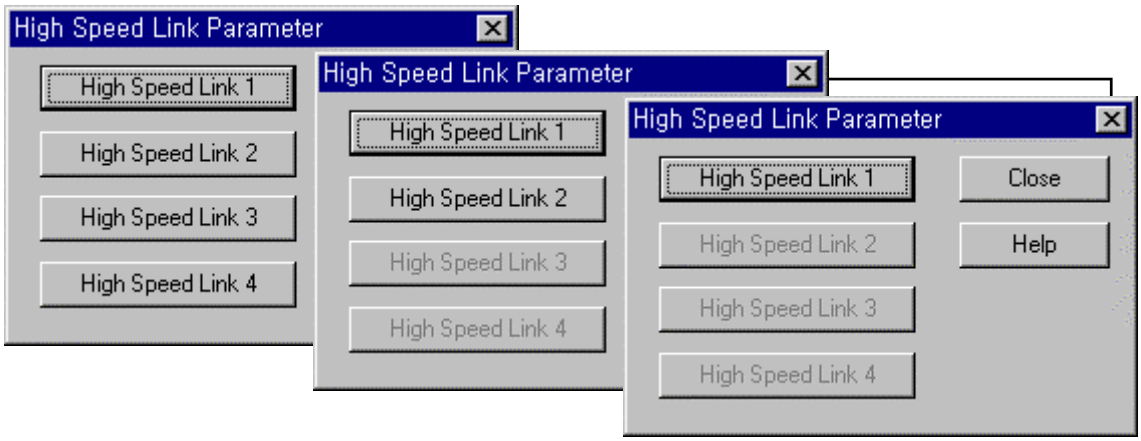
I/O type	Content
DEF_I	When power is on, the input module in a selected slot is registered as default value at the I/O refresh table.
DEF_O	When power is on, the output module in a selected slot is registered as default value at the I/O refresh table.
DEF_IO	When power is on, the input/output module in a selected slot is registered as default value at the I/O refresh table.
DEF_SP	When power is on, the special module in a selected slot is registered as default value at the I/O refresh table.
DEF_MODULE	When power is on, the module in a selected slot is registered as default value at the I/O refresh table.
DEF_EMPTY	When power is on, the selected slot is registered as empty slot at the I/O refresh table.

4.5.3. Set the High Speed Link Parameter

To set the High Speed Link Parameter,

□ Double-click on the "***Parameters - Link Parameters***" in Project window, or move a cursor to "***Parameters - Link Parameters***" and select "***Project - Edit Project It***

GM4 GM6

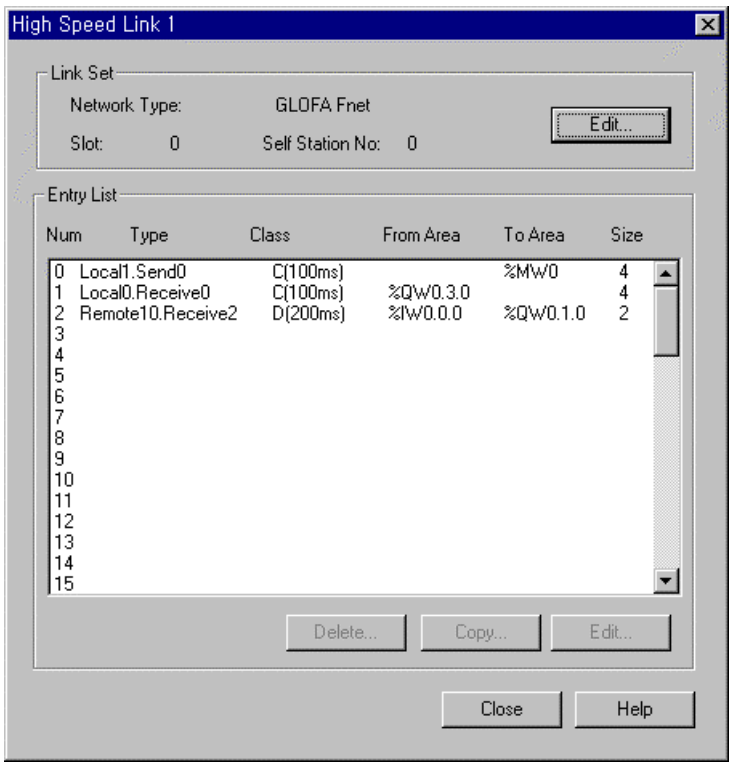


GM5

Note

The configuration for setting High Speed Link Parameter according to PLC type is like the above figure.
GM1/2/3 : High Speed Link 1 □ 4 , GM4 : High Speed Link 1 □ 2, GM5 : High Speed Link 1

If you click the High Speed Link Number button in the ***High Speed Link Parameter*** dialog box, then "***High Speed Link***" dialog box will be displayed, which shows the list of registered item and setting information of selected link.



The "***High Speed Link***" dialog box allows you to setup the information of Link Setup and each registered List. You can use the "***Delete***", "***Edit***", "***Copy***" and etc. button, or "***Del***" key to delete an item and "***Ctrl-V/Ctrl-C***" key to "***Copy/Paste***".

Reference

Method of multi-selection has two ways, one is selection in order, the other is selection of scattered items in list.

1) How to select multi-items in order.



- Click the first registered item you wanted in the list.
- Drag a mouse to the final item in the desired list with pressing the left button of it.



- Move a cursor to registered list with "**Tab**" key, and move the cursor to the first registered item in the desired list with "**Arrow**" key.
- Move the cursor to the final item in the desired list with "**Arrow**" key by pressing "**Shift**" key.

2) How to make a multi-selection for scattered items.



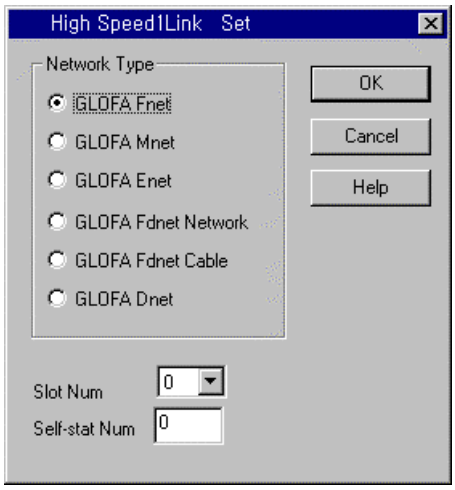
- By pressing "**Ctrl**" key, click mouse button on each registered item.



- Move a cursor to the registered list with "**Tab**" key, and move cursor to the first registered item in the desired list with "**Arrow**" key.
- Press the "**Shift + F8**" key, and cursor start to blink.
- Move cursor to the desired item with "**Arrow**" key.
- Select each registered item with "**Space**" key.
- If you finish the selection, Press "**Shift + F8**" key.

4.5.3.1. Set Link Information

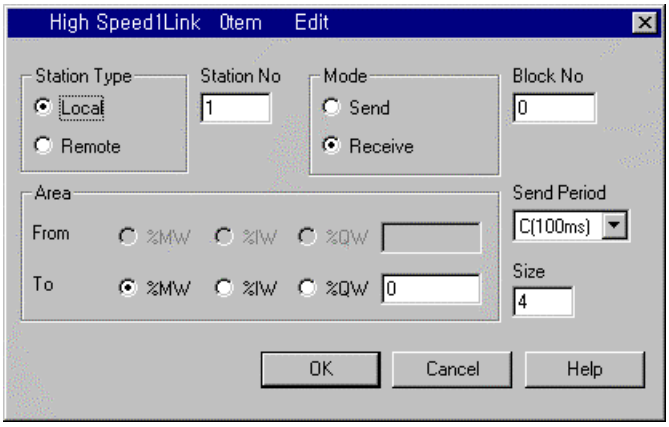
- Click "***Edit***" button at the "***Link Set***" area in the "***High Speed Link Set***" then "***High Speed1Link Set***" dialog box appears, which allows you to setup the information for the link setting.



- Select a network type in "***Network Type***" option radio button.
- Select the slot number of the link module in "***Slot Num***" List box.
- Select the self station number to save the High Link Parameter in the "***Self-Stat Num***" text box.

4.5.3.2. Set Entry List

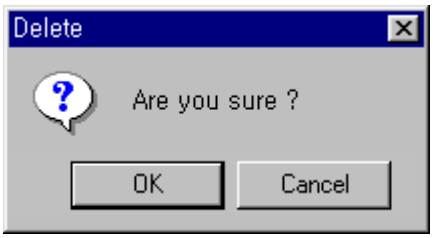
- Click "***Edit***" button at ***Entry List*** box after selecting registered list number, then " ***High Speed Link Item Edit*** " dialog box appears, which allow you to setup the information of the entry link list.



□ Select whether Station Type is local or remote in "***Station Type***" option radio button.
□ Set the station number in the "***Station No***" text box.
□ Select whether it is data to send or receive in "***Mode***" option radio button.
□ Set the block number in the "***Block No***" text box.
□ Select the send period in the "***Send Period***" list box.
(A:20ms, B:50ms, C:100ms, D:200ms, E:500ms, F:1S, G:5S, H:10S)
□ Set the send/receive area in the "***Area***" option radio box. Each area is selected by option button and address is fixed in each text box.
□ Set the data size to communicate in the "***Size***" text box.(by word size)

4.5.3.3. Delete Entry List

□ Click "***Delete***" button or "***Del***" key, after selecting the entry list number to delete at entry list box in "***High Speed Link***" dialog box.

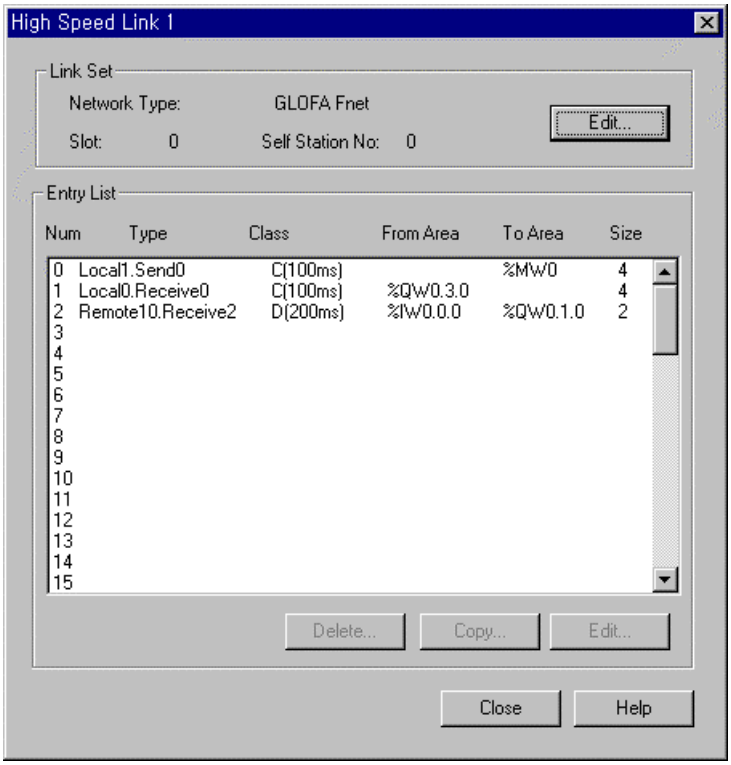


□ You can delete the selected item by clicking "***OK***" button, otherwise click "***Cancel***" button.

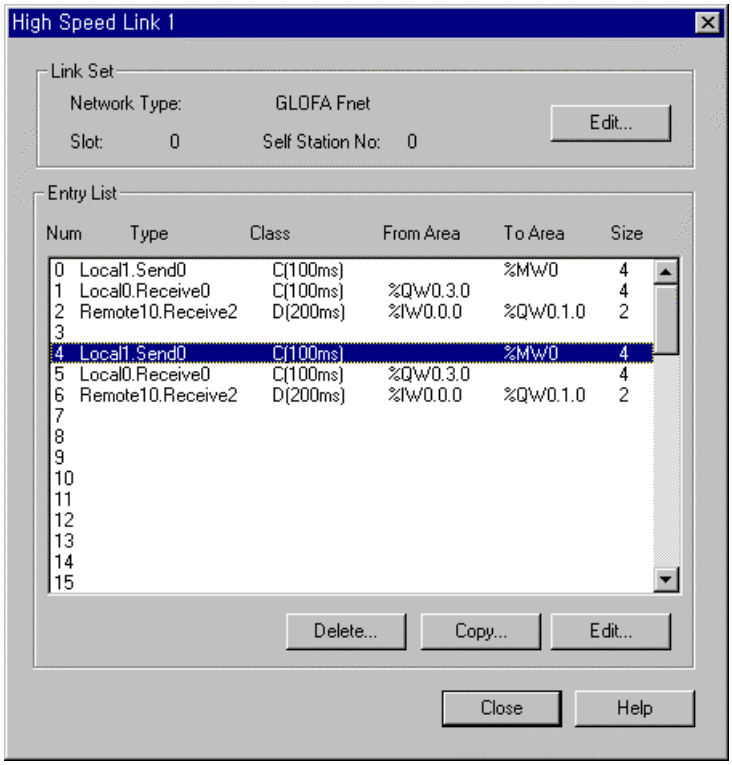
4.5.3.4. Copy Entry List

□ To copy the list within Entry List each other in "***High Speed Link***" dialog box,

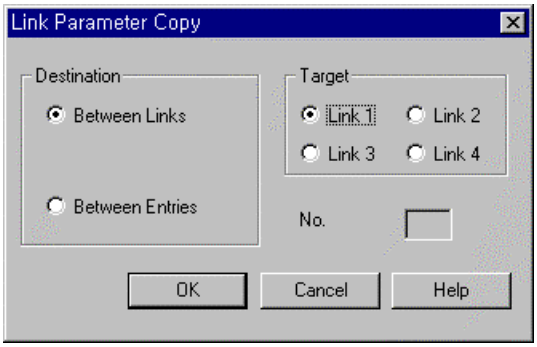
1) Press "**Ctrl - C**" to copy, after selecting the item to copy using a cursor or mouse.



2) Press "**Ctrl - V**" to paste, after moving a cursor to the location you want.



□ Click "***Copy***" button, after selecting the entry item number at the entry list box in the "High Speed Link" dialog box.



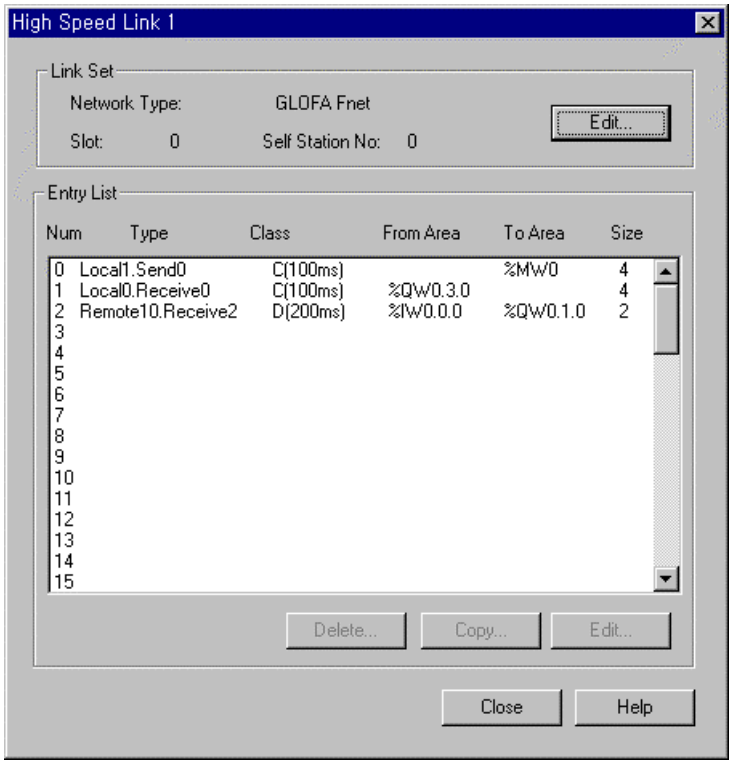
A) Copy Between Links

□ Select "***Between Links*** " option to copy a selected list to other link.

□ Select the Link number to paste in "***Target***" option radio button.

Example) To copy the entry list 0.1.2.3 in High Speed Link 1 to 0.1.2.3 in High Speed Link 2,

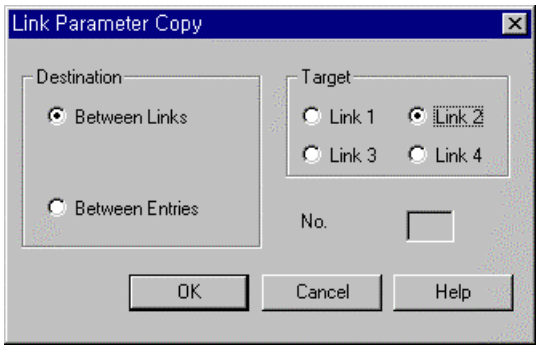
1) Select the entry list 0.1.2 in the "***High Speed Link 1***".

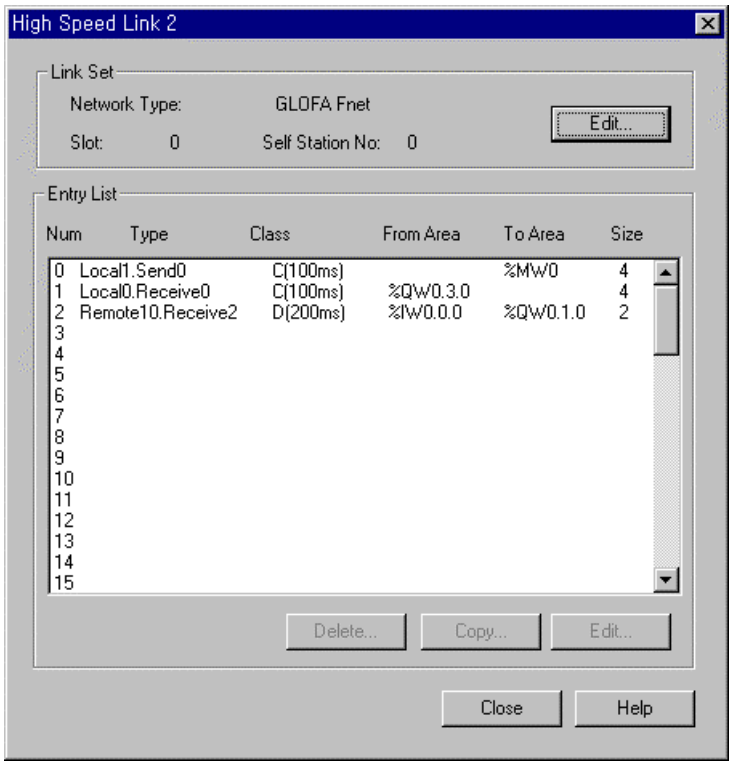


2) Click "***Copy***" button

3) Choose the "***Between Links*** " in "***Link Parameter Copy***" dialog box

4) Select "***Link 2***" in "***Target***" box and click ***OK*** button.


Link Parameter Copy
Destination
Between Links
Between Entries
Target
Link 1
Link 2
Link 3
Link 4
No.
OK
Cancel
Help

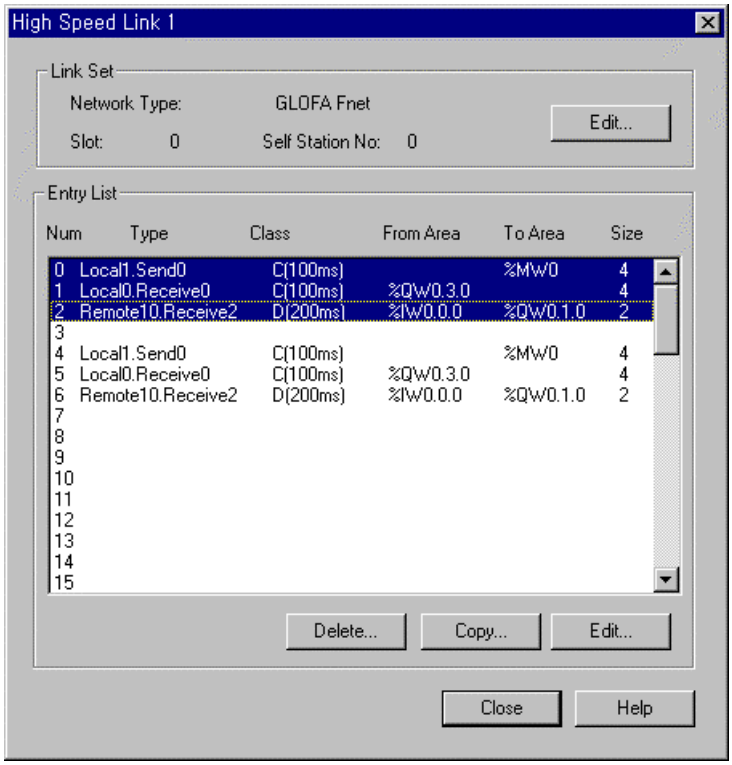

High Speed Link 2
Link Set
Network Type: GLOFA Fnet
Slot: 0
Self Station No: 0
Edit...
Entry List
Num Type Class From Area To Area Size
0 Local1.Send0 C(100ms) %MW0 4
1 Local0.Receive0 C(100ms) %QW0.3.0 4
2 Remote10.Receive2 D(200ms) %IW0.0.0 %QW0.1.0 2
3
4
5
6
7
8
9
10
11
12
13
14
15
Delete...
Copy...
Edit...
Close
Help

B) Copy Between Entries

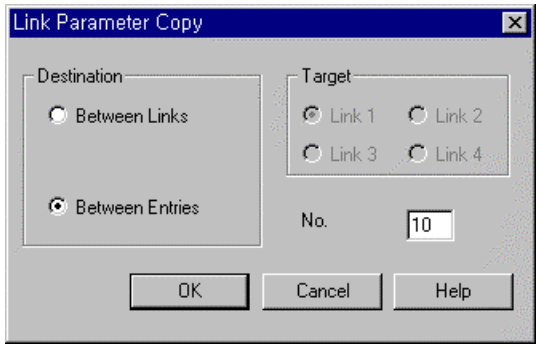
□ Select the "***Between Entries***" option to copy selected entries to other link list in the same link.
□ Enter the entry Item number to paste in "***Target***" option radio button.
selected entry Items are copied from selected number.

Example) To copy entry Items 0.1.2 in High Speed Link 1 to 10.11.12 in High Speed Link 1,

1) Click "***Copy***" button, after selecting entry Items 0.1.2 in High Speed Link 1.



2) Choose "***Between Entries***" at the "***Link Parameter Copy***"
3) Enter "***10***" in the "***Link Parameter Copy***" text box.
4) Click ***OK*** button.



Chapter 5 Edit a Program

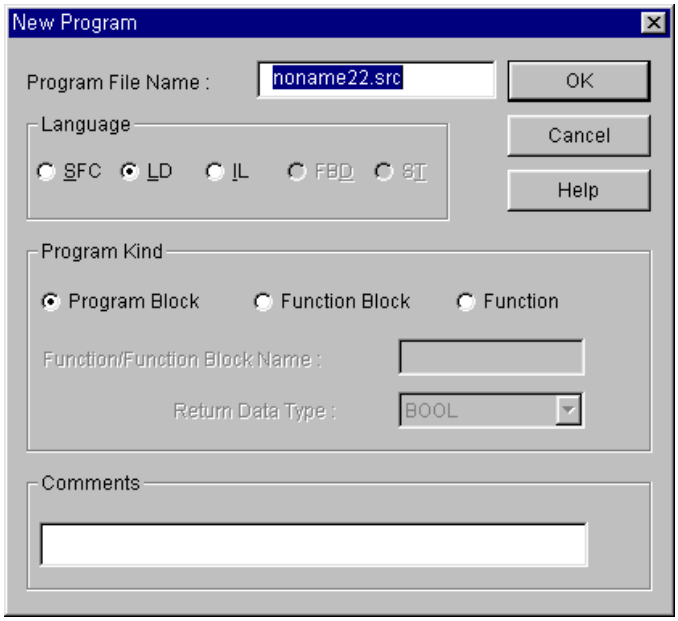
5.1. Create a Program 5-1
5.2. Open a Program 5-2
5.3. Save a Program.....5-3
5.4. Program Properties 5-4
5.5. Edit a Variable 5-5
5.6. Edit LD.....5-9
5.7. Edit SFC 5-30
5.8. Edit IL 5-56

Chapter 5 Edit a Program

5.1. Create a Program

To create a new program,

□ Select ***Program - New Program...*** () in the pull-down menu.



□ Enter Program File Name.

□ Select a language in ***Language*** radio option button.
(GMWIN supports SFC, LD and IL. FBD and ST will be supported later.)

□ Select a program in ***Program Kind*** radio option button.
If you select ***Function/Function Block*** to create a user-defined function/function block, refer to chapter.11 Library. In this chapter, select ***Program Block*** option.

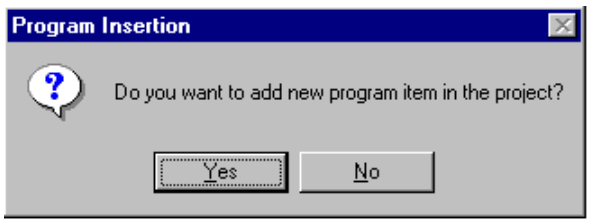
Note

You can select a ***Function*** option button in only case of LD or IL language.
You cannot create a user-defined function in SFC.

Note

Function/Function Block Name is only in active when ***Function/Function Block*** option button is selected and ***Output Data Type*** is in active only when ***Function*** option button is selected.
(Refer to '10.3. Making a library file defined by user' for detail comment)

- Enter comments in ***Comment*** text box.
- Click ***OK*** button.
- If there is not any new program in the project, the following dialog box appears.



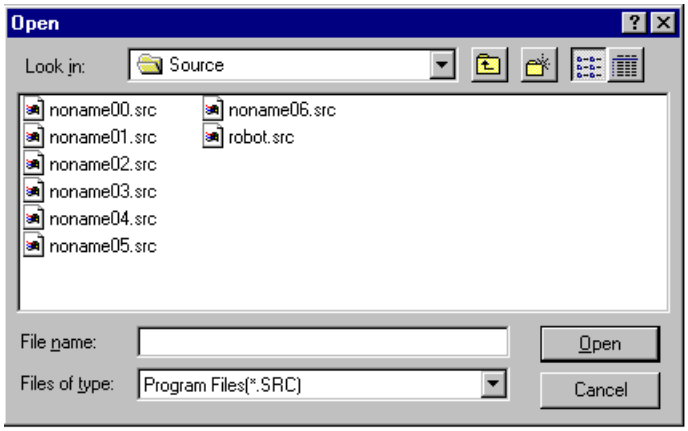
- Click ***Yes*** button. Then ***Define Program*** dialog box appears. (refer to the section 4.4.8.)
- Define a program. Then it is inserted in the project as an item.
  (In case of GM1 and there are more than two resources, you can select a resource to be inserted for the definition of the program)

5.2 Open a Program

There are two ways to open an existing program. One is selecting in the pull-down menu and the other is opening the designated program in the project directly.

1) Open by selecting in the pull-down menu

- Select ***Program - Open...*** ( ) in the pull-down menu.



- Select a program and click ***Open*** button.

2) Opening a program file included in Project.

□ If you want to open a program file included in Project, double-click a mouse on the appropriate program item in Project window list.

Note

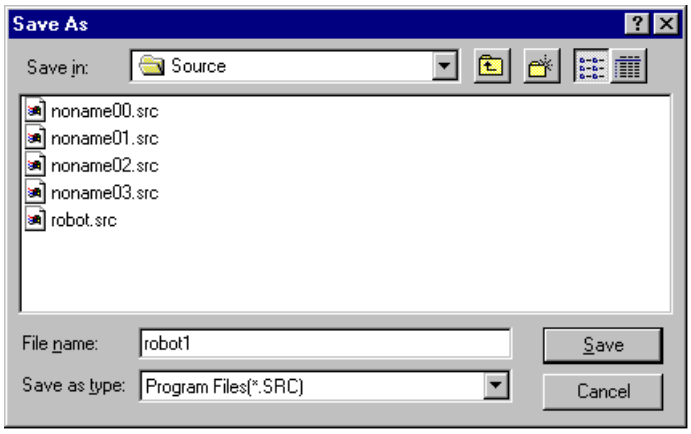
You cannot open the same program more than two in Edit or Debug mode.
In case of monitor mode, if you cannot see a long program at the same time, open the same program more than two and monitor a different part in each program.

5.3. Save a Program

To save a program as file.

□ Select ***Program - Save***... () in the pull-down menu.
To save an existing program file, there is no message for saving.

□ If you save a new file or select ***Program - Save as***... in the pull-down menu, the following dialog box appears.

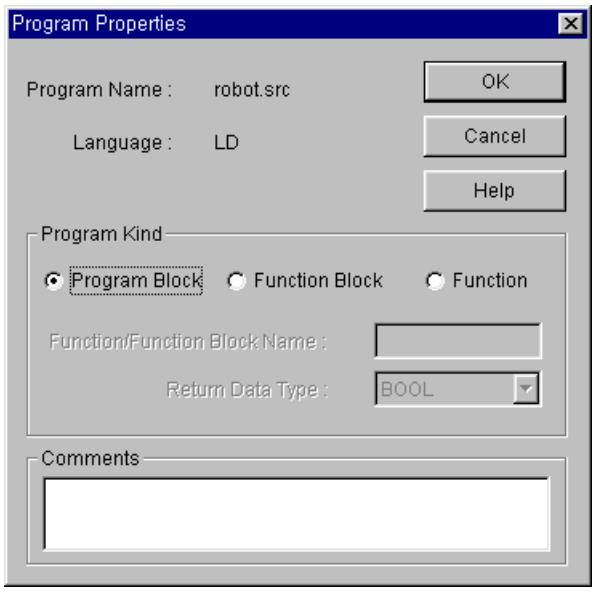


□ Enter the file name and click ***Save*** button.

5.4. Program Properties

You can change the kind or comment of program on editing.

□ Select ***Program - Properties***... in the pull-down menu.

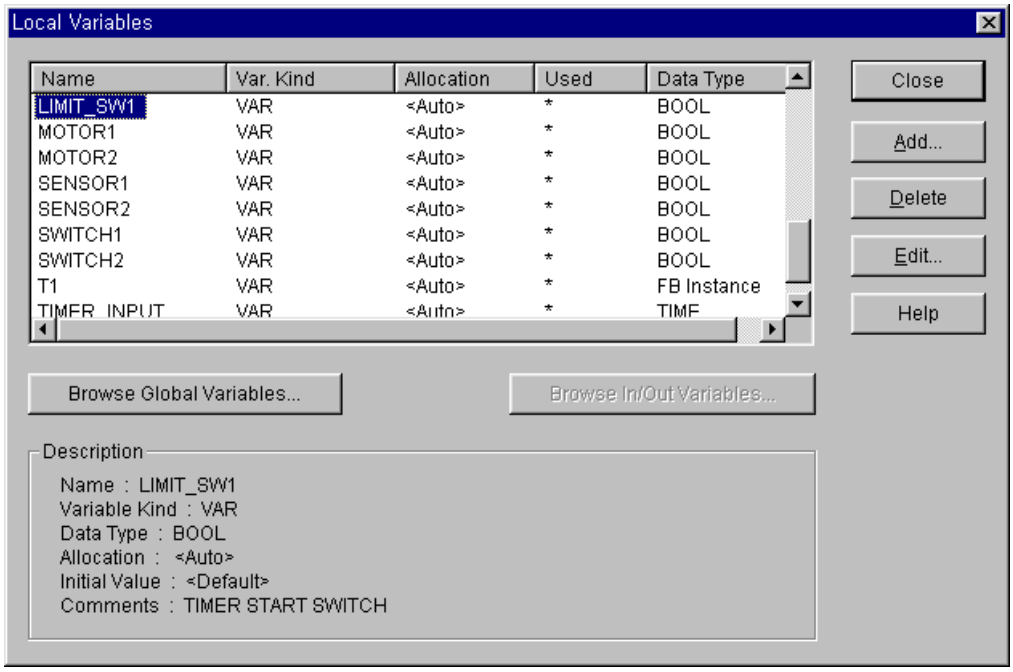


In this dialog box, you can't change the already registered language

□ Edit an item that you wish to change and click ***OK*** button.

5.5. Edit a Variable

□ Select ***Program - Local Variables*** ....



□ Add, Delete or Edit each variable.

□ Click ***Close*** button after editing the variables.

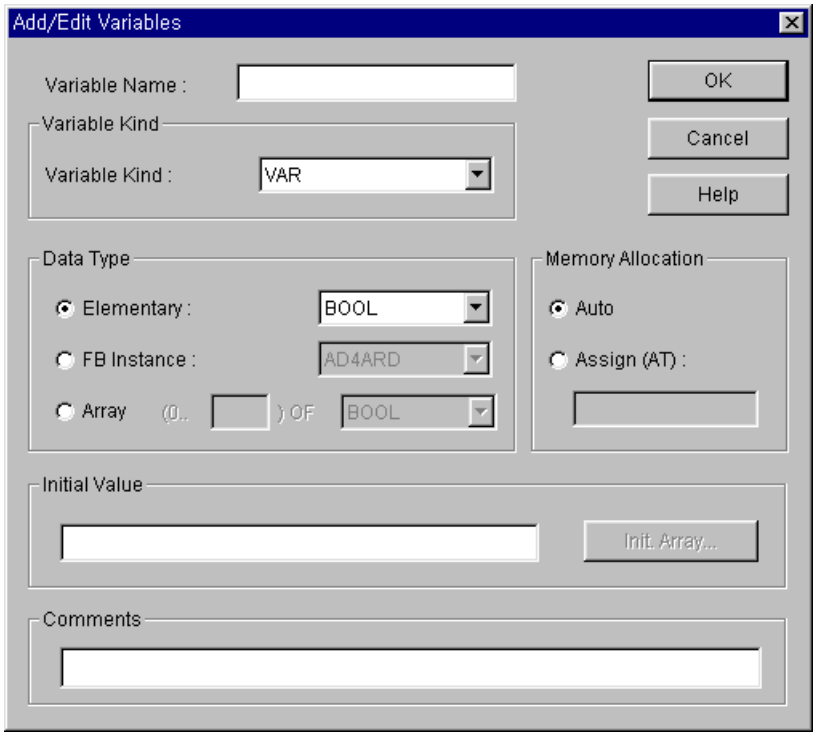
Note

In the list box of ***Local Variables***, you can see another variables besides local variables that user enter. In case of function/function block, you can see I/O variable and output variable name to return and in case of SFC, you can see executive condition variable 'TRANS'. but you cannot edit or delete these variables.
Examples for these variables are as below.

RETVAL	<Return Variable>	INT - output variable name to be returned in function
IN1	VAR_INPUT	BOOL - input variable in function/function block
IN2	VAR_INPUT	INT - input variable in function/ function block(FB)
OUT1	VAR_OUTPUT	BOOL - output variable in function/FB
TRANS	<SFC transition>	BOOL - SFC execution condition variable

1) Add a Variable

□ Open ***Add/Edit Variables*** dialog box by clicking ***Add*** ...button.



□ Enter Variable Name in ***Variable Name*** text box.

Note

Maximum size for Variable Name is 16 characters.
However, in case of Function Block, the size is limited to 8 characters.

□ Select Variable Kind in ***Variable Kind*** list box.

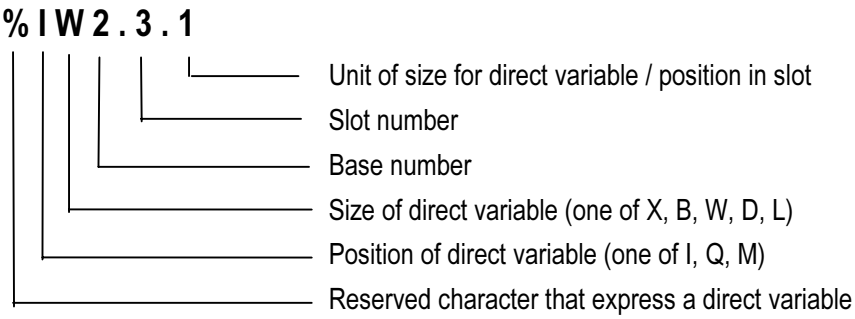
□ Select one of ***Data Type*** option buttons(**Elementary *Data Type, Function Block Instance, or Array***) and its type in that list box.

□ Select one of ***Memory Allocation*** option buttons(***Auto*** and ***Assign***), and in case of selecting ***Assign*** enter the exact position in the text box.

Auto : When you compile a program, declared variable is automatically assigned to data area by type.

User Define : User assigns the declared variable to I,Q,M area.

□ In case of ***User Define,*** designation of I,Q,M area to input is as follows



Prefix	Comments
I	Input
Q	Output
M	Internal Memory
X, none	1 bit
B	1 byte (8 bits)
W	1 word (16 bits)
D	2 word (32 bits)
L	4 word (64 bits)

Examples)

%QX3.1.4 or %Q3.1.4 : 4th bit of slot 1 on base 3

%IW2.4.2 : 2nd word of slot 4 on base 2

%MD48 : 48th double words for internal memory (start from 0)

%MW10.3 : 3rd bit of 10th word in the internal memory

(There is no general concept about base and slot in the internal memory)

□ If there is an initial value, enter the value in the text box of ***Initial Value***.

□ Enter the comment in ***Comments*** text box.

2) Delete a Variable

□ Select a variable to delete in the list box of ***Local Variables***.

□ Click ***Delete*** button.

3) Edit a Variable

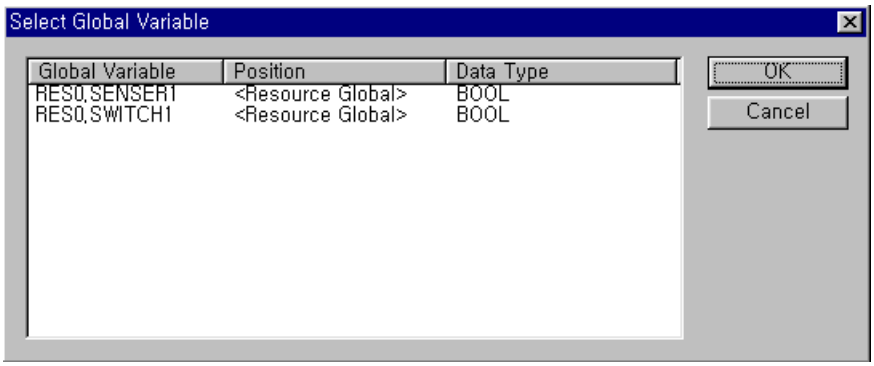
□ Select a variable to edit in the list box of ***Local Variables***.

□ In the list box of ***Add/Edit Variable***, edit a variable in the same way as inserting a variable and click ***OK*** button.

4) Browse Global Variable

□ This Function is used when you use a declared global variable in the program.

□ Click ***Browse Global Variable*** button.



□ Select a global variable to use in the program and click ***OK*** button.

□ Selected global variable will be declared as ***VAR_EXTERNAL*** automatically and be added in ***Local Variable List***.

Note

When you declare a variable, if the program belongs to the project, the variable declared as VAR_EXTERNAL is registered to VAR_GLOBAL automatically.

5) Browse In/Out Variables

□ This Function is used when you want to refer to the currently declared I/O variable without closing ***Local Variables*** dialog box.

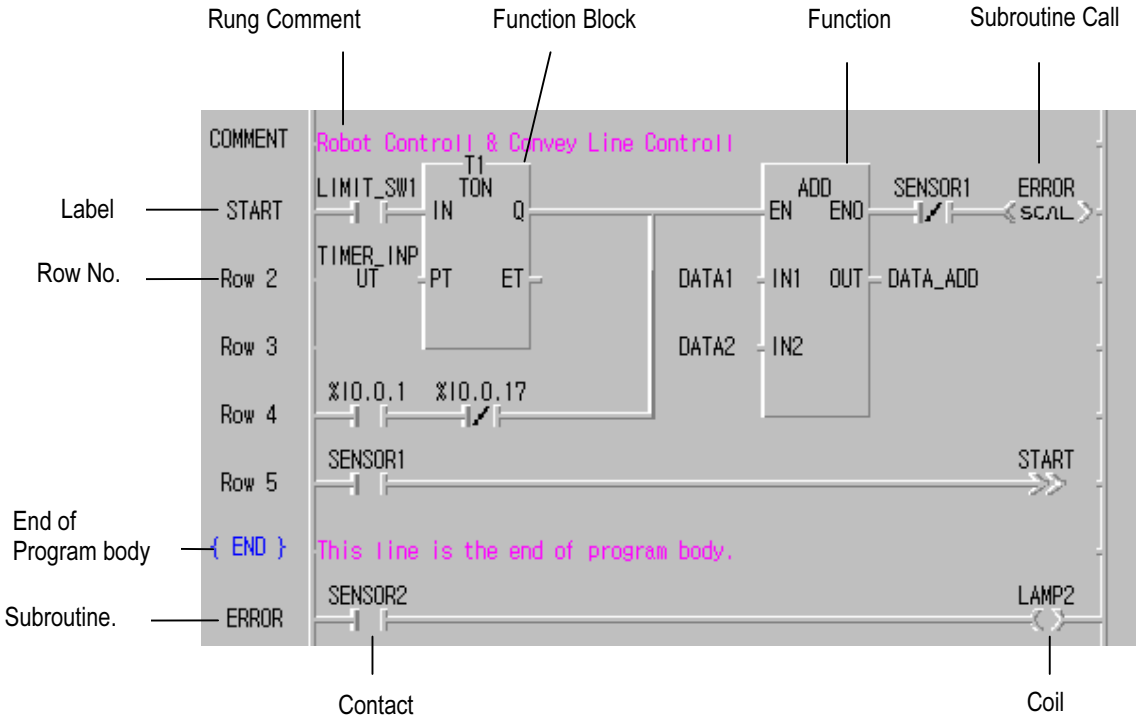
□ Click ***Browse In/Out Variables*** button. You can add, edit or delete the I/O variable in the same way.

.

5.6. Edit LD

LD program creates a PLC program with a graphic symbol like coil or contact, which is used in relay logic diagram. In the below picture, ' **Rung Comment** ' is the comment for the appropriate rung.

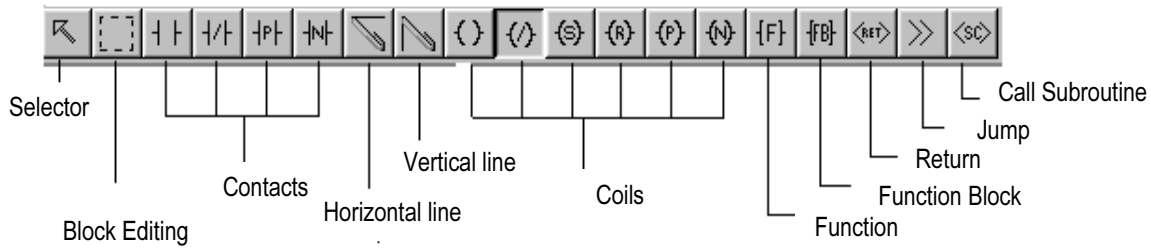
Rung is a unit of continuous line, which is connected vertically. i.e., in the below picture, a rung is from Row '1' to Row '4' and row '5' is also a rung.



{ ***END*** } in Row '7' expresses the end of the main program.

Error management, which is continued in the next column, is one type of subprogram and calls this subroutine in Row 1, Column 7.

Toolbox for LD Program



The shape and meaning of each element is as below.

Symbol	Hot Key	Comment
	F2	Normally open contact
	F3	Normally closed contact
	shift-F1	Positive transition-sensing contact
	shift-F2	Negative transition-sensing contact
	F6	Normal coil
	F7	Reverse coil
	shift-F1	Latched coil
	shift-F1	Unlatched coil
	shift-F1	Positive transition-sensing coil
	shift-F1	Negative transition-sensing coil
	F4	Horizontal line
	F5	Vertical line
	F8	Function
	F9	Function block
	shift-F7	End command of LD program and subroutine
	shift-F8	Jump command (the branch of LD program and subroutine)
	shift-F9	Call a subroutine

If you select an arbitrary element in toolbox, the shape of the mouse is changed into that of the element.

5.6.1. Create a Contact

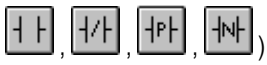


□ Select a desired contact () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.

□ When you draw a line (), after moving the mouse from a desired position, drag a mouse by clicking the left button and you can draw a long line.

□ When you draw a continuous line as the above way, if there is another contact under the mouse position, that contact is conserved.

□ To change a contact () under the mouse position to horizontal line (), double-click on a desired contact.



□ Move the cursor to the position that you want to input a contact in.

□ Select a desired contact(F2,F3,Shift-F1,Shift-F2,F4,F5) of commands in ***Toolbox***.

In case of contact, you can insert it between column '1' of program and column '30'.

In case of vertical line, however, you can insert it between column '2' and column '29'.

5.6.2. Create a Coil



□ Select a desired coil () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.



□ Move the cursor to the position that you want to insert a coil in.

□ Select a desired coil (F6,F7,Shift-F3,Shift-F4,Shift-F5,Shift-F6) of commands in ***Toolbox***.

Coil is inserted in the last (31st) column of LD program automatically.

5.6.3. Create a Function



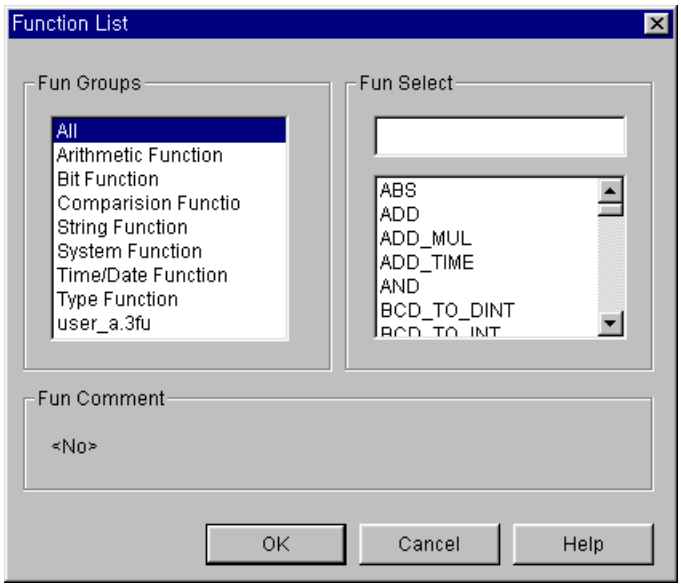
□ Select ({F}) in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.



□ Move the cursor to the position that you want to insert a function in.

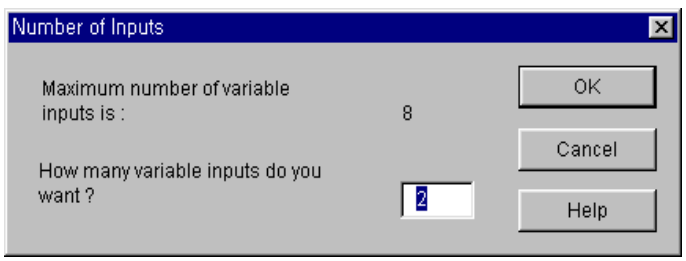
□ Select a function (F8) of commands in ***Toolbox***.



□ Select a function group in ***Function List*** dialog box. Then only appropriate functions appear in the list.

□ Select a desired function in ***Function List*** dialog box and click ***OK*** button.

□ If the selected function is an extensible function(you can adjust input_number in this function), the following dialog box appears automatically.



□ Enter the desired input_number.

You can enter a function between column '2' and column '30' in LD program.

5.6.4. Create a Function Block



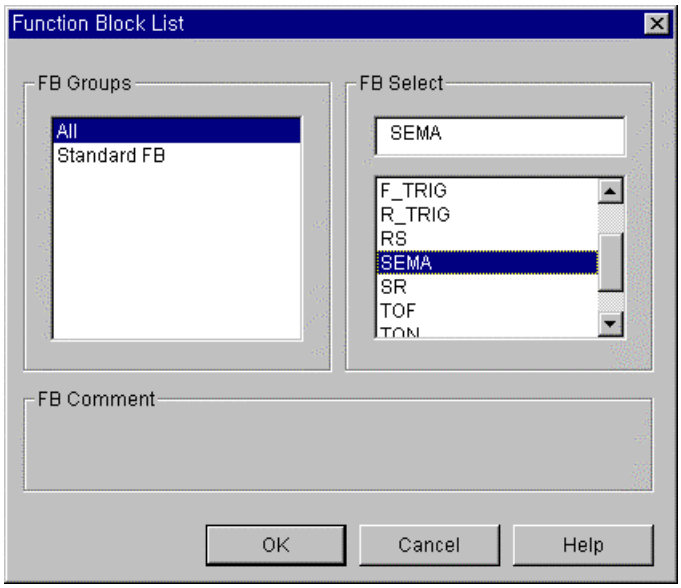
□ Select () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.



□ Move the cursor to the position that you want to insert a function block in.

□ Select a function block (F9) of commands in ***Toolbox***.



□ Select a function block groups in ***Function Block List*** dialog box.
Then only appropriate function blocks appear in the list.

□ Select a desired function block in ***Function Block List*** dialog box and click ***OK*** button.

□ Insert a desired variable name of function block in ***Variables*** dialog box.
You can insert a function block between column '2' and column '30' in LD program.

5.6.5. Return



□ Select () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.



□ Move the cursor to the position that you want to insert Return in.

□ Select Return (Shift-F7) of commands in ***Toolbox***.

Return is inserted in the last (31st) column of LD program.

5.6.6. Jump and Label

In LD program, ***Jump*** command allows you to go directly to the position that you want to branch out.

A ***Label*** indicates a destination. Position of label must be column '0'.

In LD program having subroutine, Jump included in the main program must use the label included in the main program and Jump included in subroutine must use the label included in subroutine.

1) Jump



□ Select () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.

To jump to the label, you need to enter the label name on the jump command.

Double-click on the jump command after selecting the selector (arrow mode).



□ Move the cursor to the position that you want to insert a jump in.

□ Select a jump(Shift-F8) of commands in ***Toolbox***.

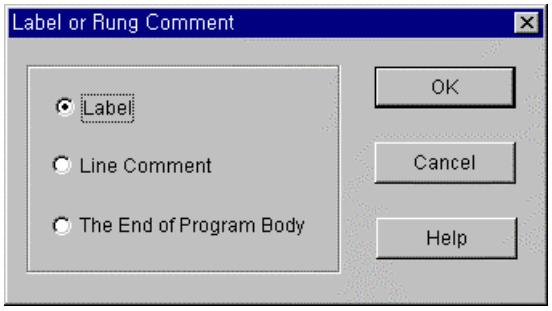
Jump is inserted in the last (31st) column of LD program.

2) Label

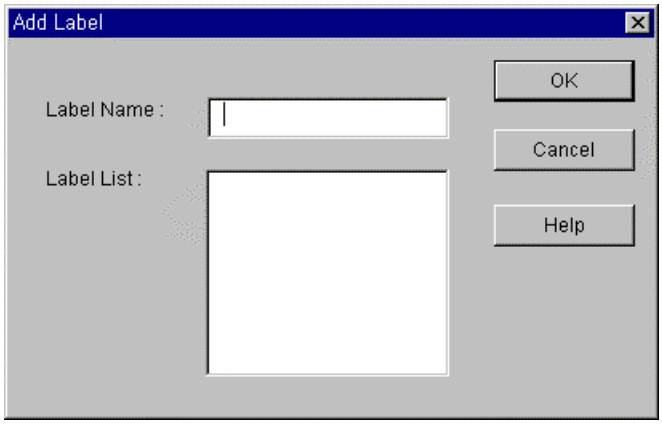


□ Select () in toolbox. To select the selector button in toolbox, click the right button of the mouse. Then select ‘To arrow mode’ command.

□ In LD program window, move the mouse to column '0' and double-click the left button.



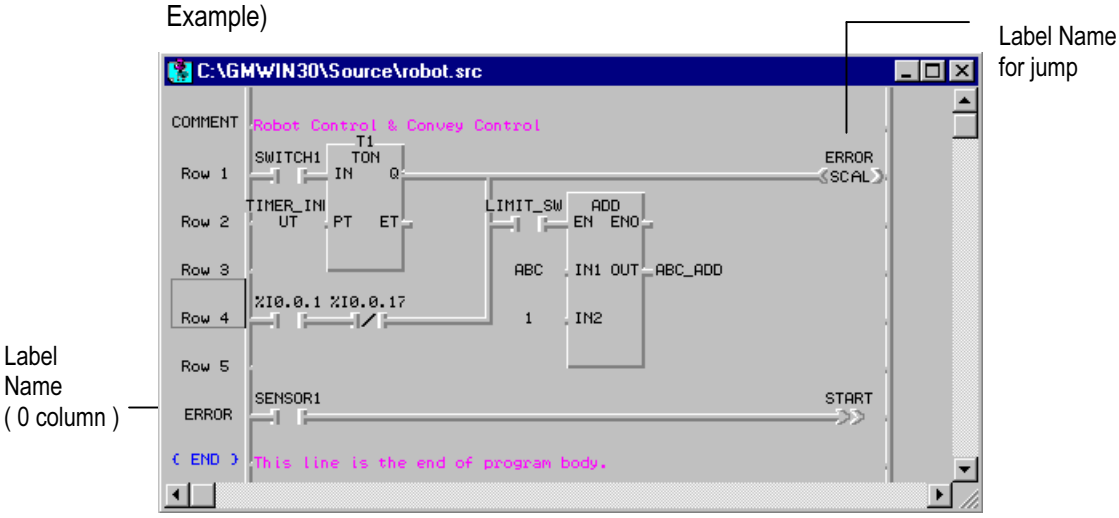
- Select ***Label*** in ***Label or Rung Comment*** dialog box.
- Input a label name in ***Add Label*** dialog box. (Maximum size of label name is 16 characters.)





- In LD program window, move the cursor to column '0'
- Press ***OK*** button.
- Select ***Label*** in ***Label or Rung Comment*** dialog box.
- Input a label name in ***Add Label*** dialog box.

Example)



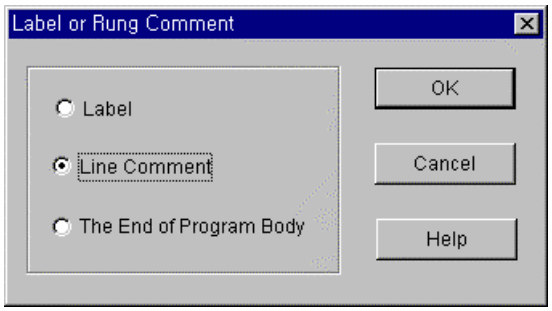
5.6.7. Rung Comment



□ Select () in toolbox.

□ In LD program window, move the mouse to column '0' of the first line in a desired rung and double-click the left button. But, if you want to edit an already existing rung comment, move the mouse to that comment and double-click the left button on it.

□ Select ***Line Comment*** in dialog box.



□ Enter the content of rung comment in ***Rung Comment*** dialog box.
(Maximum size of comment is 170 characters.)

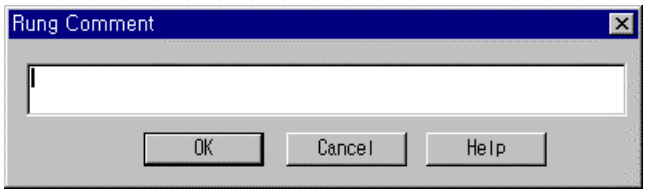


□ In LD program window, move the cursor to column '0' of the first line in a desired rung. But, if you want to edit an already existing rung comment, move a cursor to that comment.

