

HITACHI PROGRAMMABLE CONTROLLER

H-SERIES

Ladder Editor for Windows®

INSTRUCTION MANUAL

TYPE : **HLW-PC3E**

Note ● Please make sure to have this manual available to the person directly responsible for the use.

HITACHI

Chargeable Repair

If a system disk of LADDER EDITOR for Windows® (CD or floppy disk with a seal) is broken, we will repair it with the charge, so please contact to the dealer or the service station.

For malfunction with products, ordering of parts, and anything else about our product, please call your dealer or service station with the following information.

- (1) Model
- (2) Contents of failure

Caution

1. This instruction manual is applies to LADDER EDITOR for Windows® Ver3.**.
2. The contents of this instruction manual may be modified without notice by the improvement of the products.

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Corrections

No.	Page	Description of Correction	Day	Manual No.
1	Notes on operation	Addition of (12)	Mar. 2000	NJI-342XA
2	9 - 13	Addition of “CPU3-40H (H-4010)” to the object machine type of the Change in RUN recover function.		
3	-	- Integrate NJI-343X - Add the function after V2.13 - Change a company name - Correct an error in writing	April. 2002	NJI-342XB
4		Add the function after V3.05	May. 2004	NJI-342XC
5	Appendix-30	Detected syntax error in PC memory of operation online changing	Sep. 2009	NJI-342XD

Safety Use

Before using Ladder Editor for Window®, make sure to read this instruction manual and other attached files carefully and use the products correctly. Also, make sure to keep this instruction manual under the maintenance adviser hand.

In this manual, it classifies the rank of the safety items as “Danger” and “Caution”.



Danger

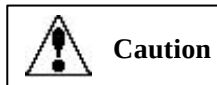
:In case that you may receive a fatal or a serious wound if you fail the treatment of the products.



Caution

:In case that you may receive a light wound, or the products may have some damages.

However, even if the items indicated in



Caution

, the serious accident may happen with the condition of the usage.

Each content is very important so please make sure to keep these promises.

Here shows the picture of “Prohibit” and “Mandatory”



Prohibit (not permitted). It will be  in the case of No fire.



Mandatory (make sure to do). It will be  in the case of the earth

1. About the installation



Caution

- It may cause an electric shock, a fire and an error operation when using the product with the condition of a high temperature, a high humidity, dust, corrosive gas, and a shock.
- Install the products according to the instruction manual. It may become the cause of a fall, trouble, and an error operation if there is failure in the installation process.
- Do not put the wire dusts in the products. It may become the cause of a fire, trouble, and an error operation.

2. About wiring



Oblige

- Make sure to execute the earth. Otherwise, it may cause a electric shock and an error operation.



Caution

- Connect with the regulated power source. Otherwise, it may cause a fire.
- Wiring should be done by the specialist who has a license. It may cause a fire, trouble, and a electric shock if fail in wiring.



Danger

- Wire and install the module according as the instruction manual.
- And, directs a wireman about the information of wiring and installation.
It may cause an error operation by the different wire and decrease of noise tolerance.

3. Caution on using



Caution

- Do not touch a terminal during power is ON. There is a danger of electric shock.
 - Compose a emergency stop circuit and an inter lock circuit, etc. at the outside of the PC.
- There is a danger to damage a machine or cause an accident.



Caution

- Execute the change of running program, force output, RUN, STOP, etc. with the enough confirmation of safe. There is a danger to damage a machine.
- Switch on the machine in order of the power switch. There is a danger to damage a machine.

4. About the maintenance



Danger

- Forbid the reverse input, charging, disassembling, heating, throwing of a battery, do not short a battery. It may burst or catch fire.



Forbid

- Do not assembling or remodeling. It may become a cause of a fire, trouble, and an error operation.



Caution

- The add/remove of module/unit should be done with the power OFF. It may become a cause of a fire, trouble, and an error operation.
- Exchange a fuse with a specified model. It may become a cause of a fire and trouble

5. About Change in RUN



Caution

- When execute Change in RUN with system that the user program scan time is running just on time of the delay check time which was set at the operation parameter, because after changed program scan time becomes longer than before Change in RUN, the delay error occurs and the CPU sometimes stops.

Therefore, before Change in RUN, use the force set function to set the specific internal output R7C0 (continue operation with delay error)ON, or compare and check the delay check time and the current scant time (WRF010-WRF012).

6. About the cable connection



Caution

- Recommend the plug on/off of the programmable controller and the personal computer will be done by cutting the power of the personal computer or the CPU. It may become a cause of trouble if both power is ON.

7. About the influence to Windows® operating system



Caution

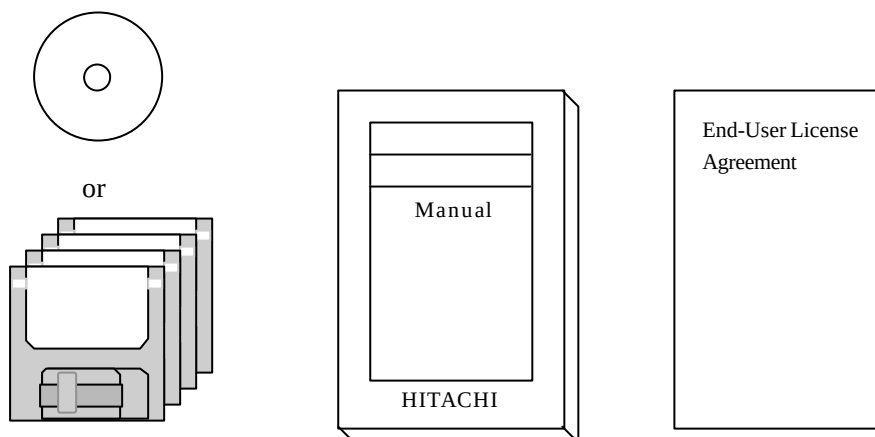
LADDER EDITOR for Windows® is the software which operating on Windows® operating system , therefore it has an influence of Windows® operating system.

When an application error and an operation trouble occur, check the cause together with Windows® operating system.

Contents of Packaging

The following items are included in LADDER EDITOR for Windows® . Check the items before using them.

- Install disk (CD or floppy 3.5 inch, 1.4 MB 4pcs.)..... 1
- Instruction manual (this book)..... 1
- End-User License Agreement..... 1



Notes on operation

Please be careful about following points when using LADDER EDITOR for Windows®.

- (1) Make backup files before you first starting up the LADDER EDITOR.

Keep LADDER EDITOR Install Disks (4 floppies) carefully as the master floppy disks.

Creation of the master floppy disk (Copy of floppy disk)

- (a) Prepare 4 installed floppy disks.
 - (b) Set the install disk to the floppy disk drive.
 - (c) Double Click the **[My Computer]** icon and click the floppy disk drive icon.
 - (d) Click **[File] - [Disk Copy]**.
 - (e) Click the copy source drive and the destination drive, and click [Start].
- (2) Can not input next 4 system reservation file names when input (Load, Save, Verify, Change, etc.) a file name.

“AUX”, “CON”, “PRN”, “NUL”

It will display the error message if these file names are input.

- (3) The trace function can be executed only with the CPU type of “CPU2-**H” or “CPU22-02H”.
- (4) The online change recover function can be executed only with the combination of the CPU Type “CPU2-**H” and the memory cassette “RAM3-**H”.
- (5) H series lower ranked CPU (H-200/250/252, H-20/28/40/64, EH-150) has limitation with the executable instruction and function with H series. Therefore, special care must be taken if you execute following operations to the lower ranked CPU.

- (a) Selecting [Write] during editing or executing [Grammar Check] with the utility.

Whether a command, I/O type, or I/O No. range (note 2) not allowed in CPU (note 1) is contained in the circuit to write in [Write] mode or the circuit written into memory in [Grammar Check] mode is checked and an error message is displayed. If an error occurs in [Write] selecting, data is not written into memory.

- (note 1) When selecting Online, On-direct in GRS screen

The CPU, connected by Network Address Setting in Environment Setting, becomes the object CPU.

When selecting Offline in GRS screen

The CPU, specified in Offline CPU Type in Environment Setting, becomes the object CPU.

- (note 2) Please refer to the instruction manual of each CPU for the usable instruction, I/O type, and I/O No. range. But, exclude WRB000-WRC3FF from the check object for all FUN instruction, and I/O No. range.

- (b) Executing [Mounted I/O Read] with the CPU setting

When execute [I/O Assignment] in CPU Setting and [Mounted I/O Read] in [Auto Set], it will does next operation.

- When CPU is H-200/250/252

Without reading I/O information mounted on the CPU, it read I/O assignment written in the parameter area of the CPU.

- When CPU is H-20/28/40/64

However it read the mounted I/O state of basic unit, it does not read the mounted I/O state of extended unit.

- (c) Selecting [Debug], [Force], [Simulation], and [Trace] during monitoring

Even if [Debug], [Force], [Simulation], and [Trace] are executed during monitoring, the function is not executed. However, in H-252, [Trace] can be executed.

- (d) Memo instruction and box comment instruction with H-200

When writing a program which includes Memo instruction and Box comment instruction to H-200 corresponds to MFG No. indicated below and operating the CPU, it becomes an error at the check which

is executed before running and the CPU does not run.

MFG No. 9

a	b		
---	---	--	--

Object MFG No.

All No. that section (a) is "0".

Section (a) is "1" and section (b) is "A" to "F".

(6) CPU writing in H-200 connecting

When connecting to HITACH FLORA-ND1/ND2/NS1, in the communication speed of 19.2 kbps, the communication error(120) might be occurred and cannot be communicate.

This is happened because the specialty of the IC chip for RS-232 which is used in FLORA-ND1/ND2/NS1. However there is a possibility to occur a same error if other maker's PC use the same IC chip. And, this error is only occurred with the combination of FLORA-ND1/ND2/NS1 and H-200 CPU. It will not be occurred with the combination with other CPU, therefore, use other PC if the error has occurred. And, even if it will be the communication error in 19.2 kbps, it sometimes can communicate normally in 4.8 kbps.

However, this is the case that using the LADDER EDITOR for DOS cable as PCCB02H (PC-9800 series) and use 29-9 convert adopter, then set the baud rate to 4.8 kbps with [Communication] from [Environment Set] in [Utility].

(7) 1 contact point width display mode of Processing box

In LADDER EDITOR for Windows®, by setting "Processing Box Display Mode" at **[Utility]-[Environment Set]-[Mode]** to "1 Contact Point Width Display", you can input 9 symbols (3 symbols if only Comparing box). In this mode, the processing box will be displayed with 1 symbol width.

When a circuit which can be displayed only with "1 contact point width display" is read by the peripheral device except LADDER EDITOR for Windows®, it becomes "Read Circuit Error" and the circuit which include the processing box or all circuit can not be displayed.

(8) Useable printer

It is possible to print with LADDER EDITOR for Windows® if it is the printer which has the printer driver for Windows®98SE/2000/XP. but take care about the following things.

When using the printer driver attached with the system disk of Windows® operating system , and printing, it sometimes printed with letters overwritten each other, etc..

When error like overwriting occurs in printing, install the last version of printer driver and use. Please call a printer maker for the installation of the last printer driver.

(9) Association of Application

In Windows, the application can be associated to the file type. The file (ex. program file (extension code prn)) which is used in LADDER EDITOR for Windows® can be associated to LADDER EDITOR for Windows®. However, when double clicking the specified file, LADDER EDITOR for Windows® will be starting but the specified file won't be open.

(10) About the FIND tab of help

FIND tab is not available. "177" error occurs when you click a FIND tab and make database.

(11) [Next I/O] of the Force Output

In the case that I/O No. is "RB". The next I/O No. becomes "RCU".

(12) About the use in Japanese version Windows

If you use this software on Japanese Version Windows, you cannot use this software as English Version. Because this software switches into Japanese Version automatically on Japanese Windows.

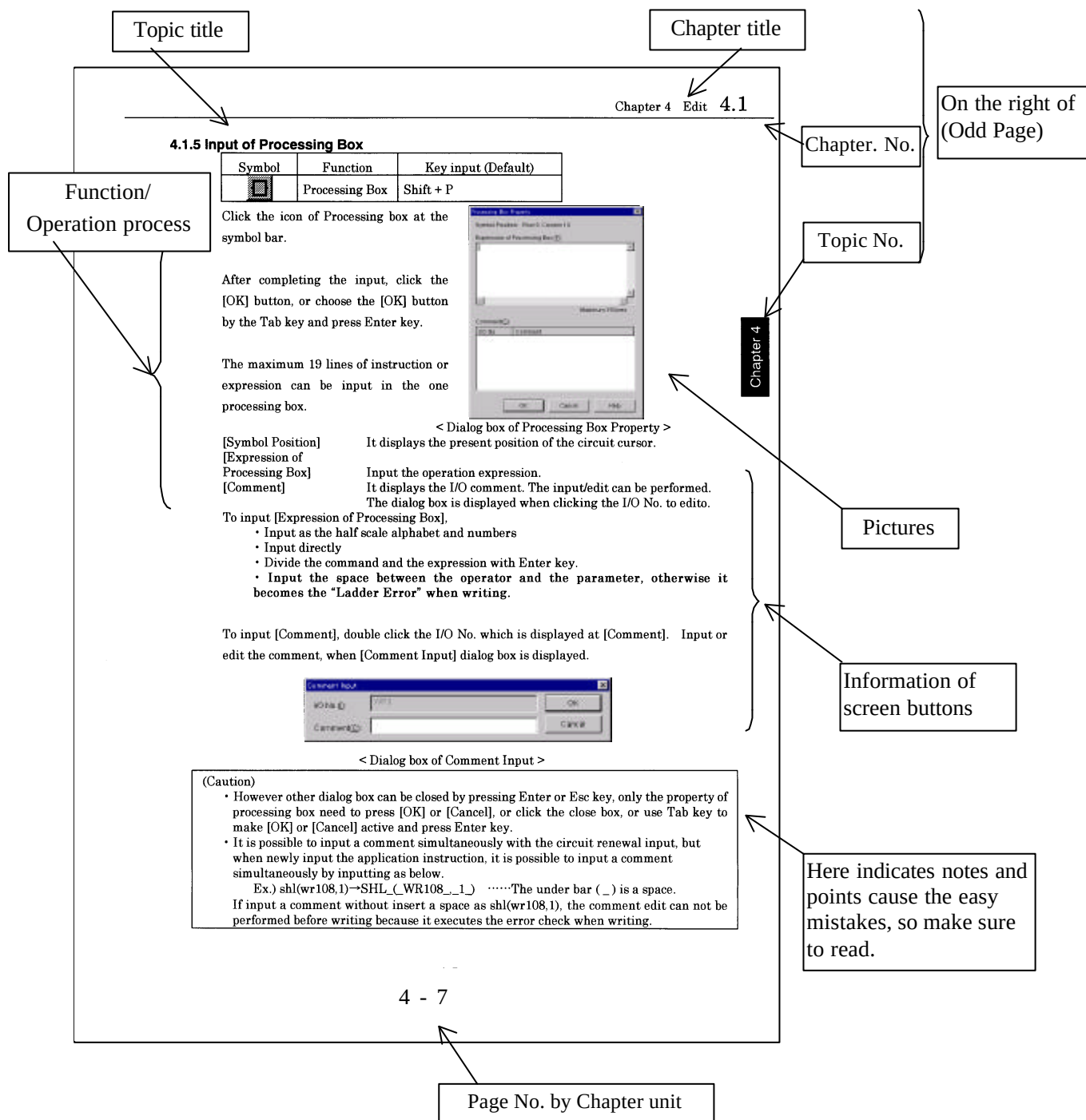
In the following case, the display of the form is not HLW-PC3E and become HLW-PC3.

(a) Version information

How to read

In this manual, each page has the following items.

And, in the contents of this manual, PC is short for the personal computer and the CPU is short for the programmable controller.



About the writing form

[]: It shows the menu name or the button name on the screen.

Menu is indicated in the bold style and "-" between [] shows the step of the menu.

CONTENTS

Contents of Packaging

How to read

Chapter 1 Before using LADDER EDITOR for Windows®

1.1 Specialty of LADDER EDITOR for Windows® -----	1 - 1
1.2 Additional function of Version 3-----	1 - 3
1.3 Operation Environment -----	1 - 5
1.4 Install Process -----	1 - 7
1.5 Uninstall Process -----	1 - 11
1.6 Compatibility of User Program -----	1 - 12
1.7 About extended on-delay timer(TM/TV) of EH-CPU516/548-----	1 - 15

Chapter 2 Basic Operation

2.1 Startup and Finish of LADDER EDITOR for Windows® -----	2 - 1
2.2 Screen Change -----	2 - 2
2.3 Screen Structure -----	2 - 3
2.4 Tool Bar -----	2 - 5
2.5 Symbol Bar -----	2 - 6
2.6 Display Switch -----	2 - 7
2.7 Basic Operation of Mouse, Window, Keyboard -----	2 - 8

Chapter 3 Simple Operation

3.1 Edit -----	3 - 1
3.2 Symbol Selection Method -----	3 - 4
3.3 Symbol Input Method -----	3 - 6
3.4 Circuit Modify, Copy, Cut, Paste -----	3 - 8
3.5 Read -----	3 - 10
3.6 Comment Edit -----	3 - 11
3.7 Circuit Monitor -----	3 - 12
3.8 I/O Monitor -----	3 - 13
3.9 Print of Program -----	3 - 15

Chapter 4 Edit

4.1 Input of Symbol -----	4 - 1
4.1.1 Outline of Operation -----	4 - 1
4.1.2 Input of Contact Point -----	4 - 4
4.1.3 Input of Coil -----	4 - 5
4.1.4 Input of Comparing Box -----	4 - 6
4.1.5 Input of Processing Box -----	4 - 7

4.1.6 Input of Horizontal Line, Vertical Line, Not, Loop Back -----	4 - 8
4.2 Circuit Write -----	4 - 10
4.3 File Save and Read -----	4 - 12
4.4 Circuit Edit -----	4 - 18
4.4.1 Modification of Symbol -----	4 - 18
4.4.2 Cut & Paste -----	4 - 19
4.4.3 Insertion of Circuit -----	4 - 21
4.4.4 Deletion of Circuit -----	4 - 23
4.4.5 Circuit Edit - Copy -----	4 - 25
4.4.6 Circuit Edit - Delete -----	4 - 27
4.4.7 Circuit Edit - Move -----	4 - 28
4.4.8 Auto Generation -----	4 - 30
4.4.9 Batch Change -----	4 - 36
4.4.10 Continuous Input of Symbol -----	4 - 41
4.4.11 Instruction Word Edit -----	4 - 42
4.5 Comment Edit -----	4 - 45
4.5.1 User Symbol, I/O Comment -----	4 - 46
4.5.2 Circuit Comment -----	4 - 53
4.5.3 Memo Comment -----	4 - 60
4.5.4 Box Comment -----	4 - 67
4.5.5 Display of Each Comment on LADDER Graph -----	4 - 74
4.6 Read -----	4 - 78
4.6.1 Basic Operation -----	4 - 78
4.6.2 Circuit No. Specification Read -----	4 - 80
4.6.3 I/O No. Specification Read -----	4 - 81
4.6.4 Symbol+I/O No. Specification Read -----	4 - 82
4.6.5 Symbol+User Symbol Specification Read -----	4 - 84
4.6.6 Application Command/User Symbol Specification Read -----	4 - 85
4.6.7 Multiple Circuit Read -----	4 - 87
4.6.8 Memory Circuit Read -----	4 - 88
4.6.9 Memory Screen Read -----	4 - 91

Chapter 5 Utility

5.1 Environment Setting -----	5 - 1
5.2 Printer Setting -----	5 - 5
5.3 Keyboard Setting -----	5 - 7
5.4 CPU Setting -----	5 - 8
5.5 Cross Reference -----	5 - 16
5.6 Check -----	5 - 20
5.7 Initialize -----	5 - 25

5.8 Status Table -----	5 - 28
5.9 Program Name -----	5 - 30

Chapter 6 Program Transfer to CPU

6.1 Read -----	6 - 1
6.2 Write -----	6 - 3
6.3 Verify -----	6 - 4
6.4 Error Transfer -----	6 - 5
6.5 Send/Receive/Verify -----	6 - 6

Chapter 7 Monitor

7.1 Circuit Monitor -----	7 - 1
7.2 I/O Monitor -----	7 - 3
7.3 Set/Reset -----	7 - 7
7.4 Force Output -----	7 - 9
7.5 Change of Setting Value -----	7 - 10
7.6 Force -----	7 - 11
7.7 Simulation -----	7 - 14
7.8 Trace Monitor, Trigger Circuit Monitor -----	7 - 16
7.8.1 Outline of Each Monitor -----	7 - 16
7.8.2 Data Setting for Execution -----	7 - 18
7.8.3 Continuous Time Chart, Trigger Time Chart -----	7 - 21
7.8.4 Continuous Trace, Trigger Trace -----	7 - 24
7.8.5 CPU Instruction Trace -----	7 - 26
7.8.6 Trigger Circuit Monitor -----	7 - 28
7.8.7 File Function of Trace Result -----	7 - 30
7.8.8 Printout of Trace Result -----	7 - 30
7.9 Debug -----	7 - 31
7.9.1 Outline of Debug Mode -----	7 - 31
7.9.2 Setting/Resetting of Debug Mode -----	7 - 32
7.9.3 Setting/Resetting of Breakpoint -----	7 - 33
7.9.4 Scan Run -----	7 - 34
7.9.5 Step Run -----	7 - 36
7.9.6 End Circuit Display -----	7 - 41
7.9.7 Halt Specify/Continuous Execution -----	7 - 42

Chapter 8 Printout

8.1 Printout of Program -----	8 - 1
8.2 Printout of Comment -----	8 - 7
8.3 Printout of Cross Reference -----	8 - 8
8.4 Printout of Setting Value -----	8 - 11

8.5 Setting of Print Layout -----	8 - 12
8.6 Setting of Print Title -----	8 - 13
8.7 CPU type at Printout -----	8 - 14

Chapter 9 Operation of H-4010 Function

9.1 Setting of H-4010 Standard Mode -----	9 - 1
9.2 Reset of H4010 Standard Mode -----	9 - 3

Chapter 10 Modem Connection

10.1 Components for Modem Connection -----	10 - 1
10.2 Setting of Modem Connection -----	10 - 2

Chapter 11 Data Memory Edit

11.1 Outline of Data Memory Edit -----	11 - 1
11.2 Edit of Data Memory -----	11 - 2

Chapter 12 IC Card

12.1 Comment -----	12 - 1
12.2 File Memory -----	12 - 6
12.3 Information Reading -----	12 - 9
12.4 File Memory Block Erase -----	12 - 12
12.5 Initial Setting -----	12 - 13

Chapter 13 Convenient Function

13.1 Cut & Paste from Reference Window -----	13 - 1
13.2 Lump Editing of I/O No. and Comment -----	13 - 2
13.3 Load and Save of CSV format file -----	13 - 3
13.4 Merge of Program -----	13 - 7
13.5 Change in RUN -----	13 - 9
13.6 Easy Read Function -----	13 - 14
13.7 Addition function of Ver2.13 -----	13 - 15

Chapter 14 Source Programming

14.1 Usual Style of Programming -----	14 - 1
14.2 Source Programming -----	14 - 2
14.3 Method to create “Source Program -----	14 - 3
14.4 Relation Ship with “H Series Programming -----	14 - 4

Appendix

Appendix 1 Example of Printout -----	Appendix - 1
Appendix 2 Function Table -----	Appendix - 15
Appendix 3 Error Message Table -----	Appendix - 21
Appendix 4 Hints for Programming -----	Appendix - 35
Appendix 5 Dealing with communication error occurs-----	Appendix - 39
Appendix 6 Connect with Ethernet Module -----	Appendix - 43
Appendix 7 Attention when using timer/counter-----	Appendix - 49

Chapter 1 Before Using LADDER EDITOR for Windows®

LADDER EDITOR for Windows® is the programming software for HITACH programmable controller HIDIC H series on Windows®98SE/2000/XP operating system.

(attention)

Install version 3.**

- When version 2.** or former is installed, please delete a "¥HLADDER" directory.
"C:¥ProgramFiles¥Hitachi¥HLADDER" is default.
- Please uninstall the old version.

Back up LADDER program files in editing and comment files in editing before uninstall the former version. And install V3.** afterwards.

1.1 Specialty of LADDER EDITOR for Windows®

(1) Correspond to Windows®98SE/2000/XP

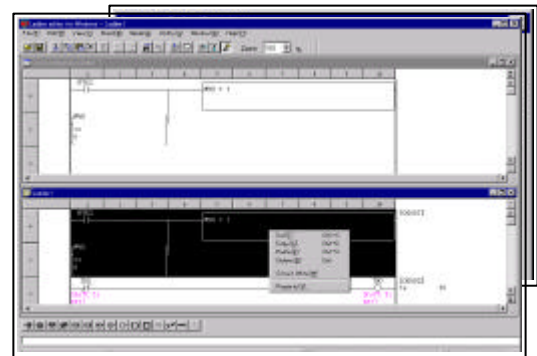
A program debug can be executed with Windows®98SE/2000/XP on a general purpose personal computer.

(2) Program Editing Task Speed will be up.

(a) You can use the common operations of Windows

- Cut & Paste by a mouse
- A right click menu
- Symbol icon operation

also supporting many functions common with other Windows application, so you can easily and effectively make a program.

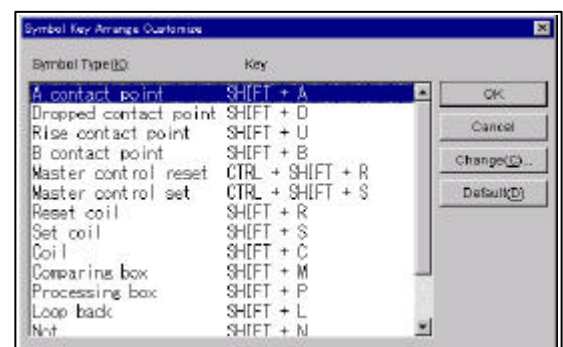


(b) Display and Edit Simultaneously

It also displays I/O comment on the input window of I/O No.. The editing can be performed simultaneously.

(c) Correspond to Keyboard

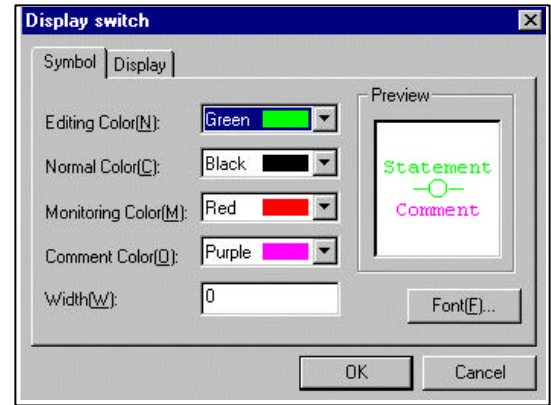
A symbol can be selected with a short cut key, so you can programming even at the small working place.



(d) Display Color in Editing

An editing circuit is displayed by another color until it is written, so you can confirm the modified circuit.

Also you can customize the display size of LADDER graph with a personal computer screen using.



(3) DOS Compatible

Each file of LADDER program, comment, force, and trace which are created by LADDER EDITOR for DOS can be read and edit with LADDER EDITOR for Windows®. It is also same in a file extended code. There is no necessity to input a program for Windows again.

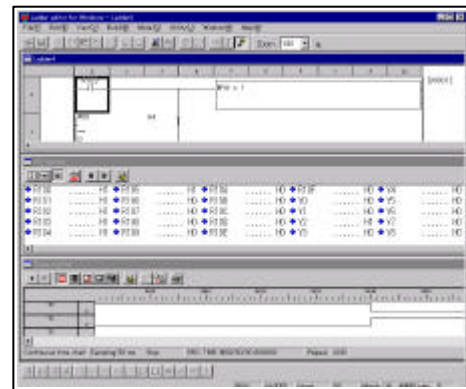
(4) Spread Sheet Software Compatible

You can read a comment file (created by a spread sheet such as Excel, etc.) into LADDER EDITOR. Or, its reverse operation can be performed.

	A	B	C	D	E	F	G
1	COO	Specify page 0 111111	SW1				
2	PO01	Specify page 1	SW2				
3	PO02	Specify page 2	SW3				
4	PO03	Specify page after 15	SW7				
5	PO07	Specify page after 20	SW8				
6	PO08	Specify page 2 to 8	SW9				
7	PO09	Specify page 9 to 19	SWC				
8	PO0D	Specify page 12 to 14	SWD				
9	POCE	ON when interchange displaying	SWE				
10	POCF	ON when displaying page	SWF				
11	TD0	ON while displaying page					
12	TD1	Page display CLACK					
13	TD2	ON while displaying value					
14	WR0000	Store page No.	SWW0				
15	WR0010	Store page value data page No.	SWW10				
16	Y0012B	Backlight ON/OFF					
17							
18							

(5) Monitor Screen Display Simultaneously

A circuit monitor, I/O monitor, Trace monitor can be displayed at the same time.



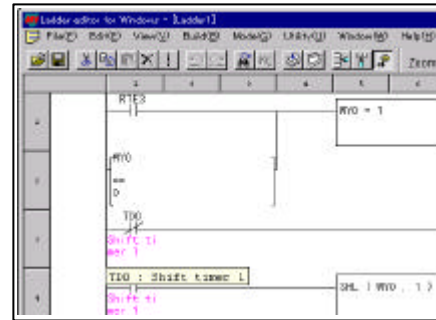
(6) Backup File Function

Like a DOS edition, an edited program and comment can be memorized in a memory by executing Circuit Write. It will be saved in a backup file until initializing or reading other program. Even if finishing an application or turn off a power of a personal computer (include a power failure), next time you start LADDER EDITOR for Windows®, the last work is read from a backup file, so you don't have to open a file again.

(7) Other Functions

(a) Capture Display of Comment

A comment becomes the capture display condition by selecting a symbol with a mouse on a Ladder graph.



(b) Communication I/F Support

A communication I/F with the CPU supports RS-232C (4.8kbps, 19.2kbps) and also Ethernet.

1.2 Additional functions of Version 3

1.2.1 Version up points of from ver.2 to ver.3

- (1) Supported Windows®98SE/2000/XP operating system.
- (2) Added function of editing and monitoring extended on-delay timer which are added to EH-CPU516/58.

Symbol: timer coil – TM , timer set value – TV(0 to 65,535) , Timer base:0.01s , points –2,048 points

1.2.2 Additional function history

(1) Ver.1.25 to Ver.2

There are the following functions in LADDER EDITOR for Windows® of version 2 or latter.

(a) 96 kstep program size supported

The program size up to 96ks can be selected. (in case of CPU “4010 standard” in offline, or Memory cassette/Ladder assignment “96ks”).

(b) Expanded timer/counter supported

Timer/counter number available from 0 up to 2047 (0 - 1023 for timer).

(In case of CPU “4010 standard” in offline or connecting to “Standard mode” of H- 4010 CPU.)

(c) Link area expanded

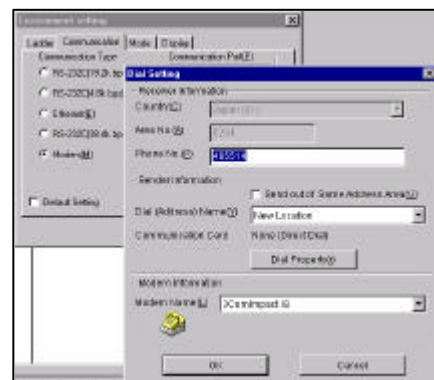
Link area of WN0 - 7FFF is available.

(In case of CPU “4010 standard” in offline or connecting to “Standard mode” of H- 4010 CPU.)

(d) New communication mode

(i) Modem communication function support

Remote programming and monitoring via modem which is connected to a personal computer using Windows®95/98, Windows NT®4.0. This is configured in [Modem Communication] in the menu [Environment Setting]



(ii) RS-232C 38.4kbps support

Available with EH-150 CPU and H-4010 CPU.

(e) IC card memory function

In the IC memory card function supported by H-4010, the operation of file memory (only SRAM) and the send/receive of comment data (SRAM, FLASH) can be done from LADDER EDITOR for Windows®.

(f) Additional FUN instructions supported

FUN instructions (FUN 80 - 82, 90 - 98, 100 - 118, 120, 128, 133 -136), which were newly supported from H-4010, are supported.

(g) Data memory editing

Editing of the data memory (R, WR, DR, M, WM, DM, WN, DN) and writing to the CPU are possible in offline, online, and on-direct mode.

(h) Auto inserting of processing box lines

Size of processing box is automatically adjusted when several lines inserted.

(2) Ver.2 to Ver.2.13

There are the following functions in LADDER EDITOR for Windows® of version 2.13.

(a) Specified contact point read

When a cursor is on a certain contact, corresponding coil can be searched.

(b) DIF/DFN definition

DIF and DFN can be defined without typing "DIF/DFN".

(c) The function about file name

(i) Last file name kept in PC memory

The last used file name is kept in the PC memory and shown in the title bar.

(ii) File name in editing kept in save dialog box

File name in editing kept in save dialog box when program is saved.

(iii) Update the file name in title bar.

The file name in the title bar is updated after the program saved.

(d) Host name in the status bar

Currently used host name is shown in the status bar.

(e) 48 ksteps memory available for EH-150

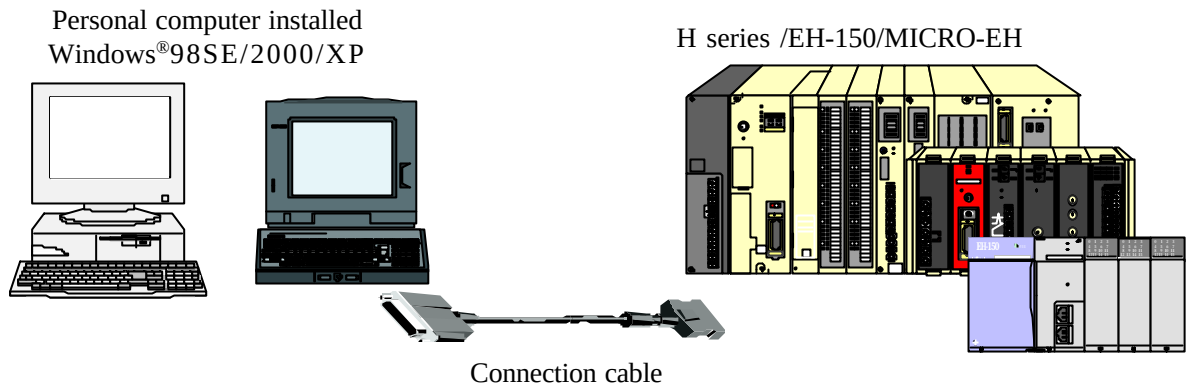
When offline CPU type is "EH-150", "48ks" can be selected.

(f) MICRO-EH supported in the offline CPU type

MICRO-EH is supported at the offline CPU type. Memory cassette size is only 4ks.

1.3 Operation Environment

To operate Ladder Editor for Windows®, the next operation environment is necessary.



(1) Available Personal Computer

Specification	Condition
PC	PC/AT Windows® PC
CPU	Over Celeron 300MHz
Operating System	Microsoft® Windows® 98SE/2000/XP98 English edition
Memory	Over 128Mbytes
Hard Disk Blank Area	20Mbytes
Floppy Disk Drive	1.44MB Floppy Disk Drive or CD Drive
Others	RS-232C interface , Ethernet interface

(note) Even if it satisfy the condition, the operational difference occurs in Ladder Editor for Windows® by the performance of the PC using.

(2) Connection RS-232C Cable (19.2kbps/38.4kbps, length: 2m)

Cable type	Connected CPU	Connector type of CPU	Personal computer Connector type
WVCB02H	H series	D-SUB15 pin	D-SUB9 pin
WVCB02H+EH-RS05	EH-150 MICRO-EH	RJ-45	D-SUB9 pin
WPCB02H+EH-RS05			D-SUB25 pin*1
EH-VCB02			D-SUB9 pin

(About compatibility of a cable)

(a) 19.2kbps/38.4kbps

- To use WPCB02H with PC/AT, D-SUB25 pin->D-SUB9 pin conversion connector is necessary.

(b) LADDER EDITOR for DOS Cable

- Set the communication type in 4.8 kbps with **[Environment Set]** from **[Utility]** in **[Offline]** menu to connect to D-SUB25 pin of PC-9800 series (the desk top PC) by PCCB02H of HL-PC3 cable. It becomes a communication error and can not connect with the set of 19.2 kbps (Refer to ch.5, 5.1, Environment Setting).
- Set the communication type in 4.8 kbps with **[Environment Set]** from **[Utility]** in **[Offline]** menu to connect to D-SUB9 pin of PC/AT by HL-AT3E cable. It becomes a communication error and can not connect with the set of 19.2 kbps (Refer to ch.5, 5.1, Environment Setting).

(3) Connect Possible Programmable Controller

It is possible to program or monitor to the CPU of H series programmable control indicated below except H-100M.

H-302/702/1002/2002

H-300/700/2000

H-200/250/252

H-20/28/40/64

EH-150

MICRO-EH

1.4 Install Process

(attention)

Install version 3.**

- When version 2.** or former is installed, please delete a "¥HLADDER" directory.
"C:¥ProgramFiles¥Hitachi¥HLADDER" is default.
- Please uninstall the old version.

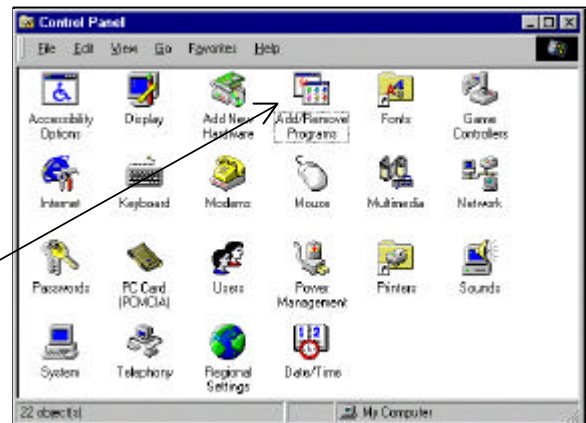
Back up LADDER program files in editing and comment files in editing before uninstall the former version. And install V3.** afterwards.

Default path is in "C:¥ProgramFiles¥Hitachi¥HLadder".

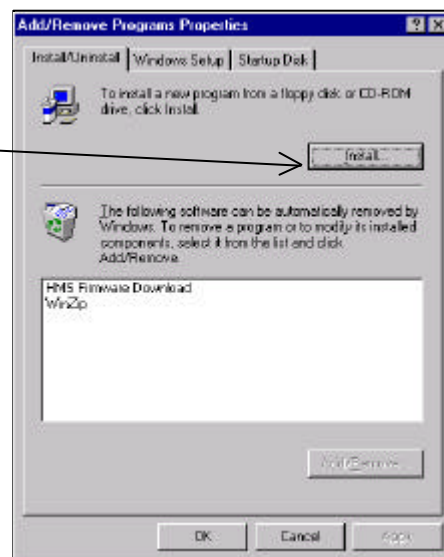
Before beginning installation of LADDER EDITOR for Windows®, finish other Windows applications. Otherwise, installation can not be done correctly.

(a) Open **[Control Panel]** from **[Settings]** in **[Start]** menu.

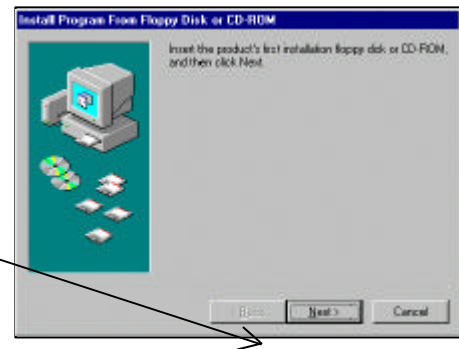
(b) Double click the icon of **[Add/Remove Programs]**.



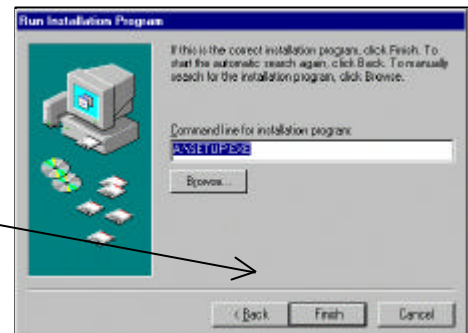
(c) Click the **[Install...]** button at the **[Add/Remove Programs Properties]**.



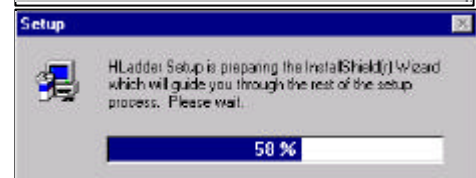
- (d) Set the 1st floppy disk to install, and click the [Next (N)>] button.



- (e) When *Run Installtion Program* dialog box appears with A:¥ SETUP.EXE at the command line, click the [Finish] button.

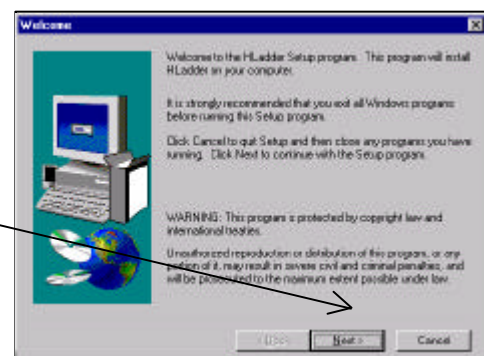


- (f) *Setup* dialog box appears.

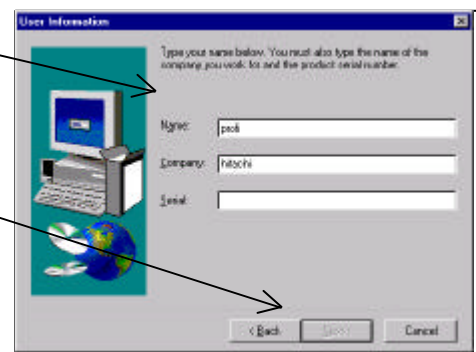


- (g) Setup window appears for confirmation of the installation.

Click the [Next (N)>] button.



- (h) *User information* dialog box appears. Type your name, company name and serial No. printed at the install disk. Click the [Next (N)>] button.



(note) The screen of Ver1 is partly different.

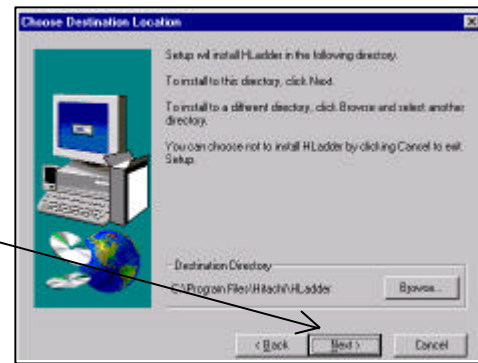
- (i) *Choose Destination Location* dialog box appears.

Default is as:

C:\ProgramFiles\Hitachi\Hladder

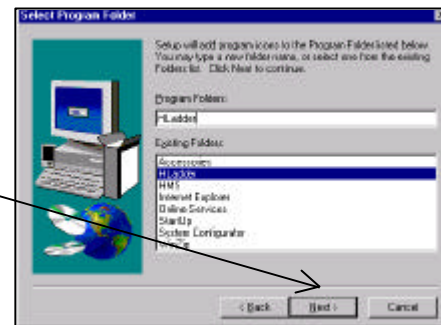
If you install the program to this place, click the [Next (N)>] button.

If you want to change the install place, click [Browse...] and specify the drive name and the folder (directly).



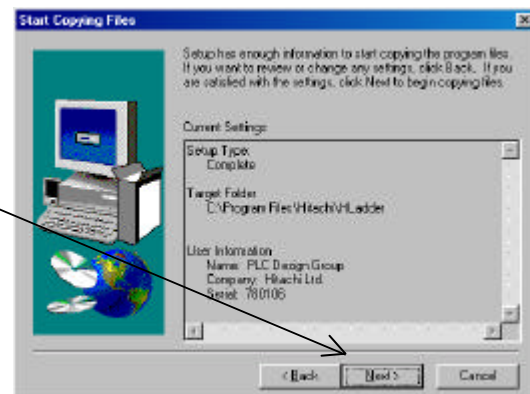
- (j) It displays the choice screen of the program folder.

Click the [Next (N)>] button.



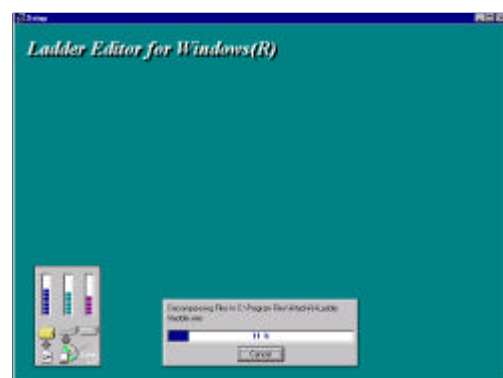
- (k) *Start Copying Files* dialog box appears.

Click the [Next (N)>] button.



- (note) This screen is not displayed in Ver1.

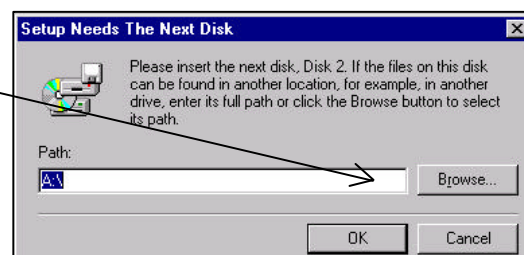
- (l) Installation starting.



- (m) Set the 2nd install floppy disk and click [OK]

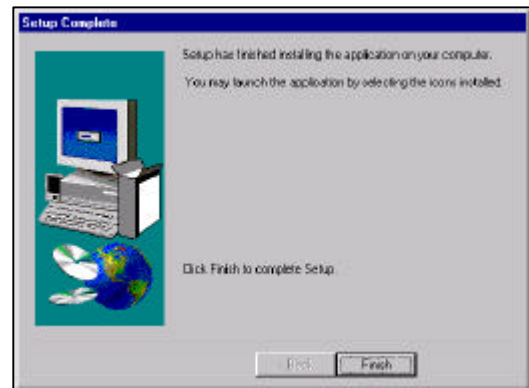
when the next floppy disk insertion message is displayed on the screen.

Set the 3rd, 4th floppy disk with a same step, and click [OK].



(n) *Setup Complete* dialog box appears.

Click the [OK] button.



The installation of Ladder Editor for Windows® is completed.

(Caution)

The installation can be completed after install the 3rd floppy disk.

The system file (dll, etc.) is used in LADDER EDITOR for Windows® for common use with other Windows application. When install LADDER EDITOR EDITOR, these system files will be installed, however, if there is the system file which has already installed, it finish install after install the 3rd floppy disk and displays the message to complete the installation. The installation was completed correctly so you can use without no problem.

(Caution)

About install and log-in to Windows® 2000/XP.

If log-ined by other users, Off-line CPU is displayed only “4010 comp”.

In case of using other users, please install by own user.

But,

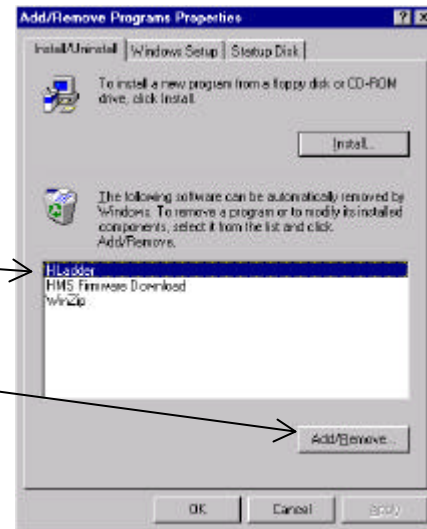
(a) In case of power users authority, warning message is displayed in starting to install, but please continue to install at that.

(b) It can not be installed by user authority.

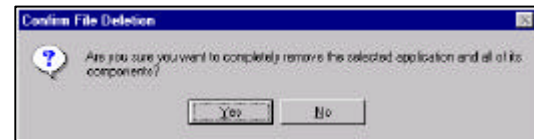
1.5 Uninstall Process

Follow the steps bellow to uninstall the program.

- (1) Open **[Control Panel]** from **[Settings]** in the **[Start]** menu.
- (2) Double click **[Add/Remove Programs]**.
- (3) After clicking HLadder in the **[Add/Remove Programs Properties]** dialog box, click the **[Add/Remove (R)...]** button.



- (4) Click **[Yes]** at the program remove confirming screen.

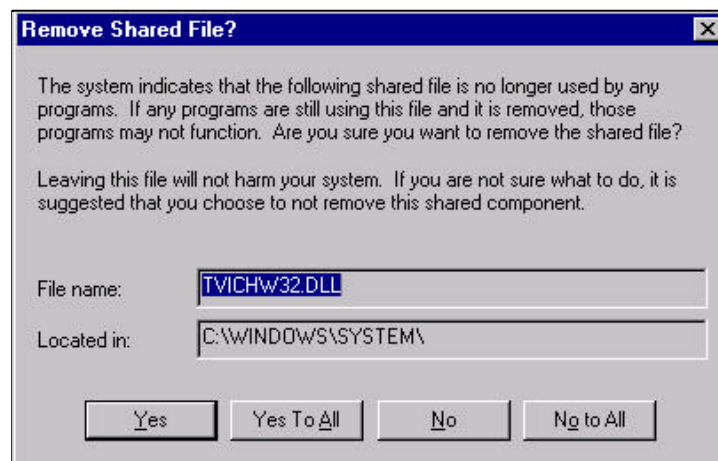


- (5) Uninstallation starting.

(Caution)

If message "Remove Shared File?" is shown in the process of uninstallation.

In this screen, make sure to click [No] or [No to All]. If you click [Yes] or [Yes to All], other applications might not work.



1.6 Compatibility of User Program

(1) Compatibility with LADDER EDITOR for Windows® Ver.2 or the former.

LADDER-EDITOR Ver.2 or the former	Compatibility	LADDER EDITOR for Windows Ver3
(1) Command language programmer(PGM-CHH) (2) Portable graphic programmer(PGM-GPH) (3) Ladder diagram/command language editor	--> O	Ladder diagram/command language editor LADDER EDITOR for Windows® Ver.3 (HLW-PC3E)
LADDER EDITOR (a) PC/AT DOS edition(HL-AT3E) (b) Windows edition Ver2 (HLW-PC3E)	- <--	

--> O: The file made by the left side programmer/software can be used by the right side software.

- <--: The file which includes symbol of TM/TV and made by the right side software can not be used by the left side programmer/software.

(2) Compatibility with LADDER EDITOR for Windows® Ver1

LADDER EDITOR for Windows® Ver2/Ver3	Compatibility	LADDER EDITOR for Windows® Ver1
Program	O<--> -	Program
Comment	O<--> -	Comment
Force / Trace	O<-->O	Force / Trace

(Meaning of -)

The program which using the extended timer or WN/DN will be displayed as “Data identity name error” and can not be loaded with Ver1 and other programming software.

And, the program which using only WN/DN can be loaded with Ver1 but the contents of the processing box which WN/DN was input can not be displayed and it becomes an assemble error (Undefined I/O).

The cic file which saving more than 32768 bytes of circuit comment can not be loaded with Ver1 and other programming software.

(3) Compatibility with LADDER EDITOR for DOS

Each file of Ladder program, comment, force, and trace which are created by LADDER EDITOR for DOS can be read and edit with LADDER EDITOR for Windows®. It is also same in a file extended code.

(4) Compatibility with HILDR/HILDRL

Each file of Ladder program, comment, force, and trace which are created by HILDR/HILDRL(special software attached to GPC/GPCL) can be read and edit with LADDER EDITOR for Windows®.

However, a comment file and a force file which are created by LADDER EDITOR for Windows® can not be read by HILDR/HILDRL.

(5) Compatibility with Data Memory Edit Software for DOS

There is no compatibility of the data file with the data memory edit software for DOS (HIDATA-G, HDT-PC3).

Table 1.1 File Compatibility with LADDER EDITOR for DOS

Type	LADDER EDITOR for Windows®	Compatibility	LADDER EDITOR for DOS
Program	H series program (*.PRN)	O<-->O	H series program (*.PRN)
	Source program (*.PRU)	O<-->O	Source program (*.PRU)
Comment	User symbol I/O comment (*.IOT)	O<-->O	User symbol I/O comment (*.IOT)
	Circuit comment (*.CIC)	O<-->O	Circuit comment (*.CIC)
	Box comment (*.BOC)	O<-->O	Box comment (*.BOC)
	Memo comment (*.MEC)	O<-->O	Memo comment (*.MEC)
Force	Force file (*.FON)	O<-->O	Force file (*.FON)
Trace	Trace file (*.TRC)	O<-->O	Trace file (*.TRC)
Object	Object program (*.OBH)	O<-->O	Object program (*.OBH)

Table 1.2 File compatibility with HILDR/HILDRL

Type	LADDER EDITOR for Windows®	Compatibility	HILDR/HILDRL
Program	H series program (*.PRN)	O<-->O	Ladder program (*.PRN)
Comment	User symbol I/O comment (*.IOT)	O<-->X	Comment file (*.CMN) (note) Device No. I/O comment
	Circuit comment (*.CIC)	O<-->X	(note) Circuit comment part
Force	Force file (*.FON)	O<-->X	Force file (*.FON)

Table 1.3 File compatibility with Other Software

Type	LADDER EDITOR for Windows®	Compatibility	HROM software
Program	Object program (*.OBH)	O<-->O	OBH file (*.OBH)

Type	LADDER EDITOR for Windows®	Compatibility	TRAC software
Program	Trace (*.TRC)	O<-->X	Trace file (*.DAT)

() : File extended code

->O : A left side file is available on a right side software.

O<- : A right side file is available on a left side software.

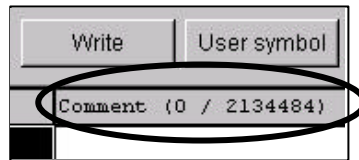
->X : A left side file is not available on a right side software.

X<- : A right side file is not available on a left side software.

(Note)

It changes the maximum capacity of I/O comment file from 256,000 byte of V1.22 to 2,134,484 byte in V2/V3.

Can not read a comment file which the used memory capacity of I/O comment edit window in V2/V3 over 256,000 byte by LADDER EDITOR for Windows® V1.22, and LADDER EDITOR for DOS, HILDR/HILDRL.



Used memory capacities of Comment edit window (V1.22)

(6) Compatibility of OBH files

Under the cases, it displays as “Data identity name error “ and stop the process of sending or send-receive verifying.

(a) Send, or send-receive verify the OBH file which was received from the CPU other than H-4010 standard (include H-4010 compatible) to the CPU of 4010-standard.

(b) Send, or send-receive verify the OBH file which was received from the CPU of H-4010 standard to the CPU other than 4010-standard (include H-4010 compatible)

(7) Compatibility with I/O comment file include Extended timer/counter

The I/O comment file which is set the offline CPU type of LADDER EDITOR for Windows® V2/V3 to “4010 standard” and input I/O comment/User symbol over TD512 or CU512 can not be loaded with LADDER EDITOR for Windows® V1 and LADDER EDITOR for DOS, HILDR/HILDRL.

1.7 About extended on-delay timer (TM/TV) for EH-CPU516/548

By using Ver3, programming and editing of an extended on-delay timer (TM/TV) supported by EH-CPU 516/548 for EH-150 series are possible .

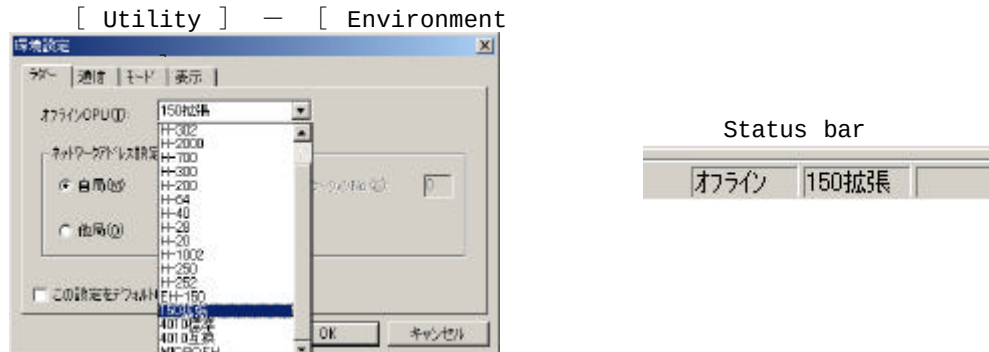
(1) Series/CPU supported extended on-delayed timer (TM/TV)

No	Series/CPU type	Support
1	H-20/40/64	-
2	H-200/250/252	-
3	H-300/700/2000	-
4	H-302/702/1002/2002	-
5	MICRO-EH	-
6	EH-150 (EH-CPU104~448)	-
7	EH-150 (EH-CPU516/548)	O

If editing the file, which includes TM/TV, reading the file from CPU, writing the file to CPU, please use LADDER EDITOR for Windows Ver3.

(2) About off-line CPU type [150ext]

The off-line CPU type [150ext] at [Utility]-[Environment set] is added in Ver3. In case of off-line, it is able to edit file only when set [150ext]. (It displayed [150ext] at status bar)



(3) In case of connecting to CPU by on-line mode and on-direct mode

In order to edit the extended timer (TM/TV) which was added by EH-150 EH-CPU 516/548, it is necessary to surely set an off-line CPU type as [150 ext] in [Utility]-[Environmental set] as off-line mode beforehand. Once connecting in on-line mode, it does not become effective the setting as change about an off-line CPU type. Please be sure to perform an off-line CPU type setup in off-line mode.

(4) Attention of using on-delayed timer(TM/TV)

- a) By the programmer and the programming software which does not support an extended on-delay timer, editing the program including TM/TV is impossible. (To edit the program by off-line mode is same, too.) The circuit including an extended on-delay timer (symbol : TM, TV) is not displayed correctly, and serves as an assembling error.)
- b) When writing in CPU (program transmission) the program including TM/TV,, LADDER EDITOR for Windows Ver3 is surely needed.
- c) When the program including TM/TV is stored in CPU and you perform CPU reading the program, please be sure to use Ver3.
- d) The programming propriety of an extended timer (TM/TV) at the time of on-line connection is dependent on an off-line CPU type setting.
- e) It is necessary to perform an off-line CPU type setting at the time of off-line mode. Once connecting in on-line mode, it does not become effective the setting as change about an off-line CPU type. Please be sure to perform an off-line CPU type setting in off-line mode.
- f) When connecting by on-line or on-direct mode, please surely let CPU and an off-line CPU type in agreement. If using it without making it in agreement, the various errors occur etc. may cause trouble.
- g) When off-line CPU type is except "150ext" at the time of off-line mode, editing extended on-delayed timer(TM/TV) becomes impossible even if reading is possible
- h) When connecting to EH-CPU516/548 in on-line mode
Editing is impossible although reading program including extended timer (TM/TV) from CPU can do even if off-line CPU type is except "150ext."
- i) In the state where Off-line CPU and connected CPU are inharmonious, if reading the file including extended on-delay timer (TM/TV) and wrote to CPU is performed, the program is not correctly transmitted to CPU.

Attention

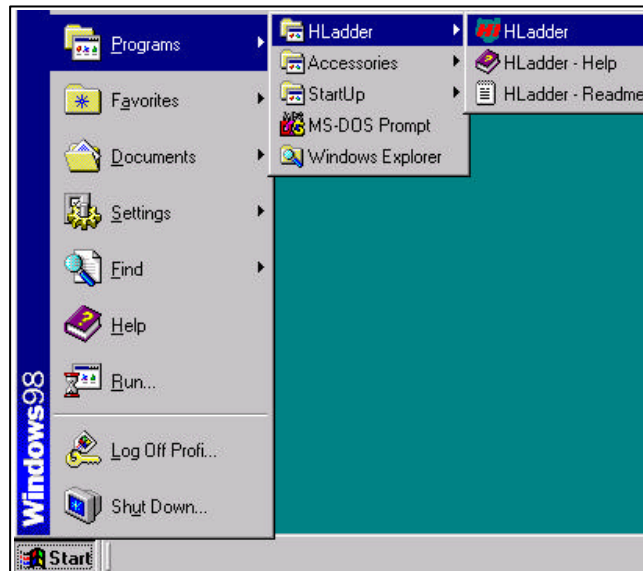
- a) When "CPU writing" is performed in the state where the program is not corrected like the above-mentioned by the programming software before Ver2, it is displayed as "an I/O conversion error" and transmission of a program is not performed. Moreover, the program currently written in CPU from the first in this case is eliminated. Reading of the program including TM/TV and CPU writing should surely use Ver3.
- b) Off-line CPU type is set as "150ext" to H-302-/EH-150 (except for CPU516/548) / MICEO-EH, and when the CPU writing of the program which includes TM/TV after connecting in on-line mode, it may not operate correctly as a heavy failure error display or RUN by CPU.

Chapter 2 Basic Operation

2.1 Startup and Finish of LADDER EDITOR for Windows®

(1) Startup of LADDER EDITOR for Windows®

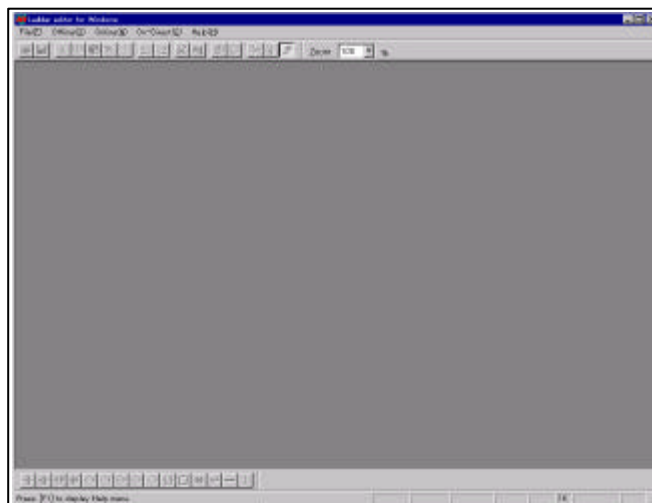
Choose **[Program]** -> **[HLadder]** -> **[HLadder]** from the start menu of Windows®98SE/2000/XP.



Or, double click the short cut icon on the desk top.

(Copy form a window of HLadder group at the end of installation)

GRS screen is displayed when starting LADDER EDITOR for Windows®

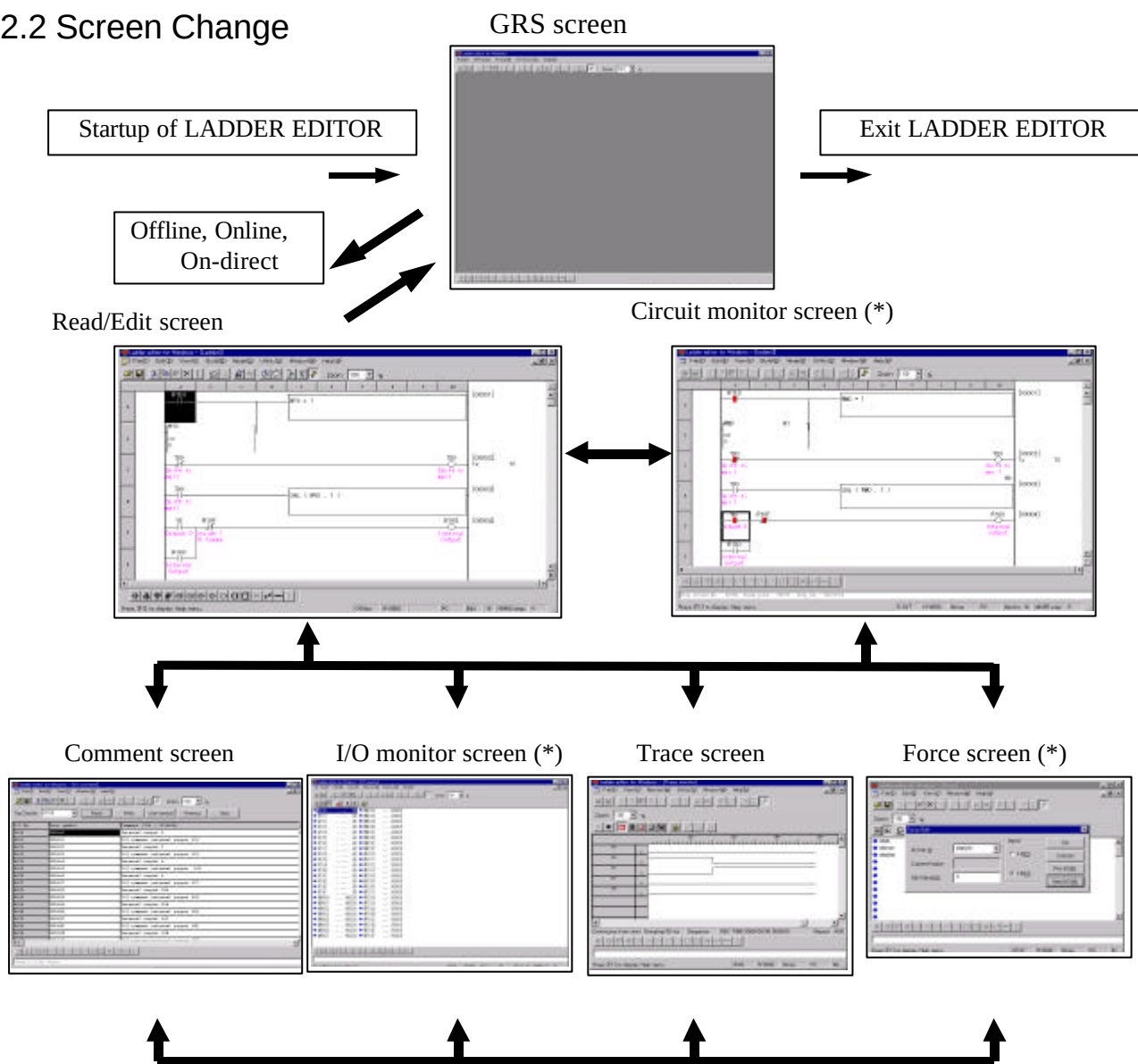


< GRS screen >

(2) Finish of LADDER EDITOR for Windows®

Choose **[Finish Application]** in **[File]** menu on a menu bar to finish LADDER EDITOR for Windows®.

2.2 Screen Change



(*) screen can not change with the offline.

1) GRS screen

Choose the connect condition (offline, online, on-direct) with the CPU on the PC which operates LADDER EDITOR for Windows®

A CPU connect condition can be changed by this screen only. Also, you can returns to GRS screen from any screen indicated above.

2) Read/Edit screen (read/edit mode)

Edit, cross reference, transfer, send/receive, and merge of Ladder graph.

3) Execute Circuit monitor screen, I/O monitor screen, Trace monitor screen, Force screen, each monitor operation, and a force output, etc.

Offline mode : It does not connect to the CPU and execute the operation such as the programming only by the PC.

Online mode : It connects to the CPU and write and read the data such as a program to or from the CPU.

On-direct mode : It connects to the CPU. A programming operation on the PC reflect also to the CPU.

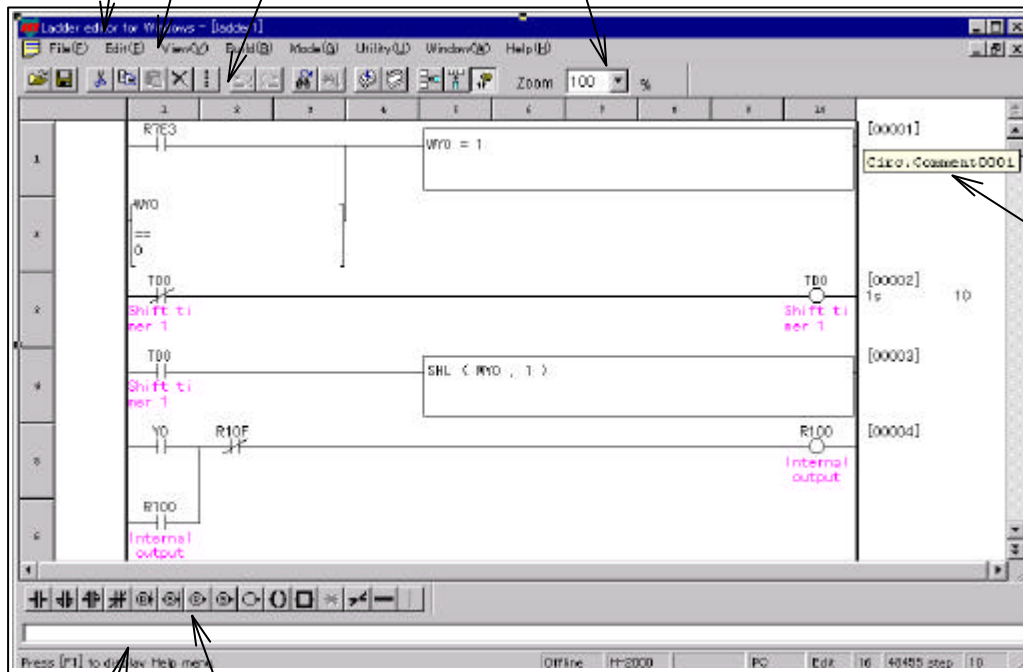
2.3 Screen Structure

Title bar: A opened file name of Ladder program is displayed after LADDER EDITOR for Windows®.

Menu bar: Choose the function from the pull down menu.

Tool bar: It displays icon which use repeatedly such as copy, write, etc..

Zoom bar: Choose a size of Ladder circuit screen .
(50,75,100,125,150,200%)



Capture display:
It displays a comment (offline) or a monitor value (online) by pointing a symbol with a mouse.

Symbol bar: Choose an object symbol to input a symbol.

Output window:

It displays the error description at the circuit write and the status at the debug mode.

Status bar:

It displays CPU condition, CPU memory capacity, the last circuit No., etc..

Each bar except Title bar and Menu bar can be move and also displayed or hidden by making a check mark on the pull down menu in [Display] at Menu bar.

But, even if you make Output window hide, it automatically displays when error occurs or the debug mode.

Take out the check mark on the pull down menu in [Display] at Menu bar to display Output window.

(Details of Status bar)

Example

RUN	H-2002	Home station	PC	Edit	16	15592 step	27
A	B	C	D	E	F	G	H

Class	Description						
A	Display the condition of the CPU. Please refer to the table at the right	No	Display	CPU operation mode	CPU operation state	I/O module	
						LED display	Output
		1	STOP	Stop	Stop	Don't *1	Don't *1
		2	RUN	Run	Execute	Do	Do
		3	HLT	Halt	Stop	Do	Do
		4	ERR	Error	Stop	Don't *1	Don't *1
		5	D.RUN	Debug run	Executed in specified range	Do	Do
		6	D.HLT	Debug halt	Stop	Do	Do
		7	S.STOP	Simulation stop	Stop	Don't	Don't
		8	S.RUN	Simulation run	Execute	Do	Don't *1
		9	S.HLT	Simulation halt	Stop	Do	Don't *1
		10	S.ERR	Simulation error	Stop	Don't	Don't
		11	S.D.RUN	Simulation debug run	Executed in specified range	Do	Don't *1
		12	S.D.HLT	Simulation debug halt	Stop	Do	Don't *1
		13	Offline *2	-	-	-	-
*1 When execute the force output, and the force set, it executes LED display and Output.							
*2 It indicates the offline on GRS screen.							
*3 Analog output module, Communication module (COMM, CPU link, etc.), and a special function module (Counter, Positioning) become an out of object, and it operate same as it does not in the simulation.							
B	It displays a name of the CPU type. It displays the CPU name set by the environment set function at the offline selecting, except that it displays the connected CPU name.						
C	It displays the destination in the offline such as Home station, or link loop No. and link station NO.. A display is blank at the offline selecting on GRS screen.						
D	It displays the memory to write at the editing.	Display	Mode selected on GRS screen and a destination memory to wrote.				
		PC	Write into PC memory at the time of online, or offline selecting.				
		PC/CPU	Write into both CPU and PC memory at the time of on-direct selecting.				
E	Mode display of LADDER EDITOR for Windows® (Edit, Monitor). But, even if LADDER window is in the edit mode, it becomes “Monitor” when executing I/O monitor or Trace and can not edit.						
F	It checks the display data of Monitor data, Trigger set data, Force set/reset data, Force output data, and Force data and makes distinction between decimal or hexadecimal. A display of Status bar becomes hexadecimal when selecting binary on I/O monitor.						
G	It displays the D’s writing destination memory capacity.						
H	It displays the last circuit No. of Ladder program written in D’s writing destination.						

2.4 Tool Bar

	: Road	It opens existing file of Ladder program, Comment, etc..
	: Save	It save a file of edited Ladder program, Comment, etc. with a specified name.
	: Cut	It cut off the specified range. It can be pasted until executing Copy or Cut.
	: Copy	It copies the specified range. It can be pasted until executing Copy or Cut.
	: Paste	It paste the cut range or the copied range at the specified place.
	: Delete	Delete the specified range. (Same as Delete key)
	: Delete vertical line	Delete a vertical line of right upper on specified position.
	: Undo	Back to the once before condition. It can return to the once before operation until the icon becomes gray display.
	: Redo	Repeate the once before operation one more time.(1 time only).
	: Circuit read	Read the specified circuit No., I/O No., User symbol, and the application command.
	: Repeated circuit read	Read repeatedly the circuit No., I/O No., User symbol, and the application command specified the last time .
	: Circuit write	Execute a connect and error check between symbols, and also write in the program memory.
	: Recover	It returns to the condition of before editing (immediately after the circuit write).
	: Insert row	It inserts the 1 blank row between circuits
	: Insert column	It inserts the blank column. It can not execute at 10th column.
	: With input (With I/O No. input)	By clicking the icon, it becomes no input and it repeatedly input only symbol, then I/O No. can be input later (initial setting is “With I/O input”).

Can not execute when icon is in the gray display condition.

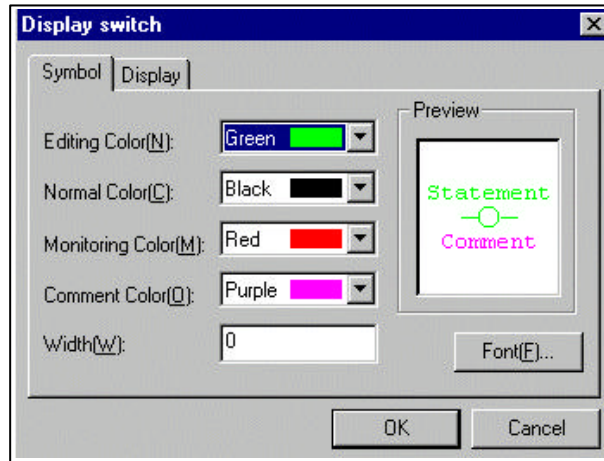
2.5 Symbol Bar

	: A contact point
	: Drop contact point (DFN)
	: Rise contact point (DIF)
	: B contact point
	: Master control reset (MCR)
	: Master control set (MCS)
	: Reset coil
	: Set coil
	: Coil
	: Comparing box
	: Processing box
	: Loop back (turn)
	: Not
	: Horizontal line
	: Vertical line

The icon becomes gray when the object symbol can not be input at the present cursor position.

2.6 Display Switch

A following information can be customized by the display switch dialog box which is displayed by selecting **[Display switch]** in **[View]** at the menu bar. The modified information is memorized, and next time it displays as same information as the last time modification .



(Symbol)

- Edit color : Before execute a circuit write (Default: Green)
- Basic color : Loading and after execute a circuit write (Default: Black)
- Monitor color : ON condition of Contact point/Coil in the circuit monitor (Default: Red)
- Comment color : Color of I/O comment (Default: Purple)
- Width : Line width of Ladder graph (Default: 0)
- Font : You can change the size of Ladder graph (also letter size of I/O No.) and the font type of I/O No. displayed on the screen.

(Note)

I/O No. and a comment on the Ladder graph can be lost by the combination of a font type and its style.

Ex.) Select MSP Gothic font with Bold style.

(Display)

- Choose the display of circuit monitor data and I/O monitor from the binary, the decimal, and the hexadecimal. But, the binary can be effective only in I/O monitor data. The monitor data becomes the hexadecimal in the circuit monitor.
- Choose display or not a comment on I/O monitor.
- Choose display or not a comment on the circuit monitor.

2.7 Basic Operation of Mouse, Window, Keyboard

(1) Basic Operation of Mouse

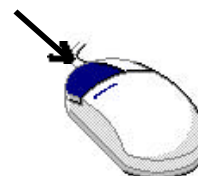
We simply introduce the use of a mouse. If you have enough experience with the operation of Windows, you can skip over Ch. 2.7.

(a) Click (left click)

The operation to push a left button one time.

Use the single click to select a button on a screen, and to specify a symbol on a Ladder graph.

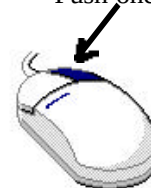
Push one time



(b) Right click

The operation to push a right button one time. By using the right click at the specified position, it displays a short cut menu and make the work more speedy.

Push one time

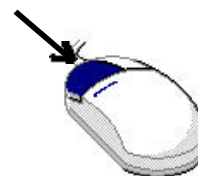


(c) Double click

The operation to push left button two times quickly.

In the edit of the Ladder graph, by double clicking the input symbol, it displays the input dialog box such as I/O.

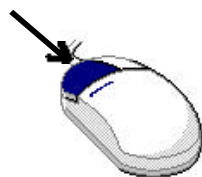
Push two times quickly



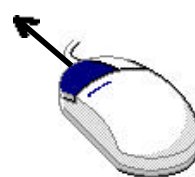
(d) Drag & Drop

Press a mouse button and hold it until the specified range is selected, then release a mouse button. This is called "Drag". "Drag & Drop" is the function to move the specified range which was selected by Drag, and use for the movement and the copy of a program, a comment, etc..

Push



Release

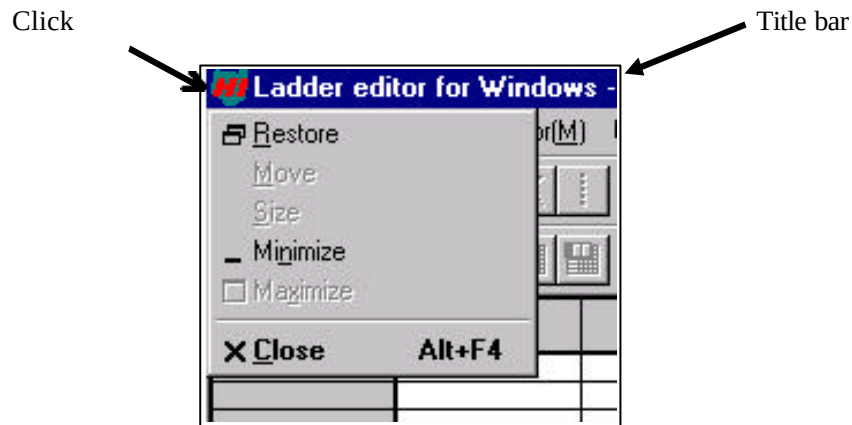


(2) Basic Operation of Window

(a) Close the window

There is a following method to close a window.

- Click  at the right upper corner. (apply to all window)
- To close a window which has an icon at the left upper corner, click “Close” in the pull down menu which is displayed by clicking the icon.
(Ladder screen, Comment screen, etc.)

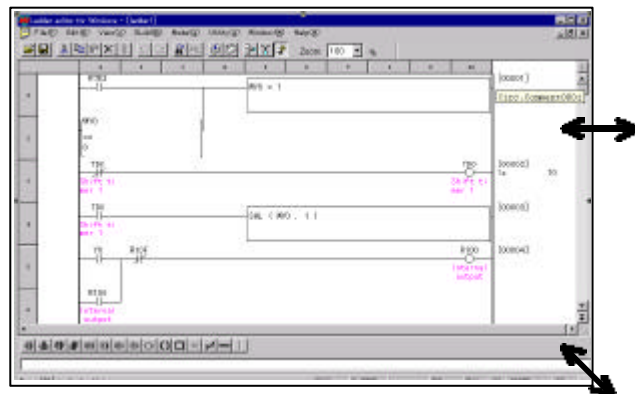


(b) Move the window

To move the window, drag the title bar on the window.

(c) Change the window size

To change the window size, drag the corner or the border of the window.



(3) Basic Operation of Keyboard

(a) Windows® operating system apply to the following key operation.

Key	Operation
Alt + F4	Finish a program (*) (note)
Ctrl + F4	Close an active window (*)
Ctrl + Esc	Display the [Start] menu (note)
Alt + Tab	Change a window or an application.

Can not execute the (*) key operation while editing the comment and monitoring the capture display of progress value.

(note) After input (Ctrl + Esc) and escape with (Esc), if input (Alt + F4), it displays the end dialog of Windows® operating system.

(b) LADDER EDITOR for Windows® apply to the following key operation, too.

Key	Operation	Related Function
F1	Display the Help (*)	-
Ctrl + C	Copy	Edit / Read
Ctrl + D	Circuit deletion	Edit / Read
Ctrl + E	Circuit write	Edit / Read
Ctrl + F	Circuit read	Edit / Read
Ctrl + Shift +G	GRS screen	-
Ctrl + H	2/10/16 display change	Monitor
Ctrl + I	Insert circuit	Edit / Read
Ctrl + J	Insert column	Edit / Read
Ctrl + K	Continuous read	Edit / Read
Ctrl + L	Insert row	Edit / Read
Ctrl + O	File road	File
Ctrl + R	Move a cursor to the top display box in the comment window. (*)	Comment
Ctrl + S	File save	File
Ctrl + U	Circuit recover	Edit / Read
Ctrl + V	Paste	Edit / Read
Ctrl + X	Cut	Edit / Read
Ctrl + Z	Undo	Edit / Read
Delete	Delete	Edit / Read
Shift + Delete	Vertical line delete	Edit / Read

Can not execute the key operation if you set (*) key operation to “Symbol” with the key customize in [Keyboard] in [Utility].

(c) Menu Selection

Press Alt key + * (* is an alphabet in () following each menu), or select with the up/down arrow key and press Enter key or input an alphabet in () to select a menu bar.

But can not execute the key operation while editing the comment and monitoring the capture display of progress value.

Please refer to “5.3 keyboard setting” about the short cut key of symbol input.

Chapter 3 Simple Operation

3.1 Edit

- (1) Change to Offline Mode.
Click "Offline" on GRS screen.

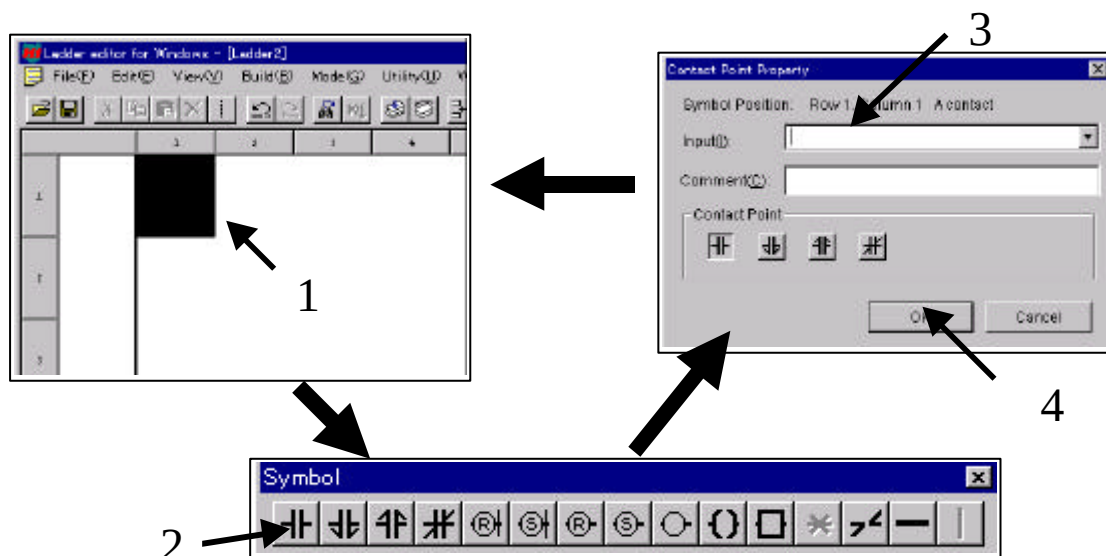


- (2) Program Road (to modify the existing Ladder program)

After clicking  icon (or, choose **[Road]** in **[File]**), specify the file name and load the Ladder program.

- (3) Ladder Program Edit

- (a) Click the input position (or, move the cursor with an arrow key)
 - (b) Click the symbol on the symbol bar (or, the short cut key)
 - (c) Input I/O No., Comparing expression, and arithmetic operation
 - (d) Click OK (or, Enter key)
- Repeat (a) to (d) operation



- (4) Write

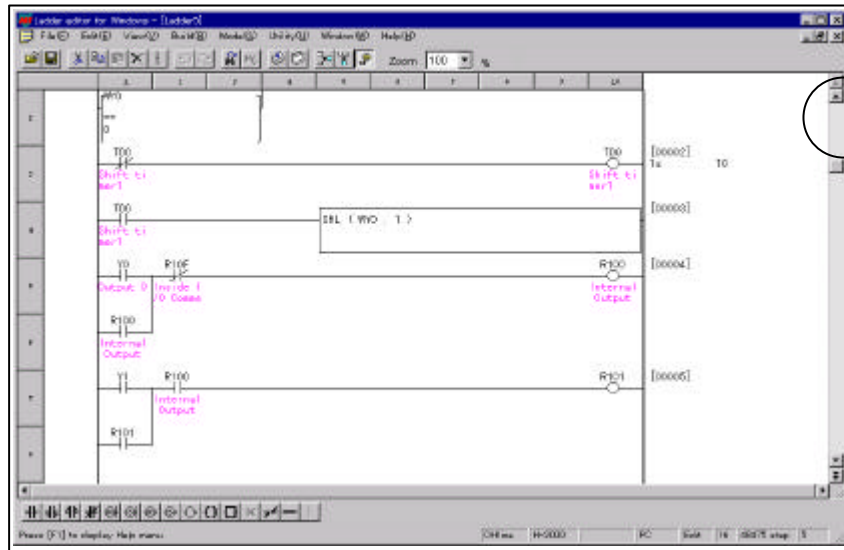
Click  icon (or, Write in the right click menu, and **[Circuit Write]** in **[Build]**). A program is written to the memory and executed error check at the same time.

(Note) About a vertical scroll

1. Operation of Scroll bar

In LADDER EDITOR for Windows®, a Ladder program is written in the buffer with particular unit, therefore it is difference from other application and only the range, written in the screen display buffer, can be move with the scroll bar.

If you want to scroll the circuit displayed on a screen at the condition that the scroll bar is at the top or bottom., move the scroll icon.



Click  or  when the scroll bar is at the top.

It scroll a line unit by , and a circuit No. unit by .

Can not scroll with the circuit No. unit when  is in gray display.

Click  or  when the scroll bar is at the bottom.

It scroll a line unit by , and a circuit No. unit by .

Can not scroll with the circuit No. unit when  is in gray display.

When “Road” the circuit, the last circuit is displayed at the top of display and also the vertical scroll bar comes at the top position.

When operating only with the keyboard, the circuit can be scrolled by moving the cursor with the up/down key.

2. Scroll Speed

When pushing a key continuously and continuing to push it, there is a case that the scroll process of a screen takes time (depending on the CPU).

The program seems to be stopping state, the processing is in the condition which doesn't attain because it is pressing a keyboard before displaying the following screen. It turns back in the condition that a screen was scrolled when giving off in a while.

Double click the [Keyboard] icon in [Control Panel] of Windows OS. "Slow" in the setting in [Display Interval] from [Speed] menu in the property dialog box of the keyboard. Drag a lever with the mouse or click [Slow] with the mouse.

The scroll process time and the time which pressing the keyboard becomes same because the interval of the display when continuing to push a key becomes long by the above operation.

3.2 Symbol Selection Method

(1) There are three ways to select the input symbol.

(a) Click the specified symbol at the symbol bar.

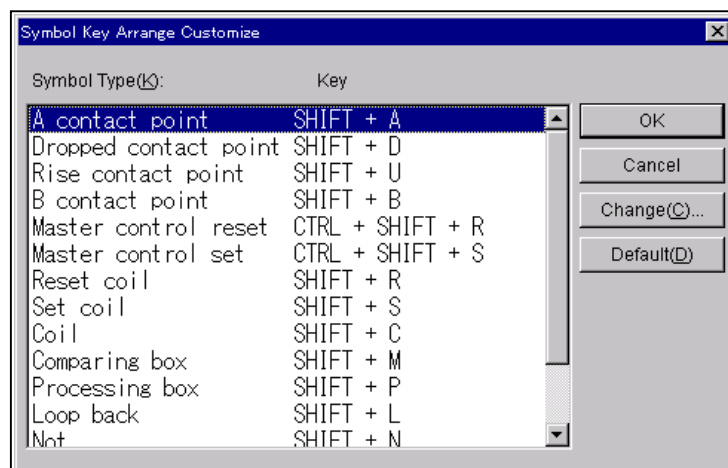
The selected symbol is displayed at the cursor position when clicking the symbol at the symbol bar.



(b) Operate by the registered key

The registered key is displayed at the cursor position by executing the registered key operation.

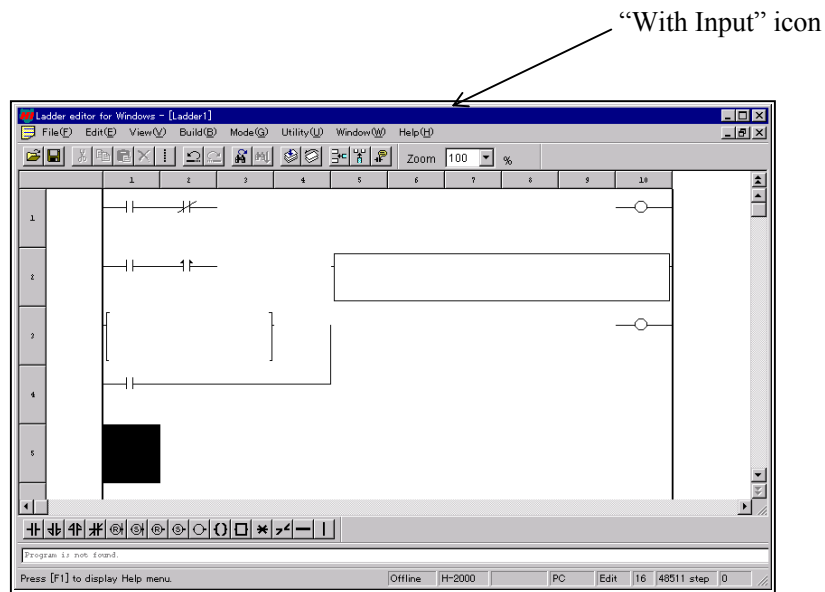
A key can be registered in [Symbol Arrangement Key Customize] which is displayed by selecting [Keyboard] in [Utility].



(c) Continuous input of the symbol

Click “With Input” icon  (initial set: With I/O Input) at the tool bar , and make it  condition (No I/O input) to make continuously input of symbol, then input other such as I/O No. later. Or, take off the check from [**With Input**] in [**Edit**] on the menu bar .

In the continuous input condition, when clicking the symbol on the symbol bar after moving a cursor to the input start position, only a symbol but the input dialog is not displayed and a cursor move the right.



After finishing the continuous input, click  icon (No input condition) and make it “With Input” condition.

Move a cursor to the uninput symbol to input I/O No., etc..

The input dialog is displayed when double click (or, press Enter key).

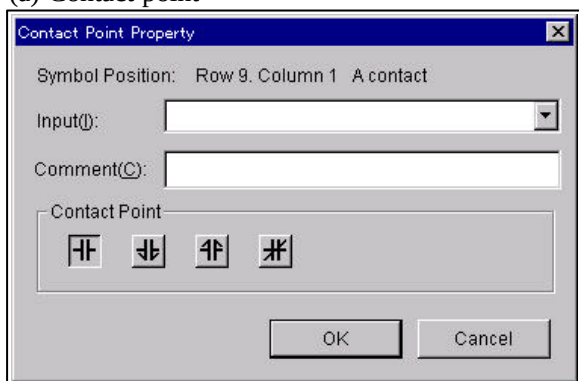
3. 3 Symbol Input Method

After selecting the symbol to input, the dialog box to input I/O No. (or, Comparing expression, Arithmetic expression) is displayed.

But, if the symbol is move to the illegal position, the contact point icon becomes gray and can not be input.

When clicking [OK] after input I/O No., a symbol and I/O No. are displayed on the Ladder graph.

