

FLEX-PC SERIES

USER'S MANUAL

FUJI FLEX-PC Programmer

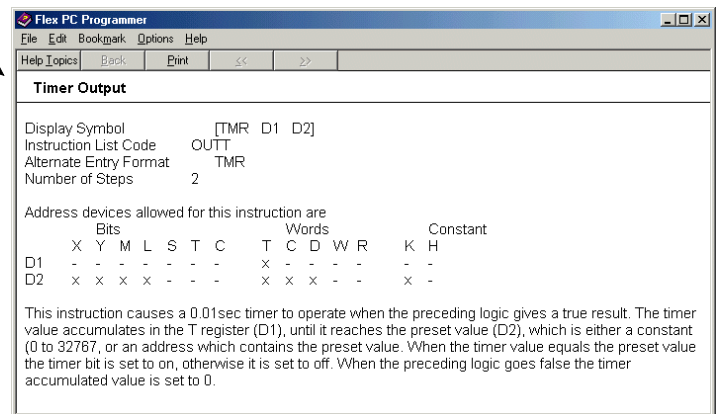
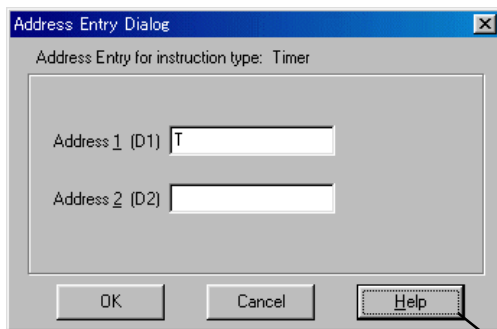
TYPE:NN4NWN-SB

When you unpack this product, make sure that you have all the items listed below. Also check that nothing has been damaged during transportation. If there is any problem, please contact your dealer.

This User's Manual explains FLEX-N series personal computer Loader (for windows). Read this manual carefully to ensure correct operation.

For contents not described in the User's Manual, refer to Help. The [Help] screen corresponding to current operation appears.

(Example) Pressing [Help] in On Delay Timer



Preface

In addition to this manual, we offer the following major User's Manuals for the FLEX-PC series. Please read an appropriate one according to the purpose.

Name	Manual No.	Remarks
MICREX-SX SPB Series <Hardware>	FH401	Description about the SBP Series hardware
MICREX-SX SPB Series <Instructions>	FH400	Description about the SBP Series instructions
MICREX-SX SPB Series <Functions>	FH404	Description about the SBP Series functions
FLEX-PC NB0 Series User' s Manual	LEH941	Description about the NBO Series software and Hardware
FLEX-PC NB Series <Software>	LEH923	Description about the old and new NB Series software
FLEX-PC NB Series <Hardware>	LEH922	Description about the old NB Series hardware
FLEX-PC NB Series <High-speed Counter>	LEH933	Description about the built-in high-speed counters for the old and new NB Series
FLEX-PC NJ Series <Software>	LEH925	Description about the NJ Series software
FLEX-PC NJ Series <Hardware>	LEH924	Description about the NJ Series hardware
FLEX-PC NS Series <Software>	LEH927	Description about the NS Series software
FLEX-PC NS Series <Hardware>	LEH926	Description about the NS Series hardware

Special Notes

The PC Series models and their compatible software versions are as listed below.
Other models are not supported.

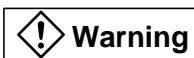
Model	Software version			
	1.01.014...	1.10.014...	1.11.003...	2.00.XXX...
NB0	O	O	O	O
NBE (24-point and 36-point basic units for NB2)	O	O	O	O
NB (56-point and 90-point basic units for NB1 and NB2)	O	O	O	O
NJE (NJ-CPU-E4)	O	O	O	O
NJ (NJ-CPU-A8, A32, B32)	O	O	O	O
NJH (NJ-CPU-B16)	O	O	O	O
NS (NS Series)	O	O	O	O
SPB	x	x	x	O

Notes

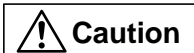
1. This manual may not be reproduced in whole or part in any form without prior written approval by the manufacturer.
2. The contents of this manual (including specifications) are subject to change without prior notice.
3. If you find any ambiguous or incorrect descriptions in this manual, please write them down (along with the manual No. shown on the cover) and contact FUJI.
4. The loader software is subject to version up due to functional improvement, etc. Therefore, an explanation of some items may not be found in this manual. For details, please check the revision log included in "Preface", using the help function of the loader software.

Safety Precautions

Be sure to read the "Safety Precautions" thoroughly before using the module.
Here, the safety precaution items are classified into "Warning" and "Caution."



: Incorrect handling of the device may result in death or serious injury.



: Incorrect handling of the device may result in minor injury or physical damage.

Even some items indicated by "Caution" may also result in a serious accident.
Both safety instruction categories provide important information. Be sure to strictly observe these instructions.

Caution

- ◇ Do not use one found damaged or deformed when unpacked, otherwise, failure or erratic operation might be caused.
- ◇ Do not shock the product by dropping or tipping it over, otherwise, it might be damaged or troubled.
- ◇ Do not leave the product in places where it is exposed to direct sunlight or where temperature and humidity are high. Otherwise, failure or malfunction might be caused.
- ◇ Keep the connectors free from accumulation of dusts. Otherwise, failure or malfunction might be caused.
- ◇ Engage the communication cable connector firmly and lock it, otherwise, erratic operation might be caused.
- ◇ When disengaging the communication cable or the power cable, do not pull the cord, otherwise, failure, erratic operation or damage might be caused.
- ◇ Sufficiently make sure of safety before program change, forced output, starting, stopping or anything else during a run. The wrong operation might break or cause machine problems.
- ◇ Do not turn off the loader during loader is in operation (accessing to the hard disk or the floppy disk, communicating to the PLC), otherwise, missing of *data, failure or erratic operation of products, damage or trouble of machines might be caused.
- ◇ Perform the version-up operation by the explanation of the user's manual, otherwise, failure or erratic operation might be caused.
- ◇ Use this package in the operating environment of software described in the user's manual, otherwise, failure or erratic operation might be caused.
- ◇ Carefully use the CD-ROM to keep its recording surface free from finger-print mark, stain, flaw, dust, water droplet, etc., which might cause failure or malfunction. Remove stain, dust, or other foreign matter sticking on the surface by lightly wiping with a dry soft cloth or commercially available CD cleaner. Do not use benzene, thinner, antistatic agent or LP cleaner for this purpose.
- ◇ Do not write characters or stick adhesive seal on the CD-ROM. Otherwise, failure or malfunction might be caused.
- ◇ Be sure to insert the CD-ROM or the communication cable in correct direction. Otherwise, failure or malfunction might be caused.
- ◇ Operate the loader in stable condition so that it do not drop or other abnormality does not occur. Operation in unstable condition might cause accidents.
- ◇ Do not play back the CD-ROM with ordinary CD player for audio system. Otherwise, your ears might get hurt or the speaker be damaged due to very large sound volume.
- ◇ Perform the periodic inspection for the floppy disk and the hard disk. If the data inside floppy disk, hard disk and CD-ROM are in fault status, failure or erratic operation of the system might be caused.
- ◇ Follow the regulations of industrial wastes when the device is to be discarded.

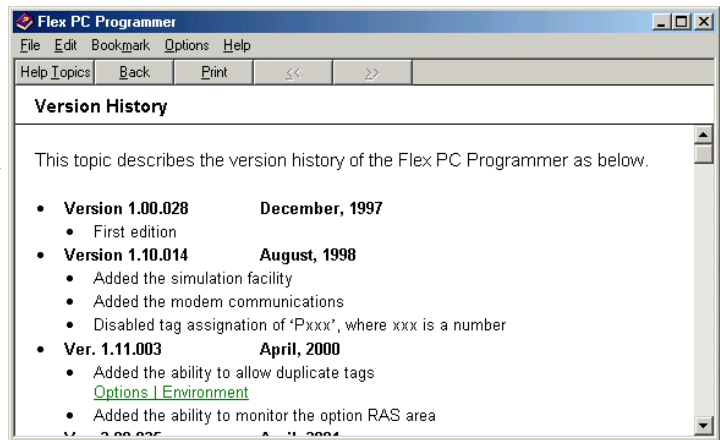
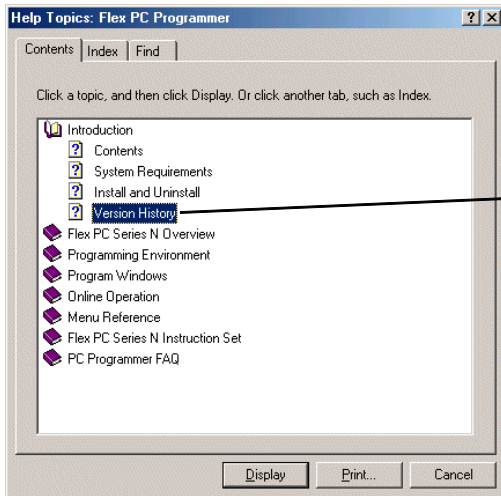
Revision

*Manual No. is shown on the cover.

Printed on	*Manual No.	Revision contents
May 2001	FEH403	First printing (Product version 2.00.XX)
Jun 2001	FEH403a	Second edition (PDF manual for CD Product version 2.1.X.X)
Jan 2002	FEH403b	3rd edition (The Import/Export Function added and the Transfer/Verify Function changed for products version 2.1.1.0)
Jun 2002	FEH403c	Four edition (The Transfer Function and Export Function changed for products version 2.1.1.1)

Revision

Check the details on the revision history by selecting [Introduction] in the Help contents and then [Version History].



Preface

Safety Precautions

Revision

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The FLEX PC Programmer is a Windows-based programming tool for the FLEX-N Series PCs. This software has a number of offline and online functions, including program edit and print functions.

This manual describes the basic operations that are most frequently used. For operations not described in this manual and detailed contents of the operations, refer to the FLEX PC Programmer Help. The Help also contains the latest information about the use of the software functions, etc.

This manual does not describe the basic operations of Windows (maximization and minimization of the screen, use of the scroll bar, etc.). For the basic operations of Windows, refer to the appropriate manual of Windows.

1-1-1 Organization of this manual

Section 1 gives the outline of the software and describes the operating environment and installation of the software and the devices that are necessary for connection between the PC and the personal computer.

Section 2 describes programming, program editing, program saving, etc. performed offline with the PC.

Section 3 describes program/data monitoring, editing, etc. performed online with the PC.

The Appendixes provide supplementary information about such subjects as the compatibility with data created by a DOS-based loader.

1-1-2 Terms and symbols used in this manual

In this manual, the following terms and symbols are used.

On mouse operation

- Click Pushing the right or left button of the mouse once and releasing it immediately.
- Double-click Clicking the mouse twice quickly.
- Drag Moving the mouse cursor with the left button of the mouse kept pushed.

On keyboard operation

A few examples of keyboard operations are given below. Basically, the keyboard operations are the same as those for Windows.

- <SHIFT> key The key with letters {SHIFT} written on keytop.
- <SHIFT> + <C> Pushing the <C> key with the <SHIFT> key kept pushed.
- [File] – [New] Selecting item [File] displayed at the top of the screen first, then selecting item [New] from the list that appears on the screen.

On text description

- Used for enumeration of items.
- ◇ Used to indicate a particular operation to be performed.

The environment required for installing and operating the software is as follows.

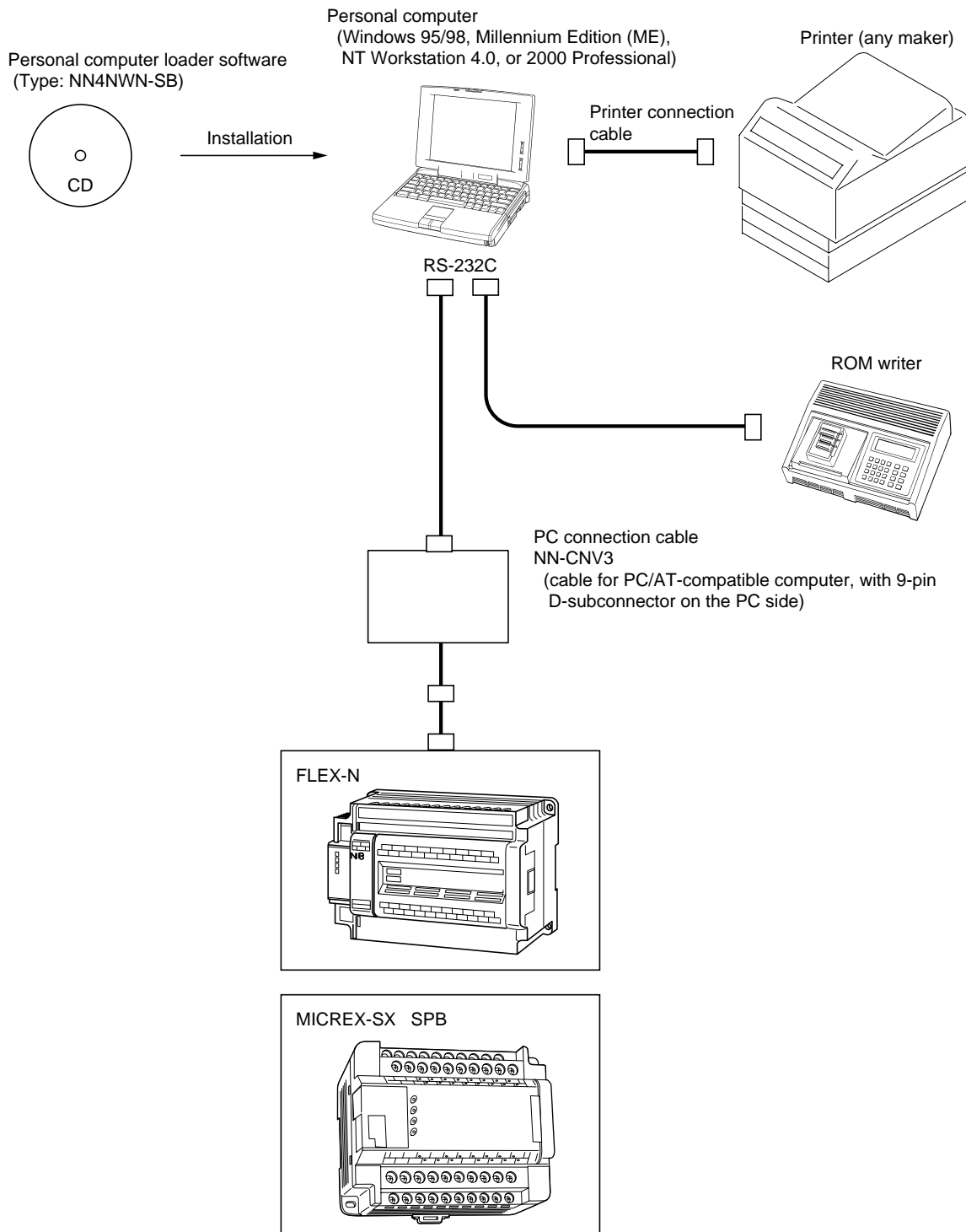
- A personal computer with following English version O/S.
(The software does not operate on Microsoft Windows 3.1.)
 - Microsoft Windows 95
 - Microsoft Windows 98
 - Microsoft Windows Millennium Edition
 - Microsoft Windows NT Workstation 4.0 (Service Pack 6 or later)
 - Microsoft Windows 2000 Professional

If the operating system is not upgraded to the latest version by a service package or other, the software may not run normally.

- RAM of 32MB or more. For comfortable running, 64MB or a greater capacity is recommended.
- 10MB or a greater capacity on the hard disk. For the operating system to run stably, about 100MB is recommended.
- A pointing device, such as the mouse or track ball.
- A display device of 800 x 600 dots or more.
- A CD drive.

1-3 Personal Computer Loader System Configuration

By installing the software on a personal computer, it is possible to use it as a programming tool for the FLEX-N Series PCs.



1-4-1 Personal computer loader software

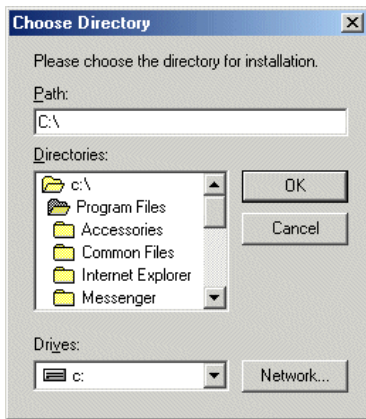
Program loader software package is supplied in the form of CD.

The installation CD includes the installation program which automatically executes operations necessary for installation as well as the registration of icons.

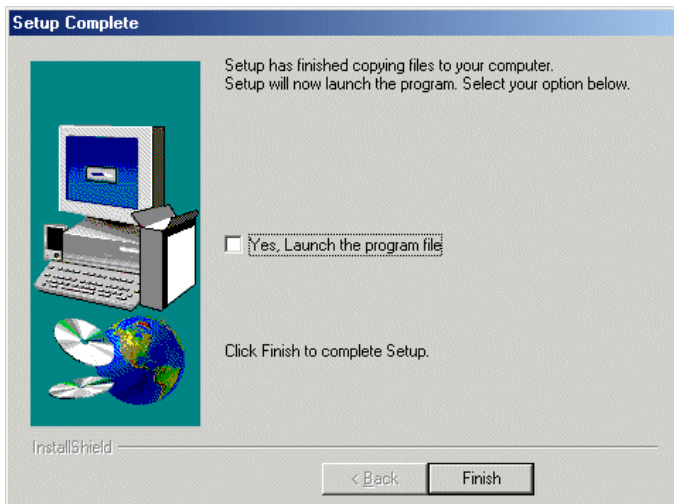
If you have already installed a beta edition of this software package, uninstall it first, then install the personal computer loader software. Do not overwrite the personal computer loader. If the personal computer loader software is installed without uninstalling the Windows-based personal computer loader, the software may not operate properly. For the method of uninstallation, refer to "1-5 Uninstall."

1-4-2 Installation procedure

- ◇ Before installing the personal computer loader software, close all the Windows programs that are open.
- ◇ Insert the CD into CD drive.
CD automatically runs, and item selection dialog box appears.
- ◇ Left-click the [PC Programmer Setup].
{Install Shield Wizard Preparing} working box appears on the screen. Then, {Welcome} dialog box appears.
- ◇ Left-click the [Next >] button.
{Software license Agreement} dialog box appears.
- ◇ If you agree with those contents, left-click the [Yes] button.
The {Choose Destination Location} dialog box appears.
- ◇ When you want to change the default directory for installation (C:\Program Files\FLEX-PC Programmer[E]), left-click the [Browse...] button, designate the desired directory for installation in the {Choose Directory} dialog box, and left-click the [OK] button.

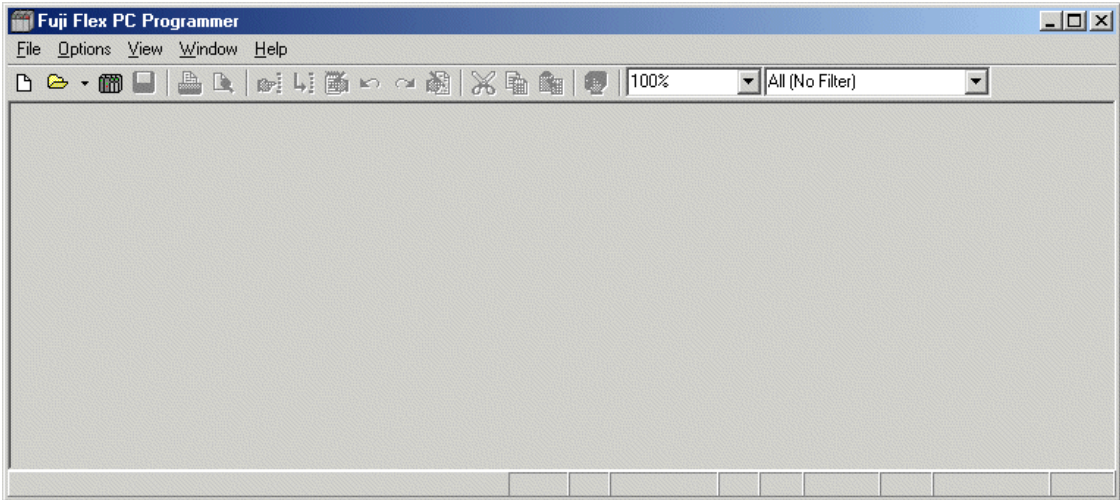


- ◇ The {Select Program Folder} dialog box is displayed. To change the default folder of the "FLEX-PC Programmer," enter an appropriate program folder name in the text box. Left-click the [Next >] button.
- ◇ The {Start Copying Files} dialog box is displayed. Confirm the content of the display and left-click the [Next >] button.
The copying of files starts.
- ◇ When setup completes, the following screen appears.



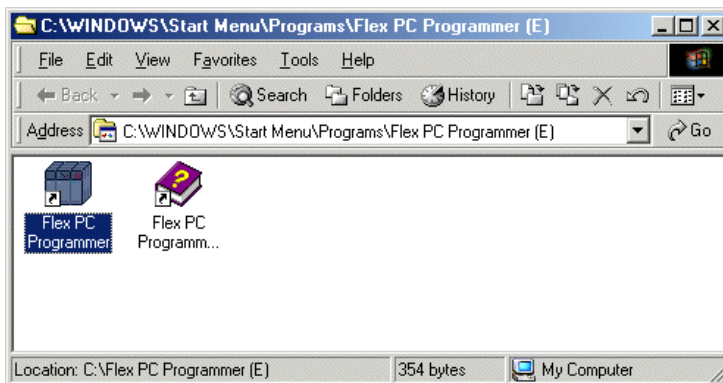
Turn on the check box of the next execution button and left-click the [Finish] button. Turn on the [Yes, Launch the program file] check box and left-click the [Finish] button to start up the PC loader as follows:

<PC loader starting screen>

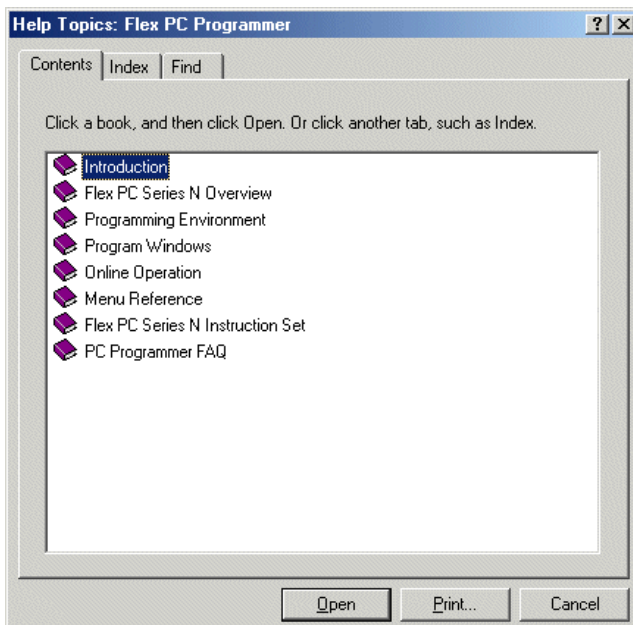


1-4-3 Group of programs installed

When the installation is completed, the following icons are registered in the program group.

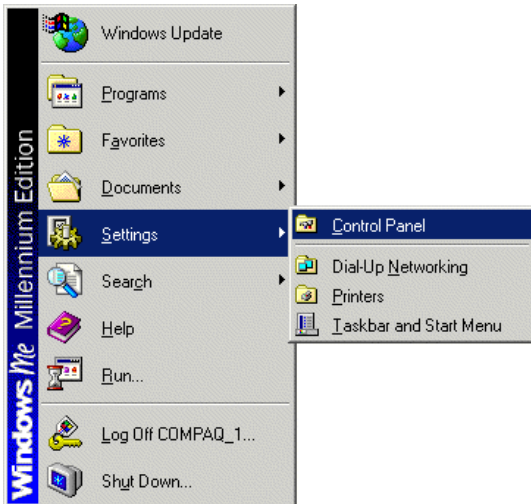


- **FLEX-PC Programmer**
This is the loader software.
- **FLEX-PC Programmer Help**
This is a file which contains the latest information that is helpful in using the loader software. This file can also be used as a reference. It is recommended that the user read through the file.

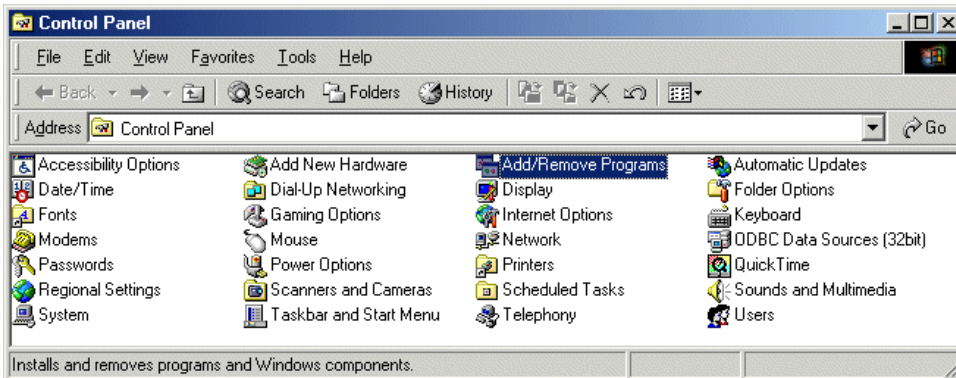


This is used to delete the personal computer loader software from the hard disk of the personal computer. Even when the loader software is uninstalled, all the files created by the user, such as ladder program files and tag files, remain installed together with the folders. To uninstall the loader software, execute the Uninstall program that is provided as a standard program of Windows. The uninstallation procedure is as follows.

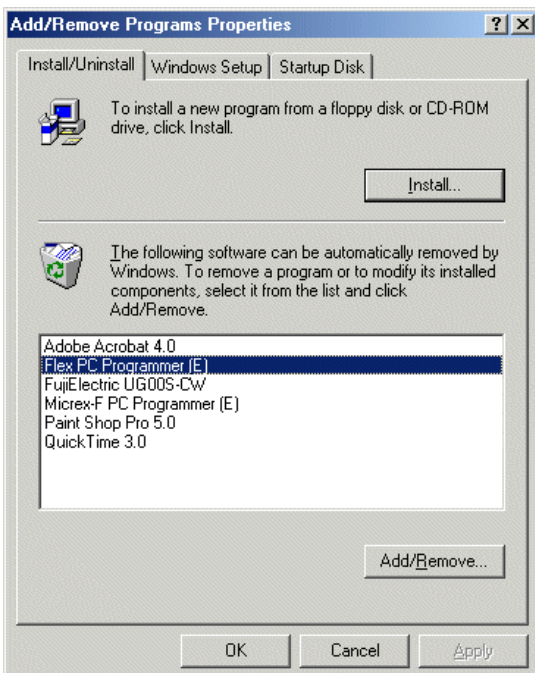
- ◇ Select [Control Panel] from the [Settings] submenu of the [Start] menu.



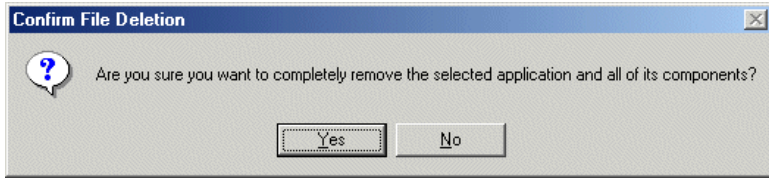
- ◇ Left-double-click the [Add/Remove Programs] icon in the {Control Panel} dialog box.



- ◇ Select [FLEX-PC Programmer [E]] from the list displayed on the screen and left-click the [Add/Remove...] button.



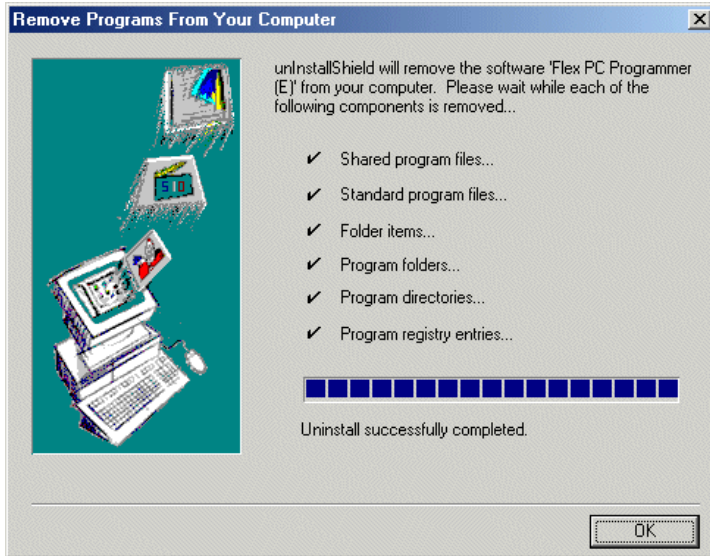
◇ The {Confirm File Deletion} dialog box is displayed. Left-click the [Yes] button.



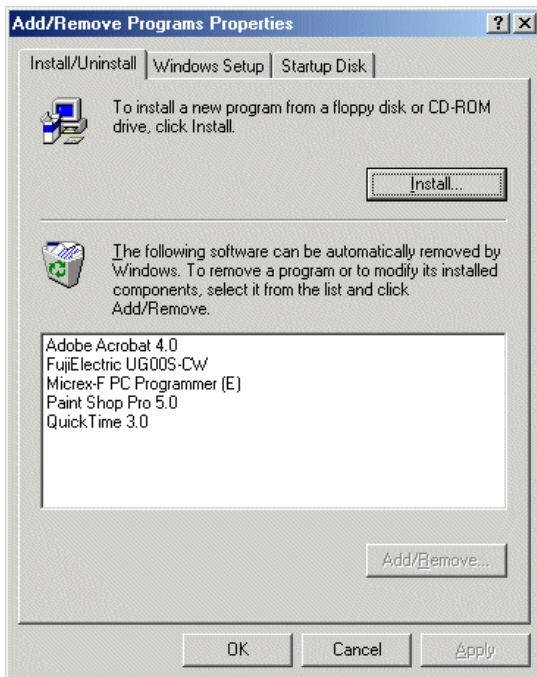
◇ The uninstall operation is started.

During this operation, the {Remove Shared File?} dialog box may be displayed as shown below. In this case, if you remove the shared file, it can happen that some programs do not function and in the worst case, Windows might fail to work. Normally, select either [No] or [No to All.]

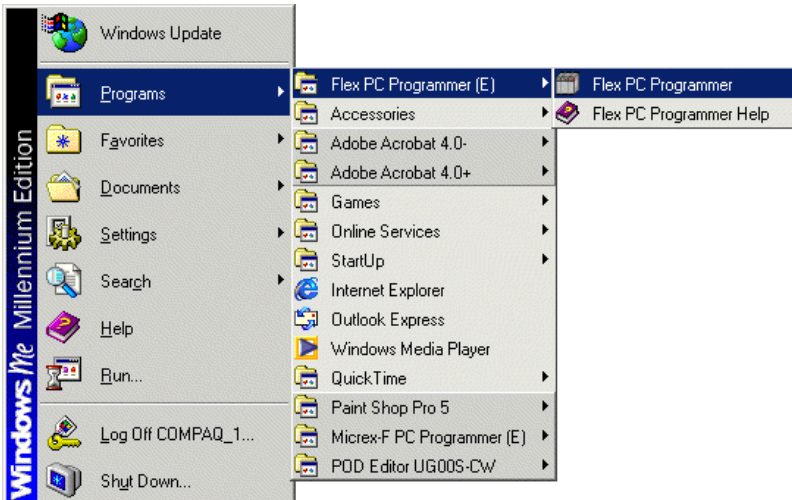
◇ When the message "Uninstall Completed," left-click the [OK] button.



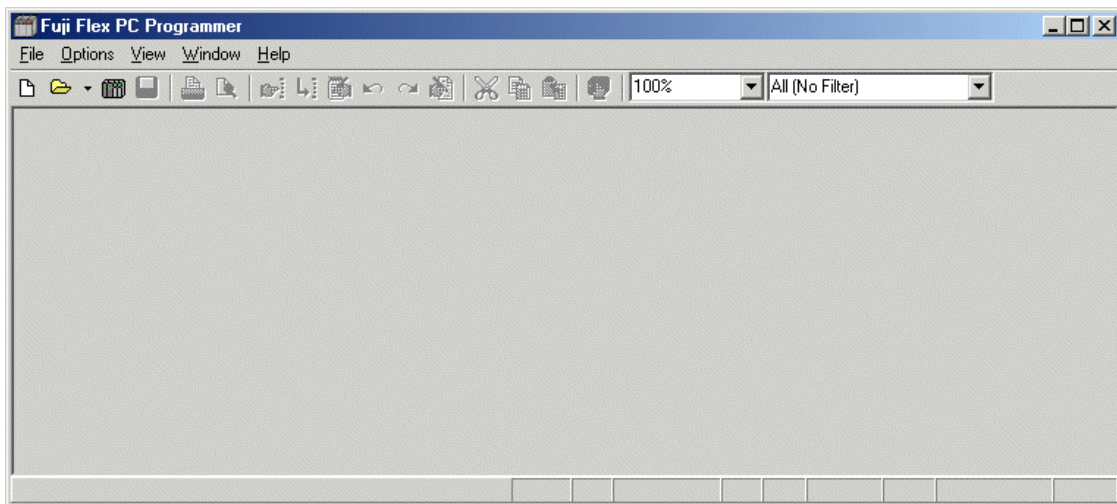
◇ The {Add/Remove Programs Properties} dialog box is displayed again. Left-click the [Cancel] button to close the dialog box. Now the uninstall operation is completed.



- ◇ First, select [FLEX PC Programmer (E)] from the [Programs] submenu of the [Start] menu. Then, select [FLEX PC Programmer] from the menu that appears on the screen.

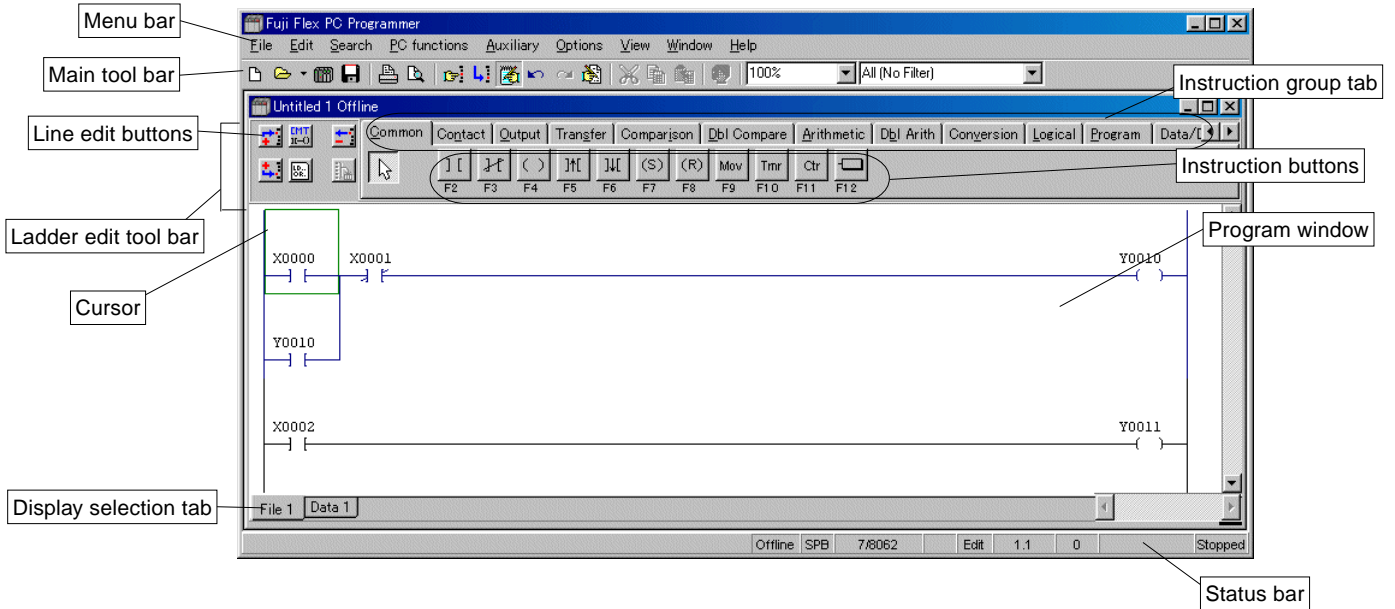


- ◇ The personal computer loader starts. From this screen, the user can perform desired offline and online operations. For the methods of offline and online operations, refer to “Section 2” and the subsequent sections.



1-7-1 Screen configuration

The personal computer loader screen contains various buttons, tool bars, etc. which are used to edit programs/data or display the current condition of a specific operation. Here, those components which are displayed on the screen are explained taking the offline edit screen as an example. Open the offline screen to enter the Edit mode, and the screen display becomes as follows.



Explanation of each component

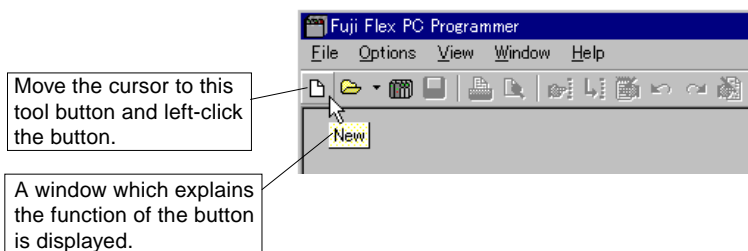
- **Menu bar**

The menu bar contains items for operating the software. When any of the items in the menu is left-clicked, a detailed command list associated with it appears on the screen.




- **Main tool bar**

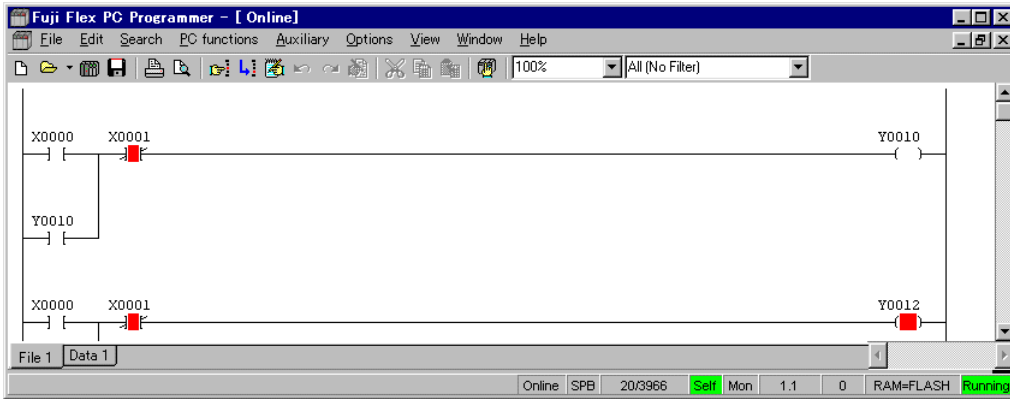
The main tool bar contains tool buttons, each of which produces the same effect as when the command corresponding to it is selected from the menu bar and executed. For example, the [New] button executes the same operation as when [File] – [New] is selected from the menu bar and executed. To see the meaning of each of the tool buttons, move the cursor to the tool button and left-click the button, and a window which explains the function of the tool button is displayed as shown below.



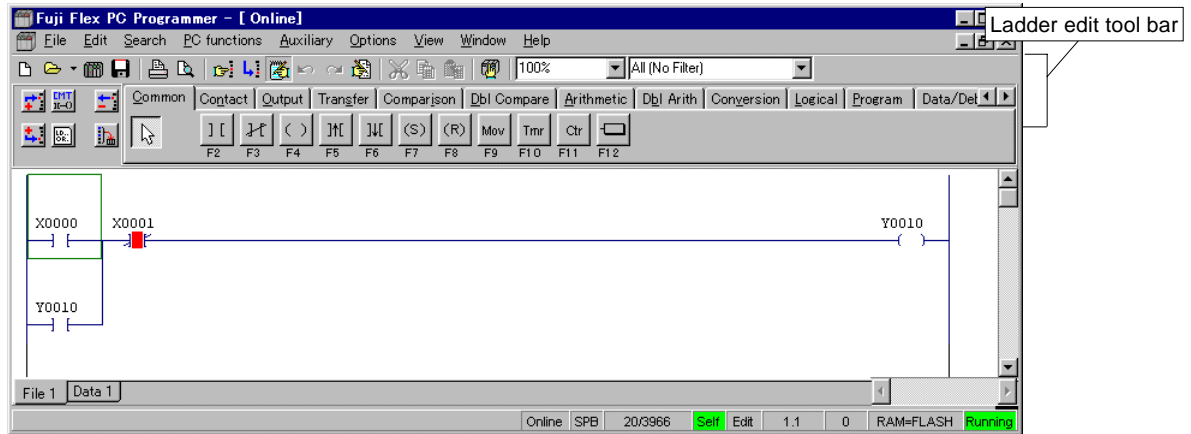
Ladder edit tool bar

This bar appears when the window is set in the [Edit] mode. It disappears when the window is set in the [Monitor] mode. To switch between the [Edit] mode and the [Monitor] mode, left-click the  [Edit] button. This bar contains tools which are necessary to edit programs.

[Monitor] mode



[Edit] mode



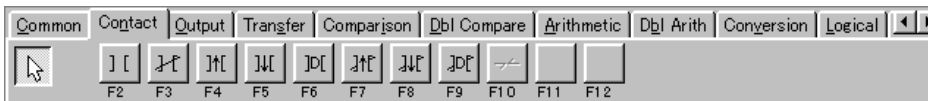
Line edit buttons

Buttons for editing lines, such as [Insert Line] and [Delete Line], are arranged here.

Instruction group tab

This tab is used to select the instruction group to be used. When any instruction group is selected and left-clicked, the associated instruction buttons change as illustrated below.

When [Contact] is selected



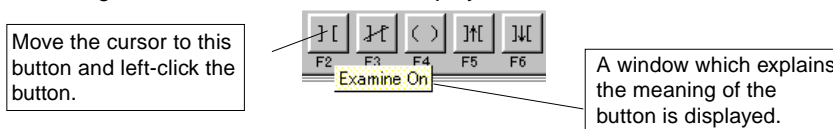
When [Output] is selected



To display a tab which is hidden in the right or left margin of the screen, left-click the Scroll Left or Scroll Right button.

Instruction buttons

These buttons are used to select ladder program instructions. To see the meaning of each of the instruction buttons, move the cursor to the instruction button and left-click the button, and a window which explains the meaning of the instruction button is displayed as shown below.



- **Cursor**

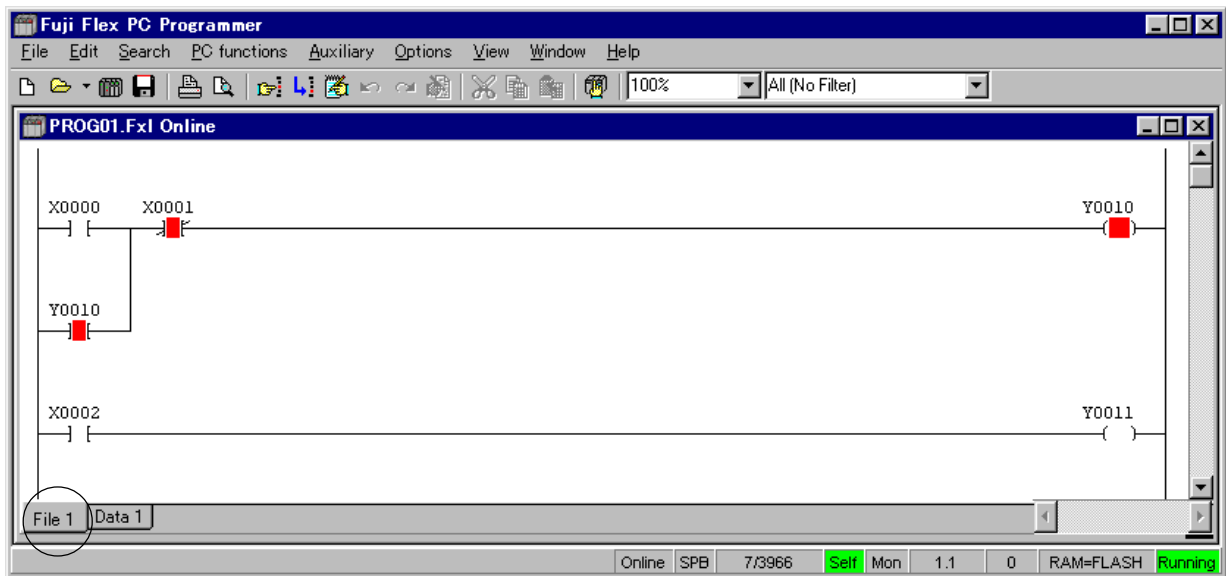
The cursor indicates the currently selected item to be edited (in the example given below, [Normally Open Contact] of address <X0000>). It is displayed as an instruction selection frame when an instruction on a ladder line is left-clicked. It is also possible to move the cursor using the Arrow keys on the keyboard. The cursor is displayed only in the [Edit] mode.

- **Program window**

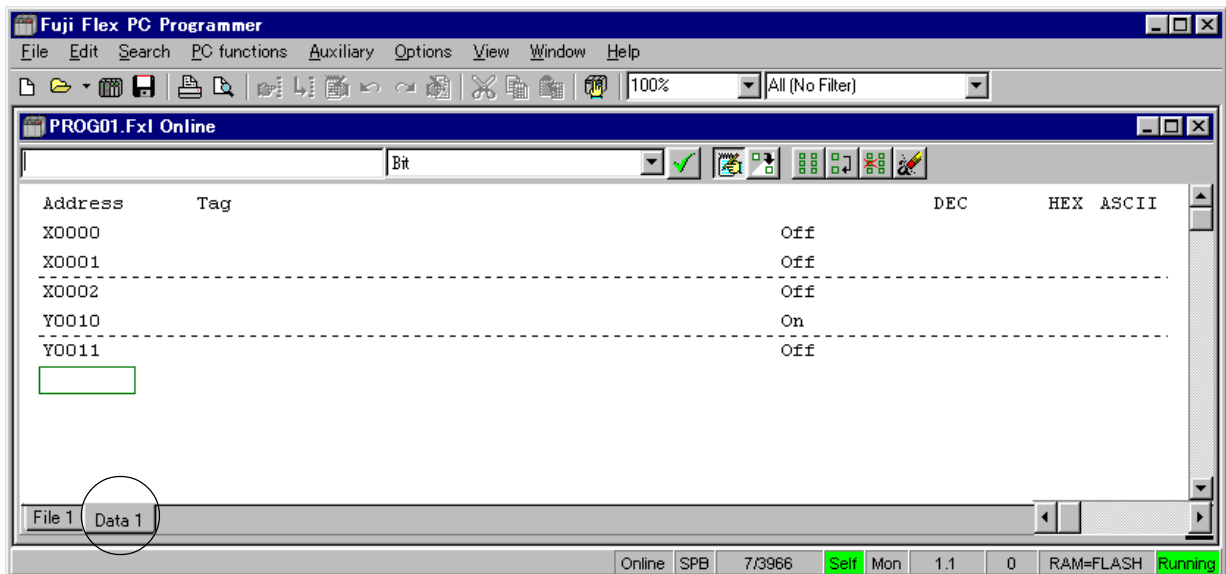
The program window is the entire screen area in which the ladder program that is being edited (or monitored) is displayed.

- **Display selection tabs**

To monitor/edit a ladder program, left-click the [File 1] tab.

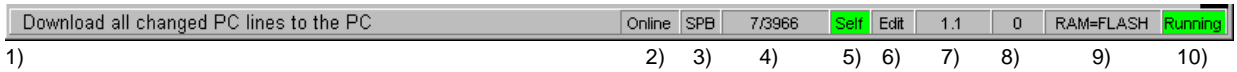


To monitor/set data, left-click the [Data 1] tab.



• **Status bar**

The status bar indicates the mode and operating condition of the window that is currently being displayed, the help message for the tool bar button currently selected, etc.



- 1) Displays the help message for the tool bar button selected.
- 2) Indicates online display, offline display, or modem display.
- 3) Indicates the PC model selected.
- 4) Indicates the number of program steps currently used and the total number of program steps that can be used with the PC model selected.
- 5) Online connection to PC at the local or other station.
- 6) Indicates the current mode ([Edit] or [Monitor]).
- 7) In the [Edit] mode, indicates a Page/Line number currently selected.
In the [Monitor] mode, indicates the line number at the top of the ladder diagram currently being displayed on the screen.
- 8) Step number of the first instruction of the line at the cursor position.
- 9) Match or mismatch between PC RAM and flash memory (for SPB).
- 10) Indicates whether the PC is in [Running] or [stop] of operation.

1-7-2 Window types

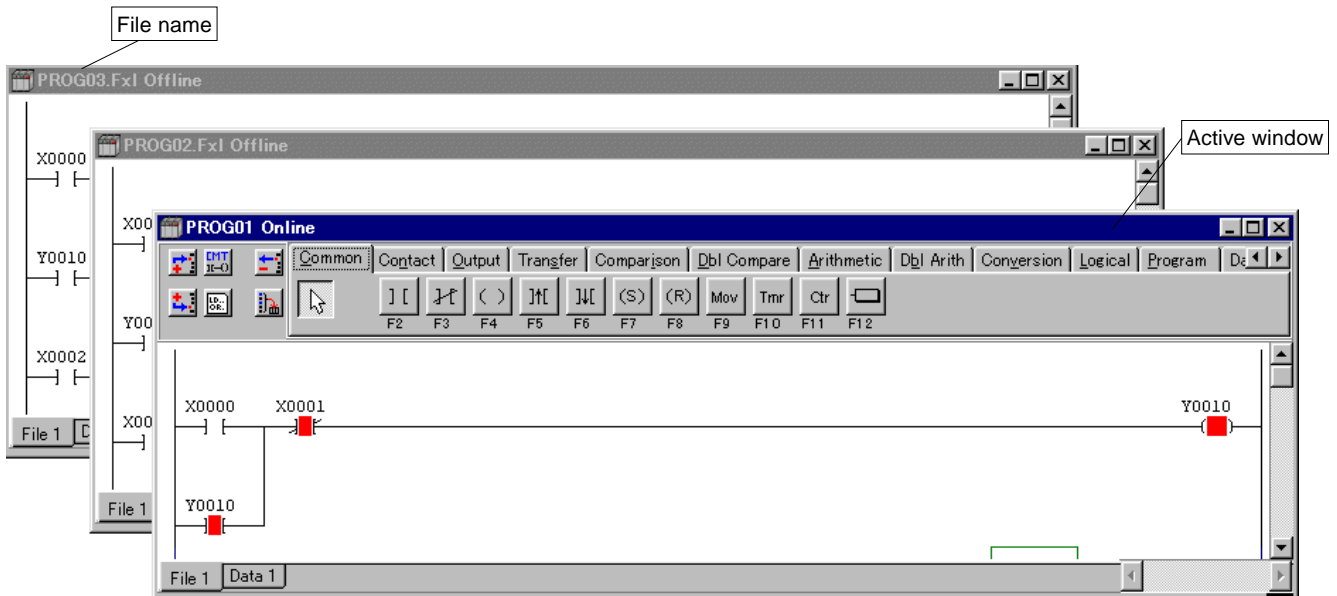
There are two types of windows—the offline window and the online window.

The offline window is used when monitoring/editing a ladder program which has been saved in the personal computer. It is possible to open more than one offline window at a time.

The online window is used when monitoring/editing a ladder program in the PC. Only one online window can be opened at a time.

It is possible to open an offline window and an online window at the same time.

The type (offline or online) of the window being opened is displayed on the title bar at the top of the window. When any point of the window being opened is left-clicked, the title bar changes in color. This indicates that the window has been selected as the one to be operated on. This window that has been selected is called an active window.



Any other window can be made “active” simply by clicking any point of it.

In the [Edit] mode, it is possible to copy a ladder program from one window to another on a line-by-line basis.

For the offline operations, refer to “Section 2.” For the online operations, refer to “Section 3.”

Section 2 Offline Operations

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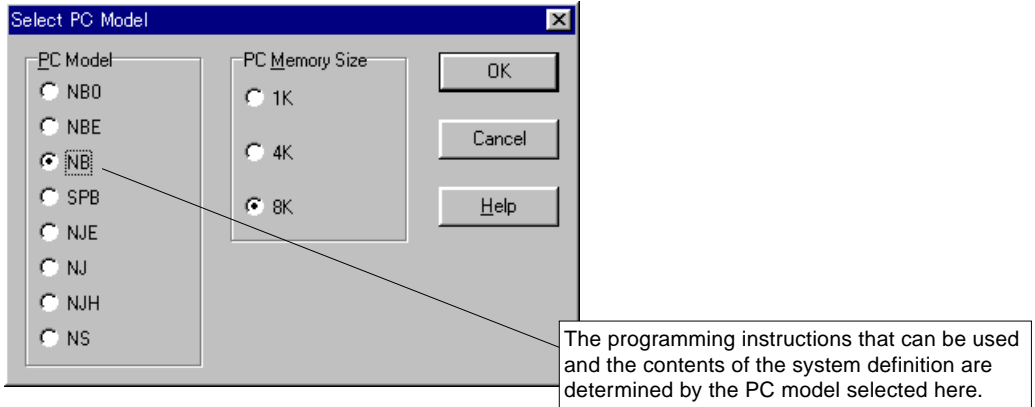
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2-1-1 Opening a new file

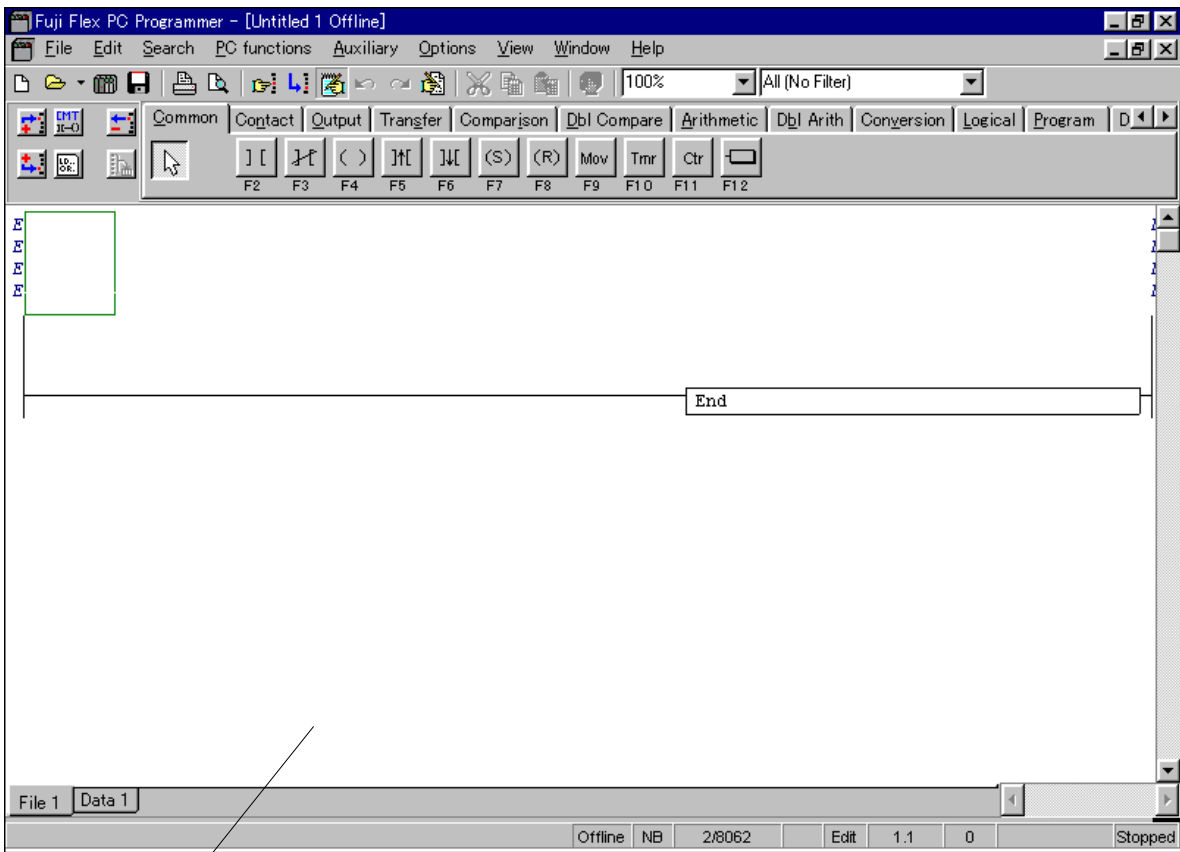
To create a new program, start the personal computer loader and open a new file (program window) by the following operations.

- ◇ Select the [New] command from the [File] menu. The {Select PC Model} dialog box is displayed.



* The models displayed in the above dialog box depend on the version of the loader software.





















- ◇ After selecting the appropriate PC model, left-click the [OK] button. A {program window} is displayed in the main window of the loader.



This is the program window. You can start writing a program in this window.

2-1-2 Menus and tool bars used to edit program

The commands in the menus and the tool bars (buttons) that are mainly used when editing a program are explained below. All the functions of the tool bars are included in the menus.

Command name (Button name)	Button	Menu	Explanation (use)
New...		File	Creates a new program file.
Open...		File	Opens a program file which has already been created.
Online		File	Opens an online PC program.
Save		File	Saves a program file. If a program file of the same file name already exists, it is overwritten.
Print...		File	Prints an active program file.
Print Preview		File	Permits the result of printout to be checked on the screen.
Find		Search	Searches for any specified address and tag name.
Jump to specified line		Search	Displays a line with a specified number.
Edit Mode		Edit	Sets a program ready to be edited.
Undo Editing		Edit	Cancels the last operation performed and restores the original condition.
Redo Editing		Edit	Reverses the operation that has been canceled by the [Undo] command.
Tag Editor		Auxiliary	Starts {Tag Editor} to permit tags to be edited.
Cut		Edit	Copies any selected line block to the clipboard. The selected line block is deleted.
Copy		Edit	Copies any selected line block to the clipboard.
Paste		Edit	Pastes a line block that has been copied to the clipboard to a specified location.
Run / Stop		PC functions	Starts or stops the online-connected processor.
Insert Line		Edit	Inserts a line block starting point which is necessary when preparing a new line block.
Insert Line below cursor		Edit	Inserts a start point below to create a new line block.
Insert / Modify Comment...		Edit	Inserts a new line comment or modifies an existing line comment. A line comment is used to explain a particular line of a program.
Delete Line		Edit	Deletes a selected line block.
Display line as Instruction List		Edit	Displays a selected line by instructions.
Download changes to PC		Edit	Downloads ladder lines changed in an online window to a PC attached.

2-1-3 Setting tag entry/display

During program editing, it is possible to enter tags while writing instructions in the program. It is also possible to display the tag entries on the program. The methods of setting tag entry/display are explained below.

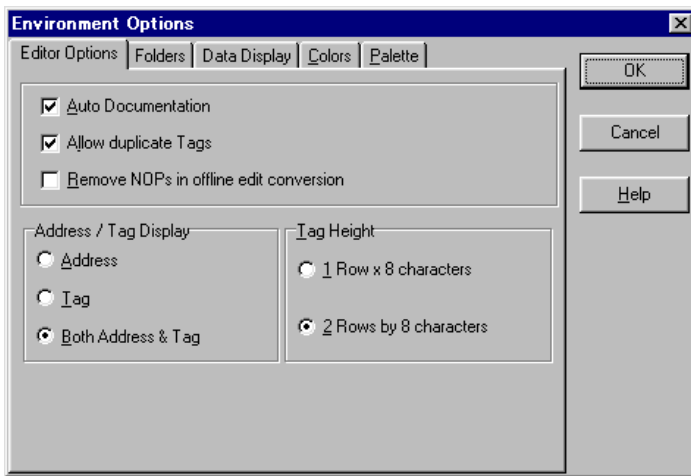


The tag is a label (name) which is in one-to-one correspondence with an address. It corresponds to a comment in the MS-DOS-based loader.

(1) Setting program editor

- ◇ Select the [Environment...] command from the [Option] menu.
The {Environment Options} dialog box is displayed.
- ◇ Left-click the [Editor Options] tab.
The items to set to edit and display the program are displayed.

[Editor Options] tab



1) Setting the edit options

[Both Address and Tag] option button

Displays an address and a tag above the instruction symbol.

```
Start Sw
itch
X0000
] |
```

[Tag] option button

Displays only a tag above the instruction symbol. (Note, however, that when no tag has been set for the instruction address, the instruction address is displayed.)

```
Start Sw
itch
] |
```

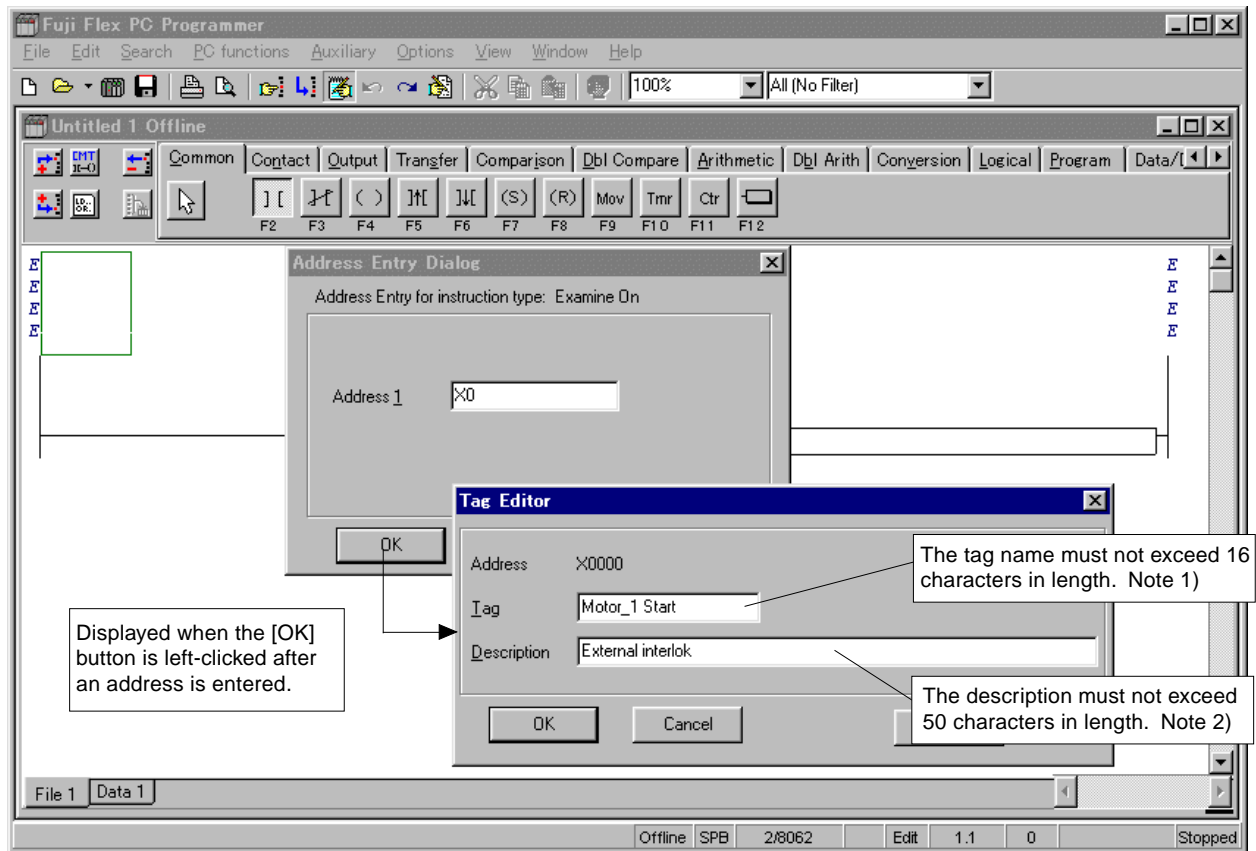
[Address] option button

Displays only an address above the instruction symbol.

```
X0000
] |
```

2) Setting automatic tag entry

When the [Auto Documentation] box is checked, the {Tag Editor} dialog box shown below is displayed during program editing.

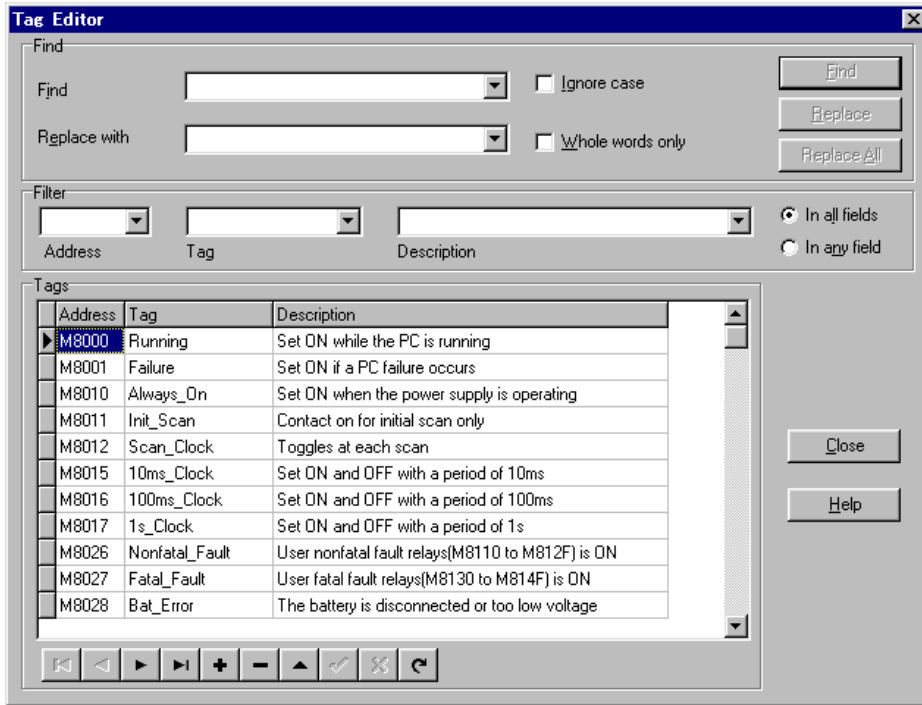


Note 1: In a tag name, the comma (,) cannot be used.

