

User's Manual

KGL for Windows

[IMO-K Series]

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Chapter.1

Introduction

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Chapter. 1 Introduction

1. 1 Features of KGL for Windows

KGL for Windows is the Programming and Debugging Tool for the IMO-K Series range of programmable Controllers.

KGL for Windows has abundant Features as listed below.

1) Utilizing a Project Structure configures the PLC System

KGL for Windows manages the User-Defined Program as one Project. A project includes the following files:- Program (*.PRG), Parameter (*.PMT), Variable (*.VAR) and Comment (*.CNT).

A user can save each File individually Program (*.PRG), Parameter (*.PMT), Variable (*.VAR) and Comment (*.CNT) and include them in another Project file.

2) User Friendly Interface

Easy and useful interface for Creating, Editing and Monitoring.

3) Online Editing

A user can Edit a Program Online. The Program is downloaded automatically, and the PLC is halted momentarily whilst the Program is downloaded.

5) Monitoring the Information from PLC

A user can easily monitor PLC status such as Error Status, Network Information and System Status.

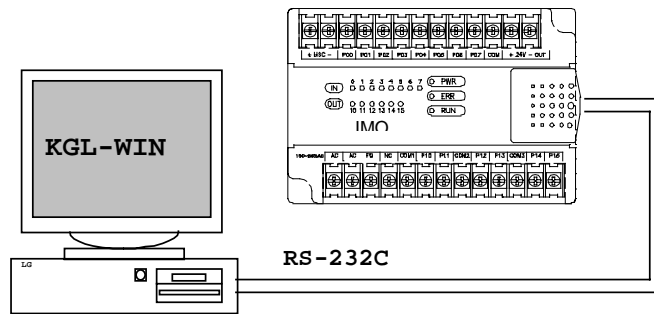
6) Monitoring the PLC status

Monitoring the status of the I/O, internal relays, timers and counters is easily achieved enabling Faultfinding and Debugging.

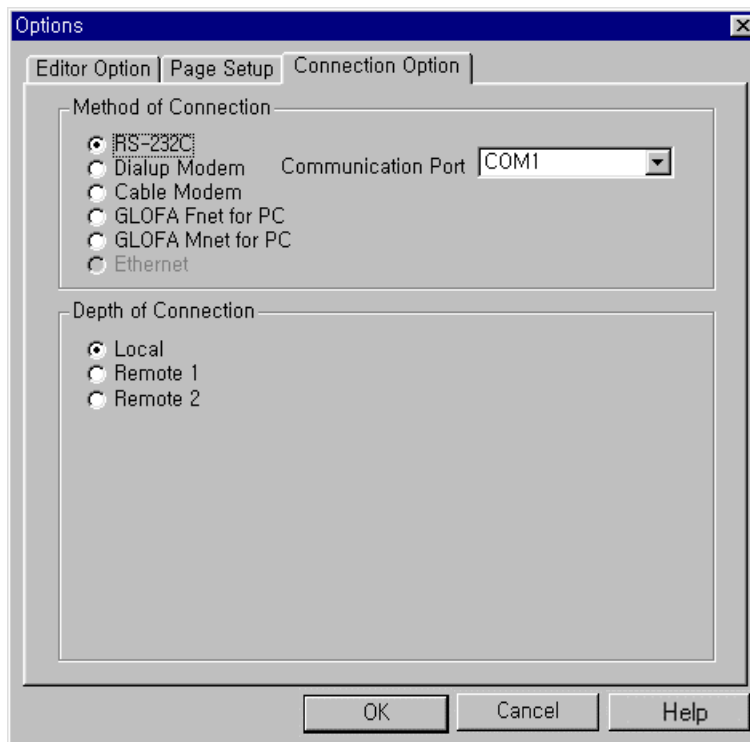
1. 2 Connection to PLC

1.2.1 Local Connection for RS-232C Interface

- ◆ RS-232C Interface for LG IMO-K Series.
- ◆ RS-232C Cable is connected to PLC using serial port (COM1 ~ COM4) in the Computer.



- ◆ Click **Options Menu** in **Project Menu** and Select **Connection option**. Then the following screen will be shown.



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Chapter. 2 Installation

2.1 System Requirements

- Recommended System Requirements for KGL for Windows

1) IBM Computer compatible and Memory (RAM)

80486DX or greater, 8Mb RAM or more

2) Serial Port

One or two Serial Ports

3) Hard Disk

20Mb or more

4) Floppy Disk Drive

One or more(3.5 Inch or 5.25 Inch)

5) Mouse and Printer

For Windows 95

6) Operating System

Microsoft Windows™ 95

2.2 Installing the Software

To install KGL for Windows from the compressed diskettes, be sure to use the original installation diskettes.

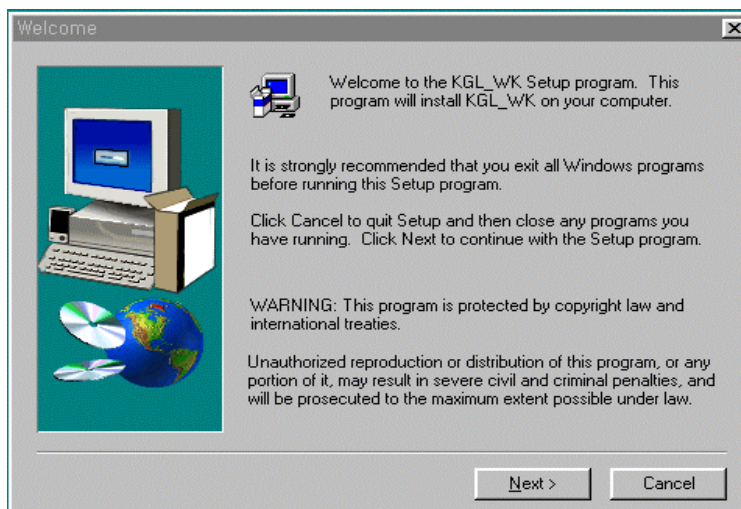
If you copy the files in the diskettes to a folder in your hard disk manually, the software won't be installed.

- ◆ Installation the setup program

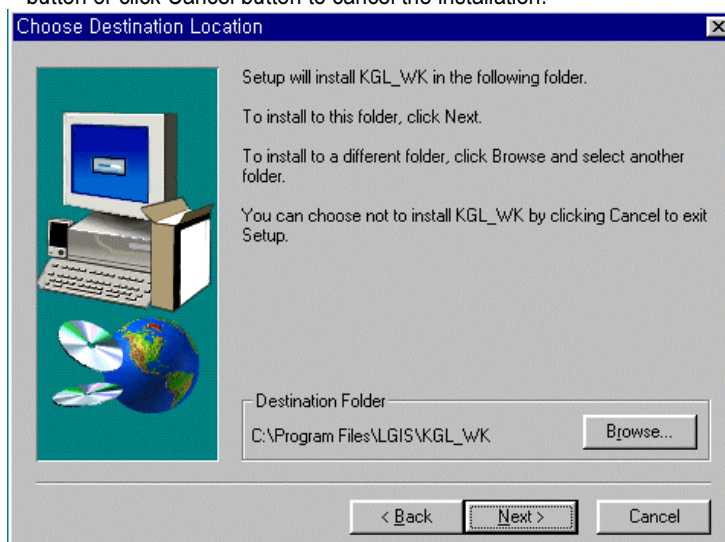
- Double-click 'Setup.EXE' file in the installation Disk1.

- ◆ The Setup Wizard will guide you to install the Software automatically.

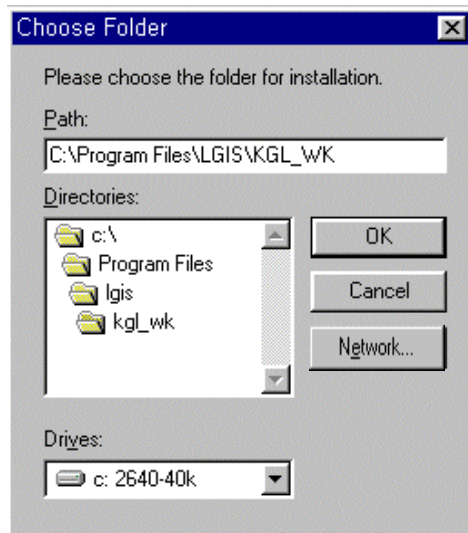
- ◆ Press Next button to start the installation. You can press Cancel button if you don't want to install KGL for Windows at this time.



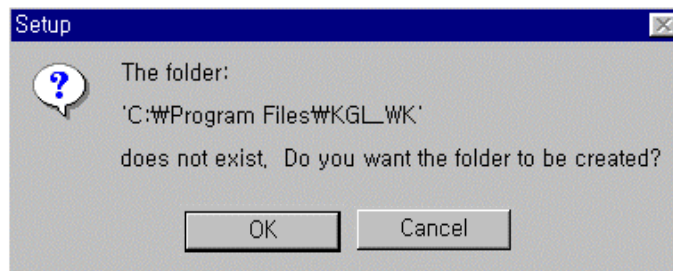
- ◆ Select Destination Folder which KGL for Windows files are to be installed. You can change the folder using Browse button or click Cancel button to cancel the installation.



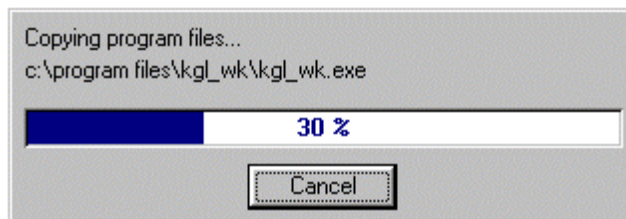
- ◆ If you press Browse button, you can choose the folder to install the Software as shown in the dialog box.



- ◆ After selecting the folder or typing the Path to install the program in the dialog box, click OK button.
- . If the folder does not exist, the following dialog box will be shown. If you want to create a new folder, press OK button.



- ◆ The installation process will be displayed as below.



- ◆ After the installation, the folder is created. The execution file and Readme icon will be also created in the Start Menu of Windows95. To start KGL for Windows, double-click the execution icon(



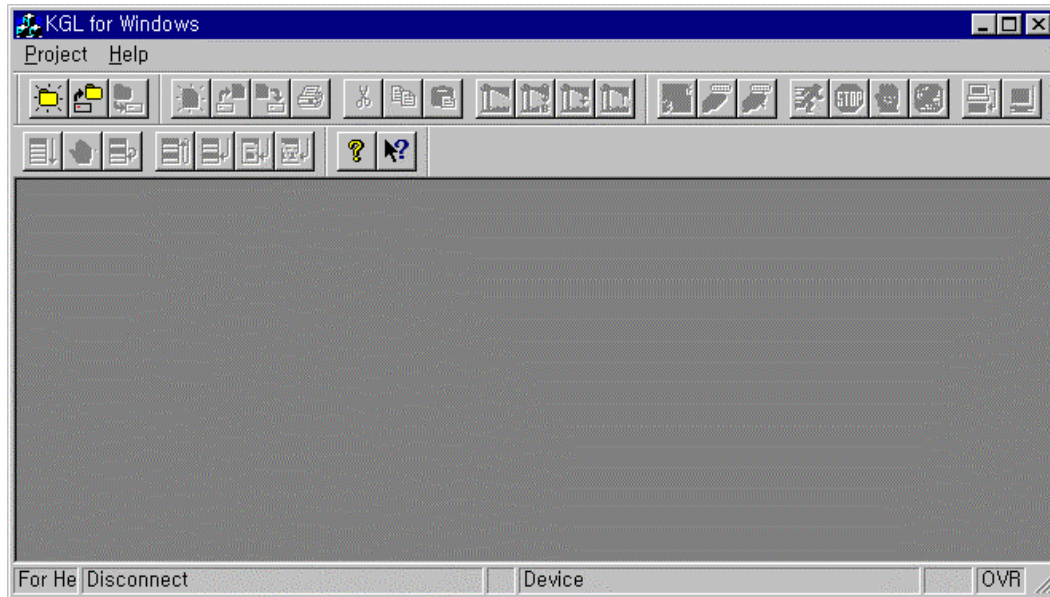
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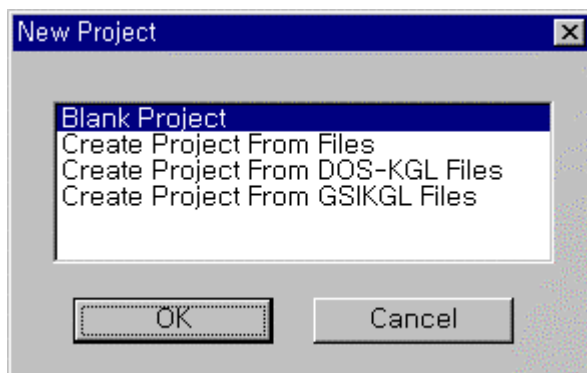
Chapter.3 Start-Up KGL for Windows

3. 1 Creating a Project

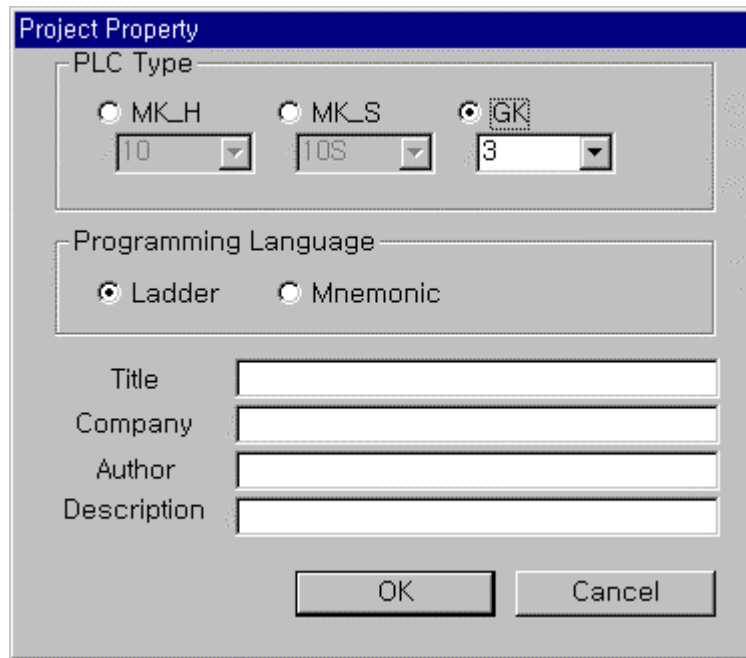
- ◆ Double-click KGL_WIN.exe file to run KGL for Windows or execution file.
- ◆ The Start-up Screen will be shown as below.



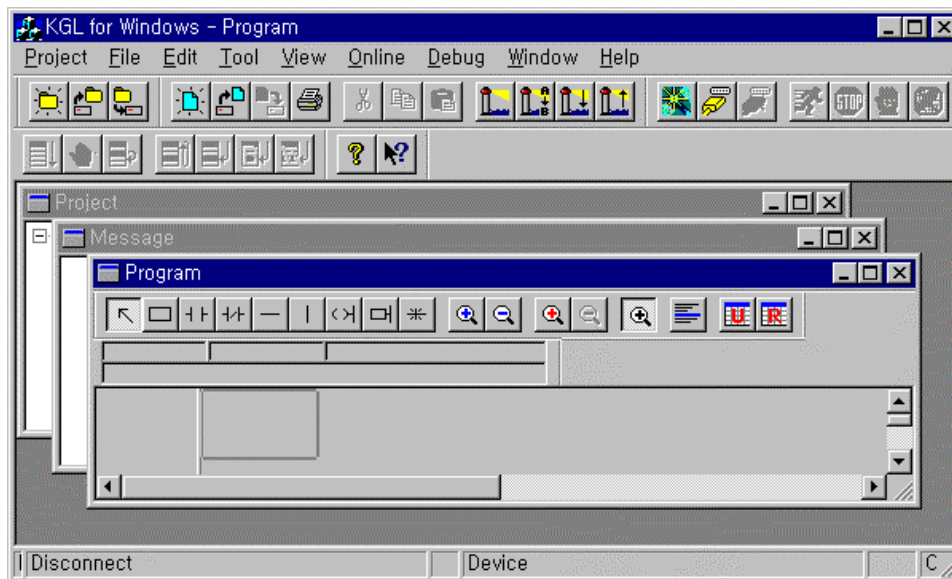
- ◆ To create a new project, select **Project- New Project...** ( the Start-up Screen.
→ This is used for creating a Project for the first time.
- ◆ Select **Blank Project** in the dialog box and click OK button.