(a) Contact point



Symbol Position: Row 9, Column 1 A contact

Input(I):

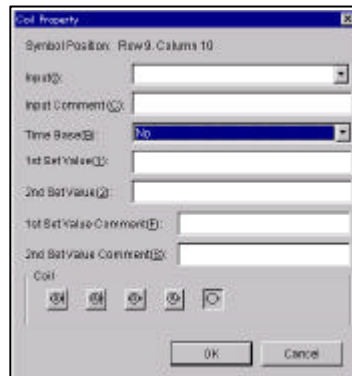
Comment(C):

Contact Point

☐ ☐ ☐ ☐

OK Cancel

(b) Coil



Symbol Position: Row 9, Column 10

Input(I):

Input Comment(C):

Time Base(T):

1st Set Value(S):

2nd Set Value(R):

1st Set Value Comment(C):

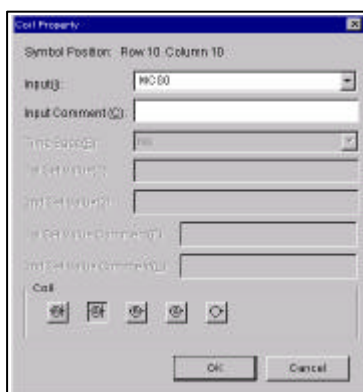
2nd Set Value Comment(C):

Coil

☐ ☐ ☐ ☐ ☐

OK Cancel

(c) Master control



Symbol Position: Row 10, Column 10

Input(I):

Input Comment(C):

Time Base(T):

1st Set Value(S):

2nd Set Value(R):

1st Set Value Comment(C):

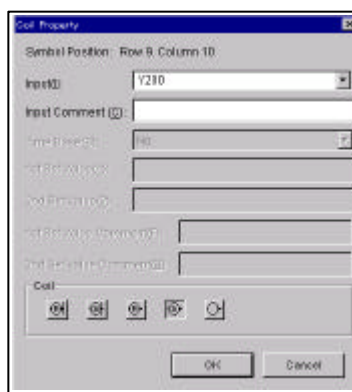
2nd Set Value Comment(C):

Coil

☐ ☐ ☐ ☐ ☐

OK Cancel

(d) Set/Reset coil



Symbol Position: Row 9, Column 10

Input(I):

Input Comment(C):

Time Base(T):

1st Set Value(S):

2nd Set Value(R):

1st Set Value Comment(C):

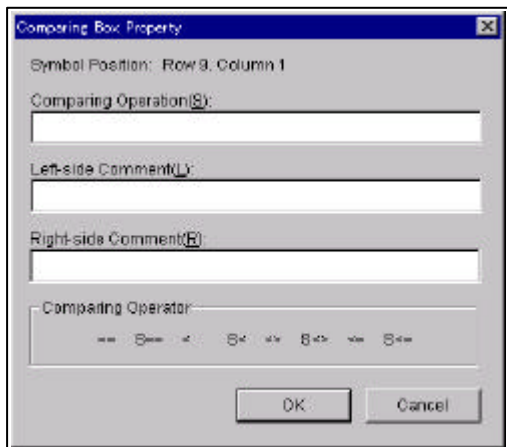
2nd Set Value Comment(C):

Coil

☐ ☐ ☐ ☐ ☐

OK Cancel

(e) Comparing box



Symbol Position: Row 9, Column 1

Comparing Operation(S):

Left-side Comment(L):

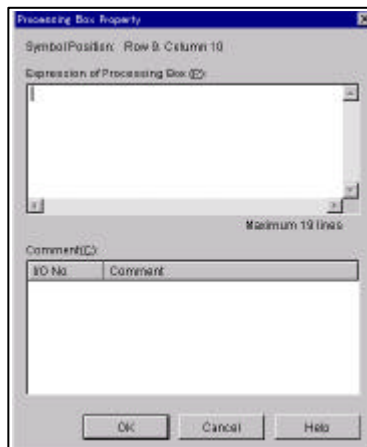
Right-side Comment(R):

Comparing Operator

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

OK Cancel

(f) Processing box



Symbol Position: Row 9, Column 10

Expression of Processing Box(E):

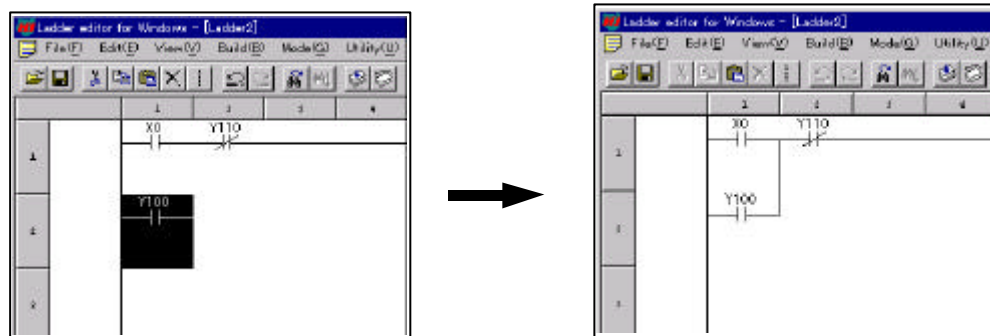
Comment(C):

I/O No. Comment

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

OK Cancel Help

Move a cursor to the left lower side of the position to input the vertical line, and select the symbol of the vertical line.



After input a symbol, a cursor moves automatically to the right except the vertical line.

3.4 Circuit Modify, Copy, Cut, Delete

	: Cut	It cut off the specified range. It can be pasted until executing Copy or Cut.
	: Save	It save a file of edited Ladder program, Comment, etc. with a specified name.
	: Paste	It paste the cut range or the copied range at the specified place.
	: Delete	Delete the specified range. (Same as Delete key)
	: Delete vertical line	Delete a vertical line of right upper on specified position.

[About the range specification method by the mouse drag]

The following operation can be performed by clicking and dragging a symbol with a mouse in Ladder Editor for Windows® 95/98.

- Range selection (Copy, Delete range on a screen)
- Movement of symbol
- Edit of symbol property (open a property)

The operation of symbol property is performed by double clicking.

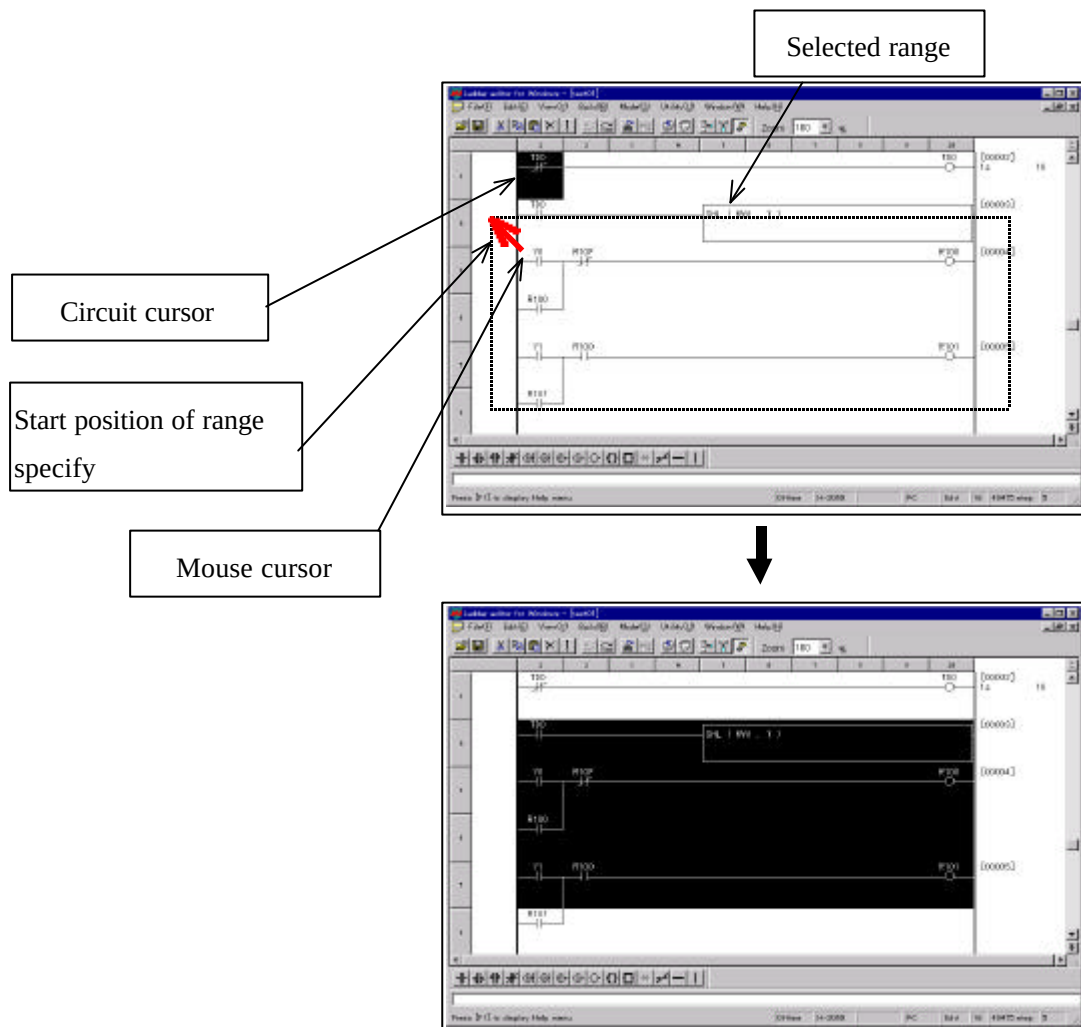
(Caution)

When copying and pasting a circuit which includes **a processing box has the width of over 2 lines**, the message of “Not enough space” is displayed if the generation circuit is next condition. In this case, make a space with the insert row and paste it.

1. A coil exist more than 2 line continuously .
2. A coil and a processing box exist continuously.
3. A width for a processing box to paste is smaller than a processing box.

(1) Range Selection

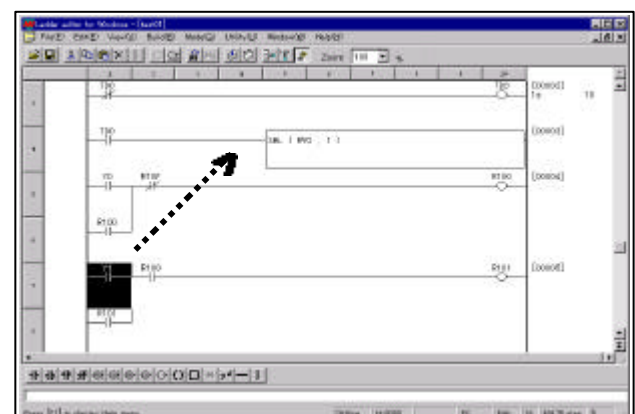
It becomes a range selection when a position of a circuit cursor and a mouse cursor does not match, and a circuit cursor exist different from a start position of range selection. Move a cursor to the start position of range selection, and specify the range by mouse dragging.



(2) Movement of Symbol

It becomes the movement of symbol when a position of a circuit cursor and a mouse cursor match and click on the position of circuit cursor.

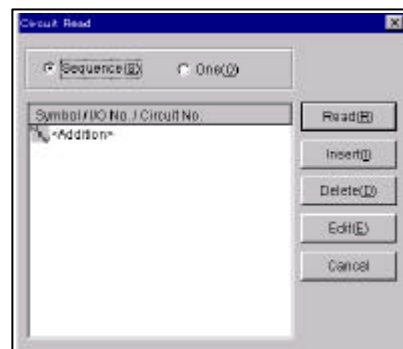
Move the circuit cursor to the object symbol, then move the mouse cursor to the circuit cursor and drag to the destination of movement.



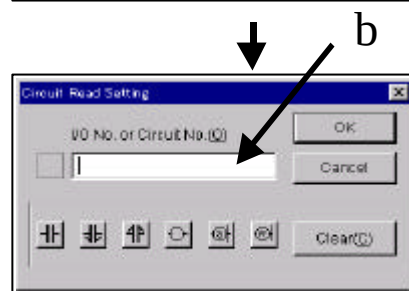
3.5 Read

Execute the read of the specified circuit No., the specified symbol by the icon of  at the tool bar, or by the circuit read dialog box which is displayed by selecting **[Read]** in **[Edit]** menu.

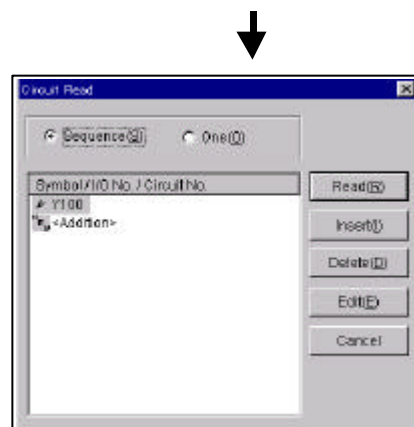
- (a) Click [Insert] to display the circuit read dialog box.



- (b) Input a symbol, I/O No., or Circuit No. and click OK to return to the circuit read dialog box.



- (c) In the dialog box of Circuit Read, choose [Sequence] or [One] and click [Read], then it displays the circuit which was set by 2).



(Caution)

“Single circuit read” displays the next line of the circuit which a cursor exists. As a result of that the circuit No. does not becomes continued No.. It can not execute the program edit when the circuit No. is not continuous in Ladder Editor for Windows® 95/98.

When editing after executed “Single circuit read”, read the optional circuit and start editing.

3.6 Comment Edit

No.	Comment name	Input word number	Description
1	User symbol	6 words	Editing a user symbol and I/O comment based on I/O No..
	I/O comment	32 words	
2	Box comment	32 words	Editing a box comment based on No. of BOXC(FUN254).
3	Memo comment	64 words	Editing a memo comment based on No. of MEMC(FUN255). 16th line can be input.
4	Circuit comment	16 words	Editing a circuit comment based on the circuit No..

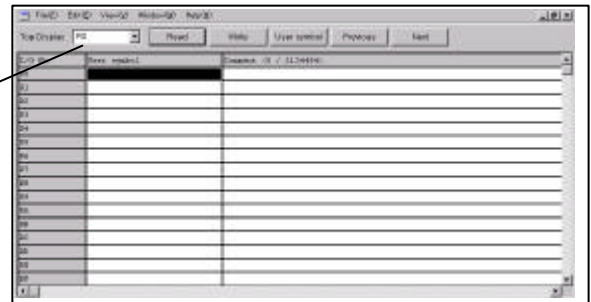
Describe with the example of the input of I/O comment, and other comment use same operation except it input the No. of each comment instead of I/O No..

(1) Display of I/O Comment Window

When choosing **[I/O Comment]** in **[Window]**, it displays I/O comment window.

(2) Top I/O No. Input

Input the top I/O No. of input comment in the top display box, and press Enter key or click the **[Read]** button.



(3) Comment Input

Input the comment by clicking the user symbol or the box of comment.

You can input the comment only with the keyboard by pressing the Enter key after selecting the comment with the cursor.

(4) Comment Write

Write in PC memory by clicking the **[Write]** button.

(5) Save of Comment file

Save the input comment file by clicking  icon, or **[Save]** in the **[File]** menu.

3.7 Circuit Monitor

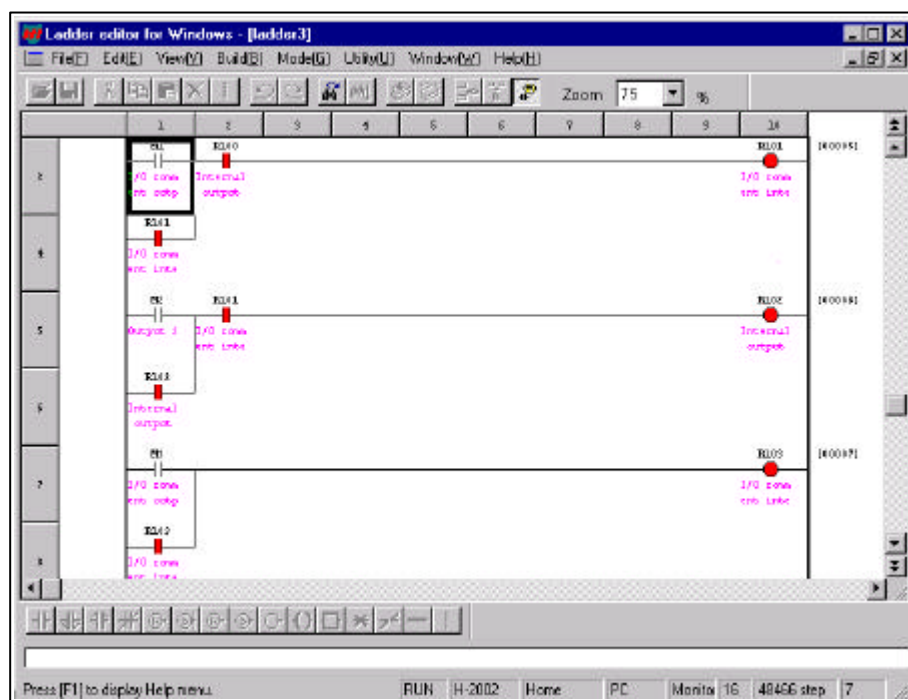
Execute the monitoring of the contact point of Ladder circuit, the coil, etc..

Choose [Monitor] from [Mode] with online mode or On-direct mode. It displays the circuit monitor window after executing the program match check, and start monitoring simultaneously.

If executing the monitor with unmatched condition, the monitoring display is not guaranteed.

The mode display of status bar becomes “Monitor” from “Edit”.

Change the CPU switch to “RUN” and operate the CPU.



CPU condition of Status bar becomes “RUN” from “STOP”.

It becomes “Monitor” from “Edit”.

In the monitor mode, it capture and display the monitor value of each I/O by selecting a symbol (include a processing box).

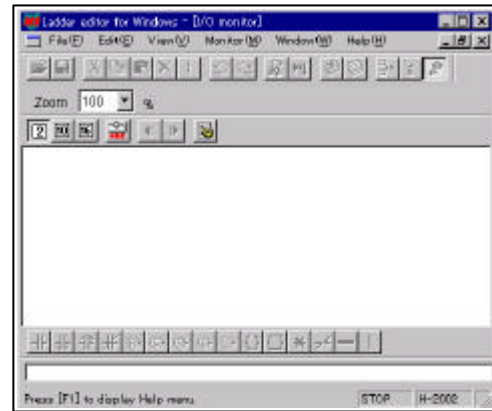
But, in the condition of the capture display, several key operation such as Alt key, short cut key can not be executed. Move the mouse cursor once to release the capture display and operate again.

3.8 I/O Monitor

It monitoring ON/OFF state and the word data of the specified I/O No.. It is possible to use with the circuit monitor simultaneously.

(1) The I/O monitor window

It displays the I/O monitor window by choosing [I/O Monitor] from the [Window] menu in a circuit monitoring.



	: Binary	It displays the monitor data by the binary. (*)
	: Decimal	It displays the monitor data by the decimal. (*)
	: Hexadecimal	It display the monitor data by the hexadecimal. (*)
	: Comment display mode switch	It specifies Display or Hide of the I/O comment of the specified I/O No..
	: Previous I/O	It changes I/O No. specified by a mouse cursor to the previous one. Several No. can be selected.
	: Next I/O	It changes I/O No. specified by a mouse cursor to the next one. Several No. can be selected.
	: I/O monitor setting	It displays the setting dialog for the input of top I/O No. to monitor, and the selection of 1 or 16 points display.

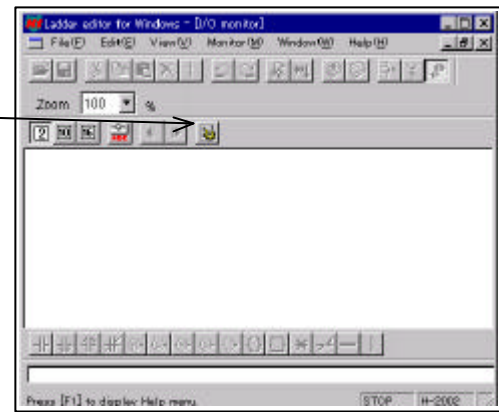
(*) When you choose the binary/decimal/hexadecimal, the monitor data display of the circuit monitor will be changed at the same period. But when you choose the binary display, the circuit monitor will be the hexadecimal display.

The display can be changed by the keyboard operation of (Ctrl) + (H).

(2) Input of I/O No.

Click the  icon at the I/O monitor window.
Display the I/O monitor setting dialog box.

Input the top I/O No. at the I/O monitor setting dialog box, and click [OK].



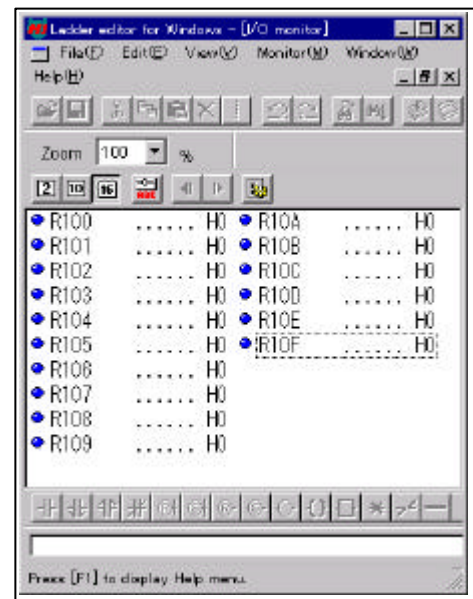
16 points or 1 point can be chosen.



(3) Monitor Start

When I/O No. has already specified, it starts monitoring when the I/O monitor window opens.

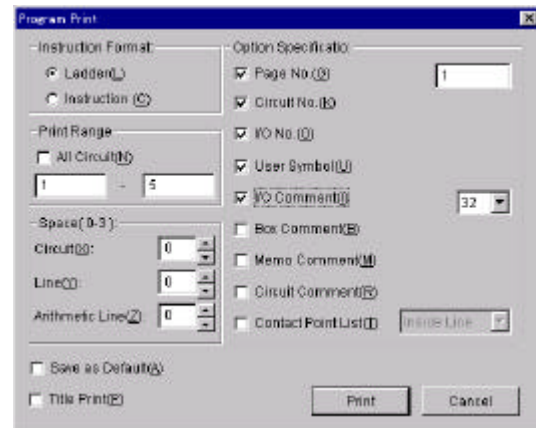
When I/O No. has not specified yet, it start monitoring when I/O No. is specified.



3.9 Print of Program

Input a program to the specified printer after specifying the comment, the contact point list, the line space, and the print range, etc..

It displays the dialog box of the print setting by choosing **[Program]** from **[Print]** in the **[Utility]** menu.



Instruction format	Check the print format, Ladder or the instruction word.
Print range	When printing all circuit, check all circuit. When printing the specified circuit, take off a check from all circuit and input the specified circuit No..
Circuit	Set the blank line No. (0 - 3) which insert between circuits.
Line	Set the blank line No. (0 - 3) which insert between the Ladder symbols.
Arithmetic line	Set the blank line No. (0 - 3) which insert between the arithmetic instructions.
Page No.	Make a check if printing a page No. and input the page No. of the top page.
Circuit No.	Make a check if printing a circuit No..
I/O No. User symbol	Choose I/O No. or a user symbol to print. One of which must be selected. Both can be selected.
I/O comment	Choose whether print the I/O comment or not. When make a check, choose the input word No. from 32 or 16.
Box comment	Choose whether print the box comment or not.
Memo comment	Choose whether print the memo comment or not.
Circuit comment	Choose whether print the circuit comment or not.
Contact point list	Choose whether print the contact point list and the coil list. When making a check, choose whether print the contact point list inside a bus or outside a bus.

After setting the options indicated above, click **[Print]** to output the program to the print which was set in **[Printer Set]** in the **[Utility]** menu.

Chapter 4 Edit

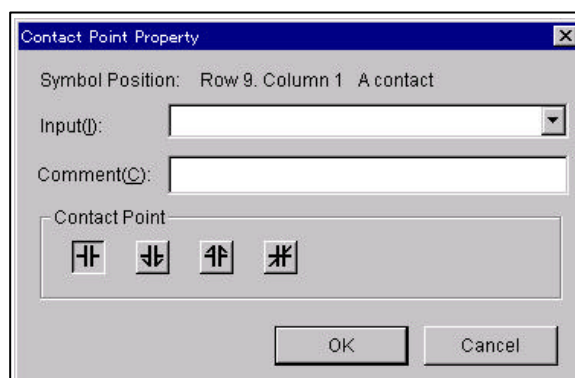
4. 1 Input of Symbol

4.1.1 Outline of Operation

(1) Input of Contact Point I/O No.

When clicking the contact point icon at the symbol bar, the dialog box of Contact Point Property is displayed .

Input I/O No. directly to [Input], or click  at the left side of input box to display the input possible I/O type by the pull down menu, then input No. after selecting I/O type.

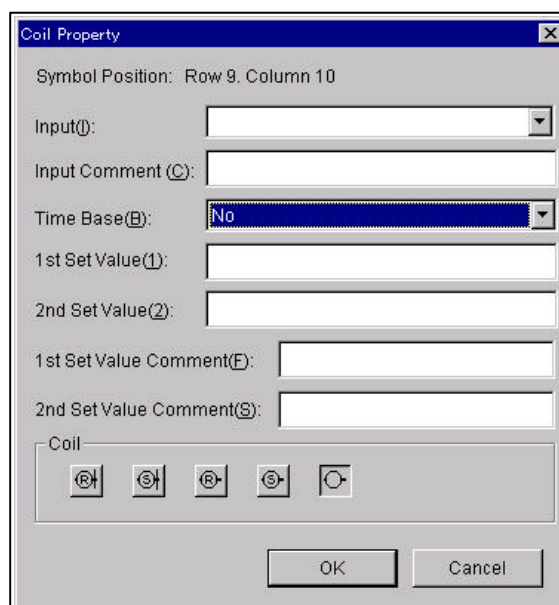


< Dialog box of Contact point property >

(2) Input of Coil I/O No.

When clicking the coil icon at the symbol bar, the dialog box of Coil Property is displayed.

Input I/O No. directly to [Input], or click  at the left side of input box to display the input possible I/O type by the pull down menu, then input No. after selecting I/O type.

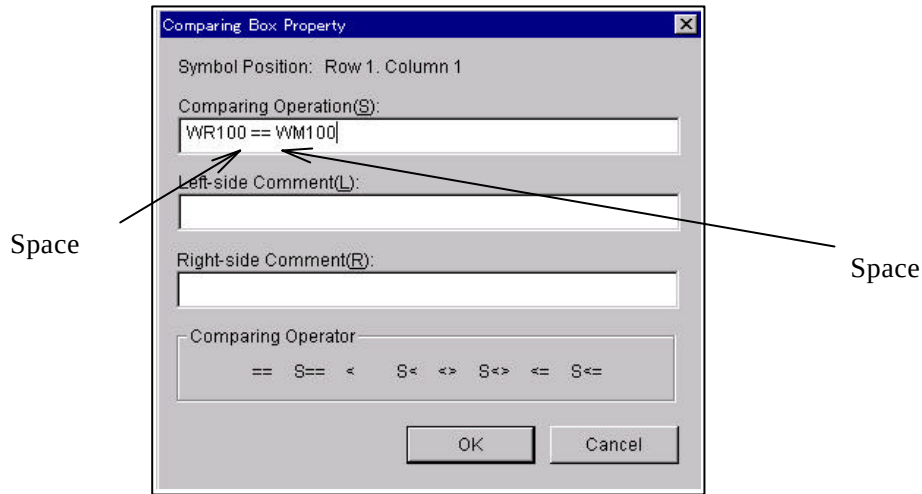


< Dialog box of Coil Property >

(3) I/O No. Input of Comparing Box

When clicking Comparing box icon at the symbol bar, the dialog box of Comparing Box Property is displayed.

Input the comparing expression to [Comparing Expression] directly.



< Dialog box of Comparing Box Property >

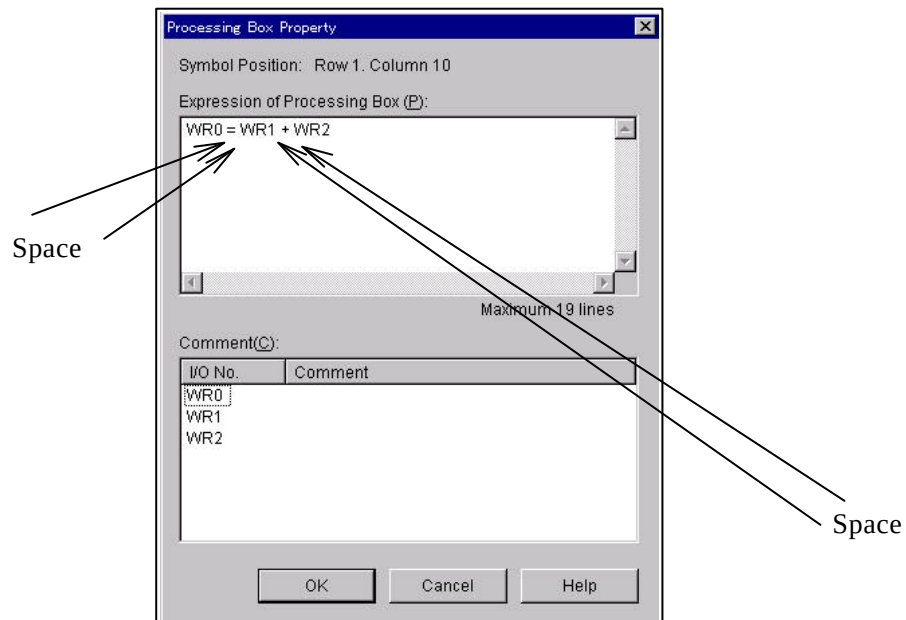
Input the space between I/O No. and the comparing operator, otherwise it becomes the “Ladder Error” when writing.

There is no pull down menu of I/O type.

(4) I/O No. Input of Processing Box

When clicking the processing box icon at the symbol bar, the dialog box of Processing Box Property is displayed.

Input the operation expression directly in [Processing Box Expression].



< Dialog box of Processing Box Property >

Input the space between I/O No. and the operator, otherwise it becomes the “Ladder Error” when writing.

There is no pull down menu of I/O type.

Additional Information

(a) Keyboard Input

A symbol can be input from a keyboard. The key input setting of symbol is displayed by choosing **[Keyboard]** from the **[Utility]** menu.

(b) Cursor movement of Each property of Dialog box input item

Each item can be input by clicking the input item with a mouse. Or, it move to the next input item and a button by Tab key.

(c) About the comment

The input comment becomes the comment of its I/O No..

When inserting a comment newly from a property dialog box, or loading and changing the existent I/O comment, it reflect to the window of **[I/O Comment]** in the **[Window]** menu.

Choose **[I/O Comment]** in the **[Window]** menu and execute **[Save]** in the **[File]** menu in the I/O comment window for the save of input/changed comment .

(d) Modification of Symbol

Set the mouse cursor on the symbol and double click, or set the circuit cursor on the symbol and press Enter key. The property dialog box of symbol is displayed, so change the contents and click [OK] or press Enter key.

(e) Deletion of Symbol

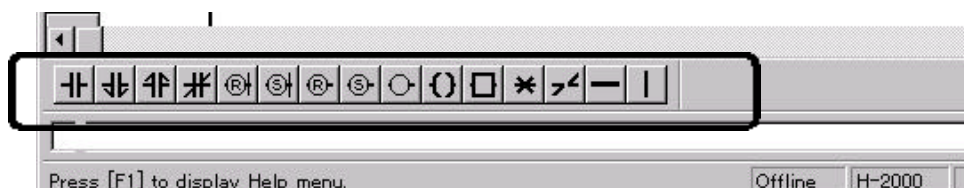
Move the cursor to the comparing box and press Delete key or choose **[Delete]** in the **[Edit]** menu, or press  at the tool bar.

Please refer to “Appendix 5: Hints for Programming” about the possible symbol number in one circuit.

4.1.2 Input of Contact Point

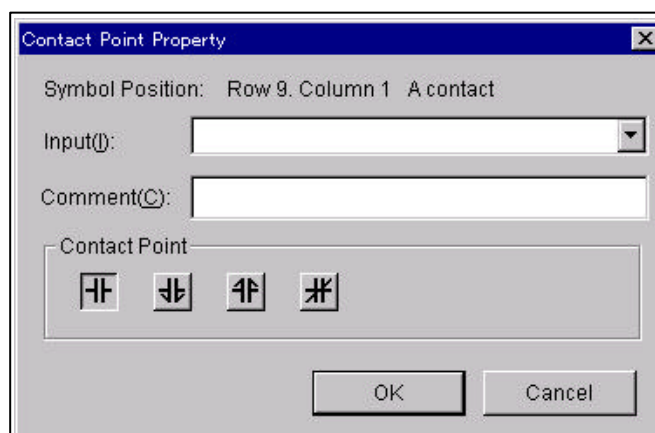
The contact point symbol has the following types.

Symbol	Function	Key input (Default)
	A contact point	Shift + A
	DFN (Rising)	Shift + D
	DIF (Dropping)	Shift + U
	Loop back	Shift + L
	B contact point	Shift + B



< Symbol bar >

Move the cursor to the position to input, and click the contact point icon at the symbol bar.



< Dialog box of Contact Point Property >

- [Symbol Position] It displays the present position of the circuit cursor.
- [Input] Input the I/O No..
- [Comment] It displays the I/O comment. The input/edit can be performed.
- [Contact Point] It displays the selected contact point. (A button is pressed state)

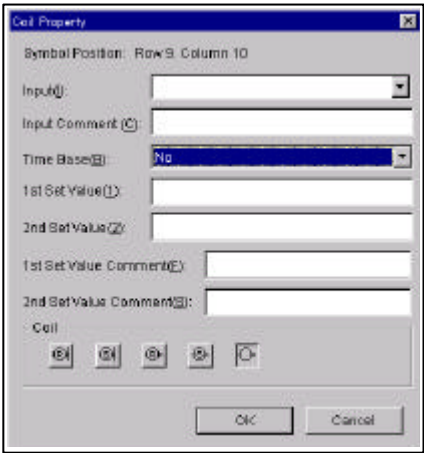
Click the [OK] button after executing necessity input such as I/O No.. It becomes the wait condition for the next symbol. If doing with the key operation, press Enter key, or use Tab key to make the [OK] button active and press Enter key.

4.1.3 Input of Coil

The Coil symbol has the following types.

Symbol	Function	Key input (Default)
	R,L,M,Y, Timer counter	Shift + C
	Reset of Master control	Ctrl + Shift + R
	Set of Master control	Ctrl + Shift + S
	Reset of R,L,M,Y	Shift + R
	Set of R,L,M,Y	Shift + S
	Loop back symbol	Shift + L

Move the cursor to the position to input and click the coil icon at the symbol bar.



< Dialog box of Coil Property >

- [Symbol Position]

[Input]

[Comment]

[Time Base]

[1st Set value]

[2nd Set Value]

[Comment of 1st Set Value]

[Comment of 2nd Set Value]

[Coil]
- It displays the present position of circuit cursor.

Input the I/O No..

It displays the I/O comment. The input/edit can be performed.

Choose from the pull down menu displayed by pressing  at the right side.

Or, 1S is set when input “1” from the keyboard. Or, each time “0” is input, it set 0.01S and 0.1S alternately.

Input the set value from 0 to 65535.

It can be input when the set value is I/O No..

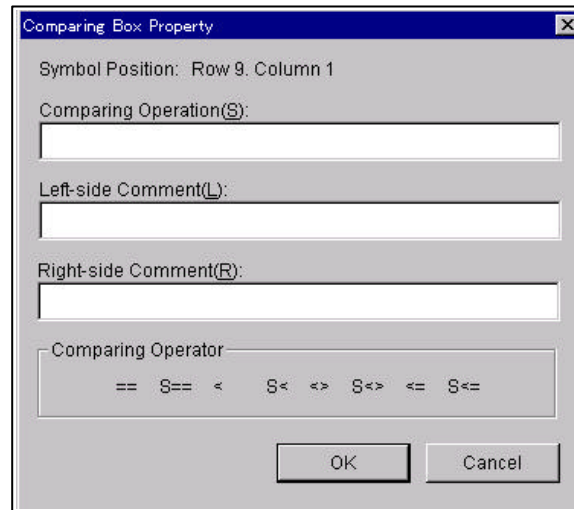
It displays the coil symbol which is now selected. A button becomes pressed state.

Click the [OK] button after executing necessity input such as I/O No.. It becomes the wait condition for the next symbol. If doing with the key operation, press Enter key, or use Tab key to make the [OK] button active and press Enter key.

4.1.4 Input of Comparing Box

Symbol	Function	Key input (Default)
	Comparing Box	Shift + M

Click the icon of Comparing box at the symbol bar.



< Dialog box of Comparing Box Property >

[Symbol Position]	It displays the present position of the circuit cursor.
[Comparing Expression]	Input the comparing expression.
[Comment on left]	It displays the I/O comment for both side of the comparing expression. The input/edit can be performed.
[Comment on right]	It displays the I/O comment for both side of the comparing expression. The input/edit can be performed.

Input the alphabet and the number directly to [Comparing Expression].

Input the space between I/O No. and the comparing operator, otherwise it becomes the “Ladder Error” when writing.

Ex.) WR1_=_WR2 (Input in half scale, _is a space)

The comparing operator are the displayed 8 types.

- Input of Hexadecimal

Add “H” at the top to input the hexadecimal.

Ex.) Input “1B” in the hexadecimal

=> Input as “H” “1” “B”.

Click the [OK] button after executing necessity input such as I/O No.. It becomes the wait condition for the next symbol. If doing with the key operation, press Enter key, or use Tab key to make the [OK] button active and press Enter key.

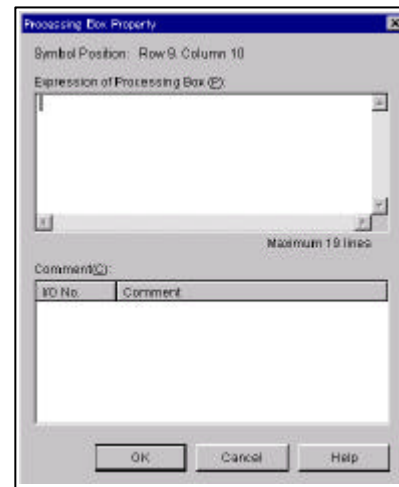
4.1.5 Input of Processing Box

Symbol	Function	Key input (Default)
	Processing Box	Shift + P

Click the icon of Processing box at the symbol bar.

After completing the input, click the [OK] button, or choose the [OK] button by the Tab key and press Enter key.

The maximum 19 lines of instruction or expression can be input in the one processing box.



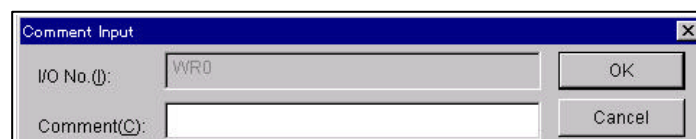
< Dialog box of Processing Box Property >

- [Symbol Position] It displays the present position of the circuit cursor.
 - [Expression of Processing Box] Input the operation expression.
 - [Comment] It displays the I/O comment. The input/edit can be performed.
- The dialog box is displayed when clicking the I/O No. to edito.

To input [Expression of Processing Box],

- Input as the half scale alphabet and numbers
- Input directly
- Divide the command and the expression with Enter key.
- **Input the space between the operator and the parameter, otherwise it becomes the “Ladder Error” when writing.**

To input [Comment], double click the I/O No. which is displayed at [Comment]. Input or edit the comment, when [Comment Input] dialog box is displayed.



< Dialog box of Comment Input >

(Caution)

- However other dialog box can be closed by pressing Enter or Esc key, only the property of processing box need to press [OK] or [Cancel], or click the close box, or use Tab key to make [OK] or [Cancel] active and press Enter key.
- It is possible to input a comment simultaneously with the circuit renewal input, but when newly input the application instruction, it is possible to input a comment simultaneously by inputting as below.

Ex.) shl(wr108,1)->SHL_(_WR108_,1_) The under bar (_) is a space.

If input a comment without insert a space as shl (wr108,1), the comment edit can not be performed before writing because it executes the error check when writing.

4.1.6 Input the Symbol of Horizontal Line, Vertical Line, Not, Loop Back

Symbol	Function	Key input (Default)
	Input Horizontal line	Shift + H
	Input Not symbol	Shift + N

(1) Input of Horizontal line

Move the circuit cursor to the position to input, and click  at the symbol bar.

(2) Input of Not symbol

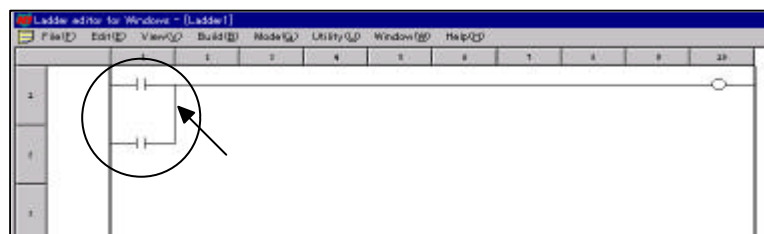
Move the circuit cursor to the position to input, and click  at the symbol bar.

(3) Input and deletion of Vertical line

(a) Input of Vertical line

Move the circuit cursor at the left lower position to input, and click  at the symbol bar.

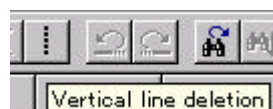
Symbol	Function	Key input (Default)
	Input Vertical line	Shift + V
	Delete Vertical line	Shift + Del



< Vertical line >

(b) Deletion of Vertical line

Move the circuit cursor at the left lower position to delete, and click  at the tool bar.

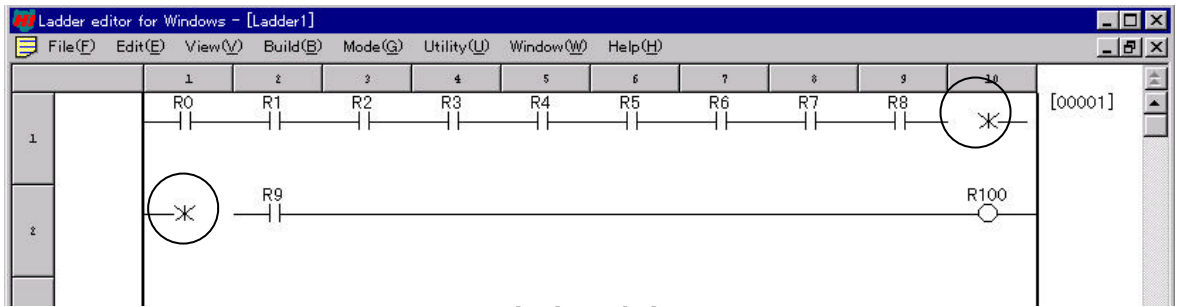


(4) Creation of Loop back circuit

It uses to input the circuit which over 9 contact points.

Symbol	Function	Key input • iDefault• j
	Loop back	Shift + L

Click the loop back icon at the symbol bar.



Input the loop back symbol at the coil position. Then, input the loop back symbol of the top.

(Caution)

- Can not create the circuit bellow.
- OR circuit exist after the loop back symbol.
- The operation box exist after the loop back symbol.

4.2 Circuit Write / Recover

(1) Circuit Write

It writes the input circuit to the program memory.

When inputting the circuit, write the circuit with the method indicated below.

(a) Choose **[Circuit Write]** in the **[Build]** menu.



< [Build] menu >

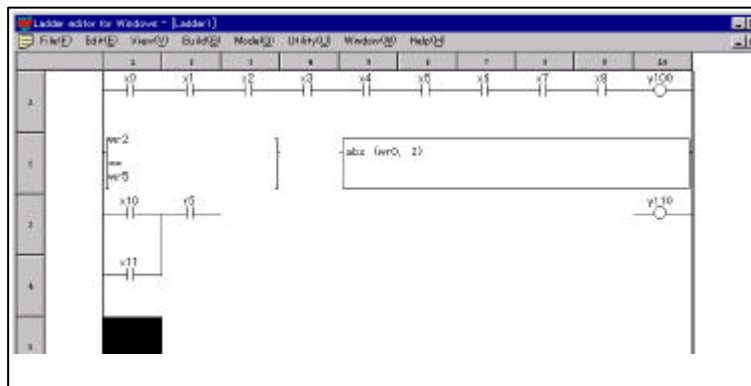
(b) Click [Circuit Write] icon  at the tool bar.



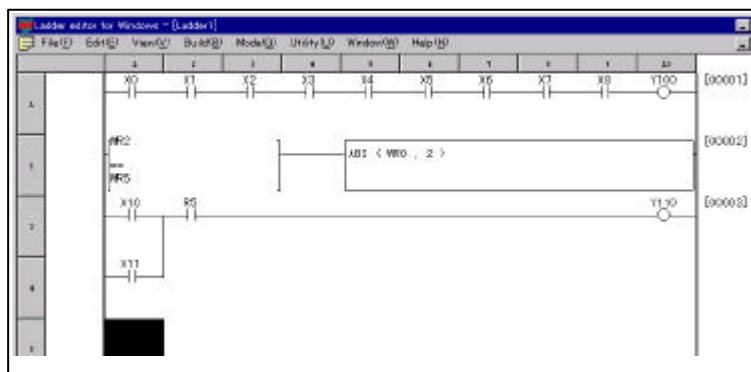
< [Circuit Write] icon >

(c) Choose [Circuit Write] in the right click menu.

• Before and After execution of Circuit Write



< Circuit before writing >



< Circuit after writing >

It connects between the coil and the contact point with the horizontal line by the auto connecting function.

It displays the circuit with the new circuit No..

The color of line changes by writing.

If there is an error input exist at the creation of the circuit, you can input but can not write. An error is displayed at the [Output] section. The cursor moves to the symbol which has an error. If an error exist many, the cursor moves the top symbol. In this case, modify the error according to the error display and writing again.

The cursor position after executing the circuit write will be the circuit which had the cursor before executing the writing.

Therefore, after editing the circuit, if move the cursor to other circuit and execute the circuit write, it displays other circuit at the top screen.

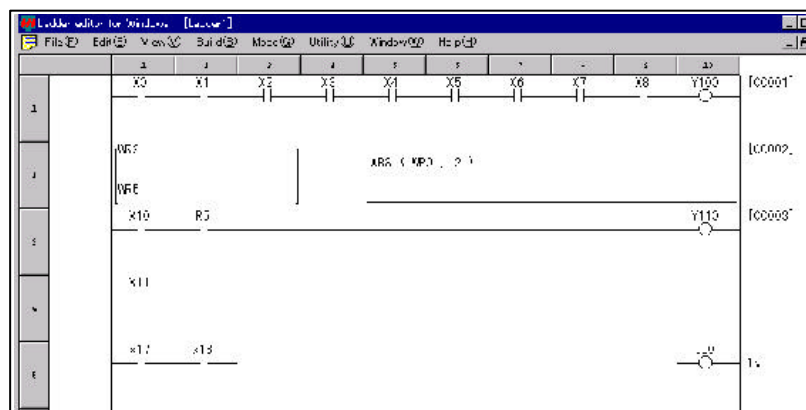
If it becomes [Step Over] error in writing, edit with the process indicated bellow .

- (a) Delete the step No. over and execute [Circuit Write].
 - (b) Edit the circuit (delete, modify, etc.) and execute [Circuit Write].
- (2) Recover

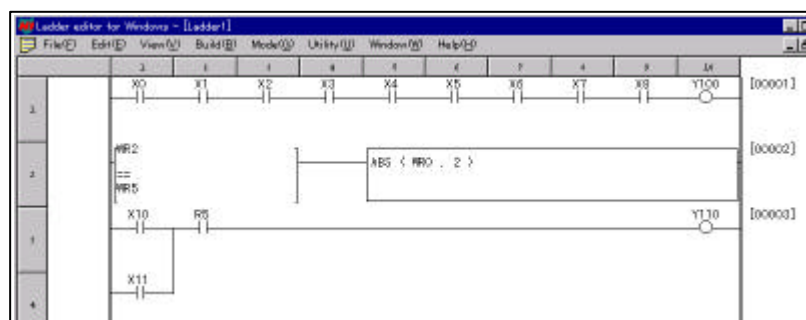
When executing [Recover] before executing [Circuit Write], it return to the condition immediately before editing (Immediately after the circuit write).

Also it return to the condition before editing, when choosing **[Recover]** in the **[Build]** menu,. Or click the [Recover] icon  at the tool bar.

- Before and After executing [Recover]



< Before executing [Recover] >

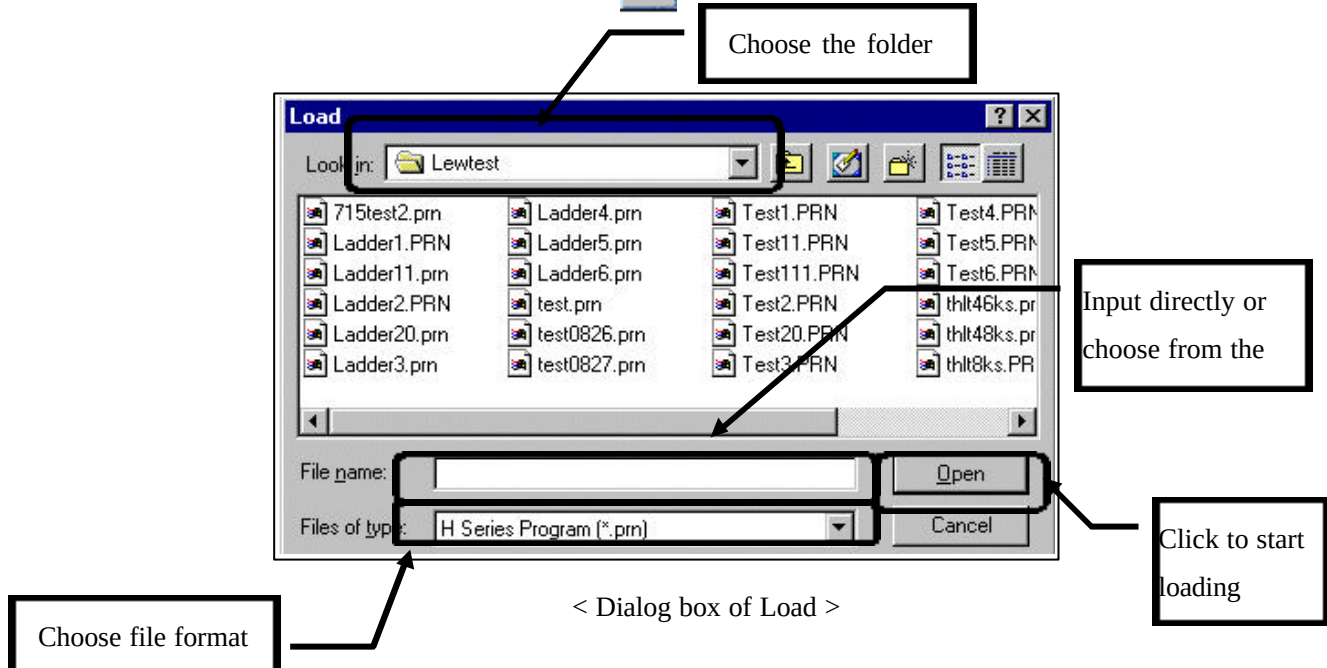


< After executing [Recover] >

4.3 File Save and Read

(1) Read

Choose **[Road]** in the **[File]** menu, or click  icon to open the [Road] dialog box.



[File Place] It displays the drive and the folder.

[File Name] Input the file name to load. Or click the file which is displayed. The extended code is not necessary to input.

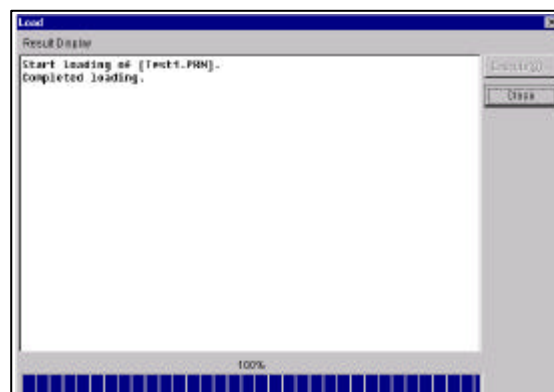
[File Type] It choose the file type. Click  at the right side to display the list of pull down, and choose form there.

[Open] Load the file.

[Cancel] Close the window.

It displays the dialog of the file load when start loading.

Confirm the result display and click the [Close] button.

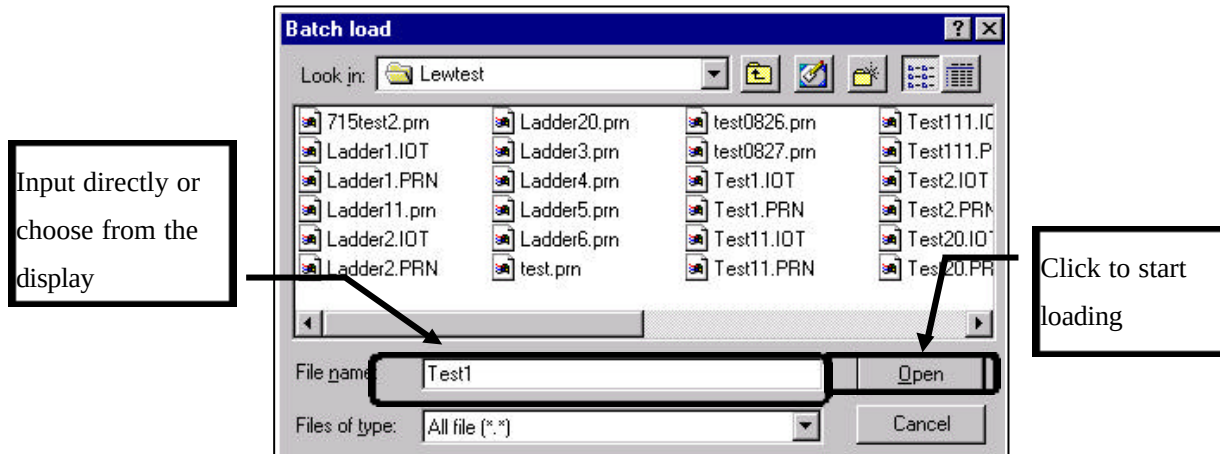


< Result display of File loading >

(2) Batch load

Choose **[Batch Load]** in the **[File]** menu.

Input the name to [File Name] or choose the file from the display, and click [OK] to load the file of H series program, I/O definition table, comment which has the same file name all together.



< Dialog box of Batch load >

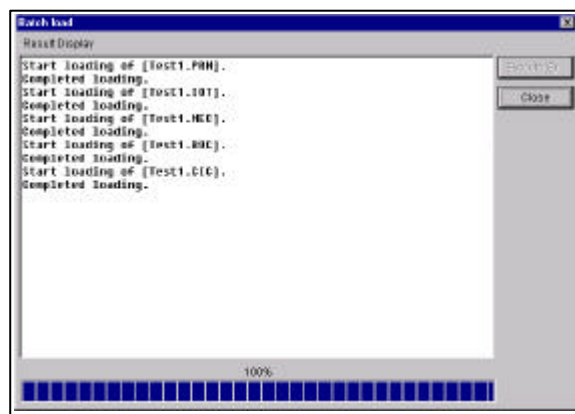
< Example >

In the case if the batch load file name is “test1”.

Input the name to [File Name]. It doesn't matter either input the name directly or click the displayed file.

Click the [Open] button after input (or choose) the file name.

No matter with the specification of extended code, it load all the files which has a name “test1”.



< Result display of Batch load >

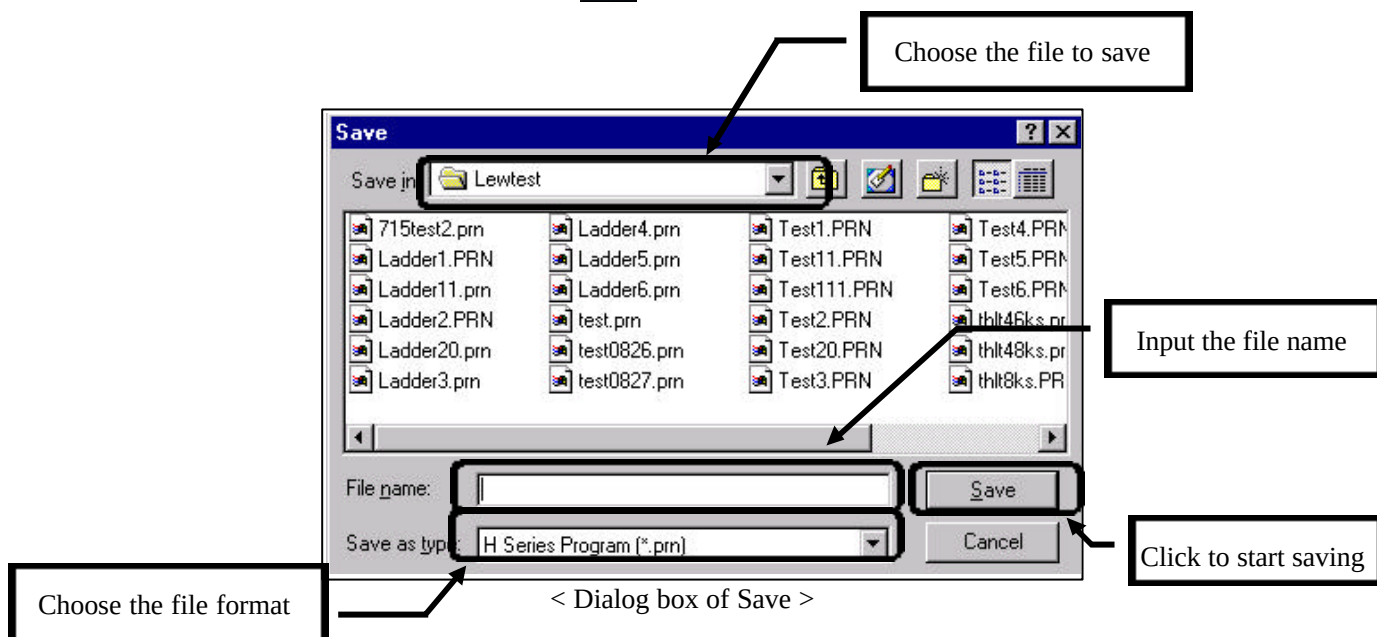
(Caution)

When executing the batch specification, next file becomes the out of the object.

- Source program Refer to Chapter 10, the source programming method.
- Comment file created by HILDR, HILDRL (.cmn).
- Trace file of TRAC software (.dat).

(3) Save

Choose **[Save]** in the **[File]** menu, or click  icon to open the [Save] dialog box.



[Save Place] It displays the drive and the folder to save. Choose to change the place.

[File Name] Input the file name directly, or click the file displayed. The extended code is not necessary to input.

If the extended code of file name and file type are different, it save prior to the extended code of file name.

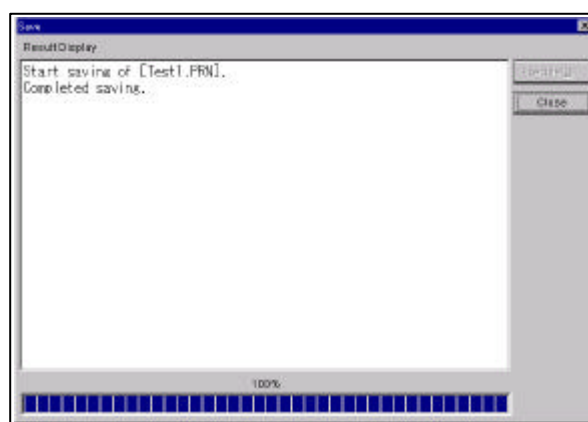
[File Type] Choose the file type. Choose from the pull down list displayed by clicking  at the right.

[Save] Save the file.

[Cancel] Close the window.

When start saving, it displays the Save dialog box.

Confirm the result display, and click the [Close] button.

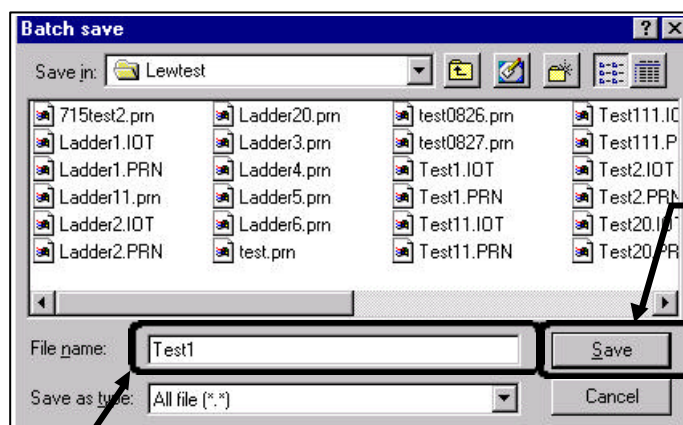


< Result display of Save >

(4) Batch Save

Choose **[Batch Save]** in the **[File]** menu.

When input the name of saving file to [File Name], it save the file of H series program, I/O comment on the PC memory all together.



Input the file name

< Folder choice dialog box of Batch save >

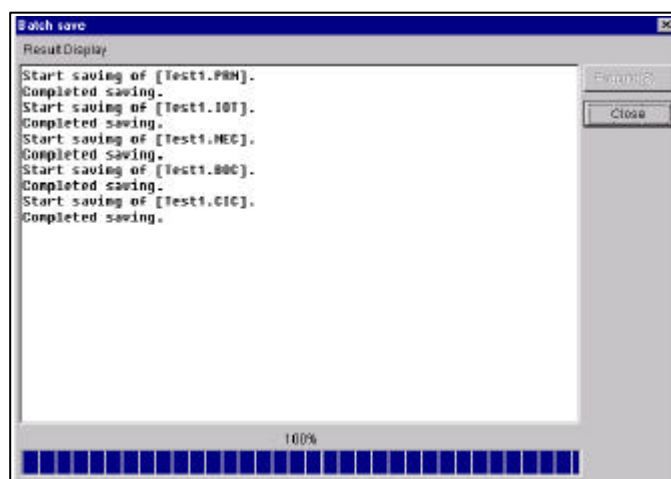
< Example >

In the case if the batch save file name is “test1”.

Input the file name directly, or click the file displayed. The extended code is not necessary to input.

Click [Save] after input the file name.

It save all the files which has a name “test1”

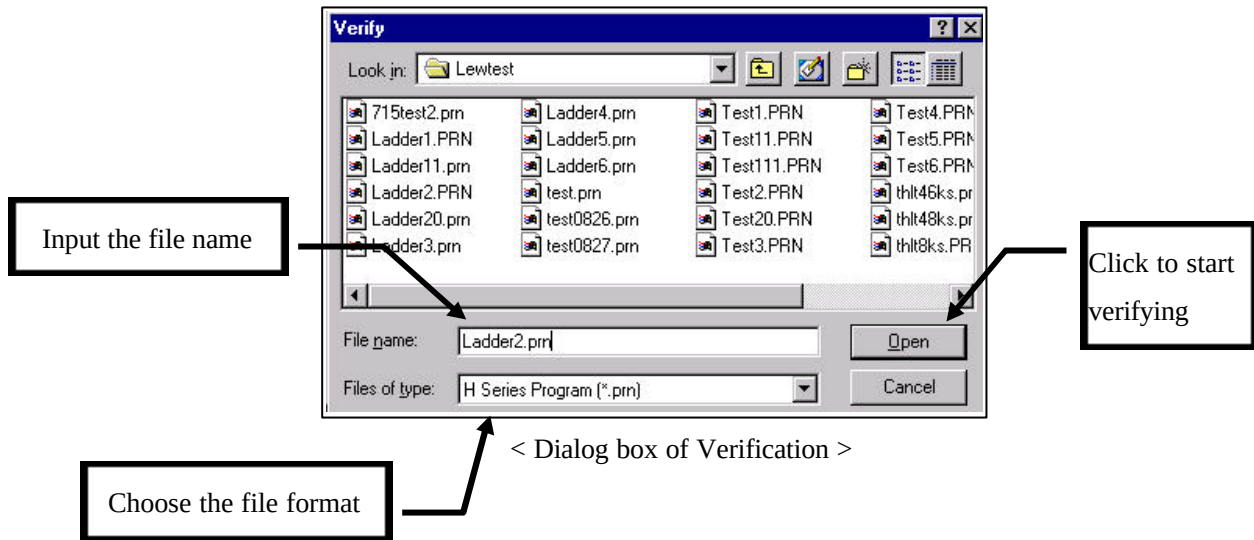


< Result display of Batch save >

(5) Verify

It verifies the programs on the PC memory and the disk.

Choose **[Verify]** in the **[File]** menu. It opens the **[Verify]** dialog box.



[File Place] It displays the drive and the folder. Choose to change the place.

[File Name] Input the file name directly, or click the file displayed.

The extended code is not necessary to input.

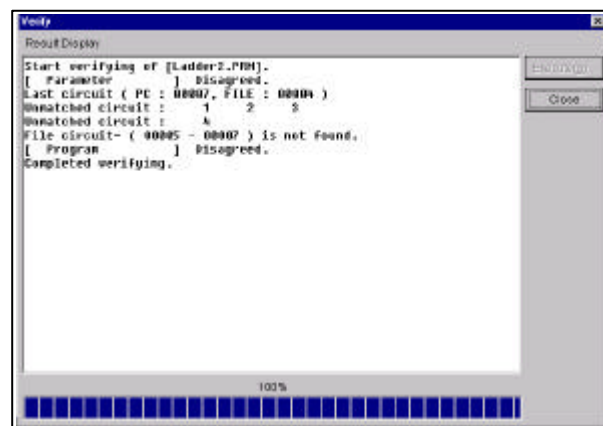
[File Type] Choose the file type. Click  to display the pull down list and choose from there.

[Open] Start to verify the program.

[Cancel] Close the dialog box to stop processing.

It displays the dialog box when starting the verification.

Confirm the result of verification, and click the **[Close]** button.

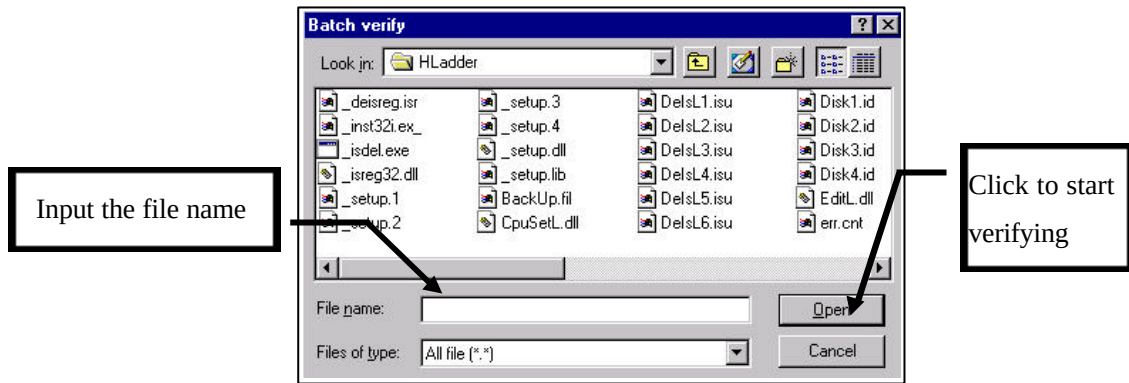


< Result display of Batch verification >

(6) Batch Verify

Choose **[Batch Verify]** in the **[File]** menu.

Input the file name to verify to [File Name], then verify the file of H series program and I/O comment on the PC memory and the file on the disk all together.



< Dialog box of Batch verify >

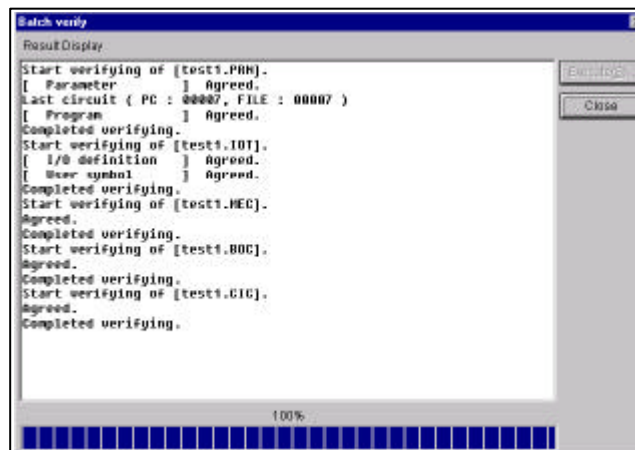
< Example >

In the case if the batch verify file is "test1".

Input the file name to verify without the extended code to [File Name].

Click the [Open] button after input the file name.

No matter with the type of file (extended code), it verify all the files which has a name "test1".



< Result display of Batch Verify >

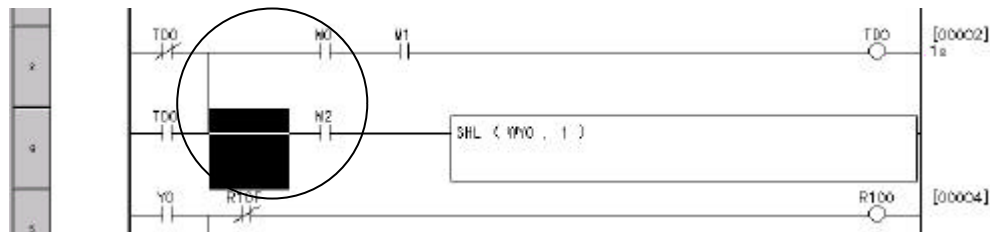
4.4 Circuit Edit

4.4.1 Modification of Symbol

It modifies the symbol, the command, and I/O No. in 1 circuit. Several numbers of circuits can be modified.

(1) Insertion of Column

Move a cursor to the position to insert a column, and choose **[Insert Column]** from the **[Edit]** menu.
A horizontal line extend from the cursor position to the right and create the empty column.



< [Insert Column] >

A column can be insert also by clicking the icon of
[Insert Column] at the tool bar.



(2) Insertion of Row

Move the cursor to the position to insert the row, and choose **[Insert Row]** in the **[Edit]** menu.
The vertical line extend from the cursor position to the bottom, and create the empty row.



< [Insert Row] >

A row can be inserted also by clicking the icon of
[Insert Row] at the tool bar.



(3) Deletion of Symbol

Move the cursor to the symbol to delete and delete with the method below.

Choose **[Cut]** in the **[Edit]** menu (Ctrl + X)

Choose **[Delete]** in the **[Edit]** menu (Delete key)

Press  at the tool bar.

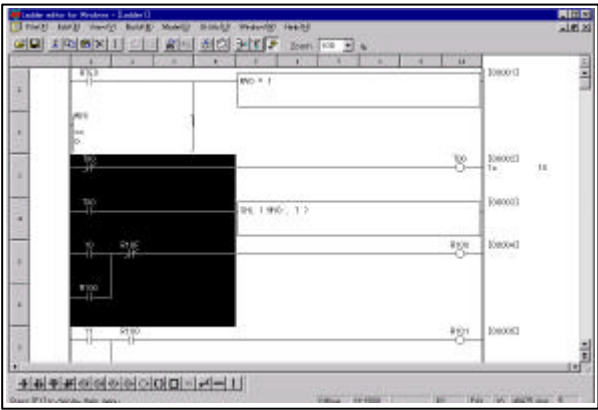
4.4.2 Cut & Paste

Execute specified (Cut / Paste).

Function	Icon	Menu	Keyboard
Cut		[Edit] - [Cut]	Ctrl + X
Copy		[Edit] - [Copy]	Ctrl + C
Paste		[Edit] - [Paste]	Ctrl + V

(1) Cut

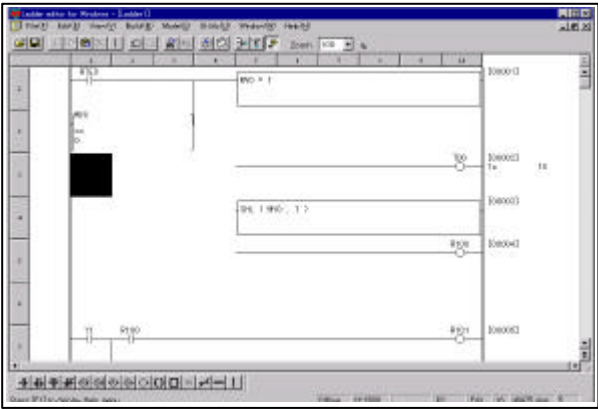
- Specify the range to cut off by the mouse dragging.
- By clicking the line No. at the left of the window, it can specify the circuit for 1 line.
- Choose [Cut] in the [Edit] menu.
- The specified range of circuit is cut off.



< Before execution of Cut >

(Caution)
When dragging from the position of the circuit cursor, it becomes not the specification of symbol but the movement of symbol.

The cut also can be performed by the [Cut] button on the tool bar, [Cut] of the right click menu, and Ctrl + X .



< After execution of Cut >

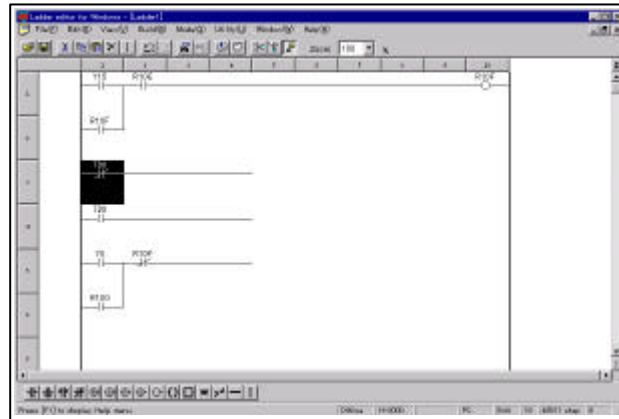
(2) Paste

Move the cursor to the place to paste the circuit.

Choose **[Paste]** in the **[Edit]** menu.

The cut circuit is pasted.

After pasting, it is written to the PC memory by executing [Circuit Writ].



< After execution of Paste >

(Caution)

When copying and pasting a circuit which includes **a processing box has the width of over 2 lines**, the message of “Not enough space” is displayed if the generation circuit is under the next condition.

In this case, make a space by using the function of Insert row and paste it.

1. A coil exist more than 2 line continuously .
2. A coil and a processing box exist continuously.
3. A width for a processing box to paste is smaller than a processing box.

(3) Copy

It specifies the range to copy by the mouse drag.

Choose **[Copy]** in the **[Edit]** menu (or [Copy] icon at the tool bar, [Copy] of the right click, Ctrl + C).

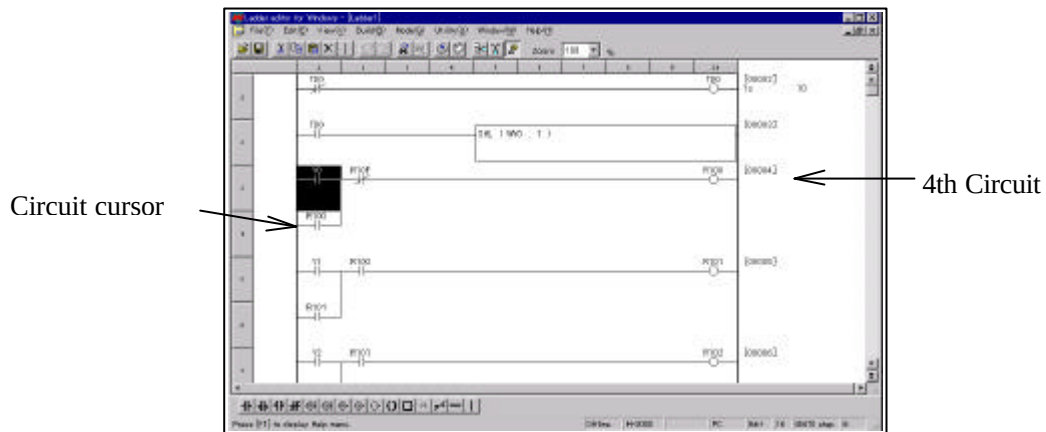
Paste operation is as same method as (2).

4.4.3 Insertion of Circuit

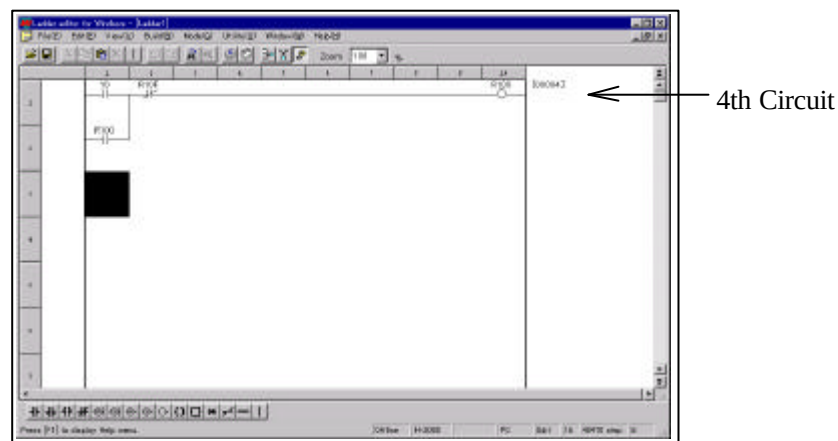
Insert the circuit.

- 1 Move the circuit cursor to the circuit to insert.
- 2 Choose **[Insert Circuit]** in the **[Edit]** menu. The circuit under the circuit cursor position becomes a blank.
- 3 Insert the circuit.
- 4 By executing **[Circuit Write]**, it add the circuit No. to the new circuit and written into the PC memory.

Outline of [Insert Circuit]

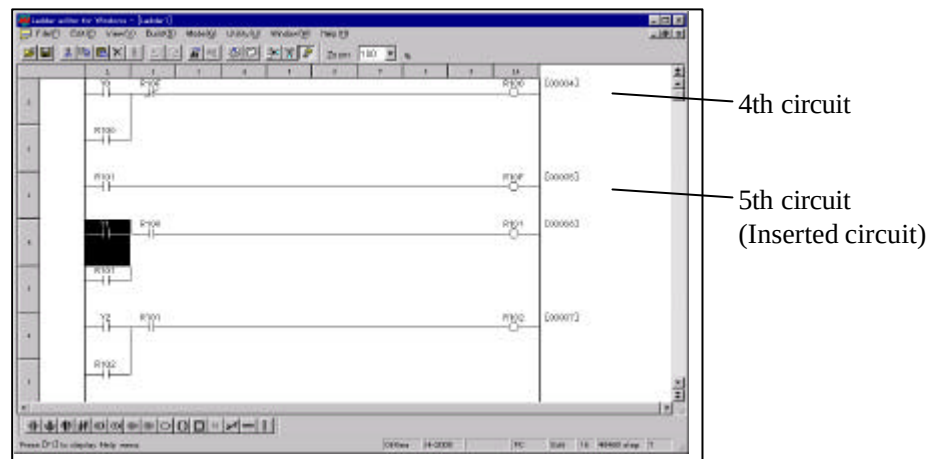


< Before execution of [Insert Circuit] >



< After execution of [Insert Circuit] >

The condition that the circuit under the circuit cursor position becomes the blank.



< After execution of [Circuit Write] >

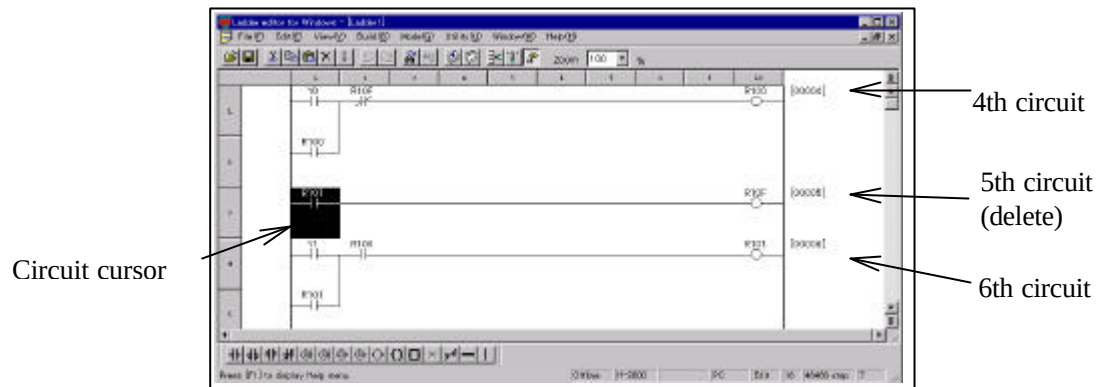
(Caution)

4.4.4 Deletion of Circuit

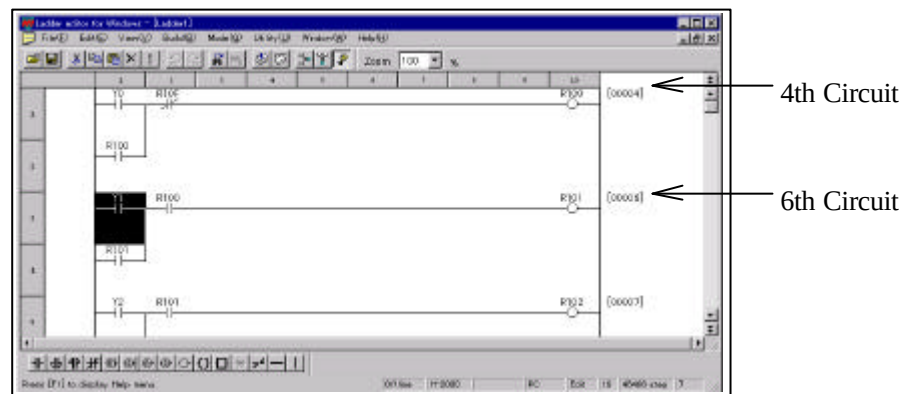
It deletes the circuit with the circuit unit.

- 1 Move the cursor to the circuit to delete.
- 2 Choose **[Delete Circuit]** in the **[Edit]** menu.
- 3 By executing **[Circuit Write]**, it becomes new circuit No. and written to the PC memory.

Outline of **[Delete Circuit]**

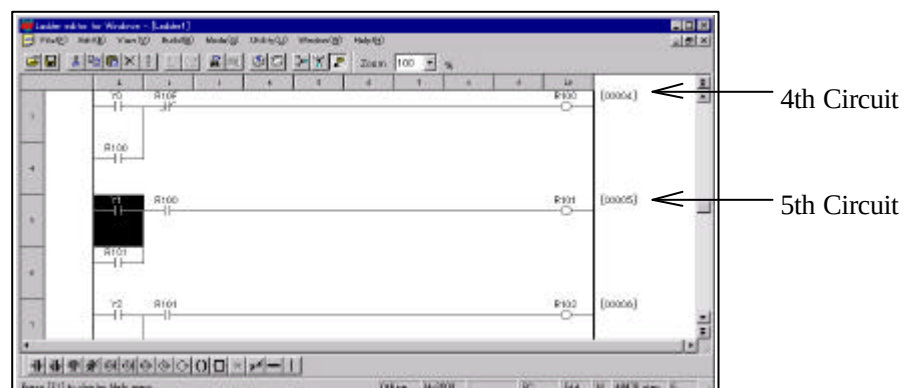


< Before execution of **[Delete Circuit]** >



< After execution of **[Delete Circuit]** >

The circuit is deleted from the screen, but it still remain on the PC memory , so the circuit NO. has not changed yet.

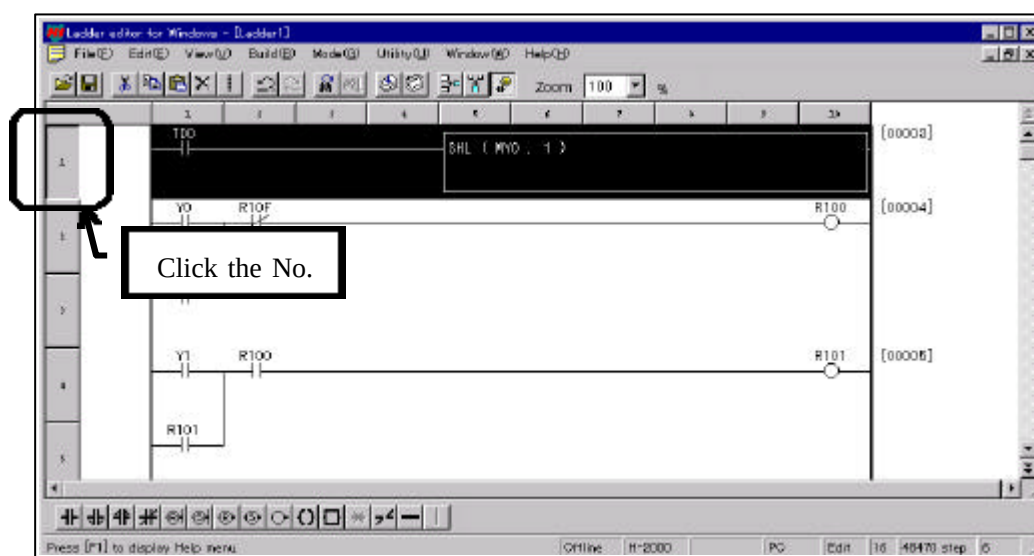


< After execution of **[Circuit Write]** >

The circuit is changed to the new circuit No..

- Delete Circuit by Row specification

The circuit can be deleted by the following method if it is the circuit of only 1 row with no OR circuit.



< Delete by Row selection >

Click the No. at the left of the window and make it the condition that 1 circuit is selected.

Choose [Delete], or press Delete key, or click  icon to delete the circuit in that condition.

After that, execute [Circuit Write].

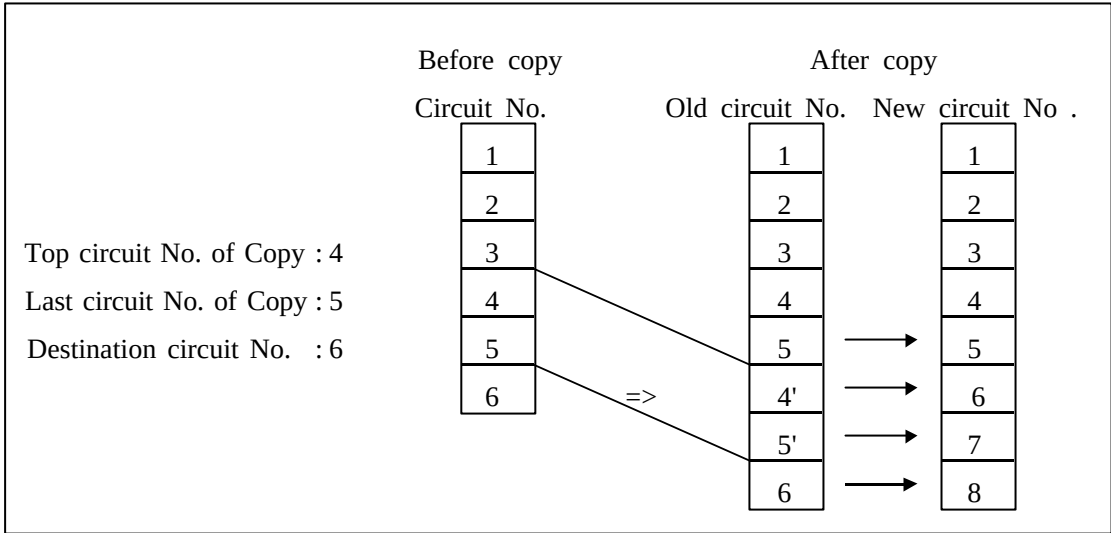
(Caution)

- The circuit can be deleted with the range of 256 lines.
- When select [Recover] before executing [Circuit Write], it return to the condition of before editing (immediately after Circuit Write at the last time).

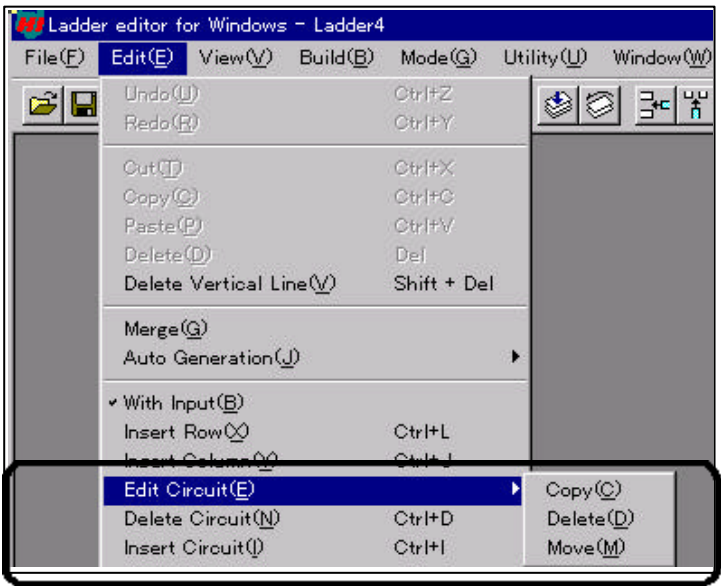
4.4.5 Circuit Edit - Copy

It copies the specified circuit with the circuit unit to the specified place. It is inserted into the circuit to specify the destination of copy, and the original copy circuit is not deleted.

< Example of Copy >



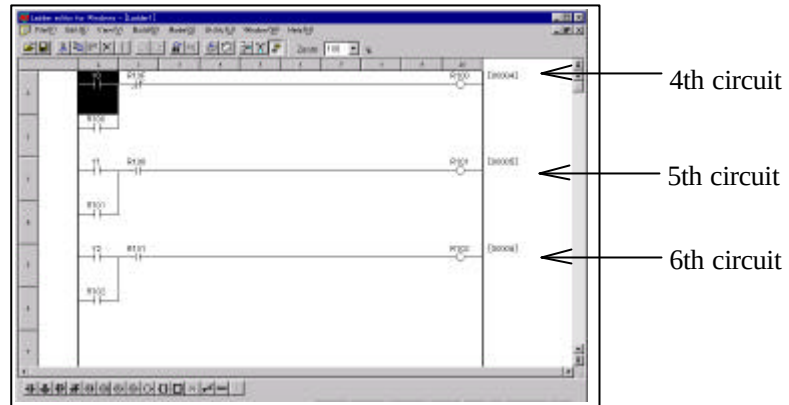
Choose **[Copy]** from **[Edit Circuit]** in the **[Edit]** menu.



< Item of Circuit edit menu >

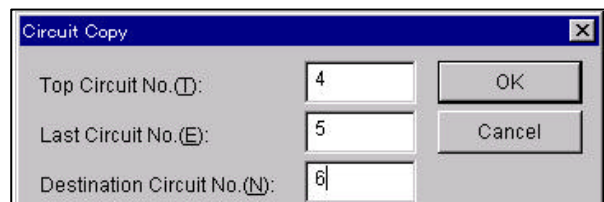
Sample of Operation

Copy the circuit No. 4, 5.



< Before execution of copy >

1. It displays Circuit Copy dialog box by choosing **[Copy]** from **[Edit Circuit]** in the **[Edit Menu]**.



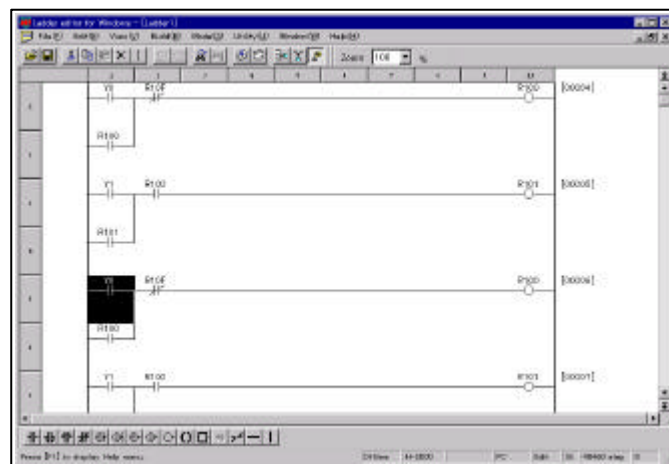
< Dialog box of Circuit Copy >

2. Input [Top circuit No.], [Last circuit No.] , and [Destination circuit No.].
3. It displays the confirmation message when press the [OK] button.

When press the [Cancel] button, it close the dialog box of Circuit Copy without executing the copy.

4. When press the [OK] button, it execute the copy.

When press the [Cancel] button, it close the dialog box.

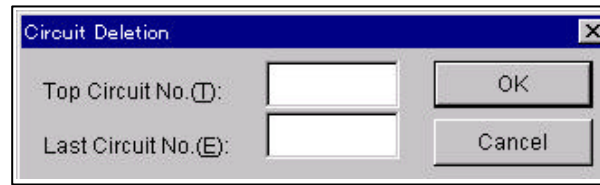


< After execution of copy >

4.4.6 Circuit Edit - Delete

It deletes the specified circuit with the circuit unit.

It displays the dialog box of Delete Circuit by choosing **[Delete]** from **[Edit Circuit]** in the **[Edit]** menu.