Note 2: In a description, the comma (,) cannot be used. If a comma is included in the description, it is automatically deleted when the description is added to the data base. Note that the description is not displayed on a ladder program.

<Tag Editor>

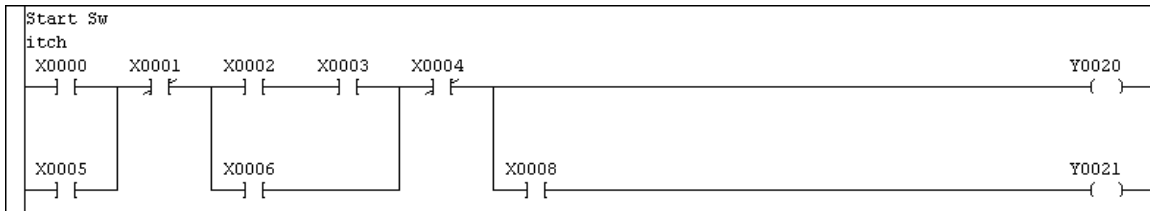
There are two methods of entering a tag name. One is using the {Tag Editor} dialog box described above, and the other is using [Tag Editor].



For the method of using [Tag Editor], refer to “2-5 Tag Edit.”

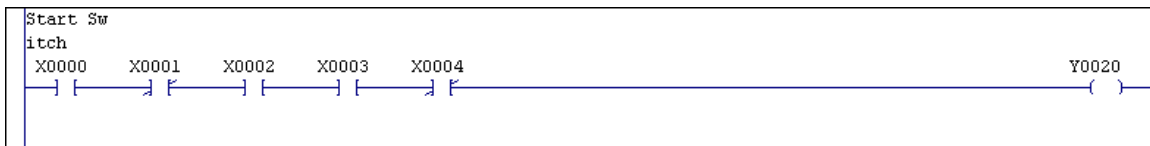
2-2-1 Writing contacts and outputs

Here, the method of preparing a line which combines contacts and outputs as shown below is explained.



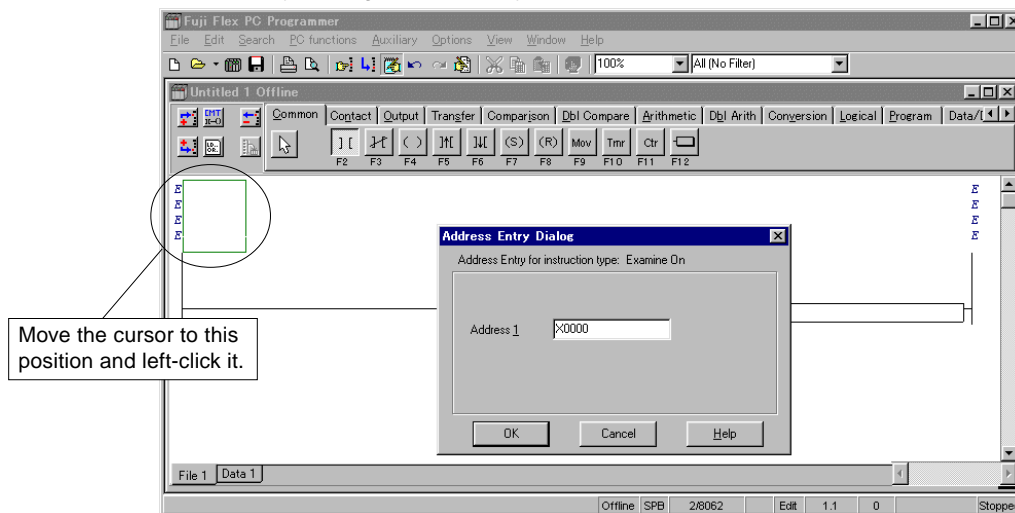
(1) Writing a series line

The method of writing a series line shown below is explained.

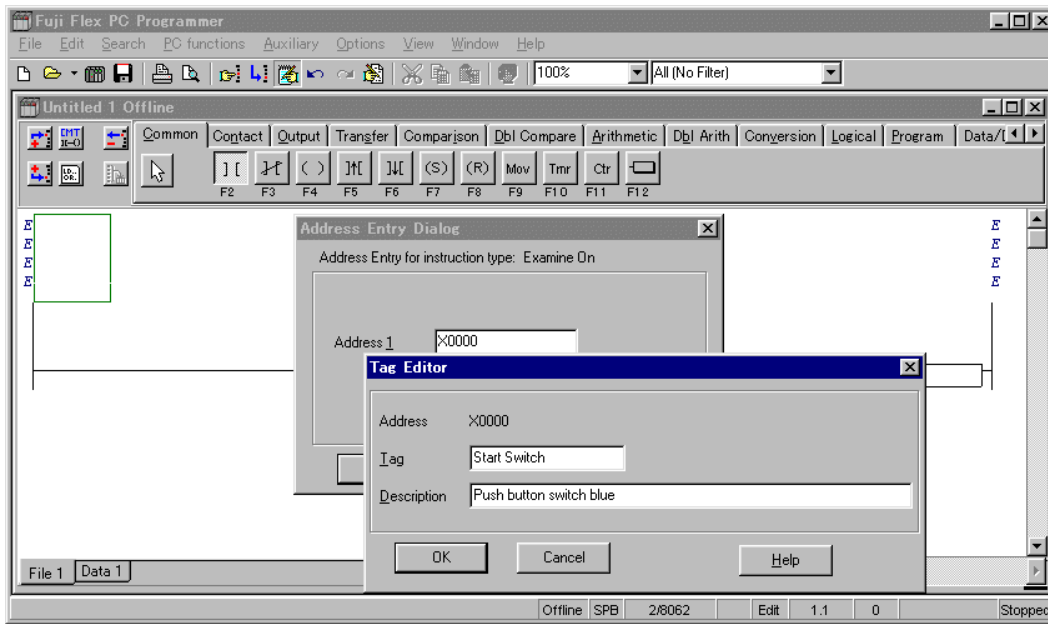


1) Writing contacts

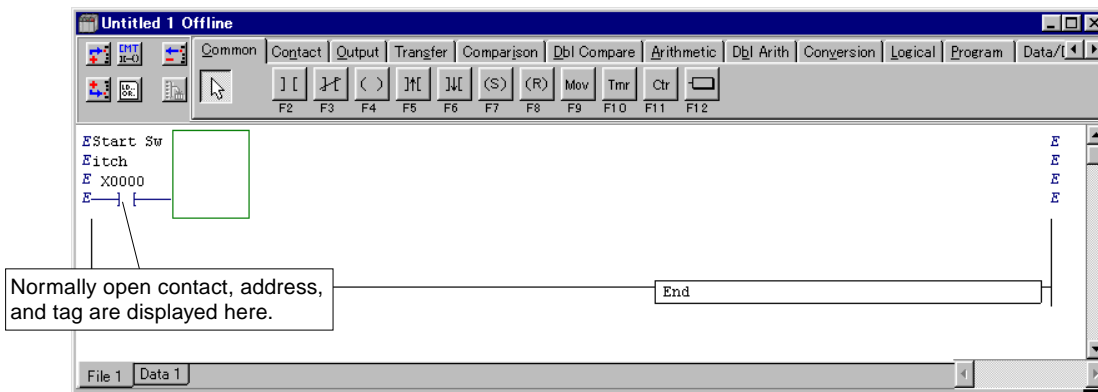
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [Examine On] button.
 - ◇ Move the cursor to the position in which to describe an instruction and left-click that position.
- The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X0> is entered.
 - ◇ Left-click the [OK] button.
- When in the {Environment Options} dialog box the [Auto Documentation] box has been checked, the {Tag Editor} dialog box as shown in the following diagram is displayed. When the [Auto Document] box has been unchecked, the {Tag Editor} dialog box is not displayed and the contact is described in the program window.

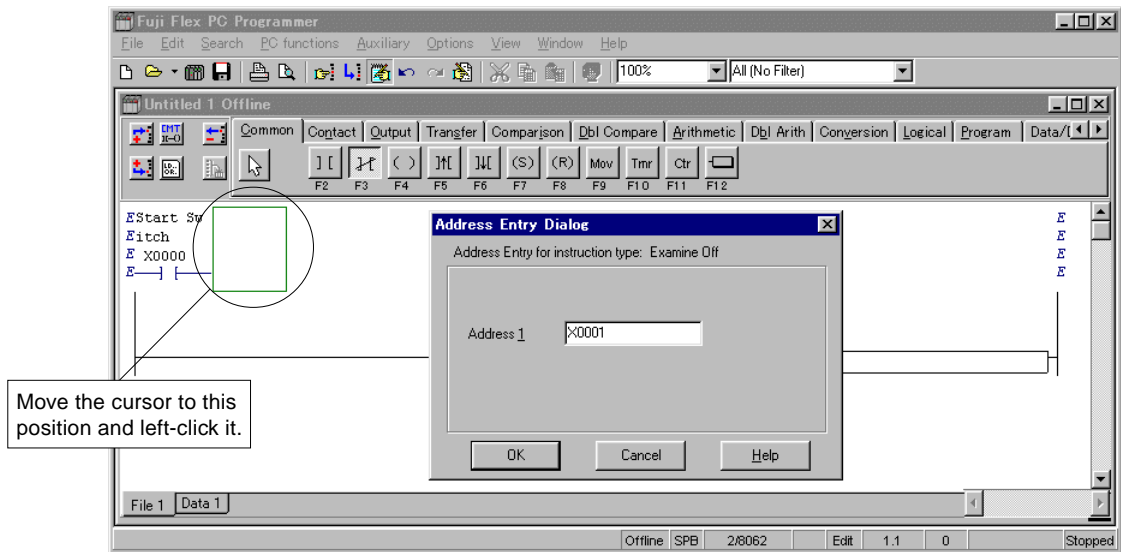


- ◇ Enter a tag name in the [Tag] text box as required.
In this example, <Start Switch> is entered.
- ◇ Enter a description in the [Description] text box as required.
In this example, <Push button Switch Blue> is entered.
- ◇ Left-click the [OK] button.
The normally open contact, address, and tag are displayed as illustrated below.



2) Writing series contacts

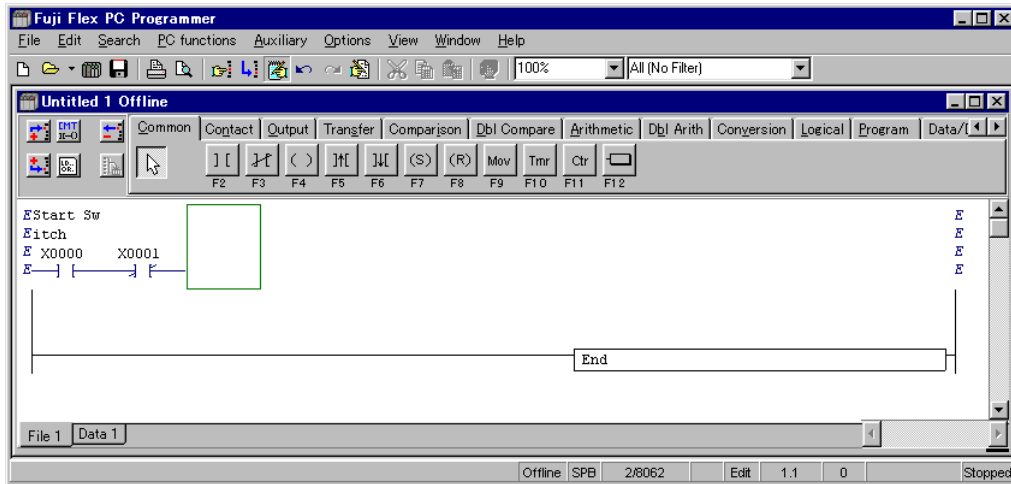
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Examine Off] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position.
The {Address Entry} dialog box is displayed.



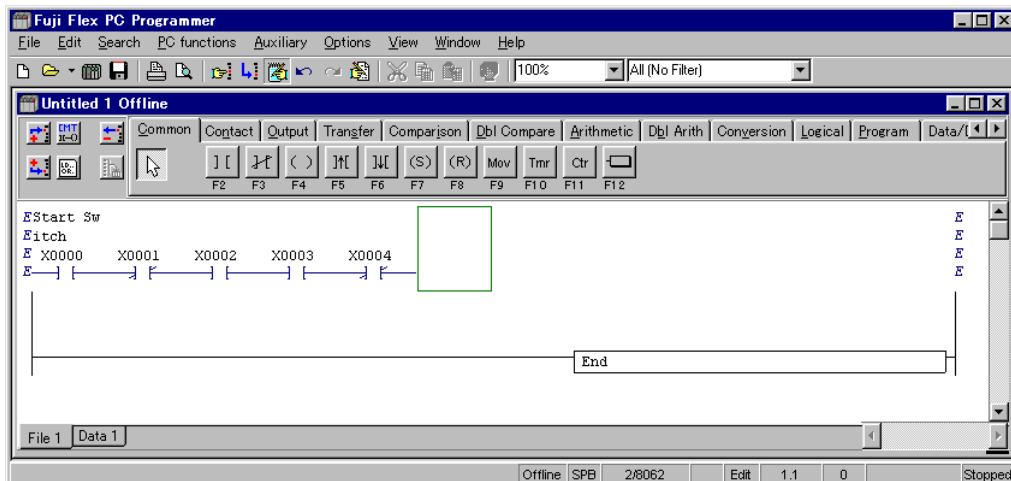
◇ Enter the address of the contact in the [Address] text box.
In this example, <X1> is entered.

◇ Left-click the [OK] button.


As shown below, the normally closed contact is connected in series to the normally open contact. Note that when in the {Environment Options} dialog box the [Auto Documentation] box has been checked, the {Tag Editor} dialog box is displayed. The explanation about this shall be omitted here.

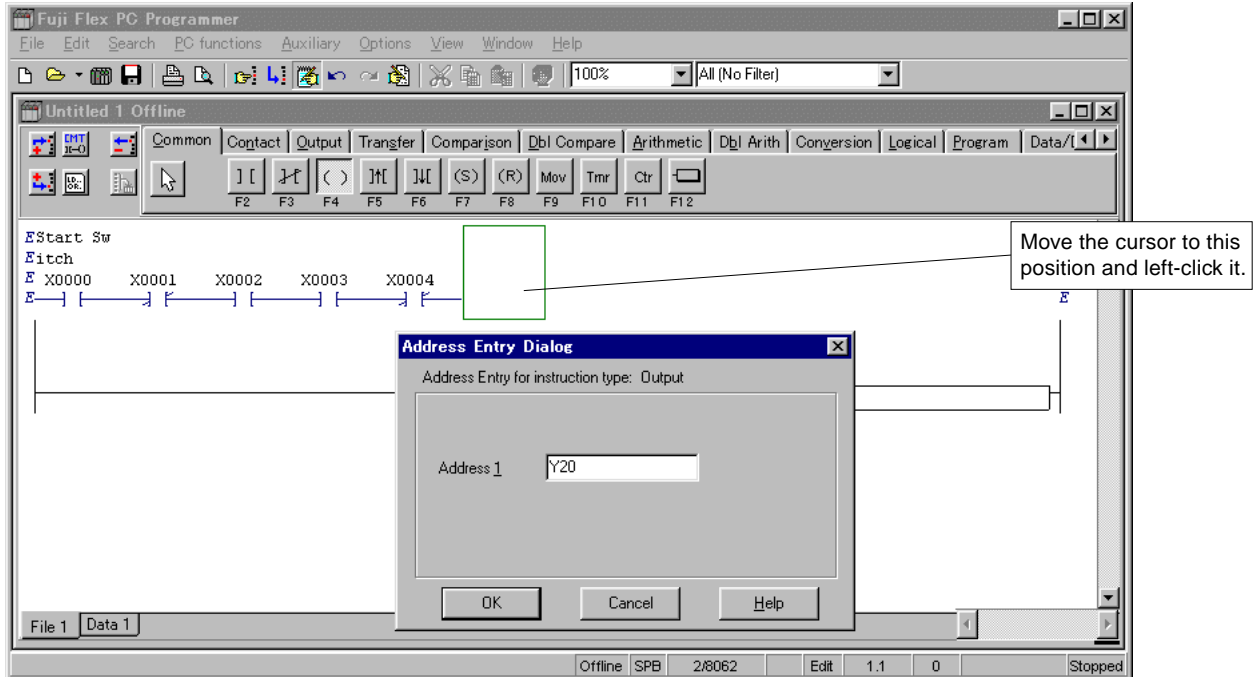


◇ In the same way as described above, write normally open contacts “X0002” and “X0003” and normally closed contact “X0004” as shown in the following diagram.

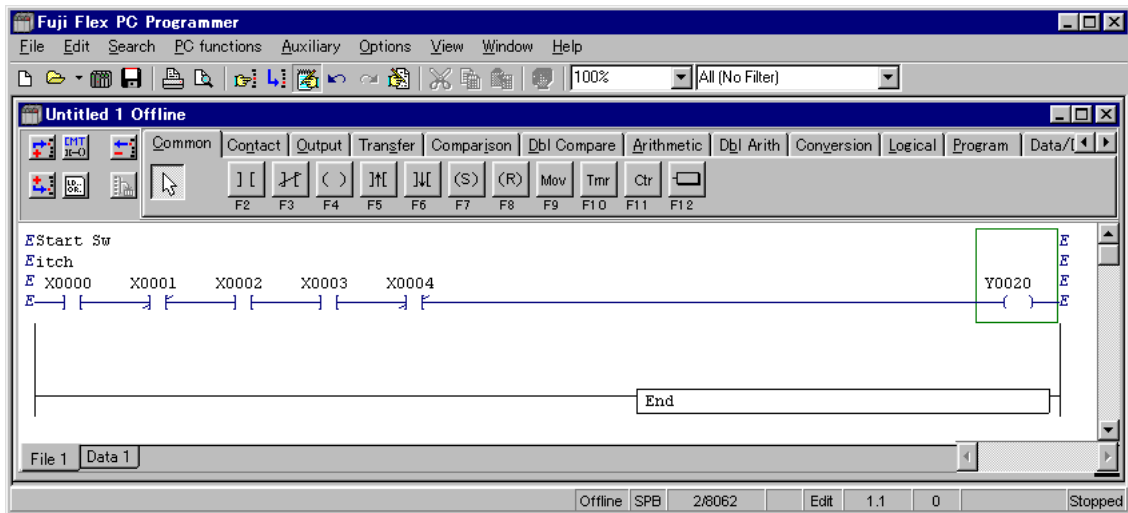


3) Writing outputs

- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Output] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position. The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the output in the [Address] text box. In this example, <Y20> is entered.
- ◇ Left-click the [OK] button. As shown below, the output is connected in series to the normally closed contact.



- ◇ After creating a line, shift the cursor from the line under edit. This converts and determines the line.

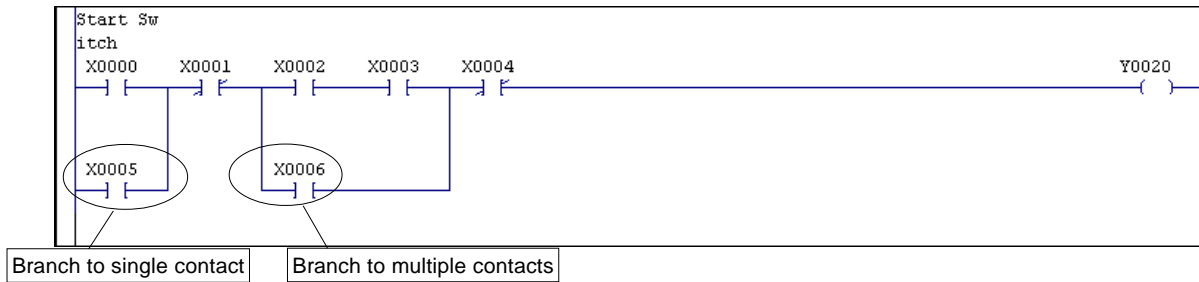


About conversion:

When the cursor is shifted from the ladder line under edit, one line is converted. This conversion changes the ladder line into a mnemonic word. If the ladder line does not permit conversion into a mnemonic word, the cursor cannot be shifted from the line under edit. Correct the erroneous ladder line into one that can be converted. If a new line is inserted during online edit, "E" is displayed at the bus. Once the line has been determined by conversion, "E" disappears from the bus.

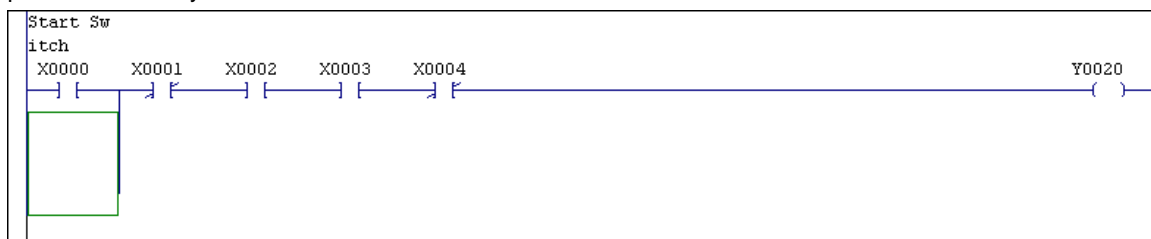
(2) Writing branches

Here, the method of writing a branch of a line shown below is explained.

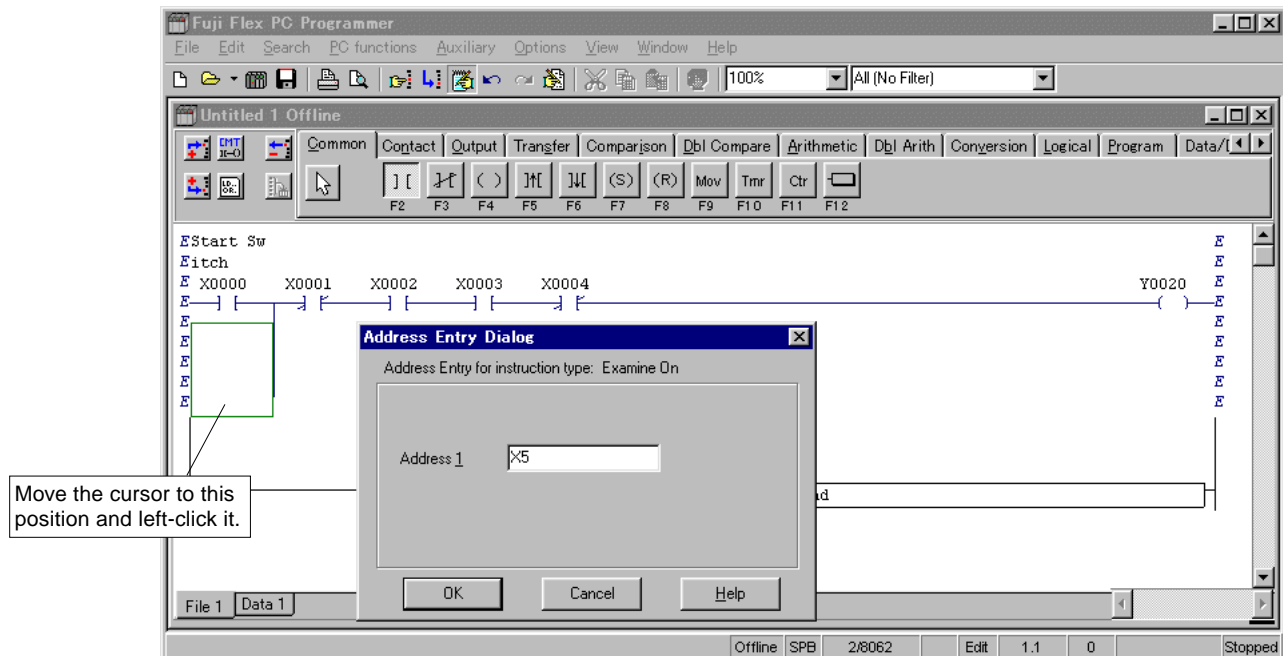


1) Writing branch to single contact

- ◇ Shift the cursor to the contact (X0000) at the instruction description position. While holding down the <Ctrl> key, press the <↓> key to draw a vertical line.

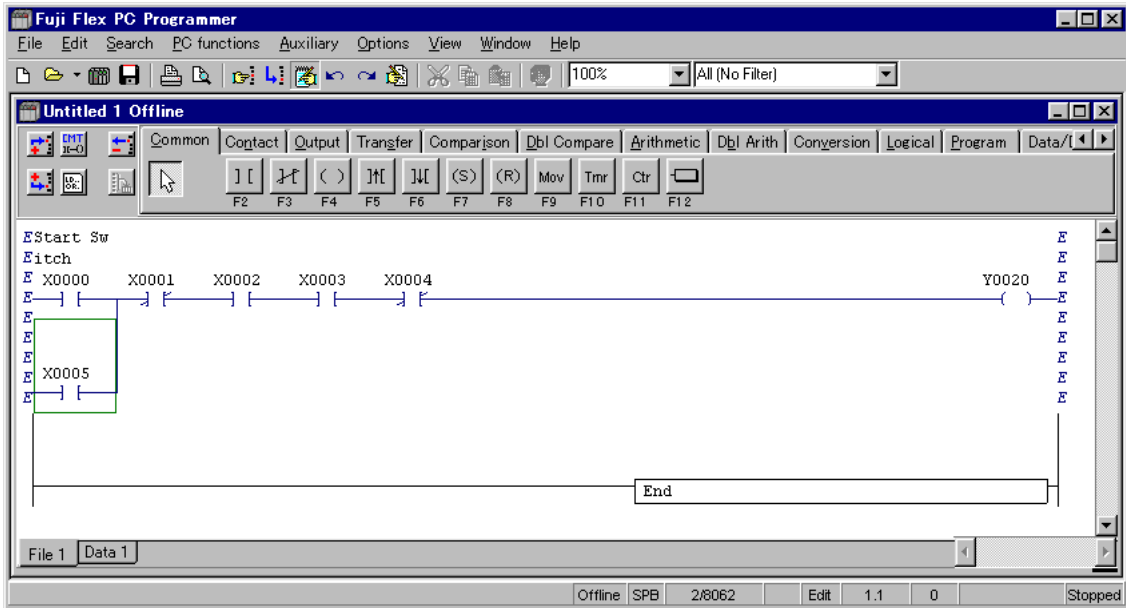


- ◇ Left-click the [Common] or [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [] [Examine On] button.
 - ◇ Move the cursor to the position in which to describe an instruction and left-click that position. (A green instruction selection frame is displayed.)
- The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the branch in the [Address] text box. In this example, <X5> is entered.

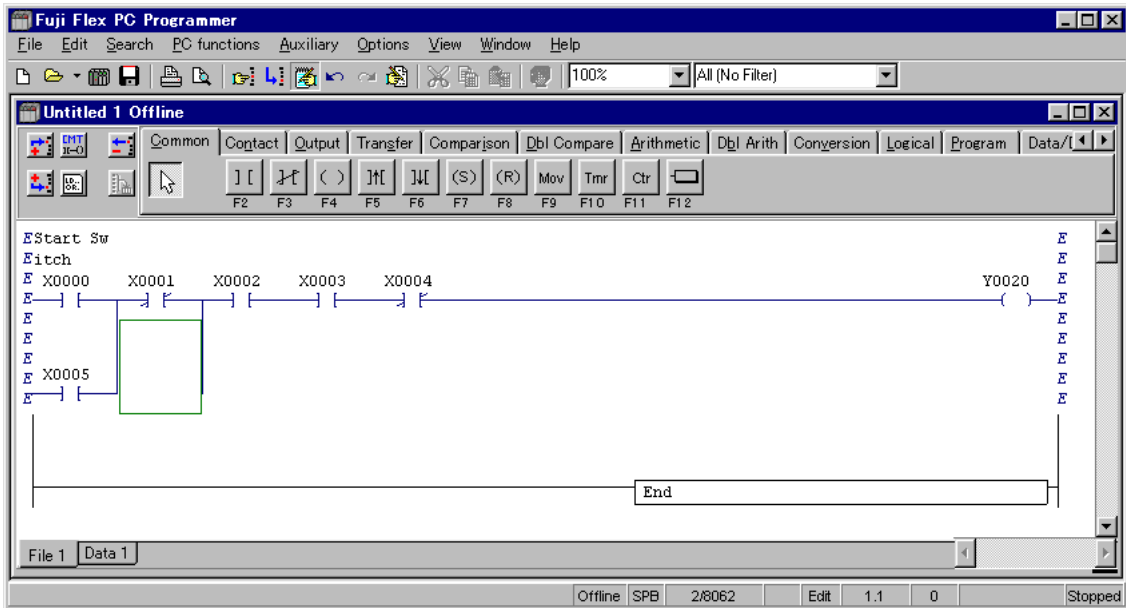
- ◇ Left-click the [OK] button.
- An Examine On is connected to the contact in series.



2) Writing branch to multiple contacts

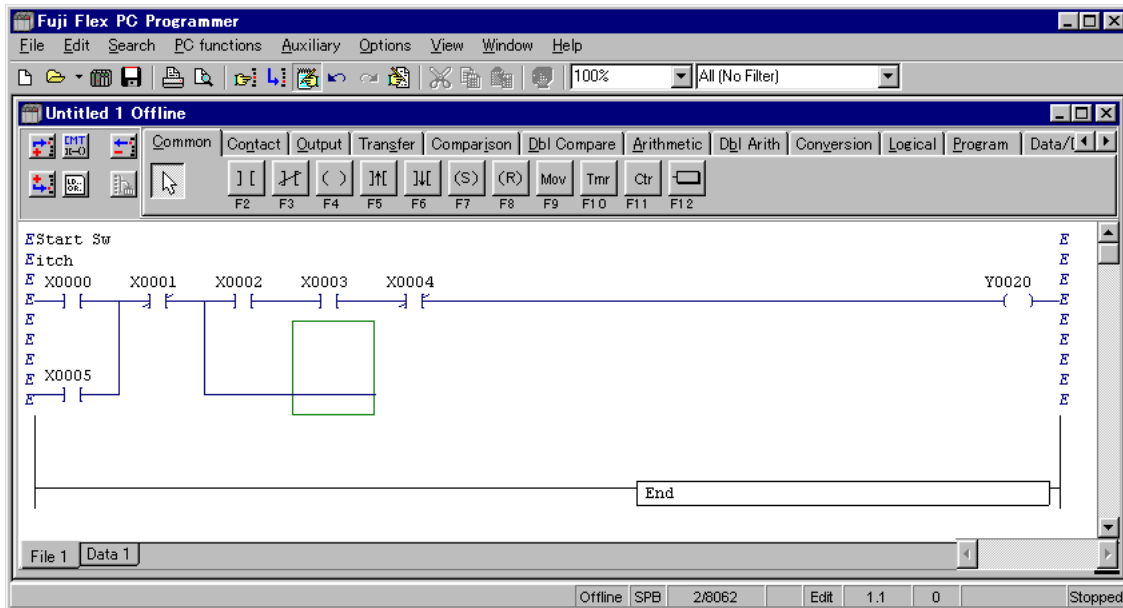
<Drawing a downward vertical connection line>

- ◇ Shift the cursor to the contact (X0001) at the top left of a parallel contact description position. While holding down the <Ctrl> key, press the <↓> key to draw a vertical line.



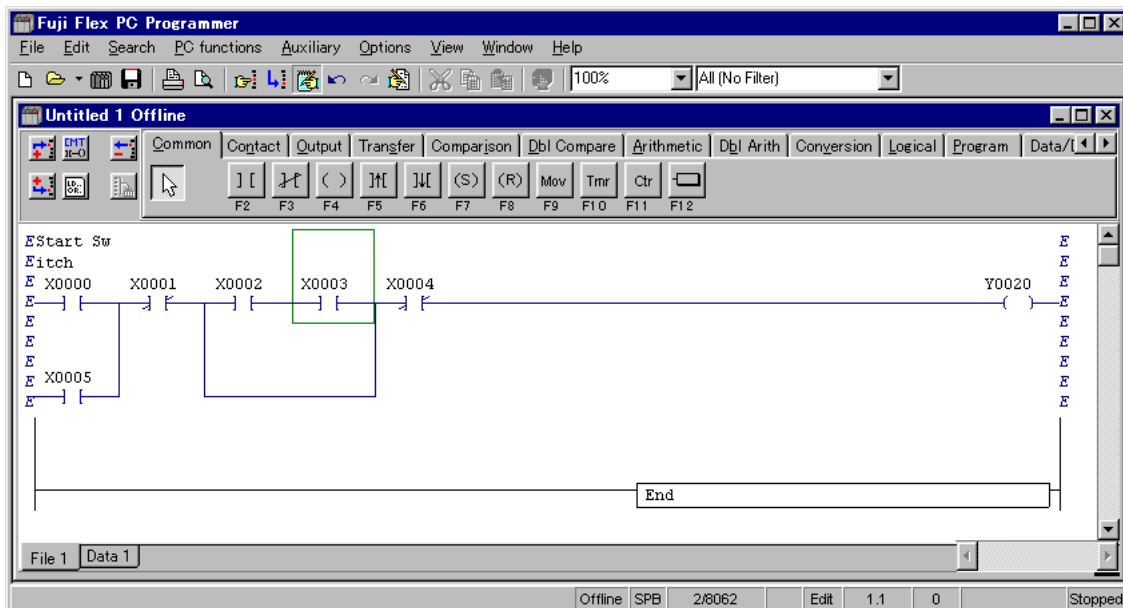
<Drawing a horizontal connection line>

- ◇ While holding down the <Ctrl> key, press the <→> key to draw a horizontal line.




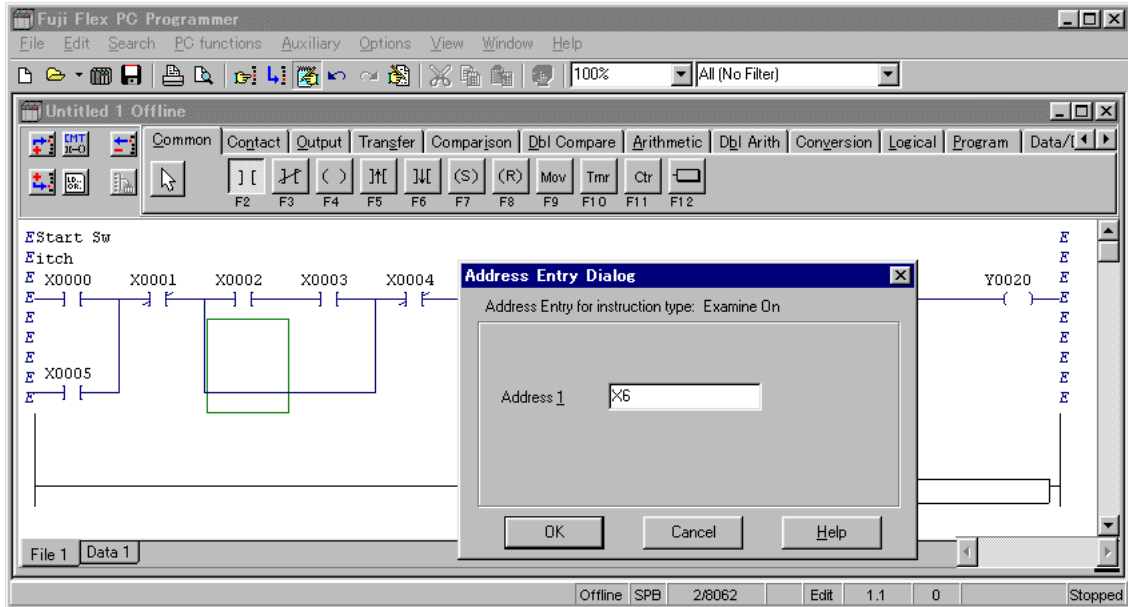
<Drawing an upward vertical connection line>

- ◇ While holding down the <Ctrl> key, press the <↑> key to draw a vertical line to the upper level.

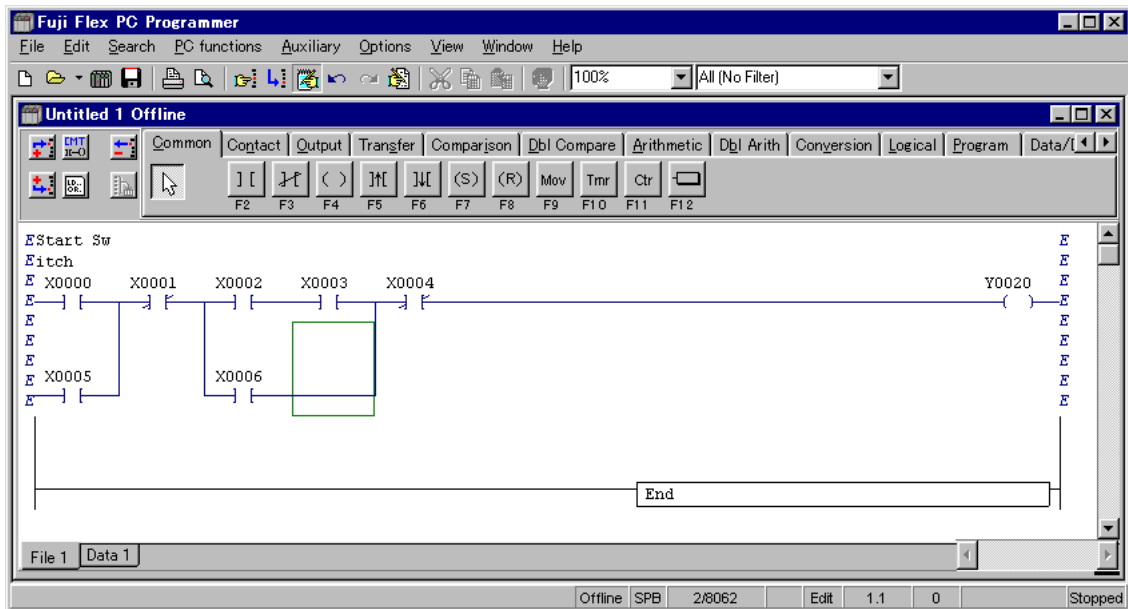


<Changing horizontal connection line to contact>

- ◇ Left-click the [Common] or the Contact tab in the [Instruction group] tabs on the ladder edit tool bar.
- ◇ Left-click the  [Examine On] button.
- ◇ Position the cursor to a horizontal connection line to change into a contact and click the mouse left button. The {Address Entry} dialog box is displayed.



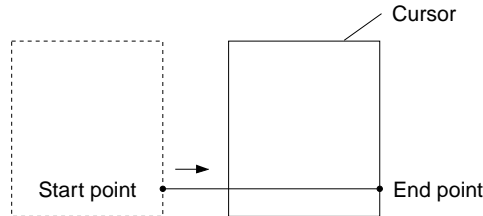
- ◇ Enter a contact address into the text box. In this example, <X6> is entered.
- ◇ Left-click the [OK] button. The horizontal connection line s changed into an Examine On as follows:



Drawing or deleting a connection line

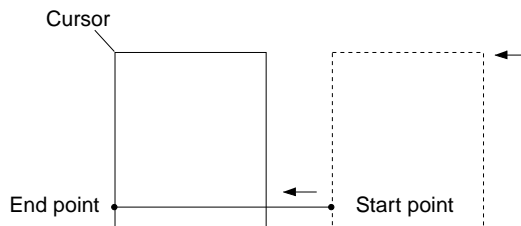
- 1) Drawing a connection line from left to right.

Operation: Align the right side of the cursor with the start point. While holding down the <Ctrl> key, press the <←> key.



- 2) Drawing a connection line from right to left to connect to the left bus.

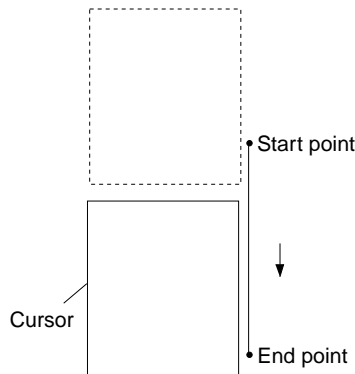
Operation: Align the left side of the cursor with the start point. While holding down the <Ctrl> key, press the <←> key.



Note: When drawing a connection line from the left bus, shift the cursor once to right and draw a connection line from right to left.

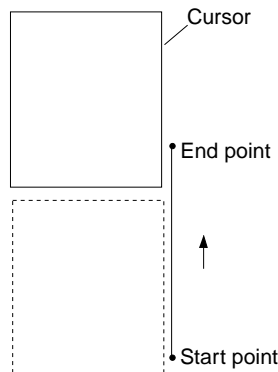
- 3) Drawing a downward connection line

Operation: Align the right side of the cursor with the start point. While holding down the <Ctrl> key, press the <↓> key.



- 4) Drawing an upward connection line

Operation: Align the right side of the cursor with the start point. While holding down the <Ctrl> key, press the <↑> key.

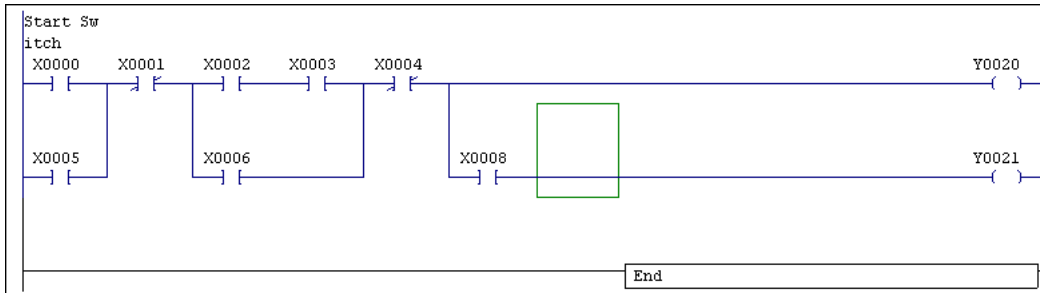


- 5) Deleting a connection line

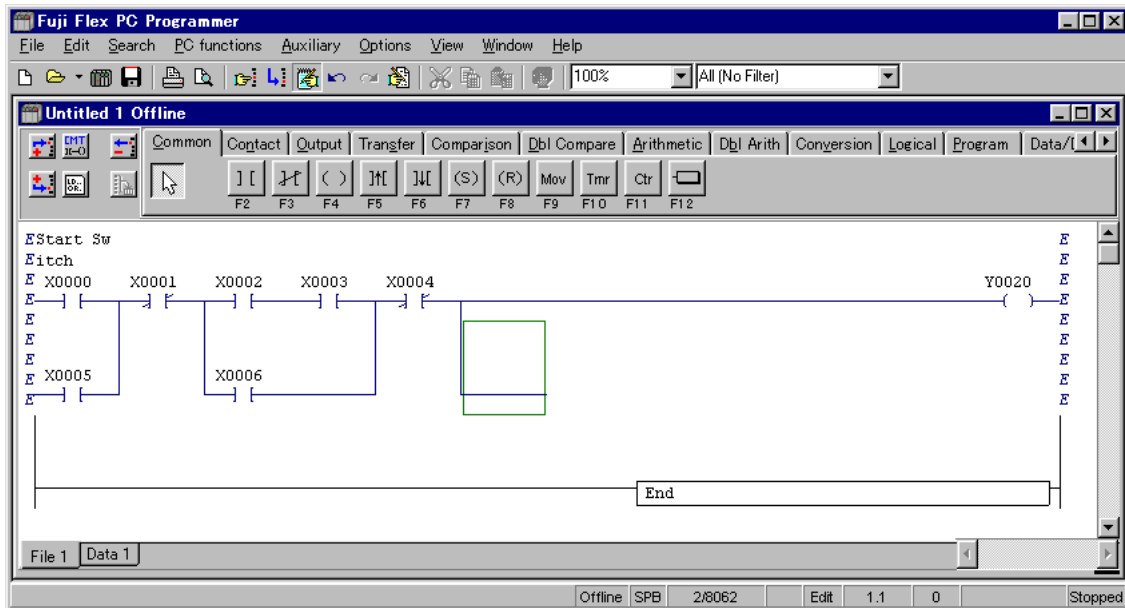
Operation: While holding down <Ctrl> + <Alt>, press the <←>, <→>, <↓>, or <↑> to trace the line in the same way as for drawing.

(3) Writing branch outputs

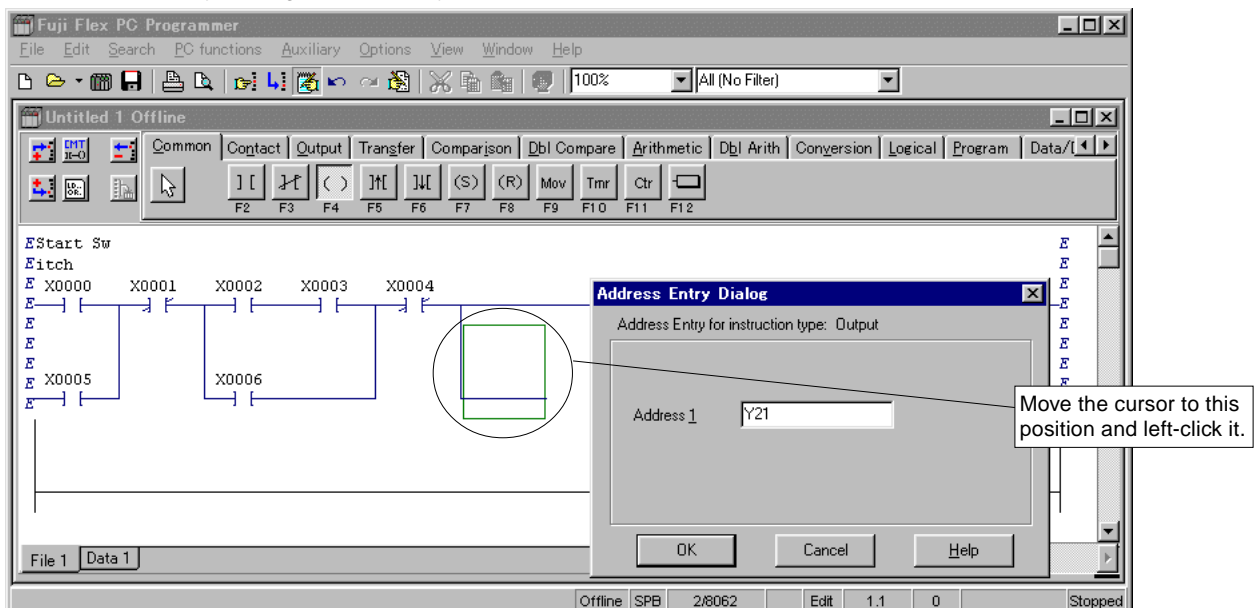
Here, the method of writing a branch output shown below is explained.



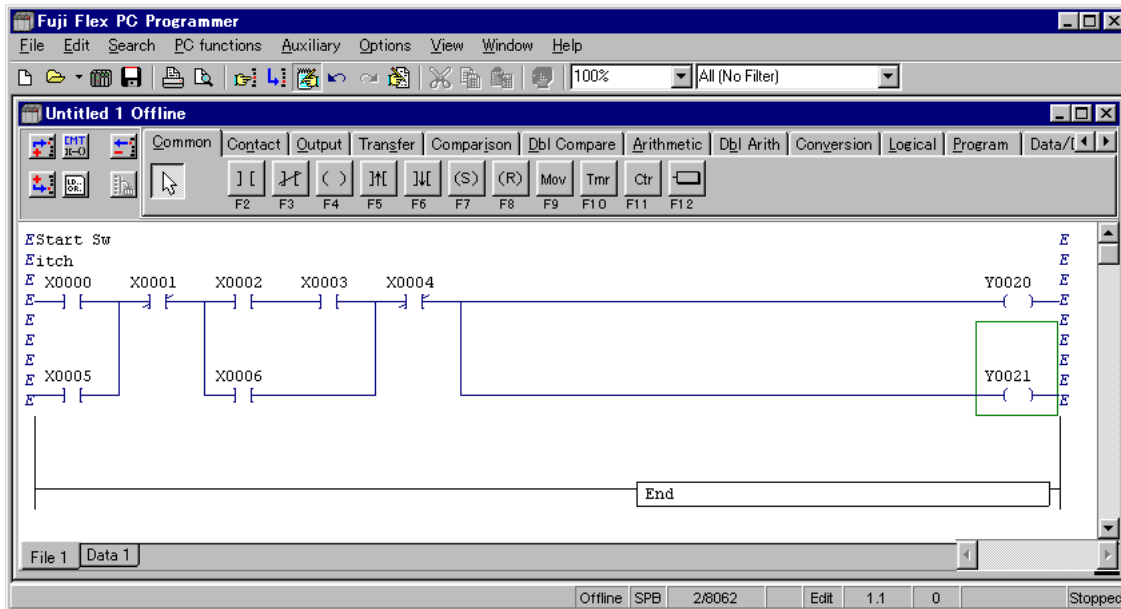
- ◇ Shift the cursor to the instruction description position (X0004 here) and press <Ctrl> + <↓> + <←> to draw a line.




- ◇ Left-click the [Common] or [Output] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the < > [Output] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position. The {Address Entry} dialog box is displayed.

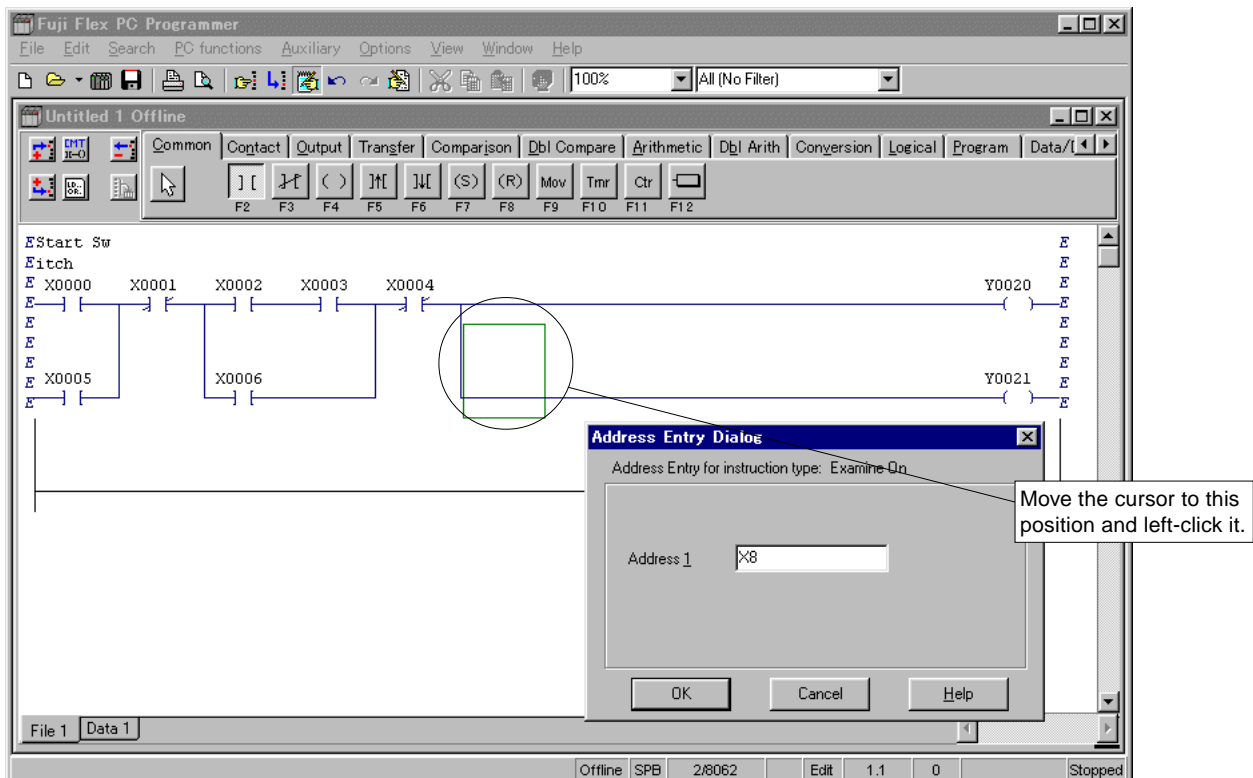


- ◇ Enter the address of the output in the [Address] text box.
In this example, <Y21> is entered.
- ◇ Left-click the [OK] button.
The branch output is connected as shown below.

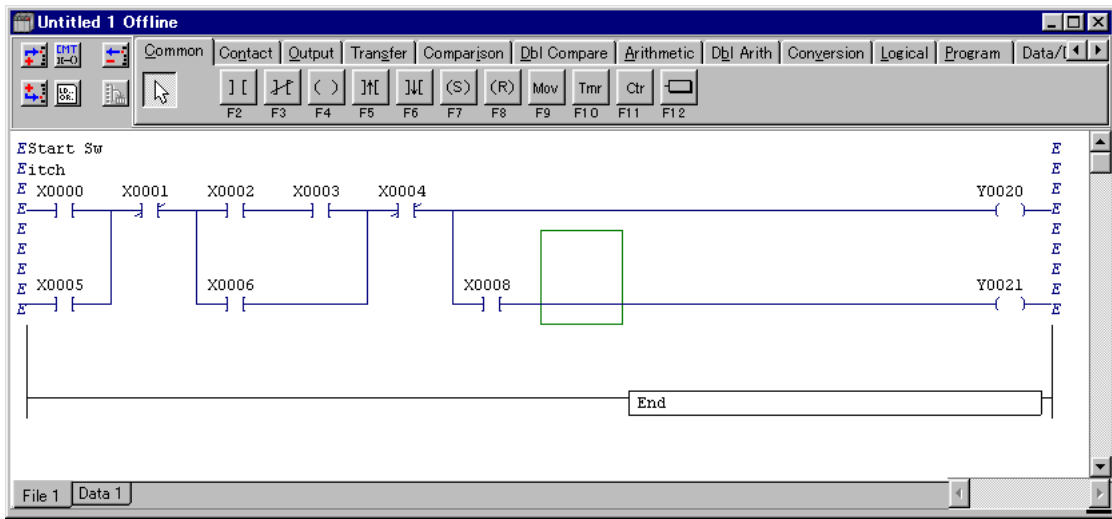


<Writing contact “X0008”>

- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Examine On] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position.
The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X8> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is connected to the left side of output “Y0021.”



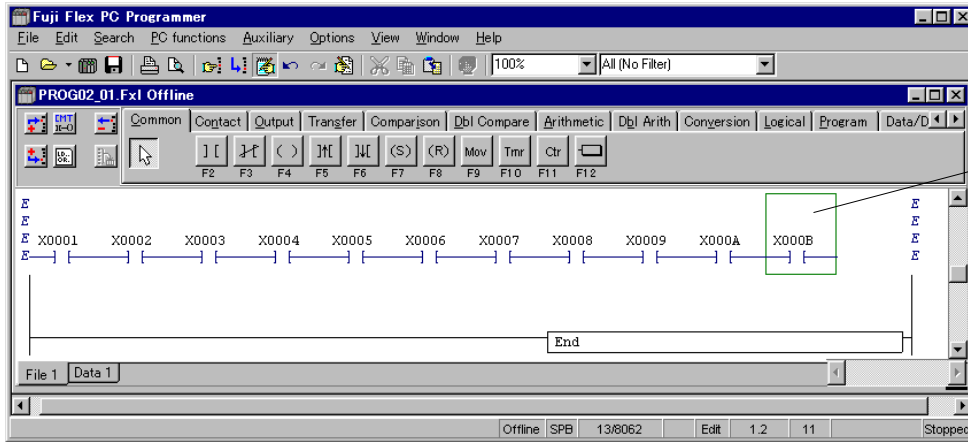
2-2-2 Writing a returning

The method of describing a "Returning" instruction is explained below.

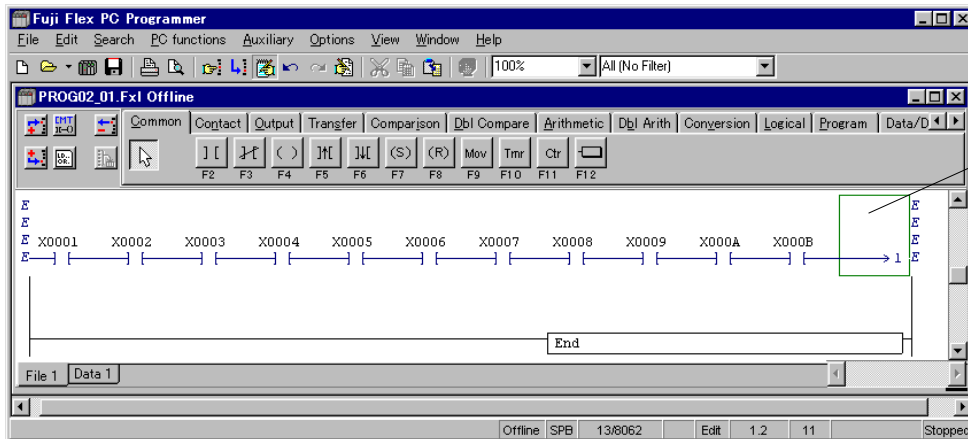
(1) Writing returning (output)

First, the method of writing a returning (output) is explained.

- ◇ Shift the cursor to the right side of the instruction description position. Press <Ctrl> + <-> to draw a horizontal line to the right bus.



- ◇ The loop source is automatically written with a loop number.

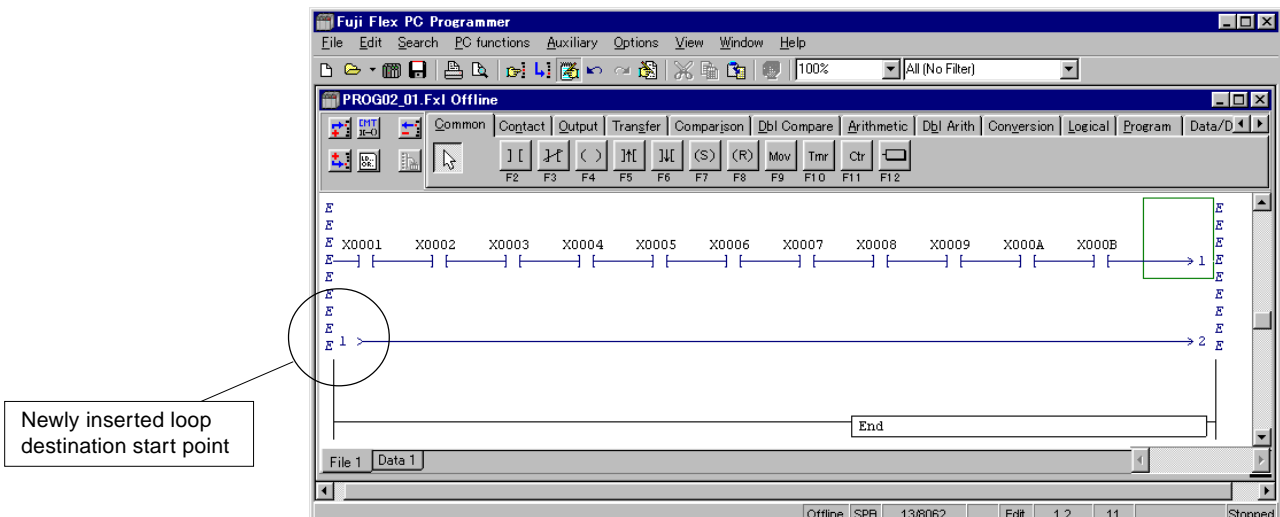


(2) Writing returning (input)

Next, the method of describing a returning (input) is explained.

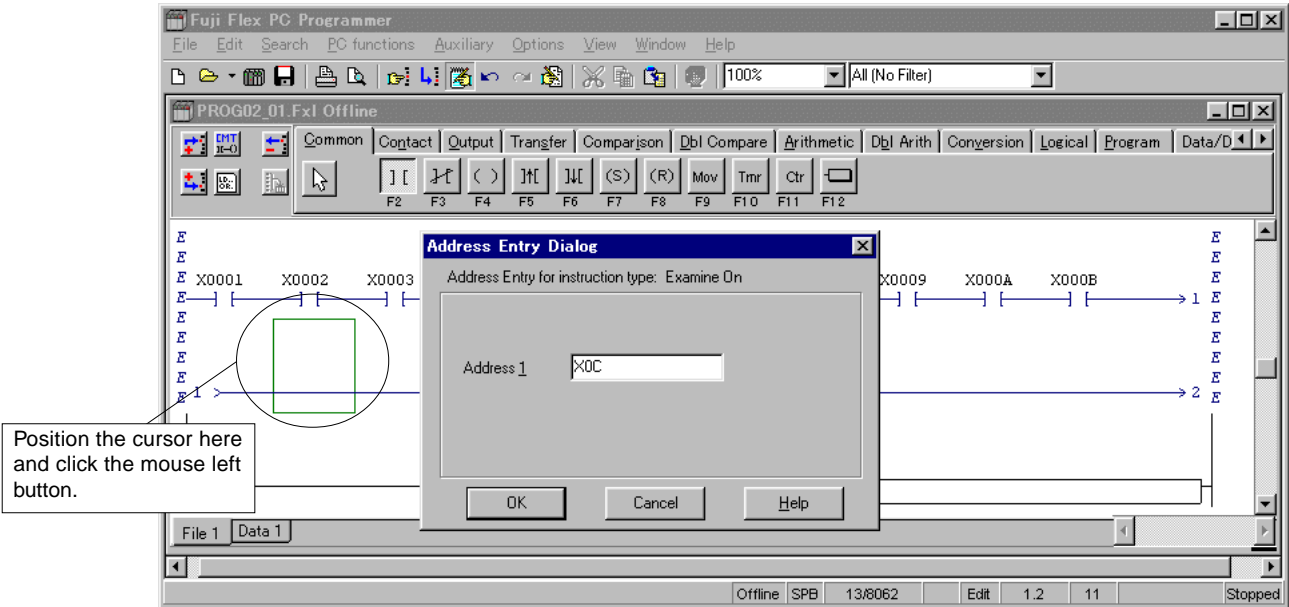
1) Preparing line block starting point

- ◇ When the cursor is at the loop destination, insert a row by pressing <Ctrl> + <Ins>. The next loop start destination point is inserted. The loop is automatically numbered by the loader.

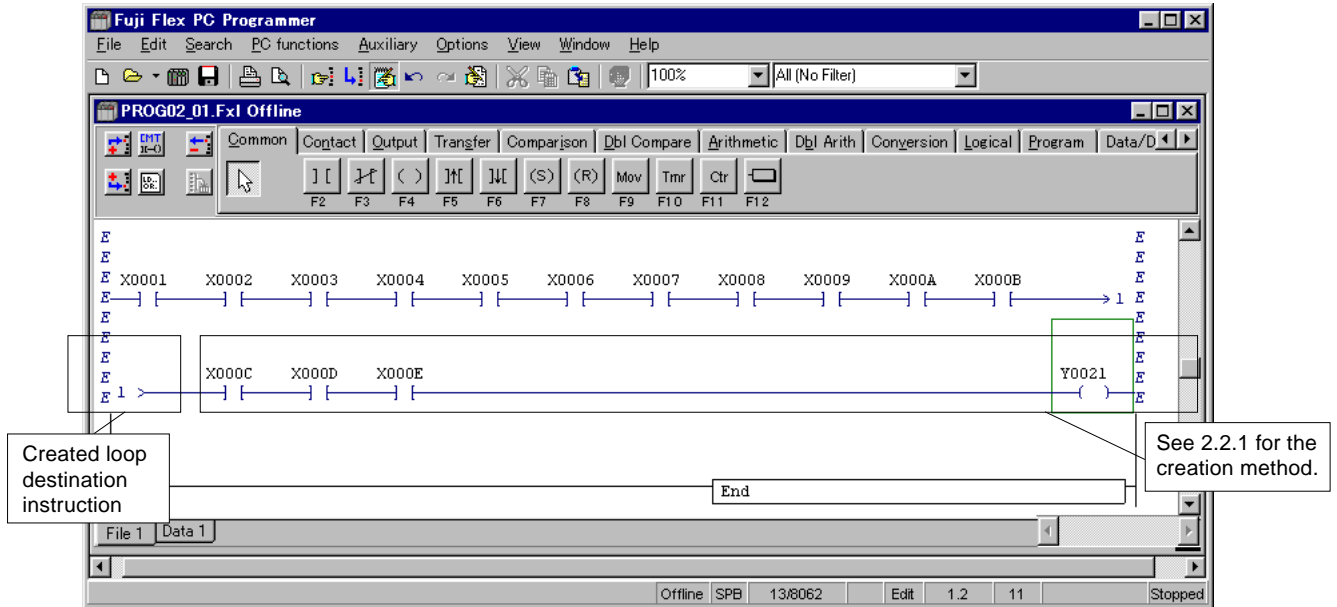


2) Creating a line at the loop destination

- ◇ Shift the cursor to the right of the arrow at the loop destination.
- ◇ Left-click the **Examine On** button.
- ◇ Click the mouse left button to create a line.

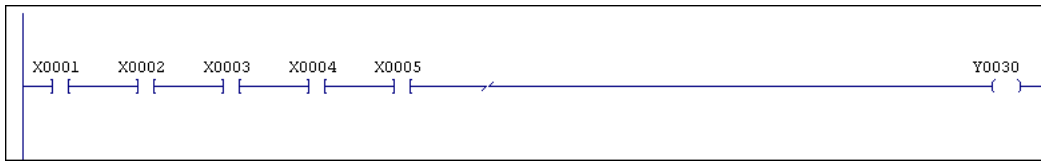



- ◇ Create a line as explained elsewhere.