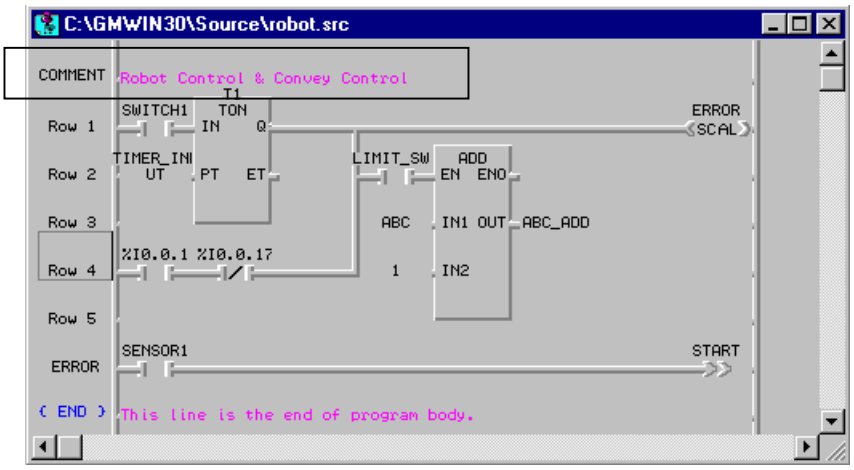
□ Press ***Enter*** key.

□ Select ***Line Comment*** in ***Label or Rung Comment*** dialog box.

□ Input a rung comment in ***Rung Comment*** dialog box.



Rung comment is displayed in all through one line as below.



5.6.8. Subroutine Call

□ Select () in toolbox.

□ In LD program window, move the mouse to a desired position and click the left button.

□ In LD program window, move the cursor to the position that you want to insert a subroutine name in.

□ Select ***Toolbox - <SCAL>*** in the pull-down menu

Insert a subroutine name (Label list)on ***Label List*** dialog box.

Subroutine call is inserted in the last (31st) column of LD program.

5.6.9. End of Main Program



□ Select () in toolbox.

□ In LD program window, move the mouse to column '0' of the row to designate as the end of main program and double-click the left button.

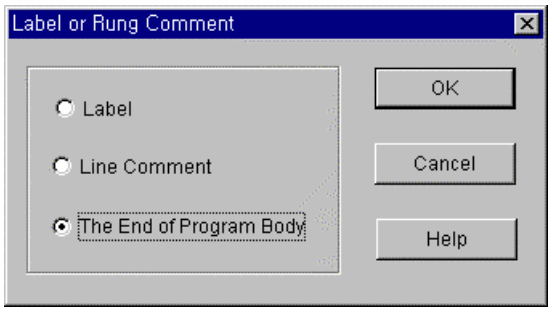
□ Select ***The end of Program Body*** in ***Label or Rung Comment*** dialog box.



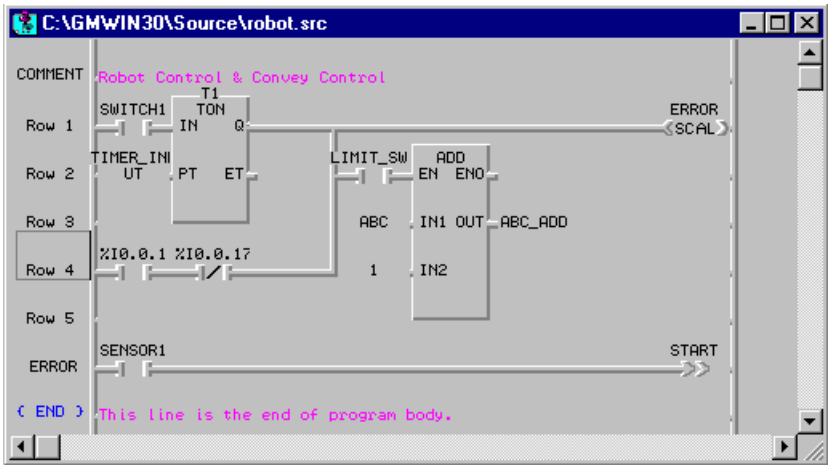
□ Move the cursor to column '0' of the row to designate as 'the end of main program.

□ Press ***Enter*** key

□ Select ***The end of Program Body*** in ***Label or Rung Comment*** dialog box.



In the end of main program, like below picture, {***END***} is displayed in column '0' of the appropriate row and "This line is the end of main program." is displayed from column '1'.

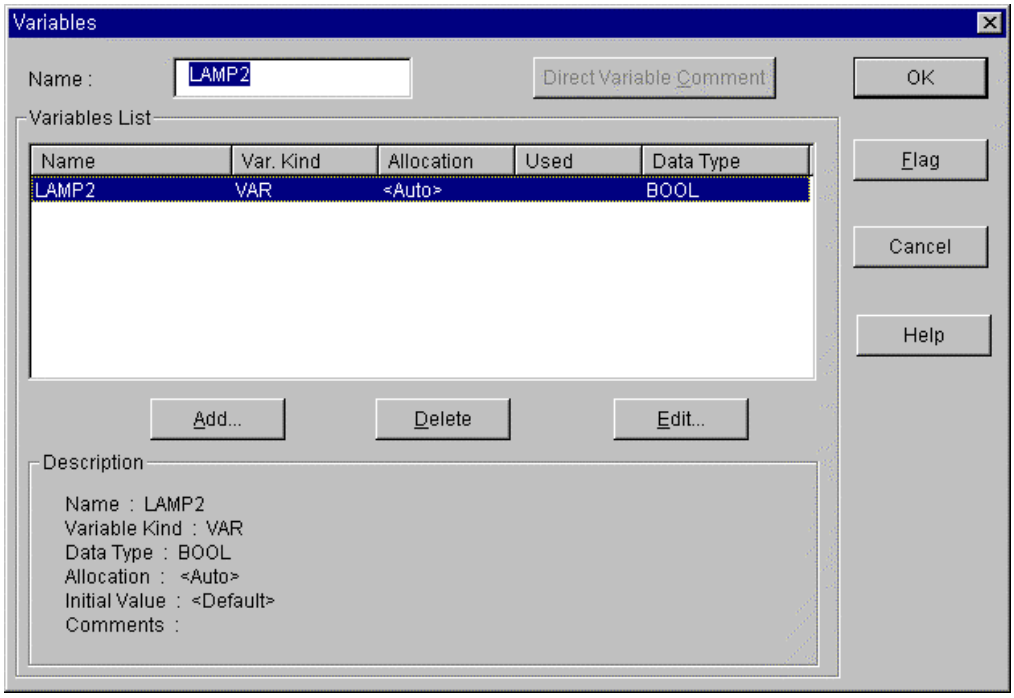


Program logic under the end sign of the main program is regarded as subroutine area.

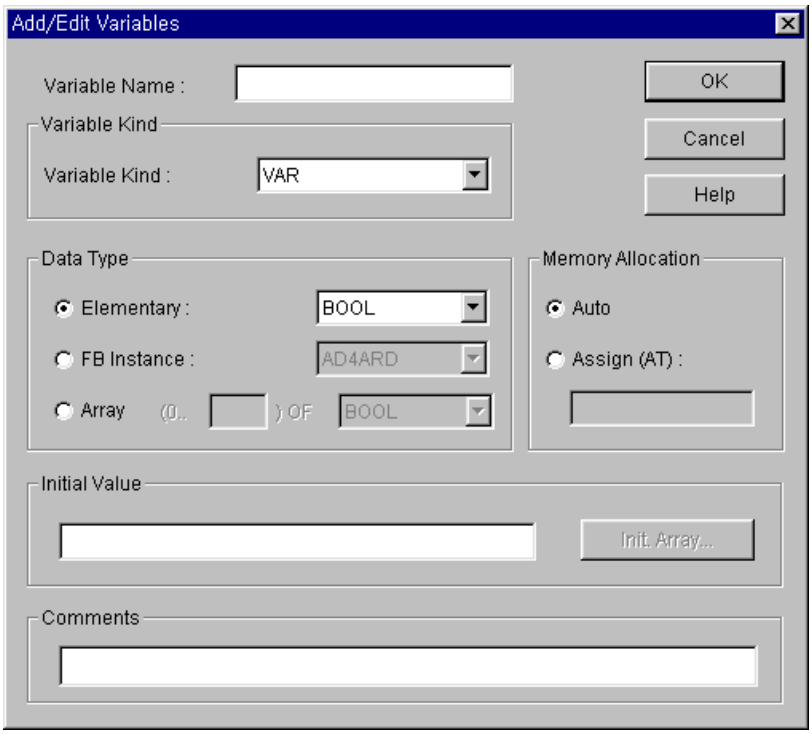
5.6.10. Variable Input

- Select ( ) in toolbox.
- In LD program window, move the mouse on a desired contact, coil or I/O position of Function/ Function block and double-click the left button.

- In LD program window, move the cursor on a desired contact, coil or I/O position of Function/ Function block and double-click the left button.
- Call a variables dialog box by pressing ***Enter*** key.



- You can add, delete or edit a variable in ***Variables*** dialog box.
- In ***Variables*** dialog box, enter the variable name to be used and click ***OK*** button.
  If you enter an already declared variable name, then variable input is over here.
- If you enter a new variable name, ***Add/Edit Variables*** dialog box, which determines the variable properties, appears.



Refer to the '5.5 Edit a Variable' for detail information about ***Add/Edit Variables*** dialog box

□ Press ***OK*** button.

5.6.11. Edit a Block

Before editing a block, you must setup the range to be applied as a block.

Namely, if you want to copy or delete a continuous program, you must designate a range desired as a block before selecting a block editing command.



□ Select () in toolbox.

□ In LD program window, after moving a mouse to the start point of a block by pressing the left button, drag the selected range to the last row of the range to select.



□ In LD program window, move the cursor to the start point of a block.

□ With pressing ***Shift*** key, move the cursor with arrow key to the last row of range to select.

Note

When you setup a block, if the end of block range is in a function or function block, the function or function block is automatically included in the block.

5.6.11.1 Cut

After selecting a block,

□ Select ***Edit - Cut (Ctrl+X,***  ***)***.

5.6.11.2 Copy

After selecting a block,

□ Select ***Edit - Copy (Ctrl+C,***  ***)***.

5.6.11.3 Paste

After copying or cutting a block,

□ In LD program window, move the cursor to the position that you want to paste on.

□ Select ***Edit - Paste (Ctrl+V,***  ***)***.

5.6.11.4 Delete

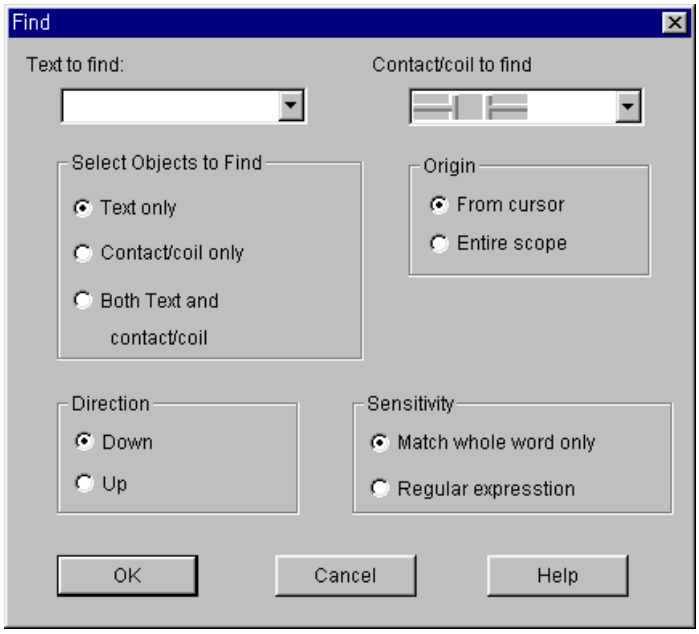
After selecting a block.

□ Select ***Edit - Delete (Delete,***  ***)***.

5.6.12. Find

This command allows you to find a variable name, position of contact and etc, which are used in the program.

Call ***Find*** dialog box by selecting ***Edit - Find*** ().



□ In ***Text to find*** edit box of ***Find*** dialog box, enter the string that you want to find.

□ Select the following options to find and click ***OK*** button.

1) Contact/Coil to find

Select the contact or coil that you want to find.

2) Select Objects to find

Text only : Find only the content of character.

Contact/Coil only: Find only LD program elements like contact, coil or etc.

Both text and Contact/Coil : Find a content of character and LD program elements like contact, coil or etc. simultaneously.

3) Origin

Select the range where find command is executed.

From cursor : Find from current cursor position.

Entire Scope : Find through the whole program.

4) Direction

Select the direction that find command is executed.

Down: Find command is executed downward.

Up : Find command is executed upward.

5) Sensitivity

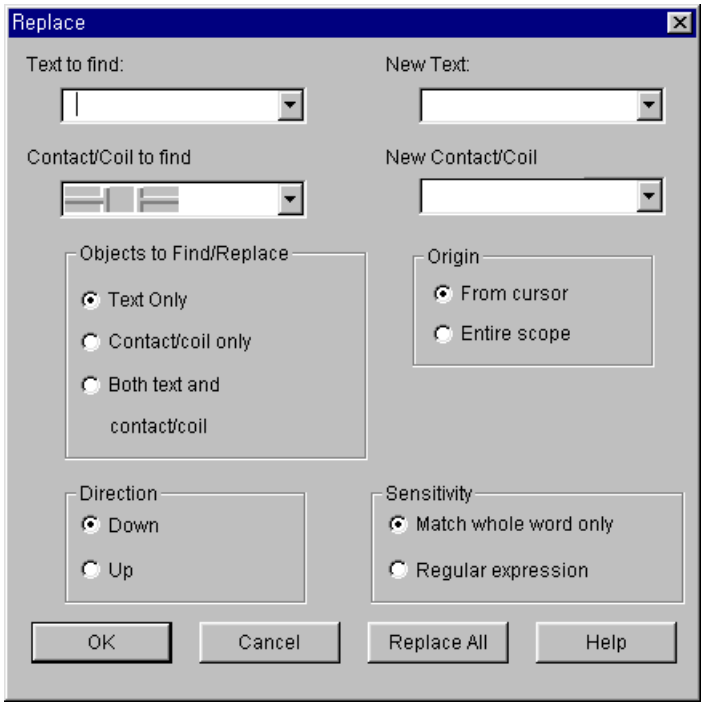
Select an accordance degree in finding a content of character.

Match whole word only : Find only an exactly corresponding word.

Regular expression : Find also a partially corresponding word.

5.6.13. Replace

Call ***replace*** dialog box by selecting ***Edit-Replace***()



□ Enter the character that you want to change in ***Text to find*** edit box.

□ Select the element of LD program to change in ***Contact/Coil*** list box.

LD program element						
	P		( )	S	N	
	/	N		/	R	P
	RETURN	SCAL	LABEL	FUN	FB	FUN/FB-IO

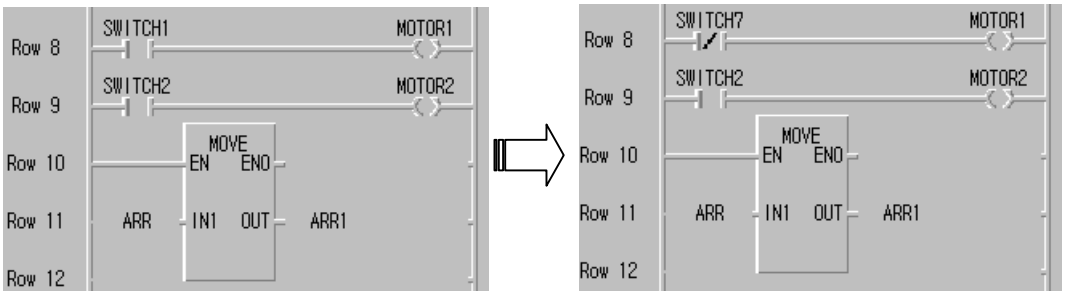
□ Enter the character that you want to replace in ***New Text*** edit box.

□ Select the element of LD program to replace in ***New Contact/Coil*** list box.

□ Select the options in the same way of find command and click ***OK*** button.



□ Click ***OK*** button.



5.6.14. Find / Replace Again

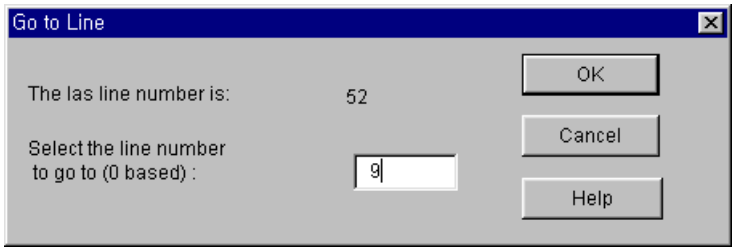
If you executed Find/Replace command before, execute that command again with the condition that designated before.

□ Select ***Edit - Again (Ctrl+F3,***  ***).***

5.6.15. Goto

□ Select ***Edit - Goto.***

□ In ***Go to Line*** dialog box, enter the row number that you want to find.



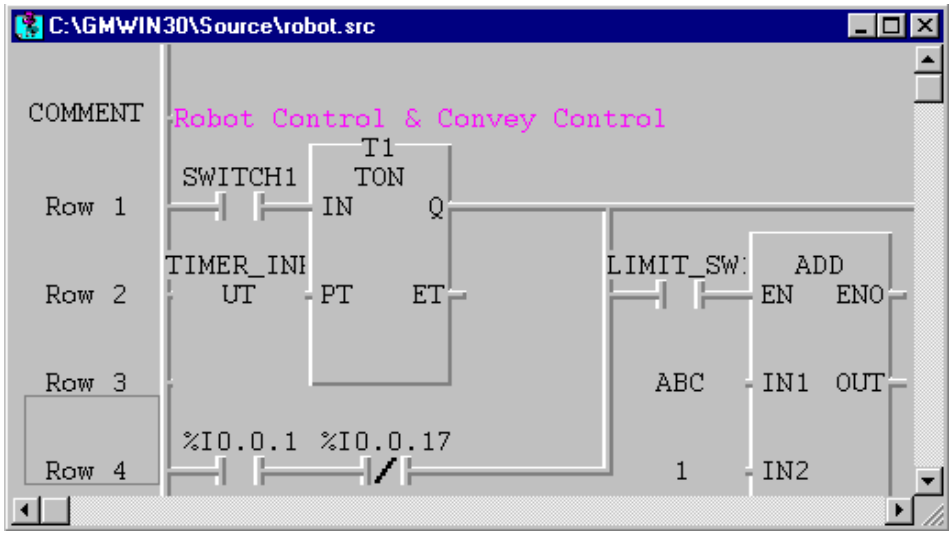
□ Click ***OK*** button.

5.6.16. Zoom In/Out

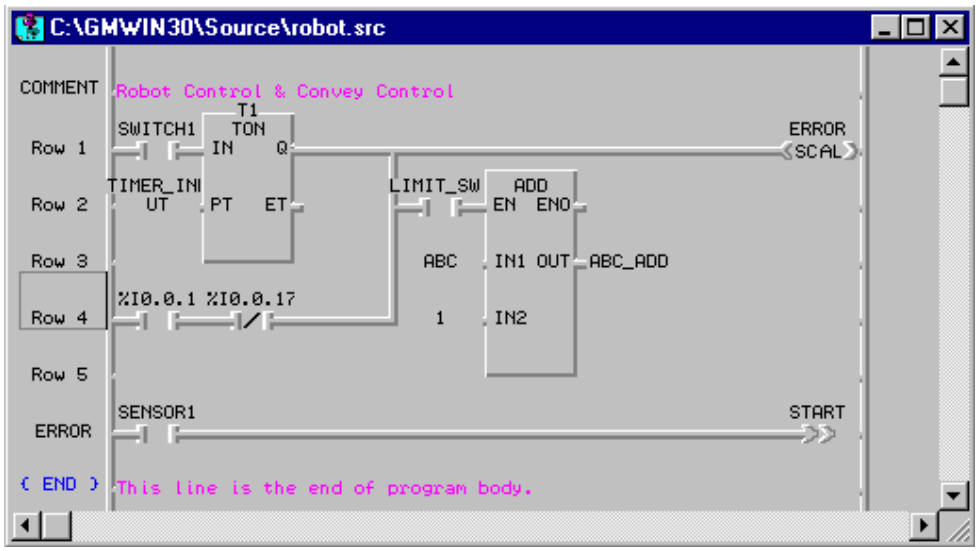
This command allows you to adjust the size of LD Program element.

- Call a dialog box by selecting ***Edit - Condense***
- Select a desired screen size in ***Condense Level*** dialog box.
  (100%, 80%, 70%, 50%, 25%, 12%)

Example) In case that compression rate is 100%



In case that compression rate is 70%



Note

In case that compression rate is 25%,12%, LD program is not displayed as 3D type.

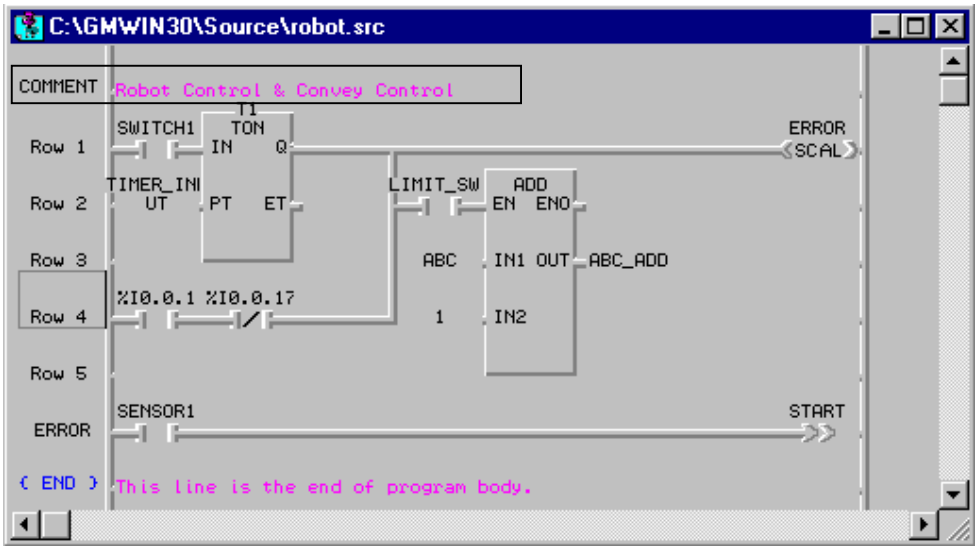
5.6.17. Variable Comment

LD program supports the function that indicates the comment of each variable.

□ Select ***Edit - Variable Comment (Ctrl+M)*** in the pull-down menu.

□ If there is a check mark at the left side of ***Edit - Variable Comment(Ctrl+M)***, a current window is in the state that shows a variable comment and if there is not, the window is in the state that does not show the comment.

Example) In case that express a variable comment



5.6.18. Delete Row

□ Select ( ) in toolbox.

□ In LD program window, move the mouse to the row that you want to delete and move the cursor with clicking a left button.

□ Select ***Edit - Delete Line***.

□ In LD program window, move the cursor to the row that you wish to delete.

□ Select ***Edit - Delete Line (Ctrl+D)*** .

5.6.19. Delete Cell

Delete the cell that cursor is on.

If the current position of the cursor is empty space, this function deletes the empty cell by one column.



□ Select () in toolbox.

□ In LD program window, move the mouse to the cell you want to delete and move the cursor with clicking a left button.

□ Select ***Edit - Delete Cell***.



□ In LD program window, move a cursor to the cell to be deleted.

□ Select ***Edit - Delete Cell (Delete)***.

5.6.20. Insert Line



□ Select () in toolbox.

□ In LD program window, move the mouse to the position that you want to insert the row and move the cursor with clicking a left button.

□ Select ***Edit - Insert Line (Ctrl+N)***.



□ In LD program window, move the cursor to the position that you want to enter the row.

□ Select ***Edit - Insert Line (Ctrl+N)*** .

5.6.21. Insert Cell

Insert an empty cell in the position where a cursor is on.



□ Select () in toolbox.

□ In LD program window, move the mouse to the position where you want to insert a cell and clicking a left button.

□ Select ***Edit - Insert Cell (Ctrl+I)*** .



□ In LD program window, move the cursor to the position where you want to insert the cell.

□ Select ***Edit - Insert Cell (Ctrl+I)*** .

5.6.22. Move/Copy Cell

(for copy, mouse and keyboard are used simultaneously)

□ Select ( ) in toolbox.

□ In LD program window, move the mouse to the cell to move/copy.

□ Drag to a desired position with clicking a left button of mouse.

□ In case of moving, release the left button of the mouse.

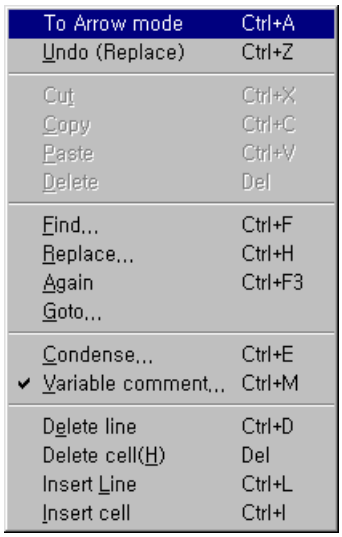
In case of copy, release a left button of mouse with pressing ***Ctrl*** key

5.6.23. Pop-Up Menu

□ Click a right button of the mouse on an arbitrary position or desired position.

□ Select a desired command in menu that is appeared in right side.

Pop-up Menus are various according to the position of the mouse. You can select frequently used functions in Pop-up Menu



If you use a Pop-up menu, then you don't need to use each command through the pull-down menu. In the upper menu, ***To Arrow Mode*** is the command that changes the input state of a current mouse into arrow mode to select or enter the data or elements of the program.

5.6.24. Undo

This command allows you to cancel previously edited action.



□ Select ***Undo (Ctrl+Z,***  ***)***.

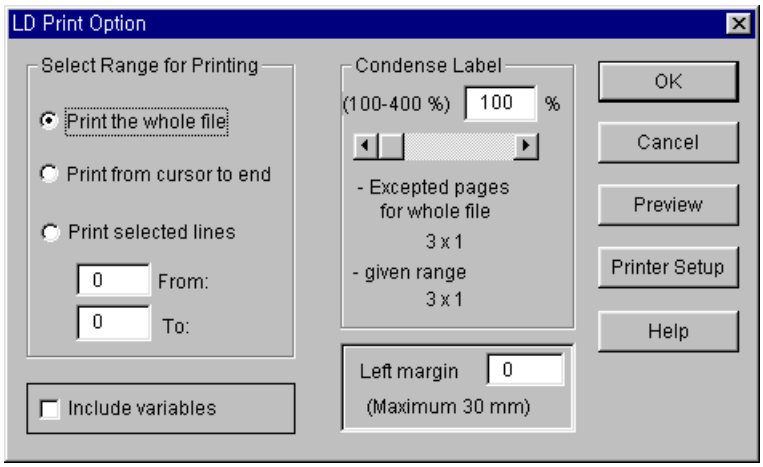


□ Select ***Undo (Ctrl+Z)***.

5.6.25. Print and Preview

Print

□ Call a LD Print Option dialog box by selecting ***Project - Print***.



□ In ***Select Range for Printing*** group box of ***LD Print Option*** dialog box, select the range of LD program to print.

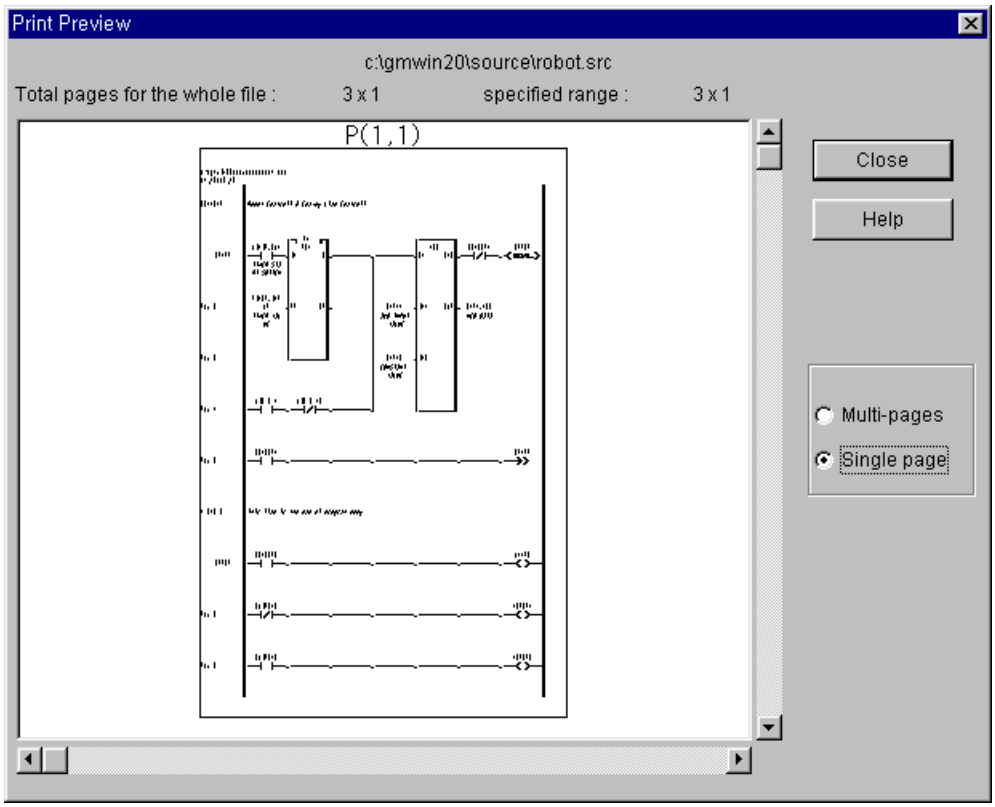
□ In ***Left Margin*** group box, enter the left blank in mm. (Maximum size is 30mm)

□ In ***Condense Label*** group box, enter the compression rate of content to print within the range that is from 100% to 400%. Indicates the required page number of printing the whole file and the required page number of printing the given range that user designate in ***Select Range for Printing***.

Preview

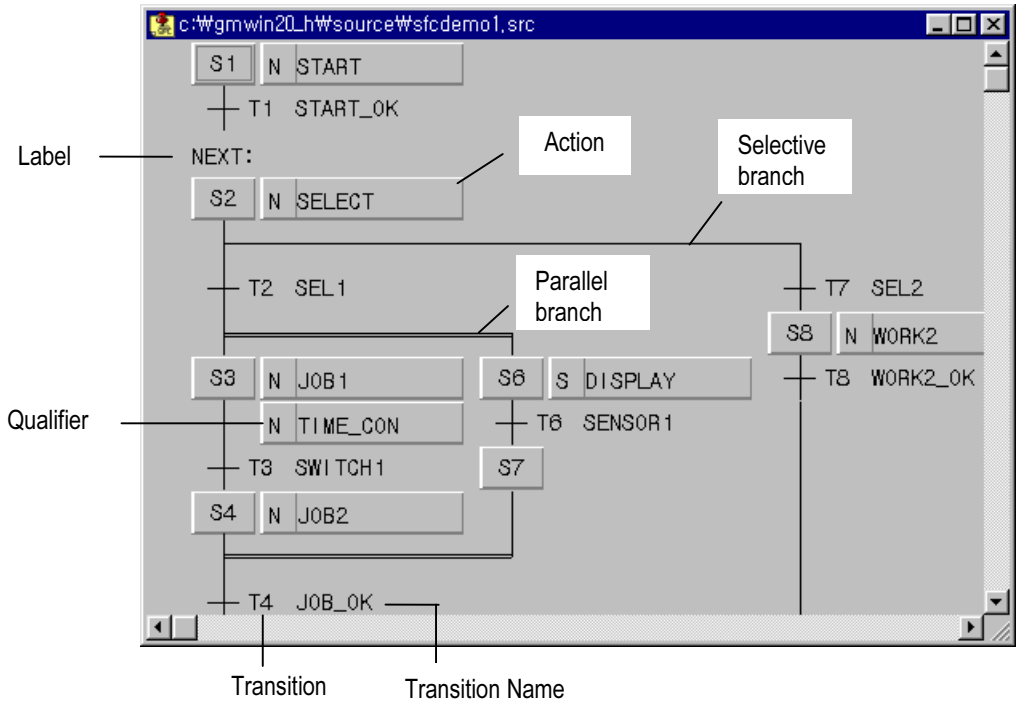
□ ***Preview*** button of ***LD Print Option*** dialog box is used when you want to see the outline of contents to print before printing actually on paper.

In ***Preview*** dialog box, you can determine either showing several pages simultaneously in a screen or by one page.



5.7. Edit SFC

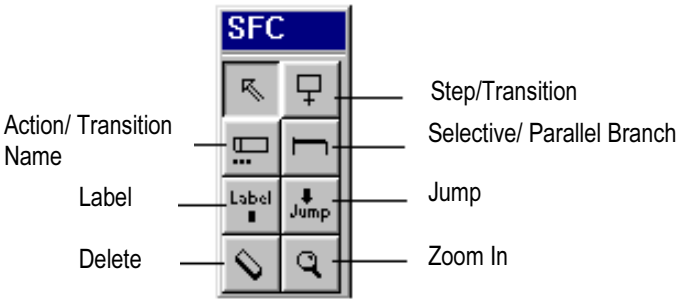
SFC supports the method that divides a PLC language (IL, LD) into step and transition according to the execution order. SFC consists of the following elements.



Note

In case of executing the automatic control of a machine with PLC, SFC(Sequential Function Chart) is the most optimal structural programming method.

SFC Toolbox



	Step	Indicates the unit of a sequence control with connecting to action
	Transition	Indicates the condition for executing from an active step to next step
	Selective Branch	The executive flow is determined by executive condition
	Parallel Branch	Used to control several sequences simultaneously
	Label	The position where an executive flow start by jump
	Jump	Used to change an executive flow
	Action	Indicates an executing content in the specified step

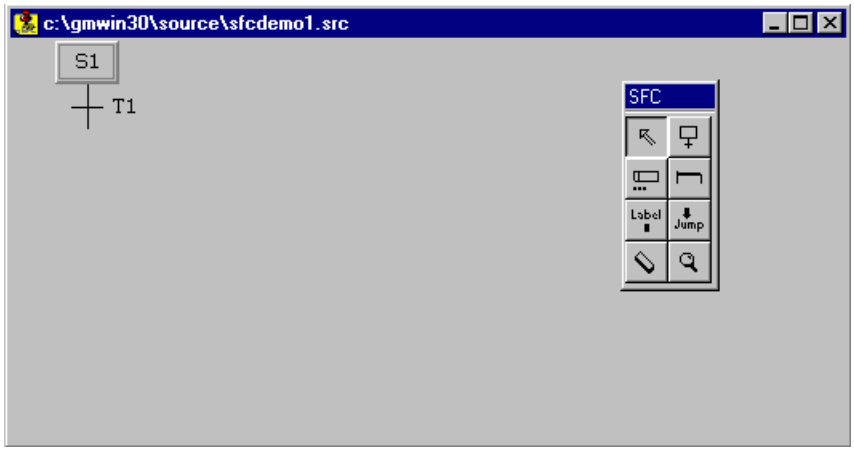
Select the element to insert and click the left button of the mouse on a desired position.

5.7.1. Create a Step/Transition

Step/Transition or Transition/Step is created in pairs by current position.



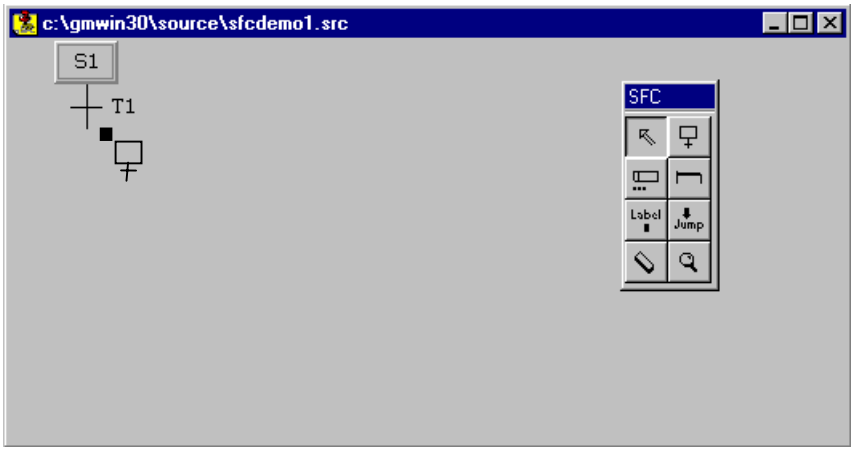
□ Initial screen of SFC program is as below.



□ Select () in toolbox.

□ Move the mouse to the position marked  .Then () symbol appears in the screen.

□ Click the left button of mouse on the position marked  .

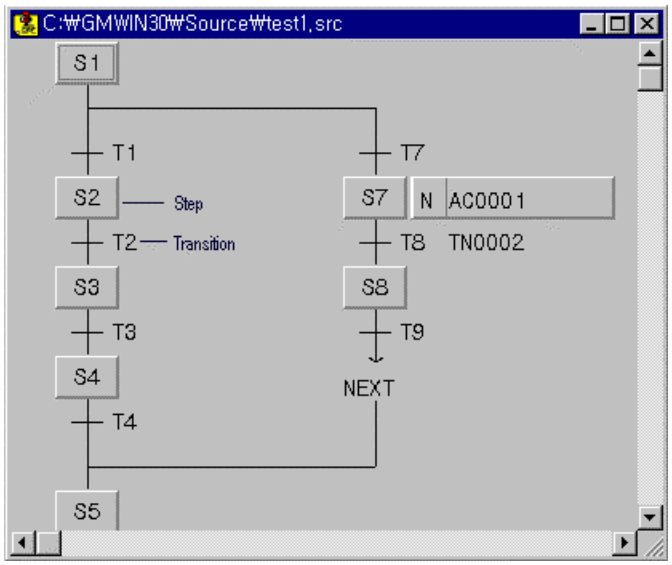


□ New Step/Transition is created on the position marked  .



□ Move the cursor with key to the position that you want to create step/transition.

□ Select ***Toolbox - Step (F2)***.

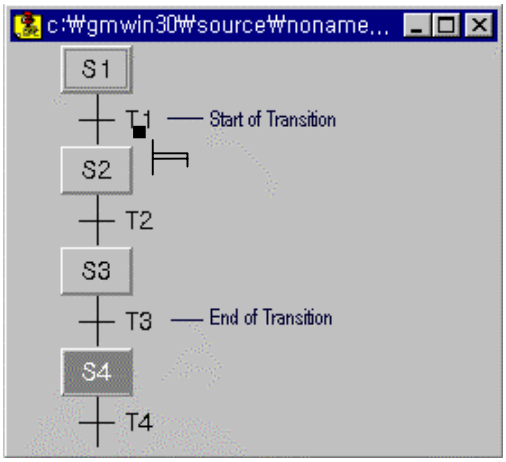


5.7.2. Create a Parallel Branch

1) To create a parallel branch for the first time,

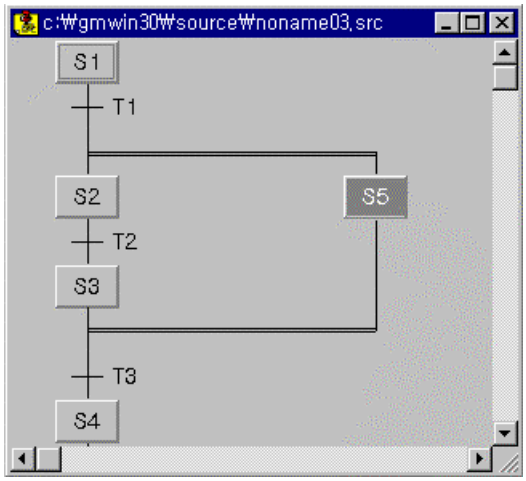


□ Select () in toolbox and move the mouse to the transition (T1) where branch starts and click a left button (You can see a mark ()).



□ Transition (T2,T3,T4) are active in red.

□ Move the mouse to the transition (T3) where branch ends and click a left button.



□ Parallel branch and new step (S5) are created.



□ Move the cursor to the transition where branch starts with key.

□ Select ***Toolbox-Branch (F3)***.

□ Move the cursor to the transition where branch ends with key.

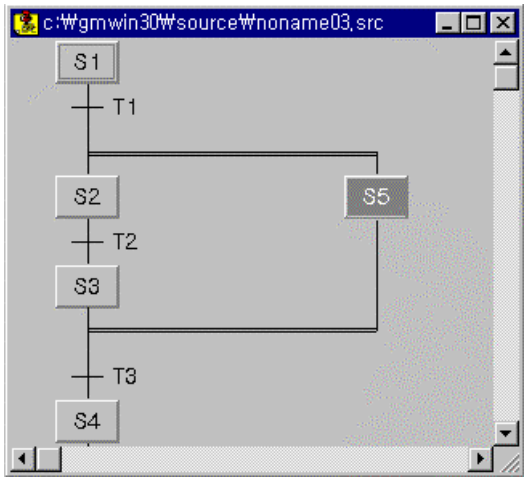
□ Select ***Toolbox-Branch (F3)***.

2) To expand a parallel branch,

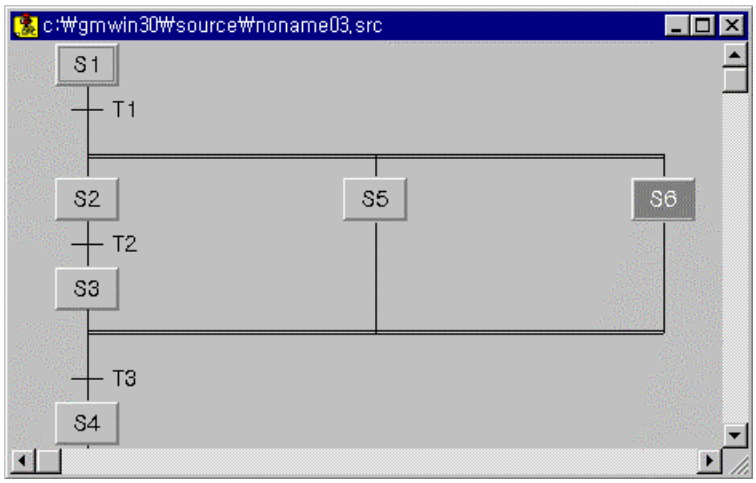


□ Select () in toolbox.

□ Move the mouse to the start position of the parallel branch and click a left button.



□ Parallel branch and new step (S6) are created.





□ Move the cursor to the start position of a parallel branch where you want to insert a branch with key.

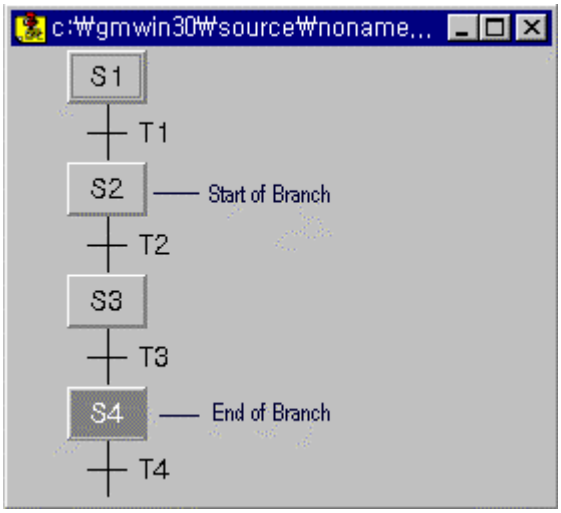
□ Select ***Toolbox – Branch (F3)***.

5.7.3. Create a Selective Branch

1) To create a selective branch initially,

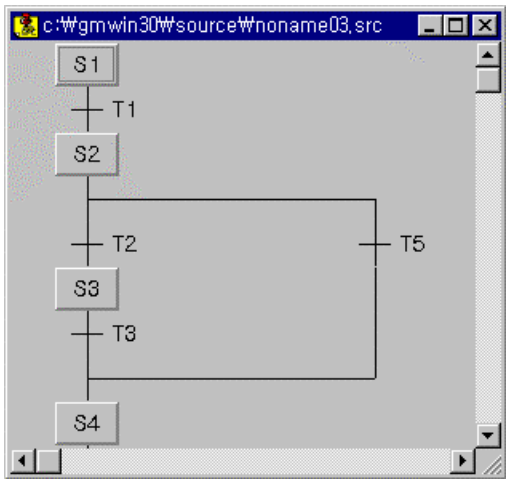


□ Select () in toolbox and move the mouse to the step (S2) where branch starts and click a left button(You can see a mark ()).



□ Steps (S3,S4) are active in red.

□ Move the mouse to the step (S4) where branch ends and click a left button.



□ Selective branch and new transition (T5) are created.

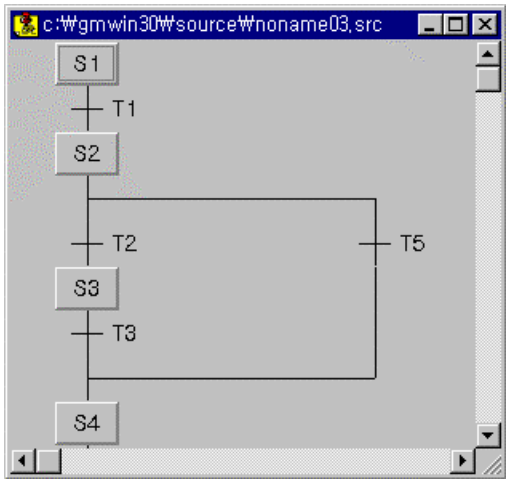


□ Move the cursor to the step where branch starts with key.
□ Select ***Toolbox – Branch (F3)***.
□ Move the cursor to the step where branch ends with key.
□ Select ***Toolbox – Branch (F 3)***.

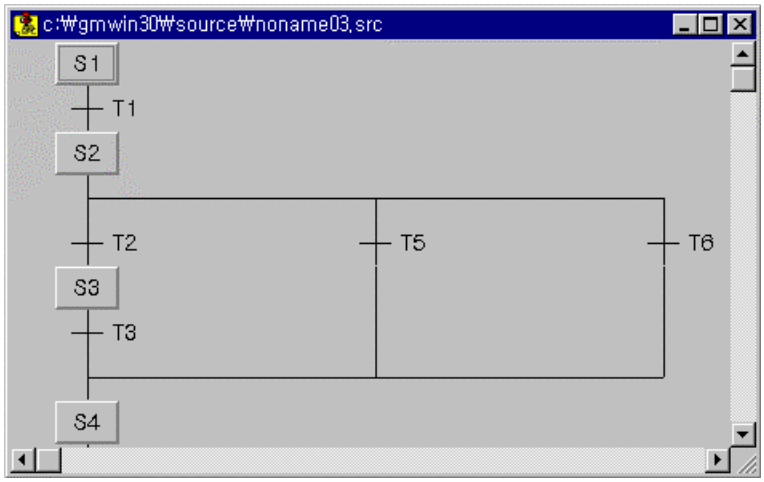
2) To expand a selective branch,



□ Select () in toolbox.
□ Move the mouse to the start position of a selective branch and click a left button.



□ Selective branch and new transition (T6) are created.





□ Move the cursor to the start position of a selective branch where you want to insert a branch with key.

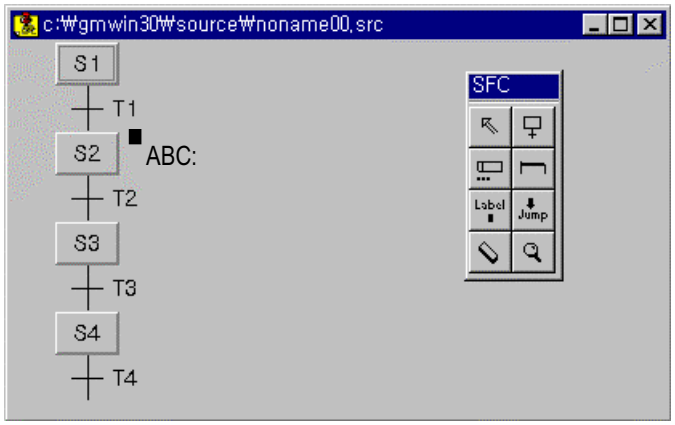
□ Select ***Toolbox – Branch (F3)***.

5.7.4. Create a Label



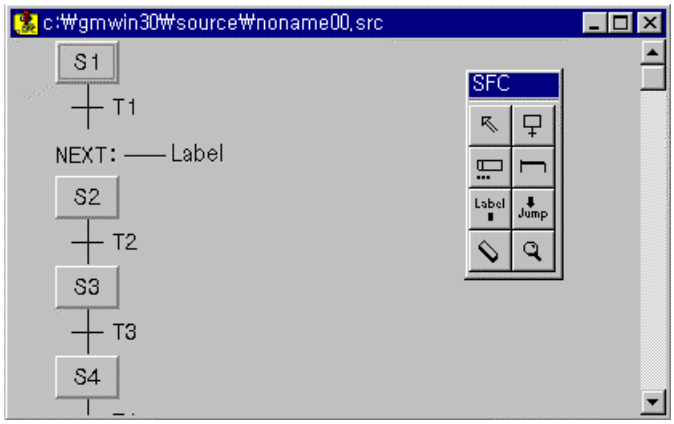
□ Select () in toolbox.

□ Move the mouse to the step (is marked with(■ ABC:)) and click a left button.



□ Input a label name in ***Label*** dialog box and click ***OK*** button.

□ Maximum size of a label name is 10 characters.



Note : Label is only inserted in the front of Step.



□ Move a cursor to the step with key.

□ Select ***Toolbox – Label (F5)***.

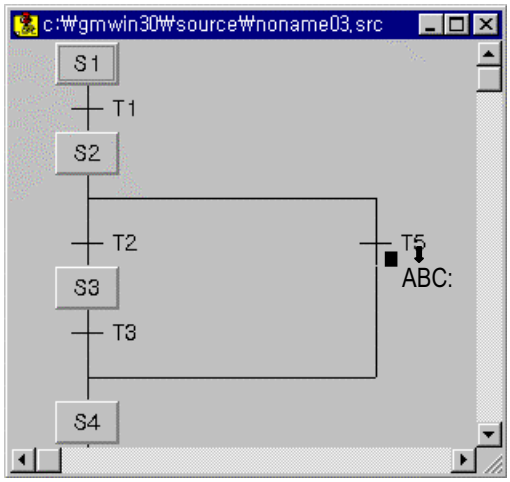
□ Input a label name in ***Label*** dialog box and click ***OK*** button.

5.7.5. Create a Jump

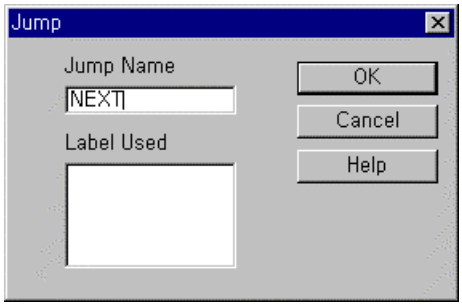


□ Select () in toolbox.

□ Move the mouse to a desired position(is marked with ()) for jump and click a left button.



□ Enter the jump name in ***Jump*** dialog box and click ***OK*** button.

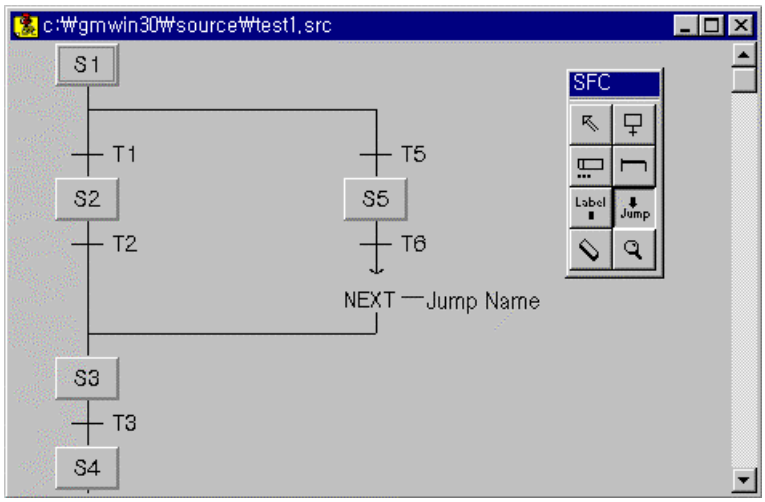


□ Maximum size of the jump name is 10 characters.

Note

Available position for Jump

- Transition at the end of the selective branch
- Transition at the last end of SFC program



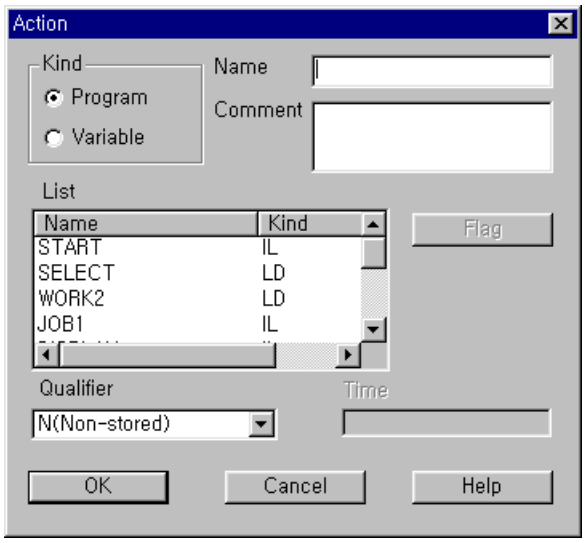
- Move a cursor to a desired position (is marked with (ABC:)) for jump with key.
- Select ***Toolbox – Jump (F6)***.
- Enter the jump name in ***Jump*** dialog box and click ***OK*** button.

5.7.6. Create an Action

To connect an action to a step,

- Select ( ) in toolbox.
- Move the mouse to a step and click a left button(. ABC)

- Move the cursor to the step with key.



- Select ***Toolbox – Action/Transition (F4)***.

□ Select whether you setup an action as a program or as a Boolean variable output in ***Kind*** radio button of ***Action*** dialog box.

If you setup an action as a variable output, the designated variable is outputted as '1' when the action is in active.

1) In case of setting up an action as a program

□ Enter the action name in the ***Name*** edit box (maximum size is 16 characters).

When you want to connect an already used action, select the action in list box.

□ Enter the comment for the action in the ***Comment*** edit box (maximum size is 40 characters).

2) In case of setting up an action as a variable

□ Enter the variable name in the ***Name*** edit box (maximum size is 16 characters).

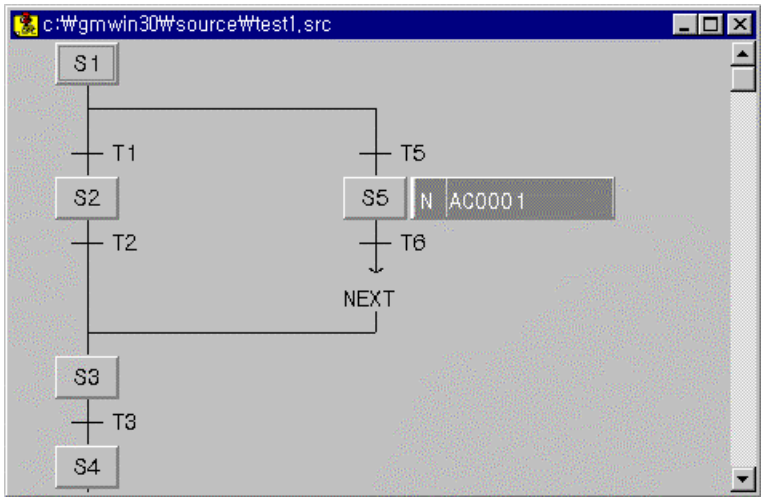
When you want to connect an already declared variable, select the variable in list box.

Select a desired qualifier in ***Qualifier*** list box.