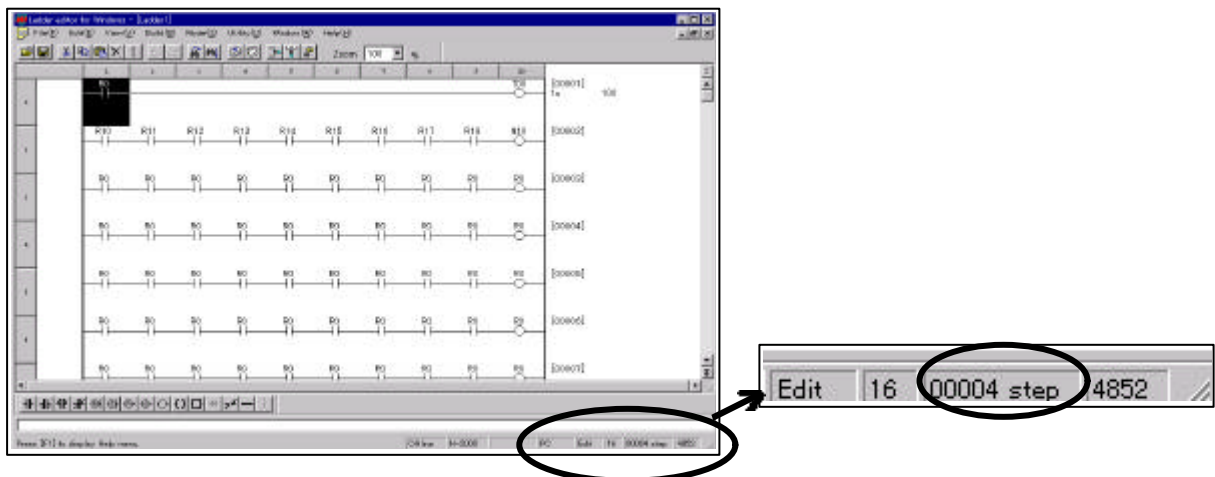
< Dialog box of Delete Circuit >

- | | |
|----------|--|
| [Top] | Specify the top circuit No. to delete. |
| [Last] | Specify the last circuit No. to delete. |
| [OK] | Execute the deletion. |
| [Cancel] | Close the dialog box without executing the deletion. |
- It returns to the edit possible condition.

(Caution)

When the remain step number step at the right edge of the status bar is smaller than the step number of the circuit to add, before adding the circuit, delete the unnecessary circuit and execute Circuit Write to make the empty step number.

(Example)



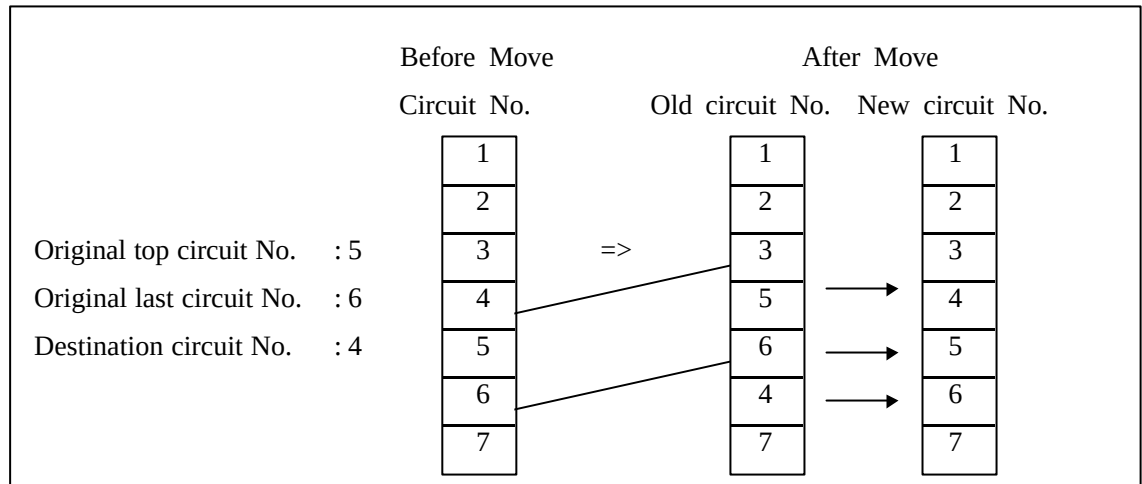
In the upper case, the remain step number are 4 steps

When adding more then 5 steps of circuits, delete the unnecessary circuit and execute Circuit Write before adding the circuit.

If add the circuit and execute Circuit Write without making the empty step, it displays "Lack of step No. Step No. ()" and can not write.

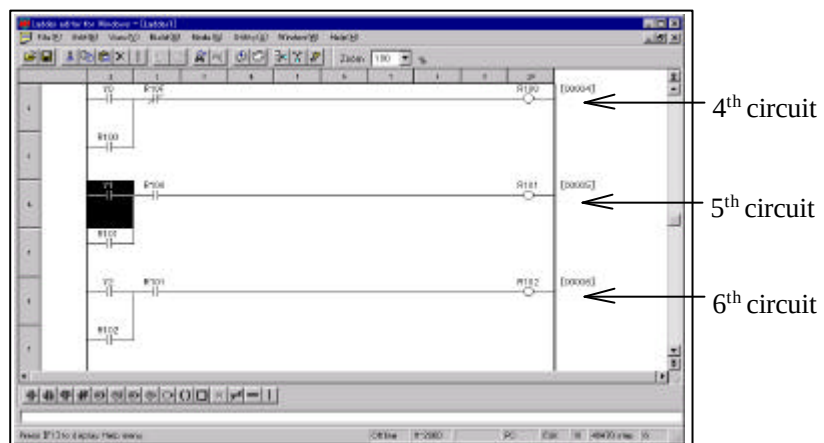
4.4.7 Circuit Edit - Move

It moves the specified circuit with the circuit unit to the specified place. The original circuit is deleted.
< Example of Move >



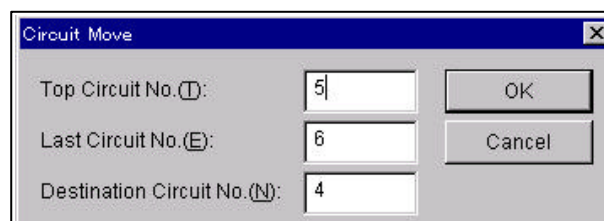
Sample of Operation

Move the circuit No. 5, 6 to the circuit No. 4.



< Before execution of Move >

1. It displays the dialog box of Circuit Move by choosing **[Move]** from **[Edit Circuit]** in the **[Edit]** menu.

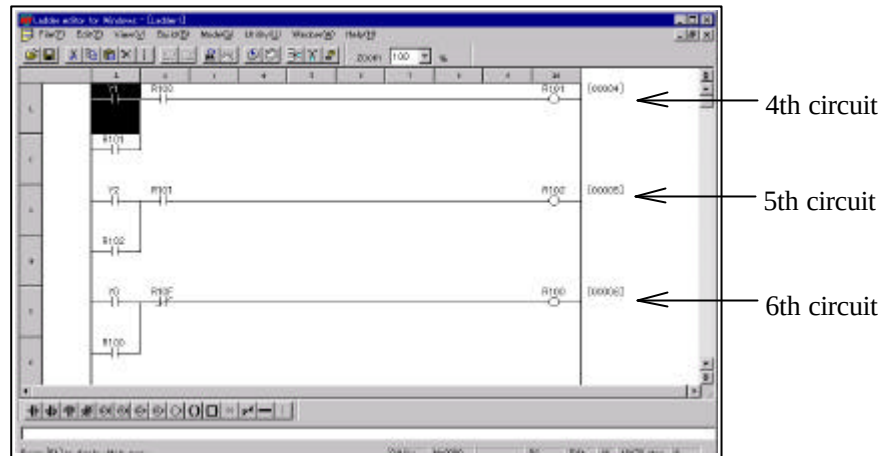


< Dialog box of Circuit Move >

2. Input [Top circuit No.], [Last circuit No.], and [Destination No.].
3. It displays the confirmation message when press the [OK] button.

When press the [Cancel] button, it closes the dialog box of Circuit Move without executing the movement.

4. Click the [OK] button to execute the movement.
Press the [Cancel] button to close the dialog box.



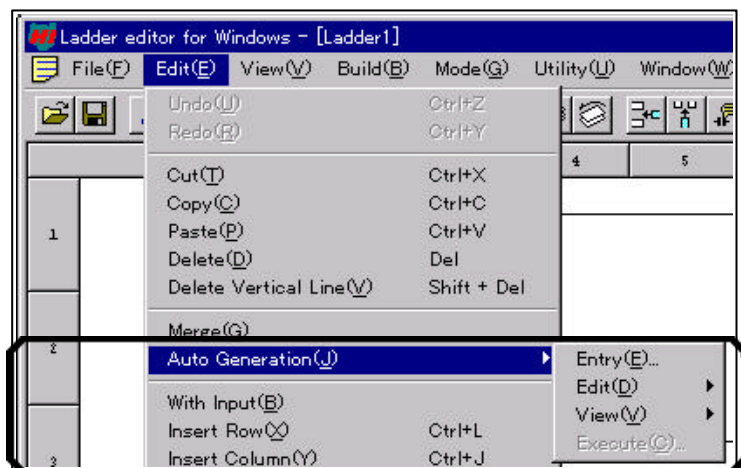
< After execution of Move >

4.4.8 Auto Generating

It creates the circuits which has the different I/O No..

It memorizes the continued circuits and renew the I/O No. and creates the continued another circuit.

Choose **[Auto Generation]** in the **[Edit]** menu.



< Item of Auto Generation menu >

[Entry] It memorizes the source circuit to execute Auto Generation.

[Edit] Input the renewal value of the memorized circuit I/O No..
[I/O Type] and [I/O No.] can be use for the setting methods.

[Display] It displays the registered circuit and the renewal value.

[Execute] To the circuit specified in the register, it executes the auto-renewal according to the renewal value set in [I/O Type], and [I/O No.].

(Caution)

- Even if the renewal value of I/O No. is set in [I/O Type], it make prior to the set of [I/O No.] when there is the set in [I/O No.].
- If the gross I/O No. used in the registered circuit is less than 100, the renewal value can be set in the each I/O No. (refer to Ex.1).

If the gross I/O No. is more than 101, set the renewal value by the I/O Type unit (refer to Ex.2).

(Ex.1)
Edit by
[I/O No.]

I/O No. used in the registered circuit	Renewal value	Description
X0	(+1)	X0 -> X1
X10	(+3)	X10 -> X13

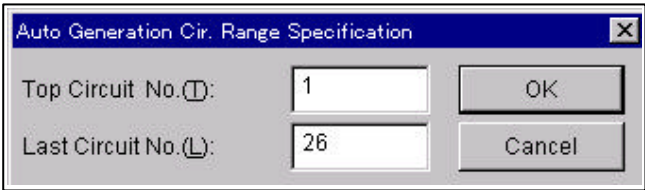
(Ex.2)
Edit by
[I/O Type]

X	(+2)	All type X increased by 2
Y	(+1)	All type Y increased by 1

- The register becomes invalid, when delete, insert, or modify the circuit which was set in the register.
- Can not execute Auto Generation while executing the circuit entry.

(1) Entry

It displays the dialog box of Auto Generation Circuit Range Specification by choosing [Entry] from [Auto Generation] in the [Edit] menu. Set the source of Auto Generation.



< Dialog box of Auto Generation Range Specification >

Set the range in [Top Circuit No.] and [Last Circuit No.].

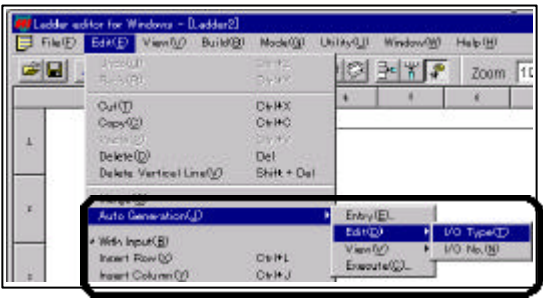
It displays "A" at the right of the registered circuit No.

(2) Edit

(a) Set by I/O Type

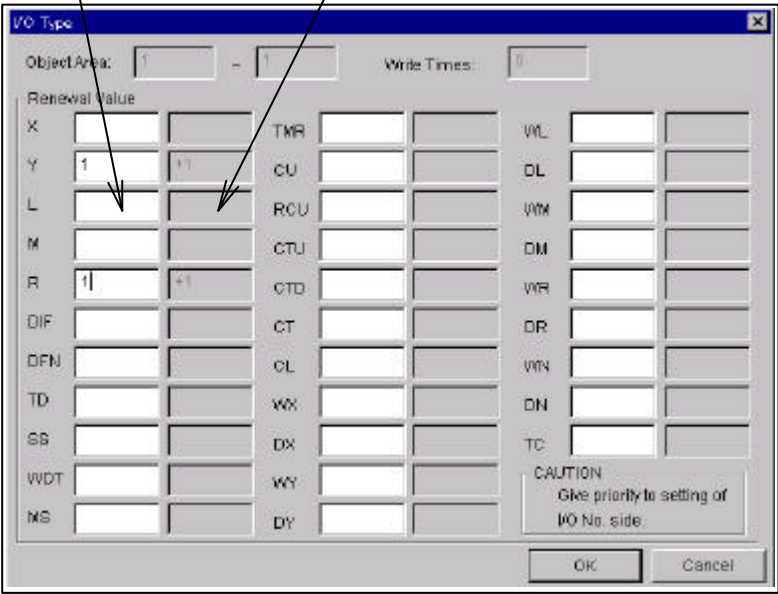
Choose [Edit] - [Auto Generation] - [Edit] -[I/O Type].

Set the renewal value by the I/O type unit.



Increase/decrease
input area

Increase/decrease
echo area



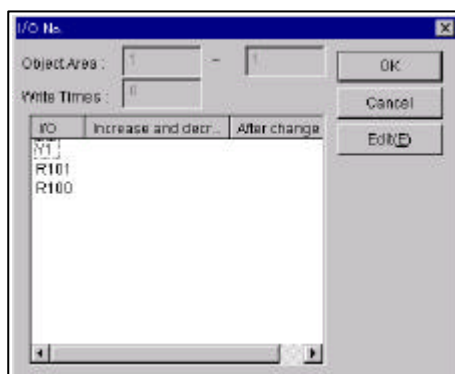
< Dialog box of I/O Type >

- [Renewal Value] Input a new value into the I/O type to set. The internal output can be input by the hexadecimal. But, in the case of the hexadecimal, input without adding "H". When input the increase/decrease input area, it displays the same value at the increase/decrease echo area.
- [OK] Set the renewal value.
- [Cancel] Stop to set and close the dialog box.

(b) Set by I/O No.

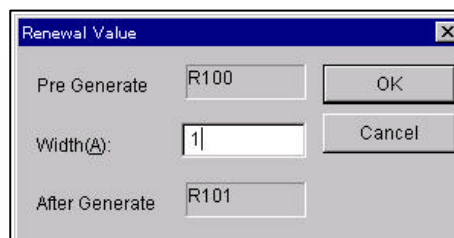
Choose [Edit] - [Auto Generation] - [Edit] - [I/O No.].

More than one of the new value can to each I/O No.



< Dialog box of I/O No. >

It displays the dialog box of the renewal value by double click the I/O No. to set the increase/decrease or press the [Edit] button.

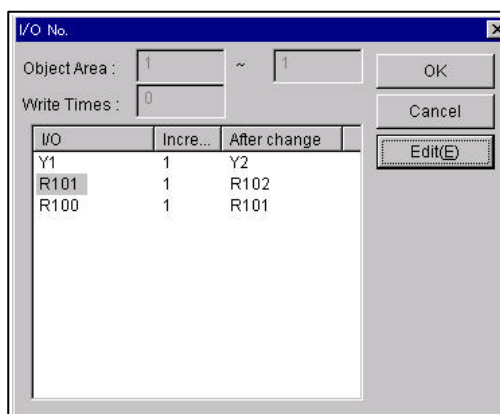


< Dialog box of Renewal Value >

When input the renewal value in [Width] for the I/O No. to set, it displays the I/O No. of after generating in [After Generation].

It sets the renewal value when press the [OK] button.

It resets the input when press the [Cancel] button.



It displays the input renewal value in the [Width].

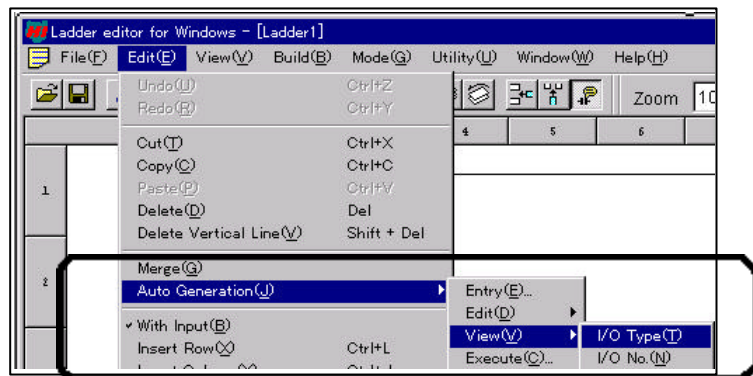
It displays the after execution of Auto Generation with the set of [Width] in [After].

(Caution)

Can not execute [Edit] if a circuit range for Auto Generation is not specified in [Entry].

(3) Display

It displays the [I/O Type] and [I/O No.] registered in [Edit] by choosing [View] from [Auto Generation] in the [Edit] menu.



< Item of Auto Generation menu >

It displays the dialog box of I/O type and I/O No. by choosing [I/O Type] and [I/O No.].

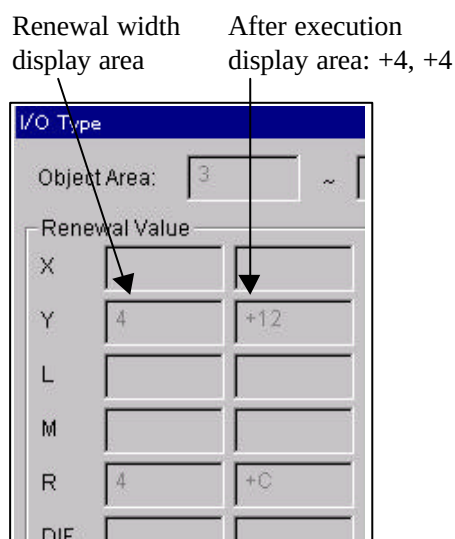
But, it returns to the edit screen mode without displaying anything, if there is no circuit has registered.

(a) Display by I/O Type

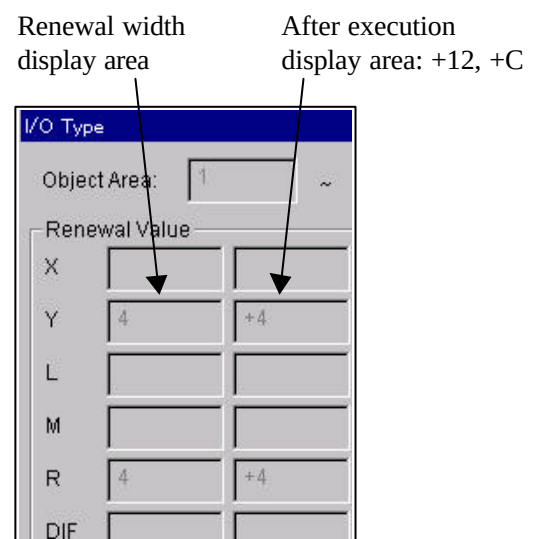
In the area of "After execution", it displays the value of after "Auto Generation" which add to the initial value.

Ex.) Make a renewal value of Y, R +4, and execute the writing of circuit include Y10, R10 2 times.

Before Auto Generation	Y: +4	R: +4
(After Auto Generation (1st time))	(Y: +8)	(R: +8)
After Auto Generation (2nd time)	Y: +12	R: +C
I/O No. created by executing of Auto Generation (2 times writing).		
1st time - - - Y14, R14 2nd time - - - Y18, R18		



Before executing Auto Generation



After executing 2nd Auto Generation

(b) Display by I/O No.

In the area of "After execution", it displays the value of after "Auto Generation" which add to the initial value.

Ex.) Make the renewal value of Y15, R10E, R10F +4, and execute the writing 2 times

Before Auto Generation

Y15 + 4 -> Y19
R10E + 4 -> R112
R10F + 4 -> R113

(After Auto Generation (1st time))

Y19 + 4 -> Y23
R112 + 4 -> R116
R113 + 4 -> R117

After Auto Generation (2nd time)

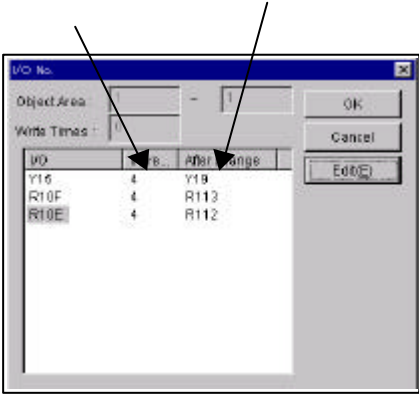
Y23 + 4 -> Y27
Y116 + 4 -> R11A
Y117 + 4 -> R11B

I/O No. created by executing Auto Generation (2 time writing)

1st time --- Y23, R116, R117
2nd time --- Y23, R116, R117

Increase/decrease width display area

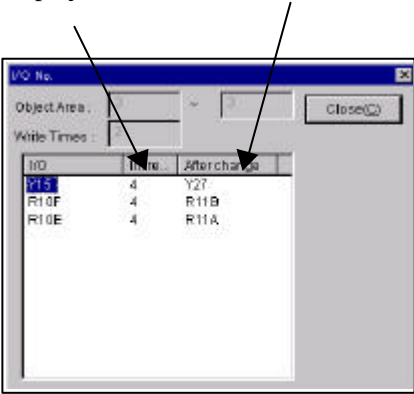
Changed I/O No.



Before executing Auto Generation

Increase/decrease width display area

Changed I/O No.



After executing 2nd Auto Generation

(4) Execute

It displays the dialog box of [Auto Generation Execution] by choosing [Execute] from [Edit] in the [Auto Generation] menu.



< Dialog box of Auto Generation Execution >

[Top Circuit No.] It sets the top circuit No. of the destination .

[Number of Write] It sets the number of times to execute Auto Generation.

(Caution)

The setting range for the number of writing time is 1 to 99.

Example

: I/O Type



< Before execution >

It executes the process with the information registered in.

(Create 3 circuits by increase R +1 and increase M +2 from the circuit 49.)



< After execution >

(Caution)

The set possible range of Auto Generation top circuit No. is as following.

1. In the case that Auto Generation top circuit No. is after the range (last circuit No. +1) specified by [Entry].

It adds the created circuit after specified circuit.

2. In the case that Auto Generation top circuit No. is before the range (include the top circuit No.) specified by [Entry].

It adds the created circuit before the specified circuit.

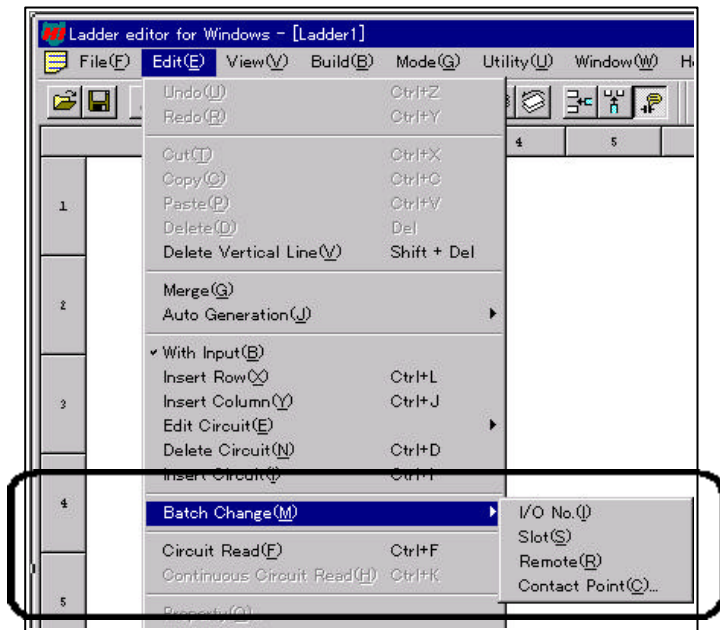
3. It can not specifies Auto Generation top circuit No. between the range of (Top circuit No. +1) and the last circuit No..

4.4.9 Batch Change

< Function Table >

Menu	Function	Description
[I/O No.]	I/O change	It executes the change by I/O No. unit.
[Slot]	Slot change	It executes the change by Slot unit of external I/O.
[Remote]	Remote change	It executes the change by Remote master station unit.
[Contact Point]	Contact Point	It executes the change of Contact point type.

Choose **[Batch Change]** in the **[Edit]** menu.



< Item of Batch Change menu >

(Caution)

- It can not execute each function of [Slot], [Remote], and [Contact Point] in On-direct mode.

(1) I/O No. Batch Change

It changes the circuit I/O No. from the top I/O No. to the last I/O No. into another I/O No. begin with a new top I/O No.

Like the example below, it executes a batch change in order of (a) to (d) by a new top I/O No.

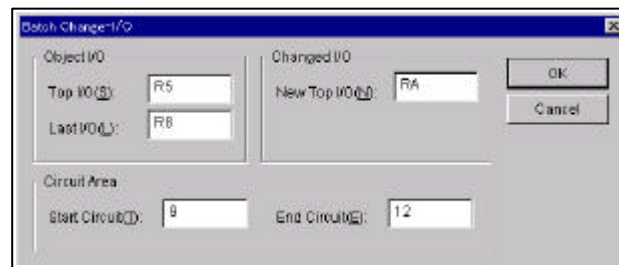
< Ex. of Batch Change > Ex.1) without the duplication of I/O. Ex2.) with the duplication

(Ex.1) Top I/O No. : R5	(Ex.2) Top I/O No. : R5
Last I/O No. : R8	Last I/O No. : R8
New top I/O No. : <u>RA</u>	New top I/O No. : <u>R7</u>
(a) R8 -> RD	(a) R5 -> R7 (Duplicate)
(b) R7 -> RC	(b) R6 -> R8 (Duplicate)
(c) R6 -> RB	(c) R7 -> R9
(d) R5 -> RA	(d) R8 -> RA

The message is displayed when I/O NO. is duplicated. Refer to the next page.

It displays the dialog box of "Batch Change-I/O" by choosing [I/O No.] from [Batch Change] in the [Edit] menu.

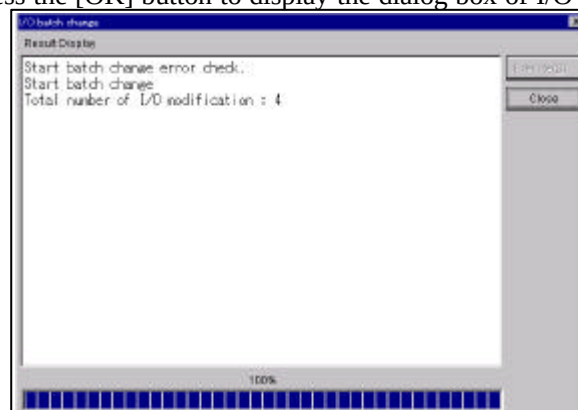
In case of Ex.1



< Dialog box of Batch Change-I/O >

- [Top I/O] Input the top I/O No. to execute the batch change.
- [Last I/O] Input the last I/O No. to execute the batch change.
- [New Top I/O] Input the top I/O No. of after changing.
- [Start Circuit] Input the start circuit No. to execute the batch change.
- [End Circuit] Input the end circuit No. to execute the batch change.

After setting each item, press the [OK] button to display the dialog box of I/O batch change.



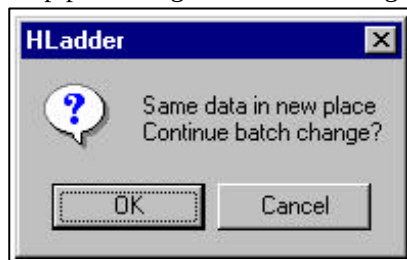
(Caution)

- Input the start circuit and the end circuit for the next formula to be concluded.
(1 ≤ Start circuit ≤ End circuit ≤ Last circuit No. of Program)

Duplication message

If I/O No. is duplicated at the batch change, it displays the message.

You can choose either continue or stop processing of the batch change.

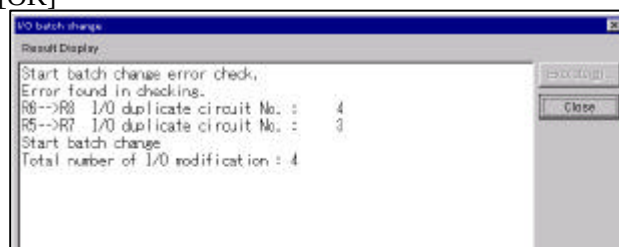


< Duplication message >

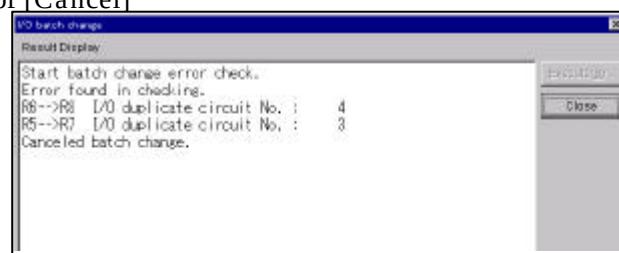
When choosing [OK], it executes the change under the duplication.

When choosing [Cancel], it checks the duplication without executing the change.

In the case of [OK]



In the case of [Cancel]



Factor of duplication

1. The changing I/O No. and I/O No. after the change are same.
2. The same I/O No. of after the change exist in the changing circuit.

(2) Slot Batch Change

Execute the batch change of the external I/O slot No. of the change circuit range specification.

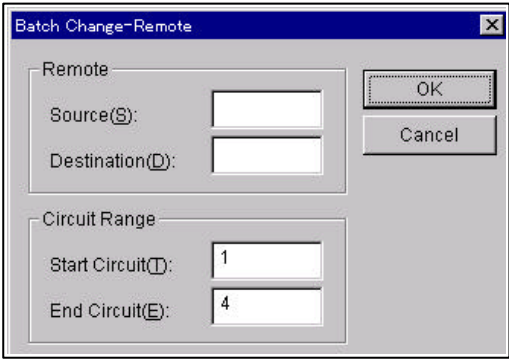


< Dialog box of Batch Change-Slot >

- [Remote] Input the remote master station.
- [Unit] Input the unit No. and the remote substation No.
- [Slot] Input the slot No.

(3) Remote Batch Change

Execute the batch change of the remote master station No. of the change circuit range specification.



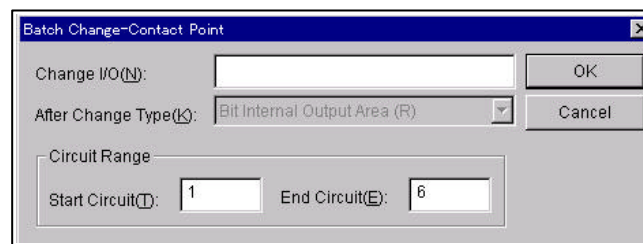
< Dialog box of Batch Change-Remote >

- [Source remote] Input the remote master station No..
- [Destination remote] Input the remote master station No..

(4) Contact Point Batch Change

It searches the part which the specified I/O is used for the contact point in a program, and it changes A into B contact point, and B into A contact point (logical inversion).

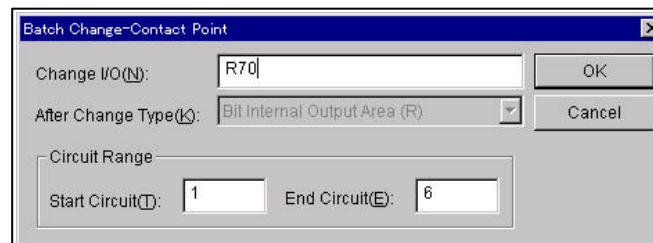
It displays the dialog box of Batch Change-Contact Point by choosing **[Contact Point]** in **[Batch Change]** from the **[Edit]** menu.



< Dialog box of Batch Change-Contact Point >

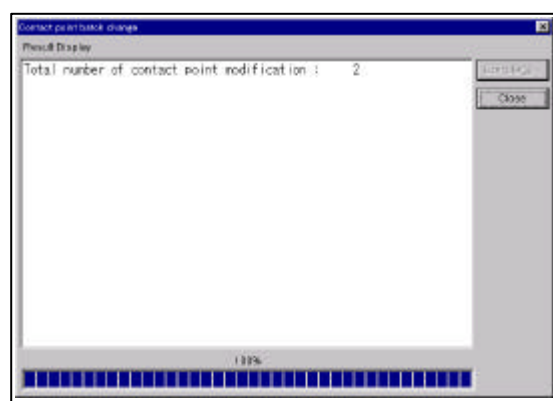
- | | |
|----------------------|--|
| [Changed I/O] | Input the I/O No. to execute the batch change. |
| [Start Circuit] | Input the start circuit No. to execute the batch change. |
| [End Circuit] | Input the end circuit No. to execute the batch change. |
| [After Changed Type] | Not use. |

Example of Setting



< Dialog box of Batch Change-Contact Point >

After setting each item, press the [OK] button to display the dialog box of the contact point batch change.



< Dialog box of Contact Point Batch Change >

4.4.10 Continuous Input of Symbol

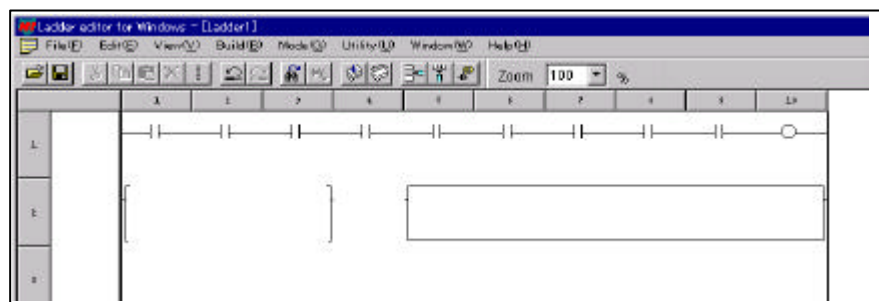
(1) Skeleton Input

It is the method to create the circuit with no I/O No. by input only the symbol continuously .

By clicking "With Input" icon  at the tool bar to make it  (No Input) condition, in this condition, "Symbol Property" does not open and only the symbol can be input continuously.

Or, take off the check at the **[With Input]** at the **[Edit]** menu.

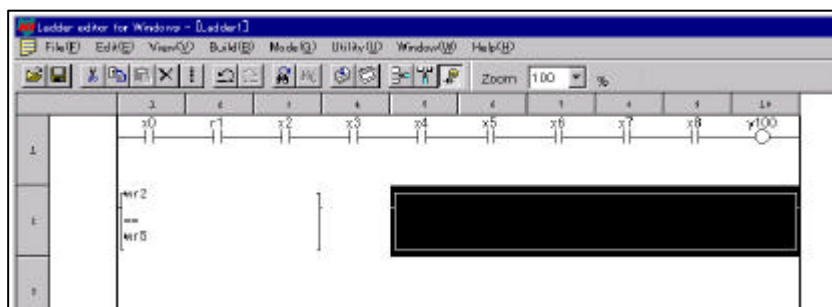
It is "With Input" condition when startup the Ladder Editor for Windows®.



< Skeleton Input >

(2) I/O No. of the skeleton input circuit and the command input.

When complete the continuous input, click  icon to make it "With Input" condition.



< Input the command in the skeleton circuit >

The property of the symbol opens when set the circuit cursor on the symbol to input the I/O No. and double click it (or Enter key). Input the I/O No. or the command in there.

A same operation can be performed in the condition of "No Input" ().

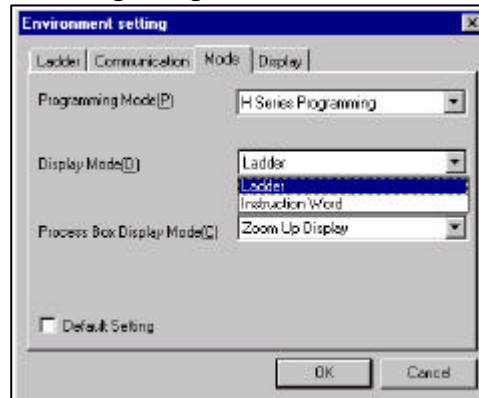
4.4.11 Instruction Word Edit

It executes the edit and the display of the source.

(1) Display Mode Switch Method

Choose **[Environment Setting]** in the **[Utility]** menu.

Click **[Mode]** at the environment setting dialog box.



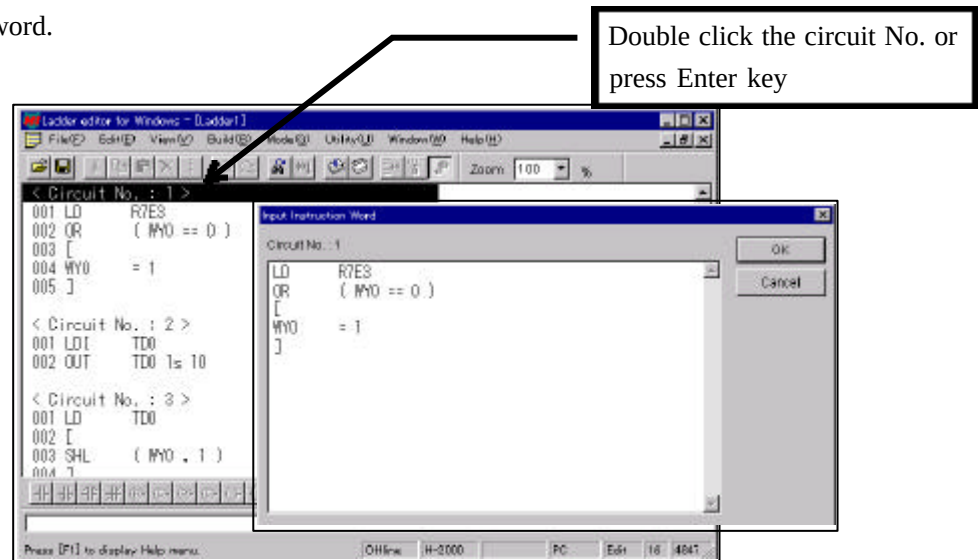
< Dialog box of Display Mode Switch >

After displaying the pull down menu by clicking  at the right of the display mode, choose Instruction Word. Click **[OK]** to change the mode.

Click **[Cancel]** to stop changing the mode.

(2) Instruction Word Edit Method

Choose the circuit No. to edit and double click or press Enter key. It displays the dialog box to input the instruction word.



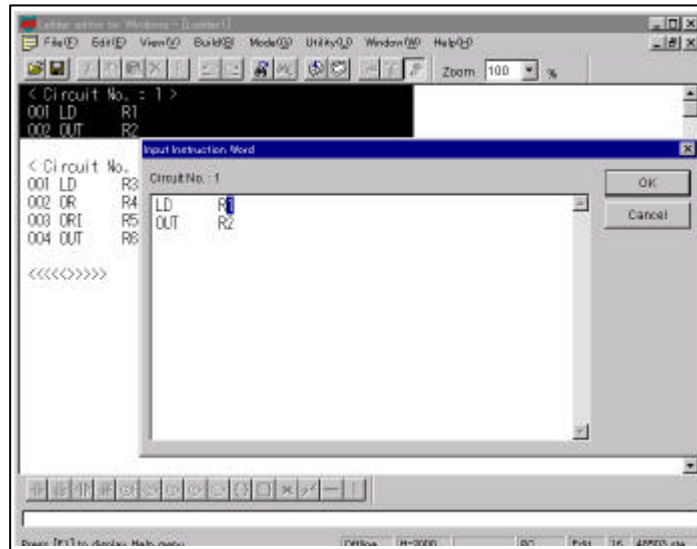
< Dialog box of Instruction Word Input >

Move the cursor to the instruction word to edit and modify it.

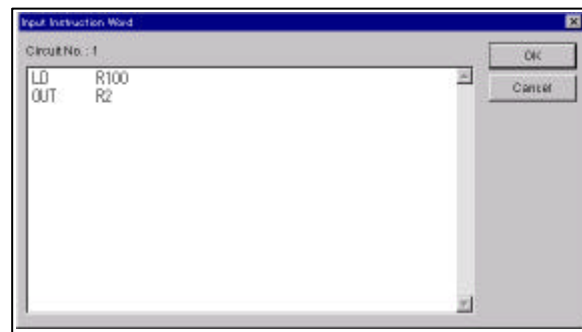
Example of Edit

Modify R1 of the circuit No. 1 to R100.

(a) Double click the circuit No. 1.

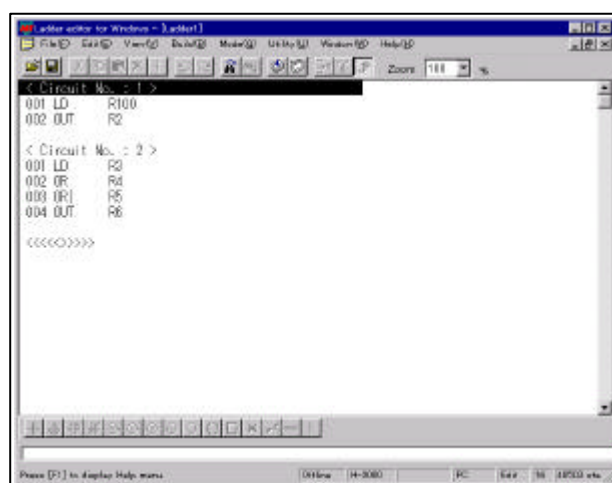


(b) Double click the behind of R1 to modify, or drag 1 and input 100 from a keyboard.



(c) Click [OK] to change R1 to R100.

Click [Cancel] to stop changing.

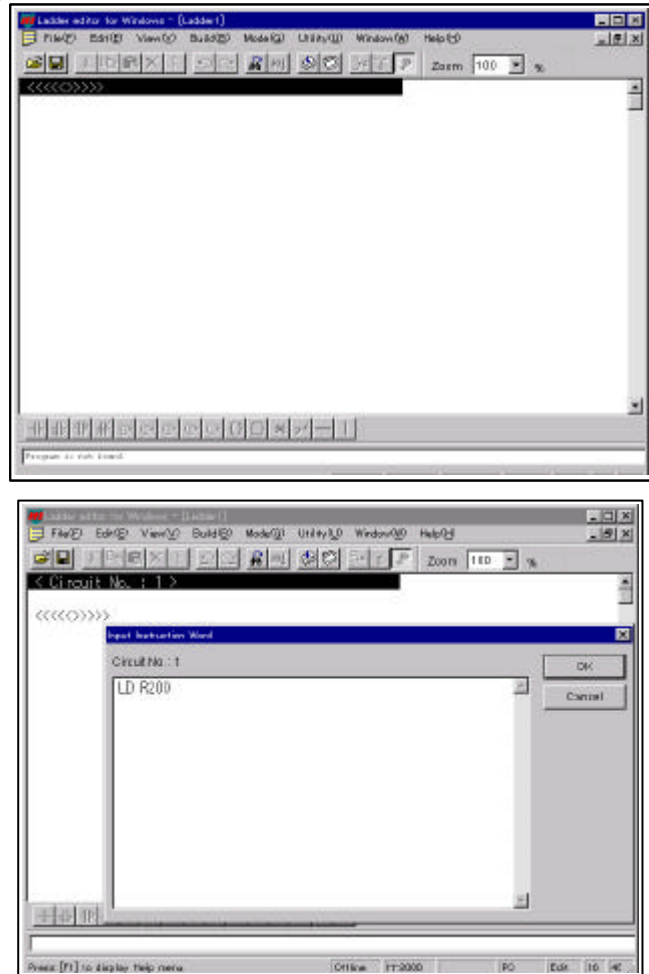


< Screen of after editing >

(d) R1 changes to R100 when executing [Circuit Write] in the [Build] menu.

(3) New input of Instruction Word

The dialog box of the instruction word input is displayed by double clicking or press Enter key after choosing "<<<<< >>>>>".



< Dialog box of Input Instruction Word >

Input the instruction word to Input Instruction Word dialog box.

(4) Method to Delete Circuit

Move the cursor to the circuit No. to delete and choose **[Delete Circuit]** in the **[Edit]** menu.

(5) Method to Insert Circuit

- (a) Move the cursor to the circuit No. to insert.
- (b) Choose **[Insert Circuit]** from the **[Edit]**.
- (c) Double click the circuit No. or press Enter key.
- (d) Input the instruction word in the input dialog box of the instruction word.
- (e) Choose **[Circuit Write]** from the **[Build]** menu.

4.5 Comment Edit

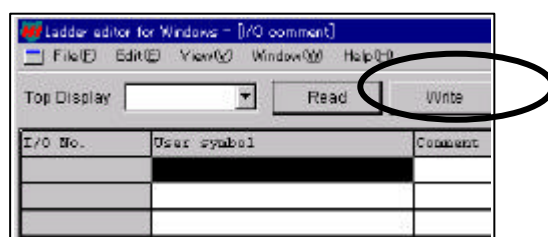
No.	Comment Name	Input Letter	Description
1	User Symbol	6 words	It edit the user symbol and the I/O comment based on the I/O No. .
	I/O Comment	32 words	
2	Box Comment	32 words	It edit the box comment based on the No. of BOXC (FUN254).
3	Memo Comment	66 words	It edit the memo comment based on the No. of MEMC (FUN255). It can be input the maximum 16 lines.
4	Circuit Comment	16 words	It edit the circuit comment based on the circuit No..

Refer to “4.5.5, Comment Display on Ladder Graph” for the display on the Ladder graph of each comment, and “8.2, Print of Comment” for the print of the comment.

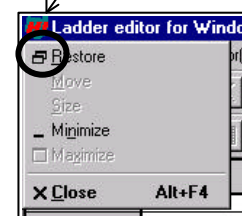
(Caution)

1. Make sure to click the [Write] button before close the comment window if executing the input or the edit of the comment.

It is written to the PC memory. It does not reflect to the edit result if close the window without clicking the [Write] button.



Click to close the window



But, when change to the previous or the next comment screen from the editing screen by [Previous], [Next] button, or the arrow key, and read other I/O No. or the comment No., the input/editing data is automatically written in to the PC memory. And, it does not have to click the [Write] button when execute [Move], [Copy], [Erase], [Erase All] in the [Edit] menu..

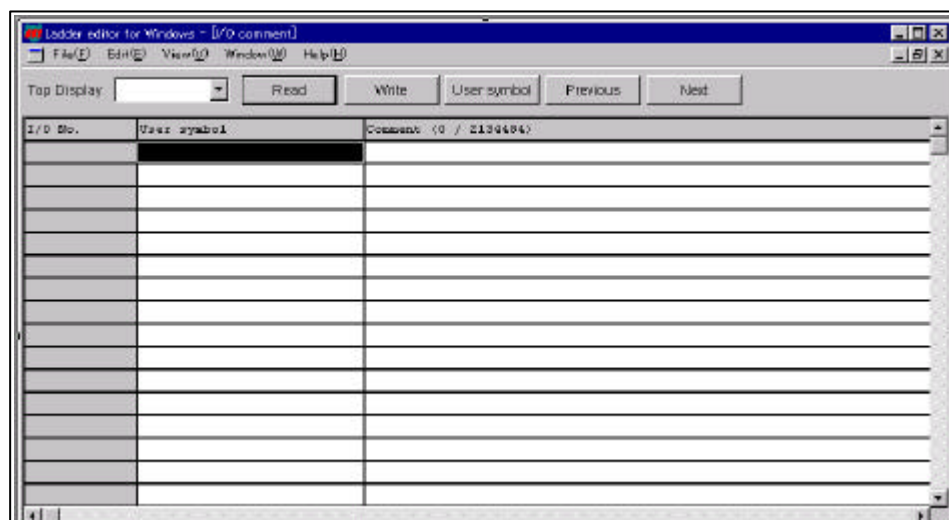
2. It executes the error check (numbers of input letters, etc.). When clicking [OK] in the error dialog box, the cursor moves to the error circuit.
3. It moves the cursor to the top display box by Ctrl + R when input only by the keyboard. After move the cursor to the top display box, move to the [Read] or [Write] button by the [TAB] key, then press the [Enter] key to execute. Or, choose Read, or Write in the Edit menu.

4.5.1 User Symbol, I/O Comment

Choose [I/O Comment] from the [Window] menu.

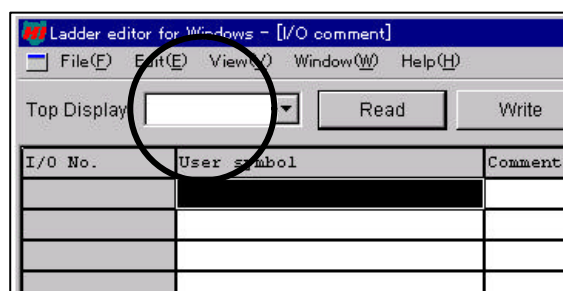
It executes the input/edit of the user symbol, and the I/O comment based on the I/O No..

Make sure to click the[Write] button when execute the input/edit of (1) to (8) below.



< I/O Comment window >

(1) Input of Top I/O No.

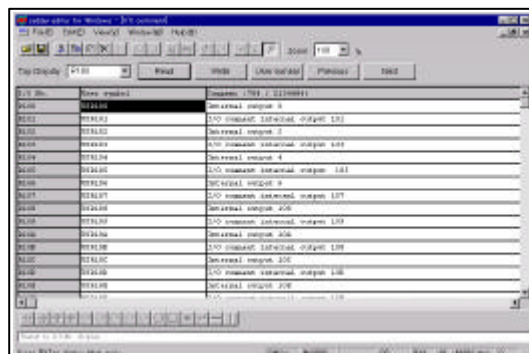


< Input I/O No. to Top Display >

Input the I/O No. directly to [Top Display], or choose the I/O type from the pull down menu by clicking  at the right and input the No..

(2) Display of I/O Comment Information

It displays 16 points of I/O comments from the top I/O No. by inputting the I/O No. or the user symbol to [Top Display] and clicking the [Read] button (or [Enter] key).



< I/O Comment Information >

(3) Input/Edit of User Symbol and I/O Comment

The input and the edit can be possible by double clicking the cell of the user symbol or the I/O comment, or press the [Enter] key.

It can be moved to other user symbol, or I/O comment by the cursor key .

(Caution)

- The I/O No. can not be used as the user symbol.
- Can not use the figure and the blank space at the initial letter of the user symbol.

(4) Display of Previous/Next Screen

It displays I/O No. of 16 points in the range of up to the last or the top I/O No. when clicking the [Previous] or [Next] button at the I/O comment window.



< Previous/Next Screen Selection >

Click to display the previous or the next screen

(5) Display by User Symbol Order

It is displayed by the user symbol order by inputting the user symbol in [Top Display].

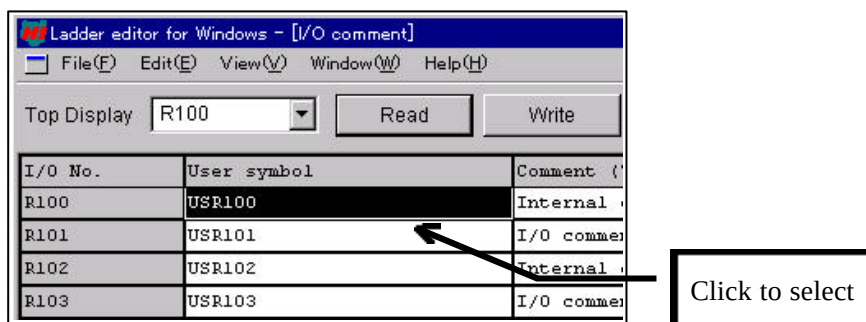
In the user symbol display order, it is only the display and the edit can not be performed.

(Caution)

- When changing [I/O No.] and [User Symbol], it does not display the user symbol and the I/O comment without clicking the [Read] button.

(6) Movement of User Symbol, I/O Comment

Choose the user symbol or I/O comment to move.



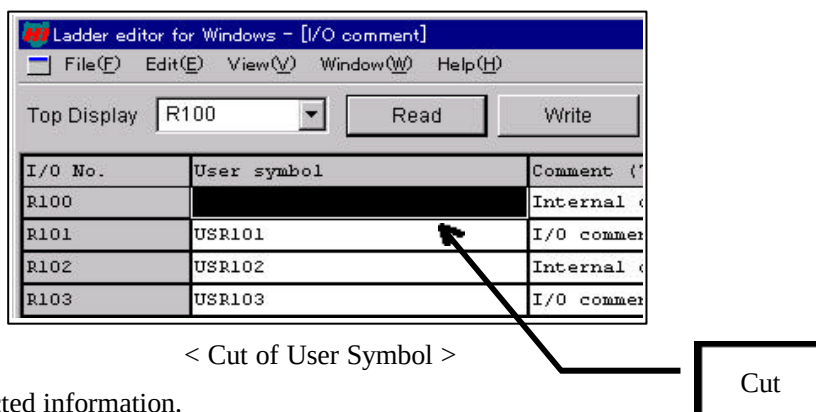
< User Symbol selection >

Execute one of the following operation.

(a) Choose **[Cut]** in the **[Edit]** menu

(b) Press Ctrl + X

(c) Click  icon.



< Cut of User Symbol >

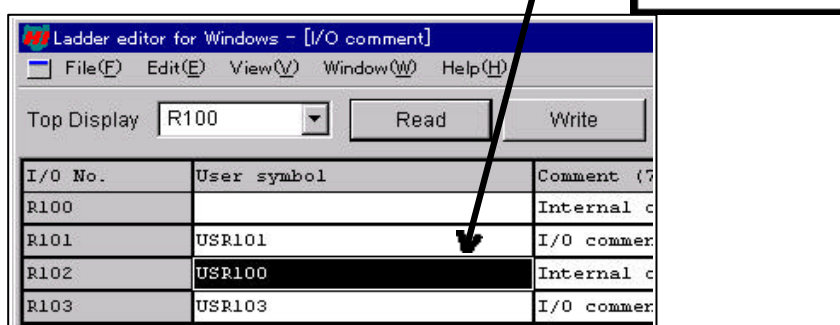
Cut off the selected information.

Click the destination of the movement, and execute one of the following operation.

(a) Choose **[Paste]** in the **[Edit]** menu

(b) Press Ctrl + V

(c) Click  icon



< Pasting of User Symbol >

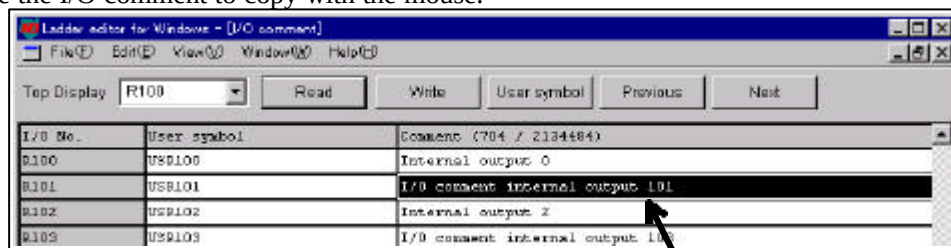
- More than one user symbol or the I/O comment can be moved by choosing them (mouse drag)

(Caution)

- It deletes original position of the user symbol and the I/O comment.

(7) I/O Comment

Choose the I/O comment to copy with the mouse.



<I/O Comment selection>

Click to select

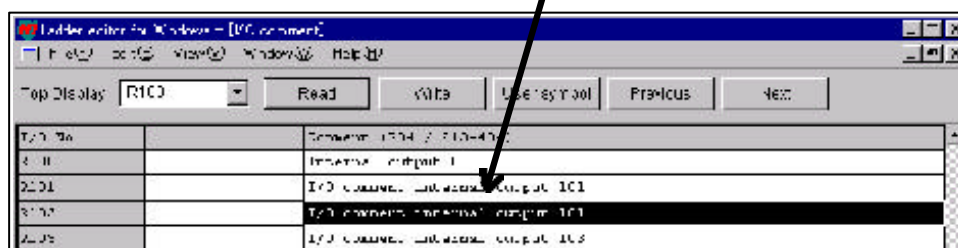
Execute one of the following operation.

- Choose **[Copy]** in the **[Edit]** menu
- Press Ctrl + C key
- Click  icon

Click the destination of the movement, and execute one of the following operation.

- Choose **[Paste]** in the **[Edit]** menu
- Press Ctrl + V key
- Click  icon

Click to paste



< Copy of I/O Comment >

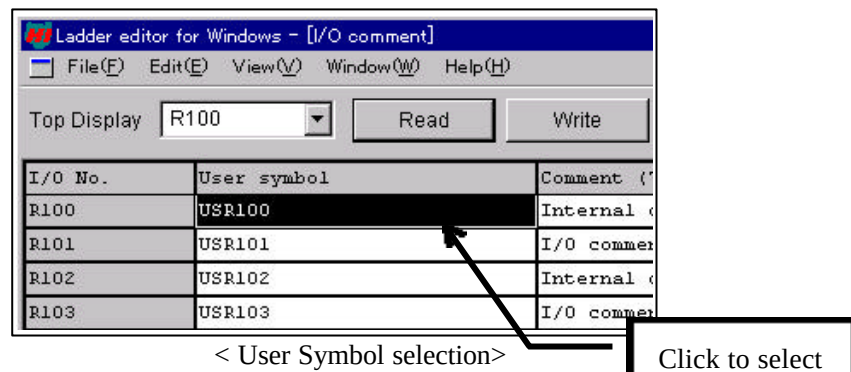
- More than one I/O comment can be copied by choosing them (the mouse drag).

(Caution)

- Because the user symbol is prohibited the multiple definition, so if it copies with the user symbol, it becomes an error and can not copy.
- The source copy remains at the original position.

(8) Deletion of User Symbol and IO Comment

Choose the user symbol, or I/O comment to delete.

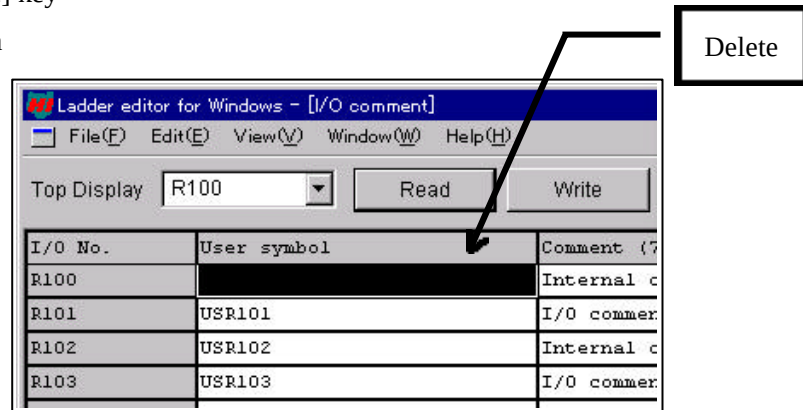


Execute one of the following operation.

(a) Choose **[Delete]** from the **[Edit]** menu

(b) Press the [Delete] key

(c) Click  icon

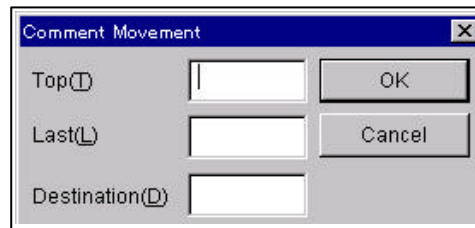


< User Symbol Deletion >

- More than one I/O comment can be deleted by choosing them (the mouse drag).

(9) Movement of User Symbol and I/O Comment

It displays the dialog box of Comment Movement by choosing **[Move]** in the **[Edit]** menu.



< Dialog box of Comment Movement >

[Top] Set the top I/O No. to move.

[Last] Set the last I/O No. to move

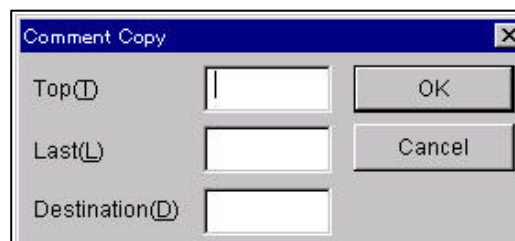
[Destination] Set the destination I/O No..

After setting the each item, it executes the movement of the specified range (I/O No. unit) by clicking the **[OK]** button.

It is written into the memory without clicking the **[Write]** button.

(10) Copy of I/O Comment (the specified range)

It displays the dialog box of the comment copy by choosing **[Copy]** in the **[Edit]** menu.



< Dialog box of Comment Copy >

[Top] Set the top I/O No. to copy.

[Last] Set the last I/O No. to copy.

[Destination] Set the destination I/O No. to copy

After setting the each item, it executes the copy of the specified range (I/O NO. unit) by clicking the **[OK]** button.

It is written into the memory without clicking the **[Write]** button.

(Caution)

It does not execute the copy of the user symbol.

(11) Erase of User Symbol and I/O Comment (the specified range)

It displays the dialog box of the comment erase by clicking **[Erase]** in the **[Edit]** menu.



< Dialog box of Comment Erase >

[Top] Set the top I/O No. to erase.

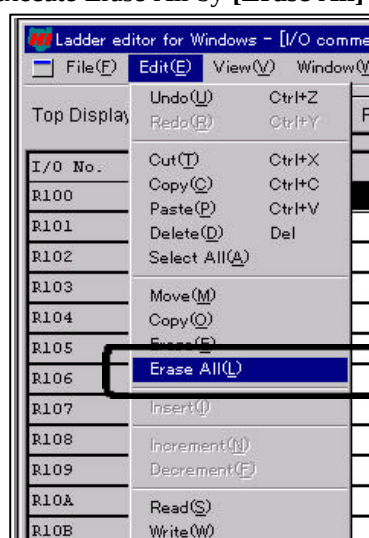
[Last] Set the last I/O No. to erase.

After setting the each item, it can execute the erase of the specified range (I/O No. unit) by clicking the [OK] button.

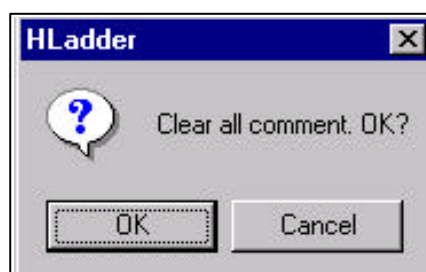
It is written into the memory without clicking the [Write] button.

(12) Erase All of User Symbol and I/O Comment

It displays the message to execute Erase All by **[Erase All]** in the **[Edit]** menu.



< Item of Edit menu >



< Confirming message of Comment All Erase >

Click the [OK] button to erase the all comment.

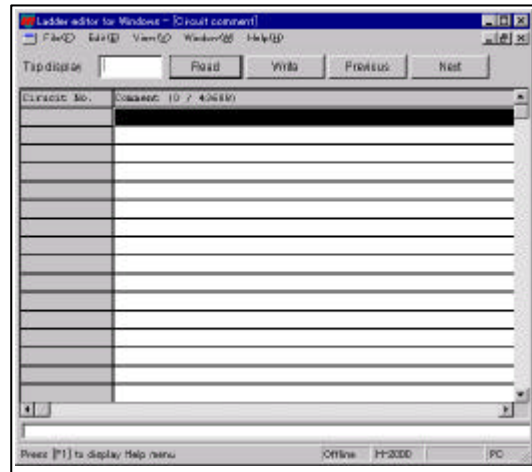
It displays into the memory without clicking the [Write] button.

4.5.2 Circuit Comment

Choose **[Circuit Comment]** in the **[Window]** menu.

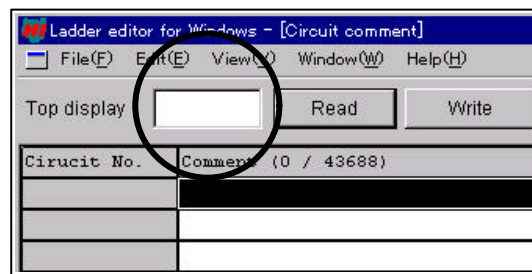
It executes the input/edit of the circuit comment.

Make sure to click the [Write] button when executing the items (1) to (7) below.



< Circuit Comment Window >

(1) Input of Top Display

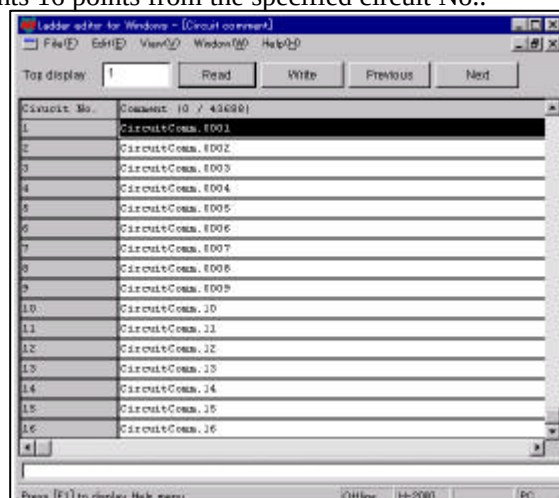


< Input the circuit No. to Top Display >

Input the circuit No. directly to [Top Display].

(2) Display of Circuit Comment Information

Input the circuit No. to [Top Display] and click the [Read] button, or press the [Enter] key to display the circuit comments 16 points from the specified circuit No..



< Display of Circuit Comment >

(3) Input / Edit of Circuit Comment

It becomes the circuit comment input/edit possible condition by double clicking the circuit comment, or pressing [Enter] key. After selecting the circuit comment, it can move with the cursor.

(4) Display of Previous/Next Screen

When clicking the [Previous] and [Next] button at the circuit comment window, it displays every 16 points to the range of the last circuit No. or the top circuit No..

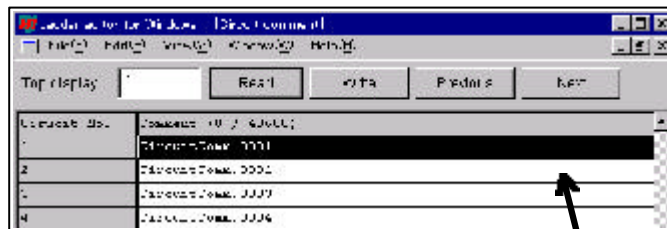


Display the previous screen and the next screen.

< Selection of Previous/Next Screen >

(5) Movement of Circuit Comment

Choose the circuit comment to move with the cursor.



< Circuit Comment Selection >

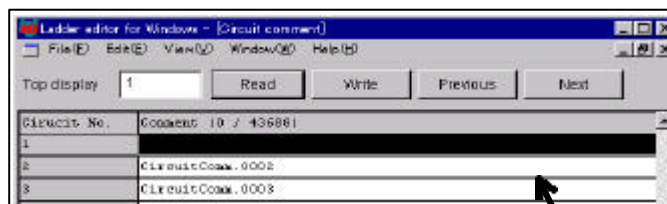
Click to select

Execute one of the following operation.

(a) Choose **[Cut]** in the **[Edit]** menu

(b) Press Ctrl + X

(c) Click  icon



< Comment cut off >

Cut

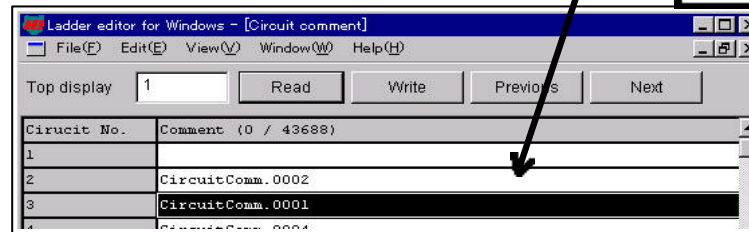
Cut the selected comment off.

Click the destination and execute one of the following operation.

(a) Choose **[Paste]** in the **[Edit]** menu

(b) Press Ctrl + V

(c) Click  icon



< Pasting of Circuit comment >

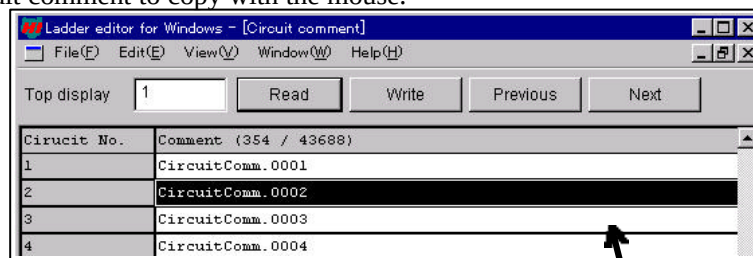
- More than one circuit comment can be moved by choosing them (the mouse drag)

(Caution)

- It deletes the original position of movement.

(6) Copy of Circuit Comment

Choose the circuit comment to copy with the mouse.



< Circuit Comment selection >

Execute one of the following operation.

(a) Choose **[Copy]** in the **[Edit]** menu

(b) Press Ctrl + C

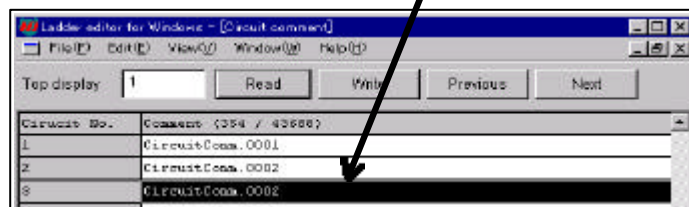
(c) Click  icon

Click the destination to copy, and execute one of the following operation.

(a) Choose **[Copy]** in **[Edit]** menu

(b) Press Ctrl + C

(c) Click  icon



< Copy of Circuit Comment >

- More than one circuit comment can be moved by choosing them (the mouse drag).

(Caution)

- The original circuit comment is not be deleted.

(7) Deletion of Circuit Comment

Choose the circuit comment to delete with the mouse.



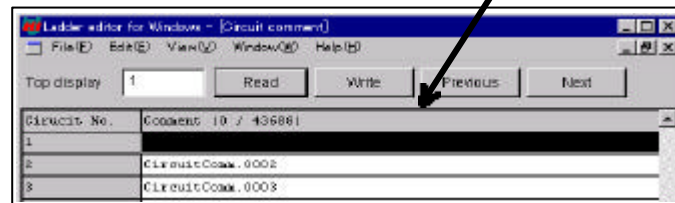
< Circuit Comment selection >

Execute one of the following operation.

(a) Choose **[Delete]** in the **[Edit]** menu

(b) Press the [Delete] key

(c) Click  icon

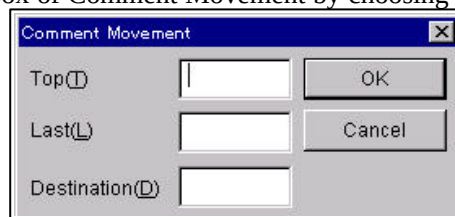


< Deletion of Circuit Comment >

- More than one circuit comment can be deleted by choosing them (the mouse drag)

(8) Movement of Circuit Comment (the specified range)

It displays the dialog box of Comment Movement by choosing **[Move]** in **[Edit]** menu.



< Dialog box of Comment Movement >

[Top] Set the top circuit No. to move.

[Last] Set the last circuit No. to move.

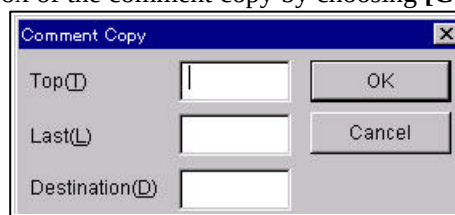
[Destination] Set the destination circuit No..

The specified range (the circuit No. unit) can be moved by clicking the [OK] button after setting each item.

It is written to the memory without clicking the [Write] button.

(9) Copy of Circuit Comment (the specified range)

It displays the dialog box of the comment copy by choosing **[Copy]** in the **[Edit]** menu.



< Dialog box of Comment Copy >

[Top] Set the top circuit No. to copy.

[Last] Set the last circuit No. to copy.

[Destination] Set the destination circuit No..

The specified range (the circuit No. unit) can be copied by clicking [OK] button after setting each item.

It is written to the memory without clicking [Write] button.

(10) Erase of Circuit Comment (the specified range)

It displays the dialog box of Comment Deletion by choosing **[Delete]** in **[Edit]** menu.



< Dialog box of Comment Erase >

[Top] Set the top circuit No. to erase.

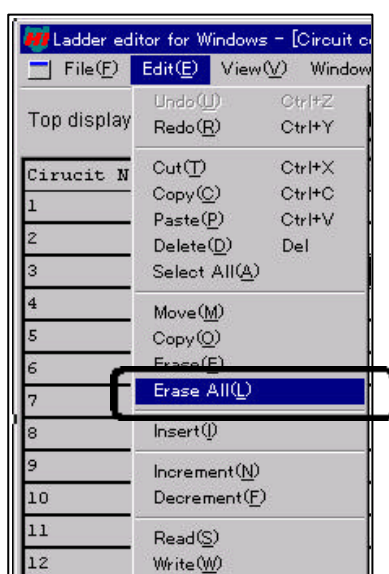
[Last] Set the last circuit No. to erase.

The specified range (the circuit No. unit) can be erased by clicking the [OK] button after setting each item.

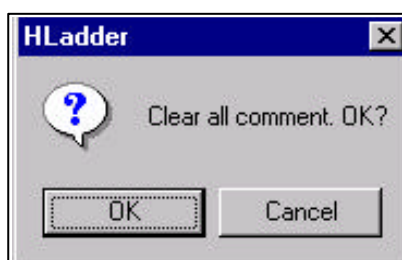
It is written to the memory without clicking [Write] button.

(11) Erase All of Circuit Comment

It displays the confirming message to execute Erase All by choosing **[Erase All]** in the **[Edit]** menu.



< Item of Edit menu >



< Confirming message of Erase All >

It erases all comment by clicking the [OK] button.

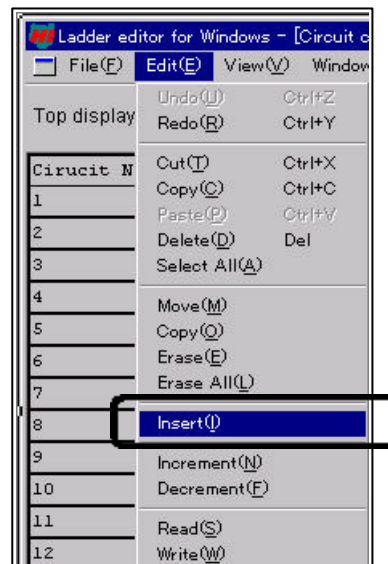
It is written to the memory without clicking the [Write] button.

(12) Insertion of Circuit Comment (the specified range)

It marks a check on [Insert] by choosing **[Insert]** in the **[Edit]** menu.

The comment can be inserted by executing **[Move]** and **[Copy]** with that condition.

The specified range of the circuit comment is inserted to the destination by executing **[Move]** and **[Copy]**.

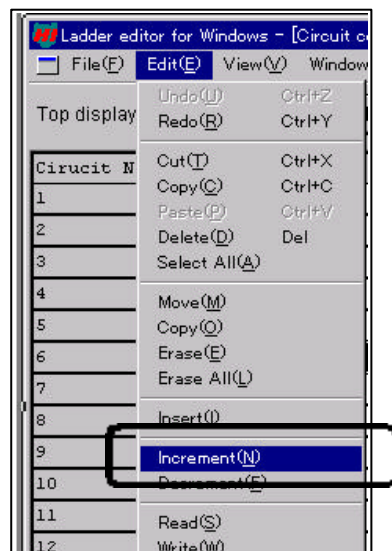


(13) Increment and Decrement of Circuit Comment

It inserts the circuit comment by one unit when choosing **[Increment]** in the **[Edit]** menu.

It is executed with no relation to (12) Insertion of Circuit Comment

It deletes the circuit comment by one unit when choosing **[Decrement]** in the **[Edit]** menu.



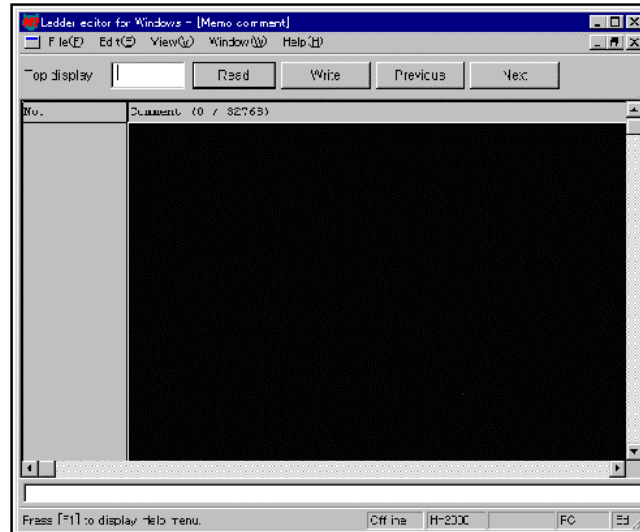
Only the top comment becomes the object comment even if it selects more than one circuit comment.

4.5.3 Memo Comment

Choose **[Memo Comment]** in the **[Window]**.

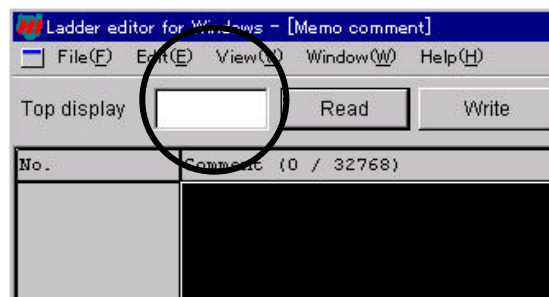
It edit the input/edit of the memo comment.

Make sure to click the [Write] button when executing the input/edit of item (1) to (7) below.



< Window of Memo Comment >

(1) Input of Top Display

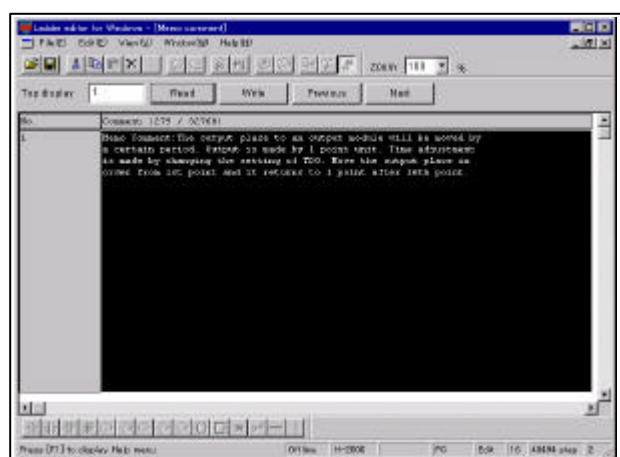


< Input of Top Display >

Input the No. to [Top Display].

(2) Display of Memo Comment Information

Input the comment No. to [Top Display] and click the [Read] button, or press the [Enter] key to display the memo comment of the input No.



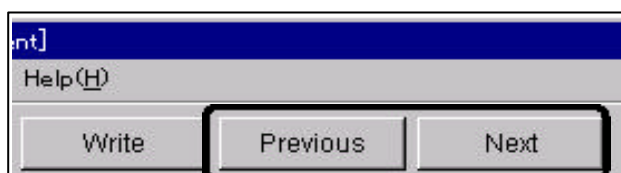
< Memo Comment Information >

(3) Input of Memo Comment

It becomes the memo comment input/edit possible condition by double clicking the memo comment or pressing the [Enter] key. It comes off input/edit possible condition by clicking the [Write] button or pressing the [Esc] key.

(4) Display of Previous/Next Screen

It displays the one point before of after of the memo comment by clicking the [Previous] or [Next] button at the circuit comment window.



< Selection of Previous/ Next Screen >

Click to display
Previous or Next screen.

It is possible to move with the cursor key.

(Caution)

1. Memo Comment No. may be selected out of 1 - 5120. This is correspond to the value of the memo comment instruction MEMC (n).
2. It automatically changes to the MEMC instruction when input and write FUN255 instruction on the Ladder circuit. And, WRB000-WRC3FF change into 1 - 5120.

Ex.)	Command at input		Command after writing
	FUN 255(WRB000)	->	MEMC(1)
	FUN 255(WRC3FF)	->	MEMC(5120)

3. It can not input the fixed No. to the (S) part, when inputting FUN255 (S) instruction. Make sure to input the I/O No. of WRB000 to WRC3FF.

However it can be input I/O No. of WR, WM, WL except WRB000 to WRC3FF, it does not display and print the comment.

4. When a memo comment instruction (MEMC (n) n=1-5120) is read by HILDRL, portable graphic programmer or an instruction word programmer, it displays as FUN 255 (S). (S: WRB000-WRC3FF)

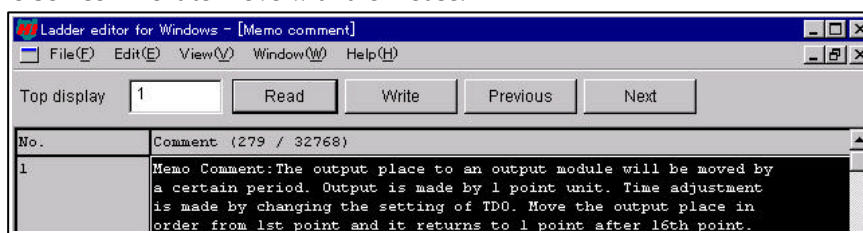
MEMC (1) correspond to FUN255 (WRB000) and MEMC (5120) correspond to FUN255 (WRC3FF).

When I/O comment is set in S (WRB000-WRC3FF), if executing the display and the print with the comment, it adds the I/O comment of WR which corresponds to n of MEMC (n).

Also when executing I/O batch change of WRB000 to WRC3FF, the corresponding comment No. changes.

(5) Movement of Memo Comment

Choose the box comment to move with the mouse.



< Memo Comment Selection >

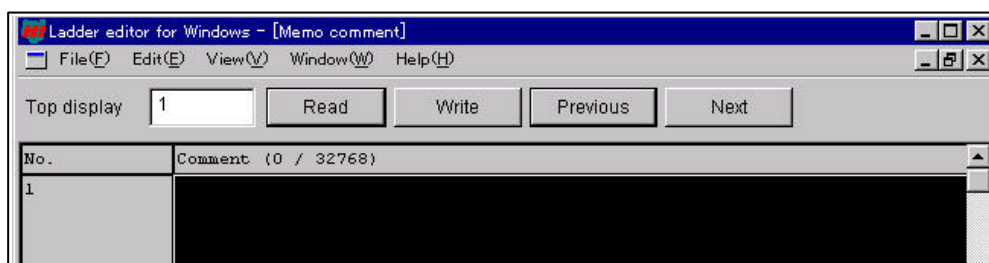
Click to select

Execute one of the following operation.

(a) Choose **[Cut]** in the **[Edit]** menu

(b) Press Ctrl + X key

(c) Click  icon



< Cut of Memo Comment >

Cut

It cut the selected comment off.

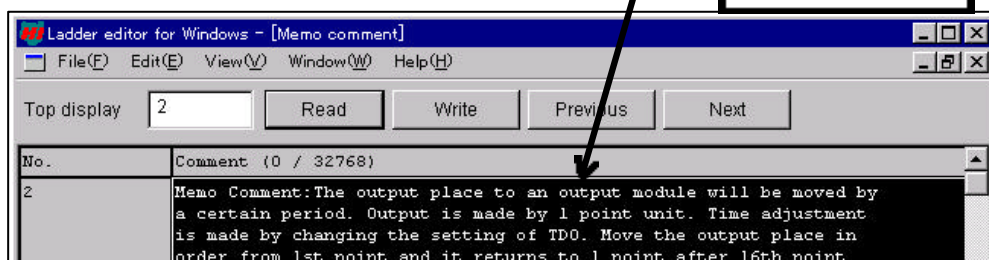
Choose (or Read) the destination memo comment No. to move, and execute one of the following operation.

(a) Choose **[Paste]** in the **[Edit]** menu

(b) Press Ctrl + V key

(c) Click  icon

Click to paste



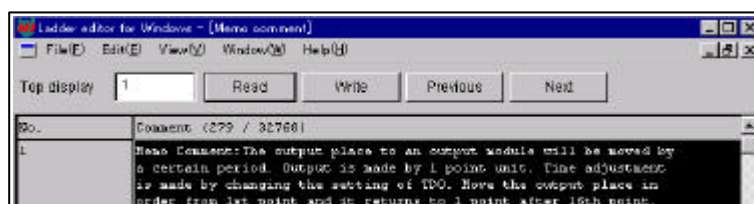
< Pasting of Memo Comment >

(Caution)

- It deletes the original memo comment.

(6) Copy of Memo Comment

Choose the memo comment to copy with the mouse.



< Memo Comment selection >

Click to select

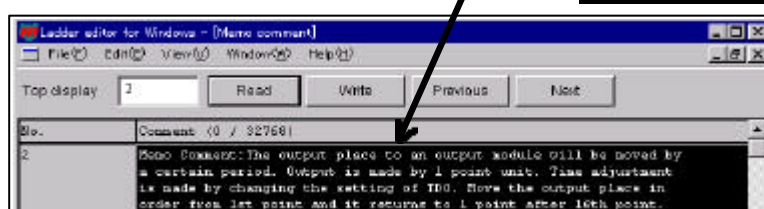
Execute one of following operation.

- (a) Choose **[Copy]** in the **[Edit]** menu
- (b) Press Ctrl + C key
- (c) Click  icon

Choose (or Read) the destination memo comment No. to copy, and execute one of the following operation

- (a) Choose **[Paste]** in the **[Edit]** menu
- (b) Press Ctrl + V key
- (c) Click  icon

Click to paste



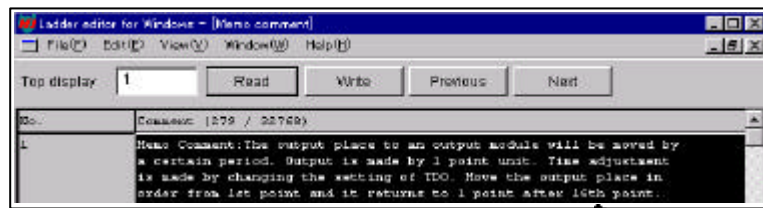
< Copy of Memo Comment >

(Caution)

- It does not delete the original copy of the memo comment.

(7) Deletion of Memo Comment

Choose the memo comment to delete with the mouse.



< Memo Comment selection >

Click to select

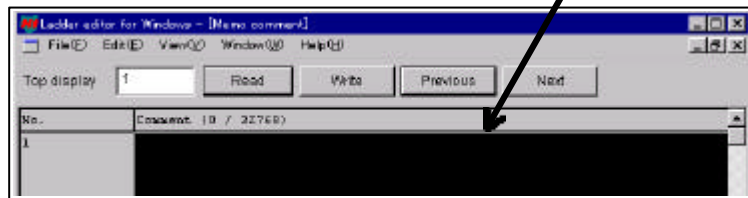
Execute one of the following operation.

(a) Choose **[Delete]** in the **[Edit]** menu

(b) Press [Delete] key

(c) Click  icon

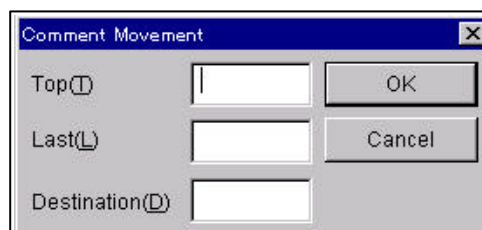
Delete



< Deletion of Memo Comment >

(8) Movement of Memo Comment (the specified range)

It displays the dialog box of the comment movement by choosing **[Move]** in the **[Edit]** menu.



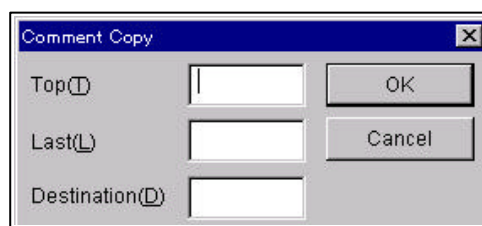
< Dialog box of Comment Movement >

[Top]	Set the top No. to move.
[Last]	Set the last No. to move.
[Destination]	Set the destination No. to move.

The specified range (No. unit) can be moved by clicking the [OK] button after setting each item.

(9) Copy of Memo Comment (the specified range)

It displays the dialog box of the comment copy by choosing **[Copy]** in the **[Edit]** menu.



< Dialog box of Comment Copy >

[Top]	Set the top No. to copy.
[Last]	Set the last No. to copy.
[Destination]	Set the destination No to copy.

The specified range (No. unit) can be copied by clicking the [OK] button after setting each item.

(10) Erase of Memo Comment (the specified range)

It displays the dialog box of Comment Deletion by choosing **[Erase]** in the **[Edit]** menu.



< Dialog box of Comment Erase >

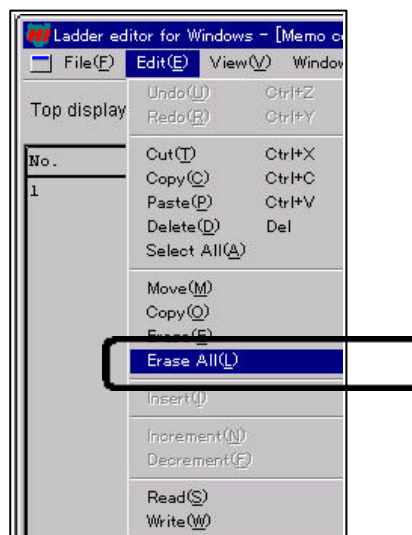
[Top] : Set the top No. to delete.

[Last] : Set the last No. to delete.

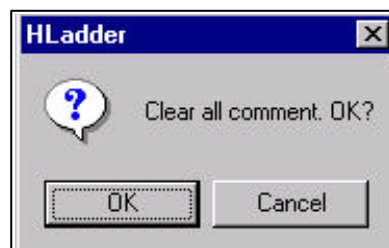
The specified range (No. unit) can be erased by clicking the [OK] button after setting each item.

(11) Erase All of Memo Comment

It displays the confirming message to execute Erase All by choosing **[Erase All]** in the **[Edit]** menu.



< Item of Edit menu >



< Confirming Message of Erase All >

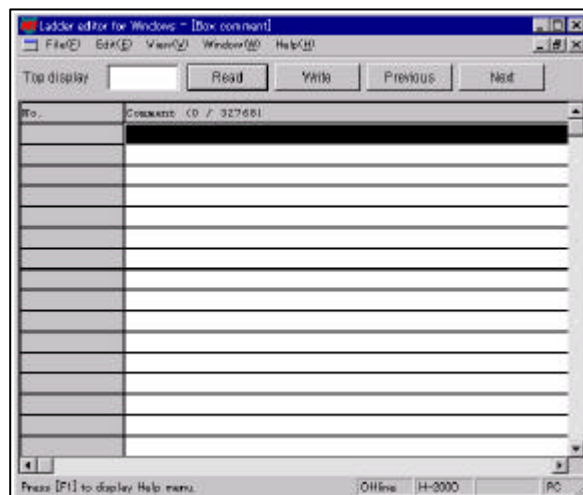
Click the [OK] button to erase all comment.

4.5.4 Box Comment

Choose **[Box Comment]** in the **[Window]** menu.

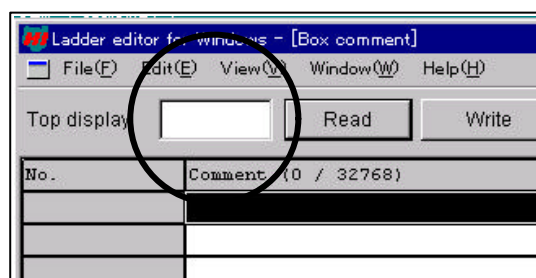
Execute the input/edit of the box comment.

Make sure to click the [Write] button when executing the item (1) to (7) below.



< Window of Box Comment >

(1) Input of Top Display

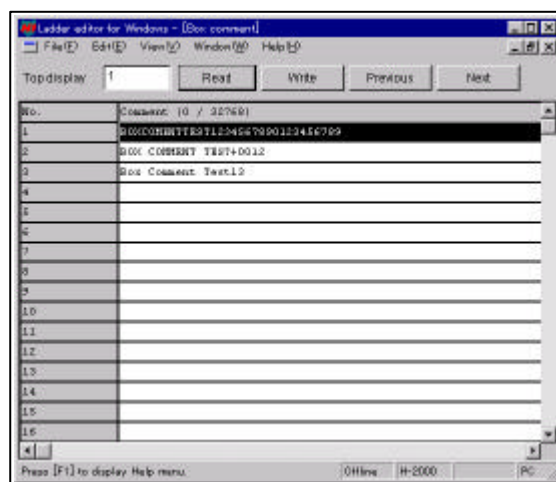


< Input of Top Display >

Input the No. directly to [Top Display].

(2) Display of Box Comment Information

It displays the box comment 16 points from the top No. by inputting the comment No. to [Top Display] and clicking [Read] or pressing the [Enter] key.