- ◆ In the following dialog box,
Type PLC Type, Programming Language, Title, Company, Author and Description.



- ◆ Click OK button. Then, Project, Message and Program Windows are displayed automatically.

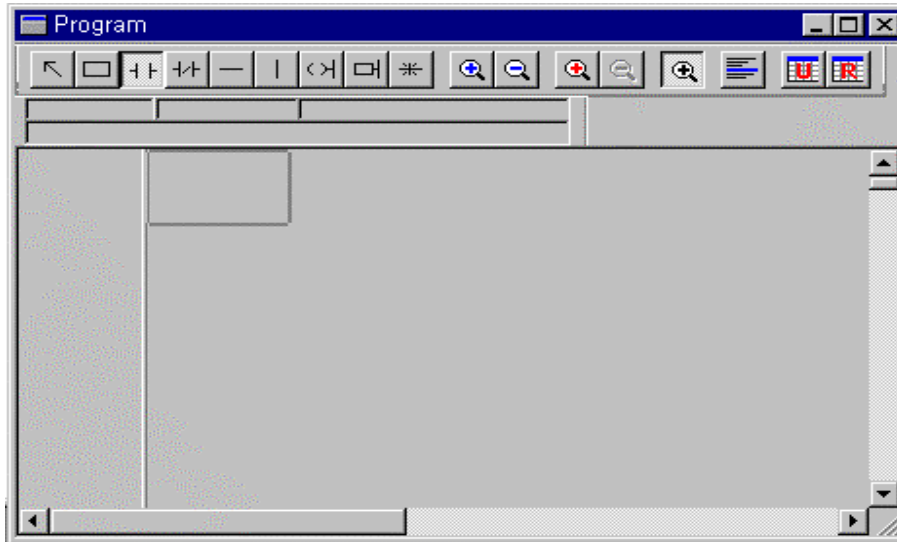



- ◆ You can also create a new Project using already created files from KGL-DOS or GSIKGL as well as KGL for Windows. For more information, please refer to Chapter. 4.2 Creating a Project.

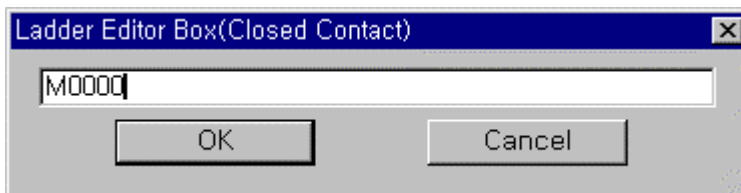
3. 2 Creating a Program

3. 2. 1 Creating a Ladder Program

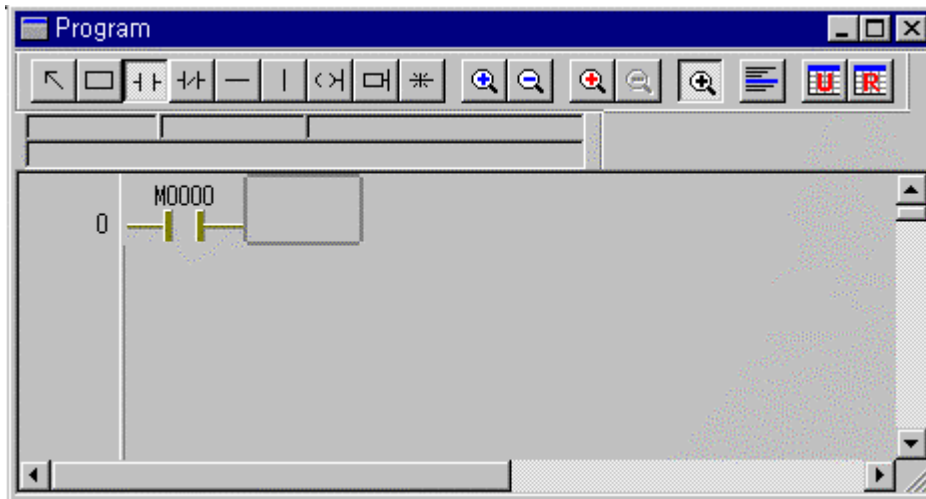
- ◆ This chapter describes creating a program in Ladder Window using the Tool Bar.




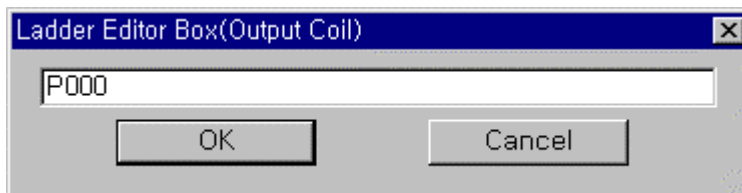
- ◆ After selecting the Normally Open Contact () on in the Ladder Tool Bar, Move the cursor to the place to insert the contact.
- ◆ Click the left button of the mouse or press Enter key, then the contact input dialog box appears.



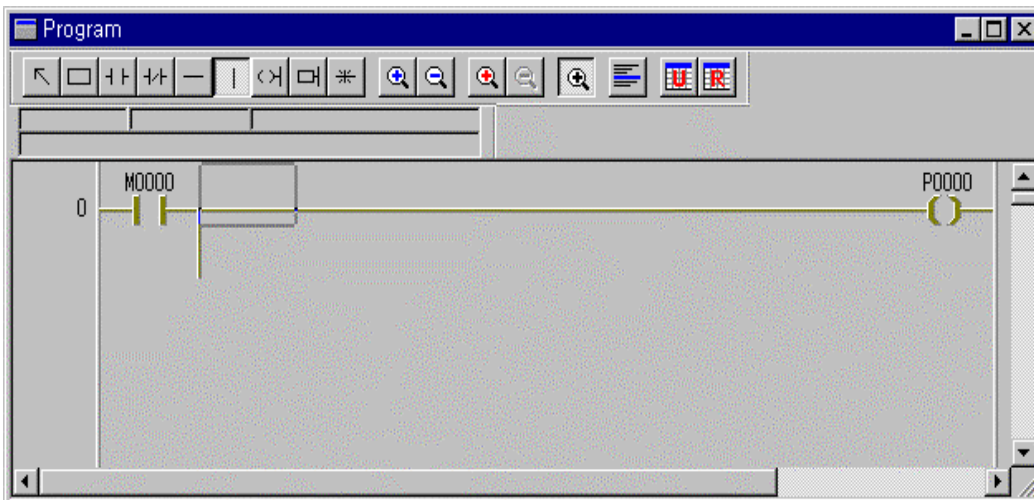
- ◆ Type the contact (M0000) you want to input and click OK button or press Enter key.




- ◆ Select the Output Coil () in the Ladder Tool Bar and move the cursor to the next column of M000. Click the mouse button or press Enter key.
- ◆ Type the Output Coil (P000) and click OK button or press Enter key.

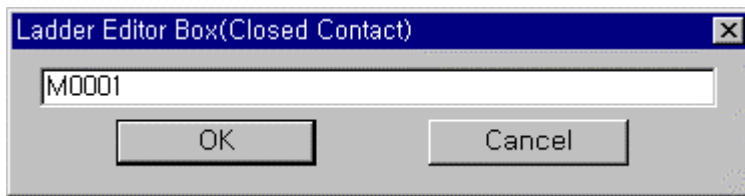



- ◆ Select the Vertical line () in the Ladder Tool Box and click the mouse button on the cursor position.

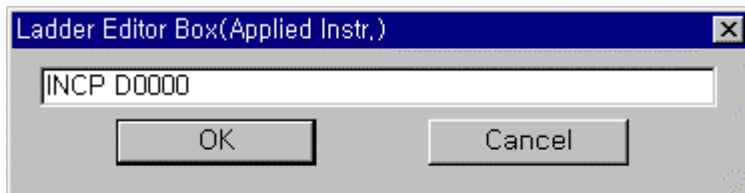



- ◆ Select the Normally Closed Contact () in the Ladder Tool Bar and Move the cursor to the place to insert the contact. Click the mouse or press Enter key to open the input dialog box for the contact input.

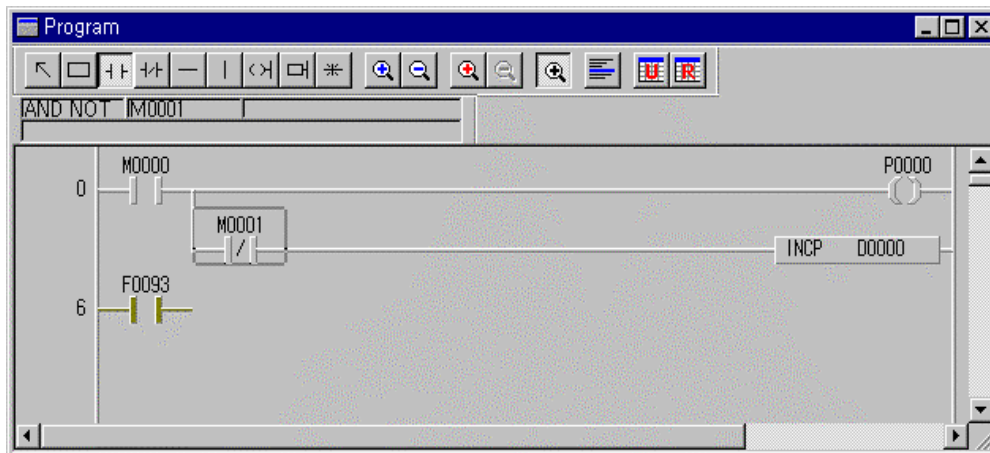
- ◆ Type an input contact that you want and click OK button or press Enter key.




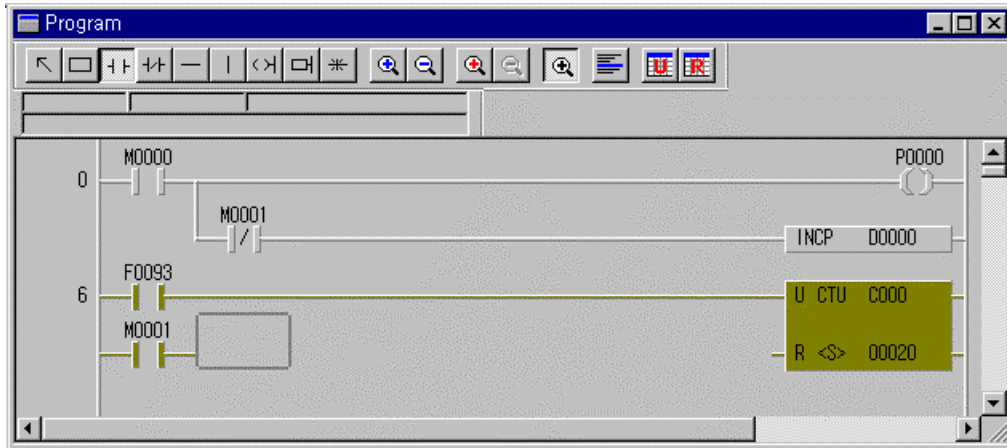
- ◆ After selecting the Applied Instruction icon() the Ladder Tool Box or Pop-up menu (click the right mouse button in the insert position), click the mouse or press Enter key.
- ◆ Type.INCP D0000 00001.in the Ladder Editor Box.




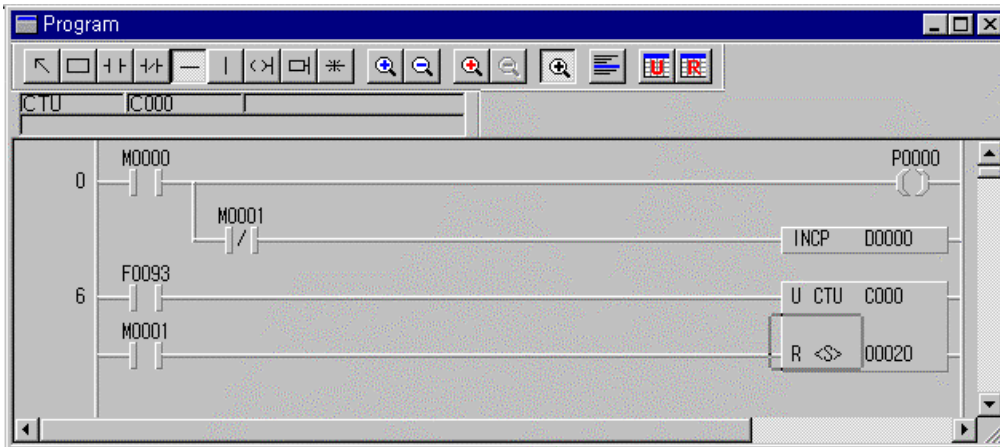
- ◆ Select the Normally Open Contact() in the Ladder Tool Bar and move the cursor to the next start line →
Click the mouse or press Enter key.
→ Type F0093 (System pulse clock for 1 second)




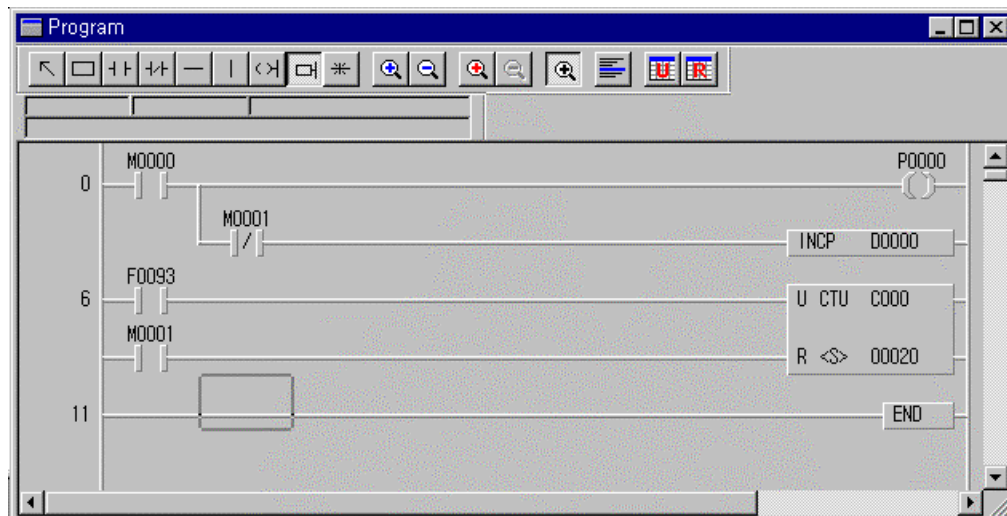
- ◆ Select the Applied Instruction icon() the Ladder Tool Bar and type.CTU C000 20..
- ◆ For the Reset input of the Counter, type M0001 in the reset position after selecting the Normally Open Contact.




- ◆ To complete the Ladder line, select the Horizontal Line () in the Ladder Tool Box. And click the mouse in the position to connect the line to the Counter.

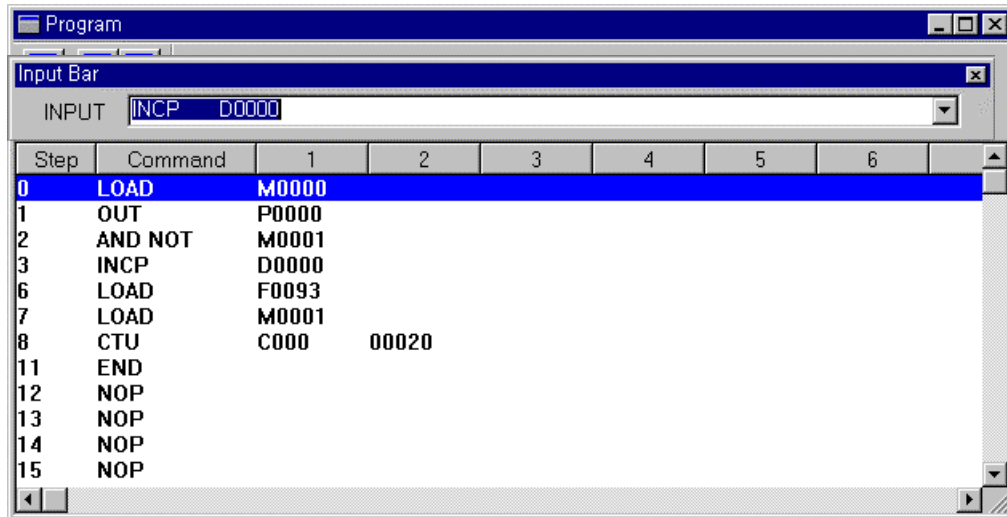


- ◆ To finish the program editing, type.END.Instruction in the next line. Select the Applied Instruction icon () to enter.END.instruction and press Enter key or click the mouse button.