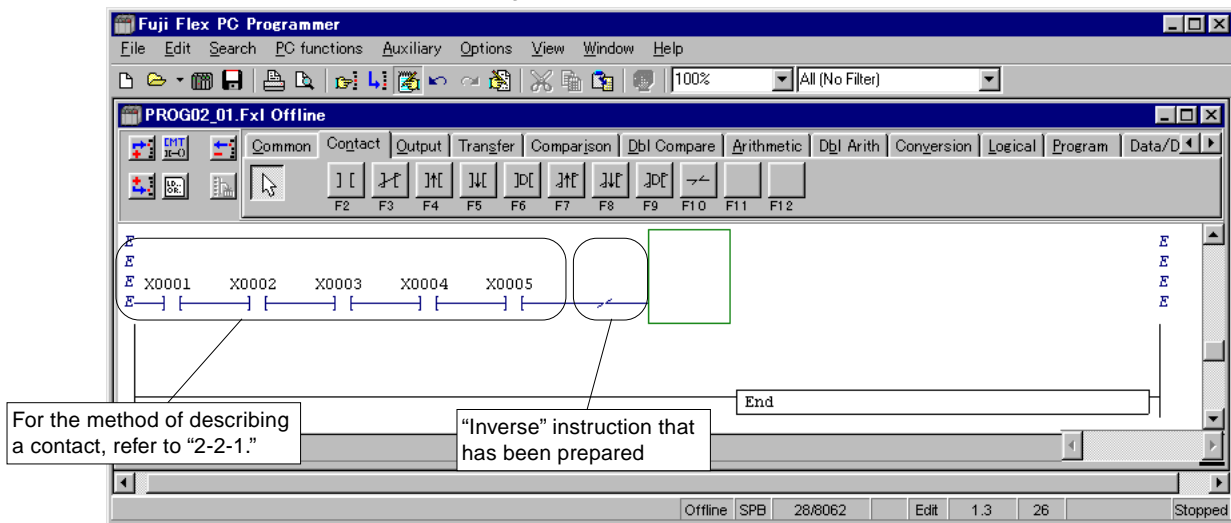


2-2-3 Writing Inverse instruction

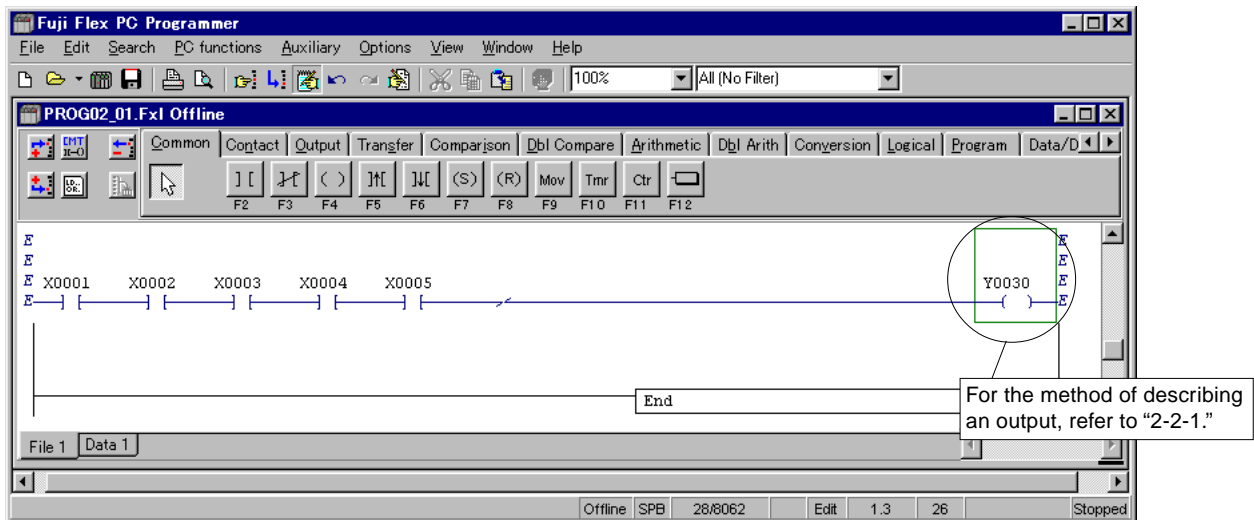
The method of describing an "Invert" instruction is explained below.



- ◇ Left-click the [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Inverse] button.
- ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.
An "Invert" instruction is described in the program window.

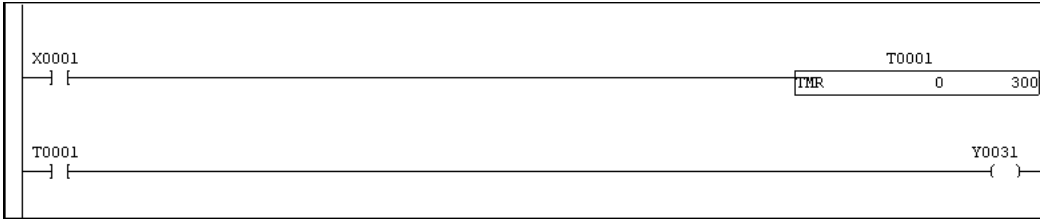


- ◇ Write in the output to complete the line.

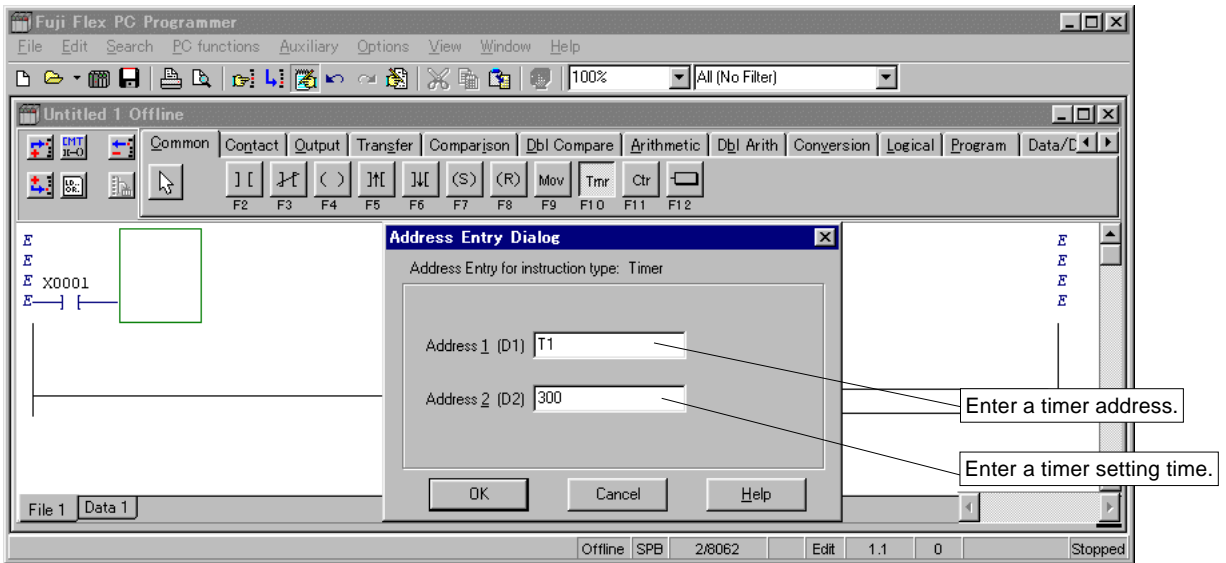


2-2-4 Writing ON-delay timer

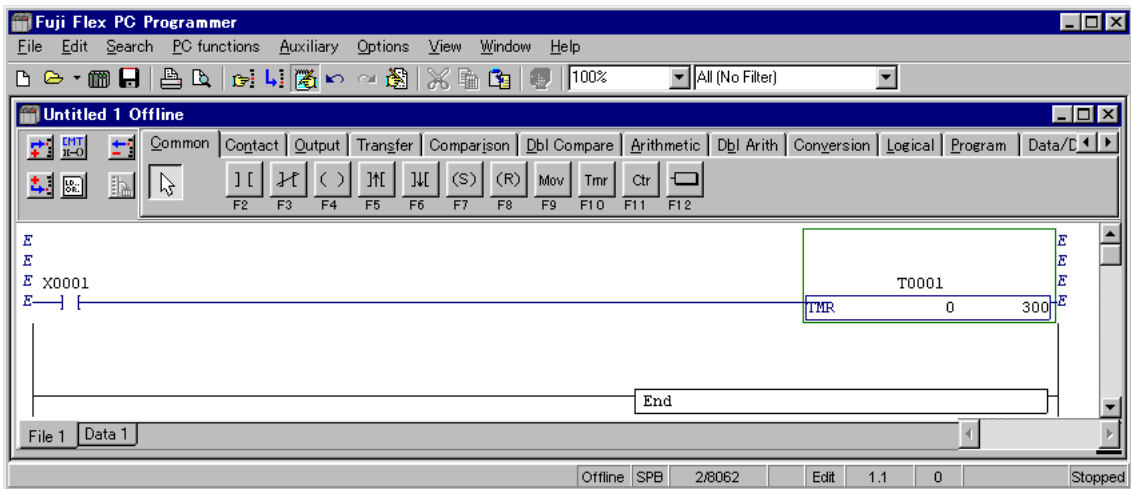
The method of describing an “ON-delay timer” is explained below.



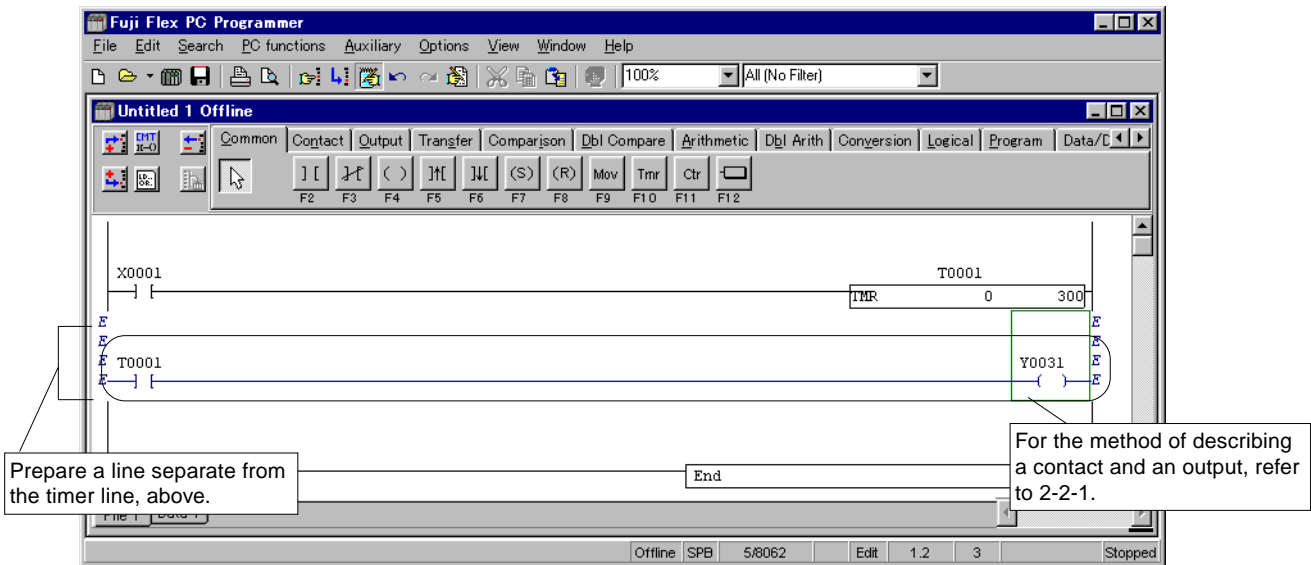
- ◇ Left-click the [Timer/Counter/Time Operation] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the **Tmr** [ON-Delay Timer] button.
- ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.
The {Address Entry} dialog box is displayed.



- ◇ Enter a timer address in the [Address 1] text box.
In this example, <T1> is entered.
- ◇ Enter a timer setting time in the [Address 2] text box.
In this example, <300> is entered (the timer starts three seconds later).
- ◇ Left-click the [OK] button.
An “ON-delay timer” is described in the program window.

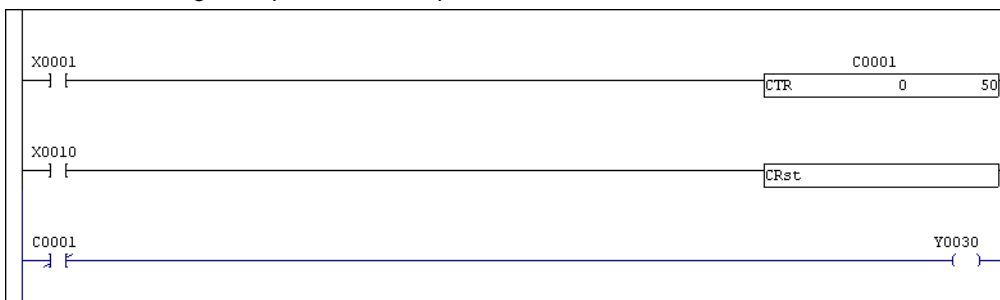


- ◇ Write in a timer output contact and an output line to complete the line block.



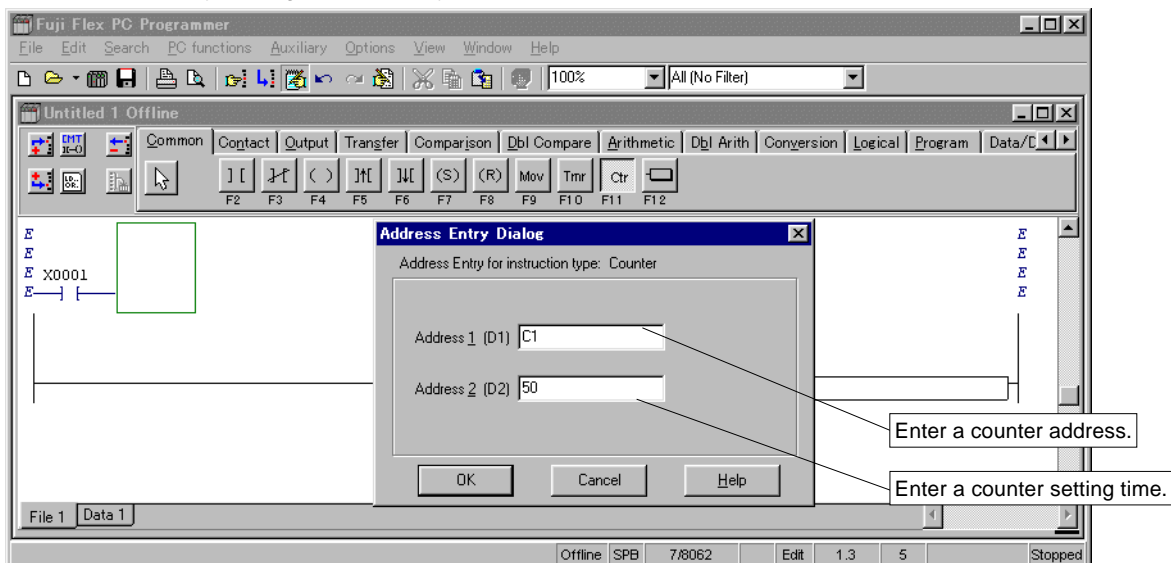
2-2-5 Writing Up counter

The method of describing an “Up counter” is explained below.



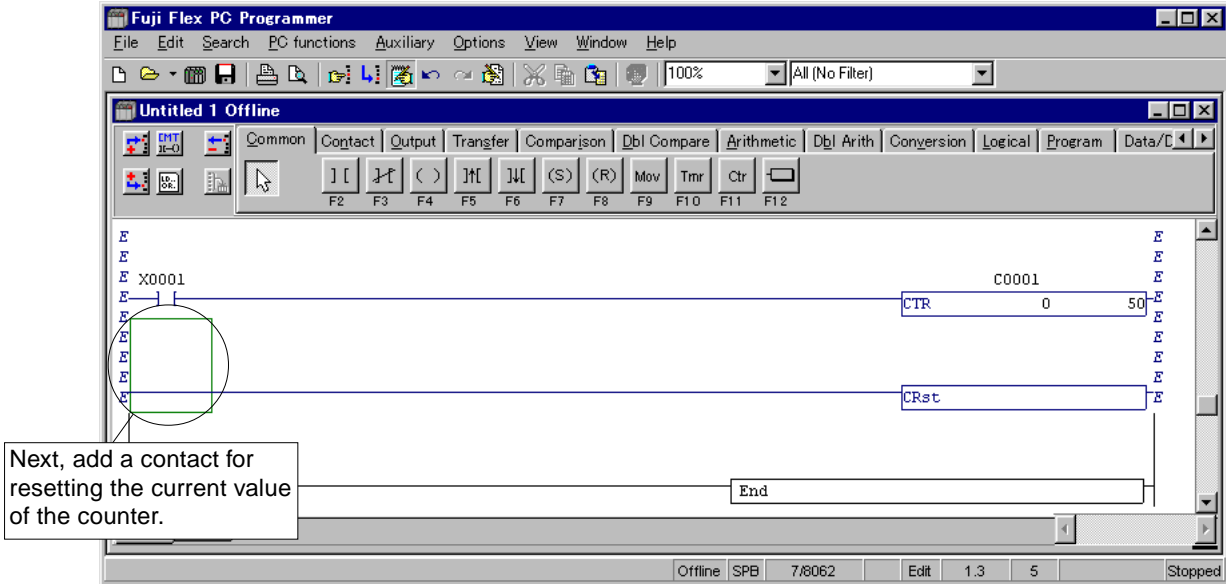
- ◇ Prepare a normally open contact (address: X0001) beforehand.
- ◇ Left-click the [Timer/Counter/Time Operation] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the **ctr** [Up Counter] button.
- ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.

The {Address Entry} dialog box is displayed.

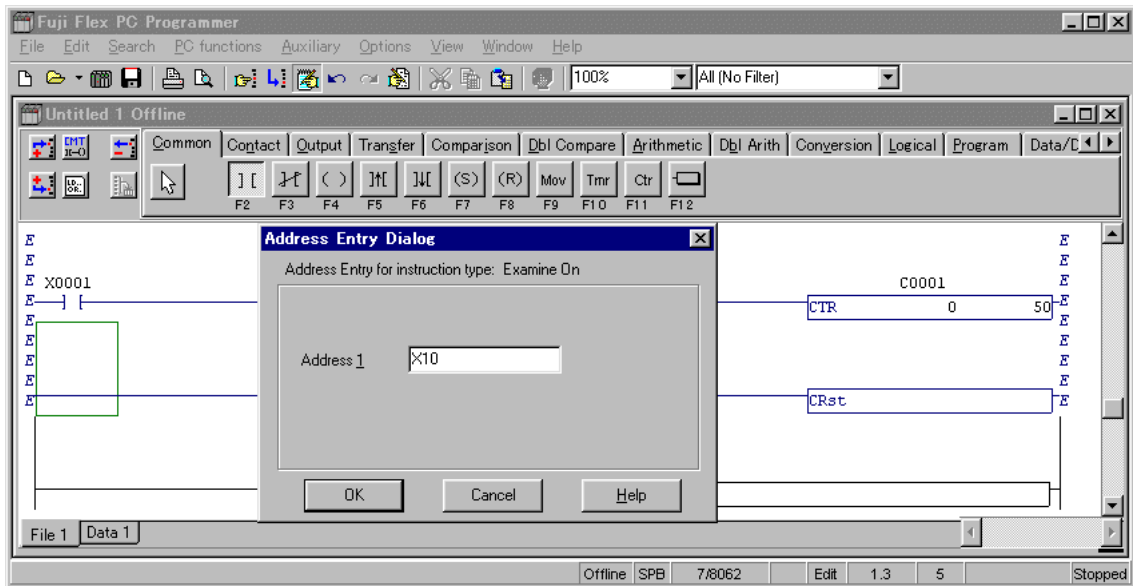


- ◇ Enter a counter address in the [Address 1] text box. In this example, <C1> is entered.

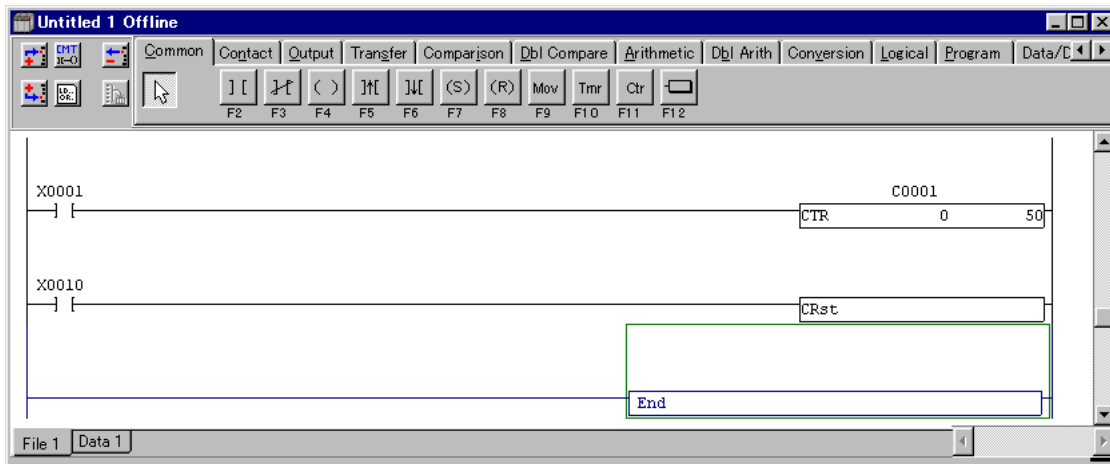
- ◇ Enter a counter setting time in the [Address 2] text box.
In this example, <50> is entered.
- ◇ Left-click the [OK] button.
An “Up counter” is described in the program window.



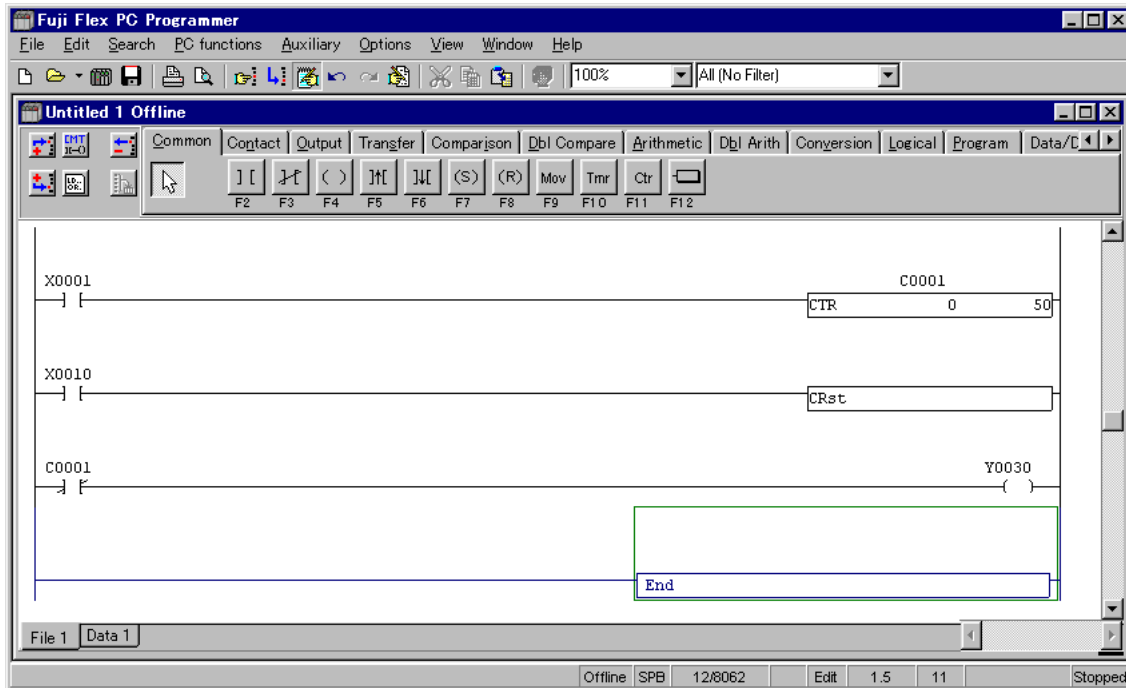
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Examine On] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position.
The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X10> is entered.
- ◇ Left-click the [OK] button.
A contact is inserted as shown below.

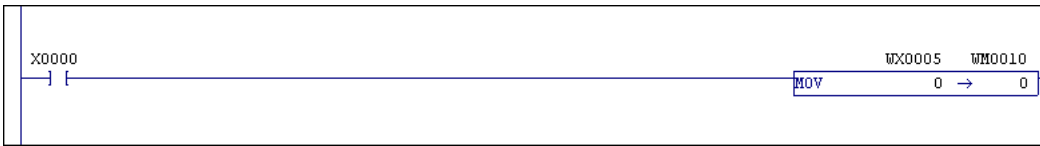


◇ Write in a counter output contact and an output line to complete the line block.

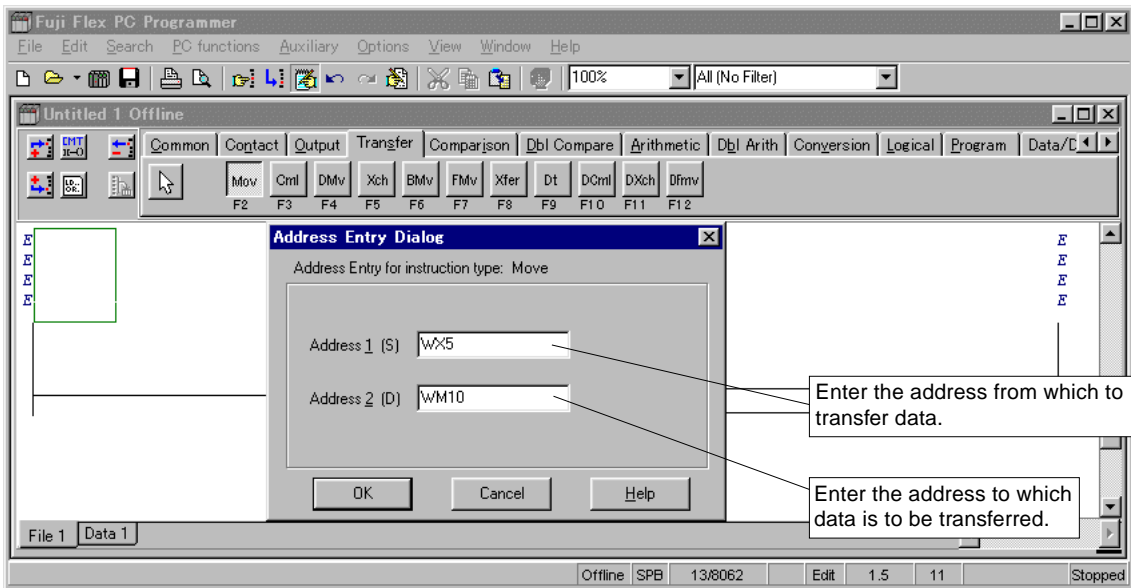


2-2-6 Writing Data Transfer (MOV) instruction

(1) The method of describing a “Data Transfer” (MOV) instruction is explained below.

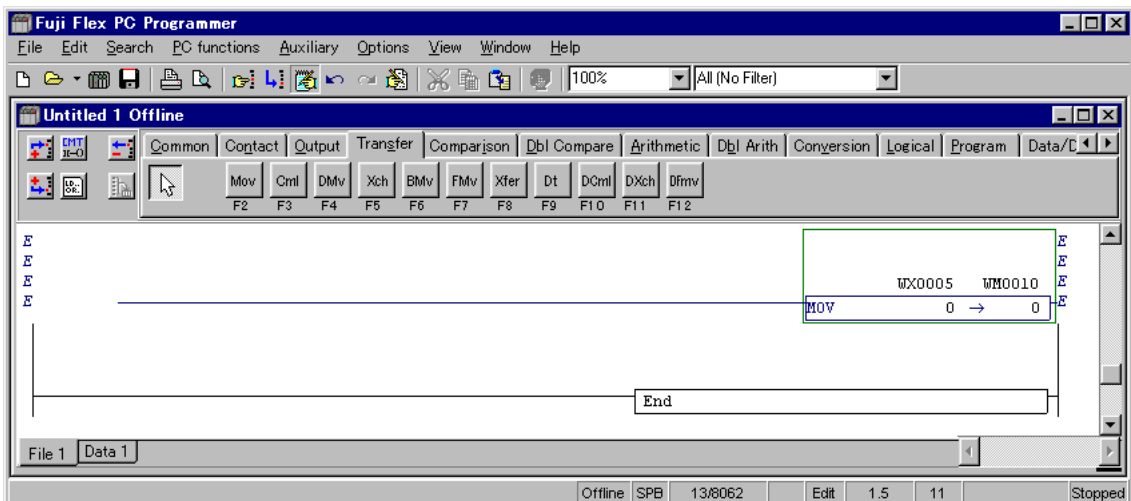


- ◇ Left-click the [Transfer] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the **Move** [Move] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position. The {Address Entry} dialog box is displayed.

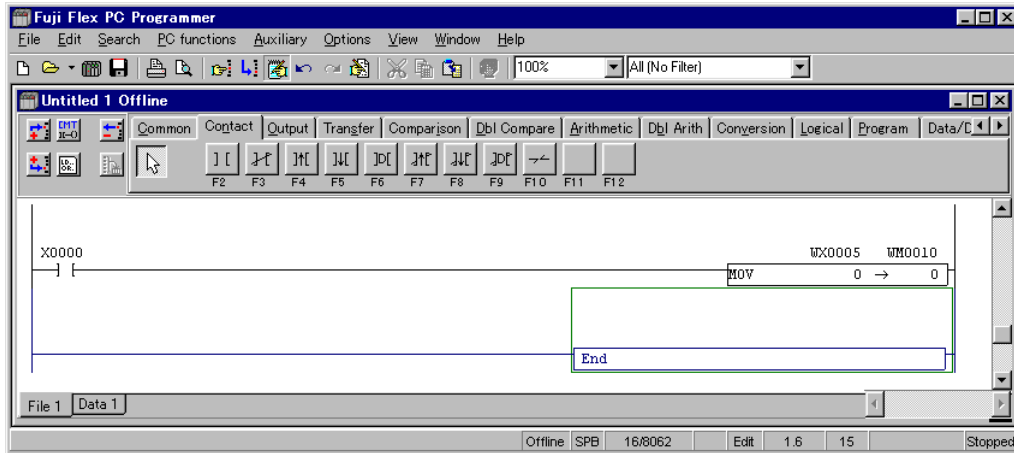


- ◇ Enter the address from which to transfer data in the [Address 1] text box. In this example, <WX5> is entered.
- ◇ Enter the address to which data is to be transferred in the [Address 2] text box. In this example, <WM10> is entered.
- ◇ Left-click the [OK] button.

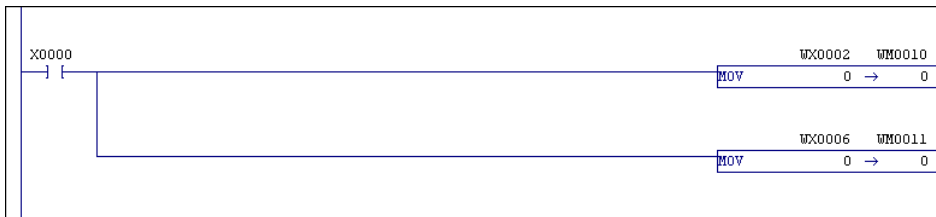
A Data Transfer instruction (MOV) with a condition contact is described as shown in the following diagram.



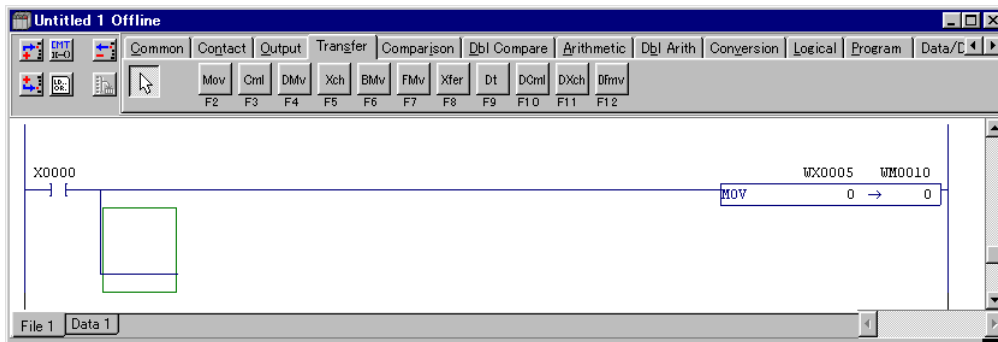
◇ Write a contact to complete.




(2) If an OR line is created for an applied instruction, a data move instruction can be described using the other input method for an applied instruction that is called applied instruction guidance input.

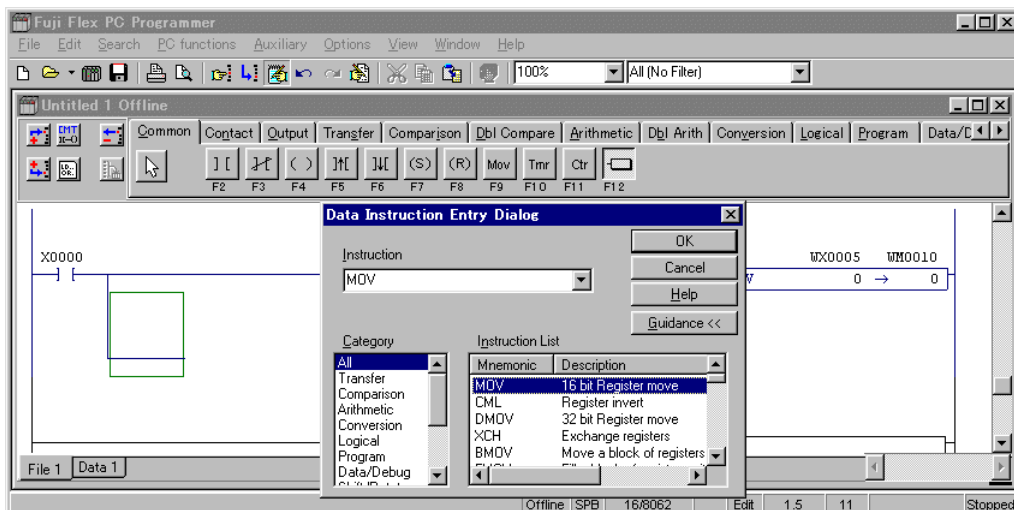


◇ Position the right frame of the cursor to a vertical connection line drawing point and press <Ctrl> + <↓> to draw a vertical connection line or <Ctrl> + <→> to draw a horizontal one.



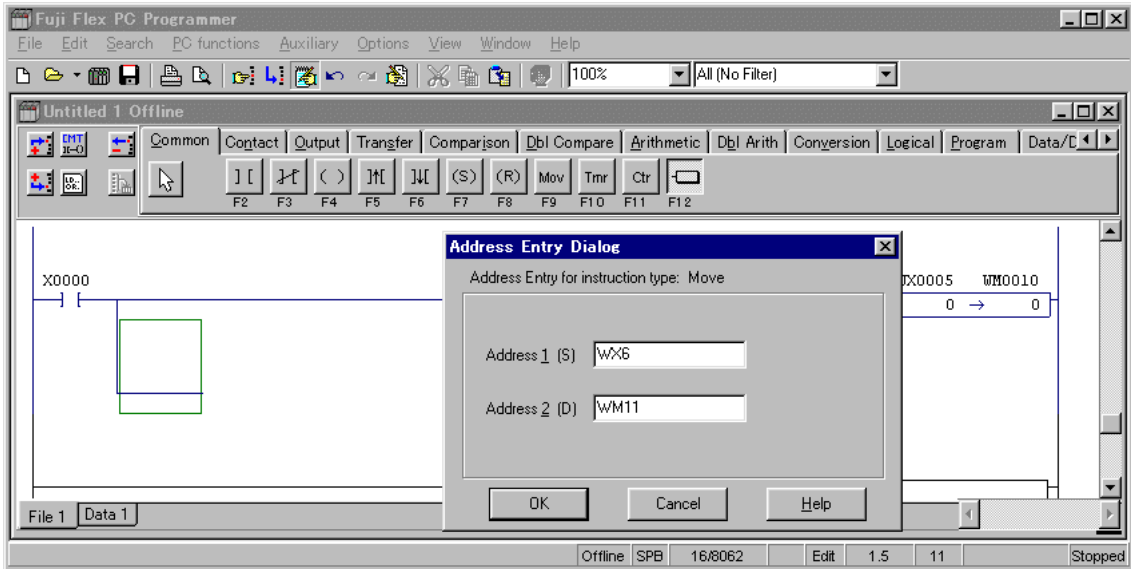
◇ Left-click the  [Data Instruction Guidance Entry] button.

◇ Shift the cursor to the instruction description position and click the mouse left button. The {Data Instruction Entry} dialog box is displayed.



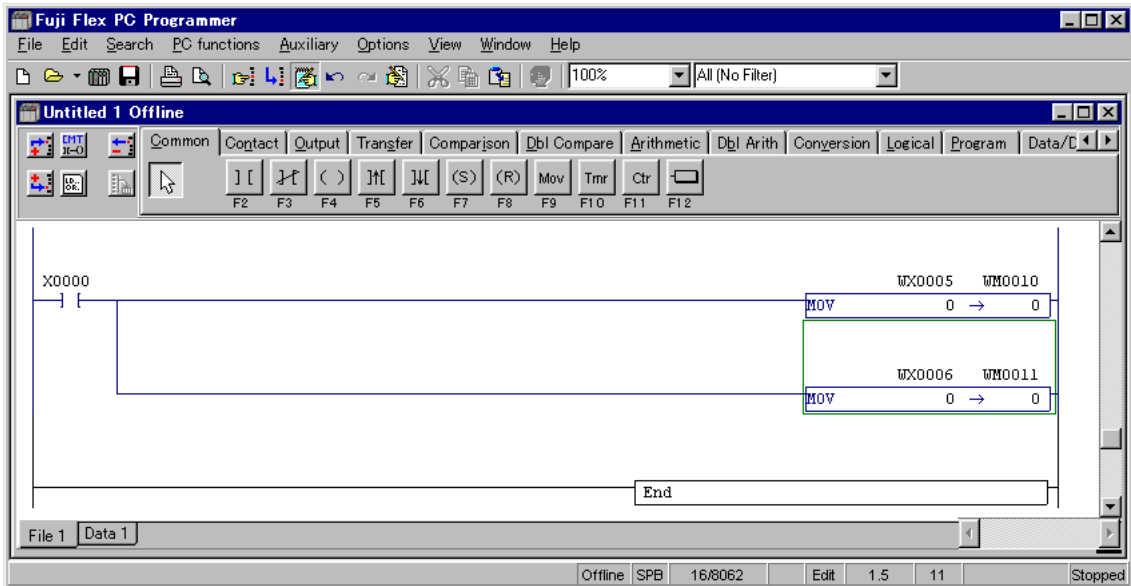
- ◇ Select [Category] from the {Data Instruction Entry} dialog.
- ◇ Select [MOV] from [Instruction List].
- ◇ Left-click the [OK] button.

The {Address Entry} dialog box is displayed for applied instruction MOV as follows:



- ◇ Enter a move-from address into the [Address 1] text box.
Enter <WX6> here.
- ◇ Enter a move-to address into the [Address 2] text box.
Enter <WM11> here.
- ◇ Left-click the [OK] button.

An OR line for an applied instruction created as follows:



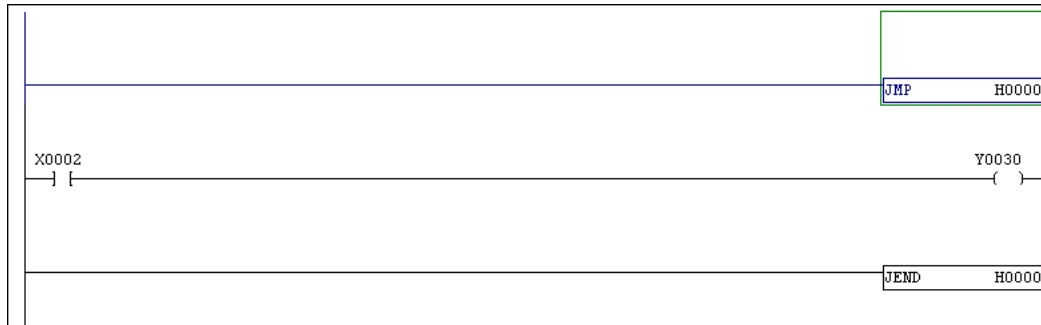
About the Data Instruction Entry Guidance:

This guidance enables applied instruction input without switching the instruction group on the ladder edit tool bar.

2-2-7 Instruction input notes

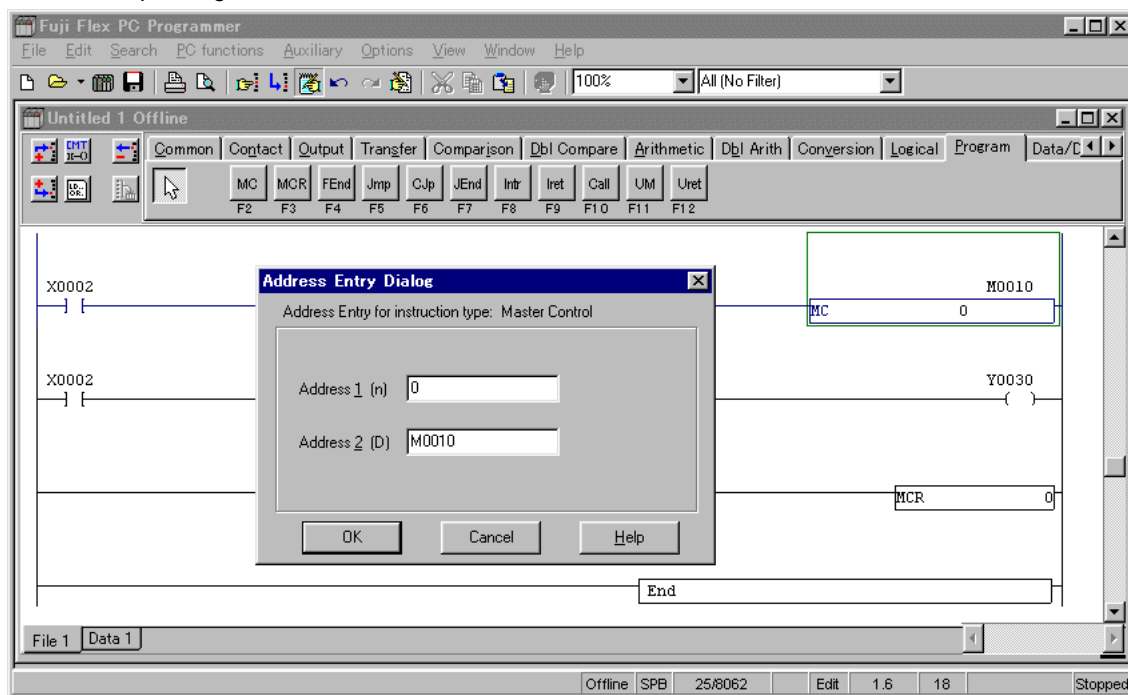
(1) JUMP and JEND instructions

Enter a jump destination number with H (ex. H01). This number is accepted even P is added at input.



(2) Master Control Set (MC) and Master Control Reset (MCR) instructions

Enter a node number into the Address 1 textbox and a memory number into the Address 2 textbox. For Master Control Reset, enter corresponding node numbers.



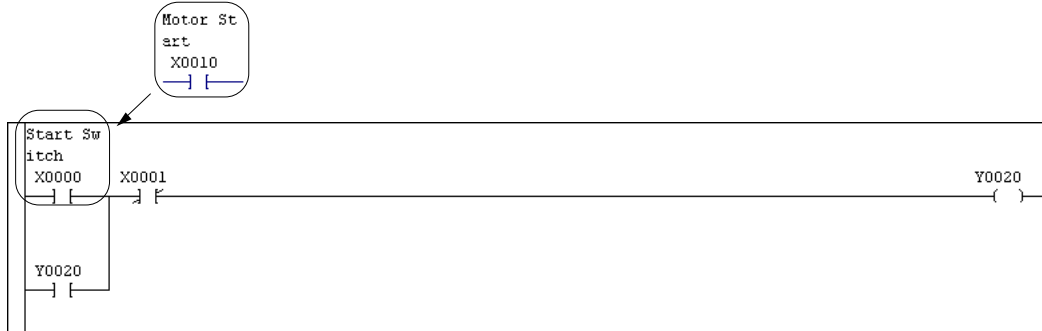
(3) Constant input

When entering a hexadecimal value, add H as an identifier. (ex. H0100). When entering a decimal value, do not attach any identifier. (Do not enter "k" as an identifier necessary for the handheld loader.)

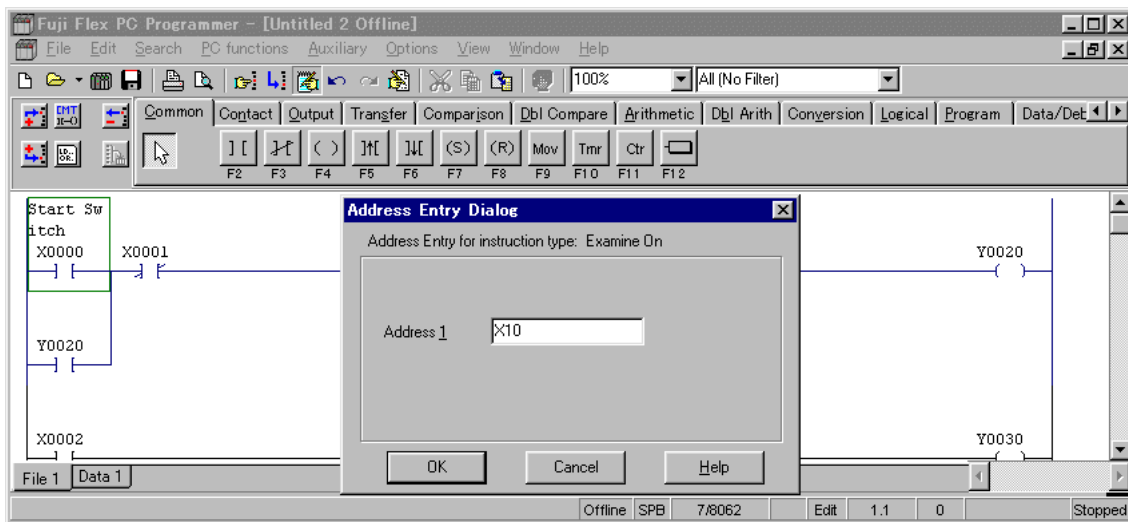
Here, the method of modifying or changing a program that has been prepared is explained.

2-3-1 Changing instructions/addresses

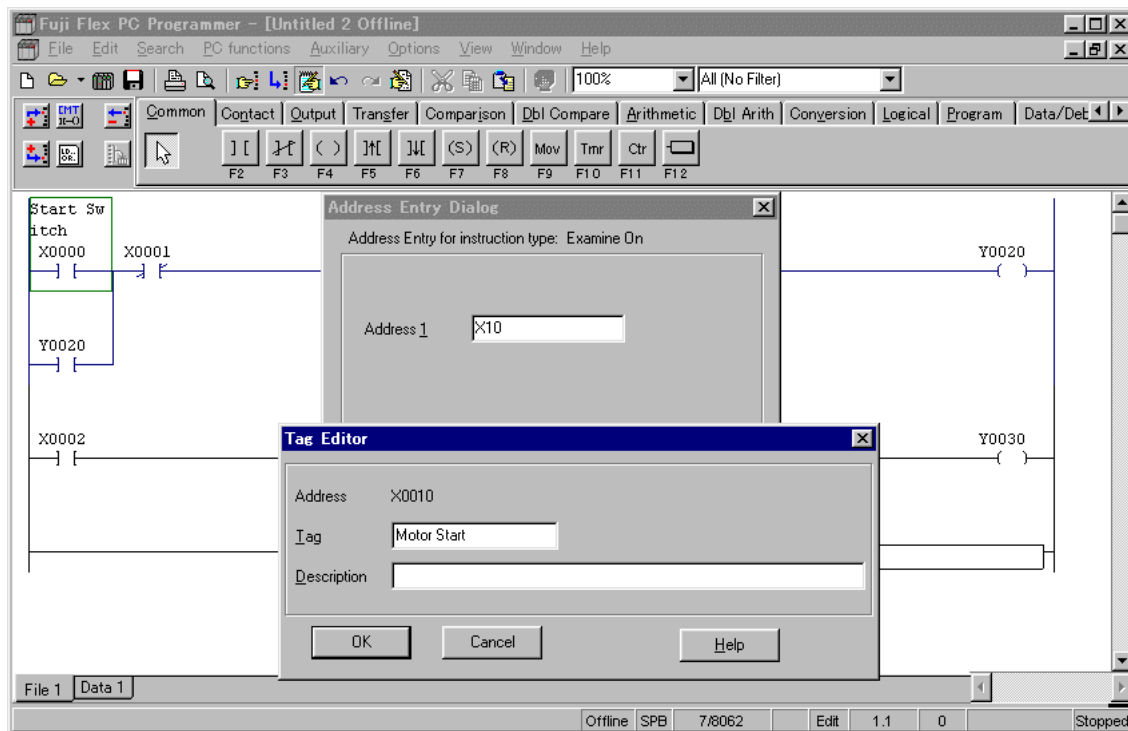
The method of changing an instruction (symbol) and an address in the following program is explained below.



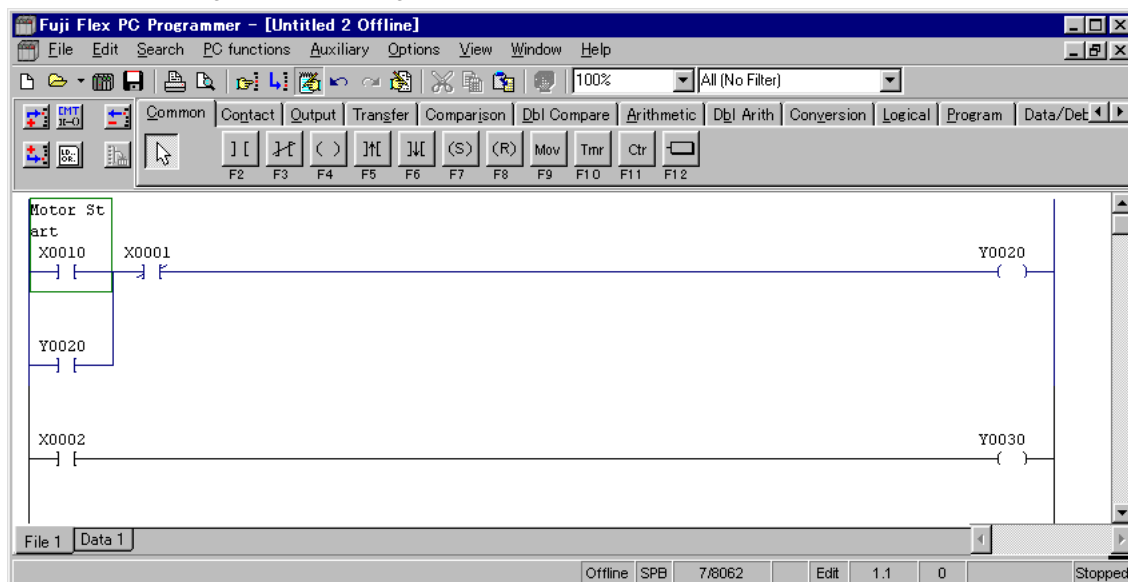
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar. (To change an instruction too, previously select the new instruction button by left-clicking it.)
- ◇ Left-click the [Examine Off] button.
- ◇ Move the cursor to the instruction (symbol) to be changed, and left-click the instruction. The {Address Entry} dialog box is displayed.




- ◇ Change the address that is displayed in the [Address] text box (the address that has been entered). In this example, <X10> is entered.
- ◇ Left-click the [OK] button. The {Tag Edit} dialog box is displayed. If the [Auto Documentation] check box is OFF at [Edit Options] in the environment setup, the {Tag Editor} dialog box is not displayed.



- ◇ Enter a tag name in the [Tag] text box.
In this example, <Motor Start> is entered.
- ◇ Enter an explanatory statement in the [Description] text box as required.
- ◇ Left-click the [OK] button.
The contact and tag name are changed.



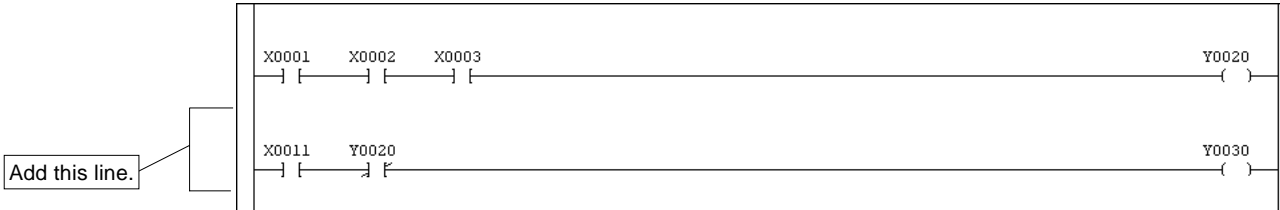
 **Tag:**
If once the tag name is defined ("X0000:Start Switch" in this sample), it is stored in a tag data base. For information on changing or deleting it, refer to "2-5 tag Editor".

2-3-2 Addition of lines/instructions

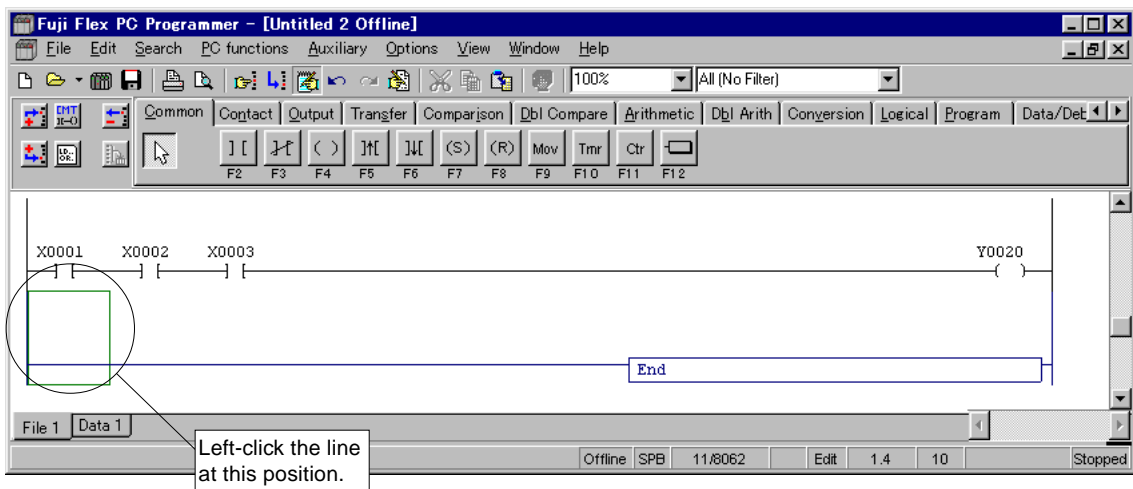
Here, the method of adding a new line or instruction to an existing program is explained.

(1) Inserting a new line

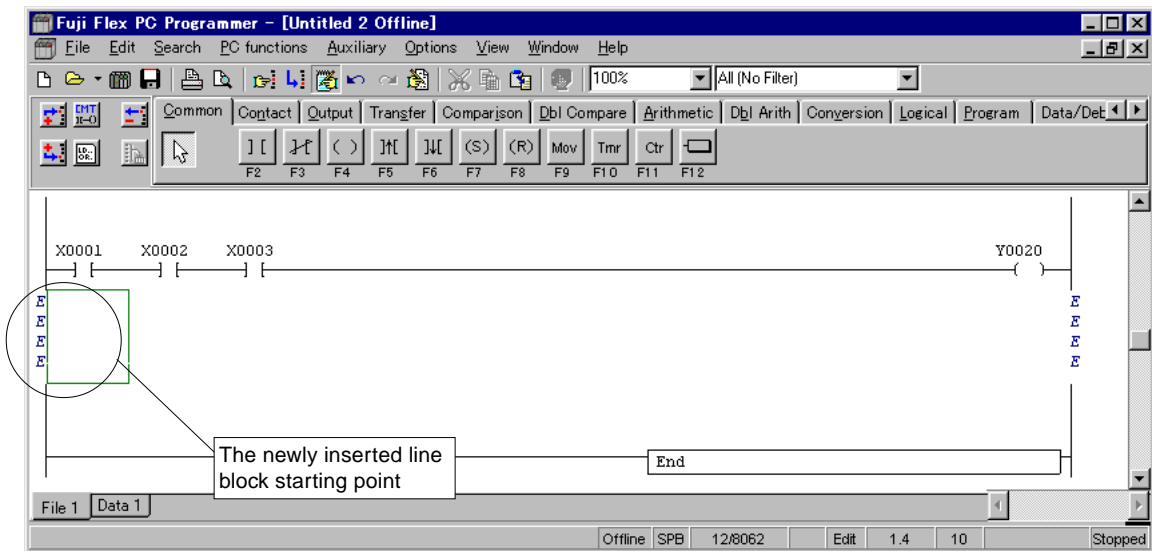
The method of inserting a new line into a program is explained below.



◇ Shift the cursor to the line (instruction symbol) below the insertion position for a line block start point.



◇ Left-click the [Insert Line] button on the ladder edit tool bar. The line block starting point is inserted.

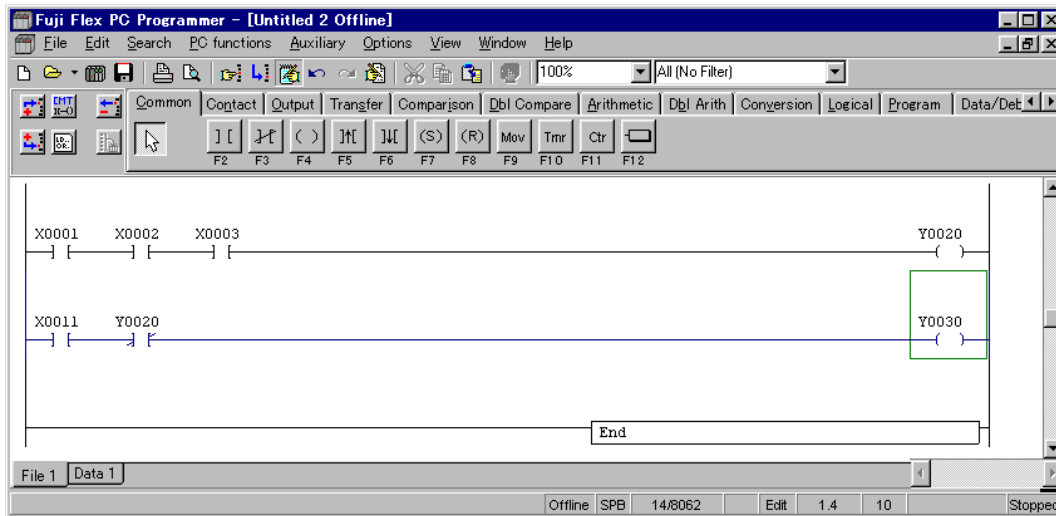


Position of [line insertion]

When the [Insert Line] button on the ladder edit tool bar is clicked, a new line is inserted before the current cursor line.

When the [Insert Line Below Cursor] button on the ladder edit tool bar is clicked, a new line is inserted after the current cursor line.

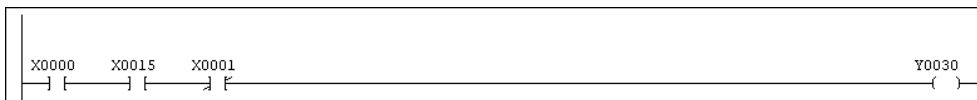
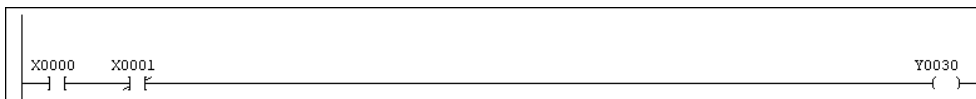
- ◇ Write a contact and an output at the newly inserted “line block starting point” as shown in the following diagram.



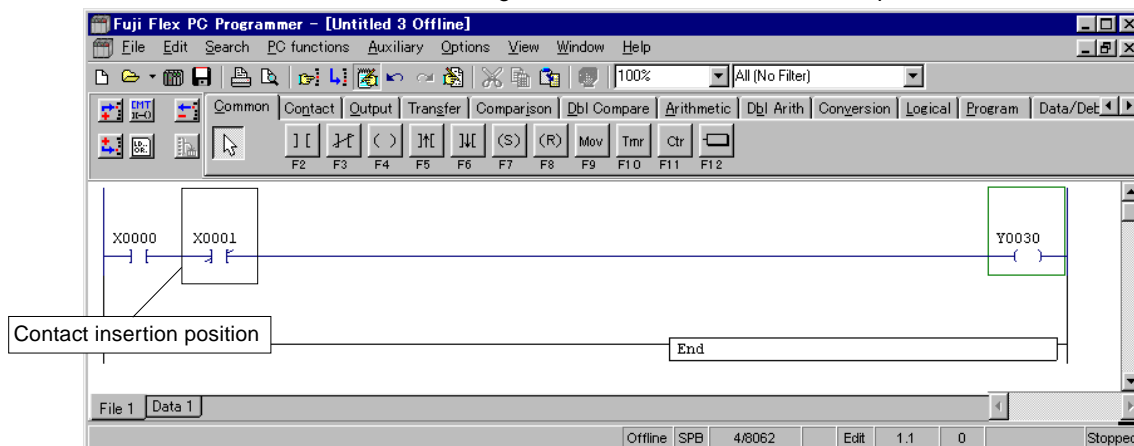
(2) Inserting a new contact

The method of inserting a contact into a series line and the method of inserting a contact into a branch line are explained below.

1) Inserting a contact into a series line

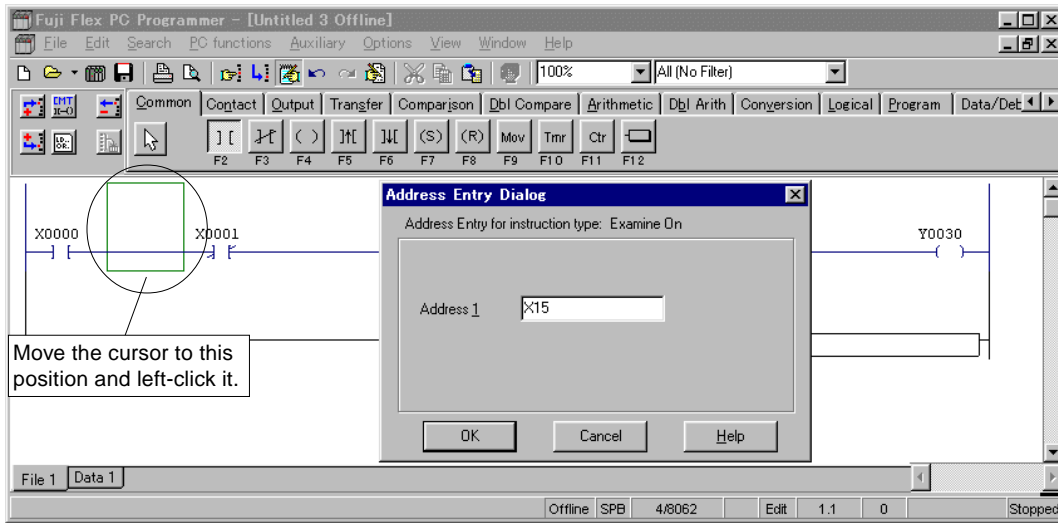


- ◇ Shift the cursor to the contact on the right side of the instruction insertion position.

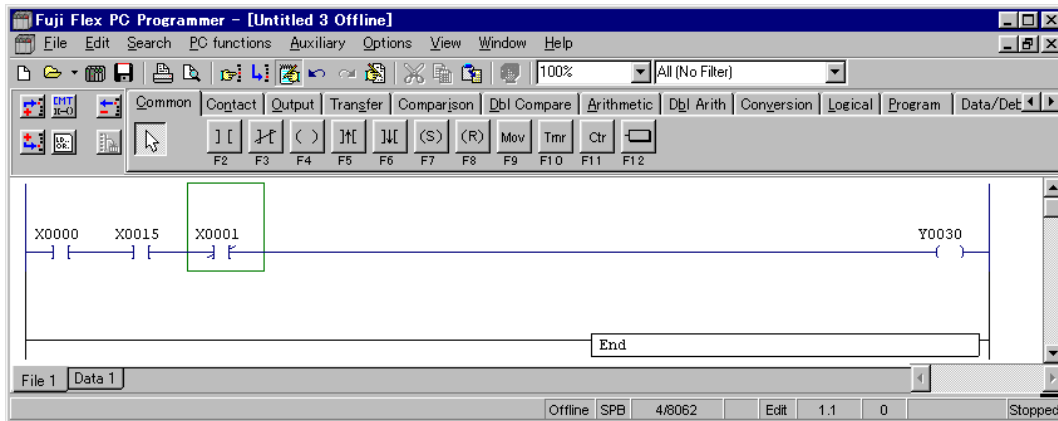


- ◇ Press <Ctrl> + <Ins> to reserve a space for writing a contact.
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Examine On] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position.