< Display of Box Comment Information >

(3) Input of Box Comment

It becomes the box comment input/edit possible condition by double clicking the box comment to input, or pressing the [Enter] key.

It can be moved by the cursor.

(4) Display of Previous/Next Screen

It displays 16 points before or next of the box comment, clicking the [Previous] or [Next] button at the circuit comment window.



< Selection of Previous/Next Screen >

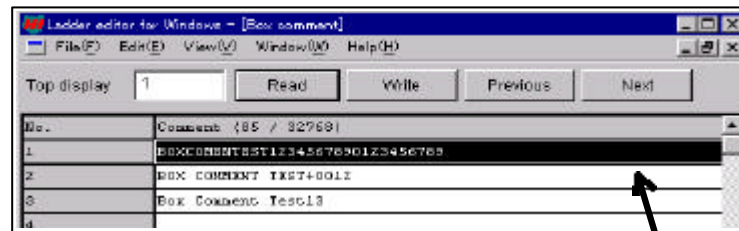
It displays the previous/next screen.

(Caution)

1. Box comment No. may be selected out of 1 to 5120. This correspond to the value of (n) of BOXC (n).
2. It automatically changes into BOXC instruction when input and write FUN254 instruction on the Ladder circuit. And WRB000-WRC3FF change to 1 - 5120.
Ex.) Command at input Command after writing
 FUN 254(WRB000) -> BOXC(1)
 FUN 254(WRC3FF) -> BOXC(5120)
3. It can not input the fixed No. to (S) part when inputting FUN254 (S) instruction. Make sure to input I/O No. of WRB000 to WRC3FF.
However it can be input I/O No. of WR, WM, WL except WRB000 to WRC3FF, it does not display and print the comment.
4. When a box comment instruction (MEMC (n) n=1-5120) is read by HILDR, portable graphic programmer or an instruction word programmer, it displays as FUN 254 (S). (S: WRB000-WRC3FF)
BOXC (1) correspond to FUN254 (WRB000) and MEMC (5120) correspond to FUN254 (WRC3FF).
When I/O comment is set in S (WRB000-WRC3FF), if executing the display and the print with the comment, it adds the I/O comment of WR which corresponds to n of BOXC (n).
Also when executing I/O batch change of WRB000 to WRC3FF, the corresponding comment No. changes.

(5) Movement of Box Comment

Choose the box comment to move with the mouse.

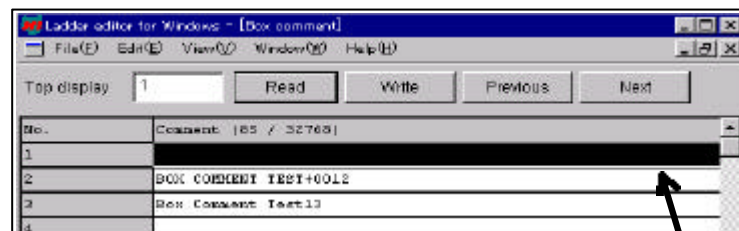


< Box Comment selection >

Click to select

Execute one of the following operation.

- Choose **[Cut]** in the **[Edit]** menu
- Press Ctrl + X
- Click  icon



< Cut of Box Comment >

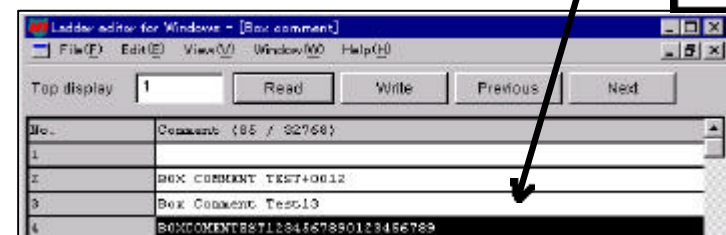
Cut

Cut the selected comment off.

Choose the destination to move, and execute one of the following operation.

Choose the box comment No. to move, and

- Choose **[Paste]** in the **[Edit]** menu
- Press Ctrl + V
- Click  icon



< Pasting of Box Comment >

Click to paste

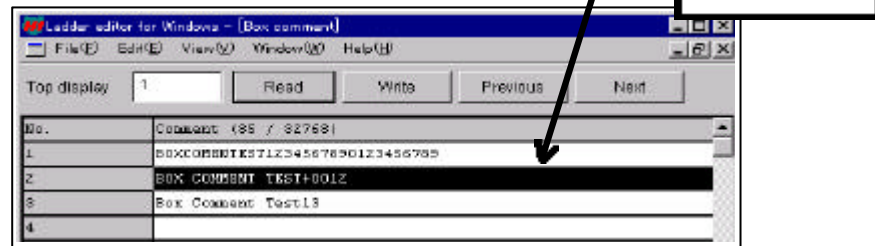
- More than one box comment can be moved by choosing them (the mouse drag).

(Caution)

- Delete the original box comment.

(6) Copy of Box Comment

Choose the box comment to copy with the mouse.



< Box Comment selection >

Execution one of the following operation.

(a) Choose **[Copy]** in the **[Edit]** menu

(b) Press Ctrl + C key

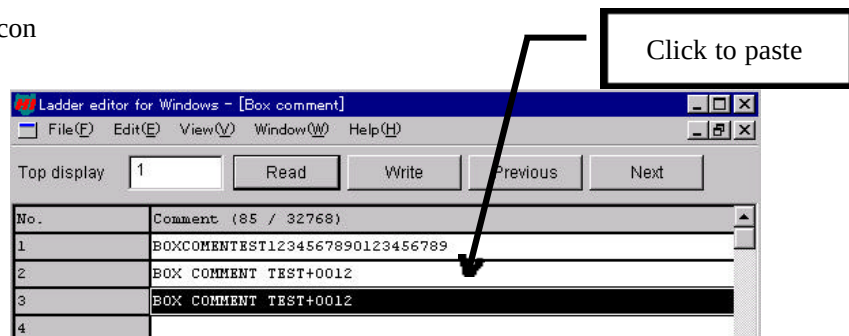
(c) Click  icon

Click the destination to copy, and execute one of the following operation.

(a) Choose **[Paste]** in the **[Edit]** menu

(b) Press Ctrl + V key

(c) Click  icon



< Copy of Box Comment >

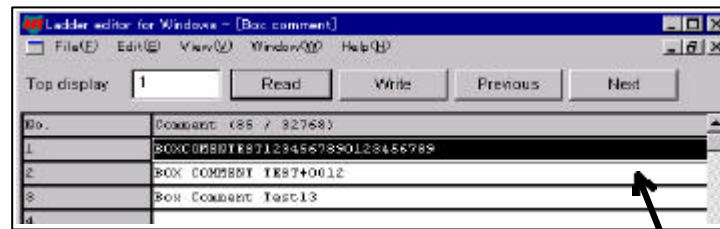
- More than one box comment can be moved by choosing them (the mouse drag).

(Caution)

- It does not delete the original box comment.

(7) Deletion of Box Comment

Choose the box comment to delete with the mouse.



< Box Comment selection >

Execute one of the following operation.

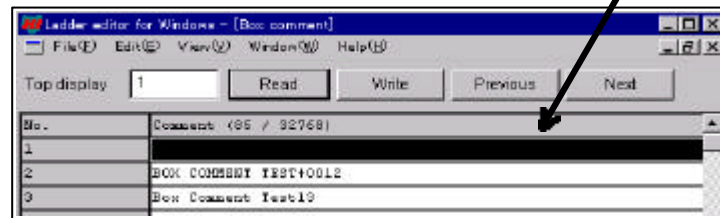
(a) Choose **[Delete]** in the **[Edit]** menu

(b) Press the [Delete] key

(c) Click  icon

Click to select

Delete

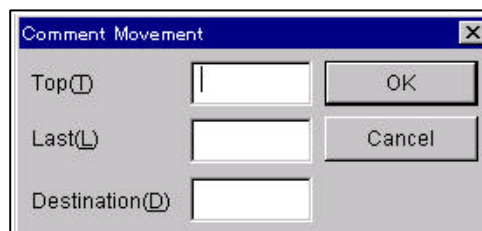


< Deletion of Box Comment >

- More than one box comment can be deleted by choosing them (the mouse drag).

(8) Movement of Box Comment (the specified range)

It displays the dialog box of Comment Movement by choosing **[Move]** in the **[Edit]** menu.



< Dialog box of Comment Movement >

[Top] Set the top No. to move.

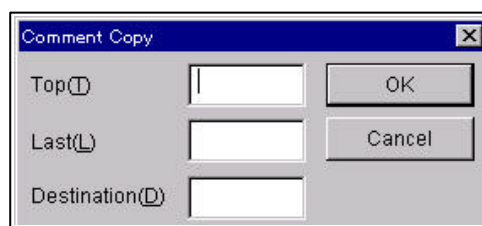
[Last] Set the last No. to move.

[Destination] Set the destination No. to move.

The specified range (No. unit) can be moved by clicking the [OK] button after setting each item.

(9) Copy of Box Comment (the specified range)

It displays the dialog box of Comment Copy by choosing **[Copy]** in the **[Edit]** menu.



< Dialog box of Comment Copy >

[Top] Set the top No. to copy.

[Last] Set the last No. to copy.

[Destination] Set the destination No. to copy.

The specified range (No. unit) can be copied by clicking the [OK] button after setting each item.

(10) Erase of Box Comment (the specified range)

It displays the dialog box of Comment Erase by choosing **[Erase]** in the **[Edit]** menu.



< Dialog box of Comment Erase >

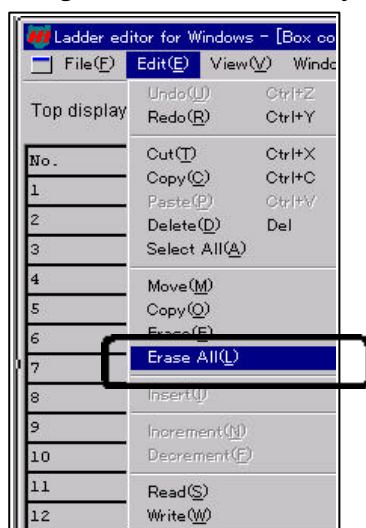
[Top] Set the top circuit No. to erase .

[Last] Set the last circuit No. to erase.

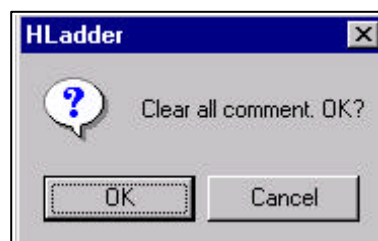
The specified range (the circuit No. unit) can be erased by clicking the [OK] button after setting each item.

(11) Erase All of Box Comment

It displays the confirming message to execute Erase All by choosing **[Erase All]** in the **[Edit]** menu



< Item of Edit menu >



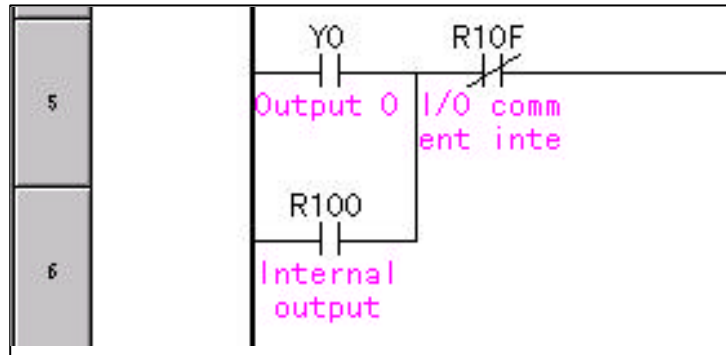
< Confirming message to erase all comment >

It erases all comment by clicking the [OK] button.

4.5.5 Display of Each Comment on Ladder Graph

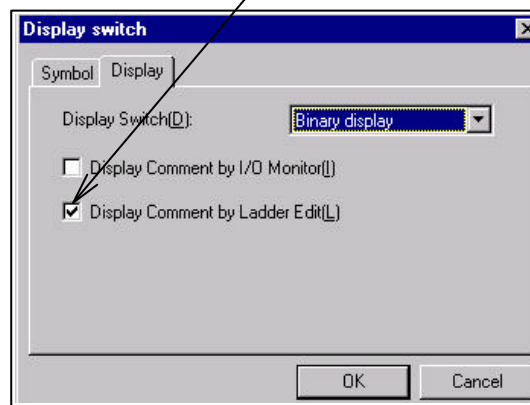
(1) Symbol Attached Display of I/O Comment

It displays 16 words of I/O comment attached to the symbol on the Ladder graph. But, it does not display on I/O in the processing box.



I/O Comment attached to the symbol on the Ladder graph

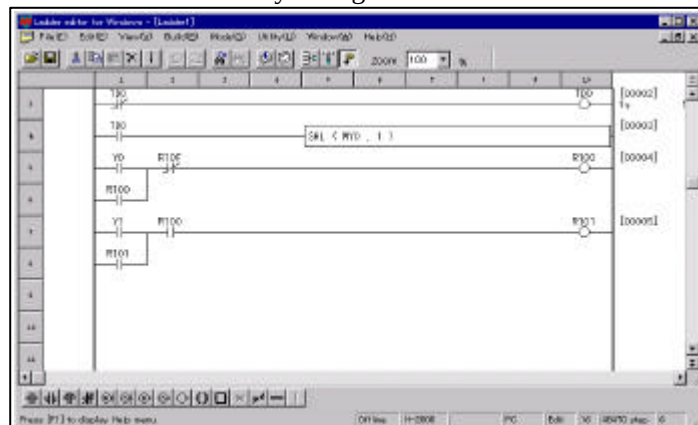
The I/O comment indicated above is displayed by checking in “Display Comment by Ladder Edit” in Display Switch dialog box displayed by choosing [Display Switch] in the [View] menu.



< Dialog box of Display Switch >

It is in the condition of “Display Comment by Ladder Edit” when starting LADDER EDITOR for Windows®.

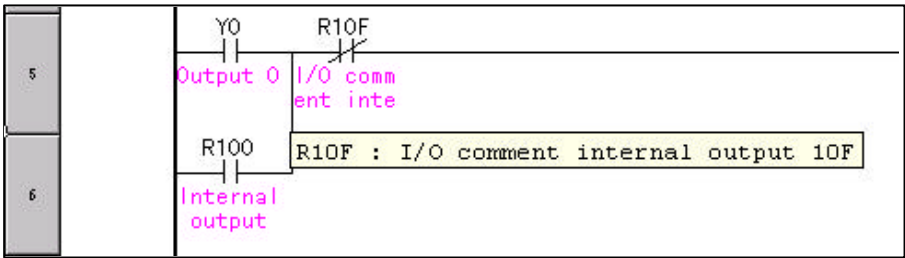
The I/O comment becomes the Hide condition by taking a check off.



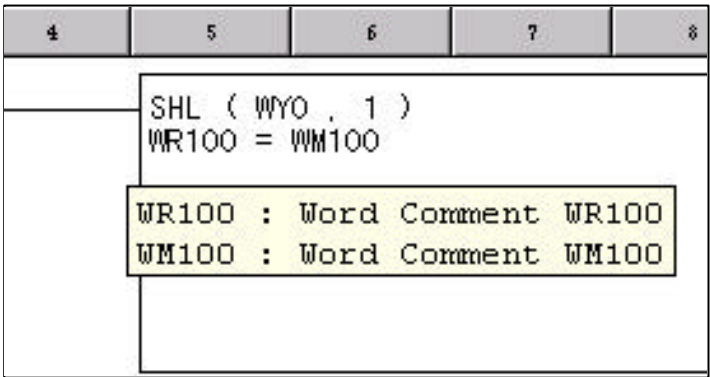
Hide condition of I/O comment

(2) Capture Display of I/O Comment

All input I/O (32 words) comment can be capture displayed by moving the mouse cursor on the symbol.



The I/O comment in the processing box can be displayed, too.

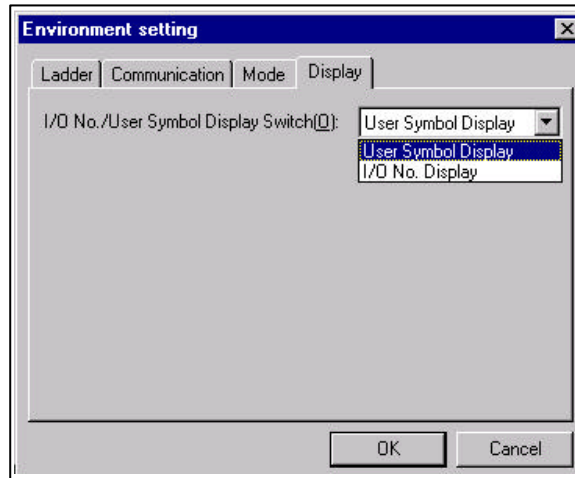


(Caution)

Some of key operations such as Alt key, short cut key can not be performed in the condition of the capture display. Move the mouse cursor once and operate again.

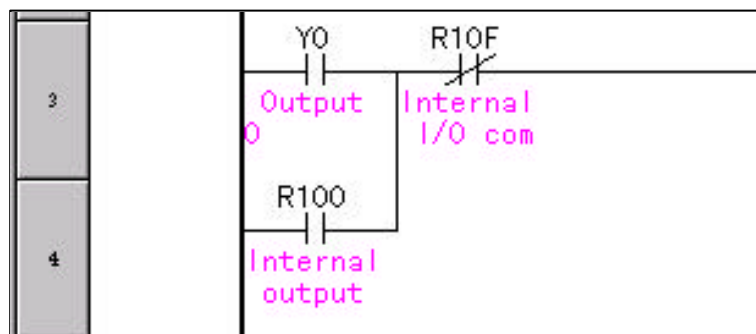
(3) User Symbol Display

It becomes the user symbol display by changing “I/O No. / User Symbol Display Switch” at [Environment Setting] in the [Utility] menu.

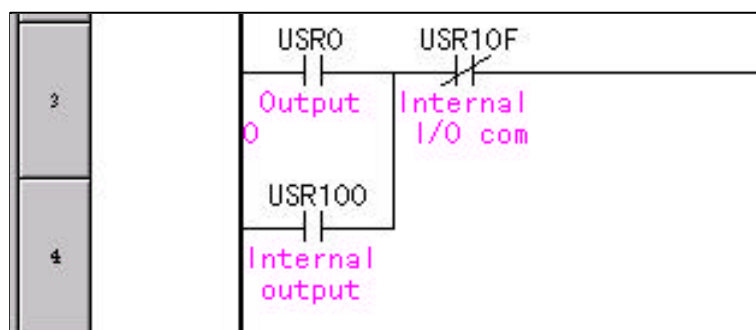


< Dialog of Environment Setting (Display Switch)>

The default setting of LADDER EDITOR for Windows® is as “I/O No. Display”.



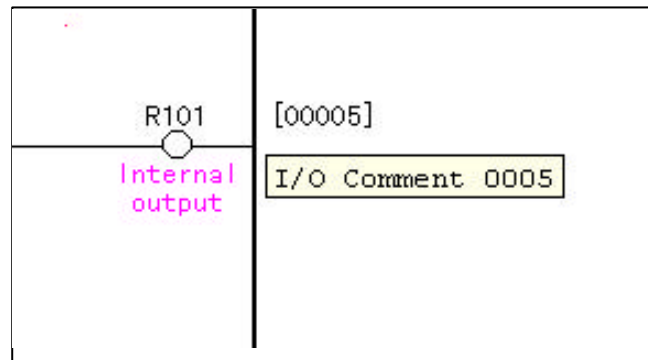
< I/O No. Display >



< User Symbol Display >

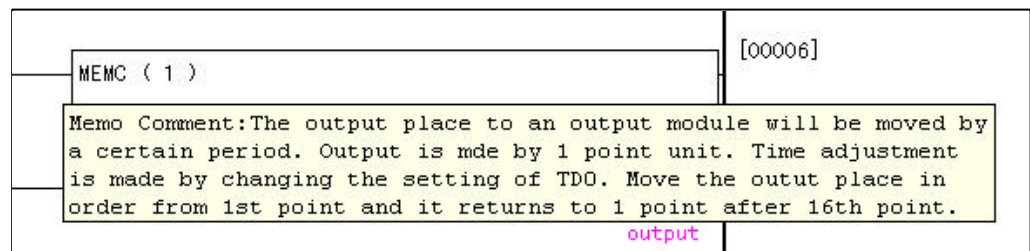
(4) Capture Display of Circuit Comment

All input circuit Comment (16 words) can be capture displayed by moving the mouse cursor on the circuit No..



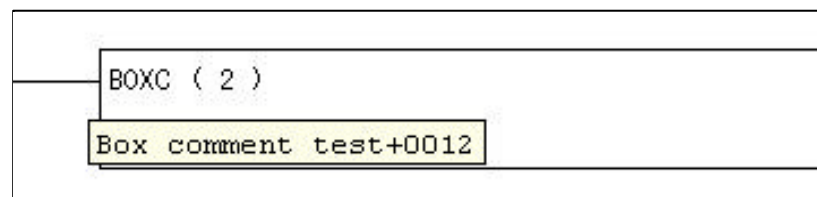
(5) Capture Display of Memo Comment

All input memo comment (66 words) can be displayed by moving the mouse cursor on MEMC (n).



(6) Capture Display of Box Comment

All input box comment (32 words) can be displayed by moving the mouse cursor on BOXC (n).



4.6 Read

4.6.1 Basic Operation

There are two kinds of Read function such as [Sequence] and [One].

(1) Continuous Reading

It displays the specified circuit in specified order from the top screen when executing Read operation.

(2) Single Reading

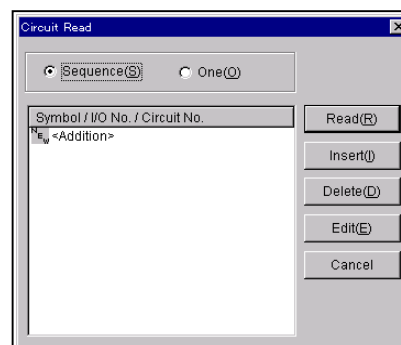
It displays the specified circuit in the specified order from next to the circuit on the cursor.

Until the circuit which had a cursor on before executing Read remains on the screen.

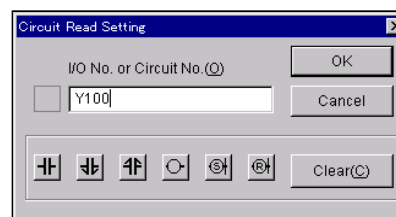
- (a) Click  icon or choose **[Circuit Read]** in the **[Edit]** menu.

It displays the dialog box of Circuit Read.

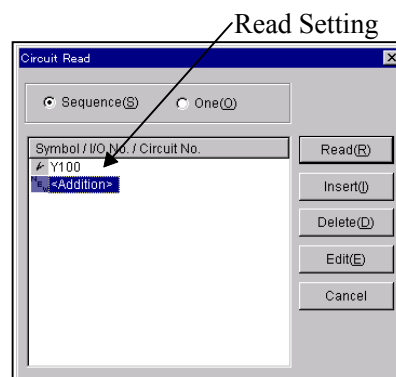
- (b) It displays the dialog box of Circuit Read Setting.



- (c) Input the symbol and I/O No., or the circuit No., then click OK to return to Circuit Read dialog box.



- (d) In the dialog box of Circuit Read, specifying either [Continuous] or [One] and click [Read] to display the object circuit.



Choose either [Sequence] or [One].

[Read] --- Execute the read function.

[Insert] --- Insert the new read setting before the read setting with the cursor on.

It is possible to insert by the [Insert] key.

[Delete] --- Delete the read setting with the cursor on.

[Edit] --- Edit the read setting with the cursor on.

[Cancel] --- Stop processing.

After reading the specified circuit, click **[Edit] - [Continuous Circuit Read]** or the continuous read icon , it continues to read from the position which was read immediately before.

A short cut key is (Ctrl + K).

Operation of Circuit Read

- (a) [One] read the specified circuit positioned next to the circuit with a cursor in the specified order.
- (b) [Continuous] read the specified circuit in the specified order from the top screen.
- (c) When the circuit No. are not continued, they will be displayed continuously by scrolling the screen.
Can not execute the circuit edit if the circuit No. are not continued. When executing the edit, execute after scrolling the screen or execute **[Recover]** in the **[Build]** menu.
- (d) In the display of the instruction word, even setting the several conditions in the single read, the several circuits (I/O) in the continuous read, it only search the top condition.
- (e) In the display of the instruction word, it treats 1 circuit for 1 block. When executing I/O No. and the symbol specification reading, the cursor moves to the circuit No. of the circuit include the searched I/O, etc.

Direct Read Function

There is the method to read the dialog box of “Circuit Read Setting” directly (not pass through the dialog box of “Circuit Read”. This is very useful function for the key input function. But, by reading this operation, the read setting contents are changed to the setting contents of after executing this operation with [Sequence] reading.

[Operation Method]

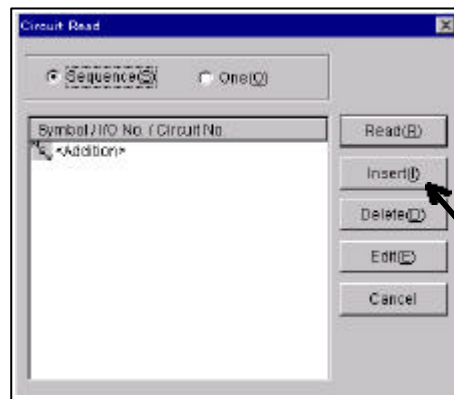
In the Ladder display or the instruction word display, input the circuit No., I/O No., the application command, user symbol directly from the keyboard.

4.6.2 Circuit No. Specification Read

Read the circuit specified by the circuit No..

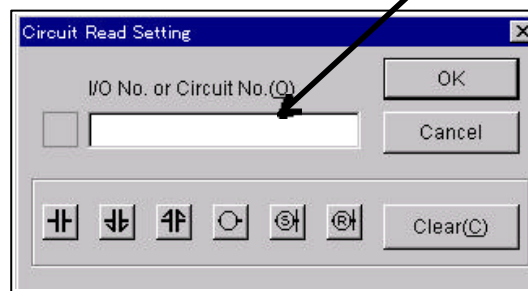
Operation Method

(a) It displays the circuit read dialog box by choosing **[Circuit Read]** in the **[Edit]** menu, or click



< Dialog box of [Circuit Read] >

(b) Input the circuit No..



< Dialog box of [Circuit Read Setting] >

To cancel the circuit No., press the [Delete] key or the [Back Space] key. Can not cancel with the [Cancel] button.

(c) It returns to the dialog box of '(a)' and displays the input circuit No. as the read setting, so click [Read].

4.6.3 I/O No. Specification Read

It searches and displays the circuit which the specified I/O No. is used from the top of the program.

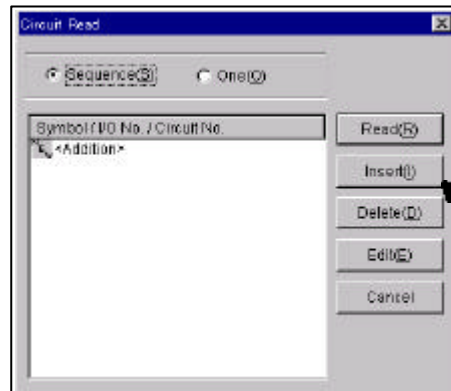
A contact point, B contact point, Coil, the setting value of timer/counter, Comparing box, and Processing box are included in the object range of search.

Operation Method

- (a) It displays the circuit read dialog box by choosing **[Circuit Read]** in the **[Edit]** menu or clicking the



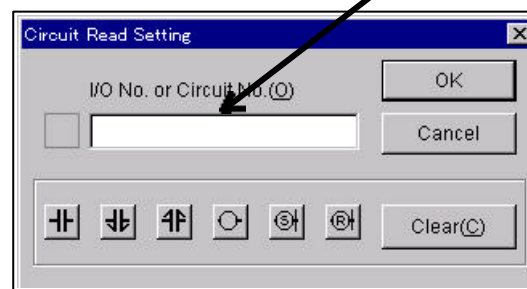
icon .



< Dialog box of [Circuit Read] >

Click to insert

- (b) Input the I/O NO..



< Dialog box of [Circuit Read Setting] >

Input the I/O No.

To clear the I/O No., press the [Delete] key or the [Back Space] key. Can not clear with the [Clear] button.

- (c) It returns to the dialog box of '(a)' and displays the input I/O No. as the read setting, so click [Read].

After reading the specified I/O No., when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with  icon or the [Ctrl + K] key.

(Caution)

For the timer/counter, regardless of the specified I/O type, it read the timer/counter with the specified No..

4.6.4 Symbol + I/O No. Specification Read

Read the circuit by specifying AND condition of the symbol and the I/O No..

The bellowing 6 kinds of symbols can be specified.

- (a)  + I/O No. specification read

It searches and displays the circuit which the specified I/O No. is used as A or B contact point from the top of the program.

It won't displays the circuit even if it is used as the coil or the processing box.

For the timer/counter, it reads the timer/counter with the specified No. regardless of the specified I/O type.

- (b)  + I/O No. specification read

It searches and displays the circuit which uses the specified DFN No. from the top of the program.

(Ex. DEF 0)

- (c)  + I/O No. specification read

It searches and displays the circuit which uses the specified DIF No. from the top of the program.

(Ex. DIF 2)

- (d)  + I/O No. specification read

It searches and displays the circuit which uses the specified I/O No. as the coil (include the set/reset coil) from the top of the program.

It won't display the circuit even if it is used as the contact point or the processing box.

For the timer/counter, it reads the timer/counter with the specified No. regardless of the specified I/O type.

- (e)  + I/O No. specification read

It searches and displays the circuit which uses the specified MCR No. from the top of the program.

(Ex. MCR 1)

- (f)  + I/O No. specification read

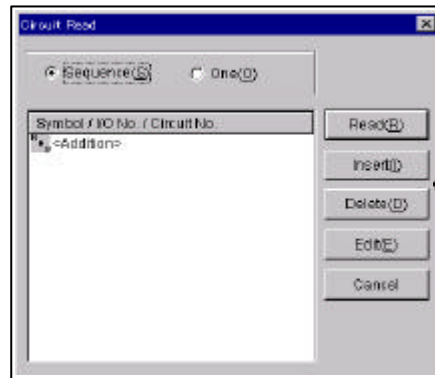
It searches and displays the circuit which uses the specified MCS No. from the top of the program.

(Ex: MCS 0)

Operation Method

- (a) It displays the dialog box of Circuit Read by choosing **[Circuit Read]** in the **[Edit]**, or clicking the  icon.

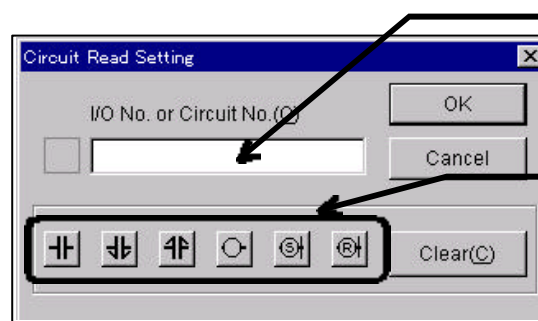
Click the [Insert] button.



Click to insert

< Dialog box of [Circuit Read] >

- (b) Specifying the I/O No. with inputting the I/O No.



Input the I/O No.

Click one of the symbol

< Dialog box of [Circuit Read Setting] >

To clear the symbol, click the [Clear] button.

To clear the I/O No., press the [Delete] key or the [Back Space] key. Can not clear with the [Clear] button).

- (c) It returns to the dialog box of '(a)', and displays the input I/O No. and the symbol as the read setting, so click [Read].

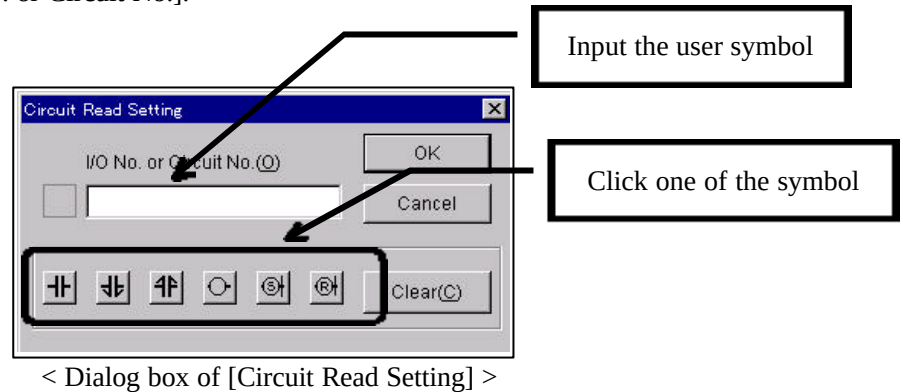
After executing Specification Read, when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with  icon or the [Ctrl + K] key.

4.6.5 Symbol + User Symbol Specification Read

Read the circuit by specifying the symbol and the user symbol.

The operation is performed as same process as the specification read of (Symbol) + I/O No..

Input the user symbol in [I/O No. or Circuit No.].



Other functions are same as the specification read of (Symbol) + I/O No..

After reading the circuit, when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with  icon, or the [Ctrl + K] key.

(Caution)

- When changing the I/O No. display into the user symbol display, change “I/O No. Display” into “User Symbol Display” in **[Display]** from **[Environment]** in the **[Edit]** menu.
- When display is “I/O No. Display”, it displays the circuit which uses the I/O No. corresponds to the specified user symbol.
- Please refer to 4.5.1, “User Symbol/I/O Comment” about more details of the input/edit of the user symbol.

4.6.6 Application Command/User Symbol Specification Read

Read the circuit by specifying the application command or the user symbol.

It reads and displays the circuit which include the specified application command or the user symbol.

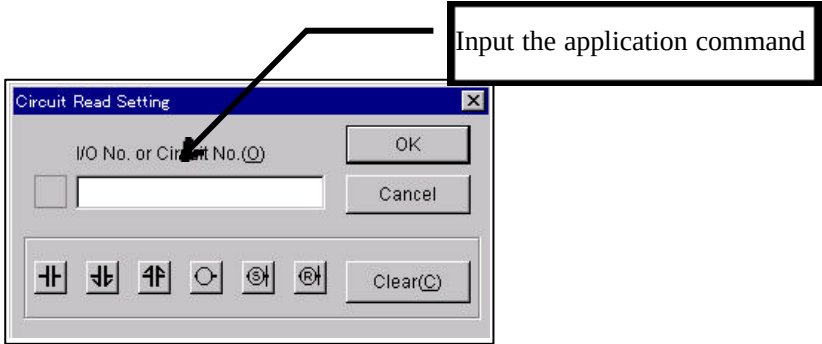
(1) Application Command Specifying Read

< Application Command Table >

No.	Application Command (possible to specify)
1	CEND
2	INT n (n=0-31)
3	RTI
4	END
5	FUN n (n=0-255)
6	RSRV n (n=0-255)
7	START n (n=1-16)
8	FOR n (n=0-49)
9	SB n (n=0-49)
10	LBL n (n=0-255)
11	RTS

The operation is same process as the specification read of I/O No..

Input the application command to [I/O No. or Circuit No.] after specifying the symbol.



< Dialog box of [Circuit Read Setting] >

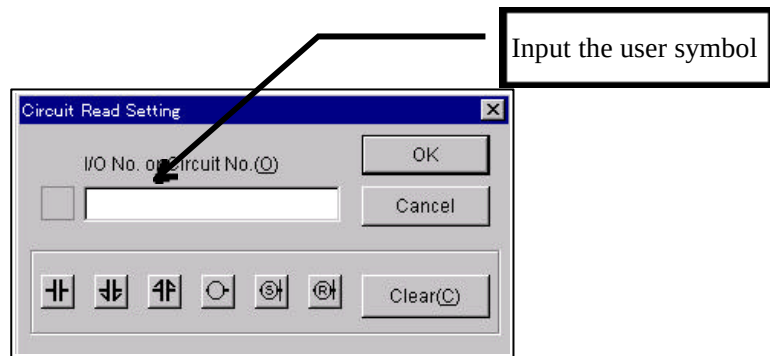
Other functions are same as the specification read of I/O No..

After reading the circuit, when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with  icon, or the [Ctrl + K] key.

(2) User Symbol Specification Read

The operation is performed as same process as the specification read of I/O No..

After specifying the symbol, input the user symbol to [I/O No. or Circuit No.].



< Dialog box of [Circuit Read Setting] >

Other functions are same as the specification read of I/O No.

After reading the circuit, when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with  icon, or the [Ctrl + K] key.

(Caution)

- When changing the I/O No. display into the user symbol display, change “I/O No. Display” into “User Symbol Display” in **[Display]** from **[Environment]** in the **[Edit]** menu.
- When display is “I/O No. Display”, it displays the circuit which uses the I/O No. corresponds to the specified user symbol.
- Please refer to 4.5.1, “User Symbol/I/O Comment” about more details of the input/edit of the user symbol.

4.6.7 Multiple Circuit Specification Read

It can be read and displayed the specified circuit once by specifying
Maximum 8 numbers of circuits can be specified.

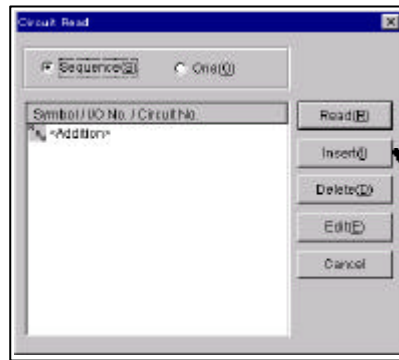
Operation Method

- (a) It displays the dialog box of the circuit read by choosing **[Edit] - [Circuit Read]**, or clicking



icon.

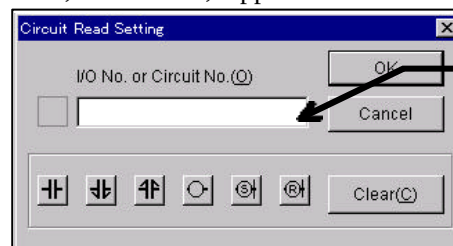
Click the [Insert] button.



Click the insert

< Dialog box of [Circuit Read] >

- (b) Input the Read Setting (I/O No., Circuit No., Application Command, Symbol).



Input the read setting

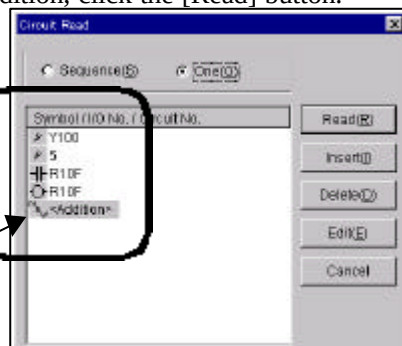
< Dialog box of [Circuit Read Setting] >

To clear the symbol, click the [Clear] button.

If clearing other than the symbol, press the [Delete] key or [Back Space] key (It can not clear with the [Clear] button).

- (c) It returns to the dialog box of '(a)', and displays the input read setting, so click [Insert] again. It input the read setting.

- (d) After inputting all read condition, click the [Read] button.



Read setting

After reading the circuit, when clicking **[Edit] - [Continuous Circuit Read]**, it continuously reads from the position before read. It is possible to execute with icon, or the [Ctrl + K] key.

4.6.8 Memory Circuit Read

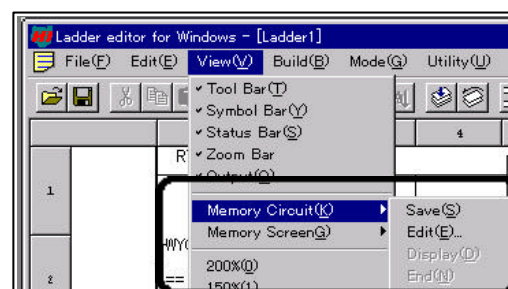
This is the function only limit to the Ladder display screen. It won't display on the instruction word screen. It memorizes maximum 16 specified circuits, then read and display according to the necessity. And, it is possible to edit the memorized circuit.

“M” is displayed right next to the circuit No. of the memorized circuit.

< Memory Circuit Read Function Table >

Save	It memorizes the circuit with the circuit display cursor
Edit	It adds/deletes the memorized circuit No.
Display	It displays the memorized circuit
End	It ends the memory circuit display

Choose **[Memory Circuit]** in the **[View]** menu at the edit screen.

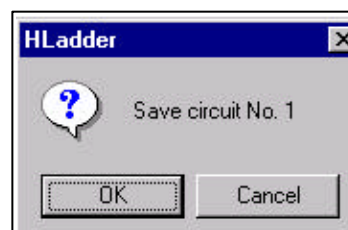


< Menu of Memory Circuit >

(1) Basic Operation

(a) Save

Choose **[Save]** from **[Memory Circuit]** in the **[Edit]** menu after move a cursor on the circuit to save.



< Dialog box of Memory Circuit Read >

It specifies the circuit No. with the cursor on. When clicking [OK], it saves the circuit No. and closes the dialog box. When clicking [Cancel], it finishes the process without saving.

(b) Display

Choose **[Display(D)]** from **[Memory Circuit]** in the **[View Menu]**. It displays the maximum 16 circuits which are memorized at that time.

Can not Choose **[Display(D)]** if there is no memory circuit.

(c) End

Choose **[End]** from **[Memory Circuit]** in the **[View]** menu while displaying the memory circuit. It ends the display of the memory circuit.

(Caution)

- When executing the specification read of Circuit No. or Application command while displaying the memory circuit, it ends the memory circuit display and changes to the normal continuous circuit read. But, “M” next to the circuit No. still remains.
- Can not execute the circuit edit in the condition of the memory circuit display. Return to the normal continuous circuit read and execute the circuit edit.

(2) Edit of Memory Circuit

It edits (add, delete, renewal) of the memorized circuit No..

Add	Add and Insert the memorized circuit No.
Delete	Delete the memorized circuit No.
Renewal	Overwrite to the memorized circuit No.

The dialog box of Memory Circuit Read opens by choosing **[Edit]** from **[Memory Circuit]** in the **[View]** menu.

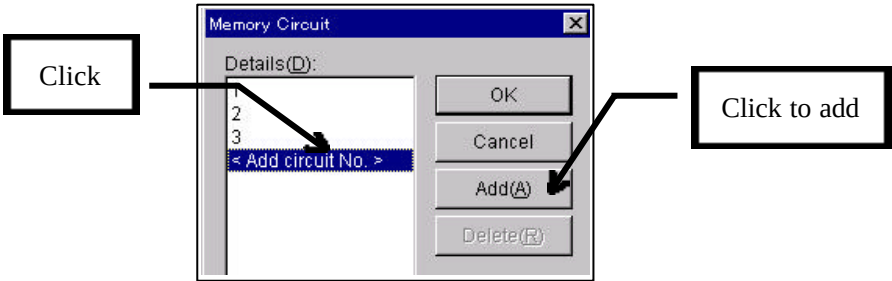


< Dialog box of Memory Circuit >

(a) Add

After clicking the “< Add Circuit No. >” or the circuit No. in Memory Circuit dialog box, click the [Add] button

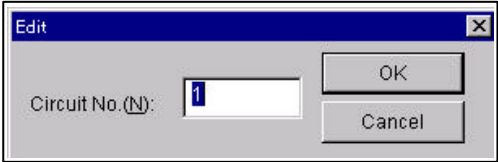
It opens the Edit dialog box.



Input the circuit No. and click the [OK] button in Edit dialog box.

It returns to the previous screen when click the [Cancel] button.

It adds the input circuit No. to the selected “< Add Circuit No. >” or before(upper) the circuit No..



< Dialog box of Edit of Memory Circuit Read >

(b) Deletion

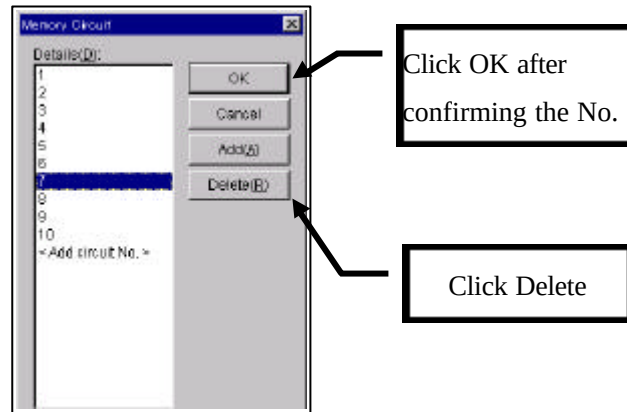
Click the circuit No. to delete at the dialog box of Memory Circuit.

When clicking the [Delete] button, it disappears from the screen.

When deleting several circuit No., repeats the operation.

Click the [Cancel] button to stop deleting.

However the No. disappears from the screen by the [Delete] button, it memorized by the [OK] button, so make sure to click the [OK] button after changing.



(c) Renewal

Double clicking the renewal circuit No. at Memory Circuit

When it displays the dialog box of Memory Circuit, renew the circuit No. and click the [OK] button.



It displays the renewal circuit No., so after confirming it click the [OK] button.

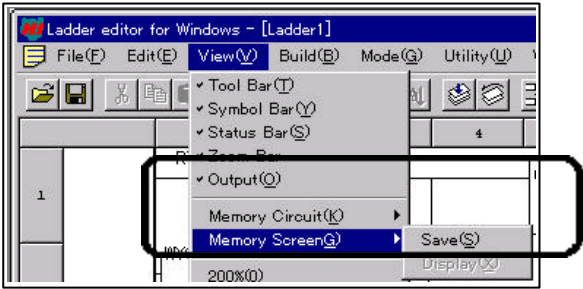
4.6.9 Memory Screen Read

This is the function only limit to the Ladder display screen. It won't display on the instruction word screen. It memorizes the screen which has the specified circuit No. at the top, then display according to the necessity.

“D” is displayed right next to the circuit No. of the memorized circuit.

Save	It memorizes the screen include the circuit with the circuit display cursor
Display	It displays the memorized screen

Choose **[Memory Screen]** from the **[View]** menu.

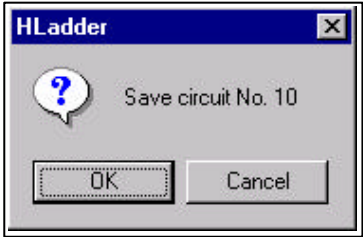


< Menu of Memory Screen >

(1) Save of Screen

Move the cursor to the memorized circuit.

Choose **[Save]** from **[Memory Screen]** from the **[View]** menu.



< Dialog box of Memory Screen >

It specifies the circuit No. with the cursor on. When clicking [OK], it saves the circuit No. and closes the dialog box. When clicking [Cancel], it finishes the process without saving.

(2) Display of Memory Screen

Choose **[Display(X)]** from **[Memory Screen]** in the **[View(V)]** menu.

It displays the memorized screen from the specified circuit No. as the top.

Can not choose **[Display(X)]** when the screen is not memorized.

Chapter 5 Utility

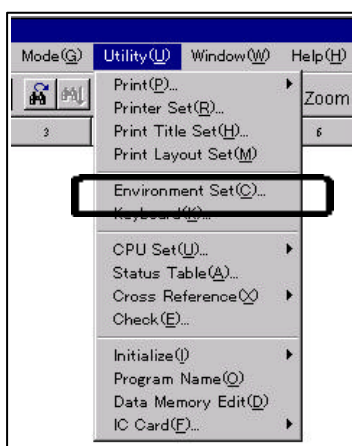
Please refer to Ch. 8, "Printout" about **[Print]**, **[Print Title Setting]**, **[Print Layout Setting]** in the **[Utility]** menu.

5.1 Environment Setting

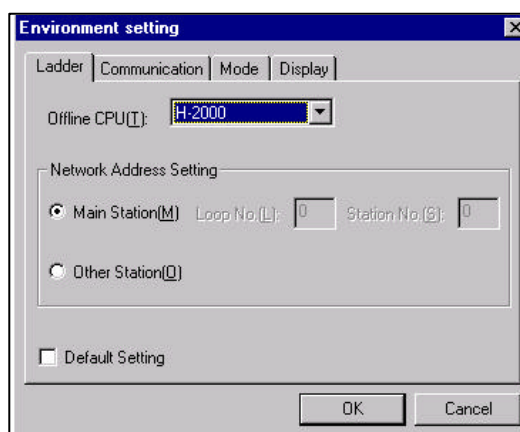
< Function Table >

Class	Function Name	Contents
Ladder	Offline CPU type	Select the CPU type
	Network address setting	Set the loop No. and the station No. of Home or Other station
Communication	CPU interface	RS-232C (19.2k bps)
		RS-232C (4.8k bps)
		Ethernet
	Communication port	Set the communication port in case of RS-232C
	Host name	Input the host name in case of Ethernet
	Port No.	Input the logical port No. in case of Ethernet
Mode	Programming mode	Select H series programming or Source programming.
	Display mode	Select Ladder or Instruction word
	Process box display mode	Select the display size of Processing box -----Zoom display/1point width display
Display	I/O No./User symbol display switch	Select I/O No. display or User symbol

It displays the dialog box of Environment Setting by choosing **[Environment Setting]** in the **[Utility]** menu.



< Item of Utility menu >

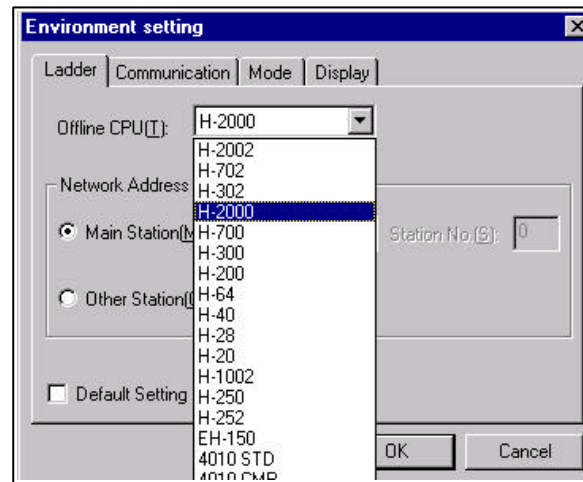


< Dialog box of Environment Setting >

(1) Setting of [Ladder] menu

(a) Offline CPU type setting

Select the CPU type

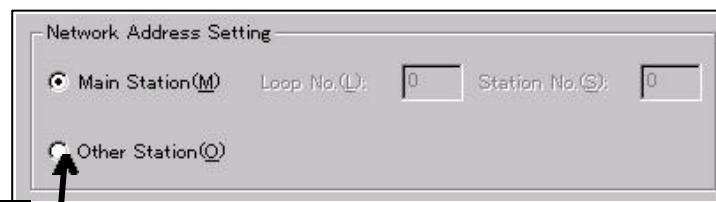


< Classification of Offline CPU >

Click  at the right of [Offline CPU] to display Offline CPU types, and select the type from there.

(b) Network Address Setting

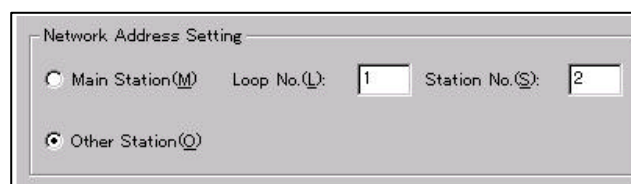
Set the loop No. and the station No. of Home or Other station.



< Selection of Home or Other >

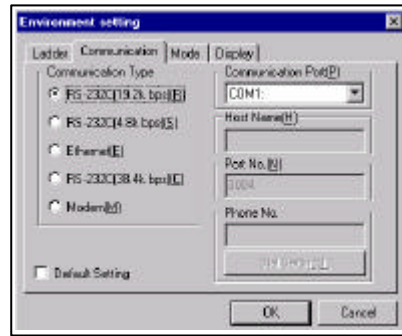
Select each radio button
with the mouse

When select [Other], the loop No. (1-2) and the station No. (0-63) can be input.



< In case of Other selection >

(2) Setting of Communication menu (Set with Offline mode)

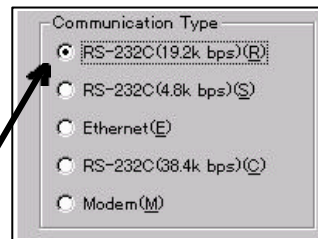


< Communication item of Environment Setting >

(a) Communication Type

Select the CPU interface .

Select each radio button
with the mouse

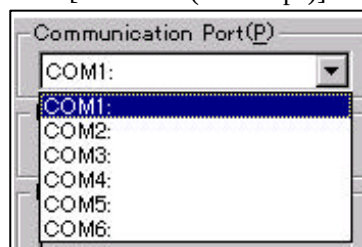


< Selection of Communication type>

(note) The special cable need for each 19.2k bps and 4.8k bps.

(b) Communication Port

Set [Communication Port] when choose [RS-232C (19.2k bps)] or [RS-232C (4.8k bps)].



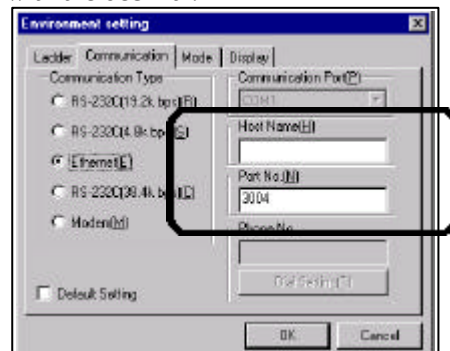
< Selection of Communication Port >

Click  at the right of [Communication Port] to display the pull down menu of the communication port type, and select the communication port from there.

(c) Host name, Port No.

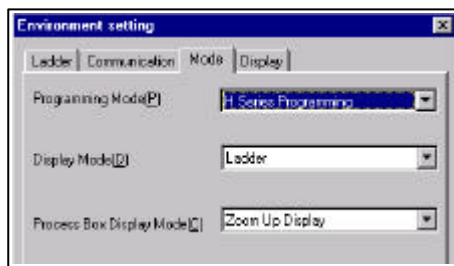
Input [Host Name] and [Port No.] directly when choosing[Ethernet].

Input the logical port No. with the decimal.



The environment setting of the peripheral device and the computer need to execute Ethernet communication. Please refer to “Appendix 6, Connect with Ethernet Module”.

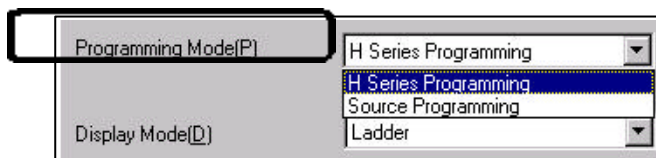
(3) Setting of Mode menu



< Items of Environment Setting mode >

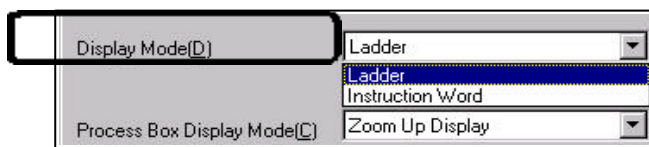
Click  at the right of each mode to display the pull down menu, and select the mode from there.

- (a) Programming Mode: It set the programming form. Specify “H series programming” normally. Please refer to Ch. 10, “Method of Source Programming” for “Source Programming”.



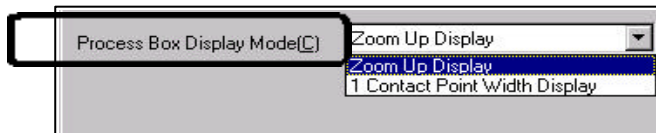
< Selection of Programming Mode >

- (b) Display Mode: Set the programming language.



< Selection of Display Mode >

- (c) Processing Box Display Mode: Set the display size of Processing Box (Zoom/1 contact point width)



< Selection of Processing Box Display Mode >

(Caution)

- When running a program which include the processing box possible to program only in “1 contact point width display” mode, using more than 5 contact points for the condition of startup, on the peripheral device except LADDER EDITOR for Windows®, it becomes the read error, and can not display the object circuit or all circuit. Please refer to “Ch.5, Hint for Programming” for more details of “1 contact point width display” mode.

(4) Setting of Display

Select either I/O No. or User Symbol display

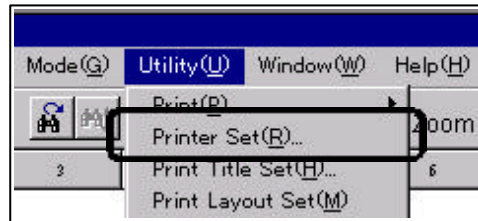
Click  to display the pull down menu, and select the display type. But, it can not operate the Ladder circuit window when User Symbol Display is specified.



< Display of Environment Setting >

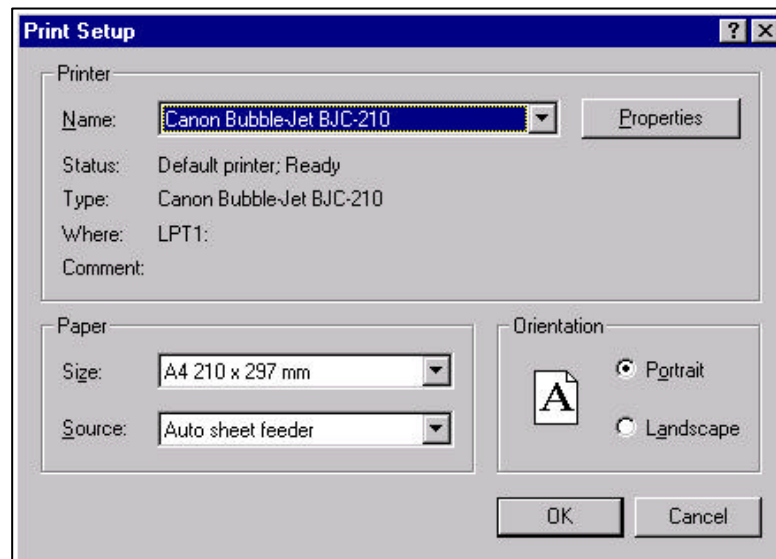
5.2 Printer Setting

It display the dialog box of Print Setting by choosing **[Printer Set]** in the **[Utility]** menu.



< Item of Utility menu >

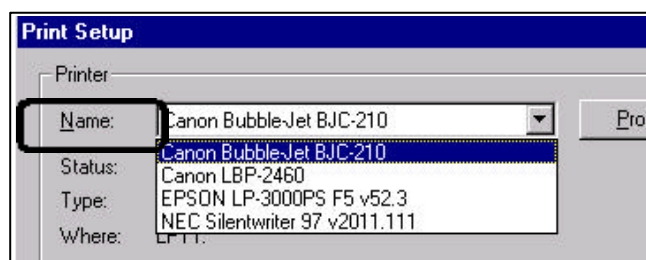
Setting the condition of the printer.



< Dialog box of Printer Setting >

(1) Selection of Printer model name

(a) [Name]: It displays the printer model name.

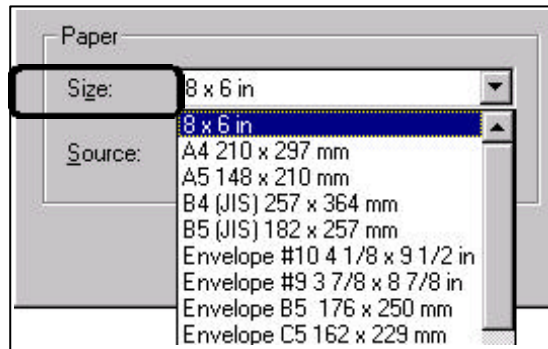


< Selection of Printer model name >

Click  at the right of [Name] to display the pull down menu and select the model name of the printer which the driver is installed in the personal computer

(2) Selection of Paper

(a) [Size]: Set the paper size of the printer.



< Selection of Size >

Click  at the right of [Size] to display the pull down menu of the printer paper size, and select the paper size from there.

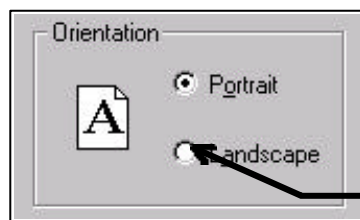
(b) [Add Paper]: Set the method to add the printer paper.



< Methods to supply paper >

Click  at the right of [Add Paper] to display the pull down menu of the method to supply printer paper.

(c) Direction of Print



Select each radio button with the mouse

< Selection of Print Direction >

Select the print direction [Vertical], [Horizontal] by the radio button.

(Caution)

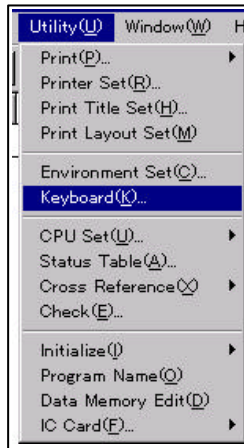
- If the Ladder program is lacking in the print possible range for the horizontal direction, the print format sometimes becomes different from the display of screen.

5.3 Keyboard Setting

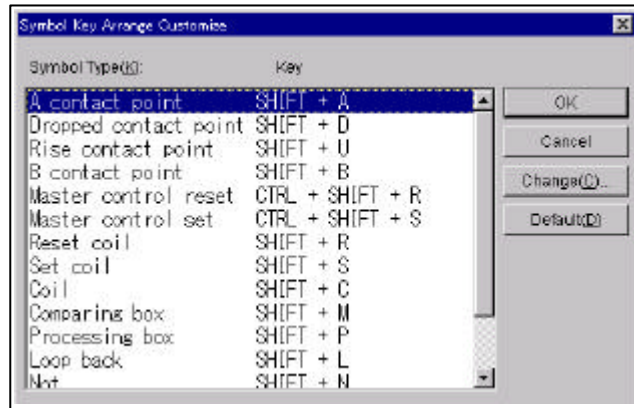
Set the entry of the short cut key to input the symbol at the Ladder program.

Choose **[Keyboard]** in the **[Utility]** menu.

It displays the dialog box of [Symbol Arrange Key Customize].



< [Utility] menu >



< Dialog box of Symbol Arrange Key Customize >

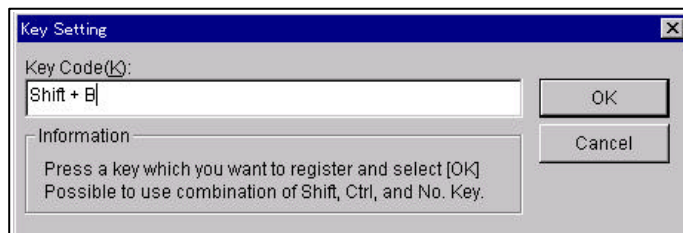
- [OK] It makes the change of the key setting effective.
- [Cancel] Close the dialog box.
- [Change] It changes the key setting.
- [Default Setting] It returns to the default key setting (default value at the install).

(1) Example of the change

Change the key setting of B contact point from [Shift + B] to [Shift + Z].

Select B contact point from the dialog box of Symbol Arrange Key Customize, click [Change].

It displays the dialog box of the key setting.



< Dialog box of Key Setting >

Press the [Shift] and the [Z] key simultaneously, and click [OK].

Click [Cancel] to stop registering the key setting.

It returns to the dialog box of Symbol Arrange Key Customize, click [OK].

(Caution)

Do not set the key setting as same setting as (Ctrl + F4) and the short cut key assigned for each menu.
There is no guarantee for the operation if the key is set like it.

5.4 CPU Setting

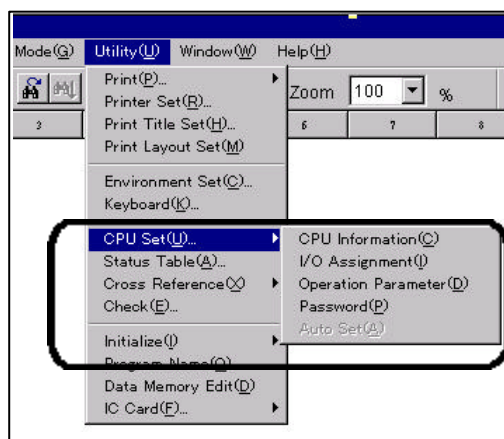
Creating the program, or setting “Parameter” which need to transfer the program to the CPU.

It needs to set part correctly at the minimum when transferring the program.

When a memory cassette is ROM memory, it can not write the setting contents to the CPU.

CPU Information	Memory Cassette/ Ladder Assignment (note1)	Set the memory capacity and the percentage of the Ladder program area to the CPU.
	Retention memory range	Set either maintain or not the data of internal CPU specific area when OFF/RUN the power of the CPU. (R,WR,WM,TD,DIF,DFN)
I/O Assignment		It assigns the CPU actual I/O assignment information to the PC memory.
Operation Parameter		It assigns each condition at the running of the CPU and the link area at the using of the CPU link module.
Password		It registers the password (4 digits in the hexadecimal) to the program.
Auto-Setting		Read the data about the CPU from the online connected CPU, and set it to the PC memory.

Choose **[CPU Set]** in the **[Utility]** menu. Choose the menu to display the dialog box for each setting.



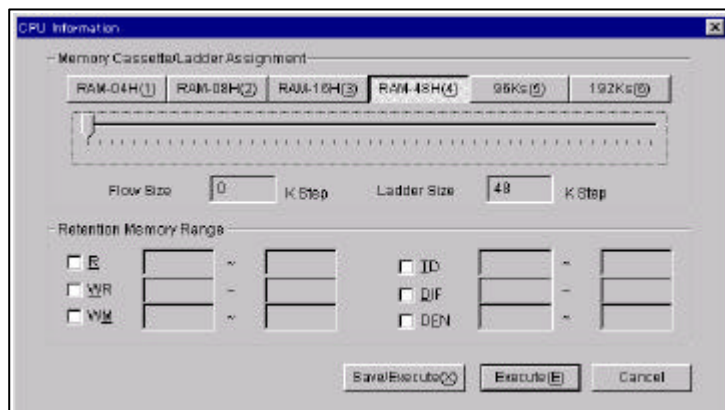
< Menu of [CPU Set]>

(1) CPU Information

Creating the program, or setting “Parameter” which need to transfer the program to the CPU. Set the memory capacity and the percentage of the Ladder program area to the CPU to be programmed.

Choose **[CPU Information]** from **[CPU Set]** in the **[Utility]** menu.

It displays the dialog box of CPU Information.



< Dialog box of CPU Information >

- [Memory Cassette] Make sure to select with the capacity of memory cassette to use.
If the setting is not unmatched, “31 error” occurs when making it ROM memorize.
- [Ladder Assignment] Move a lever to right and left by dragging a mouse. Move right to make the flow size larger, and move left to make the ladder size larger. It move bigger by clicking the right/left of the lever.
- [Retention Memory Area] Click the check box of I/O Type to memorize the data, and input the range of I/O Type. Even if the range is input, it does not be executed if there is not check mark in the box.
- [Execute] Memorize the CPU information to the PC memory.
- [Entry/Execute] It writes the CPU information to the PC memory and also registers to the registry of Windows. The setting becomes effective even initialize the program.

< Possible Range of Retention Memory >

(a) In case of H-302/702/1002/2002, H-300/700/2000

R 0 - 7BF	It can be set with no relation to the memory cassette to use
WM 0 - 3FF	
TD 0 - 511	
DIF 0 - 511	
DFN0 - 511	
WR 0 - 3FF	RAM-04H, RAM-08H, RAM2-04H, RAM*-08H
WR 0 - 43FF	RAM-16H, RAM*-16H, ROM-16H, ROM2-16H
WR 0 - C3FF	RAM-48H, RAM*-48H, RAM2-48H

(b) In case of H-200/250/252B/C, H-20-64, EH-150

R 0 - 7BF	It can be set with no relation to the CPU to connect.
WM 0 - FF	H-200, H-20-64
WM 0 - 3FF	H-252B/C, H-250, EH-150
TD 0 - 511	It can be set with no relation to the CPU to connect.
DIF 0 - 127	H-200, H-20-64
DIF 0 - 511	H-252B/C, H-250
DFN0 - 127	H-200, H-20-64
DFN0 - 511	H-252B/C, H-250
WR 0 - 3FF	H-200, H-20-64, H-250
WR 0 - FFF	EH-150(EH-CPU104)
WR 0 - 1FFF	EH-150(EH-CPU208)
WR 0 - 43FF	H-252B/C

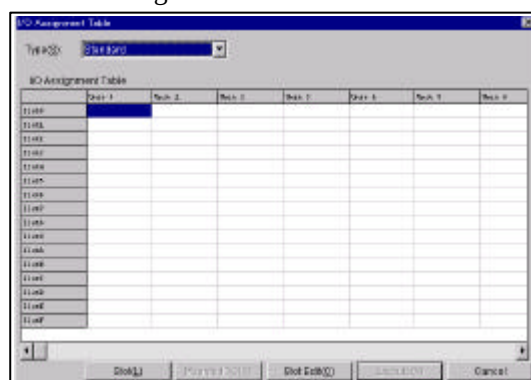
It does not become an error if the setting over the range indicated above. But the it always becomes 0 (zero) for the over value.

(2) I/O Assignment

It assigns the I/O assignment information which set on the CPU to the PC memory.

Choose **[I/O Assignment]** form **[CPU Set]** in the **[Utility]** menu.

It displays the dialog box of the I/O assignment table.



< Dialog box of I/O Assignment Table >

[Type] It displays the pull down menu by clicking  at the right. Select the standard, or the remote master station 1 to 4.

[Execute] It writes the displayed assignment to the PC memory.
The button becomes an active when setting the assignment data at the “Assignment Setting” dialog box.

[Cancel] Stop processing without setting the assignment.

[Slot] It displays the dialog box of the slot setting condition.

[Mounted I/O] It reads the I/O which is mounted on the CPU in the online mode.

[Slot Edit] It displays the dialog box of the slot edit.

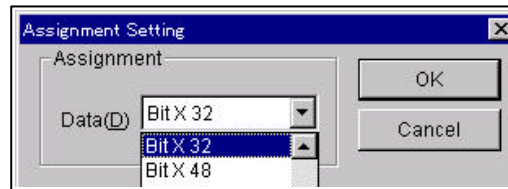
(Caution)

When executing the I/O assignment in Setting, Copy, or Mounted I/O Read, make sure to click [Execute] in the dialog box of “I/O assignment table” to write the I/O assignment to memory.

(a) Direct Setting in I/O Assignment Table dialog box

Choose the standard or the remote master station in the [Type] of I/O Assignment Table dialog box, and double click the cell (unit No., slot No.) to set, or select the cell and press the [Enter] key.

When it displays the dialog box of the assignment setting, click  to select the assignment data.



< Dialog box of Assignment Setting >

It is set by the [OK] button. The [Cancel] button to stop the setting process.

(b) Setting in Slot Setting Condition dialog box

It displays the dialog box of the slot setting condition by clicking [Slot] after selecting the standard or the remote master station in the [Type] of I/O assignment table dialog box.

I/O assignment can be executed by the same method as the I/O assignment table dialog box by the slot image.

After selecting [Unit] (0 - 9), click the setting slot or select the slot and press the [Enter] key. When the assignment setting dialog box is displayed, click  and select the assignment data.



< Dialog box of Slot Setting Condition >

After setting, click the [Close] button.

Click the [Execute] button at the I/O assignment table dialog box.

(c) Reading of Mounted I/O

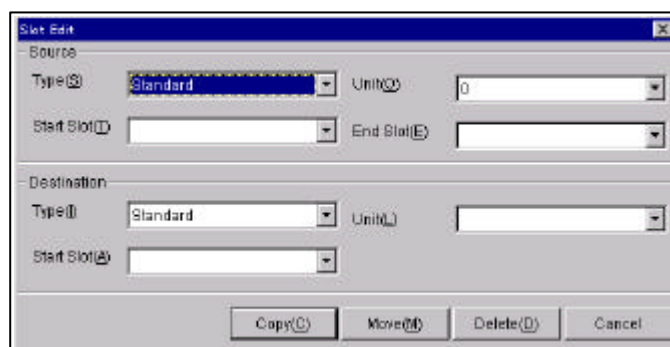
When clicking the [Mounted I/O] button of the I/O assignment table dialog box in the online mode, it reads the I/O assignment which is mounted on the CPU. When the I/O assignment is displayed on the screen, click the [Execute] button.

(Caution)

It does not support the mounted I/O reading in the extended I/O, H-200/250/252B/C of H-20 - 64.

(d) Slot Edit

When clicking the [Slot Edit] button of the I/O assignment table dialog box, it displays the slot edit dialog box.



< Dialog box of Slot Edit >

[Source]	It specifies the range (type, unit, start slot, end slot) of the I/O assignment to copy.
[Destination]	It specifies the type and the unit of the destination, and in “Start Slot”, it specifies the start slot of the destination.
[Copy]	It executes the copy. The original copy remain.
[Move]	It executes the movement. The operation is same as Cut and Paste
[Delete]	Delete the original copy.

(Caution)

(1) Treatment of Unused Slot

Assigns the unused slot as [Empty Slot].

(a) Assign as “Empty 0 point”

If the slot is assigned as “Empty 0 point”, the object slot becomes a blank.

Can not use the external input/output of this slot when creating a program.

The CPU does not take in and out the input against to the slot.

Also it can not use as the internal output.

(b) Assign as “Empty 16 point” - “Empty 128 point”

When creating a program, the external input/output correspond to this slot can be used as the internal output. Can not be used a the external input/output.

The CPU operates as the internal output to the I/O No. correspond to the slot.

(c) In case of H-200/250/252B/C, H-20-64, EH-150

The input/output No. shift to the next if the empty slot is not assigned as “Empty 16 point”.

Make sure to assign “Empty 16 point” in the empty slot.

(2) Mounted I/O reading of Remote substation

Execute the mounted I/O read of the remote substation as following method.

(a) In case that the remote master station is I/O assigned in the CPU

The mounted I/O assignment information of the remote substation can be read by executing [Mounted I/O].

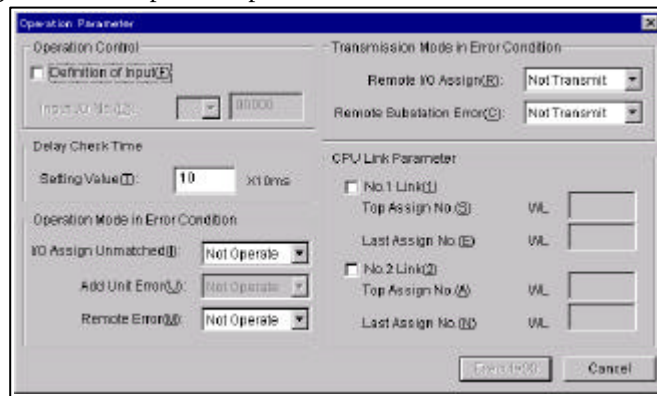
(b) In case that the remote master station is not I/O assigned in the CPU

Execute the assignment of the remote mater station by **[Utility] - [CPU Setting] - [I/O Assignment]** first, and after transferring the assignment information to the CPU, read the mounted I/O assignment information.

(3) Operation Parameter

Choose **[Operation Parameter]** from **[CPU Set]** in the **[Utility]**.

It displays the dialog box of the operation parameter.



< Dialog box of Operation Parameter >

Click [Execute] after setting each item.

(4) Password

Execute the entry/reset of the password.

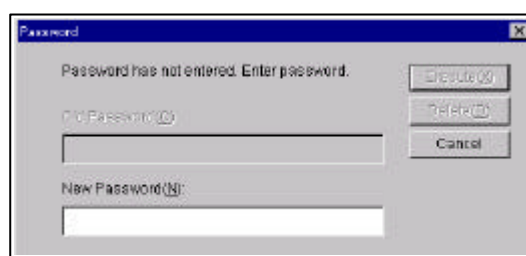
A password (4 digits in the hexadecimal) can be registered by a program file unit.

Use the password when you want to protect the secret file. The program which has the password can not be seen on the screen and can not be printed.

Renewal Entry

Choose **[Password]** from **[CPU Set]** in the **[Utility]**.

It displays the dialog box of Password



< Dialog box of Password >

Input the password (4 digits in the hexadecimal) to the [New Password], then click [Execute].

It displays the confirming message, click the [OK] button.

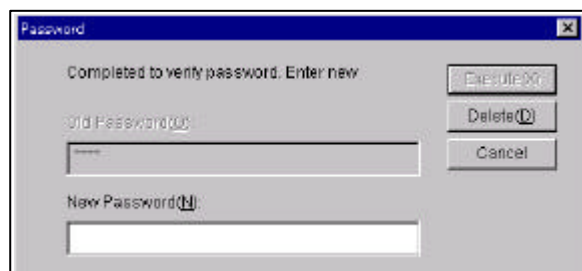
The Ladder program disappear (or Command program) from the screen.

Change of Password

After registering the password, when choosing **[Password]** from **[CPU Set]** in the **[Utility]** menu, the contents of dialog box changes to the bellow.



When inputting the registered password, it becomes the dialog box of the verification.



Input the new password, and click the [Execute] button.

Reset of Entry

It reset the password when clicking in order of [Delete], [Execute] in the dialog box of the verification. When it displays the confirming message, click the [OK] button.

(Caution)

1. The program can not be displayed and read, add/modify/delete, monitor, etc., if the password is incorrect. So, do not forget the password.
2. The program can not be displayed and printed if the password is incorrect even if it read from the CPU to PC.

(5) Auto-Setting

Read the data of the CPU setting from the online connected CPU, and set to the memory of the PC automatically. Each data can be selected from Auto-Setting /Not Auto-Setting.

Choose **[Auto-Set]** from **[CPU Set]** in the **[Utility]** menu.

It displays the dialog box of Auto-Setting

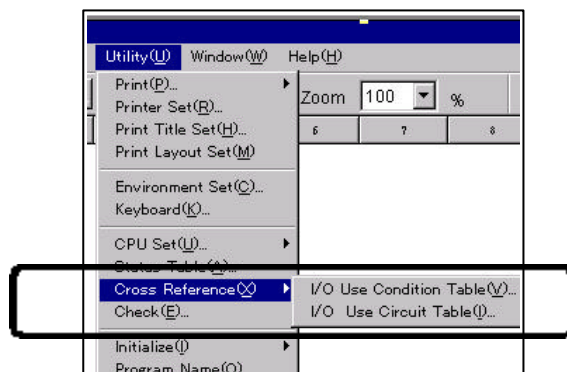


< Dialog box of Auto-Setting >

After selecting Auto-Setting or Not Auto-Setting for each data, click the [Execute] button. It reads the data from the CPU.

5.5 Cross Reference

It searches the I/O used in the Ladder program.



< Item of [Utility] menu >

(1) I/O Use Condition Table

It searches whether the specified I/O is used or not in the program, and displays the result.



< Dialog box of I/O Use Condition Table >

(a) Search Contents

Do not output	Do not search.
Used I/O	It searches the I/O using in the Ladder program.
Unused I/O	It searches the I/O not using in the Ladder program.
All I/O	It searches all range of object I/O type and display the “*” mark at the left of the using I/O.
[OK]	Start searching.
[Cancel]	Close the dialog box of the cross reference.

When selecting other than “Not Output”, you can specify the searching range. If the range is not specified, all I/O of the selected type becomes the object range. When specifying the only one side of the box, the specified 1 point becomes the object.

(Caution)

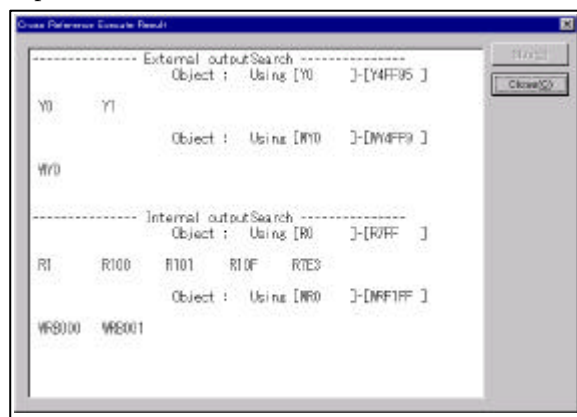
Input also the I/O type when specifying the range with DIF, DFN, MCS, and MCR.

Ex.) DIF0 - DIF50

(b) Search I/O Type, I/O No. Specification Possible Range

External	X0 - X4FF95	WX0 - WX4FF9	DX0 - DX4FF8
I/O	Y0 - X4FF95	WY0 - WX4FF9	DY0 - DX4FF8
Internal	R0 - R7FF	WR0 - WRF1FF	DR0 - DRF1FE
Output	L0 - L13FFF	WL0 - WL13FF	DL0 - DL13FE
	M0 - M3FFF	WM0 - WM3FF	DM0 - DM3FE
Timer/ Counter	TD0 - TD255	CU256 - CU511	CL0 - CL511
	TC0 - TC511		
DIF/ DFN	DIF0 - DIF511		DFN0 - DFN511
Master Control	MCS0 - MCS49		MCR0 - MCR49
Control Command	END	CEND	FREE
	RTS	RTI	SB0 - SB99
	CJMP0 - CJMP255		CAL0 - CAL99
	FOR0 - FOR49		RSRV0 - RSRV255
	NEXT0 - NEXT49		LBL0 - LBL255
	INT0 - INT31		START1 - START16
	JMP0 - JMP255		FUN0 - FUN255

Example of Search Output

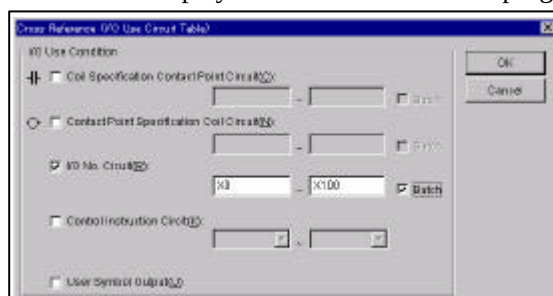


< Execution result of Cross Reference >

- [Stop] Stop searching a while.
 When clicking [Stop] while searching, the button change to [Restart].
 When clicking [Restart], it start searching again, and the button back to [Stop].
- [Close] Close the dialog box.

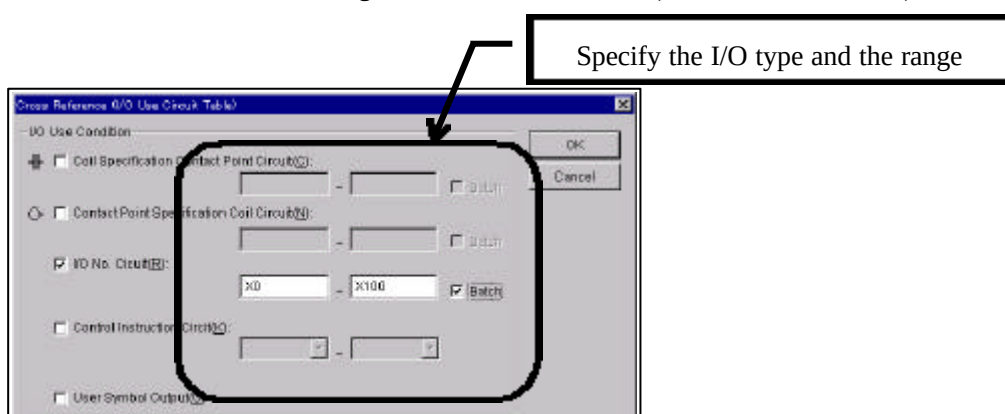
(2) I/O Use Circuit Table

It searches the specified I/O and displays where it is used in the program.



< Dialog box of Cross Reference (I/O Use Circuit Table) >

Coil Specify Contact	It specifies the I/O No. to be used as the output, and displays Point Circuit the circuit No. which the I/O is used as the contact point or the comparing box.
Contact Point	It specifies the I/O No. to be used as the output, and display the Specify Coil circuit No. which the I/O is used in the left side of the coil and the comparing Box.
I/O No. Circuit	It specifies the I/O No. and displays the circuit No. which the I/O is used for the contact point/coil/processing box separately.
Control Command	It specifies the control command, and displays the circuit No. Circuit which the command is used.
User Symbol Output	The user symbol is output in the output result.
[OK]	Start searching.
[Cancel]	Close the dialog box of Cross Reference (I/O Use Circuit Table).



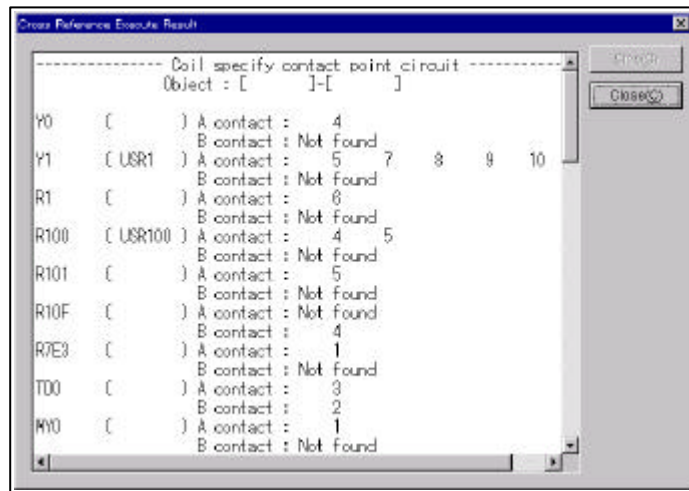
< Dialog box Cross Reference (I/O Use Circuit Table) >

When putting a check mark in “Batch”, if the range specified I/O is the bit/word common use I/O, it searches I/O related to.

Ex. Range specify: X0 - X100

Search object: X0 - X100, WX0 - WX10, DX0 - DX10

Example of Coil Specify Contact Point Circuit



< Execution result of Cross Reference >

[Stop] Stop searching a while.

When clicking [Stop] while searching, the button change to [Restart].

When clicking [Restart], it start searching again, and the button back to [Stop].

[Close] Close the dialog box

I/O which possible to specify

Search Type	Bit	Word	Double Word
Coil specify contact point circuit	Y, R, L, M, TD	WY, WR, WL, WM	DY, DR, DL, DM
Contact point specify coil circuit	Y, R, L, M, TD	WY, WR, WL, WM	DY, DR, DL, DM
I/O No. circuit	X, Y, R,L, M, TD, CL, DIF, DFN, MC	WX, WY, WR, WL, WM, TC	DX, DY, DR, DL, DM
Control command circuit	END, CEND, FREE, LBL, FOR, SB, RTS, START, INT, RTI, FUN, CAL, RSRV, JMP, CJMP, NEXT		

It searches All I/O type and I/O No. if the I/O range is not specified.

When specifying the only one side of the box, the specified 1 point becomes the search object.

5.6 Check

It checks whether the program on the memory is correct or not. And also, it checks whether the CPU self-check and a program on the CPU memory is correct or not.

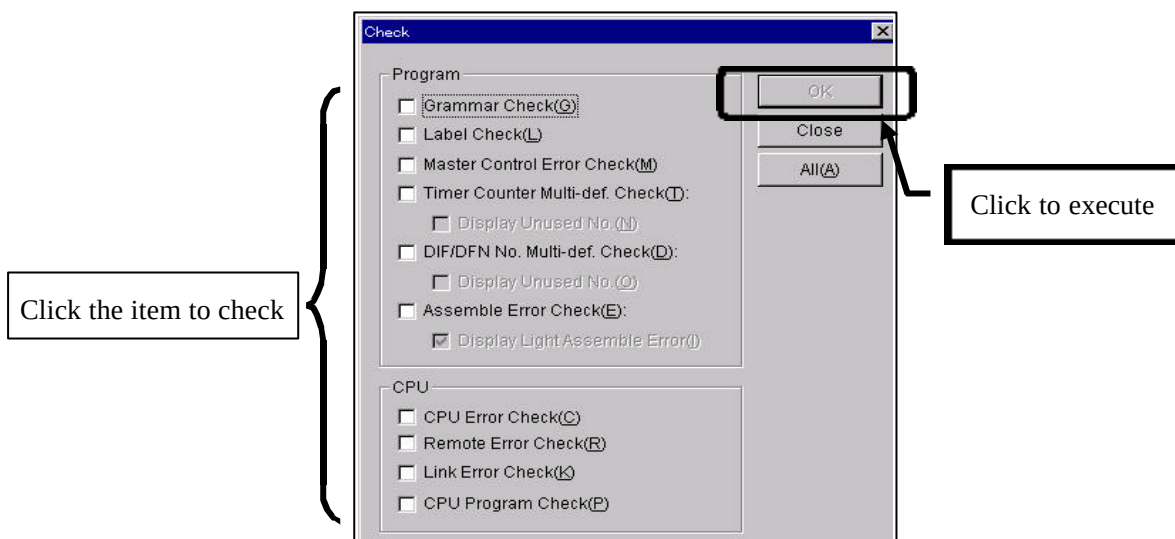
< Error Check Table >

Function name		Description
All item check		Check all the check items indicate bellow.
Program	Grammar check	Check the grammar of the program by 1 circuit unit through all the circuits.
	Label check	Check whether a label No., used in Processing Box, is used other place in the program or not. Or, check a label No. which is not defined in the program.
	Master controller check	Check a combination of a master control (No. of MCS, MCR is used in pair or not) or depth of a nest is correct or not.
	Timer/Counter multiple definition check	Check whether timer/counter No., used in Processing Box, is used other place in the program or not. It displays the unused No. table by setting ON a display check box. It won't display if DIF, DFN are not used.
	DIF/DFN No. multiple definition check	Check whether each DIF No., DFN No. is duplicated in a program or not. It displays the unused No. table by setting ON a check box of unused No. display. It won't display if DIF, DFN are not used in a program.
	Assemble error check	Check whether the external input/output I/O (X, Y, etc.) correspond to the I/O assignment table correctly or not. It is possible to select display or hide of the light assemble error display.
CPU	CPU error check	Execute the CPU self-checking
	Remote error check	Execute the remote module self-checking
	Link error check	Execute the CPU link module self-checking
	CPU program error check	The CPU check a program on a memory by a direction of the peripheral device

(note) Can not check the CPU in the offline mode.

(1) Basic Operation

Choose **[Check]** in the **[Utility]** menu. It opens the dialog box of the error check.



< Dialog box of Error Check >

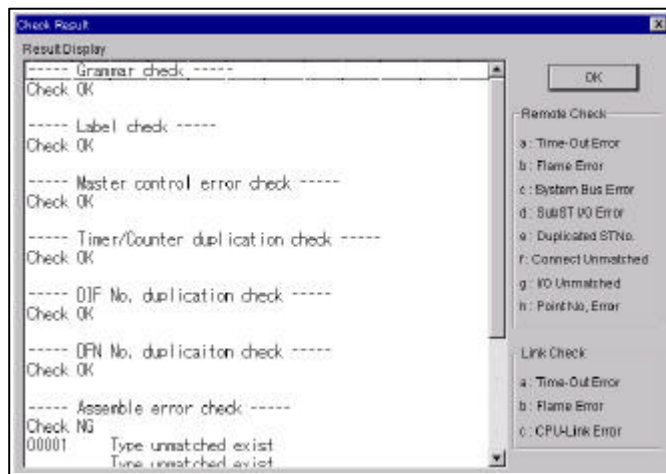
Select each item to execute the error check. Click the check box or the item name with the mouse.

Click the [All Item] button to make all the check items ON.

Click the [Execute] button to start checking.

Click the [Close] button to close the window.

After complete checking, it opens the dialog box of result display.



< Result display of Check >

To move the screen down, click the right scroll bar with the mouse.

Close the dialog box of result display by pressing the [OK] button.

About the Assemble Error

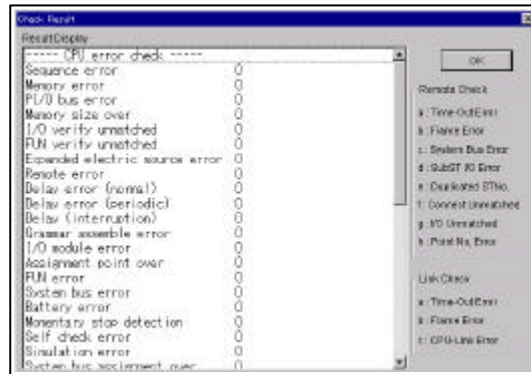
The error occurs if the I/O assignment is different from the I/O use condition.

Correct rightly the I/O assignment or the I/O No. in the program.

Error type	Error message	Error description
Light assemble error	Type Unmatched	A program is made using Y, WY (X, WX), but corresponding I/O assignment is DX(DY).
	Type Unmatched (D Word)	A program is made using DY(DX), but corresponding I/O assignment is DX(DY).
Serious assemble error	Undefined Number	A module like Link, Remote or BASIC is assigned to I/O assignment point corresponding X, WX(Y,WY) used in program. Or nothing is assigned to the point.
	Undefined Number (D Word)	A module like Link, Remote or BASIC is assigned to I/O assignment point corresponding DY(DX) used in program. Or nothing is assigned to the point
	Input I/O No. Error	A program is made with I/O type as bit Y, but “Assignment input module” has already assigned in I/O assignment position correspond to Y

(2) CPU Error Check

Execute the self-checking of the CPU.