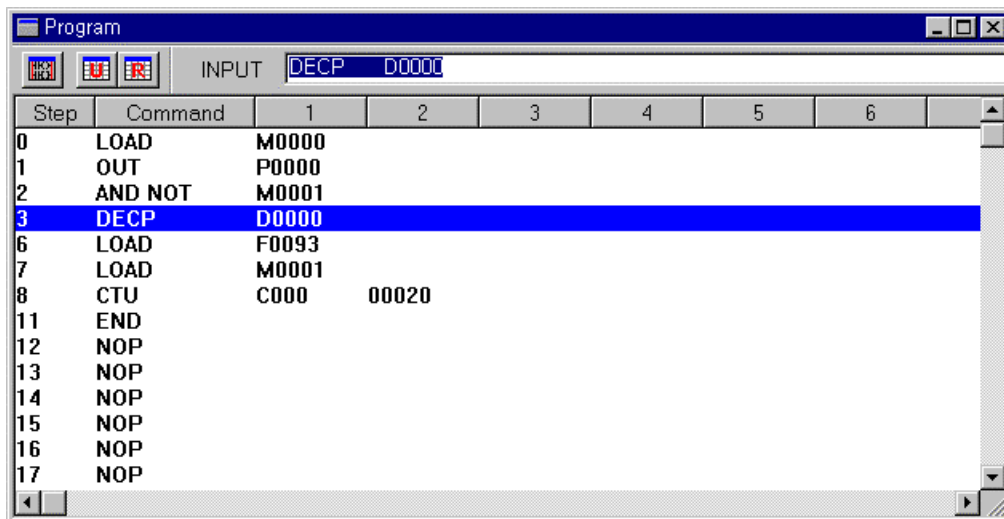


3. 2. 2 Creating a Mnemonic Program

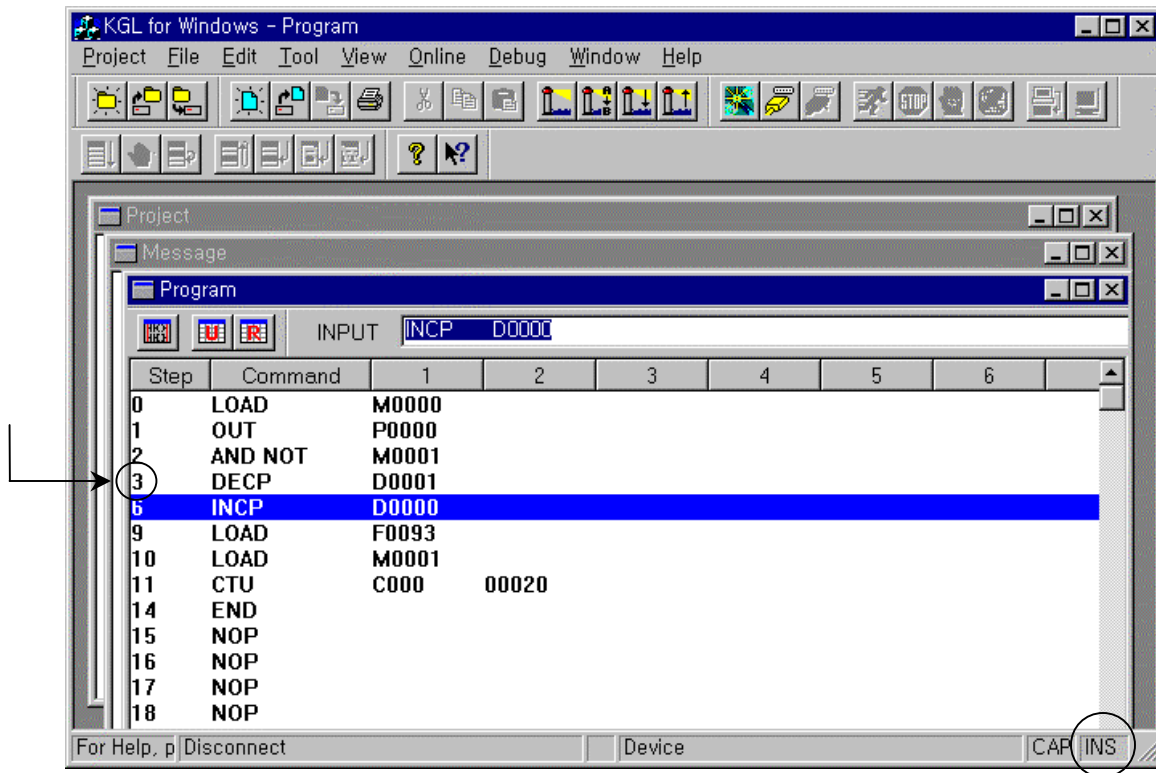
- ◆ To view the Mnemonic Program in the Ladder Program Mode, Click the Mnemonic icon() the Ladder Tool Box.




- ◆ To edit a Mnemonic Program, move the selection bar to the Step you want to input.
- ◆ Type.DECP D0000.on the Step No. 3 by using the Input Bar to replace the Instruction.INCP.into.DECP..



- ◆ If you want to insert the Instruction.DECP.in front of the Instruction.INCP., press Insert key in the keyboard. → The edit mode is changed into **INS**.
→ Type the Instruction on the Input Box and press Enter key.



- ◆ To return to the Ladder Program Mode, press the Ladder icon() the Mnemonic Tool Bar.

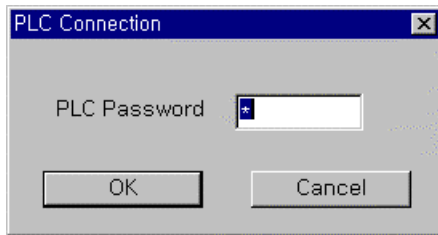
3. 3 Connect to PLC (Online)

3. 3. 1 Connection

- ◆ To communicate with PLC, connect the RS-232C port in PLC CPU module with the serial port of the computer using RS-232C Cable.

→ Select **Online-Connect** () the Pull-down menu.

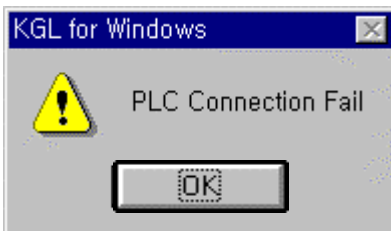
→ Type the Password




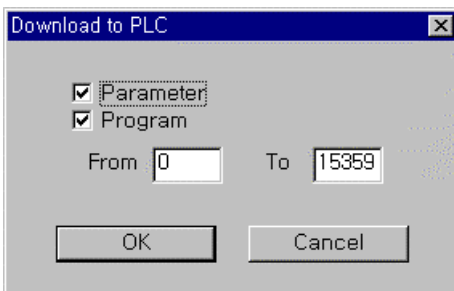
- ◆ If you don't have any password, click OK button or press Enter key.
- ◆ If the connection is completed, the message appears on the Status Bar as below..



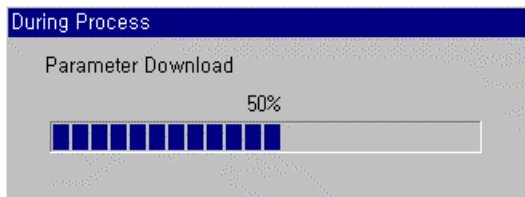
- ◆ If the connection is not completed normally, the Message Window will be displayed as below



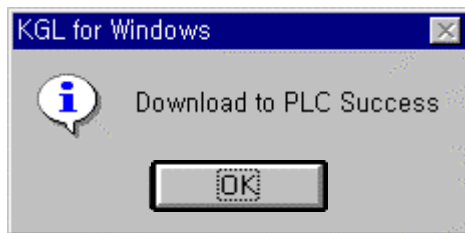
- ◆ If the connection is failed, confirm the RS-232C Cable or if the Connection Option is selected to **Local** correctly in **Project- Options...** of the Pull-down menu.
- ◆ If the connection is completed normally, select **Online-Download** () menu. Then the following dialog box will be opened.



- ◆ Click OK button to continue the process. Then, the program and parameter is downloaded to PLC.



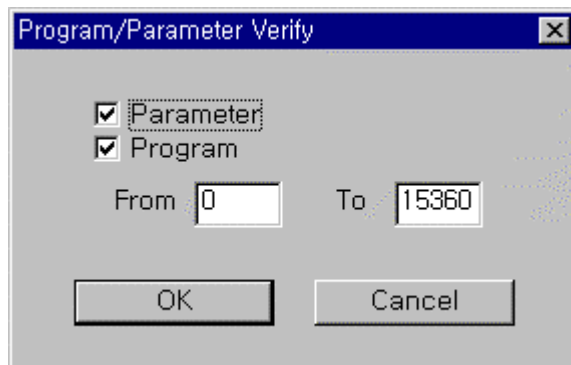
- ◆ **Download** is only available on **Stop** ( mode. Confirm the status in the Change Mode.



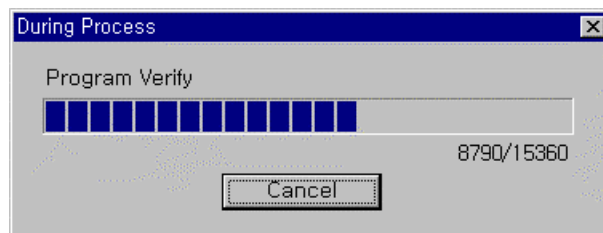
→ Click OK button.


- ◆ Select **Run** ( mode in **Online - Change Mode** menu.

- ◆ To check the program and parameters stored in PLC are same as them of KGL-WIN, select Online-Verify menu. Then, the following message box will appear to verify the program and parameter with the PLC. Click OK button to verify them.



- ◆ Click OK button to start verifying. If you don't want to verify, click Cancel button.



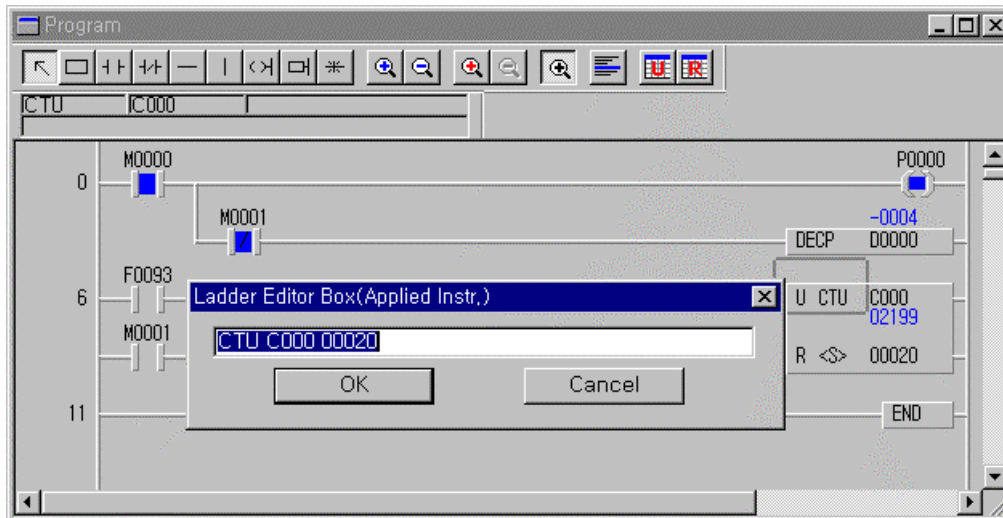
- ◆ To monitor the Used Device or PLC System, select **Monitoring**( mode in **Online – Monitor Start** menu. Then, the following message box appears to verify the program and parameter with ones in PLC.

3. 3. 2 Connect+Download+Run+Monitor Start(

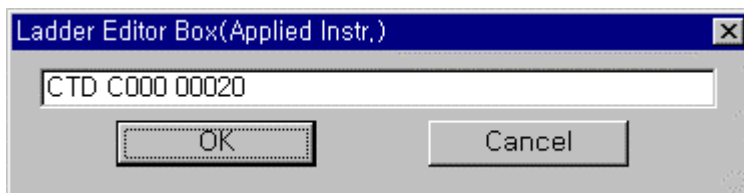
- ◆ Connect, Download, Run and Monitor Start Functions described in Chapter.3.3.1 are executed at one time by clicking the Connect+Download+Run+Monitor Start Menu in the Pull-down menu.

3. 3. 3 Online Edit

- ◆ This Function is performed only when the verification is completed and in the Monitoring mode. In this mode, you may not execute the Download Function after editing. It'll be done automatically.
- ◆ The program is changed automatically without the mode change into Stop mode. So, you must be careful when you do edit the program in the Online mode.
- ◆ For the program in Chapter. 3. 3.1, Move the cursor on the Instruction that you want to change and double click or press Enter key.

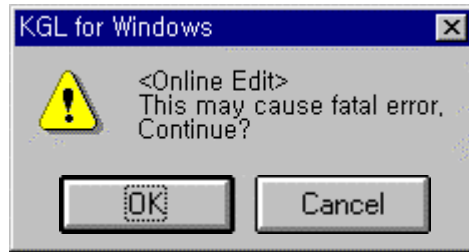


- ◆ Type the Instruction and Device to change in the Editor Tool Box.



→ Click OK button.

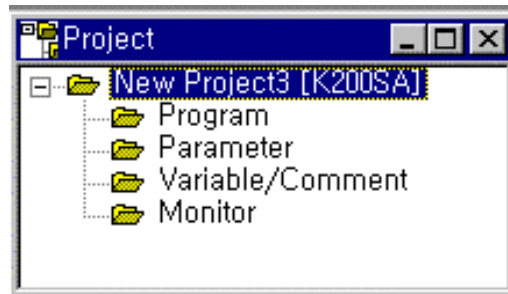
- ◆ The Message Box to confirm the change will be displayed as below.



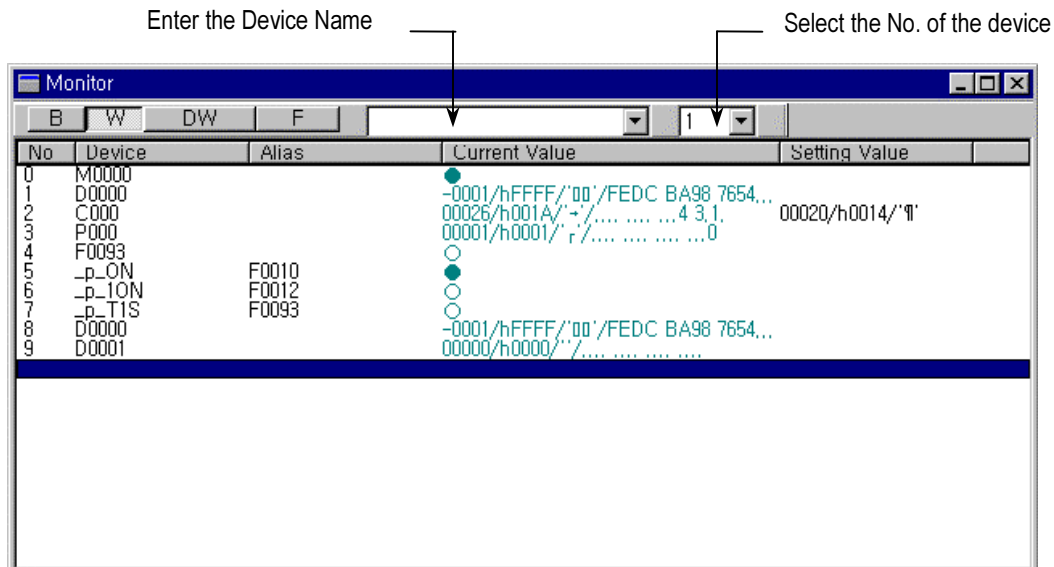
- ◆ Click OK button to complete the Online Edit.