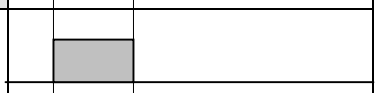
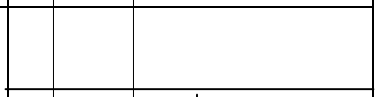
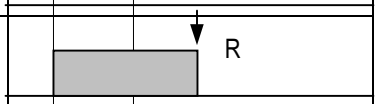
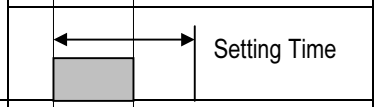
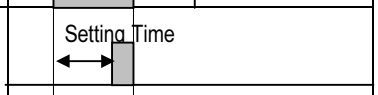
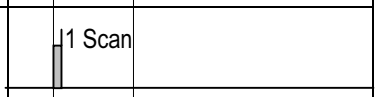
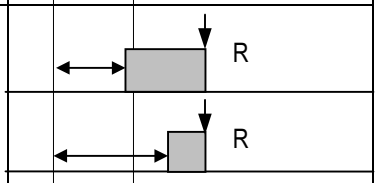
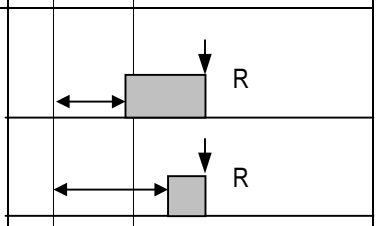
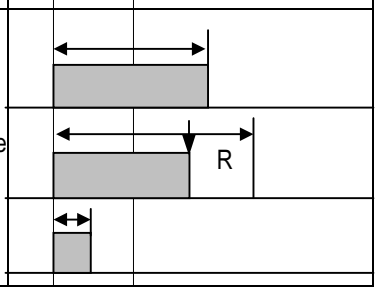
□ If the selected qualifier has a time value (D, L, SD, SL, DS), enter the time value in the ***Time*** edit box.

Example) T#10S

□ Click ***OK*** button.



3) Kind and Function of Qualifier

Symbol	Function	Step: Active Condition / Passive Condition
N(Non-stored)	Action is executed while Step is in active.	
R(overriding Reset)	R(overriding Reset) makes stopping the execution of action executed by qualifier(S,SD,DS,SL) before.	
S(Set)	After Step is in active, an action is executed until R qualifier acts.	
L(time Limited)	After Step is in active, an action is executed as long as setting time.	 
D(time Delayed)	After Step is in active, the execution of action is delayed as long as setting time.	
P(Pulse)	Action is executed at the only moment when Step is in active.	
SD(stored & time Delay)	After Step is in active, an action is executed after the lapse of setting time until R qualifier acts. If the R qualifier, However, acts before the lapse of setting time, the action is not executed.	
DS(Delayed & stored)	After Step is in active, an action is executed after the lapse of setting time until R qualifier acts. But, if the step is in passive or the R qualifier acts before the lapse of setting time, the action is not executed.	
SL(stored & time Limited)	After Step is in active, an action is executed as long as setting time, and when the setting time elapses or R qualifier acts, the action is stopped.	

5.7.7. Create a Transition

To connect Name to Transition,



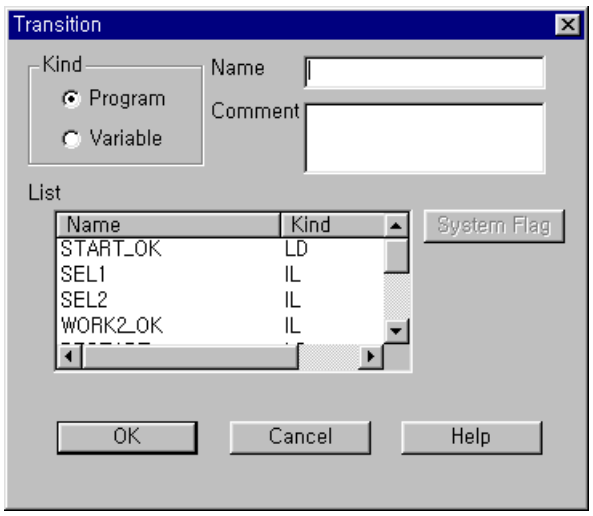
□ Select () in toolbox.

□ Move the mouse to a transition and call a transition dialog box by clicking a left button.



□ Move the cursor to a transition with key.

□ Select ***Toolbox – Action/Transition (F4)***.



□ Select whether you setup an executive condition as a program or as a Boolean variable in ***Kind*** button of ***Transition*** dialog box.

If you setup an executive condition as a Boolean variable, the condition becomes '1' when a variable becomes '1'. And the program executes the next step.

1) In case of setting up Transition as a program,

□ Enter the transition name in the ***Name*** edit box (maximum size is 16 characters).

When you want to connect the already declared transition, select the transition in list box.

□ Enter the comment for the transition in the ***Comment*** edit box (maximum size is 40 characters).

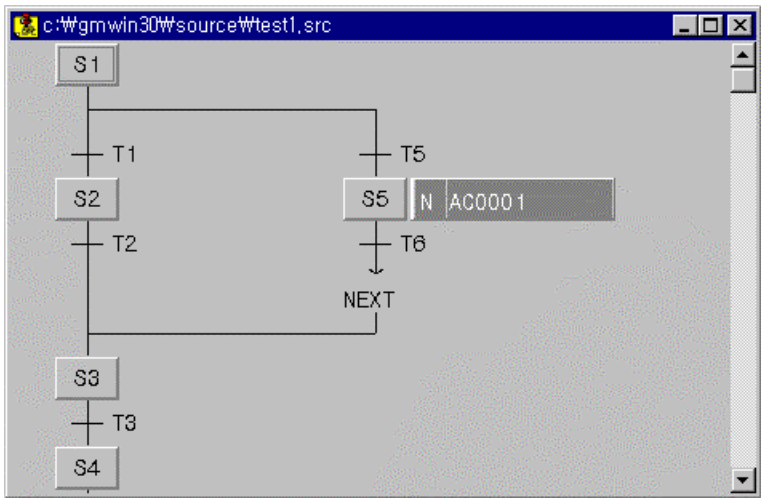
2) In case of setting up Transition as a variable,

□ Enter the transition name in the ***Name*** edit box (maximum size is 16 characters).

When you want to connect the already declared variable, select the variable in list box.

□ Enter the comment for the transition in the ***Comment*** edit box (maximum size is 40 characters).

□ Click ***OK*** button.



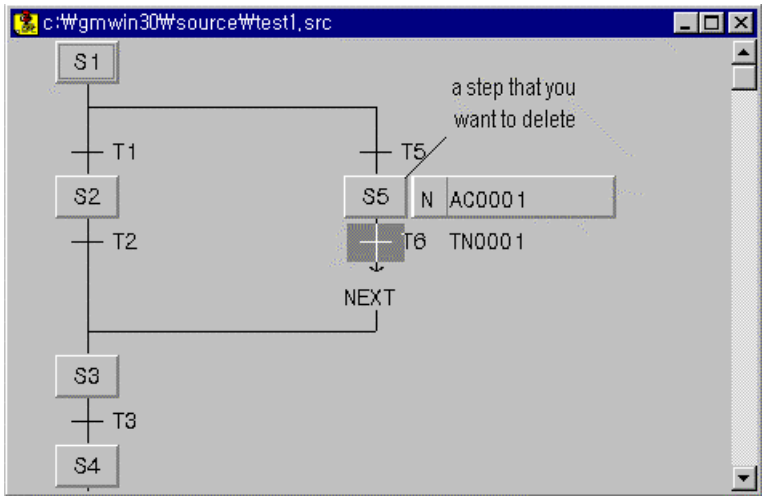
5.7.8. Delete

5.7.8.1 Delete a Step/Transition

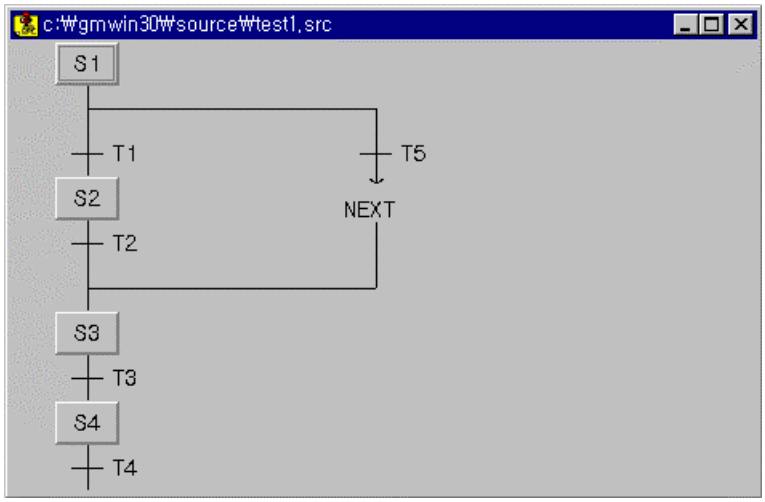


□ Select () in toolbox.

□ Move the mouse to the step or transition that you want to delete.



□ Click the left button of the mouse.





□ Move the cursor to a step or transition that you want to delete with key.

□ Select ***Edit – Delete***.

Note

Although you delete a transition in SFC program, a transition program is not deleted.
If you want to delete the program, you must delete it in transition list.
(select ***Program – Transition List***)

5.7.8.2 Delete a Branch

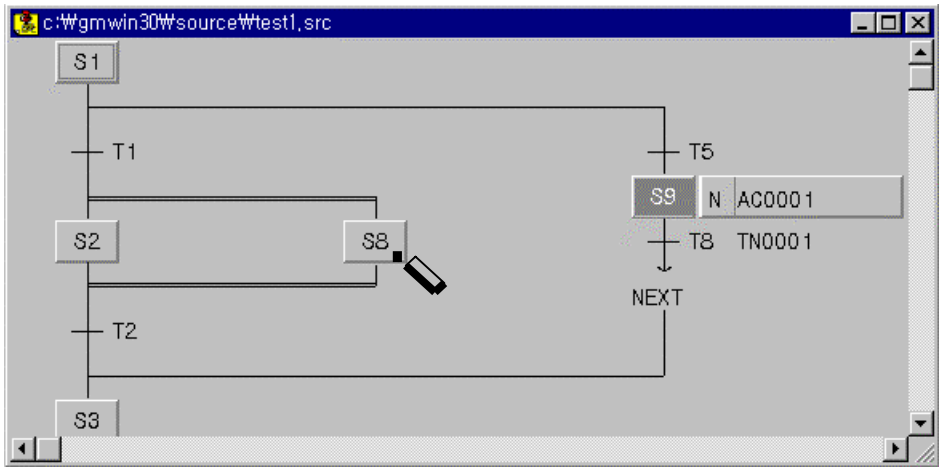
To delete the branch, All elements must be deleted before deleting a branch.

Namely, there must be only Step (in case of parallel branch) or Transition (in case of selective branch) in branch.



□ Select () in toolbox.

□ Move the mouse to Step(in case of parallel branch, is marked with ()) or transition (in case of selective branch) in branch and click a left button.





□ Move the cursor to a step (or transition) in the branch that you want to delete.

□ Select ***Edit – Delete***.

5.7.8.3 Delete a Label



□ Select () in toolbox.

□ Move the mouse to the label that you want to delete and click a left button.



□ Move the cursor to the label that you want to delete.

□ Select ***Edit – Delete***.

5.7.8.4 Delete a Jump



□ Select () in toolbox.

□ Move the mouse to the jump that you want to delete and click a left button.



□ Move the cursor to the jump that you want to delete with key.

□ Select ***Edit – Delete***.

5.7.8.5 Delete an Action



□ Select () in toolbox.

□ Move the mouse to the action that you want to delete and click a left button.



□ Move the cursor to the action to be deleted with key.

□ Select ***Edit – Delete***.

Note

Although you delete an action in SFC program, an action program is not deleted.

If you want to delete the program, you must delete it in action list (select ***Program – Action list***).

5.7.9. Zoom In Action/Transition

This Function is used for editing an action or transition program.

Note : A variable used in action or transition is commonly shared in other actions or transitions.



□ Select () in toolbox.

□ Move the mouse to an action or transition and call a ***Select Language*** dialog box by clicking a left button.

At this time, if it is declared as a variable, you cannot zoom in.

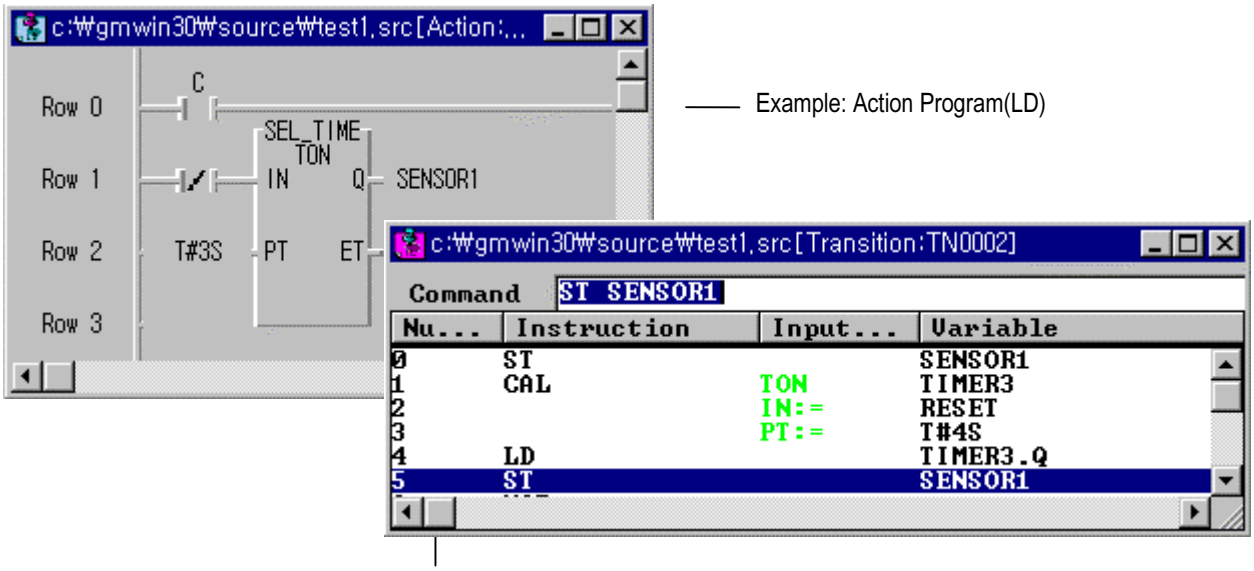
□ Selecting a language type is omitted for the action or transition that selected a program type before.



□ Select a desired language type in ***Language*** option button of ***Select Language*** dialog box.

□ Call the screen of making a program by clicking ***OK*** button, and create a program.

□ When you edit a transition, the execution condition must be outputted as ***TRANS*** variable.



Example: Action Program(LD)

Example: Transition Program(IL)

Note

Action and transition programs are not saved by individually. They are also saved when SFC program is saved. So if you save SFC program in window, then action and transition are also saved.

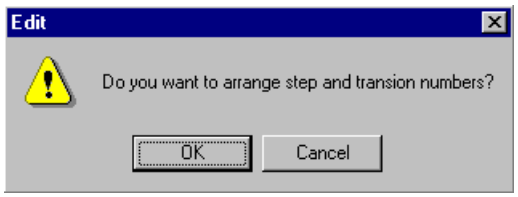
5.7.10. Arrange Number

This is the function for putting the number added to Step and Transition in order.

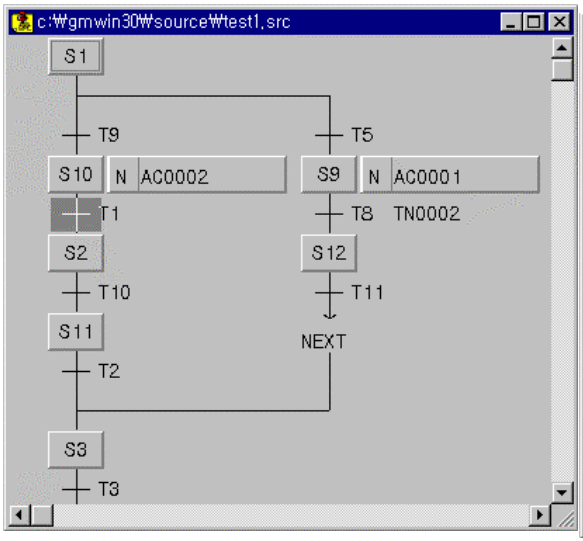
Step or Transition number is added in inserted order, and they have no other meaning.

It is arranged automatically when you compile or save the program.

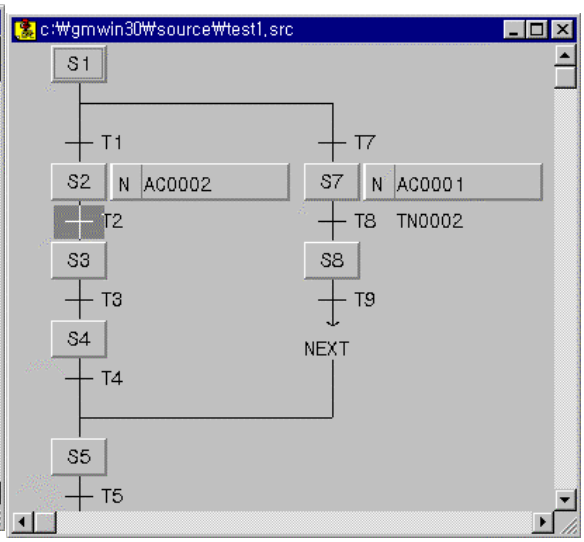
□ Select ***Edit – Arrange Number***.



□ Click ***OK*** button and the numbers are given in order.



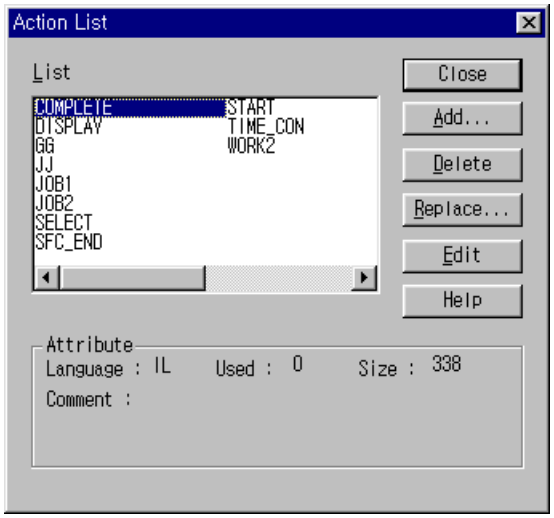
Before arrangement



After arrangement

5.7.11. Action/Transition List

□ Select ***Program - Action List*** (or ***Transition List***).



□ Action list and the attribute of the selected action appears in ***Action List*** dialog box.

Language	: Language type of the action
Used	: The number of being used in SFC program
Size	: Program size of the action(byte)
Comment	: Comment for the action

1) Add the action

□ Click ***Add*** button in ***Action List*** dialog box.

□ Enter the action name and comment, and click ***OK*** button.

2) Replace the action name

□ Click ***Replace*** button in ***Action List*** dialog box.

□ Enter the action name and comment that you want to replace, and click ***OK*** button.

At this time, the action on using in SFC program is also replaced in SFC program.

3) Delete the action

□ Click ***Delete*** button in ***Action List*** dialog box.

At this time, you cannot delete the action on using in SFC program.

4) Edit the action

To edit an action program,

□ Click ***Edit*** button in ***Action List*** dialog box.

5.7.12. Edit a Block

Before editing a block, you must setup the range to be applied as a block.
Namely, if you want to copy or delete a continuous program, you must designate the desired content as a block before selecting edit a block function.
When you fix a block in SFC, a correct program is only available.
For example, you must setup the block, which starts from a step, as a transition for the end of the program.

To setup a block,



□ Select () in toolbox.
□ In SFC program window, move the mouse to the start point of the block and drag it to the last row of the range to select with clicking the left button.



□ In SFC program window, move the cursor to the start point of the block.
□ With pressing ***Shift*** key, move the cursor with arrow key to the last row of the range to select.

5.7.12.1 Cut

After selecting a block,

□ Select ***Edit-Cut (Ctrl+X,***  ***)***.

5.7.12.2 Copy

After selecting a block,

□ Select ***Edit-Copy (Ctrl+C,***  ***)***.

5.7.12.3 Paste

After copying or cutting,

□ In SFC program window, move the cursor to the position that you want to paste .

□ Select ***Edit-Paste (Ctrl+V,***  ***)***.

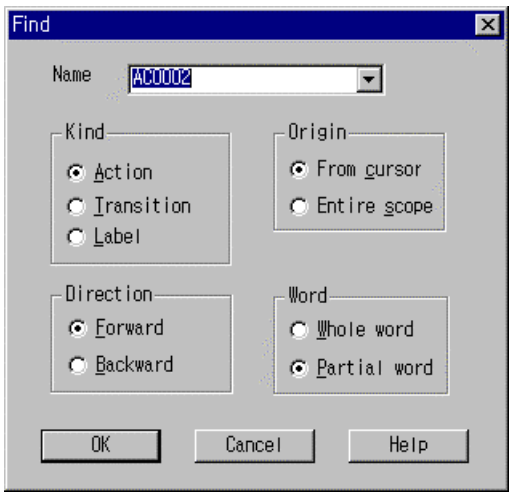
5.7.12.4 Delete

After selecting a block.

□ Select ***Edit-Delete (Delete,***  ***)***.

5.7.13. Find

□ Select ***Edit – Find (***  ***)***.



□ In ***Name*** edit box of ***Find*** dialog box, enter the string that you want to find.

□ Select the following option and click ***OK*** button.

1) Kind

Select the type of string that you want to find.

2) Origin

Select the range where Find function is executed.

From cursor : Find from current cursor position.

Entire scope : Find through the whole range.

3) Direction

Select the direction that Find function is executed.

Forward : Find function is executed forward.

Backward : Find function is executed backward.

4) Word

Select Whole word or Partial word to find

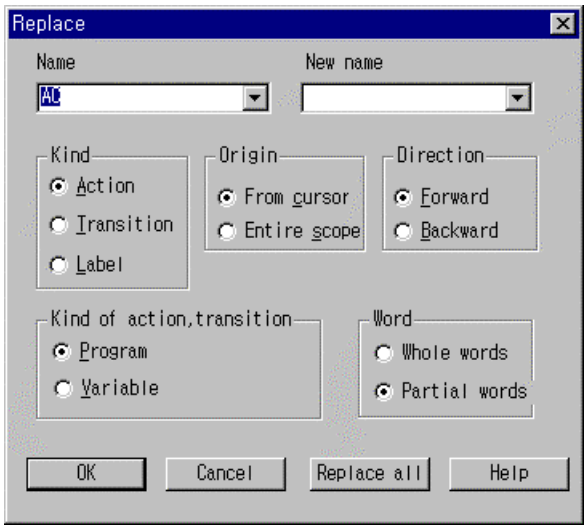
5.7.14. Replace

□ Select ***Edit-Replace*** ().

□ In ***Name*** edit box of ***Replace*** dialog box, enter the character that you want to find.

□ Enter the new character in ***New Name*** edit box of ***Replace*** dialog box,

□ Select options in the same way as Find function and click ***OK*** button.



5.7.15. Again

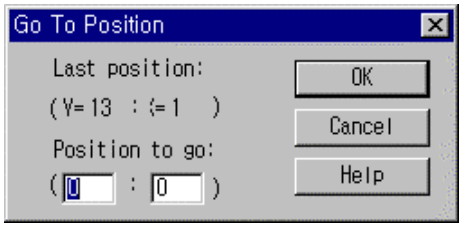
If you executed Find/Replace function before, executes the function again with the condition that designated before.

□ Select ***Edit – Again (Ctrl+F3,***  ***).***

5.7.16. Goto

□ Select ***Edit - Goto***.

□ In ***Go to Position*** dialog box, enter the Y(vertical),X(horizontal) coordinates that you want to go.

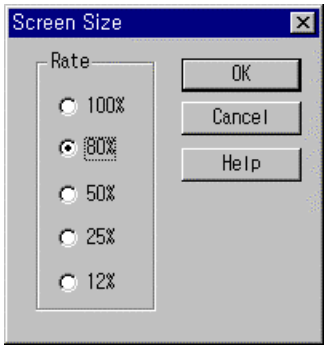


5.7.17. Condense Screen

To adjust the screen size,

□ Select ***Edit – Condense Screen***.

□ Select a desired screen size in ***Condense Screen*** dialog box and click ***OK*** button.

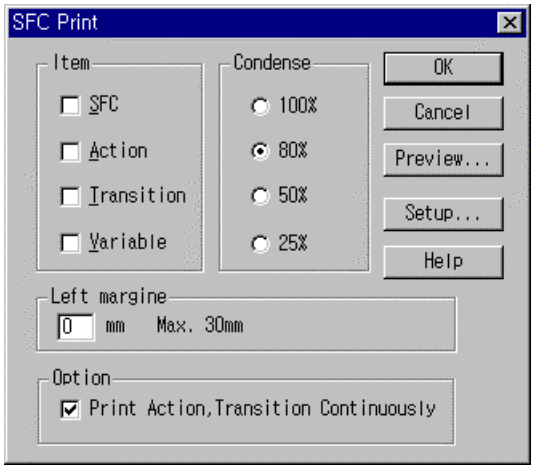


5.7.18. View Comment

If you click ***View comment*** button to see the comments that you edited in the program.

5.7.19. Print

□ Select ***Project-Print*** in the pull-down menu.



□ Setup the conditions to print in SFC program.

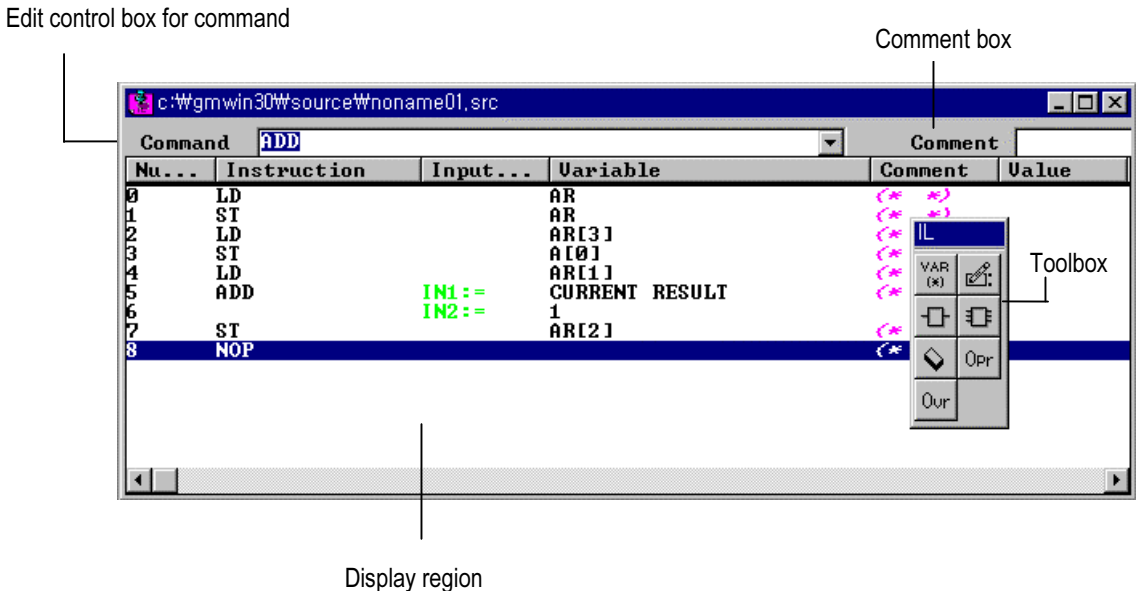
□ To preview the program, select Preview button.

□ Close ***Preview*** screen and click ***OK*** button to print.

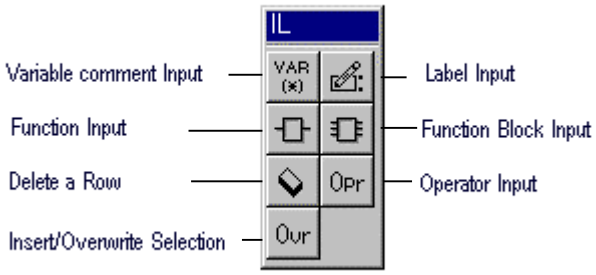
5.8. Edit IL

IL is a language that consists of instructions, whose elements are operators, functions, function block and label. The input of an instruction and a variable is accomplished in edit control box for command and the input of a comment is accomplished in a comment input box.
A blank separates instruction from variable and in case of several variables, they are separated by ','.

Example) ADD A, B, 2

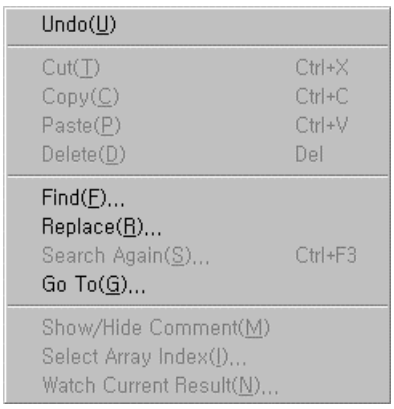


Toolbox for IL



	Function Input	Select a function to input
	Function Block Input	Select a function block to input
	Label Input	Input a label
Opr	Operator Input	Select an operator to input
	Delete a Row	Delete a present row
—(*) —(*)	Row Comment Input	Input a row comment
VAR (*)	Variable Comment Input	Input a variable comment
Ins	Insert Mode	Change into insert mode
Ovr	Overwrite Mode	Change into overwrite mode

The below picture is the menu that is displayed with clicking the right button of the mouse in IL. You can execute each command simply using this menu.



5.8.1. Operator Input

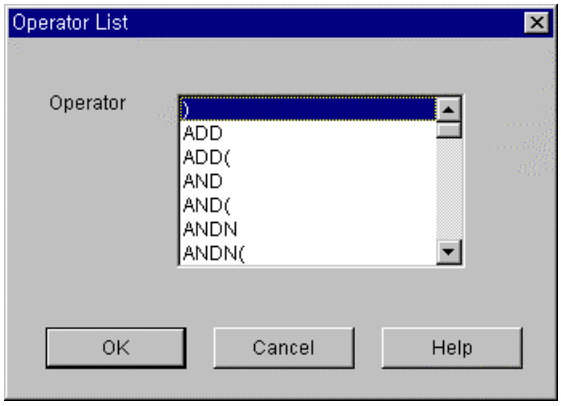
End indicates the end of the main program and the program after ***End*** is a subroutine program.
If there is not ***End***, the whole program is the main program.
You can use ***SCAL, SCALC, SCALN*** for calling a subroutine and ***RET, RETC, RETN*** for return from a subroutine. The name created in ***SCAL(C,N)*** must not be in front of ***End***.
If ***JMP(C, N)*** is in front/rear of ***End***, the appropriate label is in front/rear of ***End***. Although ***RET(C,N)*** is not in the rear of ***End,*** the last is regarded as the return from a subroutine.



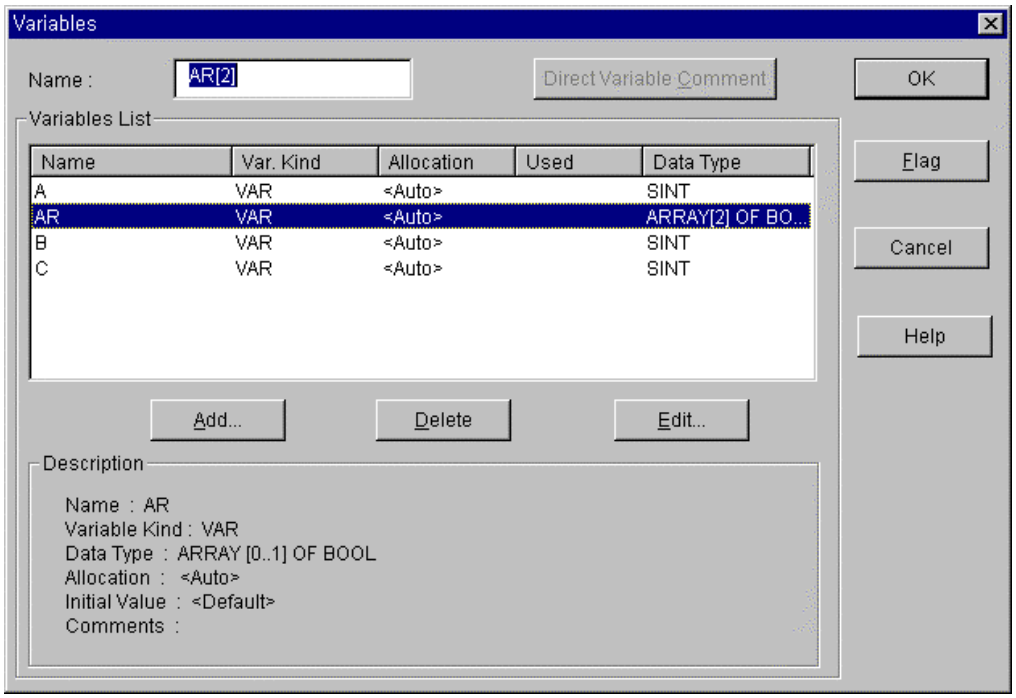
To insert the operator,

□ Click (

) in toolbox.



□ Select the operator in ***Operator List*** dialog box.



□ Enter the variable name in ***Name*** edit box of ***Variables*** dialog box.

□ Click ***OK*** button.

Note

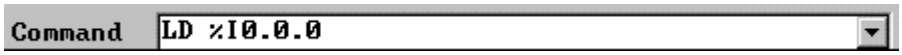
If you want to enter the already declared variable as a variable, select the variable in list box of ***Variable*** dialog box.



method 1

□ Move the cursor in program region to the position in where you want to insert an operator.

□ Input an operator and object in ***Command*** edit box.



□ Press ***Enter*** key.

method 2

□ Move the cursor in the display region which you want to insert an operator.

□ Select ***Toolbox - Operator***.

□ Select an operator in ***Operator List*** dialog box.

□ Enter the variable name in ***Name*** edit box of ***Variables*** dialog box.

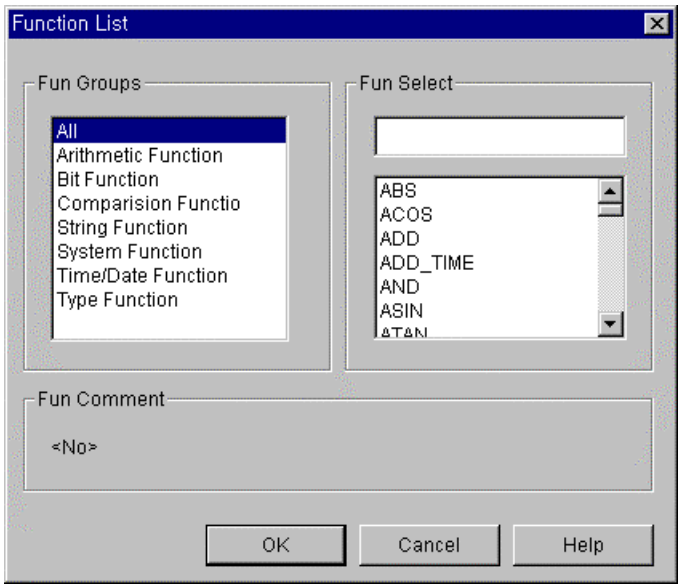
□ Press ***Enter*** key.

5.8.2. Function Input



□ To insert the Function in IL,

□ Click () in toolbox.



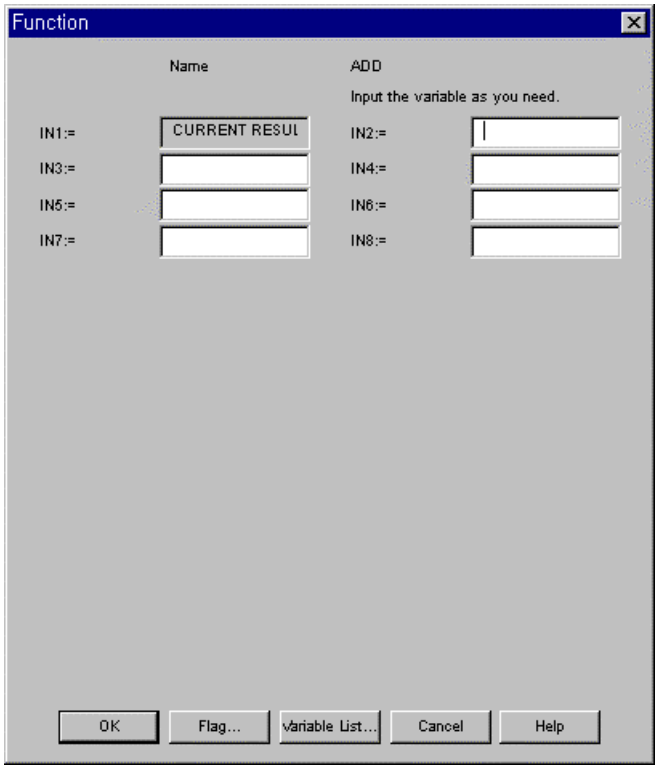
□ Select the function in ***Function List*** dialog box.

□ Enter the variables as many as you want in edit box of ***Function List*** dialog box.

□ Click ***OK*** button.

Note

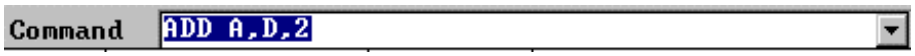
If you want to use the already declared variables as the variable, click Variable list button of ***Function*** dialog box and select the variable in the list box of ***Variables*** dialog box.



method 1

□ Move the cursor in the display region which you want to insert a function.

□ Enter the function and variable in ***Command*** edit box.



□ Press an ***Enter*** key.

method 2

□ Move the cursor in the display region which you want to insert a function.

□ Select ***Toolbox - Function***.

□ Select the function that you want to insert in ***Function List*** dialog box.

□ Enter the variables for the function in ***Function*** dialog box.

□ Press ***OK*** button.

Note

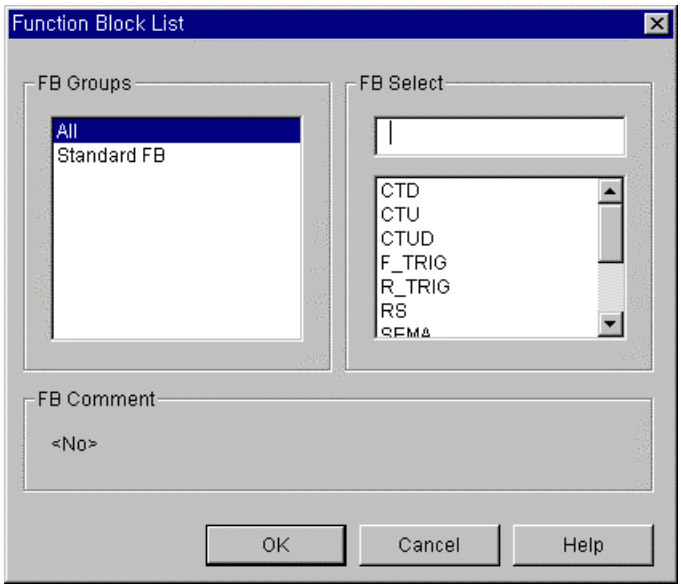
I case of extensible function (refer to GMWIN commands for the detail information), the number of input for the variable is not designated.

5.8.3. Function Block Input

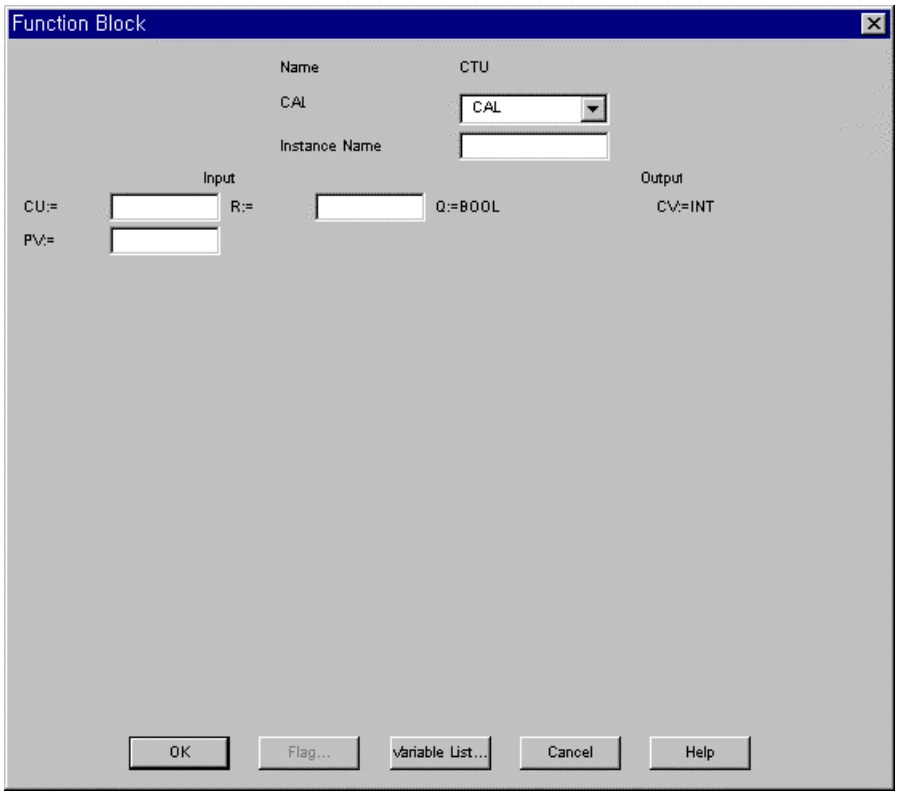


□ To insert the Function Block,

□ Click () in toolbox.



□ After selecting a function block to use in ***Function Block List*** dialog box, click ***OK*** button.



□ Input an instance name in ***Instance Name*** edit box.

□ Click ***OK*** button.

Note

If you want to insert the already declared variable for a new variable, click Variable list button of ***Function Block*** dialog box and select the variable in list box of ***Variables*** dialog box.



method 1

□ Move the cursor in the display region which you want to insert a function block.

□ Enter CAL/CALC/CALN in ***Command*** edit box.



□ Select the function block in ***Function Block List*** dialog box.

□ Enter the instance name and variables in ***Function Block*** dialog box.

□ Press ***Enter*** key.

method 2

□ Move the cursor in the display region which you want to insert a function block.

□ Select ***Toolbox - Function Block***.

□ Select the function block in ***Function Block List*** dialog box.

□ Enter the instance name and variables in ***Function Block*** dialog box.

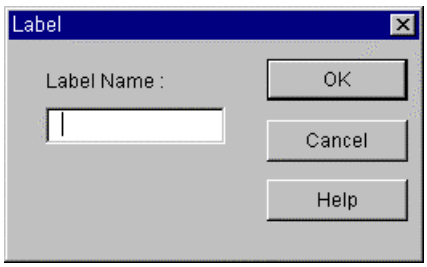
□ Press ***Enter*** key.

5.8.4. Label Input



□ To input the Label,

□ Click () in toolbox.



□ Enter the label name (maximum size is 8 characters) in ***Label*** dialog box.
□ Click ***OK*** button.



method 1
□ Move the cursor in the display region which you want to insert a label.
□ Enter the label name and '**:**' in ***Command*** edit box.

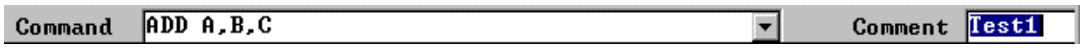


□ Press ***Enter*** key.

method 2
□ Move the cursor in the display region which you want to insert a label.
□ Select ***Toolbox - Label***.
□ Enter the label name in ***Label*** dialog box.
□ Click ***OK*** button.

5.8.5. Comment Input

Comment is created in ***Comment*** edit box in IL program screen. You can insert a line comment and variable comment separately by the comment display of toolbox. You can edit directly the comment in ***Comment*** edit box.





□ Move the cursor in the display region which you want to insert a comment.
□ Make a comment (maximum size is 24 characters) in ***Comment*** edit box.



□ Move the cursor in the display region which you want to insert a comment.
□ Select ***Toolbox – Variable Comment (Line Comment)***.
□ Enter the comment in ***Comment*** edit box.

5.8.6. Change an Inset/Overwrite Mode of Program

To change into Insert Mode,



□ Click () in toolbox.



□ Select ***Toolbox - Insert***

To change into Overwrite Mode,



□ Click () in toolbox.



□ Select ***Toolbox - Overwrite***

5.8.7. Delete a Program



□ Move the cursor in the display region which you want to delete.

□ Click () in toolbox.



□ Move the cursor in the display region which you want to delete.

□ Select ***Toolbox - Delete***.

5.8.8. Edit a Block

Before editing a block, you must setup the range to be applied as a block.
Namely, if you want to copy or delete a continuous program, you must designate a desired range as a block before selecting Edit Block Function.



- Move the mouse to the row of the display range to select.
- Drag the mouse to the last row of the range to select with clicking the left button.



- Move the cursor to the row of the display range to select.
- With pressing ***Shift*** key, move the cursor with arrow key to the last row of the range to select.

5.8.8.1 Cut

After selecting a block,

- Select ***Edit-Cut (Ctrl+X,***  ***)***.

5.8.8.2 Copy

After selecting a block,

- Select ***Edit-Copy (Ctrl+C,***  ***)***.

5.8.8.3 Paste

After copying or cutting,

- Move the cursor in the display region which you want to paste.
- Select ***Edit-Paste (Ctrl+V,***  ***)***.

5.8.8.4 Delete

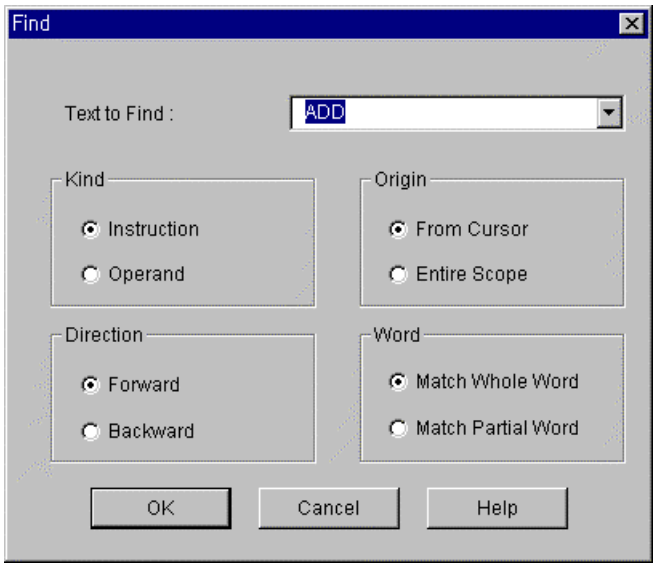
After selecting a block,

- Select ***Edit – Delete (Delete,***  ***)***.

5.8.9. Find

To find an instruction or variable in the program on editing,

□ Select ***Edit-Find*** ().



□ In ***Text to Find*** edit box of ***Find*** dialog box, enter the string that you want to find.

□ Select the following option and click ***OK*** button.

1) Kind

Select the string type to find.

2) Origin

Select the range where Find function is executed.

From cursor : Find from the current cursor position.

Entire scope : Find through the whole program.

3) Direction

Select the direction that Find function is executed.

Forward : Find function is executed forward.

Backward : Find function is executed backward.

4) Word

Select an accordance degree in finding a word.

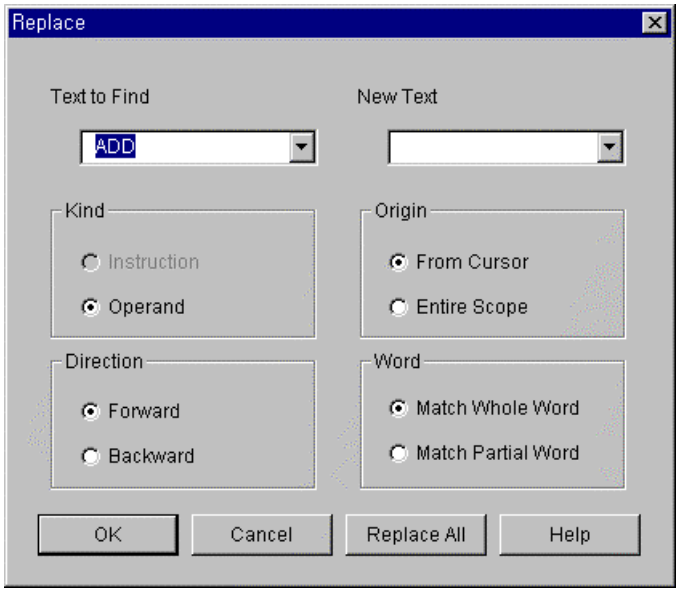
Match Whole Word : Find only an exact same word.

Match Partial Word : Find also a partial same word.

5.8.10. Replace

To replace a variable with a desired variable in the program on editing,

□ Select ***Edit – Replace*** ( ).



□ In ***Text to Find*** edit box of ***Replace*** dialog box, enter the string that you want to find.

□ In ***New Text*** edit box, enter the new string.

□ Select options in the same way as Find function and click ***OK*** button.

□ Click ***Replace All*** button to replace all string at once.

Note
You can replace the string only for a variable.

5.8.11. Again

If you executed Find/Replace command before, execute the command again with condition that designated before.

□ Select ***Edit – Again (Ctrl+F3,).***

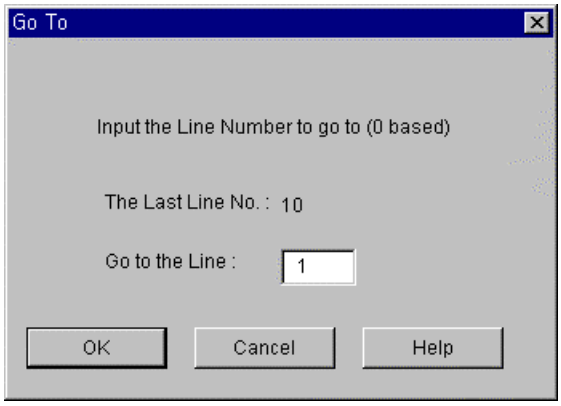
5.8.12. Go to

This function allows you to find the desired line in the program.

□ Select ***Edit - Goto***.

□ In ***Goto*** dialog box, enter the line number that you want to find.

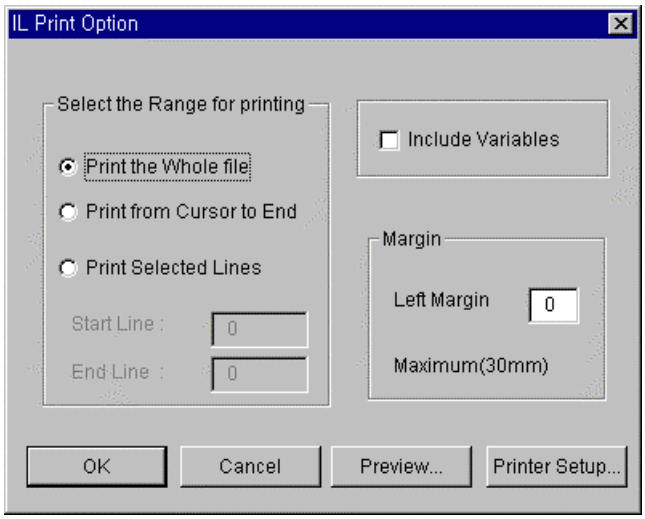
□ Click ***OK*** button.



5.8.13. Print

If you click a ***Preview*** button before printing a program, the outline of content is printed on the screen.

□ Select ***Project - Print***.



□ Select the Range for printing in IL ***Print Option*** dialog box.

Print the Whole file : Print the whole program.

Print from Cursor to End : Print from a cursor to the end

Print selected lines : Print from start line to end line

□ To print variables, select ***Include Variables*** check box.

□ Setup the margin to print in ***Margin*** edit box.

Chapter 6 Compile a Program

6.1. Make 6-1
6.2. Compile 6-2
6.3. Build All 6-3
6.4. Message 6-3
6.5. Memory Reference 6-3

Chapter 6. Compile a Program

To create an execution file,

1) Compile the Program that belongs to a project.

Compile the program that is defined as a program instance in a project.

At this time, the compiler verifies for errors in a program. If error do not exist, it creates an object file.

2) Create an execution file

It links all object files used, which have been created by the compiler.

At this time, the linker verifies for errors on Global Variable, Function, Function block, and creates one execution file.

Execution file name : Project file name**.BN0**

.

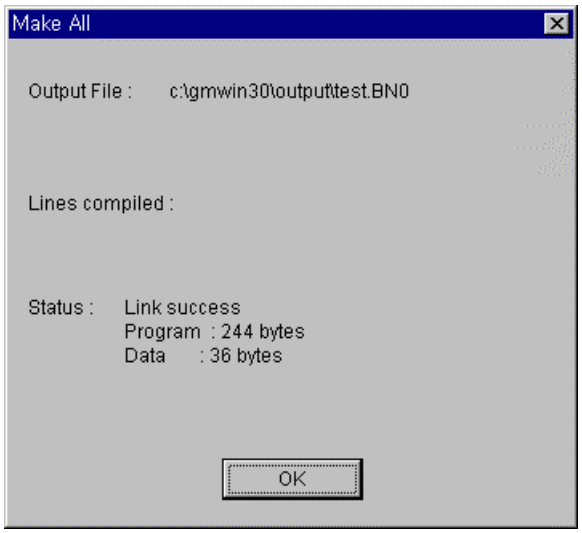
6.1. Make

It creates an execution file after compiling only those programs, which have changed and need compiling, in the project.

□ Select ***Compile - Make*** () in the pull-down menu.

If an error occurs, the error message is displayed in ***Make*** dialog box and execution file is not created.

□ Click ***OK*** button in ***Make*** dialog box.

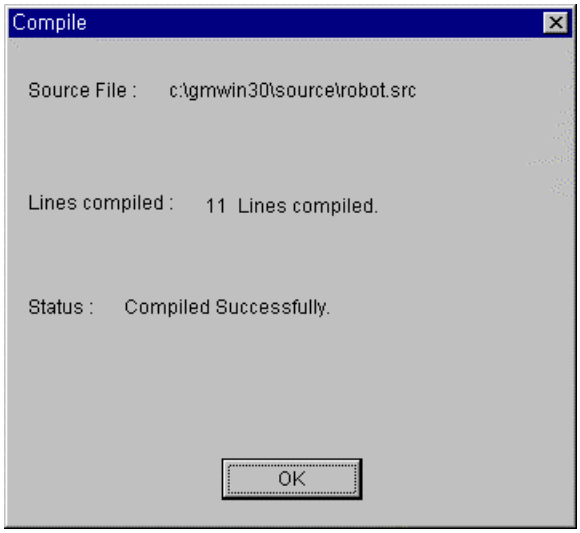


6.2. Compile

It compiles only the currently active program, and creates an object file.

□ Select ***Compile - Compile*** () in the pull-down menu.
If an error occurs, the error message is displayed in ***Compile*** dialog box and object file is not created.

□ Click ***OK*** button in ***Compile*** dialog box.



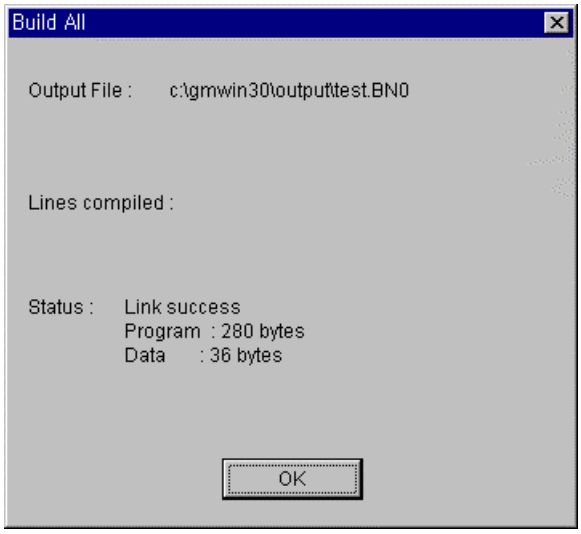
Note

Only compiling a program cannot make an execution file.