< Result display of CPU error check >

O : No error

X : Error

(Caution)

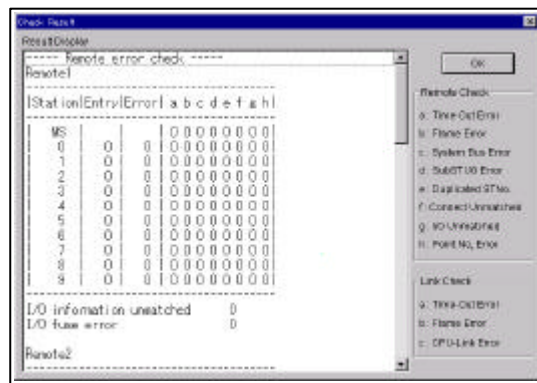
It displays the result of the error which the CPU detects before.

To display the last error, set "R7EC" to "1" in the force set/reset in the monitor function and execute the CPU error check

(3) Remote Error Check

Execute the self-checking of the remote module

It displays the error information from Remote 1 to Remote 4



< Result display of Remote Error Check >

[Station] Station No. (Master: Master Station, 0 - 9 : Substation)

[Participate] Display "O" at the No. position of normally operating substation.

[Error] Display "X" at the No. position of the error substation.

[Error Contents] a: Time out error e: Multiple ST No.
b: Flame error f: Connection unmatched
c: System bus error g: I/O unmatched
d: Substation I/O error h: Point error

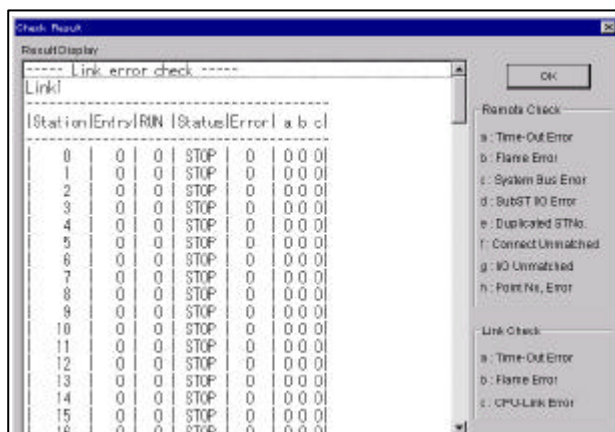
[I/O Information Unmatched] It displays "1" when the error occurs.

[I/O Fuse Error] It displays "1" when the error occurs.

(4) Link error check

It executes the self-checking of the link module.

It displays the error information of Link 1 and Link 2.



Link	Station	Entry	RUN	Status	Error	a	b	c
0	0	0	0	STOP	0	0	0	0
1	0	0	0	STOP	0	0	0	0
2	0	0	0	STOP	0	0	0	0
3	0	0	0	STOP	0	0	0	0
4	0	0	0	STOP	0	0	0	0
5	0	0	0	STOP	0	0	0	0
6	0	0	0	STOP	0	0	0	0
7	0	0	0	STOP	0	0	0	0
8	0	0	0	STOP	0	0	0	0
9	0	0	0	STOP	0	0	0	0
10	0	0	0	STOP	0	0	0	0
11	0	0	0	STOP	0	0	0	0
12	0	0	0	STOP	0	0	0	0
13	0	0	0	STOP	0	0	0	0
14	0	0	0	STOP	0	0	0	0
15	0	0	0	STOP	0	0	0	0
16	0	0	0	STOP	0	0	0	0

< Result display of Link error check >

[Station] Station No. (0 - 63)

[Participate] It displays the "X" at the station No. of a normally participating link station. It displays "O" if it is not participating.

[RUN] It displays the "X" at the station No. of a normally operating link. It displays "O" if it is STOP condition.

[Status] It displays the CPU status (STOP / RUN) which the link module of the applicable station No. is mounted.

[Error] It displays "X" at the station No. of an error station. It displays "O" if there is no error.

Error contents
a: Time out error
b: Flame error
c: Error between CPU link

And if the following error occurs, it displays "X" at the position of the applicable error.

The cut-off station No. displays the applicable station No..

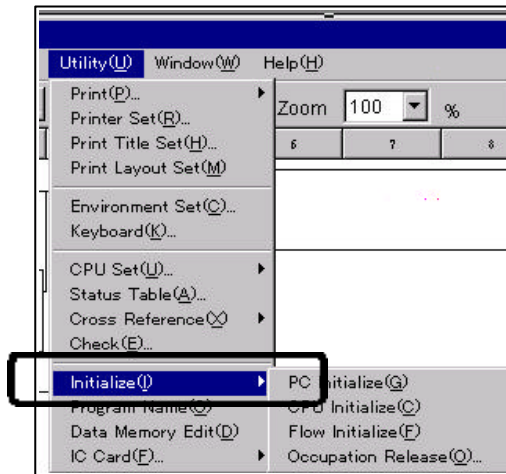
System bus error
Area setting error
Area duplication error
Station No. error
Cut-off line
Cut-off line station No.

5.7 Initialize

< Initialize Function Table >

Function name	Description
PC initialize	Initialize the information of the PC memory area.
CPU initialize	Initialize the information of the CPU memory.
Flow initialize	Based on the memory assignment written in the CPU, initialize all the flow program area.
Occupation Release	Clear the information about the occupation of CPU memory.

Choose **[Initialize]** in the **[Utility]** menu.

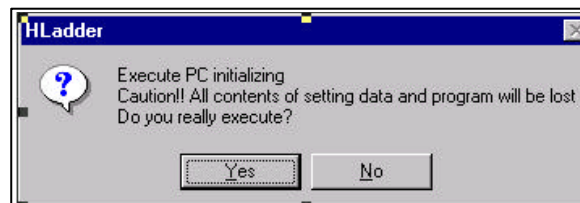


< Menu of Initialize >

(1) PC Initialize

Choose **[PC Initialize]** from **[Initialize]** in the **[Utility]** menu

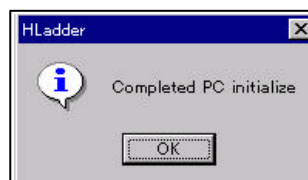
It displays the confirming message of the initialization.



< Confirming message of PC Initialize >

Click [Yes] to execute PC Initialize.

Click [No] to stop initializing and return to the previous screen.



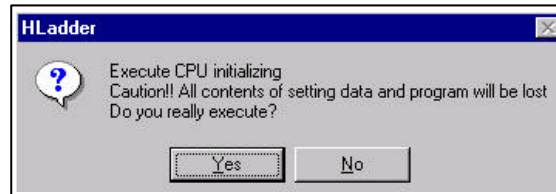
< Completion message of PC initialize >

(Caution)

- The assignment becomes like a following by the PC initializing
 - Memory Assignment : All becomes the Ladder area
 - I/O Assignment : All assign as "Empty 0 point".
- It remembers the file name which is saved by the file operation.

(2) CPU Initialize

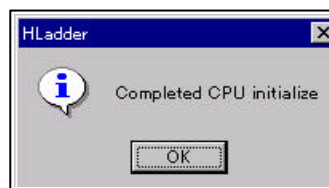
Choose **[CPU Initialize]** from **[Initialize]** in the **[Utility]** menu in the online or on-direct mode.
It displays the confirming message of the initialization.



< Confirming message of CPU Initialize >

Click [Yes] to execute PC Initialize.

Click [No] to stop initializing and return to the previous screen.



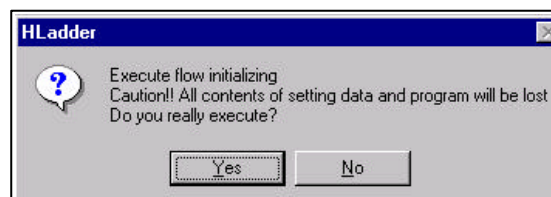
< Completion message of PC initialize >

(Caution)

- The assignment becomes like a following by the PC initializing
Memory Assignment : All becomes the Ladder area
I/O Assignment : All assign as "Empty 0 point".

(3) Flow Initialize

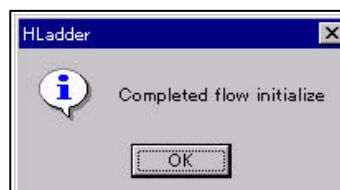
Choose **[Flow Initialize]** from **[Initialize]** in the **[Utility]** menu
It displays the confirming message of the initialization.



< Confirming message of Flow Initialize >

Click [Yes] to execute PC Initialize.

Click [No] to stop initializing and return to the previous screen.



< Completion message of Flow initialize >

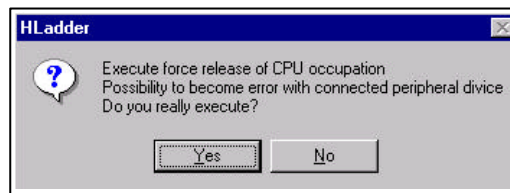
(Caution)

- When the flow capacity change by the change of the memory assignment, the Flow Initialize becomes necessity.

(4) Occupation Release

Choose **[Occupation Release]** from **[Initialize]** in the **[Utility]** menu.

It displays the confirming message of the occupation release.



< Confirming message of Occupation Release >

Click [Yes] to execute the occupation release.

Click [No] to return to the previous screen without executing the occupation release.



< Completion message of Occupation Release >

5.8 Status Table

It displays the status of the CPU and the PC by choosing **[Status Table]** in the **[Utility]** menu.

It displays the only the PC status in the case of the offline mode.

Item			Description
CPU Status	CPU	Type	It displays the CPU type name of the PC connected.
		Status	It displays the status of the CPU (RUN/STOP, etc.)
	Memory	Type	It displays the memory type (RAM/ROM)
		Capacity	It displays the memory capacity of the memory cassette.
		Flow	It displays the memory capacity of Ladder/Flow assigned in the memory assignment
		Ladder	
		Data	It displays the data memory capacity of the memory cassette (include the internal output memory)
		Battery	It displays the condition of the backup battery of the memory cassette.
Operation Control			It displays the setting of operation control input
Delay Check Time			It displays the setting time of the delay check.
PC Status	CPU	Type	It displays the offline CPU type name set in the environment setting.
		Memory	Capacity
	Flow		It displays the memory capacity of Ladder/Flow set in the CPU information.
	Ladder		
Network Setting		CPU Port	It displays the connected CPU port of PC.
		Loop No.	It displays also Loop No. and Station No. when connecting to the CPU of other station by using the CPU link.
		Station No.	

The 'Status Table' window is divided into two main sections: 'CPU Type' and 'PC Status'.

CPU Type Section:

- CPU Type: H-2002
- CPU Status: STOP
- Memory Type: RAM
- Memory Capacity: 49152 (Step)
- Memory Flow: 0 (Step)
- Memory Ladder: 48512 (Step)
- Memory Data: 65536 (Word)
- Battery: OK
- Operation Control: No
- Delay Check Time: 10 * 10ms

PC Status Section:

- CPU Type: H-2000
- Memory Capacity: 49152 (Step)
- Memory Flow: 0 (Step)
- Memory Ladder: 48512 (Step)

Network Setting Section:

- CPU: Home
- Loop No.:
- Station No.:

< Status Table >

About the CPU status

The CPU status has the following 12 conditions

No.	Display of PC status bar	Operation Mode of CPU	Operation Status of CPU	I/O Module	
				LED display	Output
1	STOP	Stop	Stop	No*	No*
2	RUN	Run	Run	Yes	Yes
3	HLT	Halt	Sop	Yes	Yes
4	ERR	Error	Stop	No*	No*
5	D.RUN	Debug Run	Run in specified range	Yes	Yes
6	D.HLT	Debug Halt	Stop	Yes	Yes
7	S.STOP	Simulation Stop	Stop	No	No
8	S.RUN	Simulation Run	Run	Yes	No
9	S.HLT	Simulation Halt	Stop	Yes	No
10	S.ERR	Simulation Error	Stop	No	No
11	S.D.RUN	Simulation Debug Run	Run in specified range	Yes	No
12	S.D.HLT	Simulation Debug Run	Stop	Yes	No

(*) When Force set and Force output are executed, it displays LED and out.

5.9 Program Name

A program name can be input by choose **[Program]** in the **[Utility]** menu.

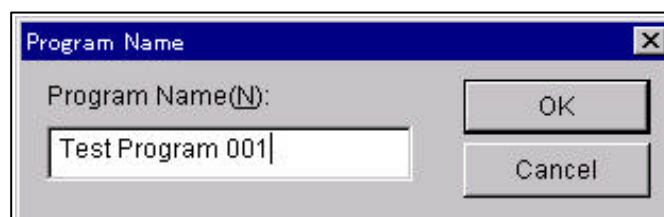
It is the name registered to the created Ladder/Instruction word program. The input program name is saved/loaded in a disk with the program (prm file). And, it is transferred to the CPU.

When printing, it prints the CPU type, the date, and the page No., set in the environment setting, at the first line of each page except the title page.

The input possible letters are the large letter, a figure, and a space. Can not input the small letter, and the under bar, etc.. Until 16 letters can be input.

(Operation Method)

It displays the dialog box of the program name by choosing **[Program Name]** in the **[Utility]** menu.



< Dialog box of Program Name >

Input the program name with the condition indicated above, and click the [OK] button. It memorizes the program name, and close the dialog box.

When clicking the [Cancel] button, make the input data invalid, and close the dialog box.

Chapter 6 Program Transfer to CPU

The special function for the offline. This function does not correspond to the offline mode or on-direct mode.

(Caution)

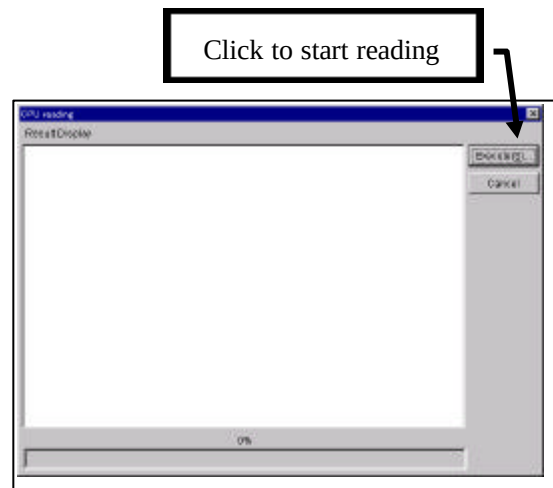
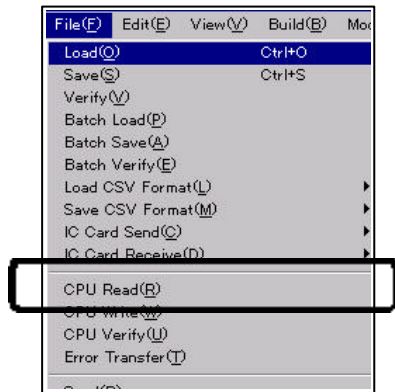
In the program transfer except the verification, if press the [Cancel] button, the [ESC] button, or the close box button, by the timing of the cancel, the receive side program finish in the cleared condition or it finish the program transfer in the uncompleted condition.

6.1 Read

It reads the program of CPU memory to the PC memory.

Choose **[CPU Read]** in the **[File]** menu.

It displays the dialog box of Read.



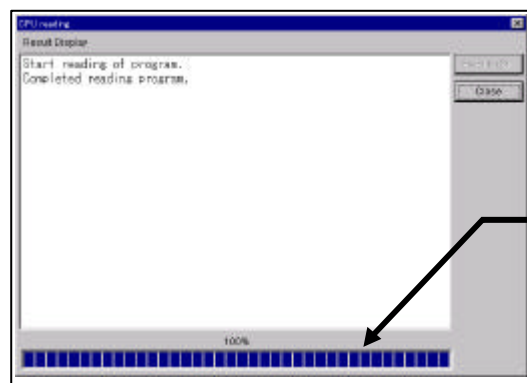
< Dialog box of Read >

[Execute] Start reading.

[Cancel] Stop processing and close the dialog box.

[Close] After complete reading, the [Cancel] button changes to the [Close] button. Close the dialog box.

Click the [Execute] button to start reading.



< Dialog box of Reading result >

It displays the current condition by % and Meter

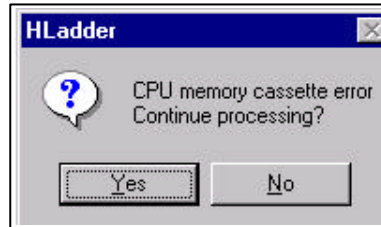
After finish reading, it displays the result.

Click the [Close] button to close the dialog box.

(Caution)

1. Even the flow program is written to the memory of the CPU side, it does not read to the PC memory.
2. Read the program from the CPU in the memory error at the CPU side.

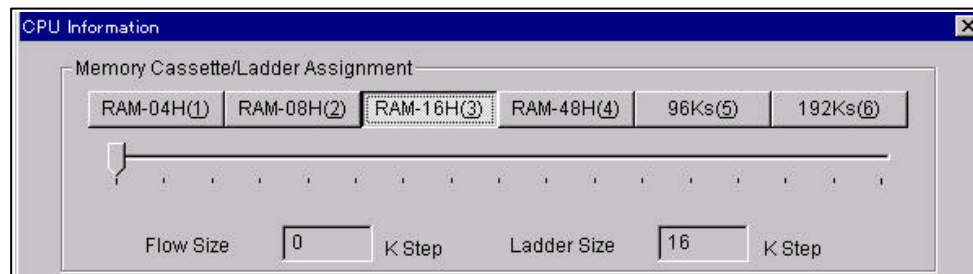
It displays the message of “Memory Cassette Error”, when executing CPU Read against to the CPU which has the broken memory contents.



< Error message of Memory Cassette Error >

Click [Yes] to display the memory assignment setting screen of the CPU setting.

Click [No] to return the previous screen (Screen of CPU Read)



< Dialog box of CPU memory assignment setting >

It read the program conform to the memory assignment set in Memory Assignment Setting dialog box. The memory cassette type and the memory capacity conform to the memory cassette type on the CPU

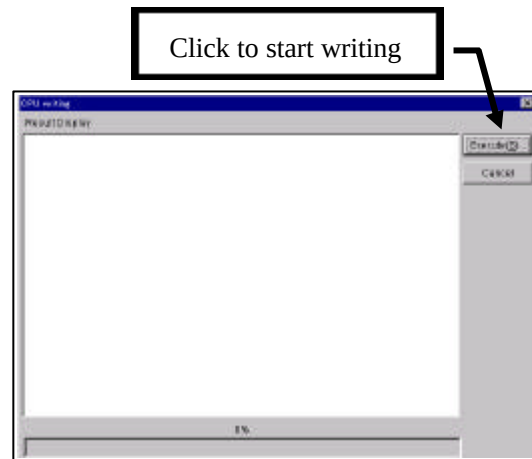
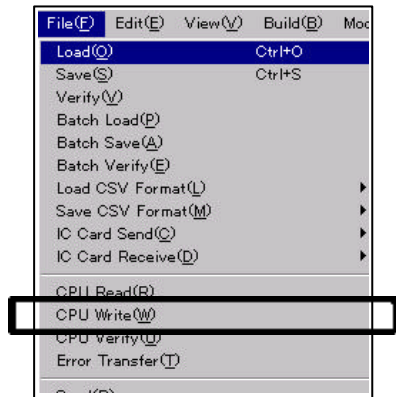
3. It read the mounted I/O assignment conform to the mounted module on the CPU.

6.2 Write

It writes a program created by the PC to the CPU memory.

Choose **[Write]** in the **[File]** menu.

It displays the dialog box of writing.



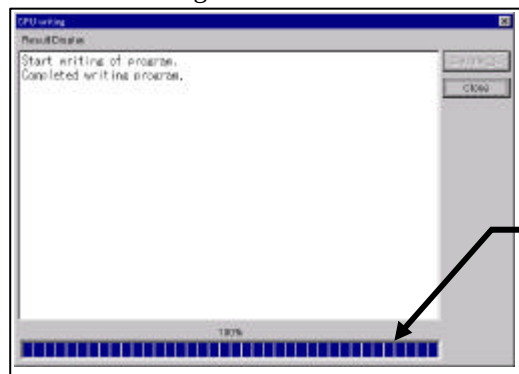
< Dialog box of Write >

[Execute] Start writing.

[Cancel] Stop processing and close the dialog box, when it is before writing or in the way of writing.

[Close] After complete writing, the [Cancel] button changes to the [Close] button. Close the dialog box

Click the [Execute] button to start writing.



It displays the current condition by % and Meter

< Dialog box of Writing result >

After finish writing, it displays the result.

Click the [Close] button to close the dialog box.

(Caution)

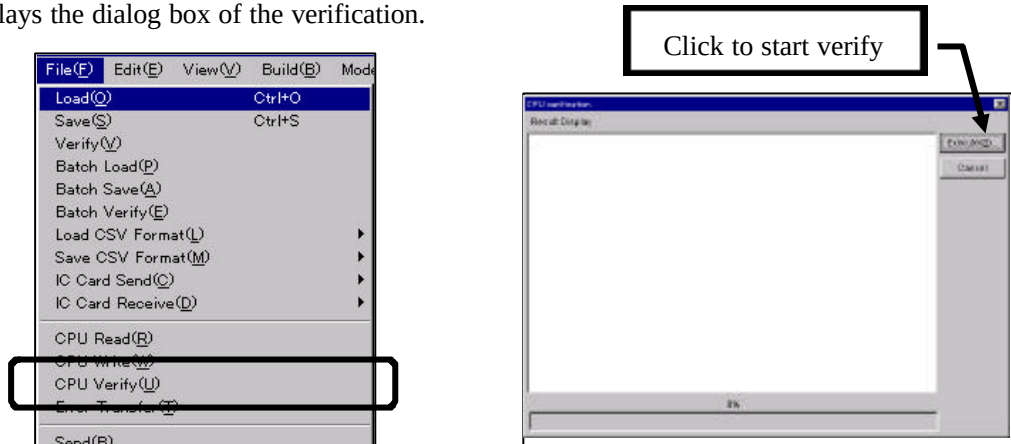
1. When interrupt the execution of writing, the CPU sometimes does not RUN correctly. In that case, execute the initialization of the CPU and execute the writing at the end again.
2. When executing ROM memorizing of the memory cassette by the option interface (PGMIF1H), or ROM writer software, when writing the program to the CPU from LADDER EDITOR for Windows®, make the setting of memory cassette size as same setting as the memory cassette to use. It becomes 31 error (Memory Error) and can not run if it is transferred in different setting of memory size and the CPU is RUN after writing the ROM.

6.3 Verify

It verifies the program of the CPU memory and the PC memory.

Choose **[CPU Verify]** from the **[File]** menu.

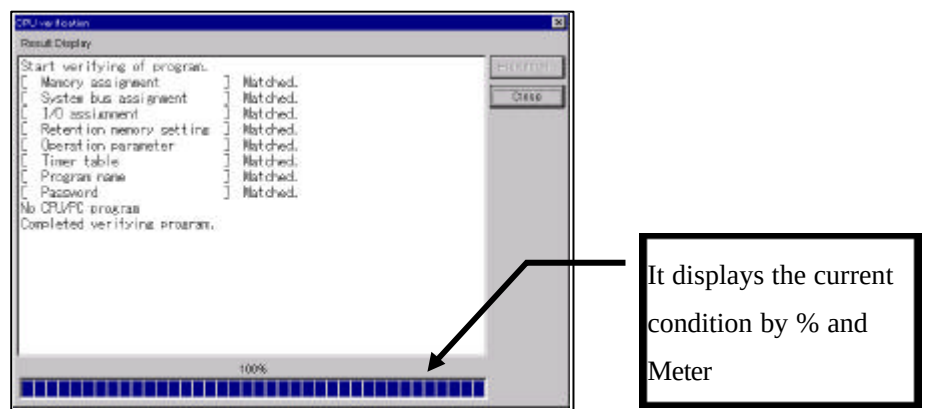
It displays the dialog box of the verification.



< Dialog box of Verification >

- | | |
|-----------|--|
| [Execute] | Start verifying. |
| [Cancel] | Stop processing and close dialog box before and in the way of verification. |
| [Close] | After complete verifying, the [Cancel] button changes to the [Close] button. |

Press the [Execute] button to start verifying.



< Dialog box of Verification result >

It displays the result when complete verifying.

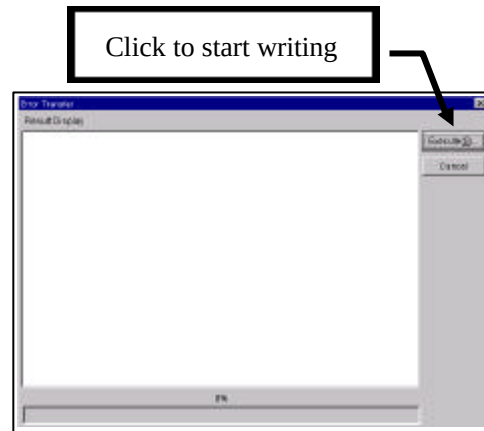
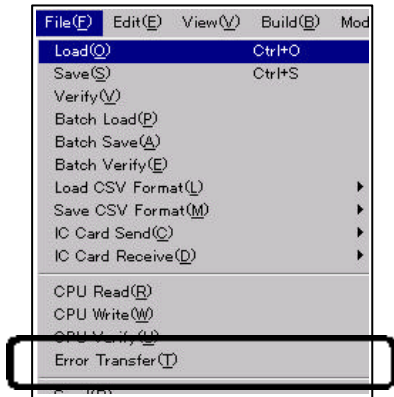
Click the [Close] button to close the dialog box.

6.4 Error Transfer

Write the problem which has the light assemble error (type unmatched) into the CPU.

Choose **[Error Transfer]** in the **[File]** menu

It opens the error transfer dialog box.



Click to start writing

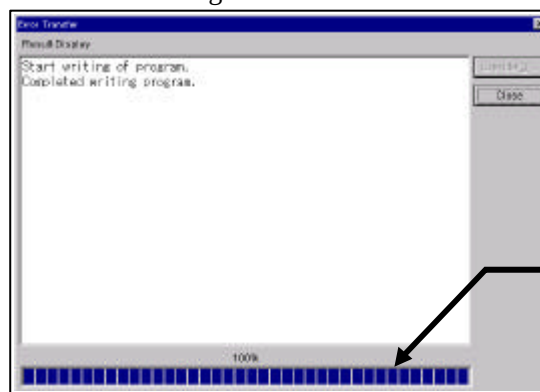
< Dialog box of Error Transfer >

[Execute] Start transferring the error .

[Cancel] Stop transferring the error and close the dialog box.

[Close] The [Cancel] button changes to the [Close] button after transferring the dialog box.

Press the [Execute] button to start transferring the error.



It displays the current condition by % and Meter

< Result display of Error Transfer >

It displays the result after complete the error transfer.

Click the [Close] button to close the dialog box.

6.5 Send/Receive/Verify

It directly send, receive, and verify the program (object program), converted for the CPU to execute the process, between the CPU memory and the disk.

[Send] (->CPU) It writes a file which is stored in the disk to the CPU memory.

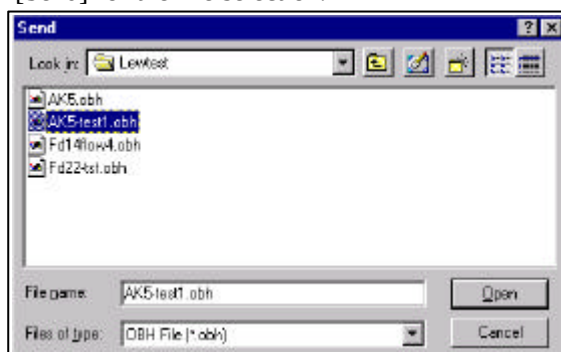
[Receive] (<-CPU) It writes the contents of the CPU memory as a file to a disk.

[Send-Receive Verify] (=CPU) It verifies the contents of the CPU memory and the file saved in the disk.

(1)Send

Choose **[Send]** in the **[File]** menu.

It opens the dialog box of [Send] for the file selection.



< Dialog box of [Send] for File Selection >

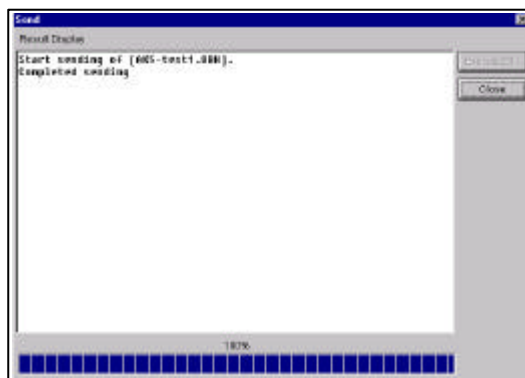
[File Place] Select the folder of the file to send.

[File Name] Choose the file to send. Click the displayed file with the mouse. Or, input the name of the file directly.

[File Type] It displays the format of the file. The file format is (*.obh).

[Open] It opens the dialog box to execute the [Send].

[Cancel] It stop processing and close the dialog box.



< Dialog box to execute [Send] >

[Execute] It start sending.

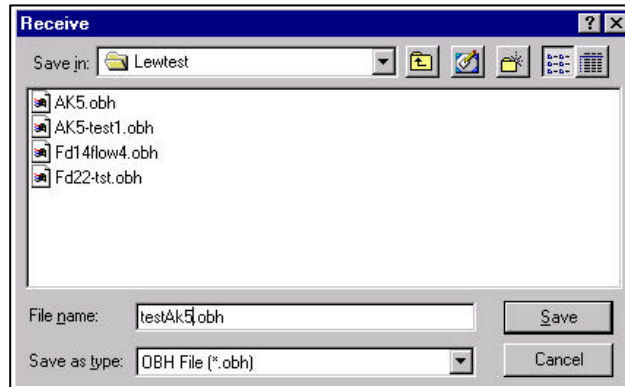
[Cancel] It stop processing and close the dialog box.

[Close] After complete sending, the [Cancel] button changes to the [Close] button. It close the dialog box.

(2) Receive

Choose **[Receive]** in the **[File]** menu.

It opens the dialog box of **[Receive]**.



< Dialog box of **[Receive]** for File Selection >

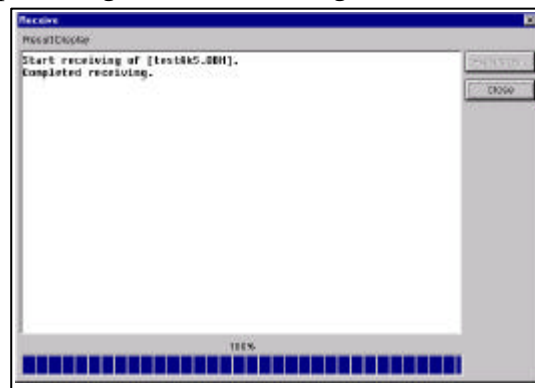
[File Place] Select the folder of the file to receive.

[File Name] Choose the file to receive. Click the displayed file with the mouse. Or, input the name of the file directly.

[File Type] It displays the format of the file. The file format is (*.obh).

[Save] It opens the dialog box to execute the **[Receive]**.

[Cancel] It stop processing and close the dialog box.



< Dialog box to execute **[Receive]** >

[Execute] It start receiving.

[Cancel] It stop processing and close the dialog box.

[Close] After complete receiving, the **[Cancel]** button changes to the **[Close]** button. It close the dialog box.

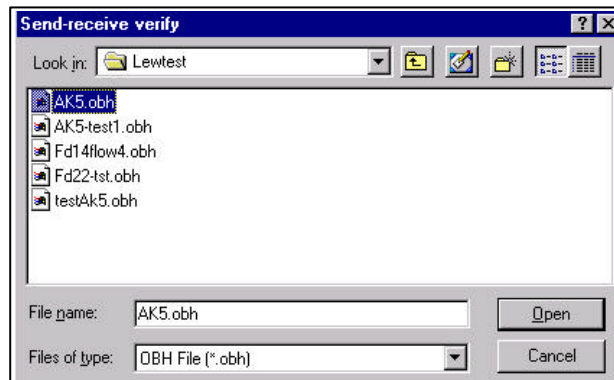
(Caution)

It becomes the overwrite of the file and the confirming dialog box is displayed if the existent file are selected and received.

(3) Send-Receive Verify

Choose **[Send-Receive Verify]** in the **[File]** menu.

It opens the dialog box of **[Send-Receive Verify]**.



< Dialog box of **[Send-Receive Verify]** for File Selection >

[File Place]

Select the folder of the file to verify.

[File Name]

Choose the file to verify. Click the displayed file with the mouse. Or, input the name of the file directly.

[File Type]

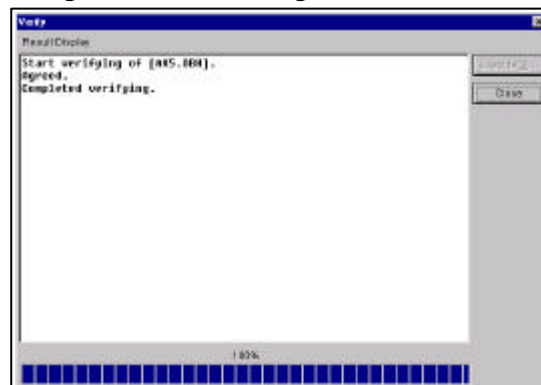
It displays the format of the file. The file format is (*.obh).

[Open]

It opens the dialog box to execute the **[Verification]**.

[Cancel]

It stop processing and close the dialog box.



< Dialog box to execute **[Send-Receive Verify]** >

[Execute]

It start verifying.

[Cancel]

It stop processing and close the dialog box.

[Close]

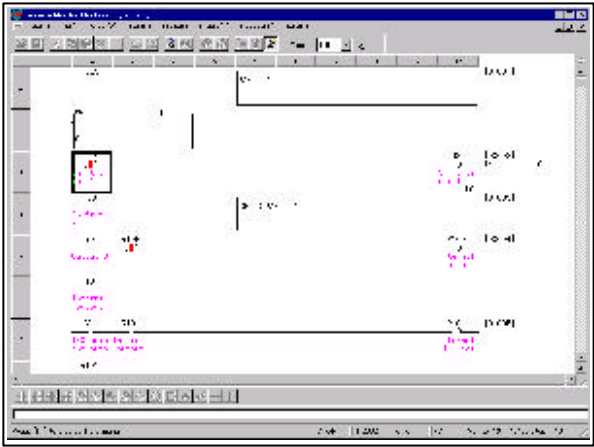
After complete verifying, the **[Cancel]** button changes to the **[Close]** button. It close the dialog box.

Chapter 7 Monitor

7.1 Circuit Monitor

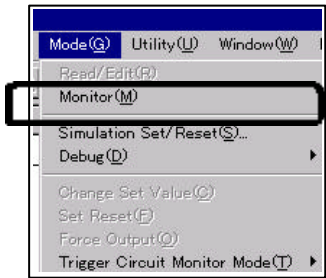
It monitoring the current condition of the CPU.

- Circuit monitor
 - Circuit No.
 - I/O No.
 - Application command
 - User symbol
 - Memory circuit
 - Memory screen

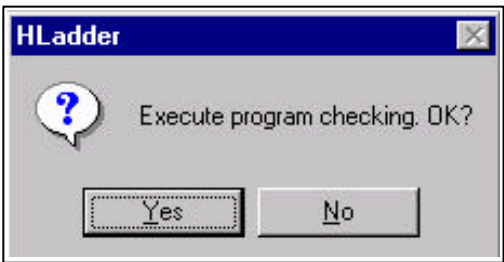


Choose **[Monitor]** in the **[Mode]** menu.

It displays the dialog box of the program check.



< Item of [Monitor] menu >



< Confirming dialog box of Program check >

Click [Yes] to start the check.

Click [No] to execute monitoring without checking.

When executing the check, if the CPU format is other than “CPU2-**H”, it sometimes takes time to complete the check.

If the check result is “Unmatched”, it displays the confirming dialog box of the monitoring. If the check result is “Unmatched”, make the program agree each other before monitoring.

(Caution)

Although the check result is “Unmatched”, you can execute the monitoring, however, it can not promise the monitoring operation such as the monitor display, etc..

Other operations are same as the operations of Read.

(Caution)

1. Response in Monitoring

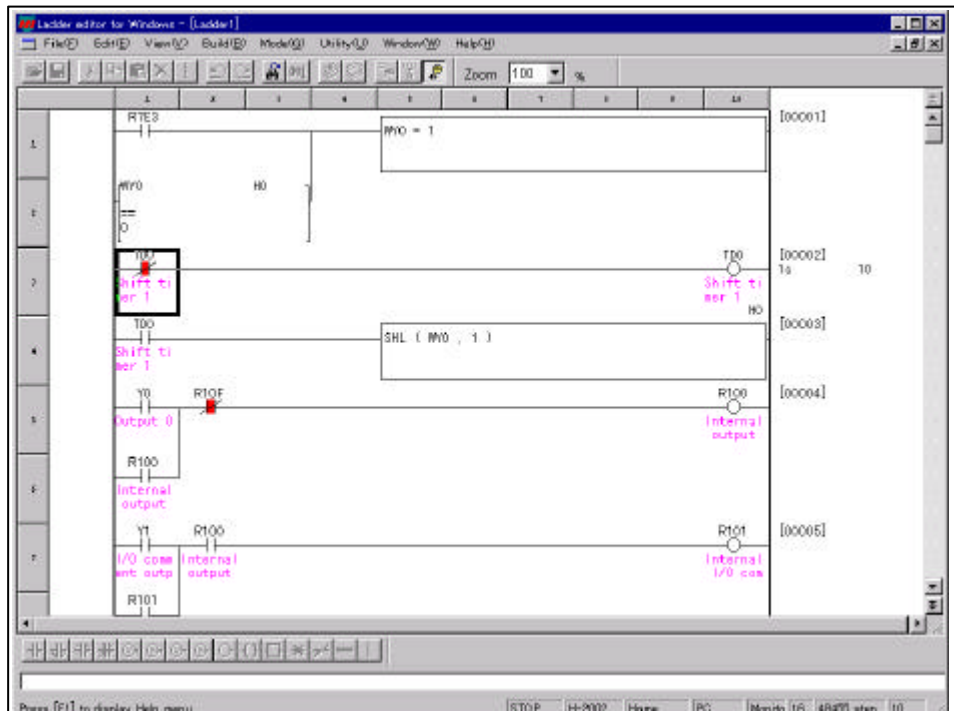
Because several applications are used simultaneously in Windows environment, opened each application need to release the CPU in the PC for other application at the second.

The CPU release time was set in the minimum (300ms) at the time of monitoring LADDER EDITOR for Window®.

- (a) It can not respond to the change (ON-> OFF-> ON) under 300ms.
- (b) Even if it is the data to change (ON-> OFF-> ON) over 300ms, the switch of screen delay by the specification of the personal computer (CPU speed, operation of other applications, etc.).

Example)

- (1) In the circuit monitoring, if the timer setting value of TD0 is 1 second, it can be monitored by synchronizing to the CPU with 1 unit like R100-> R101-> R102...R10F. If the timer setting value of TD0 is 0.5 second, by the specification of the personal computer, the several points of R102 and R103, etc. simultaneously ON/OFF on the screen without synchronizing to the operation of the CPU.



- (2) If executing I/O monitor and Circuit monitor at the same time, by the specification of the personal computer, the monitor operation display may be stopped.

2. The response of the cursor movement on the monitor display screen

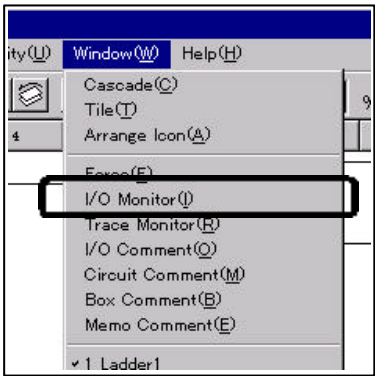
When moving the monitor cursor with the arrow key, by the specification of the computer, the cursor response may be slow.

7.2 I/O Monitor

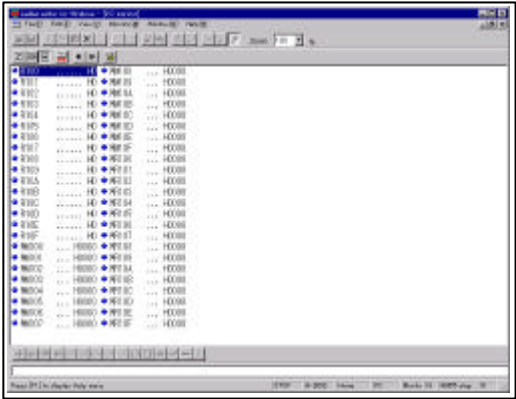
It monitors the specified I/O.

(1) Open the I/O monitor window.

Choose [I/O Monitor] in the [Window]. It opens the I/O monitor window.



< Item of [Window] menu >



< I/O monitor window >

< Tool bar of I/O monitor window >

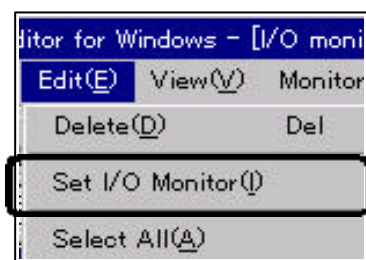
- | | | |
|---|----------------------------------|--|
|  | : Binary | Changes the monitor data display to the binary. |
|  | : Decimal | Changes the monitor data display to the decimal. |
|  | : Hexadecimal | Changes the monitor data display to the hexadecimal. |
|  | : Switch of Comment display mode | Display or hide the I/O comment of the specified I/O No.. |
|  | : Previous I/O | Display I/O No. once before of the specified I/O No..
Several I/O No. can be specified. |
|  | : Next I/O | Display I/O No. once after of the specified I/O No..
Several I/O No. can be specified. |
|  | : Setting of I/O Monitor | Display the I/O monitor dialog box to execute the input of the top No. of the specified I/O No. or the selection of 1 or 16 point display. |

- It starts monitoring when open the I/O monitor window if I/O No. has already be set. If there is no I/O No., it start monitoring when setting I/O No..
- When set the external output which is not mounted on the CPU, or I/O No. of the external output, the monitor data becomes “*” which indicates the undefined I/O No..
- Maximum 64 points can be set as I/O No.,
- Same as other window, the size of I/O monitor window can be changed. Therefore, it displays the hidden I/O No. with the vertical and the horizontal screen.

(2) 1 point or 16 point I/O No. monitor input

Choose **[I/O Monitor Set]** in the **[Edit]**.

Or, click the  icon at the I/O monitor window.

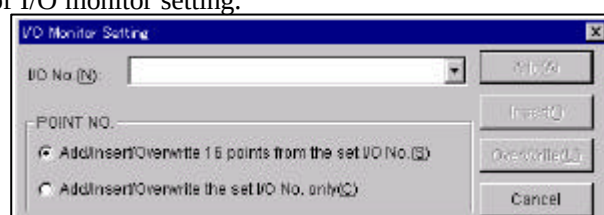


< Item of [Monitor] >



< Tool bar of I/O Monitor >

It opens the dialog box of I/O monitor setting.



< Dialog box of I/O monitor setting >

[I/O No.]	Input the I/O No.. Click  to display the pull down menu of I/O type.
[Point]	Select either “16 points” or “1 point”.
[Add]	Add the specified point from the inverted display position. (*)
[Insert]	Insert the specified point before the inverted display position.
[Overwrite]	Overwrite the specified point from the inverted displayed position.
[Cancel]	Return to the I/O monitor without doing anything.

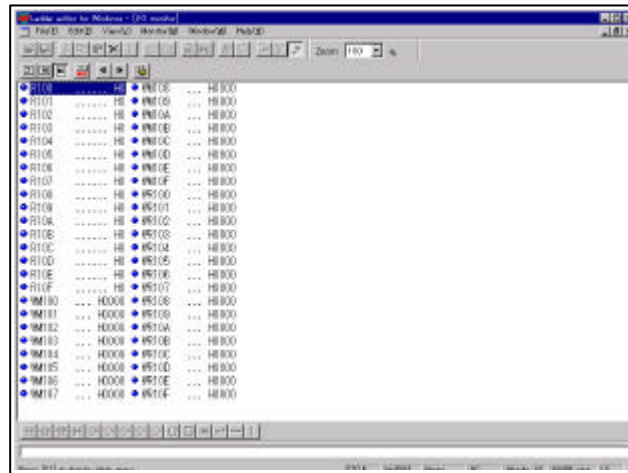
(*) Add and Overwrite

- (a) When specifying the several I/O No., the function of Add, Insert, and Overwrite is executed to the I/O No. at the first inverted display position.
- (b) In the I/O monitor window, when click the blank area to release the inverted display (becomes a dotted line), it add, insert, and overwrite at the end of the data. But the specified I/O No. is maximum 64 points.

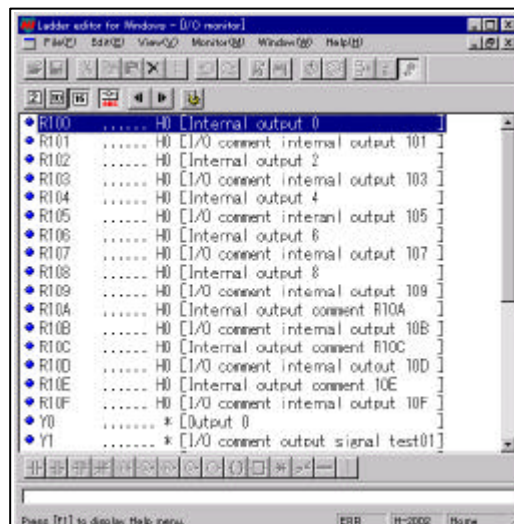
(3) Display with the comment

Choose **[Comment]** in the **[Display]** menu or click  icon to display or hide the I/O comment of the specified I/O No..

It displays 64 points vertically when specifying the comment display.



< Comment hide >



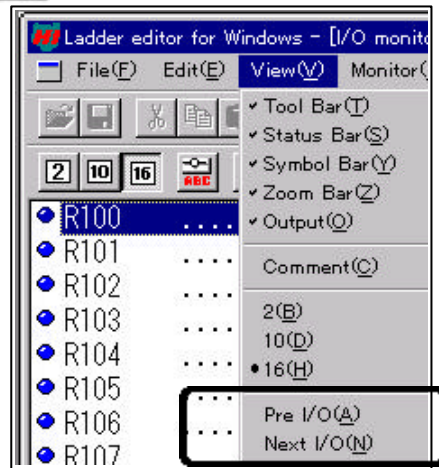
< Comment display >

(4) Input by Previous I/O or Next I/O specification

Specify **[Previous I/O]** or **[Next I/O]** in the **[Display]** menu.

The I/O No. of the cursor position changes to once before or after the No..

Click  (previous I/O) or  (next I/O) at the tool bar.



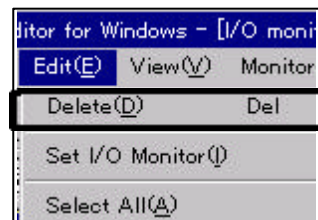
< Item of [Display] menu >

(5) Deletion of I/O No.

It deletes the inverted I/O No.. It shifts and displays the I/O No. after the deleted I/O No..

Choose **[Delete]** in the **[Edit]** menu after specifying the I/O No..

The I/O No. can be deleted by  at the tool bar or the [Delete] key of the keyboard.



< Item of [Edit] menu >

(6) Method to specify the several I/O No.

The following are the methods to specify the displayed I/O No.

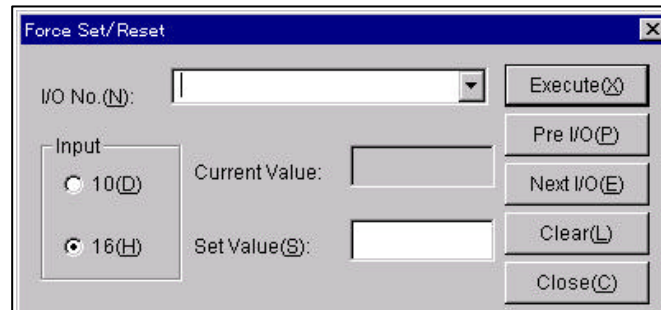
(a) Select All Specify **[Select All]** in the **[Edit]**.

(b) Select Several According to the basic function of Windows 95/98, with the mouse and the key function, use the [Ctrl] key and the [Shift] key.

7.3 Set/Reset

It forced sets and resets the data to the specified I/O No. whether the CPU is **in halt** or **in run state**.

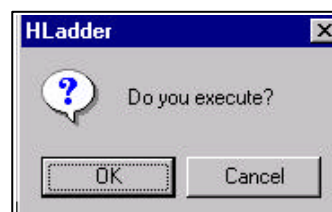
Choose **[Set/Reset]** in the **[Mode]** menu of the circuit monitor mode, or **[Set/Reset]** in the **[Monitor]** menu of the I/O monitor mode. It opens the dialog box of Set/Reset setting value input.



< Dialog box of [Set/Reset] setting value input >

[I/O No.]	Input the I/O No. to set or reset.
[Input]	It changes the display (decimal or hexadecimal) of the setting value.
[Current Value]	It displays the current value.
[Setting Value]	Input the new setting value.
[Execute]	Set the setting value to the I/O No..
[Previous]	Change the input I/O No. to the I/O No. of once before.
[Next]	Change the input I/O No. to the I/O No. of once after.
[Clear]	(a) Erase the input setting value and the I/O No.. (b) It OFF the output of all external output module. After setting (input) the setting value to the external output module, if it make OFF by [Clear], the circuit monitor data value and the I/O monitor data value keep the setting (input) value
[Close]	Close the dialog box.

It displays the confirming dialog box by click the [Execute] button.



< Confirming message of [Set/Reset] >

It sets (input) the setting value by clicking the [OK] button.

Click the [Cancel] button to stop processing.

For the I/O No. of the external input/output, only the I/O which the I/O assignment is written to the CPU can be input.

Difference between Set/Reset and Forced Output

	Set/Reset	Forced Output
I/O type (Possible to use)	X,Y,M,L,R,TD,SS,WDT,MS, TMR,CU,RCU,CTU,CTD,CT, WX,WY,WM,WL,WR,TC,DX,D Y,DM,DL,DR	Y,WY,DY
CPU condition (Possible to use)	RUN, Halt	Halt
Mode	Monitor	Monitor
Function	It changes the area data which store the operation result of the CPU to the specified value.	ON/OFF output or Data output only the one specified external output (1 point or 1 data) while stopping the CPU. Other external output becomes all OFF.
Usage	Set and change of the retention memory area data. Check in trouble.	The external output line check.

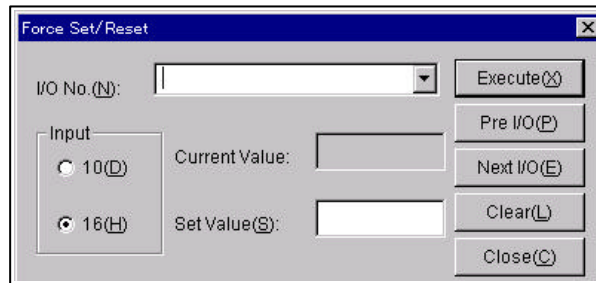
(Caution)

- (a) When the CPU changes RUN to STOP, the output of the external output module becomes OFF, and turn off LED.
However, the output data which immediately before STOP remain in the CPU. In this condition, if execute Set/Reset to the specific external output I/O No., other external output I/O No. remains in the CPU output, too.
For the external line check of the external output module, do not use Set/Reset because it takes a risk, so please use 7.4 Forced Output
- (b) For the external input (X, WX, DX), only the same I/O No. with I/O No. which is forced set by the bit I/O No., the word I/O No. unit can be executed.
- (c) For the link area (L, WL, DL) assigned to other station, only the I/O No. which is forced set by the bit I/O No., the word I/O No. unit.
Can not execute Set/Reset if there is no forced specification.
- (d) For the external input, the external output I/O No., only the I/O which assigned by the I/O assignment written in the CPU.
- (e) It is possible to execute whether the specified I/O No. is used in the CPU program or not. But, when the CPU is running, if the execution is made to the output I/O No. used in the program, the operation executed by the program and Set/Reset compete each other.
- (f) It execute the zero clearing to the input/output data when changing the CPU from STOP to RUN.

7.4 Force Output

It outputs forcibly to the external output (Y, WY, DY) only in the CPU **halt condition**.

Other I/O can not forcibly output. Choose **[Force Output]** in the **[Mode]** menu of the circuit monitor mode, or **[Force Output]** in the **[Monitor]** menu in I/O monitor. It opens the setting dialog box of Force Output.



< Dialog box of Force Output >

[I/O No.] Input the forced output I/O No.

[Input] Change the display of the setting value (decimal or hexadecimal).

[Current Value] It displays the current value .

[Setting Value] Input the new setting value.

[Execute] Output the setting value to the I/O No..

[Pre I/O] It changes the input I/O No. to the I/O No. of once before.

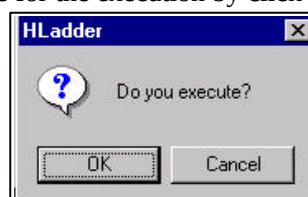
[Next I/O] It changes the input I/O No. to the I/O No. of once after.

[Clear] (a) It clears the input setting value or the I/O No..
(b) It OFF the output of all external output module.

But, after output the setting value to the external output module, if making it OFF by [Clear], the circuit monitor data value and, I/O monitor data value keep the output setting value.

[Close] It closes the dialog box.

It displays the confirming message for the execution by click the [Execute] button.



< Confirming message of Force Output >

It output the setting value by clicking the [OK] button.

It stop processing by clicking the [Cancel] button.

(Caution)

- (a) It can not execute the force output while the CPU is running.
- (b) It output only 1 point (bit word, double word) of the specified external output, and make all other I/O No. OFF.
- (c) For external output I/O No, only the I/O which is assigned by I/O assignment written in the CPU can be executed.

7.5 Change of Setting Value

Even if the CPU is running, the time base at the CPU side timer, and the setting value can be changed. The change will be executed to both the CPU and the PC side. The setting value can not be changed during the CPU debug running and LED of “RUN”, “HLT” is light on.

CPU Status (note)	Change of Setting Value
D.HLT	Impossible
S.D.HLT	Impossible
Other	Possible

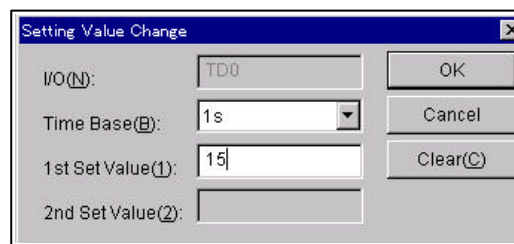
(note) Confirm the CPUT status by the display of the status bar or **[Utility]-[Status Table]**.

How to change the setting value

On the circuit monitor window, move the circuit cursor to the timer/counter to change the setting value.

Choose **[Change Set Value]** in the **[Mode]** menu.

It displays the dialog box of the changing of the setting value.



< Dialog box of Change Set Value >

[Clear] (a) Clear the current setting value.
(b) It makes the output of all external output module OFF.

[OK] It changes the setting value which is newly input.

[Cancel] It stop processing without changing the setting value.

[Time Base] Choose the time base of after changing from the pull down menu displayed by clicking .

[1st, 2nd Set Value] Input the setting value of after changing.

(note) The second setting value is set in only the watch dog timer (WDT).

(Caution)

After selecting **[Change Set Value]** in the **[Mode]** menu, it takes a few seconds to display the dialog box of the setting value changing by the specification of the personal computer.

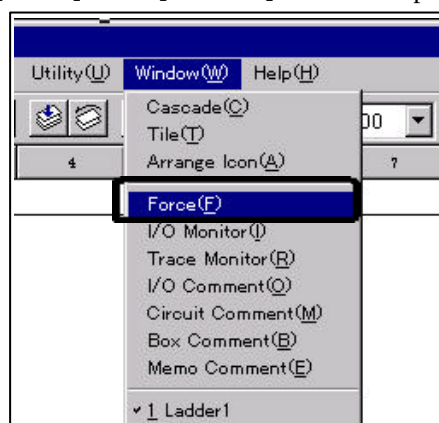
7.6 Force

Whether the CPU is **running** or **stopping**, it keeps ON/OFF condition of the specified I/O No. in the set value without regard to the operation content and the operation result of the CPU.

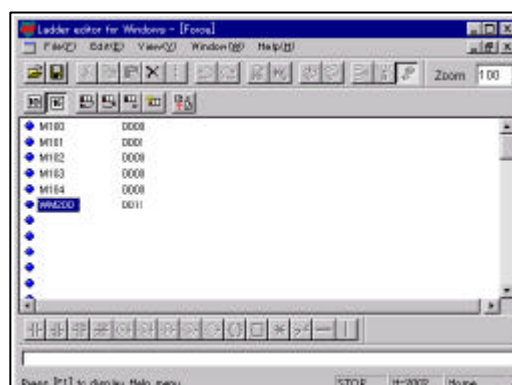
< Force Function Table >

Function		Description
1	Editing of Force	It sets the force I/O data
2	Read (CPU->PC)	It reads the force I/O data for the CPU
3	Merge (CPU+PC)	Merge the force I/O data of the CPU and the PC, and set it in the PC.
4	Compare (CPU=PC)	It compares the force I/O data of the CPU and the PC.
5	File operation	It executes Load, Save, Verify of the force I/O data

Choose **[Force]** in the **[Window]** menu. It opens the window of Force.



< Item of [Window] menu >



< Window of Force >

I/O Type (Possible to use)	X,Y,M,L,R,TD,SS,WDT,MS,TMR,CU, RCU,CTU,CTD,CT,WX,WY,WM,WL,WR
CPU Status (Possible to use)	RUN, Halt (Possible in D.HLT, S.D.HLT)
Mode	Force
Function	It keeps ON/OFF condition of the specified I/O No. in the set vale without regard to the operation content or result of the CPU.
Usage	Trouble shooting or Debug

(Caution)

- Maximum 64 points of I/O type (above written) can be force specified.
- I/O which is specified as the retention memory output the forced data without changing even if making the CPU RUN from Halt. Without regard to the force, if making the CPU RUN from Halt, all force data of I/O which is not specified as the retention memory is zero cleared.
- All force data does not change if making the CPU RUN from Halt.
- Can not specify the specific internal output area (R7C0-R7FF, WRF000-WRF1FF).
- When executing the force specification to the bit/word common I/O (X, WX, Y, WY, M, WM, L,WL), execute the force specification as the bit when using as bit, the word when using as the word, and the bit/word when using as the bit/word common.
- When setting the data to the external input (X, WX) by Set/Reset function, it needs to execute the force specification against to the same I/O No. first.

(1) Editing of Force I/O

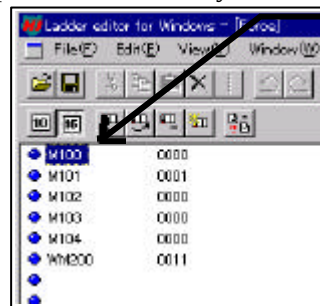
By opening the window of the force, I/O can be modified with the table format.

< Force edit function table >

Editing mode	Description
Execution of Force	It writes the force setting to the CPU.
Reset of Force	It resets the force of I/O at the cursor position.
All reset of Force	It resets the force of all I/O which is specified the force.

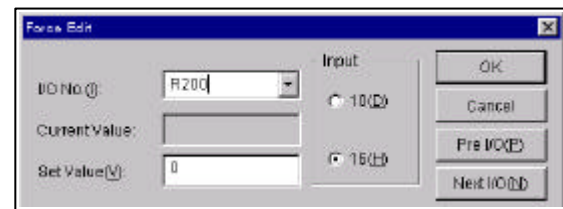
(a) Execution of Force

It displays the dialog box of [Force Edit] by double clicking the I/O No. at the force window, or press the [Enter] key.



< Force window >

Double click the I/O No.



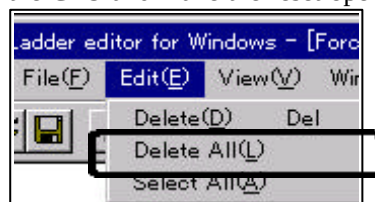
< Dialog box of Force Edit >

- | | |
|----------------------|---|
| [I/O No.] | Input the I/O No.. |
| [Current Vale] | It displays the current set value. |
| [Set Value] | Input the new setting value. |
| [Input] | It changes the display of the set value (decimal, hexadecimal). |
| [OK] | Set the input value to the CPU. |
| [Cancel] | Stop processing and close the dialog box. |
| [Pre I/O] [Next I/O] | It displays the I/O No. of once before or after the current No. |

(b) Reset of Force

Choose the resetting I/O No. by clicking with the mouse, or the up/down arrow key. Then choose **[Reset]** from the **[Edit]** menu to reset the force. It can be reset by the [Delete] key. However, if the data of the force set I/O No. is modified by the operation other than Force, it can not be reset.

Read the data from the CPU and make the reset operation, or execute [Reset All] at the next.



(c) Reset All of Force (Force Reset)

- Choose **[Reset All]** from the **[Edit]** menu to reset all the specified force.

Or, it becomes the Reset All when selecting **[Reset]** after clicking **[Select All]**.

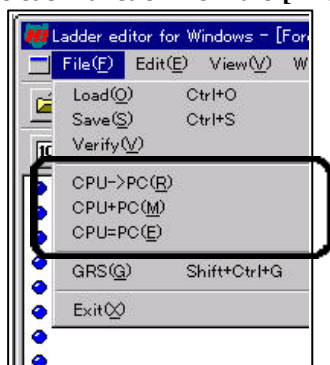
- However, if the data of the force set I/O No. is modified by the operation other than Force, reset of Force is not able to reset it by the **[Reset]** operation. In this case, it can be reset forcibly by executing **[Reset All]**.

(Caution)

Even if the force is released, the data set by the force remain in the CPU.
To clear the data, set the data zero by the force, and execute.

(2) Read/Merge/Compare of Force Data

Choose each function from the **[File]** menu or the tool bar on the force window.



[CPU-> PC] or  It reads the force I/O No. data of the CPU.

[CPU+PC] or  It reads the force I/O No. data of the CPU, and merge with the force data of the PC.

[CPU=PC] or  It compares the force I/O No. data of the CPU.

(Caution)

- It stop merging and displays the error message if the merge result over 64 No..
- If the same I/O No. with different data exists in the CPU and the PC, it make prior to the CPU side.
- It stop comparing and displays the error message if the comparing result is unmatched. Can not execute the force reset if the result is unmatched. Execute the reset after making it agree by forced reset with **[Reset All]**, or read the CPU data by **[CPU-> PC]**.
- It displays the message like “Edit condition is not formed” if the data edit is executed under the condition of unmatched force data between the CPU and the PC. Read the data from the CPU and make it agree.

(3) File operation of Force data

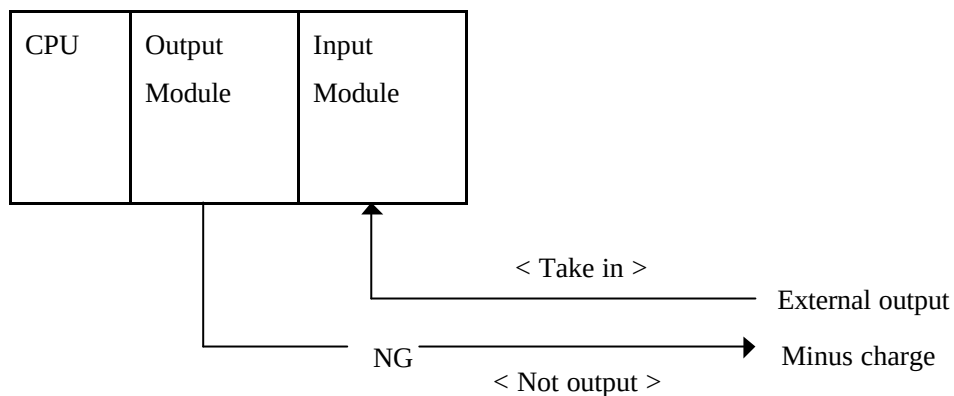
A saving, loading, and verification of the force data can be executed. The extended code is “.fon”. Choose the each function from the icon on the tool bar of the file menu or the force window. But, there is no icon for the verification.

(Caution)

- When reading the force I/O from the disk, if the external input-output I/O, different from the I/O assignment of the CPU is included in the I/O, the force I/O can not read correctly.

7.7 Simulation

It operates the CPU without send the output to the external output module.



(note) It turn the LED of the output module on.

Object output module of Simulation module.

The output module of 16 points, 32 points, and 64 points becomes the object module.

Analog output module, Communication function module (COMM, CPU link, etc.), and the specific function module (Counter, Positioning) become the out of object, and operate normally as it is not set the simulation.

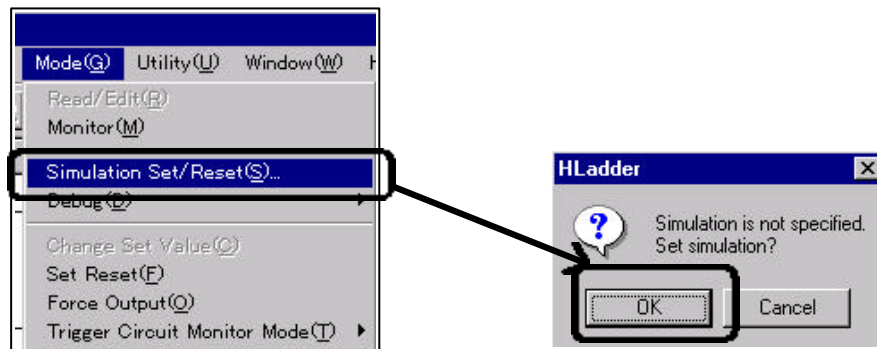
< Simulation setting by the CPU Status, Set/Reset table >

CPU Status	Set	Reset
STOP	O	X
S.STOP	X	O
S.ERR	X	O
Other than above	X	X

O: Possible to operate X: Impossible to operate

(1) Simulation Setting

Choose **[Simulation Set/Reset]** in the **[Mode]** menu.

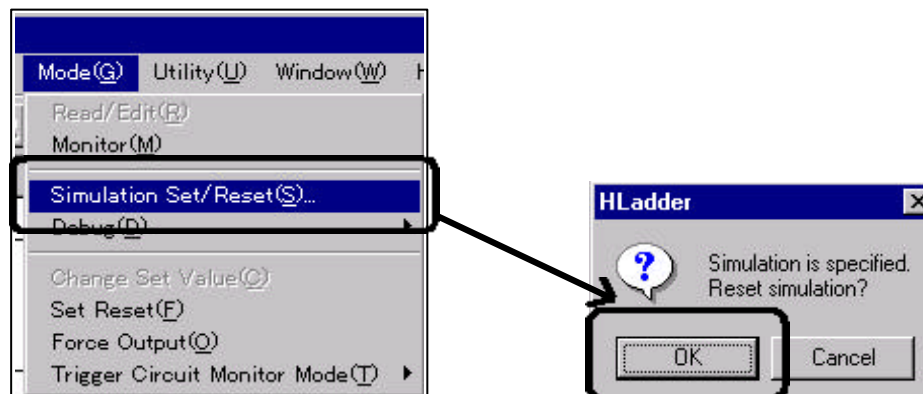


It displays the confirming dialog box. When clicking the [OK] button, the simulation is set and the “SIM” LED of the CPU is turned on.

The CPU status on the status bar changes [STOP] to [S.STOP].

(2) Simulation resetting

When resetting the simulation in the condition of the simulation, choose **[Simulation Set/Reset]**.



When clicking the [OK] button, it reset the simulation.

The CPU status changes [S.STOP] to [STOP] and the “SIM” LED is turned off.

7.8 Trace Monitor, Trigger Circuit Monitor

7.8.1 Outline of Each Monitor

Trace Monitor is the function to display the operation result of the program. There is the time chart function to display the bit data by the time chart format, or the trace function to display the change of bit/word/double I/O by the table format. And, the trigger circuit monitor to display the Ladder monitor condition when the trigger condition is formed.

< Trace function table >

Class	No.	Function	Description
Trace Monitor	1	Continuous time chart	It displays the change of bit I/O by the time chart format.
	2	Trigger time chart	When specified I/O becomes the set condition, it displays the change of the bit I/O by the time chart format.
	3	Continuous trace	It displays the change of bit/word/double word I/O by the table format.
	4	Trigger trace	When specified I/O becomes the set condition, it displays the change of the bit/word/double word I/O by the time chart format.
	5	CPU instruction trace	When executing the trace instruction written in the Ladder program, it displays the change of the bit/word/double word I/O by the table format.
Trigger Circuit Monitor			When specified I/O becomes the set condition, it keeps the monitor display of the circuit.

< Setting item table > O: Necessary to set -: Ether-or X: Unnecessary to set

No.	Function	Sampling time chart	I/O No.	Trigger condition formed display	Trigger condition AND/OR	Trigger condition data	Disk auto-saving	Saving file name
1	Continuous time chart	O	O	O	X	X	X	X
2	Trigger time chart	O	O	O	O	O	-(note2)	-(note 2)
3	Continuous trace	O	O	O	X	X	X	X
4	Trigger trace	O	O	O	O	O	-(note2)	-(note2)
5	CPU instruction trace	X	O	X	X	X	X	X
6	Trigger circuit monitor (note1) (note3)	X	O	O (note4)	O	O	X	X

(note1) The trigger circuit monitor can not be executed when **[Offline]** is selected in GRS screen. In the offline, only the file operation and the print can be performed.

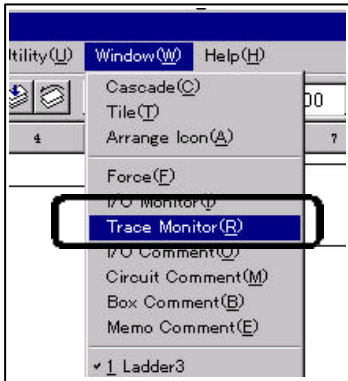
(note2) When setting the data, taken from the CPU by “Disk Auto-Saving”, as “Auto save to the disk”, make sure to select “Saving file name” and set the file name.

(note3) The memory circuit No. need to register by **[Memory Circuit]** in the **[Display]** menu at the Ladder window.

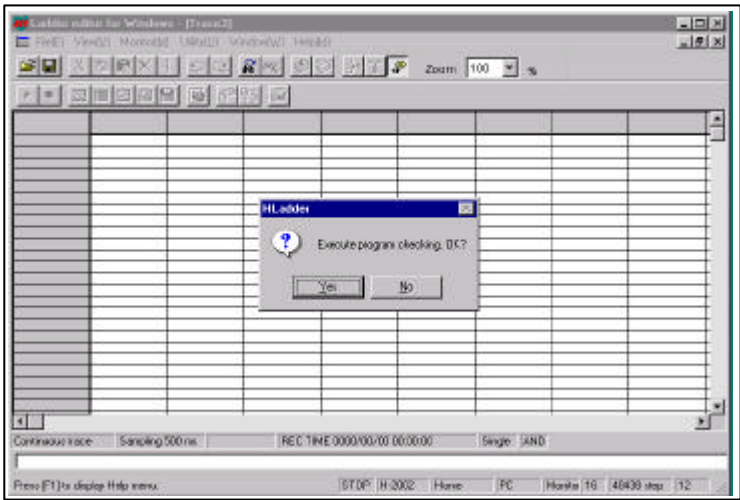
(note4) Set as “Single”.

When executing each function except the trigger circuit monitor, make sure to set the O part of the item of each setting condition by **[Trace Condition Set]** in the **[Monitor]** menu or click  icon. It does not matter about the setting item of X part.

It displays the dialog box of Program Check by choosing [Trace Monitor] in the [Window] menu.



< Item of [Window] menu >



< Window of Trace Monitor >

(Caution)

Trace Monitor can be executed with the condition of unmatched program, the monitor data is not guaranteed. Make the program match and execute .

It opens the trace monitor window after completing the program check.
The opened window is the window which was executed and finished last time.

Status display of Trace monitor

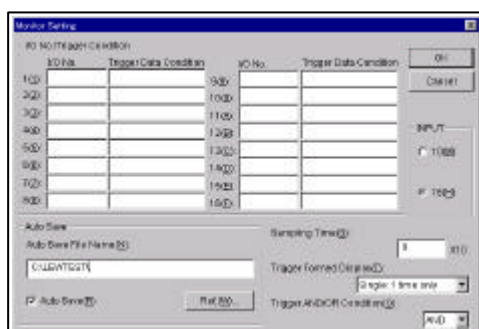


Continuous time chart	Sampling time 200 ms	Continue	REC TIME 98/ 5/29 21:51:53	Repeat	AND
A	B	C	D	E	F

Class	Description
A	It displays the function name of trace monitor in selection or execution.
B	It displays the sampling time (ms) which is set by “Monitor Set” dialog box in the [Trace Condition Set] .
C	It displays the trace condition (Continue, Stop, Trace, Trigger) of the CPU.
D	For Trigger chart, Trigger trace, it displays the time of the internal calendar timer of the CPU for the “Trigger” time taken by the CPU.
E	It displays “Single” or “Repeat” depends on the setting of the trigger condition formed display of “Monitor Set” dialog box.
F	It displays the setting of the trigger condition AND/OR condition of “Monitor Set” dialog box as “AND” or “OR”

7.8.2 Data Setting for Execution

It displays the dialog box of the monitor setting by choosing **[Trace Condition Se]** in the **[Monitor]** menu or clicking  icon.



< Dialog box of Monitor Setting >

[OK]:

It saves the input setting value to the PC.

[Cancel]:

It stop processing and close the dialog box.

< Setting Item Table >

	Item	Content	Description
1	Sampling time	1 - 255	It sets the sampling data during the CPU is running.
2	I/O No.	Under 16 points	It sets the I/O to execute the data sampling such as bit, word, double word I/O, etc. But, Set only the bit I/O in the case of the time chart.
3	Data display at the trigger condition formed	Single	- When executing the continuous time chart, the continuous trace, it makes sampling and displays the 8192 data on the screen. - When executing the trigger time chart, the trigger trace, it displays the data when all samples are completed after a trigger is formed.
		Repeat	- Sample the data continuously when executing the continuous time chart, the continuous trace. But, it stop sampling if the display speed run behind the sampling speed. - In case of the trigger time chart, the trigger trace, it repeats the trace operation every time the trigger condition is formed (detect the edge)
4	Trigger AND/OR condition	AND	It complete the sampling if all set trigger conditions are formed at the once.
		OR	It complete the sampling if one of the trigger conditions is formed.
5	Trigger data condition	Setting Data	It sets I/O which becomes the trigger condition and the maximum 16 points of setting value. 10(decimal) and 16(hexadecimal) can be selected to display.
6	Disk auto-saving	Do	It saves the trigger formed sampling data to the disk automatically.
		Do not	It does not save the sampling data even if the trigger is formed.

	Item	Content	Description
7	Save file name	File name	Set the file name for the auto saving in 3 letters of alphabet. If the auto-setting is specified as “Do”, make sure to set the name. It is saved in the installed place of LADDER EDITOR for Windows® (¥ Program Files¥ Hitachi¥ Hladder). If changing the directly, click [Ref.] button and specify the new directly.

(Caution)

- It reads the setting contents which has already written in the CPU from the CPU. And, the contents set in the monitor set dialog box is written in the CPU by choosing [Start] at the monitor. After changing the setting contents at the monitor setting dialog box, if finishing the trace monitor without choosing [Start] at the monitor, the changed contents has lost and not written in the CPU.

- I/O type to set possible

The following are the I/O types which can be set as the trace I/O.

Only bit I/O can be set in the continuous time chart, the trigger time chart.

Bit	X, Y, R, L, M, TD, CU (note1)
Word	WX, WY, WR, WL, WM , TX
Double (note2)	DX, DY, DR, DL, DM

(note1) Set the timer as TD, the counter as CU.

(note2) Treat the double word I/O as two words. Therefore, when setting the double word I/O as 8 points, other I/O can not add to it.

And, the double word I/O is displayed as 2 points of word I/O.

But, The trigger data condition can not be set in the double word I/O.

- When setting the sampling time in 0.01s, etc. like a short time, it sometimes does not display a moment.

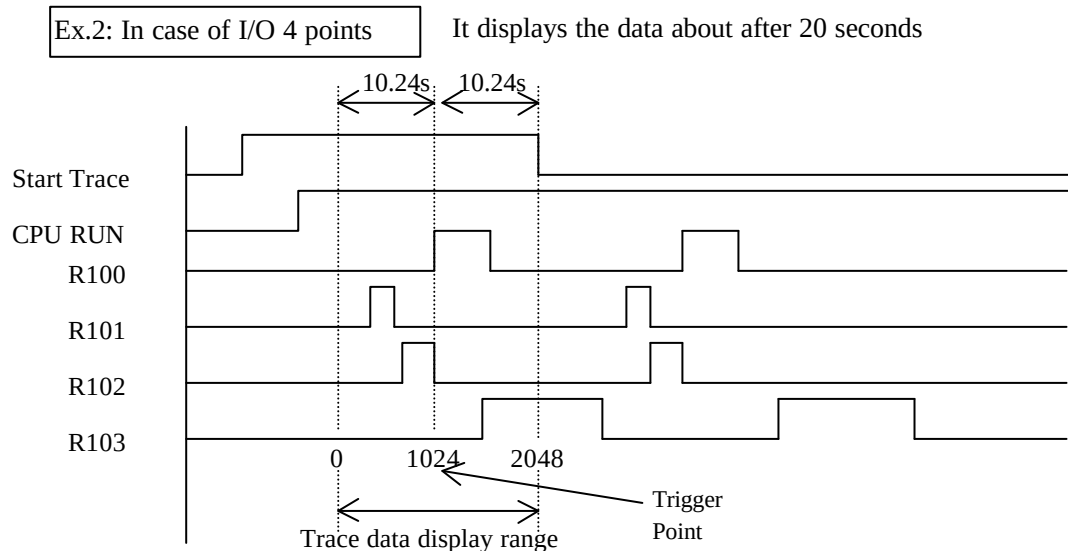
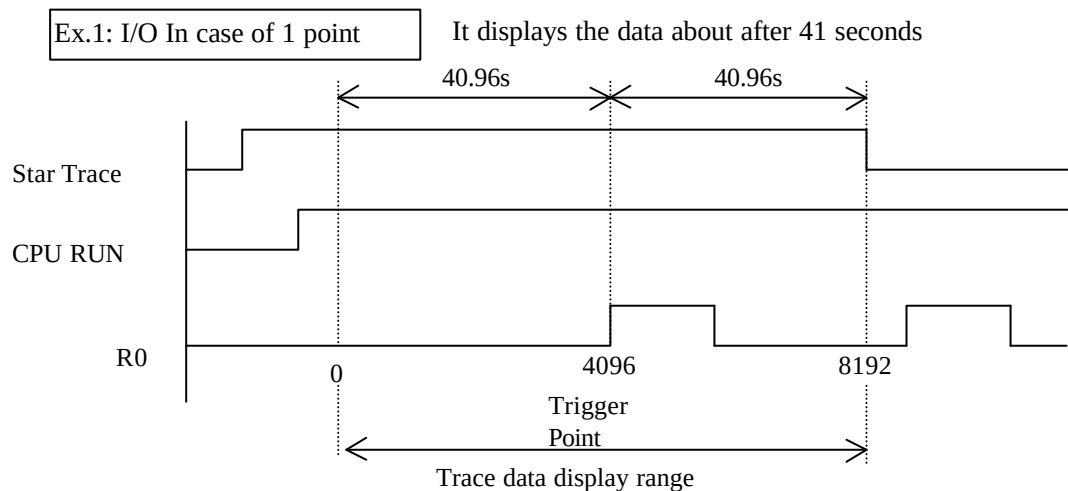
Sampling Operation

- Idea of the time chart function and the trace function are same.

The buffer capacity that the CPU keeps to memorize the sampling data are 8192 words. The data which can be memorized by one time sampling is 1 word (2 words in double word) for each I/O. For example, if the set I/O No. which is composed by bit and word together is 4 points, make this 4 points as 1 unit, it can memorize the 2048 unit ($8192 / 4 = 2048$). If the trigger condition is formed, the CPU continues the sampling until it memorizing 1024 data ($2048 / 2 = 1024$). A data is displayed 1024 units before and after from the trigger point (Center trigger method).

- But, if the time from the start of tracing to the trigger point is shorter than the time from the trigger point to the end of sampling, in the displayed data, the data length before the trigger point becomes shorter than the data length after the trigger point and the trigger point does not become a center. All sampling time is decided by the set I/O No. and the setting value of the sampling time.
- Even if the trigger is formed, it samples the data after formed the trigger, so the display of the trigger delay a few second. If the sampling time is set as 10 ms, it displays the data Ex.1) about after 41 seconds ($10\text{ms} * 4096 = 41\text{ second}$), and Ex.2) about after 10 seconds ($10\text{ms} * 1024 = 10\text{ second}$).

Example of the time chart (Sampling time 10ms)



7.8.3 Continuous Time Chart, Trigger Time Chart

It monitoring ON/OFF condition of the bit I/O in the time chart format. And, it executes the monitor and saves to the disk by searching the timing which the specified I/O becomes the specified condition by specifying the trigger.

(note) Can not specify the word I/O, and the double word I/O.

< Setting data which need for execution >

	Samplin g time	I/O No.	Formed trigger condition display	Trigger condition AND/OR	Trigger condition data	Auto saving	Save file name
Continuous time chart	O (note1)	O	O (note2)	X	X	X	X
Trigger time chart	O	O	O (note2)	O	O	-	-

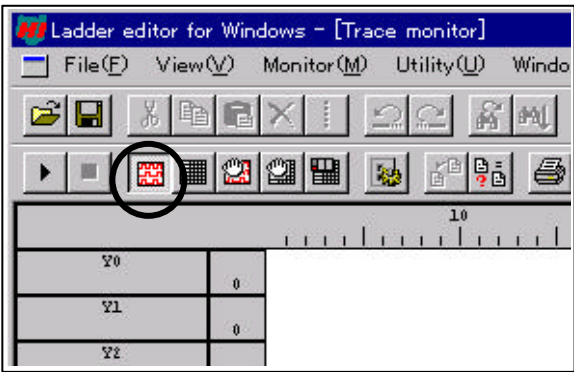
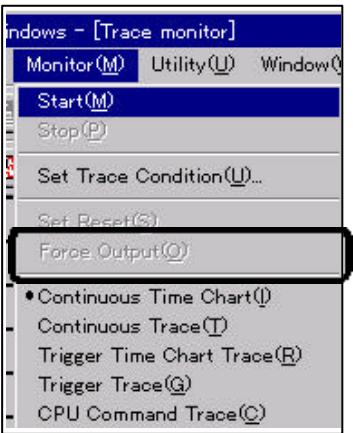
(note1) Setting value of the sampling time is from 1 to 255. O: necessary to set -: either-or
X: unnecessary to set

(note2) Contents of the trace monitor by setting of [Formed trigger condition display]

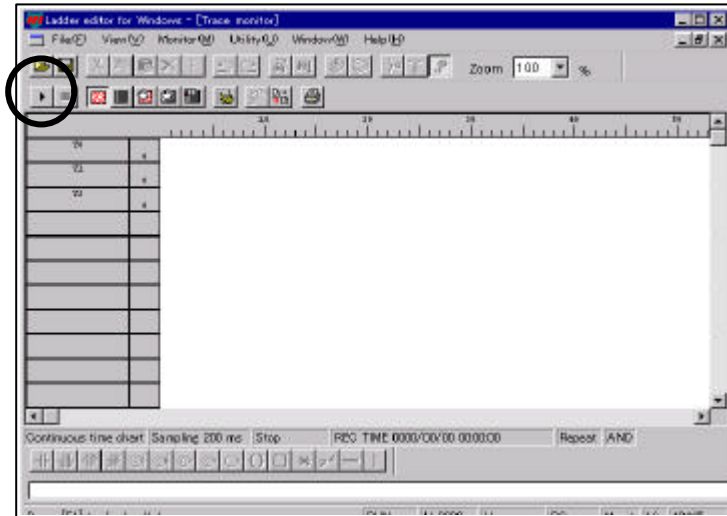
Function \ Set	Single	Repeat
Continuous time chart	Display the data when complete sampling 8192 data.	It repeats the sampling completion-> the data display.
Trigger trace	When the trigger is formed, it displays the maximum 8192 data before and after the trigger point.	It repeats the formed trigger condition-> the sampling completion- > the data display.

(1) Continuous Time Chart

Choose [**Time Chart**] in the [**Monitor**] menu at the trace monitor window, or click the [Time Chart] icon at the tool bar.



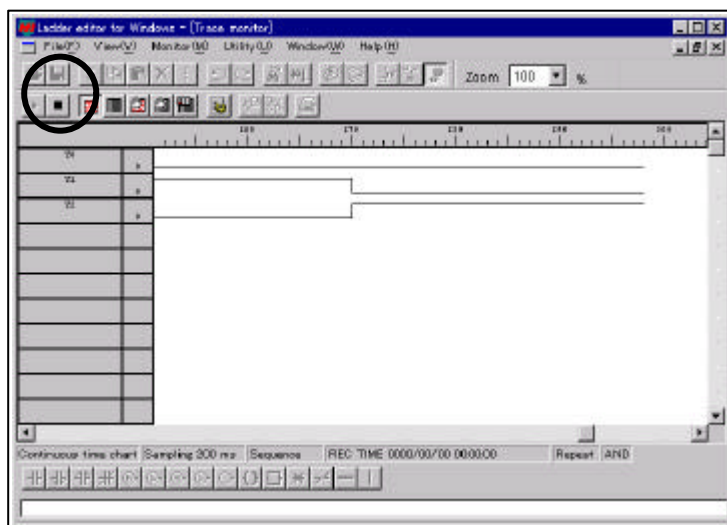
To start sampling, choose **[Start]** in the **[Monitor]** menu, or click  icon. But, make the CPU RUN condition.



< [Time Chart] window >

While executing the sampling in the continuous time chart, when starting the continuous trace, the screen immediately changes to the execution of continuous trace.

To stop the sampling, choose **[Stop]** in the **[Monitor]** menu, or click  icon.

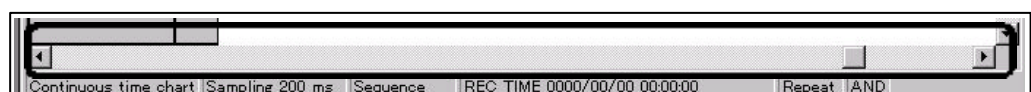


< [Time Chart] window >

Scroll Display

The screen can be scrolled in monitoring.

Click the scroll bar at the bottom or the right of the screen to move the screen.

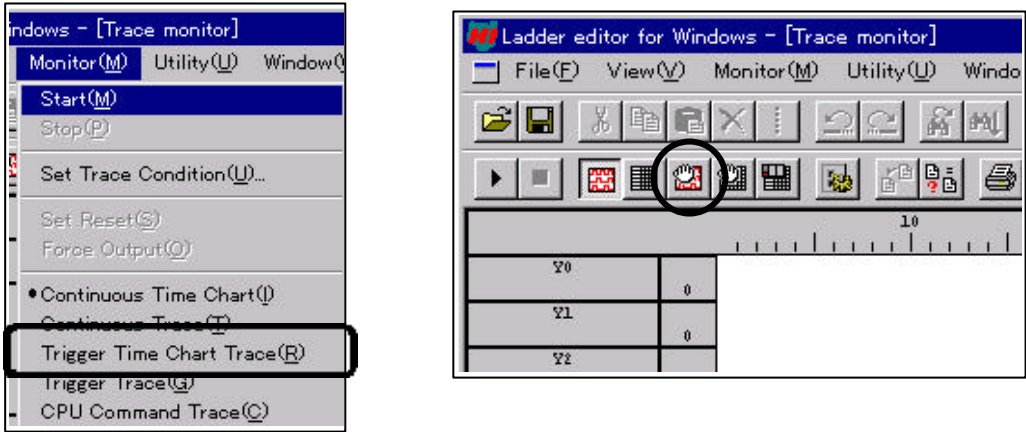


(2) Trigger Time Chart

It displays each before and behind 4096 sampling data in the time chart format by making the trigger point which the specific bit I/O data which correspond to the specified data (trigger data condition) as the center.

It displays the time chart display after completing all sampling at the screen.

Choose **[Monitor]** in the **[Trigger Time Chart]** at the trace monitor window, or click the trigger time chart icon at the tool bar.



Execute other operations as same as [Continuous Time Chart] .

To start sampling, choose **[Start]** in the **[Monitor]** menu, or click  icon. But, make the CPU RUN condition.

To stop sampling, choose **[Stop]** in the **[Monitor]** menu, or click  icon.

Choose **[Save]** in he **[File]** menu if saving the trace data to the disk manually.

(Caution)

After starting the trigger time chart, even if the trigger condition were formed, it sometimes takes time to display the data by the contents of the trace condition setting.

7.8.4 Continuous Trace, Trigger Trace

It monitoring the data change condition of the bit I/O, the word I/O, the double word I/O by the table format. The double word I/O is displayed as the word I/O 2 points. And it displays each before and after 4096 sampling data in the time chart format by making the trigger point which the specific bit I/O data which correspond to the specified data (trigger data condition) as the center.

(note) Can not set the trigger condition to the double word I/O by the trigger trace.

< Setting data which need for execution >

	Sampling time	I/O No.	Formed trigger condition display	Trigger condition AND/OR	Trigger condition data	Auto saving	Save file name
Continuous trace	O (note1)	O	O (note2)	X	X	X	X
Trigger trace	O (note2)	O	O (note2)	O	O	-	-

(note1) Setting value of the sampling time is 1 to 255. O: necessary to set -: either one

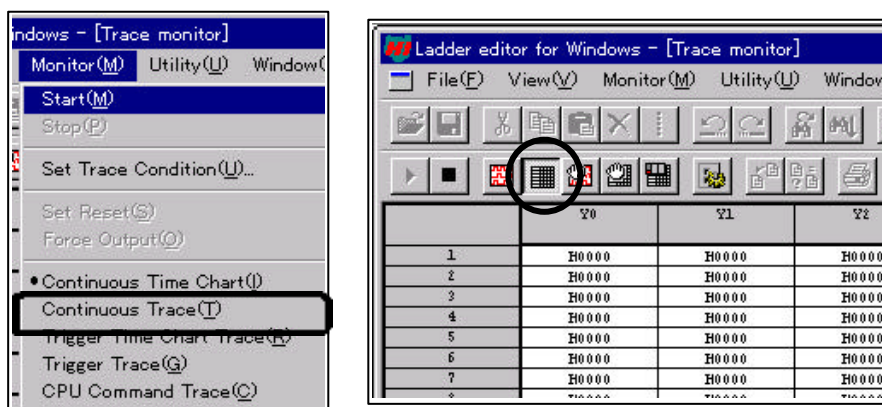
X: unnecessary to set

(note2) The trace monitor run contents by setting of [Formed Trigger Condition Display]

Function \ Set	Single	Repeat
Continuous trace	Display the data when complete sampling 8192 data.	It repeats the sampling completion->the data display.
Trigger trace	When the trigger is formed, it displays the maximum 8192 data before and after the trigger point.	It repeats the formed trigger condition->the sampling completion->the data display.

(1) Continuous Trace

Choose **[Continuous Trace]** in the **[Monitor]** menu at the trace monitor window, or click the [Continuous Trace] icon at the tool bar.



To start sampling, choose **[Start]** in the **[Monitor]** menu or, click  icon. But, make the CPU RUN condition.

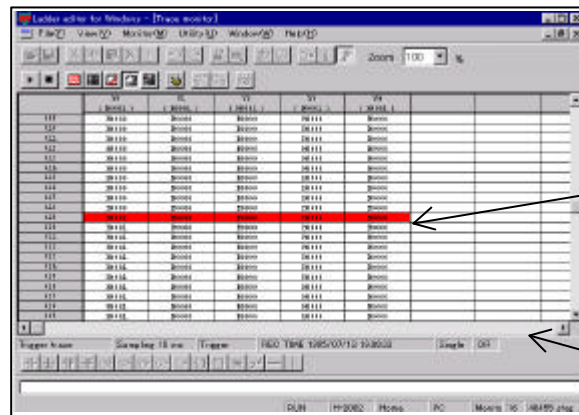
While executing the sampling in the continuous trace, when starting the continuous time chart, the screen immediately changes to the execution of continuous time chart.

To stop the sampling, choose **[Stop]** in the **[Monitor]** menu, or click  icon.

(2) Trigger Trace

It displays each 4096 sampling data before and behind from the point as the center that the specific bit or word I/O data meets the condition of the trigger setting data.

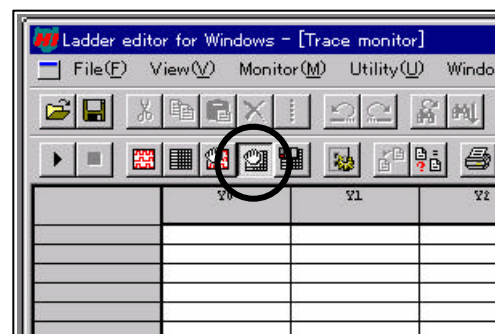
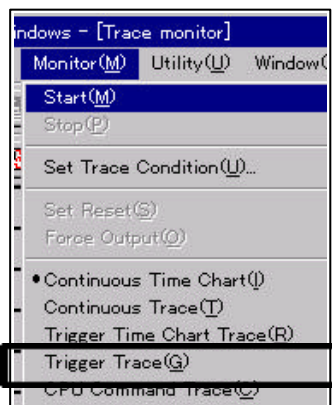
(note) Can not set the trigger condition to the double word I/O.