3. 3. 4 Monitoring

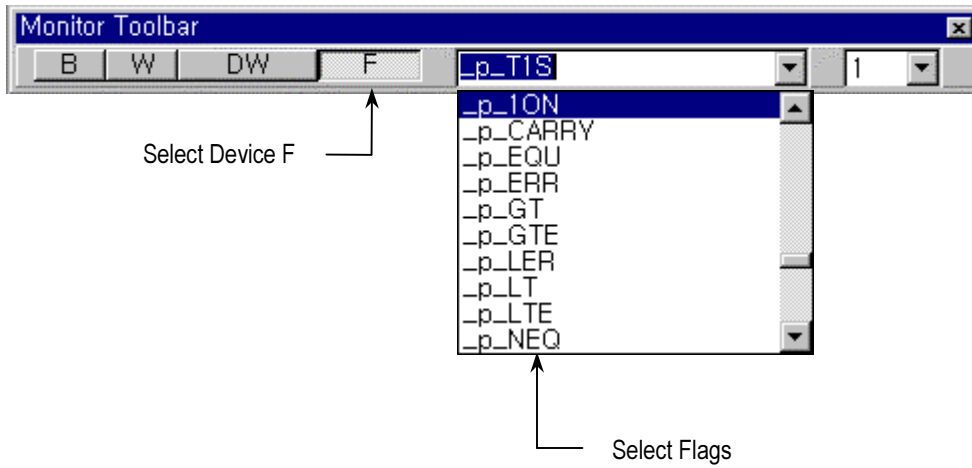
- ◆ To monitor PLC Devices or System Information in PLC, select the Monitor in the Project window.



- ◆ After selecting the type of Device to monitor, enter Device Name and Number of Device.



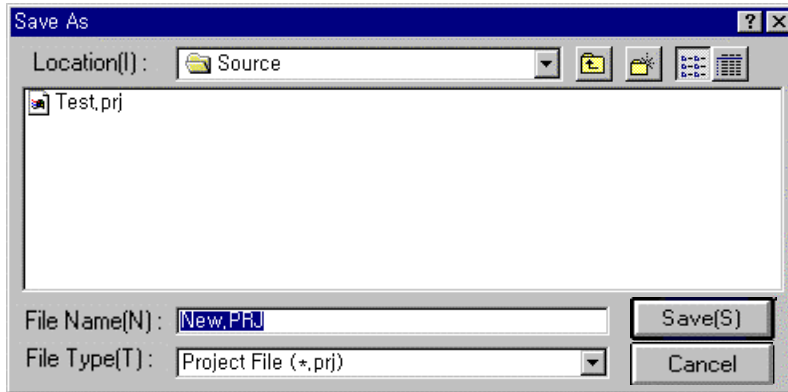
- ◆ If you want to monitor Flags, you can choose Flags in the following combo box after selecting F Device.



- ◆ You can monitor other detail information such as PLC system, I/O Information, Link Information and more.
For more information about the Read/Write Information, please refer to Chapter. 6. 2. Monitoring & Mode Change.

3. 3. 5 Save the Project

- ◆ To save the Project created in the above, select **Project - Save Project** in the Pull-down menu.

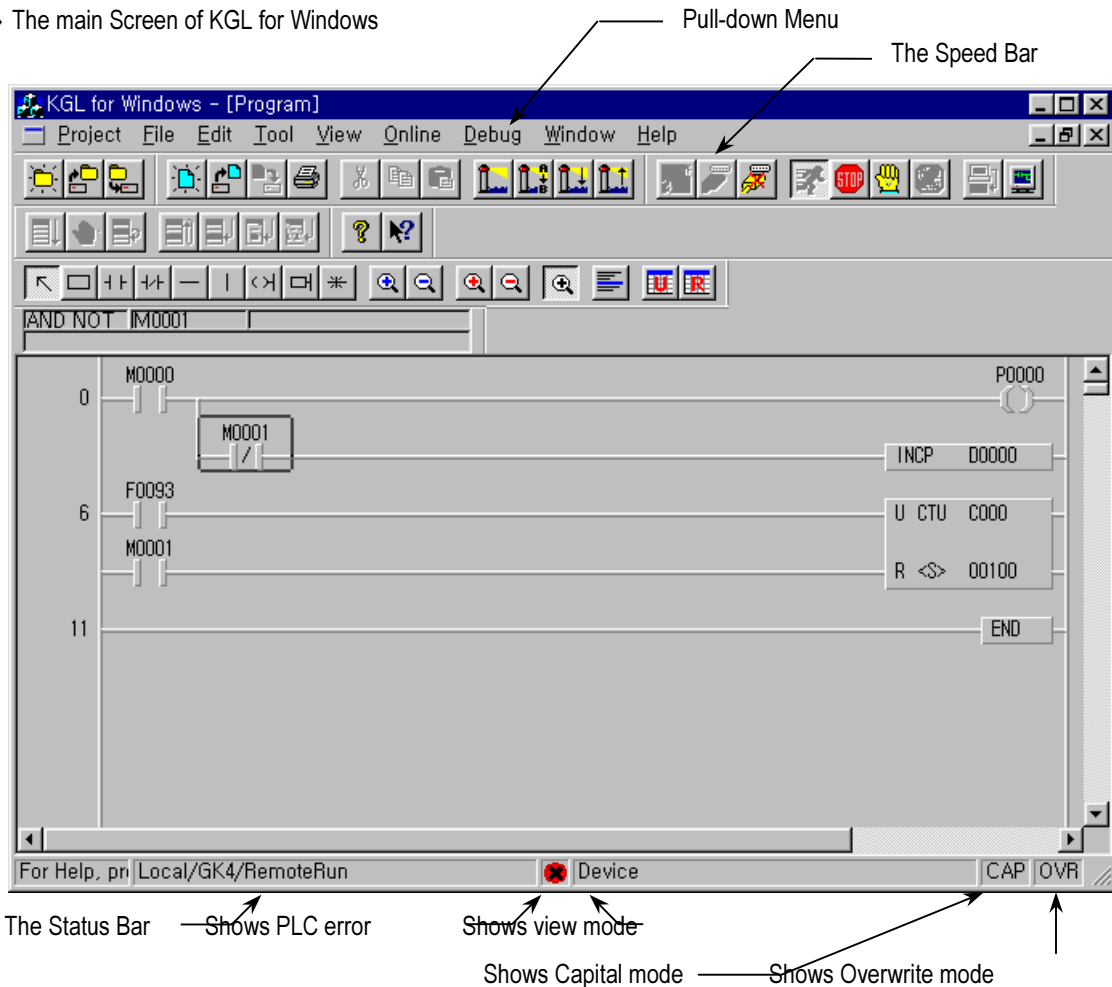


- ◆ Enter the Project Name (Test.prj) to save the active. If you don't enter the name, the name of the Project will be saved to New.prj.
- ◆ When the Project is saved, all the Items(Program, Parameter, Variable/Comment) are stored in the Project including the status of the window arrangement.

3. 4 The Screen Setup and Functions

3. 4. 1 The Screen Setup

- ◆ The main Screen of KGL for Windows



- ◆ The Status Bar

→ Description Mode : Describes the Function of the Command or Menu.

→ PLC Mode : Shows the Connection Status, PLC Type, Depth of Connection, PLC Operating Mode, View Mode, Monitoring Mode and more.

3. 4. 2 Menu

- ◆ To perform the items (commands) in the Menu, you can select the Command in the Pull-down menu or Tools in the Speed Bar.
- ◆ The Menu Bar provides two ways for you to access the Pull-down menus. Once the Pull-down menu appears, You can access the menu items in the same way by either using the mouse or pressing the underlined letter (Project...). To use the underlined character of the item in the menu list, press the <ALT> key.

1) Project

Commands		Descriptions
New Project...		Create a new Project
Open Project...		Open an existing Project
Save Project		Save the active Project
Save Project As...		Save the active Project as a new Project.
Close Project		Close the current Project
Save Item	►	Save Program, Parameter and Variable/Comment as Files
Load Item	►	Load Program, Parameter and Variable/Comment files in a Project
Options...		Set KGLWin Options
Print...	Ctrl+P	Print the active document
Print Preview		Preview documents to print
Project Print		Print all the contents of the Project
Print Setup...		Setup the Printer Options.
Recent Project		Open the recent Project
Exit		Quit the application

2) File

Commands		Descriptions
New...	Ctrl+N	Create a new File
Open...	Ctrl+O	Open an existing File
Save	Ctrl+S	Save the active File
Save As...		Save the active File as a new File
Recent File		Open the recent Files

3) Edit

Commands		Descriptions
Cut	Ctrl+X	Remove the selected block and send it to the Windows clipboard
Copy	Ctrl+C	Copy the selected block to the Windows clipboard without affecting it
Paste	Ctrl+V	Retrieve it from the Windows clipboard
Delete	Ctrl+Delt	Delete the selected block
Insert Line	Ctrl+M	Insert a line at a caret position
Delete Line	Ctrl+U	Delete a line at a caret position
Edit Rung Comment		Edit a Comment at a specified rung
Block Selection...		Select a block using Step range
Optimize Program		Optimize the program
Find...	Ctrl+F	Find the specified string
Replace	Ctrl+H	Find the specified string and replace it a new device
Forward Again	Ctrl+F3	Search again forward
Backward Again	Ctrl+B	Search again backward.
Go to Step	Ctrl+G	Move the cursor to the step

4) Tool (Only available for Ladder Program)

Commands	Descriptions
Arrow	Go to Arrow mode
Range	Set the range for block
Normally Open Contact F3	Select a Normally Open Contact
Normally Closed Contact F4	Select a Normally Closed Contact
Horizontal Line F5	Select a Horizontal Line
Vertical Line F6	Select a Vertical Line
Output Coil F9	Select a Output Coil
Applied Instruction F10	Select an Applied Instruction
NOT Instruction	Select a NOT Instruction

5)

View

Commands	Descriptions
Mnemonic/Ladder Ctrl+Space	Change the program to Ladder or Mnemonic Mode
Device Name	Display the Device Name
Variable Name	Display the Variable Name.
Device+Variable Name	Display the Device and Variable Name
Device+Comment	Displays the Device and Variable Name
Used Device	Display the Used Device
Device Reference	Show the Device Reference
Check Program...	Check the errors in the Project
Change No of Column ▶	Change the number of the input contact in one line
Zoom In/Out ▶	Zooming

6) Online

Commands	Descriptions
Connect+Download+Run +Monitor Start Ctrl+R	Execute Transfer, Run and Monitor Functions simultaneously
Connect	Connect to PLC
Disconnect	Disconnect from PLC
Monitor Start	Start Monitoring
Mode Change	Run
	Stop
	Pause
	Debug
Read	System Monitor
Information	PLC Information...
	I/O Information...
	Link Information...
	Mnet Information...
	HSLink Parameter ▶
Write	Set PLC Clock...
Information	Change Password...
	Write Mnet Parameter...
	FSM Emergency Output
Download...	Download Program/Parameter to PLC
Upload...	Read Program/Parameter from PLC

Verify...		Verify Program/Parameter with PLC
Clear	Data...	Clear Devices in PLC
	Program/Parameter	Clear the program/parameter in PLC
Flash Memory	Read	read the program/parameter from Flash Memory
	Write	write PLC program/parameter to Flash Memory
	Verify	verify the program/parameter with Flash Memory
EPROM	Type Selection...	Select EPROM Type
	Write	write PLC program/parameter to EPROM
	Read	read the program/parameter from EPROM
	Verify	verify the program/parameter with EPROM
	Check Blank	Check if EPROM is empty
Binary File	Load Binary File...	transfer the program/parameter in KGL for Windows to EPROM
	Make Binary File...	receive the Binary File from EPROM

7)

Debug

Commands	Descriptions
Trace Ctrl+T	Run only one Step
Go	Run until current Break point
Stop	Stop Debugging
Break Step...	Run to the specified Break Step
Break Scan...	Run to the specified Break Scan
Break Bit...	Run until the specified Bit is set
Break Word	Run until the specified Word data
Change Current I/O... Ctrl+I	Change Current I/O
Forced I/O Enable	Enable Forced I/O setting
Set Forced I/O...	Set Forced I/O
Sampling Trace	Execute sampling Trace
Trigger	Execute Trigger

9) Window

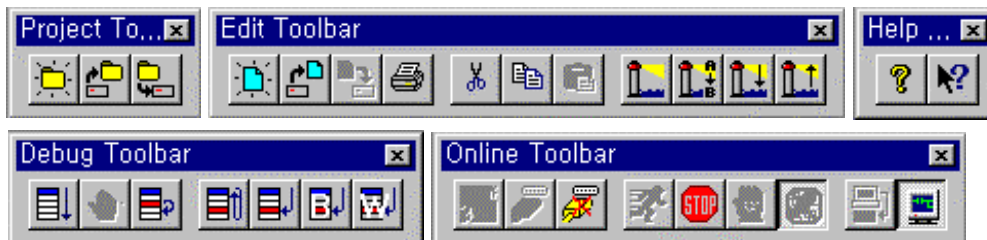
Commands	Descriptions
New Window	Open a new window for the active program
Cascade	Cascade windows on the screen
Tile Horizontally	Arrange window as non-overlapping tiles
Tile Vertically	Arrange window as non-overlapping tiles
Arrange Icons	Arrange icons at the bottom of the window

10) Help

Commands	Descriptions
Help	Display help topics of KGL for Windows
Help in Help	Display detailed instructions about how to use
About	Display general information of KGL for Windows

3. 4. 3 Tool Bars

- ◆ These Tools are supported in KGL for Windows.



- ◆ The Tools in the Speed Bar

Tools	Commands	Tools	Commands
	New Project		Connect
	Open Project		Disconnect
	Save Project		Download
	New File		Monitoring Mode
	Open File		Run
	Save File		Stop
	Print		Pause
	Cut		Debug
	Copy		Go
	Paste		Debug Stop
	Find		Trace
	Replace		Break Scan
	Forward		Break Step



	Backward		Break Bit
	Connctet+Dowload+Run+Monitor Start		Break Word

Chapter. 4 Creating a Project

4.1 Create a Project	4-1
4.2 Open a Project	4-2
4.3 Save a Project.....	4-3
4.4 Manage an Item	4-4
4.5 Editing a Parameter	4-5
4.6 Editing a Variable/Comment	4-7

Chapter. 4 Creating a Project

4. 1 Create a Project


4. 1. 1 About a Project

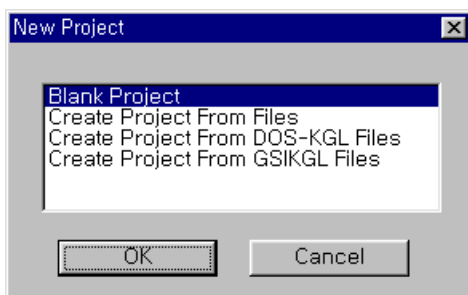
- ◆ A Project is the highest level to communicate with PLC and KGL for Windows.
A Project consists of Program, Parameter and Variable/Comment of Device.
- ◆ KGL for Windows manages User Defined Programs and contains all elements necessary to describe a Project.



- ◆ A Project consists of 3 Items (Program, Parameter and Variable/Comment) and Monitoring item is used when the Monitoring Window is opened. Each Item can be saved respectively for another Project.
- ◆ Saved Items (Program, Parameter and Variable/Comment) can be used for creating other Projects or to reuse for other Projects.
- ◆ A Project stores not only Program, Parameter and Variable/Comment but, also PLC type, Used status of KGL, various information registered for monitoring. Thus, When you reopen the Project after saving a Project, the Window keeps the previous working condition.
- ◆ Only Program and Parameter can be downloaded to PLC.
- ◆ A Project is saved as *.PRJ File.

4. 1. 2 Create a Project

- ◆ To create a New Project file, Select **File--New Project...** () from the Project pull-down Menu.
The New Project dialog box will appear as below.

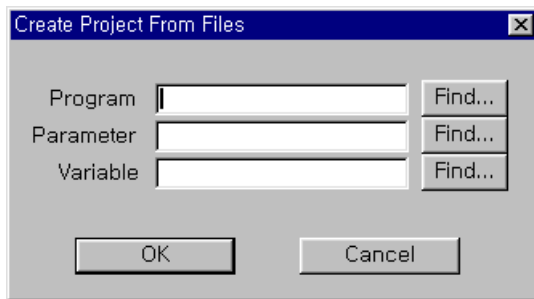


- ◆ Open a Blank Project

→ This is used to create a Project for the first time. (Refer to Chapter. 3.1)

- ◆ Create from Old Files

→ To create a New Project using the already existed Items (Program, Parameter and Variable/Comment),
Select Items to be used by clicking the Find button in the dialog box.