6.3. Build All

It creates PLC execution file after compiling all programs in the project.

□ Select ***Compile - Build All*** in the pull-down menu.
If an error occurs, the error message is displayed in ***Build All*** dialog box and execution file is not created.
□ Click ***OK*** button in ***Build All*** dialog box.



6.4. Message

It shows an error or warning message in the process of Compiling, Make and Build All.
If you double-click the message, it helps you to move directly to the occurred place of error/warning.

□ When an error or warning occurs in the process of Compile, Make and Build All,
message window appears automatically and it shows the type and occurred place of error/warning by list.
□ If you double-click the each list item, the cursor moves to the occurred place of error/warning.
□ If you select ***Compile – Message…*** in menu, you can repeatedly see the previous message after closing the message window.

6.5. Memory Reference

It allows you to see the global variable and direct variable at the program in project.

□ Select ***Compile – Memory Reference*** in the pull-down menu.

Chapter 7 Online

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7.2. Disconnect 7-1
7.3. Read from PLC 7-1
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Chapter 7. Online

To connect GMWIN to PLC, you must setup a connection option.
(Refer to 'Chapter 1.1.2. How to Connect GMWIN to PLC' for detail description)
After setting the option for connection, you must set a PLC key on REM (Remote Stop) mode to connect with GMWIN.
If you connect GMWIN to PLC in proper order, you can do the following functions. (reading from PLC, writing to PLC, monitoring, debugging, change a PLC mode, erase PLC data area, set the use of link parameter, PLC information, I/O information, Forced I/O setup, Enable Forced I/O, Set a PLC password, etc.).

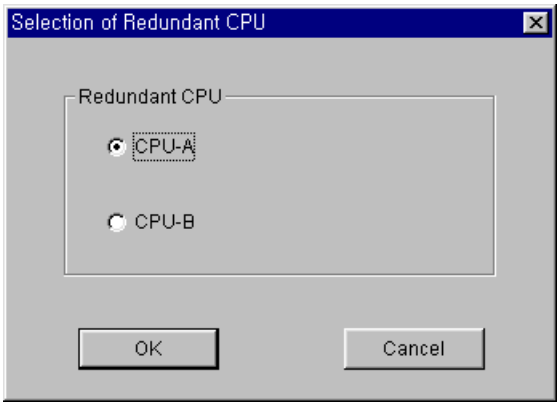
7.1. Connect

7.1.1.Connect+Write+Run+Monitor On ( )

It is a macro command that executes a program at one time.
To execute the communication with PLC automatically, select this menu.
This function can download the project created in GMWIN to PLC, make PLC Run and monitor the project at one time.
Prior to perform this menu, confirm the switch in CPU module of the PLC is at REM(Remote Stop) mode.

7.1.2. Connect ( )

□ Select ***Online - Connect*** in the pull-down menu .
In case of redundancy, select the CPU to connect.

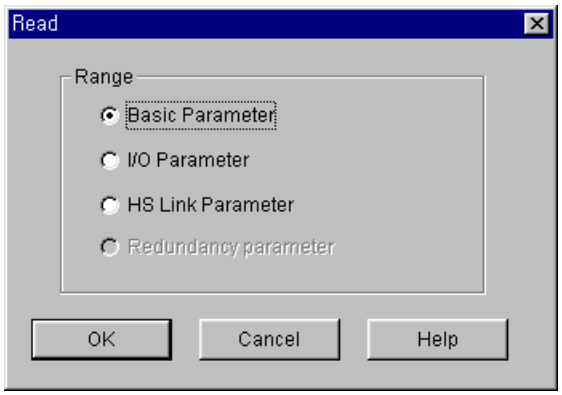


7.2. Disconnect ( )

You can disconnect GMWIN with PLC.
□ Select **Online - Disconnect** in the pull-down menu.

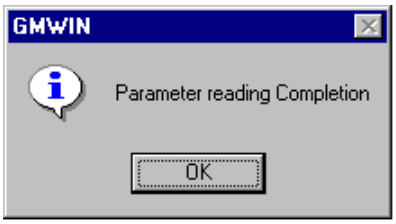
7.3. Read from PLC

You can read PLC parameters in GMWIN after connecting with PLC.
□ Select **Online - Read** in menu.



- Basic Parameter : Read only a basic parameter from PLC.
- I/O Parameter : Read only an I/O parameter from PLC.
- HS Link Parameter : Read only an express link parameter from PLC.
- Redundancy Parameter : Read only a redundancy parameter. (In only case of redundancy, it is activated)

□ In ***Read*** dialog box, select the memory area of parameter to read and click ***OK*** button.



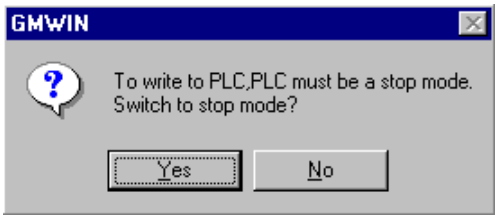
7.4. Write to PLC

This function is used for writing a parameter and program of GMWIN to PLC after the connection with PLC.

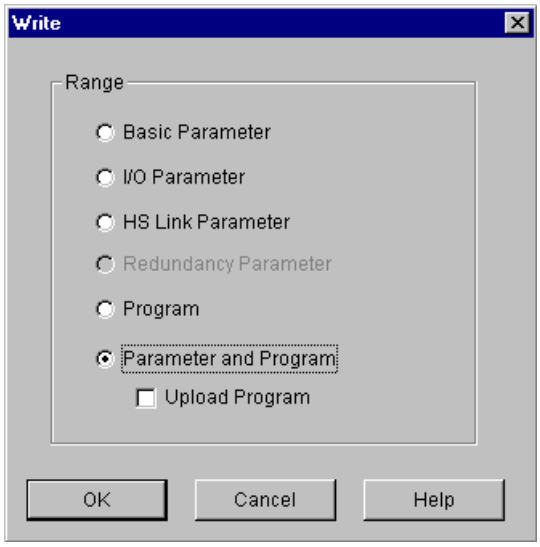
In GM1 and Resource is more than two, when you write a parameter and program to PLC, select the appropriate resource.

□ Select ***Online - Write*** in the pull-down menu.

□ If the state of PLC is ***Run***, then following dialog box will appear.



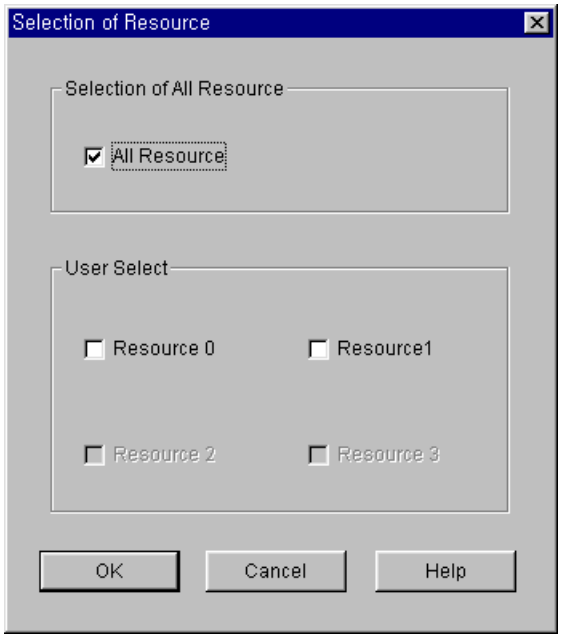
□ Click ***YES*** button



- Basic Parameter : Read only a basic parameter from PLC.
- I/O Parameter : Read only an I/O parameter from PLC.
- HS Link Parameter : Read only an express link parameter from PLC.
- Redundancy Parameter : Read only a redundancy parameter from PLC.
- Program : Read only a program from PLC.
- Parameter and Program : Read a parameter and program from PLC.
  - Upload Program : Read a program from PLC.

□ Select the memory area to write to PLC and click ***OK*** button.

□ When you use a ***GM1 Multi CPU***, select a resource in ***Selection of Resource*** dialog box and click ***OK*** button.



7.5. Change PLC Mode

To change PLC mode,

Run Mode

□ Select ***Online - Mode Change - Run*** in menu.

Stop Mode

□ Select ***Online - Mode Change - Stop*** in menu.

Pause Mode

□ Select ***Online - Mode Change - Pause*** in menu.

Debug Mode

□ Select ***Online - Mode Change - Debug*** in menu.

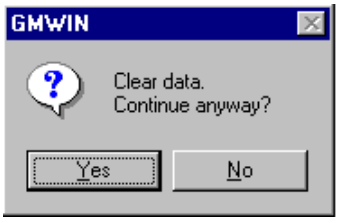
Master Change

□ Select ***Online - Mode Change - Master Change*** in menu.

(When you use GM1 Redundancy PLC, this function changes a master CPU.)

7.6. Clear PLC Data

□ Select ***Online - Data Clear*** in menu.

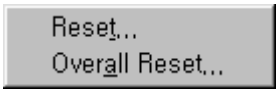


□ Click ***Yes*** button.

7.7. PLC Reset

7.7.1. Reset

□ Select ***Online - Reset*** in menu.



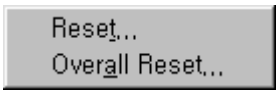
□ Select ***Reset*** in menu.



□ Click ***Yes*** button.

7.7.2. Overall Reset

□ Select ***Online - Reset*** in menu.



□ Select ***Overall Reset*** in menu.



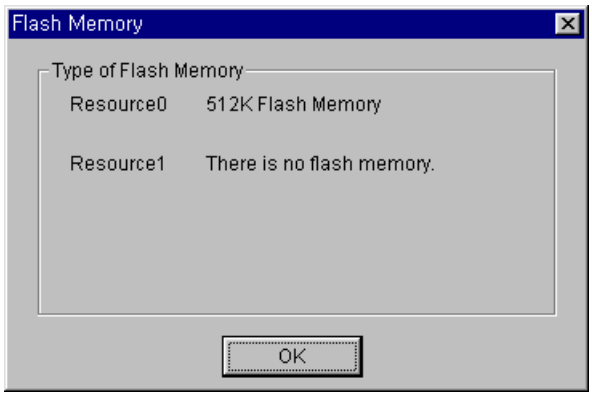
□ Click ***Yes*** button.

7.8. Flash Memory

This function is used for confirming a flash memory type mounted on CPU module or transferring a program in data RAM of PLC to flash memory.



□ Select ***Online - Flash Memory - Flash Memory Type*** in menu.

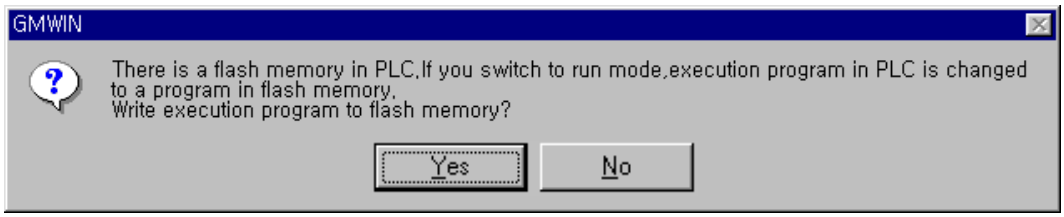


□ Select ***Online - Flash Memory - Flash Memory Write*** in menu.



□ Click ***Yes*** button.

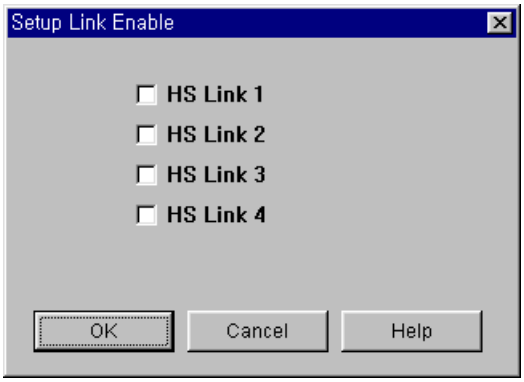
In the state that flash memory is mounted on CPU module, if you execute ***Online – Write*** menu, the following dialog box appears when GMWIN finishes writing a program.



□ Click ***Yes*** button and you can write the current program to memory module directly.

7.9. Setup Link Enable

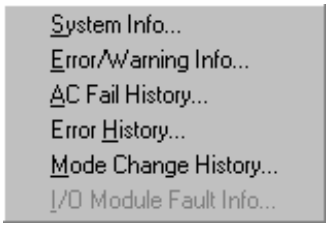
This allows you to designate the block for the link parameter use.



- Select ***Online – Setup Link Enable*** in menu.
- Click ***OK*** button after selecting the HS Link.

7.10. PLC Information

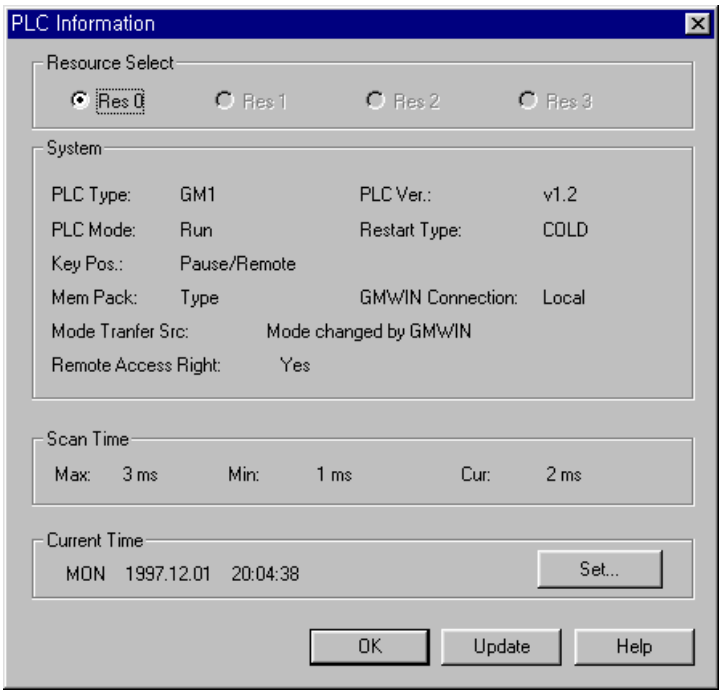
It is the function that indicates various information for PLC system.



7.10.1. System Information

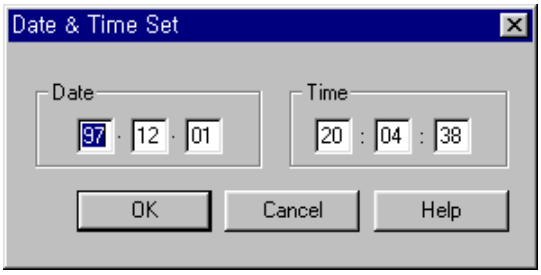
It is the function that indicates the current state of PLC system.
You can see system information, scan time, current time and error status.
You can also setup current time.

□ Select ***Online - PLC Information - System Info…*** in the pull-down menu.



If you want to setup or edit current time,

□ Select ***Set…*** button of current time in ***PLC Information*** dialog box



□ Setup Date and Time in ***Date-Time Set*** dialog box.

7.10.2. Error/Warning Information

When the following error occurs, you can confirm the detail information about an error.

□ In case that I/O parameters are different from practically mounted modules.

□ In case that module configurations are changed in Run mode.

□ In case that the fuse of module is blown.

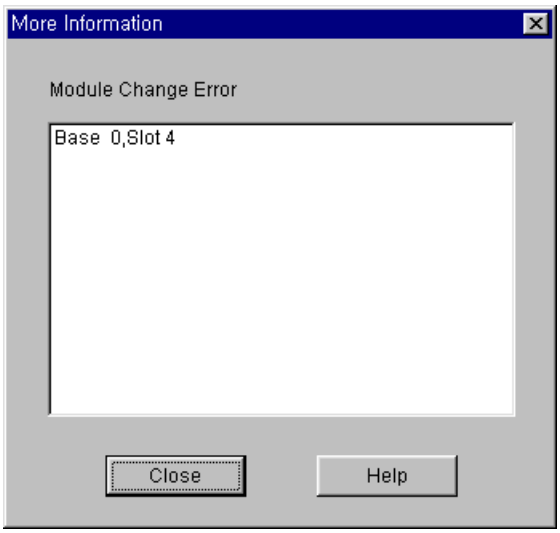
□ In case that GMWIN cannot normally read or write program or parameter in I/O module.

□ In case that normal interface is impossible in special or communication module.

□ In case that the position of error slot is incorrect or there is a trouble in peripheral device.

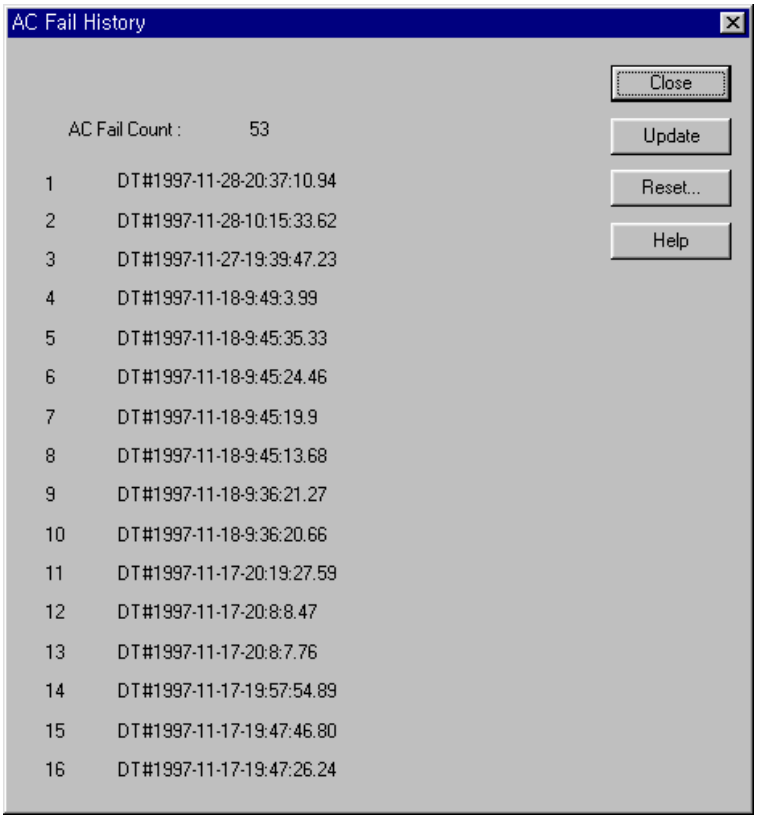
□ In case that there is a collision between tasks.

□ Select ***Online - PLC Information – Error/Warning Information***.
□ Click ***More*** button.



7.10.3. AC Fail History

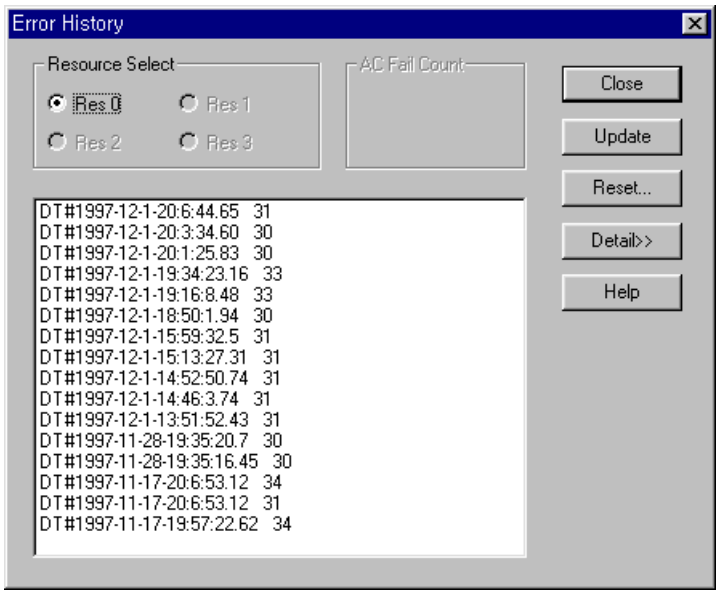
□ Select ***Online - PLC Information – AC Fail History*** in the pull down menu.



7.10.4. Error History

Error history shows the history of errors that has occurred in PLC.

□ Select ***Online - PLC Information - Error History*** in the pull-down menu.

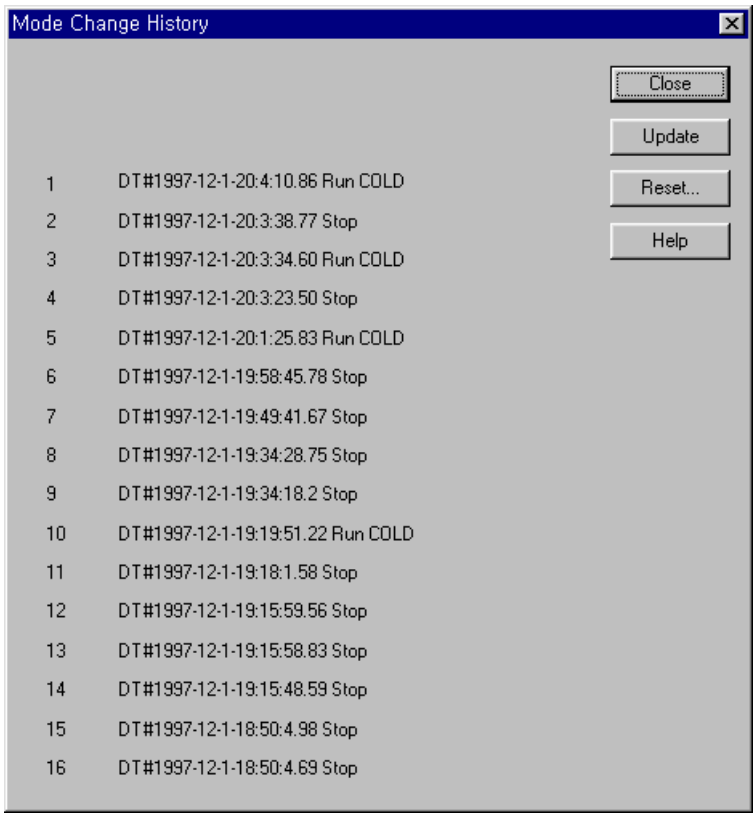


If you want to see detail information about the history of occurred error, select the item to see the detail information in list box and click ***Detail*** button.

7.10.5. Mode Change History

This shows the history that has changed PLC mode.

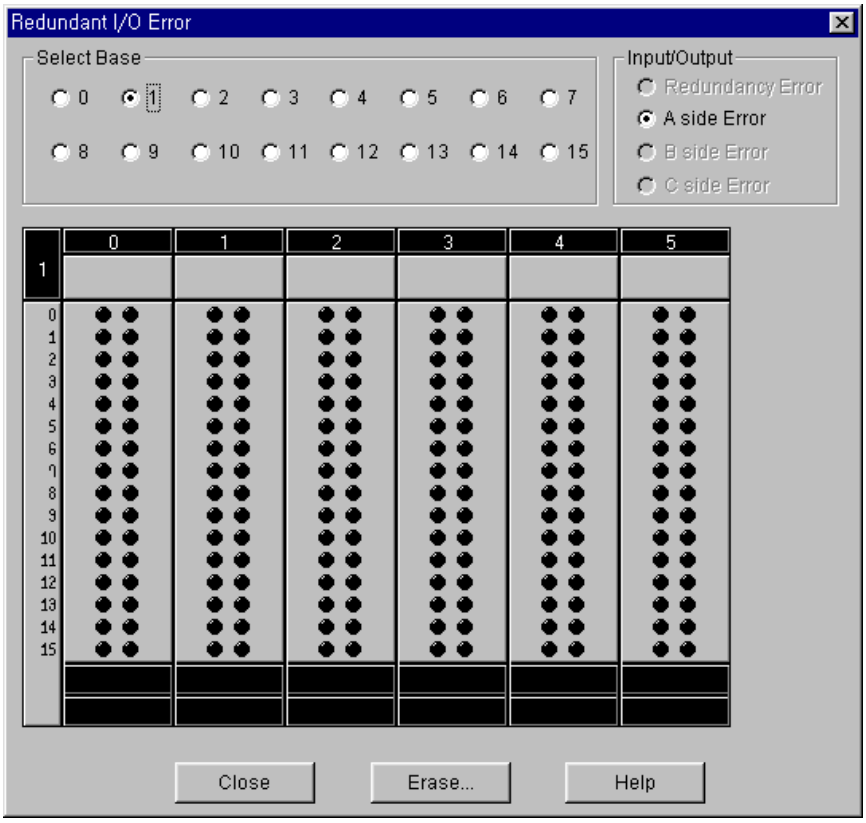
□ Select ***Online - PLC Information - Mode Change History*** in the pull-down menu.



7.10.6. I/O Module Fault Information

This shows information about the fault of input/output contacts in redundant system.

□ Select ***Online - PLC Information –I/O Module Fault Info*** in the pull-down menu.



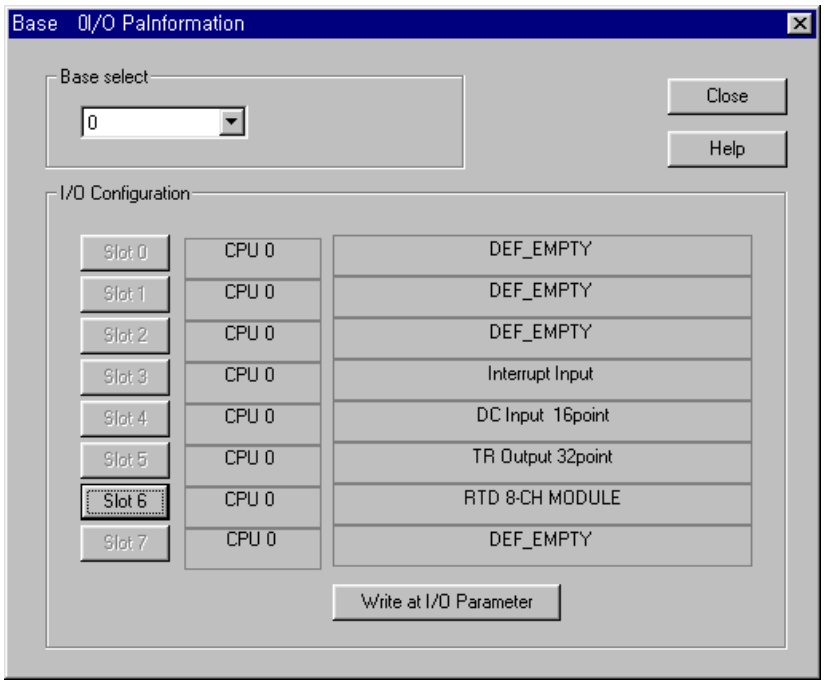
□ If you want to erase the detail information about error, click ***Erase...*** button.

When PLC is connected as a master, you can erase a redundancy error and C side error. And when PLC is connected to each CPU, you can erase A side terror and B side error.

7.11. I/O information

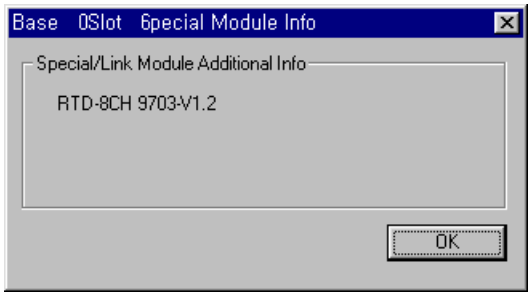
This shows the configuration of I/O modules in PLC system.

□ Select ***Online - I/O Information*** in the pull-down menu.



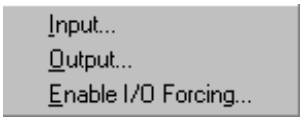
□ Select the base number in ***Base Select*** list box.

□ If you select the slot number in ***I/O Configuration*** dialog box, you can read the information of special module.

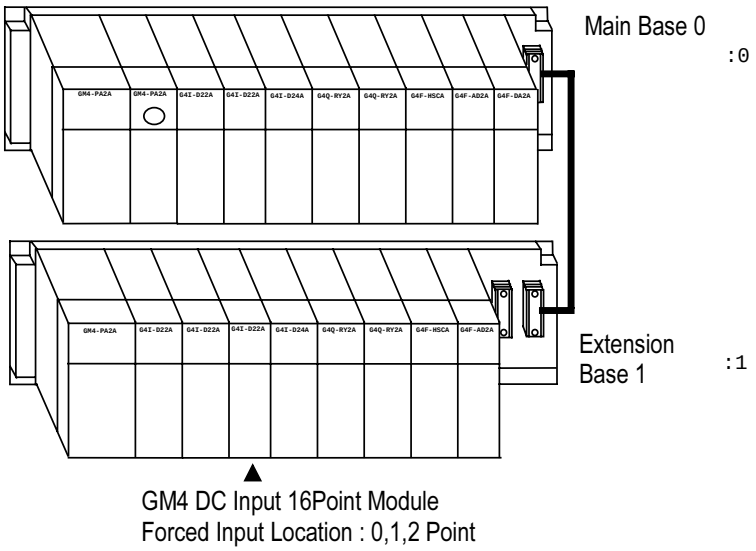


7.12. Forced I/O Setup

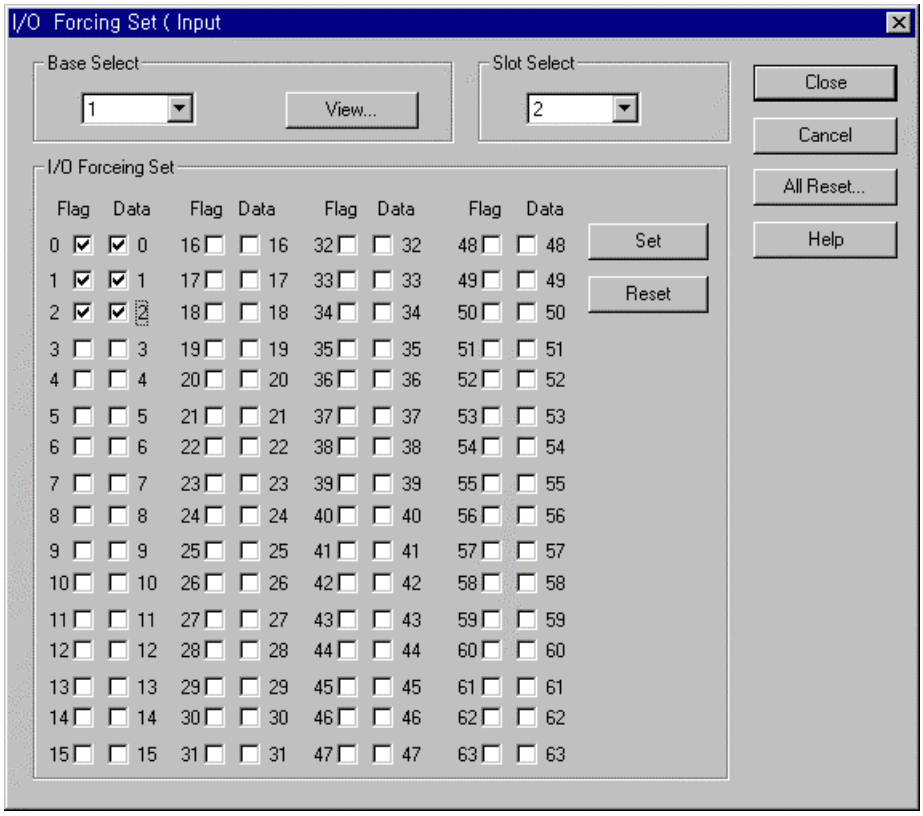
This is a function that sets up forced input/output of refresh area in PLC.
It is different from Forced writing of variable in program.



In the following PLC system, how to setup Forced Input of the part marked with (▲) is as below.



□Select ***Online - I/O Forcing- Input*** in the pull-down menu.

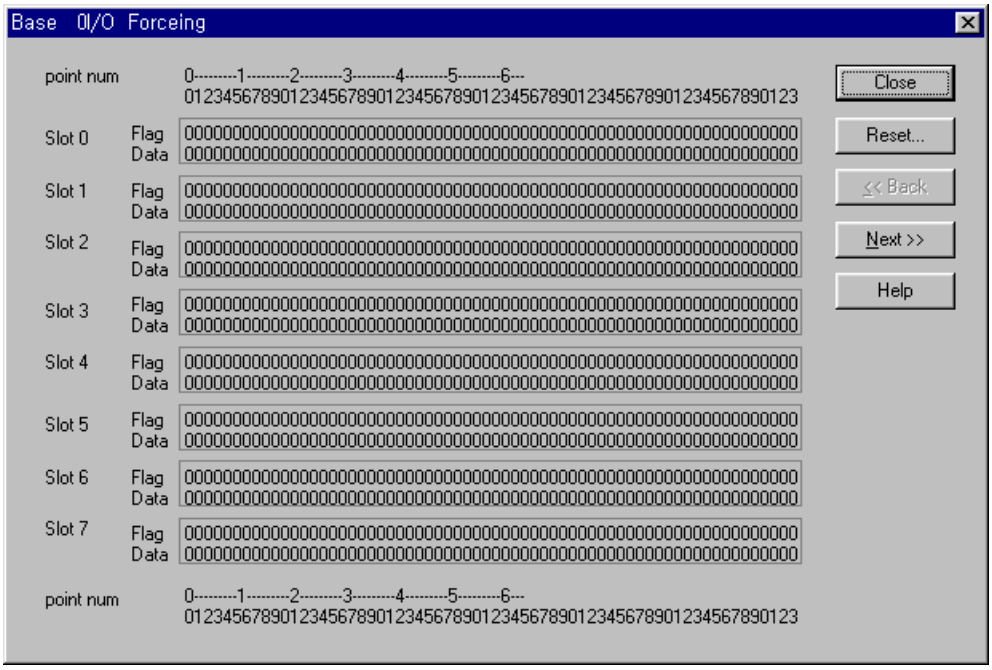


□ Input Base Select : 1, Slot Select : 2 in dialog box.

□ Setup the forced data and flag(0 □ 2) in I/O forcing set of dialog box.

□ Click ***Close*** button.

□ If you click ***View*** button in dialog box, you can see the content of forced I/O setup.



Forced Output setup is same as the Forced Input setup.

□ Select ***Online - I/O Forcing- Output*** in the pull-down menu.
□ Select a base and slot in dialog box.
□ Setup the forced data and flag in I/O Forcing set of dialog box.
□ Click ***Close*** button.

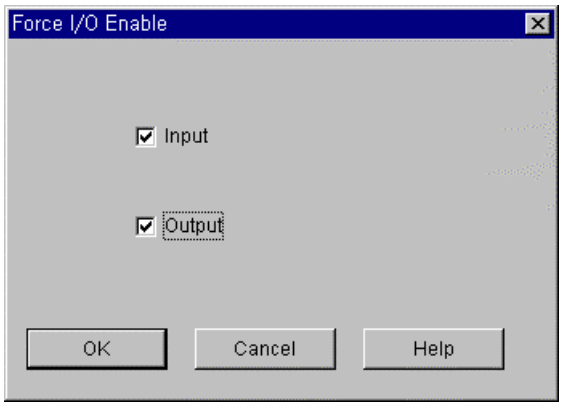
Note

To input/output the data that you setup, you should setup Enable I/O Forcing in section 7.13.

7.13. Enable I/O Forcing

It allows you to enable the execution of Forced input/output.

□ Select ***Online – I/O Forcing – Enable I/O Forcing*** in the pull-down menu.

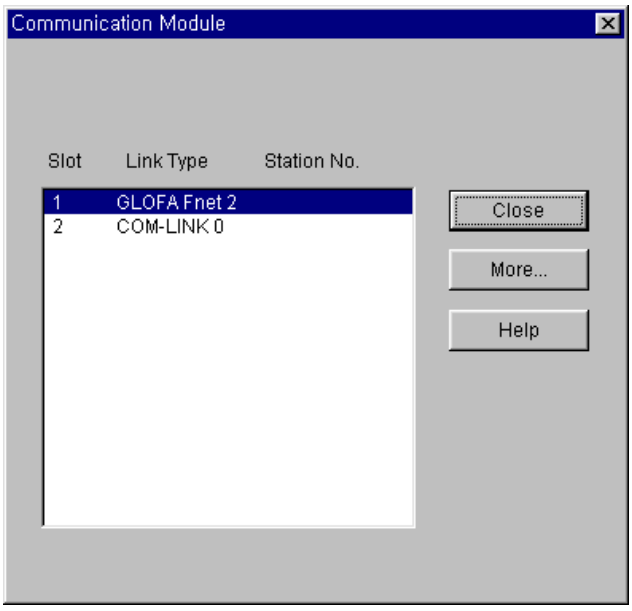


□ Select the area for Forced I//O in ***Enable I/O Forcing*** dialog box and click ***OK*** button.

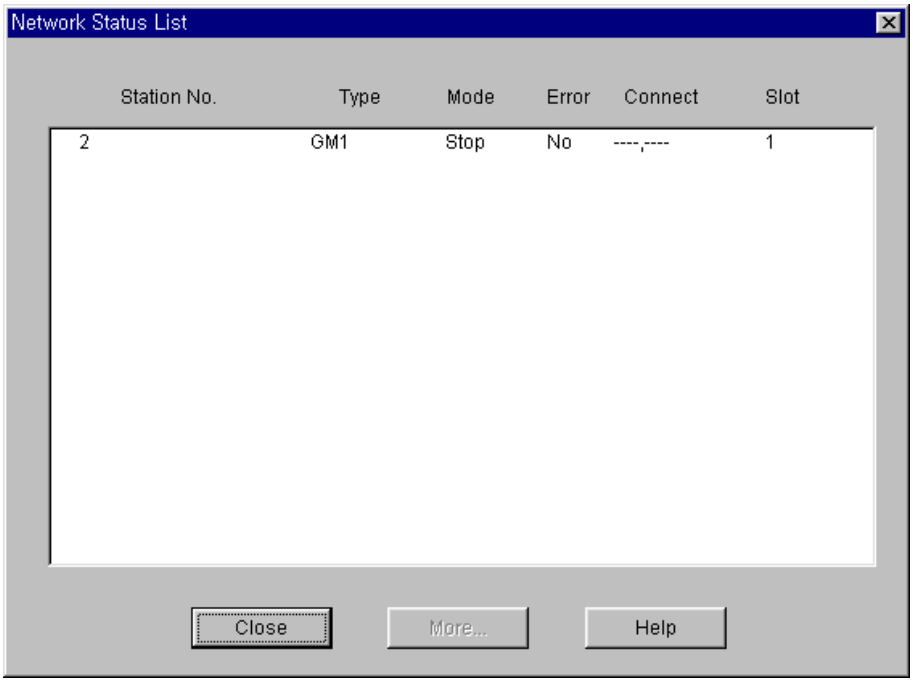
7.14. Link Information

This function shows the station number, type, PLC mode, error, and slot number of communication module mounted on PLC.

□ Select ***Online – Link Information*** in the pull-down menu.



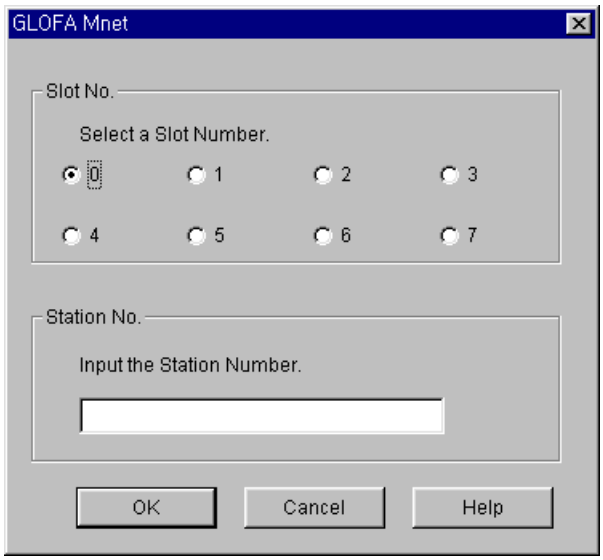
□ Click ***More…*** button for the detail information in ***Communication Module*** dialog box.



7.15. Mnet Parameter

It allows you to setup the parameter of Mnet (Mini-MAP) communication module in PLC.

□ select ***Online - Mnet Parameter*** in the pull-down menu.

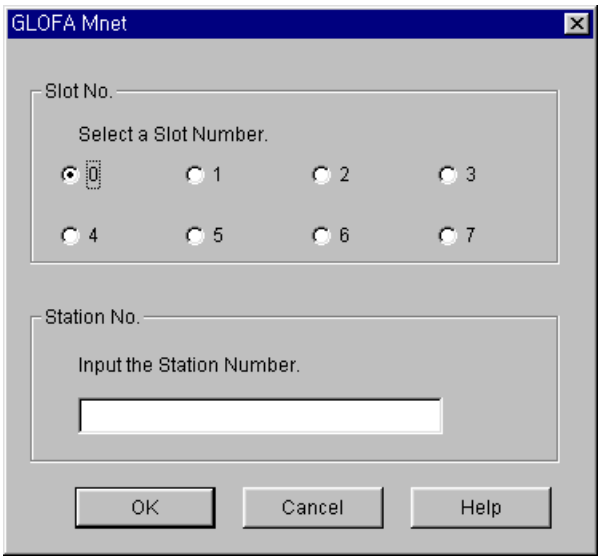


□ Setup ***Slot No***. and ***Station No***. in ***GLOFA Mnet*** dialog box.

7.16. Mnet Information

This function indicates modem's status of Mnet (Mini-MAP) communication module in PLC.

□ Select ***Online – Mnet Information*** in the pull-down menu.



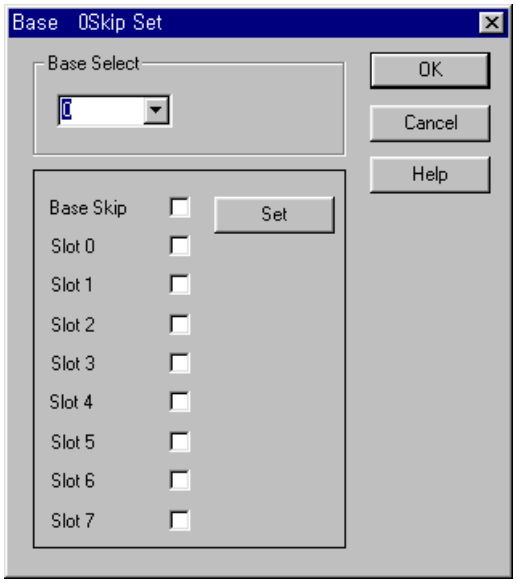
□ Setup ***Slot No***. and ***Station No***. in ***GLOFA Mnet*** dialog box.

7.17. I/O Skip

This function is used for excluding the designated module or base in Run mode.
The designated module or base stops the function for the update or error check at the moment of the designation in Run mode. This function is only selectable in the condition of connection for GM1.

To setup the I/O Skip,

□ Select ***Online - I/O Skip*** in the pull-down menu.



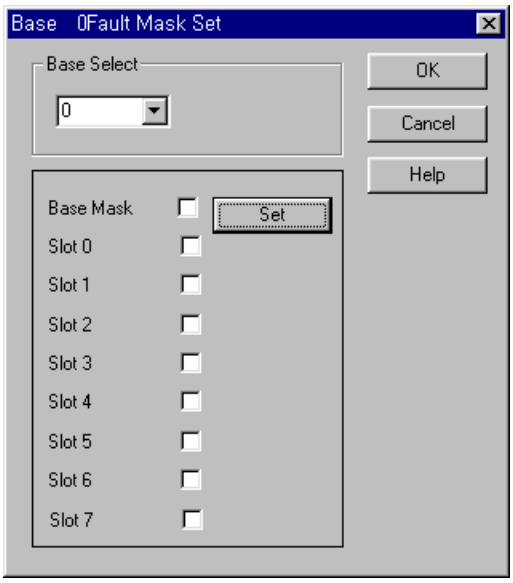
□ Setup a base number to skip the I/O in ***Base Skip Set*** dialog box.
□ Setup a slot number in ***Base Skip Set*** dialog box and click ***OK*** button.

7.18. Fault Mask

Fault Mask is used for continuous execution of the program even though error is occurred in the designated module or base of the PLC system in Run mode.
The module or base executes the update or error check before the error is occurred.
This function is only selectable in the condition of connection for GM1.

To setup Fault Mask,

□ Select ***Online - Fault Mask*** in the pull-down menu.



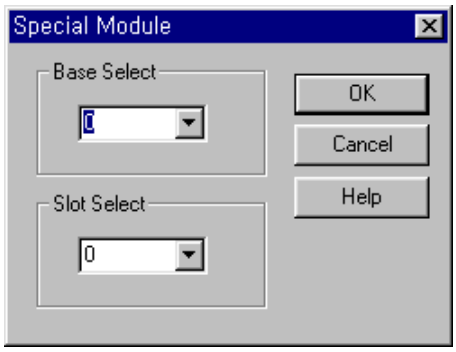
□ Setup the base number to mask in ***Base Fault Mask*** dialog box in menu.
□ Setup the slot number in ***Base Fault Mask*** dialog box and click ***OK*** button.

7.19. Initialize Special Modules

It allows you to initialize a special module in PLC.

To initialize a special module,

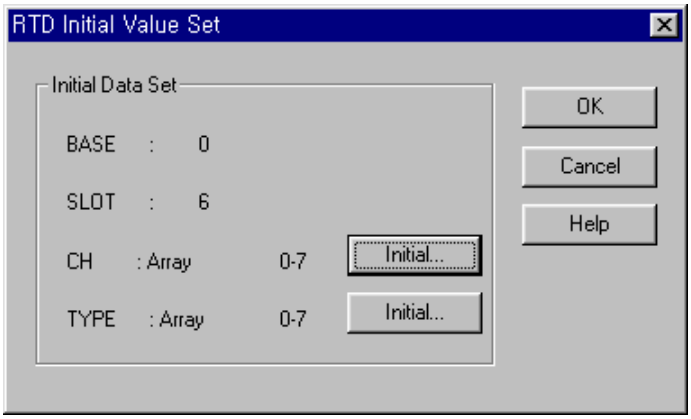
□ Select ***Online – Initialize Special Modules*** in the pull-down menu.



□ In ***Special Module*** dialog box, select the slot number and base which has a special module to initialize.
□ Click ***OK*** button.
□ If you setup the wrong number, the error message box appears on the screen as below.



□ After selecting the number correctly, click ***OK*** button.
□ Select the parameter to initialize in ***Initial Value Set*** dialog box.



- Then ***Array Initialization*** dialog box appears and the designated value is outputted to the selected parameter.
- In ***Array Initialization*** dialog box, after selecting the item that you want to change, double-click the item or click ***Edit*** button
- Change the value to initialize in ***Array Initialization*** dialog box and click ***OK*** button.

Chapter 8 Monitoring

8.1. Monitor a Program....8-1
8.2. Monitor a Variable....8-7
8.3. I/O Monitoring....8-13
8.4. Monitor a Link Parameter....8-15
8.5. Monitor a Time Chart....8-16

Chapter 8. Monitoring

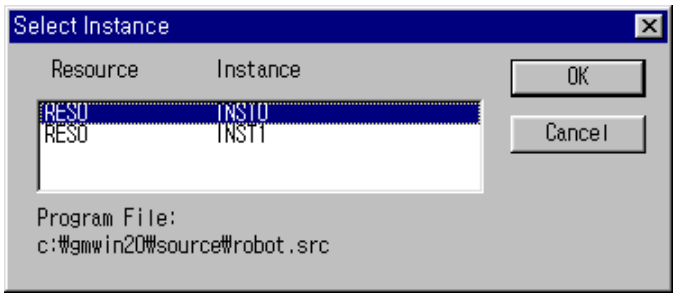
1) Program Monitoring
2) I/O Monitoring
3) Variable Monitoring
4) Time Chart Monitoring
5) Link Parameter Monitoring

8.1 Monitor a Program

To monitor the operation of PLC in Run mode,

- Select ***Online - Connect*** in the pull down menu.
- Select ***Monitor – Monitor On*** in menu.

If there is more than 2 defined instances in a program, ***Select Instant*** dialog box appears.



- Select an instance in the list box of ***Select Instance*** dialog box, and click ***OK*** button.

Note

To monitor in GMWIN, the program in the current window must be exactly same with a transferred program in PLC.
If you monitor the program edited after downloading to PLC, monitored data of the program may be operated differently with the real one in the current window.
So, if you edit the program after downloading to PLC, you must execute monitoring after creating an execution file again in ***Compile-Make*** menu.

8.1.1. Monitor LD

LD Monitoring basically has two functions. One is that showing the variable status, and the other is that setting or getting ON/OFF the variable value by force.

8.1.1.1. Monitor a Variable

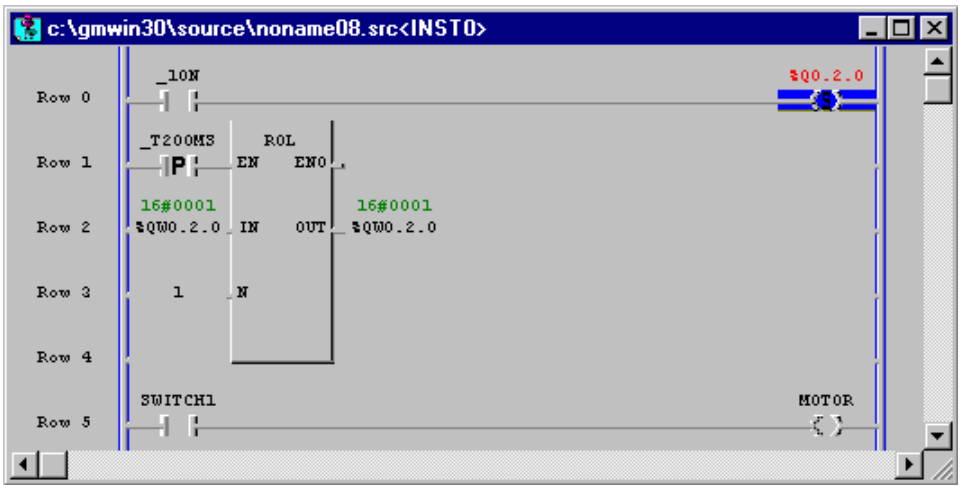
1) Monitor a Contact or Coil variable

You can see the ON/OFF status of variable by the change of color(black ↔ red) of the appropriate variable name, because the variable of contact or coil is ***BOOL*** type in Ladder Diagram.

If the color of the variable name turns to be red, the variable means ***On*** status, and ***Off*** status for black one.

2) Monitor I/O Variable for the Function or Function Block

I/O variable for the Function or Function Block is displayed as a number or string on the line of the variable name.



8.1.1.2. Forced Variable

This function allows you to turn the variable of contact or coil ON/OFF and set the variable for the function or function block as a desired value forcibly..

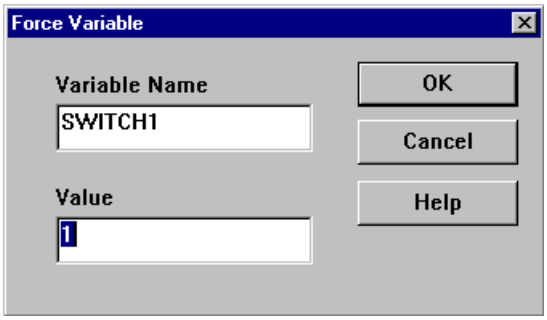


□ In LD Program, move the mouse to the variable that you want to set and double-click the left button of the mouse. Then ***Force Variable*** dialog box appears.

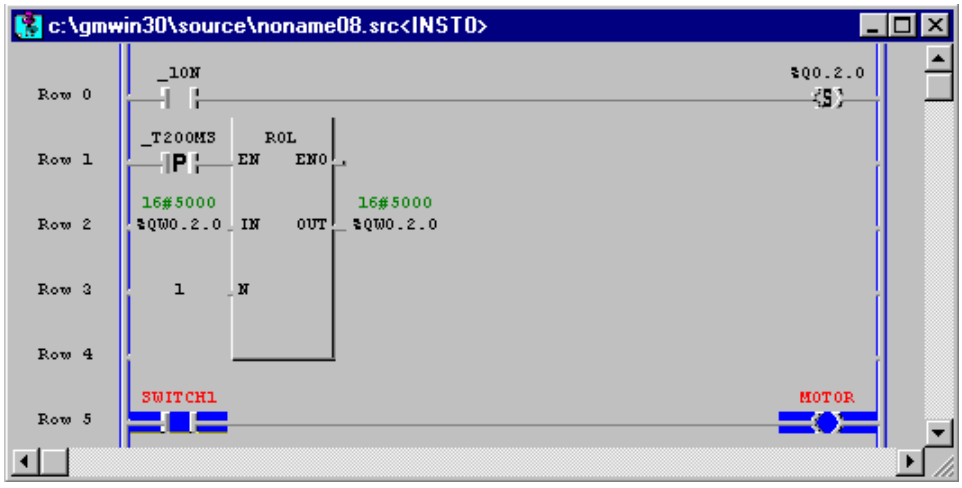


□ In LD Program, move the cursor to the variable that you want to set.

□ Press ***Enter.***



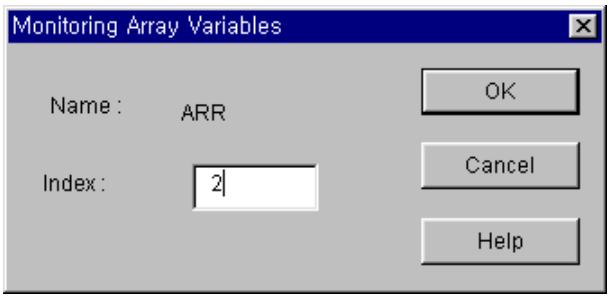
□ Input '0'(Off) in the Value box of ***Force Variable*** dialog box and click ***OK*** button.



8.1.1.3. Monitor Array Variable

When a program monitoring starts, array variable basically monitors the first elements of array.
If array variable name is ***ARR***, this variable is displayed as ***ARR(0)*** and monitors the first element of array.

□ Move the cursor on the array variable that you want to monitor.
□ Select the ***Toolbox - Select Array Subscript***.



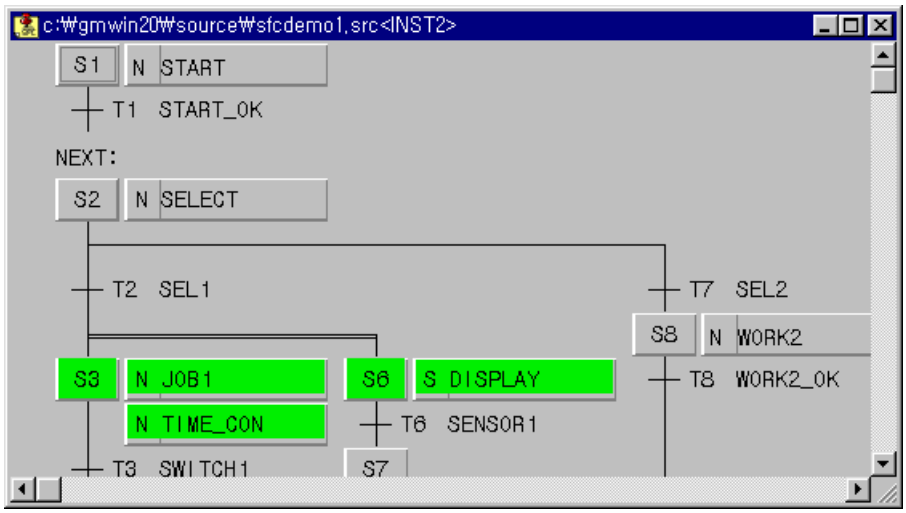
□ In ***Monitoring Array Variables*** dialog box, enter the index of element that you want to monitor
□ Click ***OK*** button.