< [Trigger Trace] window >

It displays the formed trigger condition data in red.

Choose **[Trigger Trace]** in the **[Monitor]** menu at the trace monitor window, or click the **[Trigger Trace]** icon at the tool bar.



Execute other operations as same as [Continuous Trace].

To start sampling, choose **[Start]** in the **[Monitor]** menu, or click  icon. But, make the CPU RUN condition.

To stop sampling, choose **[Stop]** in the **[Monitor]** menu, or click  icon.

Choose **[Save]** in the **[File]** menu if saving the trace data to the disk manually.

(Caution)

After starting the trigger trace, even if the trigger condition were formed, it sometimes takes time to display the data by the contents of the trace condition setting.

7.8.5 CPU Instruction Trace

It monitors the changing condition of the bit or word I/O when executing the trace instruction in the Ladder program.

< Setting data which need for execution >

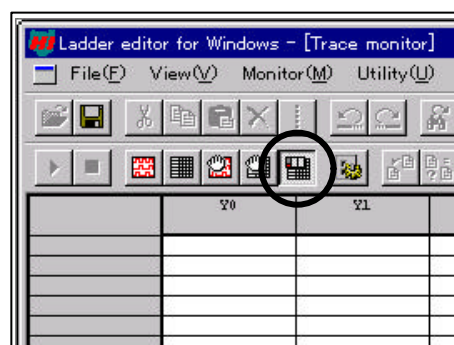
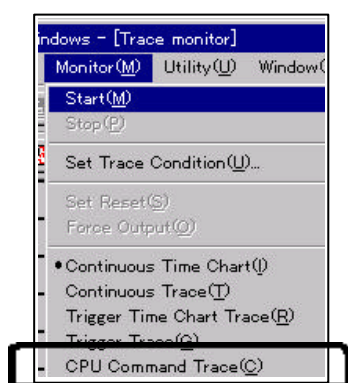
	Sampling time	I/O No.	Formed trigger condition display	Trigger condition AND/OR	Trigger condition data	Auto saving	Save file name
CPU instruction trace	X (note)	O	X	X	X	X	X

(note) Impossible to make a blank for the sampling time setting. O: necessary X: unnecessary
(Input the value 0 to 255)

Choose **[Save]** in the **[File]** menu if saving the trace data to the disk manually.

Choose **[CPU Instruction trace]** in the **[Monitor]** at the trace monitor window, or click the CPU instruction trace icon at the tool bar.

[Monitor] - [Start] : It becomes a select possible condition after displaying the CPU instruction trace data, and when executing the CPU instruction trace once again, it clears the display data.



(1) The CPU instruction trace sampling the trace data by executing the trace instruction written in the Ladder program of the CPU.

TRSET (S) ... It clears the sampling buffer of the CPU, and validate TRACE (S) instruction

TRACE (S) ... It samples the data of the specified I/O No. every time executing the instruction by the Ladder program.

TRRES (S) ... It invalidates TRACE (S) instruction, and send the sampling data to the PC.

S: Input the I/O No. (WR, WL, WM) as the dummy.

Therefore, the control of the sampling start/stop is executed by the Ladder program.

(2) LADDER EDITOR for Windows® receives and displays the sampling data which the CPU sends by executing the TRRES (S) instruction.

But, the before received sampling data becomes invalid and can not display if the CPU execute TRSET (S) instruction before complete receiving a data from the CPU.

- (3) It displays the sampling data before when executing the TRRES (S) at the point which the sampling is not reached at 8192.
- (4) When retrying after displaying the data by executing the CPU instruction trace, clear the displayed data by executing **[Start]** in the **[Monitor]** menu, and turn OFF each startup condition of the trace instruction of the Ladder program once and retry again.
- (5) The CPU instruction trace can be seen the data after executing by the online and the on-direct mode.
- (6) Can not choose **[Load]** and **[Verify]** in the **[File]** menu when selecting the CPU instruction trace.
The data which is saved in the disk can be opened by only on the offline.

7.8.6 Trigger Circuit Monitor

It continues to monitor the circuit until the specified I/O becomes the condition which is specified by the trigger condition. It searches the timing that the trigger specified I/O becomes the trigger setting condition and keep the condition of the circuit monitor screen.

< Setting data which need for execution >

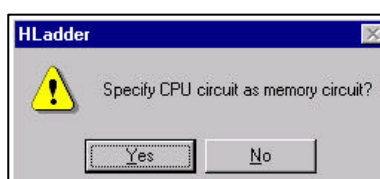
	Sampling time	I/O No.	Formed trigger condition display	Trigger condition AND/OR	Trigger condition data	Auto saving	Save file name
Trigger circuit monitor	X (note)	O	Single	O	O	X	X

(note) Setting time of the sampling time is from 0 to 255. O: necessary to set X: unnecessary to set

It has to memorize the circuit before executing the trigger circuit monitor. Entry the memory circuit No. by the memory circuit function. Please refers to “4.6.8 Memory Circuit Read” for the registration.

Operation method

- (a) Choose **[Trigger Circuit Monitor Display]** from **[Trigger Circuit Monitor Mode]** in the **[Mode]** menu while monitoring the circuit on the monitor mode. The memory circuit registered by the memory circuit function is displayed. And, the following dialog box will be displayed if execute (start) the trigger circuit monitor after registering the memory circuit once and the memory circuit is specified in the CPU. Select “No” if the new memory circuit is registered by the PC side.

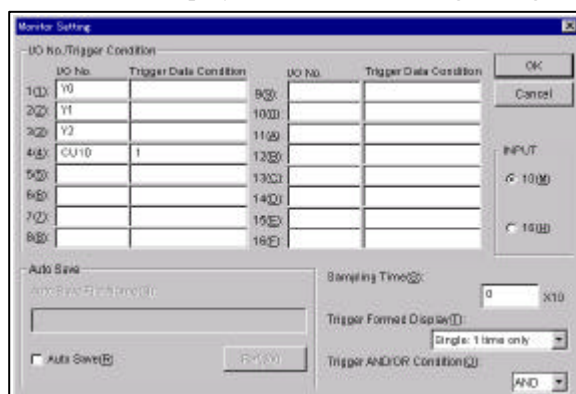


(Caution)

This dialog box will be displayed after executing the trigger circuit monitor once and when starting the trace monitor except the trigger circuit monitor. This dialog box has no mean so please click “Yes” to exist from it. It won’t display after executing the trace monitor.

- (b) Choose **[Trigger Condition Set]** from **[Trigger Circuit Monitor Mode]** in **[Mode]** menu.

Set the trigger condition when displays the monitor setting dialog box.



< Dialog box of Trace execution setting >

- (c) Choose **[Start Trigger Circuit Monitor]** from **[Trigger Circuit Monitor Mode]** in the **[Mode]** menu.

It monitoring the saved circuit until the trigger condition is formed.

When the trigger condition is formed, it stops the circuit monitor and keep the ON/OFF condition in the circuit. And, it displays

When trigger is formed “Trigger Circuit Monitor Mode Trigger”

When trigger is unformed “Trigger Circuit Monitor Mode Tracing...”

to the monitoring output window

- (d) Choose **[Stop Trigger Circuit Monitor]** when the monitor data is kept at the trigger formed condition, the keep condition will be reset and restart the monitoring of the memory circuit
- (e) Choose **[End Trigger Circuit Monitor]** when monitoring the trigger circuit, it stops the trigger circuit monitor and moves to the usual circuit monitor.

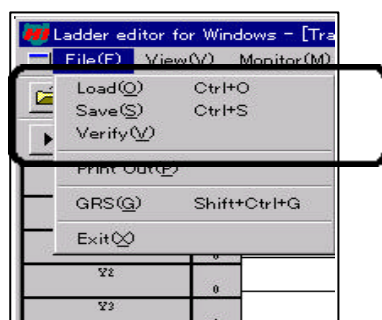
(Caution)

- Can not choose **[Mode] - [Trigger Circuit Monitor Mode]** in the offline.
- When setting the trigger condition formed display as “Repeat”, it continues the circuit monitor by displaying “Tracing...” even if the trigger is formed.
- Set the numbers of I/O included in the circuit (maximum 16) which is registered by the memory function less than 100. Reduce the circuit No., if it over 100.
- The setting of the memory circuit is registered in the CPU by executing **[Start Trigger Circuit Monitor]**.

7.8.7 File Function of Trace Result

It saves, loads, verifies the trace result of the trace monitor except the trigger circuit monitor to the file.

Choose **[Load]**, **[Save]**, or **[Verify]** from the **[File]** menu when the status is “Stop” condition on the Trace monitor window.

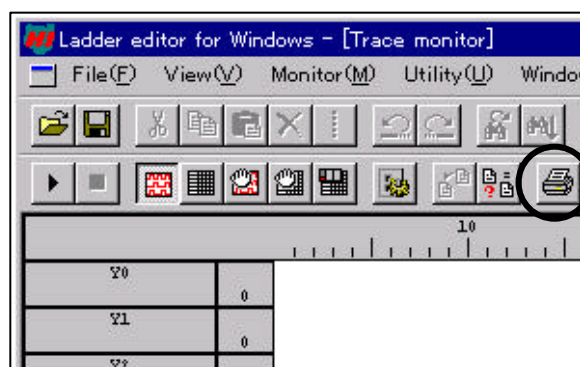
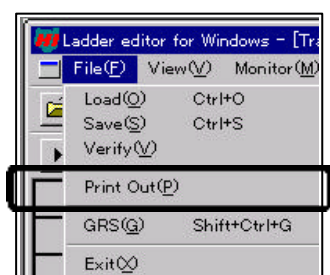


Can not choose **[File]** - **[Load]** and **[Verify]** when selecting the CPU instruction trace.

7.8.8 Printout of Trace Result

Print the trace result of the trace monitor except the trigger circuit monitor to the printer.

At the trace monitor window, when status is “Stop” condition, choose **[Print]** from the **[File]** menu or click the print icon at the tool bar



(Caution)

- Printing data is the data inside the PC memory.
To print the data in the disk, read the data from the disk.
When reading the data from the disk, the data is loading according to the trace type at the saving include the online mode.
- Adjust the size of font by **[Font]** from **[Display Switch]** in the **[View]** menu at the Ladder circuit screen.
- Set the margin of the print paper by **[Print Layout Set]** in the **[Utility]** menu.

7.9 Debug

7.9.1 Outline of Debug Mode

The debug mode can be executed when monitoring the Ladder circuit.

< Debut function table >

Function		Description
Breakpoint	Circuit No. specification	Set a breakpoint at the top of the specified circuit. The breakpoint which is specified before becomes invalid.
	Cursor setting	Set a breakpoint at the ladder cursor position. The breakpoint which is specified before becomes invalid.
	Reset	Reset the breakpoint.
Scan run		It scans specified times from the top circuit, and stop at the scan END. But the first scan beginning at the current position. When a breakpoint is set, the scan stops at the breakpoint and the rest of scan times become invalid.
Step run		It executes 1 symbol or 1 instruction unit from the current stopped position.
Execution stop circuit display		It executes the circuit display/monitor with 1 screen unit from the circuit includes the position that the CPU stops executing. The cursor is displayed at the execution stopped position
CPU HALT specification		Stop the execution of the CPU at a scan END.
Continuous execution (CPU HALT reset)		Execute from the position that the CPU stop execution. The breakpoint which is set before execution continues to be valid.

< Debug Setting/Resetting condition table >

Key Switch of CPU	CPU Status	Setting	Resetting
REMOTE	STOP D.HLT D.RUN S.STOP S.D.HLT S.D.RUN	O	O
Position except over written	Except over written	X	Impossible to select

O: Possible X: Impossible

7.9.2 Setting and Resetting of Debug Mode

To execute the debug when monitoring the Ladder circuit.

(a) Set it to the monitor condition by choosing **[Monitor]** from the **[Mode]** menu.

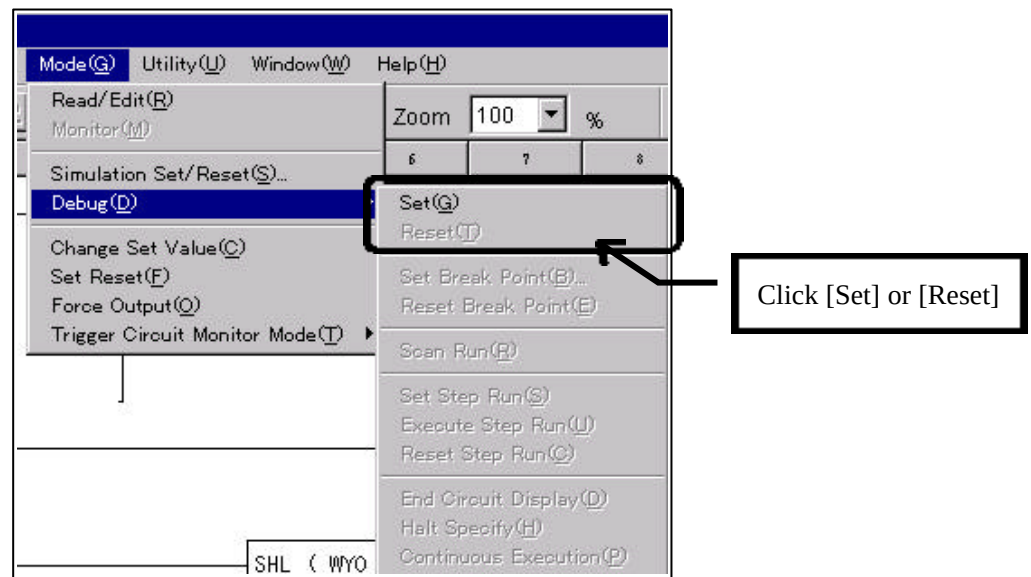
(b) Set the key switch of the CPU to “REMOTE”.

(c) Choose **[Set]** in **[Debug]** from the **[Mode]** menu.

The debug is specified.

It displays as “D. HLT” at the CPU status bar. The CPU light up “RUN” and “HLT” LED and stop executing the program.

To reset it, choose **[Reset]**, so it returns to the Ladder circuit monitor.

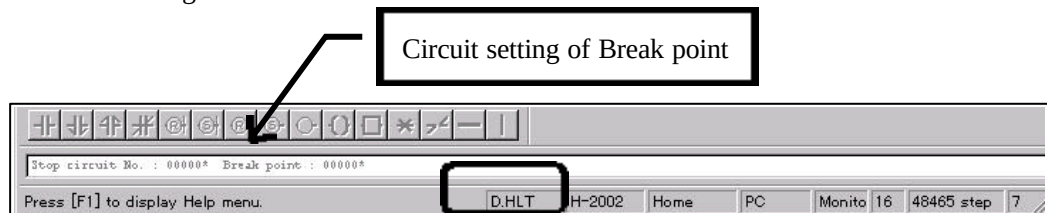


< Item of [Debug] menu >

(d) The CPU status at the status bar change to the following.

Set the debug STOP -> D.HLT

Reset the debug D.HLT -> STOP



< CPU status at the Status bar >

Stop circuit No. : It displays the circuit No. that the CPU stop executing.

Breakpoint : It displays the circuit No. that the breakpoint is specified.

(Caution)

When specifying the internal output (R, M) to the run control input, set the retention memory. If the retention memory is not specified, the debug setting can not be done even if the setting is specified as “ON”.

7.9.3 Setting/Resetting of Breakpoint

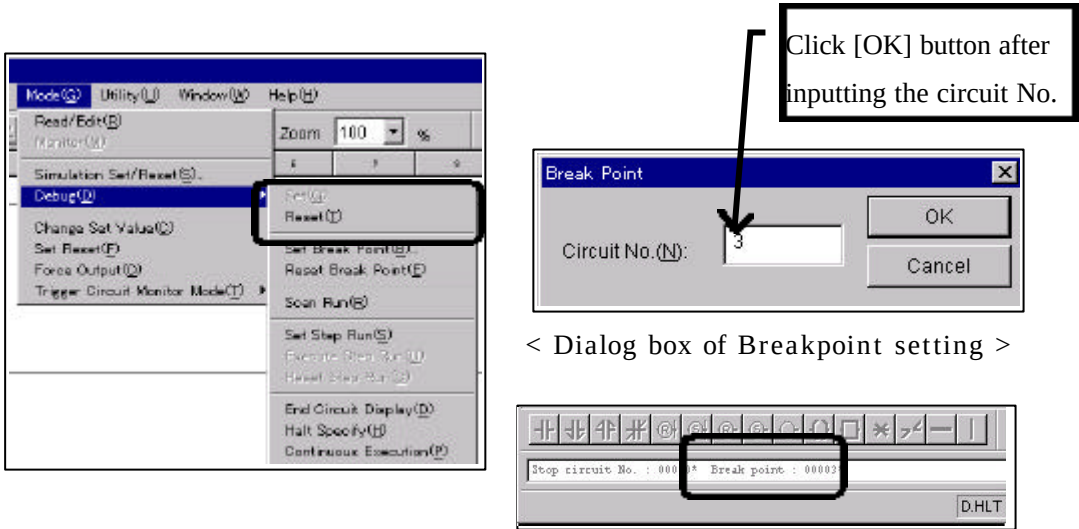
It sets the breakpoint at the cursor position of the Ladder circuit and the top of the specified circuit. And, reset the specified breakpoint.

(1) Set the breakpoint by the circuit No. specification

Set the breakpoint at the top of the input circuit.

Confirm the CPU status as “D. HLT”, and choose **[Set Break Point]**.

When it displays the dialog box of the breakpoint setting, input the circuit No. .

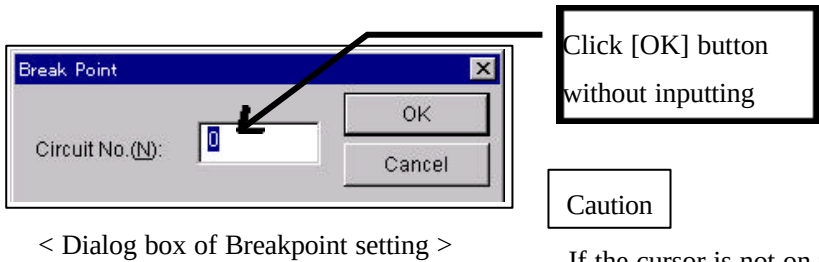


(2) Setting the breakpoint by the cursor

Move the circuit cursor to the circuit to set the breakpoint a the Ladder circuit monitor screen.

Confirm the CPU status as “D. HLT”, and choose **[Set Break Point]**.

Click the [OK] button, or press the Return key without inputting anything to the breakpoint setting dialog box. It sets the breakpoint at the top of the circuit which has the circuit cursor.



If the cursor is not on the circuit, the setting can not be executed.

(3) Reset of Breakpoint

Confirm the CPU status as “D. HLT”, and choose **[Reset Break Point]**.

It resets the breakpoint of the last setting.

(Caution)

When specifying the new breakpoint, the old breakpoint will be cleared.

7.9.4 Scan Run

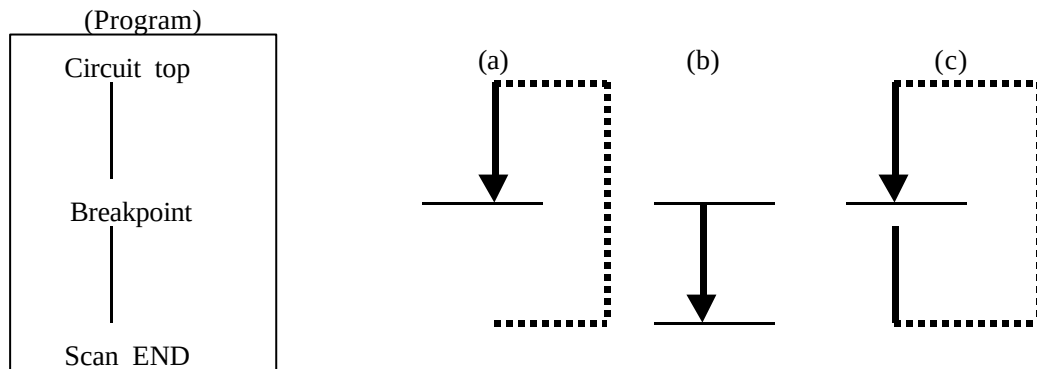
It making scans from the top circuit at the specified times, and stop at the Scan END

The scan times can be specified in the range from 1 to 9999.

If the breakpoint is specified, it stops at the breakpoint, so the setting of the scan times becomes invalid.

However, when setting the scan run in the condition that stopping at the breakpoint, the scanning operation is different between 1 time scan setting and more than 2 times scan setting.

The scanning operation becomes as the following when the breakpoint is specified.



(a) Start scanning before a breakpoint : Stop at the breakpoint without completing 1 scan.
or the Scan END

(b) Start scanning at the position of breakpoint, or after the breakpoint. : Stop at the breakpoint before completing 1 scan.
Set the scan times as 1, and execute.

(c) Same as (b). Set the scan times as 2 : Complete 1 scan from the breakpoint to the breakpoint,
and execute. and stop at the breakpoint.

When start scanning from the breakpoint and the Scan END continues to (a) to (c), it is possible to start scanning by executing **[Continuous Execution]**. Either one stop at the breakpoint when executing.

< Display in scan running >

It displays [Rest of Scan times/Setting scan times] at the output window.



The scan display will be disappeared when completing the setting times. And, the display can not be seen because the scan run completes at a few moment, if the setting number is small.

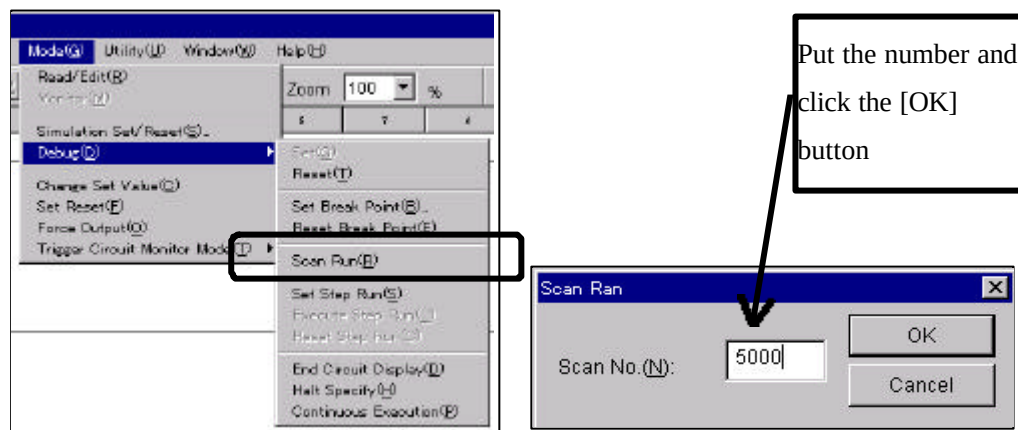
However, the display is disappeared when it stops at the breakpoint.

Operation Method

Choose [Scan Run] from [Debug] in the [Mode] menu when the CPU status is in the “D. HLT” condition. Set the number when it displays the scan times setting dialog box.

When specifying the number, it execute the scan run and displays “D. RUN” at the CPU status bar in the execution.

The CPU status returns to “D. HLT” when completing the scan run.



< Dialog box of Scan times setting >

(Caution)

The first scanning begins at the current stopping position.

When stopping at the breakpoint, the rest of the scan times becomes invalid.

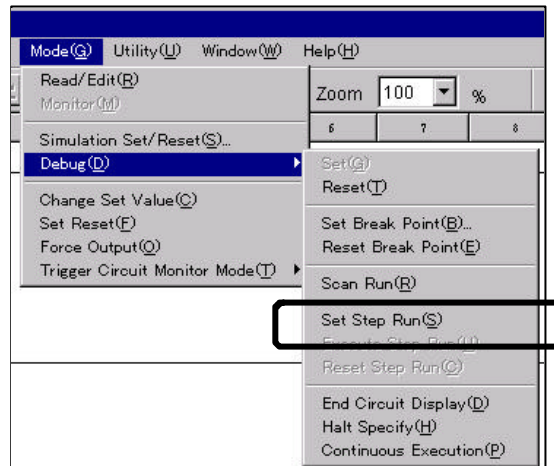
7.9.5 Step Run

Executing by 1 symbol or 1 instruction unit from a position where stopping the execution.

(1) Setting of Step Run

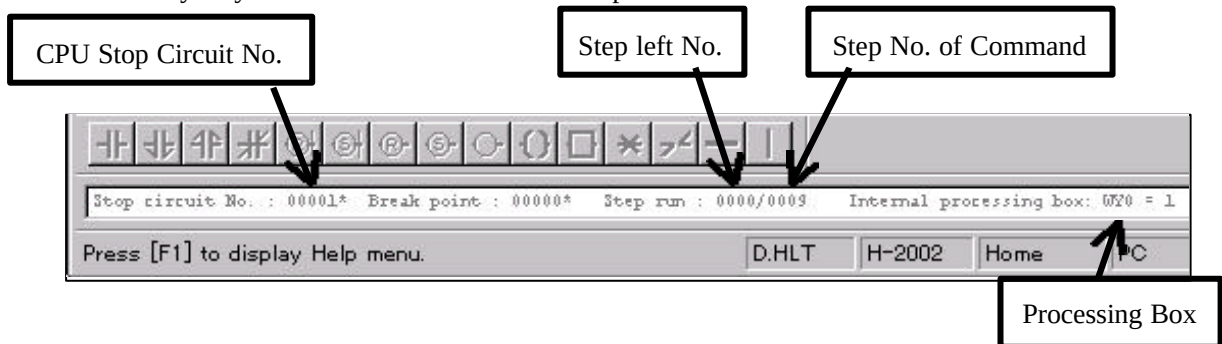
Choose **[Step Run Set]** when the CPU status at the status bar is “D. HLT”. It becomes the step run mode and displays “Step Run 0000/0000” at the output window.

It moves the circuit cursor to the position that stopping the execution.



(2) Execution of Step Run

Confirm the CPU status is “D. HLT” in the condition of the step run mode, and press the TAB key from the position that the CPU stops executing, or choose **[Execute Step Run]**, so the circuit cursor moves by 1 symbol or 1 instruction and the step run is executed.



CPU halt circuit No. : A circuit No. which the CPU stop executing.

Command step No. : Command (a circuit cursor position) step No. immediately before execute Step Run when a circuit cursor is moved by pressing the TAB key or choosing [Execution of Step Run].

Not the step No. of the command at the cursor position.

Step left No. : Step left No. which the command step No. is processed in the CPU. But, the CPU internal processing is high speed, so it displays like “0000”.

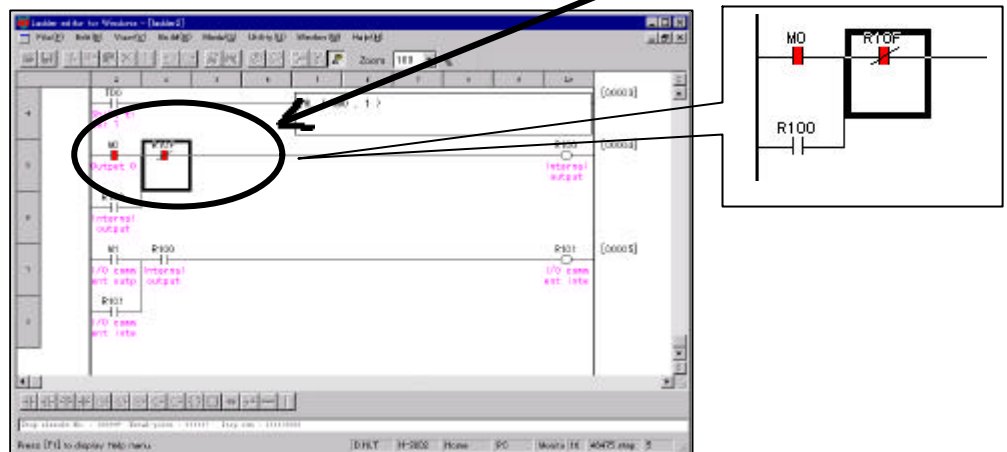
Internal process box : The instruction exist in Waiting for Step Run Execution in Processing box.

About Step Run

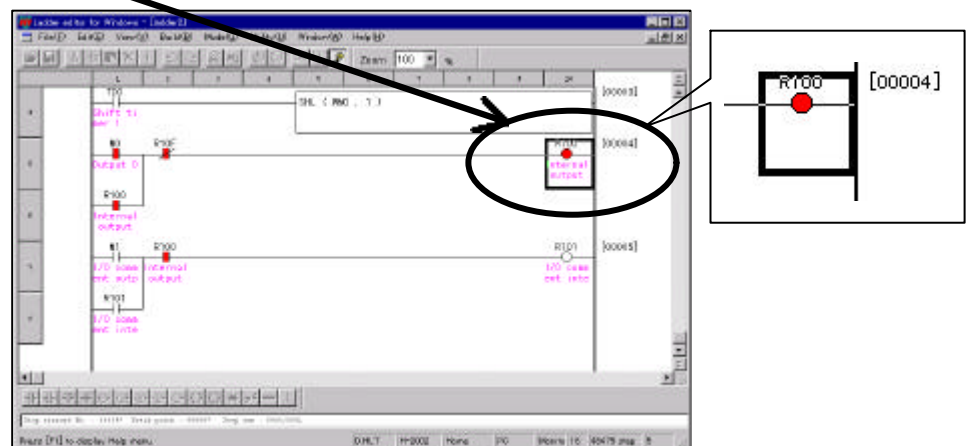
1. At the time of execution of Step Run, the instruction of circuit cursor position has not be executed yet. By pressing the TAB key, or choosing **[Execution of Step Run]**, the instruction of circuit cursor position will be executed, and the circuit cursor moves to the next instruction.

Ex.

- (1) The condition that the circuit cursor exist at B contact point of R10F



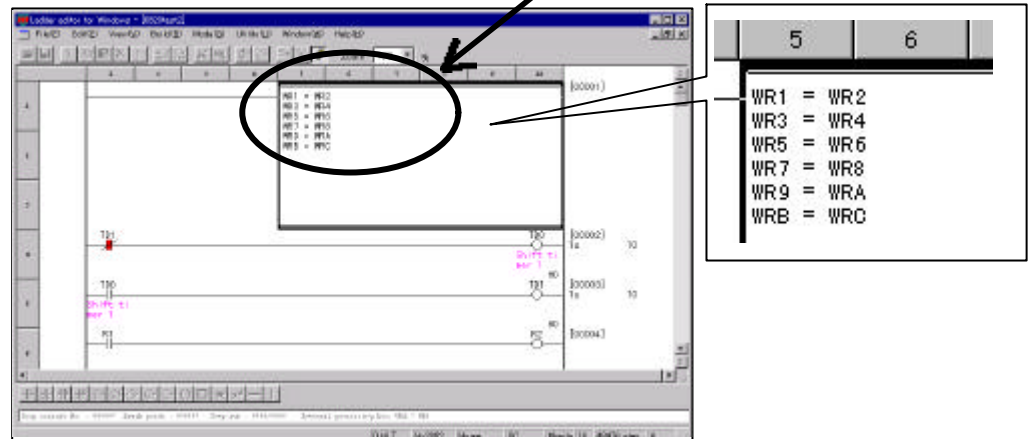
- (2) The instruction of B contact point of R10F will be executed and the circuit cursor moves to R100 coil by pressing the TAB key or choosing **[Execution of Step Run]**.



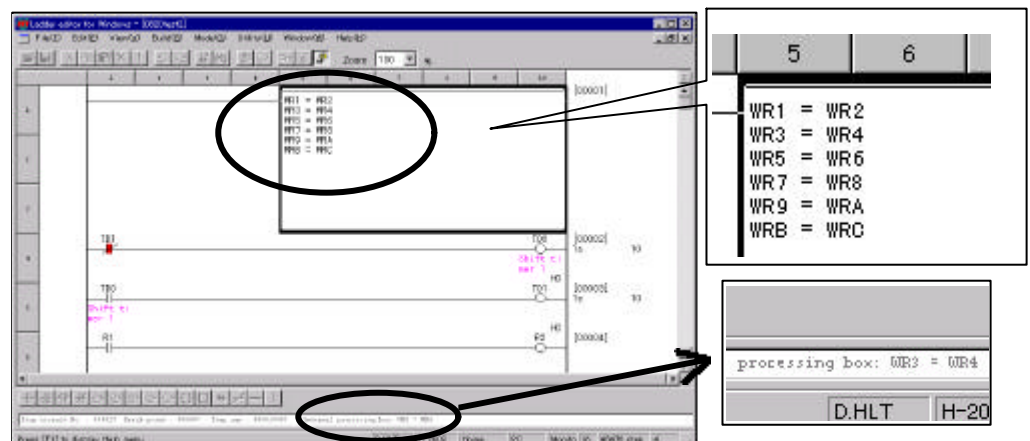
2. A circuit cursor does not move to outside processing box until it finish all instructions in a processing box because it is executed by 1 instruction (line) unit in a processing box.

Ex.

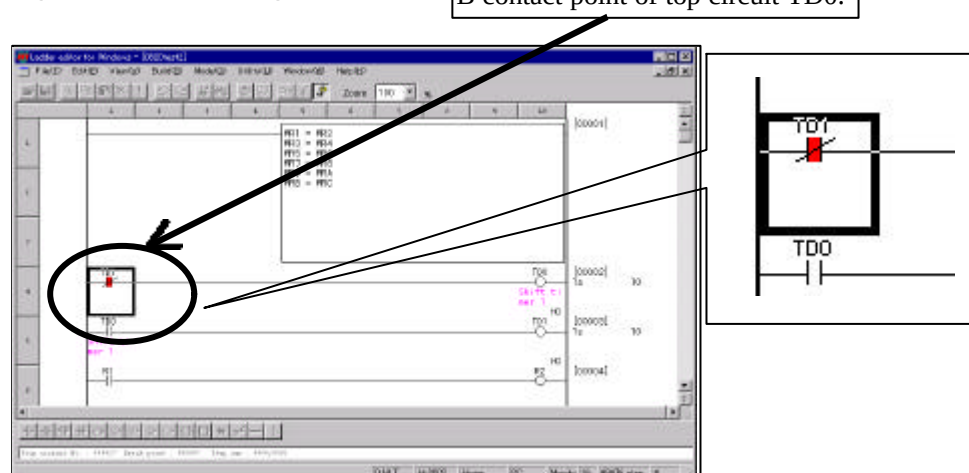
- (a) The condition that the circuit cursor exist in the processing box



- (b) However the top of “WR1=WR2” will be executed by pressing the TAB key or choosing **[Execution of Step Run]**, the circuit cursor does not move. It becomes the waiting condition of execution of “WR3=WR4” .



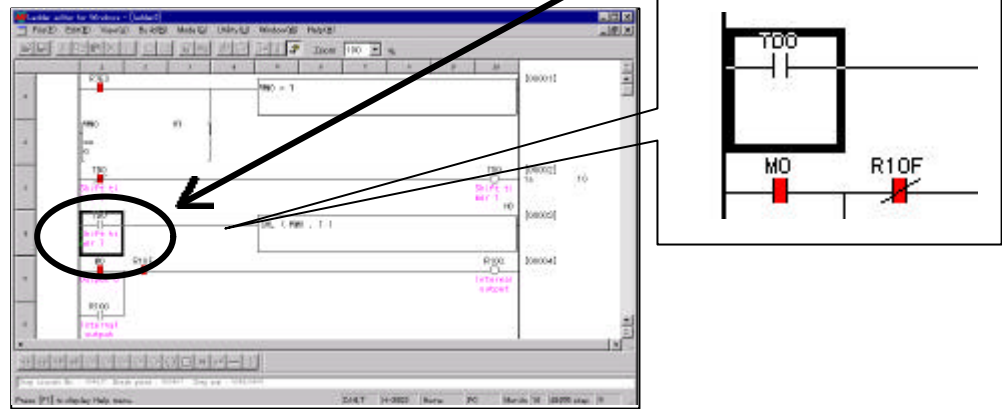
- (c) The circuit cursor move to B contact point of top circuit TD0 by pressing the TAB key or choosing **[Execution of Step Run]** when “WR=WRV” that instruction at the last line of the processing box is in the waiting condition.



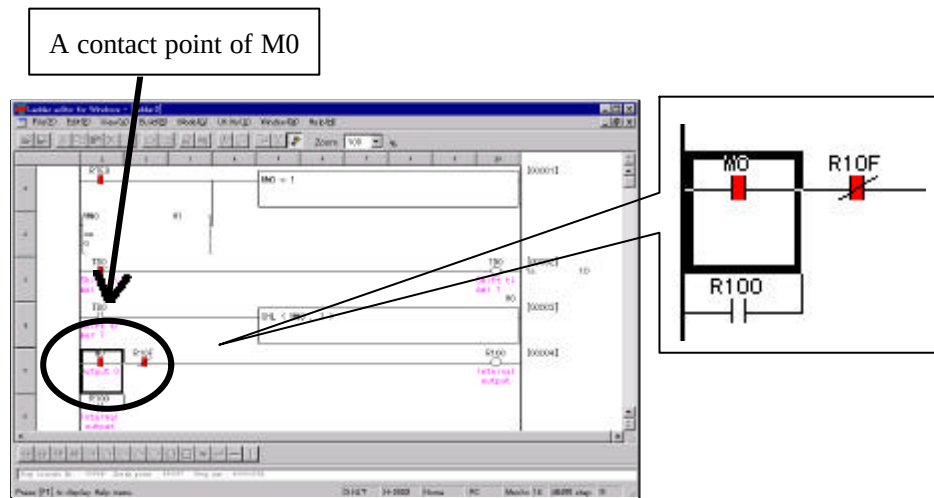
3. The circuit cursor skip the processing box and move to the next circuit when the startup condition of the processing box is not formed in the circuit.

Ex.

- (a) The condition that the circuit cursor exist at A contact point of TD0



- (b) Because A contact point of startup condition TD0 of the processing box is OFF, the circuit cursor move to the top of the next circuit, A contact point of M0 by pressing the TAB key or choosing **[Execution of Step Run]**, after executed the instruction of A contact of TD0.



(3) Reset of Step Run

Choose **[Reset Step Run]** while executing Step Run.

It finish Step Run.

It remains the last position of before resetting.

It starts Step Run again by the last stopped position of before resetting when choosing **[Set Step Run]**.

The last stopped position will be cleared by executing **[Reset Step Run]** and choosing **[Debug]-[Rest]**.

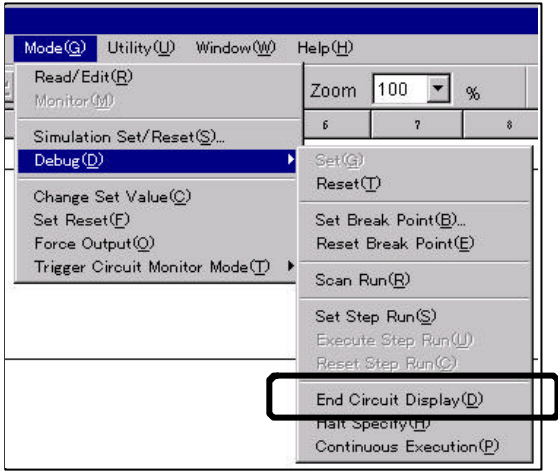
It executes Step Run from the top circuit b choosing **[Set Step Run]**.

7.9.6 End Circuit Display

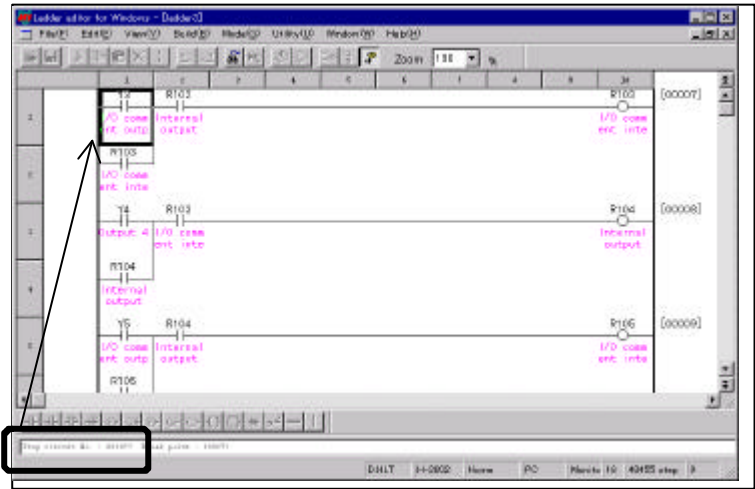
It displays the circuit which the CPU stop execution as the top of the screen

Choose **[End Circuit Display]** at the condition that stopping at the breakpoint. It displays 1 screen from the circuit which stop executing as the top.

The cursor displays at the last stopped position.



The display won't be changed if the CPU is running.



It displays the circuit No. that the CPU stop scanning.
If the circuit No. shows like "00000*", it means that the CPU is stopping at Scan End.

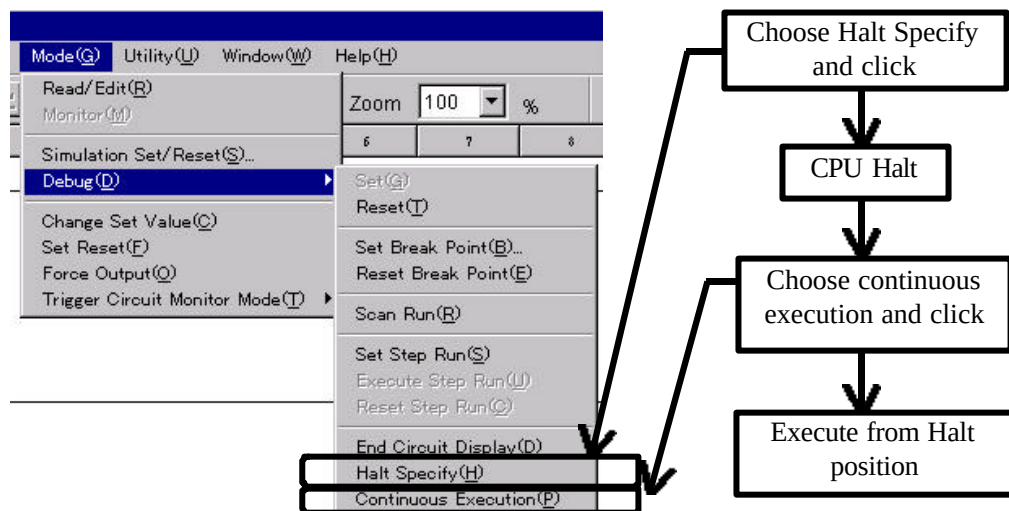
7.9.7 Halt Specify / Continuous Execution

(1) Continuous execution

It executes again from the position that the CPU stop (halt condition) executing. The breakpoint which is specified before execution stop is continuously valid.

Choose [**Halt Specify**] at the debug mode, and make the CPU in the halt condition (“HLT” LED is ON).

When the CPU is halt condition, if choosing [**Continuous Execution**], it executes from the stopped position. The CPU status display at the status bar change D. HLT to D. RUN. But, it becomes D. HLT when stopping at the breakpoint.

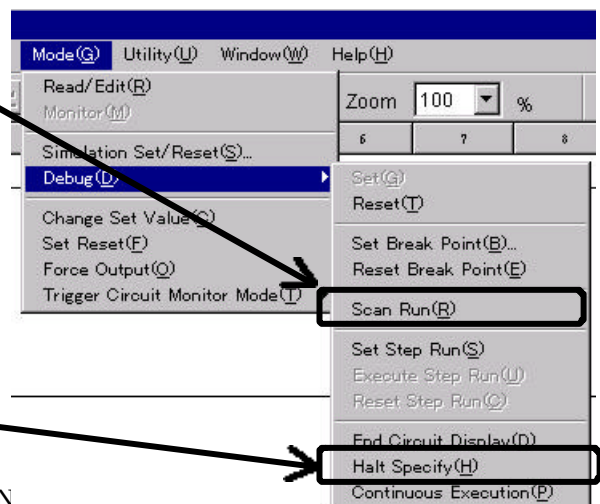


(2) Stop at Scan End

It stop the execution of the CPU at the scan end.

However, if the breakpoint was specified, it stop at the breakpoint.

- (a) Choose [**Scan Run**] when the CPU is debug running (D. HLT). The CPU status at the status bar change to “D. RUN”. But, when the setting time of Scan RUN is small, or the breakpoint is stopping, it displays “D. HLT”.

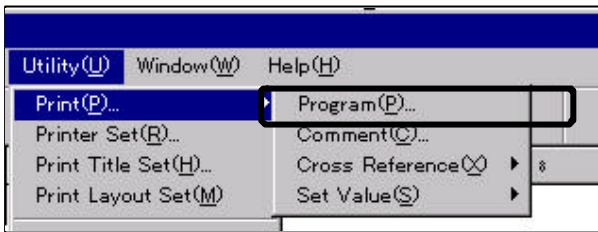


Chapter 8 Printout

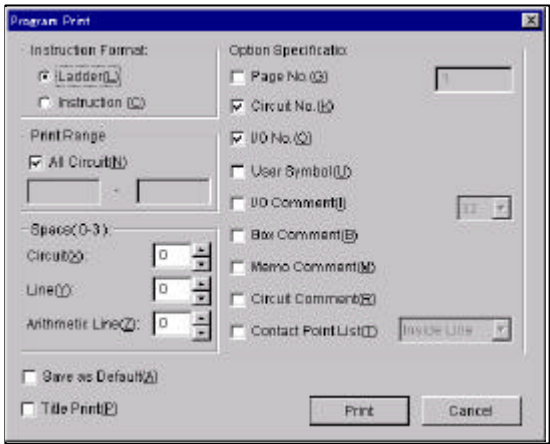
Please refer to Appendix 1 for the example of the printout

8.1 Printout of Program

It displays dialog box of Program Print by choosing **[Program]** from **[Print]** in the **[Utility]** dialog box.
Choose the print information to print.



< Utility menu >



< Dialog box of Program Print >

The setting contents of Program Print dialog box is as following.

< Print information setting contents table >

Print range		Contents
Instruction format		Set the print of Ladder or the instruction word.
Print range		Specify all circuit or circuit No. (1 - last circuit No.) and set the print range.
Line Space	Circuit	Set a space line No. (0-3) to insert between circuits
	Line	Set a space line No. (0-3) to insert between Ladder symbols.
	Arithmetic line	Set a space line No. (0-3) to insert between arithmetic lines
Option Setting	Page No.	Set the top page No. (integer, more than 1) in print, or set the print without the page No..
	Circuit No.	Set the print with or without the circuit No.
	I/O No.	Set the print with or without the I/O No.
	User symbol	Set the print with or without the user symbol
	I/O comment	Set the print with 32 or 16 words I/O comment or without the I/O comment.
	Box comment	Set the print with or without the box comment
	Memo comment	Set the print with or without the memo comment
	Circuit comment	Set the print with or without the circuit comment
	Contact point list	Se the print with or without the contact point list, and the coil list. And, set the print position of the contact point list inside or outside the bus.

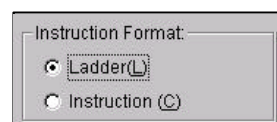
Contact point list : I/O which is used as the coil displays the circuit No. which the circuit is used in the contact point, the processing box by A contact point, B contact point, and the processing box separately.

Coil list : It displays I/O which is used as the contact point displays the circuit No. which the circuit is used in the coil , and left side of the processing box.

If several circuit No. exist, the first No. is printed and “*” is added top of the circuit No.

< Setting example >

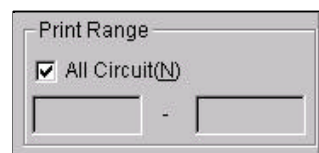
- (a) Choose the radio button of the instruction format for [Ladder] or [Instruction Word].



< Select Instruction format >

- (b) Make the check box “ON” if the print range is [All Circuit].

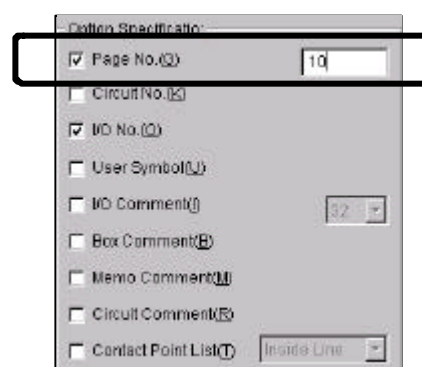
Take the check mark of [All Circuit] to make it “OFF” and input the last circuit No..



< Specification of Print range >

- (c) Set the top page No. to print by clicking the page No. check box at [Option Specify] “ON”.

Other option becomes valid by clicking the check box to make it “ON”.



< Page No. specify >

- (d) When completing all setting, click the [Print] button to start printing the program.

(Caution)

When printout the program, be careful about the following things.

1. When output to the printer which is connected to the network

When printing the program with all circuit, there is possibility to become the network error. Specify and divide the program and printout.

2. When output to the printer which is connected to the printer port.

When printing the program, it sometimes occurs the error such as [Over Run]. You can decrease the error by reducing the level of the printer resolution. Please refer to the manual of the printer for more details.

< Setting of Print Condition >

Print of output program, comment, cross reference, set value, trace are different in print result by the condition following.

- A. Print paper size and its direction which is specified with **[Printer Set]** in **[Utility]**.
- B. Font name and its size which is specified with **[Font]** in **[Display Switch]** in **[View]**.
- C. Resolution of printer.
- D. Margin setting with **[Print Layout Set]** in **[Utility]**.

Set a font, paper size, print direction like a following (a)-(d) to meet a printer and a paper.

And, the setting (a)-(d) are the cases of which are specified as following.

- (1) Specify the small font size (96dpi default value of screen property) for the font size of the screen
- (2) Specify MS Gothic for the font type.
- (3) Specify all comment print for the print condition, 32 words for I/O comment, the contact point list at outside bus, the margin all "0".

When changing the setting condition (1) to (3), the result may be changed.

About difference in print out of Ver1 and Ver2,3

In Ver1, there are two kinds of print formats of 80 columns and 132 columns. The print format is decided by paper size, the direction of paper, screen font size, the kind, printer resolution.

In Ver2 and Ver3, there are 132 columns of print formats.

Print of Ver2 and Ver3 suffers a loss in 80 columns of print formats.

(a) Printer resolution: 150dpi (Ex. Canon, LBP-A304EII)

Font size	A4 vertical	A4 horizontal	A3 vertical	A3 horizontal
6	132	132	132	132
8	132	132	132	132
10	80	132	132	132
12	80	132	132	132
14	80	80	80	132
16	NG	80	80	132
18	NG	80	80	132
20	NG	NG	NG	80
22	NG	NG	NG	80
24	NG	NG	NG	80

132 : Print with horizontal direction
and 132 column format

80 : Print with horizontal
direction and 80 column
format

NG : Cannot print correctly

(b) Printer resolution: 300dpi (Ex. Canon, LPT-A309GII)

Font size	A 4 vertical	A4 horizontal	A3 vertical	A3 horizontal
6	132	132	132	132
8	80	132	132	132
10	80	132	132	132
12	80	80	80	132
14	NG	80	80	132
16	NG	80	80	132
18	NG	80	80	80
20	NG	80	80	80
22	NG	NG	NG	80
24	NG	NG	NG	80

(c) Printer resolution: 360dpi (Ex. Canon, BJ-220JCII)

Font size	A4 vertical	A4 horizontal	A3 vertical	A3 horizontal
6	132	132	132	132
8	132	132	132	132
10	80	132	132	132
12	80	132	132	132
14	NG	80	80	132
16	NG	80	80	132
18	NG	80	80	80
20	NG	80	80	80
22	NG	NG	NG	80
24	NG	NG	NG	80

132 : Print with horizontal direction
and 132 column format

80 : Print with horizontal
direction and 80 column
format

(d) Printer resolution: 600dpi (Ex. Canon, LBP-750)

Font size	A4 vertical	A4 horizontal	A3 vertical	A3 horizontal
6	132	132	132	132
8	132	132	132	132
10	80	132	132	132
12	80	132	132	132
14	NG	80	80	132
16	NG	80	80	132
18	NG	80	80	80
20	NG	80	80	80
22	NG	NG	NG	80
24	NG	NG	NG	80

(e) Printer resolution: 1200dpi (logical value)

Font size	A4 vertical	A4 horizontal	A3 vertical	A3 horizontal
6	132	132	132	132
8	132	132	132	132
10	80	132	132	132
12	80	132	132	132
14	80	80	80	132
16	NG	80	80	132
18	NG	80	80	80
20	NG	80	80	80
22	NG	NG	NG	80
24	NG	NG	NG	80

Details of symbols

132 : Print with horizontal direction and 132 column format.

Print the program name of the print title, date, and page as:

Program name =

Date = Year Month Date

Page =

Print the I/O comment of the contact point beside the symbol.

Print a coil, the I/O comment of processing box, a circuit comment to the outside bus.

When set the contact point list to the outside bus, print all contact point list to the outside bus.

When set the contact point list to the inside bus, print only the contact point list of timer/counter and the contact point list (more than 5 points) which can not be printed with one line to the inside bus, and others are printed to the outside bus.

80 : Print with horizontal 80 column format.

Print the program name of the print title, date, and page as :

Program name =

DATE = - -

PAGE =

Print the contact point, the coil, the I/O comment of the processing box, the circuit comment between lines to the next circuit.

When set the contact point list to the outside bus, it does not print a contact point list.

When set the contact point list to the inside bus, it print all contact point list to the inside bus.

NG : The print cannot be performed correctly with the specified pager size.

And, please refer to “Appendix 1” for the print sample.

(Caution)

1. About the usable printer.

It is possible to print with LADDER EDITOR for Windows® only by a printer with the printer driver for Windows® operating system, but be careful about the following points to use.

When use the printer drivers of several makers which are attached to the system disk of Windows® OS, a letter sometimes overlap each other.

If a letter is printed overlapping each other, install the last version of printer driver for the using printer.

Please ask to printer makers for the last version of printer driver.

2. In the printer resolution of (a)-(e), the result may be changed by the printer which is not checked.

If the print is not performed correctly, change the setting (font, etc.) of the printer.

3. Print speed is affected by the specification of the printer, and the printer driver, etc.

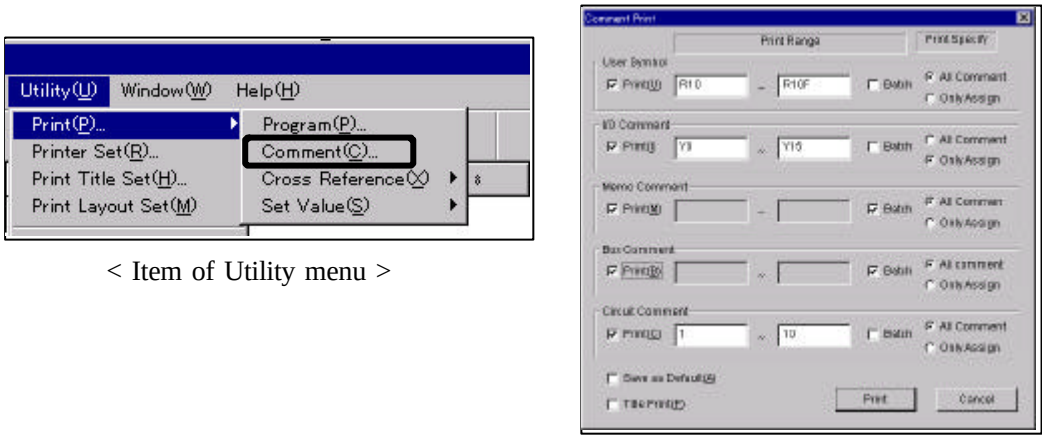
8.2 Printout of Comment

Print the created each comment with the table format.

< Comment print information >

Print type	Print information
Comment	User symbol print
	I/O comment print
	Memo comment print
	Box comment print
	Circuit comment print

It displays the dialog box of Comment Print by choosing [Comment] from [Print] in the [Utility] menu.



< Item of Utility menu >

< Dialog box of Comment Print >

The setting of print contents of comment becomes [Print] by making ON the check box, and [Not Print] by making OFF the check box. The range can be specified by making OFF the batch check box.



< Print range specify >

Input value of print range

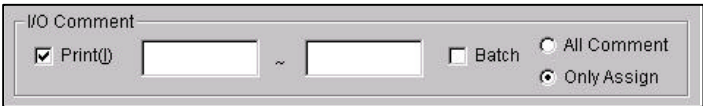
User symbol, I/O comment : I/O No.

Memo comment, Box comment : Comment instruction No.

Correspond to (S) of BOXC (S), MEMC (S)

Circuit comment : Circuit No.

Select each radio button of [All Comment] , [Using Only] when setting the print specification.



< Setting of Print Specification >

All Comment : Print the unsettled comment as a blank space.

Using Only : Does not print I/O No. or the comment of unsettled comment.

Click the [Print] button after complete all setting, then start printing the comment.

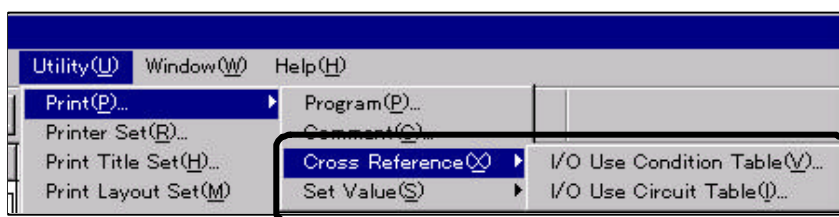
8.3 Printout of Cross Reference

Print the I/O use condition in the created program .

< Cross reference print information >

Print type	Use condition	Search division
Cross reference	I/O use condition table	External input-output
		Internal input-output
		Timer, Counter
		DIF, DFN
		Master control
		Control instruction
	I/O use circuit table	Coil specify contact point circuit
		Contact point specify coil circuit
		I/O No.
		Control instruction circuit

It displays each dialog box by choosing **[I/O Use Condition Table]** or **[I/O Use Circuit Table]** of **[Cross Reference]** from **[Print]** in the **[Utility]** menu.

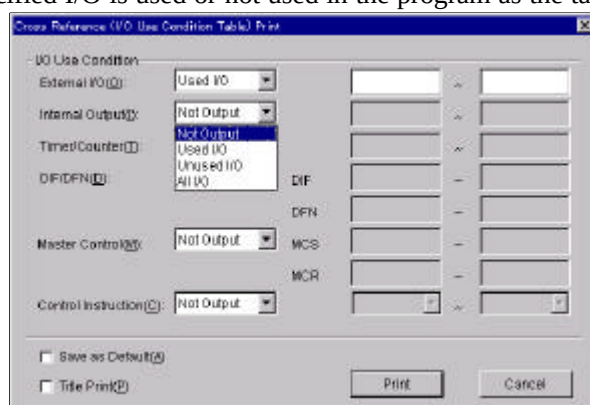


< Menu of Cross Reference >

It specify needful search division.

(1) I/O use condition table

Print whether the specified I/O is used or not used in the program as the table format.



< Dialog box of I/O use condition table >

It displays the pull down menu by clicking  of each output, so select the output type.

Not output : Does not make search.

Used I/O : Search I/O which is used in the Ladder program.

Unused I/O : Search I/O which is not used in the Ladder program.

All I/O : Search all range of object I/O type and print “*” at the left side of the using I/O.

When selecting other than “Not Output”, the search range can be specified. If not specifying, all I/O range of selected type become an object.

The following are I/O No. which can be search,

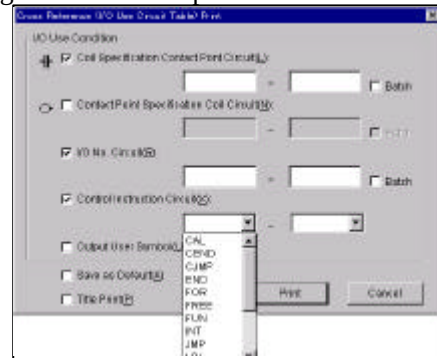
External input-output	X0 - X4FF95	WX0 - WX4FF9	DX0 - DX4FF8
	Y0 - X4FF95	WY0 - WX4FF9	DY0 - DX4FF8
Internal output	R0 - R7FF	WR0 - WRF1FF	DR0 - DRF1FE
	L0 - L13FFF	WL0 - WL13FF	DL0 - DL13FE
	M0 - M3FFF	WM0 - WM3FF	DM0 - DM3FE
	TC0 - TC511		
Timer/ Counter	TD0 - TD255 (note)	CU0 - CU511 (note)	CL0 - CL511
DIF/ DFN	DIF0 - DIF511		DFN0 - DFN511
Master control	MCS0 - MCS49		MCR0 - MCR49
Control instruction	END	CEND	FREE
	RTS	RTI	SB0 - SB99
	CJMP0 - CJMP255		CAL0 - CAL99
	FOR0 - FOR49		RSRV0 - RSRV255
	NEXT0 - NEXT49		LBL0 - LBL255
	INT0 - INT31		START1 - START16
	JMP0 - JMP255		FUN0 - FUN255

After complete all setting clicking the [Print] button to start printing of the cross reference.

(note) Timer/Counter can be specified with all type.

(2) I/O use circuit table

Print the place of the program where the specified I/O is used

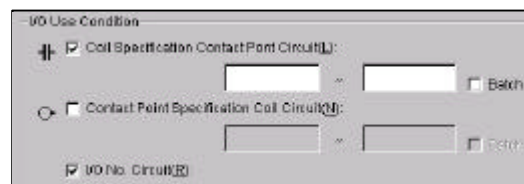


< Dialog box of I/O use condition >

The each output setting becomes [Print] by making ON the each check box, and [Not Print] by making OFF the check box. When setting the print range, if a check mark is in “Batch”, it searches include related I/O if the range specified I/O (all I/O if not specified) is bit/word common I/O.

Ex. Range specify : X0-X100

Search range : X0-X100,WX0-WX10,DX0-DX10



< Setting of Output >

Coil specify contact : Specify I/O No. which can be used as the output, and print the circuit No. of point circuit circuit which I/O No. is used as the contact point.

(include Processing box).

Contact point : Specify I/O No. which can be used as the output, and print the circuit No. of specify coil circuit circuit which I/O No. is used in the coil and the left side of the pressing box.

I/O No. circuit : Specify I/O No., and print the circuit No. of circuit which I/O No. is used separately with the contact point, the coil, and the processing box.

Control instruction : Specify the control instruction, and print the circuit No. of circuit circuit which the instruction is used.

User symbol output : Print the output result with the user symbol.

And, the following are I/O which can be specified.

Search type	Bit	Word	Double word
Coil specify contact point circuit	Y,R, L, M,TD	WY,WR, WL,WM	DY, DR, DL, DM
Contact point specify coil circuit	Y,R, L, M,TD	WY, WR, WL, WM	DY, DR, DL, DM
I/O No. circuit	X,Y,R,L,M,TD,CL ,DIF,DFN,MC	WX,WY,WR,WL, WM, TC	DX, DY,DR, DL, DM
Control instruction circuit	END,CEND,FREE,LBL,FOR,SB,RTS,START,INT,RTI,FUN, CAL,RSRV,JMP,CJMP,NEXT		

After complete all setting, click the [Print] button to start printing the cross reference.

(Note)Timer/Counter can be specified with all type.

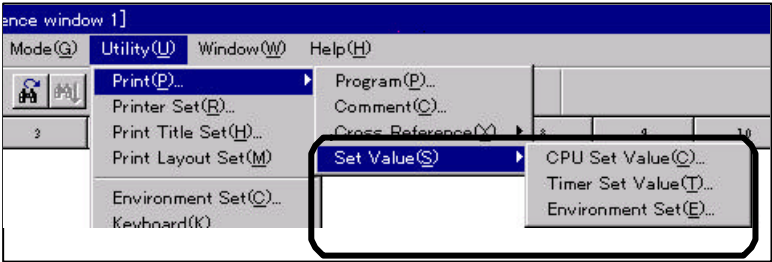
8.4 Printout of Setting Value

Print the data of CPU setting, Timer/Counter setting value, and Environment setting to which is set to create the program in the table format.

< Setting value print information >

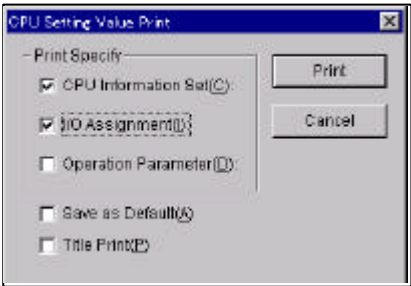
Print type	Setting	Print information
Setting value	CPU setting table	CPU information setting
		I/O assignment
		Operation parameter
	Timer setting value table	
	Environment setting	

It displays each dialog box by choosing [CPU Set Value], [Timer Set Value], [Environment Set] from [Set Value] in [Print] in the [Utility] menu.



< Item of Utility menu >

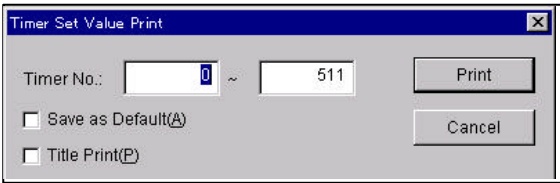
(1) CPU setting value



< Dialog box of CPU Setting Value >

The print setting can be done by making ON the check box of each print specification. After complete all setting, click the [Print] button to start printing the CPU setting.

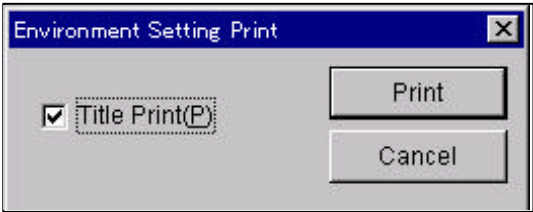
(2) Timer setting value



< Dialog box of Timer Setting Value >

Input the timer No. directly in the setting box if you specify the range. After complete all setting, click the [Print] button to start printing the timer setting.

(3) Environment setting



< Dialog box of Environment Setting >

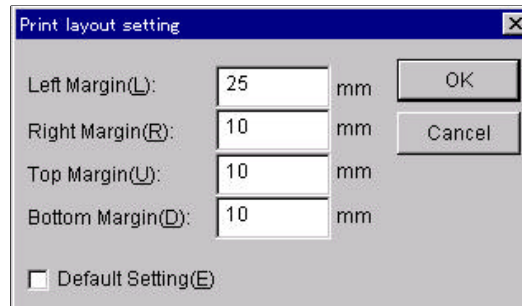
The print of the tile can be possible by making ON the check box. After complete all setting, click the [Print] button to start printing the environment setting.

8.5 Setting of Print Layout

Set the margin of the paper to print.

Choose **[Print Layout Set]** from the **[Utility]** menu.

It displays the dialog box of Print Layout Setting.



< Dialog box of Print Layout Setting >

Input the margin size with mm unit.

And, same as the printer setting, the setting of the print layout reflect to all print contents like the program, the comment, the cross reference, the setting value, and the trace, etc..

8.6 Setting of Print Title

You can printout with the tile by inputting the title to the **[Print Title Setting]** dialog box in the **[Utility]** menu.

< Dialog box of Print Title >

The input letter numbers of each item is as following.

Item	Input word numbers
TITLE	58
SUBJECT	53
DRW No.	31
PROGRAMMER	9
VERSION	24
DATE	15

When printing with the tile, make ON the check box of the title print of each print dialog box.

(Caution)

The data of the input print title is saved as the part of the memo comment. Therefore, when saving in the disk, save as the memo comment (extended code *.mec) by **[File] - [Save]**, or **[File] - [Batch Save]**.

8.7 CPU type at Printout

- CPU name in Print title
- "Offline CPU Name" in Print - Set Value - CPU Set Value - CPU Information Set
- "Offline CPU Name" in Print - Environment Set

Refer to "CPU name at Printout" in the following table for the CPU types related to print.

No.	Offline CPU type	CPU type at Printout	Comment
1	H-2002	H-2002	
2	H-702	H-702	
3	H-302	H-302	
4	H-2000	H-2000	
5	H-700	H-700	
6	H-300	H-300	
7	H-200	H-200	
8	H-64	H-64	
9	H-40	H-40	
10	H-28	H-28	
11	H-20	H-20	
12	H-1002	H-1002	
13	H-250	H-250	
14	H-252	H-252	
15	EH-150	EH-150	Ver2.13 or latter *1
16	4010 STD	H-4010	Ver2 or latter
17	4010 CMP	H-2002	Ver2 or latter
18	MICROEH	MICROEH	Ver2.13 or latter

*1 In case of older version than ver.2.13, the printed CPU type is "H-302" instead of "EH-150".

Chapter 9 Operation of H4010 Functions

9.1 Setting of H-4010 Standard Mode

You need to set the offline CPU type to “4010 standard” and the memory cassette type to “96ks” to use the following functions which are added newly in H-4010.

It becomes an error when execute the next programming under the condition that the offline CPU type is the conventional type CPU or “4010 compatible” and the memory cassette type is under 48ks.

(a) Editing of program over 48.5s

(b) Extended timer/counter

Programming that the counter is 256 - 2047 and the timer is 256 - 1023

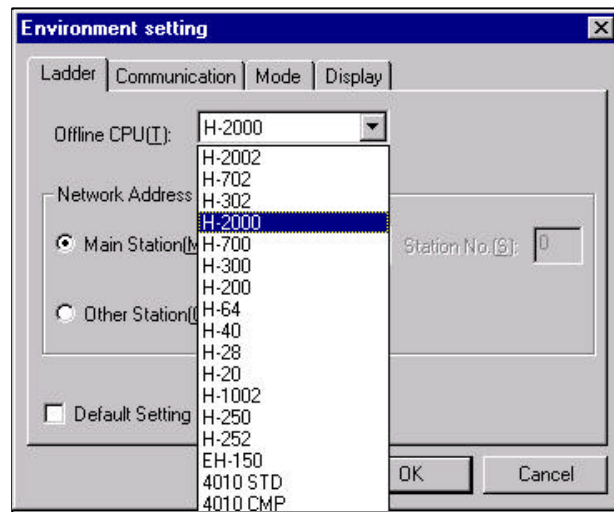
(c) Programming of link area of WN0 - 7FFF

(Caution)

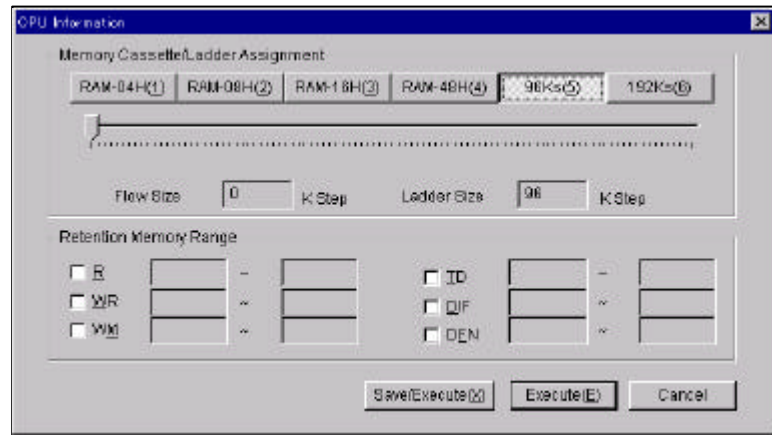
1. When changing a program which using the extended timer, WN from 4010 standard mode to other mode, the editing of extended timer, WN can not be done.
2. Online connecting to H-4010 CPU
Even if the offline CPU is other than H-4010 standard (4010 compatible or conventional CPU), it can load a program using the extended timer and WN but can not be edit.
3. When connecting to H-4010 CPU, if the CPU mode is not agree with the PC mode as following, the editing/transfer can be possible but can not connect with on-direct.
 - (a) In the case that the CPU is “4010 standard” and LADDER EDITOR for Windows® Ver2 and Ver3 is “Except 4010 standard”.
 - (b) In the case that the CPU is “Except 4010 standard” and LADDER EDITOR for Windows® Ver2 and Ver3 is “4010 standard”.
4. Make sure to make match the setting of compatible/standard mode of LADDER EDITOR for Windows® Ver2 and Ver3 when making the online and on-direct connecting. The several types of error occur if it is used without matching.
5. When creating or editing a program in the offline, the setting of compatible/standard mode and the memory cassette size and its combination should be specified as follows. It cause some kind of problems if the setting is other than this.

4010 compatibility mode ->	RAM-48H
4010 standard mode	-> 96ks
6. The programming of WN and the extended timer/counter are depended on the mode setting of the CPU side. It is possible if the CPU is in the standard mode and impossible if the CPU is in the compatible mode. However, when changing to the offline, if the offline setting of LADDER EDITOR for Windows® Ver2 and Ver3 was “4010 compatible”, the editing of circuit which using WN and the extended timer/counter can not be done. Change to “96ks” setting of “4010 standard” and editing.

(1) Set [Offline CPU] of [Environment Setting] in the [Utility] menu to “4010 standard”.



(2) Set [Memory Cassette] of [CPU Information] from [CPU Setting] in the [Utility] menu to “96ks”.



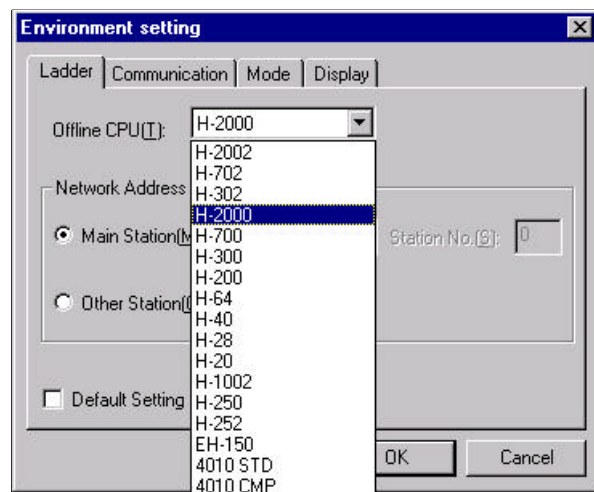
9.2 Reset of H-4010 Standard Mode

The following programs may be happen if creating or editing the user program for the conventional CPU under the setting of “4010 standard mode” and “96ks” in the offline mode.

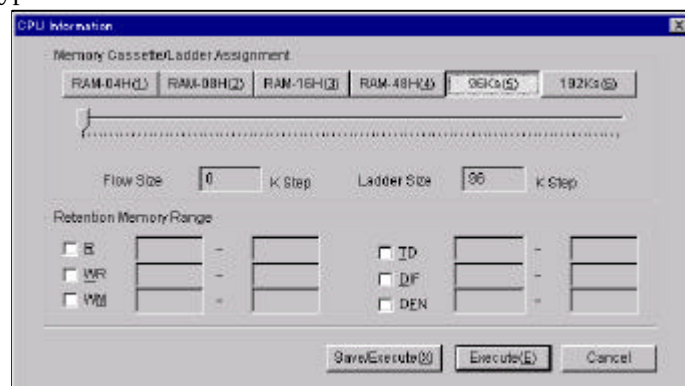
- (a) A program larger than 48ks can be input .
- (b) Timer/counter can be input 0 - 2047 (timer is 0 - 1023).
- (c) Link area of WN0 - 7FFF can be input.

In the result, after inputting the program, it becomes an error at the transfer of the CPU and can not write. Therefore, make sure to execute the following operations when creating/editing a user program for a conventional CPU.

- (1) Set [Offline CPU] of [Environment Setting] in the [Utility] menu to the using CPU type.



- (2) Set [Memory Cassette] of [CPU Information] form [CPU Setting] in the [Utility] menu to the using memory cassette type.



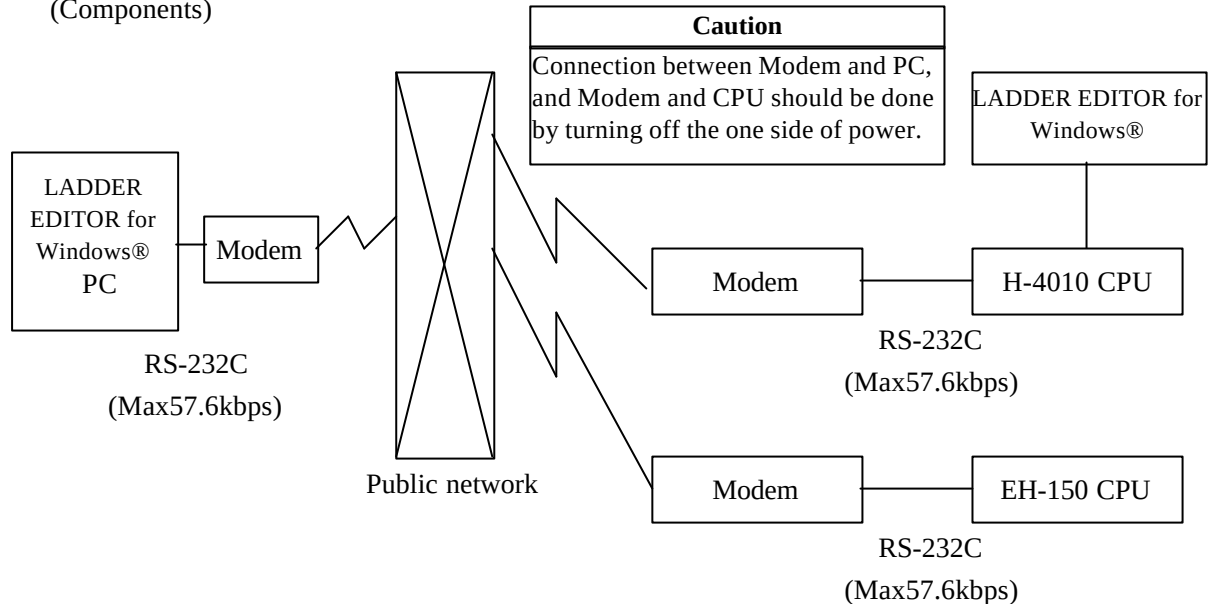
- (3) Execute [PC Initialize] from [Initialize] in the [PC Initialize].

Chapter 10 Modem Connection

10.1 Components for Modem Connection

The following is the machine components for the modem connection.

(Components)



(Specification of Connection)

Item	Specification
Transmission speed between CPU and Modem	2400, 4800, 9600, 14.4k, 19.2k, 28.8k, 38.4k, 57.6kbps (Transmission speed is decided by Specific internal output WRF01A.)
Transmission speed between LADDER EDITOR for Windows and Modem	2400, 4800, 9600, 14.4k, 19.2k, 28.8k, 38.4k, 57,6k bps (Transmission speed is decided by specification of modem and setting of PC)
Communication method	Full duplication (Half duplication control for communication program)
Synchronous method	Start-stop transmission
Transmission method	Serial transmission (Bit serial transmission)
Transmission code	ASCII code
Transmission code components	Start bit (1 bit) Parity bit (1 bit) Stop bit (1 bit) 2⁰ 2¹ 2⁶ P Data (7 bit) (Even parity)
Order of transmission code sending	Send from a lower bit (2 ⁰) with a character unit
Error check	Vertical check, Overrun check, Framing check
Interface	RS-232C
Control process	H series specific process (HI-Protocol)
Startup method	One side startup method by the host side command
Others	Can not change baud rate and specify/reset binary mode when connecting

10.2 Setting of Modem Connection

To connect the modem, specify the following setting in Windows® OS and LADDER EDITOR for Windows®. And the functions of Windows® OS are used without changing to the setting related to the modem except the specific function of LADDER EDITOR for Windows®. Please refer to the manual of Windows® operating system about it.

10.2.1 Setting of Windows® OS

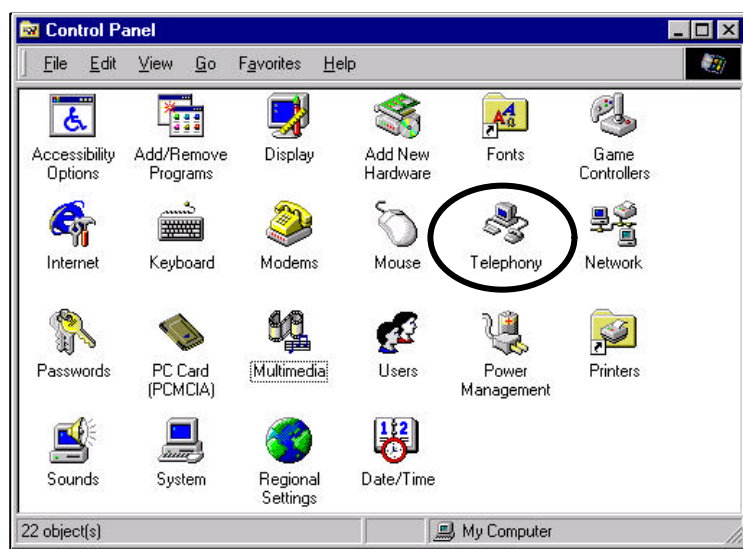
(1) Add “Telephony” icon

To execute the modem communication and the dial setting, the icons of [Modem] and [Telephony] should be displayed in the control panel of Windows.

In some version of Windows case, the telephony icon is not displayed initially.

In that case, the icon will be displayed by changing

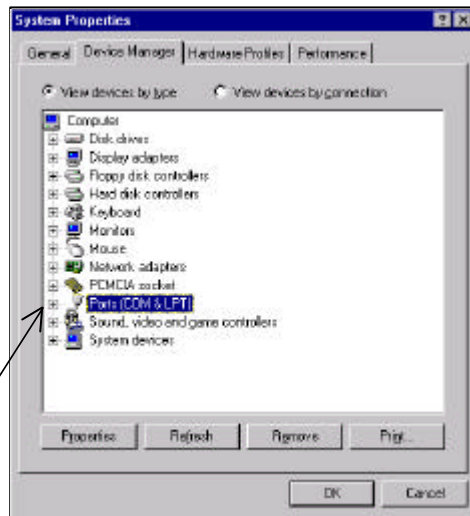
c:\Windows\System\Telephony to c:\Windows\System\Telephony



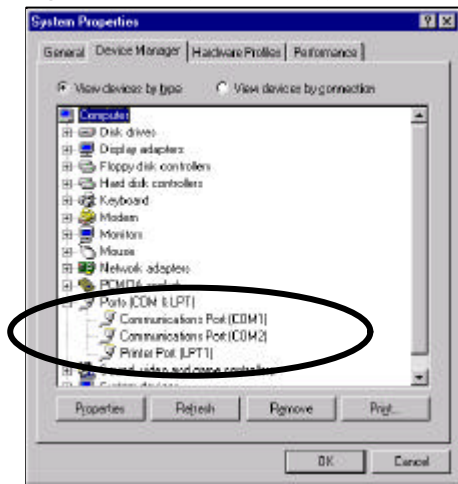
Control panel with “Telephony” icon

(2) Setting of Transmission code components

Double click the [System] icon in the control panel to display the device manager.



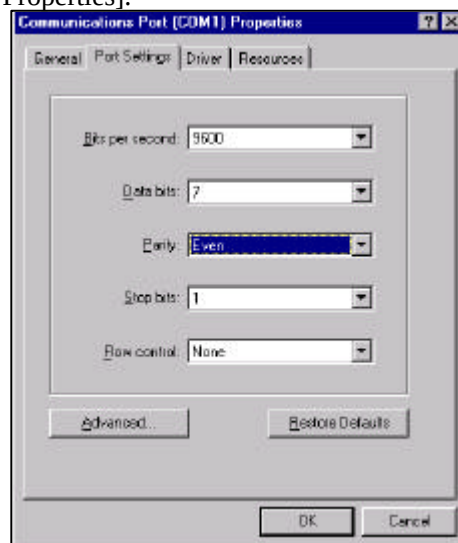
Click “+” on the right of [Port (COM&LPT)].



Click COM port to use, and click the [Properties] button.

Set the transmission code components to the specification of H series of the following values in [Port Settings] dialog box in [Communication Port Properties].

- Bits per second : Unnecessary
- Data bits : 7
- Parity : Even
- Stop bit : 1
- Flow control : None

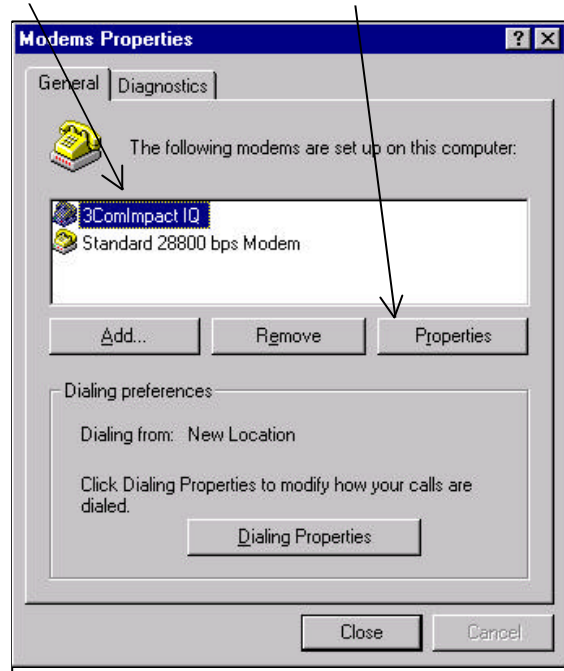


Click the [OK] button and close the dialog box.

(3) Setting of Modem property

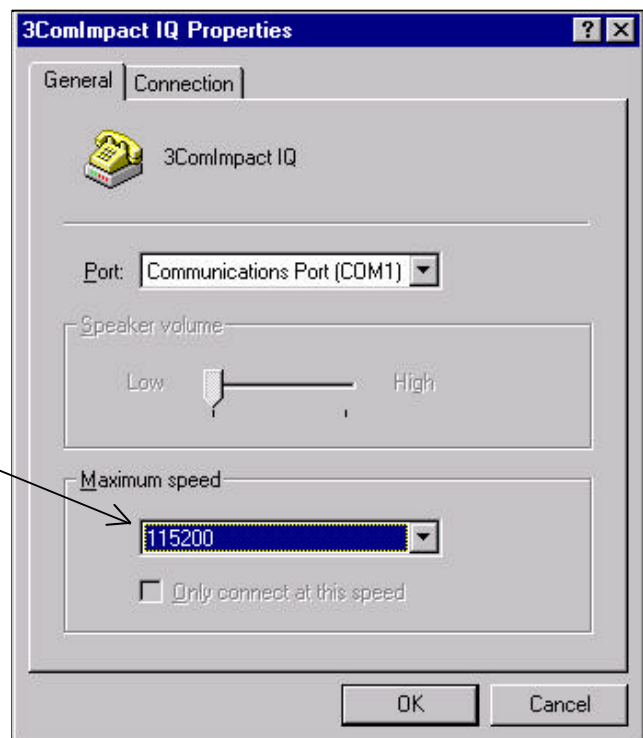
Double click the modem icon in the control panel to display “Modem Properties”.

Click the modem to use and click the [Properties] button.



In “General” in the modem property dialog box,

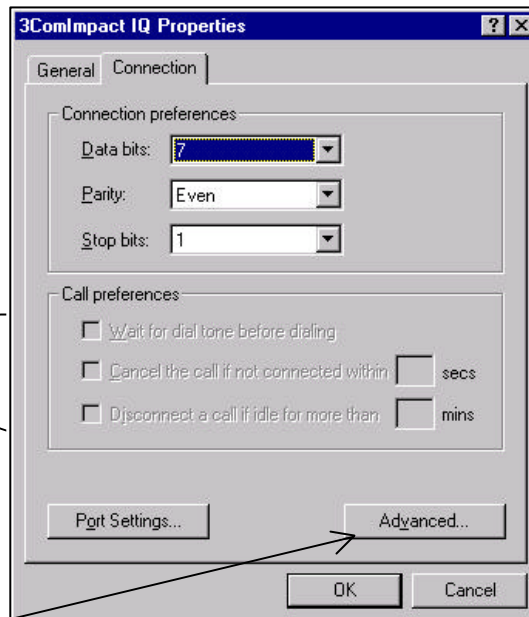
Select the highest speed as “115200”.



Then, click [Connection] tab, and set the specification of H series of the following values to “Call Option”.

- Data bits : 7
- Parity : Even
- Stop bit : 1

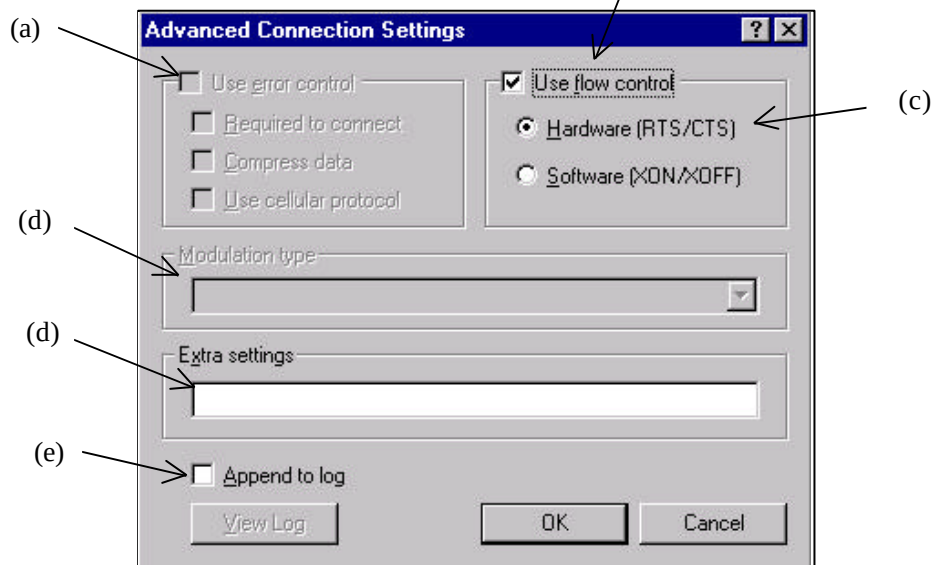
And, taking off all checkmark at Connecting option.



After that, click the [Advanced] button.

Set as the following in Connection Detail Setting dialog box.

- (a) Use error control : OFF
- (b) Use flow control : ON
- (c) Hardware (RTS/CTS) : ON
- (d) Modulation type : Standard
- (f) Extra settings : Blank space
- (g) Record a log file : OFF



After complete setting, click the [OK] button.

Click the [OK] button in the property dialog box of the modem to use.

Click the [OK] button in the dialog box of the modem property.

(Caution)

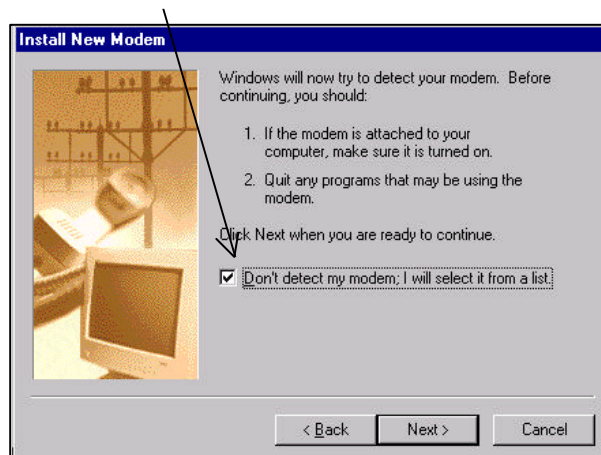
1. When first using the modem in Windows®OS, it automatically install the specific driver for the modem to use by the plug & play function of Windows®OS, but with the modem specific driver, the telephony function sometimes does not work correctly and cannot connect to the CPU. Install the driver of “Standard modem” if it can not connect with the CPU by the modem specific driver.
If you use the modem for other than LADDER EDITOR for Windows®, do not erase the installed modem specific driver. Otherwise, it can not use with other than LADDER EDITOR for Windows®.
2. If the contents of the modem memory had been changed by AT command, it sometimes can not connect.
Restore the contents of the modem memory to the condition of initial setting by using (Accessory) - (Hyper Terminal). (Ex. AT&F command is different in each modem. Please refer to the manual of each modem.)

The following are the confirmed modem makers and models.