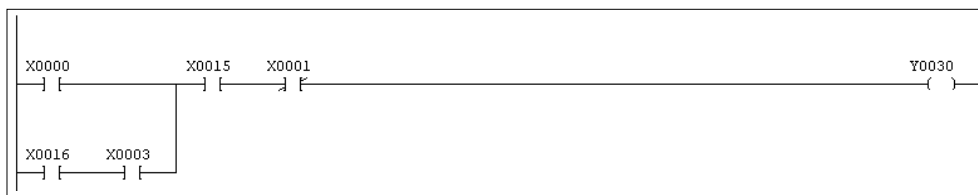
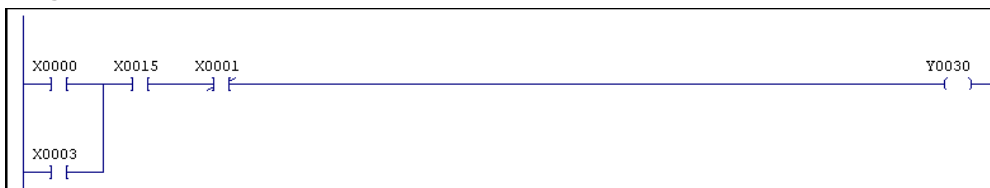
The {Address Entry} dialog box is displayed.



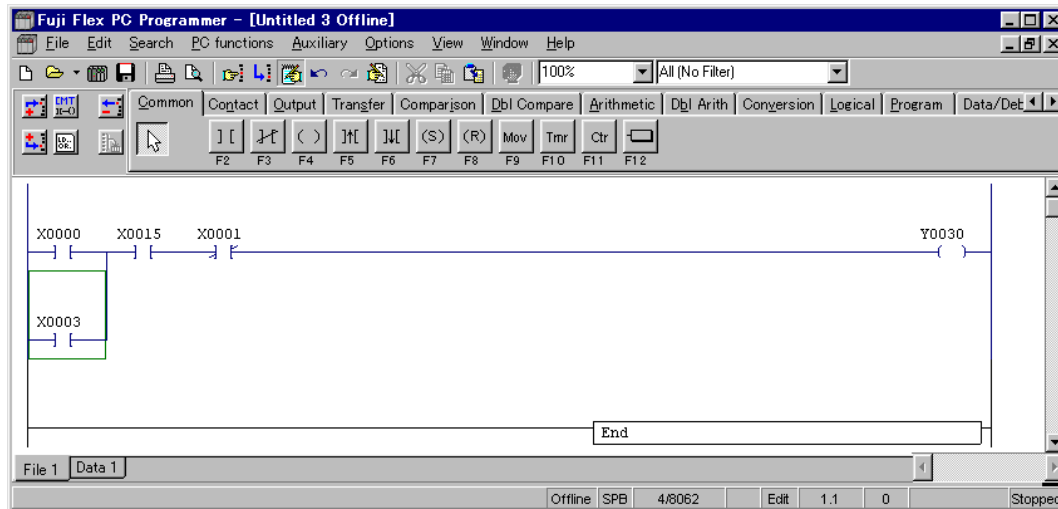
- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X15> is entered.
- ◇ Left-click the [OK] button.
The contact is inserted in series between contacts as shown in the following diagram.



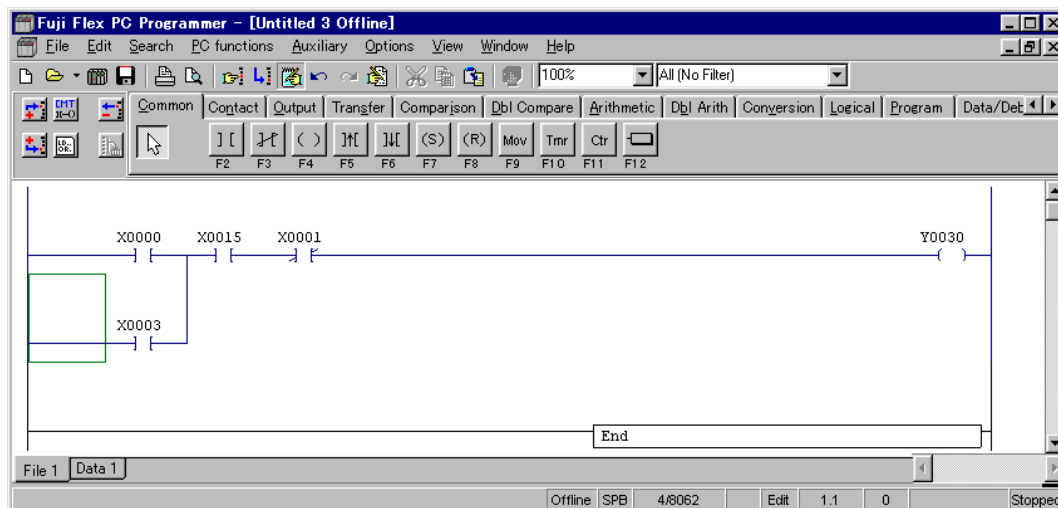
2) Inserting series contact into branch line




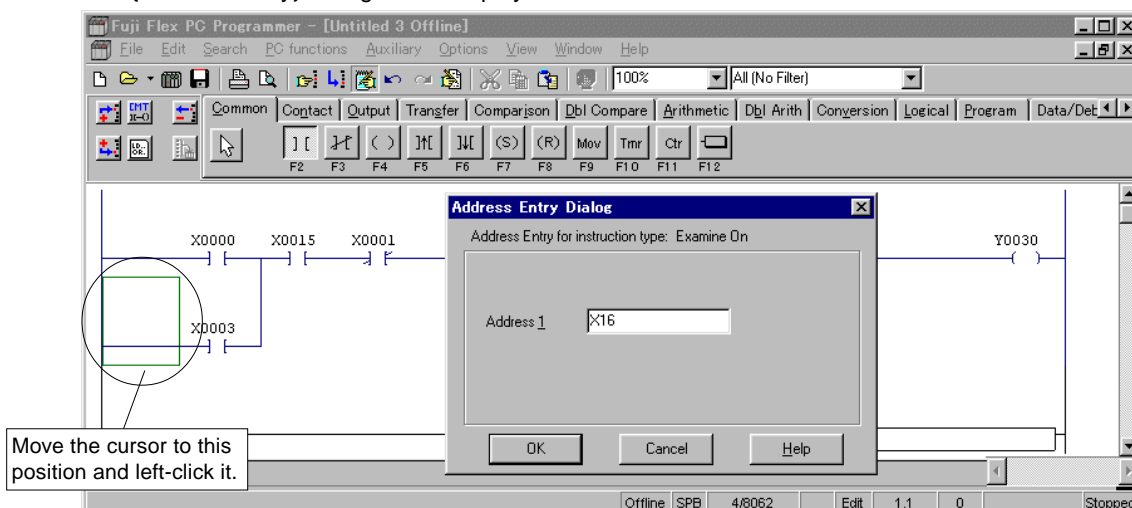
- ◇ A contact is inserted on the left side of the cursor. Here, insert a contact between the bus and contact. Shift the cursor to the contact on the right side of the instruction insertion position.



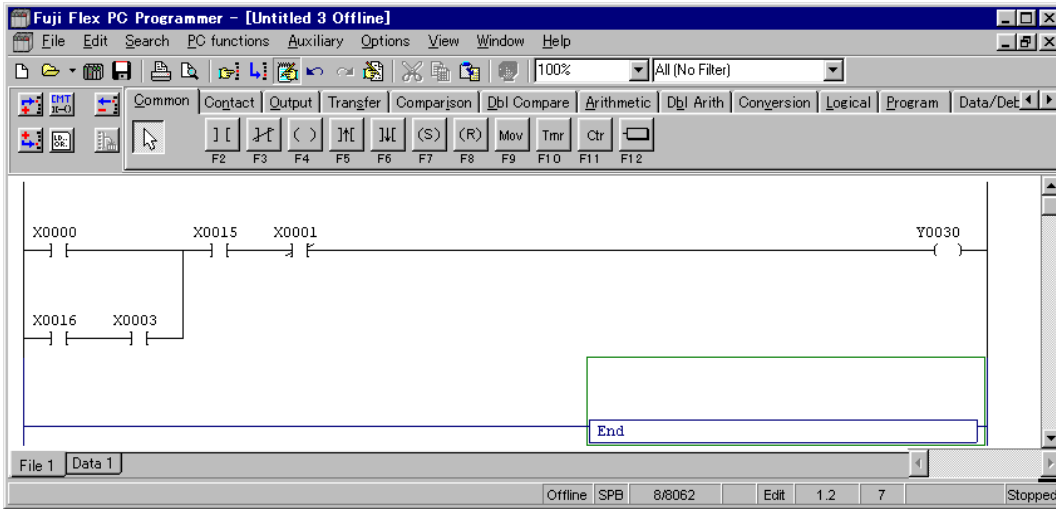
Press <Ctrl> + <Ins> to reserve a space.



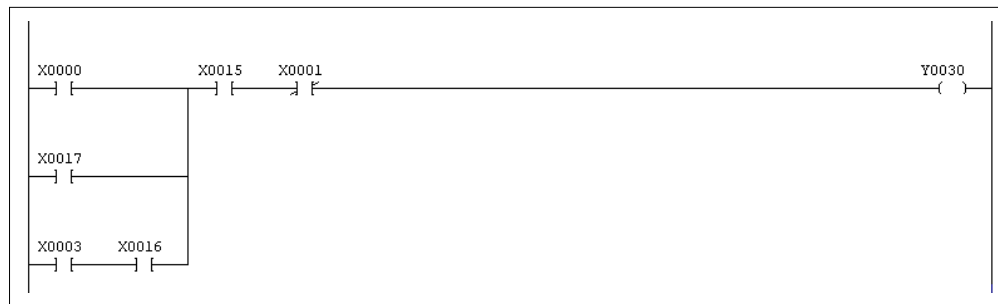
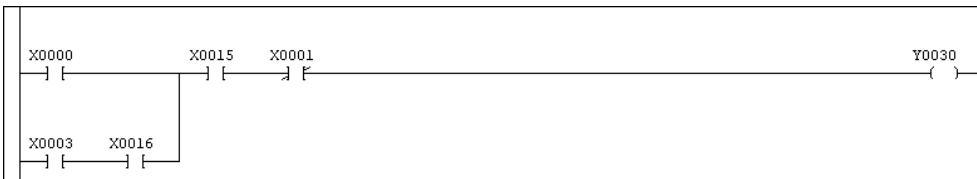
- ◇ Left-click the Common tab or the Contact tab in the Instruction Group tabs on the ladder edit tool bar.
- ◇ Left-click the  [Examine On] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position. The {Address Entry} dialog box is displayed.



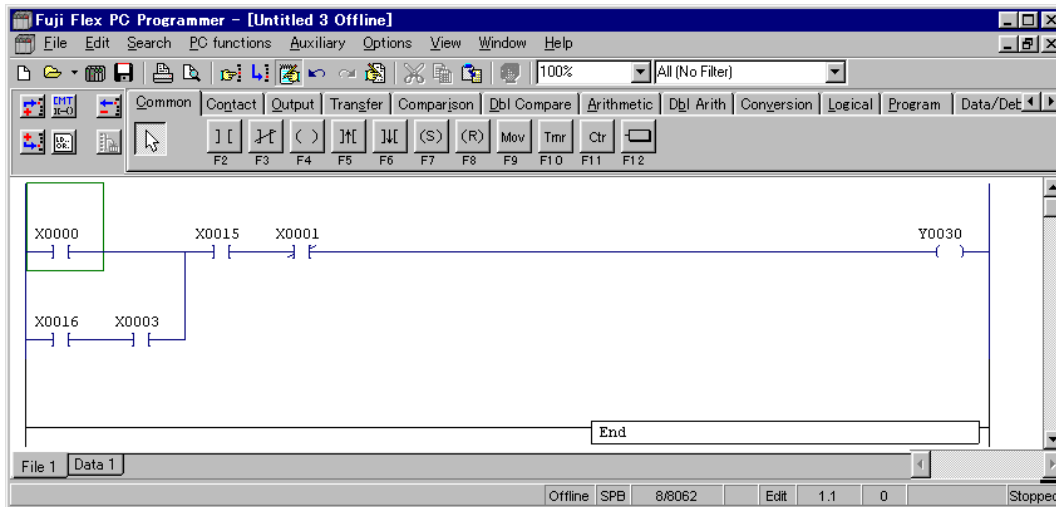
- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X16> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is inserted and the “branch down” shifts to the right.



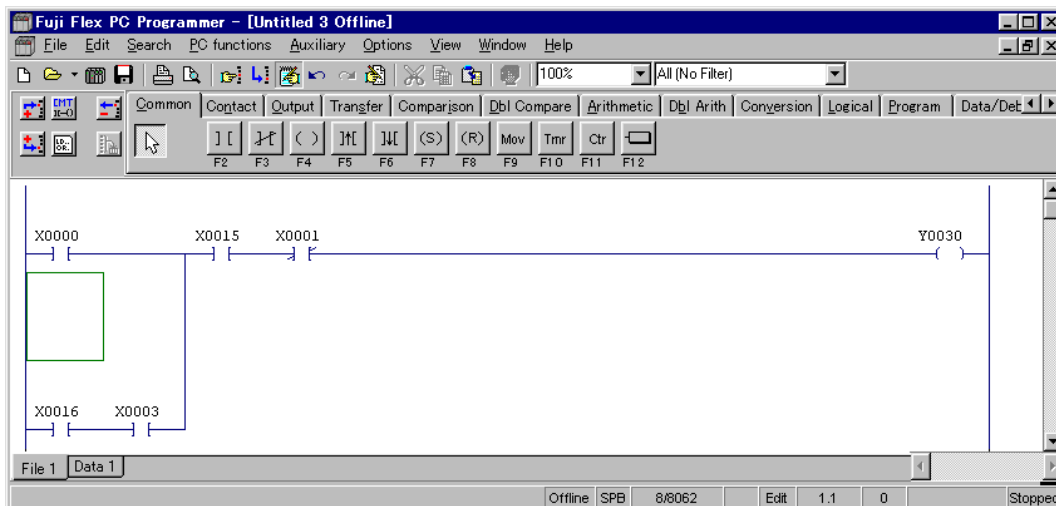
3) Inserting branch contact into branch line



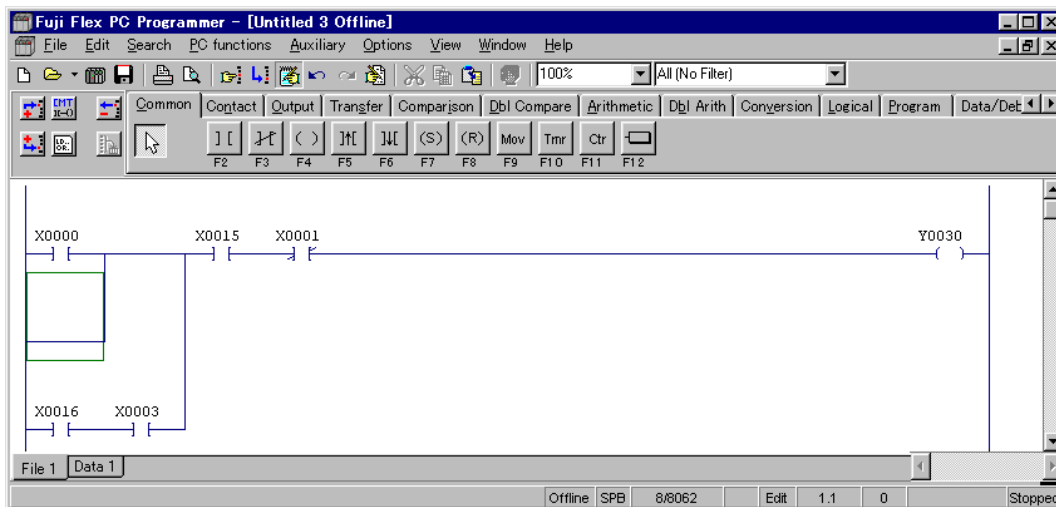
- ◇ A contact is inserted below the cursor. Shift the cursor above the instruction insertion position.




Press <Alt> + <Ins> to reserve a space.

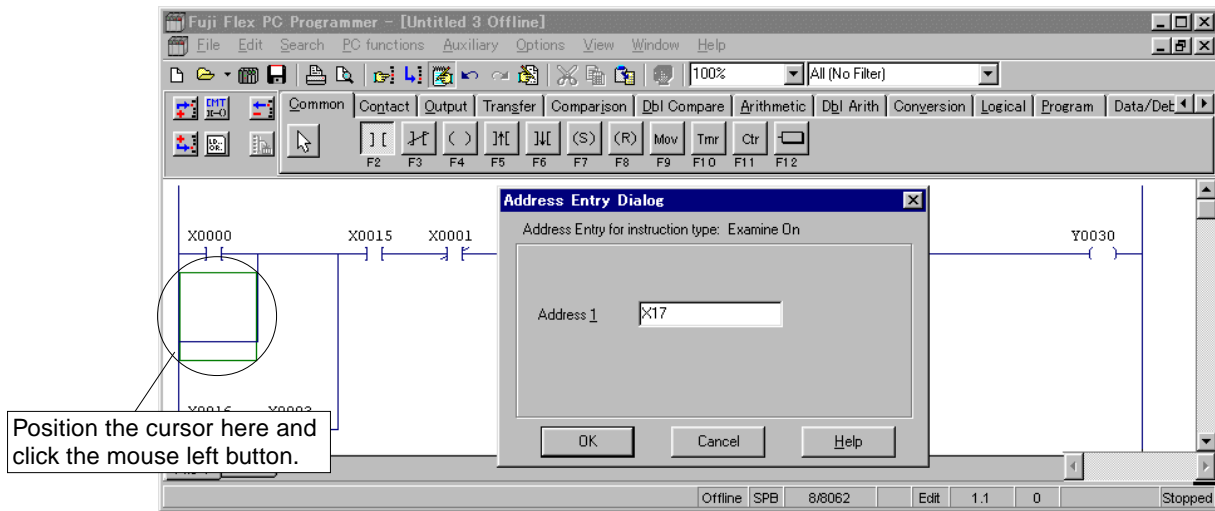


Press <Ctrl> + <↓> or <Ctrl> + <←> to draw a connection line.

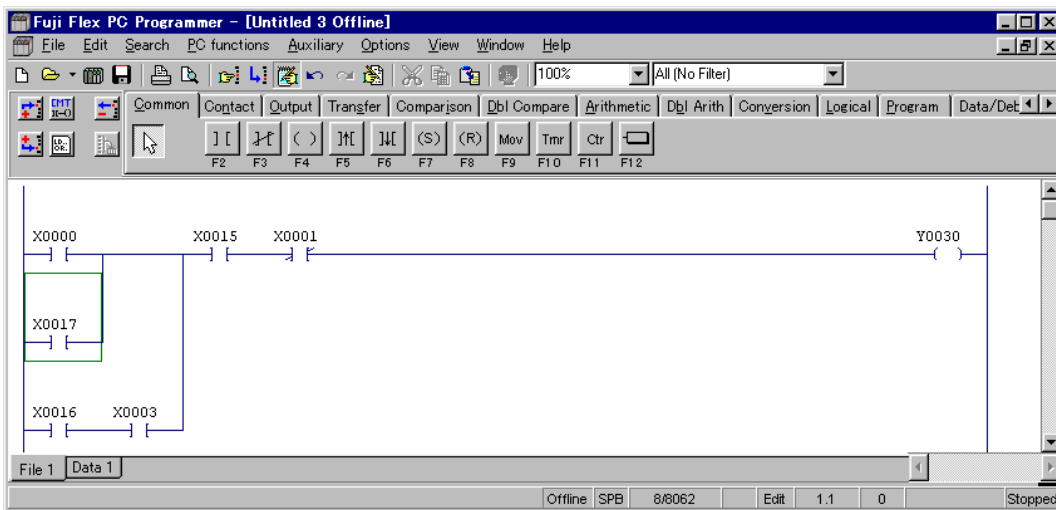


- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Examine On] button.
- ◇ Move the cursor to the position in which to describe an instruction and left-click that position.

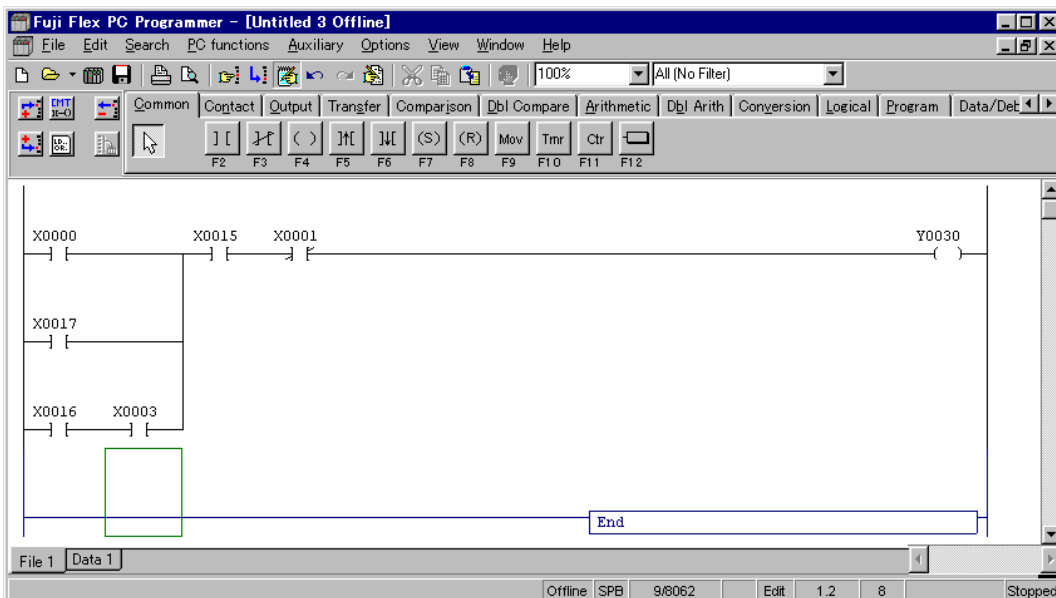
The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <X17> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is inserted in parallel between the upper and lower contacts.

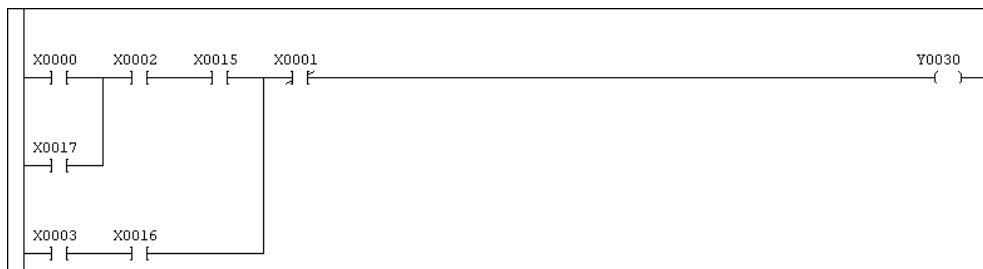
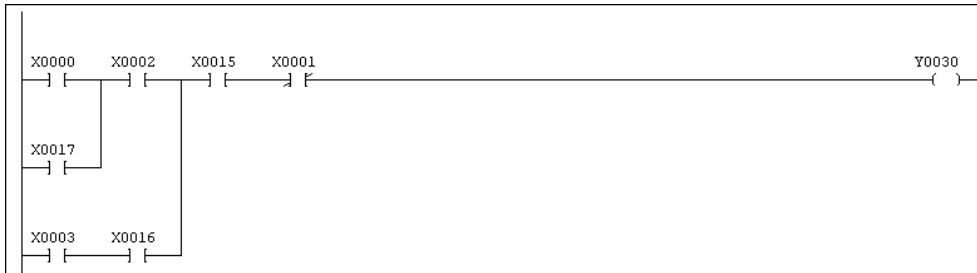


- ◇ Shift the cursor to the lower line for conversion.



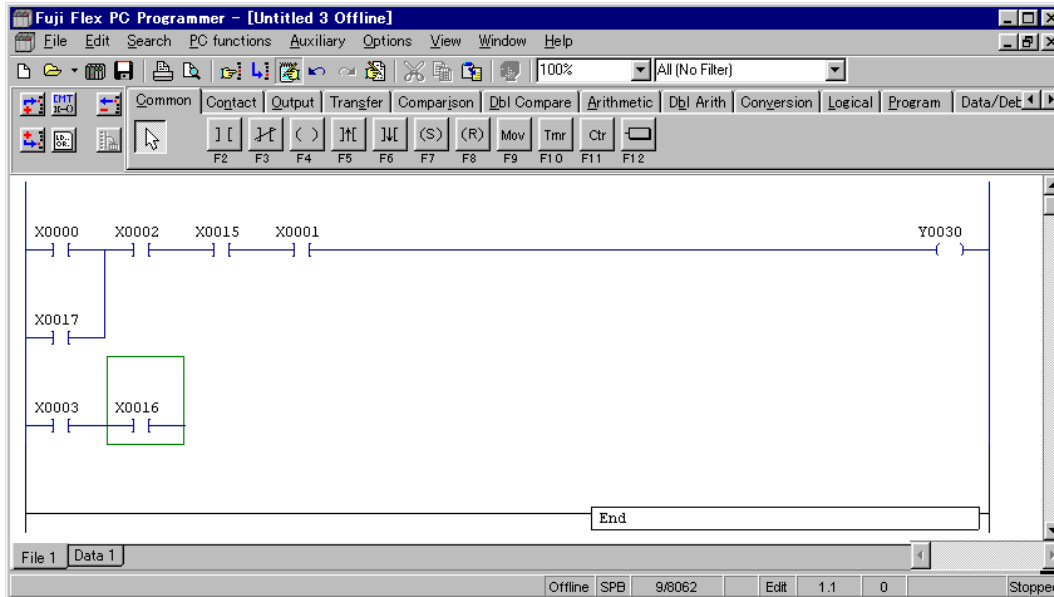
(3) Editing connecting lines

Here, the method of inserting or deleting connecting lines between instruction symbols (vertical and horizontal lines) is explained.



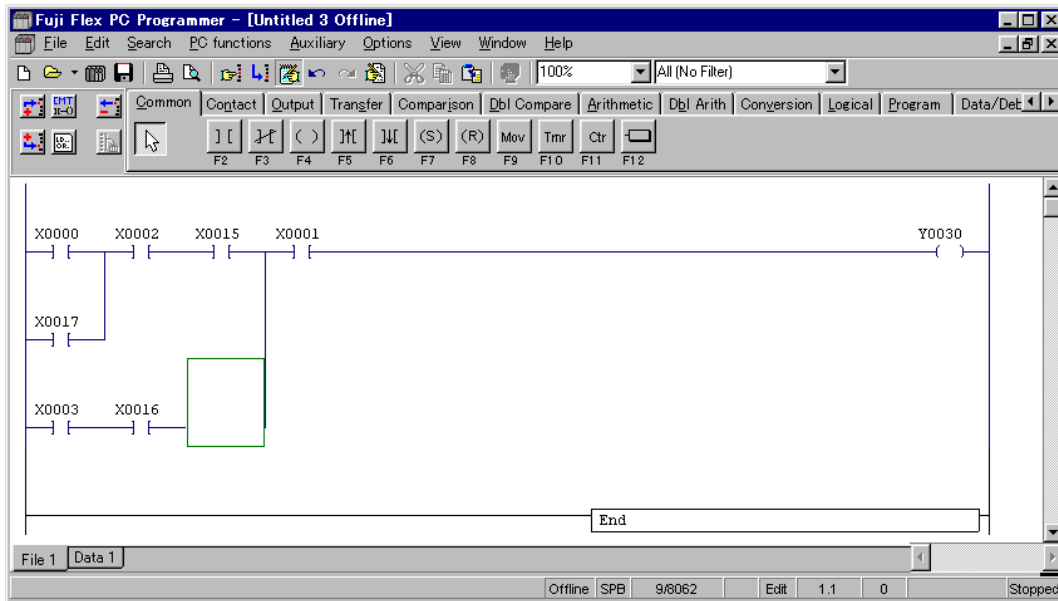
1) Deleting vertical connecting line

- ◇ Shift the cursor to the upper left end of the vertical connection line to erase.
- Press <Ctrl> + <Alt> + <↓> to erase one vertical connection line as the cursor moves.



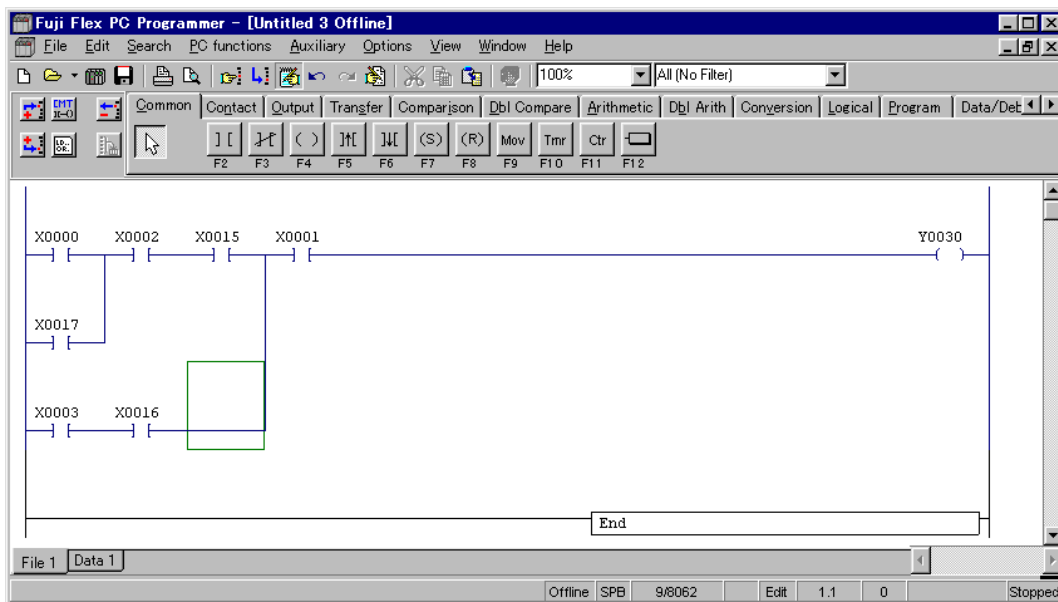
2) Writing a vertical connection line

- ◇ Shift the cursor to the upper left end of the vertical connection line to insert.
Press <Ctrl> + <↓> to draw a connection line downward from the right end of the selected instruction symbol.



3) Writing a horizontal connection line

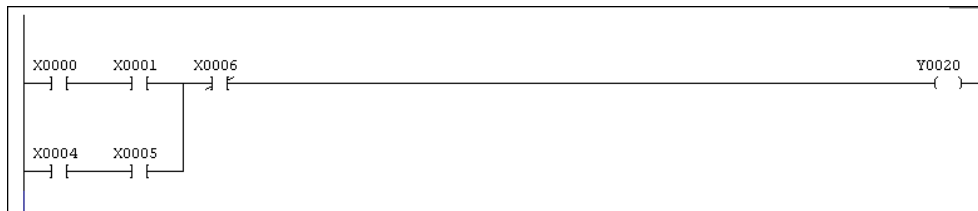
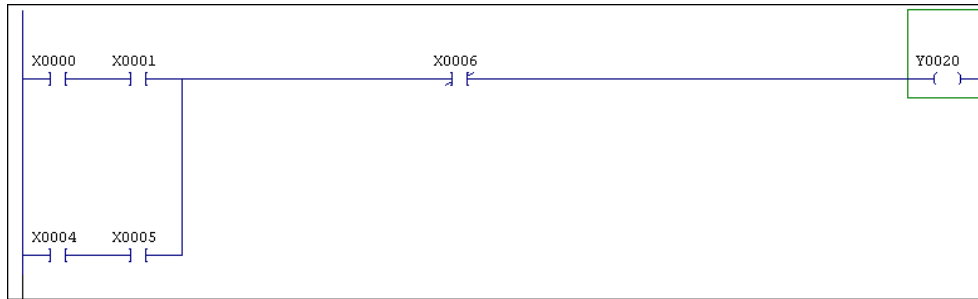
- ◇ Shift the cursor to the left side of the space reserved for a path (horizontal connection line).
Press <Ctrl> + <←> to draw a horizontal connection line.



(4) Compressing the program (removing blanks)

A line is compressed upward or to left if it permits vertical or horizontal compression by removing blanks left after program creation.

The compression procedure is as follows:

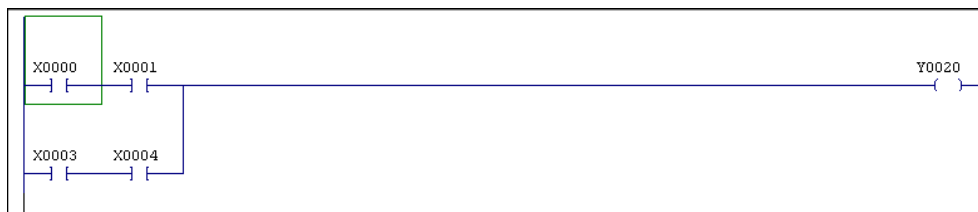


◇ When the cursor is shifted to another line, this loader automatically converts and compresses the current program.

(5) Inserting a line (inserting a blank line)

This function is used to create a blank line in a line.

(This is different from line insertion.) When creating a parallel line, it is recommended to create a blank line in advance for easy edit.

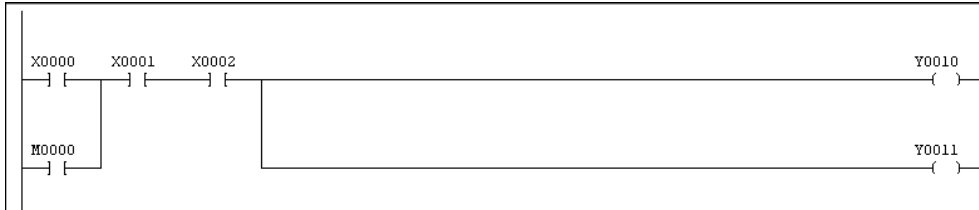


◇ Press <Alt> + <Ins> to create a blank line below the instruction line at the cursor position.

(6) Deleting a contact or coil

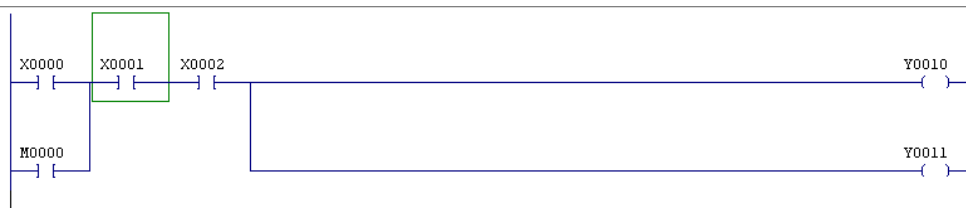
A contact or coil can be deleted by shifting the cursor to its symbol and pressing the key. However, a coil cannot be deleted from the first line of a line.

Example: Delete a contact or coil from the following line.

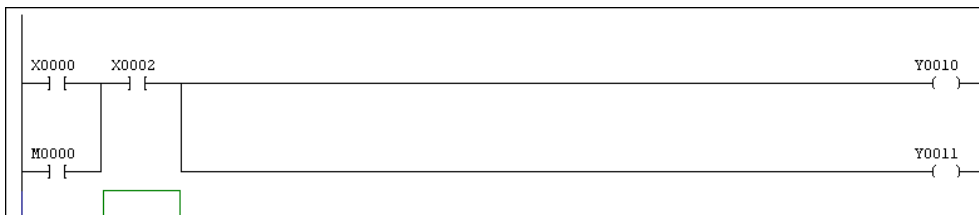


• Deleting contact X1

◇ Shift the cursor to X1.



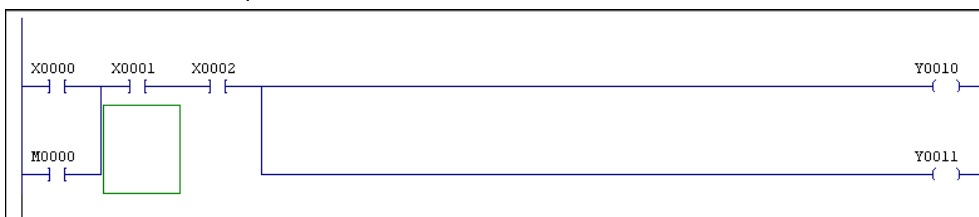
◇ Press the key to shift the cursor from the current line to another.



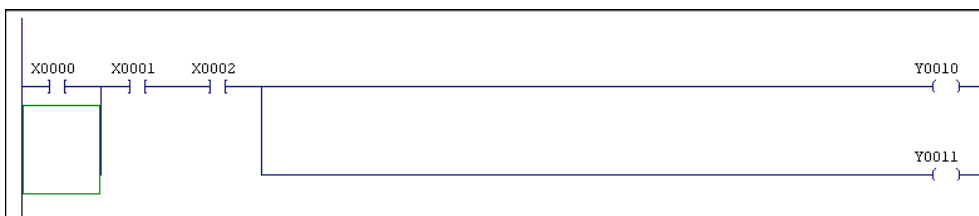
• When deleting contact M0

The connection line remains even when the key is pressed. Therefore, use the <Ctrl>, <Alt>, and arrow keys instead.

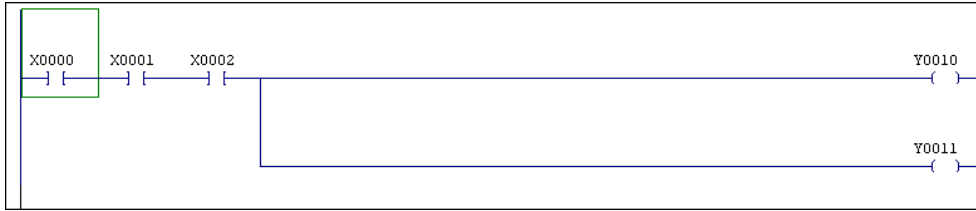
◇ Shift the cursor to the position shown below.



◇ Press <Ctrl> + <Alt> + <←> to delete M0000.

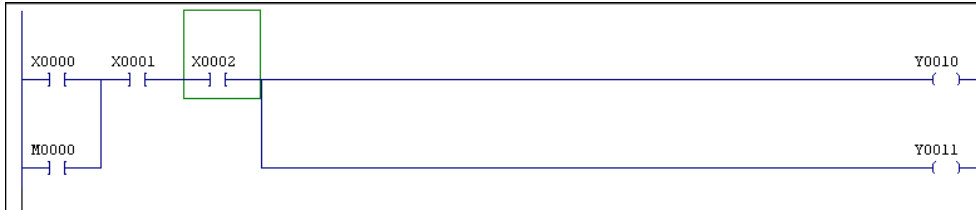


- ◇ Press <Ctrl> + <Alt> + <↑> to delete the vertical connection line.

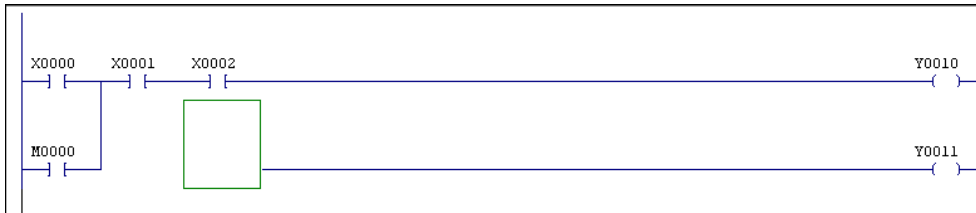


- When deleting coil Y11

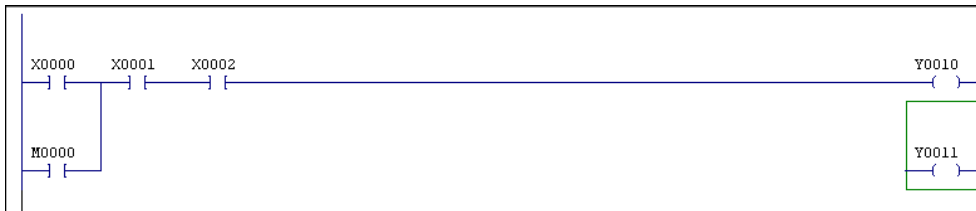
- ◇ Shift the right end of the cursor to the vertical line connection part of Y11.



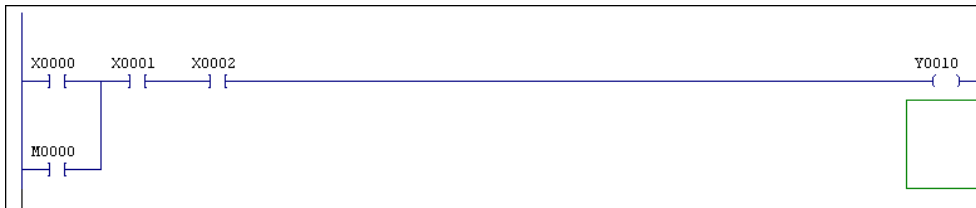
- ◇ Press <Ctrl> + <Alt> + <↓> to delete the vertical connection line.



- ◇ Press <Ctrl> + <Alt> + <→> to delete the horizontal connection line.



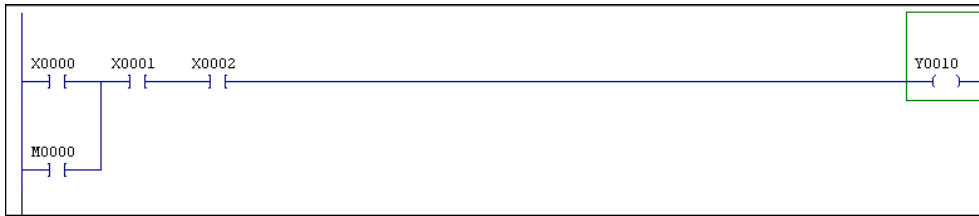
- ◇ Press the key twice.



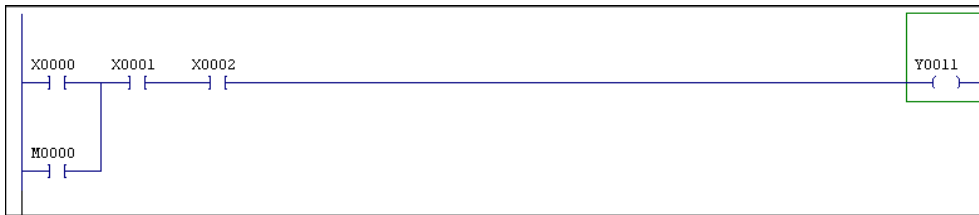
- When deleting coil Y10

Since a coil cannot be deleted directly from line 1, a coil should be deleted from line 2 and the address of the coil in line 2 is changed from Y10 to Y11.

- ◊ Delete Y11 by the procedure mentioned before.



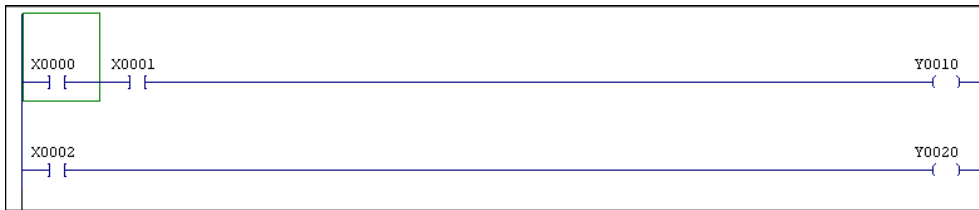
- ◊ Double-click Y10 to change the address to Y11.



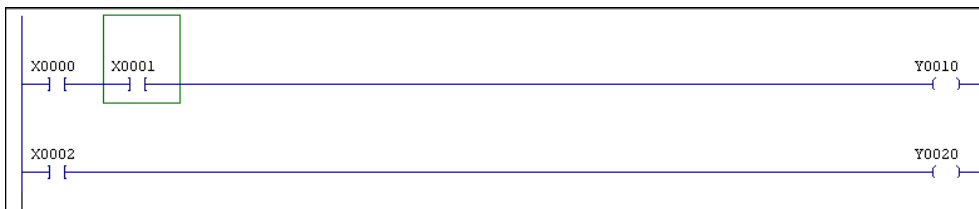
(7) Merging lines

Two independent lines can be merged into one. This is useful when connecting two independent lines vertically.

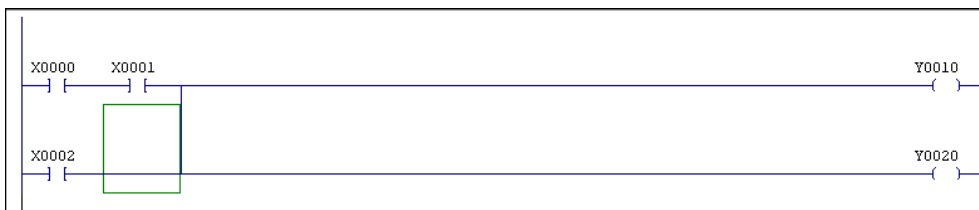
- ◊ Shift the cursor to a line to connect vertically.



- ◊ Select [Merge with Next Line] from the [Edit] menu. The line at the cursor position is merged with the one below.



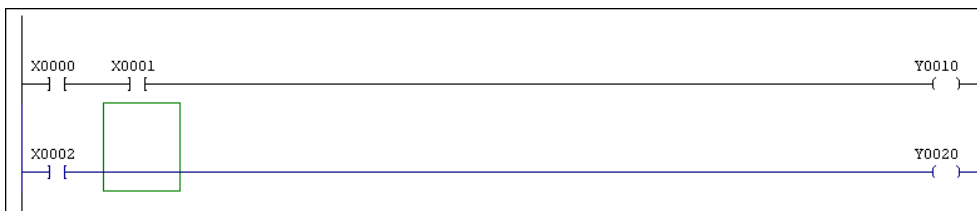
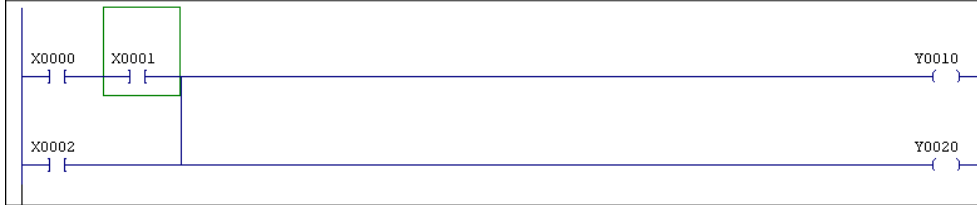
- ◊ Align the right side of the cursor with the vertical line drawing position.
- ◊ Press <Ctrl> + <↓> to draw a vertical connection line.



(8) Dividing a line

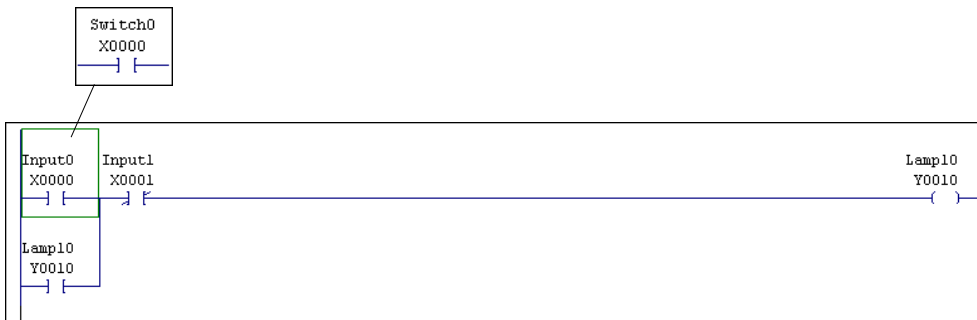
A line can be divided by erasing a vertical connection line.

- ◇ Align the right side of the cursor with the vertical connection line to erase.
- ◇ Press <Ctrl> + <Alt> + <↓> to erase the vertical connection line.
- ◇ When the cursor is shifted to another line, the current line is divide into two.

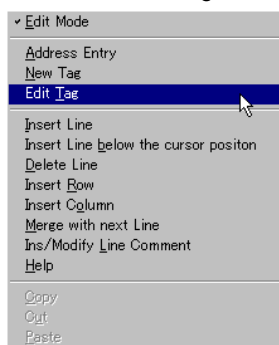


2-3-3 Changing a tag

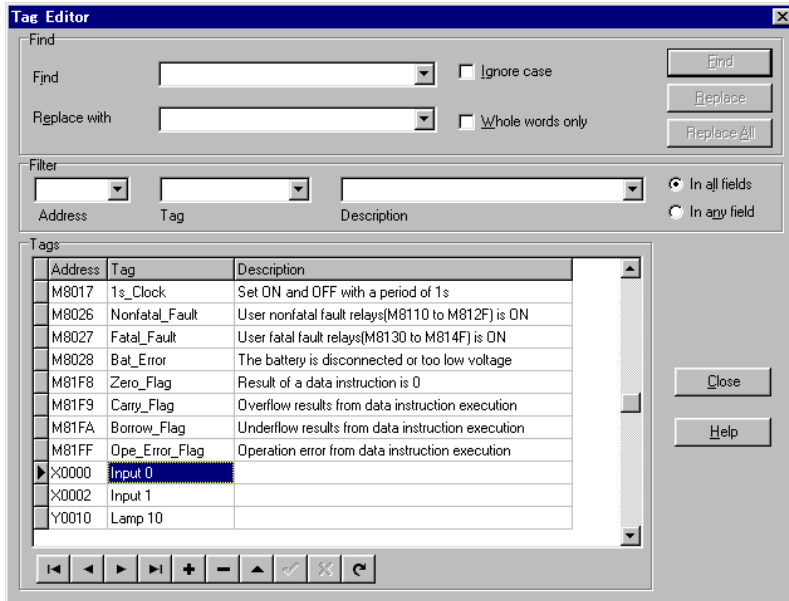
This subsection explains how to change an input tag on a ladder window.



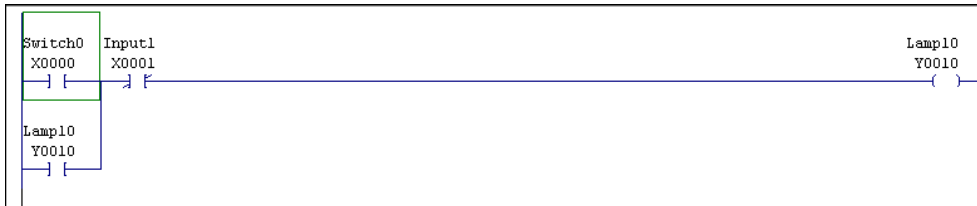
- ◇ Shift the cursor to X0000.
- ◇ Click the mouse right button to display the {Right Click} menu.



- ◇ Left-click [Edit Tag] on the {Right Click} menu.
- With the cursor at an address to change, the Tag Editor window is displayed.



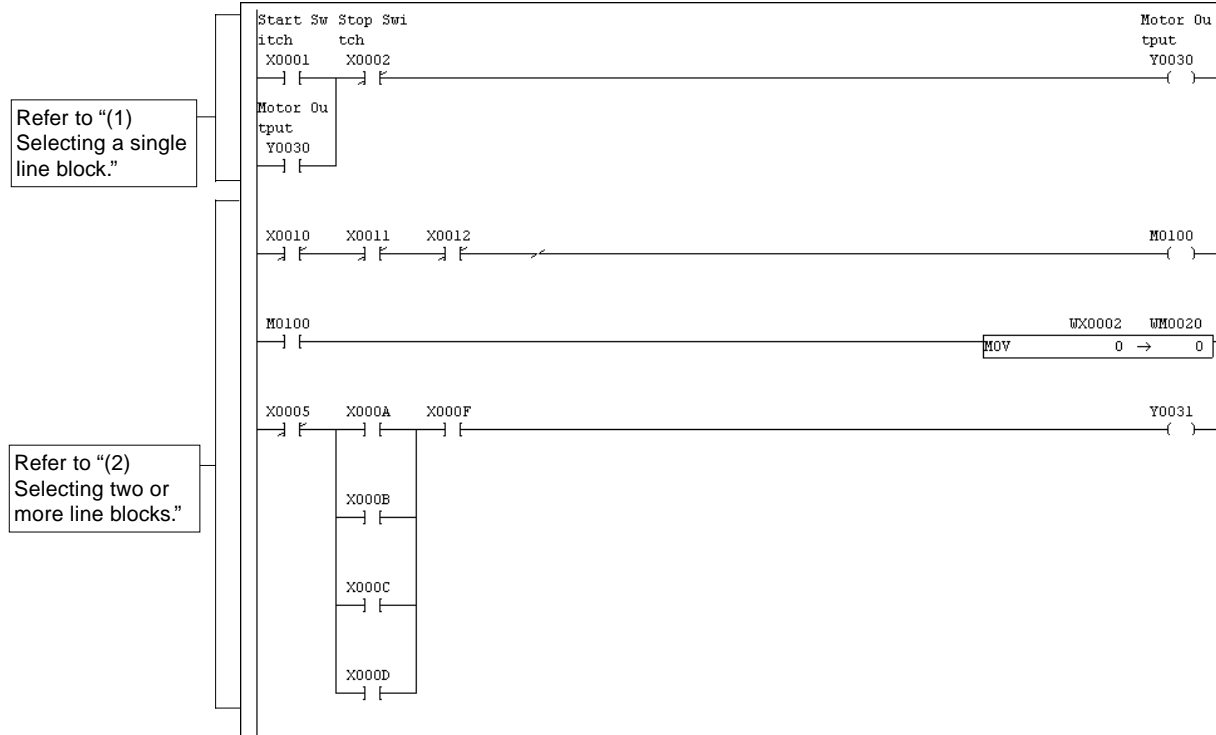
- ◇ Enter "Switch 0" into the Tag field on the Tag Editor window.
- ◇ Left-click the [Close] button to change the tag.



Here, the method of copying or cutting one or more line blocks and pasting them to some other place and the method of deleting unnecessary line blocks are explained.

2-4-1 Selecting a line block

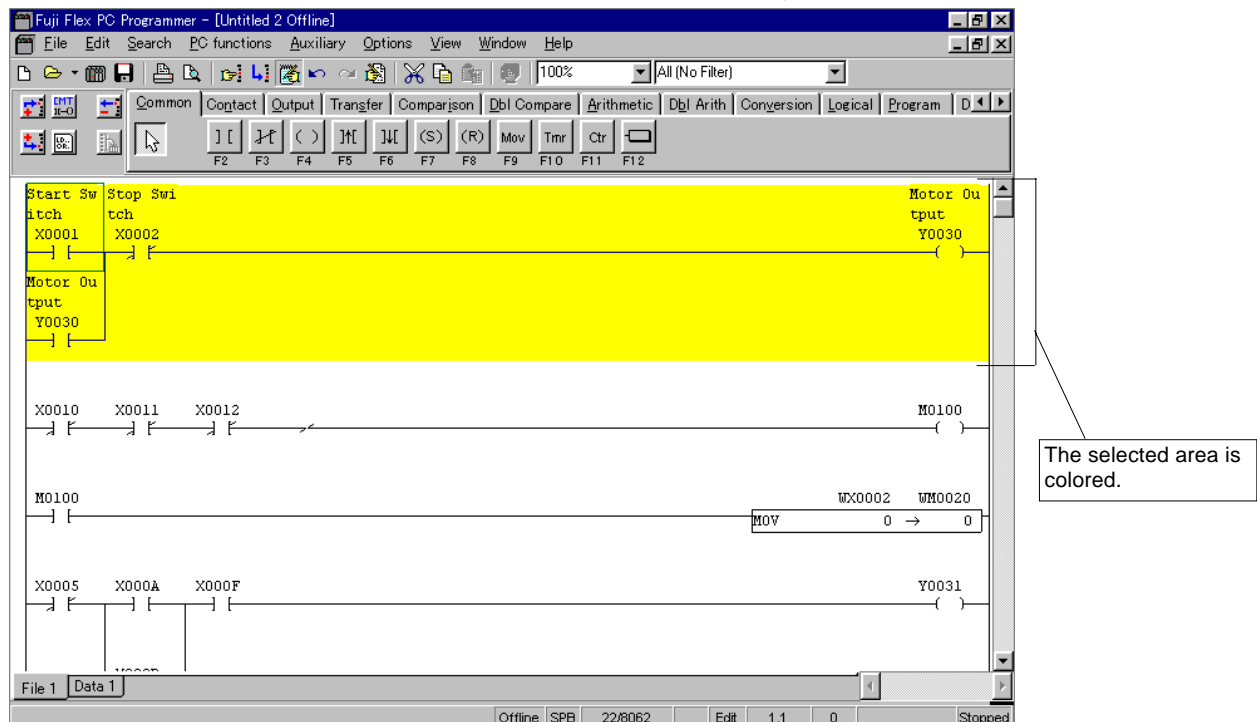
In order to copy, cut, or delete a line, it is necessary first to select a or groups of line.



(1) Selecting a single line block

- ◇ Move the cursor to the line to be selected.
- ◇ Left-click the mouse with the <Shift> key kept pressed.

The area of the selected line block is filled with a specified color. Specify a color in environment setup.

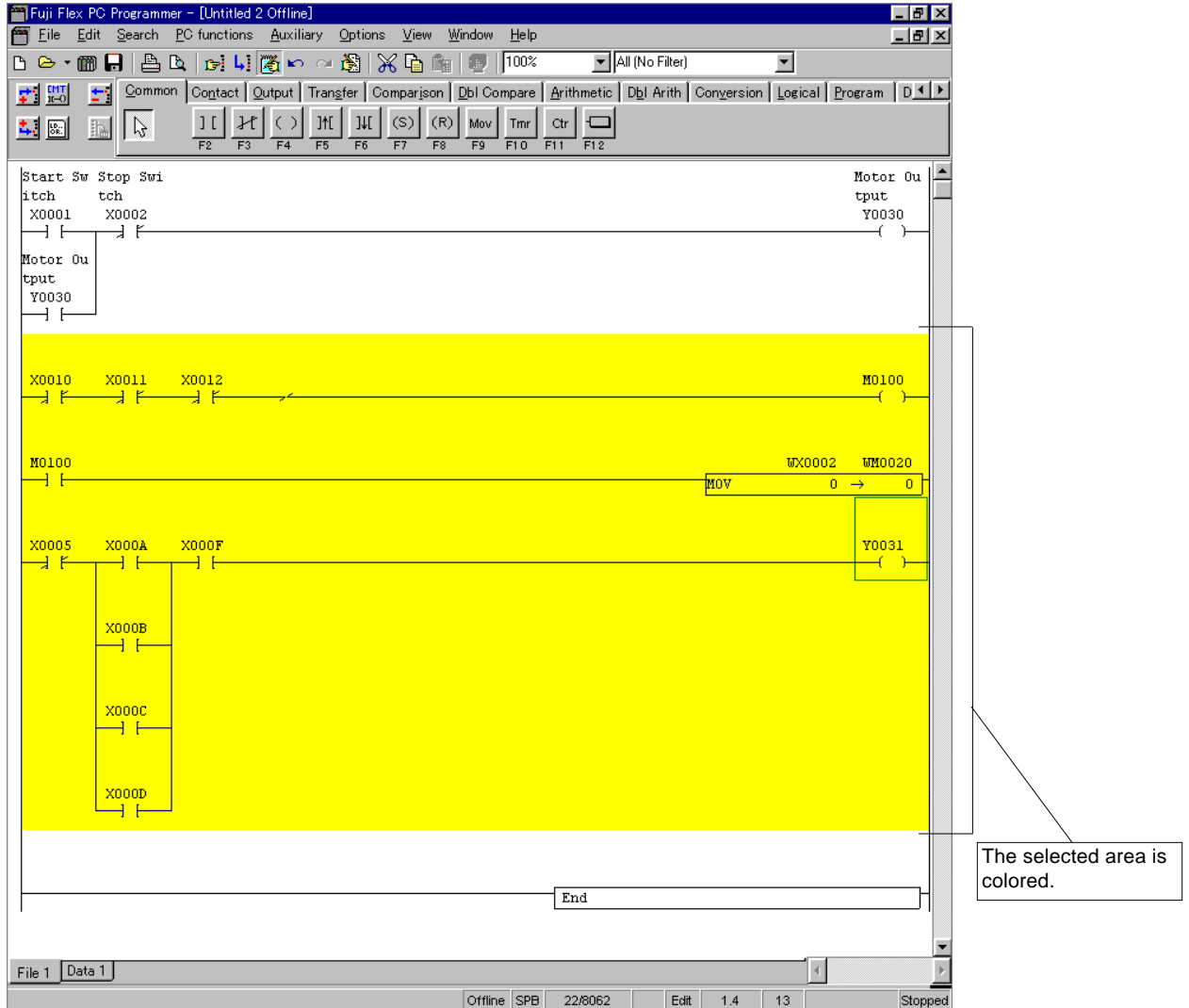


- * Releasing select status:
To deselect a selected square area, press the <ESC> key or left-click.

(2) Selecting two or more line blocks

- ◇ Move the cursor to the first one of the line blocks to be selected and left-click it.
- ◇ Using the scroll bar, let the last one of the line blocks to be selected be displayed. Then, left-click that line block with the <Shift> key kept pushed.
(When selecting a line outside the program window, press an [arrow] button while holding down the <Shift> key, <Page Up>, or <Page Down> key at the current position on the first line block to display and select the last line block.)

The selected line block is filled with a specified color.



* Releasing select status:
To deselect a selected square area, press the <ESC> key or left-click.

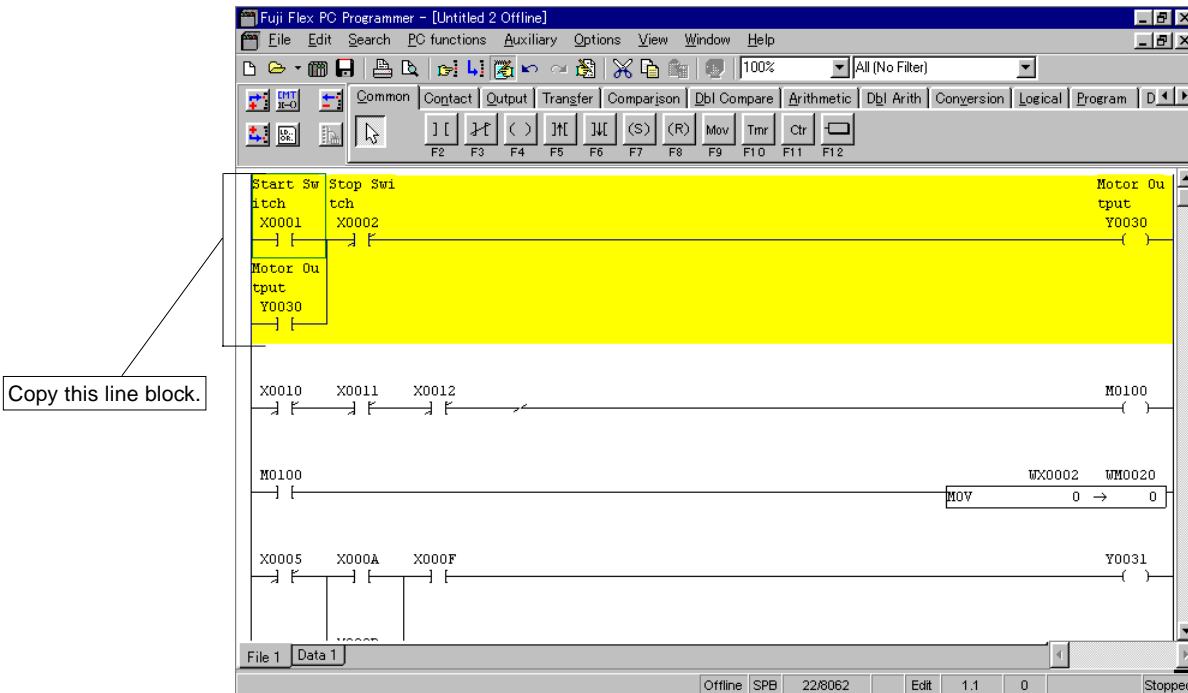



Select square area:
When selecting area, press an [allow] button while holding down <Shift> key and <Alt> key.
It is possible to copy and paste a selected square area to some other location.
To deselect a selected square area, press the <ESC> key or left-click.

2-4-2 Copying and pasting a line block

The method of copying a selected line block to the clipboard and pasting it to some other location is explained below.


(1) Copying a line block

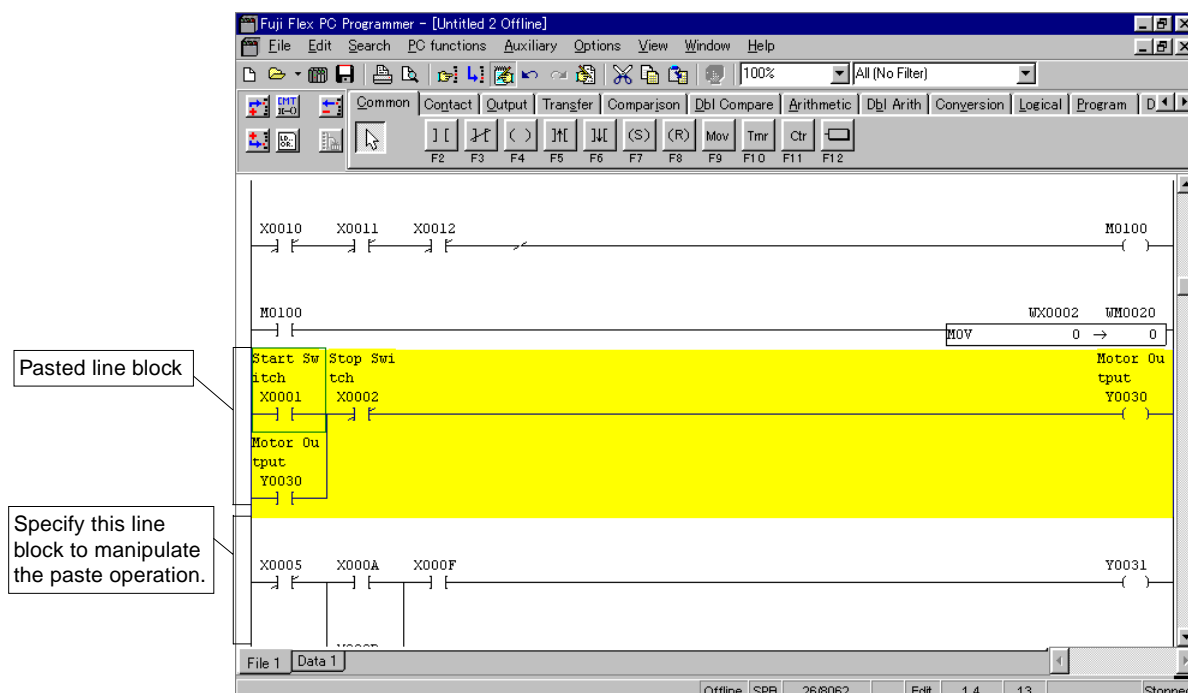


- ◇ Select a line block to be copied.
(For the method of selecting a line block, refer to “2-4-1.”)
- ◇ Left-click the  [Copy] button in the main window. (Alternatively, use the [Copy] command in the [Edit] menu or the <Ctrl> + <C> keys.)
The selected line block is copied to the clipboard.