→ Click OK button after registering Items.

→ Items can be selected up to 3 items and Items, which are not selected in this dialog box, are displayed as default(Initial data).

- ◆ After selecting PLC Type and Programming Language, press the OK button. Then Project, Message and Program Windows will be opened.

- ◆ Create from DOS KGL file

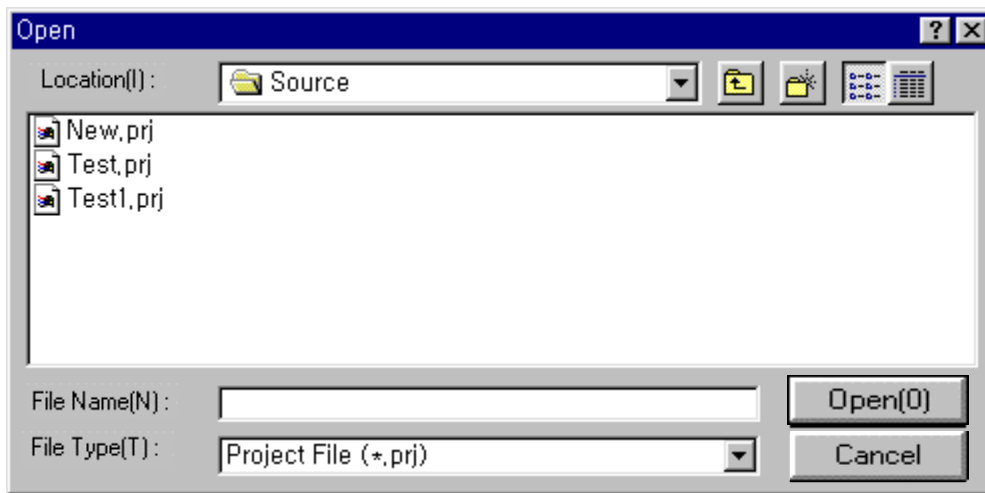
→ To create a New Project using Items (Program, Parameter and Variable/Comment) created in KGL for DOS,
Select PLC Type and Programming Language after selecting already created Items in KGL for DOS. Then, a New Project will be opened.

- ◆ Create from GSIKGL file

→ To create a New Project from GSIKGL file,
Select already created files (*.PGM, *.CMT) from GSIKGL in the dialog box and select PLC Type and Programming Language.


4. 2 Open a Project

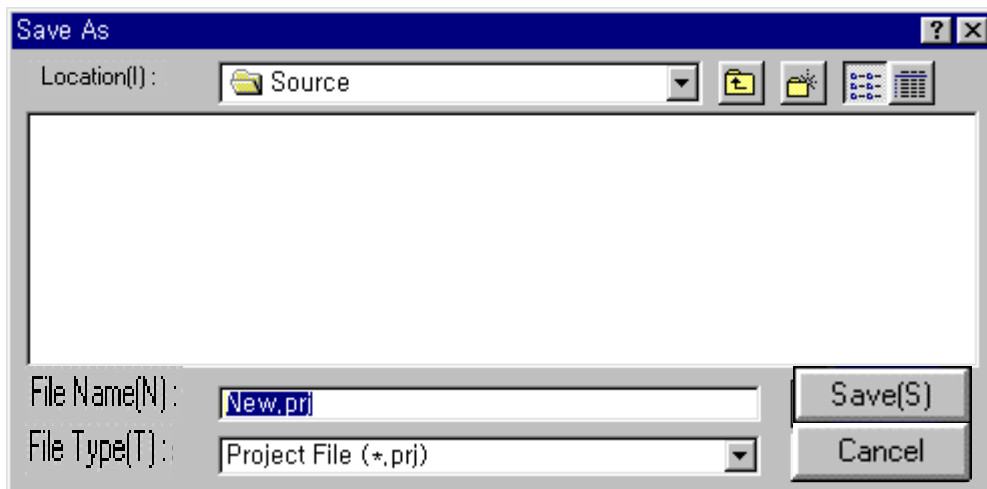
- ◆ To open an existing Project, Select **Project—Open Project...** () from the Project pull-down Menu.



- ◆ Press Open button after selecting the Project that you want.

4. 3 Save a Project

- ◆ To save a Project, Select **Project—Save Project...** () from the Project pull-down Menu. All Items (Program, Parameter and Variable/Comment) contained in the Project will be stored at the same time.
- ◆ If you save an existing Project file in the specified folder, the file will be saved without any message.
- ◆ If you save a New Project that is not existed in the specified folder or select **Project—Save as...** from the Project pull-down Menu, the software will ask you if you want to save the Project in the folder.

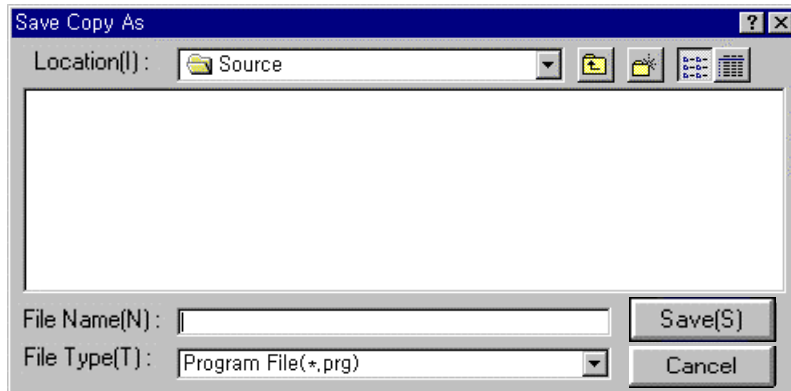


- ◆ Select **Project—Close Project** or **Project—Exit** from the Project pull-down menu. Then, the Window asking if you save the Project will appear. Click 'Yes' button to save the edited Project or 'No' button not to save.

4 . 4 Manage an Item

4 . 4. 1 Save an Item

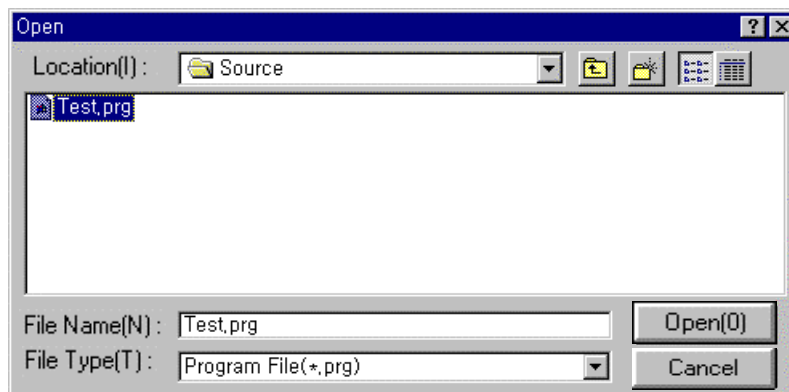
- ◆ To save Items included in a Project respectively, select **Project—Save Item...** from the Project pull-down Menu.



- ◆ Press Save button after entering the name of the Item.
- ◆ This can be used when creating a New Project or changing Items respectively.

4. 4. 2 Load an Item

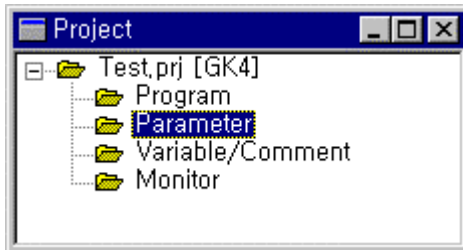
- ◆ To load some items in the on-editing project from the saved items, select **Project—Load Item...** from the Project pull-down Menu.
- ◆ Click Open button after selecting item in Open dialog box as below.



- ◆ After the completion, the program among Items of the Project will be changed into Test.prg file.

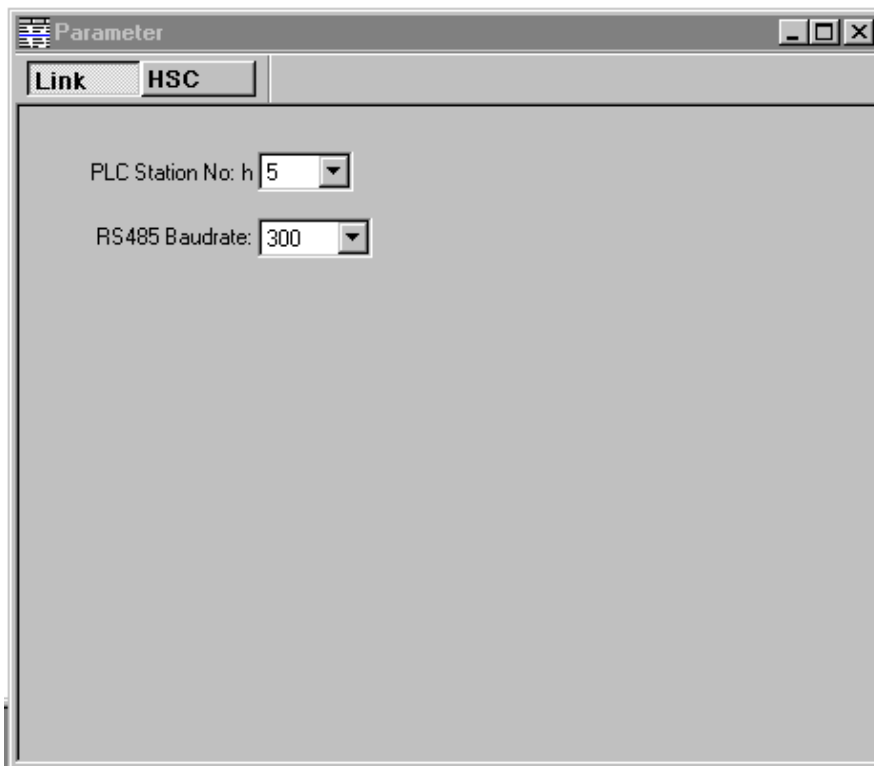
4. 5 Editing a Parameter

- ◆ In one Project, There are 2 types of Parameters, 'Link Parameter' and 'High Speed Counter'
- ◆ Select Parameter in Project Window.



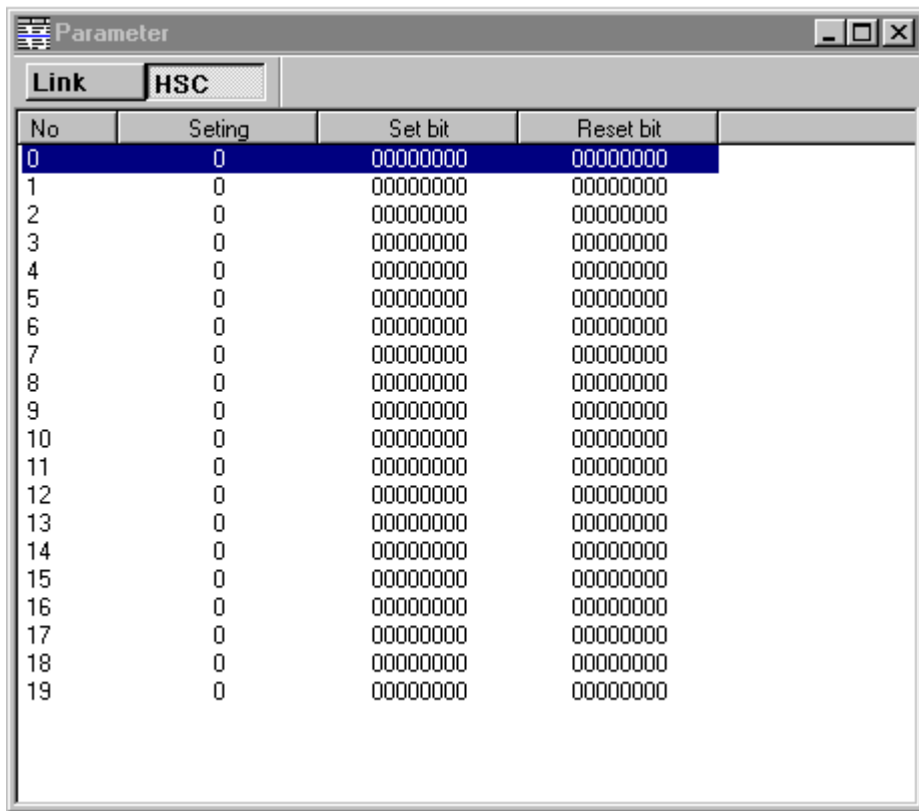
4. 5. 1 Link Parameter

- ◆ This is used to select the RS485 Link Parameters for the K10S1 and the K30S/K60S Option module (K56E-OPT)
- Select the PLC station No and Baudrate



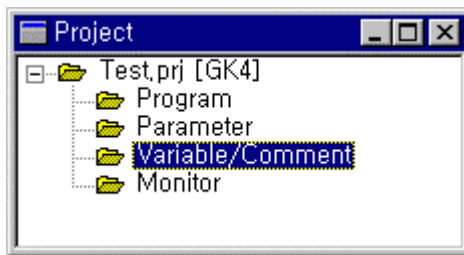
4. 5. 2 High Speed Counter Parameter

This is used to configure the HSC instruction in the K10S1 and K30/K60

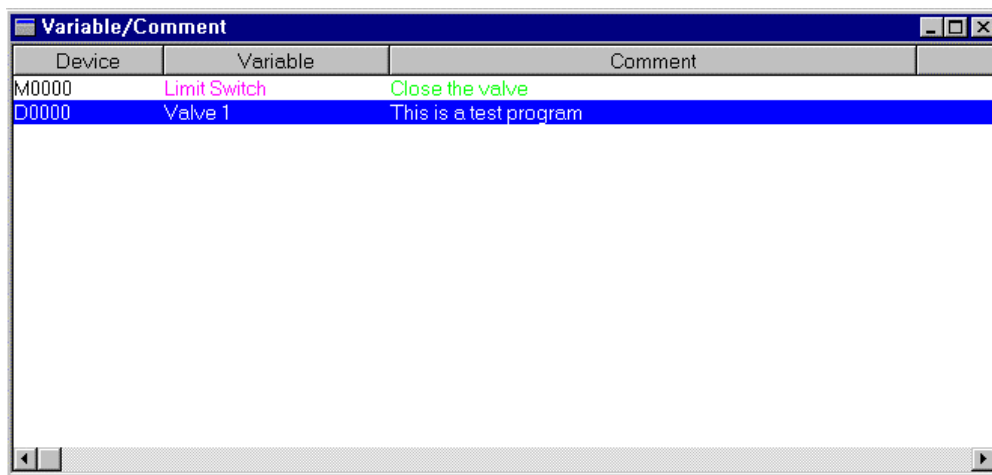


No	Setting	Set bit	Reset bit
0	0	00000000	00000000
1	0	00000000	00000000
2	0	00000000	00000000
3	0	00000000	00000000
4	0	00000000	00000000
5	0	00000000	00000000
6	0	00000000	00000000
7	0	00000000	00000000
8	0	00000000	00000000
9	0	00000000	00000000
10	0	00000000	00000000
11	0	00000000	00000000
12	0	00000000	00000000
13	0	00000000	00000000
14	0	00000000	00000000
15	0	00000000	00000000
16	0	00000000	00000000
17	0	00000000	00000000
18	0	00000000	00000000
19	0	00000000	00000000

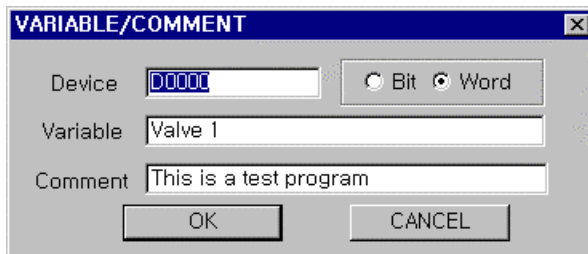
- ◆ Variable/Comment is for the detail description of devices used in PLC. This also makes you understood more easily in processing a Project..
- ◆ Select Variable/Comment in Project window.



- ◆ Double-click the Variable/Comment in Project window.



- ◆ Enter Variables in the dialog box and setup the types of Variables (Word/Bit).
- ◆ Enter Variable Name or Comment Name in the dialog box.



- ◆ To exit the dialog box, click OK button.