You can also monitor an array variable with hot key without using ***Monitoring Array Variables*** dialog box.

□ Move the cursor to the array variable.
□ Increase the element index with pressing ***Ctrl-*** or decrease with pressing ***Ctrl-_***.

8.1.2. Monitor SFC

It allows you to know about the flow of SFC program with display of an active step and action.
If you select the ***SFC Auto Scroll*** in ***Option*** menu, SFC window automatically scrolls along the active step.



To monitor an action and transition program,



□ Move the mouse on the action or transition, and double-click the left button of the mouse.



□ Move the cursor on the action or transition, and select the ***Toolbox - Zoom*** in menu.

8.1.3. Monitor IL

It monitors only the program in a project. It is impossible to edit the program during monitoring.
Monitoring data is shown at the position of program value. You can see
the monitoring data in a desired place by adjusting the column of display region.
During the monitoring, you can hide the comment by clicking ***Toolbox - Comment Show/Hide*** menu.

8.1.3.1. Monitor a Variable

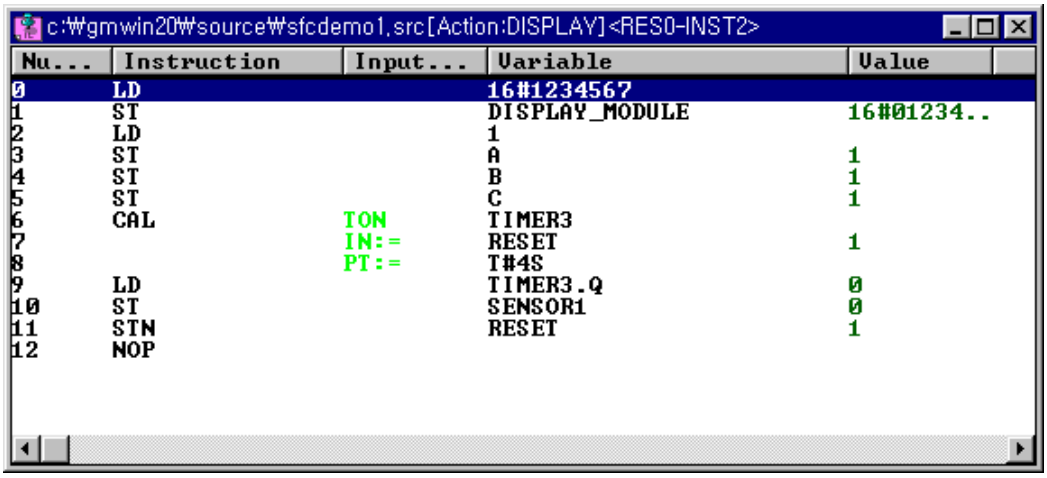
The variable declared as an array is monitored with assigned as initial index '0'.

□ If you want to change the index, move the cursor on a desired line.

□ Select ***Toolbox - Select Array Index (I)…*** in the pull-down menu

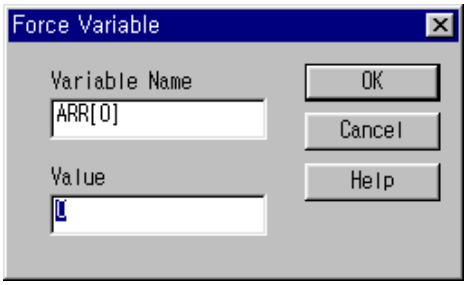
□ Assign the index of array element.

□ Click ***OK*** button, or hit the Ctrl-¯, Ctrl-_.



8.1.3.2. Forced Variable

□ Double-click the line of variable that you want to write.



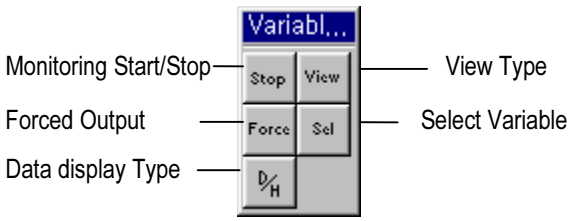
□ Enter the value of variable in the ***Force Variable*** dialog box.

□ Click ***OK*** button.

8.2. Monitor a Variable

You can monitor a variable declared in a program, global variable, I, Q, M area, system flag and etc.

Toolbox for Variable monitoring



To monitor the program initially,

□ To call the ***Select Variable*** dialog box, select ***Online - Monitor – Monitor On*** in menu.

□ select ***Online – Monitor - Variable Monitor*** in menu.

To monitor the program,

□ To call the ***Select Variable*** dialog box, select ***Online - Monitor - Variable Monitor*** in menu

Note

If GMWIN is not connected to PLC, select ***Connect*** in menu before selecting the above menu.
Before monitoring the program, you must download the project file for the execution.

□ In the ***Register Variable*** dialog box, select the variable that you want to monitor.
Refer to the following section for selecting variable.

8.2.1. Register Variable

To select the variable declared in program, global variable, I, Q, M area, system flag and etc. at the same time,



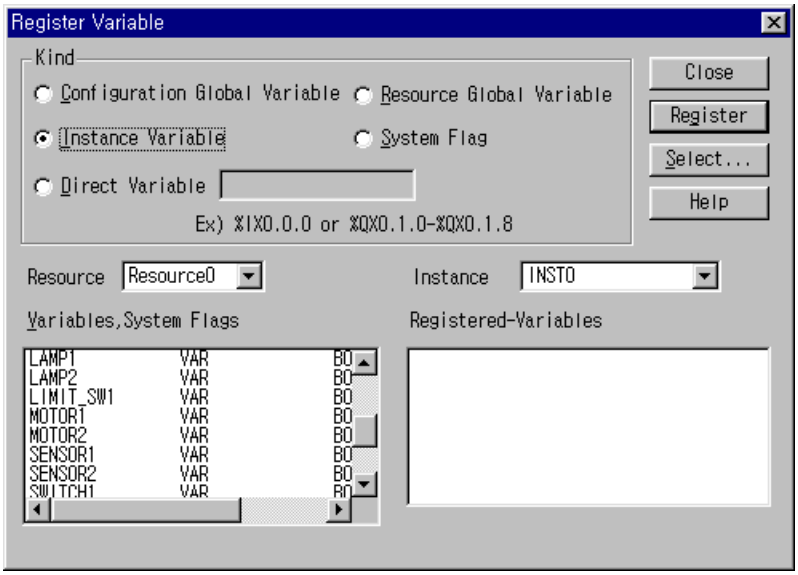
□ Click () in toolbox.

□ Select a variable to monitor in accordance with the ***Register Variable*** dialog box.



□ Select the ***Toolbox – Select (F5)*** in menu.

□ Select a variable to monitor in accordance with the ***Register Variable*** dialog box.



8.2.1.1. Register Configuration Global Variable

(only available in GM1)

To register configuration global variable,

- Select the ***Configuration Global Variable*** in option button.
- Select the variables to monitor in the ***Variables, System Flags*** list box.
- Click ***Register*** button.

8.2.1.2. Register Resource Global Variable

To register resource global variable,

- Select the ***Resource Global Variable*** in option button.
- Select the variable to monitor in the ***Variables, System Flags*** list box.
- Click ***Register*** button.

8.2.1.3. Register Instance Variable

To register the variable declared in the designated program,

- Select the ***Instance Variable*** in option button.
- Select the instance in the ***Instance*** list.
- Select the variable to monitor in the ***Variables, System Flags*** list box.
- Click ***Register*** button.

8.2.1.4. Register Direct Variable

□ Select the ***Direct Variable*** in option button.
□ Enter the address of direct variable in the input text box.
□ Click ***Register*** button.

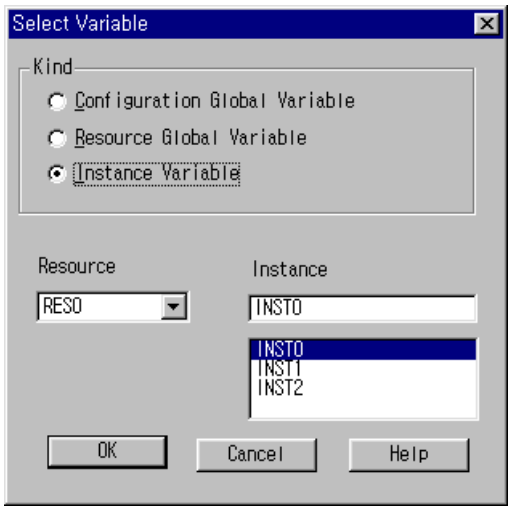
8.2.1.5. Register System Flag

□ Select the ***System Flag*** in option button.
□ Select the flag to monitor in the ***Variables, System Flags*** list box.
□ Click ***Register*** button.

Registered Variable will be displayed in ***Registered Variables*** list box.

8.2.1.6. All Select

It allows you to monitor one program or the entire global variable.
□ Click ***Select...*** button, and ***Select Variable*** dialog box appears.



1) Select Configuration Global Variable
To monitor only configuration global variable,
□ Select the ***Configuration Global Variable*** in option button, and click ***OK*** button.
2) Select Resource Global Variable
To monitor only resource global variable,
□ Select the ***Resource Global Variable*** in option button, and click ***OK*** button.
3) Select Instance Variable
To monitor only program instant variable,
□ Select the ***Instance Variable*** in option button, and click ***OK*** button.

8.2.2. Start Monitoring

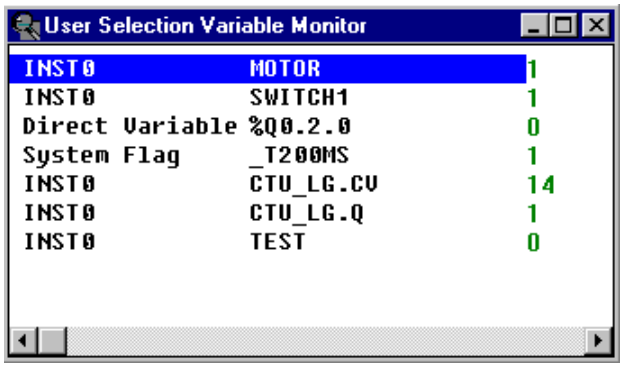


□ Click (

) in toolbox.



□ Select ***Toolbox – Start (F2)*** in menu.



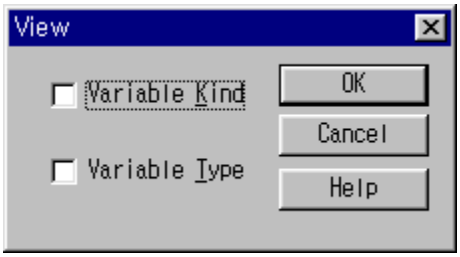
8.2.3. Set the View Type of Monitoring

It allows you to monitor the detail information of variable selectively.



□ Click (

) in toolbox.

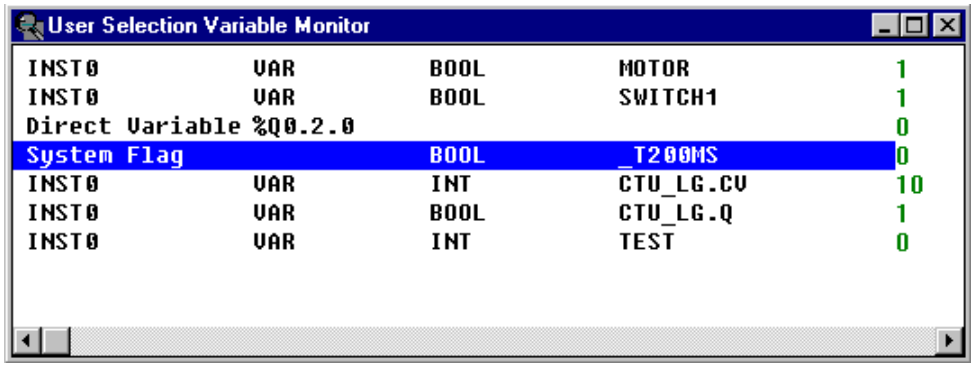


□ In the ***View*** dialog box, select the information that you want to display and click ***OK*** button.



□ Select ***Toolbox – View (F3)*** in the pull-down menu.

□ In the ***View*** dialog box, select the information that you want to display and click ***OK*** button.



8.2.4. Data Display Form

To display type of variable's value as decimal, hexadecimal or by the variable type,

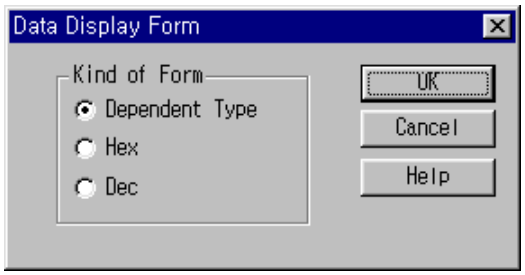


□ Click (

) in toolbox.



□ Select ***Toolbox – Hex (F6)*** in menu.



□ Select display type with ***Kind of Form*** option radio box.

□ Click ***OK*** button.

8.2.5. Forced Variable Output

To output the desired variable's value forcibly,

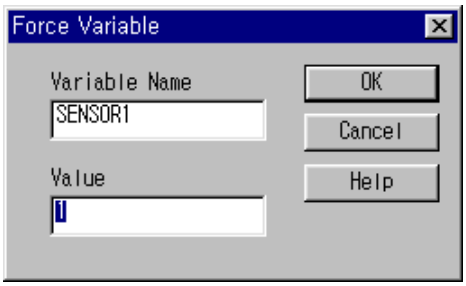


□ Click (

) in toolbox.

or

□ Move the mouse on the variable to change a value, and double-click the left button of the mouse, which calls the ***Force Variable*** dialog box.



□ Enter the variable's value in the ***Value*** input text box.
□ Click ***OK*** button.



□ Call the ***Force Variable*** dialog box.
□ Enter the variable's value in the ***Value*** input text box.
□ Click ***OK*** button.

If the type of a variable is a direct variable and Boolean type, forced I/O setting is available and you can prevent the value from being changed by program.

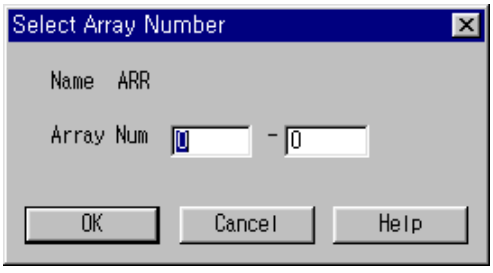
Note

Although you output a variable's value forcibly, it can be changed by program.

8.2.6. Monitor Array Variable

Select array range to monitor the variable of array type.
(Use ***Select*** menu in monitoring of variable selected by User)

□ To call the ***Select Array Number*** dialog box, move the cursor to Array Type Variable and select ***Toolbox – Array Number Select (F7)*** in menu.



□ Select the array range in the ***Select Array Number*** dialog box.

8.3. I/O Monitoring

It monitors I/O modules mounted on the PLC system. First assign the base to monitor, and the I/O cards mounted on the base are displayed.

And click (Start) button in toolbox, then the PLC system starts monitoring.
Start/Stop Monitoring button in toolbox is toggled each other.
Selected base number is displayed at the left upper corner, and at the bottom of each slot the value of monitoring data is displayed as decimal scale or hexadecimal by the display type to monitor.
If you click the each contact in the I/O module with mouse, each contact are toggled into On or Off.

Toolbox for I/O Monitoring (This toolbox appears after selecting ***I/O monitor*** in ***Online – Monitor*** menu)



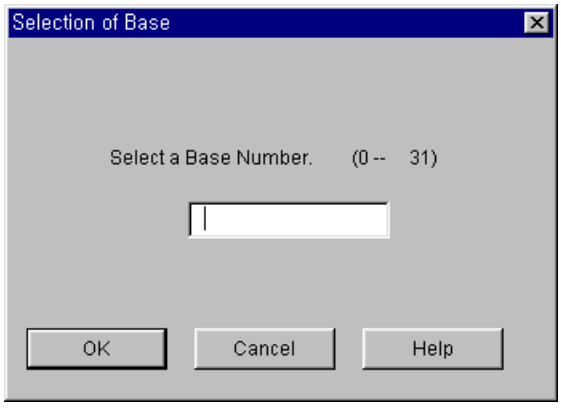
To monitor the program initially,
□ Select the ***Online - Monitor – Monitor on*** in menu, ***Online - Monitor - I/O Monitor*** in menu.

To monitor the program in monitoring mode,
□ Select ***Online - Monitor - I/O Monitor*** in menu.

To start I/O Monitoring in monitoring mode,



□ Call the ***Select Base*** dialog box by clicking (Sel!) button in toolbox.



□ Enter the base number to monitor in the ***Select Base*** dialog box and click ***OK*** button.

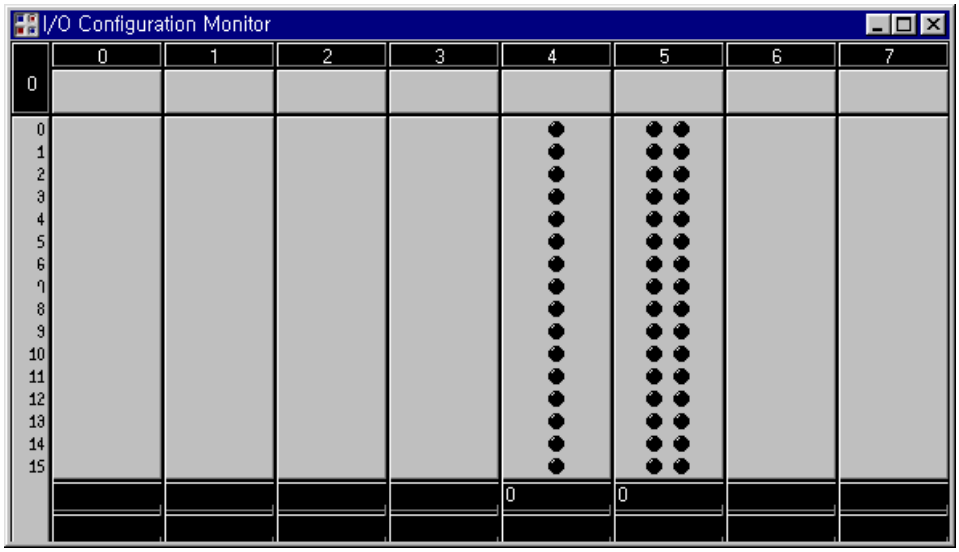
□ Click () in toolbox.



□ Call the ***Select Base*** dialog box by selecting ***Toolbox - Select Base (F2)*** in menu.

□ Enter the base number to monitor in the ***Select Base*** dialog box, and click ***OK*** button.

□ Select ***Toolbox - Start/Stop (F3)*** in menu.



To stop the I/O monitoring,



□ Click () in toolbox.



□ Select ***Toolbox - Start/Stop (F3)*** in menu.

8.4. Monitor a Link Parameter

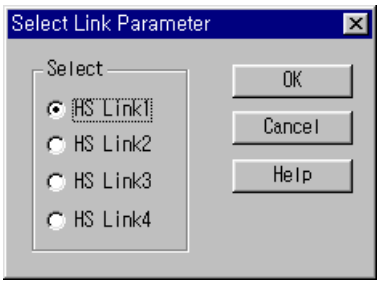
It allows you to monitor the status of link parameters, which is set by the parameter items in Project window.

To monitor the link parameter initially,

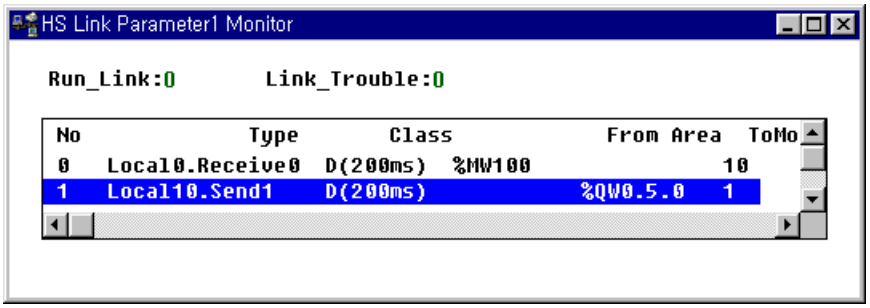
□ Select the ***Online - Monitor – Monitor on*** in menu, ***Online - Monitor - Link Parameter Monitor*** in menu.

To monitor the link parameter in monitoring mode,

□ Call the ***Select Link Parameter*** dialog box by selecting ***Online - Monitor - Link Parameter Monitor*** in menu.



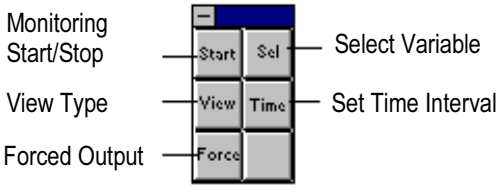
□ Select ***HS Link Parameter*** to monitor in the ***Select Link Parameter*** dialog box, and click ***OK*** button.



8.5. Monitor a Time Chart

It allows you to monitor ON/OFF status by time chart for anything that declared as Boolean type out of declared variables in the program, global variables, I, Q, M area and system flag.
If a variable to monitor is not Boolean type, you can monitor the variable in ***Variable Monitor*** menu.

Toolbox for Time Chart Monitoring



To monitor the program by time chart initially,
□ Select ***Online – Monitor – Monitor on*** in menu, ***Online - Start Monitor - Time Chart Monitor***.

To monitor the program by time chart in monitoring mode,
□ Select ***Online – Monitor – Time Chart*** in menu

Note

If GMWIN is not connected to PLC, setup the **connect option** in project menu and select **connect** in online menu before selecting the above menu.

□ Select a variable in the ***Select Variable*** dialog box.

8.5.1. Select a Variable

It is selected when you monitor the variable declared in a program, global variable, I, Q, M area, system flag and etc. at the same time.

To monitor a variable time chart,



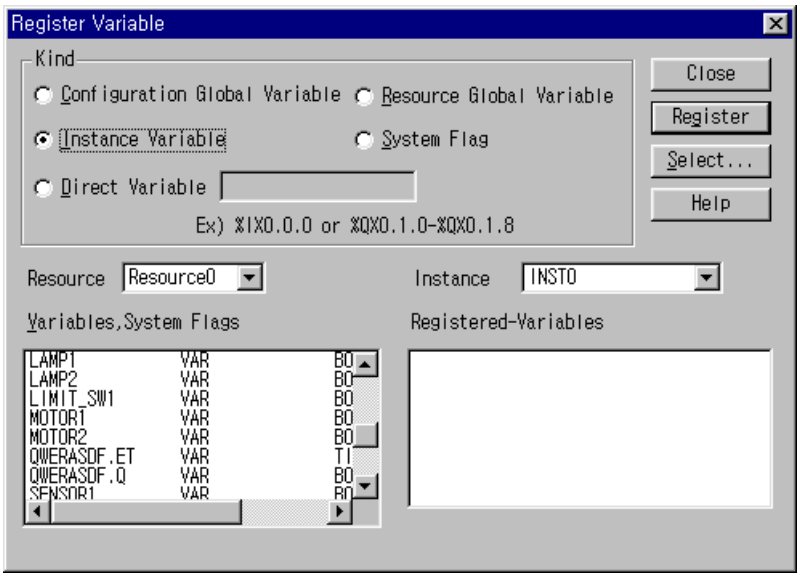
□ Click (

) in toolbox.
□ Select variables to monitor in the ***Register Variable*** dialog box.



□ Select ***Toolbox – Select (F5)*** in menu.

□ Select variables to monitor in the ***Register Variable*** dialog box.



Refer to the section 8.2.1 **Register Variable** for the detail description.

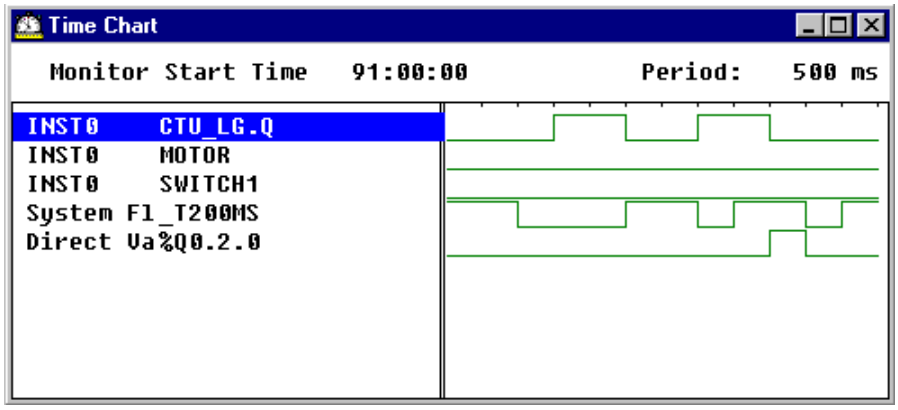
8.5.2. Start Monitoring



□ Click () in toolbox.



□ Select ***Toolbox – Start (F2)*** in menu



8.5.3. Set the View Type of Monitoring

It allows you to monitor the detail information of variable selectively.



□ Click (

) in toolbox.
□ Select information to display in the check box.



□ Select ***Toolbox – View (F3)*** in menu.
□ Select information to display in the check box.

8.5.4. Set Time Interval

It sets the time interval of monitoring the status of a variable's value.
It determines the time interval of collecting the PLC variable's value.
If you set the 5-second, you cannot monitor the variable's value that changes within the 5-second.



□ Click (

) in toolbox.
□ Enter the time interval to monitor in the ***Time Chart Period*** dialog box.



□ Select ***Toolbox – Time (F6)*** in menu.
□ Input the time interval to monitor in the ***Time Chart Period*** dialog box.

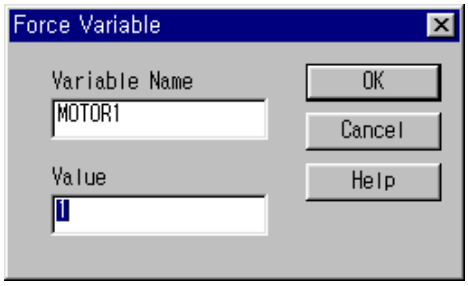
8.5.5. Forced Variable Output

To output the desired variable's value forcibly,



□ Click (

) in toolbox. Or move the mouse on the variable to change a value,
and double-click the left button of the mouse.



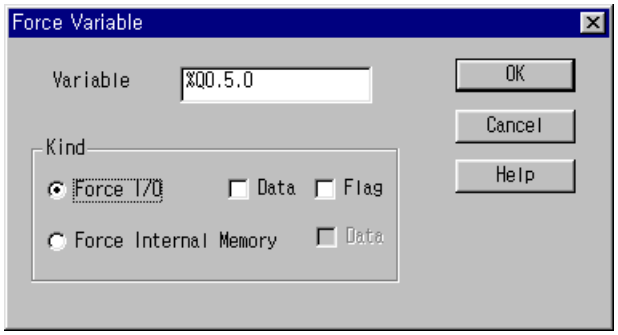
- Enter the variable's value in the ***Value*** input text box.
- Click ***OK*** button.



- Call the ***Force Variable*** dialog box.
- Enter the variable's value in the ***Value*** input text box.
- Press ***Enter*** key.

8.5.6. Forced Direct Variable Output

For a direct variable, the following dialog box appears.



- If you want to change the input/output value, select the ***Force I/O*** in option.
  And if you would like to set the value as '1', select ***Data, Flag*** check box.
  (Refer to the section 7.12 Set Forced I/O and section 7.13. Enable I/O Forcing)
- If you want to change the internal value, select the ***Force Internal Memory*** in option.
  And if you want to set the value as '1', select ***Data*** check box.

Chapter 9 Debugging

9.1. LD Debugging 9-2
9.2. SFC Debugging 9-5
9.3. IL Debugging 9-8
9.4. View Break Point 9-9
9.5. Set a Break Condition 9-11
9.6. Enable Task Turnover 9-13

Chapter 9. Debugging

Debugging detects an error and removes it, so that the PLC program created by user may be operated normally. The ways of finding a program error are following as.

1) **Step Run**
: Detecting an error with running the program step by step

2) **Break Run**
: Detecting an error after stopping the program on a specified step with break

3) **Data Break Run**
: Detecting an error with break on the access conditions of the specified variable or value of it

4) **Break Run with Specifying Scan Account**
: Detects an error after the program has executed a specific no of scans, as specified by the scan account.

In Step Run mode, it is impossible to access the program with multiple tasks, but in Break Run mode, you can access the task program. Maximum number of break point is 32 points for **Program Break** and only 1 point for **Data Break**.

If the program for debugging is opened, Step Run starts from the first line of its program.

If not, it starts from the first line of the first scan program assigned in project.

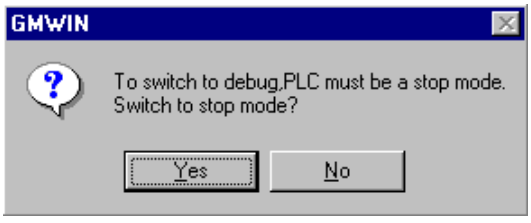
Step run ends at the last line of the program.

Break point is displayed in red color in each program, and in blue for the execution of break to the point.

If you change to debugging mode, program monitoring starts automatically.

Note

Change to debugging mode is available only in Stop mode.



- Select ***Online - Connect*** in menu. The execution project file must be downloaded to PLC before debugging.
- Select ***Debug - Debug Start*** in menu.
- or select ***Online – Mode Change - Debug*** in menu

9.1. LD Debugging

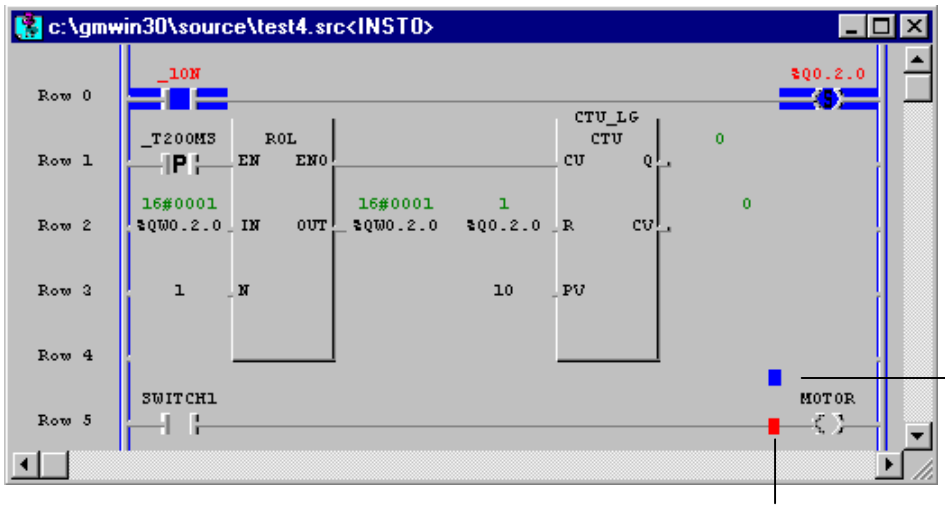
9.1.1. Break Run

1) Select Break Run

□ Move the cursor to the position that you want to assign as break point.

□ Select the ***Debug – Add/Remove Break Point (Ctrl + F5)*** , () in the pull-down menu.

□ Select the ***Debug – Go (Ctrl + F9)***, () in menu.



Debugging stops at the line set as break point.(row 5 in above figure)

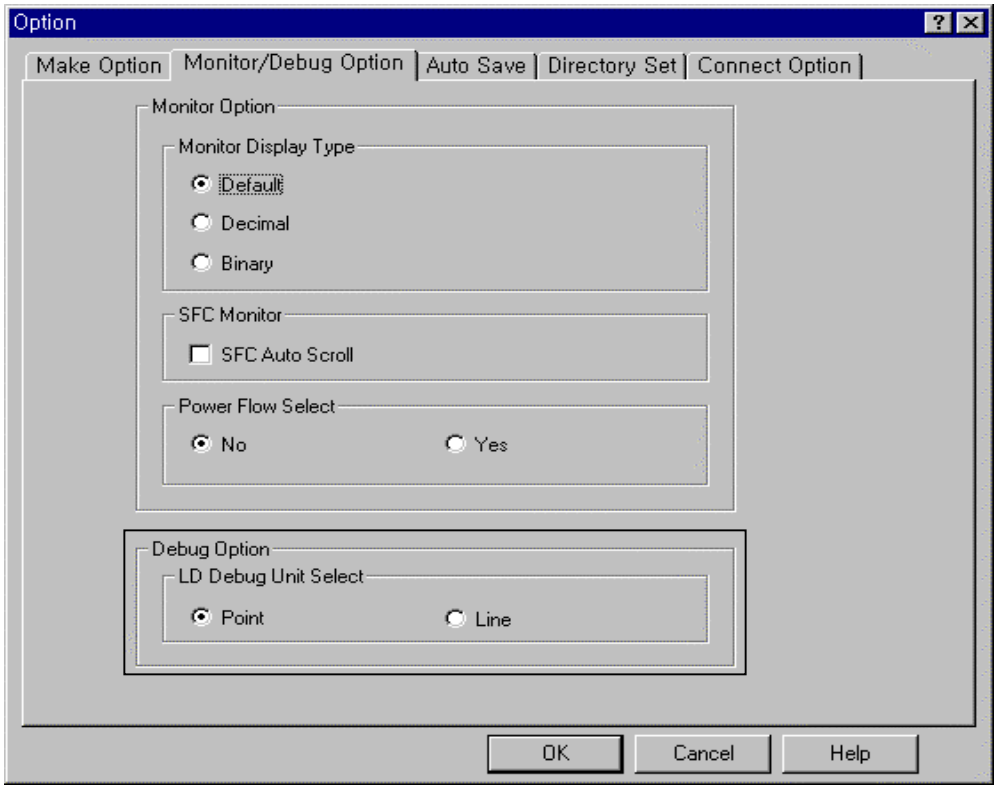
2) Run to cursor position

□ Move the cursor to the position that you want to assign as break point.

□ Select the ***Debug - Go to Cursor (Ctrl + F2)***, () in menu.

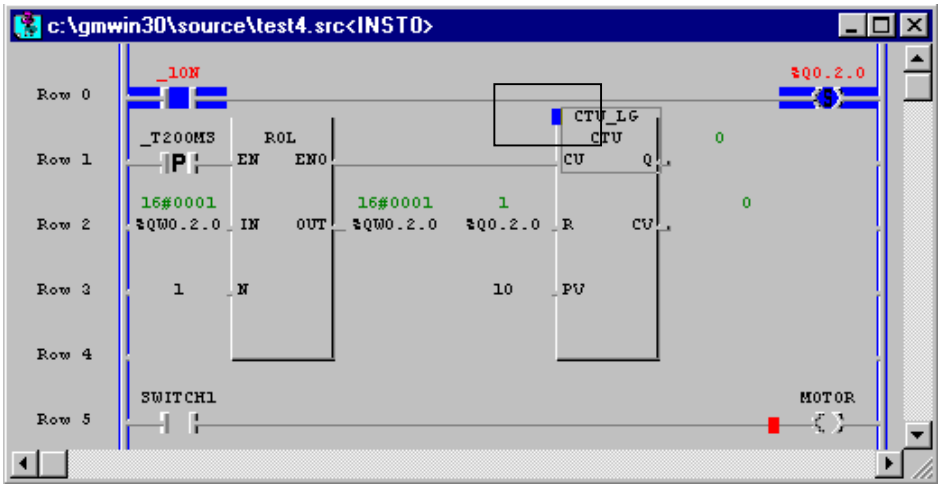
9.1.2. Step Run

You can use two types of **Step over** in LD debugging. One is step over by Point,
the other is step over by Line It can be chosen at the ***Monitor/Debug Option*** folder in ***Option*** dialog box of ***Project*** menu..

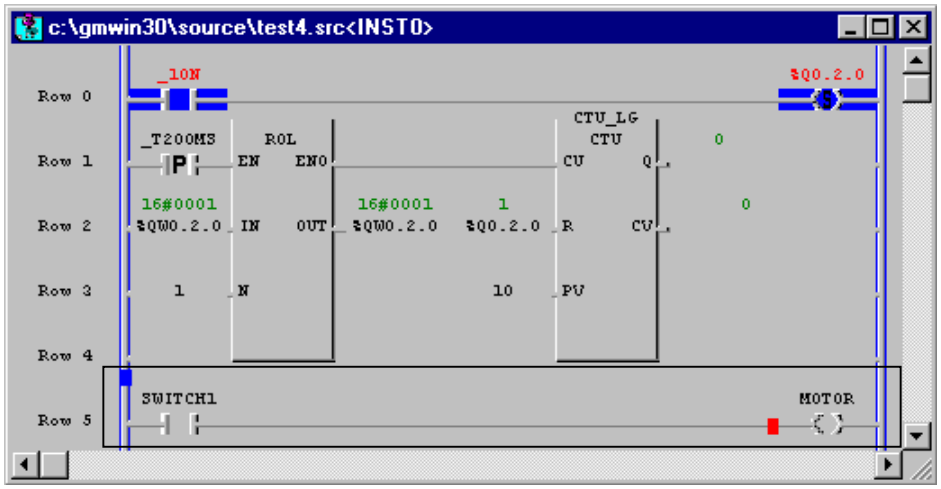


□ Select the ***Debug - Step Over(Ctrl + F8)***, () in menu.

When you run Step Over by **Point** for the program in **9.1.1 Break Run**, the result is as below.



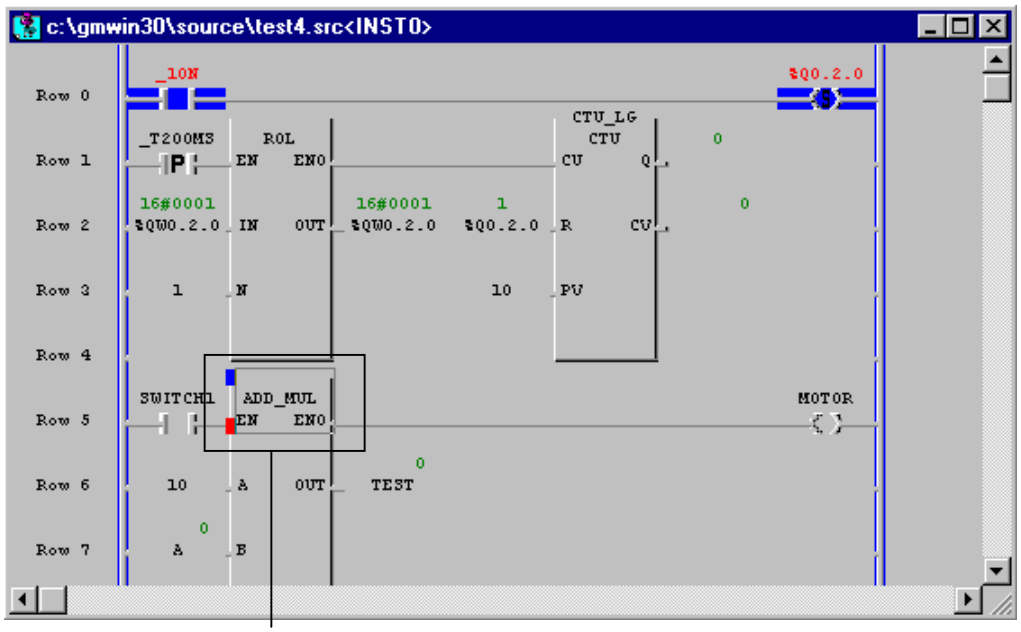
When you run Step Over by **Line** for the program in ***9.1.1 Break Run***, the result is as below.



9.1.3. Step Into

When you want to debug a User defined Function/Function Block in a program, select ***Step Into*** function.

□ Add the Break point for debugging on the User defined Function/Function Block.

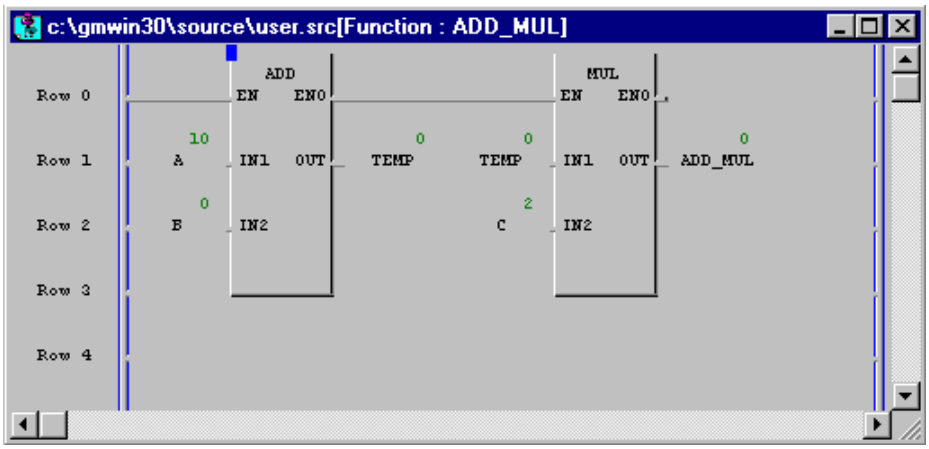


User defined Function

□ Select the ***Debug - Step Into (Ctrl + F7)***, () in menu to enter into the User defined Function.
If the source program of User defined Function/Function Block exists,
you can monitor/debug it by ***Step into*** function.

9.1.4. Step Out

To return to the program block from the User defined Function/Function Block after debugging, select ***Debug – Step Out*** () in menu.



The above program is a User defined Function (ADD_MUL).
For creating User defined Function or Function Block, refer to the section 10.3 Create User defined Library.

9.2. SFC Debugging

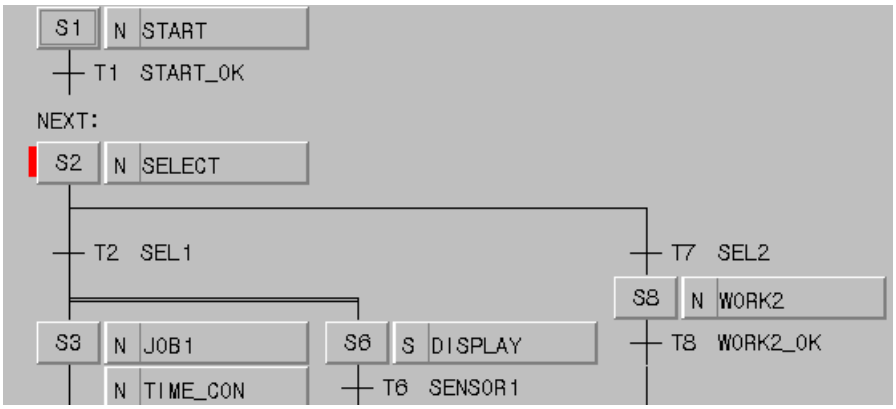
9.2.1. Break Run

In SFC, you can execute a ***Break Run*** function for only Step.

1) Set a Break Point

□ Move the cursor to the Step that you want to assign as Break Point.

□ Select the ***Debug – Add/Remove Break Point (Ctrl + F5)*** , () in menu.



□ Select the ***Debug – Go (Ctrl+F9)*** , () in menu.
Then **Step 1** (Start action) is executed

□ After Start_OK transition condition is satisfied, at the moment **Step 2** set as Break Point is in active, PLC is stopped immediately.

2) Run to cursor position

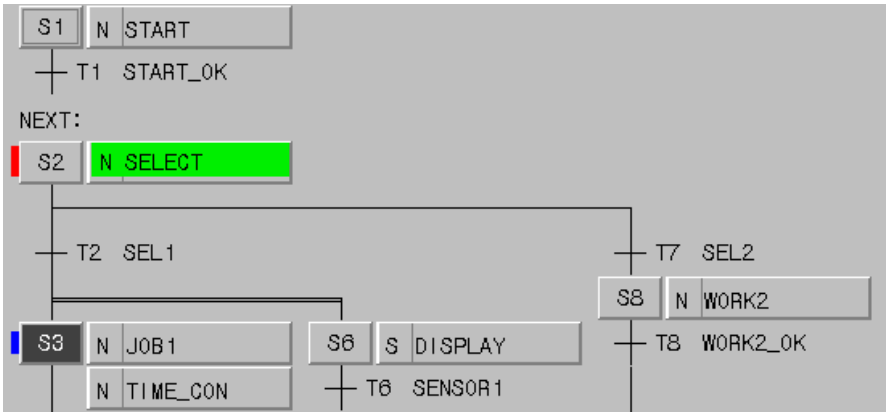
□ Move the cursor to the step that you want to set as Break Point.

□ Select the ***Debug - Go to Cursor (Ctrl + F2)*** ,() in menu.
At the moment Step that cursor is placed on is in active, PLC is stopped immediately.

9.2.2. Step Run

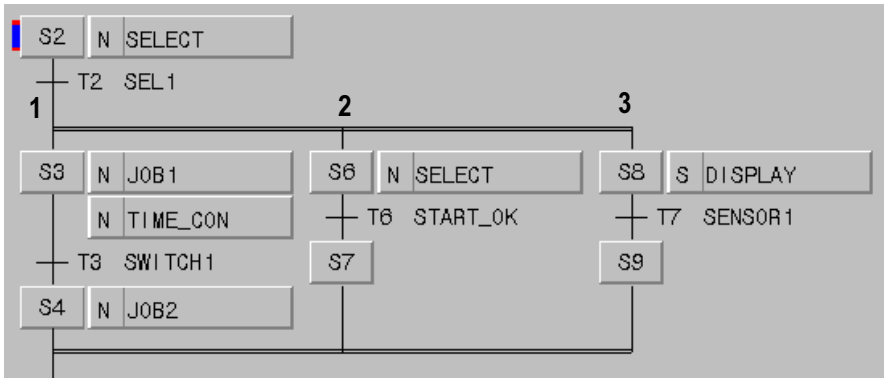
It executes a program by one step (S1, S2, S3).

□ Select the ***Debug - Step Over (Ctrl+F8)*** ,() in menu.



Step S3 connected with Step S2 on break is executed when SEL1 transition condition is satisfied. At the moment Step S3 is activated, PLC is stopped immediately.

When you select ***Step Run***, if the next step is a parallel branch, then you should select the branch to execute ***Step Run***.



□ Select a branch number (select among the 1, 2 and 3 in the above figure) in the ***Branch Select*** dialog box, and Click ***OK*** button.

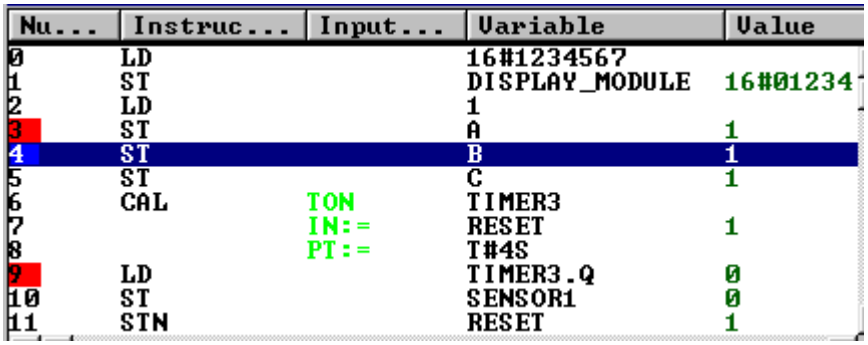
9.2.3. Step Into

When Step is under break condition, if you select ***Step Into***, (), a break occurs at the first line of connected action.

9.2.4. Action Debugging

It allows you to debug the program by **Zoom** function for the action program.
It is the same as IL, LD debugging.

9.3. IL Debugging



Nu...	Instruc...	Input...	Variable	Value
0	LD		16#1234567	
1	ST		DISPLAY_MODULE	16#01234
2	LD		1	
3	ST		A	1
4	ST		B	1
5	ST		C	1
6	CAL	TON	TIMER3	
7		IN:=	RESET	1
8		PT:=	T#4S	
9	LD		TIMER3.Q	0
10	ST		SENSOR1	0
11	STN		RESET	1

9.3.1. Break Run

To execute a program break,

1) Set a Break Point

□ Move the cursor to the line that you want to set as a break.

□ Select the ***Debug – Add/Remove Break Point (Ctrl + F5)*** , () in menu.

□ Select the ***Debug – Go (Ctrl + F9)*** , () in menu.

2) Run to Cursor Position

□ Move the cursor to the line that you want to set as a break.

□ Select the ***Debug - Run to Cursor (Ctrl + F2)*** , () in menu.

9.3.2. Step Run

It runs a program by one step.

□ Select the ***Debug - Step Over(Ctrl + F8)*** , () in menu.

9.3.3. Step Into

It debugs a program in the Function or Function Block.

□ Select the ***Debug - Step Into(Ctrl + F7)*** , () in menu.

9.3.4. Step Out

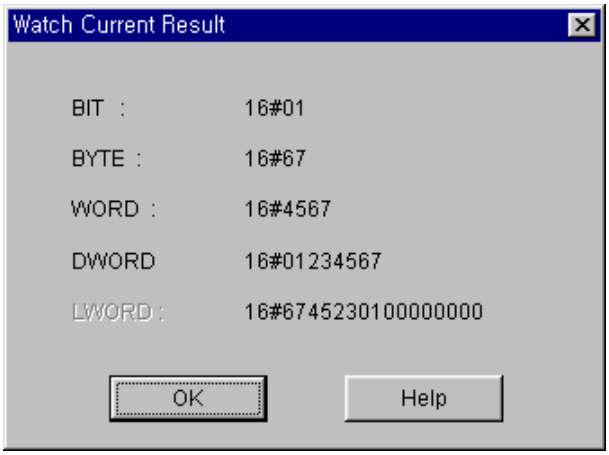
It returns from Function or Function Block to original program.

□ Select the ***Debug - Step Out*** , () in menu.

9.3.5. Watch Current Result

It allows you to view the current result in the program that is under break.

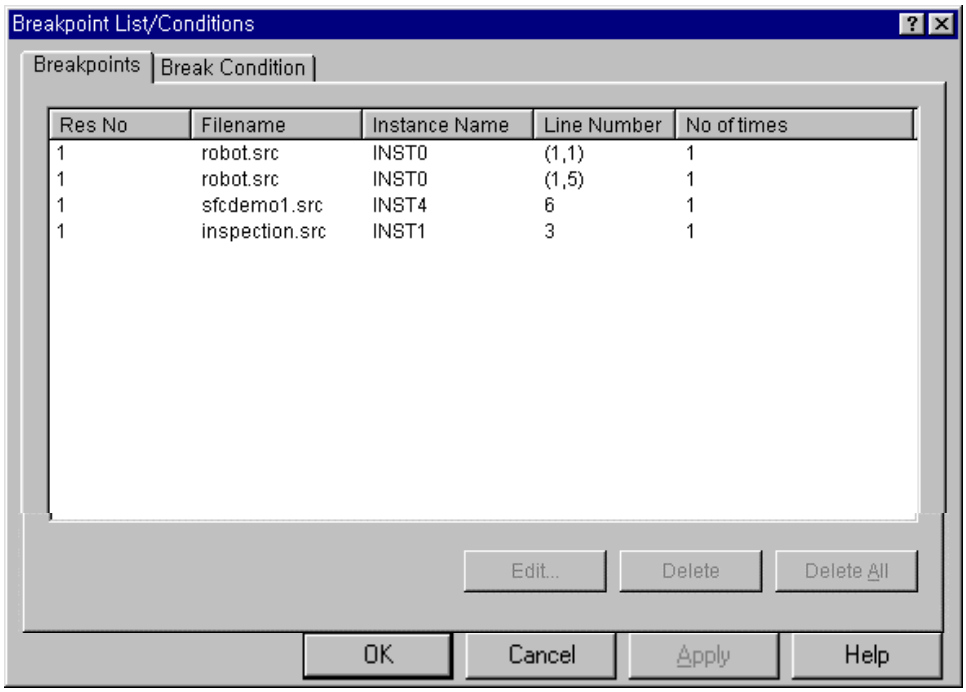
□ Select the ***Toolbox - Watch Current Result*** in menu.



9.4. View Break Point

You can view and delete the break points in the ***Break Point List/Condition*** dialog box.
GMWIN saves the break point by Project unit. That is, when you reload a project,
the break points of the project are same as you set previously.
If you delete a break point in the ***Break Point List/Condition*** dialog box, the break point set in the program is deleted.

□ Select the ***Debug – Break Point List/Condition*** in menu.
□ Select the ***Break Points*** Tab.



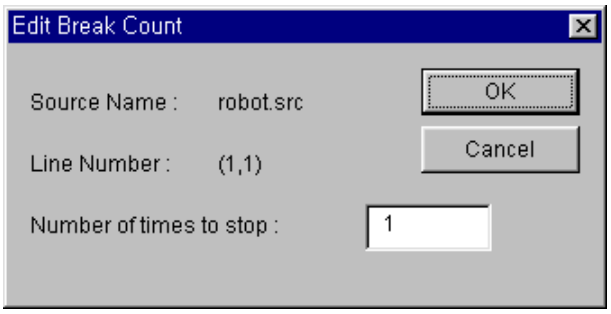
□ You can view and delete the entire break points. Moreover you can set the number of break count.
□ Click ***OK*** button.

1) Delete a Break Point
□ Select the break point to delete in dialog box.
□ Click ***Delete*** button.

2) Delete the entire Break Point
□ Click ***Delete All*** button.

3) Edit the number of Break
After executing the breaks as many as you set the number of break count, the PLC is stopped.

□ Select the break point to edit the number of break count in dialog box.
□ Click ***Edit…*** button.

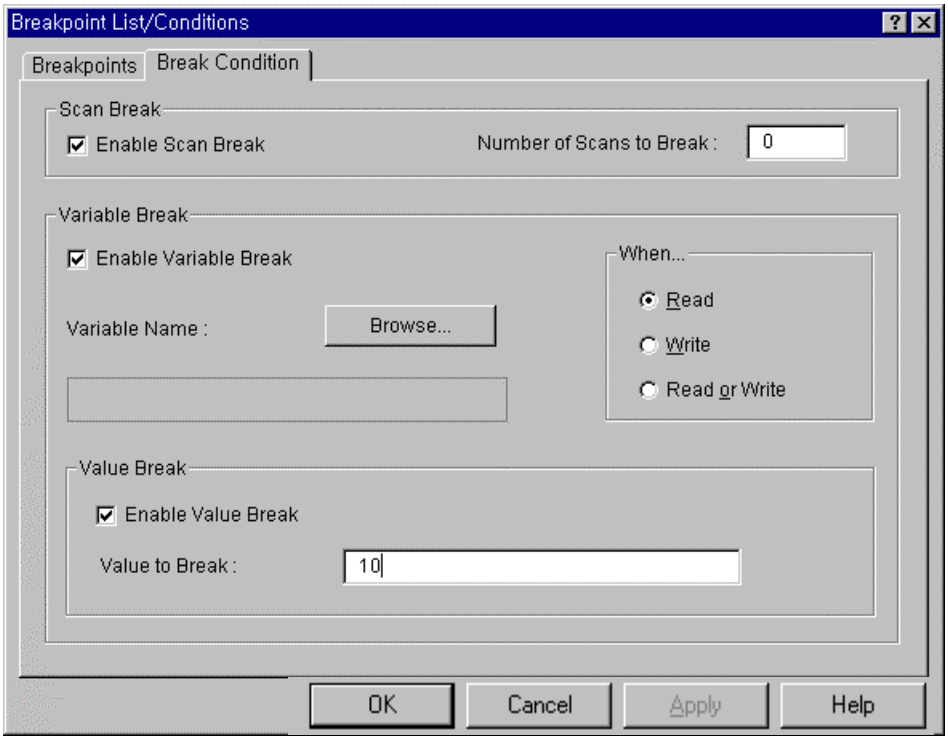


□ Enter the number of Break count that want to break, and click ***OK*** button.