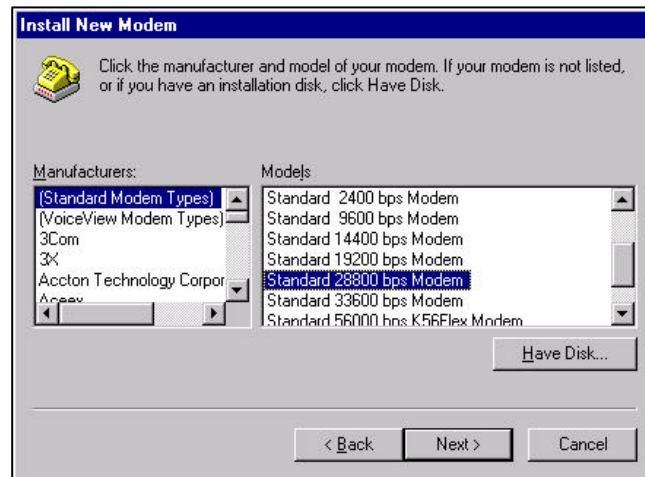
AIWA PV-BF3360
AIWA PV-BF2880
AIWA PV-BF5600
OMRON ME3314A
3Com Japan SPORTSTER VOICE SP560V
HUCOM HUCOM-EX336
INTEGRN MP1414F

(Way to install the standard modem)

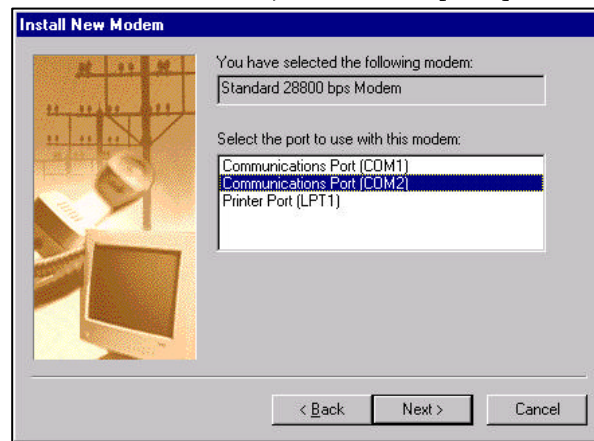
- (a) Double click the modem icon in the control panel.
- (b) Click the [Add] button in the modem property dialog box.
- (c) In the dialog box of Install New Modem, click to ON the check box of “Don’t detect my modem; I will select it from a list.”, and click the [Next] button.



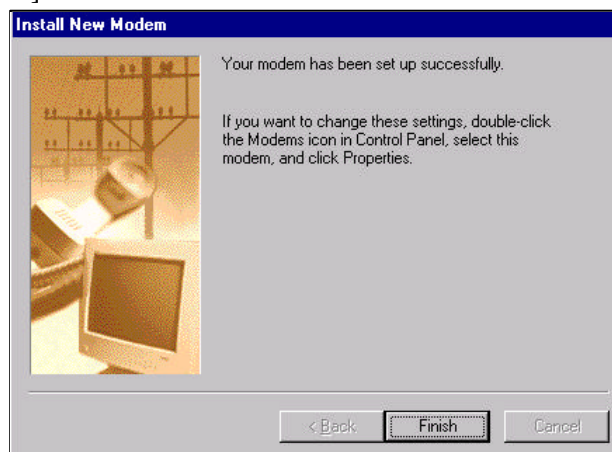
- (d) In the modem list, select “Standard Modem Types” in the “Manufacturers” list and the modem (baud rate of modem to use) in the “Models” list, and click the [Next] button.



- (e) Choose the port to connect the modem, and click the [Next] button.



- (f) Click the [Finish] button.



After that, in the process of (3) Modem Properties, set the highest speed, Call option, etc..

(4) Setting of Specific internal output of connecting CPU

Connect LADDER EDITOR for Windows® and the CPU in the online, and set the CPU-Modem transmission baud rate, and the time of modem time out in the specific internal output like following.

(a) EH-150

Set the CPU-Modem transmission baud rate in WRF01A.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
										a	b	c	d	e	f

a: 57.6kbps b: 38.4kbps c: 19.2kbps

d: 9600bps e: 4800bps f: 2400bps

Make the corresponding bit to 1.

When setting several bits, the lower bit prior to others.

When all the bits are 0, it becomes 2400bps.

Set the time of modem time out of CPU-Modem in WRF03C.

Example of Setting (Set “***” part of H80** in a second unit)

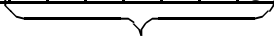
H8001 -> Set the time of modem time out to 1 second.

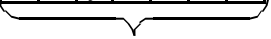
Normally set it as no time out of “H8000” or “0000” (default).

(b) H-4010

Set the CPU-Modem transmission baud rate in WRF01A.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	a	b	c	D	e	f	g		h	i	j	k	l	m	n


Port 1


Port 2

a,h: 57.6kbps b,i: 28.8kbps c,j: 19.2kbps
d,k: 14.4kbps e,l: 9600bps f,m: 4800bps
g,n: 2400bps

Make the corresponding bit to 1.

When setting several bits, the lower bit prior to others.

When all the bits are 0, it becomes 2400bps.

Set the time of modem time out of CPU-Modem in WRF03C or WRF03D.

Example of Setting (Set “***” part of H80** in a second unit)

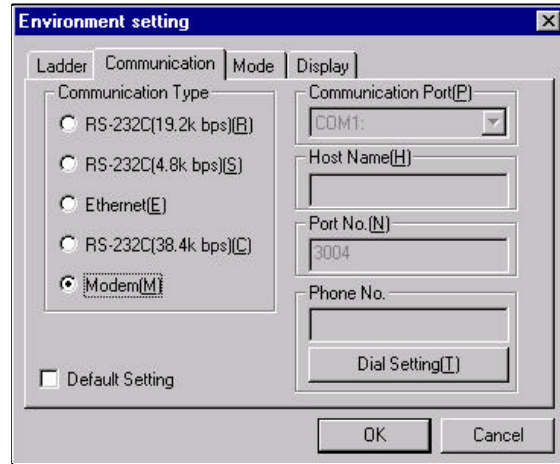
H8001 -> Set the time of modem time out to 1 second.

Normally set it as no time out of “H8000” or “0000” (default).

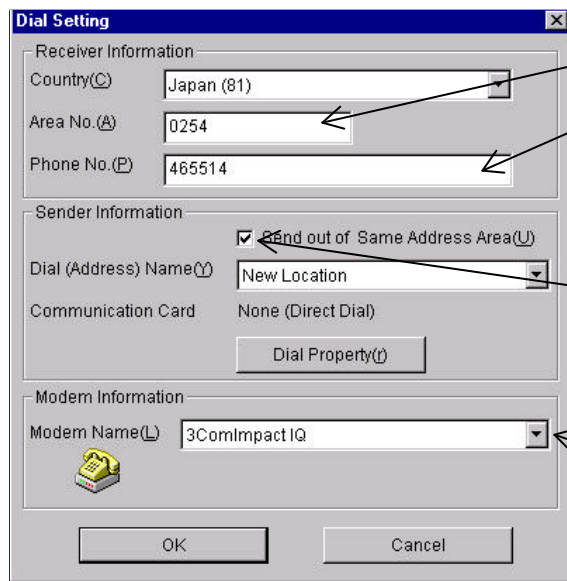
(5) Setting of LADDER EDITOR for Windows®

Make the following settings under the offline state of LADDER EDITOR for Windows®.

- (a) Display the communication dialog box of [Environment Setting] - [Utility] menu.
- (b) Select [Modem] in the communication type.
- (c) Click the [Dial Setting] button.



- (d) Input the destination telephone number and choose the modem connected with the personal computer (or in the PC) by the dial setting dialog box.

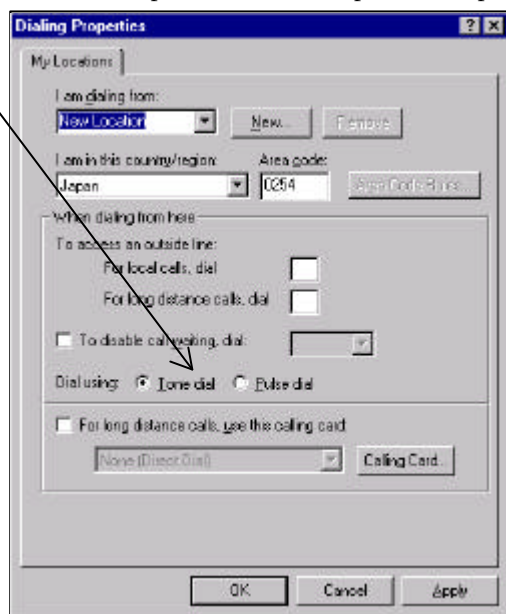


Input the destination area number and the phone number.

To make it OFF when calling to the same area.

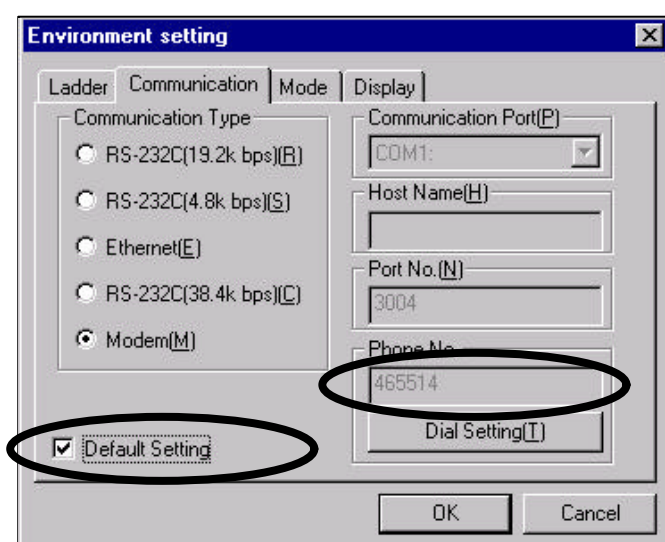
Choose the modem to connect with the PC.

- (e) Click the [Dial Property] button in the dial setting dialog box.
Choose “Tone” or “Pulse” of the dial setting by the telephone line to use.
If you are not sure about it, please ask the telephone company.



Click the [OK] button after setting.

- (f) Click the [OK] button in the dialog setting dialog box.
- (g) Confirm the set number in the telephone number window of the communication dialog box, and click to make a check mark in the “Make this setting default” box, and click the [OK] button.



(6) CPU display switch setting for Modem connection

Set the display switch to make the connecting CPU becomes the modem connection.

EH-150: Only No.2 ON

H-4010 : Peripheral port 1: No. 1 of DIPSW2 ON

Peripheral port 1: No. 2 of DIPSW2 ON

Please refer to the application manual of EH-150 and the manual of H-4010 for more details.

(7) After complete settings, choose [Online] or [On-direct] in GRS screen, it dial to the connecting place and you can use the modem connection.

It displays “Modem online...” dialog box during the connection.



(Caution)

After execute modem settings above indicated, if directly connect the serial port of the PC with the CPU and execute [Online] or [On-direct], it becomes “Communication Error” and can not operate LADDER EDITOR for Windows®. If click the [Cancel] button when displaying the dialog box of “Modem online...”, the same problem will be occurred.

Please operate as following.

- (1) Finish LADDER EDITOR for Windows by [Ctrl] + [Alt] + [Delete].
- (2) Finish Windows OS and restart the personal computer.

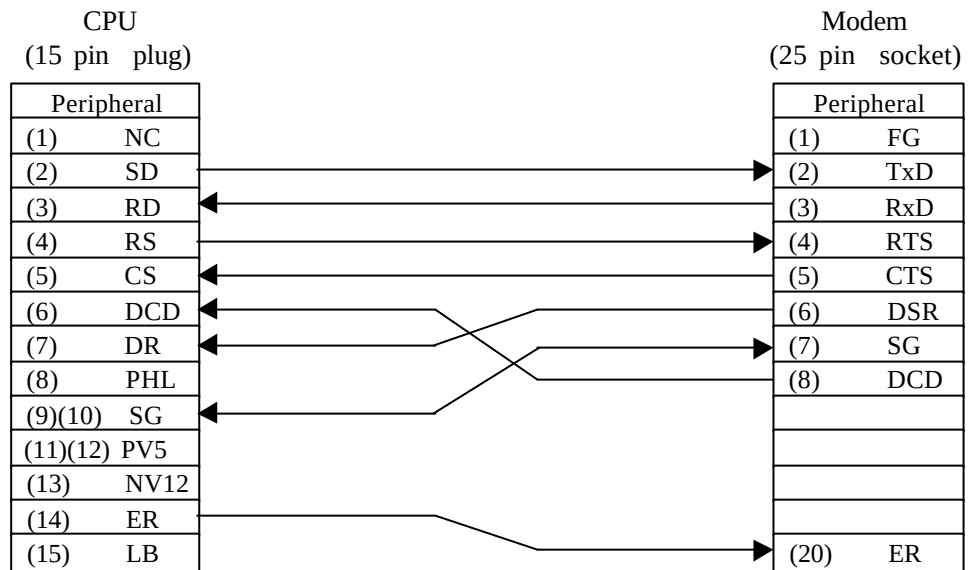
(About the modem connecting cable)

(a) Between PC and Modem

Use a cable attached to a modem for connection between a PC and a modem.

(b) Between CPU and Modem

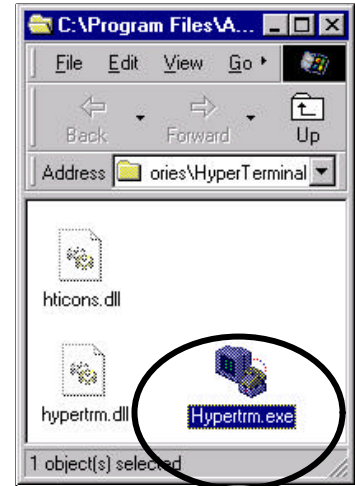
Prepare the cable for connection between a CPU and a modem as following lines.



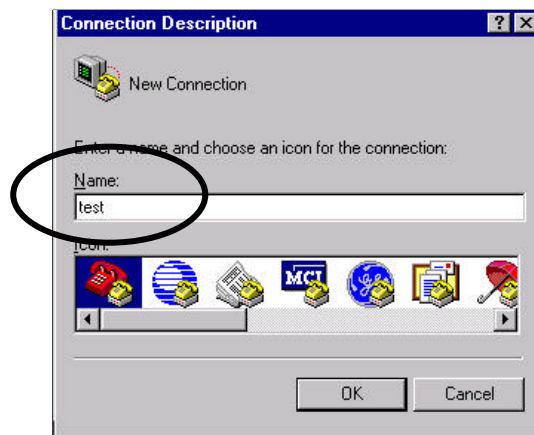
(About the hyper terminal)

As it was mentioned before, when the contents of the modem had already been changed by using AT command, it sometimes can not connect. In the case of that, the contents of modem memory has to be restored to the condition of the shipping. It shows the example of the setting method using the hyper terminal (communication software) attached to Windows OS.

- (a) Connect a modem with a PC and turn on the power.
- (b) Click (Hyper terminal) in (Accessory).
- (c) Click the Hypertrm icon.



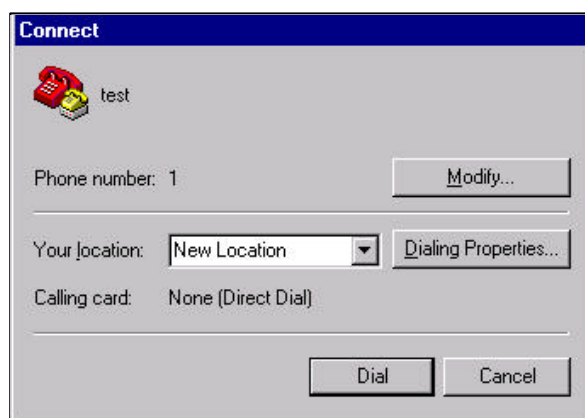
- (d) In the dialog box of Setting of Connection, input the optional name (Ex. test), and click the [OK] button.



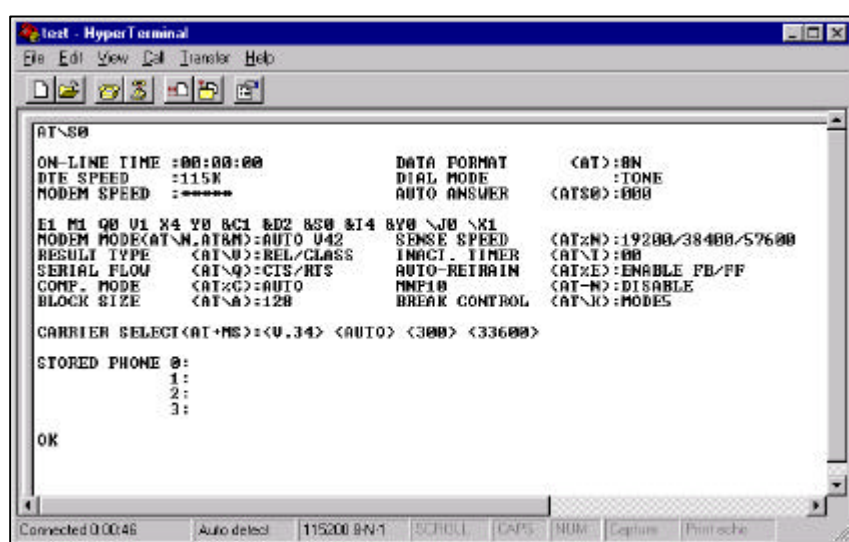
- (e) In the Telephone Number dialog box, input the optional phone number and click the [OK] button.



(f) When Connection dialog box is displayed, click the [Cancel] button.



(g) When New Connection window (Hyper terminal) is displayed, input AT command.



AT command is different with the specification of the modem. Please refer to the manual of the modem for more details. This is the example of AIWA PV-BF3360.

In the above case, it displays the memory information of the modem by inputting “AT¥ S0”.

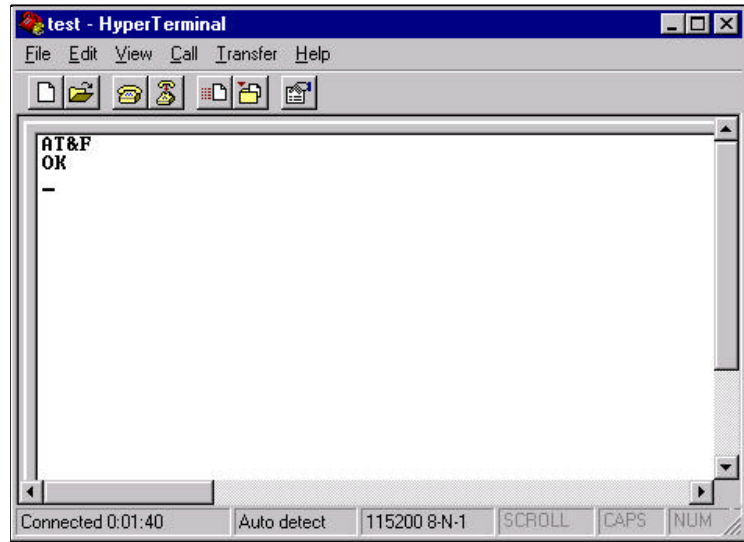
After inputting “AT¥ S0”, press the [Enter] key. It displays the memory information.

It inform the method to restore the contents of modem memory in the initial state.

This is also the case of AIWA PV-BF3360.

- (a) Input AT command to restore in the initial state.

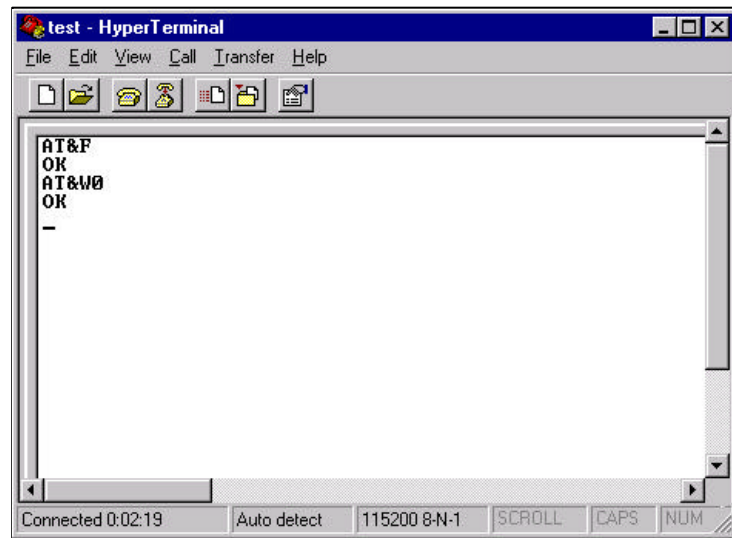
In this modem, input as “AT&F0” and press the [Enter] key.



It will display “OK” in the screen.

- (b) Input AT command to write to the memory.

In this modem, input as “AT&W0” and press the [Enter] key.



It will display “OK” in the screen.

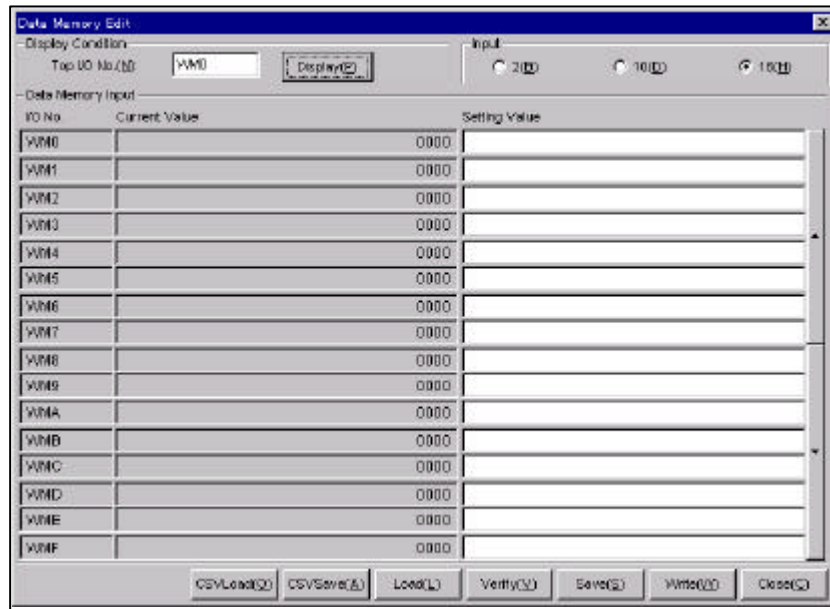
Finally, the memory was restored in the initial state.

Finish the hyper terminal and turn off the power of the modem once, and restart it.

Chapter 11 Data Memory Edit

11.1 Outline of Data Memory Edit

Data memory edit function is the function that can be read, edit, write I/O memory of the CPU by 16 points unit.



- (a) It displays the data edit dialog box by choosing [Data Memory Edit] in the [Utility] menu.
It can be startup with the online, the offline, and the on-direct mode.
- (b) In the offline, make the data memory area of the PC to the read/write process object.
- (c) In the online, on-direct, make the data memory are of the CPU to the read/write process object.
- (d) The data memory area of the PC becomes the object of the initialize process, however, it does not written when finish LADDER EDITOR for Windows® and restart.
- (e) It can be start with any one of mode as [Read/Edit], [Monitor].

(Caution)

As it was indicated above, when execute [Load], [CSV Load], [Write] in the online/on-direct mode, it directly write to the data memory of the CPU so please check the messages displayed at the data memory edit operation.

Be careful specially in Change in RUN.

11.2 Edit of Data Memory

(1) Read/Display Process

- (a) R, WR, DR, M, WM, DM, WN, DN can be input as [Display Condition].

It can be read by the [Enter] key after input [Top Display I/O No.].

- (b) When input the display condition, it read and display 16 points data memory area of [I/O NO.] - [I/O No. + 15] from the specified I/O No. as the top.

However, when I/O No. is double word, the I/O No. is increased by 2.

When the increased I/O No. becomes out of range, it does not execute read/display of the out of range I/O No. and display the blank space.

- (c) It read and display the previous or next 1 point I/O No. data by pressing   buttons or [Page Up][Page down] keys.

 button, [Page Up] Key : Read and display the previous 1 point.

 button, [Page down] key : Read and display the next 1 point.

- (d) It changes the data format of the read current value by choosing the [Input] option button.

Binary : Data is displayed with 1, 0 as the binary.

Decimal : Display the decimal data.

Hexadecimal : Display the hexadecimal data by the word (4 figures), or the double word (8 figures) unit.

The default in display of the dialog box is decided by the setting of [Display Switch] of the system.

However, the result changed in the dialog box does not reflect to the system.

(2) Edit Process

- (a) Input the setting value to the setting value table. This setting value is only be written input the data memory by clicking the [Write] button.

- (b) It move a cursor to the next column of the setting value table by pressing [Enter] or [Tab] key. At the end of the table, by pressing the [Enter] key, it move to the top of the setting value table.

- (c) It change the data format of the setting table by choosing the [Input] option button.

Binary : Data is displayed with 1, 0 as the binary.

Decimal : Display the decimal data.

Hexadecimal: Display the hexadecimal data by the word (4 figures), or the double word (8 figures) unit.

(3) Write Process

- (a) It writes all data existing in the setting value table. It does not write the blank data of the setting value table. After finishing writing, renew the current value.
- (b) It does not judge the RUN/STOP mode of the CPU.

Therefore, the data value which was written to the CPU data memory will be affected by the CPU operation.

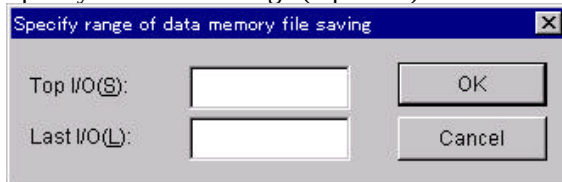
(Caution)

If the writing is executed while the online or the on-direct connecting, the data is written to the CPU directly. Be careful especially in Change in RUN. Check carefully the message displayed at the load operation.

(4) Save Process

- (a) It saves the data of the data memory to the file. The file extended code will be DMM (*.dmm).

Specify the I/O No. range (top - end) for the saving range.



I/O No. which is not specified in "Data Memory Edit" dialog box can be specified.

- (b) In the case that saving in the file, the state of the internal CPU memory is read by the timing of the save, it does not always save the screen data if the CPU is running.

(Caution)

The data which is saved in the file is limited in the I/O type which the range was specified. Therefore, save the necessary data by the I/O type unit. There is no file compatibility with a file saved by the data memory edit software for DOS.

(5) Load Process

Load the file data in the memory. The file extended code will be DMM (*.dmm).

The unwritten data existing in the setting value table is kept as it is.

After loading, read the current value from the data memory and renew.

(Caution)

When executing the file loading while the online or on-direct connecting, the data is directly written to the CPU. Check carefully the message which will be displayed at the loading operation.

(6) Verify Process

- (a) It verify the file data and the data memory by the I/O No. unit.

The result of the verification is displayed in the message box as the following.

When it's agree : [Match]

When it's disagree : [Unmatched]

- (b) It stop verifying if it detects the unmatched data.

(7) Save/Load Process of CSV File

The CSV format comment file is the text file which the word strings is divided by the comma (,).

It can create with the general type of spreadsheet.

The file extended code will be CSV (*.CSV).

The file format is as following.

I/O No., Data (current value), Data type

I/O No. : I/O No. of internal output (bit, word, double word)

Data : Data of internal output

Data type : Binary/Decimal/Hexadecimal

Binary: "2", Decimal: "10", Hexadecimal: "16"

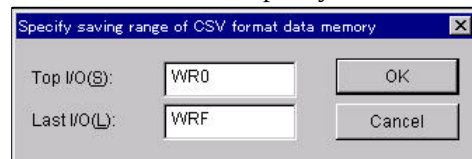
	A	B	C	D
1	WR0	1111	16	
2	WR1	2222	16	
3	WR2	3333	16	
4	WR3	4444	16	
5	WR4	0	16	
6	WR5	0	16	
7	WR6	0	16	
8	WR7	0	16	

	A	B	C	D
1	WR0	1111	2	
2	WR1	1111	2	
3	WR2	0	2	
4	WR3	0	2	
5	WR4	0	2	
6	WR5	0	2	
7	WR6	0	2	
8	WR7	0	2	

< Display the CSV format data memory data with Microsoft®Excel >

(a) Save Process

Click the [CSV Save] button and specify the I/O No. range (top - end) for the saving range.



A dialog box titled "Specify saving range of CSV format data memory" with a close button (X). It contains two input fields: "Top I/O(S):" with the value "WR0" and "Last I/O(L):" with the value "WRF". There are "OK" and "Cancel" buttons.

You can specify the I/O No. which was not specified in "Data Memory Edit dialog".

The data type will be decided by the setting of "Input" (binary, decimal, hexadecimal) in the data memory edit dialog box.

When saving to the file, it read the internal CPU memory state in the saving timing so the screen data is not always saved if the CPU is running.

(Caution)

The data which is saved in the file is limited in the I/O type which the range was specified.

Therefore, save the necessary data by the I/O type unit.

(b) Load Process

Read the file data of CSV format to the memory and renew.

Several types of data can be exist in the same file.

(Caution)

(1) When execute the CSV loading in the online or on-direct connecting, the data will be directly written to the CPU. Be careful specially in Change in RUN. Check carefully the message displayed at the load operation.

(2) The record which include the incorrect data in the data type is not loaded.

Bit I/O : 1 figure data is not "1" or "0" and more than 2 figures of data.

Word I/O : Data except H0000 - HFFFF in the hexadecimal.

W word I/O : Data except H00000000 - HFFFFFFF in the hexadecimal.

Ex.)

R100, 1, 2

R101, 10, 2 <- Does not load

R102, 1,

R103, 2, 16 <- Does not load

WR100, 10, 10

WR101, 10,

WM0, 65530,16 <- Does not load

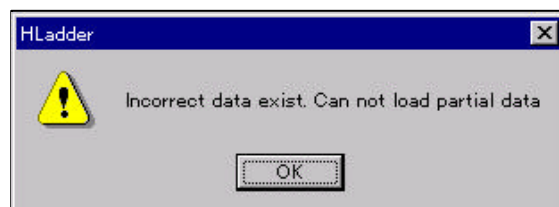
WM1, 65535, 10

DM10, FFFFFFF,

DM11, 100000000, <- Does not load

DM13, Edit, <- Does not load

And if it contains the incorrect data, it display the message as "Incorrect Data Exist, Some of data can not be loaded. [OK]" after finish loading.



Chapter 12 IC Card

(Caution)

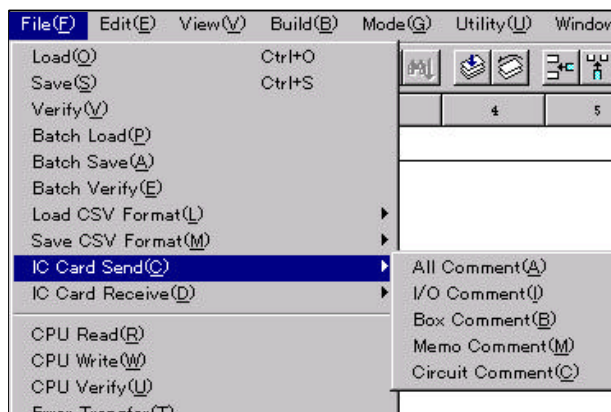
Use the IC card which special for H series. Other IC card can not be used.
Please refer to the manual of H-4010 CPU module to check the IC card type.

12.1 Comment

The comment file on the PC disk can be exchanged between LADDER EDITOR for Windows® and the IC card by connecting to the CPU .

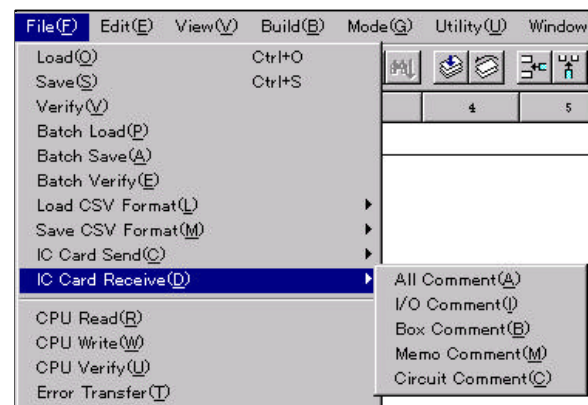
IC card sending

(PC -> IC card)



IC card receiving

(PC <- IC card)



< IC Card Comment Send/Receive menu >

When choosing [All Comment], it send and receive the comments of the same file name in a lump.

And, with the **[File]** menu in the each comment edit window, the each comment can be send and receive individually.

(Caution)

The writing possible size of I/O comment file is different with the size of the IC card.

IC card size	The writing possible size of I/O comment file
1MB	262,144 byte
2MB	1,310,720 byte
4MB	2,883,584 byte

Operation Process

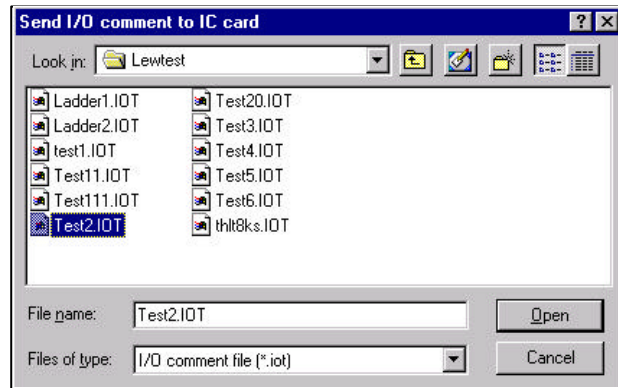
(1) Comment sending

Write the file on the PC disk to the IC card

(a) Choose **[I/O Comment]** from **[IC Card Send]** in the **[File]** menu.

(b) It open the file selecting dialog box of [Send I/O Comment to IC Card].

Input the file name and click the [Open] button.



< File selecting dialog box of [Send I/O Comment to IC Card] >

[File Place] Choose the folder of the file to send.

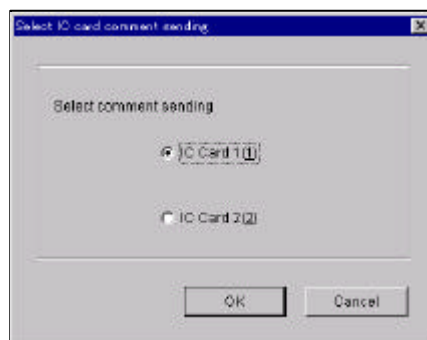
[File Name] Choose the file to send. Click the file displayed. Or, input directly to the column.
It does not need to input the extended code.

[Open] Open the dialog box of [IC Card Comment Send Selection].

[Cancel] Stop processing and close the dialog box.

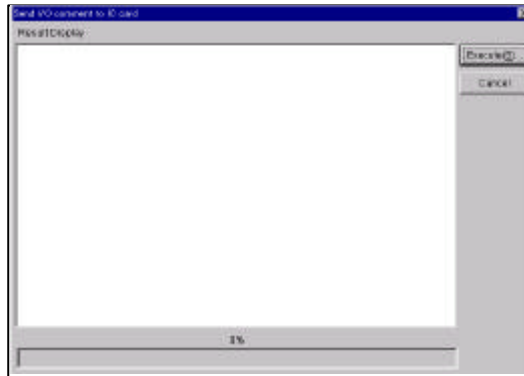
(c) Choose the sending place of IC card in the [IC Card Comment Send Selection] dialog box, and click the [OK] button.

It stop sending by clicking the [Cancel] button.



< Dialog box of [IC Card Comment Send Selection] >

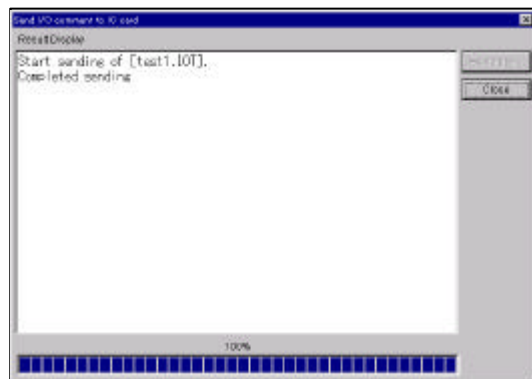
(d) It start sending by clicking the [Execute] button in the [Send I/O Comment to IC Card] dialog box.



< Dialog box of [Send I/O Comment to IC Card] >

- [Execute] Start sending.
- [Cancel] It stop processing and close the dialog box .
- [Close] After complete sending, the [Cancel] button change to the [Close] button.
It close the dialog box.

(e) In the dialog box of sending result, check the result and click the [Close] button to close the dialog box.



(2) Comment Receive

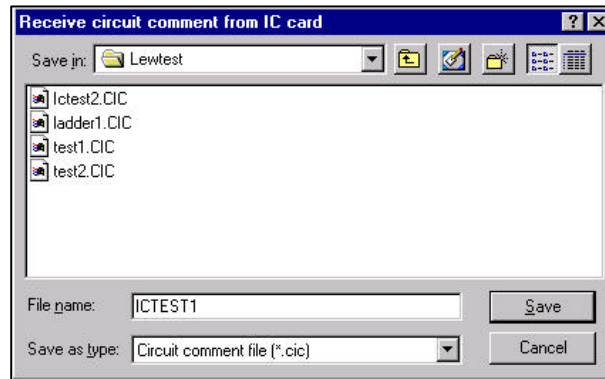
Write the comment file saved in the IC card to the PC disk.

Explain the operation process using by the example of the circuit comment.

(a) Choose **[Circuit Comment]** from **[IC Card Receive]** in the **[File]** menu.

(b) It open the file selecting dialog box of [Receive Circuit Comment from IC Card].

Input the file name and click the [Save] button.



< File selecting dialog box of [Receive Circuit Comment from IC Card] >

[File place] Choose the folder of the file to receive.

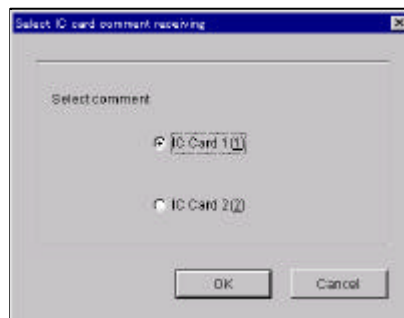
[File name] Choose the file to receive. Click the file displayed. Or, input directly to the column. It does not need to input the extended code.

[Save] Open the dialog box of [IC Card Comment Receive Selection]

[Cancel] Stop processing and close the dialog box.

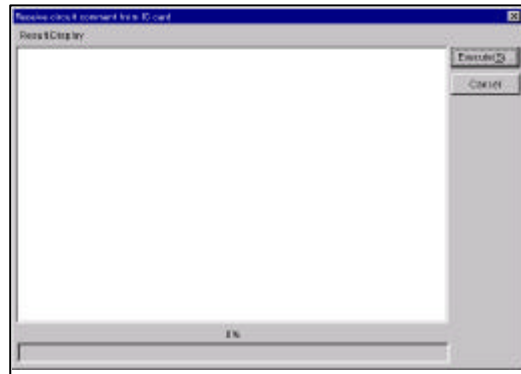
(c) Choose the receiving place of IC card in the [IC Card Comment Receive Selection] dialog box, and click the [OK] button.

It stop receiving by clicking the [Cancel] button.



< Dialog box of [IC Card Comment Receive Selection] >

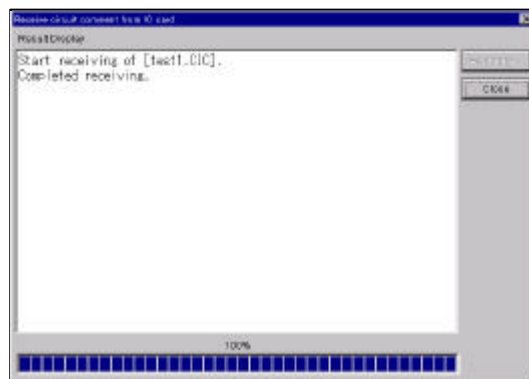
- (d) It start receiving by clicking the [Execute] button in the [Receive I/O Comment from IC Card] dialog box.



< Dialog box of [Receive I/O Comment to IC Card] >

- | | |
|-----------|---|
| [Execute] | Start sending. |
| [Cancel] | It stop processing and close the dialog box. |
| [Close] | After complete sending, the [Cancel] button change to the [Close] button.
It close the dialog box. |

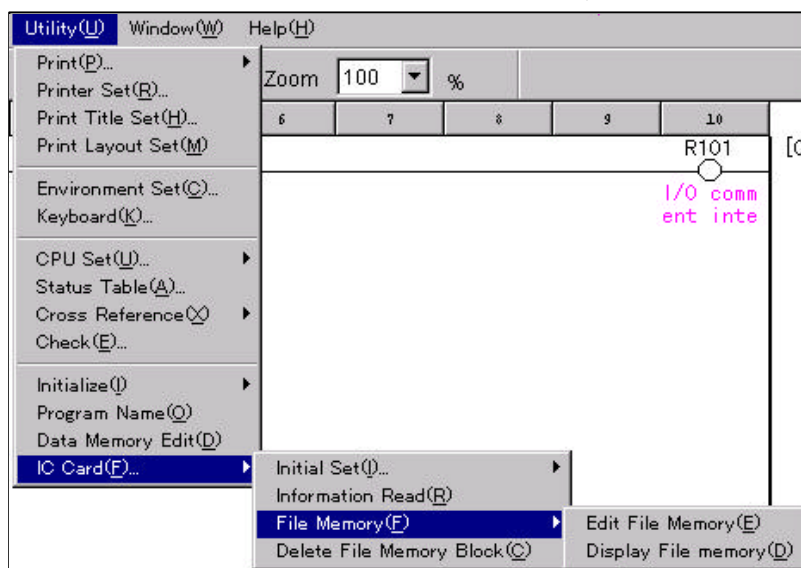
- (e) In the dialog box of receiving result, check the result and click the [Close] button to close the dialog box.



12.2 File Memory

The function which is limited to SRAM card.

By the FUN instruction (FUN133 - 136) of the file memory, you can read, display, edit and rewrite WR/WM/WL/WN data which were written in the IC card to the PC memory.

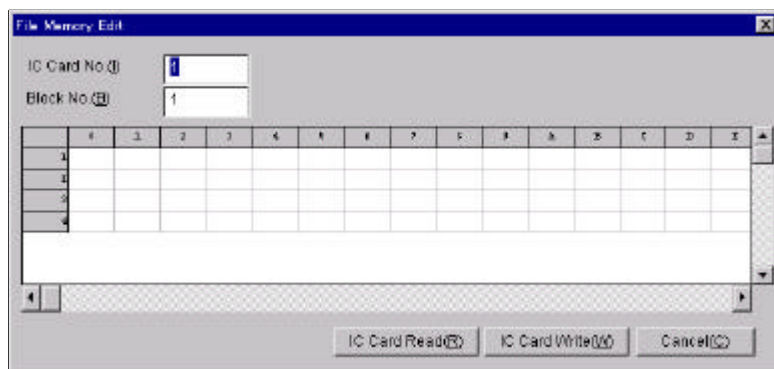


< Menu of File memory >

(1) File memory edit

You can read, edit and rewrite the data which was written in the IC card to the PC memory.

(a) Choose [Utility] - [IC Card] - [File Memory] - [Edit File Memory].



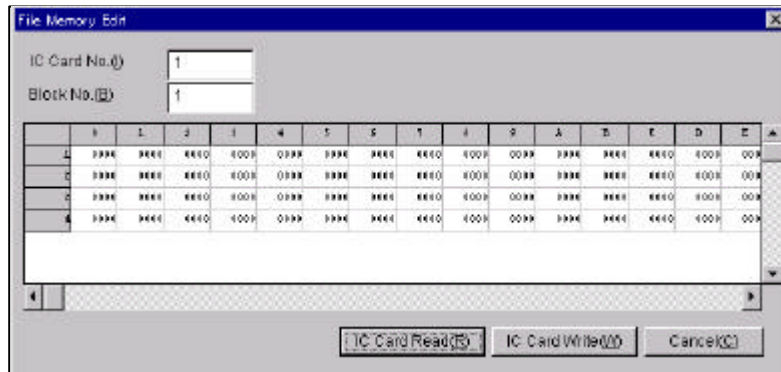
< Dialog box of [Edit File Memory] >

- (b) Input [IC Card No.] and [Block No.] and click the [Read IC Card] button. Specify 1 or 2 for the IC card No. and 1-32768 for the block No.. However, the maximum capacity of block No. is changed by the size of the mounted IC card.

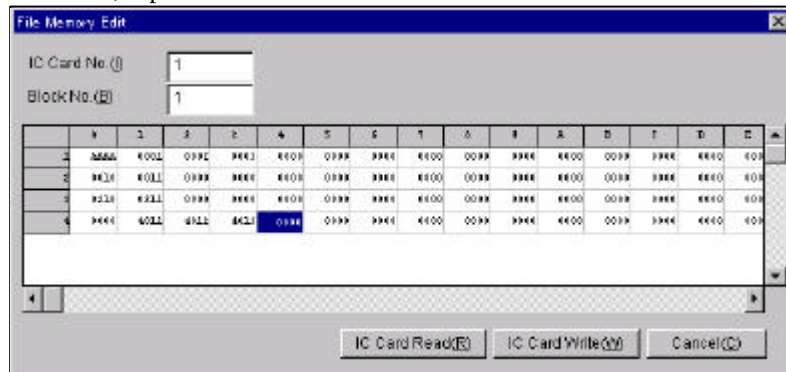
1M - 8192 , 2MB - 16384 , 4MB - 32768

It displays the saved data in the IC card by 64 word unit.

The data is displayed by the hexadecimal.



- (c) Click the cell to edit the data, input the data .



- (d) Click the [IC Card Write] button.

Write the data to the specified I/C card and the block.

When changing [IC Card No.] or [Block No.] and click the [IC Card Read] button, it becomes the copy operation.

- (e) Click the [Close] button to close the dialog box.

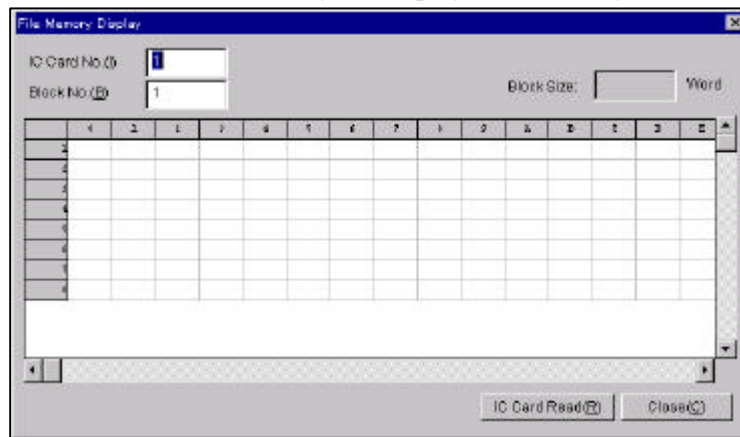
(Caution)

Can not input to the cell or write to the IC card without executing the [IC Card Read]

(2) File memory display

It reads the data which was written in the IC card to the PC memory, and only displays it. Cannot write into it.

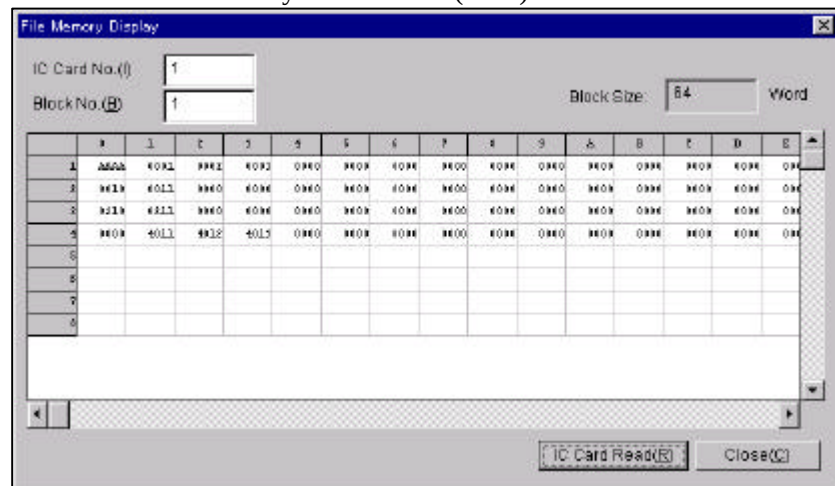
(a) Choose [Utility] - [IC Card] - [File Memory] - [Display File Memory].



< Dialog box of [Display File Memory] >

(b) Input [IC Card No.] and [Block No.], and click the [IC Card Read] button.

It displays the saved data in the IC card by 64 word unit (fixed) in the hexadecimal.



(c) Click the [Close] button to close the dialog box.

12.3 Information Reading

It display the classification of SRAM/FLASH, the setting block number, the condition of battery of IC card installed in the IC card slot.

Choose **[Utility] - [IC Card] - [Information Read]** to display the dialog box of [IC Card Information].

IC Card 1			IC Card 2		
Set	OK		Set	OK	
Use	OK		Use	OK	
Type	SRAM		Type	FLASH	
Battery	Normal		Battery	Normal	
Memory Capacity	2	MB	Memory Capacity	2	MB
User Program Area	Undefined	k Step	User Program Area	96	k Step
I/O Comment Block No.	0		I/O Comment Block No.	22	
I/O Comment File Size	0	Byte	I/O Comment File Size	0	Byte
Circuit Comment Block No.	0		Circuit Comment Block No.	1	
Circuit Comment File No.	0	Byte	Circuit Comment File No.	0	Byte
BOX Comment Block No.	0		BOX Comment Block No.	1	
BOX Comment File Size	0	Byte	BOX Comment File Size	0	Byte
Memo Comment Block No.	0		Memo Comment Block No.	1	
Memo Comment File Size	0	Byte	Memo Comment File Size	0	Byte
File Memory Block Size	64	Word	File Memory Block Size	0	Word
File Memory Block No.	1024		File Memory Block No.	0	

Close(C)

< Dialog box of [IC Card Information] >

Click the [Close] button to close the dialog box.

(Contents of IC card information)

Display item	Normal value	Description
Mount	OK	It display “OK” when IC card is mounted and SW is ON. Otherwise it displays “NG”.
Use	OK	It display “OK” when H series IC card is mounted, otherwise it display “NG”.
Type	-	It display “SRAM” when SRAM IC card is mounted and “FLASH” when FLASH IC card is mounted.
Battery	Normal	It display the state of SRAM card battery. In FLASH, it does not use the battery but it display as “Normal”. • Normal: “Normal” • Battery power is low: “Lower Power” • Cannot backup by dead of battery: “Impossible to backup”
Memory size	-	It display the inserted IC card size. It display one of 1MB, 2MB, or 4MB.
User program area	-	A display will be differ from a mode state of program written in IC card for program/comment data by uploading. • A+B compatible: 48+48 (*) • A, B compatible: 48 (*) • Standard: 96 • Unused (initialize): 96 In the case of IC card for file memory, it display as “Undefined”. (*) : “48” is 48.5ks with the actual program size of CPU.
I/O comment block No.	-	It display the value indicated below by the inserted IC card. Program/Comment 1MB : 2 Program/Comment 2MB : 10 Program/Comment 4MB : 22 File memory : 0
I/O comment file size	-	It display the file size of saved I/O comment. It display “0” if it is new IC card and IC card for a file memory.

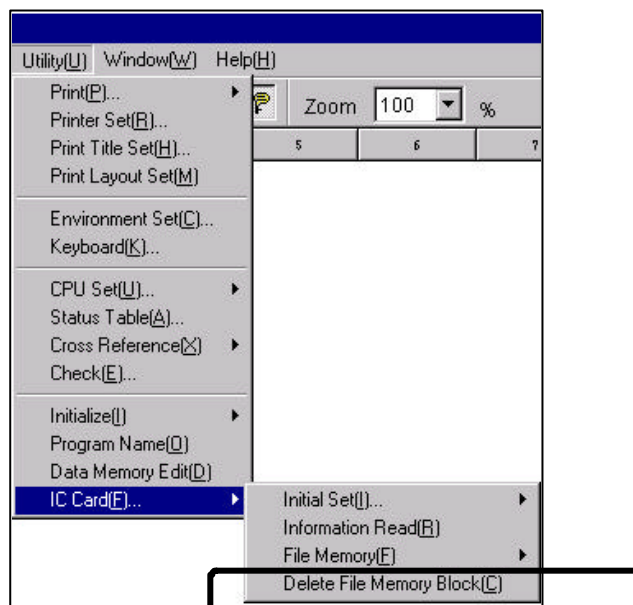
Display item	Normal value	Description
Circuit comment block No.	-	It display the value indicated below by the inserted IC card. Program/Comment : 1 File memory : 0
Circuit comment file size	-	It display the file size of saved circuit comment. It display "0" if it is new IC card and IC card for a file memory.
BOX comment block No.	-	It display the value indicated below by the inserted IC card. Program/Comment : 1 File memory : 0
Box comment file size	-	It display the file size of saved Memo comment. It display "0" if it is new IC card and IC card for a file memory.
Memo comment block No.	-	It display the value indicated below by the inserted IC card. Program/Comment : 1 File memory : 0
Memo comment file size	-	It display the file size of saved Memo comment. It display "0" if it is new IC card and IC card for a file memory.
File memory block size	-	It display the value indicated below by the inserted IC card. Program/Comment : 0 File memory : 64
File memory block No.	-	It display the value indicated below by the inserted IC card. File memory : 8192 File memory : 16384 File memory : 32768 Program/Comment : 0

12.4 File Memory Block Erase

This is the function to erase the specified block data of FLASH IC card, however, it does not support FLASH card for the file memory, therefore, this function can not be used.

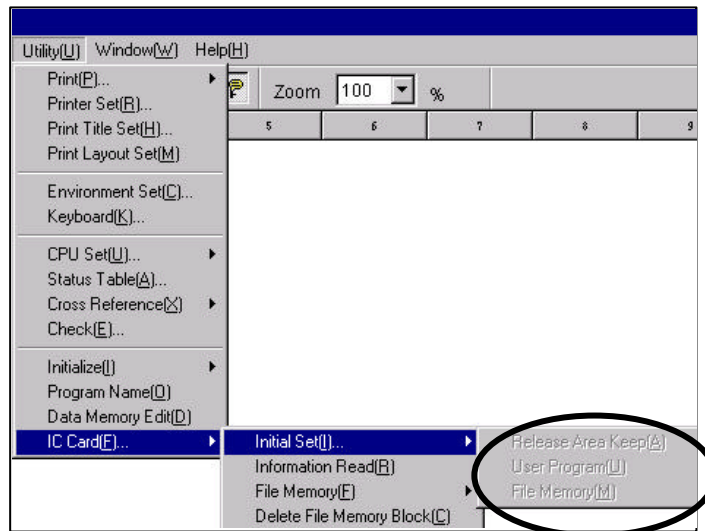
It displays the message as “Can not use file memory” when this function was executed with FLASH card for the program/comment.

And if this function was executed by SRAM card for the file memory or the program/comment, it displays the error message as “SRAM is mounted”.



12.5 Initial Setting

This function can not be executed.



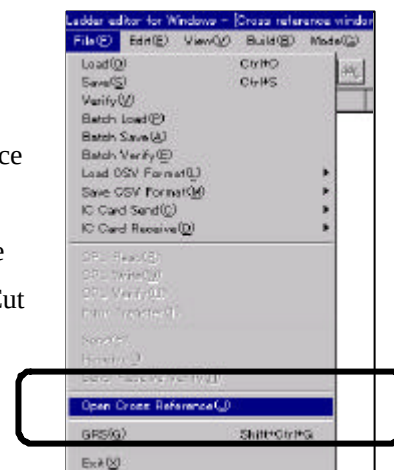
Chapter 13 Convenient Function

13.1 Cut & Paste from Reference Window

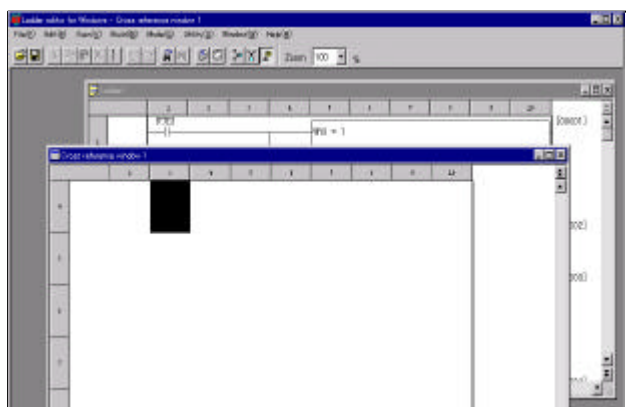
Open the Ladder program which is other than the Ladder program now editing, and you can edit the Ladder program by Cut & Paste.

Open the reference window and edit the circuit.

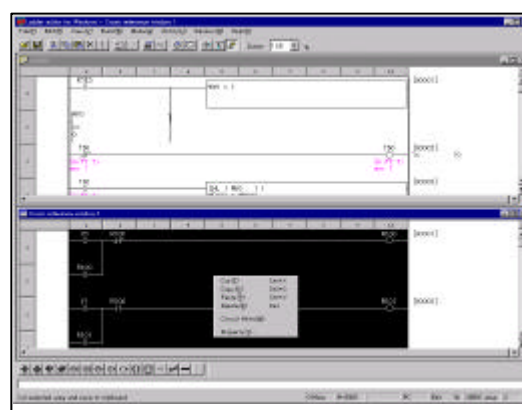
- Choose **[Open Reference Window]** from the **[File]** menu.
- Load the Ladder program file (*.prn) which becomes a source of reference at the active condition of the reference window.
- When choose **[Cascade]** or **[Title]** in the **[Window]** menu, it displays the editing Ladder program and the reference Ladder program, so execute Cut & Paste between windows to edit.



Condition that opens the reference window



< Display by Cascade >



< Display by Title >

A circuit can be input and edited to the reference window like a normal Ladder window. The disk operation like the file loading and saving can be done.

The operation of Cut & Paste in the reference window can be done like the operation of the normal Ladder window, so the editing of the circuit between reference windows can be performed freely.

(Caution)

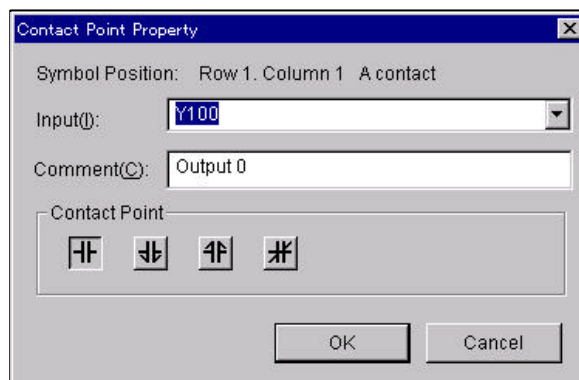
The reference window is not the object of backup.

Therefore, if return to GRS, or open the editing screen by finishing LADDER EDITOR for Windows® by keeping the reference window open, the displayed Ladder circuit will be the Ladder circuit of the normal window which is opened before opening the reference window.

13.2 Lump Editing of I/O No. and Comment

In the I/O No. input dialog box, the I/O comment can be edited simultaneously.

However, if **[Display]** from **[Environment Set]** in the **[Utility]** menu is set as “User Symbol”, it can not be edited.



< I/O No. input dialog box >

The I/O comment on the Ladder program will be changed by editing the I/O comment and clicking the [OK] button.

(Caution)

I/O comment renewal timing

1. It only displays the Ladder program window, and when editing the I/O comment in the I/O No. input dialog box, I/O comment will be changed by clicking the [OK] button on the Ladder program.
2. When opens the Ladder program window and the I/O comment editing window at the same time, it gives priority to the I/O comment editing window, so the renewal timing of the I/O comment becomes as following
 - (a) Edit the user symbol and I/O comment at the I/O comment editing window.

Even if editing the user symbol and I/O comment at the I/O comment editing window and make [Write], the I/O comment at the Ladder program will not be changed. It can be changed by executing Read operation at the Ladder program window.
 - (b) Edit the I/O comment at the Ladder program window.

Even if editing the I/O comment at the Ladder program window, the I/O comment at the I/O comment editing window will not be changed. It will be changed by close the I/O comment editing window once and open again.

13.3 Load and Save of CSV Format File

It execute saving and loading of CSV format comment file (*.CSV).

CSV format comment file is the text file which the string of letters are divided by a comma . It can be created by the general type spread sheet.

Each comment of the format is as following.

Comment type	File format	Description
I/O comment	I/O No., Comment, User symbol	
Circuit comment	Comment No., Branch No., Comment	Branch No. = 0
Box comment	Comment No., Branch No., Comment	Branch No. = 0
Memo comment	Comment No., Branch No., Comment	Branch No. = 0-15

The comment file which is saved as CSV format becomes as following when it is displayed by Microsoft® Excel.

I/O No. Comment User symbol

Comment No. Branch No. Comment

< Example of I/O comment >

< Example of Circuit comment >

Comment No. Branch No. Comment

< Example of Memo comment >

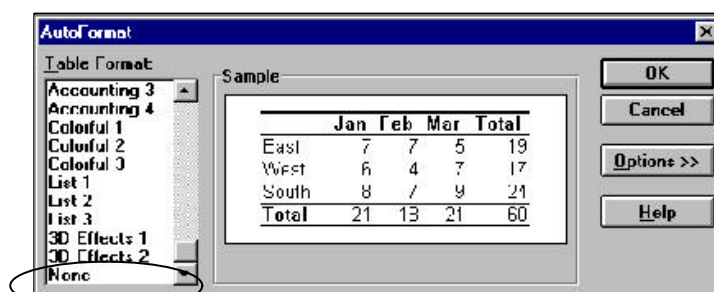
(Caution)

(1) Notification for creating the I/O comment with Microsoft® Excel

To the input I/O No., the comment or the user symbol has not be input, if the blank cell exist, it does not add “,” before the blank at the time of saving of CSV file.

When edited, make sure to execute the following operation and save as the CSV file. When save without executing the following operation, the loading of the I/O comment file can not be executed correctly by CSV format in LADDER EDITOR for Windows®.

- (a) Choose the range of data which include the blank cell which the comment and the user symbol are not input by the mouse dragging.
- (b) The “,” is added to the cell (include the blank cell) by choosing Format Erase in the **[Auto Format]** dialog box in the **[Format]** menu and press the [OK] button.
- (c) Save the file as CSV format.



And, even if it is the file except the I/O comment, make sure to execute the above operation when saving the comment as CSV file.

(2) Notification for creating the circuit comment, the box comment with Microsoft® Excel

It doesn't matter if the branch cell is the blank, but the comment can not be input in the branch cell. Make sure to put the comment in the comment cell.

(3) Notification for creating the memo comment with Microsoft® Excel

Input the number 0 to 15 to the branch cell.

And the comment can not be input the branch cell. Make sure to input the comment in the comment cell.

(4) Notification for creating with Microsoft® Excel (Common with all comment)

Input with the numbers of letters and types of letters indicated below. If the comment is input out of the range below, LADDER EDITOR for Windows® can not load it correctly.

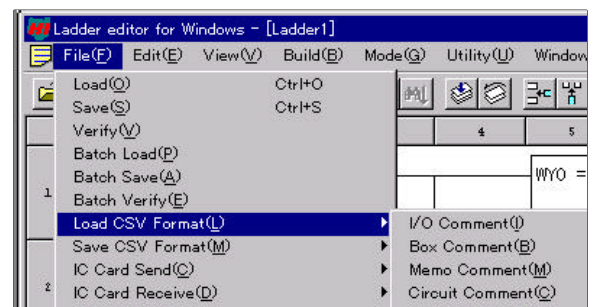
Comment name	Input letter No.	Unusable letters
User symbol	6 words	I/O No. Figures and blank for initial letter Multiple use of User symbol
I/O comment	32 words	Comma in comment (*)
Box comment	32 words	Comma in comment (*)
Memo comment	66 words	Comma in comment (*)
Circuit comment	16 words	Comma in comment (*)

(*) It can be use when editing with LADDER EDITOR for Windows® without using the CSV file.

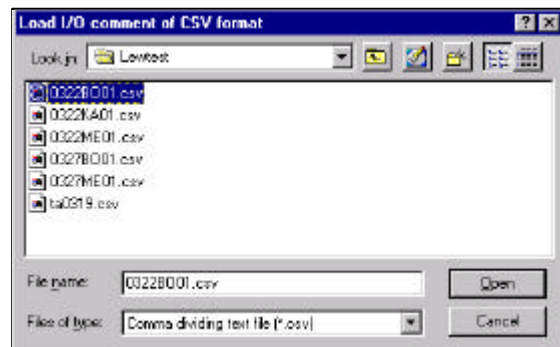
(1) Load of CSV format comment file

Choose the comment type from [**Load CSV Format**] in the [**File**] menu.

It load the selected CSV format comment file.



< Ex.> Load CSV format I/O comment file



< Dialog box of Load of CSV format I/O comment >

The display of the loaded comment file is executed as same as each item of “Comment Edit”.

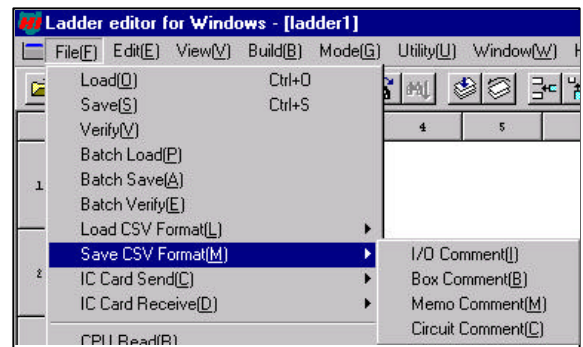
(Caution)

It become error and cannot load if the CSV file has already be opened by Microsoft® Excel.

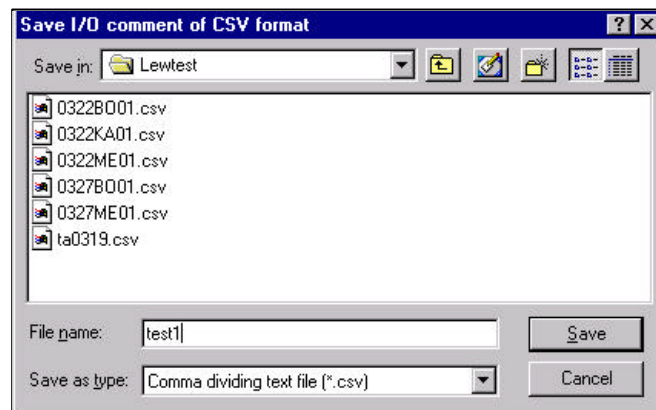
(2) Save of CSV format comment file

Choose the comment type from **[Save CSV Format]** in the **[File]** menu.

It save the selected CSV format comment file.



< Ex.> Save CSV format I/O comment file



< Dialog box of Save of CSV format I/O comment >

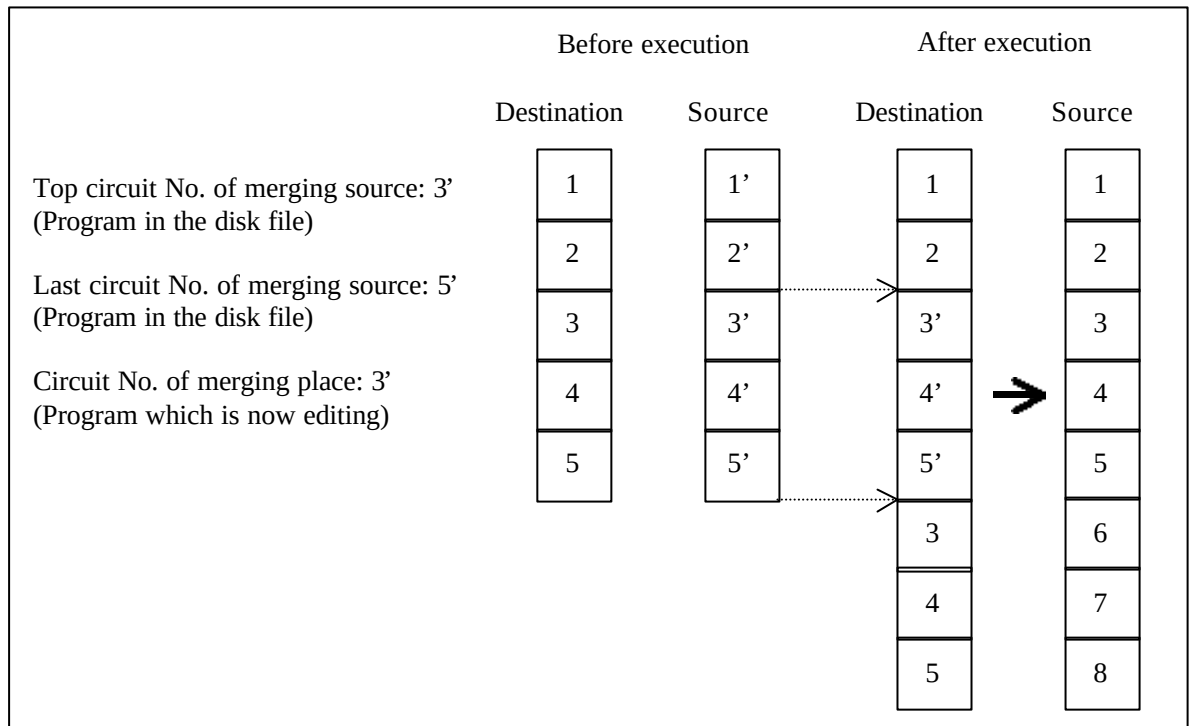
(Caution)

It becomes “Overwriting of File” when choose the existing file and save.

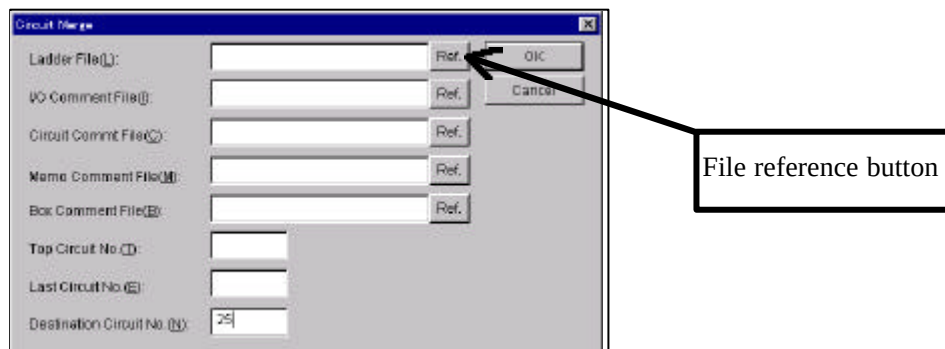
It displays the dialog box to confirm.

13.4 Merge of Program

Insert the specified circuit range of the program (merging source) in the disk file to the specified position of the editing program (merge source).

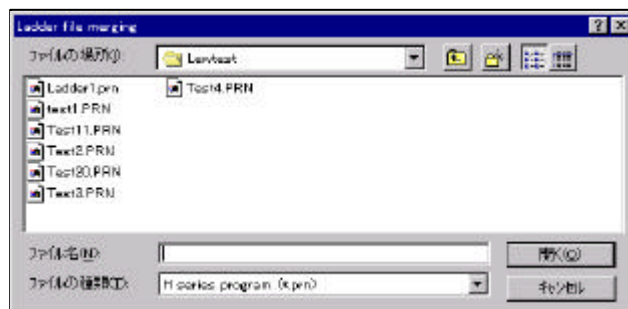


It displays the dialog box of Circuit Merge by choosing **[Merge]** in the **[Edit]** menu.



< Dialog box of Circuit Merge >

(a) Input the file name of the merging source. It displays the merge dialog box of Ladder file by clicking the file reference button. Specify the directly/the file name and click the **[Open]** button.



(b) Input [Top circuit No.] and [Last circuit No.] of the merging source (program in the disk file) and [Destination circuit No.] of the merging place (editing program) by “Circuit Merge” dialog box, and click [OK] button. It execute merging.

< Merge of Comment file >

The comment can be merged by the file unit by specifying each comment file in “Circuit Merge” dialog box. The comment in the place of the merging after merging execution becomes as following.

Destination (screen)	Source (file)	After merging (screen)
No comment	With comment	Merging source comment
With comment	With comment	Merging place comment
With comment	No comment	Merging place comment

(Caution)

When merging only the comment file, the setting of the top circuit No., the last circuit No., the destination No. of the “Circuit Merge” dialog box becomes ineffective. These circuit No. are needful for merging the Ladder file.

The place of the merging source and the destination can not be specified by the comment.

13.5 Change in RUN

(1) Change in RUN

Execute **[Circuit Write]**, **[Move]**, **[Delete]**, **[I/O Batch Change]** without depressing the output of the CPU while the CPU is running in on-direct mode.

It displays the dialog box to confirm the execution of [Change in RUN] when choosing [Circuit Write] while the CPU is running in on-direct mode. Choose whether execute Change in RUN or not.



< Dialog box to confirm Change in RUN >

- [OK] Execute Change in RUN.
- [Cancel] Stop the writing processing.

(2) Restriction of Change in RUN

(a) Prohibit the change of Master control coil

Can not insert and delete the master control coil (MCSn, MCRn) while the CPU is running. It displays an error message “No Online Change (With MC)” when insert or delete a master control coil and execute [Circuit Write], however, the No. (n part) of MCSn, MCRn can be changed. And, the startup condition contact point of MSC circuit can be added or deleted.

(b) Prohibit the change of Control instruction

When adding, changing, deleting the control instruction while the CPU is running, after checking the program which is written to the CPU, it stops (RUN->HALT) the CPU momentary. It writes the modified part of the program to the CPU while the CPU is stopping (HALT), then restart ‘HALT->RUN) the CPU again. By the checking in this case, depending on the editing situation of the program, it detects an assemble error or an operation error and the CPU sometimes causes the error stop.

Therefore, the editing of the control instruction can not be executed by Change in RUN function as the principal. The control instruction can be edited while the CPU is running by the method of (3) Change in RUN of Control Instruction, however, please be careful for not stop the CPU. When editing the control instruction and executing [Circuit Write], it becomes an error and displays as “No Online Change (With Control Instruction)”.

The control instruction which becomes an error is as follows.

END, CEND(S), JMP, CJMP(S), RSRV, FREE, LBL, FOR(S), NEXT, CAL, SB, RTS, START, INT, RTI

note: The parameter part of I/O No. which is indicated as (S) can be changed.

(c) Prohibit the change of circuit which becomes the startup condition error.

When the existing circuit or the newly created circuit has the factor to become the startup condition error, if trying to write this circuit to the CPU by Change in RUN, it becomes an error in the assemble error check which is executed before Change is RUN, and can not write into the CPU.

Circuit becomes startup condition error:

Circuit which has startup contact point in the processing box include either of RTS, RTI, END instruction.

Solution:

Delete the contact point of the processing box which include the instruction of RTS, RTI, END, and execute the writing.

(d) Delay check time of Change in RUN

If executing Change in RUN with the system which the scan time of the user program is operating in the border of the delay check time which is set in the operator parameter, the delay error sometimes occurs and the CPU stops because the program scan time after changing become longer than before executing Change in RUN.

Therefore, before executing Change in RUN, making R7C0 (Continue operation with delay error) of the specific internal output ON by using the force set function, or compare the delay check time and the current scan time (value of WRF010 - WRF012) and check them very carefully then execute Change in RUN.

(e) It can not execute Change in RUN when the CPU status is in the debug condition (D.RJN, S.D.RUN).

(f) Others

If checking the operation error of the CPU by referring the specific internal output (R7F3 or WRF015) in the user program, be careful to the operation error which will be occurred by Change in RUN.

(3) Method of Change in RUN of Control Instruction

The control instruction can be edited while the CPU is running by the method indicated below, however, please be careful for not stop the CPU.

(Caution)

Even if it keeps the creating process indicated in “(b)”, when contact with an error indicated in “5.6 Check”, the CPU becomes an assemble error and stop. The error code is set in WRF001.

(a) Operation with GRS screen

When executing Change in RUN of the control instruction, execute following operations before changing the on-direct mode.

- 1) Return to GRS screen.
- 2) Choose [Version Information] in the [Help] menu, and display the version information dialog box.
- 3) Input FREE (can be small letter) from the keyboard at the condition that keep to display the version information dialog box. But, nothing displayed on the screen.
- 4) Choose the on-direct on the menu.

Change in RUN include the control instruction can be executed by taking these steps.

This setting will be effective until it returns GRS screen next time.

(b) Creating process of Circuit which include Control instruction

With Change in RUN

Subroutine	: CAL-SB-RTS
Interruption process	: INT-RTI
Jump instruction	: JMP/CJMP-LBL, RSRV-FREE
Loop instruction	: FOR-NEXT

When input these instructions, input correctly as the process indicated below. If it does not input in the correct process, the CPU may becomes an assemble error or an operation error and stops.

1) Subroutine

[When creating CAL and SB circuits at once]

When creating CALn (call the subroutine), SBn (a called subroutine), and RTS (end of the subroutine) simultaneously and writing to **[Circuit Write]** at once, the CPU operates correctly.

Note 1 : Input END command in the usual scan end part, if there is no END command.

Note 2 : When lines from the top line of circuit include CAL to the last line of circuit include RTS over 19 lines include the existing line, it can not write to the CPU by the one time of **[Circuit Write]**.

[When creating CAL and SB circuits separately]

First, create a new subroutine SBn (a called subroutine), and execute **[Circuit Write]**.

Input END command in the usual scan end part, if there is no END command.

Then, create CALn at the usual scan area, and execute **[Circuit Write]**.

Note 1 : When writing CALn first, the CPU becomes an operation error and set an error code but it continues to operate.

Note 2 : When lines from the top line of circuit include SBn to the last line of circuit include RTS over 19 lines, create SBn and RTS separately in the processing box, and execute **[Circuit Write]**. After that, create the command part of SBn before the processing box which RTS is written, and execute **[Circuit Write]**.

2) Interruption process

[When creating INT and RTI circuits at once]

When create INTn and RTI simultaneously and write it with the one time of **[Circuit Write]**, the CPU operate correctly.

Note1 : Input END command in the usual scan end part, if there is no END command.

Note2 : When lines from the top line of circuit include INT to the last line of circuit include RTI over 19 lines, it can not write with the one time of **[Circuit Write]**.

[When creating INT and RTI circuits separately]

First, create INTn (an interruption process start) and RTI (an interruption subroutine end) separately in the processing box, and execute **[Circuit Write]**.

(Input END command in the usual scan end part, if there is no END command.)

Then, create an interruption program before RTI command and execute **[Circuit Write]**.

3) Jump instruction

[When creating the jump circuit and its destination circuit at once]

When creating JMP (a jump instruction) and LBLn (a destination) simultaneously and write it with one time of **[Circuit Write]**, the CPU operate correctly.

Note 1 : When lines from the top line of circuit include JMP to the last line of circuit include LBLn over 19 lines, it can not write with the one time of **[Circuit Write]**.

Note 2 : When adding RSRVn command, make sure to add the corresponding FREE command.

[When creating the jump circuit and its destination circuit separately]

First, create the destination circuit (LBLn) and execute **[Circuit Write]**.

Then, create the jump circuit (JMP, etc.) and execute **[Circuit Write]**.

Note 1 : When writing a jump source instruction like JMP first, the CPU becomes an operation error and set an error code but it continues to operate.

Note 2 : When adding RSRVn command, make sure to add the corresponding FREE command.

[When deleting Jump instruction]

First, delete a jump source instruction (JMP, etc.) and execute **[Circuit Write]**.

Then, delete a destination of jump (LBLn) and execute **[Circuit Write]**.

When delete a destination of jump (LBLn) first and execute **[Circuit Write]**, the CPU becomes an operation error and set an error code but it continues to operate.

4) Loop instruction

[When creating loop source and its destination circuits once]

When creating FOR (a loop source) and NEXIT (a destination) simultaneously and write it with one time of **[Circuit Write]**, the CPU operate correctly.

Note 1 : When lines from the top line of circuit include a loop source (FOR) to the last line of circuit include a destination (NEXT) over 19 lines, it can not write with the one time of **[Circuit Write]**.

[When creating the loop source and its destination circuit separately]

First, create a destination (NEXT) and execute **[Circuit Write]**.

Then, create a loop source (FOR) and execute **[Circuit Write]**.

Note 1 : When write FOR instruction first and write NEXT later, the CPU becomes an operation error and set an error code but it continues to operate.

(4) Change in RUN recover function

After executing Change in RUN in on-direct mode, if it is before returning GRS screen, you can return the program before executing Change in RUN.

It displays the last circuit after executing Recover function .

[Method]

Input [Ctrl + Shift + Enter] key in the editing screen or the circuit monitor screen of the Ladder circuit window.

When click the [OK] button of the message of “Execute Recovering of Change in RUN?”, it returns to the program before executing Change in RUN.

(Caution)

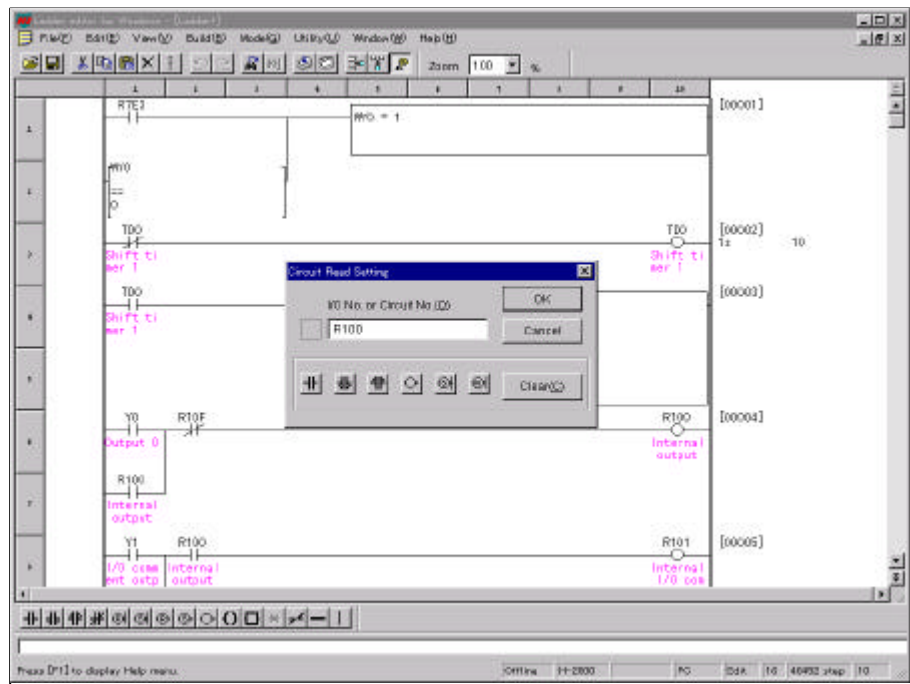
- Recover function is effective only in the combination of CPU2-***H (H-2002, H702, H-302, etc.), CPU3-40H (H-4010) CPU and the high speed Change in Run special memory cassette (RAM3-***H).
- There is a personal computer which is not corresponding to [Ctrl + Shift + Enter] key. In that case, get the tool from the personal computer shop.
(Confirmed model: FLORA-ND2, Tool name: “Key combination effectuating tool”.

13.6 Easy Read Function

(1) Direct specification reading

When input the I/O No., the circuit No., or the user symbol in the condition that the cursor is on the Ladder graph with the Ladder window, it displays the dialog box of Circuit Read Setting like below. The dialog box of [Circuit Read Setting] is displayed at the time when one word of an alphabet or a figure is input.

It can be read the specified circuit by clicking the [OK] button (or Enter key) after input the read condition.



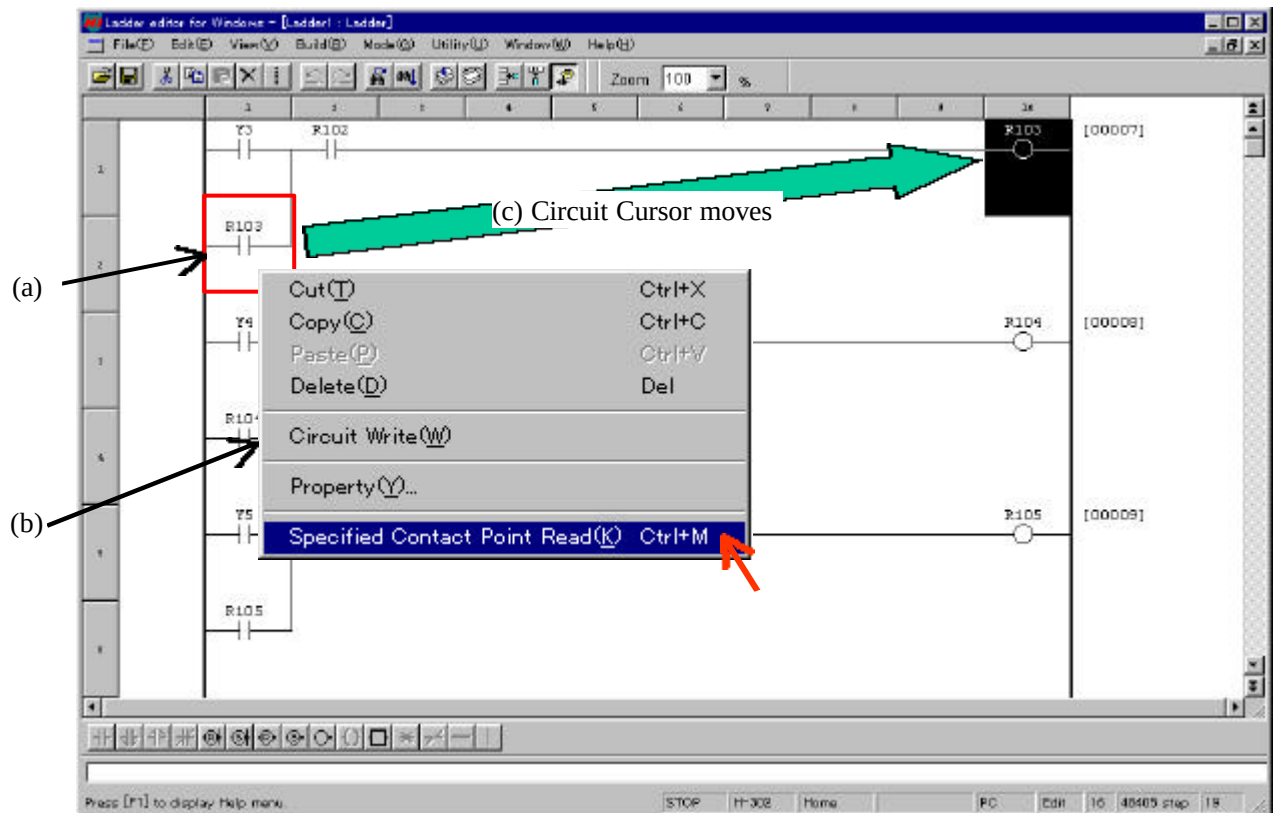
13.7 Addition function of Ver2.13

There are the following functions in LADDER EDITOR for Windows(R) of version 2.13 or latter.

(1) Specified contact point read

When a cursor is on a certain contact, corresponding coil can be searched by the following steps.

- (a) Put a circuit cursor on a contact to be searched.
- (b) Execute “Specified Contact Point Read” by either of the following operations.
 - Use right click menu : Click “Specified Contact Point Read”.
 - Use shortcut key : Press with [Ctrl + M].
 - Use menu bar : Choose [Specified Contact Point Read] in [Edit].
- (c) A circuit cursor will jump to a coil of the same I/O No.



Note : X contact point, DIF and DFN are not available.

When a circuit cursor is put on a certain coil, and "Continuous circuit reading" is executed (shortcut key, Ctrl+K), next coil will be searched as long as the coil existing. If no new coil is found, "No specified I/O No." message is shown in output window.

Additional information of this function is described as follows.

- When there is no coil to be searched,

Message "No specified I/O No." will be shown.

- When X contact is specified,

Message "No specified user symbol" is shown.

- When DIF / DFN specified,

Message "Specified Contact Point Read operation error" is shown.

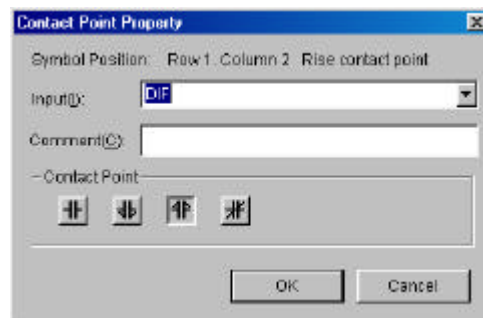
- When other symbol than contact specified,

Message "Specified Contact Point Read operation error" is shown.

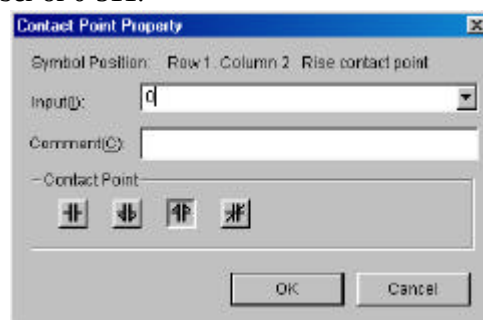
(2) DIF/DFN definition

DIF and DFN can be defined without typing "DIF/DFN".

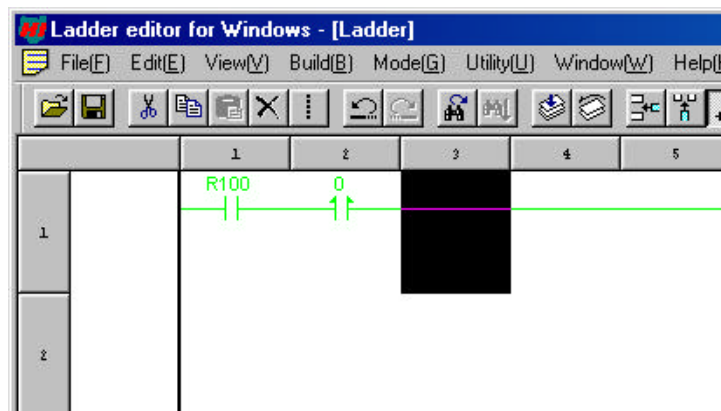
(a) Select DIF or DFN.



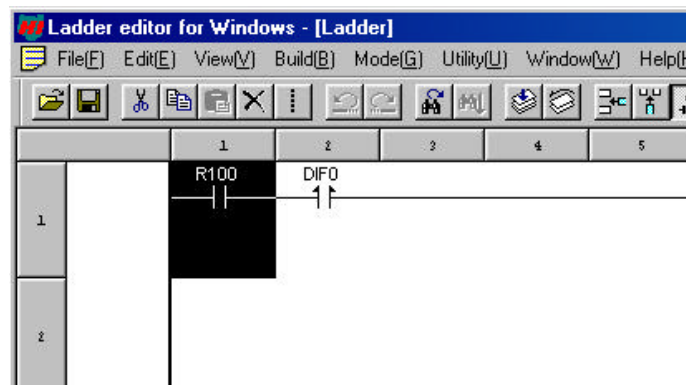
(b) Input a number of 0-511.



(c) Click the [OK] button, or press the enter key.



(d) Execute "Circuit Write".

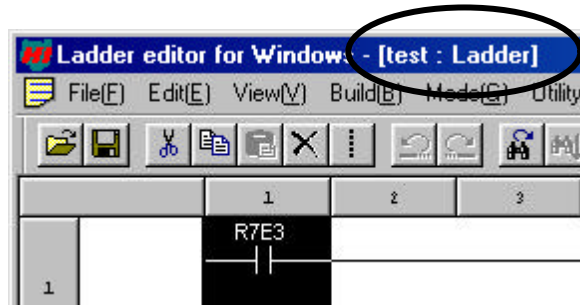


(3) The function about file name

(a) Last file name kept in PC memory

The file name which edited in the last time is displayed in title bar when chooses mode from GRS screen.

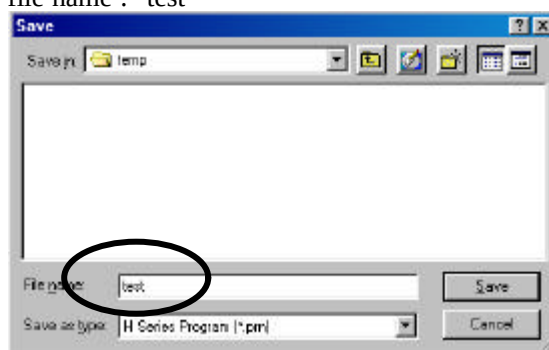
(Example) When edited the file name of "test" the last time



(b) File name in editing kept in save dialog box

The file name in editing is kept in save dialog box.

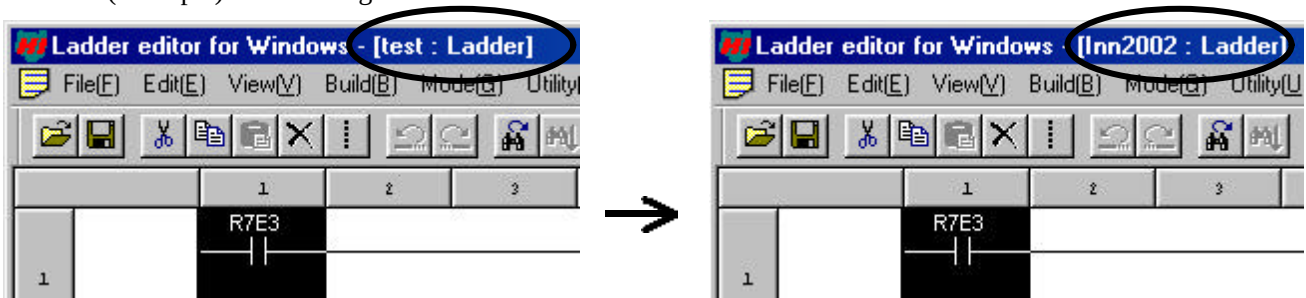
(Example) The file name : "test"



(c) Update the file name in title bar.