(2) Pasting the copy of line block

The method of pasting the copy of the line block to the position shown in the following diagram is explained.

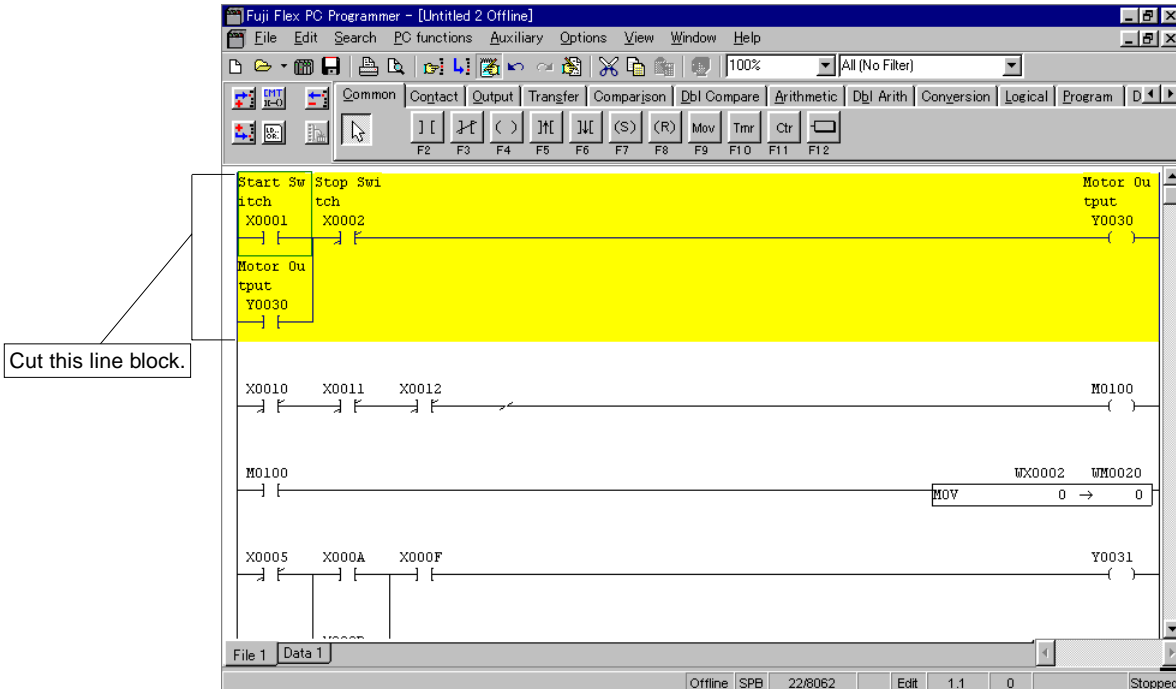
- ◇ Move the cursor to the line containing contact address “X0005” (normally closed contact), and left-click the mouse.
- ◇ Left-click the  [Paste] button in the main window. (Alternatively, use the [Paste] command in the [Edit] menu or the <Ctrl> + <V> keys.)
As shown in the following diagram, the copy of the line block is inserted before the line block at the specified paste location.



2-4-3 Cutting and pasting line block (move)

Here, the method of cutting a selected line block, copying it to the clipboard, and pasting it to some other location is explained.

(1) Cutting a line block

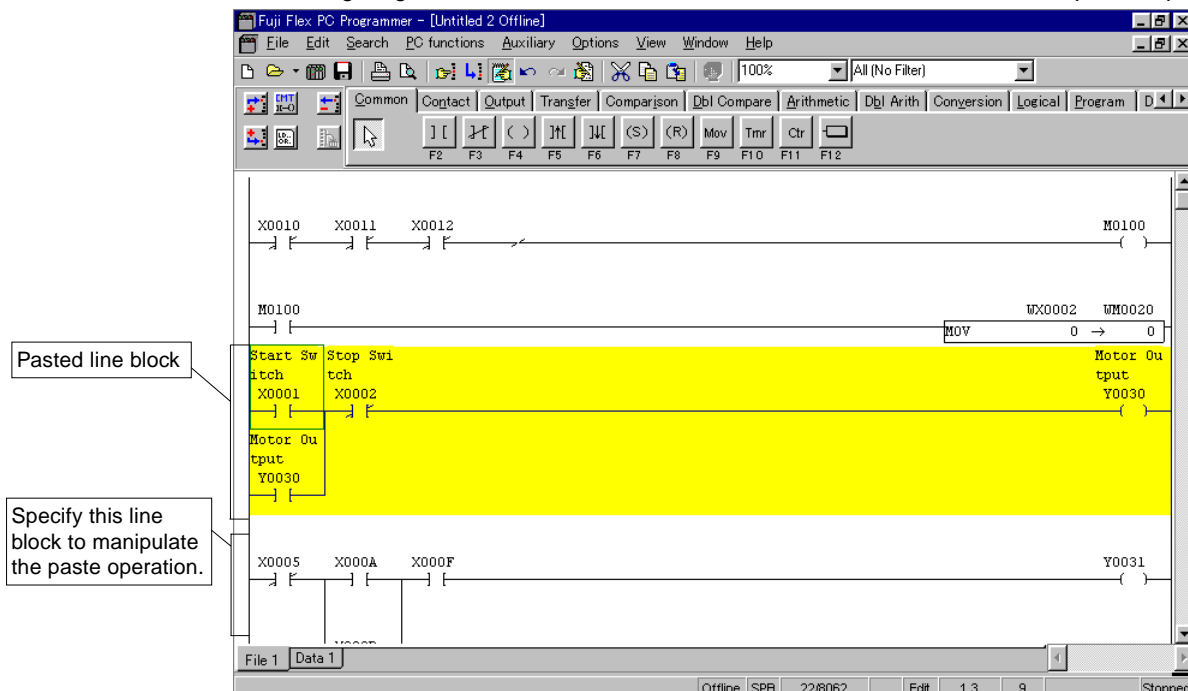


- ◇ Select a line block to be cut.
(For the method of selecting a line block, refer to “2-4-1.”)
- ◇ Left-click the [Cut] button in the main window. (Alternatively, use the [Cut] command in the [Edit] menu or the <Ctrl> + <X> keys.)
The selected line block is copied to the clipboard, and the line block in the program window is deleted.

(2) Pasting the cut line block

The method of pasting the cut line block to the location shown in the following diagram is explained.

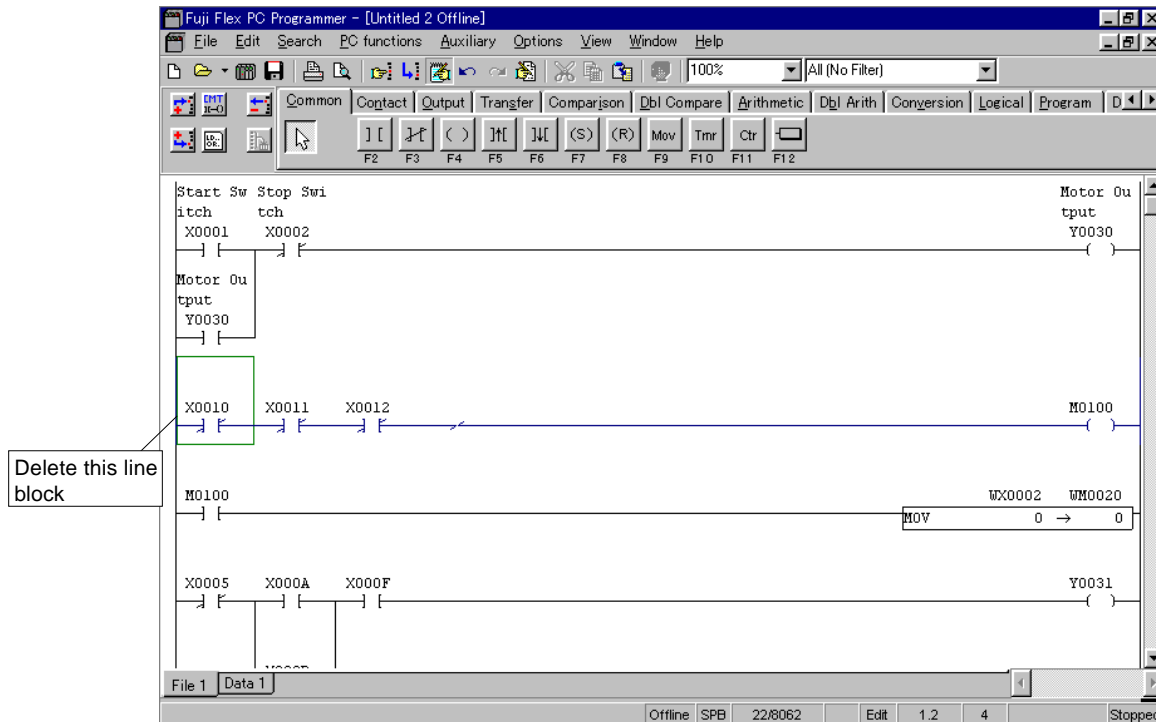
- ◇ Move the cursor to the line containing contact address “X0005” (normally closed contact) and left-click the line.
- ◇ Left-click the [Paste] button in the main window. (Alternatively, use the [Paste] command in the [Edit] menu or the <Ctrl> + <V> keys.)
As shown in the following diagram, the cut line block is inserted before the line block at the specified paste location.



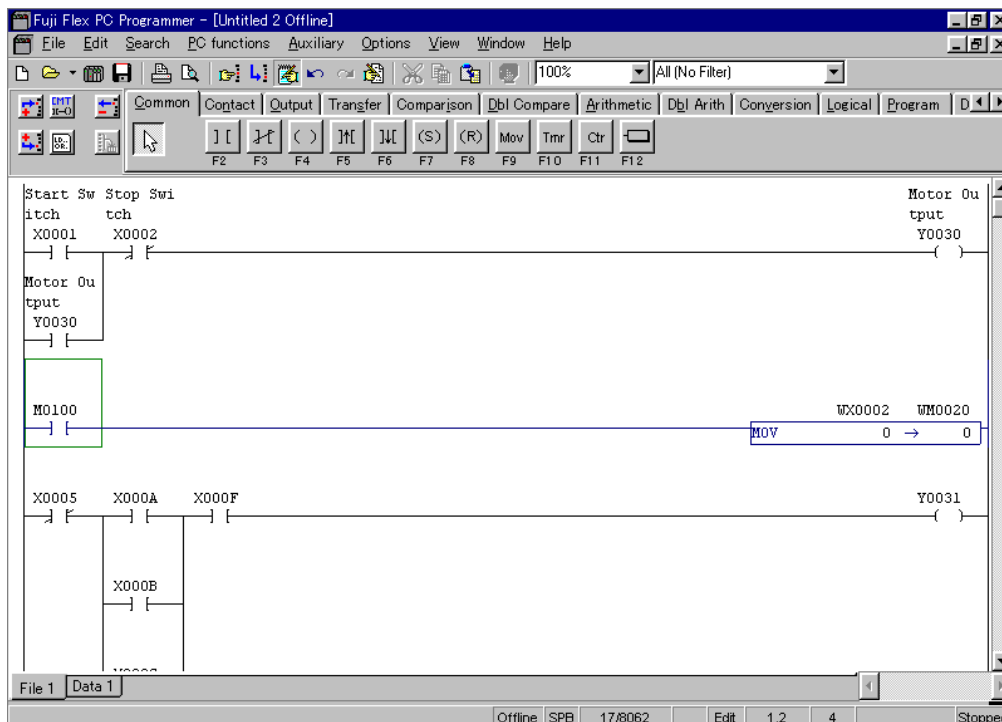
2-4-4 Deleting a line block

Here, the method of deleting a selected line block is explained.

(1) Deleting a single line block



- ◇ Move the cursor to the line block to be deleted and left-click the line block.
 - ◇ Left-click the [Delete Line] button on the [Edit Line] tool bar.
- The selected line block is deleted.



(2) Deleting two or more line blocks at a time

For the method of deleting two or more line blocks at a time, refer to “2-4-3 Cutting line blocks.”

There are two methods for preparing tags. One is using the {Tag Editor} dialog box that is displayed after the entry of an instruction address during program editing. The other is using the {Tag Editor} window explained below.

2-5-1 Outline of Tag Window

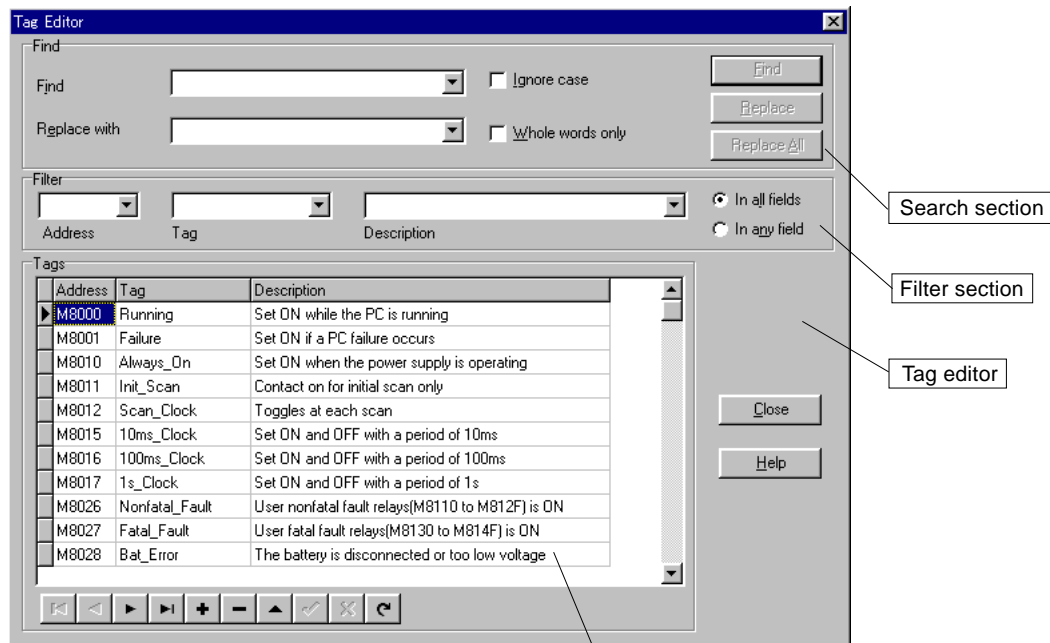
The {Tag Editor} window consists of a search section for search and replacement, a filter to limit the objects of display and edit, and a tag editor.

The {Tag Editor} is capable of directly editing address/tag data bases. This editor can be used only when the program window is in the Edit mode.

<Getting the Tag Editor to be displayed>

- ◊ Left-click the  [Tag Editor] button or select the [Tag Editor] command from the [Auxiliary Functions] menu in the main window.

The {Tag Editor} window is displayed.

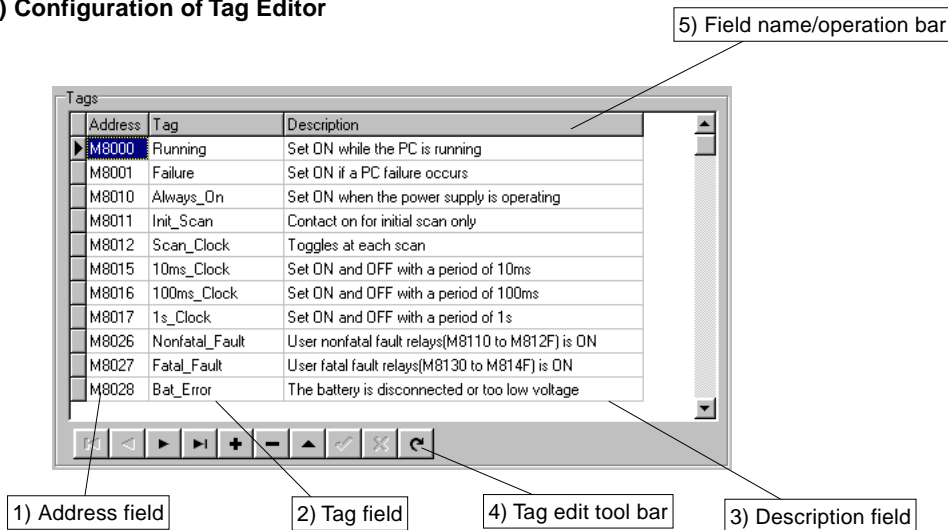


{Tag Editor} window in initial state

2-5-2 Operation with Tag Editor

Here, the controls and fields on the tag Editor and the method of editing records (contents of records) are explained.

(1) Configuration of Tag Editor



1) Address field

"Addresses" of the PC memory are described in this field. Describe "addresses" within the PC memory capacity.

2) Tag field











"Tags" are described in this field. Each tag must be within 16 characters in length. For a tag, do not use a comma (,), quotation marks (" and "), period (.), half-size numerals only, or address itself.

If <Permit identical tag> is enabled in environment setup, the same tag can be set with a different address.

3) Description field

"Descriptions" are described in this field. Each description must be within 50 characters in length. The comma (,) cannot be used in descriptions. Any commas in a description are automatically deleted when the description is added to the data base.

4) Tag edit tool bar

	[First record]	Moves the cursor to the first record in the data base.
	[Prior record]	Moves the cursor to the prior record in the data base.
	[Next record]	Moves the cursor to the next record in the data base.
	[Last record]	Moves the cursor to the last record in the data base.
	[Insert record]	Inserts a blank record right in front of the record at which the cursor is positioned.
	[Delete record]	Deletes the record at which the cursor is positioned. Before the record is deleted, the {Confirm} dialog box is displayed.
	[Edit record]	Sets the record at which the cursor is positioned in the Edit mode to enable the record to be edited.
	[Post edit]	Registers the record that is being edited. The record is registered after it is confirmed that the record contains both an address and a tag, that the address format is valid, and that there is no tag duplication.
	[Cancel edit]	Cancels the Edit mode and resets the record in the pre-edit state.
	[Refresh data]	Refreshes the record displayed from the data base.

5) Field name/operating bar

Displays field names. It also has the following functions.

<Changing field width>

To change the field width, move the cursor to any of the boundary lines between Address, Tag, and Description, and shift it right or left with the left button of the mouse kept pushed.

Address	Tag	Description
M8000	Running	Set ON while the PC is running
M8001	Failure	Set ON if a PC failure occurs

<Changing order of display of fields>

Move the cursor into any of the frames of Address, Tag, and Description, and shift the frame right or left with the left button of the mouse kept pushed.

Address	Tag	Description
M8000	Running	Set ON while the PC is running
M8001	Failure	Set ON if a PC failure occurs

While holding down the mouse left button, shift the cursor.

Tag	Address	Description
Running	M8000	Set ON while the PC is running
Failure	M8001	Set ON if a PC failure occurs

(2) Inserting a new tag

- ◊ Left-click the **+** [Insert record] button on the tag editor tool bar or push the <Insert> key. A blank record is inserted.

The screenshot shows the Tag Editor window with a table of tags. A new record, 'Always_On', has been inserted and is highlighted in blue. A callout box points to this record with the text 'Newly inserted record'.

Tag	Address	Description
Running	M8000	Set ON while the PC is running
Failure	M8001	Set ON if a PC failure occurs
Always_On	M8010	Set ON when the power supply is operating
Init_Scan	M8011	Contact on for initial scan only
Scan_Clock	M8012	Toggles at each scan
10ms_Clock	M8015	Set ON and OFF with a period of 10ms
100ms_Clock	M8016	Set ON and OFF with a period of 100ms
1s_Clock	M8017	Set ON and OFF with a period of 1s
Nonfatal_Fault	M8026	User nonfatal fault relays(M8110 to M812F) is ON
Fatal_Fault	M8027	User fatal fault relays(M8130 to M814F) is ON

- ◊ Enter addresses, tags, and descriptions.
The <Tab> key can be used to shift from the address to the tag to the description. The entry of a description may be omitted. However, be sure to enter an address and a tag before the record is registered in the data base. Each time a new record is registered, the records in the data base are automatically sorted (rearranged) in order of address.

2-5-3 Find and replacement using the tag editor

(1) Find section

Enter an address or tag into the [Find] text box for search.

The address or tag entered into the [Find] text box is searched.

The address or tag entered into the [Replace with] text box is replaced.

When the [Ignore Case] check box is set to ON, an address or tag is searched by ignoring uppercase and lowercase.

When the [Whole words only] check box is set to ON, a text is extracted with a half-size space or comma or ASCII code other than A-Z (a-z) as a delimiter code address and searched as a word.

2-5-4 Tag editor filter

(1) Configuration of the filter section

Depending on the input contents of each text box, the tag editor displays only specified objects for edit.

2-5-5 Reading a tag text file

A text file (file extension: *.txt or *.csv) prepared by a word processor, data base application program, etc. can be imported as tag data.

* CSV-format data

CSV (Comma Separated Value) refers to text data, each data item of which is separated by a comma (,).

(1) Text file format

For a text file to be input as tag data, it is necessary to describe each of its lines in the following format.

1) Text format

[Address],[Tag],[Description],[CR/LF]

- For [Address], describe a valid PC address (e.g., X0, Y0010, M20, C15, etc.).
- For [Tag], describe a tag which does not exceed 24 characters in length.
If it exceeds 16 characters in length, only 16 characters are input from the first character. A duplicate tag name is ignored.
- For [Description], the entry of a description may be omitted. When entered, the description must not exceed 50 characters in length.
- [CR/LF] refers to carriage return. Be sure to put a [CR/LF] at the end of each line.



A tag cannot be read on an address to which a tag has already been assigned.
Before loading a tag, delete the existing tag using a tag editor.

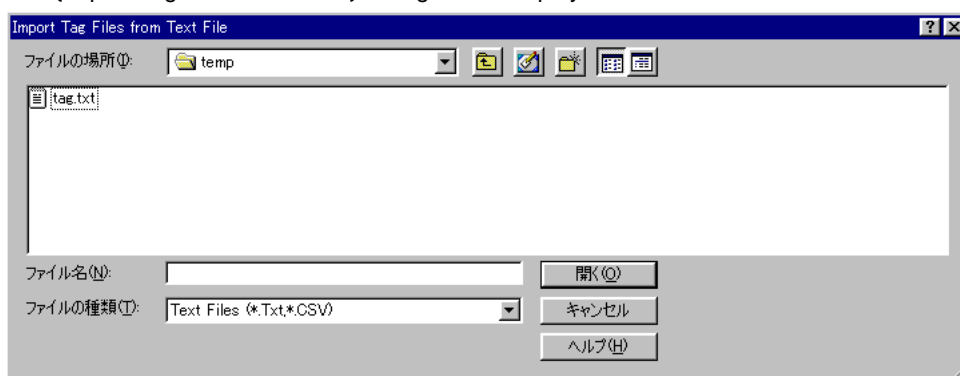
2) Example of description of text data

```
X0000, Start_Switch      ,
X0010, Conveyer_No1 Output, Mg-Switch1 ON
X0011, Conveyer_No2 Output, Mg-Switch2 ON
X0012, Conveyer_No3 Output, Mg-Switch3 ON
X0020, Stop_Switch      ,
X0021, Emergency_stop   ,
M0100, STA_conditions_1 ,
[EOF]
```

An example of display on the program when the above text data is input as tag data is given later in “(3) Display of tag after input to file.”

(2) Importing text file

- ◇ Open the program (file) to which the text data is to be input.
- ◇ Select the [Import Tag File...] command of the [Documentation] from the [Auxiliary] menu.
The {Import Tags from text Files} dialog box is displayed.

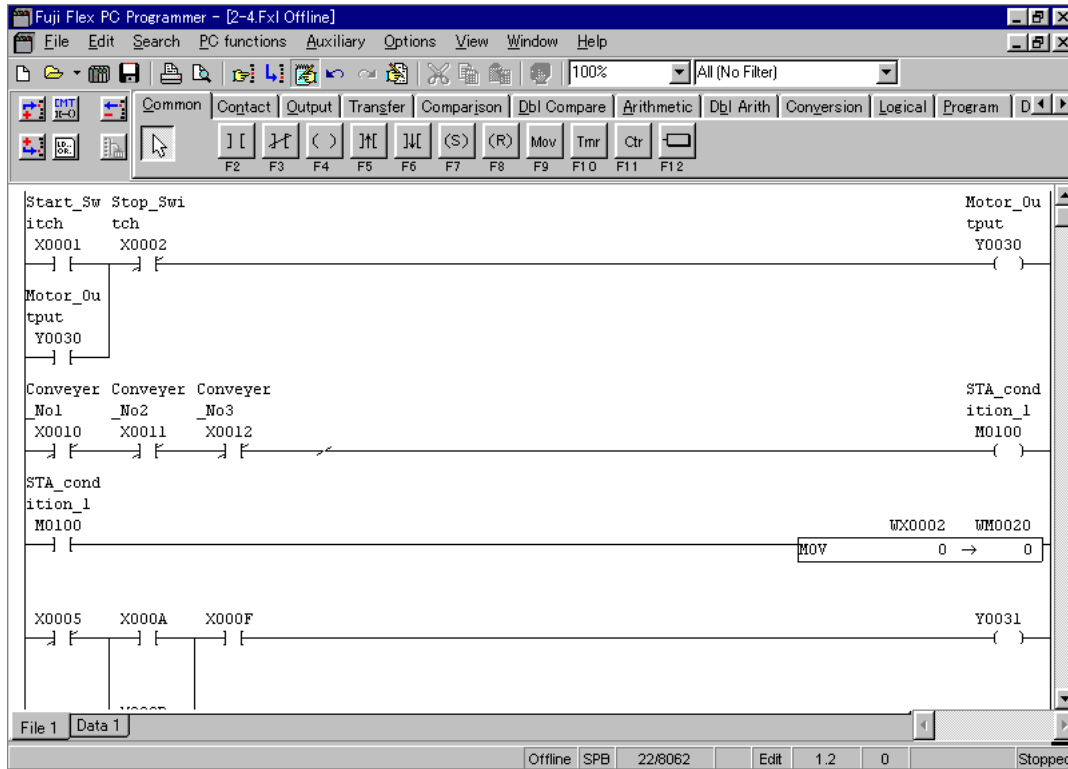


- ◇ Select a drive and a folder to which the file is to be saved from the [Look in] list box.
- ◇ Select from or enter in the [File name] list box a text filename to be input.
- ◇ Left-click the [Open] button.
The text file (data) is input to the specified tag file.

(3) Display of tag after inporting text file

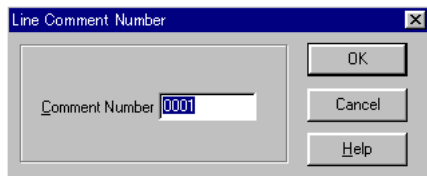
Tag imported from text file are immediately displayed in ladder display. (provided that "tag display" in editor setting in the environment setting session is valid).

An example of display is given below.

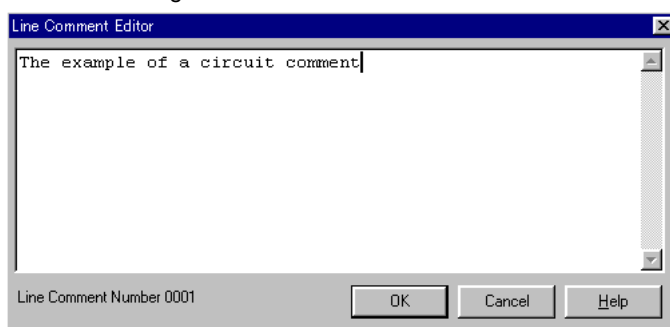


A line comment can be used as an explanation of each line in a ladder program.
A line comment can be edited only when the program window is in Edit mode.

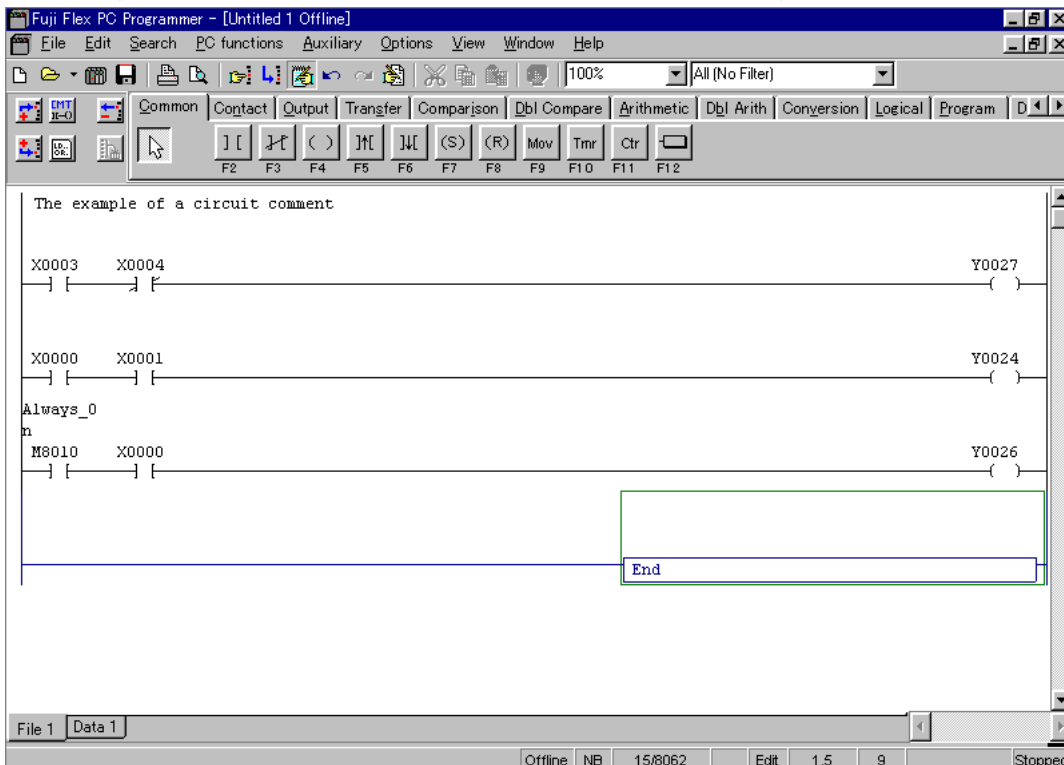
- ◇ In Edit mode, shift the cursor to a line to edit its comment.
- ◇ Select the [Insert/Modify Line Comment] command from the [Edit] menu.
If the line has no comment, the {Line Comment Number} dialog is displayed. The Comment No. text box displays an unused line comment number in default. An arbitrary number may be entered.



- ◇ If the line has a comment, left-clicking the [OK] button on the Line Comment No. dialog displays the Edit Line Comment dialog.



- ◇ Enter a line comment into the text box and left-click the [OK] button.
The display returns to the ladder window and the line comment is displayed.



If the cursor is at the current or next comment line, the line comment can be modified.
Execute the [Insert/Modify Line Comment] command to display the {Line Comment Editor} dialog for modifying a line comment.
A line comment is saved at a selected place in the ladder program as a line comment instruction containing a line comment number. Since a line comment is regarded as an instruction, a step is used and a line number is counted. The line comment number is displayed and used to refer to a text in the comment file.

Irrespective of the locations, unused line comment numbers are automatically assigned in ascending order. If a used number is entered, the text of the same number is displayed.

<Using the same line comment number>

- ◇ Create a line comment for 1) at “Line comment No. 002.”
 - ◇ When the “Line Comment No.” dialog is displayed at 2), enter “0002” into the Comment No. text box.
 - ◇ The same text as the line comment at 1) is displayed.
- Since the line comments of 1) and 2) share the same line comment number, the alteration of either contents also changes to the other.

```

The example of a circuit comment

X0003   X0004                               Y0027
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
The comment sentence of the circuit comment number 0002

X0000   X0001                               Y0024
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
The example of a circuit comment
Always_0
n
M8010   X0000                               Y0026
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|


```

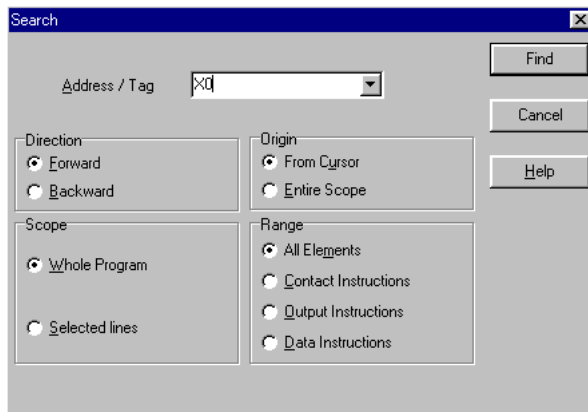
When the [OK] button on the {Line Comment Editor} dialog is clicked, the line comment is saved into the comment file.

2-7-1 [Address/Tag] Find function

The method of retrieving an instruction address and a tag in the program being displayed in the program window is explained below.

(1) First retrieval

- ◇ Get the appropriate program to be displayed in the program window.
- ◇ Left-click the  [Find] button or select the [Find] command from the [Search] menu.
The {Search} dialog box is displayed.



- ◇ Enter an address or a tag name in the [Address/Tag] text box and left-click the [Find] button to start the search operation.
When the address (or tag name) is found, the associated line is displayed at the top of the screen. Since the dialog box remains the same, press the [Find] button for the next search. If it is not found, the message "Search item not found" is displayed in the message box.
This find function searches for only a character string which completely coincides with the input character string.

<Explanation of the {Search} dialog box>

Direction:

Either "Forward" (search from the beginning of the scope of search toward the end) or "Backward" (search from the end of the scope of search toward the beginning) can be selected.

Origin:

This option specifies the starting point of search. As the starting point, either "From Cursor" or "Entire Scope" can be specified.

Scope:

This option specifies the scope of search.

- Whole Program: This is the default, searching the entire program.
- Selected Lines: Only a previously selected line block is searched. For the method of selecting a particular line block, refer to "2-4-1 Selecting a line block."

Range:

This option specifies an instruction to be searched for.

- All Elements: All instructions are searched for.
- Contact Instructions: Only contact instructions are searched for (normally open contact and normally closed contact).
- Output Instructions: Only output instructions are searched for (normal Output/Set/Reset/Rising Differentiation Output/Falling Differentiation Output).
- Data instructions: Searches all instructions not contained in the above contact and output instructions.

(2) Succeeding search


This item is used, after searching for an address or a tag name using the [Search] command explained in {(1) First search}, to search for the same address or tag name. The search options that have been selected in the [Search] command remain valid. The search operation is started from the last address or tag name that has been found.

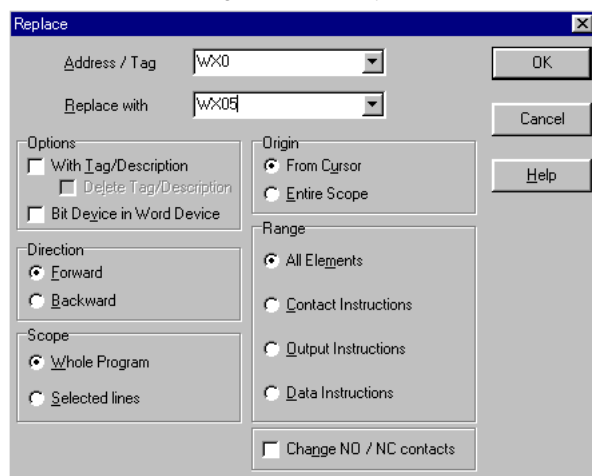
- ◇ By selecting the [Search Next] command from the [Search] menu, it is possible to continue the search operation.

2-6-2 [Address/Tag] Replace function

The method of searching for an instruction address and a tag name in the program being displayed in the program window and replacing them with any specified character strings is explained below.

The Replace function can be used only when the program window is in the Edit mode.

- ◇ Get the appropriate program to be displayed in the program window.
- ◇ Left-click the  [Edit] button or select the [Edit Mode] command from the [Edit] menu. The program window enters the Edit mode.
- ◇ Select the [Replace] command from the [Search] menu. The {Replace} dialog box is displayed.



- ◇ Enter the address or tag to be replaced in the [Address/Tag] text box.
- ◇ Enter the new replacement address or tag in the [Replace with] text box.
- ◇ Left-click the [OK] button to start the replace operation. When the replace operation is completed, the {Information} dialog box is displayed and the number of replaced addresses or tags is displayed.

<Explanation of the {Replace} dialog box>**Items related to search:**

For the explanation of the search options (direction, scope, origin, target), refer to "2-6-1 [Address/Tag] Search function."



Several addresses can be replaced simultaneously if a range of old addresses is specified using a hyphen (ex. X10-X2F).

Replace option :

This item is effective only when the entire program is to be searched for.

When [With Tag/Description] is selected, the tag is changed at the same time as the address. The tag name of the address before replacement remains the same.

When [Delete Original] is selected, the tag name of the address before replacement is deleted.

<Example of simultaneous tag change>

When replacing address WB0 with WB50, processing is performed as follows:

(Before replacement)

Address	Tag
WX0	Analog 0CH
WX50	Reserved

This tag is changed

Delete Original not selected

(After replacement)

Address	Tag
WX6	Analog 0CH
WX50	Analog 0CH

Delete Original selected

Address	Tag
WX0	Deleted
WX50	Analog 0CH

When [Bit Device in Word Device] is selected, the bit addresses corresponding to the changed word address are changed simultaneously.

Replace All A/B-Contacts:

This option replaces all NO and NC contacts of specific addresses in the specified scope. When this option box is checked, the [Replace] text box is hidden. Here, enter the address in the [Address/Tag] text box. All instructions of NO and NC contacts are replaced.

Key-point

Address replacement

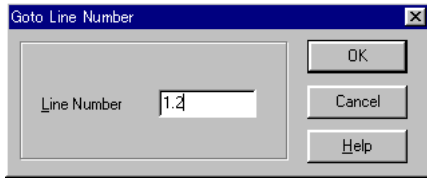
All specific addresses in a specified scope are replaced with different addresses. Enter the address to be replaced in the [Address/Tag] text box, and enter the replacement address in the [Replace with] text box. A bit address can be only replaced with another bit address, and a word address can be only replaced with another word address. As the bit address/word address to be replaced, either an address or a tag may be entered. During the replace operation, the system checks whether or not the replacement address can be used for the instruction to be executed. If the replacement address cannot be used, the replace operation is not performed.

- | | | | | | | |
|-------------------------|---|-----------------------|--|----------------|---|--------------|
| ¥ Bit address | → | Bit address | | ¥ Bit address | → | Word address |
| ¥ Word address | → | Word address | | ¥ Word address | → | Bit address |
| ¥ Tag | → | Address
(bit/word) | | | | |
| ¥ Address
(bit/word) | → | Tag | | | | |

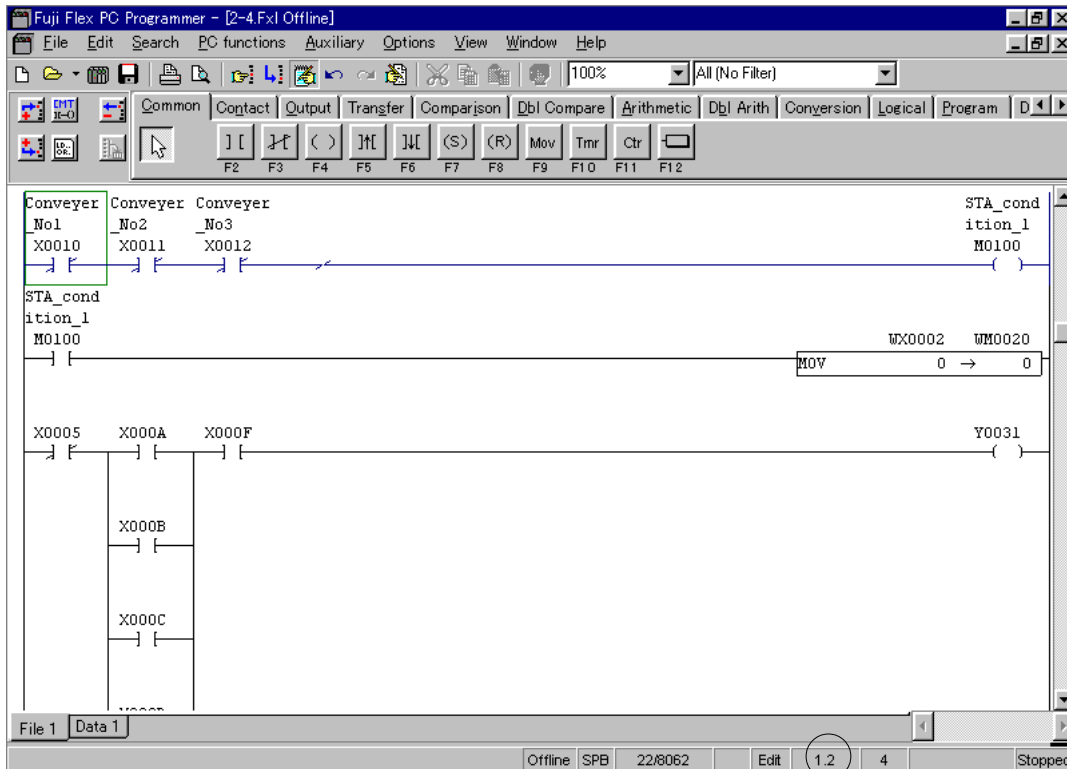
2-7-3 Line Search function

This function searches for the program of any specified line number and displays it at the top of the screen.

- ◇ Select the [Go to Line Number...] command from the [Search] menu.
The {Go to Line Number} dialog box is displayed.



- ◇ Enter the line number to be searched for in the [Line Number] text box.
- ◇ Left-click the [OK] button.
The specified line is displayed at the top of the screen.



Specified line number

Specified lines can be fetched and registered as a library for use when necessary.

2-8-1 Library registration function

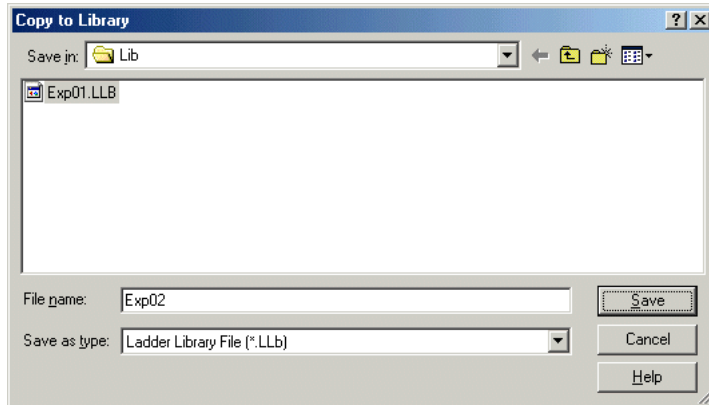
This subsection explains how to register specified lines in a library.

The library registration function can be used only when the [Edit Mode] button is ON and a ladder program is selected.

This function is executed on lines (single or multiple lines, excluding some lines). When registering lines in a library, a line block should be selected first.

See 2-4-1 for selecting a line block.

- ◇ When an object line block is selected, select the [Copy to Library] command from the [Edit] menu. The {Copy to Library} dialog box is displayed.




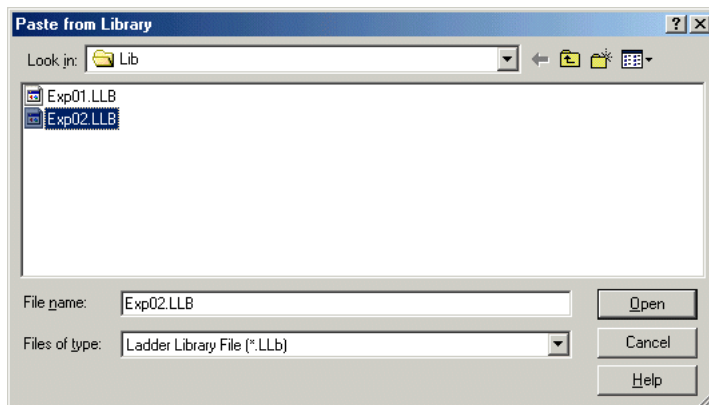
- ◇ Select a save-to drive or folder or create a new folder in the [Save in] list box.
- ◇ Select or enter a save-to library file name in the [File name] text box.
- ◇ Left-click the [Save] button.
The selected line block is saved in the file. The file extension is 'LLB'.

2-8-2 Library read function

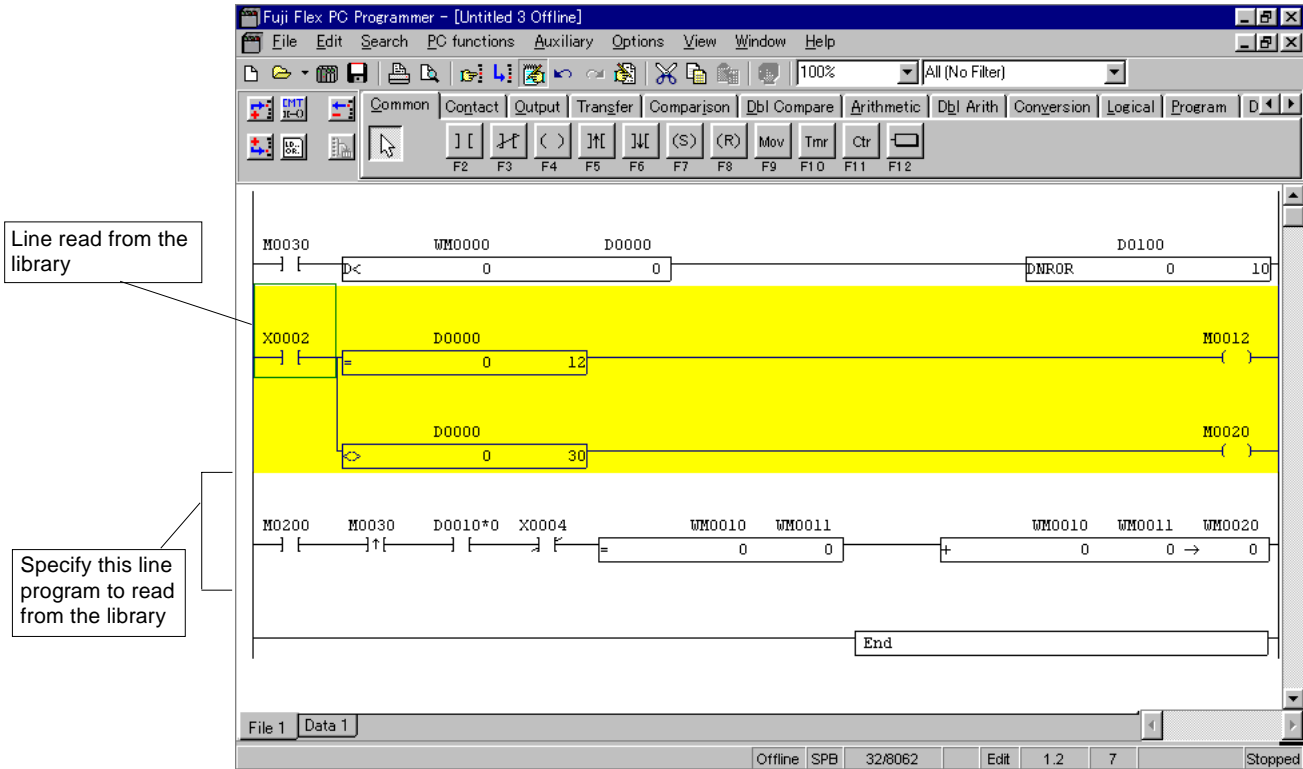
This subsection explains how to paste a registered line from a library to a ladder program.

The library read function can be used only when the program window is in Edit mode.

- ◇ Display an object program on the window to paste lines from the library.
- ◇ Left-click the  [Edit] button or select the [Edit Mode] command from the [Edit] menu.
The program window changes to Edit mode.
- ◇ Shift the cursor to the line below the line paste position.
- ◇ Select the [Paste from Library] command from the [Edit] menu.
The {Paste from Library} dialog box is displayed.



- ◇ Select a save-to drive or folder or create a new folder in the [Look in] list box.
 - ◇ Select or enter a save-to library file name in the [File name] text box.
 - ◇ Left-click the [Open] button.
- The selected line is pasted from the library.



A line just pasted is in the selected status.

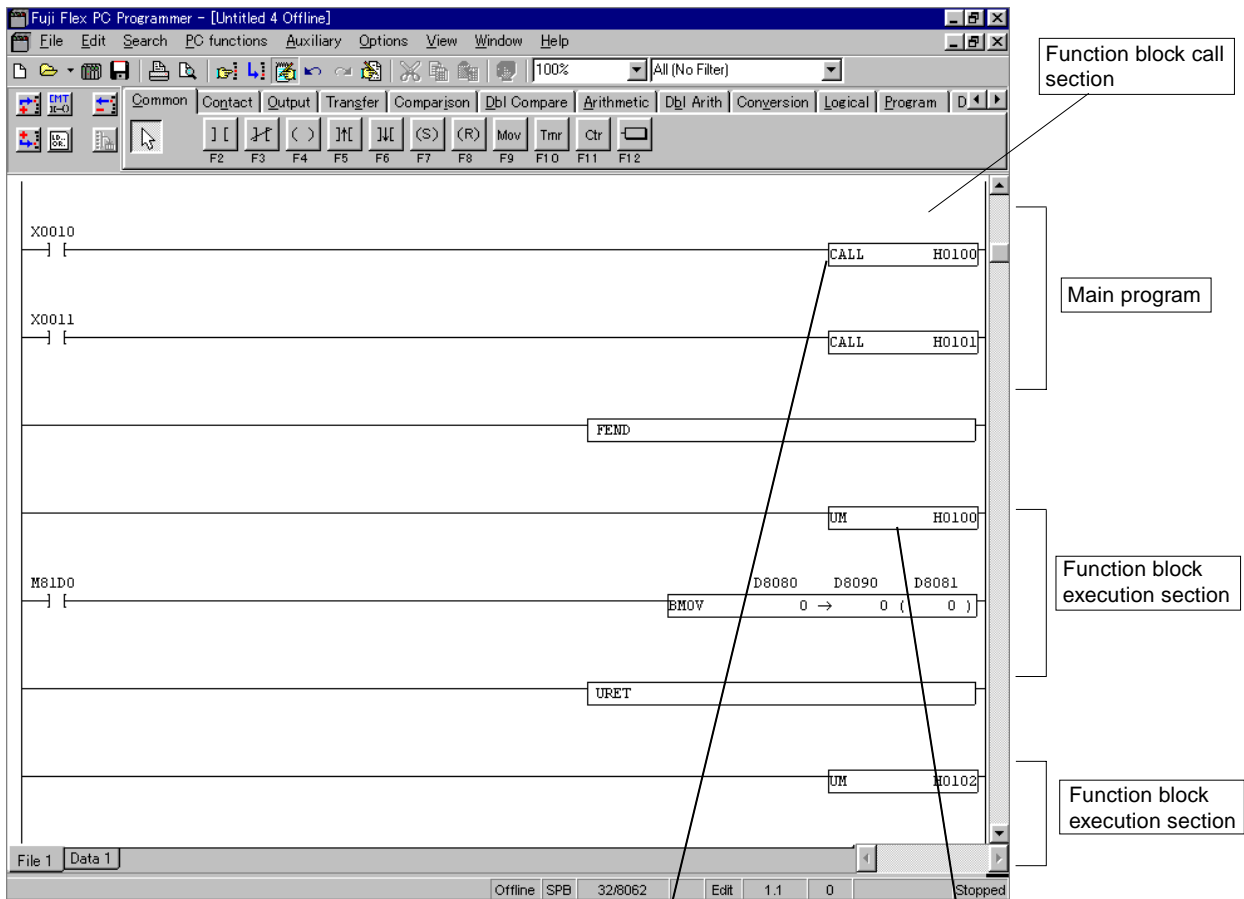
A function block (User Macrocommand) makes a user-created program available as a subroutine. A created function block can be saved in a function block library or called for user by another program. For using function block instructions, refer to “User Macrocommand Manual LEH943.”

2-9-1 Outline of function block (User Macrocommand)

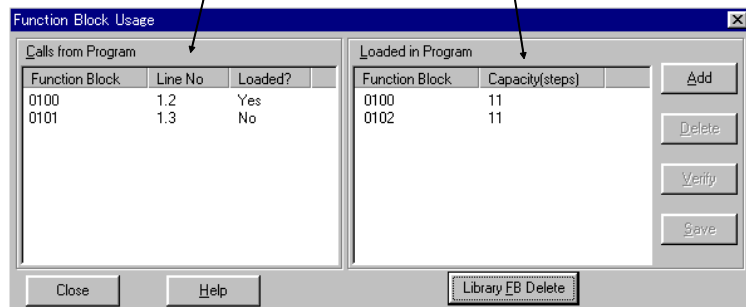
(1) Describing a function block and displaying function block information

A function block is described in a program as a function block call section and function block execution sections.

1) Edit window



2) Function block information display



- ◇ Set the program window to Edit mode.
- ◇ Select the [Function Block...] command from the [PC Functions] menu. The {Display Function Block Information} dialog box is displayed.

The [Call Function Block] command lists all function blocks called by the CALL instruction in a ladder program. These are displayed in their order in the program. This list also displays the function block number called by the CALL instruction, the line number where the CALL instruction is written, and whether the function block is loaded in the user program (Yes/No). If a CALL instruction is issued to a function program not loaded, an error occurs and the PC does not start up.



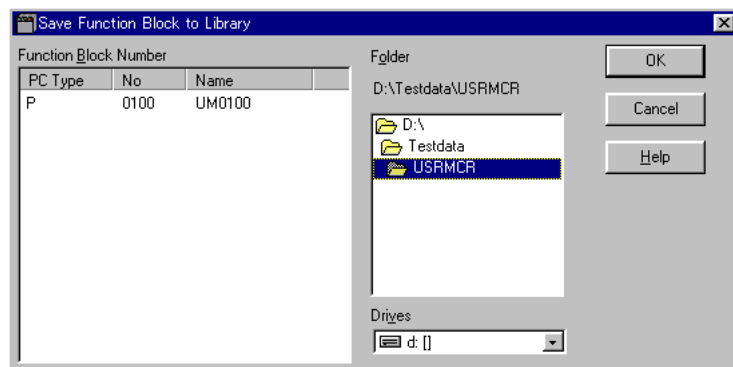
Enter a function block number with H (ex. UM H0100).

The [Execute Function Block] command lists all function blocks loaded in the program with the numbers of steps used for them.

2-9-2 Function block (User Macrocommand) library

(1) Saving into the function block library (the function block execution section → the function block library)

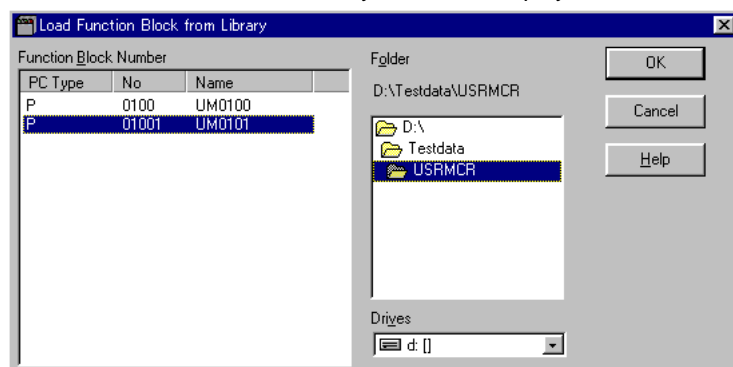
- ◇ Select a function block to save at [Execute Function Block].
- ◇ Left-click the Save button.
- ◇ The Save Function Block window is displayed.
- ◇ Select a location and left-click the [OK] button to save the function block.



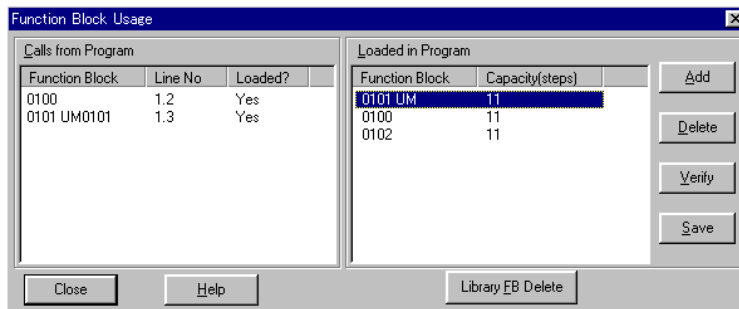
(2) Adding or deleting a function block

1) Adding a function block from a function block library (the function block library → the function block execution section)

- ◇ Left-click the Add button.
- ◇ The Select Function Block Library window is displayed.



- ◇ Select a necessary function block and left-click the [OK] button to import the block from the function block library into the function block execution section.

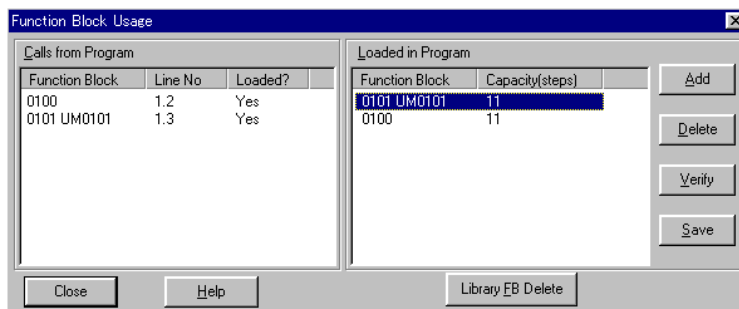


To set the default directory for a function block library, select [Options] - [Environment Options].
 If a function block available for the current model is not found in the function block library, the Add button does not become valid.

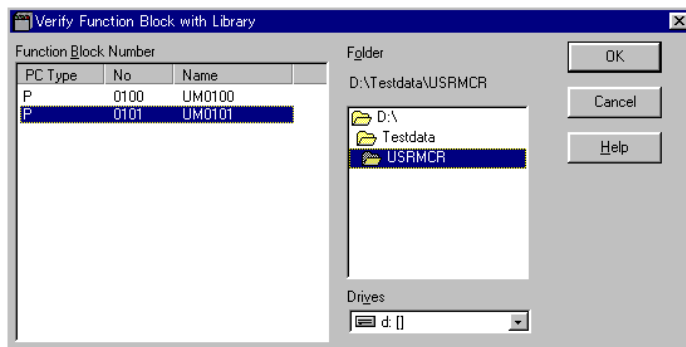
(3) Collating with the function block library (the function block library ↔ the function block execution section)

A function block at [Execute Function Block] is collated with one selected from the function block library.

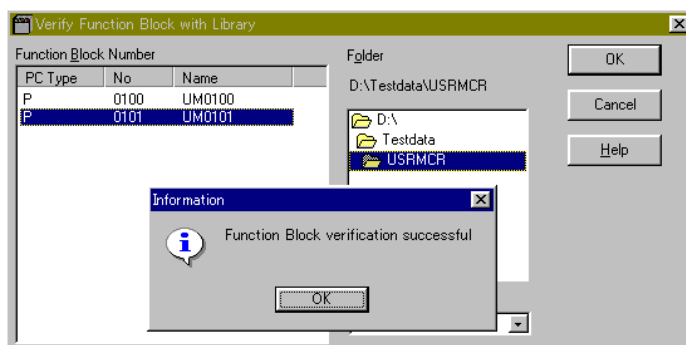
- ◇ Select one of the function blocks at [Execute Function Block].



- ◇ Left-click the [Collate] button to display the {Verify Function Block with Library} dialog box.



- ◇ Select a function block to collate, then left-click the [OK] button to start collation. Match or mismatch is displayed.

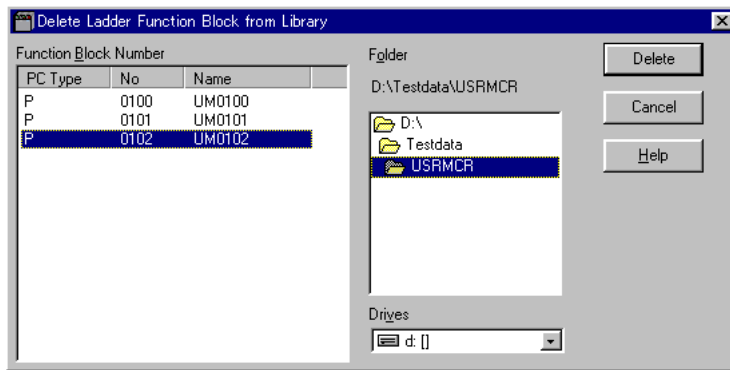


(4) Deletion from the function block execution section


- ◇ Select a function block to delete at [Execute Function Block], then left-click the [Delete] button.

(5) Deletion from the function block library

- ◇ Left-click the [Library FB Delete] button to display the Delete Function Block window listing function blocks that can be deleted.



- ◇ Select a function block to delete, and left-click the [Delete] button.

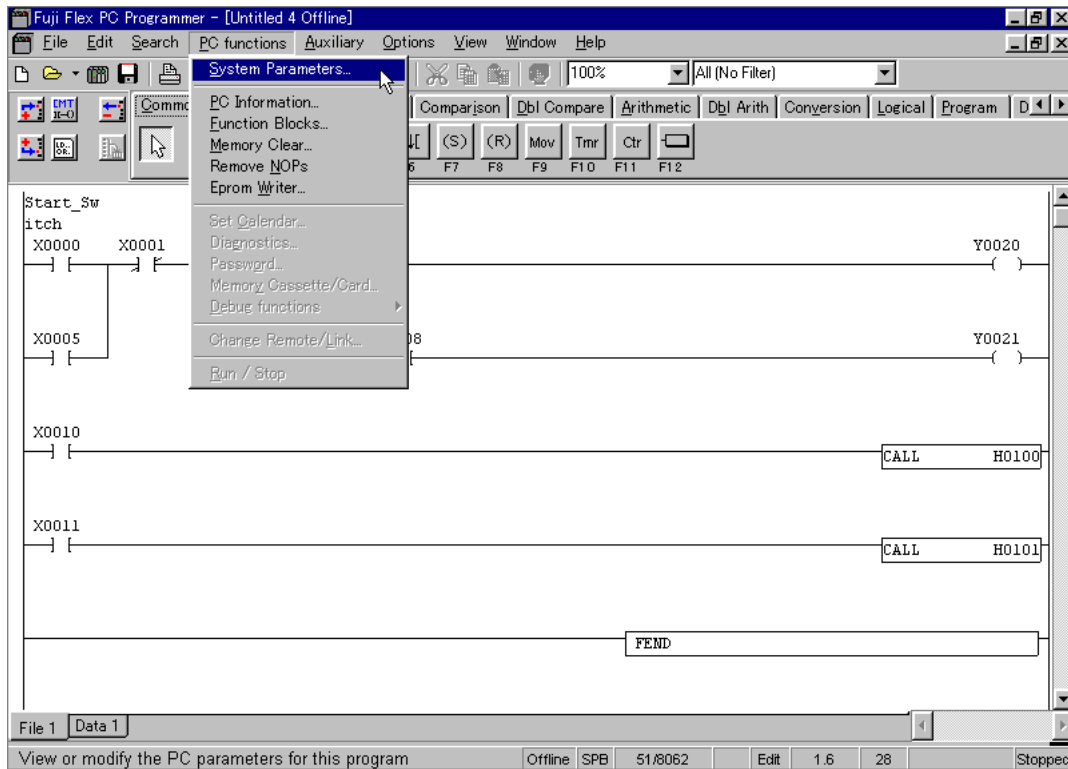
 This manual explains how to display and operate parameter setting dialog box.
For the details of parameter settings, refer to User's Manual (Instructions)

2-10-1 Displaying parameter setting dialog box

This subsection explains how to display parameter setting dialog box.

Parameter settings are registered in the same file as the program. Therefore, open the parameter setting program (file) first.

- ◇ Open the program (file).
- ◇ Select the [System Parameters...] command from the [PC Functions] menu.



2-10-2 Operating parameter setting dialog box

The parameter setting dialogs can roughly be classified into six. This subsection explains a display example of each dialog box.

(1) Processor operation definition dialog box

This dialog is used to define the module operations (I/O status and other) in the entire PC system, processor, and processor-mounted base board.

<SPB dialog box>

The SPB dialog box is titled "Parameter Setting Dialog". It contains the following sections:

- PC Processor Definition:**
 - Fixed cycle scan time(ms): 0
 - User watch dog (x10 ms): 25
 - Remote Run / Stop:
 - Run/Stop Addr X 000
- PC Operation mode:**
 - Monitor battery error
 - Display discrepancy in FLASH
 - Reset Latch relays
 - Stop PLC on non fatal fault
 - Freeze I/O when PC stopped

Buttons: OK, Cancel, Help.

Navigation tabs: PC Definition, Memory Definition, Input Filtering, HS Counter Config, General Commu.

<NB/NJ/NS dialog box>

The NB/NJ/NS dialog box is titled "Parameter Setting Dialog". It contains the following sections:

- PC Processor Definition:**
 - Fixed cycle scan time(ms): 0
 - User watch dog (x10 ms): 25
 - Remote Run / Stop:
 - Run Address X 000
 - Stop Address X 000
- PC Operation mode:**
 - Monitor battery error
 - Enable EEPROM writing
 - Reset Latch relays
 - Stop PLC on non fatal fault
 - Freeze I/O when PC stopped

Buttons: OK, Cancel, Help.