9.5. Set a Break Condition

In ***Break Condition*** dialog box, you can set the break condition, which is the condition to break by the state of assigned variable or number of the scan times.

□ Select the ***Debug - Break Point List/Condition…*** in menu.
□ Select the ***Break Condition*** Tab.



9.5.1. Break Scan

It stops the program after PLC runs as many as assigned number of scan times.

□ Select the ***Enable Scan Break*** option check box.

□ Enter the number at ***Number of Scan to Break*** input box.

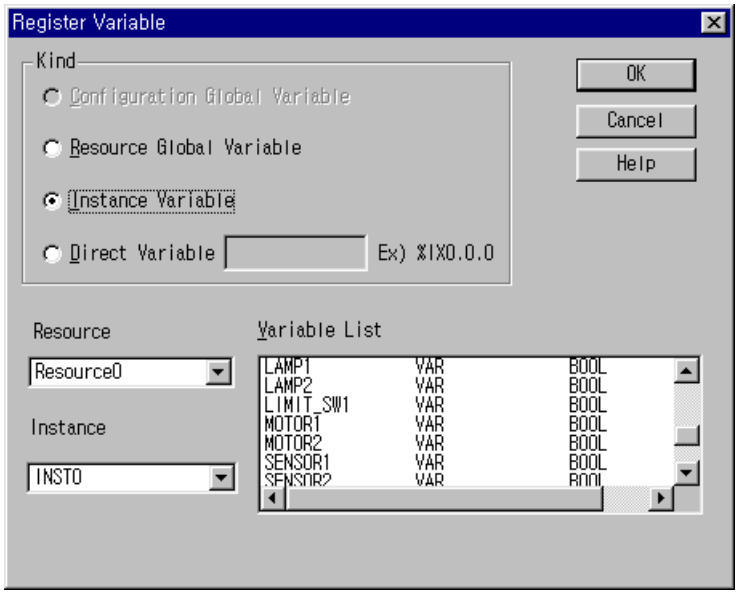
9.5.2. Break Variable

If you read a variable or write an arbitrary value to assigned variable, PLC is stopped.

□ Select the ***Enable Variable Break*** option check box.

□ Select ***Browse*** button.

□ Select a variable in ***Register Variable*** dialog box, click ***OK*** button.



□ Choose one option in ***Variable...*** option radio box.

Read : stops, when it reads the variable.

Write : stops, when it writes an arbitrary value to variable.

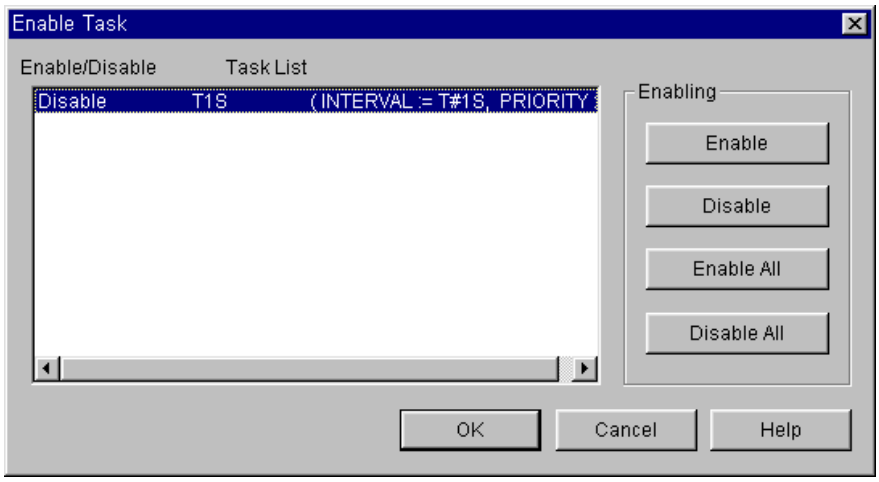
Read/Write : stops, when it reads a variable or writes an arbitrary value to variable.

□ If you want to stop when a specific value has been reached, select the ***Enable Variable Break*** option check box, and enter the value in the input text box.

9.6. Enable Task Turnover

In a program instance with a task, if you run the program after debugging by one step, the ***Task Enable…*** allows you to choose either Enable or Disable of the task turnover.

□ Select the ***Debug - Task Enable…*** in the pull-down menu.



□ Select a task to Enable/Disable in the ***Enable Task*** box.
□ Click ***Enable/Disable*** button.
□ When you want to set the entire lists as a enable/disable, click the ***Enable/Disable All*** button.
□ Click ***OK*** button.

Chapter 10 Library

10.1. Type of Library File 10-1
10.2. Load a Library 10-2
10.3. Create User defined Library File 10-6

Chapter 10. Library

By saving Function or Function Blocks as files, they can be used in other programs saving time. It is possible to create your own library file containing your own custom Function Blocks .

10.1. Type of Library File

Library File consists of Function or Function Block.

Library File	Extension	Example
Function Library	**. *FU**	stdlib.6fu: standard function library for G6
Function Block Library	**. *FB**	special.6fb: standard function block library for G6

Note

***** in **.*FU** or **.*FB** indicates the type of appropriate PLC in. (In case of G6, the type is .6FU)

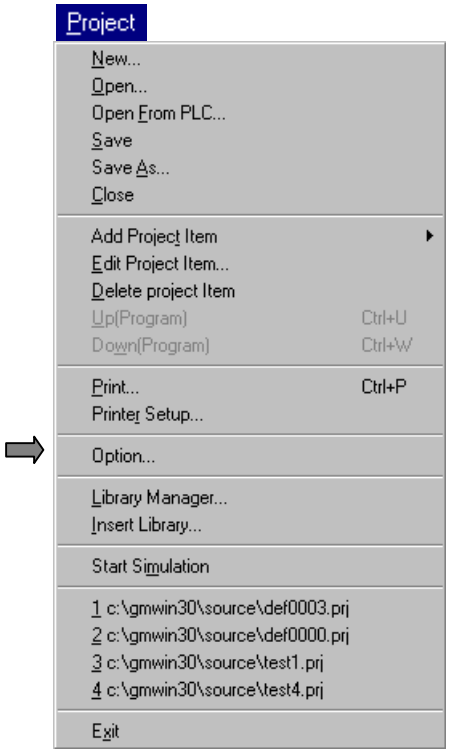
Library Type	Comment	Example
Standard Library	It is the files that collect basic functions/function blocks.	stdlib.*fu, stdlib.*fb
Exclusive Library	It is the files that collect the function blocks used in special/ communication module (for A/D, D/A, Link ..), etc.	special.*fb, communi.*fb
Extensible Library	It is the files that supplied by manufacturer for the user using other LG PLC.(To add this libraries, select 'Project - Insert Library' menu)	mkstdlib.*fu (for MASTER-K)
User defined Library	It is a library that user make personally. (It is added by 'Project - Insert Library' menu)	(User defined name).*fb

10.2. Load a Library

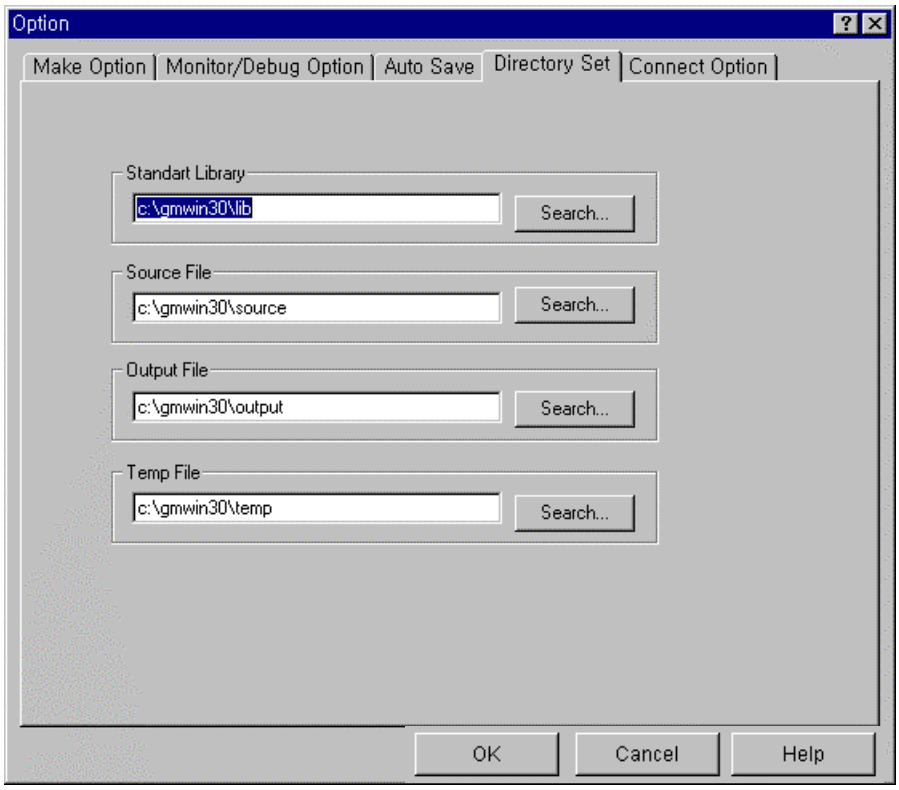
1) Load Standard Library

If you execute GMWIN program in the designated directory, the standard library is loaded automatically.

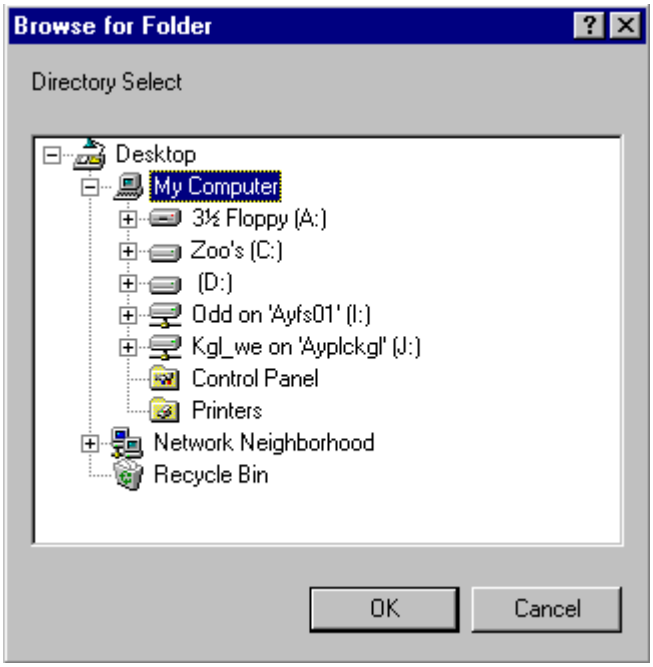
□ Select option item in ***Project*** menu.



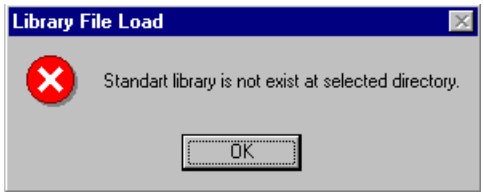
□ Select folders in ***Option*** dialog box.



□ Enter the path of library in ***Standard Library*** input text box of ***Directory Set*** menu.
If you can't remember the path, select ***Search*** button where the library is in.



□ In case that the library is not in the selected directory, the error message appear as below



Note

If there are no "stdlib.*fu and stdlib.*fb (* is the type of PLC. The type is stdlib.6fu for G6) in the selected folder, an error message that cannot open appears when open a project.
In this case, enter the folder correctly in ***Project - Option – Directory Set*** menu.
Or copy the standard library to the selected folder.

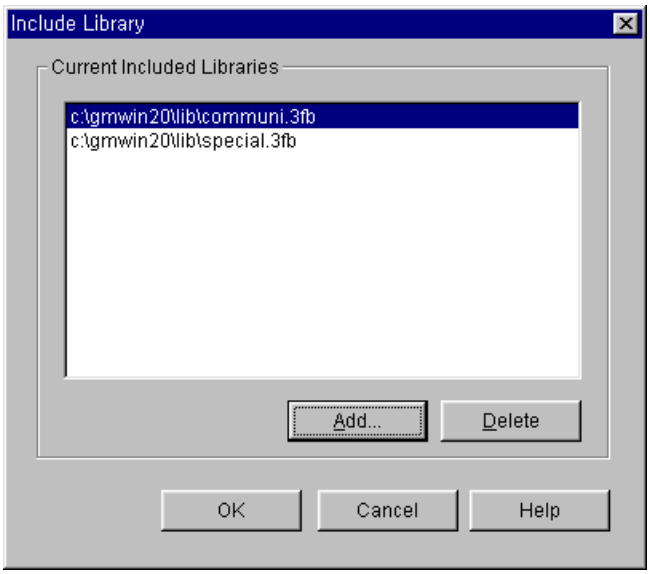
2) Load an Exclusive, Extensible Library and the User defined Library

You can load selectively exclusive, extensible library and user defined library.
In the state that project file is opened, call ***Include Library*** dialog box by selecting ***Project – insert Library***.

Note

You can also call ***Include Library*** dialog box by double-clicking on the appropriate library in library file list.

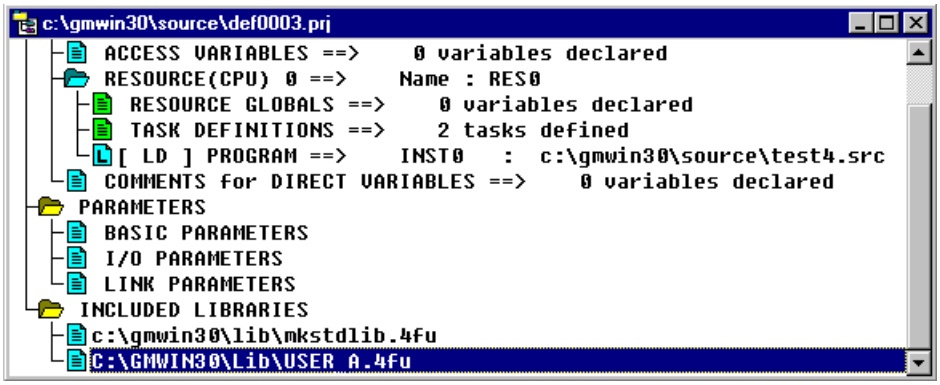
□ Add a desired library in ***Include Library*** dialog box, and click ***OK*** button.



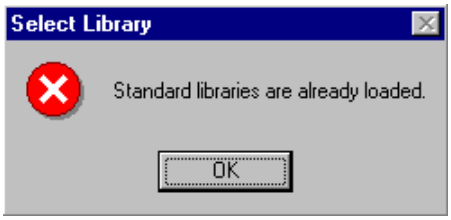
If you select a desired library and click **OK** button, then added libraries appear ***Current Included Libraries***.

- communi.3fb : Function blocks for the communication in GM3 (Cnet, Fnet, Mnet)
- mkstdlib.3fu : Functions for MASTER-K series
- remote3.3fb : Function blocks for special modules in GM3 (for REMOTE communication)

□ If you finish to add the libraries, added libraries appear on Project window.

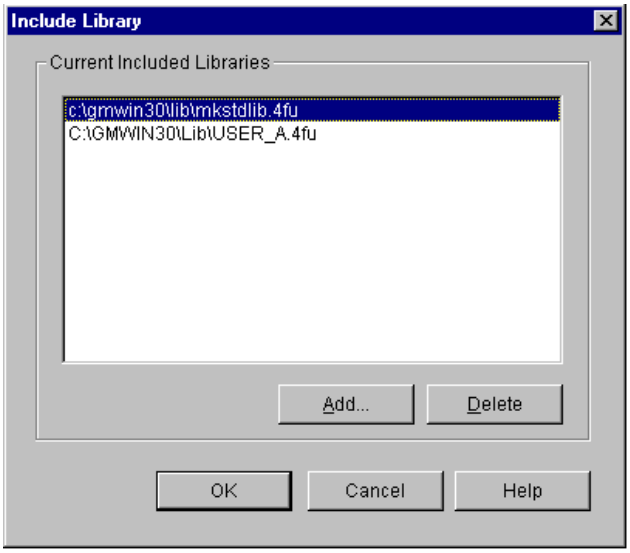


□ When you add a library, If the item that selected in ***Library List*** is a standard library, the following error message appears.



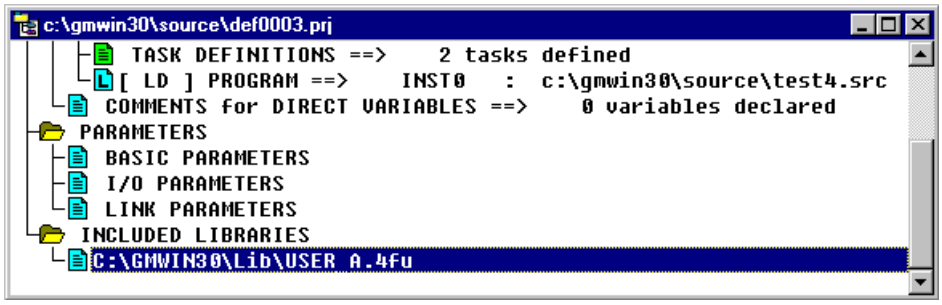
To delete the inserted library,

□ In ***Current Included Libraries*** list box, select a desired library and click ***Delete*** button.



□ Click ***OK*** button.

□ You can confirm whether the library is deleted on project screen or not.



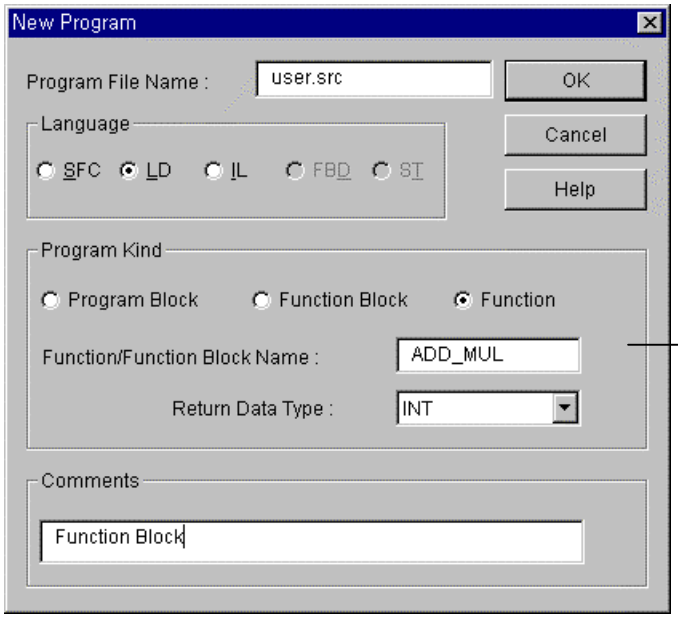
10.3. Create User Defined Library File

Besides the standard library or extensible library, a custom can program can be converted into, a Function / Function block and stored in a user defined library for reuse.

10.3.1. Create User Defined Function

10.3.1.1. Create a new Function Program

□ Select ***Program - New program*** ()in the pull-down menu.



Function Name for other program

□ Enter the name of function program with '*.src'.

□ In ***Language*** option radio button, select language type to use in editing the function.

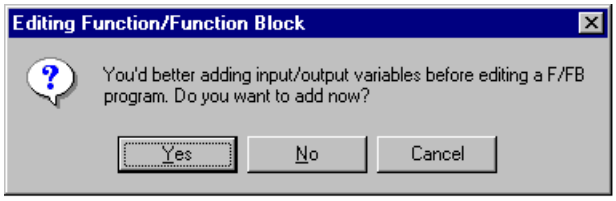
□ Select ***Function*** in ***Program kind*** option button.

□ In ***Function / Function Block Name*** input text box, enter the function name to use

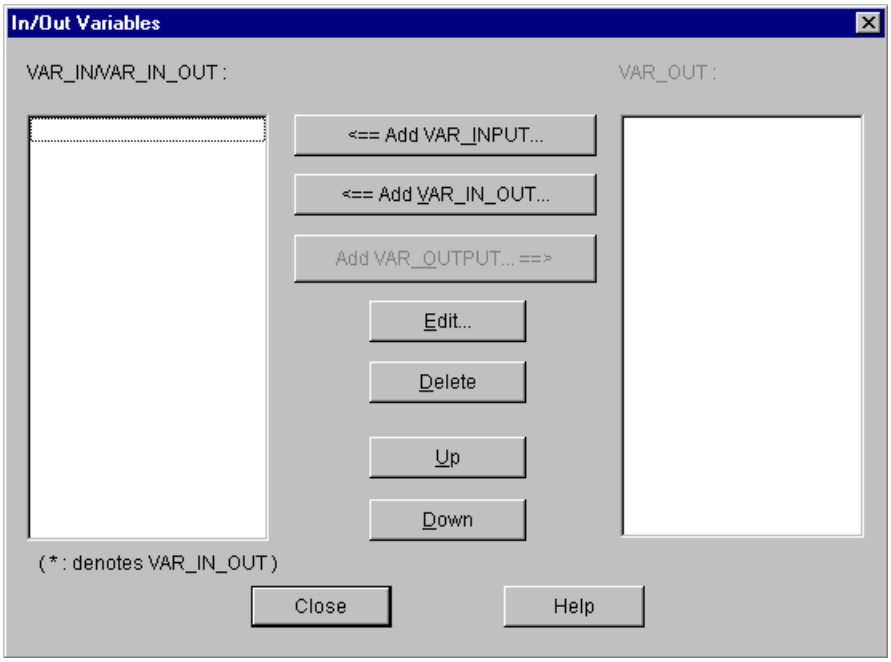
□ In Return Data Type list box, select the type of variable.

□ If there is an additional comment for the function, enter the comments in ***Comments*** window.

□ Click ***OK*** button and the following message appear.



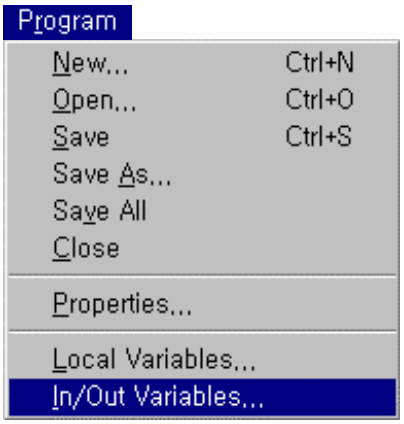
□ If you click ***Yes*** button, ***In/Out Variables List*** dialog box appears.



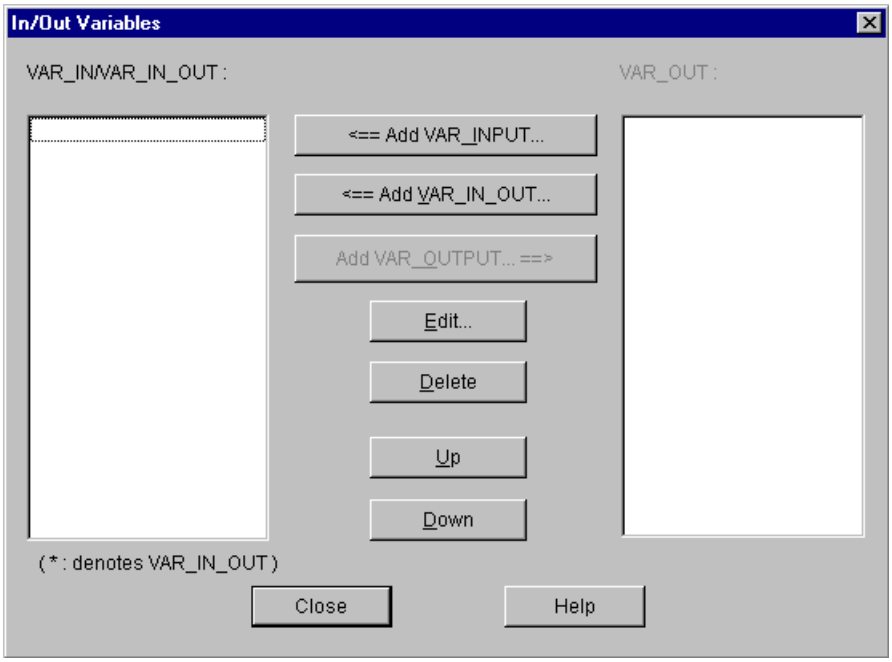
□ If you click ***No*** button, ***In/Out Variables*** window for the selected language appears.

10.3.1.2. Create Input Variable

□ Differently from editing a Program Block, select ***Program - In/Out Variables*** to create variables.



□ Add a variable in I/O variable input text box of ***In/Out Variables*** dialog box.



Note

VAR_IN_OUT is distinguished from VAR_IN by * mark.

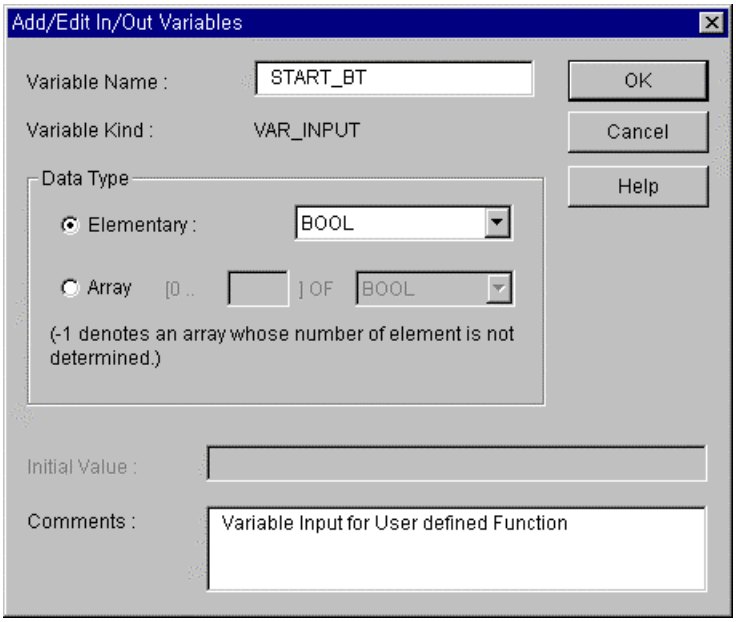
Differently from VAR_IN, VAR_IN_OUT means that you can change the value of parameter taken from the side that call function / function block in that function / function block.

1) Add an Input/Output Variable

□ Click ***Add VAR_INPUT, Add VAR_OUTPUT, or Add VAR_IN_OUT*** button.

□ Add a desired input/output variable name in ***Variable Name*** input text box.

(Maximum size of name is 8 characters)



□ Select a variable type in ***Data Type*** list box.

□ If you need a comment about input/output variable, enter the comment in ***Comment*** window and click ***OK*** button.

Note

If you fix an array number as -1, it means that the array number of input variable is fixed when call the function / function block.

2) Edit an Input/Output Variable

□ Select the item that you want to edit in ***In/Out Variables*** list.

□ Click ***Edit*** button.

□ Edit the content that you want to correct in dialog box and click ***OK*** button.

3) Delete an Input/Output variable

□ Select the item that you want to delete in ***In/Out Variables*** list.

□ Click ***Delete*** button.

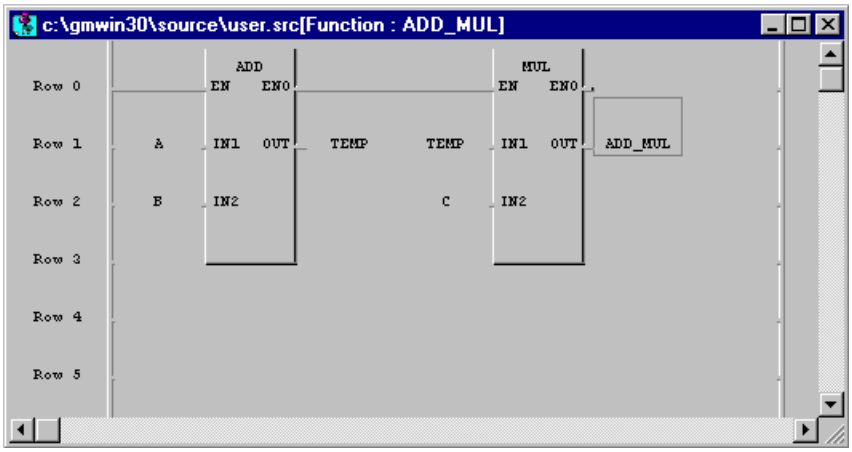
4) Change the order of Input/Output variable

□ Select the item that you want to change the order in ***In/Out Variables*** list.

□ Move the position of list by clicking ***Upward(⬆)*** or ***Downward(⬇)*** button as many as you want to move.

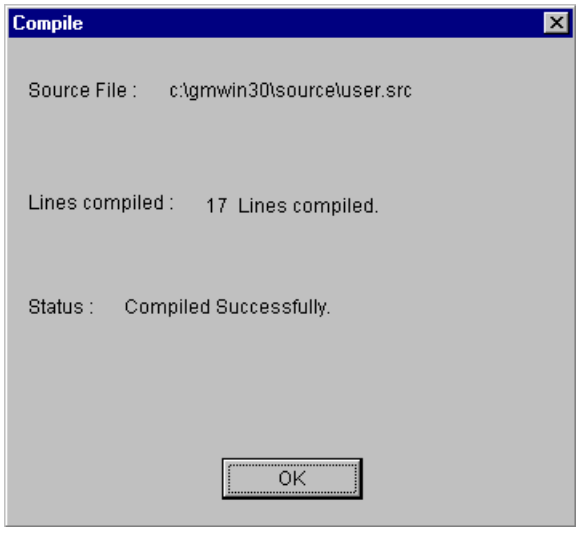
10.3.1.3. Create a Function Program

□ You can create a program with the same way of other program.



10.3.1.4. Compile a Function Program

□ If you finish creating a program, make an execution file by selecting ***Compile – Compile*** in menu. The object file is created after compiling a program. It has the extension of .OB*,



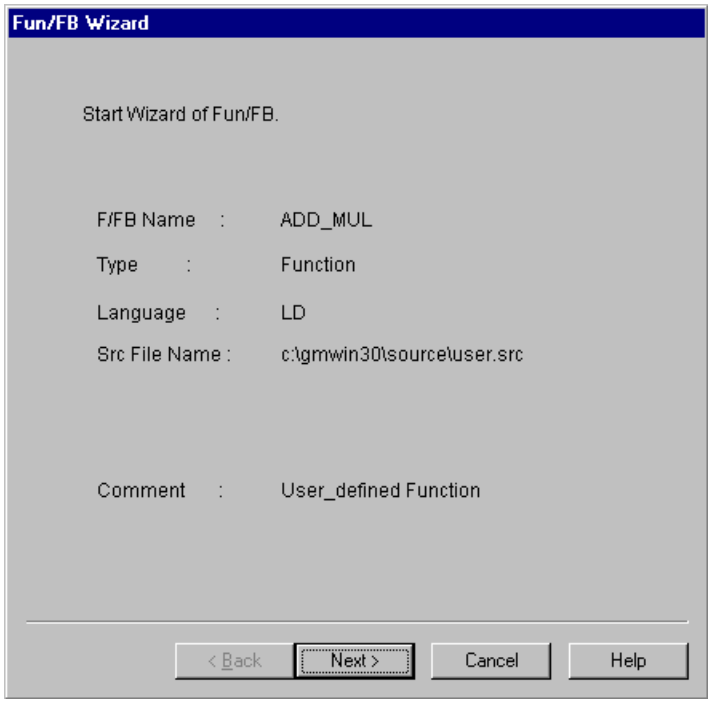
Note

Each PLC has a different object file. If you created a object file for G6, it can only be used with G6.

10.3.1.5. Function Wizard

□ If compiling is finished without an error and warning, ***Wizard*** dialog box appears automatically to insert the compiled function into the library.

Fun / FB Wizard dialog box shows the various information for function / function block.

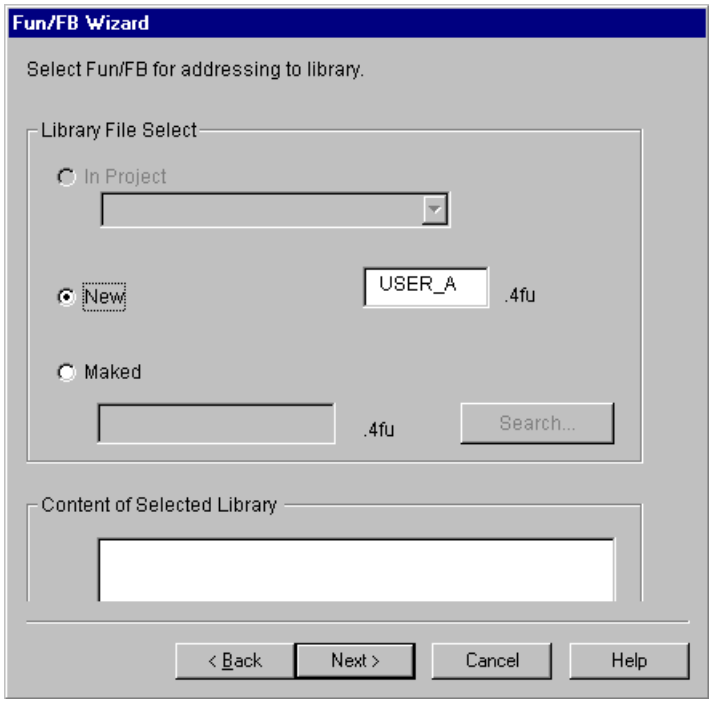


□ If you select ***Cancel*** button, it stops inserting the compiled function into the library and project.

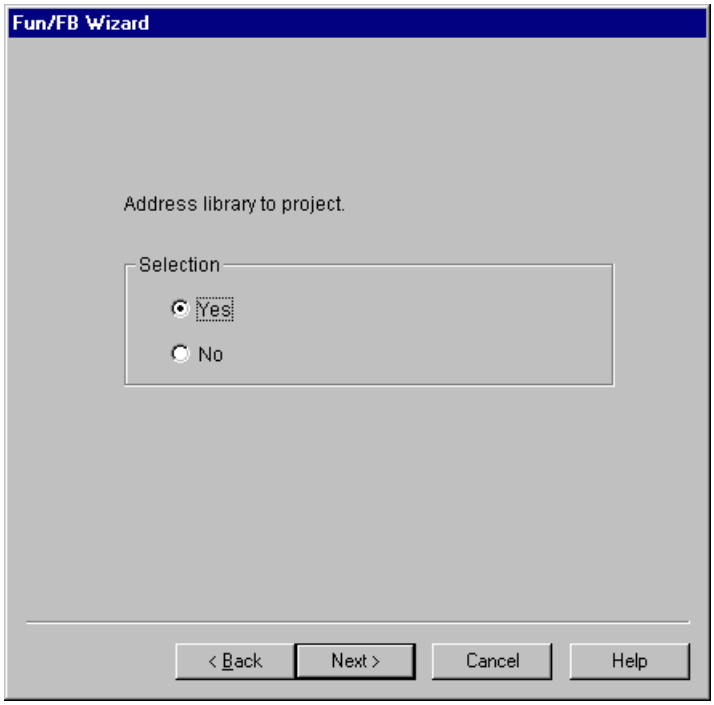
If necessary, you can create a ***User Defined Library*** for the compiled function by selecting ***Project - Library Manager***.

Similarly, you can also insert the compiled function into a project by selecting ***Project - Insert Library*** in menu.

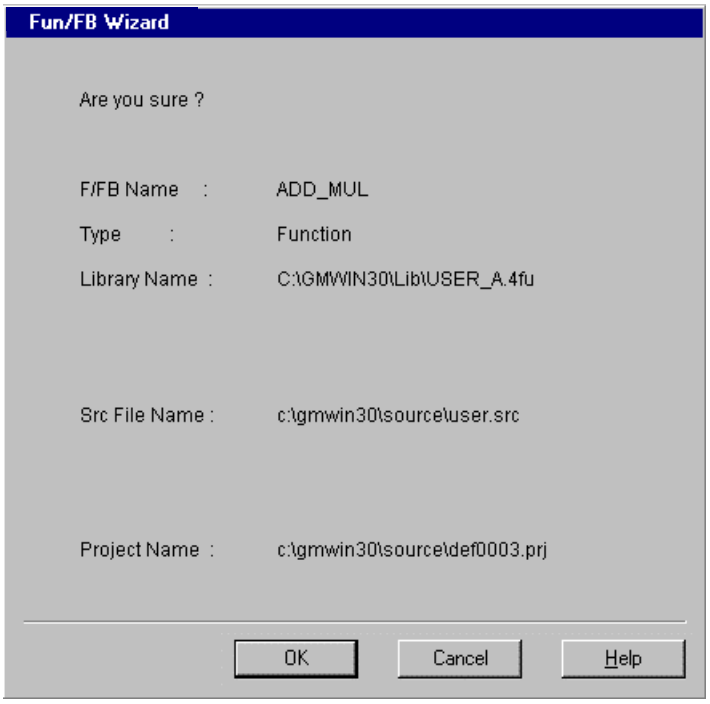
□ Click ***Next*** button in ***Fun / FB Wizard*** dialog box.



- In ***Library file Select***, enter new created library name in ***New*** input text box.
- If you want to insert new created library from the user defined library that exists already in the project, click ***In Project*** button and select a desired library file.
- If you want to insert the library from the user defined library that does not exist in the project, click ***Made*** button.
- Click ***Next*** button.

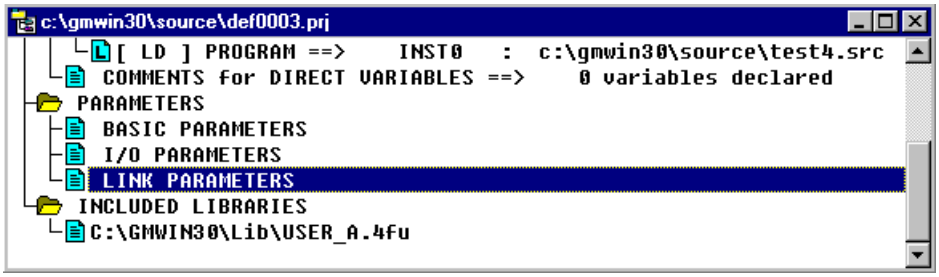


□ In this ***Fun / FB Wizard*** dialog box, it determines whether you insert the library into a current project. If the library selected in the previous dialog box exists in the project, the project updates the file automatically.



□ Click ***OK*** button and ***Next*** button.

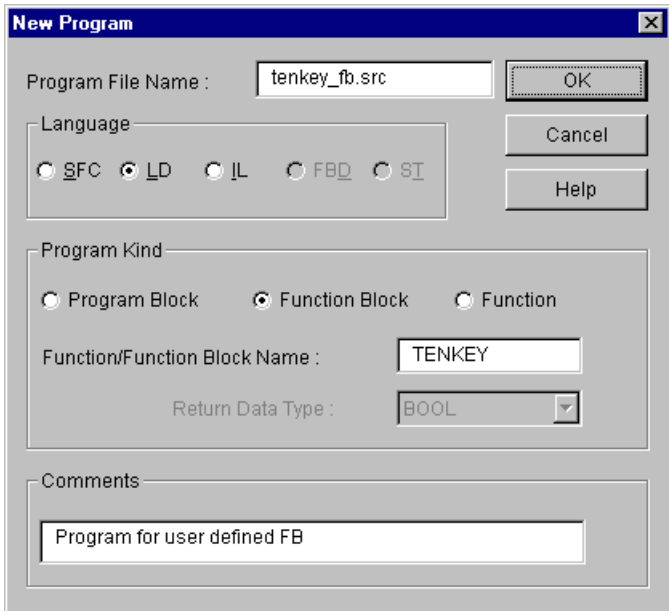
□ The new library is added on the project window.



10.3.2. Create a User Defined Function Block

10.3.2.1. Create a Function Block Program

□ Select ***Program - New Program*** in menu.



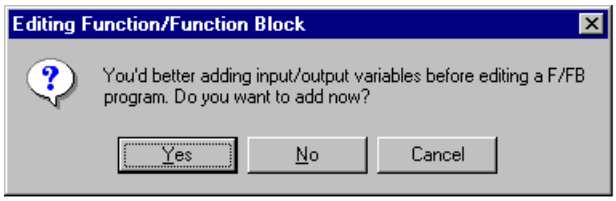
□ Enter Program File Name with *.src file

□ When you create Function Block, select the type of language to use in ***Language*** option button.

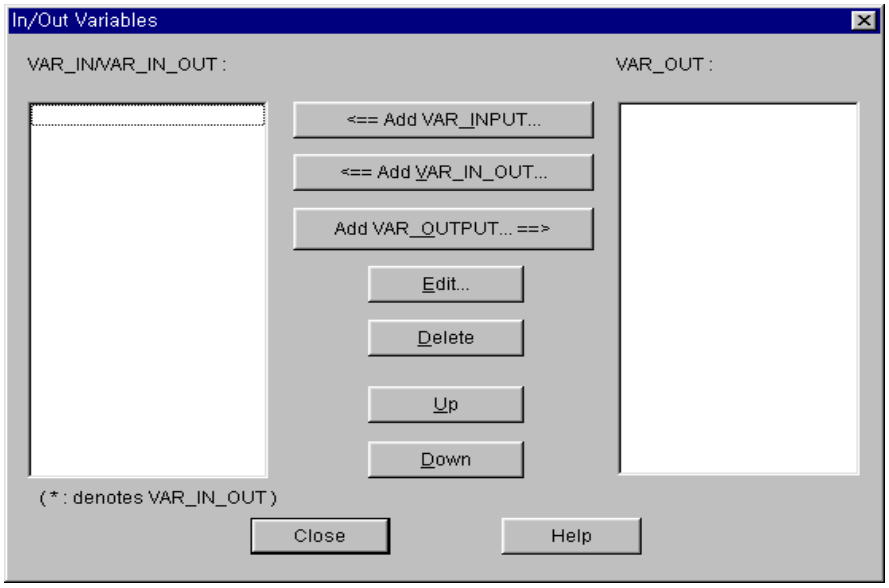
□ Select ***Function Block*** in ***Program Kind*** option button.

□ In ***Function / Function Block Name*** input text box, enter the function block name to be used in another program .

□ Click ***OK*** button and the following message appears.



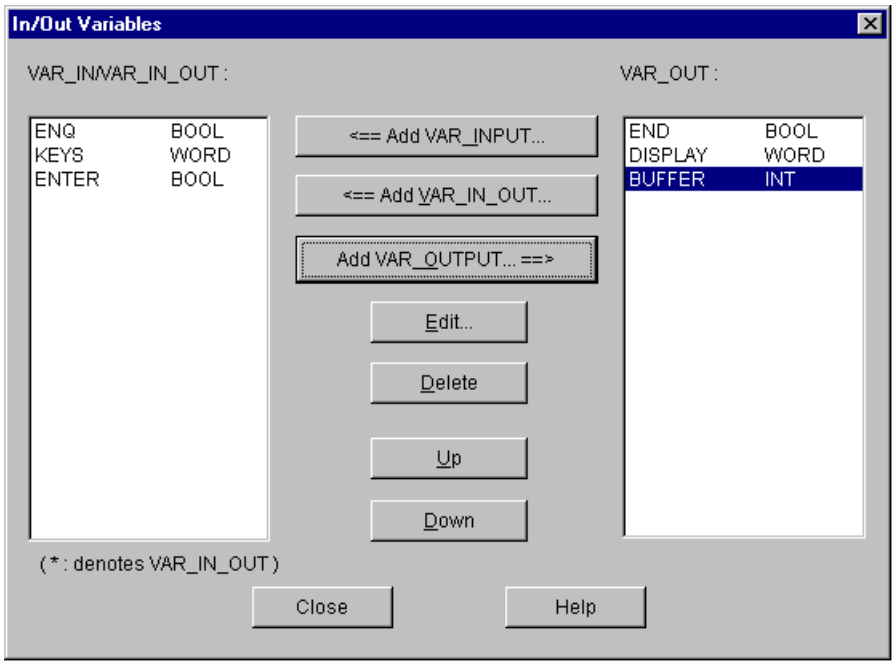
□ If you click ***Yes*** button, ***In/Out Variables*** dialog box appears.



□ If you click ***No*** button, edit dialog box for the selected language appears.

10.3.2.2. Create Input/Output Variable

□ Creating method is same as the creating of function. However, in function block, there must be more than one input-output variable instead of variable to return.

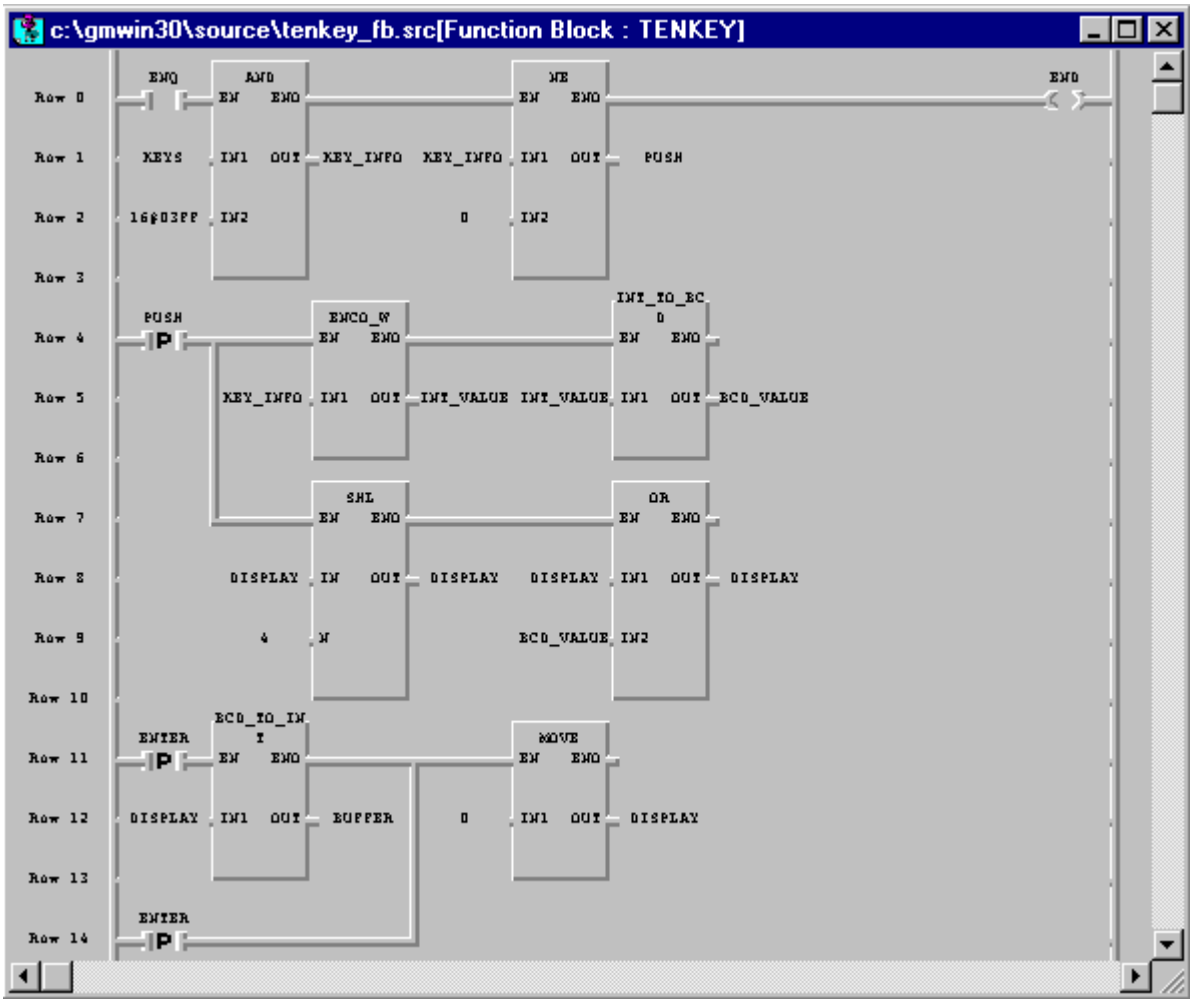


□ To insert input/output variable, use ***Add VAR_IN or_OUT...*** button.

□ When you insert input/output variable, the first input/output variable must be Boolean type. If it is not a Boolean type, an error message appears.

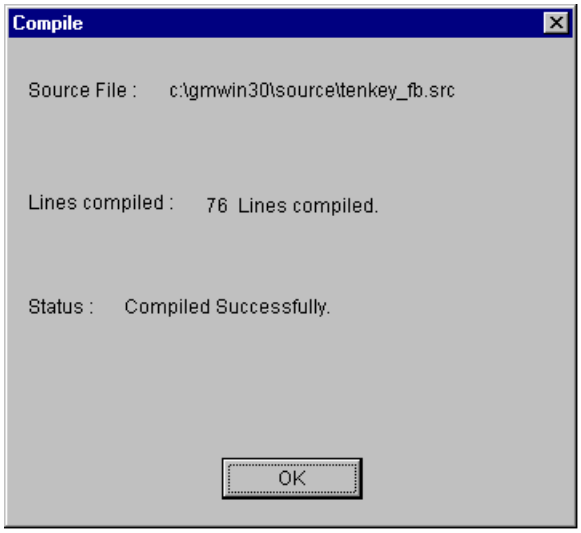
10.3.2.3. Create a Function Block Program

□ You can create a program with the same way of other program.



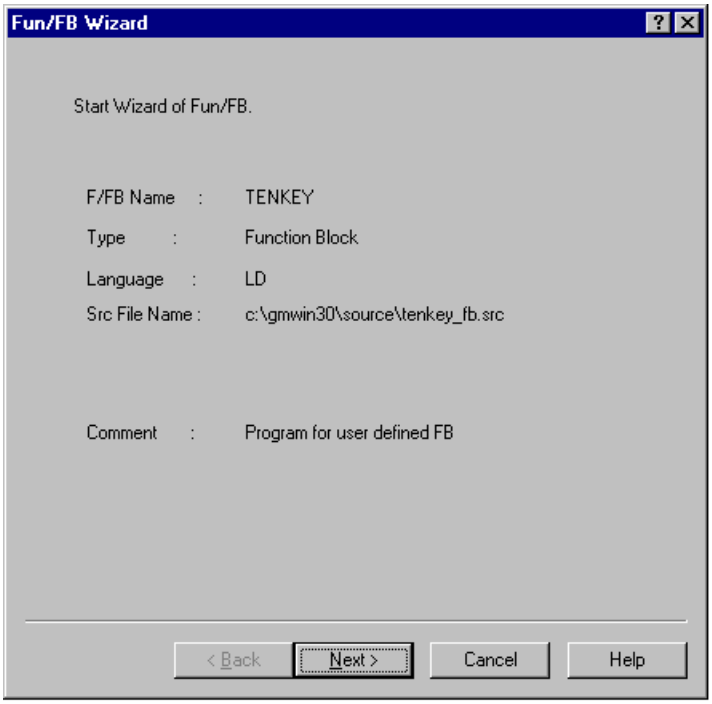
10.3.2.4. Compile a Function Block Program

□ If you finish creating a program, make an execution file by selecting ***Compile – Compile*** in menu.



10.3.2.5. Function Block Program Wizard

□ If the compiling is finished without an error and warning, ***Fun/FB Wizard*** dialog box appears automatically to insert the compiled function block into the library.

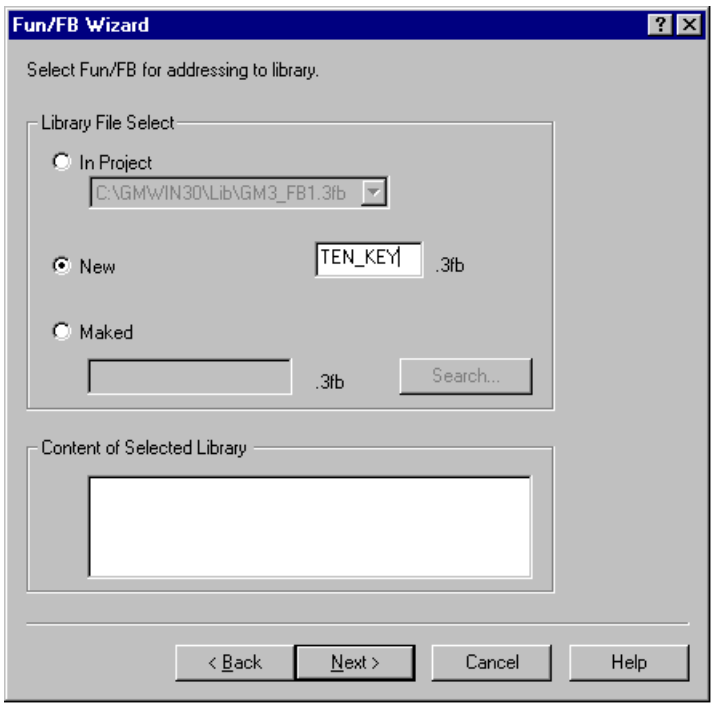


□ If you select ***Cancel*** button in the above dialog box, it stops inserting the compiled function block into a library and project. If necessary, you can make a ***User Defined Library*** for the compiled function block by selecting ***Project - Library Manager***.
Similarly, you can also insert the compiled function block into a project with selecting ***Project - Insert Library*** in menu.

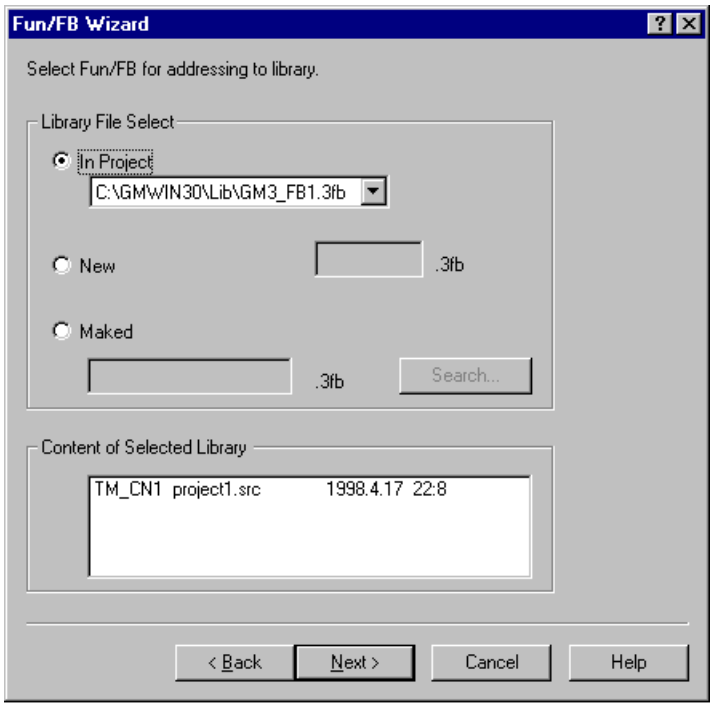
□ If the compiling is finished with warning, the following message appears.
This message asks whether you continue the function program wizard after correcting the warning.

□ The first dialog box of function program wizard shows various information.

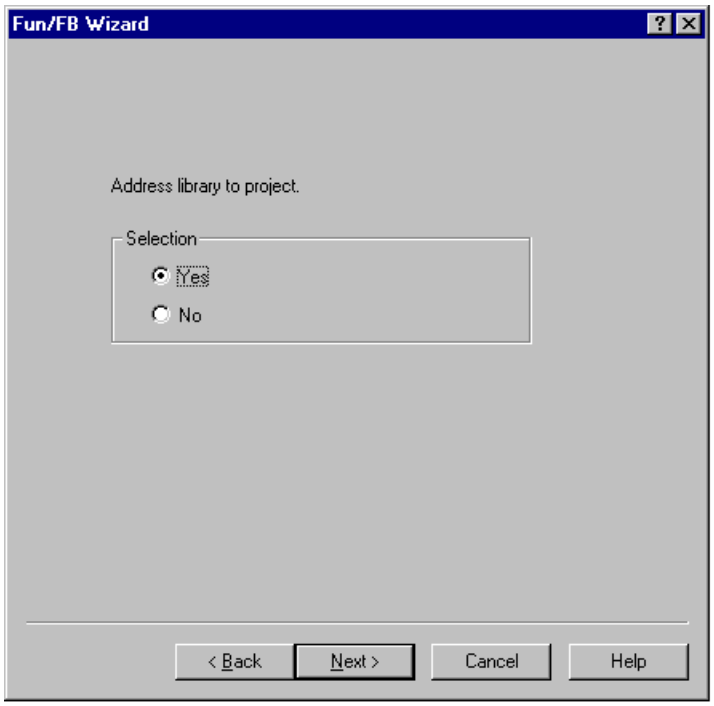
□ Click ***Next*** button in the first dialog box of the function program wizard.