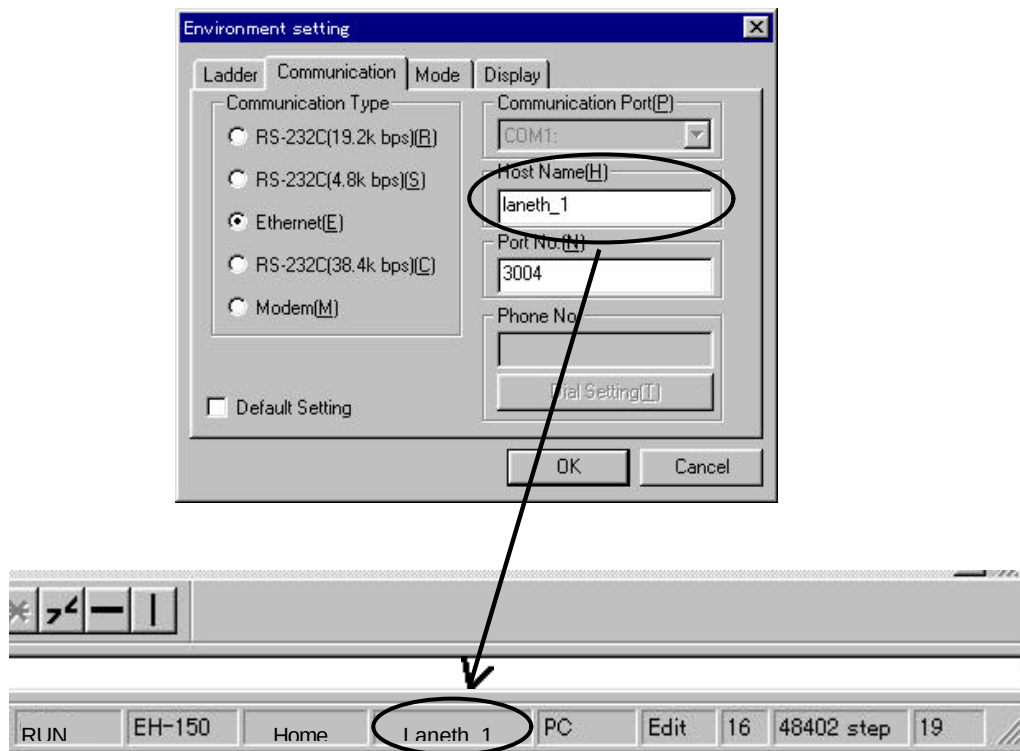
The file name in title bar is updated after saved.

(Example) When changed the file name from "Test" to "Inn2002"



(4) Host name in the status bar

Currently used host name is shown in the status bar.



Host name is up to 8 characters.

Chapter 14 Source Programming

14.1 Usual Style of Programming

When creating the Ladder program, programming with using the external output which correspond to the hardware and the I/O No. which is assigned to the internal output, and save into the floppy disk .

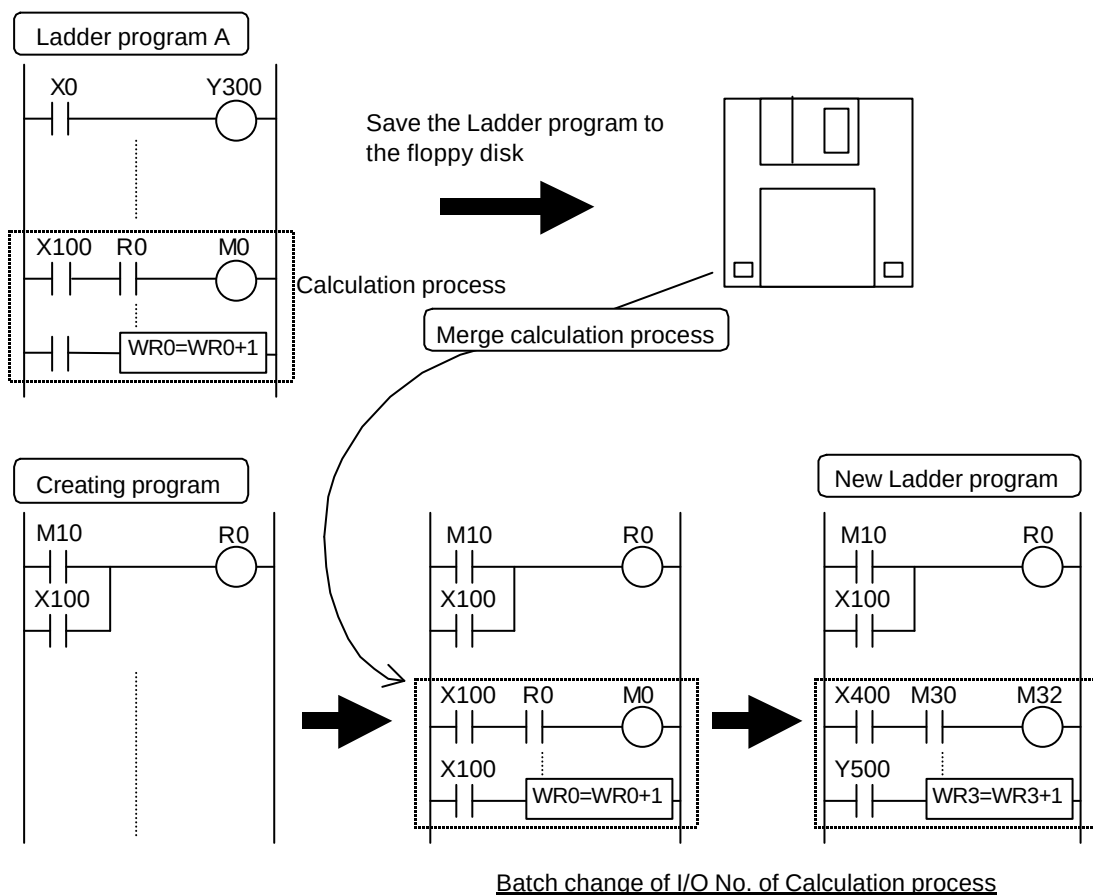
And, there is the method to find the usable Ladder program from the Ladder program which was created and saved in the floppy disk, and create a new program by connecting the needful part by the merge function of the program.

This function help to improve the creation and the confidence of the program because the program which already has finished debugging can use repeatedly and keep minimizing a new creating part.

Therefore, after complete debugging the Ladder program, the users divide the program in the usable form and save to create “Basic of Diversion” or “Diversion Program”

However, the I/O No. of the debugging of the diversion Ladder program correspond to the input-output assignment match with the system at that time, it sometimes does not work correctly with the input-output assignment correspond to the hardware at the time of use.

Therefore, before or after merging, check the I/O No. which is used in the diversion program carefully with the I/O batch change function and modify it to make agree with the new input-output assignment.



14.2 Source Programming

It is easy to divert the program when using the Ladder program which is created without setting the I/O No. as “Diversion Program” or “Source Program” because you don’t have to execute I/O batch change ever time using it.

There is the one of the way that crating the form of the Ladder circuit (skeleton input) without setting I/O No. to the contact point and coil save to the floppy disk.

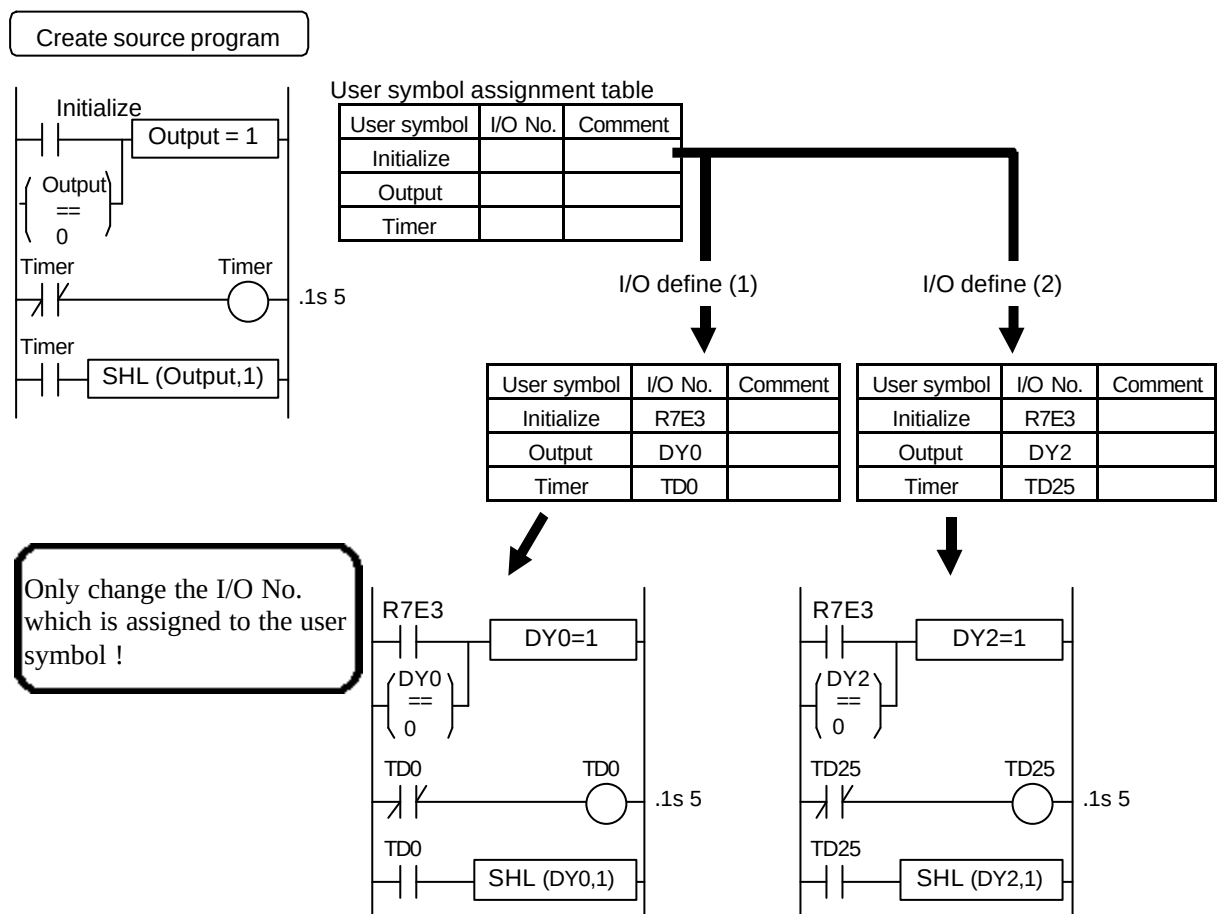
So, when using the circuit created by this form, assign the I/O No. to the contact point and the coil, etc.

This method is effective to make the source of Ladder circuit as “form”, but this method is not effective to make the source of the program which gather multiple circuits and execute the significant operation like take in the output of the previous circuit as the input of the next circuit.

There is the other method to crate the source program (Ladder program) by using the user symbol (a symbol which significant for a user) instead of the I/O No.

You can judge the operation of those program because the source program has the user symbol to the contact point and the coil, etc.

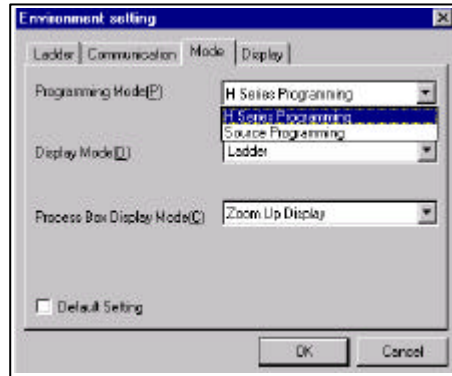
And, when using this source program as the Ladder program by defining the user symbol using in the source program to the object I/O No..



14.3 Method to create “Source Program”

Take the following steps to create a source program.

- (1) Choose “Offline” in GRS screen.
- (2) Choose **[Environment Set]** in the **[Utility]** menu, and set the programming mode to “Source Program” in the mode item dialog box, and click the [OK] button.



< Dialog box of Mode Item >

Caution : When newly crating “Source Program”, delete all Ladder program which is written to the program memory.

Now, be ready for creating the source program.

After that operating as the way to execute a usual program.

14.4 Relationship with “H Series Programming”

Take the following steps to change the program when using the created H series program as the source program or the source program as the H series program.

(1) Choose “Offline” in GRS screen.

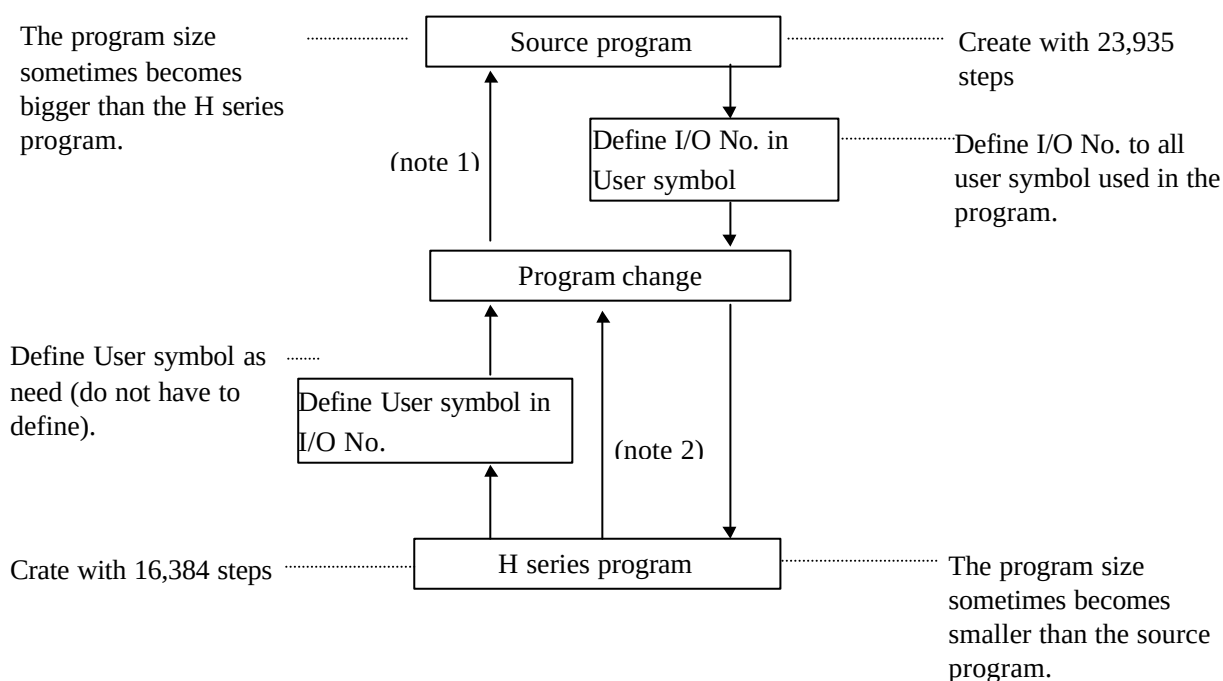
(2) Program change is executed by choose **[Environment Set]** in the **[Utility]** menu], and choose the object programming mode in the mode item dialog box.

Caution : Define the I/O No. to all user symbol used in the program when changing a source program into the H series program.

When the user symbol and the I/O No. are the same in the source program, the user symbol will be deleted after changing into the H series program.

Also, when changing the H series program into the source program, if the H series program size is less than 26,384 steps, a program change can be done.

The flow chart is indicated below.



And, when an error occurs in the way of changing, it displays as “Fail to Change Program”, and stop changing.

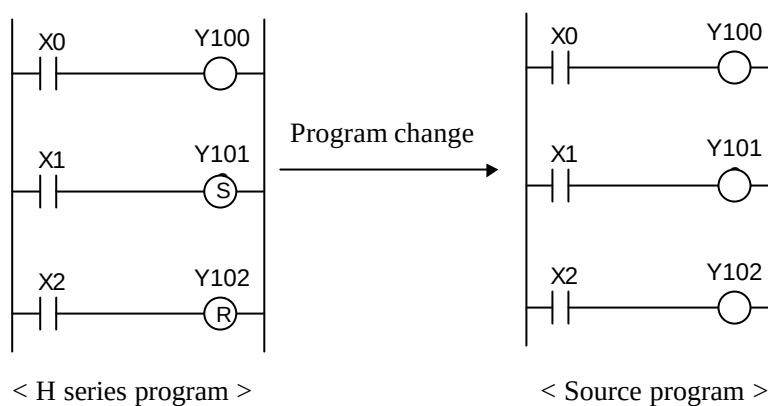
(note 1) When the user symbol and the I/O No. are the same, if changing them to the H series program, the user symbol will be deleted.

(note 2) When changing to the source program without defining the user symbol, the user symbol becomes as the same as the I/O No. on the source program.

Caution to execute “Program Change”

The set coil/reset coil (except master control) can not use with the source programming mode. Therefore, when changing to the source program by executing “Program Change” to the H series program include the set coil/reset coil (except master control), the information of the set coil/reset coil will be lost and becomes the usual coil.

It indicate the example below.



< Example that the set coil/reset coil is lost by the “Program Change” >

Therefore, when saving H series program include the set coil/reset coil (except master control) to the floppy disk, save the H series program without executing “Program Change”

Caution to input “User Symbol”

The I/O No., and the application command, etc., can be used to the user symbol with the source programming mode.

(Ex.) In case that executing **[Circuit Write]** in  R7E7 ,  Y100.



In this case, it regard “R7E7” and “Y100” as the user symbol, and entry them by **[Circuit Write]** . After completing, choose **[I/O Comment]** in the **[Window]** menu, and click [Read] button then confirm the I/O No. to the user symbol.

User symbol, I/O No.
(Source program mode)

User symbol	I/O No.	Comment
R7E7	R7E7	
Y100	Y100	

The program is only crated and not I/O defined, but the input has finished already for the I/O No. column.

This happens because the Ladder Editor system program judge the user symbol which is input at the programming can be used as the I/O No. and set in the I/O No.

Change the source program which is created before in to the H series program.



There is no change with the looking of the program.

Then, choose “User symbol, I/O comment” of the comment function.

I/O No., User symbol
(H series program mode)

I/O No.	User symbol	Comment
R7E7		
Y100		

There are blank space in the user symbol column, and the user symbol which is input by the source program will be deleted.

This is because the I/O No. can not be used for the user symbol in the H series program. And, the comment remains after the change.

Attention

The Ladder program that includes extended on-delay timer for EH-CPU516/548 is impossible to support source programming.

APPENDIX

Appendix 1 Examples of Printout

Appendix 2 Function Table

Appendix 3 Error Message Table

Appendix 4 Hints for Programming

Appendix 5 Dealing with communication error occurs

Appendix 6 Connect with Ethernet Module

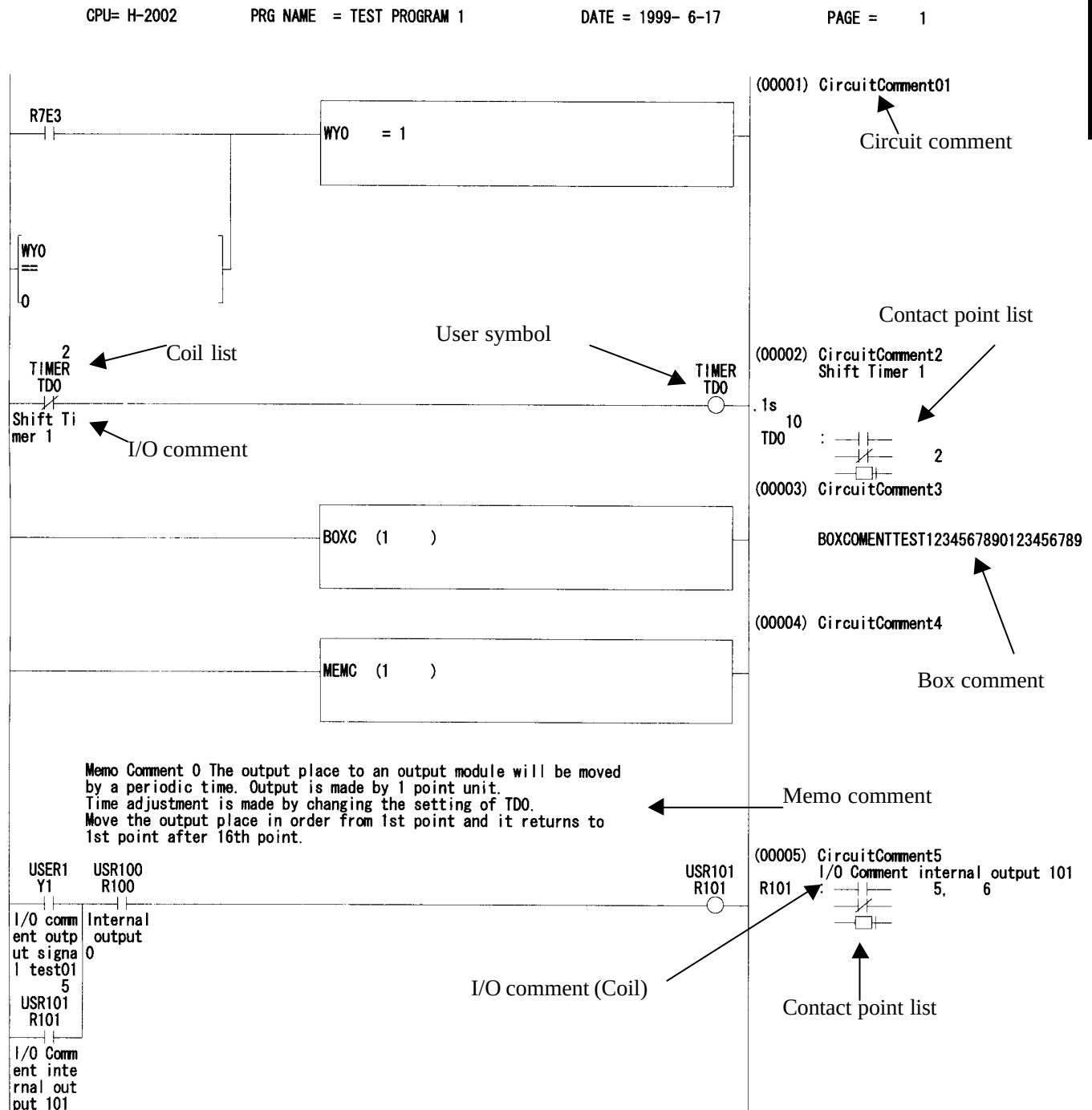
Appendix 7 Attention when using timer/counter

Appendix 1 Examples of Printout (HP Laser Jet 4V)

1. Program

In the case that the print condition is specified as all comment print, I/O comment 32 words, and "0" for all margin.

(1) 132 figures formats (600dpi, font 8, Inside contact point list bus)



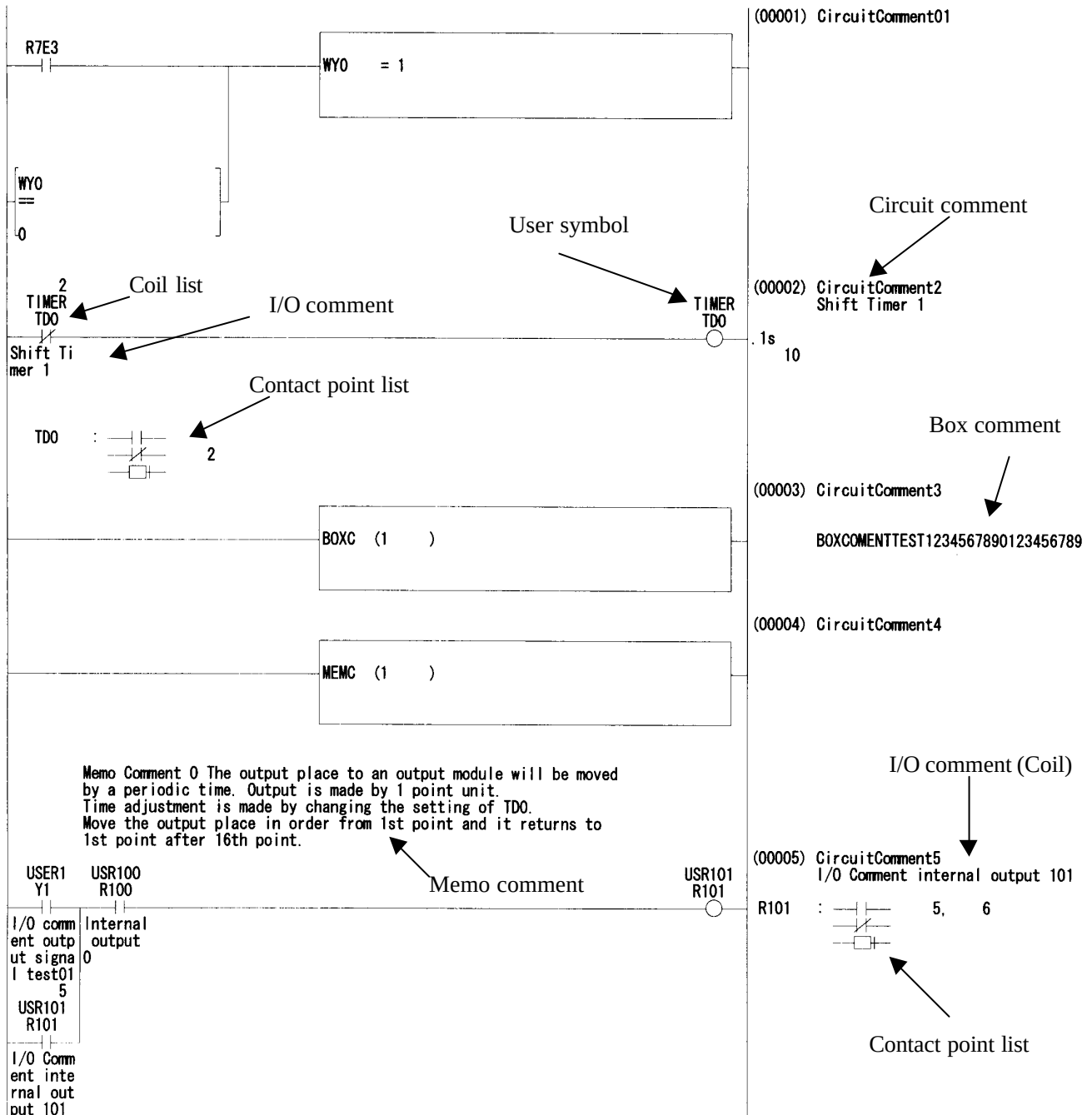
(2) 132 figures formats (600dpi, font 8, Outside contact point list bus)

CPU= H-2002

PRG NAME = TEST PROGRAM 1

DATE = 1999- 6-17

PAGE = 1



2. Comment

(1) 132 figures format (600dpi, font8)

(a) User symbol

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM
Y00000	USER0										
Y00001	USER1										
Y00002	USER2										
Y00003	USER3										
Y00004	USER4										
Y00005	USER5										
Y00006	USER6										
Y00007	USER7										
Y00008	USER8										
Y00009	USER9										
Y00010	USER10										
Y00011	USER11										
Y00012	USER12										
Y00013	USER13										
Y00014	USER14										
Y00015	USER15										
I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM
R100	USR100										
R101	USR101										
R102	USR102										
R103	USR103										
R104	USR104										
R105	USR105										
R106	USR106										
R107	USR107										
R108	USR108										
R109	USR109										
R10A	USR10A										
R10B	USR10B										
R10C	USR10C										
R10D	USR10D										
R10E	USR10E										
R10F	USR10F										
I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM	I/ONo.	USER SYM
T00	TIMER										
WY0010	DE-TA1										

(b) I/O comment

CPU= H-2002

PRG NAME = TEST PROGRAM 1

DATE = 1999- 6-17

PAGE = 1

I/ONo.	USER SYM	I/O CMT
Y00000	USER0	output0
Y00001	USER1	I/O comment output signal test01
Y00002	USER2	output2
Y00003	USER3	I/O comment output signal test03
Y00004	USER4	output4
Y00005	USER5	I/O comment output signal test05
Y00006	USER6	output6
Y00007	USER7	I/O comment output signal test07
Y00008	USER8	output8
Y00009	USER9	I/O comment output signal test09
Y00010	USER10	output comment 110
Y00011	USER11	I/O comment output signal Y0110
Y00012	USER12	output comment 112
Y00013	USER13	I/O comment output signal Y0113
Y00014	USER14	output comment 114
Y00015	USER15	I/O comment output signal Y0115
R100	USR100	Internal output 0
R101	USR101	I/O Comment internal output 101
R102	USR102	Internal output 2
R103	USR103	I/O Comment internal output 103
R104	USR104	Internal output 4
R105	USR105	I/O Comment internal output 105
R106	USR106	Internal output 6
R107	USR107	I/O Comment internal output 107
R108	USR108	Internal output 8
R109	USR109	I/O Comment internal output 109
R10A	USR10A	Internal output Comment 10A
R10B	USR10B	I/O Comment internal output 10B
R10C	USR10C	Internal output Comment 10C
R10D	USR10D	I/O Comment internal output 10D
R10E	USR10E	Internal output Comment 10E
R10F	USR10F	I/O Comment internal output 10F
TDO	TIMER	Shift Timer 1
WY0010	DE-TA1	Word test data

I/ONo.	USER SYM	I/O CMT

(c) Memo comment

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

No.	MEMCNT
1	Memo Comment 0 The output place to an output module will be moved by a periodic time. Output is made by 1 point unit. Time adjustment is made by changing the setting of TD0. Move the output place in order from 1st point and it returns to 1st point after 16th point.
2	0123456789012345678901234567890123456789012345678901234

(d) Box comment

CPU= H-2002

PRG NAME = TEST PROGRAM 1

DATE = 1999- 6-17

PAGE = 1

No.	BOX CMT
1	BOXCOMMENTTEST1234567890123456789
2	Box Comment Test + 0012
3	box comment test 13

No.	BOX CMT

(e) Circuit comment

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

No.	CRCT CMT	No.	CRCT CMT	No.	CRCT CMT	No.	CRCT CMT
1	CircuitComment01						
2	CircuitComment2						
3	CircuitComment3						
4	CircuitComment4						
5	CircuitComment5						
6	CircuitComment6						
7	CircuitComment7						
8	CircuitComment8						
9	CircuitComment09						
10	CircuitComment10						
11	CircuitComment11						
12	CircuitComment12						
13	CircuitComment13						
14	CircuitComment14						
15	CircuitComment15						
16	CircuitComment16						
17	CircuitComment17						
18	CircuitComment18						
19	CircuitComment19						

APPENDIX

3. Cross reference

(1) I/O use condition table

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

EXTERNAL I/O LIST				ALL I/O No LIST				
Y0	*Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17
Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26
Y27	Y28	Y29	Y30	Y31	Y32	Y33	Y34	Y35
Y36	Y37	Y38	Y39	Y40	Y41	Y42	Y43	Y44
Y45	Y46	Y47	Y48	Y49	Y50	Y51	Y52	Y53
Y54	Y55	Y56	Y57	Y58	Y59	Y60	Y61	Y62
Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70	Y71
Y72	Y73	Y74	Y75	Y76	Y77	Y78	Y79	Y80
Y81	Y82	Y83	Y84	Y85	Y86	Y87	Y88	Y89
Y90	Y91	Y92	Y93	Y94	Y95	Y100	Y101	Y102
Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111
Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120
Y121	Y122	Y123	Y124	Y125	Y126	Y127	Y128	Y129
Y130	Y131	Y132	Y133	Y134	Y135	Y136	Y137	Y138
Y139	Y140	Y141	Y142	Y143	Y144	Y145	Y146	Y147
Y148	Y149	Y150	Y151	Y152	Y153	Y154	Y155	Y156
Y157	Y158	Y159	Y160	Y161	Y162	Y163	Y164	Y165
Y166	Y167	Y168	Y169	Y170	Y171	Y172	Y173	Y174
Y175	Y176	Y177	Y178	Y179	Y180	Y181	Y182	Y183
Y184	Y185	Y186	Y187	Y188	Y189	Y190	Y191	Y192
Y193	Y194	Y195	Y200					

(2) I/O use circuit table

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

COIL CNTCT CRCT No.			
Y1		5	
Y2		NOT FOUND	
Y3		6	
Y4		NOT FOUND	
Y5		7	
Y6		NOT FOUND	
Y7		8	
Y8		NOT FOUND	
Y9		9	
Y10		NOT FOUND	
Y11		10	
Y12		NOT FOUND	
Y13		11	
Y14		NOT FOUND	
Y15		12	
R100		NOT FOUND	
R101		13	6
R102		14	7
R103		15	8
R104		16	9
R105		17	10
R106		18	11
R107		19	12
R108		20	13
R109		21	14
R10A		22	15
R10B		23	16
R10C		24	17

APPENDIX

CPU= H-2002

PRG NAME = TEST PROGRAM 1

DATE = 1999- 6-17

PAGE = 1

CONTACT COIL CRCT No.

R101		:	5
		:	NOT FOUND
R102		:	6
		:	NOT FOUND
R103		:	7
		:	NOT FOUND
R104		:	8
		:	NOT FOUND
R105		:	9
		:	NOT FOUND
R106		:	10
		:	NOT FOUND
R107		:	11
		:	NOT FOUND
R108		:	12
		:	NOT FOUND
R109		:	13
		:	NOT FOUND
R10A		:	14
		:	NOT FOUND
R10B		:	15
		:	NOT FOUND
R10C		:	16
		:	NOT FOUND
R10D		:	17
		:	NOT FOUND
R10E		:	18
		:	NOT FOUND
R10F		:	19
		:	NOT FOUND
TD0		:	2
		:	NOT FOUND
WY0		:	NOT FOUND
		:	1

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

I/O CRCT No.

Y1		:	5	
		:	NOT FOUND	
Y2		:	6	
		:	NOT FOUND	
Y3		:	7	
		:	NOT FOUND	
Y4		:	8	
		:	NOT FOUND	
Y5		:	9	
		:	NOT FOUND	
Y6		:	10	
		:	NOT FOUND	
Y7		:	11	
		:	NOT FOUND	
Y8		:	12	
		:	NOT FOUND	
Y9		:	13	
		:	NOT FOUND	
Y10		:	14	
		:	NOT FOUND	
Y11		:	15	
		:	NOT FOUND	
Y12		:	16	
		:	NOT FOUND	
Y13		:	17	
		:	NOT FOUND	
Y14		:	18	
		:	NOT FOUND	
Y15		:	19	
		:	NOT FOUND	
R100		:	5	
		:	NOT FOUND	
R101		:	5	6
		:	5	
R102		:	6	7
		:	6	
R103		:	7	8
		:	7	

4. Setting Value

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 1

CPU DFN I/O ASN		[STANDRD I/O ASGN]									
		UNT NO.									
		0	1	2	3	4	5	6	7	8	9
S L O T N o. A B C D E F	0	Y16									
	1	Y16									
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	A										
	B										
	C										
	D										
	E										
	F										

CPU= H-2002 PRG NAME = TEST PROGRAM 1 DATE = 1999- 6-17 PAGE = 2

CPU DFN I/O ASN		[STANDARD]										BASIC					
		SLT NO.															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
P O W E R	C P U	Y	Y														
		16	16														

```
NAME = TEST PROGRAM 1 DATE = 1999-
OFF CPU TYPE H-2002

MEM CST & LDR ASGN:RAM-48H
CAPACITY: 48512TEP
FLOW: 0TEP
LDR: 48512TEP
```

```
RETNTV AREA:      R UNSET
                  :      WR UNSET
                  :      WM UNSET
                  :      TD UNSET
                  :      DIF UNSET
                  :      DFN UNSET
```

```

CPU= H-2002   PRG NAME  = TEST PROGRAM 1   DATE = 1999- 6-17   PAGE =    1
                      RUN PARAMTR

```

[RUN CNTRL]

```

INPUT DEFINE      : NO
INPUT I/O No.    : *****

```

[TRANSFER WHILE ERR]

```

REM I/O ASSGN:      TRNS NG
REM SUBSTATION ERR: TRNS NG

```

[DELAY CHECK TIME]

SETTING : 010 x 10ms

[CPU LNK PRMTR]

No. 1LNK
TOP ASSGN No. : WL*****
END ASSGN No. : WL*****

[RUN WHILE ERROR]

```

I/O ASSGN UNMATCH : RUN NG
EXPANSION UNIT ERR: RUN NG
REM ERR           : RUN NG

```

No. 2LNK
TOP ASSGN No. : WL*****
END ASSGN No. : WL*****

```
*****
*LADDER EDITOR WINDOWS
*FUNCTION CONFIRMING TEST PROGRAM
*TEST2.PRN TEST2.IOT TEST2.MEC
*TEST2.CIC TEST2.BOC
*****
```

SUBJECT LADDER EDITOR WINDOWS FUNCTION CONFIRMING

DRW No. 3254012346

VERSION 1.00

PROGRAMMER TEST PROGRAM 1

DATE 1999-06-17 PM

PROGRAM NAME : TEST PROGRAM 1

ENV I SET

Appendix 2 Function Table

■: The addition function of Ver2

HP = H-Series Program, SP = Source Program, SI = STOP, RN = RUN, DB = DEBUG, ER = ERROR
O = OK X = NG

[illegible]

HP = H-Series Program, SP = Source Program, SI = STOP, RN = RUN, DB = DEBUG, ER = ERROR
OK = OK

Appendix-16

HP = H-Series Program, SP = Source Program, SI = STOP, RN = RUN, DB = DEBUG, ER = ERROR
O = OK

Appendix -17

■: The addition function of ver2

HP = H-Series Program, SP = Source Program, SI = STOP, RN = RUN, DB = DEBUG, ER = ERROR

$$\Omega = \Omega_K$$

Utility	Cross reference	I/O use condition table	External output		O = OK
			Internal output		
			Timer/counter		
			DIF/DEF		
			Master control		
			Control instruction circuit		
		I/O use circuit table	Coil specify contact point circuit		
			Contact point specify coil circuit		
			I/O No circuit		
			Control instruction circuit		
			User symbol		
Utility	Check	All item check			
		Grammar check			
		Label check			
		Master control error check			
		Timer/counter multi define check	Display unused No.		
			Hide unused No.		
		DIF/DEF multi define check	Display unused No.		
			Hide unused No.		
		Assemble error check	Light assemble error display		
			Light assemble error hide		
		CPU error check			
		Remote error check			
		Link error check			
		CPU program check			
Utility	Initialize	PC initialize			
		CPU initialize			
		Flow initialize			
		Occupation release			
Utility	Program name				
Utility	Data memory edit				
Utility	IC card	Initial set	Release area keep		
			User program		
			File memory		
		Information read			
		File memory	Edit file memory		
			Display file memory		
		Delete file memory block			
Window	Cascade				
Window	Tile				
Window	Arrange icon				
Window	Force	Edit force	I/O No.		
			Current value		
			Setting value		
			Input decimal		
			Input hexadecimal		
			Previous I/O		
			Next I/O		
		File	Load (*.ion) *3		
			Save (*.ion) *3		
			Verify (*.ion) *3		
			CPU->PC (Read from CPU)		
			CPU+PC (merge to CPU)		
			CPU=PC (Verify to CPU)		
			GRS		
		Exit			
		Edit	Reset		
			Reset All		
			Select All		
		View	Tool bar		
			Symbol bar		
			Status bar		
			Zoom bar		
			Output		
			Decimal		
			Hexadecimal		
Window	Force	Window	Cascade		
			Tile		
			Arrange icon		
			Force		
			I/O monitor		
			Trace monitor		
			I/O comment		
			Circuit comment		
			Box comment		
			Memo comment		
Window	I/O monitor	Display not with I/O comment			
		Display with I/O comment			
		File	GRS		
			Exit		
		Edit	Delete		
			I/O monitor set		
			I/O No.		
			16 point add / Overwrite		
			1 point add / Overwrite		
			Add		
			Overwrite		
		View	Select all		
			Tool bar		
			Symbol bar		
			Status bar		
			Zoom bar		
			Output		
			Comment		
			Binary		
			Decimal		
			Hexadecimal		
			Previous I/O		
			Next I/O		

Appendix -19

Appendix 3 Error Message Table

	Error message	Description and cause	Solution
A	Abnormal Trigger Setting Value	When trace monitor starts, other than 0 or 1 is set to bit I/O or an inexistent value is set to word I/O.	Set the trigger condition correctly.
	Access Error	Can not make access by the protect state of the IC card or the power OFF.	Check the protection of the IC card and the condition of the power.
	Assemble Error	An assemble error is found in program check.	Check a program or I/O assignment.
	Assign Table Creation Error	The setting I/O assignment has the error.	Correct program or I/O assignment.
	Auto Save File Name Error	The auto saving file name of the trace setting dialog is input with over 3 letters.	Input the auto saving file name with 3 letters.
	Auto Save File Name is Not Specified	The save file name is not specified at the time of the setting of the auto saving setting in the trace function.	Set the auto saving file name at the setting screen of the trace.
B	BASIC Assign Over	Basic module is assigned more than 2.	Only one module can be assigned. Correct I/O assign list.
	Block No. Specify Error (1 to 32768)	There is an error in the specification of the block No. to read out (write in).	Specify the block No. from 1 to 32768, and operate again.
	Block Specify Error (1 to 32)	There is an error in the number of blocks to keep the file memory area for the IC card.	Specify the number of blocks from 1 to 32.
C	Can Not Change CPU Type	However try to change the offline CPU name in On-direct mode, it can not change the offline name because the selected offline CPU name and the CPU are different in the memory assignment.	After checking the type of CPU, select the correct CPU name.
	Can Not Execute by Any Other Bit I/O	Other than a bit (word) of I/O is set in I/O to monitor at the time of the timer chart monitor.	Delete word I/O in I/O set screen of trace data, or execute the trace monitor.
	Can Not Execute Without Setting I/O No.	When trace monitor starts, I/O No. is not set.	Set I/O No. to execute the trace monitor.
	Can Not Execute Without Setting Sampling Time	When the trace monitor starts, the sampling time has not specified.	Set the sampling time.
	Comment Memory Over	Try to write more than the permitted comment capacity.	Delete an unnecessary comment, and operate again.
	Communication Error	A communication error occurs between CPU.	Confirm the key SW and the error code of the CPU, and operate again.

	Error message	Description and cause	Solution
C	Communication Error () (Note: () is the system error code)	1. CPU power is not ON. 2. CPU connection cable is not connected correctly. 3. Specified network address does not exist. 4. Connected module (CPU, Remote, COMM, or LINK module) is not operated. 5. No replying from the CPU in specified time. 6. Serial port of computer is broken.	1. Power ON the CPU. 2. After confirming the format of CPU connection cable, connect the cable again and retry. 3. After setting the correct network address, operate again. 4. Confirm rightness of I/O assignment of Remote, COMM, LINK module, and the error state of CPU, Remote, COMM, LINK module. 5. Finish processing, and select the mode from GRS screen again.
	CPU Debug	When executing the change of set value, CPU is debug Running.	Reset CPU debug, or make CPU "HALT" and operate again.
	CPU Error	The data of CPU parameter area or flow area is broken.	Execute CPU initialize and transmit the program to CPU.
	CPU Memory Cassette Error	CPU memory assignment has error.	Execute CPU initialize and transmit the program to CPU.
	CPU Memory is ROM Memory	The set value of ROM memory was changed.	Can not change and edit the set value of ROM memory.
	CPU Memory Sum Error	Program of CPU is broken.	Execute CPU initialize and transmit the program to CPU.
	CPU Parameter Area Sum Error	Data in parameter area might be broken.	Execute CPU initialize and transmit the program to CPU.
	CPU ROM Memory Error	When CPU is ROM memory cassette program writing is executed.	When CPU is ROM memory, CPU writing is ineffective. Writing to CPU when using RAM memory.
D	Data Identify Error	Try to read the file which is created by other system.	Check the file name again.
	Defined I/O No. Error! There is user symbol without defining correct I/O No.	I/O No. of timer counter is set to a user symbol specified as normal coil.	Specify R, L, M, Y for the normal coil.
	Display Error! Can Not Edit	Can not be displayed with User symbol display.	Switch to I/O No. display.

	Error message	Description and cause	Solution
E	Edit Condition is Not Completed	When selecting [Force] on Force, edit condition is not completed.	Read Force data from CPU and make data of PC and CPU agree.
	Error in Running CPU	While CPU is RUNNING, forced output or simulation function is executed.	Stop CPU and execute the function again, or finish the operation.
	Error in Running CPU	While CPU is RUNNING, forced output is executed.	Stop CPU and execute the function again. OR, finish the operation. (Can not execute Forced output while CPU is RUNNING. After selecting Forced set/reset, select Forced output again.)
	Executing Error	1. However CPU is not debug mode, the function of debug is executed. 2. Select the debug mode on a low-ranked model below H-252.	1. Escape from the debug mode, and get in the mode again. 2. Can not select the debug mode on a low-ranked model below H-200.
	Extension Timer/Counter Error	Try to transmit the program which has the extension timer/counter to the CPU which can not use the extension timer/counter.	Correct the program.
F	Fail to Load File	Specified file is not the file saved the data memory.	Specify the file which was saved the data memory, and operate again.
	Fail to Save File	Can not save the data memory because of the write protect state or the lack of capacity of the disk.	Check the disk which was specified to save, and operate again.
	Fail to Verify File	Specified file is not the file saved the data memory.	Specify the file which was saved the data memory, and operate again.
	Force Assign Over	The number of Force I/O over 64 point.	Delete Force data and make it less than 64 point, and operate again.
	Force I/O Assign Over Error	As the result of merging Force I/O data of CPU and PC, the sum over 64 point.	Release Force data of CPU or PC, and make the sum of CPU and PC less than 64 point.
	Force I/O Data of CPU and PC are different	CPU and Force data are verified by Force (FULL) of Monitor mode. As the result, it is found that data is different.	1. Read Force data of CPU, and set in PC. 2. Merge Force data of CPU and PC.
	Format Error	The data input in Circuit No., Memo comment, Box comment, Circuit comment, Page No. and Timer No. is incorrect.	Input the correct data.
H	Header Size Error	Read file is broken.	Select the correct program.
	HIFLOW is Unsupported	The flow initialize was executed for a low-ranked model, below H-252.	Can not program with HIFLOW language on a low-ranked mode, below H-252.

	Error message	Description and cause	Solution
I	I/O Assign Error	The contents of I/O assignment table is incorrect.	Correct I/O assignment error on the table.
	I/O Assign Error! Assign table making error occurred	I/O assignment data read with AUTOSSET has error (I/O module is not attached correctly).	Fix I/O module.
	I/O Assign No. Error! Auto setting completed	I/O No. in program and contents of I/O assignment table is different.	Correct the program.
	I/O Convert Error	I/O No. in program and contents I/O assignment table is different.	Correct program or I/O assignment table.
	I/O No. Error	1. Incorrect I/O No. is selected. When changing time set value, the set value error, I/O No. range error, the timer No. error are found. 3. Input I/O No. is incorrect. 4. No I/O No is input.	Confirm the input I/O No. and correct it.
	I/O No. Not Found	Input unused I/O No., then read and monitor it.	Input I/O No. using, and operate again.
	I/O No. Specify Error	The specified I/O No. or the specified range is incorrect in the file saving of data memory edit.	Input correct I/O No..
	IC Card Block Size Error	Can not edit because the block size of the IC card is other than 64 word.	Use the IC card which is specified the block size as 64 word, and operate again.
	IC Card Error	FLASH format error of the IC card.	Change the IC card, and operate again.
	IC Card No. Error! Specify IC Card No. between 1-2	Error in specification of the IC card No..	Input the correct IC card No. and operate again.
	IC Card Not Exist	Execute the operation to the slot that the IC card is not mounted.	Check the setting condition of the IC card, and operate again.
	Illegal Writing Times	Writing number set in Auto generation is incorrect. (Ex. set value is 0)	Correct the number of writing, and retry.
	Impossible to Display Command	There is a command can not be converted when converting Ladder to the command.	Read and edit with Ladder. (Some circuit made by Ladder can not be described by the command)
	Impossible to Execute Without Setting Trigger	When trace monitor starts, the trigger data condition is not set.	Set the trigger data condition. Set the trigger condition correctly.
	Incorrect Input Data	Error in the input of the top and the last I/O at the time of I/O batch change.	Input a correct I/O.

	Error message	Description and cause	Solution
I	Input I/O No. Error	A program is created by specifying I/O as Y, but the assignment input module has already assigned in the I/O assignment point which corresponding to the Y.	Correct the I/O assignment table or the program.
	Input I/O No. is Not Assigned	Specify I/O No. which is not assigned with I/O as the operation control input.	Correct I/O assignment and specify the operation control input again.
	Input Password	Execute the file loading or the CPU reading which has a password.	To display a program, release a password.
K	Key Position is Not Remote	[Debug] is selected when CPU key switch is not set to Remote.	Set CPU key switch to REMOTE, and select [debug].
	Key-In Error	1. When CPU is D. RUN, the debug operation such as scan run is executed. 2. Try to execute the functions of debug when CPU is not debug mode. 3. When Online change starts, make Online change permission flag (R7C7) OFF in a program. 4. When inputting a cross reference or a comment print range with the user symbol, input the user symbol which becomes a smaller character code than the top user symbol for the last. 5. Try to make Online change for CPU (error code [44]) which becomes the delay error. 6. Try to execute the function of trace debug simulation which is not supported EH-150. 7. Try to execute the unsupported simulation in H-250/252.	1. Operate halt specification. After CPU became D.HLT, operate again. 2. Press [debug]. And enter debug mode again. 3. Change the program to prevent that Online change permission flag (R7C7) becomes OFF by Online change. 4. Input the user symbol to be top <= end as they are converted to character code. 5. Can not execute Online change to CPU which becomes the delay error. 6. Can not execute the trace debug simulation with EH-150. 7. Can not execute the simulation with H-250/252.
L	Ladder Error	1. Ladder program has error. 2. Create the circuit which has grammar error, and execute [Circuit Read]. 3. Grammar error in the read program.	Correct a program and operate again.
	Ladder Error! Program Error	I/O No. which is specified with type X (input) exist in the coil or the left side of the expression.	Assign I/O No. except X to user symbols specified in coil or the expression.

	Error message	Description and cause	Solution
L	Link Over Assignment	CPU link module is assigned more than 3.	Correct the assignment list which to be the CPU link module no more than 2.
M	Memory Assignment Error	Error in the memory assignment.	Initialize the CPU with the online mode, or transmit H series program to the CPU.
	Memory Cassette Error	Memory cassette which can not be selected in a present offline CPU type in CPU information dialog.	Select the correct memory cassette.
	Memory Cassette Unmatched	A memory cassette type set in PC is different from a memory cassette mounted on CPU.	Correct the set memory cassette type to the type mounted on CPU actually.
	Memory Cassette Unset	1. CPU memory cassette is not mounted correctly. 2. Memory cassette is broken.	1. Change the capacity of the memory cassette in CPU setting. 2. If same error occurs after resetting the power of CPU, change the memory cassette.
	Memory Size Error	1. Try to load a program larger than the memory cassette capacity set in CPU setting. 2. Set PC memory cassette that is larger than CPU memory cassette and transmit it to CPU.	1. Change memory cassette capacity in CPU setting and execute again. 2. Change CPU memory cassette with larger one. Or, set the memory cassette capacity as same setting as CPU, and execute again.
	Memory Size Error! This program is too big to convert	H series program before conversion is over the permission capacity to convert.	Reduce program size to permission capacity (26k steps) and operate again.
	Multi Define Error	Try to define the user symbol which has already defined.	Define the user symbol which has not defined.
	Multi Timer	As the result of copy or merge, timer No. is doubled.	Change the timer No. and operate again.
N	Nesting Error	Assortment of MCS and MCR is incorrect.	Correct the program.
	Network Error	There is no connected CPU which corresponding to the input loop No. and the station No..	Check the loop No. and the station No. of CPU to connect, and input again.
	No Application Command	Input unused application command, then read and monitor it.	Input the application command using, and operate again.
	No Circuit No.	Input unused circuit No., then read and monitor it.	Input the existing circuit No., and operate again.
	No Comment Merge for Lack of Capacity	When merging the comment, the circuit comment is larger than the load possible size.	Reduce the size of the circuit comment, and operate again.

	Error message	Description and cause	Solution
N	No Cursor Timer/Counter Coil	Though [Set Value Change] is selected on Ladder or the command monitor screen, there is no timer counter coil on cursor.	Move cursor to timer counter coil, and press [Set Value Change].
	No Data for Auto Setting	All setting item of Auto Setting is defined as unset.	Change the definition for Auto Setting to set.
	No Data in Memory	However there is no data to save in PC memory, save is executed.	It is impossible to save without the saving data in PC memory.
	No I/O Assignment	I/O assignment is not correct. I/O No. which is not assigned in the PC side by the each data setting of Trace monitor, Set/Reset, Force output, and Force is selected.	Input the correct No., or correct I/O assignment of PC side.
	No Input Data	There is no input data of the top/last I/O No. in the retentive memory range.	Specify the range correctly.
	No Memory Circuit	Try to execute the trigger circuit monitor in the condition that the memory circuit is not registered.	Register memory screen and operate again.
	No More Application Command	At the time of reading or continuous reading on Monitor, there is no more application command.	It is impossible to continue reading from the last point of application command.
	No More Circuit	At the time of multiple circuited read on Monitor, specified circuit does not existed.	Change the specified circuit No. after confirming, and operate again.
	No More Command	At the time of reading or continuous reading in Monitor, there is no more command.	It is impossible to continue reading from the last command.
	No More Display	It is impossible to display the circuit specified by multiple circuit reading with 1 screen.	Specify and read the circuit that is not displayed on 1 screen.
	No More I/O No.	At the time of reading or continuous reading in Monitor, there is no more I/O No.	It is impossible to continue reading from the last I/O.
	No More User Symbol	At the time of reading or continuous reading in Monitor, there is no more user symbol.	It is impossible to continue reading from the last user symbol.
	No Next I/O No.	Press [Next I/O] as the last I/O No. is displayed.	Click [Next I/O] in the effective range (above the last I/O No.).
	No Online Change (Control Instruction Exist)	Try to execute Online change of the control instruction.	Refer to the method of Online change of the control instruction.

	Error message	Description and cause	Solution
N	No Online Change (with MC)	A circuit including MCS & MCR is changed (move, delete, and I/O batch change) when CPU is RUNNING.	Stop writing. (Impossible to change in RUN a circuit including MCS and MCR)
	No Pre I/O No.	Click [Pre I/O] when I/O No. is at the top.	Click [Pre I/O] in the effective range of I/O No.
	No Program	There is no program in CPU and PC memory.	Write a program to CPU and PC memory.
	No Program Merge for Lack of Capacity	Try to merge a program which is larger than rest memory.	Press the END key. Set memory cassette capacity to large one in CPU setting, or correct a program to merge in rest memory and operate again.
	No User Symbol	Input unused user symbol, then read and monitor it.	Input the user symbol using, and operate again.
	No Writing Error	Can not execute the top display without inputting and writing of the setting value (input data exist). Or, it can not scroll because the input data exist.	Write the data when it is necessary, clear the data when it is unnecessary.
	No. X Link Parameter is Incorrect (X is 1 or 2)	A set value of 1st or 2nd link area is top > end.	Correct the set value of link area.
	Not to Assign Extension Unit	BASIC, COMM, GPIB, LINK, are found in I/O assignment of the extension unit.	Can not assign BASIC, COMM, GPIB, LINK to the extension unit. Delete them from I/O assignment.
	Not to Execute at This CPU Type	Simulation or Force function is selected with connecting a low-ranked model, below H-252.	Can not select Simulation or Force function by a low-ranked model, below H-252 (EH-15-, H-200/250/252, H-64, etc.).
	Not to Execute Auto Creation	The created circuit becomes larger than rest memory capacity at the time of the auto creation.	Change the memory cassette with a cassette has a larger capacity (rest of memory cassette), or reduce the writing circuit to make the step number less than rest memory capacity.
	Not to Input New Value	Try to write without input the renewal value.	Register renewal value by register function of Auto generation, and operate again.
O	Occupation Error	Because other station occupies CPU, CPU can not be occupied. Execute the force with EH-150, H-250/252.	After processing on other station, operate again. Or, after release of occupation, operate again. Can not execute the force with EH-150, H-250/252.

	Error message	Description and cause	Solution
O	Operation Control is OFF	An input define I/O specified in run parameter is OFF.	Enter debug mode after set ON input define I/O specified in operation parameter.
	Operation Control Unmatched	Try to change the I/O assignment which correspond to the external input I/O (X) specified in the operation control input.	Can not change the I/O assignment which correspond to the external input I/O (X) specified in the operation control input. Or, after changing I/O specified in the operation control input, change the I/O assignment.
	Other Debugging	Try to debug the CPU that is debugged by other station.	Can not debug CPU while the CPU is debugged by other station.
	Out of Assignment Table Area	The alphabet (A-F) are used in the number part of the unit No. and the remote station No. in the external I/O No.. (EX. X1A022, WX1B20, etc.)	Make the unit No. and the remote station No. in external I/O No. under 9.
P	Print Error	Execute the print of the trace without displaying the trace data.	Execute the print after loading or executing the trace data.
	Program Capacity for Copy is Lack	Try to specify a circuit range that is over a rest capacity and copy it.	Reduce the copied range and operate again.
	Program Error	Error in I/O definition which appending to H series program of before conversion. (Ex: an user symbol specified as timer is not numbered.)	Correct I/O definition and operate again.
	Program Unmatched	Programs of CPU and PC do not agree.	Make a program be agree by program transmission, etc..
R	RAM Error	Error in Memory cassette (RAM memory).	If it does not recover by CPU power ON/OFF, change the memory cassette.
	Remote Assign is Impossible	BASIC, COMM, GPIB, LINK, REMOTE, and INTERRUPT are set in I/O assignment of remote substation.	Impossible to set BASIC, COMM, GPIB, LINK, REMOTE, INTERRUPT in the remote substation. Delete them from I/O assignment.
	Remote Over Assignment	Remote master station is assigned more than 5.	Correct the assignment list which to be the remote master station no more than 4.
	ROM Memory Edit Impossible	Edit when CPU is ROM memory.	Choose [GRS] in [File] menu, or finish the application. (Can not write to ROM memory)
	ROM Memory Error	The writing has executed to ROM memory.	Choose [GRS] in [File] menu, or finish the application. (Can not write to ROM memory)

	Error message	Description and cause	Solution
R	Running CPU	CPU goes out debug state during debug operation.	Finish debug mode.
S	Setting Error	Error in the specification of setting value.	Input the correct setting value.
	Setting is Beyond Area	The setting value is over the permitted range.	Reset the setting value.
	Size Error of Setting	A data at the area specification is set as top > end.	Reset the data to be top <= end.
	SRAM is Mounted	Can not execute the block clear because SRAM is mounted on specified IC card.	Confirm the IC card setting, and operate again.
	Stack Error	A nest of MCS or MCR is deeper than level 8.	Set a nest no more than 8.
	Start Condition Error	Try to write a circuit that cause Start condition error (END,RTS,RTI) with the change in RUN.	Correct program and operate again.
	Syntax Error	Detected syntax error in PC memory of operation online changing	Please check the program by utility-check and correct the error circuit
T	Target CPU is Not H Series CPU	1. CPU which tried to connect was H series. 2. Error occurs on CPU	1. Connect to H series CPU and operate again. 2. If same error occurs by restarting with GRS screen, OFF/ON the power of CPU.
	This CPU does not execute trace monitor	Try to execute the trace monitor with the CPU except H-4010/2002/702/302/252.	There is no function of the trace monitor with the CPU except H-4010/2002/702/302/252.
	Timer Error	1. In I/O batch change, a timer No. that is specified as destination has already used. 2. Try to change the timer of time base 0.01S to timer more than No. 64 all together.	1. Specify an unused timer No. and operate again. 2. A timer which timer base is 0.01S can be used to timers No. 0-63.
	Too Many No.	1. Standard I/O assignment point is over 4096. 2. Remote I/O assignment point is over 512 at each home station. 3. I/O assignment is over 1024 at home station of remote 2.	Delete the overflowed I/O assignment.
	Trace Mode by Other Station. Can Not Change Setting	Try to trace CPU that is traced by other station with different setting.	Can not trace CPU while the CPU is traced by other station with different setting.
	Type Unmatched	A program is created by using Y, WY (X, WX), but the corresponding I/O assignment is X, WX (Y, WY).	Correct I/O assignment or I/O No. in a program.

	Error message	Description and cause	Solution
T	Type Unmatched (D Word)	A program is created by using DY (DX), but the corresponding I/O assignment is DX (DY).	Correct I/O assignment or I/O No. in a program.
U	Undefined Assignment	1. When I/O module is not fixed enough, read mounted I/O and press the execute key. 2. I/O assignment data in memory becomes abnormal condition. 3. Set the incorrect module on a extension unit or remote substation, and execute the reading of mounted I/O.	1. Fix I/O module correctly, and execute the reading of mounted I/O again. 2. Correct the error I/O assignment. 3. Remove the incorrect module from the extension unit or the remote substation. And execute the reading of mounted I/O again.
	Undefined Module	Abnormal data exist in I/O assignment data which is read in AUTOSET (I/O module is not fixed correctly)	Fix I/O module and operate again.
	Undefined No.	A module like LINK, REMOTE or BASIC is assigned to I/O assignment point corresponding to X, WX (Y, WY) used in program. Or nothing is assigned to the point.	Correct I/O assignment or I/O No. used in program.
	Undefined No. (D Word)	A module like LINK, REMOTE or BASIC is assigned to I/O assignment point corresponding to DY (DX) used in program. OR nothing is assigned to the point.	Correct I/O assignment or I/O No. used in a program.
	User Program Version Error	Other station change program while connecting Online or On-direct mode.	Select Online mode, and execute CPU Read to make agreement between CPU and PC.
	User Symbol Error	Input I/O No. for the I/O No. or a figure, space for the top of character, and execute the writing.	Input the user symbol correctly.
W	Writing Error	Can not write because the symbol (command) or I/O No. which can not be used in CPU specified by the offline CPU name exist.	Check the offline CPU name, symbol (command) or I/O No.

Ver2 Error Message Table

Here only shows the error messages added in Ver2.

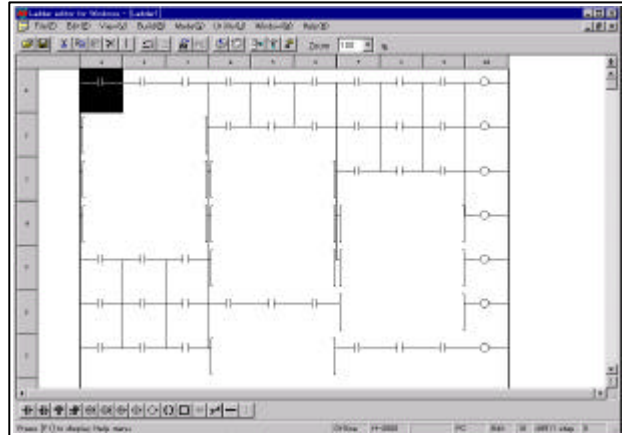
	Error message	Description & Cause	Solution
A	Access Error	Can not make access by the protect state of the IC card or the power OFF.	Check the protection of the IC card and the condition of the power.
B	Block No. Specify Error (1 to 32768)	There is an error in the specification of the block No. to read out (write in).	Specify the block No. from 1 to 32768, and operate again.
	Block Specify Error (1 to 32)	There is an error in the number of blocks to keep the file memory area for the IC card.	Specify the number of blocks from 1 to 32.
C	Can Not Change CPU Type	However try to change the offline CPU name in On-direct mode, it can not change the offline name because the selected offline CPU name and the CPU are different in the memory assignment.	After checking the type of CPU, select the correct CPU name.
	CPU Memory Cassette Error	CPU memory assignment has error.	Execute CPU initialize and transmit the program to CPU.
E	Extension Timer/Counter Error	Try to transmit the program which has the extension timer/counter to the CPU which can not use the extension timer/counter.	Correct the program.
F	Fail to Load File	Specified file is not the file saved the data memory.	Specify the file which was saved the data memory, and operate again.
	Fail to Save File	Can not save the data memory because of the write protect state or the lack of capacity of the disk.	Check the disk which was specified to save, and operate again.
	Fail to Verify File	Specified file is not the file saved the data memory.	Specify the file which was saved the data memory, and operate again.
	IC Card Block Size Error	Can not edit because the block size of the IC card is other than 64 word.	Use the IC card which is specified the block size as 64 word, and operate again.
I	IC Card Error	FLASH format error of the IC card.	Change the IC card, and operate again.

	Error message	Description & Cause	Solution
I	IC Card No. Error! Specify IC Card No. between 1-2	Error in specification of the IC card No..	Input the correct IC card No. and operate again.
	IC Card Not Exist	Execute the operation to the slot that the IC card is not mounted.	Check the setting condition of the IC card, and operate again.
	I/O No. Specify Error	The specified I/O No. or the specified range is incorrect in the file saving of data memory edit.	Input correct I/O No..
M	Memory Cassette Error	Memory cassette which can not be selected in a present offline CPU type in CPU information dialog.	Select the correct memory cassette.
N	No Writing Error	Can not execute the top display without inputting and writing of the setting value (input data exist). Or, it can not scroll because the input data exist.	Write the data when it is necessary, clear the data when it is unnecessary.
S	SRAM is Mounted	Can not execute the block clear because SRAM is mounted on specified IC card.	Confirm the IC card setting, and operate again.
T	This CPU does not execute trace monitor	Try to execute the trace monitor with the CPU except H-4010/2002/702/302/252.	There is no function of the trace monitor with the CPU except H-4010/2002/702/302/252.
W	Writing Error	Can not write because the symbol (command) or I/O No. which can not be used in CPU specified by the offline CPU name exist.	Check the offline CPU name, symbol (command) or I/O No.

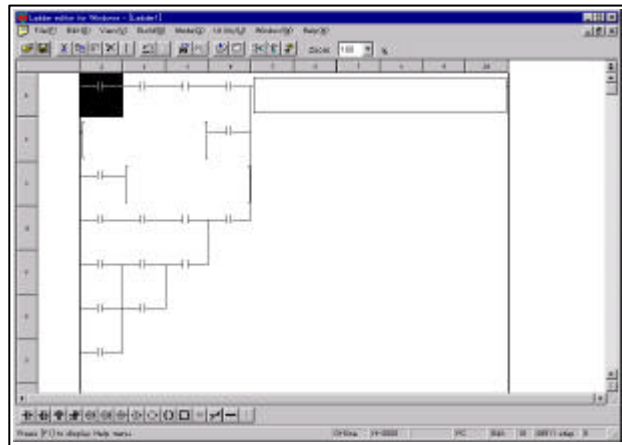
Appendix 4 Hints for Programming

1. Permitted symbol numbers for 1 circuit

In case of the contact point, the comparing box, and the coil, maximum 7 lines of 9 contact points and 1 coil can be input.



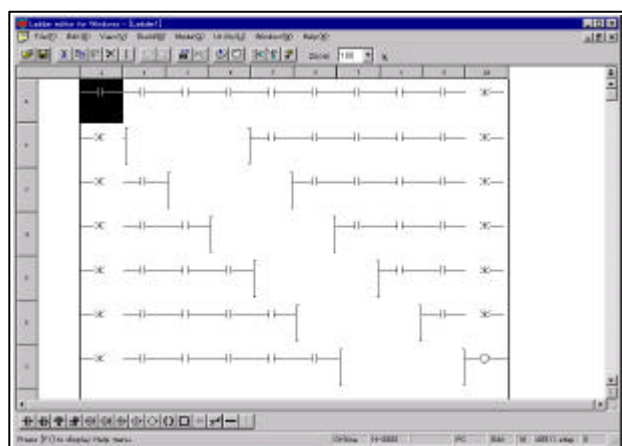
In case of the contact point, the comparing box, and the processing box, 7 lines of 4 contact points, and 1 processing box can be input.



When you use the return symbol, 57 contact points within 7 lines, and 1 coil circuit can be input.

A coil and a processing box can not be create on a same line.

A return symbol and a processing box can not be created on a same line.



2. Processing Box in “1 Contact Point Width Mode”

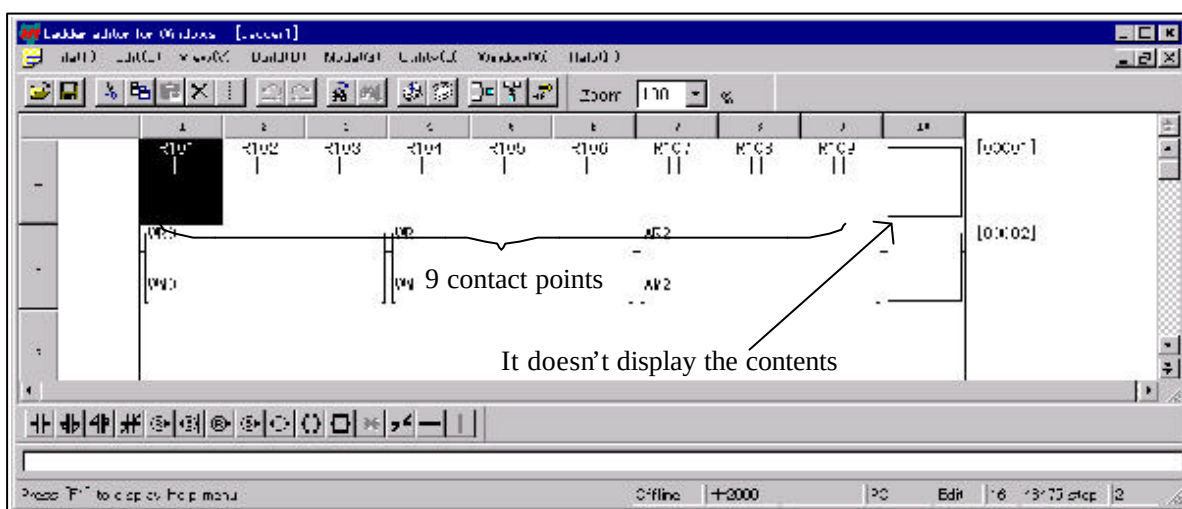
In LADDER EDITOR for Windows®, you can make the processing box as 1 contact point width display and input 9 contact points + 1 processing box of horizontal direction symbol numbers.

Set “Processing box display mode” of **[Mode]** in **[Environment Set]** in the **[Utility]** menu to “1 contact point width display”

(Caution)

When create the program which include 1 contact point width processing box in LADDER EDITOR for Windows® and load it with other than LADDER EDITOR for Windows®, it becomes “Read Circuit Error” and does not display the circuit which include the concerned processing box or all circuit .

When programming with 1 contact point width mode, you have to concern the peripheral devices to use.

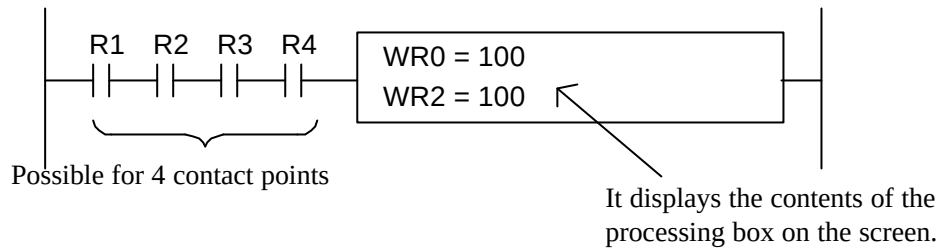


The operation formula which input in the processing box can not be seen in that condition.

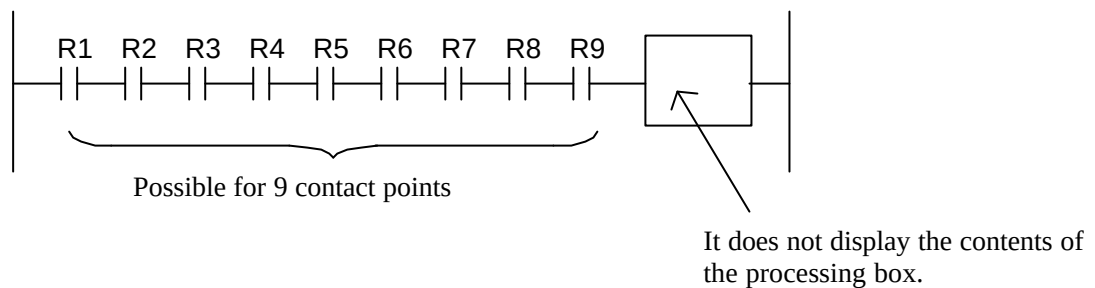
It can be seen by displaying “Property of Processing box” in editing.

Zoom display

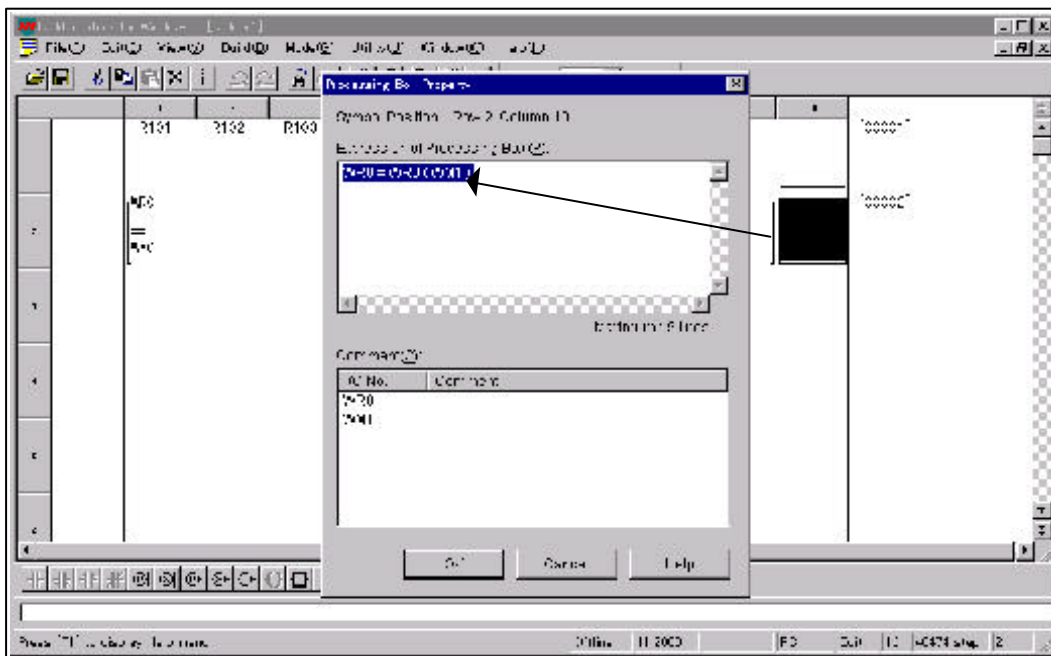
A same display mode to the usual peripheral device except LADDER EDITOR for Windows®



1 contact point width display



The contents of the processing box of “1 contact point width display” mode can be confirmed by displaying “Property of Processing box”.



Appendix 5 Dealing with communication error occurs

The cause and solution when not being connectable with CPU by "the abnormalities in communication" are shown below at the time of connection with CPU in LADDER EDITOR for Windows.

Please deal with it after checking the number of a "communication error."

Moreover, when error codes other than the following are displayed, please ask to our company.

Error Codes	Application		A phenomenon and a cause
	RS-232C	Ethernet	
100	O	O	A problem is in the communication environment of Windows.
102	O	-	A circuit is not establishable.
103	O	-	The circuit was cut during communication.
106	-	O	Relevance I/O allotment (COMM) of an Ethernet interface module is not carried out.
108 110	-	O	The error occurred in Ethernet communication.
109	O	-	The setup of a baud rate does not suit.
120	O	-	NAK was received from the connection place. Even connection with H-200 may be generated rarely.

<Error codes>

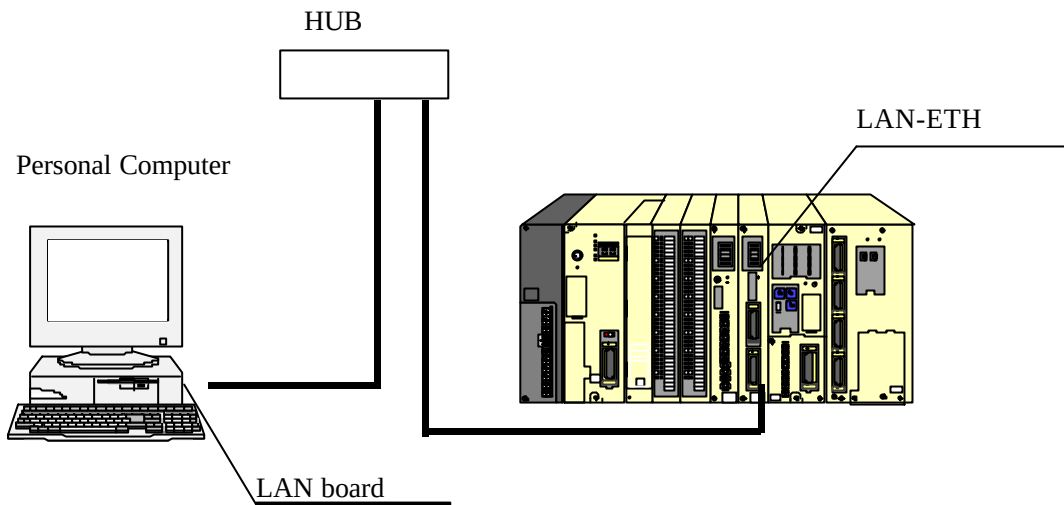
Error Codes	Disposal
100	(1) The COM port of LADDER EDITOR for Windows specified by environmental setup does not exist physically on a personal computer. Or use has become improper. Ex) By LADDER EDITOR for Windows, COM3 was specified by the case where there are only COM1 and COM2 in a personal computer. (2) An Ethernet port does not exist physically on a personal computer. Or use has become improper. Ex) An Ethernet port (adapter) does not exist in a personal computer. ->Please check a setup of a COM port, and a network connection setup from the "control panel" of Windows.

102	(1) Has not the connection cable separated? ->Please check connection of the cable to the serial port or CPU circumference port of a personal computer. (2) Is the power supply of CPU on? ->Please check to see the power supply of connected CPU is on. (3) Does the serial port to be used suit? ->Please check to see a setup of the [communication port] of the dialog box of [environmental setting]-[communication] of LADDER EDITOR for Windows and the serial port of the personal computer which connected the cable suit. (4) Can the serial port of a personal computer be used? Can CPU use communication apparatus, such as other modems? ->In some personal computers, there are some which are setup which cannot use a serial port by setup at the time of purchase. Please confirm to the manual or personal computer maker of a personal computer. Moreover, it cannot be used when red x mark is attached to the serial port by the device manager of Windows. (5) Does connecting of a cable suit? ->Please confirm whether in use of except for an exclusive cable (WVCB02H, WPCB02H, EH-VCB02) or the connection cable for HL-PC3 (PCCB02H) of LADDER EDITOR for Windows, connecting of a cable suits. (6) It is failure of the port of CPU. ->When connectable with other CPUs, or when other circumference equipment cannot be connected, the port of CPU has broken. Please exchange CPUs.
103	The circuit was cut during on-line-on direct connection. ->Please check the serial port of a personal computer, and connection of the cable to CPU. Or please check whether the power supply of CPU has fallen.
106	I/O allotment (COMM) of an Ethernet interface module is not carried out by Ethernet connection. ->Please perform I/O allotment of CPU before making Ethernet connection through LAN-ETH2 or EH-ETH. I/O allotment of an Ethernet interface module serves as "COMM." (Ethernet connection is unestablishable if there is no allotment of "COMM" in CPU.)

108	The error occurred in Ethernet communication. (1) Has not the connection cable separated? ->Please check connection of the cable to the LAN port or Ethernet module of a personal computer. (2) Has not the power supply of network composition apparatus, such as a hub, fallen? ->Please check the state of Ethernet composition apparatus. (3) Can the network top carry out data communications normally? ->Please execute the ping command from a Windows command prompt, and check whether communication between personal computer and Ethernet modules is established.
109	(1) In the case of an exclusive cable (WVCB02H, WPCB02H) of LADDER EDITOR for Windows. ->Please choose "RS-232C (19.2kbps)" by the [communication kind] of dialog box of environmental setting - (communication). (2) In the case of the connection cable for HL-PC3 (PCCB02H) ->Please choose "RS-232C (4.8kbps)" by the [communication kind] of dialog box of (environmental setting) - (communication).
120	NAK was received from the connection place. (1) Please check whether communication apparatus other than CPU of our company (modem etc.) is connected. (2) CPU transmitted NAK. Please inform of apparatus composition to our company. (3) Since the processing speed of a personal computer is too quick in some personal computers in connection with H-200 (CPU-02H), "the abnormalities 120 in communication" may occur by dropping data. ->Please use the transmission speed of LADDER EDITOR for Windows, setting it to 4,800bps.

Appendix 6 Connect with Ethernet Module

Device components (Minimum scale) Example of 10 BASE T



1. Setting of LAN-ETH (Intelligent Ethernet Interface Module) side

(1) IP Address Information Setting

Home station IP address, Other station address, Home station logical port No.

Item	Example of Setting
Home station IP address	192.0.0.1
Home station logical port No. (Task port 1 or 2)	3004 (Decimal)
Service type	1 (TCP/IP)

Please refer to “Chapter 5 5.2 Setting of IP Address” in the manual of LAN-ETH for the setting method. There is no need to set other station address in LAN-ETH side.

(2) Each Setting of LAN-ETH

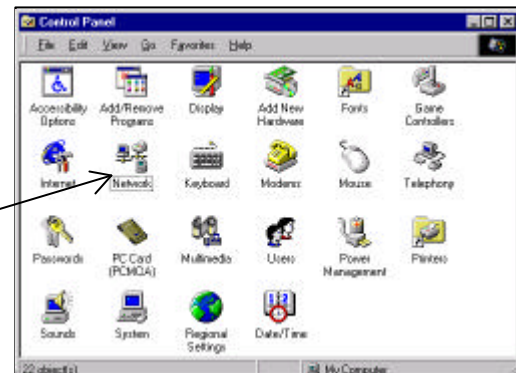
Please refer to the manual of LAN-ETH for each setting.

2. Setting of Personal Computer

(1) Install of TCP/IP Protocol

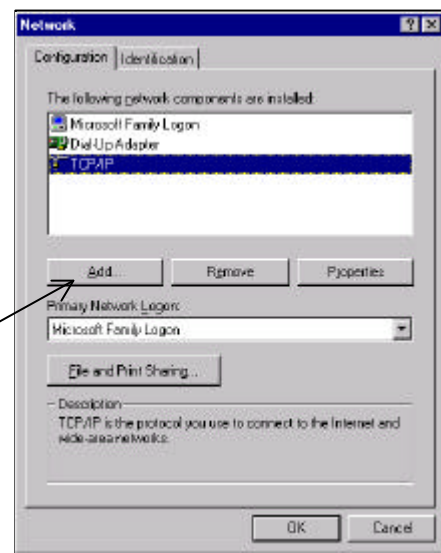
To communicate with LAN-ETH, TCP/IP protocol should be installed in a personal computer.

(a) Open [Start] - [Set] - [Control Panel].



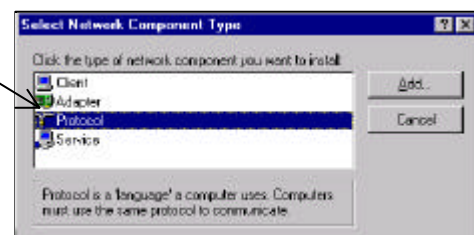
(b) Double click Network.

(c) Check the existence of TCP/IP in the window of “The following network components are installed”. If it has been already installed, move to “(2) Setting of IP Address”.

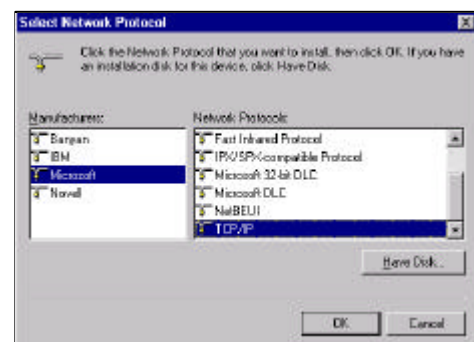


(d) Click the [Add] button.

(e) Click [Protocol] and click [Add]



(f) Click in order of Microsoft, TCP/IP, then click the [OK] button.

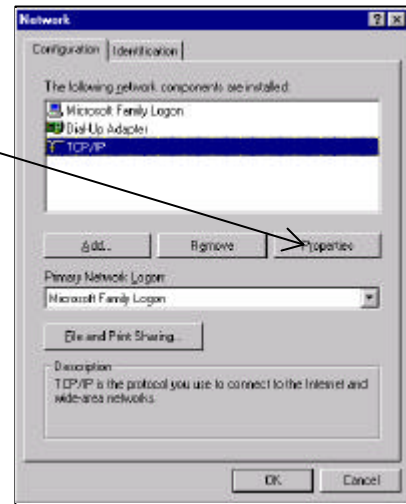


(2) Setting of IP Address

(a) Double click Network in [Control Panel].



(b) Click TCP/IP in the window of “The following network components are installed”, then click the [Property] button.



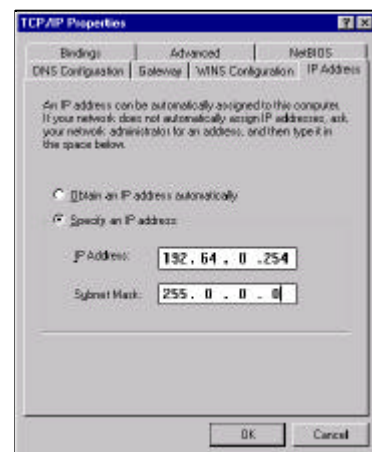
(c) Click [IP Address Specification], and input IP address of PC side to [IP Address].

Please ask to the network manager about the subnet mask. In this case, the subnet is set as 255.0.0.0.

The subnet mask :

- The figure of 0 value is not protected.
- The figure of 255 value is an address decided already.

Input unique address (1-254) into the figure without a mask..



Click the [OK] button, and close the property of TCP/IP and each dialog box of the network..

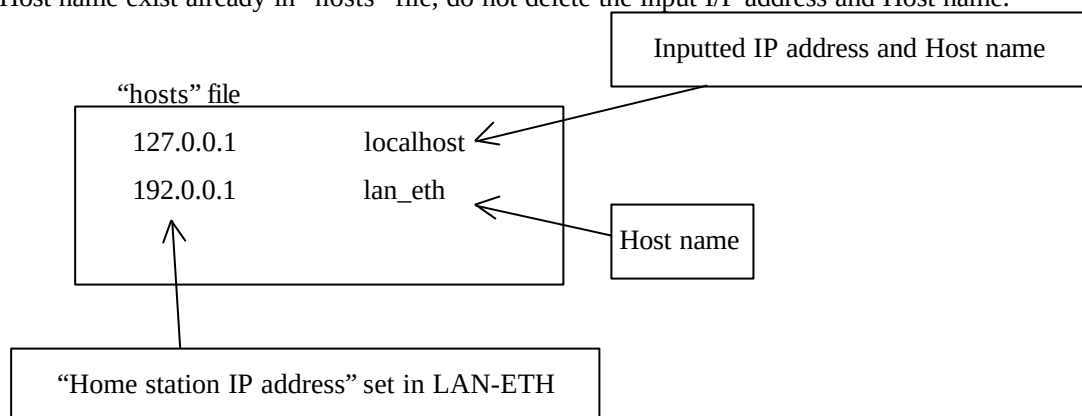
(d) Restart Windows according to the message displayed.

(3) Editing of hosts file

Edit the file “hosts” (no extended code) in the directly (usually in ¥ Windows) which Window 95, 98 is installed by the following process.

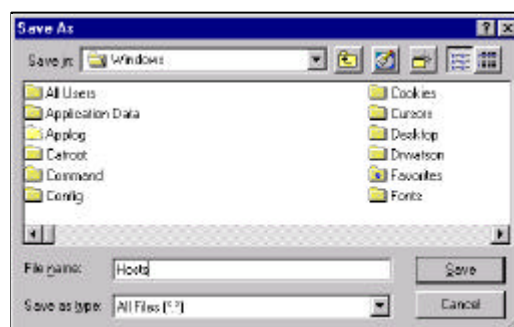
(a) Open the file “hosts” with the memo.

(b) Input “Home IP address” and “Host name” which were set in LAN-ETH to the last line. “Host name” is optional but it has to agree (distinguish large and small letters) with “Host name” which is input in Environment Setting of Ladder Editor for Windows®. And, when another IP address and Host name exist already in “hosts” file, do not delete the input I/P address and Host name.



(c) Save “hosts” file.

In the [Save as] dialog box of Memo, make the file type as all file (*.*) for the file name for no extension code, then click the [Save] button.



When the file is saved as text file (.txt), “Home station IP address” and “Host name” will not work. Make sure to delete extension code for the hosts file.

(d) Close Windows and restart it.

(e) After restart Windows, check the connected condition.

Connect a personal computer and LAN-ETH to HUB (or Network), and start MS-DOS prompt. Execute ping command.

Ex. ping lan_eth

Host name which is input by “hosts” file

IP address which is input by “host” file

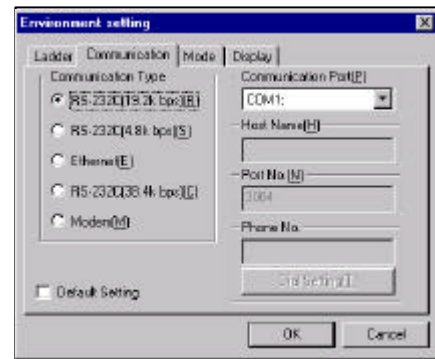
Pinging lan_eth [192.0.0.1] with 32 bytes of data:

Reply from 192.0.0.1 bytes = 5ms TTL = 32

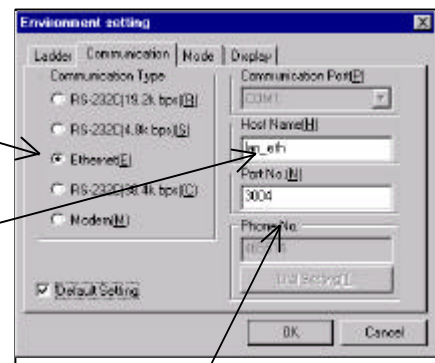
The connected condition is OK when it displays as above. A “_” part will be changed.

(4) Setting of Ladder Editor for Windows®

- (a) Choose [Environment Set] in the [Utility] menu in the offline mode.
 (b) It displays the [Communication] dialog box.



- (c) Select [Ethernet] for the communication type



- (d) Input the same host name which was input in
 “hosts” file to [Host Name].

- (e) Input “Logical Port”, set in LAN-ETH”, by the decimal to [Logical Port].

- (f) Click [Make the setting default], and click the [OK] button.

All setting are completed with these processes.

(Caution)

After setting Ethernet connection, it takes about 45 seconds to display “Communication Error” message in the following cases. This happens because of Windows 95, 98 internal processing.

- (a) When OFF the power of the CPU which install the connecting Ethernet module (LAN-ETH).
 (b) When making online/on-direct connecting to Ethernet module which the power is not ON.
 (c) When the connecting Ethernet module (LAN-ETH) is broken.
 (d) When the Ethernet cable is taken off or cut off while online communicating.

Appendix 7 Attention when using timer/counter

When the information table of a timer counter has written the unnecessary data of LADDER EDITOR for Windows while in use, the phenomenon shown below may occur.

1. Phenomenon

- The timer counter of a certain specific number does not operate.
- The circuit writing of the timer counter of a certain specific number cannot be carried out.
- It becomes timer table disagreement at the time of program collation.

2. Evasion measure

It is avoidable by merging the user program saved at FD etc. with a new file by the following method.

- (1) Save a program at FD etc. ([File]-[record / package record])
- (2) Change the program on a rudder editor the first stage. ([Utility]-[initialization]-[PC initialization])
- (3) Call the program saved by (1) by the merge function, and combine with a new file.([Edit]-[merge])
- (4) Since it is not merged, newly reset up various CPU setup.
([Utility]-[CPU setting]-[CPU information and I/O allotment / operation parameter])

3. Others

In the program which is not using the timer counter, it does not matter in a actual use even if timer table disagreement occurs at the time of program collation, and carries out program transmission and operates to CPU.