Chapter. 5 Editing a Program

5.1 Edit a Ladder program	5-1
5.2 Edit a Mnemonic program	5-2
5.3 Edit Menu	5-3
5.4 Pop-up Menu	5-4
5.5 View Menu	5-4
5.6 Manage a File	5-7

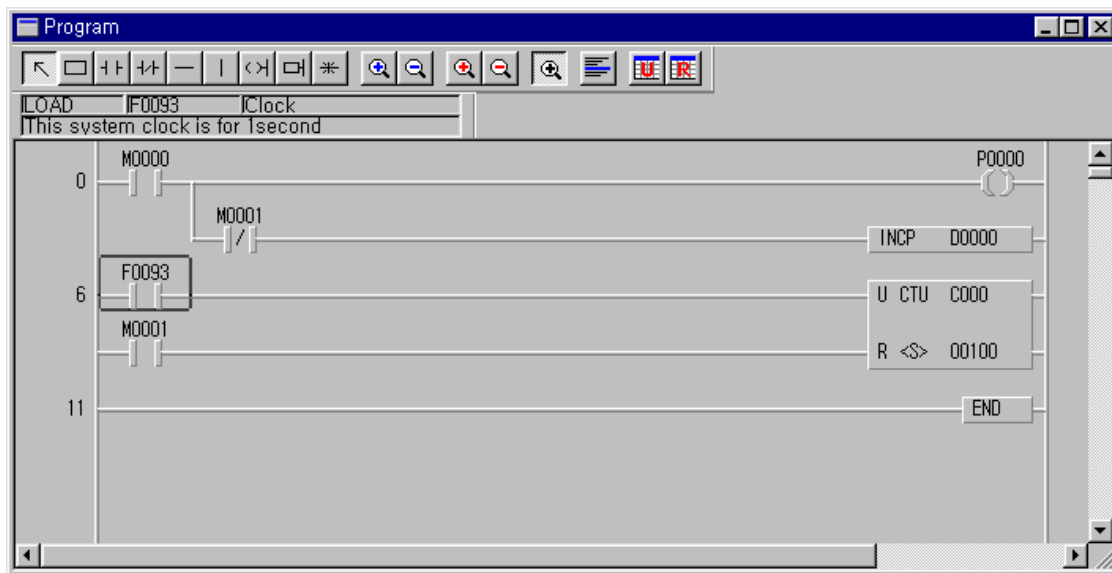
Chapter. 5 Editing a Program

- ◆ A Program is used for editing and developing Commands to control a machine or process by PLC System.

This chapter shows creating, saving and editing a Program.

5. 1 Edit a Ladder program

- ◆ A program is contained in a Project as an Item and created automatically in a Project.
- ◆ Open the Test .prj created in Chapter. 3.1.

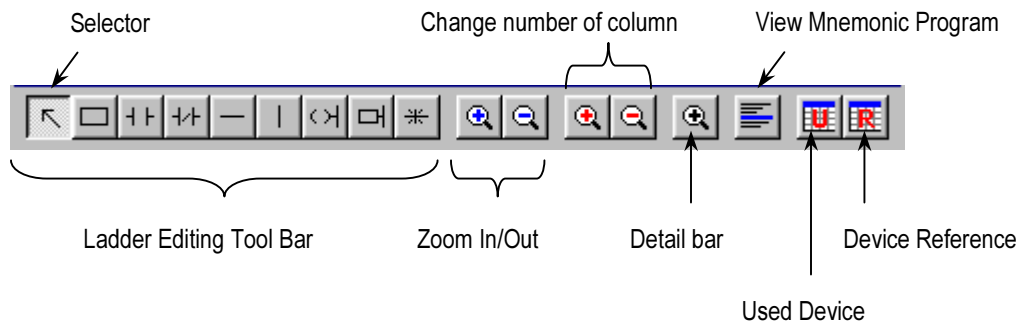


◆ Tool Bars

◆ Ladder Tool Bar

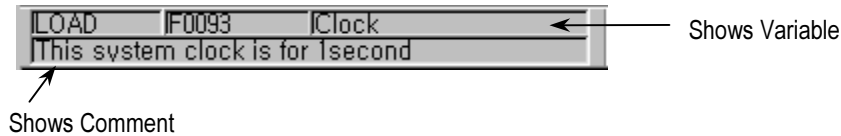
→ This Tool Bar is only visible when you are in a Ladder Program editing mode.

In the case of Ladder select tool bar, You can also use in **Menu-Tools** in the Main pull down menu



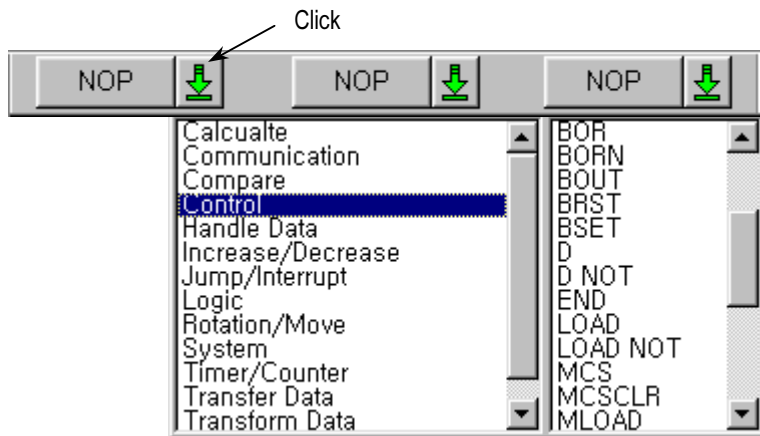
◆ Detail Bar

→ This Bar shows the used Command and Variable/Comment of the used Device where the cursor is placed.



◆ Instruction List Bar

→ To select the Instruction List Bar, move the mouse pointer into an area of the illustrations below, then click the right mouse button in the Tool Bar.

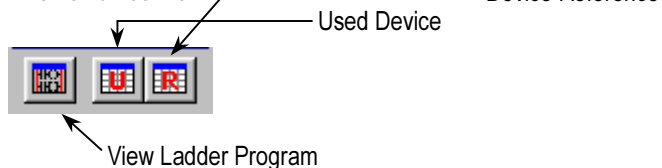


→ You can install the instructions that are used frequently into these Instruction List Bars. To use the Instruction registered in the Instruction List Bar, Just click the specified Instruction List Bar. Then, the instruction will be entered in the position.

5. 2 Edit a Mnemonic program

◆ A Mnemonic Program uses the Input Bar for Instruction Input.

◆ Mnemonic Tool Bar



◆ Input Bar

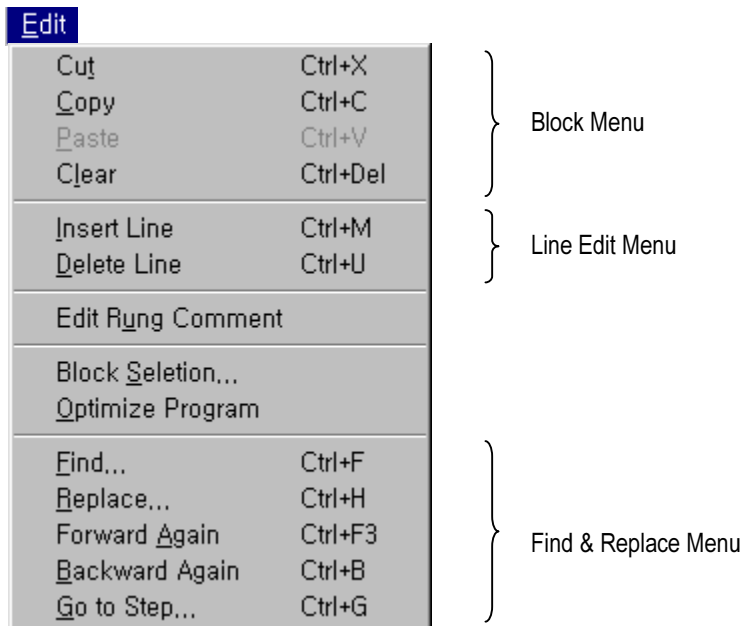
→ The Input Bar shows Instructions where the cursor is placed on and you can also edit or insert a Program using Insert/Overlap Mode.



◆ Instruction List Bar

→ This executes the same function as the one in the Ladder program.

5.3 Edit Menu



◆ Block Menu

→ Cut(Ctrl+X), Copy(Ctrl+C) and Paste(Ctrl+V) are only available after selecting a Block.

◆ Line Edit Menu

→ Inserts or deletes a line where the cursor is placed.

◆ Edit Rung Comment

→ Edits the Rung Comment in the specified line.

◆ Block Selection...

→ Selects a Block by a step number.

◆ Optimize a Program

→ Optimizes a Program by deleting NOP or unnecessary lines.

◆ Find... & Replace... Menu

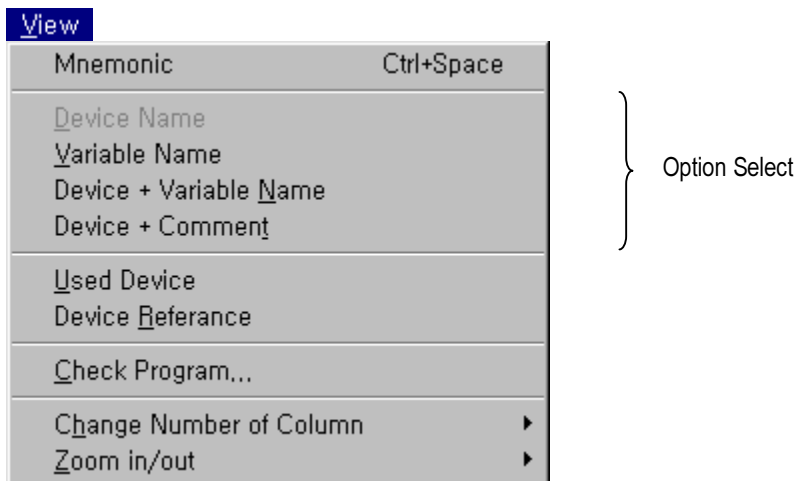
→ Used to find or replace a specific Operand.

5. 4 Pop-up Menu

- ◆ Click a right mouse button to see a Pop-up Menu.
- ◆ Pop-up Menus are various according to the position of the mouse. You can select frequently used functions in Pop-up Menu.
- ◆ The Functions are almost same as the Main Menu. But, Functions for Enforced I/O are operated differently.

5. 5 View Menu

- ◆ Select **Menu - View** in the Pull-down menu.



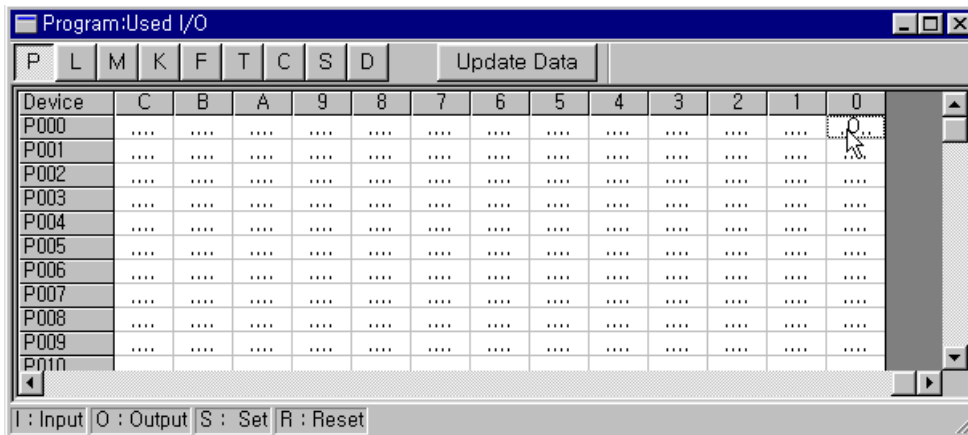
5. 5. 1 View Device

You can select only one view among 4 types.

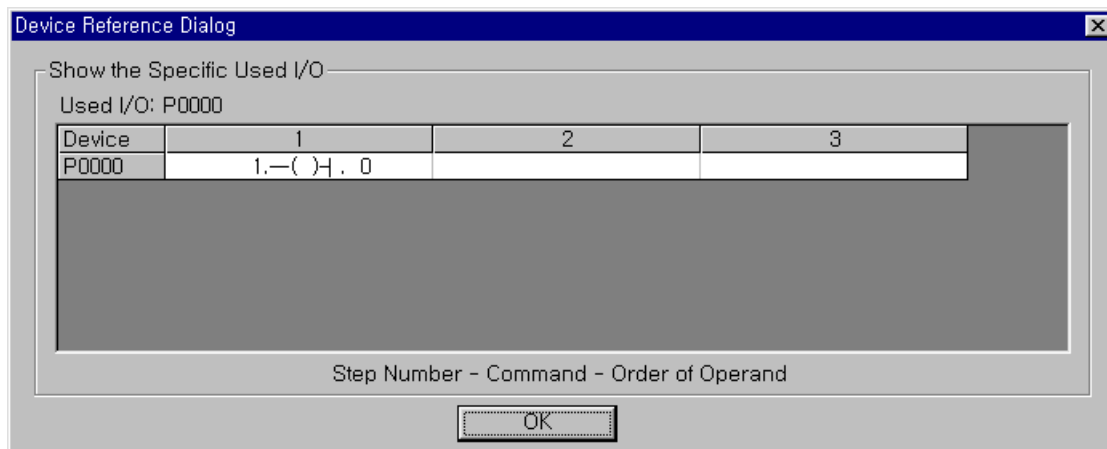
- ◆ Displays the Device and Variable/Comment used in the Program.
 - Device Name : Displays the Device Name on the screen. (For example, P0010, D0100)
 - Variable Name : Displays the Variable Name registered in Variable/Comment Item.
 - Device + Variable Name : Displays the Device Name and Variable Name.
 - Device + Comment : Displays the Device Name and Comment.


5. 5. 2 View Device Information

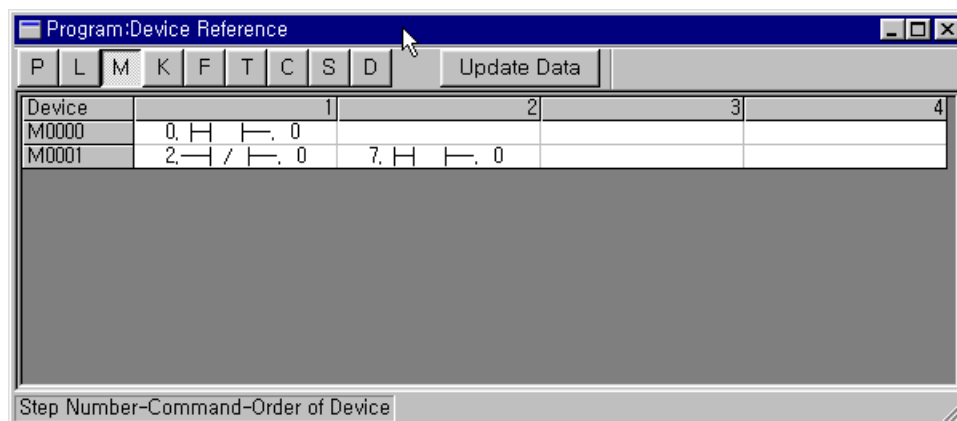
- ◆ Select **Menu - View – Used Device** () in the pull-down menu.



- ◆ A Region Bar is used for selecting the Device Region to be monitored or updating the information of the Device being monitored.
- ◆ To see the detail information for the used Devices, click the right mouse button after moving a mouse where to monitor. Then, the Device Reference Dialog box for the specified Device appears.

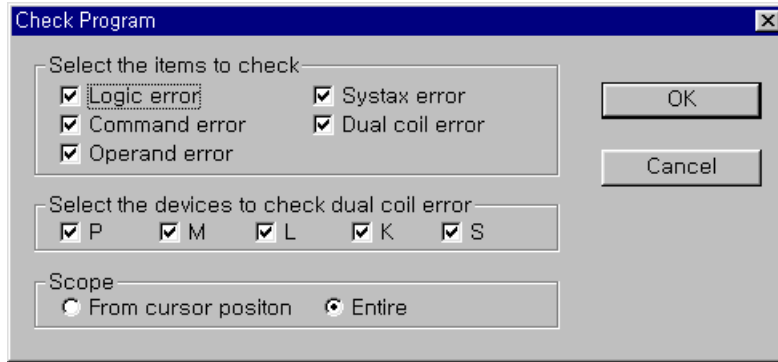


- ◆ The Device Reference Dialog box shows the step number, command and used status of the used Devices.
- ◆ You can also select the function from **Menu - View - Device Reference** () the pull-down menu. This shows all used Devices for each Device.