- In ***Library File Select*** of ***Fun/FB Wizard*** dialog box (the second dialog box), enter new created library name in ***New*** input text box. (GM3_FB1)
- If you want to insert new created library into user defined library that exists already in project, click ***In Project*** button and select a desired library file.
- If you want to insert the library into user defined library that does not exist in the project, select a desired library file by clicking ***Made*** button.



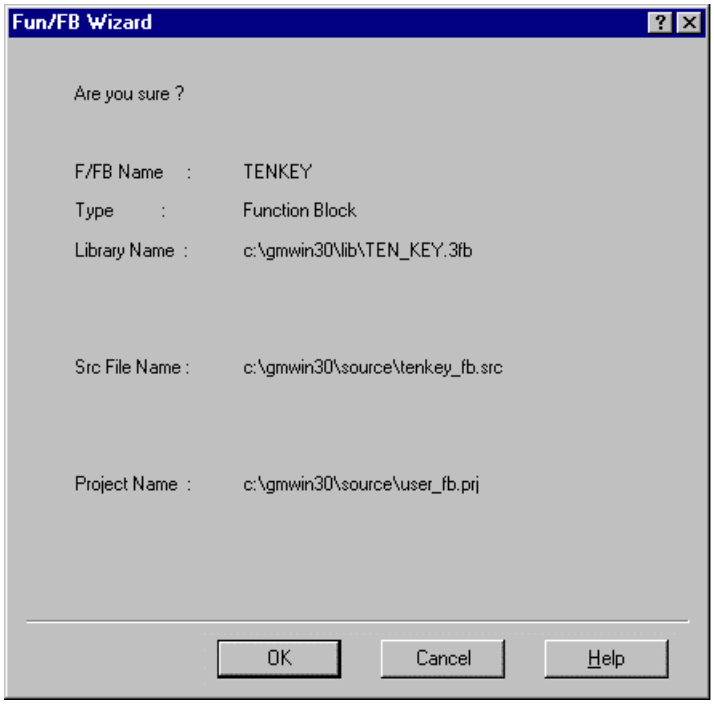
- If you finish selecting a file, click ***Next*** button.



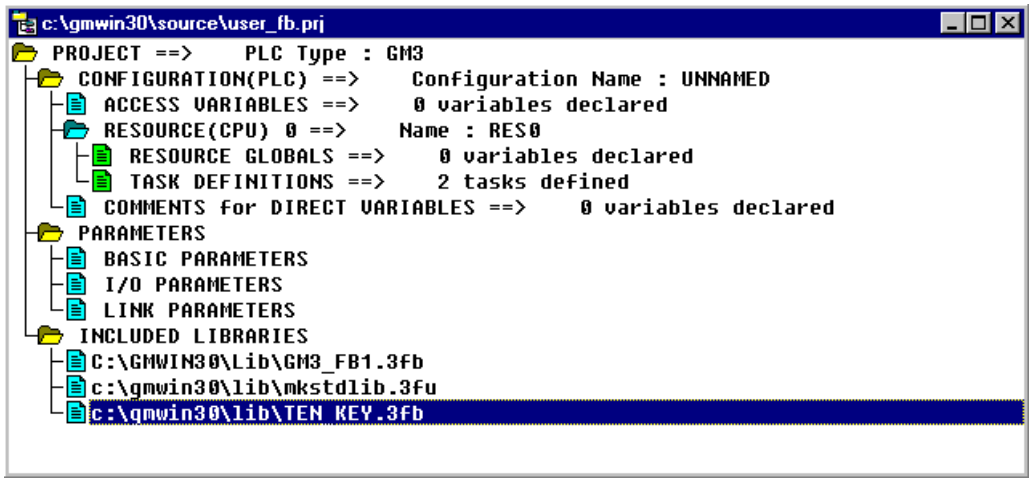
□ In this ***Fun/FB Wizard*** dialog box, it is determined whether you insert the library, which has function block, into the current project.

If the library selected in the previous dialog box exists in project, the content of project is automatically updated.

□ Select ***Yes*** button and enter ***Next*** button.

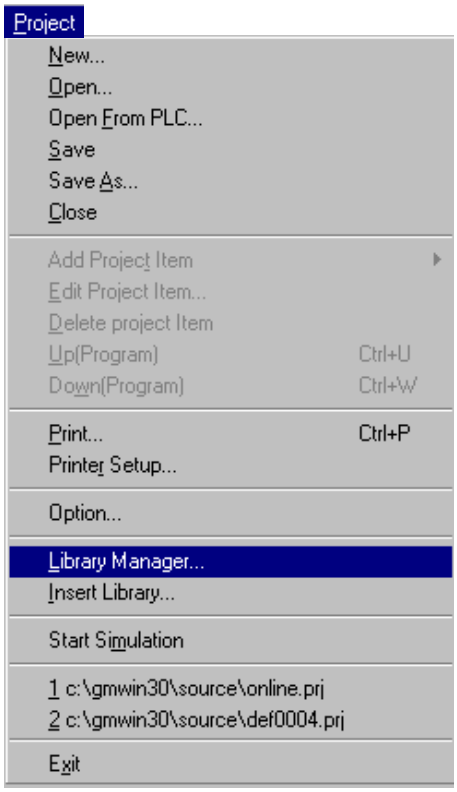


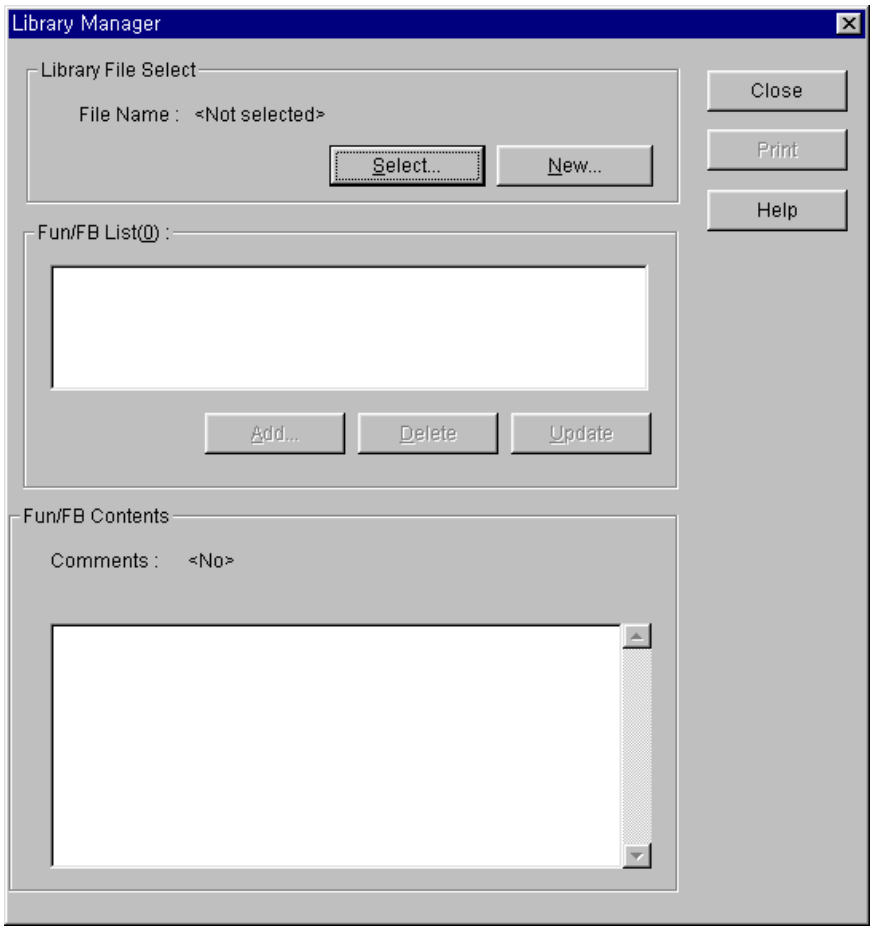
□ Click ***OK*** button.



10.3.3. Library Manager

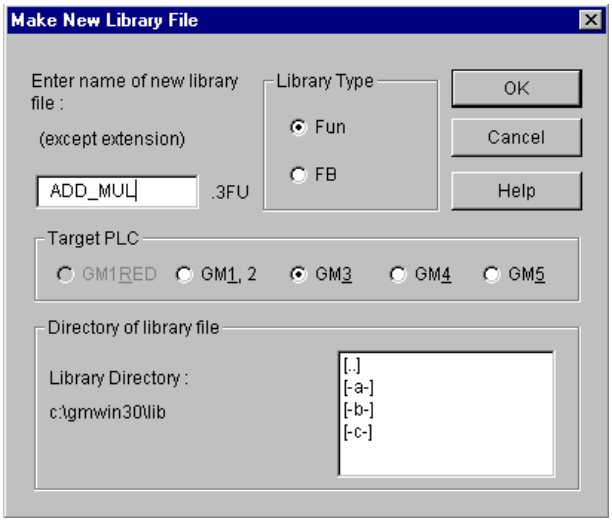
In Library Manager, you can create and edit library file that is not concerned with project.

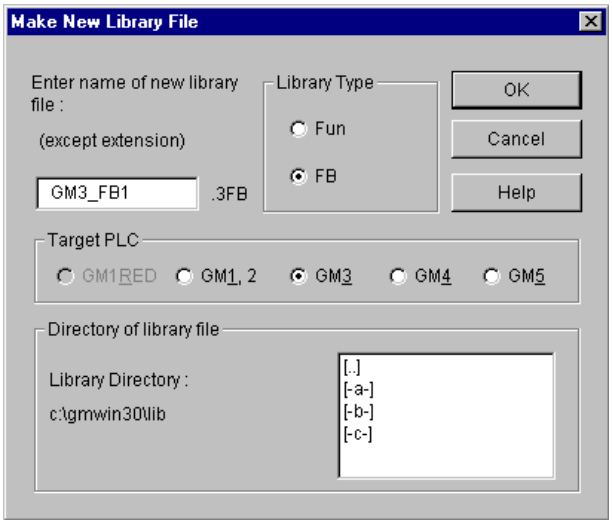




10.3.3.1. Create a Library File

- Select ***Project - Library Manager*** in menu.
- Click ***New*** button in the library dialog box.
- Enter a library file name. (less than 8 characters)

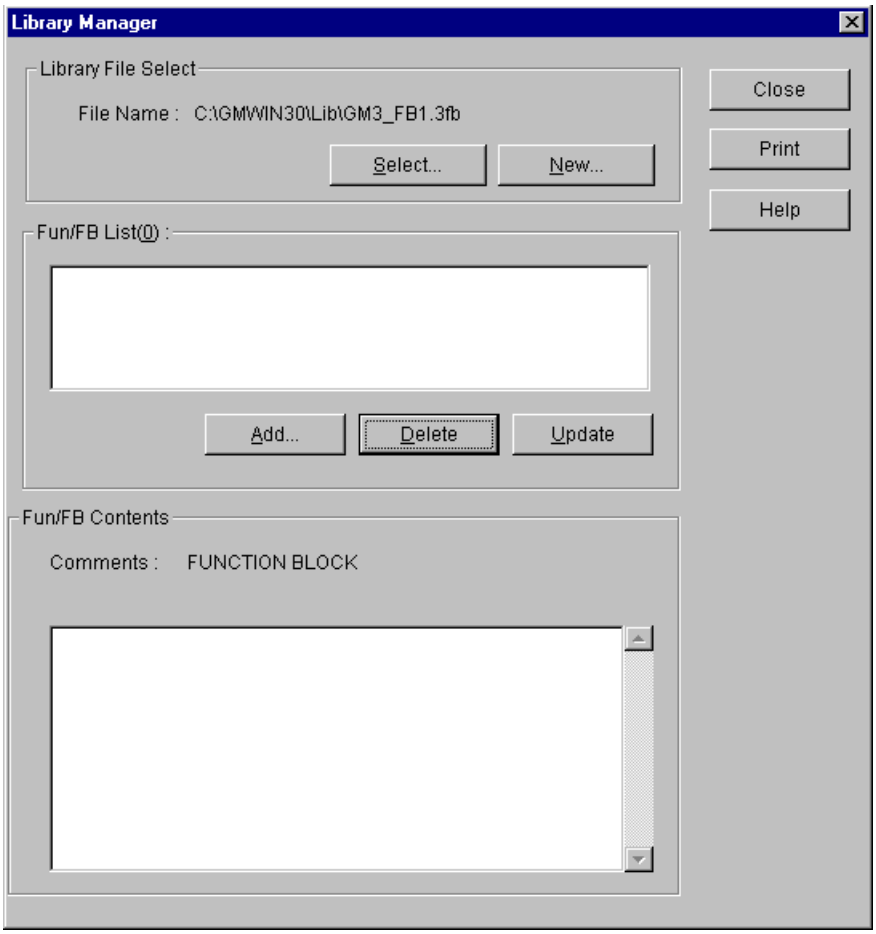




□ With library type option button, you can select the type of library to create newly.

□ With objective PLC option button, select a PLC to which the library is applied.

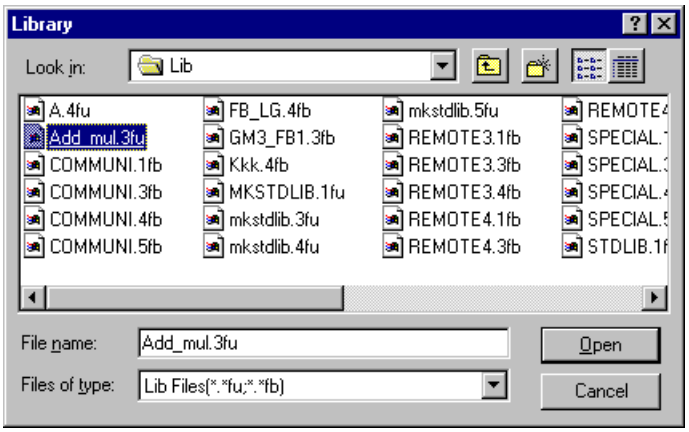
□ Select a directory in where the library file will be. At this time, it is important to input the same directory that fixed in ***Directory of Library file*** of option.



□ Click ***OK*** button and library manager dialog box appears.

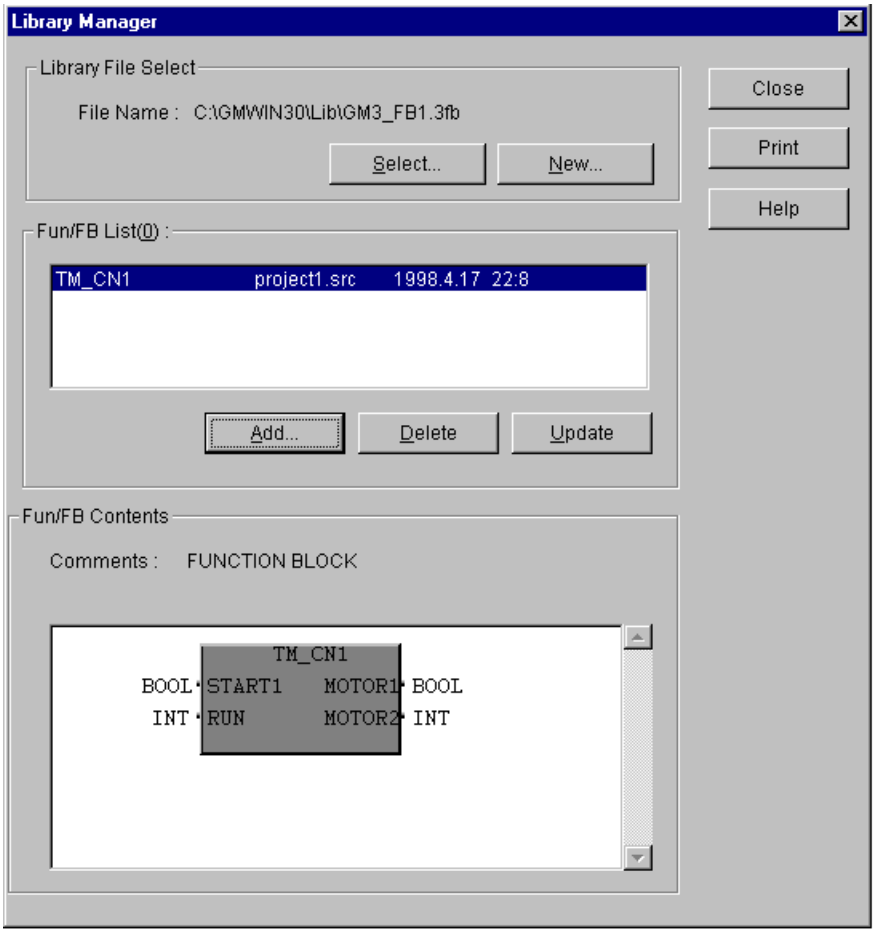
10.3.3.2. Select a Library File

□ Click ***Select*** button in ***Library Manager*** dialog box.



□ After selecting the library file that you want to edit, click ***Open*** button.

□ Then the entire function / function block in selected library file appears automatically in ***Fun / FB List***.



10.3.3.3. Add a Function / Function Block Object File

□ Enter ***Function / Function Block File*** to add in ***Add Function / Function Block*** dialog box and click ***OK*** button.

10.3.3.4. Delete a Function / Function Block Object File

□ In ***Fun/ FB List*** in ***Library*** of ***Library Manager*** dialog box,
select function / function block that you want to delete and click ***Delete*** button.

10.3.3.5. Update a Function / Function Block Object File

□ In ***Fun/FB List*** in ***Library*** of ***Library Manager*** dialog box,
select function / function block that you want to update and click ***Update*** button.

Chapter 11 Option

11.1. Connect Option.....11-1
11.2. Set the Directory of GMWIN 11-2
11.3. Auto Save 11-4
11.4. Set a Password.....11-5
11.5. Monitor/Debug Option.....11-6
11.6. Make Option 11-7

Chapter 11. Option

11.1. Connect Option

You should set the communication port (COM1□4) to communicate with PLC.

□ Select the ***Project-Option-Connect Option*** in menu.

□ Default Connection is RS-232C interface.

For the detail information about **Connect Option**, refer to section 1.2. How to Connect GMWIN to PLC.

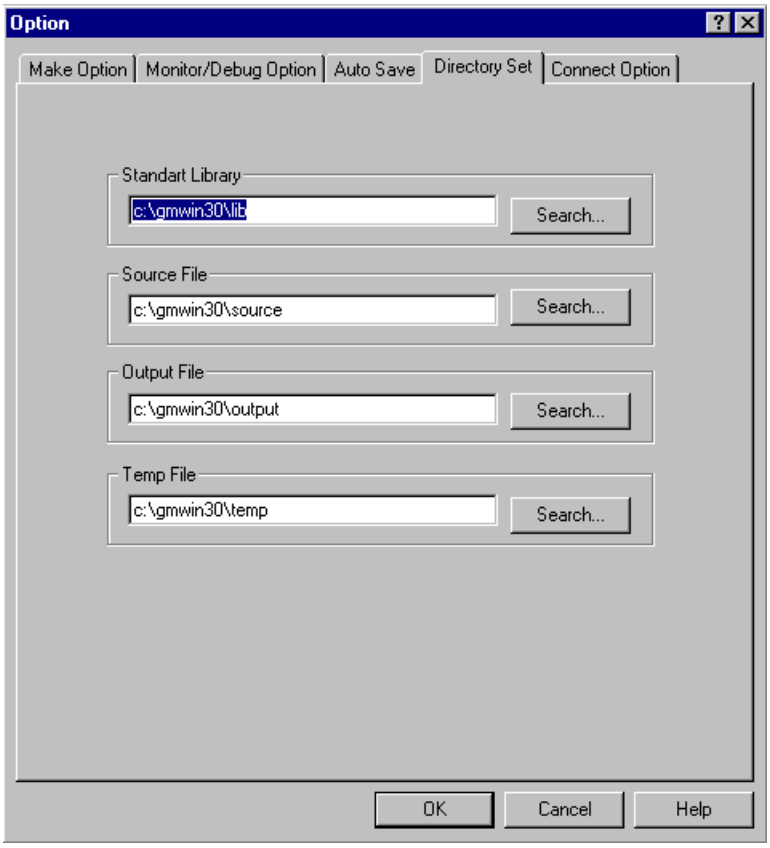
Computer Link Information

Item	Standard	
Serial Communication	RS-232C 1 Channel	Standard RS-232C specification
	RS-422/485 1 Channel	Standard RS-422/485 specification
User Defined Protocol	A user makes Communication Frame with Frame Editor and downloads to a link module, then a user can control the communication protocol by F/B of user program.	
PLC Interface	Queue Access type by 32K universal RAM	
Communication Protocol	Exclusive Protocol	It supports the multi drop 1 on 1 type with Exclusive Protocol of LGIS
	GMWI Protocol	It supports Remote PLC control with GMWIN uses by GMWIN Protocol of GLOFA PLC.1
	User Defined Protocol	Download with Frame Editor. (Set the RS232C and RS422 independently)
Data Type	7 or 8	Download after setting in the Editor (Set the RS232C and RS422 independently)
	1 or 2	
	1	
	Even/Odd	
Channel Selection	Select Independent Channel/Dependent Channel in Editor	
Synchronization Type	Supplement Synchronization Type	
Transmission Speed(BPS)	You can select among the 300/600/1200/2400/4800/9600/19200/38400	
Modem Communication	RS-232C Channel connection available	
System Configuration	1:1, 1:N, N:M configuration available (N + M 32)	
Transmission Range	RS-232C : Maximum 15M (Extension by Modem is available)	
	RS-422 : Maximum 500M	
Diagnosis	Loop-Back Test Mode	Test 1 / Test 2 Mode
	Operating status is displayed by 16 LED Display in the Run.	

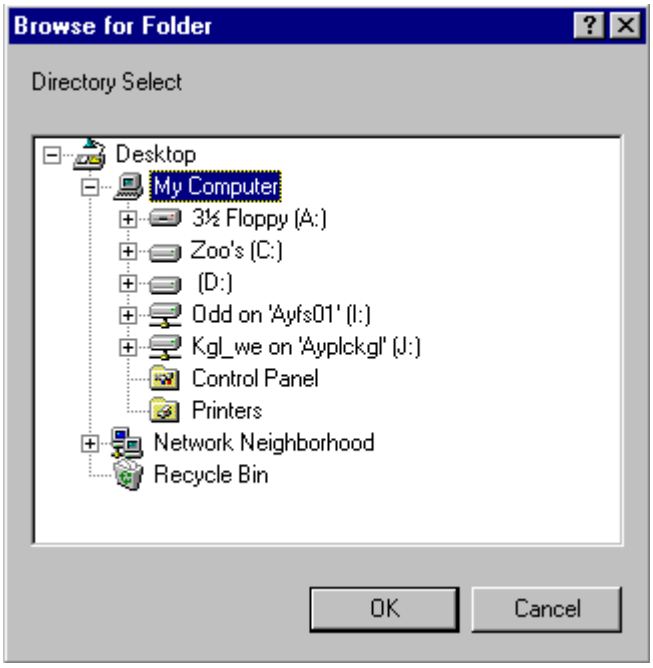
11.2. Set the Directory of GMWIN

You can set directories for the files to be created in GMWIN.

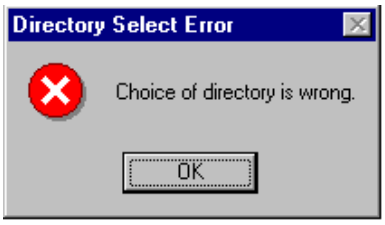
- Standard Library Directory : Libraries for GMWIN are located in this directory, and User Defined Libraries also do.
- Source File Directory : In Source File Directory, GMWIN saves source program files of program, function, function block and etc.
- Output File Directory : Object files are saved in this directory, which are created when source file is compiled.
- Temporary File Directory : GMWIN saves temporary file in this directory during the execution.
- Select ***the Project-Option-Directory Set*** in menu.



- To find the directory which the file is already entered or to create a new file, click ***Search…*** button.



- If you finish the setup of the directory, click ***OK*** button.
- If the directory that you select for the standard library does not exist, the following error message box appears.



- Enter the directory to save source file in the ***Source File*** input text box, and click ***OK*** button.
- If the entered directory does not exist, the following error massage box is displayed. If you want to create the entered directory, click ***OK*** button. Otherwise click ***Cancel*** button.

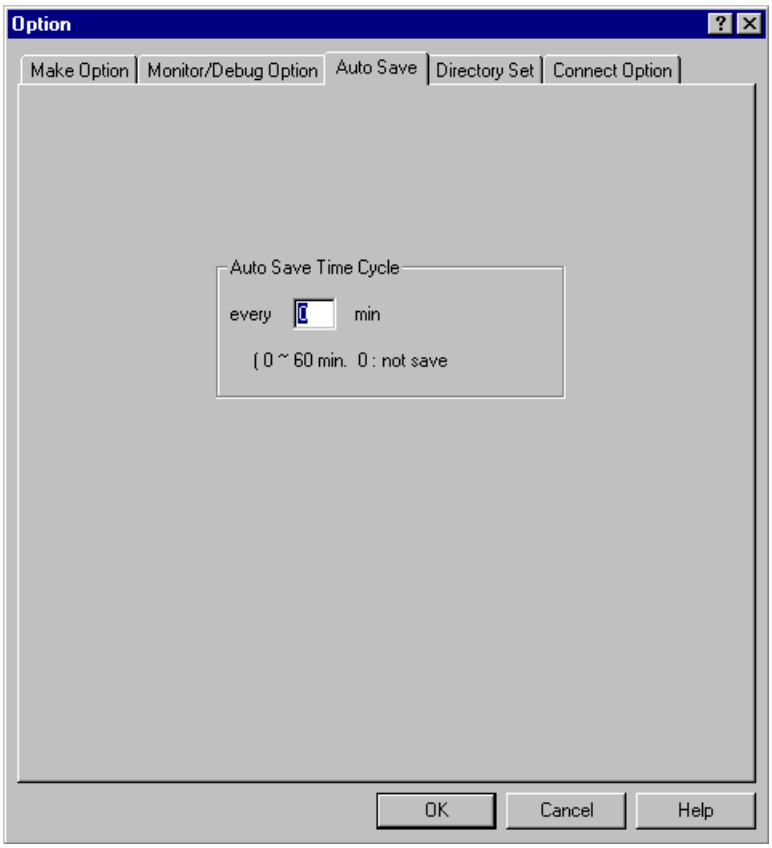


- The input method of ***Output*** file/***Temporary*** file is the same as input method of source file.

11.3. Auto Save

This function is to set the time interval for Auto saving.

Automatically saved file is saved with ".ASV" file in the current directory. The file is automatically deleted when the program window is closed. Therefore if a program cannot be saved by "Program Error" before program is not saved, you can recover some program by loading auto saved file.



□ Select the ***Project-Option-Auto Save*** in menu.

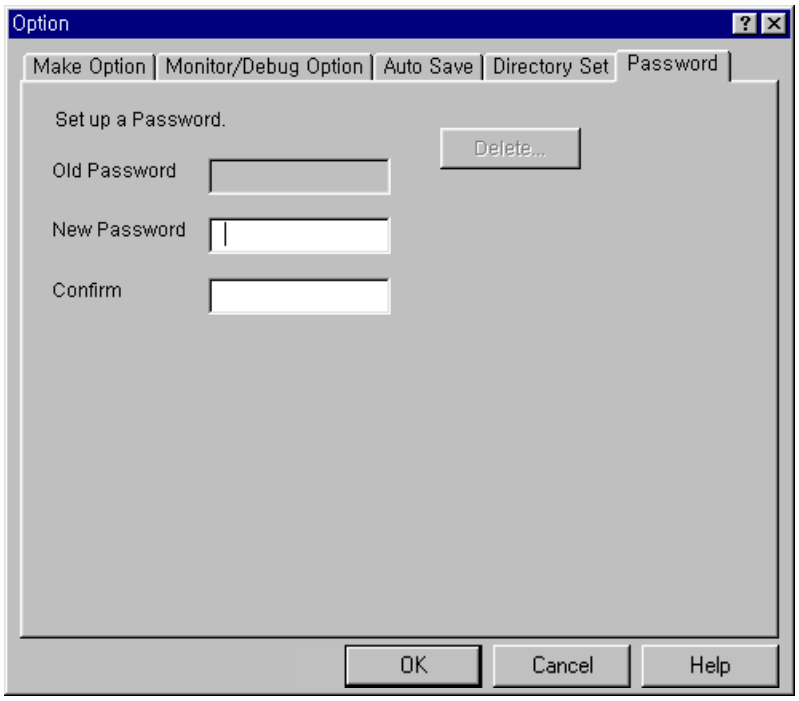
□ Enter the time interval for auto saving.(1 to 60 minutes is available, and if you enter '0', auto save function is disabled.)

□ Click ***OK*** button.

11.4. Set a Password

To set a password,

□ Select the ***Project-Option-Directory-Set*** in menu. (It is available only in Online mode)



□ Select the ***Password*** Tab, and enter the previous password, new password and confirm the password.

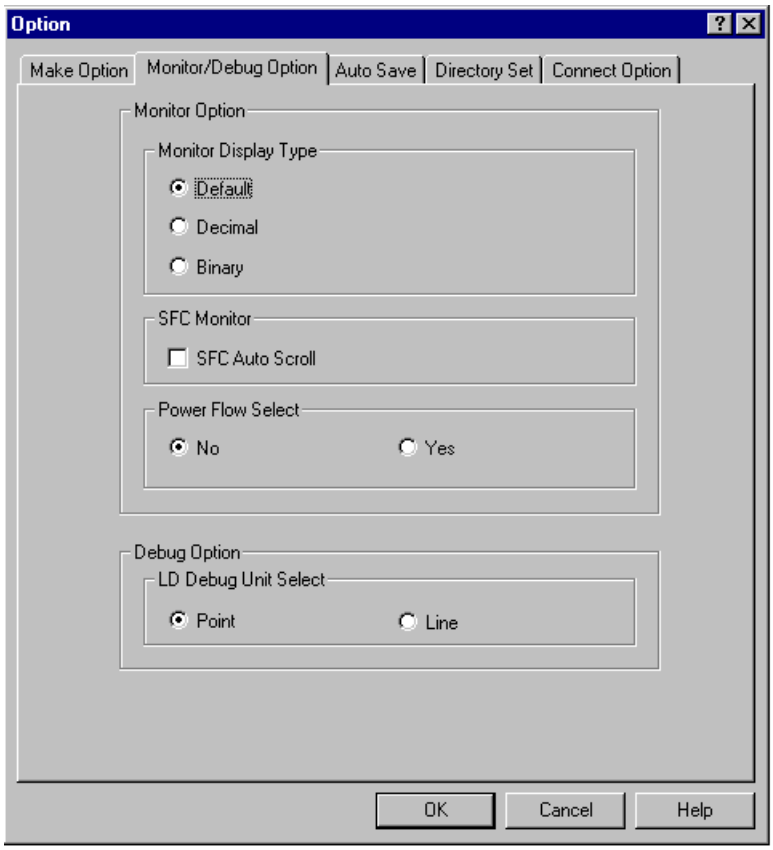
□ Click ***OK*** button.

□ Click ***Delete*** button to cancel the password setting.

11.5. Monitor / Debug Option

To set the whole options for monitoring,

□ Select the ***Project-Option-Monitor/Debug Option*** in menu.



In monitoring mode, it allows you to change the display type of monitoring variable.

□ Select the ***Project-Option-Monitor/Debug Option*** in menu.

□ Select the desired display type in the ***Monitor Display Type***, click ***OK*** button.

Example) If you select the ***Default*** in ***Monitor Display Type***,
The value of variable monitoring is displayed as hexadecimal type like "16#*".

SFC Auto Scroll Option

□ If you check the ***SFC Auto Scroll***, it scrolls automatically with monitoring position.

Power Flow View Option

□ When you debug LD, if you want to view the power flow, select ***Yes*** button.

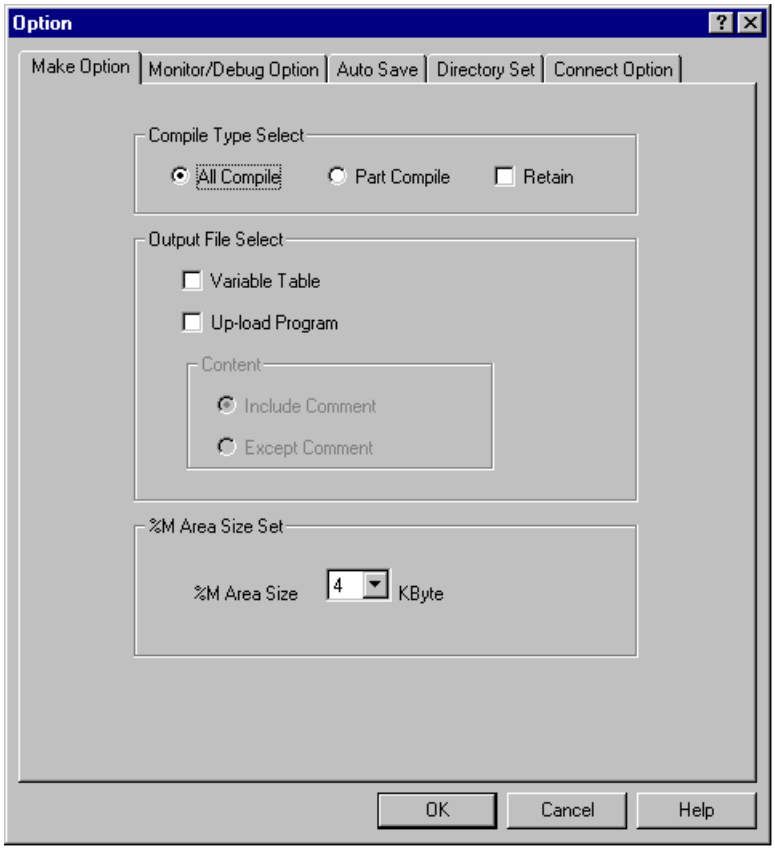
Debug Option

□ When you debug LD, you can select the ***Point*** or ***Line*** in ***Debug Option*** menu.
If you select ***Point*** option, the debugging for the program is executed by one point.
If you select ***Line*** option, the debugging for the program is executed by one line.

11.6. Make Option

It allows you to select compile type, to select output file and to set the size of %M area in ***Make*** option.

□ Select the ***Project-Option-Make Option*** in menu.



□ ***Compile Type Select*** allows you to set the method of compile for the source program.
□ If you select the ***Compile All*** in the ***Compile Type Select***, GMWIN compiles again from the first line regardless editing a source program.
□ If you select the ***Part Compile*** in the ***Compile Type Select***, GMWIN compiles the updated part.
□ You can select making variable table or upload program for the output file in ***Output File Select*** .
□ You can select the size of %M in ***the %M Area Size Set***.

Chapter 12 Upload

12.1. Make Upload File 12-1
12.2. Write to PLC (Download) 12-2
12.3. Read from PLC (Upload)..... 12-2

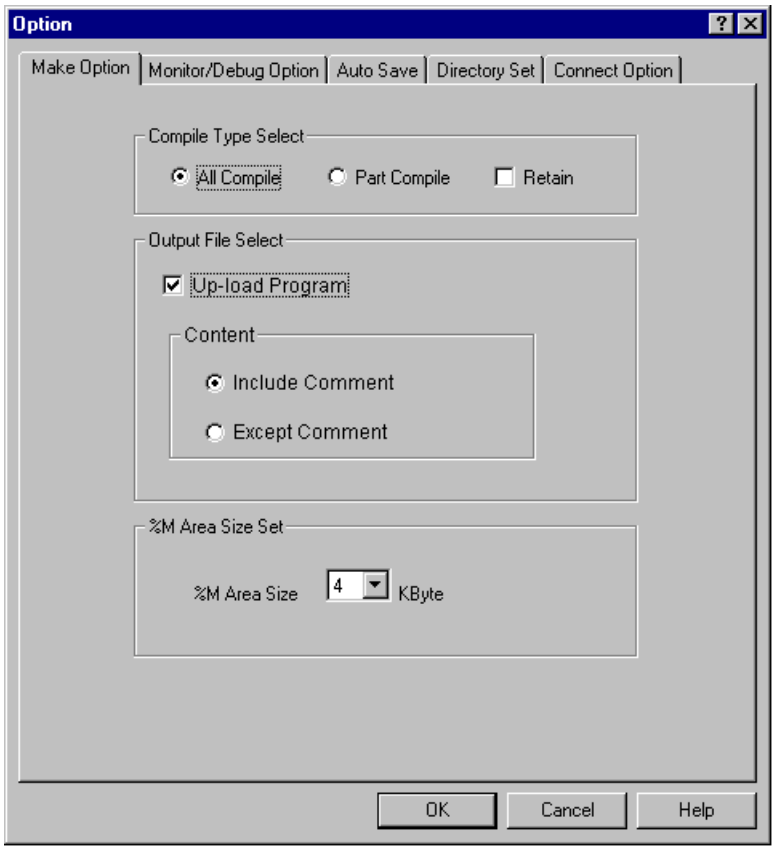
Chapter 12. Upload

It saves a compressed project file and source file to RAM(program area) or flash memory of PLC, and uploads a program from PLC.

12.1. Make Upload File

You can make an upload file by selecting Make Option menu.
An upload file includes project, program, function block and user define function used in program.

- Select the ***Project-Option*** in menu.
- Check the ***Up-load Program*** in ***Make Option*** dialog box, and click ***OK*** button.



Then it creates the execution file for PLC program and Upload File.

12.2. Write to PLC (Download)

Select the Upload program when writing a program to PLC.

□ Select the ***Online-Write*** in menu.

□ Select the ***Parameter and Program, Upload Program*** in the ***Write*** dialog box.



According to the program size, it runs as below.

Program Size	The place to save upload program
Size of (Execution Program + Upload Program) < Size of Program RAM	It writes to RAM in CPU
Size of Program RAM < Size of (Execution Program + Upload Program)	If device has flash memory, it writes to flash memory after query to user

12.3. Read from PLC (Upload)

□ Select the ***Project-Open From PLC*** in menu.

It makes a project, program file and user library after reading upload file from PLC, then it opens a project.

If there is the same name of project or program in GMWIN, it overwrites, or is saved to another directory or as another name that a user assigned.

Chapter 13 Online Edit

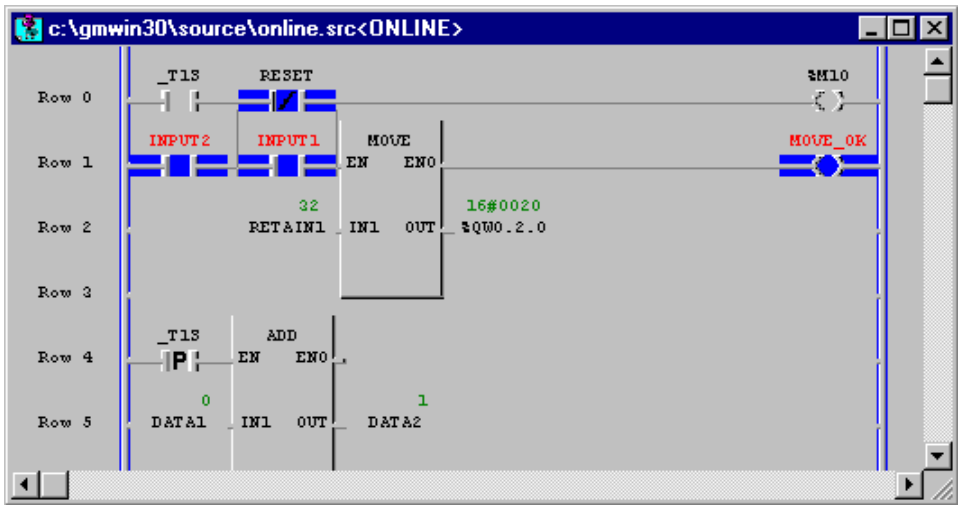
13.1. Start Online Edit 13-1
13.2. Write for Online Edit 13-2
13.3. Cancel Online Edit..... 13-2
13.4. Files for Online Edit 13-3
13.5. Available Items for Online Edit 13-3
13.6. Non-available Items for Online Edit 13-3

Chapter 13. Online Edit

In Run Mode, You can edit a program without changing the PLC Mode to Stop Mode.

13.1. Start Online Edit

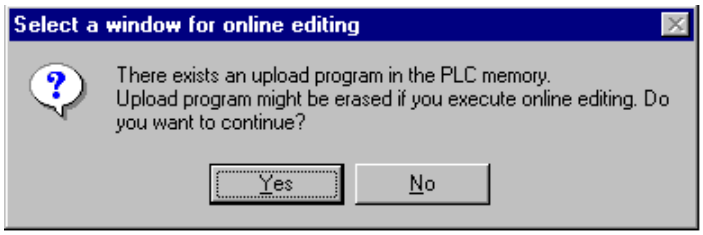
To edit the program in Run mode, the program to edit must be identified with the program in the PLC.
. Select the program.



. Select ***Online-Start Online Edit*** in the pull-down menu.

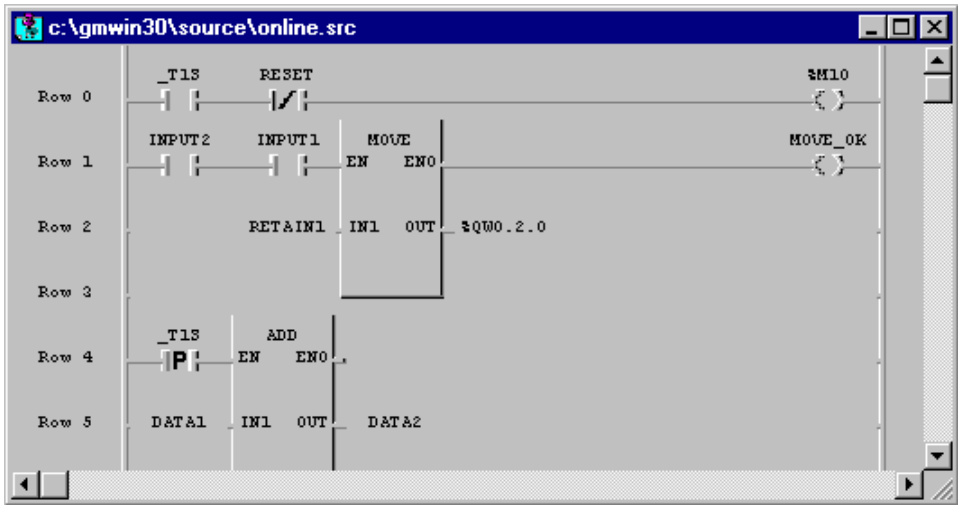
At this moment, If PLC Mode is Monitoring Mode, only the program for online editing is changed to Edit Mode.

. If there is the Upload program in PLC, the following message appears.



. If you click ***Yes*** button, the Upload program is downloaded to PLC after the online editing.
But, the PLC must have a enough memory space.

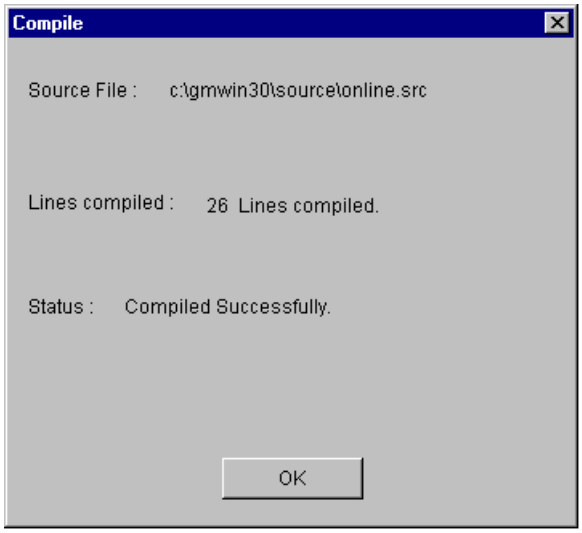
. Edit the program.



13.2. Write for Online Edit

To write the edited program to PLC,

. Select ***Online-Write for Online Edit*** in the pull-down menu.



. If an error is occurred in this step, the program can't be downloaded to PLC.
So, edit the program again after selecting ***Online-Write for Online Edit*** in the pull-down menu.

13.3. Cancel Online Edit

To cancel the online editing and return to the previous program,

. Select Online – Cancel Online Edit in the pull-down menu.

13.4. Files for Online Edit

For Online Edit, the following files are necessary.

..In Gmwin30\Source directory, <Program Name>.SRC, <Program Name>.PCI,
<Project Name>.PRJ

..In Gmwin30\Output directory, <Project Name>.EW**m**, <Program Name>.OP**n**
(**m** means CPU number for Multi-CPU in GM1, **n** means the type of PLC: 1 ~ 5.)

. Besides SRC, PRJ files, Other files are created automatically when compiling.

13.5. Available Items for Online Edit

. Edit, Add or Delete for Contacts and Variables

. Edit for the directly used data in Program

. Add initial Variable, Retain Variable
Initial Value and Retain Variable are applicable in Mode change (from Stop to Run mode).

. Add or Delete Rung

. Edit Parameter
Only Basic Parameter and High Speed Link Parameter (including Link Enable) Not available for I/O Parameter

. Add Jump or Label

. Delete Variable in Variable List

. Change Memory Allocation for Variable
Example) AT %I0.2.0 ==> %I0.2.1

13.6. Non-available Items for Online Edit

. Change of Variable Property
Example) Standard Variable ==> Variable with Initial Value,
Local Variable (VAR) ==> Global Variable (VAR_EXTERNAL)
BYTE ==> WORD
Initial Value declared as Initial Value can be changed.

. Edit, Add or Delete Global Variable

. Add or Delete Program Block

. Add or Edit User Defined Function/Function Block
(Available for Function or Function Block for already used in the Project)

. Edit many rungs at the same time)
<No. of edited Rung + No. of Label included in edited Rung> must be within 256 numbers

Chapter 14 Simulation

14.1. Applied PLC and Specification for PC 14-1
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Chapter 14. Simulation

GMWIN allows you to simulate the program logically you've created without PLC or I/O system.

14.1. Applied PLC and Specification for PC

14.1.1. Applied PLC

GLOFA GM1, GM2, GM3, GM4, GM5

14.1.2. Specification for PC

- O/S : Window 95
- Memory : 16M bytes or more
- HDD : 30M bytes or more

14.2. Create a Program

Creating a Program is same as the program in GMWIN.

According to the type of program, the number of program is limited as below.

. Scan Program: Max. 256 Programs

. Task Program: Single : Max. 32 Programs

Interval : Max. 16 Programs

Interrupt : Max. 16 Programs

14.3. Available Program for Simulation

. Program : All programs defined in a Project of GMWIN

. Standard Function/Function Block

(Only Function/Function Block of A/D and D/A modules are available for simulation)

. User Defined Function/Function Block

(Not available for Function/Function Block having special functions)

. If the compiled code for Simulator does not exist, You must compile the program again.

14.4. Start Simulation

To start Simulation,

. Select ***Project- Start Simulation*** in the pull-down menu.

. When you select ***Start Simulation***, GMWIN executes Compile+Link+Connect+ Download+ Stop+Monitor Start Functions simultaneously.

. Run Mode in Simulation : Impossible to edit Monitor Mode

. Debug Mode : Keeps the current data of the previous mode

. Timer : Run Mode :: PC Clock base

. Debug :: Accumulated as much as the running time.

14.5. Build an I/O module

. If I/O variables or Direct variables are used in editing a Program, they are displayed in the appropriate base and slot when starting Simulation.

Data Type	16Points	32Points	64Points
X	0 ~ 15	16 ~ 31	32 ~ 63
B	0 ~ 1	2 ~ 3	4 ~ 7
W	0	1	2 ~ 3
D	X	0	1
L	X	X	0

. I/O Modules are set as 16 points as default.

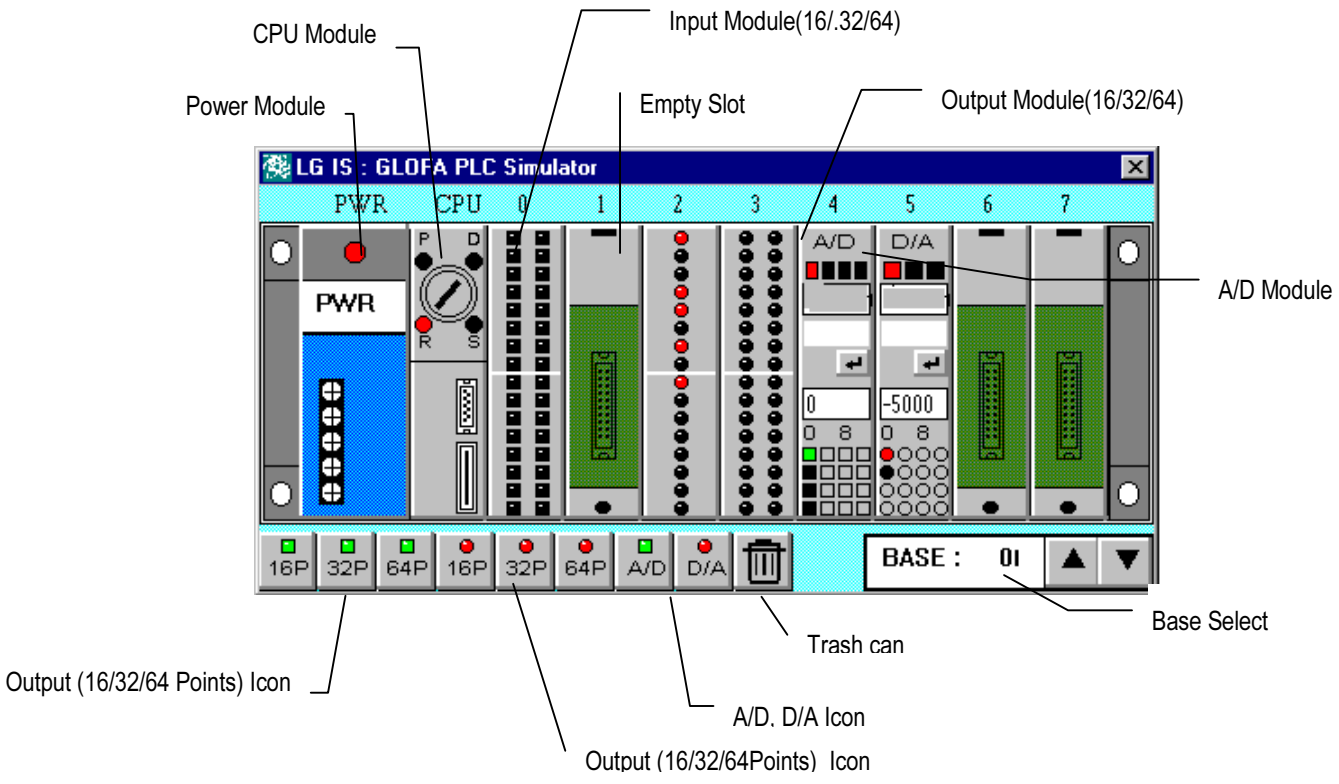
If input and output contacts are used together, draw a output module.

16/32/64 I/O modules are all applicable for Input or Output module.

A/D module : Square (ON:GREEN / OFF : BLACK)

D/A module : Circle (ON:RED / OFF : BLACK)

Base : Supported as type of combination box



14.6. Add/Remove Module

To add or remove a module, the PLC mode must be **Stop** mode,

. Add : Drag and drop the icon which you want to add on the appropriate slot

. Remove : Drag the appropriate slot and throw it to the trash can()

14.7. Simulation of I/O Module

To turn the Input/output contacts ON/OFF,

. Click the appropriate contact on the I/O module directly.

14.8. Power Simulation

This function is only available in **Run** mode.

. When Simulator begins to start, the power gets On.

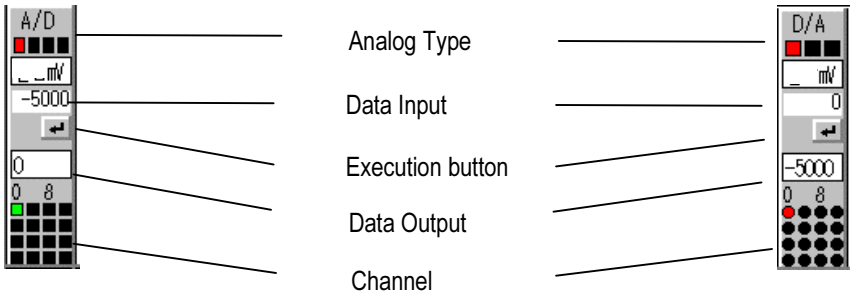
. If you click the red lamp on the power module, the power gets Off and gets On in a few moment.

This function is almost same as the power turns to be Off in a second.

If there is a program defined as Hot Restart, the program is executed.

14.9. A/D, D/A Simulation

14.9.1. Shape



- Analog Type : Kind of A/D Input range, D/A Output range
- Data Input : Input box for Analog data of A/D or digital data of D/A
- Execution button: Converted to the inputted data
- Data Output : Display the converted data
- Channel : Currently selected channel .

14.9.2. Simulation

. A/D, D/A Simulation retains the data such as base, slot, channel and data type among the data set in the initial function block (AD?INI / DA?INI) for A/D, D/A module. Others are ignored.

. If you mount the A/D or D/A module on the slot, which is not used in the program, the base and slot are effective. But, the data type is all '0' i.e., DT=0 (0~16,000) and all channels are supposed to be used

. After entering the data in data input position, click execution button.

14.9.3. Analog type of A/D, D/A module

. A/D Input : +- 5V, +-10V, +-20mA, 4 ~ 20mA

. D/A Output : +- 5V, +-10V, 4 ~ 20mA

14.9.4. Change of Analog type and Display of converted data by channel

. Change of analog type is only available in Stop mode

. The selected channel is changed into the property of changed channel.

. Change of channel is available in all modes and the converted data of the changed channel is displayed.

. According to each channel of A/D module, the kind of analog can be set.
If a channel is changed, the property of the channel is also changed.

. In case of D/A module, Only one type of analog for all channels is available.
(You can't setup the type of analog by channel.)

14.9.5. Analog Input of A/D module and Display of converted data

. Input Unit - Voltage: mV, Current : uA

. Input value for the input data window in A/D module is analog data.
The value can't exceed the range of the current analog type. If the value exceeds the maximum upper limit, the data will be the maximum upper limit.
Example) Let's say Analog type is +-5V(DT=0). If inputted analog value is –6,000, the data is regarded as -5,000. The converted digital data is displayed as '0'.

14.9.6. Digital Input of D/A module and Display of converted data

. Input Range : It is up to Data type (DT) of D/A module.

DT = 0 : 0 ~ 16000, DT = 1 : -8000 ~ 8000

. Input value for the input data window in D/A module is digital data.

The value can't exceed the range of the current digital type. If the value exceeds the maximum upper limit, the data will be the maximum upper limit.

Example) Let's say Analog type is +-5V(DT=0). If inputted digital value is 17,000, the data is regarded as 16,000 and the converted analog data is displayed as 5,000.