Navigation tabs: PC Definition, Memory Definition, Input Filtering, HS Counter Config, Expansion Para.

<NB0 dialog box>

The NB0 dialog box is titled "Parameter Setting Dialog". It contains the following sections:

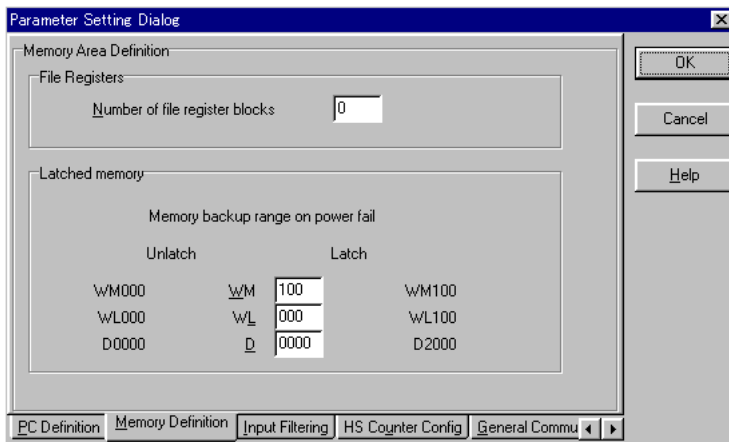
- PC Processor Definition:**
 - Fixed cycle scan time(ms): 0
 - User watch dog (x10 ms): 25
 - Remote Run / Stop:
 - Run/Stop Addr X 000
- PC Operation mode:**
 - Reset Latch relays
 - Stop PLC on non fatal fault
 - Freeze I/O when PC stopped
- NB0 I/O filtering:**
 - X0 & X1: Default
 - X2 - XE: Default
- NB0 Timebase for T18..T1F:**
 - 1ms
 - 10ms

Buttons: OK, Cancel, Help.

Navigation tabs: PC Definition.

(2) Area setting dialog box

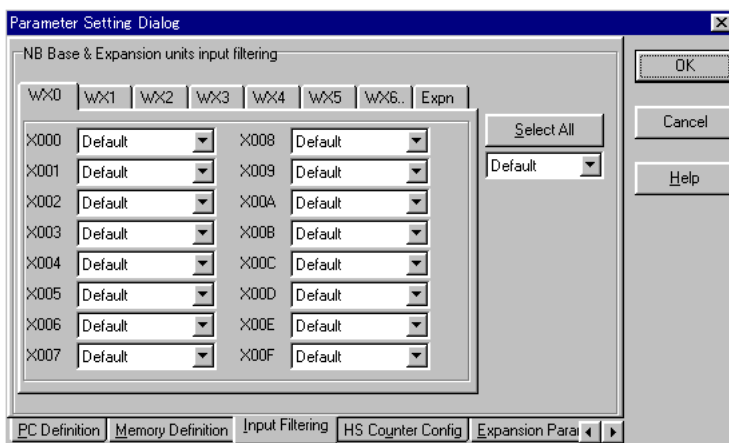
This dialog is used to set the file register capacity and latch (hold) areas.



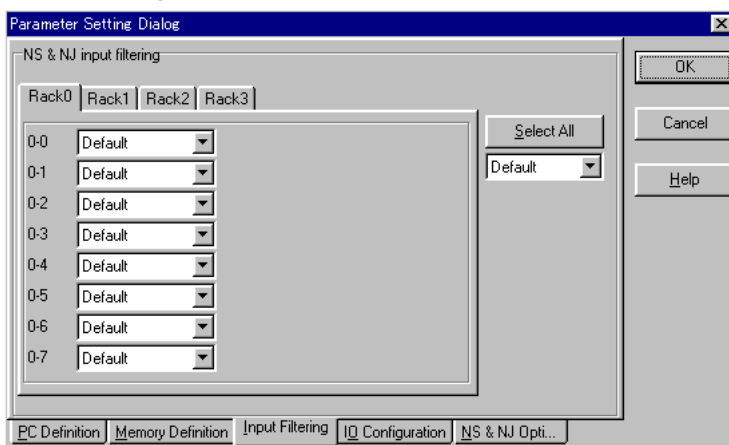
(3) Input filter setting dialog box

This dialog is used to set the input filter values.

<NB/SPB dialog box>



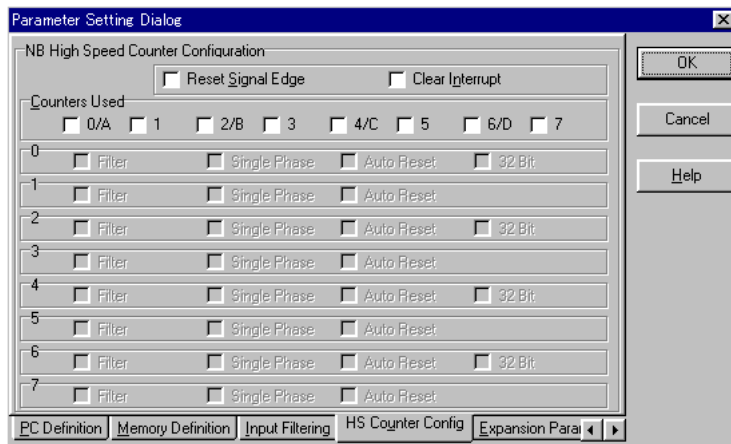
<NS/NJ dialog box>



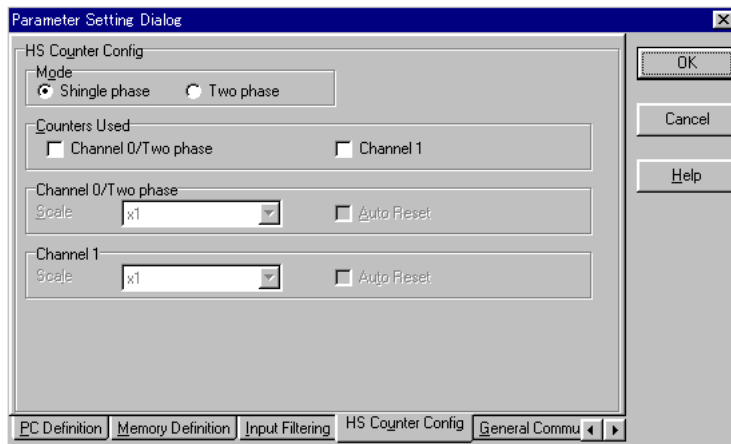
(4) High-speed counter setting dialog box

This dialog box is used to define the built-in high-speed counters.

<NB dialog box>

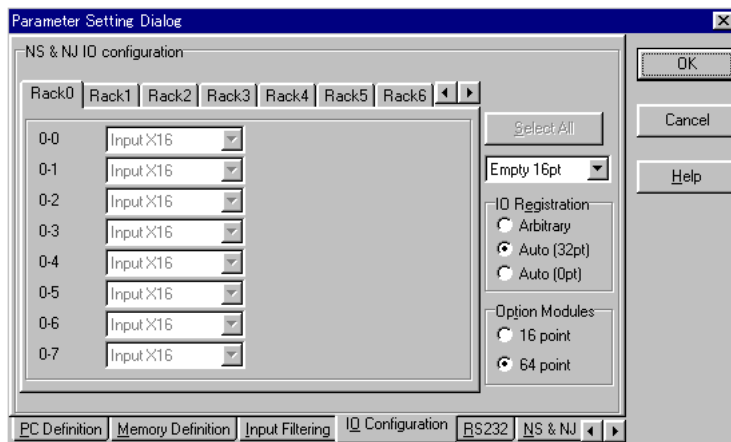


<SPB dialog box>



(5) I/O configuration setting dialog box

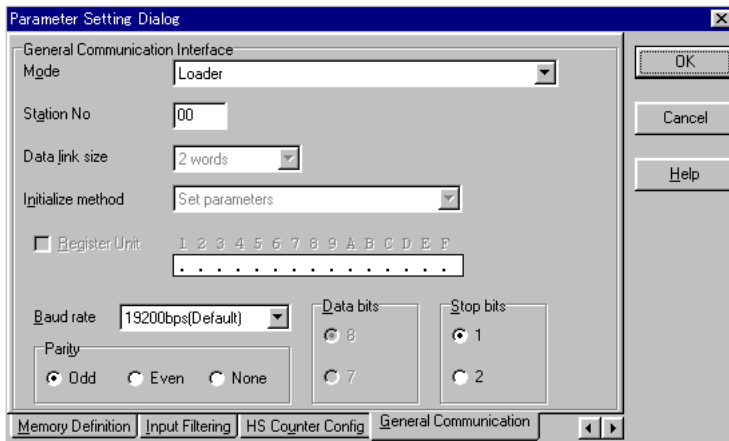
This dialog box is used to set the I/O configuration of the NS/NJ Series.



(6) Other function setting dialog box

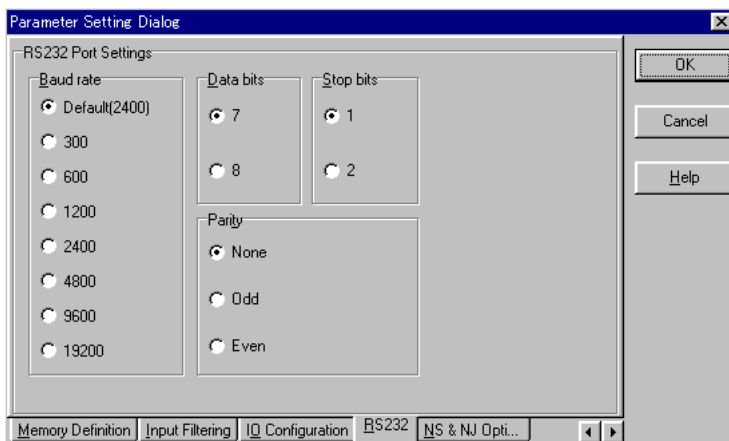
<SBP general-purpose communication interface setting dialog box>

This dialog box is used to set the loader interface, general-purpose communication adapter, and easy CPU link adapter.



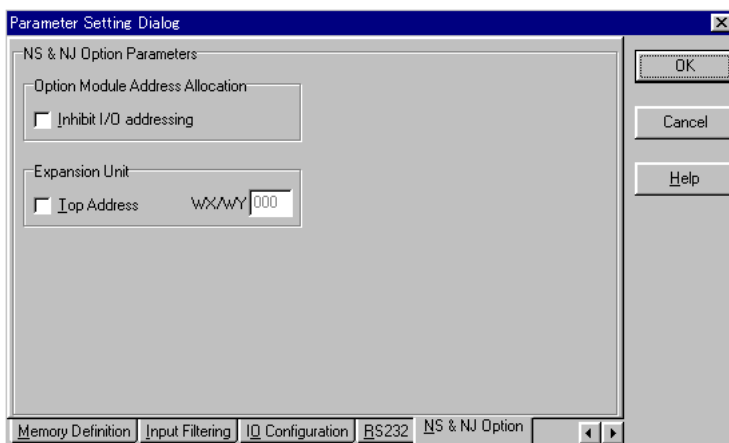
<CPU RS-232C port setting dialog box for NS/NJ Series>

This dialog box is used to set the operations of the RS-232C port with the CPU.



<Option setting dialog box for NS/NJ Series>

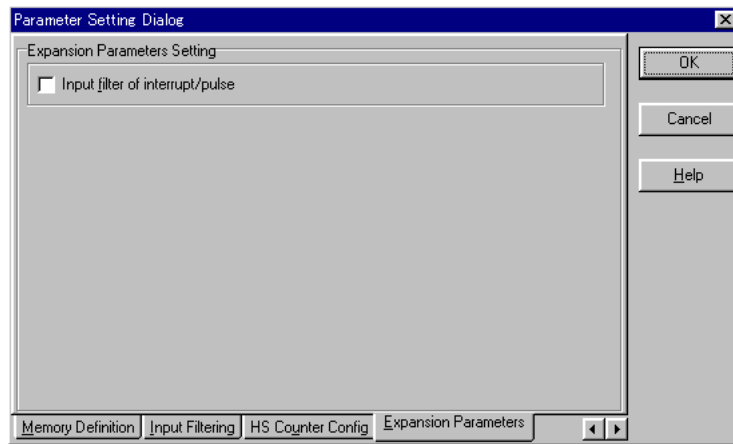
This dialog box is used to fix the occupied address of the option module at 0 and to set the first address of an extension unit.



<Extended parameter setting dialog for NB Series>

This dialog box is used to enable or disable the interrupt input or pulse input filter.

When this dialog box is checked, the filter becomes valid and operates according to the input filter setup.



This section explains how to save the current program and to open an existing program.

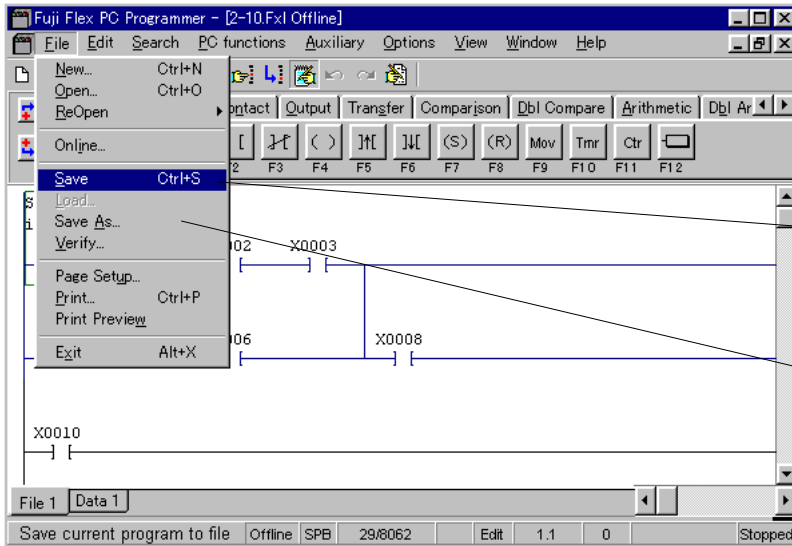
2-11-1 Saving a program

This section explains how to save the current program (contents of the program window now displayed).

(1) Saving a program into a file

- ◇ Select the [File] menu.

The following commands are displayed:



Save in a program file.
If this command is executed again after a file once saved is modified, the program contents are saved on the original file.

Save as a new program file.
The program contents can be saved as a separate file by specifying a drive name, folder name, and file name.

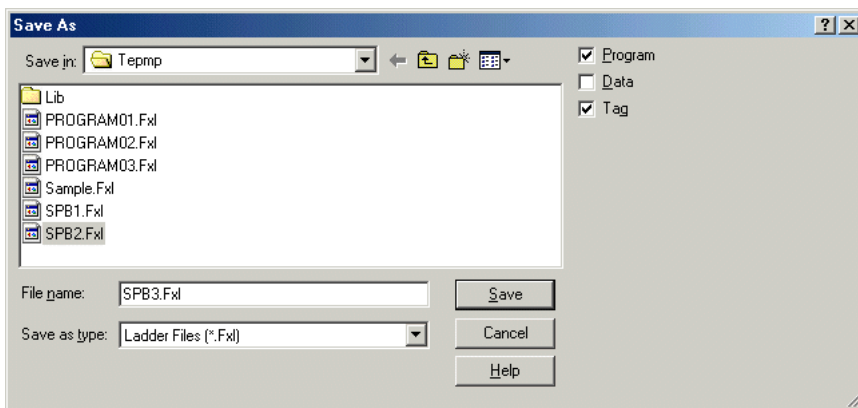
- ◇ Select the [Save As...] command.

The {Save As} dialog box is displayed.



One of the following file types can be selected:

- Ladder file (*.Fxl): File of the Windows V2.0 format
- Old ladder file (*.Lad): File of the Windows V1.0 format
- DOS Loader file (*.Pma): File of the MS-DOS Loader format



- ◇ Select a save-to drive or folder or create a new folder in the [Save in] list box.
- ◇ Select or enter a save-to file name in the [File Name] text box.
- ◇ Left-click the [Save] button.
The program contents are saved as a new file.

(2) File contents when a program is saved

If a program is saved in a file, the following contents are also saved:

• Saving in the ladder file (.Fxl) format

<*.FXL file>

- PC model information
- Parameter
- Program

<*.FXP file > (Can be specified for loader version V2.1.1.0 or later.)

- Parameter

<*.TAG file>

- Address tag and explanation

<*.CMT file>

- Line comment (Text only. An instruction indicating the line comment display position is saved in the *.FXL file.)

<*.DTA file>

- Data register contents

• Saving in the old ladder file (*.LAD) format of the Windows version (V1.□□)

<*.LAD file>

- Ladder program
- SFC program
- PC function information
- Parameter
- File register contents

<*.TAG file>

- Address tag and explanation

<*.DTA file>

- Data register contents

• Saving in the DOS Loader file format

<*.PMA file>

- Program

<*.PRM file>

- PC model information
- Parameter

<*.CTD file>

- Comment file

<*.AMD file>

- Data register contents

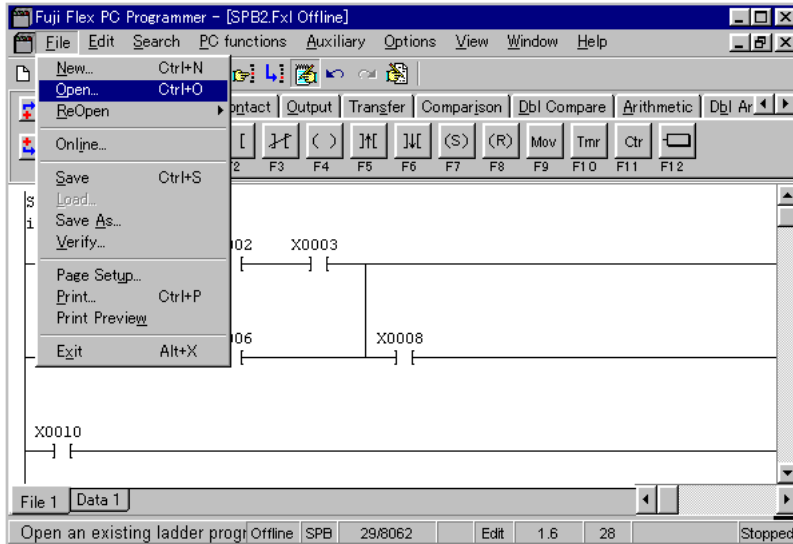
Note: Each of the PC model information and program cannot be stored alone.

2-11-2 Opening a program

This subsection explains how to open a program file already saved.

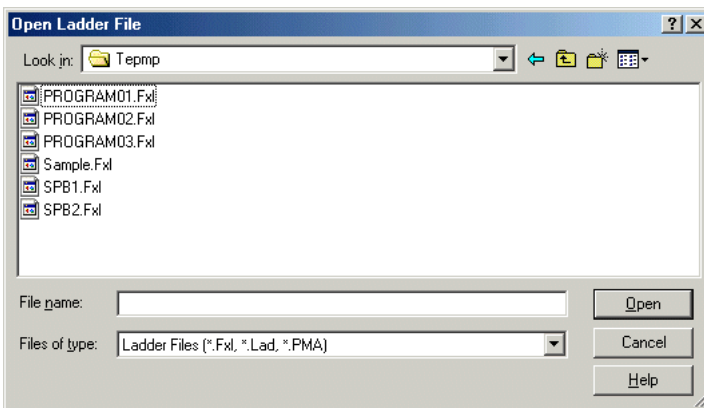
- ◇ Select the [File] menu.

The following commands are displayed:



- ◇ Select the [Open] command.

The [Open Ladder File] dialog box is displayed.



- ◇ Select a save-to drive or folder or create a new folder in the [Look in] list box.
- ◇ Select or enter a save-to file name in the [File Name] text box.
- ◇ Left-click the [Open] button.

The window displays the program.

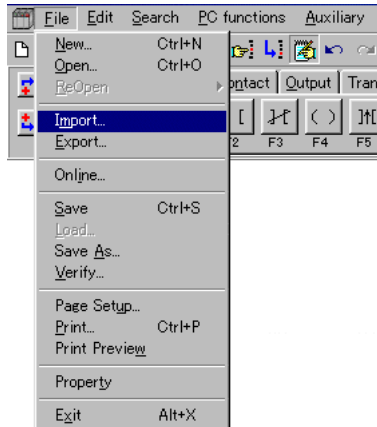
2-12-1 Import

(Loading the parameter, data, and tag files by specifying them separately)

This function loads the contents of the parameter, data, and tag stored in the program currently loaded. When you load a new parameter or tag and then execute the [Save] command, the {Save As} dialog box is displayed allowing you to store it under a new file name.

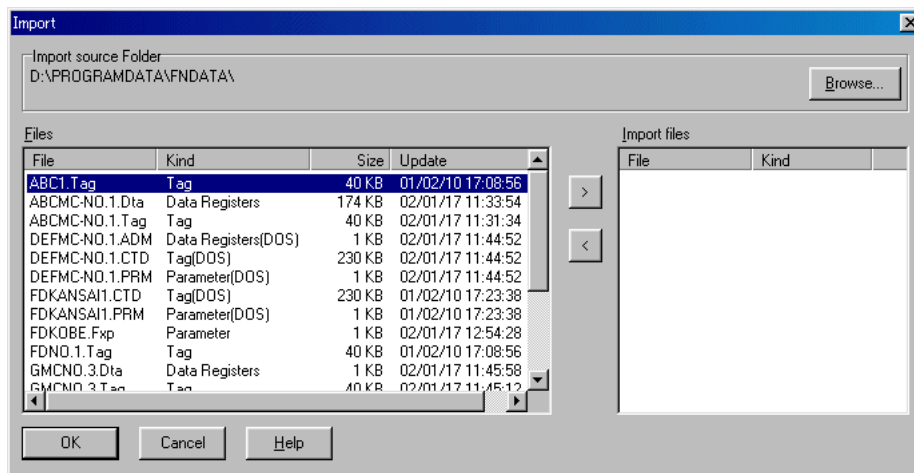
- ◇ Select the [File] menu.

The following command menu is displayed.



- ◇ Select the [Import...] command.

The {Import} dialog box is displayed.



- ◇ Left-click the [Browse...] button to display a dialog box. Select the drive and holder in which the file to be imported is stored.
- ◇ Select the file to be imported and then click the [>] button to move it to "Import files".
To delete the file, click the [<] button or use the Delete key.
If you move a file with the same type (parameter, data, and tag) as the one in "Import file", the existing file is removed from "Import file".
- ◇ Left-click the [OK] button to load the contents of the file.

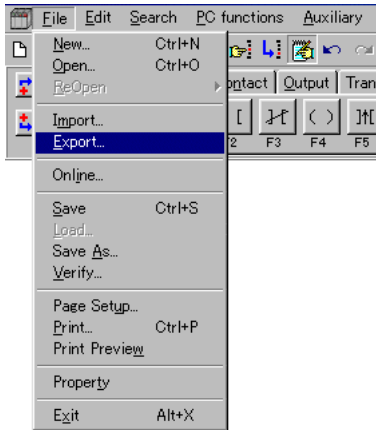
2-12-2 Export

(Saving the parameter, data, and tag files by specifying them separately)

This function saves the contents of the parameter, data, and tag stored in the program file currently loaded under a specified file name.

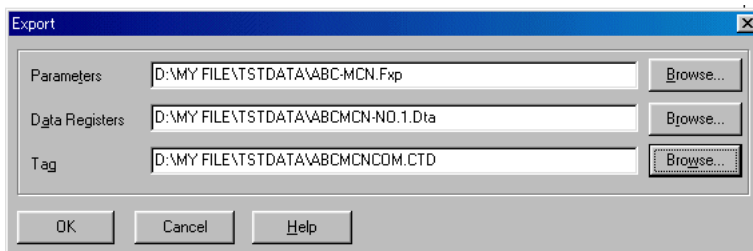
- ◇ Select the [File] menu.

The following command menu is displayed.



- ◇ Select the [Export...] command.

The {Export} dialog box is displayed.

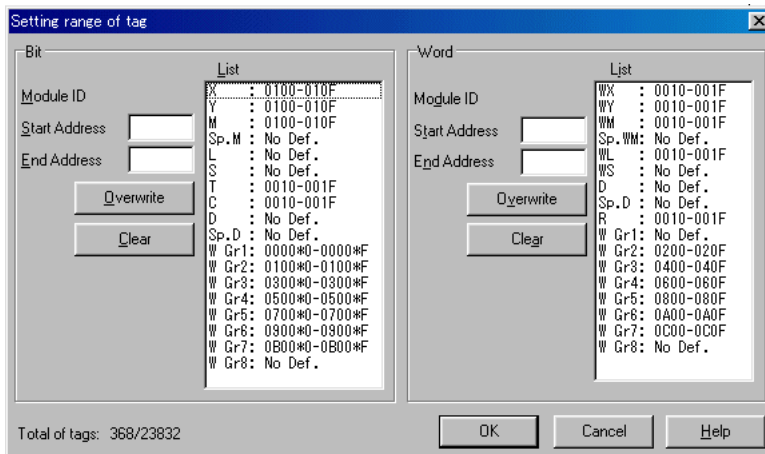


- ◇ Specify the parameter, data, and tag to be saved separately.

Specify the drive, file name, and file type of the target file.

Using the [Browse...] button for each parameter, data register, and tag, select the target drive and holder and specify the target file name.

- ◇ When the file name of a [tag] is specified by ***.CTD, specification of the range of a tag is possible.



- ◇ Left-click the [OK] button to save the specified parameter, data, and tag.

2-12 Import/Export



- The extensions of files which can be imported and exported are shown below.

Files for Windows loader

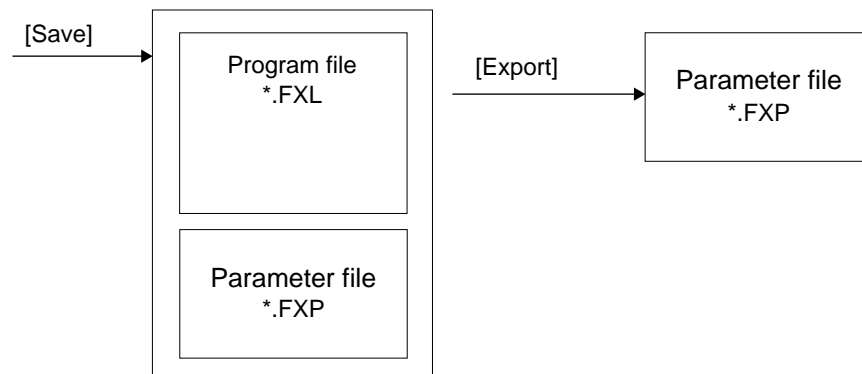
- Parameter file (*.FXP)
- Tag file (*.TAG)
- Data file (*.DTA)

Files for DOS loader

- Parameter file (*.PRM)
- Tag file (*.CTD)
(Comment file)
- Data file (*.ADM)

Note: The parameter file (*.FXP) cannot be opened with loader versions earlier than V2.1.1.0.

- The relation between the program file and parameter file is shown below.



The parameter file (*.FXP) is a file storing the parameters extracted from the program file. Only the program cannot be extracted.

2-12-3 Property

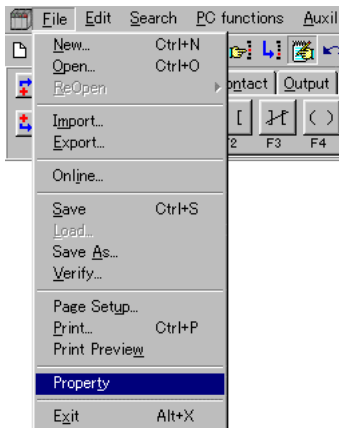
This function displays the name of the file currently loaded as a program file. If the program file is imported separately, the file name is displayed for each file. The target location and file name are displayed.



This information displays the name of the file imported for the currently loaded program file. If you close the program file and then open it again, the name of the imported file is not displayed. If you want to leave this information, use the [Save] button.

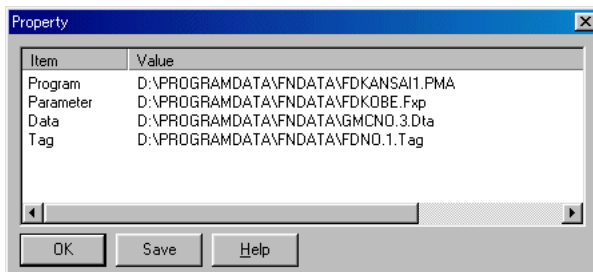
- ◇ Select the [File] menu.

The following command menu is displayed.



- ◇ Select the [Property] command.

The {Property} dialog box is displayed.



- ◇ To save this information, press the [Save] button.
The data is saved in the text (CSV) format.

This section explains how to edit a program by mnemonic instructions.

2-13-1 Outline of mnemonic edit windows

The mnemonic edit windows can be classified into two types. [Display Edit Line Instruction] displays the line at the cursor position and [Display Line as Instruction List] displays all lines of a ladder program. These windows displays lines as mnemonic codes. Instructions can be edited in Edit mode only.

A mnemonic code is displayed in the following format:

```
Instruction code | ' Tag ' ( Address )
                  |-----|
                  Operand
```


If no tag is entered or only address display is set at [Environment Setup] - [Display Address/Tag].

```
Instruction code | Address
                  |-----|
                  Operand
```

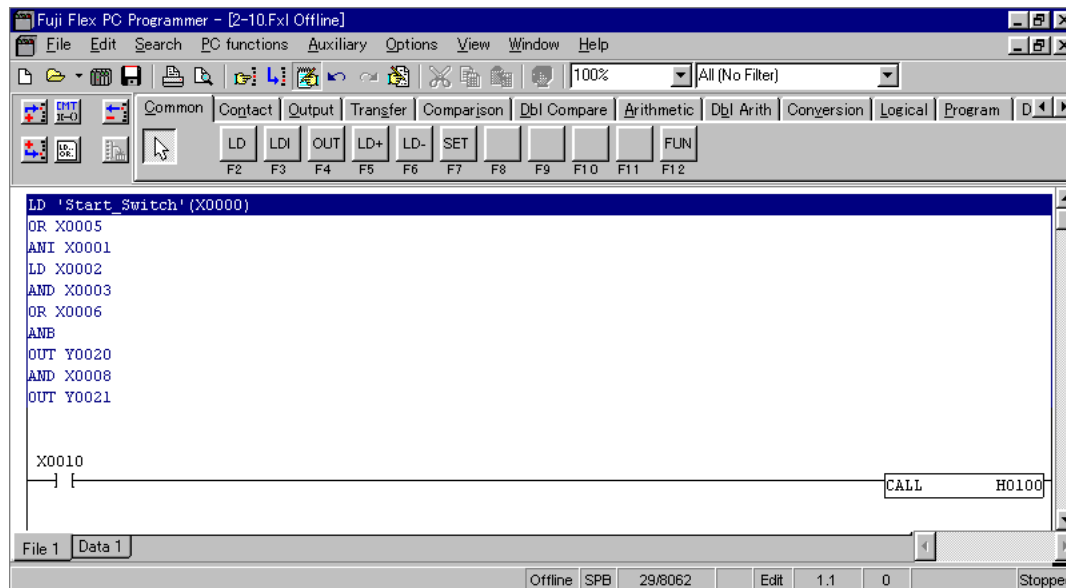
If only tag display is set at [Environment Setup] - [Display Address/Tag].

```
Instruction code | ' Tag '
                  |-----|
                  Operand
```

(1) Displaying edit line instructions

- ◇ Shift the cursor to the object line.
- ◇ Left-click the  [Display Line Instruction] on the Edit Line toolbar or select the [Display Line Instruction] command from the [Edit] menu.

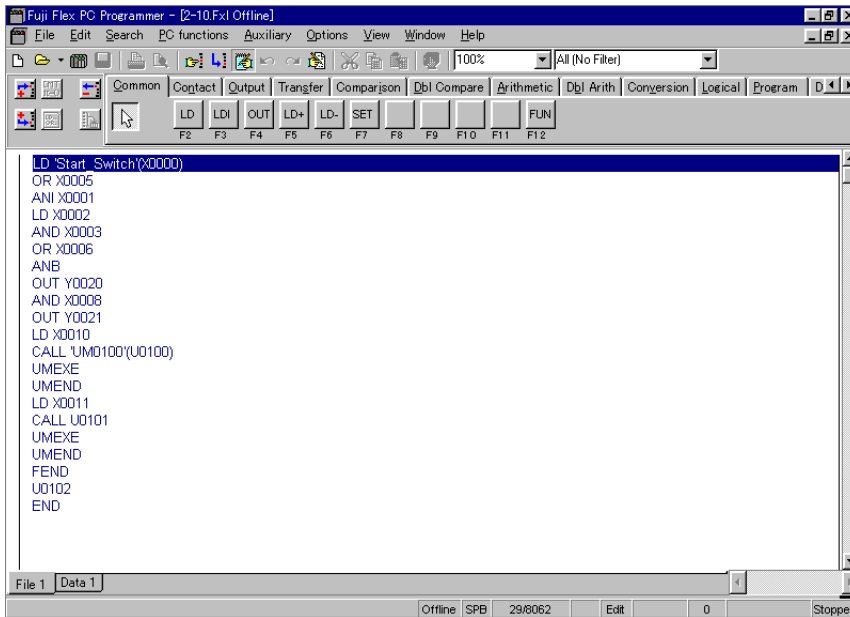
A cursor-specified line is displayed in the mnemonic code format.



One line can be edited in Edit mode.

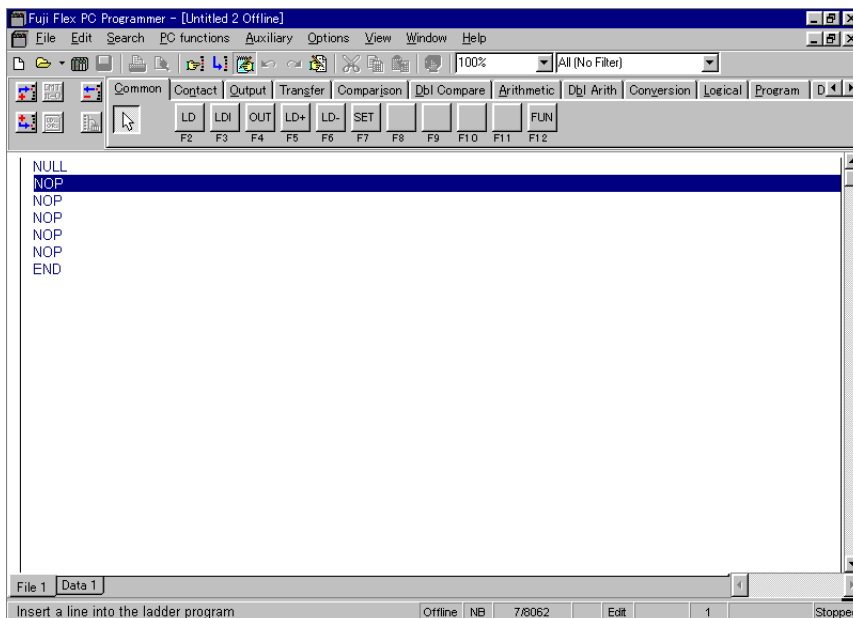
(2) Displaying an instruction list

- ◊ Select the {Display All as Instruction List} command from the [Edit] menu. The lines of a ladder program are displayed as mnemonic codes.



2-13-2 Editing a mnemonic instruction

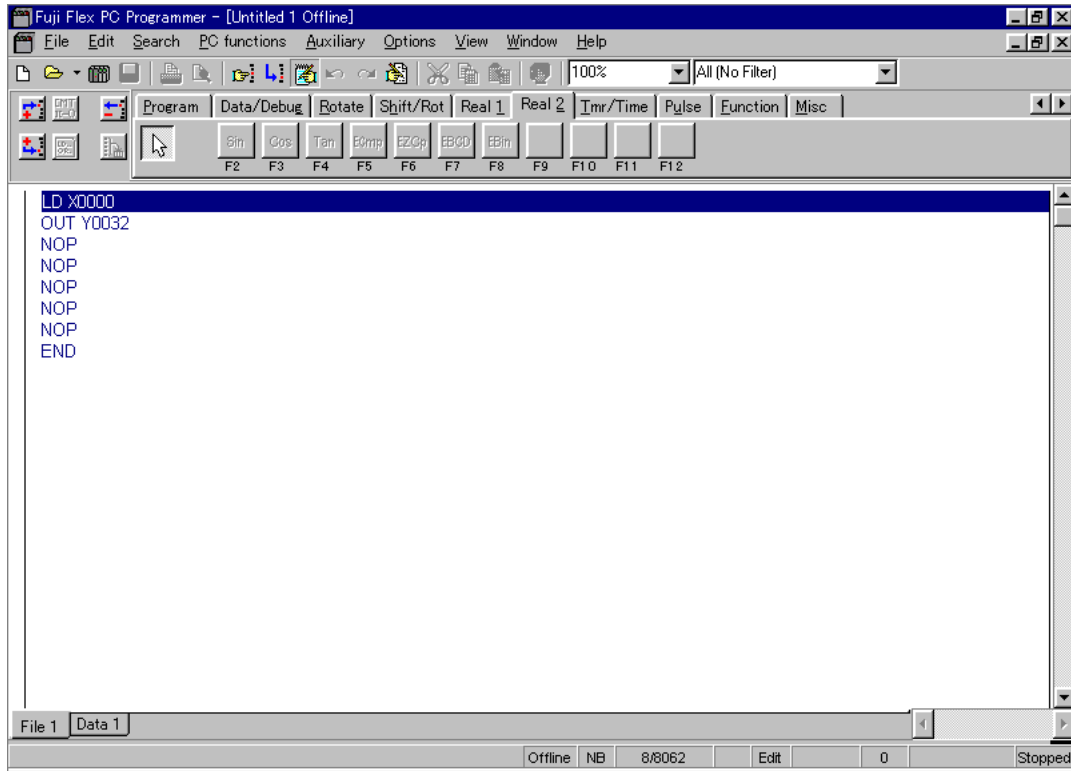
- ◊ Left-click the [Edit Mode] button or select the [Edit Mode] command from the [Edit] menu on the main window. The display changes to the ladder program edit window.
- ◊ Select the [Display Line as Instruction List] command from the [Edit] menu on the main window. The display changes to the mnemonic code edit window.
- ◊ Left-click the [Insert Line] button on the ladder edit toolbar or press <Alt> + <Ins>. One line is inserted before the cursor with an NOP instruction.



If an instruction list is displayed by the New command, a NULL code is displayed. This is a special instruction inserted when a line is not complete or in the middle of line edit. The user need not mind this instruction because the instruction is automatically deleted if the line becomes correct.

- ◊ Shift the cursor to NOP where to write an instruction. Create a program by rewriting the NOP. The input methods are as follows:
 - (1) Direct input from the keyboard
 - (2) Input by [Instruction group] tab functions on the ladder edit tool bar

- ◇ Like a ladder program, an instruction is converted when the cursor is shifted from the position after instruction operands are entered.



By the <TAB> key, shift the cursor to the [Instruction group] tab on the ladder edit tool bar. Then the tab can be switched using the <←> or <→> key.



A program is saved not only by instruction list display but also by ladder line display.

Section 3 Online Operations

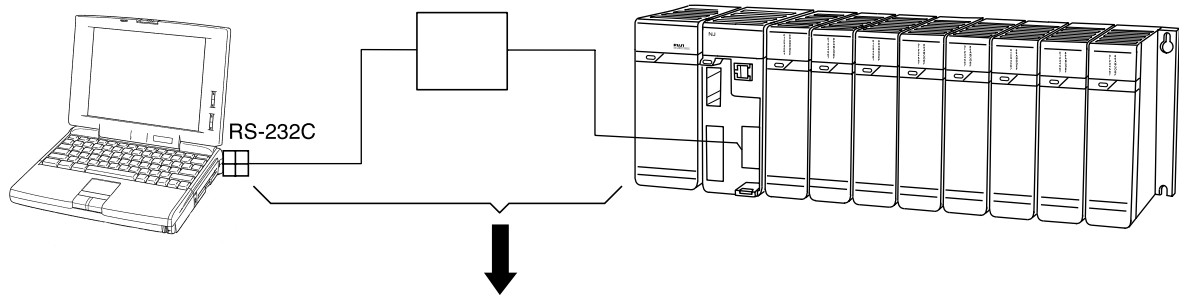
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3-1 Preparation for Online Connection and Outline of Online Operations

3-1-1 Hardware system configuration

Connect a personal computer using the PC loader cable for FLEX-PC/N.



- Applicable personal computer
 - PC/AT-compatible machine
 - Connection cable
 - NN-CNV3 (9-pin D-subconnector)
-

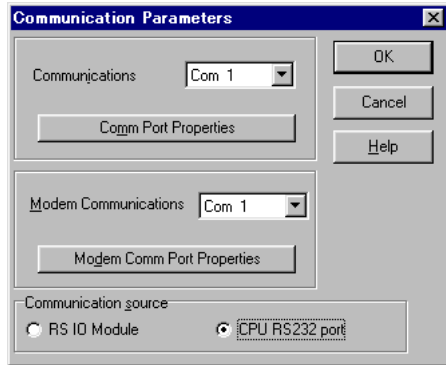
3-1 Preparation for Online Connection and Outline of Online Operations

Setting communication parameters for the loader

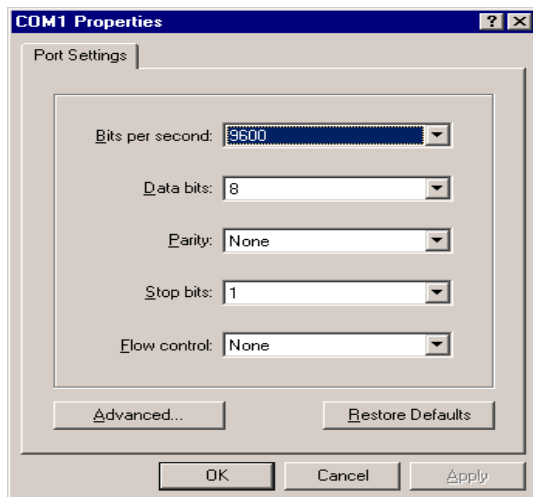
3-1-2 Setting communication parameters for the loader

Here, the procedure for adjusting communication parameters of the personal computer loader to those of the loader adapter (or general-purpose interface capsule) is explained.

- ◇ Select [Options] - [Communications...] from the menu bar.
- ◇ The {Communication Parameters} dialog box is displayed. Select a personal computer RS-232C port number (Com 1 to Com 9) from the [Communications] list. Then, left-click the [Comm Port Properties] button.



- ◇ Check that the port is set as shown below. If incorrect, correct as follows. Then, left-click the [OK] button.



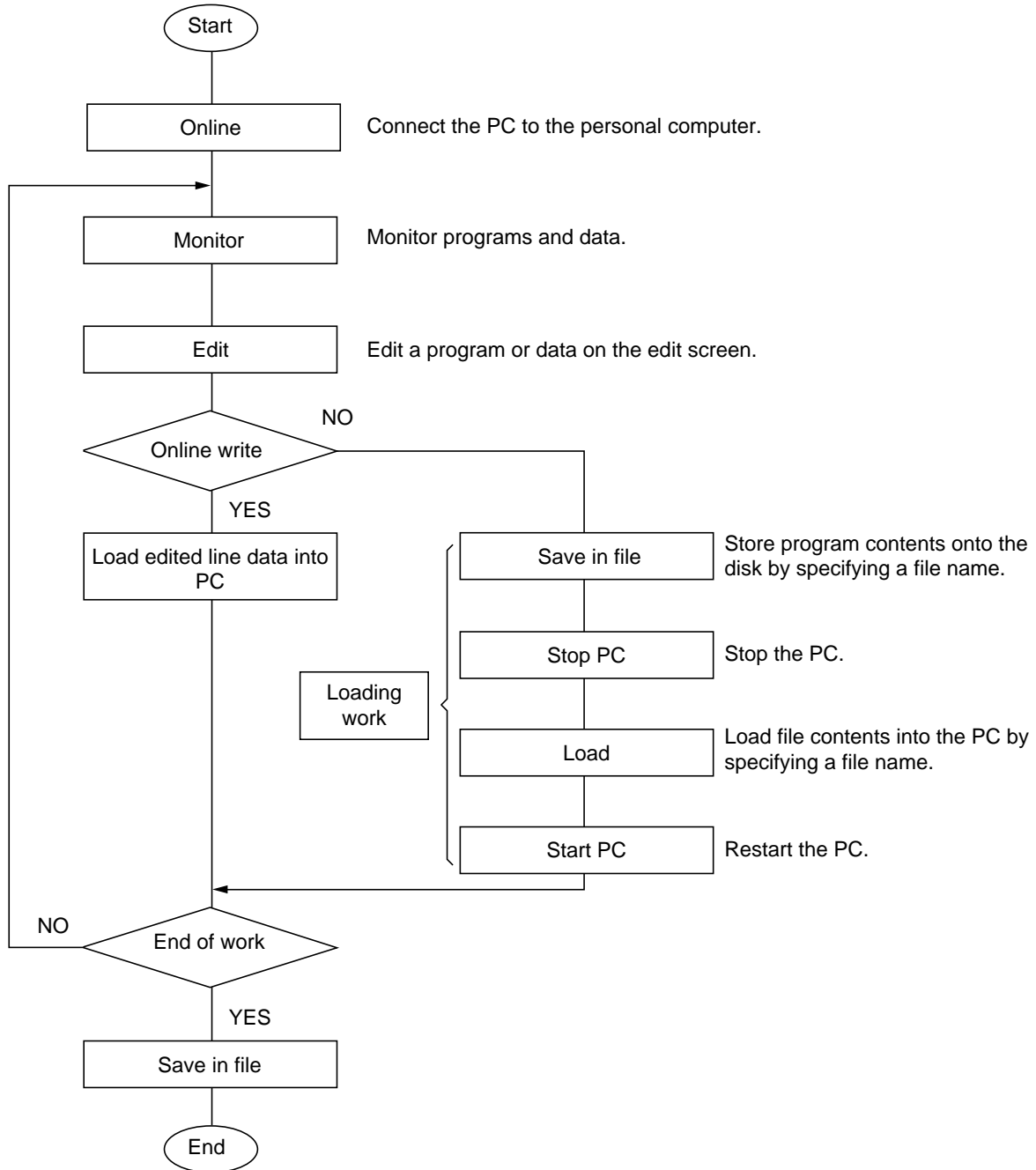
[Bits per second] in the dialog box is the same in meaning as “baud rate.” Normally, select [1] for [Stop bit].

- ◇ The dialog box returns to the former one. Left-click the [OK] button. This is all for the setting of parameters.

Outline of online operations 3-1 Preparation for Online Connection and Outline of Online Operations

3-1-3 Outline of online operations

The flowchart below shows an outline of online operations.



When loading a program into the PC, specify a file name. If the program has not been saved immediately after monitoring or during edit, save the program once before loading.

Here, the method of connecting the personal computer online to the PC is explained.

This online connection is necessary when monitoring/editing PC programs, saving PC programs to the personal computer, transferring personal computer programs to the PC, and so on.

After finishing "3-1 Preparations for online connection," use the following procedure for online connection.

- ◇ Select [File] - [Online] from the menu bar.

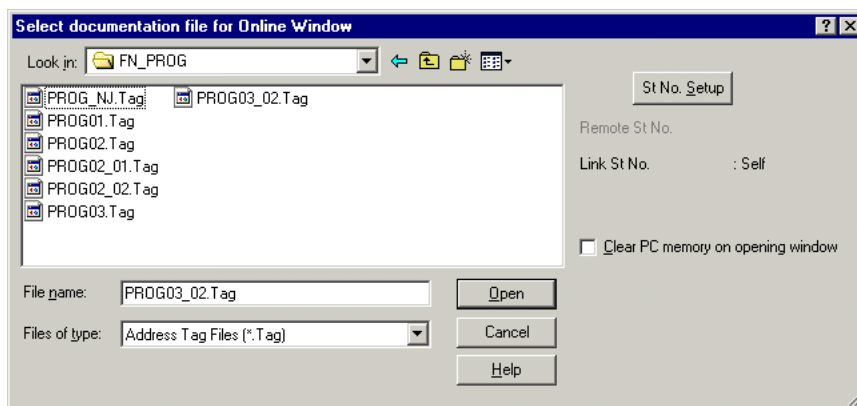
(Alternatively, left-click the  [Online] button on the main tool bar.)

- ◇ The {Select tag file to attach to online window} dialog box is displayed. If there are tag files for online display, select the tag file to be displayed.

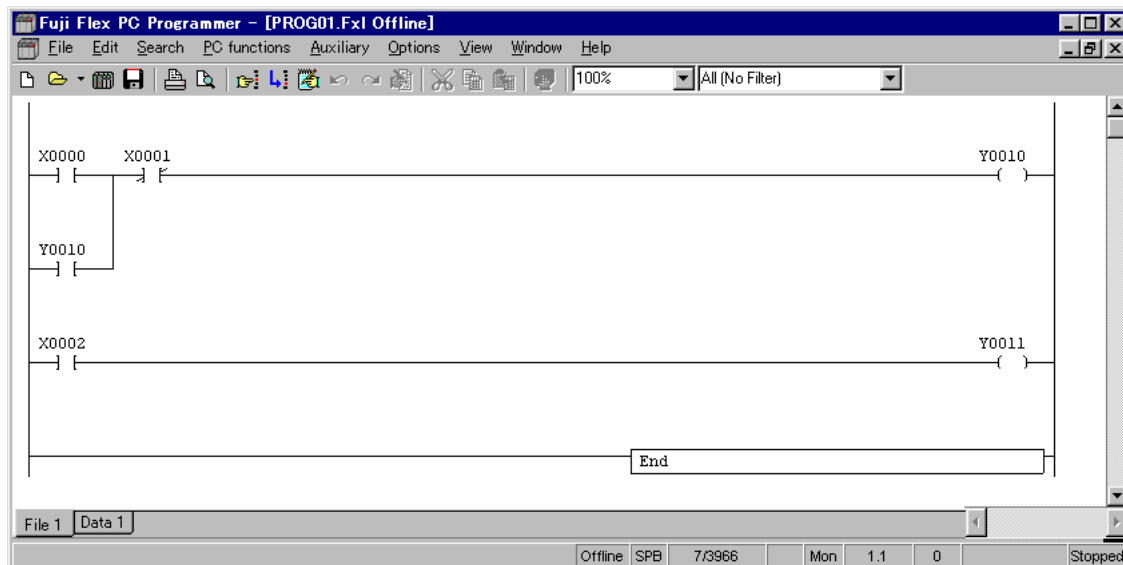
If there is no tag file to be displayed, keep the initial string [No Tag File is Required] set in the [File name] text box. Left-click the [Open] button.



A tag is like a label which can be attached to any PC address.
For a detailed explanation of tags, refer to "Section 2."



- ◇ Reading status is indicated on the progress dialog box. When the reading is completed, the PC ladder program is displayed on the screen. The screen displayed at this time is called an {online window}.

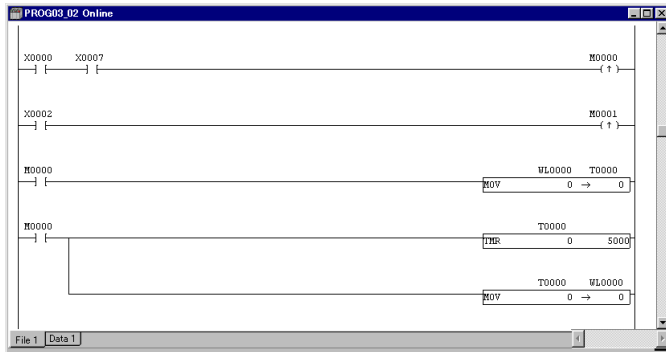


Changing sheet displayed on the window

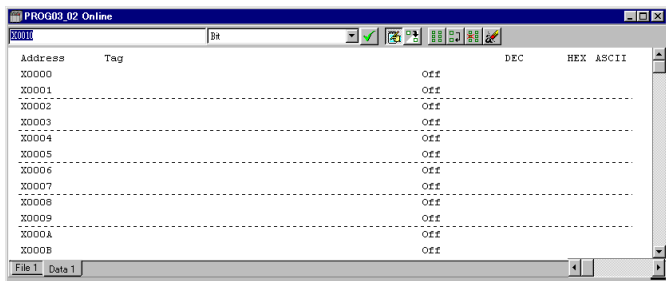
[File 1] and [Data 1] tabs are displayed at lower left on the program window so that you can change between “ladder sheet” and “data sheet” screens.

Left-clicking either tag displays the corresponding sheet.

Ladder program sheet screen

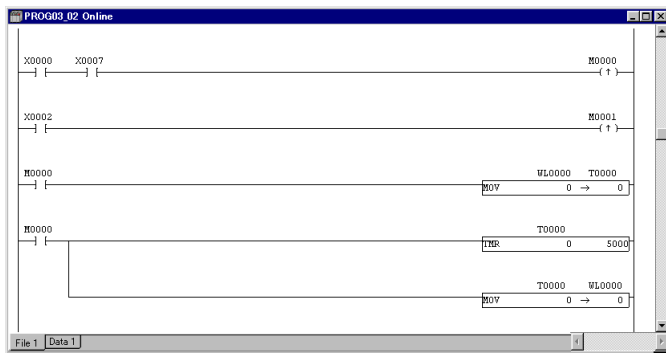


Data sheet screen

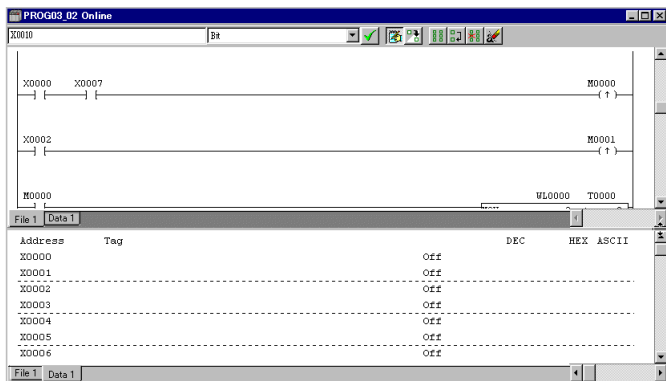


Window split

Select [View] - [Split Window] from the menu bar. Or when the window split part under the vertical scroll bar on the right of a window is dragged, the window is split into two. Position the cursor on the window split part, and it will change to the $\frac{\updownarrow}{\leftarrow\rightarrow}$ mark. While pressing the left side button of the mouse, move the cursor in the direction above.



Sample window split



To restore the original window, double-click the window split part. Or move it to the lowermost position.

3-3-1 Save PC program

Here, the method of saving a PC program to a file in the disk is explained.
After selecting the online window, use the following procedure to save the program.

- ◇ Select [File] - [Save as...] from the menu bar.
- ◇ The {Save as} dialog box is displayed.

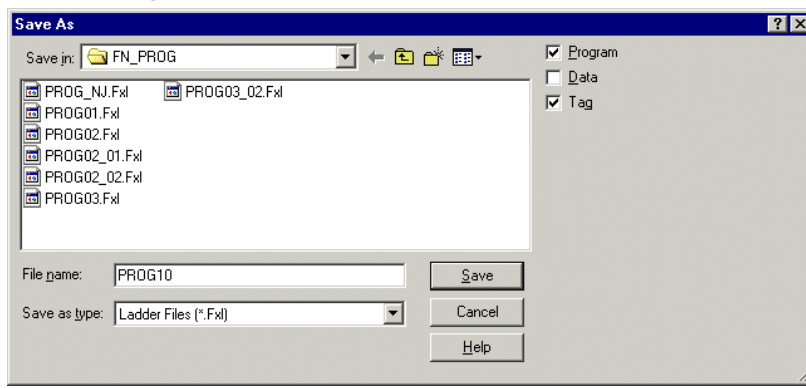


For [Save as type], either of the following two can be selected:

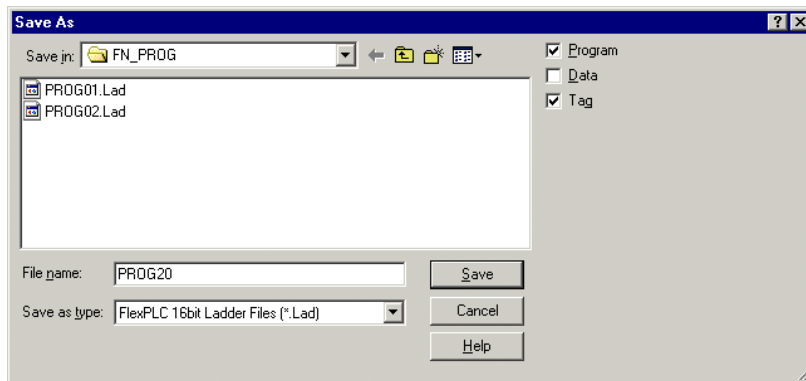
- Ladder file (*.Fxl): Save file of the Windows V2.00 or later format
- Old ladder file (*.Lad): Save file of the Windows V1.11 or earlier format
- DOS loader file (*.Pma): Save file of the MS-DOS format

- ◇ Enter any file name in the [File name] text box and left-click the [Save] button.
Enter extension “.Fxl”, “.Lad” or “.PMA” according to the type of the file to be saved.

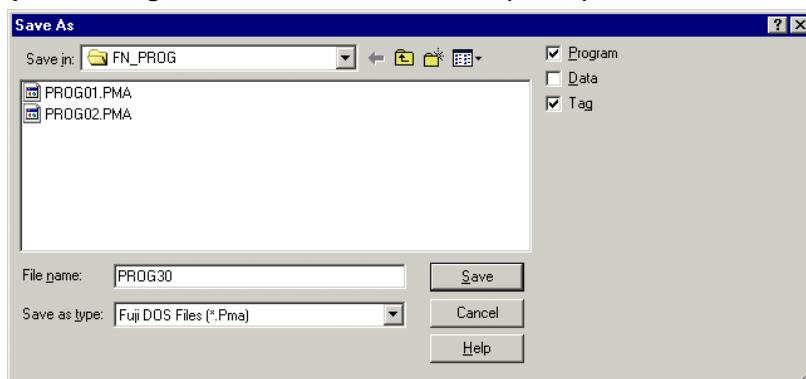
• Example of saving in the ladder file format (*.Fxl)



• Example of saving in the old ladder file format (*.Lad)



• Example of saving in the DOS loader file format (*.PMA)





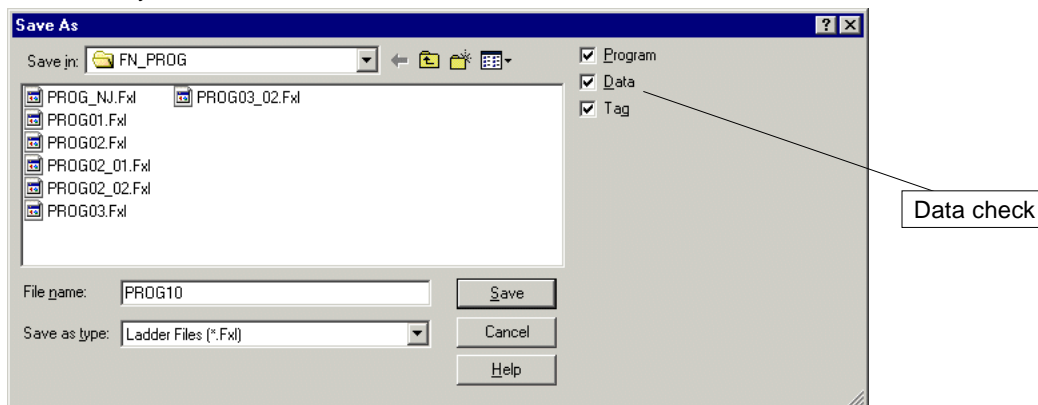
To save as a DOS version loader file (*.PMA), the length of the file name must be 8 single-byte characters or less. Because DOS version is an MS-DOS application, it cannot deal with file names that are longer than 8 characters. If saved by a file name longer than 8 characters, DOS version references the file by a file name shortened to 8 characters or less.

3-3-2 Saving PC data

Here, the method of saving PC data in a personal computer is explained.

After selecting the online window, use the following procedure to save the data.

- ◇ Select [File] - [Save As...] from the menu bar.
- ◇ The {Save As} dialog box is displayed. When saving data, click the Data checkbox to ON. The data is saved with the same file name as the program.
- ◇ To save data, the file name must be set. Specify a save location (folder) and a file name. An extension is added automatically.




Data may usually be saved alone. In this case, however, the data cannot be transferred to the personal computer alone because the data is managed under the same name as the program.

3-4 Transfer (Verify) Contents of File to the PC

3-4-1 Transfer contents of program file to the PC

Here, the method of transferring a program which has been saved in a file in the disk to the PC is explained. (The program that is transferred to the PC is overwritten on the program in the PC.)

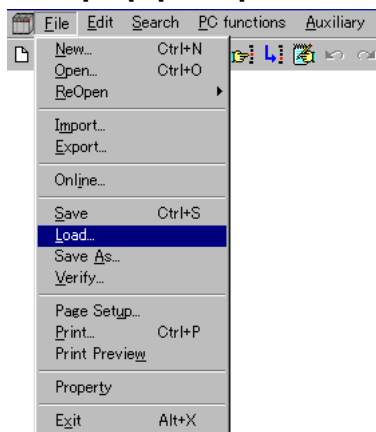
The appropriate online window must be opened before the program can be transferred. First, open the online window using the procedure described in 3-2.

 The transfer of a program from the personal computer to the PC cannot be effected when the PC is in either of the following conditions. Make the PC ready as described below.

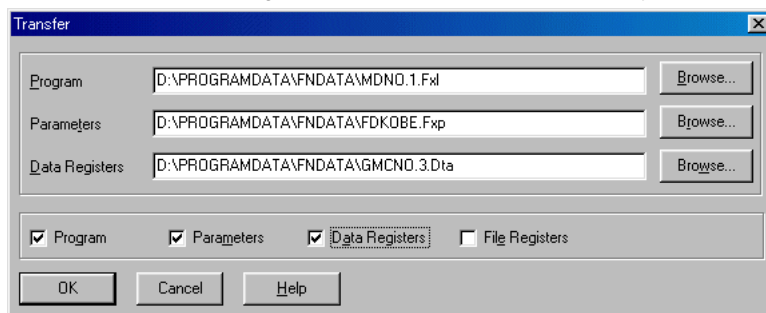
- With a PC model whose operation mode can be changed by a key switch (e.g., NJ or NS), the key switch is in the {RUN} or {STOP} position.
Measure to take: Set the key switch in the {TERM} position.
- The PC is in operation.
Measure to take: Stop the PC from the loader. For the method of stopping the PC, refer to 3-5.

When the PC becomes ready, transfer the program to the PC by the following procedure.

- ◇ Select [File] - [Load...] from the menu bar.



- ◇ The {Transfer} dialog box is displayed.
Check whether the [Program] check box is checked. Usually, check the [Parameter] and [Program] check boxes.



- ◇ Specify the location and file name of the program to be transferred in the [Program] text box. When you left-click the [Browse...] button, a dialog box for drive, holder, and file selection appears.
- ◇ Left-click the [OK] button to execute transfer processing.



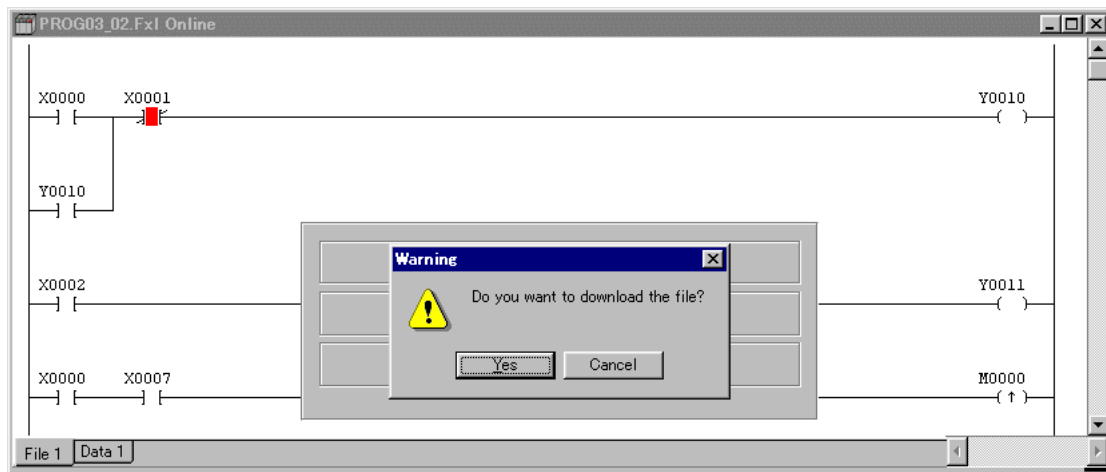
This function allows you to transfer the contents of the program, parameter, data register, and file register separately or collectively. The program file (*.FXL) for the Windows version loader contain parameters. However, if you want to transfer the program together with the parameter, check both the [Program] and [Parameters] check boxes. If you check only the [Program] check box, only the program is transferred.

If you check both the [Program] and [Parameters] check boxes and leave the [Parameters] text box blank and if there is a parameter file (*.FXP) with the same location and file name as the program file (*.FXL), the contents of the parameter file are transferred. If there is not a parameter file (*.FXP) with the same file name as the program file, the contents of the parameter in the program file (*.FXL) are transferred.