5. 5. 3 Check a Program...

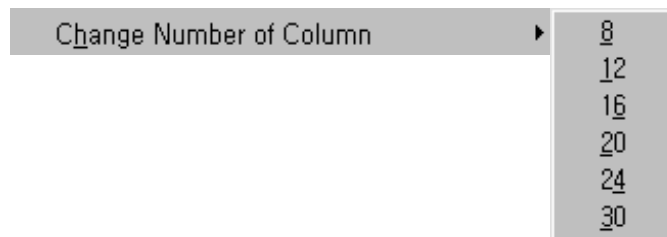
- ◆ Program Check Function shows logic errors, operand errors, dual coil errors and more errors.
- ◆ Select **Menu - View – Check Program...** in the pull-down menu.





- ◆ You can select items to check in the dialog box. Press OK button to execute the checked items.
- ◆ After the check, the result message appears and if errors are occurred, the detail information is recorded in the Message Window.

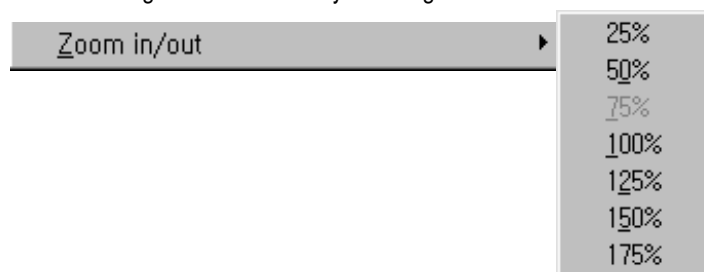
5. 5. 4 Change Number of Column

- ◆ To change the number of the input contact to insert in one line of Ladder program, Select the number of the input contact in **Menu - View – Change Number of Column** ()  a pull-down menu. (red ones)



5. 5. 5 Zoom In/Out

- ◆ You can enlarge or reduce the magnification of Ladder program by clicking on the  b  s.(blue ones)
- ◆ You can change the zoom level by selecting **Menu - View – Zoom In/Out** in the Pull-down menu.

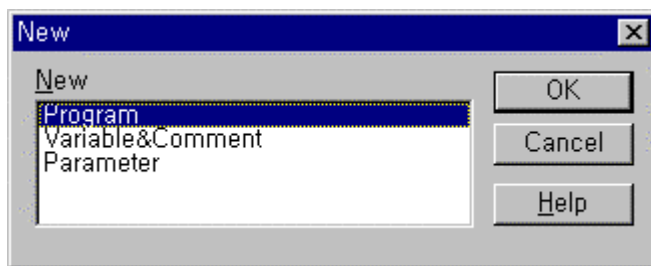


5. 6 Manage a File

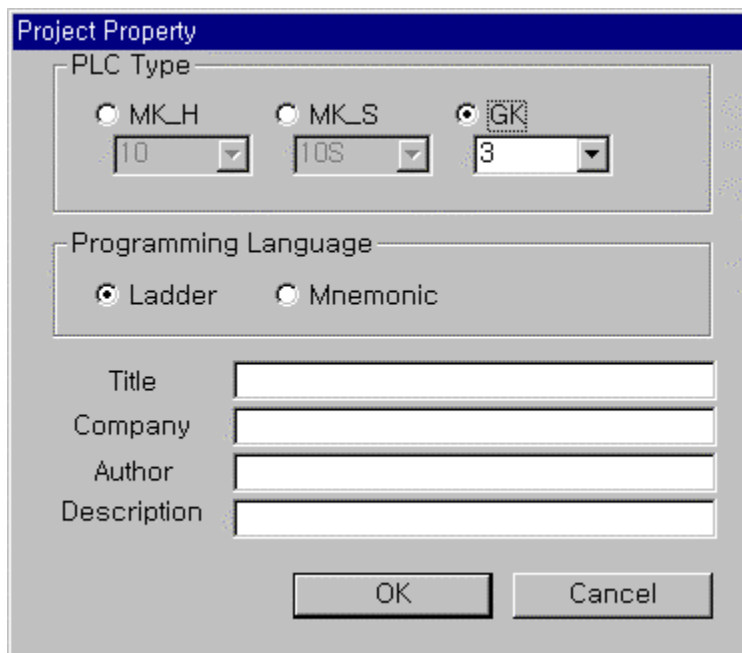
- ◆ When a Project is created, 3 Items (Program, Parameter and Variable/Comment) are created automatically.
- ◆ These Items are stored as one project not respectively. If you want to save the each files separately, select **Project – Save Item** in the pull-down menu.
- ◆ An **Item** means Program, Parameter or Variable/Comment in one Project. To use Items in other projects, The items should be saved as files respectively.
- ◆ A **File** means Program, Parameter or Variable/Comment not included as Items in a Project. If you use a file in a Project, the file that is included in the project will be changed into an Item.

5. 6. 1 New...

- ◆ To create a new file, select **Menu - File – New...** () the pull-down menu.



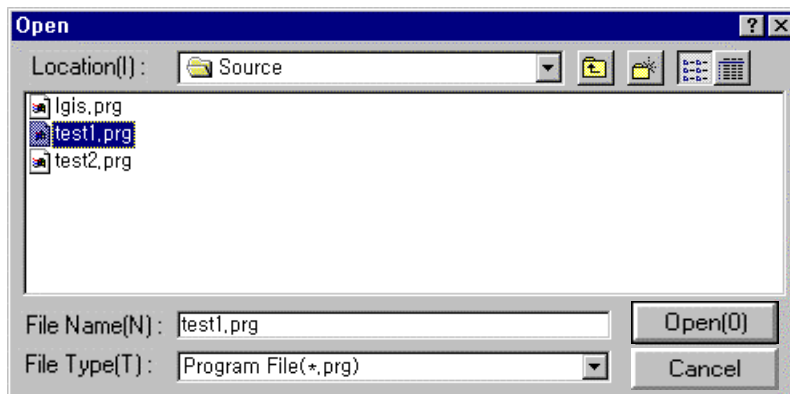
- ◆ Select an Item (Program) to create and press OK button.



- ◆ Setup PLC Type and Programming Language and press OK button.


5. 6. 2 Open...

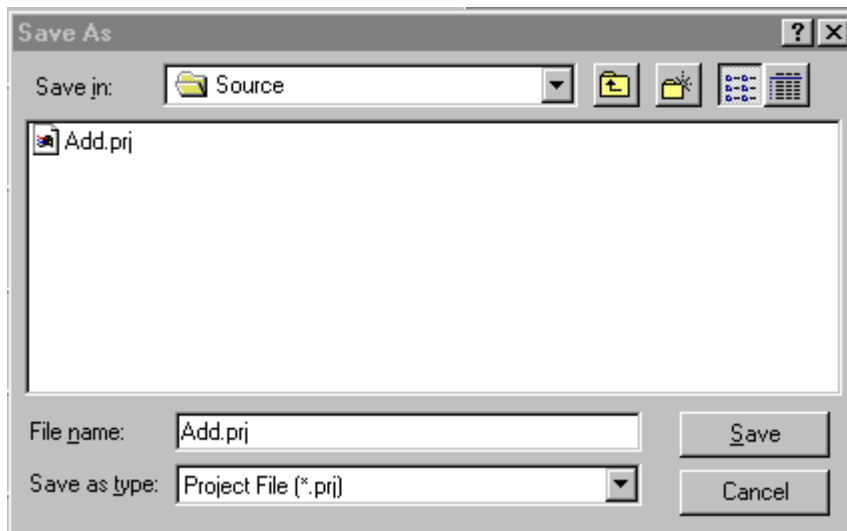
- ◆ To open a file, select **Menu - File – Open** ( the pull-down menu.



- ◆ Select a File Name and Type and press Open button.

5. 6. 3 Save, Save As...

- ◆ To save a file, select **Menu - File – Save** ( the pull-down menu.
- ◆ To save a file as a different name, select **Menu - File – Save As...** in the pull-down menu.
- ◆ Type the File Name to be saved and press Save button.



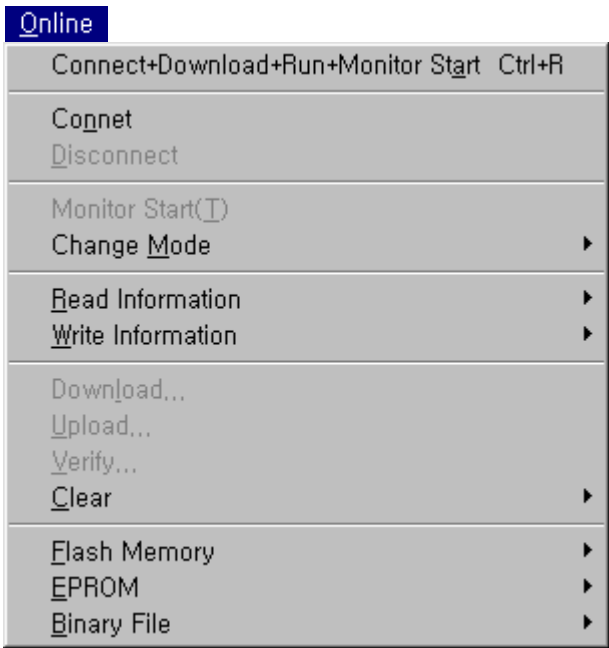
Chapter. 6 Online

6.1 Connect	6-1
6.2 Monitoring & Mode Change	6-3
6.3 Read Information.....	6-3
6.4 Write Information.....	6-4
6.5 Download	6-5
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6.7 Clear	6-6

Chapter. 6 Online

- ◆ Online Function is for the communication between PLC and KGL for Windows in PC.

Select Online in the Pull down menu



- ◆ In this Function, you can setup the communication conditions such as Reading from PLC, Writing to PLC, Monitoring, Debugging, PLC Mode Change, Link Parameter Setup, PLC I/O Information, Setup Enforced I/O, and Password Setup.

6.1 Connection

6.1.1 Connect + Download + Run + Monitor Start

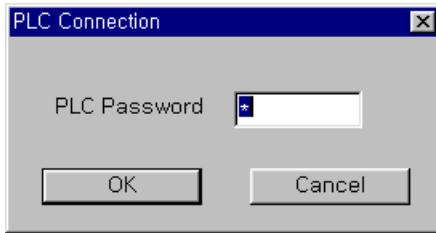
- ◆ To execute the communication with PLC automatically, select this menu.
- ◆ This Function can download the Project created in KGL for Windows to PLC, make PLC Run and monitor the Project at one time.

Prior to perform this menu confirms the switch in CPU module of the PLC is at **PAU/REM** (Remote Stop) mode.

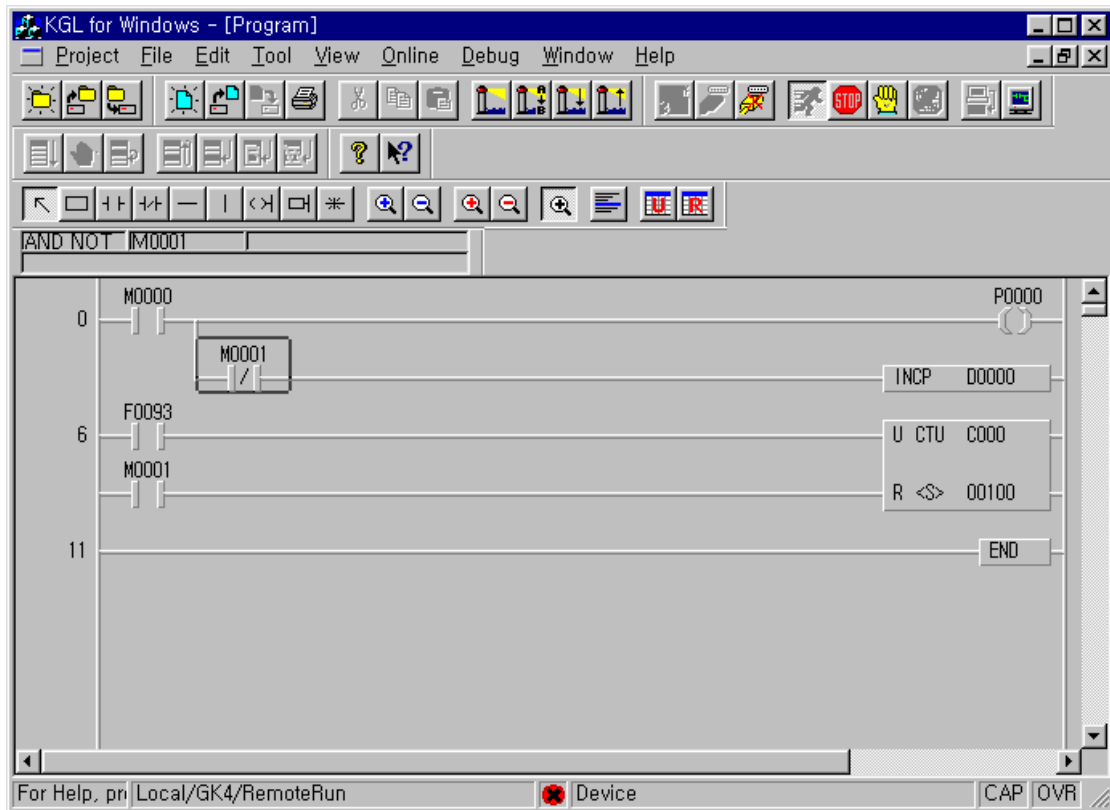
If the key is at **STOP** mode, only Connect + Download commands will be performed

6.1.2 Connect

- ◆ Click **Connect** menu to connect to PLC CPU module. Then, the following window to enter password will appear.



- ◆ Enter a password and click OK button



Status Bar Shows PLC error Shows view mode Shows Capital mode Shows Overwrite mode

- ◆ The Status Bar helps to know what is open in the Screen. Connection status, CPU Type and Key switch mode are displayed in order from left to right at the left bottom of the screen.
- ◆ Connection Status : Local, CPU Type : GK4 , Key switch mode : Remote RUN

6.1.3 Disconnect

- ◆ To disconnect the communication between PLC and KGL for Windows, select Disconnect menu in Online Pull- down menu. Then " Disconnected " Message will be displayed.

6.2 Monitoring & Mode Change

6.2.1 Monitor Start/Stop

- ◆ To monitor the Program in RUN mode, select **Monitor Start** menu in Online Pull- down menu.
- ◆ You should do verify the program before making PLC Run.

The message to verify the Program and the Parameter in PC with the ones in PLC will be displayed.



- ◆ If the Program and Parameter are verified by the command, the following screen will be displayed.
 - ◆ If you want to stop the Monitoring Function, select the **Monitor Stop** in Online Pull- down menu.
- (Monitoring Start/Stop is toggled)
- ◆ This function monitors only the used device in the program. If you want to monitor other devices not shown in the program, select **Monitor** in the Project Window.

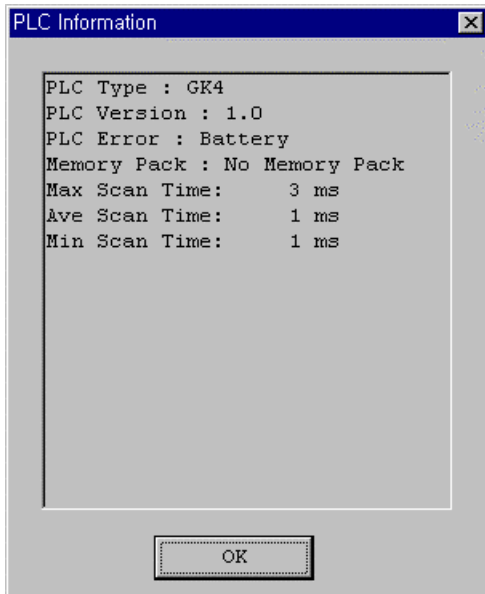
6.2.2 Mode Change

- ◆ Run Mode : Changes PLC Mode to run.
- ◆ Stop Mode : Changes PLC Mode to stop.
- ◆ Pause Mode : Changes PLC Mode to pause.
- ◆ Debug Mode : Changes PLC Mode to debug.