A/D Simulation Step

1. Add A/D module	: Stop Mode
2. Change of Analog type	: Stop Mode. Executes whenever it is necessary.
3. Run	: Executes whenever it is necessary.
4. Select Channel	: Display analog type and converted data
5. Enter the analog value	: consider the input range
6. Click execution button	: Execute the conversion!
7. Display the converted data	: Display the digital data according to DT
1 ~ 6 Step	: Executed by user
7Step	: Executed in the Simulator

14.10. Function by Online menu

Refer to Chapter 7. Online for the detail information.

14.10.1.Monitor

. Program Monitor

. Variable Monitor

. Time Chart Monitor

. I/O Monitor

14.10.2. Forced I/O Setup

. I/O Flag, Data Setup

. Forced I/O Enable

14.10.3. Data Clear

. Only available in Stop mode.

. Clear the current data into zero.

14.10.4. Reset

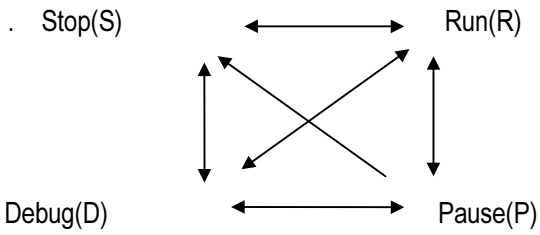
. Reset/Overall Reset

14.10.5. Mode Change

. GMWIN : ***Online – Mode Change***

. Simulator : Click each mode in CPU module.

. Stop → Pause mode is not available. .



14.11. Debugging

Refer to Chapter 9 Debugging for the detail information.

. GMWIN : ***Debugging***

Simulator : Click Debug (D) Mode in CPU Module

. Debug function in Simulator is same as GMWIN excluding Variable Break.

.. When each mode is changed to Debug mode, the current value is retained.

. Debug Start/Stop

. Debug Run/Pause

. Step Over/Step In/Step Out

. Run to Cursor

. Add/Remove Break Point

. Break Point List/Condition

. Task Enable

14.12. Stop Simulation

. GMWIN : ***Project – Stop Simulation***

Simulator : Click (X) to close the simulator window.

Appendix

A. GMWIN Error Code A-1
B. GMWIN Glossary B-1

A. GMWIN Error Code

A-1

♦Warning! Cannot find library files. You should reassign library directory or copy library files in that directory!

It is the case that this library file is not in this directory when you open project-file.

♦ HS Link Parameter Set Error

Download after making express link parameter again.

♦ Abnormal HS Link parameter

It is the cases that download fails because error causes while you download the program, so you should download again.

♦ Abnormal Common RAM

Reboot the PLC.

♦Current variable type should be same as one before left parenthesis.

Data type of current Result in IL has to continue before beginning bracket and after ending bracket.

♦This Operator cannot be placed in parenthesis.

LD,LDN,JMP(C,N),CAL(C,N) and etc. cannot exist inside the bracket in IL, so delete it.

♦Cannot define any more global variables.

The maximum number of global variable is 300.

♦ Abnormal Basic parameter

In case of download failure during program download, do download again.

A-2

♦Cannot declare local variables over 32kBytes. Delete redundant variables.

PLC cannot use internal memory over 32kByte, so Delete the variable that is not used among the declared variable or reduce the number of variable.

♦Wrong Single variable name is given.

It is the case that wrong single variable name is given if you select Single task.
(See also 4.4.7 task definition in GMWIN user guide)

♦Single variable task number over.Maximum number : N

Reduce the number with deleting internal contact task in the task definition of the project window.

♦Task number for Single task is between 48 to 63.

The task number to come under the Single task is 48 to 63.
(See also 4.4.7 task definition in GMWIN user guide)

♦Too many input or output parameters declared.

The maximum size of input/output parameter is 32

♦The given FB instance name refers to a different FB.

It causes when instance name of the function block has been used with another instance name of the function block. You should give different names to each function block.

♦Cannot add resources any more.

The maximum number of resource is 4 in case of GM1.

♦Cannot add any break point. If you want to add a break point, delete another one.

The maximum number of break point is 32.

A-3

♦No more In/Out variable can be added.

The maximum number of input/output variable is 32 each.

♦No more programs can be added.

The maximum number of the program item is 180 in case of GM1~4 , 90 in case of GM5.

♦Data size over error.. All: M byte, using: N byte.

It is the case that the memory size(N byte) which is used in the project exceeds (M byte) which is permitted in PLC. You should change your PLC version to the upper PLC version or reduce the declared variable (global variable or local variable which is declared in the program)in the program.

♦Data type and Direct variable type are mismatched.

It is the case that X, B, W, D, L which indicate the memory size do not match Data type, if you select user define of memory allocation.

♦Data type of current result is not determined yet. Use 'LD' operator.

It is the case that you make program, which has the integer or the direct variable, as the object without using LD command after CAL command in IL. Use LD command because you cannot know the datatype of the object after CAL command.

♦Cannot progress compiling because data type is not determined.

Use the variable that has the data type or start the program from LD.

♦Wrong data type is assigned.

It is the case that the data type ofthe object and operator do not match when the object is given as variable.

♦ Abnormal Data RAM

Reboot the PLC.

A-4

♦Library file<library file name> not found

It is the case that the library file cannot be found. Confirm

♦Can not open <file name> of the library file.

Confirm the existence of the selected library-file on the option in the declared directory.

♦Can not open <file name> of the library file.

Confirm the existence of the selected library-file on the option in the declared directory.

♦Library-file error

Library-file is damaged. Copy backup-library-file to library-directory again.

♦Can't find object in that library file.

Confirm the existence of the object-file that is included in library on setting directory.

♦Cannot open library file(s).

Confirm the existence of the selected library-file on the option in the declared directory.

♦This function/function block is not in the library.

It is the case that the used function/function block is not in the library, which is inserted in the present project. Insert a related library file and compile/make again.

♦F/FB is not registered in library

The function or the function block that is using now is not the basic library or the function/function block which is inserted in the project. It happen when the inserted library is deleted on the project after editing LD. Insert the function which is using now or the library which has function block.

♦Cannot find function block '<function block name>' from library files.

It is not inserted that the library-file that has function-block that is assigned in library insert list

In certain case, some CPU has not this function block, so please attend using function block.

A-5

♦¨Cannot find the function block in the library.

It is the case that the library file that has function block that has a proper function block in the library insert list of the project now. In certain case, some CPU has not this function block, so please attend using function block.

♦¨ This is Rung Comment area

It causes when insert the command to the area of rung comment. Command cannot be inserted in the rung comment area.

♦¨ This is Rung Comment area. Only line insertion is allowed here.

It causes when insert the command in rung comment area. It is impossible to insert and delete cells, possible to insert and delete row. If you want to delete the rung comment row, delete comment row.

♦Rung comment cannot be longer than 170characters.

The maximum size of the rung comment is 170 characters.

♦This is Rung Comment area. To delete a rung comment by menu you must delete the whole line.

You have to delete all of row to delete the rung comment.

♦The rung is too long !

The size of one rung is over 40 rows.

You should make one rung under 40 rows.

♦¨Label <label name> position error.

The label should be in front of the step.

♦Too many characters in label.

The maximum size of label is 16 characters.

♦ Same label name is used more than twice.

The same label name is used more than twice.

It is wrong that same label name exist.

A-6

♦¨ Label given cannot be longer than 16 characters.

It is the case that the label name is too long.

♦¨ The label name specified cann't be allowed.

It causes when input label name is wrong, you use a special character that is not permitted, and name exceeds maximum size.

♦Invalid label name.

If you input string that cannot be used, confirm it is the string that is declared as variable or the reserved character, and input again.

♦¨In case of jumping to the label, it is impossible to jump between the main program and subroutine program with a reference of END.

♦Label cannot be in the parenthesis.

The label cannot be in the parenthesis

♦Label must be placed at start line of rung !

The label is in the rung.

Move the label to the beginning row of rung.

A-7

♦Cannot find the label.

It is the case that the using label is not selected in JMP(C, N), SCAL(C, N) command.

♦Label Name has been duplicately defined.

Label name cannot be declared twice in the program.

♦Label is not assigned !

There is no the label name in the jump and subroutine call command.

You should label the label name to the jump or the subroutine call command.

♦Invalid resource name

You should input correct resource name for the identifier.

(See also 3.1.1. Identifier command manual)

♦ Resource name is duplicated.

It is the case that resource name is duplicated. You should give a different name.

A-8

♦Impossible to step over at the last step.

You should declare a break point to the position you want and debug.

♦ Nothing can be inserted on the last column.

It causes when you insert cells right beside the last column, a right power line. You cannot insert cells at the left to the right power line.

♦ Can't proceed the stepover.

It is impossible to proceed with step-over at the last row of the program. You can go to the next break point by using debug run or step out.

♦ Step-over cannot be done at the last line(rung) of LD program.

It is the case of trying to step over at the end of the program block, or function/function block. Step over cannot be continued, therefore try to debug run or debug run after declaration of a break point to the position you want.

♦ Abnormal Memory Module

After confirmation of fitting with memory module, reboot the PLC.

If you have an error again, replace the memory module.

♦Memory error

It is memory allocation error to write input/output information from PLC to the computer.

♦Insufficient memory

The memory is not enough; you should shut down other application and restart, or expand the memory.

♦ Memory Allocation Error

It is the case that it cannot be continued to running the tasking due to a lacking of memory. You should shut down other program that is being used and try again.

♦Insufficient memory

It is the case that it cannot use memory because main memory is not enough or other program except GMWIN is using a large memory. Shut down applications and try again or expand a memory.

A-9

♦Insufficient memory

The memory allocation has an error due to a lacking of memory in a using computer. Expand memory by shutting down programs that is not using now and try again.

♦Insufficient memory. Use after expand the memory.

It causes when system memory is not enough. Try again after shutting down other applications.

♦ Too many characters in the instruction.

It is the case that the characters of inputted command are too long. The maximum command character has 17 characters.

♦Cannot open down-load information file.Make project and write it to PLC

Select COMFILE-MAKE in menu to make executive file, and select ONLINE-CONNECT+WRITE+RUN+MONITOR START in menu.

♦Variables to be monitored are too many.\nUse user selection variables.

It is the case that there are so many bundles of selected program instance variables that it cannot monitor. You should decrease the variable that you want to select.

♦ Module type Inconsistent Error

It is the case that a declared module in the parameter and an installed module of PLC do not match. Download again after modification of module in wrong slot, restart, and parameter.

♦ Array number over

You should input numbers in the range of declared array.

♦Invalid array range

You should input numbers in the range of declared array.

A-10

♦Invalid array index

It is the case that there is no a selected array element. Confirm the size of array and input again.

♦ Array name cannot exceed 8 characters.

You should declare array name within 8 characters.

♦ Invalid array size.

The array size can be designated from 1 to 2048.

♦ The specifed value is over the permitted range.

It is the case that INDEXES that is inputted in monitor dialog box of array variable exceed the range (0-2047).
You should designate it below the maximum INDEX size.

♦ Data type of array element is mismatched.

LD, ST command is effective for only Arrays having the same element number.

♦ Array index is out of range.

It is the case that array number is bigger than element number of declared array.

♦ Variable used as an array index should be INT type.

Variable that indicates array element must be INT type.

♦Battery Error

Change the battery.

♦Integer is not within the permitted range.

It causes the inputted integer is out of range.
Input the correct integer again.

♦ Select a base number.

It is the case that base number to monitor is not inputted.
You should input the base number.

♦ Invalid base number.

It is the case that there is no base number to select. Confirm the base number and input again.

A-11

♦ ¨Variable <variable name> not found. Make project and write it to PLC.

It is the case that you cannot monitor by program to be changed. . Select COMFILE-MAKE in menu to make executive file, and select ONLINE-CONNECT+WRITE+RUN+MONITOR START in menu.

♦ Variable <variable name> 'type is not BOOL.

If you declare action or transition as variable, it should be BOOL type.

♦ Variable '<variable name>' already exists.

It is the case that there is same variable name that was declared before.

♦ Invalid value.

You should input value of proper variable type.

See also data type.

♦ Select a variable which is the object of break.

It is the case that variable to execute variable break is not declared in variable break dialog box.

♦ Variable given is too long. Check your manual for allowable length.

It is the case that variable name is too long.

The maximum size of general variable is 18 characters except special variable.

♦ This variable name exists already in a different attribute. Give a different name.

It causes when variable name in block is already used in window that you want to add during block paste.

You should change variable name of variable in block.

♦ The variable name can't be allowed.

The case inputted variable name is not correct.

It is the case that you use special character (@, $, etc) that cannot be used, or insert blank in string. Also it causes length of string is over 18 characters.

♦ Wrong name is given.

It is the case that you input the incorrect variable name. You should input a proper identifier

(See also 3.1.1. Identifier command manual)

A-12

♦Variable name is incorrect.

It is the case that you input incorrect variable name. You should input a proper identifier

(See also 3.1.1. Identifier command manual)

♦ Operand Syntax Error

It is the case that inputted the type of variable is wrong. You should confirm variable type and input correct type of variable.

♦ The variable type is not ARRAY.

It causes when variable of different type is inputted to window in which array variable type is inputted.

♦ Not defined as a BOOLean variable.

It causes when you insert variable of different type at the position in which only BOOL variable can be inputted

♦Variable type is not BOOL.

The time chart can monitor only variable of BOOL type

♦Cannot jump to label<label name> across simmultaneous branch

(See also SFC jump of command manual)

♦Branch number over

Delete the branch.

♦Branch end point cannot be located at block end..

It can be at the end of block that only step, transition, label, and jumping.

♦Branch start point cannot be located at block start.

It can be at the beginning of block that only step, transition, labeled.

A-13

♦Step must be exist between branchs.

As you can see, it is the case that there is only transition between branch.

You should insert step between branch.

♦Can't appoint the breakpoint.

The label or comment row cannot designate break point.

♦ Wrong number of scan break is defined.

It is the case that you input not integer but string in breaks frequency.

Input integer value.

♦ Can't find the breaked source file.

It causes when there is no the source file in case of executing step over in the state of beginning of debugging.

♦The end of the block should be transition.

♦The end of the block should be step.

A-14

♦ Abnormal Shutdown Error

On executing the program, it indicates there is an error of calculating of reserved data area in case of executing warm start by starting to calculate program from the beginning when you reboot the PLC after program is paused by unusual shut down of power.

♦ Input variable, which is not referenced, '%s' is found.

It is the case that you declared input variable but you did not use it.

♦ Local variable, which is not referenced, '%s' is found.

It is the case that you declared local variable, but you did not use it.

♦ Output variable, which is not referenced, '%s' is found.

It is the case that you declared output variable but you did not use it.

♦There is no label to delete.

It is the case that you try to delete cell in first column that is being empty.

♦ Can't find Function Block in the included libraries.

It is the case that you do not insert library file which function block is included to project; though, you declared instance of function block.

Insert library file.

♦ Constant range over detected.

You should give constant value that is proper to range of data type of Current result when you want to give constant which is integer, real number asthe object.

♦ Cannot create a new program file '<program filename>'.

It is the case that there is program file, which has already existed, or insufficient disk area, or other application is using it.

♦ You can call subroutine Label which is after the END operator.

You should call the only label that locates after END when you use subroutine call command (ex. SCAL etc.)

A-15

♦ END operator is needed when using subroutine call.

If you want to use a call subroutine command (ex. SCAL, etc) then you should distinguish main program and subroutine by using END.

♦ This variable is not defined.

It is the case that used the object is not declared as variable. Declare variable in variable declaration dialog box.

♦ Variables selected are too many to monitor

Delete selected variable by using delete key

♦ There is nothing to move in the selected cell.

It causes when it is empty that the cell which you try to move.

♦ Selected library file is not a GM? Library.

The version of selected library file does not match with GMWIN.

♦ Selected library file is not a LGIS GMWIN library file.

The version of selected library file does not match. Confirm library-modified date.

♦ Cannot open selected library file.

Confirm there is selected library file in the library directory that is selected in option.

♦ This object file is not a LGIS GMWIN object file.

The version of selected object file does not match with GMWIN. Compile source file to GMWIN again.

♦ Label can't be placed on a rung comment area.

You cannot designate label in comment.

A-16

♦ Warning : Variable break may not be performed because the program instance which contains that variable is disabled by Task Enabling

It is the case that program instance to which declared variable belongs is prohibited by task executive condition when you declare variable break.

♦ The selected range is too large to copy on to the Clipboard. Only deletion is possible.

Only possible to delete block.

It causes that selected block is too large to copy. Though you cannot copy it, you can delete selected block.

♦ Short circuit error !

It is short circuit.

You should delete short circuit.

♦ Scan Watchdog Error

On execution, it is the cases that scan time of program exceeds the scan delay watch time that is designated by parameter. Modify parameter or program by confirming scan delay watch time that is designated by parameter, then re-download and execute it again.

♦ Wrong number of scan is given.

It is the case that frequency of scan is designated incorrectly when you designate scan break. You should designate frequency of scan between 1 to 65535.

♦ Stack overflow will happen when running. Lessen local variables in Function.

It is the case that function uses too many internal variables.

A-17

♦Stack overflow error

It causes when stack of the program is out of range while program is executing.

Modify the program, re-download then execute it again.

♦ STRING variables should be allocated at the address of multiple of 4.

If you assign user define memory with the declaration of string variable, you should assign it to address of 4'multiple.

♦ Invalid string size.

The maximum size of string variable is 30 characters.

♦ String constant cannot exceed 16 letters.

The maximum size of string variable is 30 characters but when you use integer on program, you can use integer below 16 characters.

♦ String size overflow.

The string is fixed at maximum 30 characters, maximum 32 byte on memory.

♦ STRING variables should be addressed at multiple of 4 when directly assigned.

You should give a direct address to address of 4'multiple because each string needs 32 byte memory.

♦ STRING initial value should start and end with apostrophe(')

The string integer should begin/end with quotation mark (').

♦Slot-ID Error

Reboot the PLC.

♦ Wrong exponent expression.

It is the case that incorrect expression of exponential function is found in real number expression.

♦ Wrong time literal expression.

It is the case that expression of time/date which begins with D#, T#, DT# is wrong.

A-18

♦ Can't open the serial port.

Confirm there is other program which is using serial port or not, and if there is no then restart GMWIN.

♦ Abnormal Serial I/O chip

Reboot the PLC

♦ Cannot open programs because of lack of system resource. Close rarely used windows and try to open again.

It is the case that it cannot open program file due to lacking of resource. Close other application or close program window that is not necessary in GMWIN, and execute again.

♦ System Self-diagonosis Information/ Abnormal CPU

Reboot the PLC

♦Down-load file is not same as one of PLC.\nWrite it to PLC!

Select COMFILE-MAKE in menu to make executive file and

Select ONLINE-CONNECT+WRITE+RUN+MONITOR STARTin menu.

♦Cannot expand source file.

It is the case that program source file is damaged.

♦ Abnormal Access path

It is the cases that download are failed because error happens on program download.

You should download again.

♦ Access path name error in a access variable < Access variable name > .

It is the case that it cannot be found that global variable or direct variable in access path that is declared as <access variable name>.

(See also access variable editing)

A-19

♦Access variable memory error

It is the case that memory is insufficient. Save all files, which is working, execute again after closing other application.

♦ Wrong access variable name is given.

It is the case that you input wrong access variable name.

You should input a proper identifier

(See also 3.1.1. Identifier command manual)

♦ Cannot define access variables any more.

The maximum size of access variable which can be declared is 128 in case of GM1~3, 64 in case of GM4~5.

♦Action <action name> is used.You can't delete this action.

If you want to delete this action, you should not use it in SFC program.

♦Action name used in transition.

You should designate it to different name.

♦Invalid action name

It is the case that you input wrong action name. You should input a proper identifier

(See also 3.1.1. Identifier command manual)

♦You cannot use TRANS variable in action program.

It is the case that you select TRANS variable in variable dialog box of action program.

You cannot use TRANS variable in action program.

♦ Wrong initial value for an array element found.

It is the case that you give wrong string when you give initial array value or integer value is out of range.

♦Blanking is error.

It is the case that you do not designate blank with integer value on print.

♦ Invalid margin.

You should input number in left blank.

♦Blanking is error.

Confirm maximum range of blank, input again.

A-20

♦Junk connection error !

The power line does not connect.

Connect power line.

♦Logic error !

You make circuit that is not good for logic.

Use circuit that is good for logic.

A-21

♦Logic branch is too deep !

The operating branch exceeds 16 levels in the operation that uses the contact.

You must modify the oerating branch not to exceed 16 levels in the operation that uses the contact.

♦ ')' is expected.

It is the case that number of left bracket is too many

♦ There exist contacts on the right.

It causes when there is other command at up or right of position when you insert coil.

The coil can be inserted when it is empty that the right area of the position where you want to inset the coil.

♦Object file open error

Confirm object file in declared directory on option.

♦ Cannot write to object file.

It is the case that there is no the file in the path, when you make new object file, other program is using it, and the disk capacity is insufficient.

♦ There needs no operand.

It is the case that you input operand to command that does not need operand.

You should delete the operand.

♦Operand Syntax Error

It is reserved word that is used in GMWIN or not a grammatical word.

A-22

♦ An input is more needed.

It is the case that the object should be inputted more, you should input more objects.

♦ An operand input is omitted.

It causes when you input nothing in variable text box of variable dialog box.

♦ This move operation is not possible.

It causes when you cannot insert the object to this position when you try to move the cell. If you want to move cell then sufficient area needs in the position, you cannot move it to the first column.

♦ External Device Error

It notifies that slight error of peripheral device happens by user program on operating.

♦ External Device Fatal Error

It notifies that fatal error of peripheral device happens by user program on operating. Fix peripheral device and operate again.

♦ Wrong interrupt input number is given.

The maximum size of external contact input number is 0 to 15 in case of GM1~2, 0 to 7 in case of GM3~5

♦ Interrupt task number over.Maximum number : N

You should reduce number by deleting external contact task in task definition of project window.

♦ Task number for Interrupt task is between 32 to 47 for GM1~2, 32 to 39 for GM3~5.

The task number which is assign to external contact task is 32 to 47 in case of GM1~3, 32 to 39 in case of GM4~5.

(See also 4.4.7-task definition in GMWIN user guide)

♦'(' is expected.

It is the case that number of right bracket is too many

♦ Left margin should be an integer between 0 to 30(mm).

It is the case that it is not integer value of 0~30 mm that left blank on print.

A-23

♦Memory allocation error !

It is failed to take necessary memory on LD compile.

You should take sufficient memory by shut down the window application program to execute except GMWIN.

♦ Invalid position or other range error.

It causes when you insert command in wrong position. It is the case that command cannot be inserted in selected position.

It happens when you double click mouse in the position in which variable cannot be inserted.

♦ Invalid IP address.

Confirm IP address of PLC, which you want to connect, connect again.

♦ There is no response.

Connect the power of PLC again.

♦ Search string '%s' not found.

It is the case that selected string at find/change is not used in IL.

♦¨ This is Rung Comment area

It causes when you insert the command to the area of rung comment. Command cannot be inserted in the rung comment area.

♦ Cannot select this variable type.

The data break for this variable type cannot be declared in present PLC model.

♦This string is a keyward.

It is the case that inputted string is been using for reserved character.

A-24

♦Cannot add this action name because it has been used already.

You should add it as different name because it has been used already.

♦ This object file is not compiled for GM?.

Load source file and compile again.

♦ This object file is compiled as a Program Block.

The selected file is program block. Select function/function block source program again.

♦This element can't be deleted .

You cannot SFC element that is incorrect for SFC composition.

♦This element can't be inserted at this position.

It causes when you insert SFC element in position that is incorrect for SFC composition.

♦ Break points cannot be set here.

You cannot declare break point at the position

Cannot declare break point on contacts, coils, and first column of function/function block and END.

♦ Input contacts cannot be placed here.

It causes when you cannot insert input in selected position.

♦ Insertion of empty cell is not possible at this location.

It causes when row that you try to insert cell is full. It is the case that you cannot insert cell any more.

♦This transition name already exists.

You should add it as another name because it has been used already.

♦ This file is not a GMWIN source file.

It is the case that selected file is not GMWIN source file or damaged source file.

♦This project was not made.Make project and write it to PLC!

Select COMFILE-MAKE in menu to make executive file, and select ONLINE-CONNECT+WRITE+RUN+MONITOR START in menu.

A-25

♦ This Flag/Keyword is READ_ONLY. (Cannot STore)

It is the case that you use command like ST, S ,and R in read only flag/keyword or output of function/function block.

♦ Cannot write value to this flag .

You cannot change the value because this flag is read only.

♦ This flag is not used with given PLC type.

Confirm it can be used or not, because available flag is different in PLC CPU model of GM1~5.

♦ END can't be placed in this line.

It causes when you input END again in line that you already inputted it.

You can input end in empty line.

♦Cannot assign break point at this element.

In SFC, You can declare break point only in step.

♦ Library file already exists.

The additional library file has already existed in library.

♦ F/FB name you want to insert is already exists in the library.

The additional library file has already existed in library.

♦ This interrupt input number is already used in another task.

It is the case that external contact input number is duplicated.

♦ This task number is already used.

It is the case that task number is duplicated.

♦ Variable already exists.

It is the case that there is same variable name that was declared before.

♦ Access variable '<access variable name>' already exists.

It is the case that there is same accesses variable name which was declared before.

A-26

♦ Instance name is already defined.

It is the case that there is same task name that was declared before.

♦ This Task name is already defined.

It is the case that there is same task name that was defined before.

♦ Same data type as previous result expected.

You should use same data type object that is same to current result that is previous operating result according to operator model in IL.

♦I/O Contact Error

It is the case that one of module that is composes of duality is error, replace module of wrong slot, and executes again.

♦ FB instance string cannot exceed 8 characters.

The instance name cannot exceed eight characters. Because general variable which includes instance name and input/output variable name is used in program.

♦ Wrong instance name is given.

It is the case that you input wrong instance name. You should input correct instance name for the identifier.
(See also 3.1.1. Identifier command manual)

♦ Wrong instance name is given.

You should input correct instance name for the identifier.
(See also 3.1.1. Identifier command manual)

♦ Multiple use for interrup number N.

Confirm tasks, which are declared as number N, are over two. Do not duplicate it.

♦Abnormal Interrupt Controller

Connect power again.

♦ This keyword is READ_ONLY.

It is the case that you cannot use read-only flag as object of ST command.

A-27

♦Temporary variables can't be made !

It is failed to create temporary variable on LD compile.

Temporary variable is created in TEMP directory. So it causes when capacity of TEMP directory is insufficient or disk has an error. If capacity is not enough then you should delete unnecessary file and if disk has an error then replace the disk.

♦Temporary file read/seek error !

It is failed to create/read temporary variable on LD compile.

Temporary variable is created in TEMP directory. So it causes when capacity of TEMP directory is insufficient or disk has an error. If capacity is not enough then you should delete unnecessary file and if disk has an error then replace the disk.

♦ Cannot Edit/Delete In/Out variables here.

It is possible input/output variable to be modified/deleted in input/output variable dialog box.

♦Invalid line number.

You should input the input value, which is proper to range.

♦ You must not exceed the maximum input number.

It causes when you define number of input variable more than maximum number when you insert the function that is varied to number of input variable.

♦ Cannot STore(or STN, S, R) to variables defined as VAR_INPUT.

You cannot use command (ex: ST, S, R, etc) that input the value in input variable.

♦Inputted value is not number.

The inputted number is not number.

♦ There must be at least two input variables.

You should define over two numbers of input variable at least when you insert the function that is varied to number of input variable,

Because first variable in function should be EN.

A-28

♦ The specified variable type is not allowed for this Fun/FB.

It causes when inputted variable type is differ from input/output variable type of function/function block.

♦ Cannot find such variable type.

It is the case that data type of the object does not match operator when you give an object as variable.

♦Powerflow must be only one !

There are several power lines in one rung.

You should one power line in one rung and input the other variable directly.

A-29

♦Jump %s position error.

The jump should be next to the transition where is at end of the selected branch or SFC program.

♦Label %s not found .

There is no label name<label name>, which is same to jump name. Confirm that there is label name, which is same to jump name.

♦Contact can'b placed in this area !

The contact should be where variable or integer must be.

Attach the variable or integer.

A-30

♦You must enter an integer.

It causes when you input real number value (ex: 9.43) in input window to input integer.

♦ Interval task number over.Maximum number : N.

You should reduce number by deleting interval task in task definition of project window.

♦ Task number for Interval task is between 0 to 31.

(See also 4.4.7 task definition in GMWIN user guide)

♦ Wrong interval value is given.

It is the case that you give wrong interval time in case of selecting the interval task.

(See also 4.4.7 task definition in GMWIN user guide)

♦ Given value string is wrong or over-ranged.

It is the cases that string of given variable value are wrong or out of range on selecting variable value break.

♦ A variable of same name as given function name is already defined.

It is the case that there is same variable name among the variables, which is declared already when you try to modify function name to another in program property dialog box.

♦ Warning : time constant unit under 10 ms will be ignored.

On definition of interval task, time value of below 10ms unit is negligible.

♦ Warning : Included library file 'library filename' is not for GM? so that F/FBs in that library will not be shown and used.

It is the case that you change PLC type for project or insert library that is not matched in proper type.

A-31

♦ Duplicated label found.

You cannot declare label repeatedly.

♦Abnormal Extended Power

It causes when PLC operating is abnormal because power module of the increasing base has an error.

♦ You cannot delete this item.

You cannot delete the item besides program and resource (over two) in project item.

♦There is no selected string.

You should input the name in name text box.

♦ The margin given is too large.

It causes when blank is too large in printer setup.

Decrease blank and input again.

♦ Too large margin

You should input the number that is below 30 in left blank.

♦ Invalid direct address.

You should modify direct variable name.

(See also 3.3.1 variable expression in command manual)

♦ Wrong directly represented variable expression found.

It is the case that it is wrong that direct variable expression starting with %I, %Q, %M.

♦ Wrong directly assigned memory allocation is found.

It is the cases that direct variable allocation in case that you select user definition of memory allocation. (See also 3.3.1 variable expression in command manual)

A-32

♦ Invalid direct variable range.

Two variable must be same area (same base, same slot), same type.

Wrong example	Correct example	Note
%10.1.0-%10.2.10	%10.1.0-%10.1.10	Different slot number
%MW10-%MB12	%MW10-%MW12	Different type

♦ Not found.

It causes when there is no anymore object (string or command) to be found.

♦ Contacts cannot be placed in the first column.

It causes when you insert the cell at the first column. You cannot insert cell at the first column.

♦ Wrong initial value is assigned.

It is the case that the initial value designation is wrong.

♦ Initial value is not correctly given.

It is the case that initial value is wrong.

(See also 3.1.1. Identifier command manual)

♦Initial value is out of range.

It is the case that initial value is out of range which data type allow when you declare initial value.

♦ You must not exceed the maximum line number.

It is the case that you input number which is bigger than maximum in find dialog box.

You should value that is below the number which is bigger than maximum number that exists in file.

♦ Enter or select one object file to add.

Confirm that object file is in the directory on option.

A-33

♦Output branch is too deep !

It is over 16 levels that branch that uses the output good command (coil, function, function block, jump, return, subroutine call)

You should make the branch that uses the output good command not to be over 16 level.

♦Configuration global variables are declared too many.Maximum 4K Byte.

You should delete unnecessary configuration global variable.

♦Size of configuration global variables cannot exceed 4K bytes.

Total size of the configuration global variable cannot exceed 4K Byte.

You should delete unnecessary configuration global variable.

A-34

♦ File related error happened while compiling.

It is the case that you have difficulty to deal with file because there is no file that is used temporarily and is used in open/close object file or disk capacity is insufficient on compiling.

♦Maybe there'll be some errors in compiling.

It is the case that you cancel without declaring same name for duplicated variable on attach operating. Error can be caused on compiling because over two types for same variable name are needed.

♦ There is nothing to compile.

It is the case that there is no content to compile because of nothing in program content.

♦Coil can’t be placed in this area.

The coil is in the position, which the variable or the integer connects to.
Attach the variable or integer.

A-35

♦ Cannot STore from/to different size of array.

LD, ST command is effective for only Arrays having the same element number.

♦ Maybe out of memory (from clipboard routines)

It causes when memory cannot be taken because memory is not enough in the system on dealing with clipboard.

♦ Keyword cannot be used as an identifier.

The reserved word (variable name etc) cannot use as identifier.

(See also 3.3.3 reserved variable and 3.4 reserved word in command manual)

♦ Invalid time value.

You should designate time value if you select the action qualifier among D, L, SD, SL, and DS. Confirm that time value is inputted correctly or not.

(See also 3.1.2.3.1 proceeding time in command manual)

♦ Task <task name> not found .

It is the case that used task name is not defined in program definition.

Confirm task name of task and program definition in project.

♦BOOL type variable of task <task name> not found .

It is the case that the used variable is not declared as the global variable in case that you select the single task executive condition.

Confirm used variable name and global variable name in task definition.

♦Task memory error.

It is the case that memory is not enough. Shut down other application after saving all files that is executing, and restart.

♦ Wrong task number is given.

You should give proper task number according to kind of task.

(See also 4.4.7 task definition in GMWIN user guide)

A-36

♦ Wrong task name is given.

It is the case that you input wrong task name. You should input correct task name for the identifier.
(See also 3.1.1. Identifier command manual)

♦Task Conflict Error

It causes when same task is demanded to execute repeatedly on use program operating.

♦Communication Internal Error

Disconnect the connection of PLC and GMWIN and connect again.

♦Transition <transition name> is used. You can't delete this transition.

If you want to delete this transition you should not use it in SFC program.

♦Transition <transition name> has no program.

You should make executive condition program in transition.

♦Invalid transition name

It is the case that you input wrong transition name. You should input correct transition name for the identifier.
(See also 3.1.1. Identifier command manual)

♦S/C Module Interface Error

It is the case that data of special/communication module do not access normally on operating, so replace module of wrong slot and execute again.

A-37

♦Cannot save file'<file name>' to the disk.

It is the case that other program is using on saving project file or there is insufficient capacity to save shut down other program or enlarge save capacity of disk.

♦Can't print %s.

It is the case that there is no printer or file to print does not exists.

♦ Cannot open file(s).

When you open /make the file, it is the case that it does not exists in the path or other program is using it or disk capacity is insufficient.

♦Cannot find function<function name>.

This function is not in selected library.

♦ Can't find FB '<function block name>' in the included libraries.

It is the case that it is not in library file that function/function block which is used in the program. Register this function/function block in library file and insert this library to project.

♦ Line insertion is impossible in case the I/Os of FUN/FB have some contacts.

If you try to insert line in the line that function/function block exists then you should insert the cell without changing the function/function block.

However, in case that contact is connected to input/output of function/function block, you cannot insert line.

♦ Wrong function block name is given.

It is the case that it is not inserted that library file which has function block that is assigned in library insert list of present project. In certain case, some CPU has not this function block, so please attend using function block.

♦Wrong function block name is given.

It is the case that wrong function block name is given in program property dialog box or in case of making new program.

A-38

♦Function block instance name cannot exceed eight characters.

The function block instance name should be declared below eight characters.

♦ Not defined as a FB instance

It causes when function block instance name has been using as other general variable.

♦ Function block instance name cannot have initial value.

It is the case that you declare initial value with defining data type as function block instance.

♦ Cannot edit function block output variable.

Function block output is the item that is added/deleted automatically on declaration or deletion of function block. So function block output cannot modify/delete.

♦ Function Block should have at least 1 BOOLean input & output parameter each.

Function block has to have over one BOOL variable in input/output for LD power line and first input/output variable must be BOOL.

♦Cannot add object of function block to the library of function.

Library does not match the form of program. Extension of library in function block is nFB.
(n is PLC type. For example: if library file name is USER and PLC is GM4 then USER.4FB)

♦Not defined as a FB instance.

It is the case that object of CAL(C, N) command is not declared as function block instance.

♦ The first input variable of Function Block should be BOOL typed.

First input variable of function block must be BOOL type because of power line in LD.

♦ The first output variable of Function Block should be BOOL typed.

First output variable of function block must be BOOL type because of power line in LD.

♦ Cannot assign a value to an output variable of function block.

You should give variable that will take the operating result to the output of function block.

A-39

♦The appropriate F/FB library does not exist. Base type may not match the FB library.

It is the case that wrong function name is given in program property dialog box or in case of making new program.

♦There is no function/function block library.

It causes when it is not inserted in project that library that includes using function/function block.

♦ Contacts cannot be placed in Fun/FB area.

It causes when you try to insert contact in function/function block area.

♦ Adjacent line is Fun/FB area.

Other command cannot be inserted in function/function block.

♦You should use operand that is proper to data type of function/function block input parameter.

You should input object of proper data type to the input parameter on inputting function/function block input parameter.

♦ Input of F/FB is not assigned !

You do not declare input value (variable, integer) to input of the function/function block.

You should connect power line, integer, variable, etc to input of the function/function block.

A-40

♦ Do you wish to delete the Fun/FB's along the way.

It is the case that function/function block is in deleted line.

If you want to delete function/function block also then push YES button, otherwise push NO button. If you want to cancel cell deletion then push CANCEL button.

♦ Cannot use directly represented variable expression as an operand in F/FB.

You cannot use direct variable expression in function/function block.

♦ Function/Function Block should have at least one input & output parameter each.

Function/function block has to have over one variable in input/output. You can add input/output variable in input/output variable dialog box.

♦Function/function block cannot call itself.

It is the case that function/function block calls itself, so function/function block cannot call itself because it makes infinite loop or computer to be unstable.

♦ Function/Function Block "<F/FB name>" you want to include is already loaded from library file named "<library filename>". Do you want to replace it with one in "<library filename" ?

It is the massage whether you change previous file or not when it is loaded from other library that object file that has same name one that is loaded before.

♦ You cannot load F/FB named "<F/FB name>" in "<library filename>" because it is a standard F/FB which is already loaded.

After changing the name of user definition function/function block, insert it to the library again.

A-41

♦ Insertion is not possible because Fun/FB is too close.

It is the case that you try to delete cell between function/function block.

It causes when capacity to write input/output variable is not enough after deleting cell.

♦ There's not enough space for Fun/FB.

It is the case that function/function block cannot be inserted because free space is insufficient in the position in which function/function block is inserted.

When you insert function/function block, you should it in the blank that has 3 lines at least for input/output variable space.

♦ String constants cannot be used in Function.

It is the case that you use string integer in function.

♦ Cannot declair or call any Function Block in Function.

It is the case that you declare/call function block in function.

♦ Functions can't be changed to other elements.

It is the case that you select function as command to replace in replace dialog box.

You cannot use REPLACE command for the function.

♦Function cannot have VAR_OUTPUT variable.

Function cannot have VAR_OUTPUT variable.

♦ Cannot assign an initial value to a local variable of Function.

There is no variable, which can declare initial value in function.

♦ Cannot add Function object to Function Block library.

The library does not match the form of program to add.

Extension of library in function block is nFU.

(n is PLC type. For example, if library file name is USER and PLC is GM4 then USER.4FU)

A-42

♦ Return value of function is indeterminate.

It is the case that the function does not work, because you do not insert the output value.

If you input the value to the output value in case of the function, the function works.

♦Output of function is not assigned !

Nothing is connected to the function output.

Declare variable to function output or connect to power line (case of BOOL output).

♦ You cannot edit standard library files. Select again.

The general library cannot be used by modifying it with user's will. You can select only user definition library to executing modification, deletion.

♦ Standard libraries are already loaded.

The general library was already loaded in memory.

A-43

♦Fuse Cutoff Error

It causes the case that FUSE break of FUSE attach module on operating. Replace the fuse of wrong slot and execute again.

♦Program <program name> is not defined in project.Make project and write it to PLC.

Select COMFILE-MAKE in menu to make executive file, and
Select ONLINE-CONNECT+WRITE+RUN+MONITOR START in menu.

♦Program <program name> not found.

It causes when there is no program file that is relevant to used program name in program definition. Confirm that there is program name .SRC in relevant directory.

♦Program Error

It is the case that program to operate is abnormal. Download again.

♦Program define number over.Delete program definition.

You declare too many program definition of project.
You should reduce program definition by Selecting the project-project item delete in menu.

♦Program Code Error

It is the case that command that cannot be decoded is met on user program operating.
Download program again and execute again.

♦Program size over error.Total: M bytes, Used N bytes

It is the case that program size (N bytes) is used in project exceeds capable program size (M bytes) in present PLC.
Change PLC model to upper model or reduce program size.

A-44

♦ Program file'<program file name>' has already opened.

It is the case that you declare file name which has already opened when you make new project or program.

♦ Program file'<program file name>' has already existed.

It is the case that you declare file name which has already existed when you make new project or program.

♦Program file name does not defined.

It is the case that you are not sure that you open which item because program file name of this item does not defined when you open the window by double click the program item in project.
Give program file name.

♦Abnormal Program RAM

Reboot the PLC.

♦FB <FB name> not found in a library!

It is the case that function block which is used in program is not in library file.
Resister relevant function block to library file and insert this library to project.

♦ Condense rate for printing is out of range. Check condense range.

It causes when compression proportion is out of range.
You should input proper compression proportion again.

♦ Flag array index is out of range.

You have not to use it over defined array number in case of using flag element that is defined as array.

♦There needs no operand.

It is the case that function (for example ABS) that does not need object in IL. You should delete the object.

A-45

♦Operand is not assigned !

Variable or integer is not at contact or coil.

You should attach variable or integer value at used contact or coil.

♦Too many characters in the operand.

The case characters if inputted object is too many. You should input the object below 16 characters.

♦ Wrong data type of operand.

It is the case that data type of the object does not match the operator or data type of Current Result in IL.

♦ Wrong operand string found.

It is the case that the string that is inputted as the object does not match the word form.

♦Cannot find the function/function block.

Confirm that library is in the library directory that is designated in option.

♦Hot Restart Backup Error.

On operating the program, it causes when hot-restart time is exceeded at the stoppage of electric current is restored, or the restart is operated by parameter because it is impossible to operate the hot-restart operating. Because operating data, which is needed in hot-restart operating, was not done backup.

♦Wrong line number is designated.

It is the case that you input wrong line number in FIND. You should input it within last line number.

A-46

♦ One of ANY_NUM data type expected.

The object (foe example: SINT, INT, DINT, REAL, etc), which has a general concept of number, has to given for the operator (for example: ADD, SUB, MUL, DIV, etc), which has a general concept of the number. Especially, it causes when you give the object (for example: WORD type) to ADD.

♦ Variable used as an array index should be INT type.

It causes when the variable type of the ARRAY index is not INT.

You should use INT variable type in ARRAY index.

♦Not ARRAY type variable.

You cannot select array number because present selected variable type is not ARRAY type.

♦ Variable used as an array index is not defined.

It is the case that INT variable B, which express array element such as A[B}, is not declared in declaration part.

You should declare B as INT variable in declaration part.

♦ Boolean array variables should be allocated at the address of multiple of 8.

When you declare an address in GLOFA PLC, beginning position of BOOL array should be at the beginning of 8-bit unit. Therefore, if you declare user definition position at the position, which is not 8'multiple such as %MX7 then you will have an error massage.

♦ BOOL type operand expected.

The object of BOOL type should be given in LD contact or BOOL output.

♦ Cannot use this kind of Operators to CONSTANT variables.

It is the case that you use the command that can change the value of ST for variable that is declared as CONSTANT.

A-47

♦CPU Error

On the composition of the multi-CPU, it is the case that other CPU error causes. You should modify this CPU error and execute again.

♦CPU Combination Error

Reboot the PLC.

♦The data of DATE AND TIME is indicated in 1/100 second.

When you input the value of DATE AND TIME, you cannot input the 1/1000 second unit.

♦ END operator is duplicated.

You cannot use over one END command in one program or one action/transition.

♦ENO can’t be assigned to variable !

Variable or integer is connected at the ENO output of the function.

Only power line can be connected at the ENO output of the function. Connect it at power line or nothing.

A-48

♦Not defined as a FB instance.

It is the case that the inputted sting as the instance name is not the string that is declared as FB instance.

♦This FB output variable type isn't an array.

The type of the FB output variable must be array. Confirm output variable type of FB and input again.

♦A kind of FB is not matched.

The inputted instance name is the string that is declared as different kind of FB instance.

♦This variable is not a FB output.

It must be output variable of FB. Confirm FB and input again.

♦Abnormal Gate Array

Reboot the PLC.

♦Can't use a GLOFA Fnet or GLOFA Mnet.

After confirming the communication module for PC is fitted in PC , if it is, then you should confirm that the declaration of port and base address is correct or not, and connect again.

A-49

♦ This data type is not supported for GM3 ~ GM5

Data type (for example: REAL, LREAL, LINT) applies only for GM1~2, therefore GM3~5 are not used.

♦There is no I/O card in that base. Select a base number again.

You cannot monitor because I/O module is not in selected base.

♦I/O Moduel Read/Write Error

On operating, it is the case that the data of I/O module is not accessed normally. Therefore, replace the module of wrong slot and execute again.

♦Abnormal I/O parameter

it is the case that the download does not success because of error on downloading the program. Download again.

♦It is not an IL operator.

It is not IL operator that is used in GMWIN.

♦Number of lines exceeds IL capacity.

IL cannot edit over 32000 lines.

♦ Can't load LD cursors.

It causes when LD cursor resource load is failed.

it is the case that system is unstable. Therefore, reboot the computer and try again.

A-50

♦M area can be monitored at only RES area.

Declare direct variable area with resource.

♦Abnormal O/S Watchdog

It is the case that the watchdog error is caused by O/S program.

♦Abnormal O/S RAM

Reboot the PLC.

♦Abnormal O/S ROM

Reboot the PLC.

♦Q area cannot be monitored at Configuration area.

The direct variable area cannot be designated as configuration.

♦ Cannot define RETAIN or CONSTANT to the variable located at %I or %Q area.

You cannot declare RETAIN,CONSTANT besides variable that is allocated in automatic variable or %M area.

♦ Cannot assign initial value to the variable located at %I or %Q area.

You cannot give initial value besides variable that is allocated in automatic variable or %M area.

♦ Cannot assign direct address to this array variable which is out of I/Q address range.

In case that array is the variable which is allocated in I,Q area by user definition, if total size exceeds maximum of the I,Q area from the beginning then error can be caused by memory overlap. Therefore, make array size small.

A-51

♦RTC Data Error

Confirm that there is an error of battery or not, if it is not ,then set the time in GMWIN.

♦Abnormal RTC

Set the time again.

♦You cannot insert SFC element any more.

You cannot insert new element any more because it exceeds the size of SFC program.

♦impossible to delete SFC transition variable.

User cannot delete/modify SFC transition variable because it is inserted in GMWIN automatically.

♦impossible to modify SFC transition variable.

User cannot delete/modify SFC transition variable because it is inserted in GMWIN automatically.

A-52

♦Tn has no name.

1) You should input the transition name and make operating condition program.

Or

2) Designate BOOL type variable in the transition.
   Input it by selecting toolbox-zoom in menu or double-clink at the position of transition.

♦ VAR_IN_OUT variables cannot be placed the first item of INPUT/INOUT variable list.

VAR_IN_OUT variable cannot be at the beginning of the input/output variable of function block, because of the power line on LD.

.

♦ A constant cannot be given to VAR_IN_OUT parameter.

VAR_IN_OUT variable cannot have integer value because its address is transferred to parameter.

(Special characters)

♦ BOOL type operator is needed before 'C' or 'N' specifier.

The object of the BOOL data type must be used in the variable that has suffix of ‘C’, ‘N’(ex. CALC, CALN, JMPC, JMPN).

A-53

♦ Cannot STore to directly represented or assigned input variables(%I).

You cannot use command that substitutes the value in the input direct variable area.

♦Trasition name : Output transition condition to variable TRANS.

You have to output the condition to TRANS variable in transition program.

Ex) LD %I0.0.0
ST TRANS

♦Cannot print %s!

It is the case that you cannot print selected file.
It causes when printer has a problem.

♦ <program name> : <direct variable name> is not in M area.Set M area of basic parameters to large size

Because selected variable as < direct variable name> exceeds declared M area, You should declare the variable again (ex: %MW20000 ➔ %MW20), make it large with selecting the project-option in menu (ex: 4K Byte ➔ 8K Byte).

♦Program <program name> : Variable <variable name> is not declared or type mismatched in Gobal Variables.

Declare the variable<variable name>, which is declared by VAR_EXTERN in <program name>, or if it is declared already ,then confirm that the type is same.
(see also configuration global variable edit (in case of GM! and multi resource) or resource global variable edit).

♦ Cannot give duration of task which is under 10 ms.

If you give the task operating interval that is smaller than 10ms on the definition of interval task, then it is negligible. Therefore, you should give time interval, which is over 10ms.

B. GMWIN Glossary

(A)

Access Variable	A variable name to be used in a local station during the communication between PLC's in Function Block.
Action	A block having a program to be performed actually in SFC language.
Allocation	If a user declares only the variable name and type in the declaration of the symbolic variable, the memory area is allocated automatically by GMWIN (←→User defined memory allocation).
Array	An aggregate that consists of data objects, with identical attributes.
Automatic Memory	
Automatic Variable	A variable to be allocated as the automatic memory.(←→ User defined variable, Direct variable)

(B)

Branch	To divide control flow in SFC language. There are parallel branch and selective branch.
Break point	The position at which a user wants to stop when debugging a program element (Program block, Function Block or Function).

(C)

Cell	A unit of LD component element such as contact, coil, function, and function block in LD language.
Cold Restart	One of restart modes. Erase all data to 0 except the variable that is declared for the initial value.
Communication Port	Serial port in PC to connect GMWIN and GLOFA-GM.
Compile	To translate PLC program, which user creates, into the machine language equivalent or an intermediate form, which a user can execute in PLC.
Configuration	An language element corresponding to one PLC system as software model in GMWIN.

Configuration Global Variable	A variable that can be used in common between resources (between CPUs in the multi CPU system). It includes the symbolic variable that is declared as the configuration global. It has one memory area on the coordinator module. It is used after declaring symbolic variable with a same name for 'VAR_EXTERNAL' when a user creates each program block.

(D)

Data type	Features of data that represents the declared variable SINT, INT, DINT, USINT, UNIT, UDINT, ULINT, REAL, LREAL, TIME, DATE, TIME_OF_DAY, STRING, BOOL, BYTE, WORD, DWORD, LWORD, DATE_AND_TIME.
Direct Variable	A variable to use without the declaration of the name/data type. I, Q, and M area. (%1*0.02, %QW1.2.1, %MD1234, etc)

(E)

Ethernet	A network technology is applied to the upper network for observation and control of system. And to send/receive data by using TCP/IP (Transmission Control Protocol/Internet Protocol) as the upper protocol and selecting CSMA/CD (Carrier Sense Multiple Access with Collision Detection) as the media access formula.

(F)

Flash Memory	An auxiliary memory module to be used in GLOFA PLC.
Forced I/O setup	A method to have a constant value without a care of the execution of program by taking the special value in I/O forcibly.
Function	Program organization unit to output operating results for the input without storing the results into the internal area. (Arithmetic operation, Comparison, etc)
Function Block	Program organization unit to store the operating results into the internal area. (Timer, Counter, etc)

(G)

Global variable	A variable which can be used in all resources within a project or all programs within a resource(←→ local variable).
GLOFA Fnet	It is the lowest network which connects a control device or instrumentation device, and the standard which adapted three layers among seven layers of OSI. Three layers consist of *Physical layer*, which consists of H2 (1Mbps electric), H1 (31.23Kbps electric), Optical, Wireless, etc, *Data link layer*, which adapted Scheduled and Circulated token bus, and *Application layer*, which take the responsibility of the application role. This standard, additionally, adapted User's layer.

(H)

High Speed link	A communication method to send/receive the data through GLOFA Mnet, Fnet modules
Hot Restart	One of the restart modes. It reconstructs all data and performed elements to the previous status and performs them.

(I)

Input/Output Variable	A variable to define input/output of the function/function block.
Instance	Assembled data to use in the program blocks or the function blocks.
Interrupt	During the normal execution of the program, If a user want to execute any program firstly after stopping the normal program, a user can define the program as Interrupt execution.

(L)

Library	Files to assemble several functions or function blocks as an executive code form.
Library Manager	A manager to execute the function of addition/deletion of a function or a function blocks in the Library.
Local Connect	A method to connect to RS-232C port in CPU module when a user tries to download, monitor or debug a program. (←→ Remote connect)

Local Variable	A variable to be effective only in one program element. It is declared in each program element and used in the program of the declared program element. It is impossible to read/write in the other program element.(←→ Global variable)

(M)

Make	A work to compile program blocks in a project and to make One executive file, which PLC can execute, by linking each object files
Modem	A device that you can send/receive a data at a long distance between PC installed GMWIN and GLOFA-PLC mounted computer link module by using a PSTN.
Module	A component having an independent function. It is used by adding it up onto baseboard. (CPU module, power module, input/output module, special function module, communication module, etc).

(O)

Operator	A symbol that represents the action to be performed in an operation. LD, ST, AND, OR, CAL, JUMP, EQ, etc.

(P)

Partial compile	To compile a modified part only when you modify a part of one program element which finished compiling before. You can reduce a compile time. (←→ Total compile)
PLC System	The system that has the complete configuration element for the PLC operating and can control the target system by the user program.
Power Flow	Suppose that the power is supplied on the left power line and this power is transferred to the right by the logic in LD language.
Priority	A number to designate which task is executed firstly when several tasks to execute wait. '0' is a high priority.
Program	A code to execute PLC, which is reserved in the program area of the PLC. (Program block, Function and Function block) On the other hand, it is called program organization unit.
Program organization unit	Function and Function block or Program block
Project	It is the executive element of GMWIN that includes a program that is needed in PLC that composes one PLC system, a system configuration,

	parameter and communication. One project consists of one PLC system

(Q)

Qualifier	The executive condition of the action in SFC language.

(R)

Remote connect	A method to connect to CPU module that user tries to download, monitor or debug a program through GLOFA Fnet, Mnet with connecting GMWIN to RS-232C port of other CPU module.
Resource	One CPU module having the saving area of a program and data.
Resource Global variable	A common variable among several programs in Resource. It includes the symbolic variable that is declared as a direct variable and resource global. It has one memory area physically. A direct variable can be used in each program and you can use a symbolic variable after you declare variable kinds of symbolic variable having a same name as 'VAR_EXTERNAL' when making each program block.
Restart Mode	An operating start mode for the user's program at the restart of PLC system. There are three restart modes, which are cold, warm and hot.
Rung	Program element that does not have a line to be connected to up/down in LD program. The horizontal line located between the left and right power rails of LD program where the elements are placed.

(S)

Scan	Total time to execute input refresh, user program execution, and output refresh in Run mode.
Scan Break	The debug method to stop PLC after the designated scan amount is executed.
Scan Watchdog Time	The longest scan time to be permitted by PLC. If scan time is longer than designated one, scan watchdog error is occurred and PLC stops the execution.
Step	The control element of the procedure in SFC language.
Step Into	Step Into is executed in where you want to call for debugging the function/function block or action/transition.
Step Out	To return to the calling program element from function/function block or action/transition when the function/function block or action/transition is

	debugged.
Step Over	To execute debugging for the program element as a minimum unit of the language (by step unit).

(T)

Task	An execution control element for starting condition of the program. (Interval task, Single task, Interrupt task and Scan task)
Task Program	Program containing the execution control element as Task.
Total compile	To compile one program element from beginning to end. (←→ Partial compile)
Transition	The condition to perform the next step in SFC language.

(U)

Upload Program	A program that is compressed to store the program, which a user created, in PLC. You can call the upload program in PLC by using 'Open From PLC' function in Project menu of GMWIN.
User defined memory allocation	A method to designate memory area to be matched as the direct variable form when a user declares a variable on the declaration of a symbolic variable.

(V)

Variable Break	A debugging method to stop the execution when the value of specified variable meets the designated value or function to read/write the variable is executed.

(W)

Warm Restart	One of the restart mode. It erases all data to 0, except variable that is declared for retention of the previous value and the initial value.