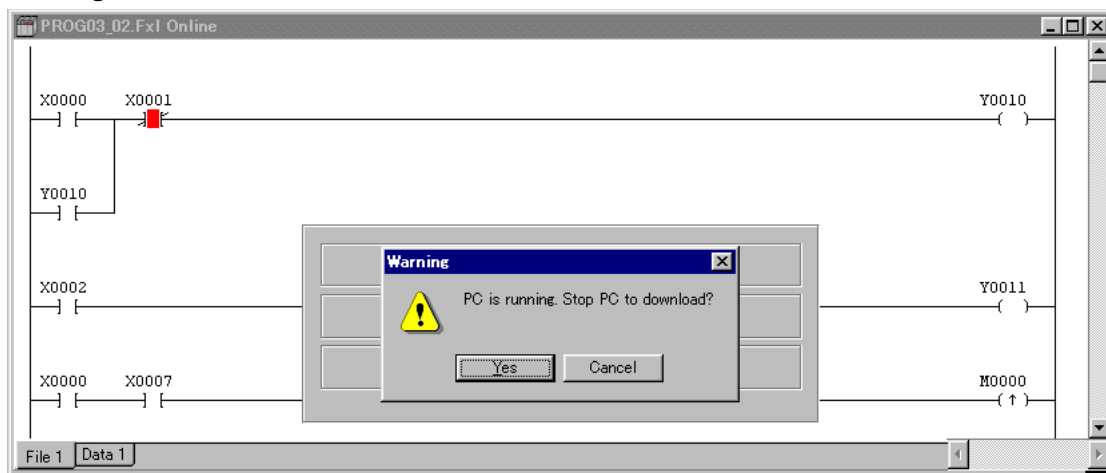
In the {Download file to PC} dialog box, if the [Program] check box is checked and the [Program] text box is specified, the [Parameters], [Data registers], and [File registers] check boxes are checked, and corresponding text boxes are left blank, the parameter, data register, and file register files with the same file name as the program file in the same location are loaded and transferred.

- ◇ Left-click the [OK] button.
A loading confirmation dialog box appears.

Not running



Running

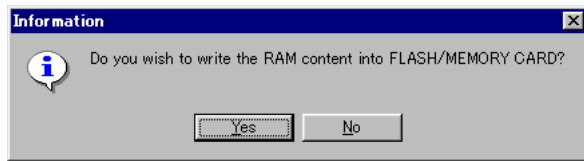


Select [Yes] to start loading.



If the PC is SPB, the window below opens

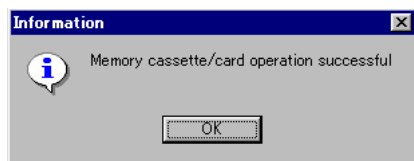
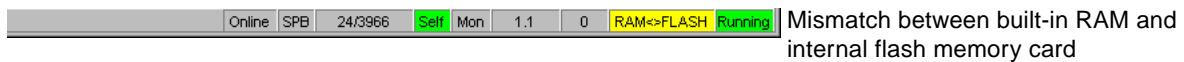
◇ The window says {Do you wish to write the RAM content into FLASH/MEMORY CARD?}



- Click [Yes] to write the contents of the built-in RAM into the internal flash memory card. Since the contents of the built-in RAM match those of the internal flash memory card, the system starts up on the new program when the power is turned off and on next time.
- Click [No] not to write the contents of the built-in RAM into the internal flash memory card. Since the contents of the built-in RAM does not match those of the internal flash memory card, the MEM LED flashes for a warning. When the power is turned off and on next time, the changed RAM memory contents are transferred into the flash memory card to match the contents.



The status bar displays the following items:



- ◇ Once a program has been loaded, the Online Window displays the loaded program with its file name on the bar at the top of the window. Click [OK] on the confirmation dialog.



- The extensions of files which can be transferred and verified are shown below.

Files for Windows loader

- Program file (*.FXL)
- Old Parameter file (*.LAD)
- Parameter file (*.FXP)
- Data file (*.DTA)

Files for DOS loader

- Program file (*.PMA)
 - Parameter file (*.PRM)
 - Data file (*.ADM)
-



With the Windows version loader, specify a program file (*.FXL or *.LAD) as the file register.

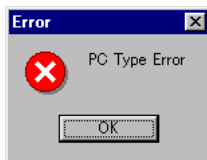
With the DOS version loader, specify a data file (*.ADM).

When transferring a data file (*.ADM) of the DOS version loader, all data (X, Y, M, L, S, T, C, D, W, and R) stored in a file are transferred.

Since data contains the contents of the file register, all data including the contents of the file register are transferred regardless of whether the [File register] check box is checked or not.



When a file is transferred to the PC, the following dialog may be displayed:



This occurs if a program of a different model is loaded into the PC. In this case, change the model by offline operation, then save and transfer the program again.

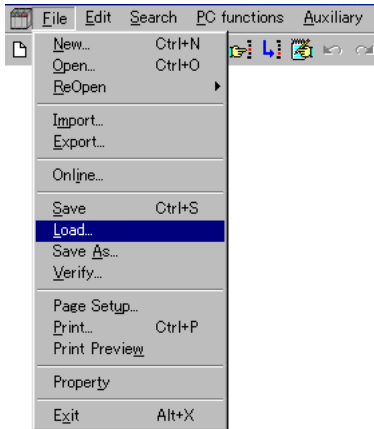
3-4 Transfer (Verify) Contents of File to the PC

3-4-2 Transfer contents of data file to the PC

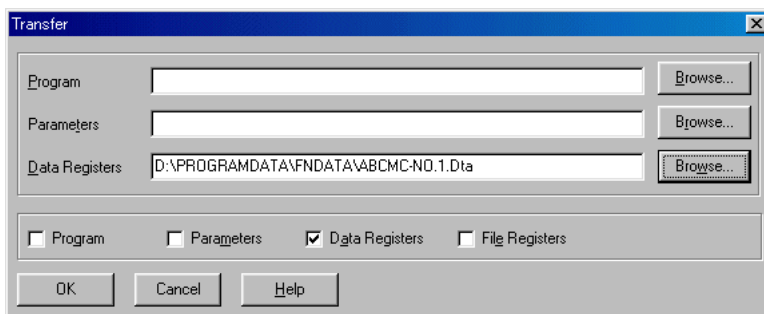
Here, the method of transferring data that has been saved in a file in the disk to the PC is explained. (The data that is transferred is overwritten on the data in the PC.)

Before performing the transfer operation, you need to open the online window according to the procedure in section 3-2.

- ◇ Select [File] - [Load...] from the menu bar.



The {Transfer} dialog box is displayed.
Check [Data] to ON.



- ◇ Specify the location and file name of the program to be transferred in the [Data registers] text box.
When you left-click the [Browse...] button, a dialog box for drive, holder, and file selection appears.
- ◇ Left-click the [OK] button to execute transfer processing.

Caution

When this programming tool is used, data saved in a data file contains no I/O areas. Therefore, external equipment is not operated directly even when data is transferred to the PC. If some kind of data is used, however, the program may cause external equipment to operate abnormally. Take great care for safety.



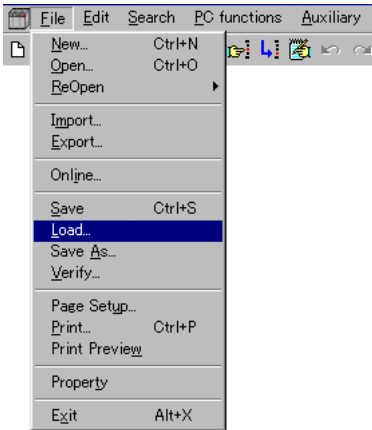
When transferring a data file (*.DTA) of the Windows version loader, only the data in the D, L, S, and C areas are transferred.

3-4-3 Transfer contents of parameter file to the PC

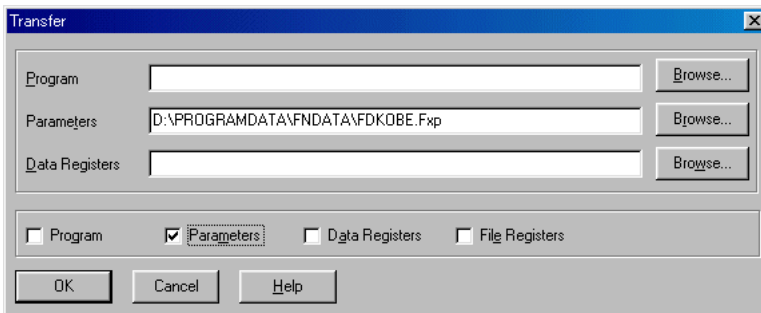
Here, the method of transferring data that has been saved in a file in the disk to the PC is explained. (The data that is transferred is overwritten on the data in the PC.)

Before performing the transfer operation, you need to open the online window according to the procedure in section 3-2.

- ◇ Select [File] - [Load...] from the menu bar.



The {Transfer} dialog box is displayed.
Check [Parameter] to ON.



- ◇ Specify the location and file name of the program to be transferred in the [Parameters] text box.
When you left-click the [Browse...] button, a dialog box for drive, holder, and file selection appears.
- ◇ Left-click the [OK] button to execute transfer processing.

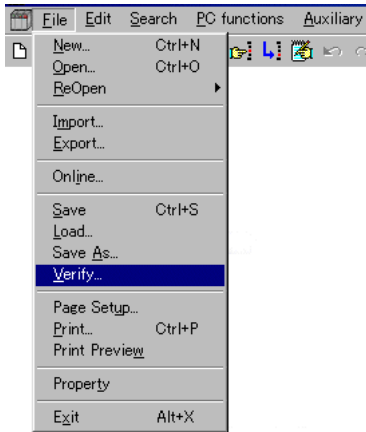
3-4 Transfer (Verify) Contents of File to the PC

3-4-4 Comparing File Contents with PC Contents

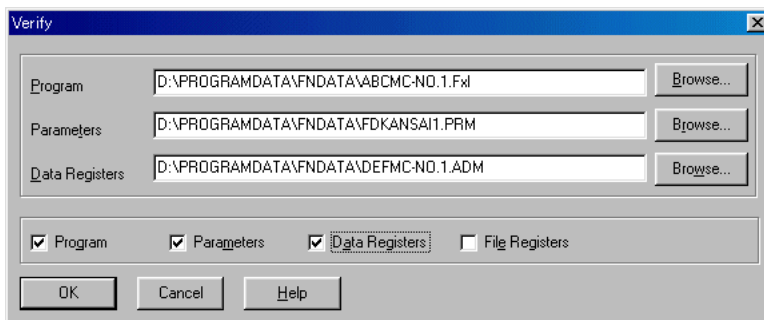
The following describes the procedure for verifying the data stored as a data file with the contents of the personal computer.

Before performing the verify operation, you need to open the Online window according to the procedure in section 3-2.


- ◇ Select [File] - [Verify...] from the menu bar.



- ◇ The {Verify} dialog box is displayed. Check the items to be verified.



- ◇ For each of the [Program(P)], [Parameter(T)], and [Data register(D)] text boxes, specify the location and file name of the file to be verified. When you left-click the [Browse...] button, a dialog box for drive, holder, and file selection appears.
- ◇ Left-click the [OK] button to execute transfer processing.


 This function allows you to verify the contents of the program, parameter, data register, and file register separately or collectively. In the {Verify} dialog box, if the [Program] check box is checked and the [Program] text box is specified, the [Parameter], [Data register], and [File register] check boxes are checked, and corresponding text boxes are left blank, the parameter, data register, and file register files with the same file name as the program file in the same location are loaded and verified.

Here, the method of starting/stopping the PC from the loader is explained.

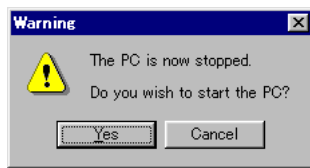


With a PC model whose operation mode can be changed by a key switch (e.g., NJ or NS), set the key switch in the {TERM} position. If the key switch is in the {RUN} or {STOP} position, the PC cannot be started/stopped with the loader.

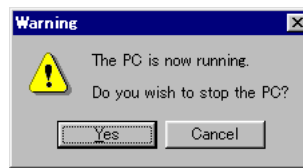
The procedure for starting/stopping the PC is as follows.

- ◇ Select [PC functions] - [Run/Stop] from the menu bar.
(Alternatively, left-click the [Run/Stop] button on the main tool bar.)
- ◇ The {Warning} dialog box for confirming the start (stop) of the PC is displayed. Left-click the [Yes] button to start (stop) the PC.

<Stop → Run>




<Run → Stop>

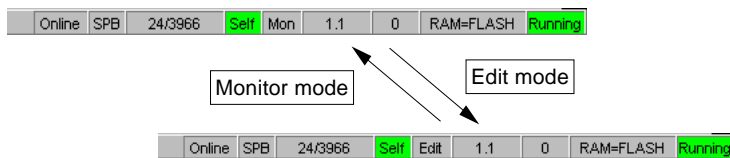


Here, the method of changing a program of the online-connected PC is explained.

With a PC whose operation mode can be selected by a key switch (e.g., NJ or NS), set the key switch in the {TERM} position. When the key switch is in the {RUN} or {STOP} position, the program cannot be changed from the loader.

- ◇ Select [Edit] - [Edit mode] from the menu bar to switch the screen mode from the [Monitor mode] to the [Edit mode]. (Alternatively, left-click the  [Edit] button on the main tool bar.)

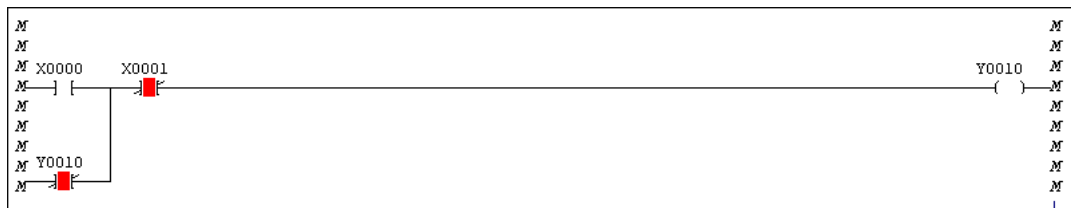
The current screen mode is displayed on the status bar at the bottom of the window.



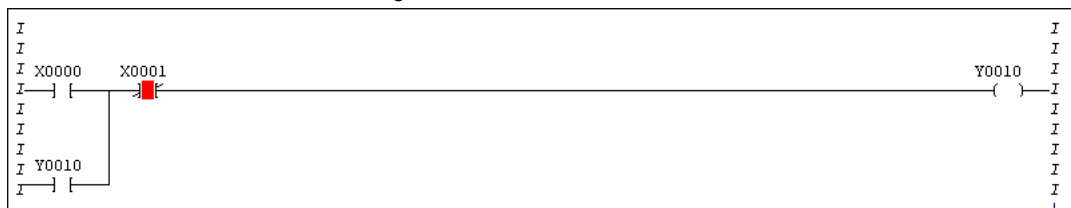
- ◇ Edit (change) the program. (For the method of editing a program, refer to Section 2.)

While the program is being edited, various symbols are displayed on the right and left power rails in the ladder program. The meanings of those symbols are explained below. Each time an edited line is transferred the PC, the associated symbol disappears. (The selection display does not disappear.)

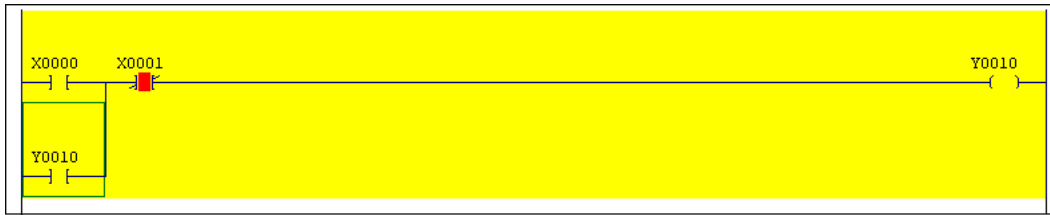
- M ... Indicates that the line is being changed.



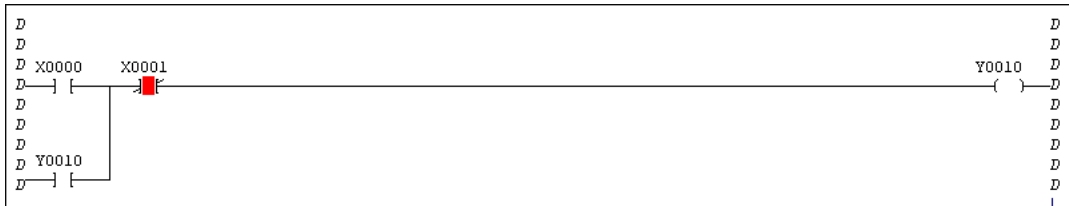
- I Indicates that the line is being inserted.




- Color of selected area ... Indicates that the line is being selected.



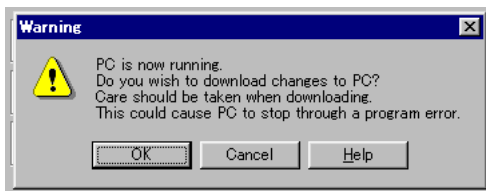
- D ... Indicates that the line is being deleted.



◇ Select [Edit] - [Download changes to PC] from the menu bar to transfer the edited program to the PC. (Alternatively, left-click the  [Download to PC] button on the main tool bar.

 **Caution**

When downloading changes to a running PC, care should be taken as this could cause a program error, which in turn can cause the PC to stop or the system to malfunction. When an attempt is made to transfer a changed program to the PC, a dialog box for confirmation is displayed. Left-click the [OK] button, and the changed program is transferred to the PC.




A line modified or deleted erroneously can be returned to the previous state if the circuit data has not been transferred to the PC yet. Select [Edit] - [Undo].

Here, the method of clearing the PC memory is explained. There are two methods of clearing the PC memory as shown below.

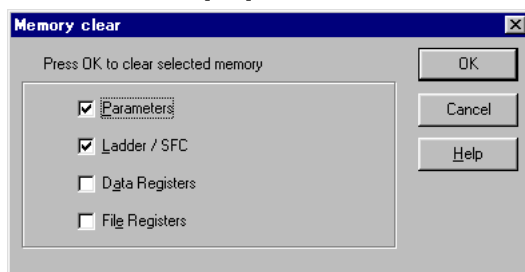
- 1) Clearing the PC memory with the online window kept open
- 2) Clearing the PC memory without opening the online window

The second method is used to clear the PC memory when the online window cannot be opened due to a PC memory error, etc.

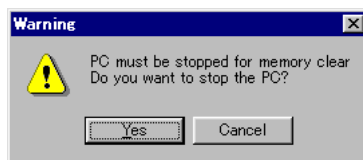
 With a PC whose operation mode can be changed by a key switch (e.g., NJ or NS), set the key switch in the {TERM} position. When the key switch is in the {RUN} or {STOP} position, the PC memory cannot be cleared from the loader.

3-7-1 Clearing PC memory with online window kept open

- ◇ Select [PC Functions] - [Memory Clear...] from the menu bar.
- ◇ The {Memory Clear} dialog box is displayed. Check the box associated with the item to be cleared. Now, left-click the [OK] button.



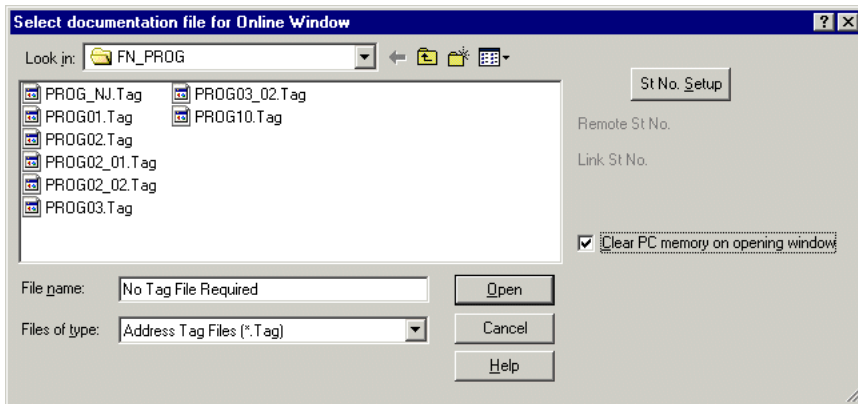
- ◇ If the PC is running, the following warning message is displayed. After confirming that there is no problem, left-click the [Yes] button.



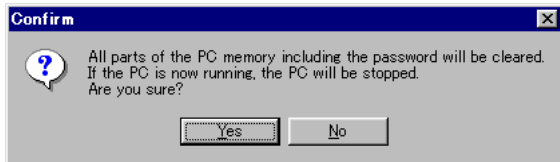
- ◇ Specified memory is cleared, and returns to the online window.

3-7-2 Clearing PC memory without opening online window

- ◇ Select [File] - [Online] from the menu bar.
- ◇ The [Select documentation file for Online Window] is displayed. Check [Clear PC memory on opening window].

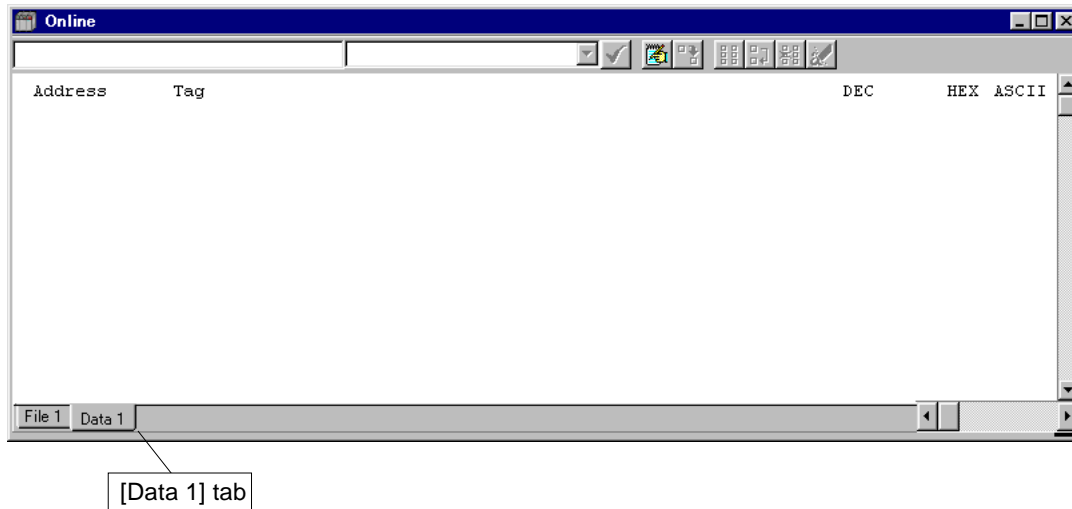


- ◇ The following warning message is displayed. Left-click the [Yes] button.



- ◇ Specified memory is cleared and return to the online window.

Here, the method of displaying (monitoring) and setting data of any address of the PC memory is explained. To display/set data, select the [Data 1] tab from the [Display Selection] tab and open the data display window.



3-8-1 Displaying data

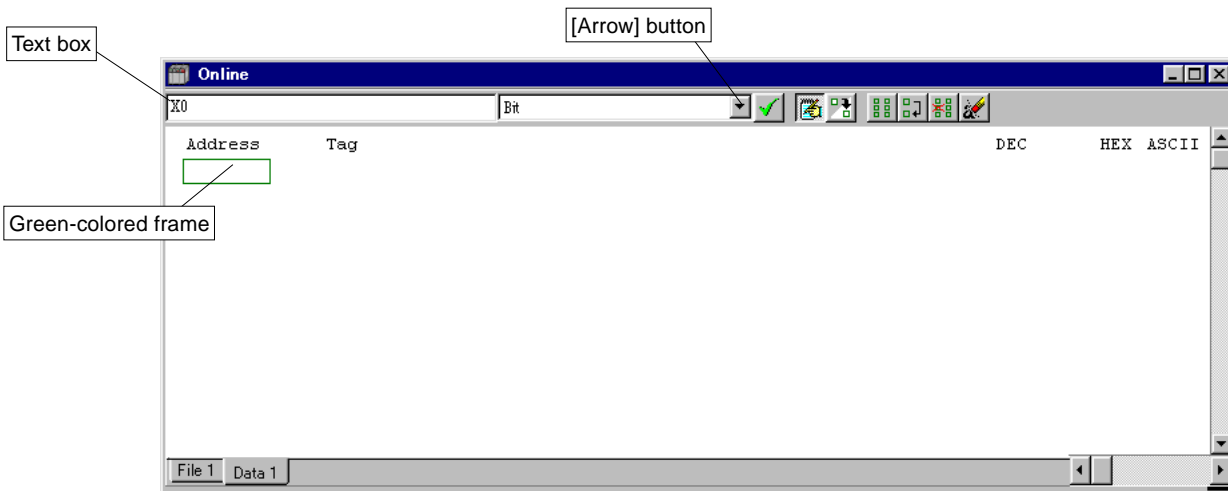
Here, the method of displaying the PC memory area in bits and in words is explained.

<Display in bits>

◇ Enter the address to be displayed. Left-click below [Address] of the data display window. (A green-colored frame is displayed.)

Next, enter the address in the text box at the top, left of the screen.

Then, left-click the [Arrow] button and select [Bit] from the data format list.

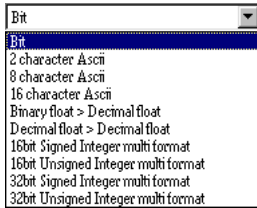





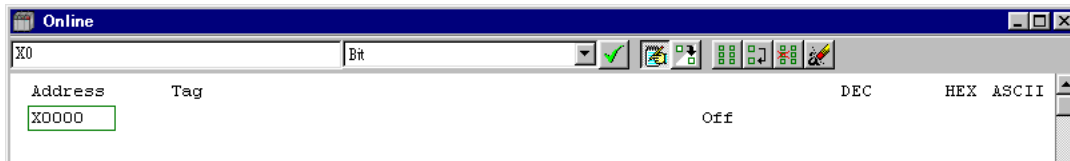
Data format

Use a suitable data format depending on the situation.

- Bit area display: Select [Bit].
- Word area display: Select [16-bit signed multi-display] for 16-bit data or [32-bit signed multi-display] for 32-bit data.
- Floating-point data display: Select [Binary float] or [Decimal float] to display an exponential rate and a mantissa rate separately.
- ASCII data: Select [2-byte ASCII], [8-byte ASCII], or [16-byte ASCII].

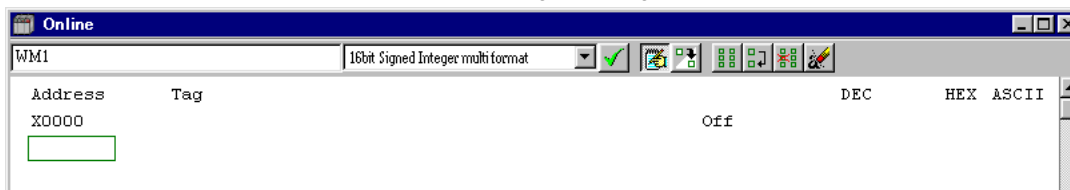



- ◇ Left-click the  [Enter] button. (Alternatively, push the <Enter> key.) The status of the specified bit (Off for 0, On for 1) is displayed.



<Display in words>


- ◇ In the data display window, left-click the part right under the part in which the address was entered in the above operation. (In this example, a green-colored frame is displayed under address "X0000.") Next, enter the address in the text box at top, right of the screen. Then left-click the arrow button to select [16-bit signed Integer multi format] from the data format list.

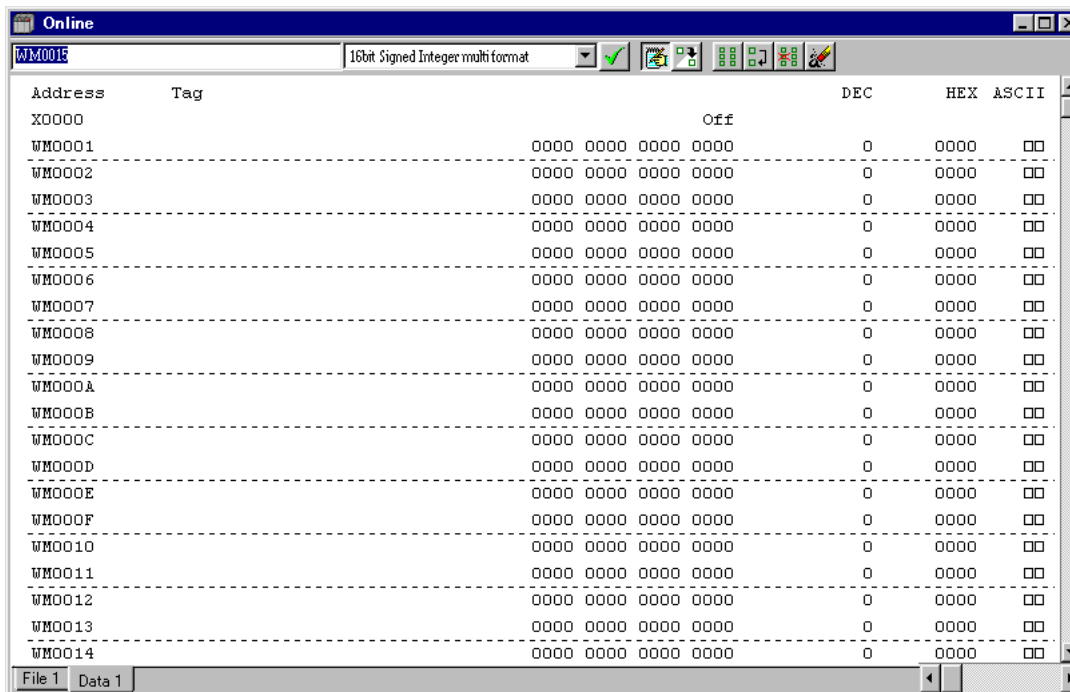


- ◇ Left-click the  [Enter] button. The status of the specified word is displayed.



<Continuous display>

- ◇ After displaying a specified bit or word by the above procedure, left-click the  [Continuous] button. The specified bit or word is displayed continuously.



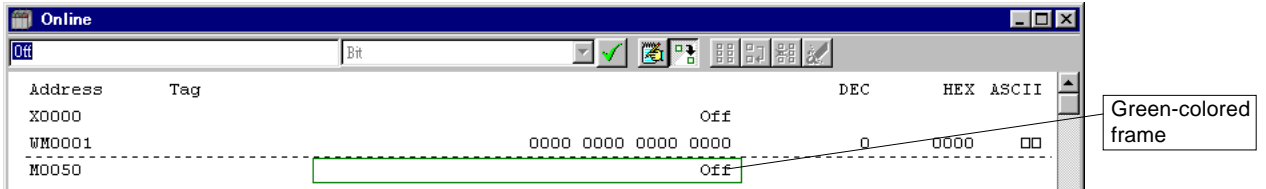
3-8-2 Setting data

In order to set any data, it is necessary first to display the memory address at which to set data. For the method of displaying data, refer to the preceding paragraph 3-8-1.

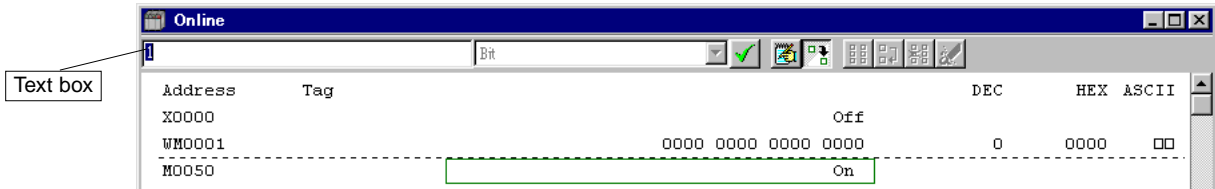
In the following explanation, it is assumed that the memory address has been displayed.

<Turning on/off bit data>

- ◊ Left-click the data display area at the right of the address whose bit is to be turned on or off. (A green-colored frame is displayed.)

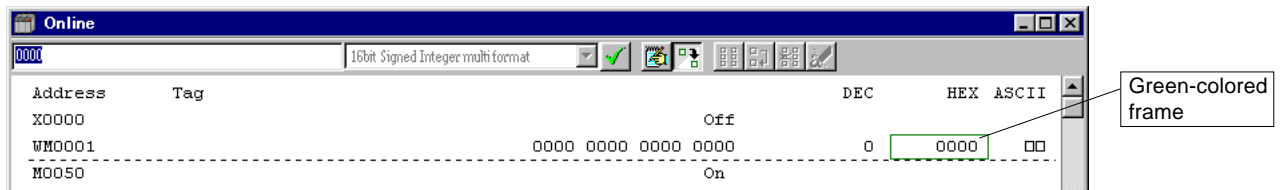


- ◊ Enter "1" (or "ON") or "0" (or "OFF") in the text box at top, right of the screen. Then, left-click the [Enter] button. The specified address bit is turned on or off

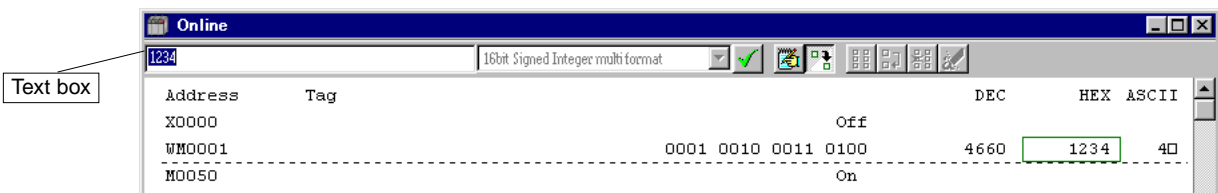


<Setting word data>

- ◊ Left-click the hexadecimal number area of the address to set data. (A green frame is displayed.)



- ◊ Enter word data to be set (e.g., "F00F") in the text box at top, right of the screen and left-click the [Enter] button. The word data is set at the specified address.

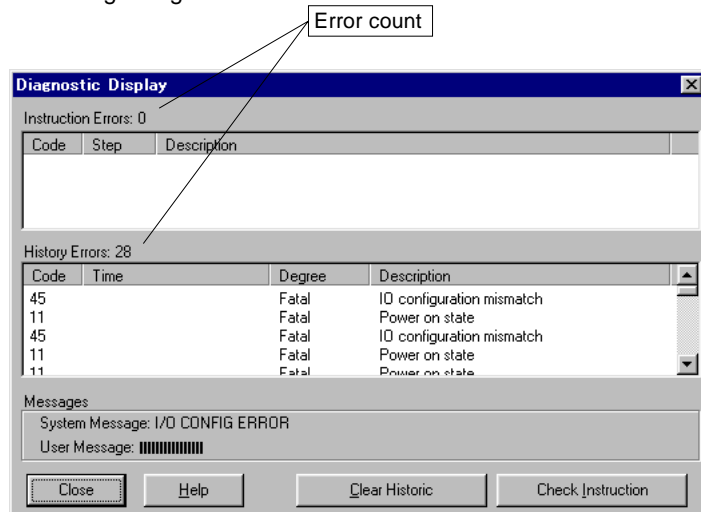


When the PC is running and when the specified address is the one where a program output or instruction data has been written, the program operation is given precedence. Similarly, in the setting of data at an address which has been specified as an external output of the PC, the external output is given precedence.

Here, the method of diagnosing the PC when some trouble has occurred with the PC is explained.

- ◇ Activate the diagnostic information screen. Select [PC functions] - [Diagnostics...] display from the menu bar. The RAS display screen consists of the following three types of display.

- Instruction diagnostics
- System diagnostics
- Message diagnostics



- **Instruction diagnostics**

This section lists instruction diagnostic error codes indicating the contents of program errors detected at startup and program steps where the program errors were detected.

(For details of the instruction diagnostic error codes, refer to the Instruction Part of your PC.)

You may select [Check Instruction] for the same program check instead.

- **System diagnostics history display**

The PC has a function to detect and store several errors. (The maximum error count in memory depends on the model. If the number of errors exceeds this limit, old error information is discarded.)

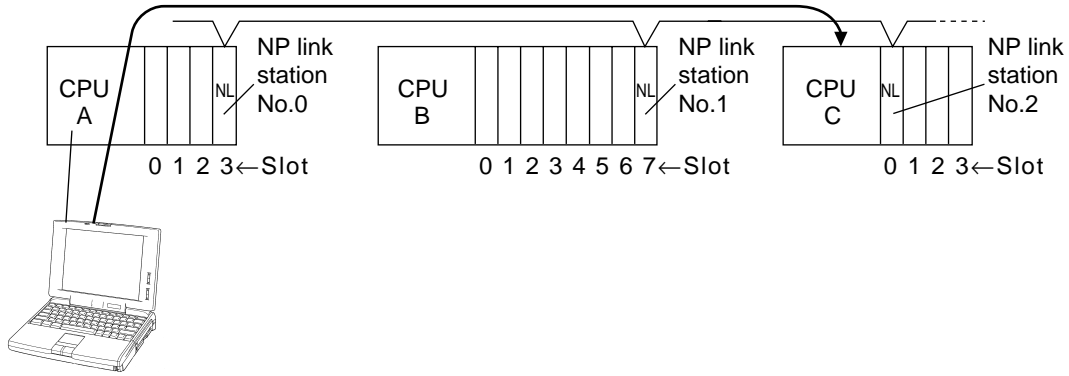
The latest error information is at the beginning. The time is displayed only when the PC has a built-in calendar function. Click [Clear Historic] to clear the information.

- **Message diagnostics**

The latest message is displayed. A system message indicates an error detected by the PC and a user message is specified from a user program. Both types of messages display the contents of specified special registers.

Loader network is the function that connects a program loader to another CPU via NP-link. When the program loader is connected to a CPU, programs and data of other CPUs connected to the network can be monitored or edited. This function is available for the NJ and NS series CPU units.

Example: Connecting a program loader connected to the CPU of NP-link station 1 to a CPU of station 7 via the NP-link

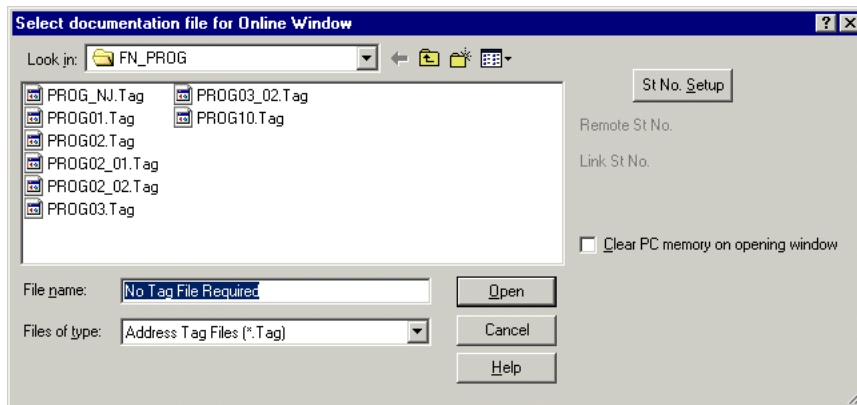


To connect another PC, set the remote office and link office numbers at the [Select tag file] dialog when the Online Window is opened. You may also select [PC functions] - [Change Remote/Link] instead. To connect not another PC but the local station, select [PC functions] - [Change Remote/Link...]. This section gives an example where the PC loader is connected to CPU(A) and the network is connected to or disconnected from CPU(B).

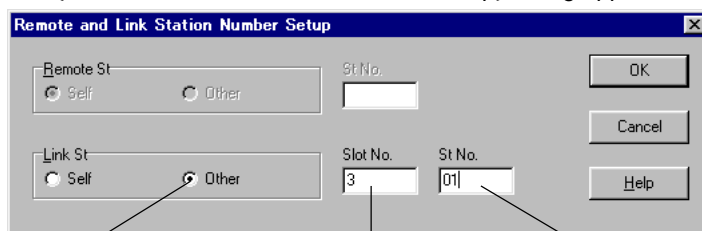
3-10-1 Network Connect

(1) Online connection

- ◇ Select [File] - [Online] or [PC functions] - [Change Remote/Link] from the menu bar.
- ◇ The {Select documentation file for Online Window} dialog appears.

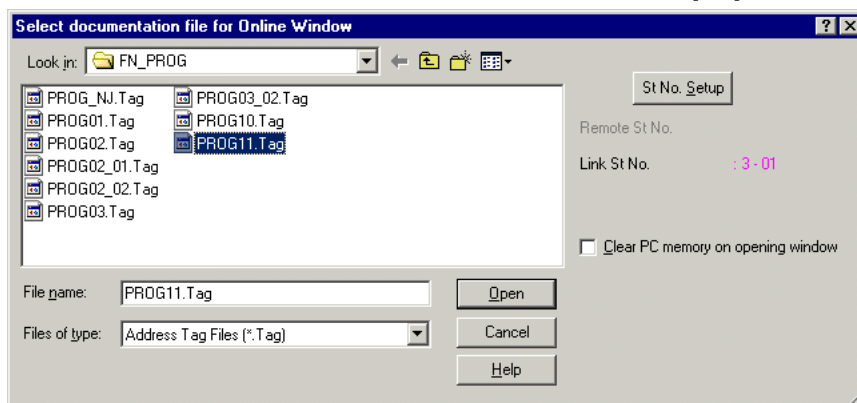


- ◇ Click the [St No. Setup] button.
- ◇ The {Remote and Link Station Number Setup} dialog appears.



- Connect to another station
- Slot number where the NP-Link module of the local station is mounted
- Remote station number

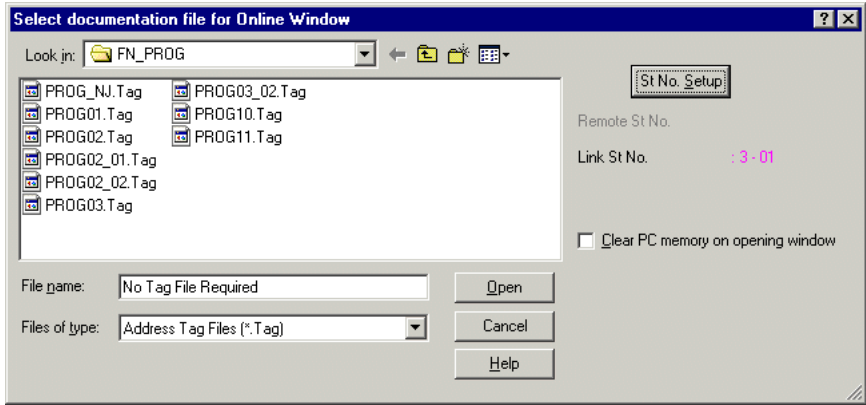
- ◇ Set a remote station and a link station to connect, and click the [OK] button.



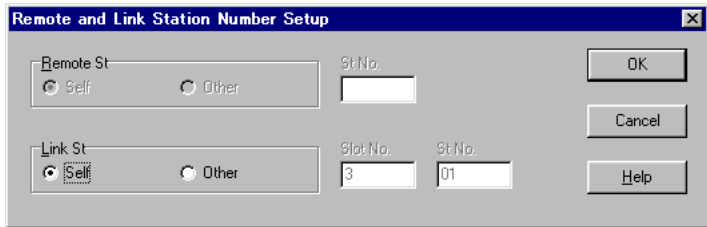
- ◇ Select a display tag file at the {Select documentation file for Online Window} dialog, left-click the [Open] button, and set the tag file.
- ◇ Left-click the [OK] button.
Programs of the CPU of the remote station are displayed. Online operation method is the same as when connected to the local station.

3-10-2 Changing or releasing the destination of network connection

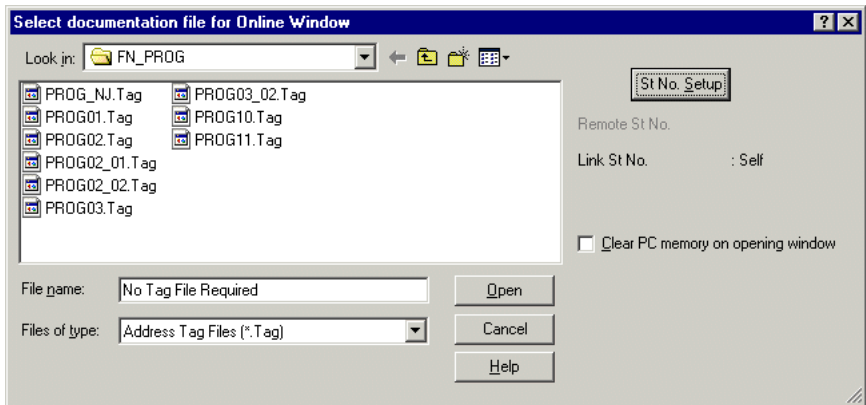
- ◇ Select [PC functions] - [Change Remote/Link] from the menu bar.
- ◇ The {Select documentation file for Online Window} dialog box is displayed.



- ◇ Click the [St No. Setup] button.
- ◇ The {Remote and Link Station Number Setup} dialog appears.



- ◇ When changing the destination of connection, set a remote station and a link station to connect, and click the [OK] button.
- ◇ When clearing the setting, return both the remote and link stations to the local station and click the [OK] button.
- ◇ The {Select documentation file for Online Window} dialog box appears.



When no tag file needs to be displayed, keep “No Tag File Required” displayed in the [File name] text box. When a tag file is to be displayed, set it in the [File name] text box.

- ◇ Left-click the [Open] button.
- The CPU programs of the specified station or those of the local station are displayed.



The network is also released when the power switch of the program loader is turned off, when the cable connecting the program loader is disconnected, or when the power switch of the CPU to which the program loader is connected is turned off.

3-11 Sampling Trace (Recording of Data History)

The sampling trace function enables the user to store the data preceding and following a specified point in the sampling trace memory of the program loader. When the sampling trace memory is monitored, the history of data alteration can be traced. Sampling trace data can be registered in the loader up to 16 for bit data and up to 6 for word data. The sampling interval can be set for each scan or time segment (10 to 2550 ms) and data can be sampled for up to 2000.

One of the following methods is selectable for setting the trigger point:

- (1) Specifying from the loader
- (2) Using the STRA instruction from a program
- (3) Using the ON address of a specified relay
- (4) Using the OFF address of a specified relay

Because data alteration before and after a point can be monitored, this function is effectively used to inspect the factor of an event.

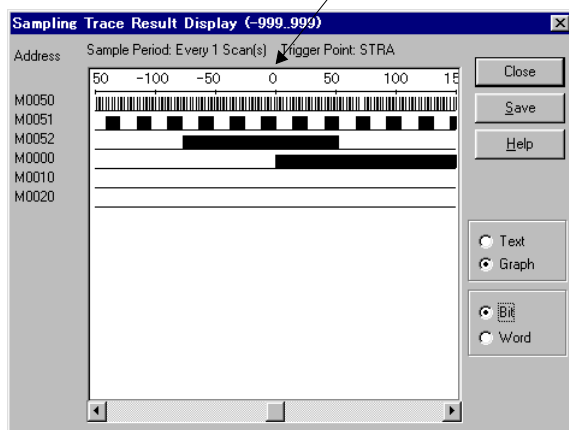


Following model of PC support Sampling trace.
NS/NJ-Series PC with debugging memory cassette (model: N-MA16) mounted

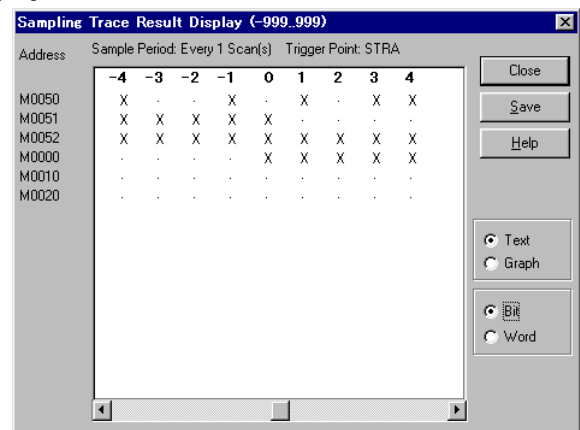
Example of sampling trace result display

1) Graph (timing chart) display [Bit]

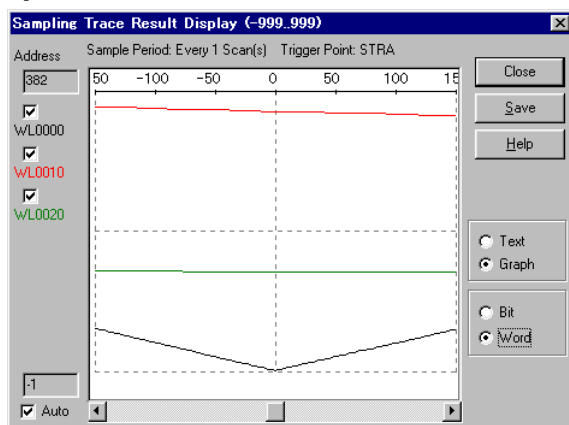
Specified point



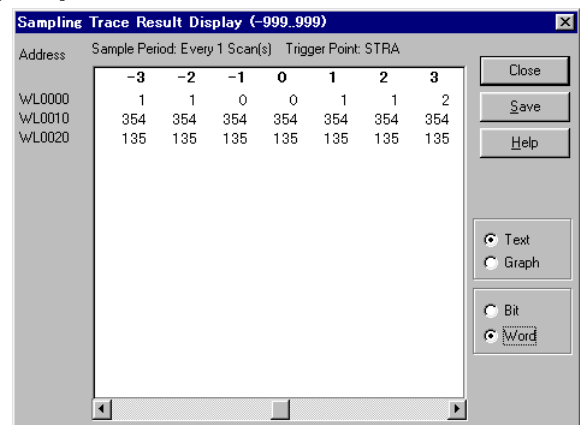
2) Text (ON/OFF) display [Bit]



[Word]

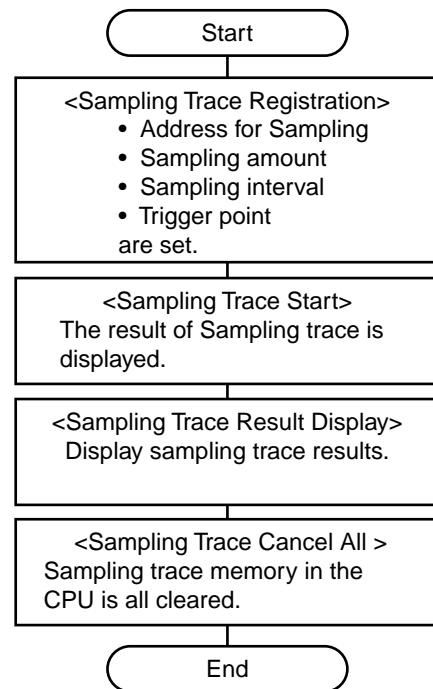


[Word]



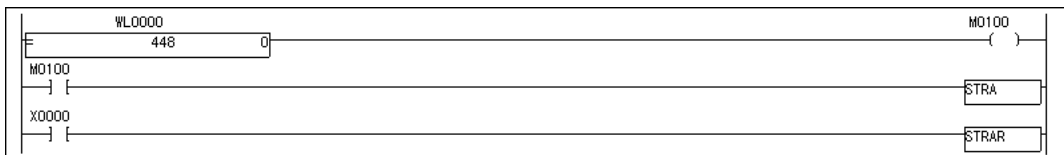
Sampling trace operation procedure

The program loader executes a sampling trace operation in the following procedure.



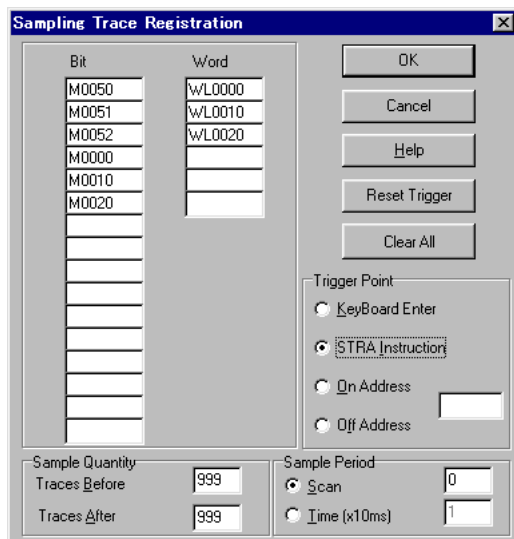
The procedure is explained with a sample program next.

(1) Trigger specification by program instruction



Explanation of program and setup

1) Click [OK] on the {Trace Registration} dialog box to start the sampling trace function.

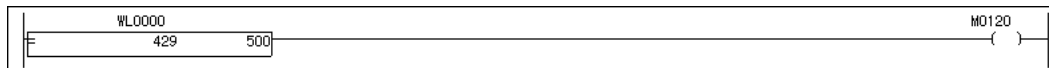


2) When indefinite data is entered into WL0000 as 0, an STRA instruction is executed. Before and after the timing, WL0000 data is traced 999 times each for sampling at 10 ms intervals.

3) When X0000 input becomes ON, the sampling trace memory function is reset and accepts the STRA instruction again.

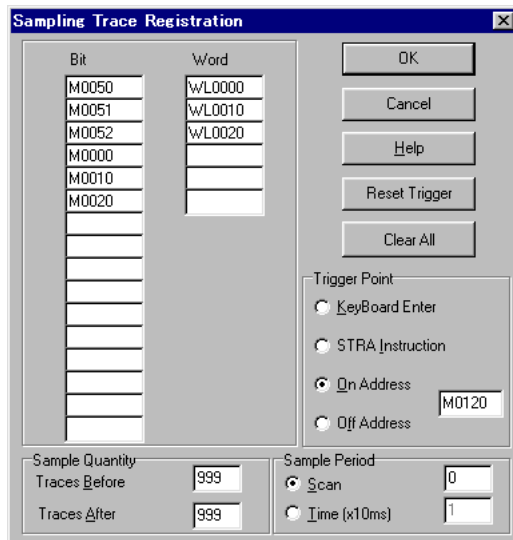
3-11 Sampling Trace (Recording of Data History)

(2) Trigger specification by device start and end



Explanation of program and setup

1) Click [OK] on the {Trace Registration} dialog box to start the sampling trace function.

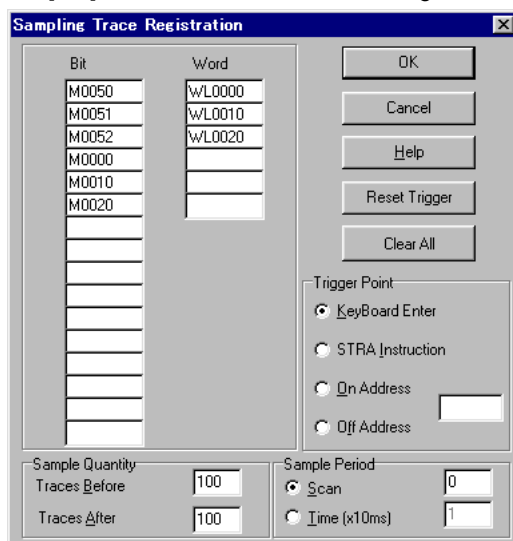


2) When indefinite data is entered into WL000 as 500, WL000 data is traced 999 times each before and after the leading edge of M0120 for sampling at 10 ms intervals.

3-11-1 Setting sampling trace

This subsection explains how to set the sampling trace function.

- ◇ Select [PC functions] - [Sampling Trace Registration] from the menu bar.
- ◇ The {Sample Trace Registration} dialog box is displayed.
Set the sampling trace conditions (Bit, Word, Sampling volume, Sampling interval, and Trigger point) and left-click the [OK] button. The conditions are registered in the PC.



<Explanation of the dialog box>

[Bit] text box:

Set the bit address where sampling is performed (maximum 16 points).

[Word] text box:

Set the word address where sampling is performed (maximum 6 points).

Sample Quantity

Register the sampling count with data position address 0 at the center: 0 to 999 for [Before Conditions] and 1 to 999 for [After Conditions]. The count should be as follows:

Note: Sampling trace register data + Status latch register data \leq Debugging RAM capacity (15360 words)
If the total of "Sampling trace register data" and "Status latch register data" exceeds 15360 words, the setting results in an error.

Sample Period

Select either of the following:

- **Scan – Arbitrary number of scans**
Samples data at every specified number of scans (synchronous scanning). The setting range is from 0 to 255. (0: sampling at every scan)
- **Time (x 10 ms)**
Samples data at specified time intervals. The setting range is from 10 to 99990 (ms). (1 to 9999 x 10 ms)
- **Trigger Point**
Select one of the following:
 - Specify from loader [Key Board Enter]
Sets the trigger point (point 0) at the start of sampling trace.
 - STRA instruction
Sets the trigger point (point 0) at the execution of the STRA instruction.
 - Relay ON [On Address]
Sets the trigger point (point 0) at the timing when a specified relay becomes ON.
 - Relay OFF [Off Address]
Sets the trigger point (point 0) at the timing when a specified relay becomes OFF.
- **[Reset Trigger] button**
Suspends sampling trace. When restarting sampling trace under new conditions, click this button once to suspend sampling trace and change the setup.
- **[Clear All] button**
Clears the setup on the screen.

3-11 Sampling Trace (Recording of Data History)

3-11-2 Sampling trace execution

Sampling trace can be executed by either key operation on the program loader or a program stored in the PC memory.

(1) Methods of execution by the program loader

1) [None] option button

When the start of sampling trace is selected, data is collected sequentially in the positive direction from the maximum address in the negative direction.

The sampling data is taken from the scan end.

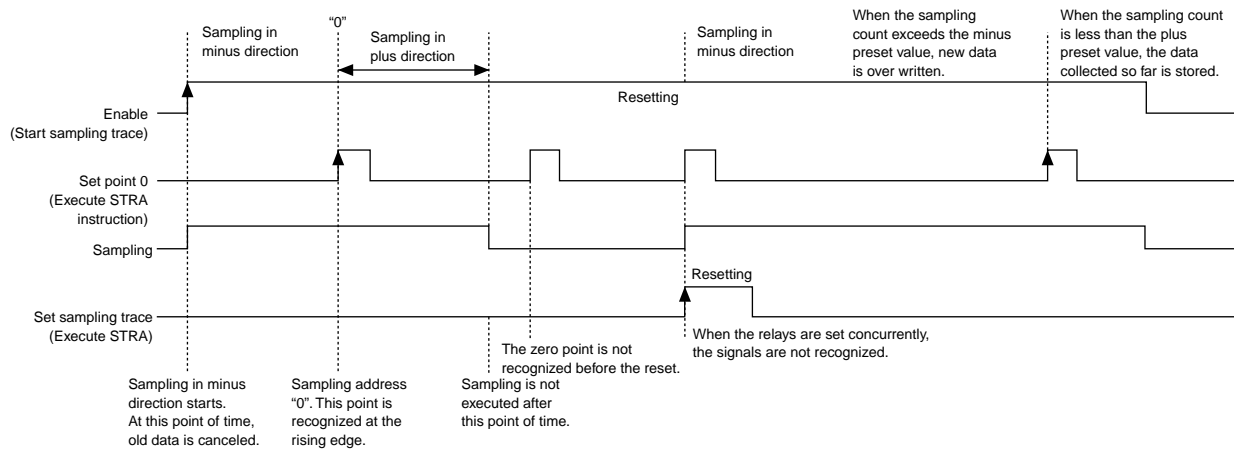
2) [On Address]/[Off Address] option button

Sampling operation is in the standby state at sampling address "0" to wait for the triggering (at the rising or falling edge) of a specified bit. When a trigger signal is issued, sampling trace is executed in the plus direction.

(2) Method of execution by a program

1) Data is collected in the negative direction when the start of sampling trace is executed, then in the positive direction when the STRA instruction (set point 0) is executed.

The operation timing chart is shown below.

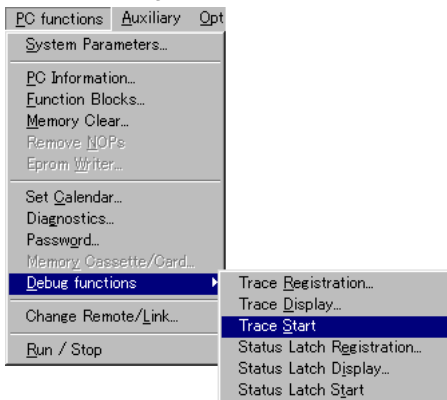


Caution

- If the program does not have the STRA instruction, sampling trace does not stop because point 0 cannot be set.
- The STRA instruction cannot be executed two or more consecutive times. (Once executed, the STRA instruction becomes invalid.) If the STRA Reset (STRAR) instruction is executed, the STRA instruction becomes valid again.

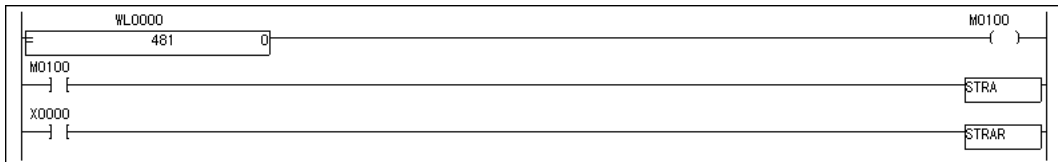
Methods of 1) and 2)

- ◇ Select [PC functions] - [Debug functions] - [Trace Start] from the menu bar.
- ◇ Then sampling data collection is started.



Method of 3)

- ◇ Select [Trace Start] to start data collection in the negative direction. Once WL000 has become 0, sampling trace data is collected in the positive direction.

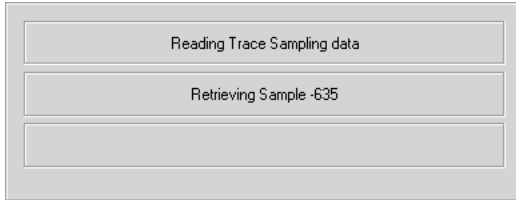


3-11 Sampling Trace (Recording of Data History)

3-11-3 Display of sampling trace

The data collected by sampling trace can be read for graphic (time chart) display or text (ON/OFF) display.

- ◇ Select [PC functions] - [Debug functions] - [Trace Display...] from the menu bar.

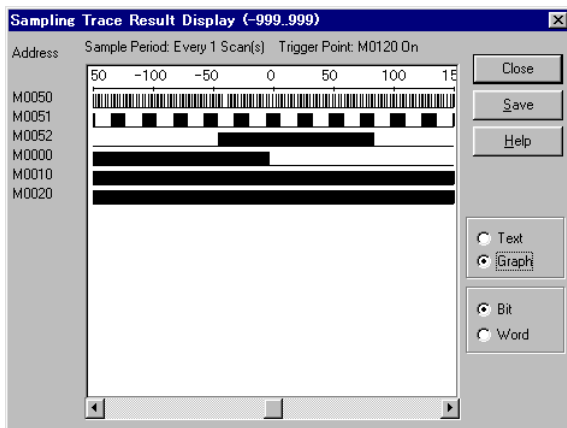


Sampling trace data is read.

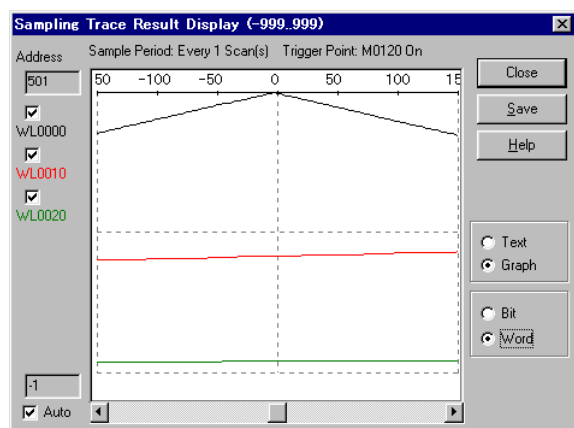
- ◇ The {Sampling Trace Result Display} dialog box is displayed.
- Display mode can be changed over with optional [Text] and [Graph] buttons.
- Click also the [Bit] or [Word] button to change the display.

<Sample graphic display>

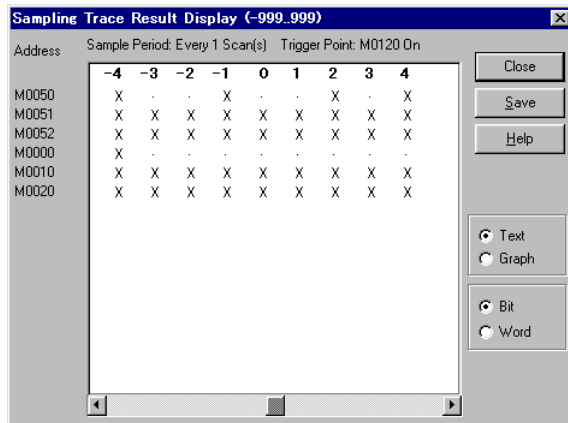
[Bit]



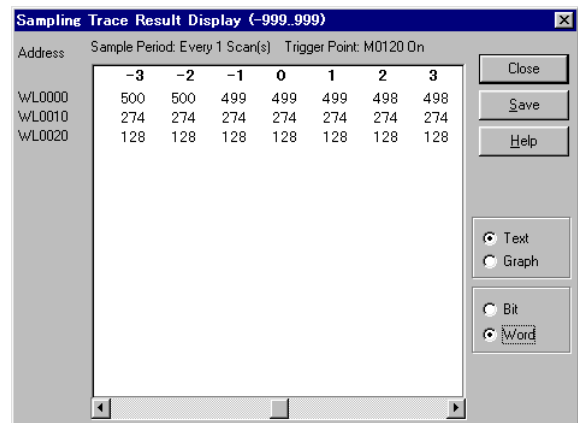
[Word]



<Sample text display>
[Bit]



[Word]

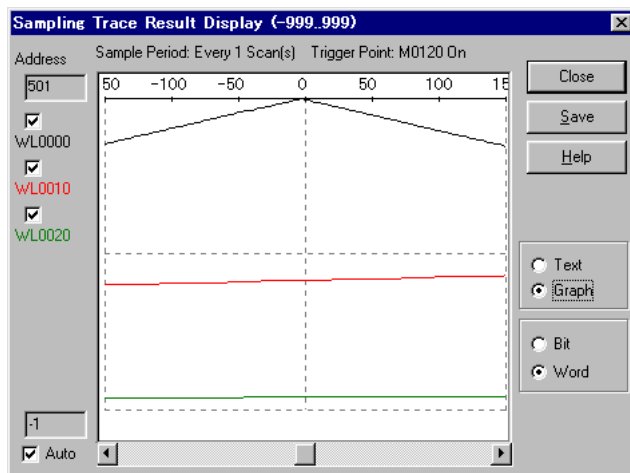


For text display, “.” is indicated for OFF status of bit address and “X” for ON status. A signed decimal number represents a word address.