6.3 Read Information

6.3.1 PLC Information

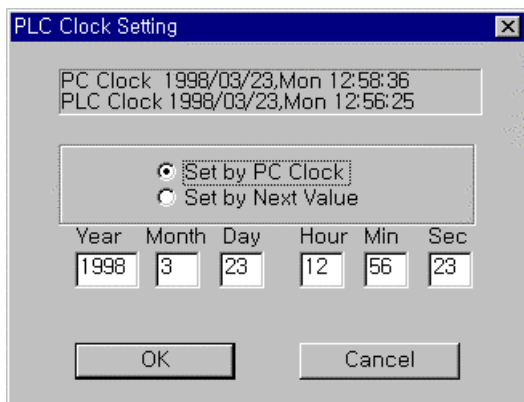
- ◆ This Function shows PLC Type, PLC Version, Memory Pack and Scan Time.



6.4 Write Information

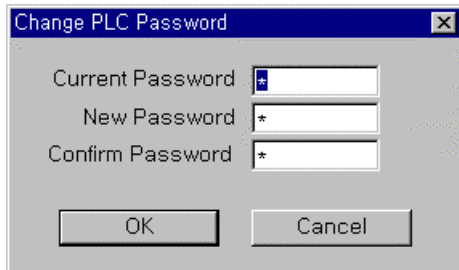
6.4.1 Set PLC Clock...

- ◆ This Function shows the Clock of PLC and PC. You can adjust the Clock. To change PLC Clock, click OK button after setting the Clock.



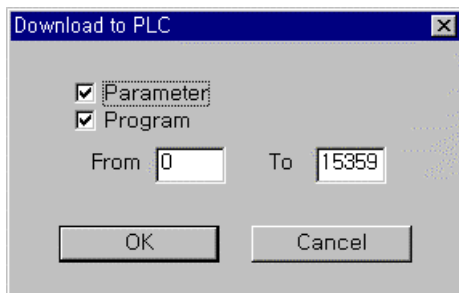
6.4.2 Change Password...

- ◆ To change Password, type the current password and new password. To confirm the new password, retype the password.



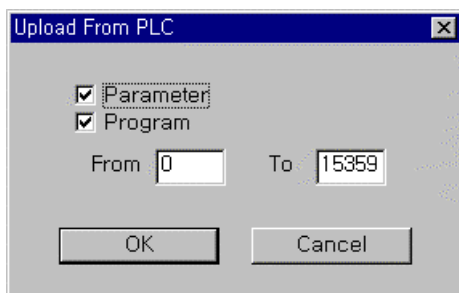
6.5 Download...

- ◆ This Function is to transfer the program and the parameter in PC to PLC.
- ◆ To download the program and the parameter created in KGL for Windows to PLC, select **Online-Download...** in the pull-down menu.



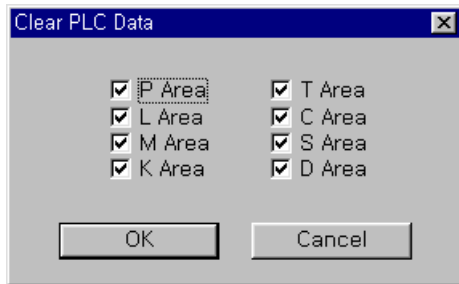
6.6 Upload...

- ◆ This Function is to receive the program and the parameter from PLC to PC.
- ◆ To receive the program and the parameter from PLC, select **Online-Upload...** in the pull-down menu.

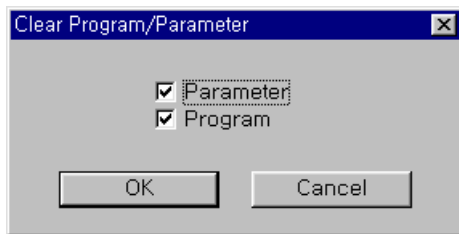


6.7 Clear

- ◆ This Function is only available in **Stop Mode** in PLC. To clear devices or the program/parameter in PLC, click **Data** in **Clear** menu.
- ◆ After selecting device area not to clear, click OK button. If not selected, all device area are cleared.



- ◆ To clear Program/Parameter in PLC, click **Program/Parameter** in **Clear** menu.



- ◆ After selecting item not to clear, click OK button. If not selected, Program/Parameter are cleared.

Chapter. 7 Debugging

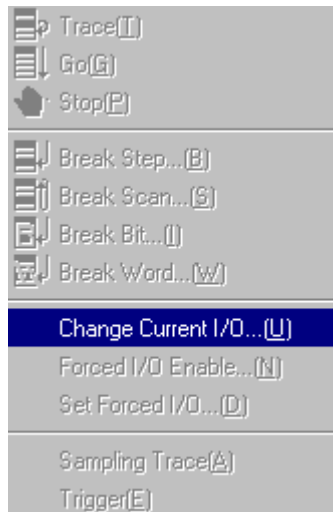
7.1 Tool Bar for Debugging	7-1
7.2 Change I/O	7-1

Chapter. 7 Debugging

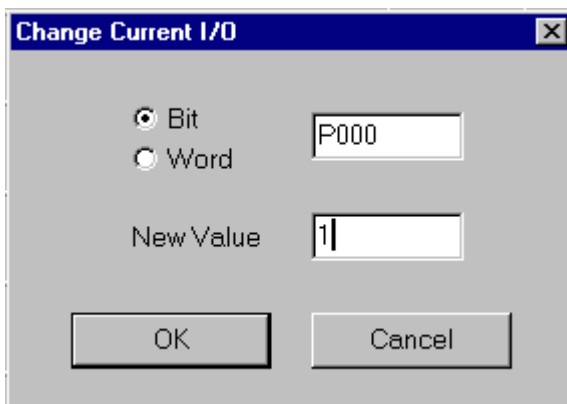
- ◆ Debugging Function is to detect errors in a program and clear the errors for the normal operation.
- ◆ To be a debug mode, the following modes must be satisfied.

7. 2. 1 Change I/O Enable

- ◆ To change the current value of Device, select **Debug-Change Current I/O**.



- ◆ Select Bit or Word then Enter the Device, and new value. If Bit has been selected 1 equals ON and 0 equals OFF. If word has been selected enter the new value.







Appendix

1.1 Hot-Keys for Ladder Program Mode	A-1
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Appendix : Hot-Keys

1.1 Hot-Keys for Ladder Program Mode

Hot-Keys	Description
F3	 Open Ladder Editor Box for Normally Open Contact
F4	 . Open Ladder Editor Box for Normally Closed Contact
F9	 Open Ladder Editor Box for Output Coil
F10	Open Ladder Editor Box for Applied Instructions
N	 Insert NOT Instruction
F6	Draw a Vertical Line
F5	Draw a Horizontal Line
Ctrl + F5	Draw a Horizontal Line by the end of line
Ctrl + Space	Toggle the program(Ladder . Mnemonic)
Ctrl + F	Open Find dialog box
Ctrl + H	Open Replace dialog box
Ctrl + F3	Search again Forward
Ctrl + B	Search again Backward
Ctrl + G	Open Go to Step dialog box
Ctrl + M	Insert one line
Ctrl + U	Delete one line
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block
F1	Open Help window
Shift + F1	Open Help about the Item that the cursor is placed on.
F2	Open Help about the instruction that the cursor is placed on
Ctrl + Enter	Change the line when entering Rung Comment or Output Comment

1. 2 Hot-Keys for Editing Block

Hot-Keys	Descriptions
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block





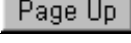
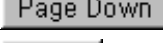



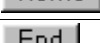



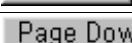

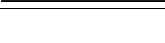
1. 3 Hot-Keys for Mnemonic Program Mode

Hot-Keys	Descriptions
Ctrl + Space	Toggle the program(Mnemonic . Ladder)
Ctrl + F	Open Find dialog box
Ctrl + H	Open Replace dialog box
Ctrl + F3	Search again Forward
Ctrl + B	Search again Backward
Ctrl + G	Open Go to Step dialog box
Ctrl + M	Insert one line
Ctrl + U	Delete one line
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block
F1	Open Help window
Shift + F1	Open Help about the Item that the cursor is placed on.
F2	Open Help about the instruction that the cursor is placed on

1. 4 Hot-Keys for Online Mode

Hot-Keys	Descriptions
Ctrl + R	Perform 'Connect+Download+Run+Monitor Start'
Ctrl + T	Perform Step Over Function in Debug Mode
Ctrl + I	Open Change Current I/O dialog box

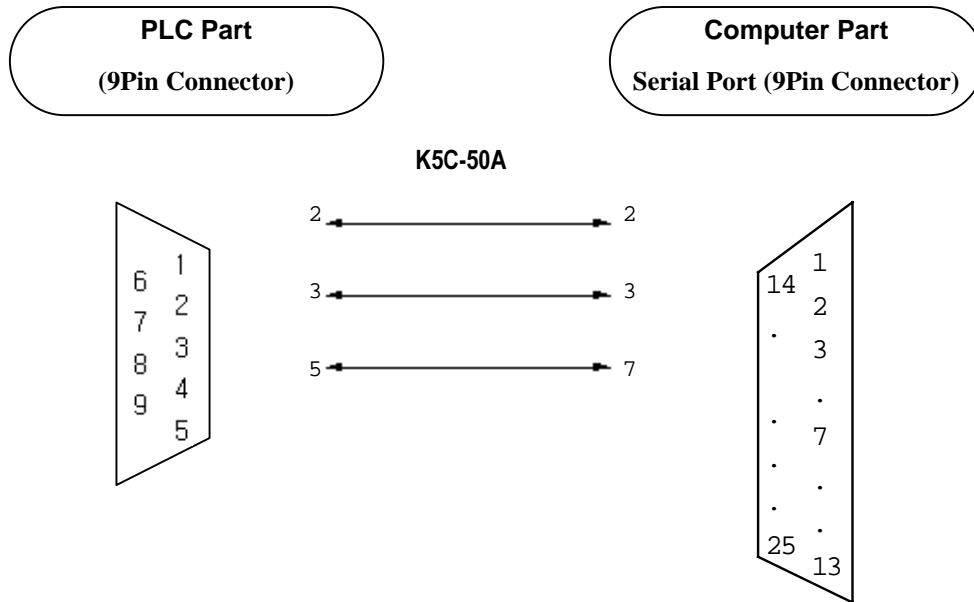
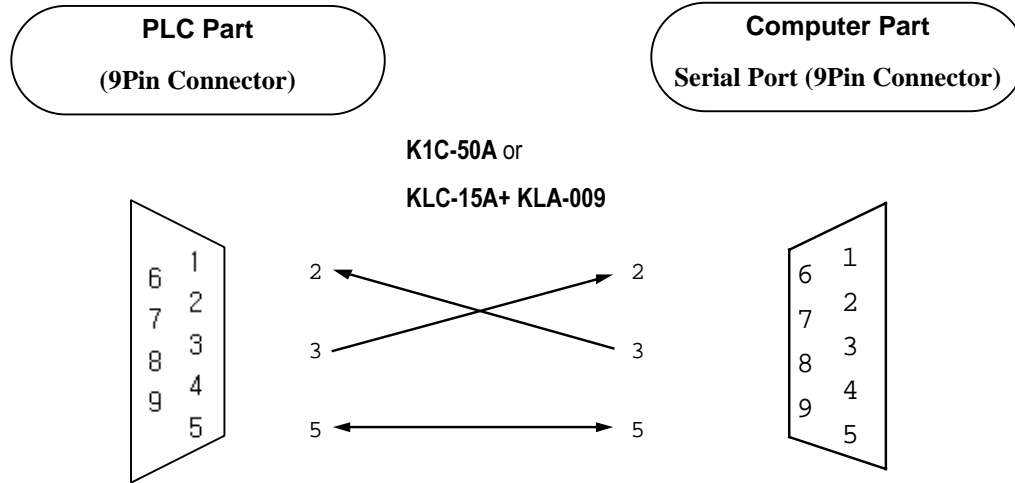
1. 5 Hot-Keys for Cursor Move

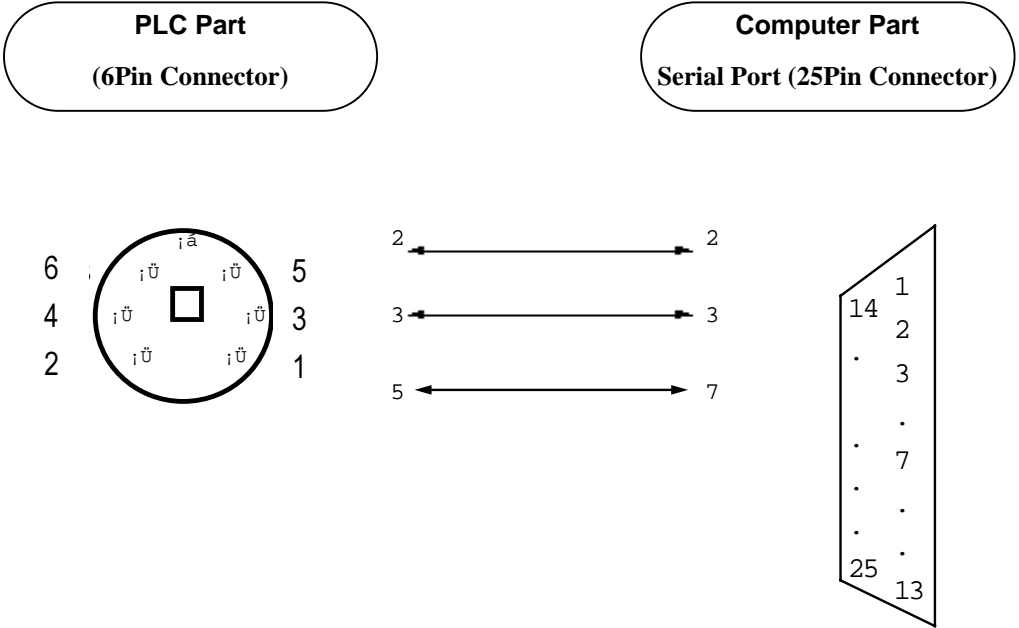
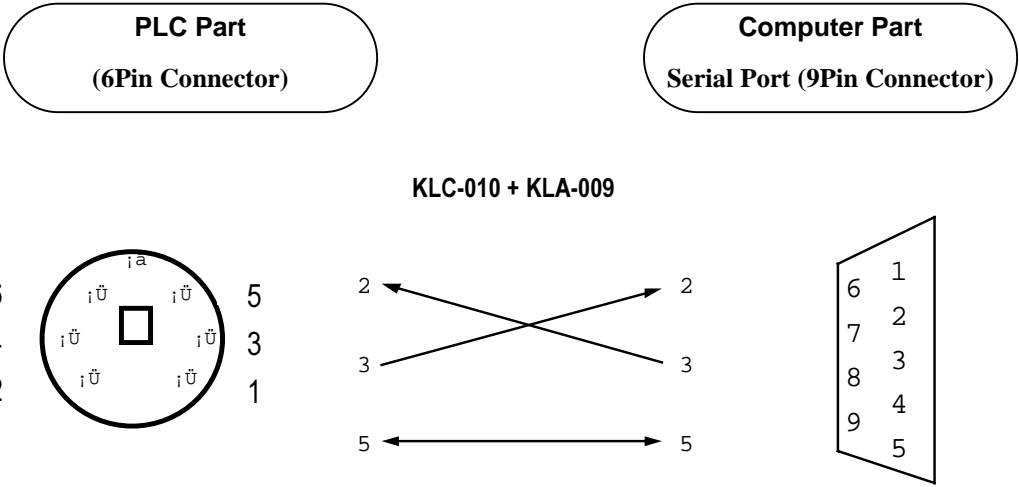
Hot-Keys	Description
	Move Pointer up in window
	Move Pointer down in window
	Move Pointer left in window
	Move Pointer right in window
	Move one page up in window
	Move one page down in window
	Move to the left end of the current line
	Move to the right end of the current line
 + 	Move to 0 Step
 + 	Move to End Step
 + 	Move the first step excluding NOP Instruction
 + 	Move the end step excluding NOP Instruction

1.6 Cable standards for communication with PLC

KGL for Windows shall be connected as follows for communication with PLC.

- *PLC communication : PLC Mode change, monitoring, program read/write function.*
- *PLC series :LG MASTER-K, LG GLOFA-K series.*





NOTE							
1) CPU Module Port (6P) : LG Master-K 10S, K10S1							
2) CPU Module Port (9P) : LG Master-K30S, 50H, 60S, 100S, 200H							
LG GLOFA-K3, K4, K5, K4E							