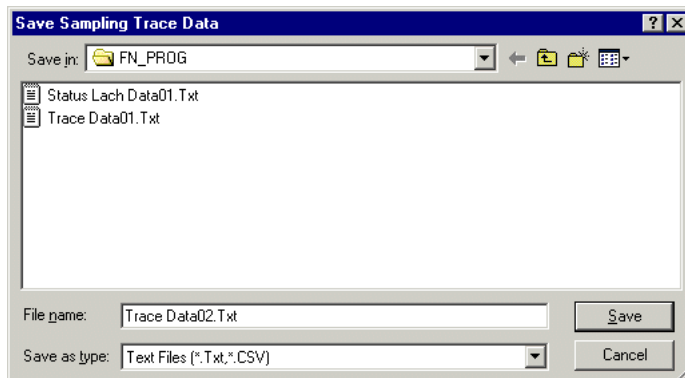
3-11-4 Saving sampling trace data

This subsection explains how to save collected sampling trace data in a text file.

- ◊ Select [PC functions] - [Debug functions] - [Trace Display...] from the menu bar.



- ◊ Left-click the [Save] button to display the {Save Sampling Trace Data} dialog box appears.



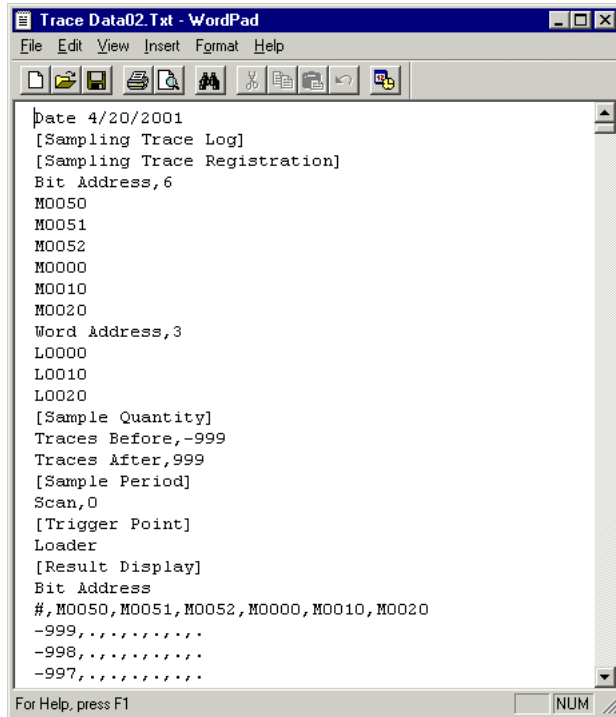
3-11 Sampling Trace (Recording of Data History)

Sampling trace cancel all

On the {Save Sampling Trace} dialog box, specify [Save in] and [File name].

[Display (Play) Saved Sampling Trace Data]

A saved sampling trace data file can be checked using Windows accessory file [Notepad] or a similar text editor.. Specify the location (folder) and name of the sampling trace data file.



```
Trace Data02.Txt - WordPad
File Edit View Insert Format Help
[Save] [Print] [Find] [Copy] [Paste] [Undo] [Redo] [Home] [End]
Date 4/20/2001
[Sampling Trace Log]
[Sampling Trace Registration]
Bit Address,6
M0050
M0051
M0052
M0000
M0010
M0020
Word Address,3
L0000
L0010
L0020
[Sample Quantity]
Traces Before,-999
Traces After,999
[Sample Period]
Scan,0
[Trigger Point]
Loader
[Result Display]
Bit Address
#,M0050,M0051,M0052,M0000,M0010,M0020
-999,.....
-998,.....
-997,.....
For Help, press F1 NUM
```

3-11-5 Sampling trace cancel all

Releasing sampling trace means to clear the sampling trace register data stored in the PC memory and the collected sampling trace data. Both data is cleared in the following cases:

- If new trace conditions are set, the data is all cleared and the next sampling trace is awaited.
- If [Trace Start] is selected and executed, the data is all cleared and the next sampling trace is awaited.
- These data are also cleared when the power switch of the CPU is turned off.

3-12-1 Outline of function

Status latch function enables the user to store various data obtained at a latch point in the status latch memory of the PC. The stored data can be monitored. Latch target data can be registered in the PC loader and specified in units of words for up to 20 blocks (start and end addresses specified).

One of the following methods is selectable for latching data:

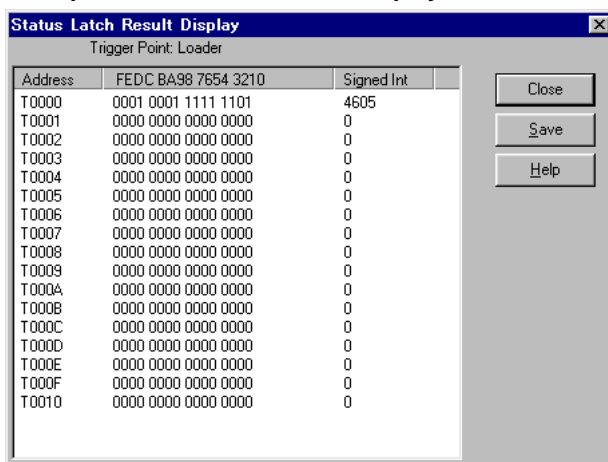
- (1) Specifying from the loader
- (2) Using the SLT instruction from a program
- (3) Using the ON address of a specified relay
- (4) Using the OFF address of a specified relay

This function can be effectively used to analyze the occurrence of a system event.



Following model of PC support Sampling trace.
NS/NJ-Series PC with debugging memory cassette (model: N-MA16) mounted

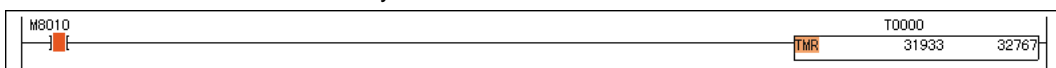
Example of status latch result display



3-12-2 Creating a program

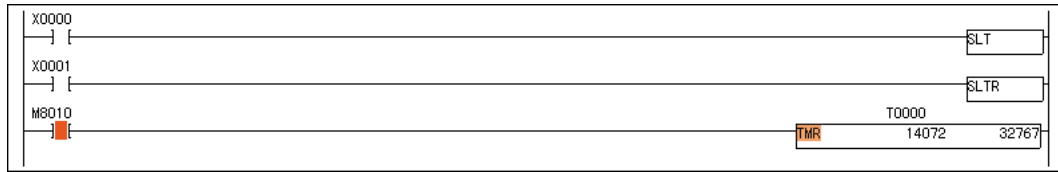
(1) Example of the program to execute status latch by key operation on the program loader

- 1) When the PC starts operation, the timer starts counting.
- 2) The timer current value at the time when status latch is executed by key operation on the program loader is stored in the status latch memory of the PC.



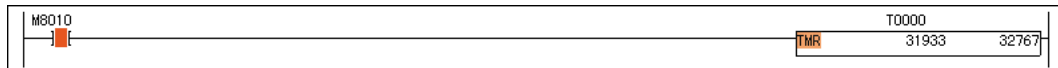
3-12 Status Latch (Recording Data at a Point of Time)

(2) Example of the program using the SLT instruction



- 1) When [SLT Instruction] is selected at [Status Latch Registration], the status latch function becomes ready.
- 2) When the X00 switch becomes ON, the current timer value is stored in the PC status latch memory.
- 3) When the X01 switch becomes ON, the status latch function is reset.

(3) Example of the program to execute status latch by operating external input switch X10



- 1) When the PC starts operation, the timer starts counting.
- 2) The timer current value at the time that "X10" connected to the input card is turned ON is stored in the status latch memory of the PC.

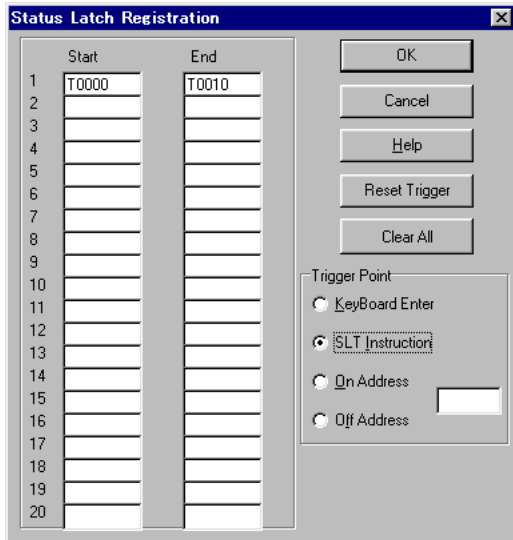


Input switch X10 is not required by the program.

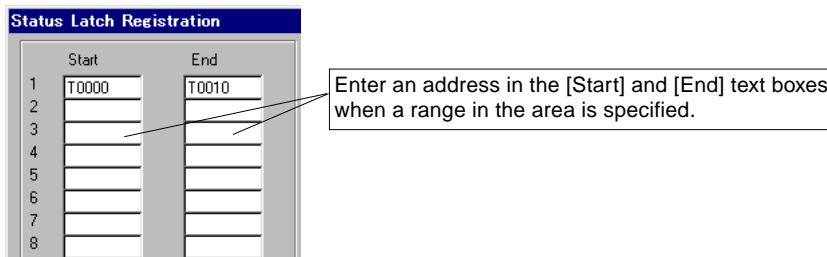
3-12-3 Status latch registration

The following example shows how to register timer current value T0 in the status latch memory.

- ◇ Select [PC functions] - [Debug functions] - [Status Latch Registration...] from the menu bar.
- ◇ The {Status Latch Registration} dialog box is displayed.
After entering T0, T10 in the [Start] and [End] text boxes for [TR], left-click the [OK] button.
Then the content of [Status Latch Registration] is set in the CPU.



<Explanation of the dialog box>



[Clear All] button

Clears all the ranges that are set on the screen.

[Reset Trigger] button

Suspends status latch. When executing status latch under the same conditions, click this button once to suspend status latch to reset the trigger point.

3-12 Status Latch (Recording Data at a Point of Time)

3-12-4 Status latch execution

This subsection explains how to execute the status latch function.

The function is executed (1) using the PC loader, (2) using a program, or (3) using an external input switch.

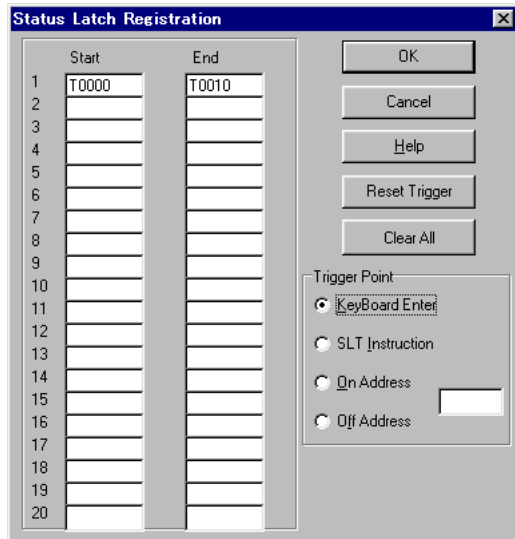
(1) Method to operate keys of the program loader

The following explanation is made, taking the program shown in 3-12-2 (3) for example.

1) Operate as follows from the program loader.

- ◇ Select [PC functions] - [Debug functions] - [Status Latch Registration...] from the menu bar.
- ◇ The {Status Latch Registration} dialog box is displayed.

Register status latch data, select [Key Board Enter], and left-click the [OK] button.



- ◇ Select [PC functions] - [Debug functions] - [Status Latch Start] from the menu bar. The current data is stored in the status latch memory.

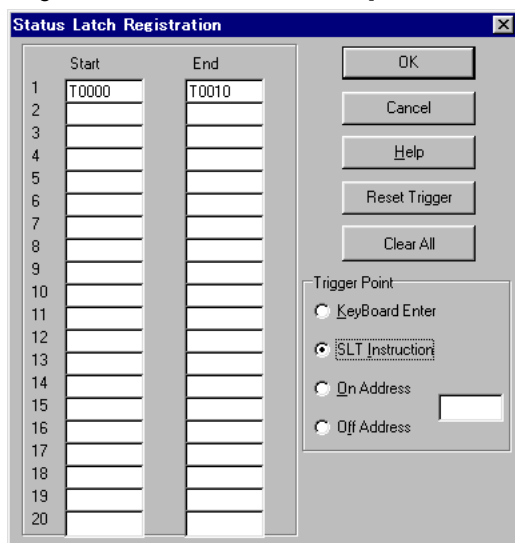
(2) Using a program

The procedure for the sample program of (1) in Section 3-12-2 is as follows:

1) Do on the PC loader as follows:

- ◇ Select [PC functions] - [Debug functions] - [Status Latch Registration...] from the menu bar.
- ◇ The {Status Latch Registration} dialog box is displayed.

Register status latch data, select [SLT Instruction], and left-click the [OK] button.



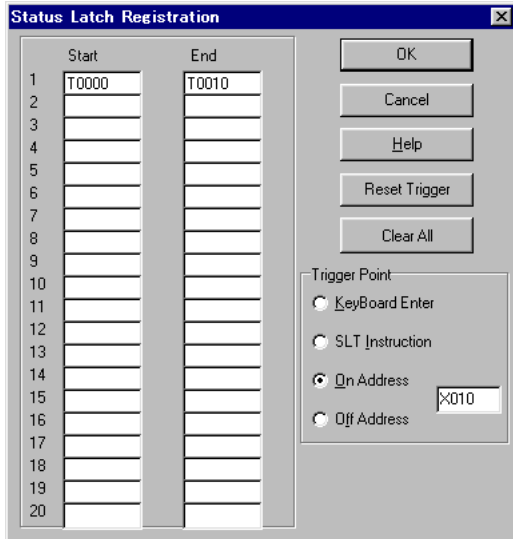
2) Set the X0 switch to ON to make the status latch instruction SLT valid. The current value (TR0) of the timer (T0) is stored in the PC status latch memory.

For the next status latch, execute the SLTR instruction once.

(3) The method to operate external input switch for execution

The following explanation is made, taking the program shown in 3-12-2 (2) for example.

- 1) Operate as follows from the program loader.
 - ◇ Select [PC functions] - [Debug functions] - [Status Latch Registration...] from the menu bar.
 - ◇ The {Status Latch Registration} dialog box is displayed.
Register status latch data, select [On Address], enter an external input switch address into the textbox, and left-click the [OK] button.

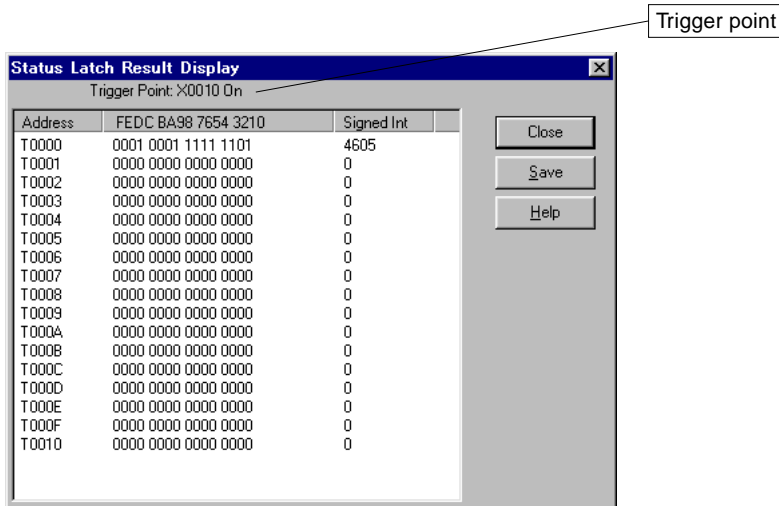


- 2) Turn on the external input switch (X10), and the current value (TR0) of timer (T0) will be stored in the status latch memory.

3-12-5 Status latch result display

Status latch data is displayed by using the following procedure.

- ◇ Select [PC functions] - [Debug functions] - [Status Latch Display...] from the menu bar.
- ◇ The {Status Latch Result Display} dialog box is displayed.

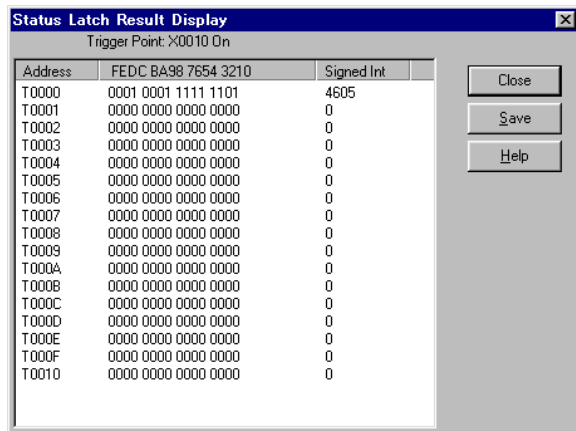


3-12 Status Latch (Recording Data at a Point of Time)

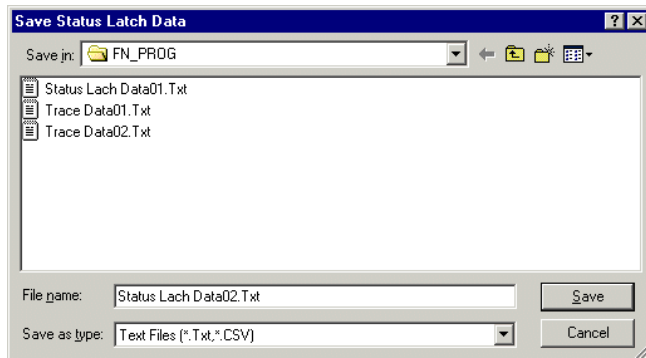
3-12-6 Saving status latch data

This subsection explains how to save latched data in a text file.

- ◇ Select [PC functions] - [Debug functions] - [Status Latch Display...] from the menu bar.



- ◇ Left-click the [Save] button to display the {Save Status Latch Data} dialog box is displayed.



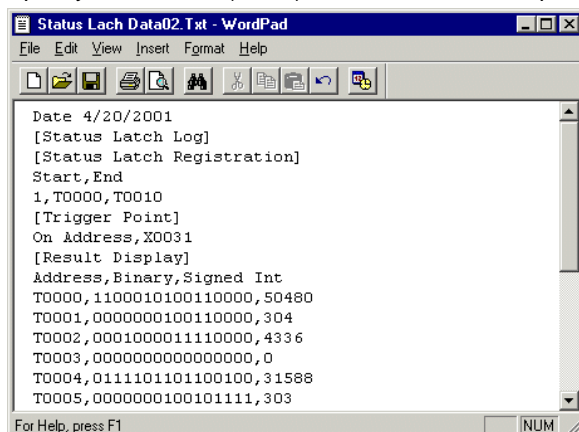
Specify [Save in] and [File name].

Click [Save] to save the data.

[Display (Play) Saved Status Latch Data]

A saved status latch data file can be checked using Windows accessory file [Notepad] or a similar text editor.

Specify the location (folder) and name of the sampling trace data file.



3-12-7 Status latch cancel all

Releasing status latch means to clear the status latch register data stored in the PC memory and the collected status latch data. Both data is cleared in the following cases:

- If new trace conditions are set, the data is all cleared and the next status latch is awaited.
- If [Status Latch Start] is selected and executed, the data is all cleared and the next status latch is awaited.
- Then status latch data is all cleared.

Section 4 Print Function

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The print function consists of the following.

- 1) Page setup
- 2) Print setup
 - Ladder (program) printout
 - I/O device listing
 - Device use condition printout
 - Instruction word list print
 - Device cross-reference printout
 - Parameter setup print
 - File register printing
- 3) Printer setup
- 4) Print preview

Here, the individual items shown above are explained.

4-1-1 Page setup

The page setup function is used to set common print items (header, footer, and margin).

(1) Displaying and setting the {Page Setup} dialog box

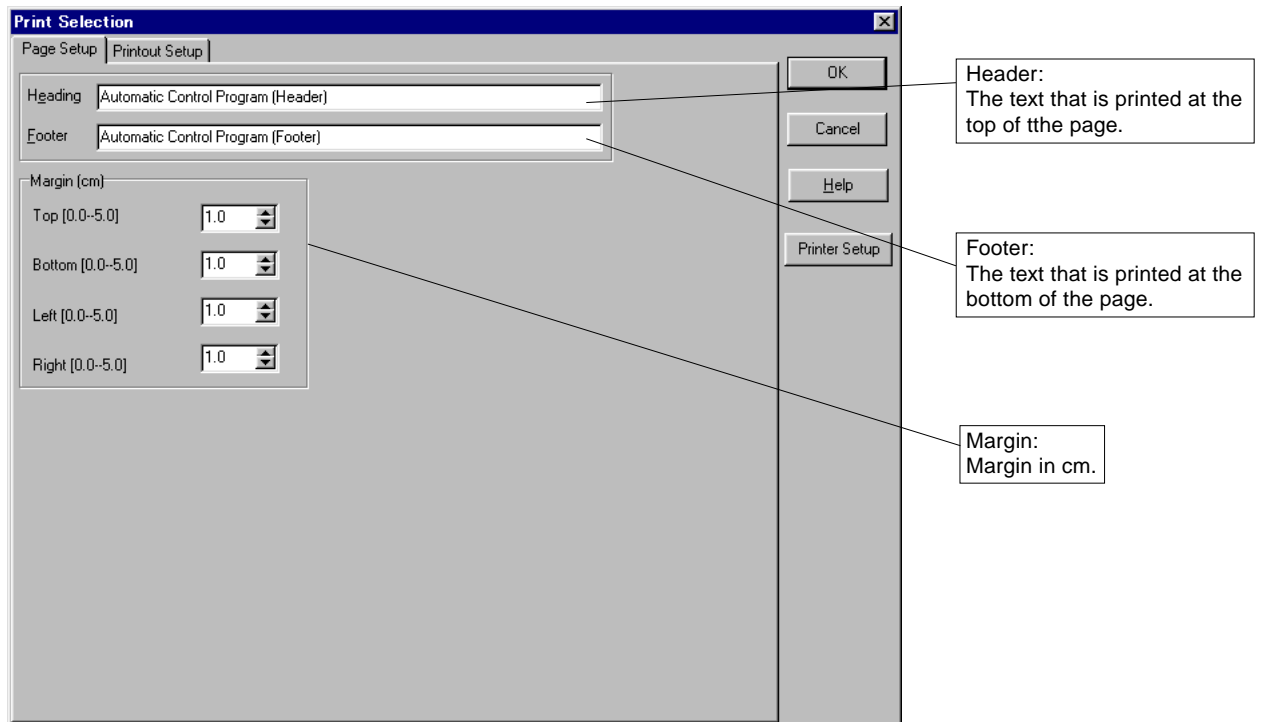
The {Page Setup} dialog box can be operated by the following two methods:

1) Use the Page Setup command.

- ◇ Select the [Page Setup...] command from the [File] menu.
The {Page Setup} dialog box is displayed.
- ◇ Left-click the [Page Setup] tab.
The dialog box shown below is displayed.

2) Use the Print command.

- ◇ Select the [Print...] command from the [File] menu.
The {Print} dialog box is displayed.
- ◇ Left-click the [Page Setup] button.
The {Print Selection} dialog box is displayed.
- ◇ Left-click the [Page Setup] tab.
The dialog box shown below is displayed.



- ◇ Set each of the items as required.
- ◇ Left-click the [OK] button.

4-1-2 Print setup

The print setup function is used to set the printing range and contents for the following:

- Ladder (program) printout
- I/O device list printout
- Instruction word list print
- Device use condition printout
- Device cross-reference printout
- Parameter setup print
- File register printing

(1) Displaying and setting the {Print Setup} dialog box

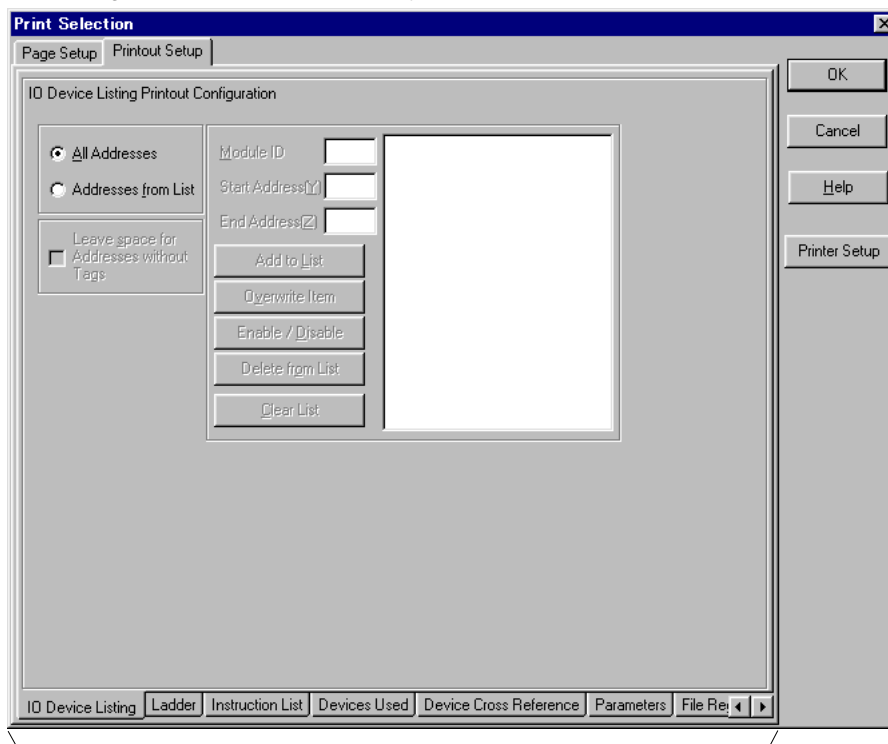
The {Print Setup} dialog box can be operated by the following two methods:

1) Use the Page Setup command.

- ◇ Select the [Page Setup...] command from the [File] menu.
The {Print Selection} dialog box is displayed.
- ◇ Left-click the [Print Setup] tab. (Usually, the dialog appears with the [Print Setup] tab selected.)
The diagram shown below is displayed.

2) Use the Print command.

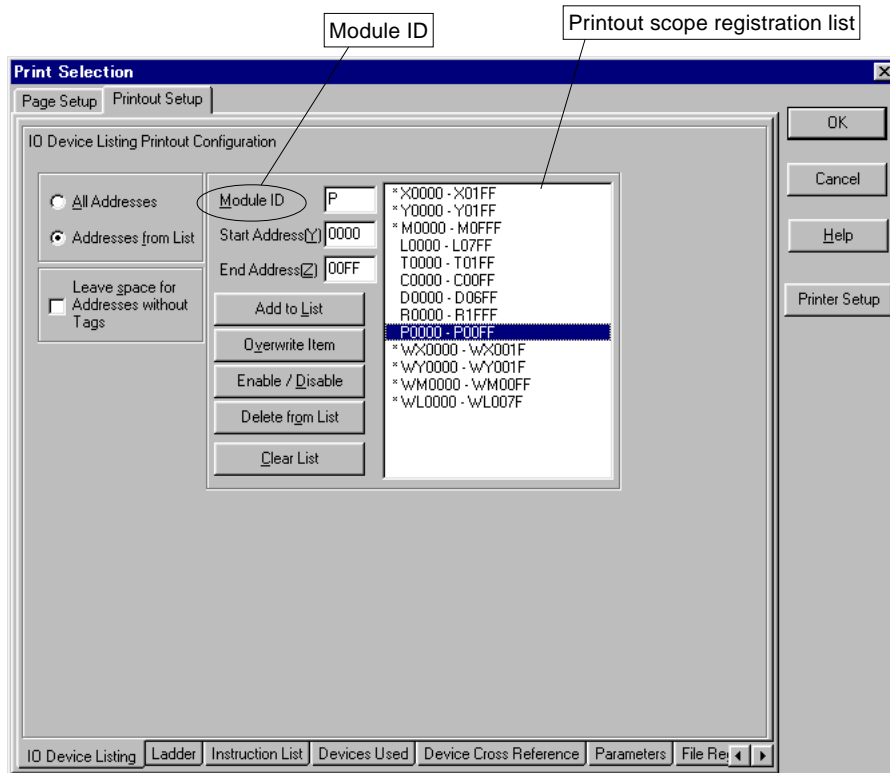
- ◇ Select the [Print...] command from the [File] menu.
The {Print} dialog box is displayed.
- ◇ Left-click the [Page Setup] button.
The {Print Selection} dialog box is displayed.
- ◇ Left-click the [Print Setup] tab. (Usually, the dialog appears with the [Print Setup] tab selected.)
The dialog box shown below is displayed.



Set each item to be printed by left-clicking the associated tab.

(2) Setting of IO Listing

When this item is set, specified tags, memory addresses, and descriptive statements are printed in the form of a list.



<Explanation of the dialog box>

Optional [All Addresses] button:

Only the tags that have been registered in the Tag Editor are printed.

Optional [Addresses from List] button:

Only the tags of the memory addresses that have been registered in the printout range registration list are printed.

[Leave Space for Addresses without Tags] check box:

When this box is checked, even the memory addresses without tags are printed. To print only the memory addresses with tags, uncheck the box.

• Use of the “Printout Scope Registration List”

[Module ID] text box:

Enter the identifier of the memory module to be printed (X, Y, M, L, WX, WY, WM, WL, etc.).

[Start Address] text box:

Enter the first address of the memory to be printed.

[End Address] text box:

Enter the last address of the memory to be printed.

[Add to List] button:

Left-click this button when registering the entries in the [Module ID], [Start Address], and [End Address] text boxes in the “Printout Scope Registration List.”

[Overwrite Item] button:

Left-click this button when overwriting (changing) any item that has been selected in the “Printout Scope Registration List.”

[Enable/Disable] button:

This button is used to specify whether or not to print any item that has been specified in the “Printout Scope Registration List.” (Items with an asterisk (*) are printed, whereas those without an asterisk are not printed.)

[Delete from List] button:

Left-click this button when selecting and deleting only one of the items that have been registered in the “Printout Scope Registration List.”

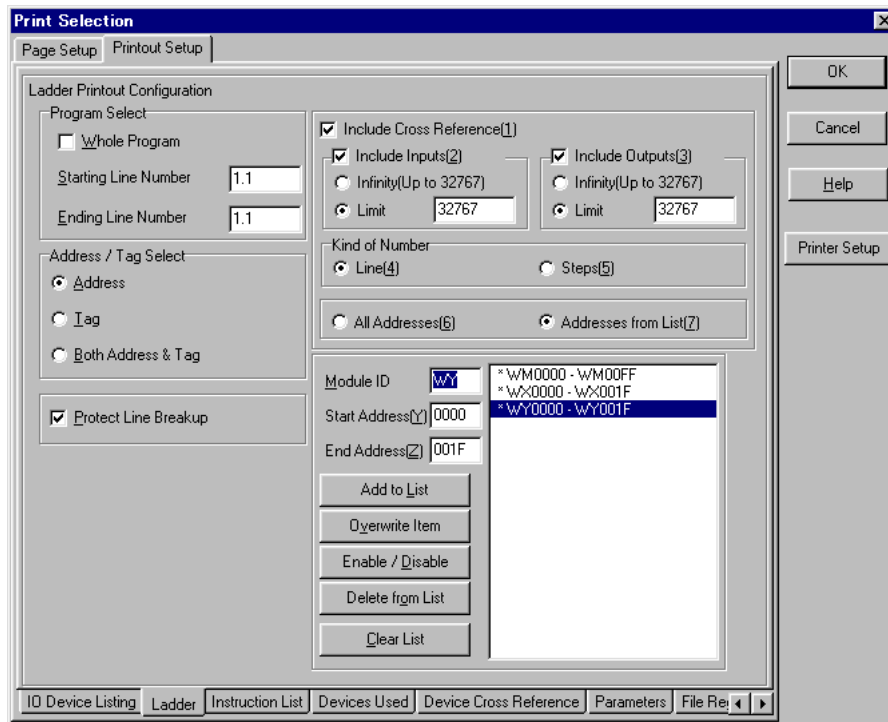
[Clear List] button:

This button is used to delete all the items that have been registered in the "Printout Scope Registration List."

- * To delete registered items on a one-by-one basis, select the item to be deleted and push the <Delete> key.

(3) Setting of Ladder

When this item is selected, a ladder program list is printed. It is possible to set either the whole program or any part of it to be printed.



<Explanation of the dialog box>

{Program Select} box

[Whole Program] check box:

Check this box when printing the whole program.

[Starting Line Number] text box:

When printing a part of the program, enter the starting line number (page number.line number) in this text box.

Entry in this text box is valid when the [Whole Program] box is unchecked.

[Ending Line Number] text box:

When printing a part of the program, enter the ending line number (page number.line number) in this text box. Entry in this text box is valid when the [Whole Program] box is unchecked.

{Address/Tag Select} box

[Both Address & Tag] option button:

Left-click this button when printing the program with addresses and tags.

[Tag] option button:

Left-click this button when printing the program with tags only.

[Address] option button:

Left-click this button when printing the program with addresses only.

[Protect Line Breakup] check box:

Left-click this box when a line is not printed with one page. If this is checked the line will be printed from the top of the next page. When [Include Cross Reference(1)] is checked, this setting cannot be used.

[Include Cross Reference (1)] check box:

Check this box when a ladder circuit with cross reference is to be printed.

Click [Include Inputs (2)] to ON to print cross references from the input side.

Click [Include Outputs (3)] to ON to print cross references from the output side.

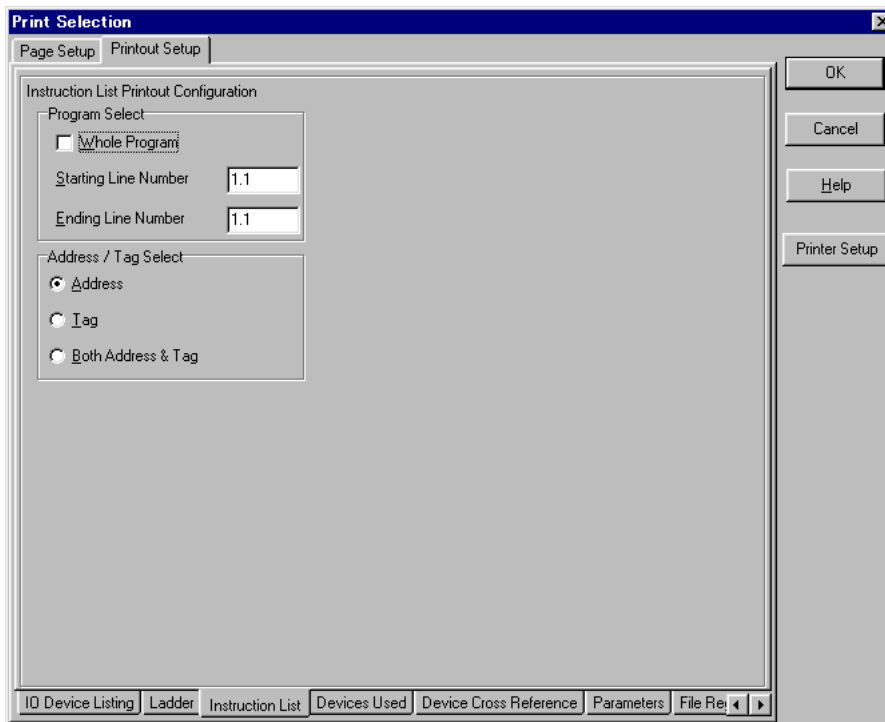
For a scope of addresses for cross-reference, left-click either [All Addresses (6)] or [Addresses from List (7)] optional button. When [Address from List (7)] is specified, the scope of memory addresses to be printed must be set.



For the method of setting the scope of memory addresses to be printed in the dialog box, refer to “(2) Setting of I/O Listing”.

(4) Print setup for instruction word list

Select this item to print an instruction word list containing all or selected programs.



<Explanation of the dialog box>

{Program Select} box

[Whole Program] check box:

Check this box when printing the whole program.

[Starting Line Number] text box:

When printing a part of the program, enter the starting line number (page number.line number) in this text box.

Entry in this text box is valid when the [Whole Program] box is unchecked.

[Ending Line Number] text box:

When printing a part of the program, enter the ending line number (page number.line number) in this text box. Entry in this text box is valid when the [Whole Program] box is unchecked.

{Address/Tag Select} box

[Both Address & Tag] option button:

Left-click this button when printing the program with addresses and tags.

[Tag] option button:

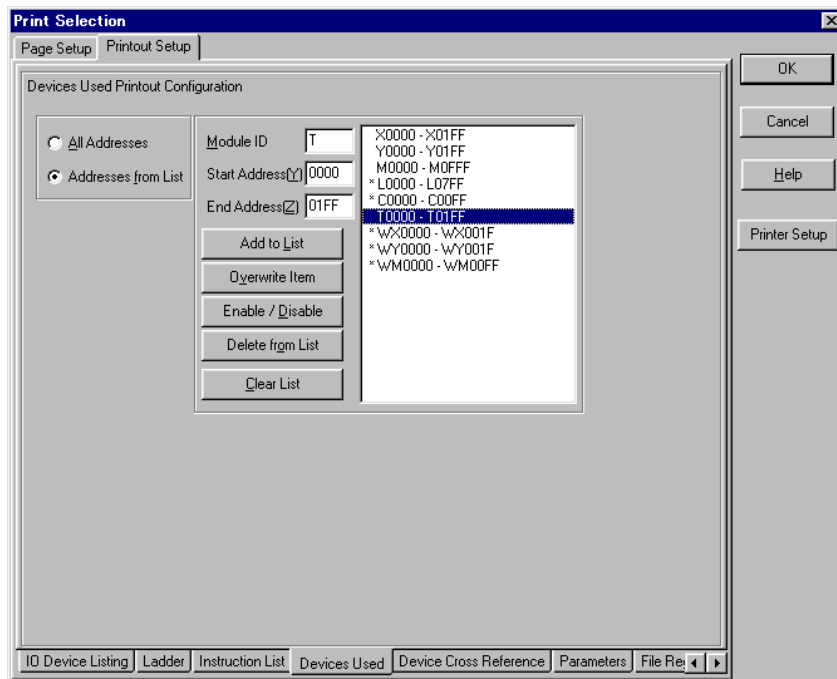
Left-click this button when printing the program with tags only.

[Address] option button:

Left-click this button when printing the program with addresses only.

(5) Setting of Devices Used

When this item is set, the conditions of use of the memory addresses (bit/word) used by a program are printed in the form of a table. It is possible to freely set a scope of memory to be printed using the following dialog box.

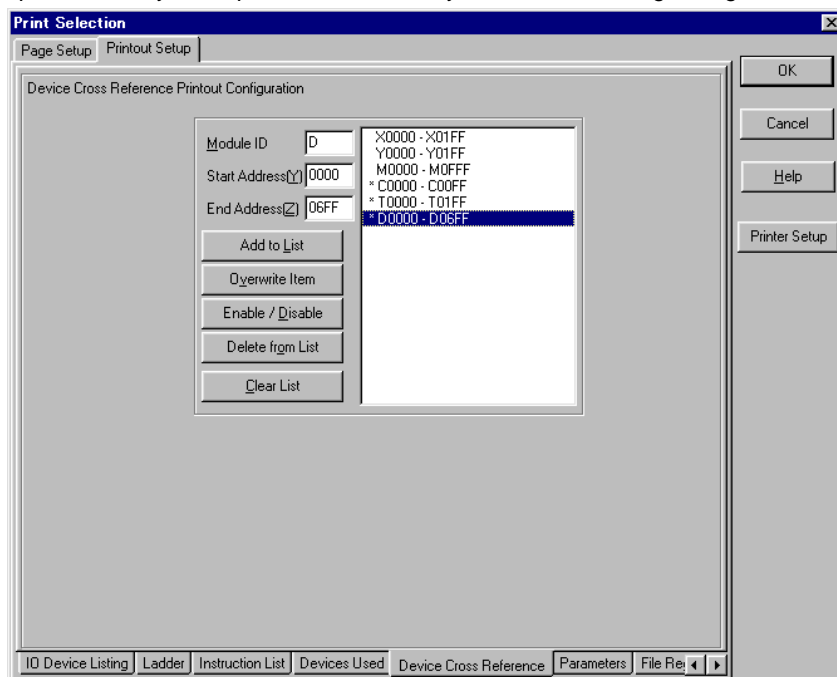


For the method of setting a scope of memory addresses to be printed in the dialog box, refer to “(2) Setting of IO Listing.”

(6) Setting of Devices Cross Reference

The cross reference indicates the line of a program in which each individual memory address is used. When this item is set, the cross-reference information is printed in the form of a table.

The scope of memory to be printed can be freely set in the following dialog box.



For the method of setting a scope of memory addresses to be printed in the dialog box, refer to “(2) Setting of IO Listing.”

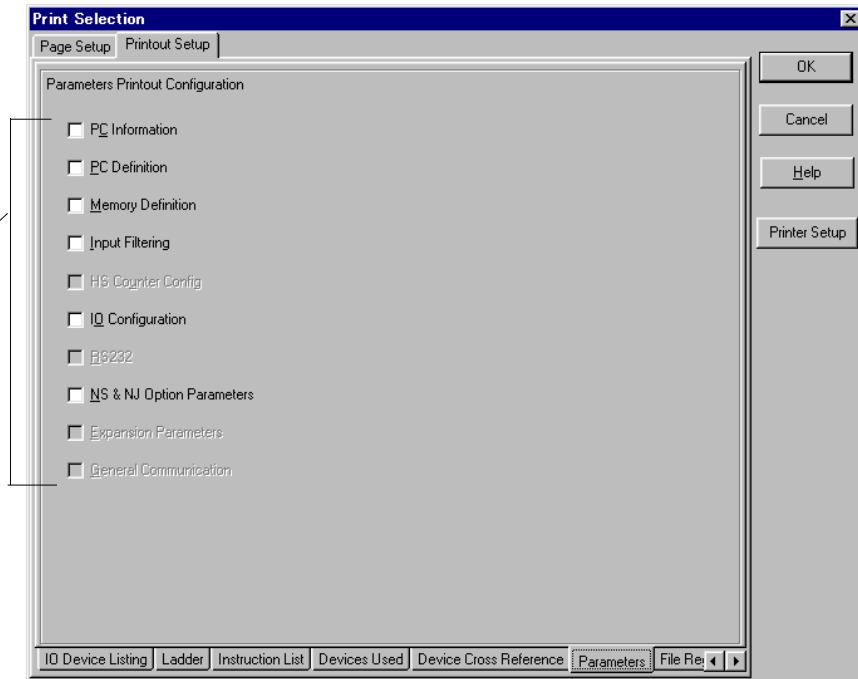


By previously checking the memory addresses used by "Devices Used" and specifying the minimum scope of memory addresses required, it is possible to reduce the time required to print the cross reference and preview the printout.

(7) Parameter setup

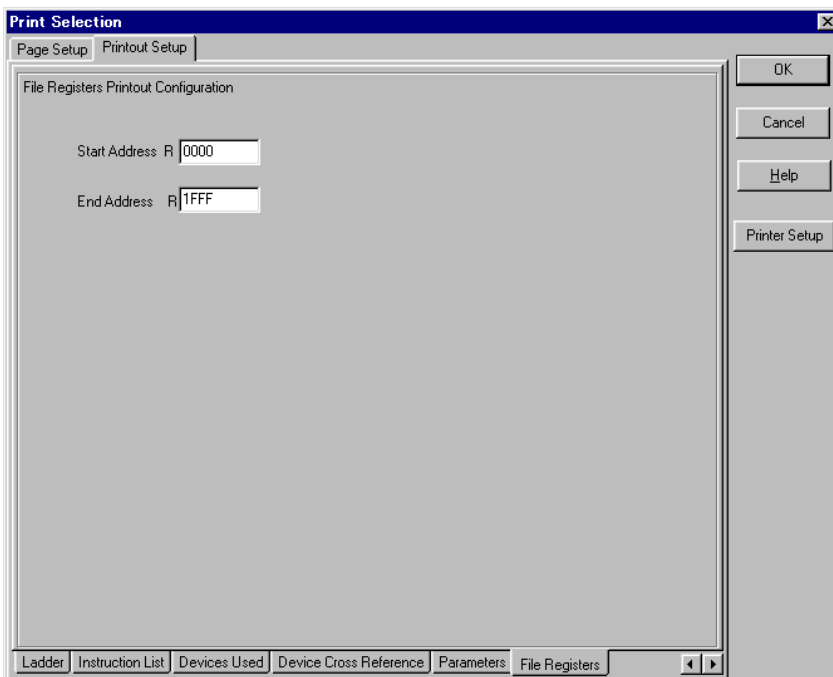
Select this item to print the information of registered parameters. The checkboxes depend on the PC type.

Click each checkbox to ON to print necessary items.



(8) Print setup for file register

Select this item to print a file register.



[Start Address] text box:

Enter the first address of a file register for printing.

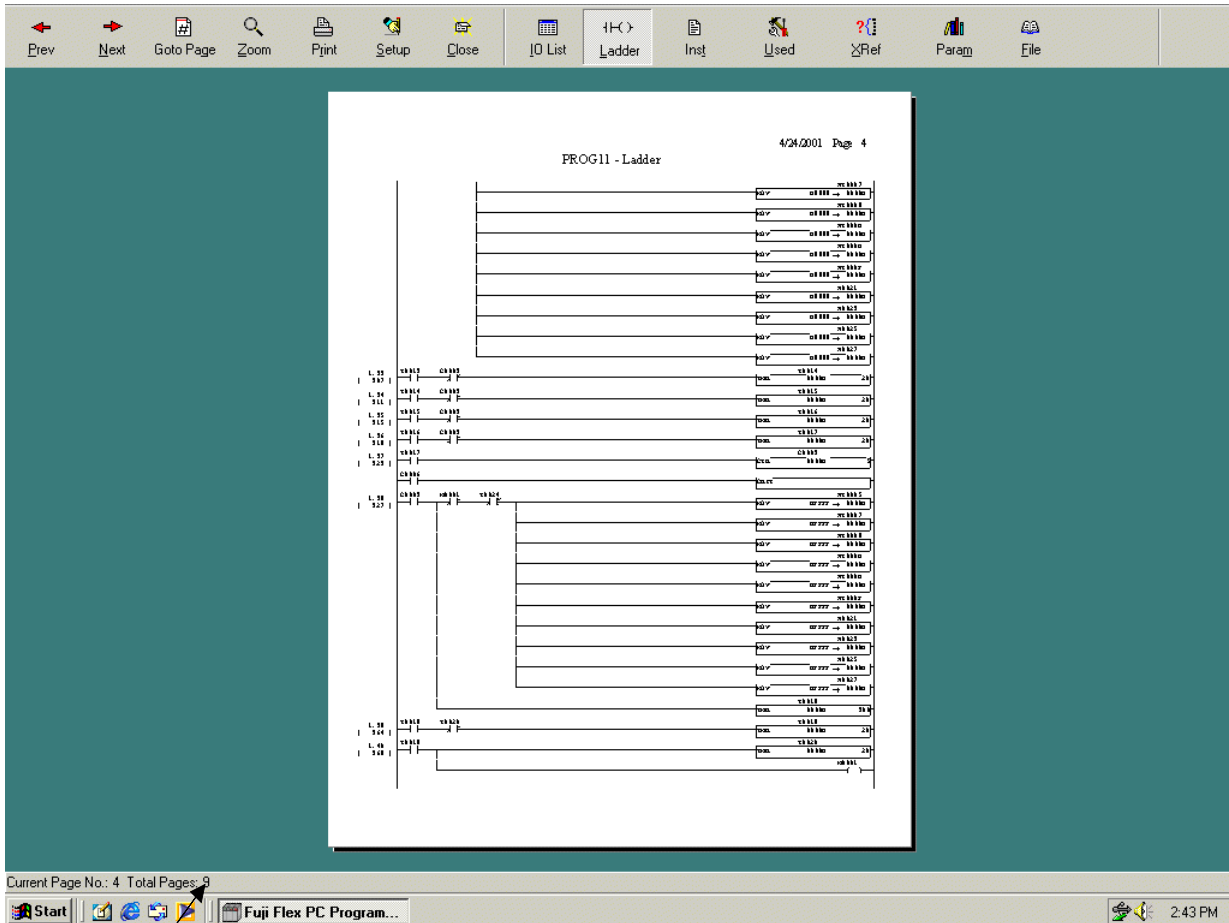
[End Address] text box:

Enter the last address of a file register for printing.

4-1-3 Print Preview

The Print Preview function permits the result of printout to be checked on the screen prior to the actual print operation. This function can be used with all the printout items, and the contents that have been set by the individual printout items (as explained in “4-1-1 Page Setup” and “4-1-2 Print Setup”) are reflected in the printout.

* The printer driver used for the print preview is the one that has been specified as “Set As Default” in the Printer Setup dialog box of Windows.



The total number of printed pages is displayed at lower left on the screen.

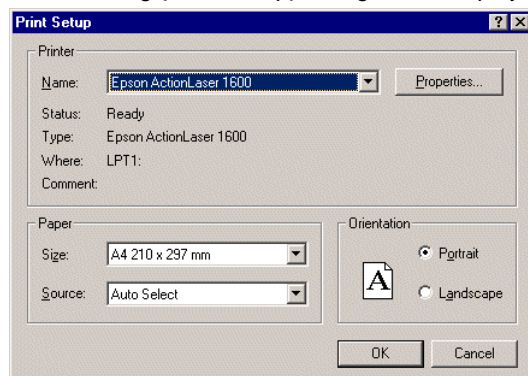
4-1-4 Print Setup

In the Print Setup dialog box, the output printer, printing method (paper size and source), etc. are set.

<Display of the Print Setup dialog box>

To cause the {Print Setup} dialog box to be displayed, left-click the [Print Setup] button in the dialog box that is displayed when the [Page Setup] or [Print...] command is selected from the [File] menu (the {Page Setup} or {Print} dialog box).

The following {Print Setup} dialog box is displayed.



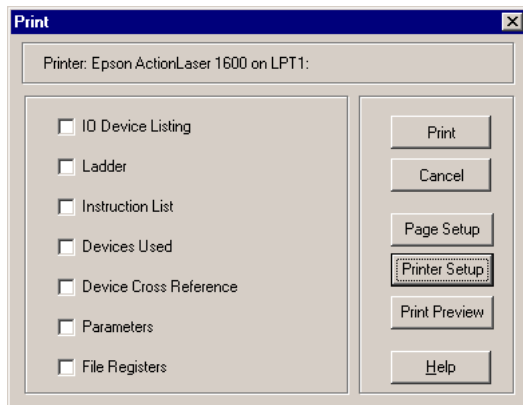
Set the output printer name, paper size and source, etc. and left-click the [OK] button.

4-2-1 Execution of print operation

After setting the appropriate items (refer to “4-1 Outline of Print Functions”), execute the print operation.

<Method of executing print operation>

- ◇ Select the [Print...] command from the [File] menu.
The {Print} dialog box is displayed.



- ◇ Check the box associated with the item to be printed.
- ◇ Left-click the [OK] button, and the print operation starts.
An example of printout of each item is given below.

4-2-2 Printout example

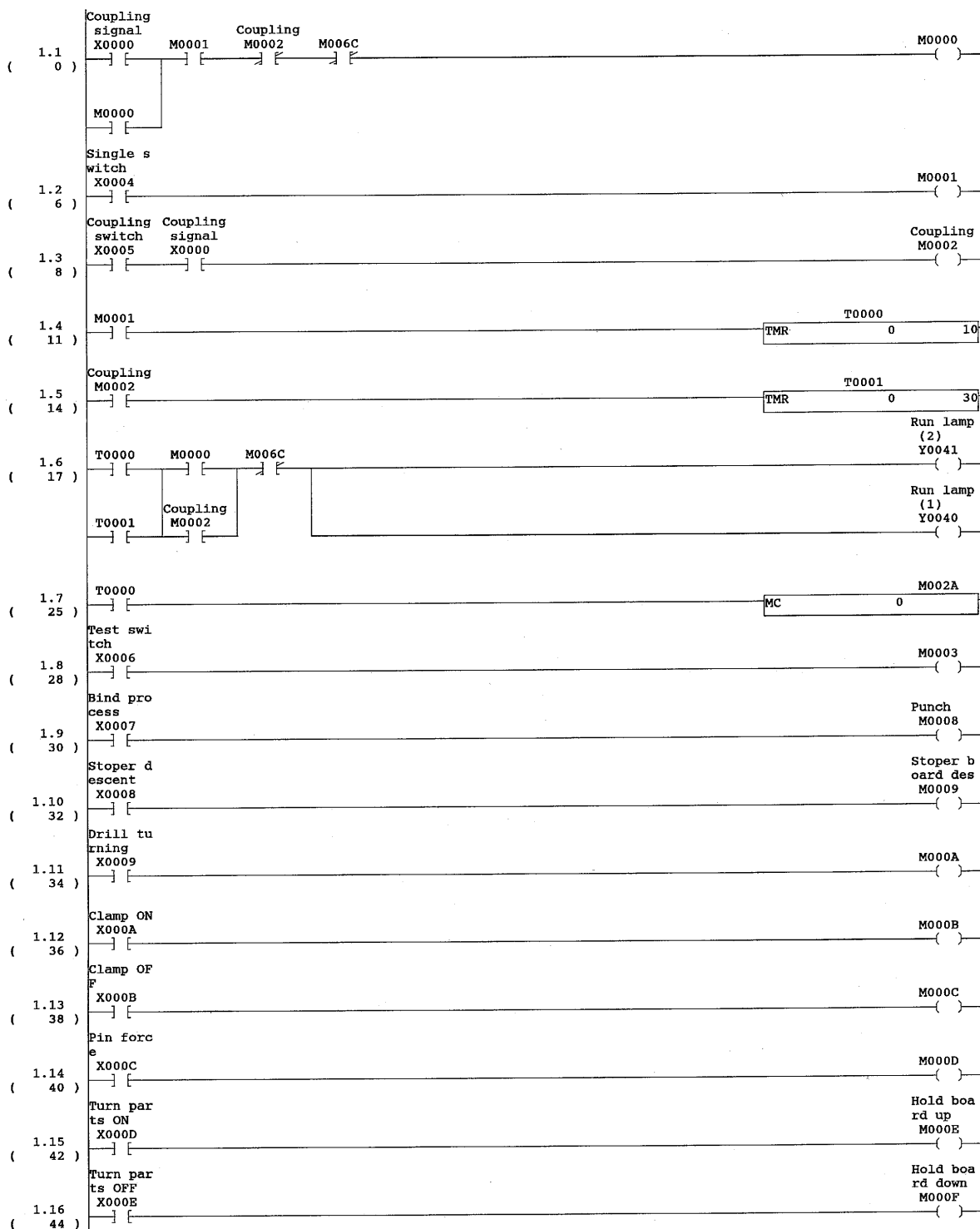
As a reference, examples of printout using the software are given below.

(1) Ladder printout

Automatic Control Program (Header)

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Sample-1 - Ladder



(2) I/O device listing

Automatic Control Program (Header)

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Sample-2 - IO Device Listing

Range : X0000 - X0021

Address	Tag	Description
X0000	Encoder Phase-A	
X0001	Encoder Phase-B	
X0002	Reset	Unused
X0003	Count Stop	Unused
X0004	Encoder Phase-Z	Unused
X0005	Origin LS	
X0006	Single Start	
X0007	Coupling Start	
X0008	Stop	
X0009	Forward Hight	
X000A	Forward Low	
X000B	Reverse	
X000C	YQ 1	
X000D	YQ 2	
X000E	YQ 3	
X000F	YQ 4	
X0010	Matrix Input 1	
X0011	Matrix Input 2	
X0012	Matrix Input 3	
X0013	Matrix Input 4	
X0014	Matrix Input 5	
X0015	Matrix Input 6	
X0016	Matrix Input 7	
X0017	Matrix Input 8	
X0018	Matrix Input 9	
X0019	Matrix Input 10	
X001A	Matrix Input 11	
X001B	Matrix Input 12	
X001C	Reserve	
X001D	YV 1	
X001E	YV 2	
X001F	YV 3	
X0020	YV 4	
X0021	YV 5	

Range : Y010A - Y010E

Address	Tag	Description
Y010A	Run Lamp	B165
Y010B	Set Lamp (Up)	B164
Y010C	Set Lamp (Lou)	B163
Y010D	Back Light W/R	B162
Y010E	Back Light ON/OFF	B161

Range : WX0004 - WX0004

Address	Tag	Description
WX0004	Display No MOV	

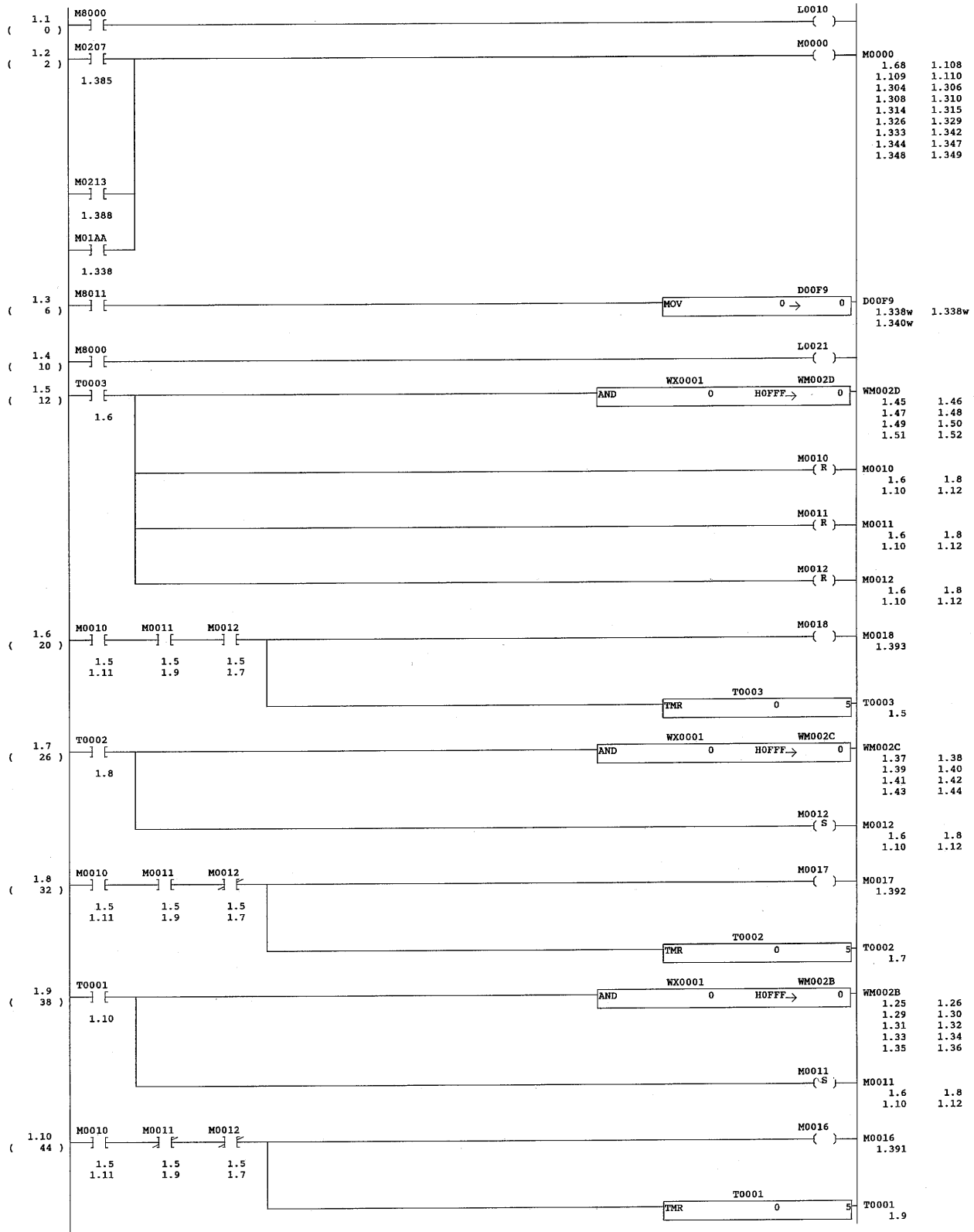
Range : WY000C - WY000F

Address	Tag	Description
WY000C	Display No CHK	
WY000D	Memory No	
WY000E	Set Value	
WY000F	Unit No	

(3) Ladder program list print (with cross reference)

Automatic Control Program (Header)

Sample-2 - Ladder



(4) Device cross-reference printout

Automatic Control Program (Header)

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Sample-2 - Devices Used

Range : X0000 - X001F

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
X0000
X0010

Range : Y0100 - Y013F

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Y0100
Y0110
Y0120
Y0130

Range : M0000 - M012F

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
M0000	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0010	x	x	x	.	.	.	.	.	.	.	.	.	.	.	.	.
M0020	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0030	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0040	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0050	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0060	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0070	x	x	x	x	x	x	x	x	.	.	.	.	.	.	.	.
M0080	x	x	x	x	x	x	x	x	.	.	.	.	.	.	.	.
M0090	x	x	x	x	x	x	.	.	.	.	.	.	.	.	.	.

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
M00A0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M00B0	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
M00C0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M00D0	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
M00E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M00F0	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0100	x	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.
M0110	x	x	x	x	x	x	x	.	.	.	.	.	.	.	.	.
M0120	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Range : L0000 - L019F

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
L0000	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0010	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0020	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0030	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0040	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0050	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0060	x	x	x	x	.	.	.	.	.	.	.	.	.	.	.	.
L0070	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0080	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0090	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L00A0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L00B0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L00C0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
L00D0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L00E0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L00F0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0100	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0110	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0120	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0130	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0140	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0150	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0160	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0170	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0180	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
L0190	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Range : T0000 - T0030

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
T0000	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T0010	x	x	x	x	.	.	.	.	.	.	.	.	.	.	.	.
T0020	x	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.
T0030	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Range : C0000 - C0030

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C0000
C0010
C0020
C0030

Range : D0000 - D0012

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
D0000	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
D0010	x

(5) Instruction word list print

Automatic Control Program (Header)

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Sample-2 - Instruction List

```

1  00000 LD      M8000
    00001 OUT    L0010
2  00002 LD      M0207
    00003 OR     M0213
    00004 OR     M01AA
    00005 OUT    M0000
3  00006 LD      M8011
    00007 MOV    0      D00F9
4  00010 LD      M8000
    00011 OUT    L0021
5  00012 LD      T0003
    00013 WAND   WX0001 HOFFF WM002D
    00017 RST    M0010
    00018 RST    M0011
    00019 RST    M0012
6  00020 LD      M0010
    00021 AND    M0011
    00022 AND    M0012
    00023 OUT    M0018
    00024 OUTT   T0003 5
7  00026 LD      T0002
    00027 WAND   WX0001 HOFFF WM002C
    00031 SET    M0012
8  00032 LD      M0010
    00033 AND    M0011
    00034 ANI    M0012
    00035 OUT    M0017
    00036 OUTT   T0002 5
9  00038 LD      T0001
    00039 WAND   WX0001 HOFFF WM002B
    00043 SET    M0011
10 00044 LD      M0010
    00045 ANI    M0011
    00046 ANI    M0012
    00047 OUT    M0016
    00048 OUTT   T0001 5
11 00050 LD      T0000
    00051 WAND   WX0001 HOFFF WM002A
    00055 SET    M0010
12 00056 LDI     M0010
    00057 ANI    M0011
    00058 ANI    M0012
    00059 OUT    M0015
    00060 OUTT   T0000 5
13 00062 LD      M02A0
    00063 OUT    M0061
14 00064 LD      M02A1
    00065 OUT    M0062
15 00066 LD      M02A2

```

Automatic Control Program (Footer)

(6) Device cross-reference printout

Automatic Control Program (Header)

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Sample-2 - Device Cross Reference

Range : X0000 - X01FF

Address	Tag	# PageNo.LineNo # (* denotes Output)
X0004	Encoder Phase-Z	1.79
X0005	Origin LS	1.80
X0006	Single Start	1.81
X0007	Coupling Start	1.82
X0008	Stop	1.83
X0009	Forward Hight	1.84
X000A	Forward Low	1.85
X000B	Reverse	1.86

Range : Y0000 - Y01FF

Address	Tag	# PageNo.LineNo # (* denotes Output)
Y000C	Matrix Output 1	1.390*
Y000D	Matrix Output 2	1.391*
Y000E	Matrix Output 3	1.392*
Y000F	Matrix Output 4	1.393*
Y001D	Forward	1.274 1.276 1.370 1.394* 1.395 1.398
Y001E	Reverse	1.370 1.394 1.395* 1.398
Y001F	Hight Set Output	1.274 1.370 1.370 1.396* 1.397
Y0020	Low Set Output	1.276 1.370 1.396 1.397*
Y0021	Brake ON	1.398 1.398*
Y010A	Run Lamp	1.401*
Y010B	Set Lamp (Up)	1.403*
Y010C	Set Lamp (Lou)	1.404*
Y010D	Back Light W/R	1.406*
Y010E	Back Light ON/OF	1.405*

Range : M0000 - M0043

Address	Tag	# PageNo.LineNo # (* denotes Output)
M0000	System Reset	1.2* 1.68 1.108 1.109 1.110 1.304 1.306 1.308 1.310 1.314 1.315 1.326 1.329 1.333 1.342 1.344 1.347 1.348 1.349
M0010	YC Read End	1.5 1.6 1.8 1.10 1.11* 1.12
M0011	YD Read End	1.5 1.6 1.8 1.9* 1.10 1.12
M0012	YE Read End	1.5 1.6 1.7* 1.8 1.10 1.12
M0015	YC Output	1.12* 1.390
M0016	YD Output	1.10* 1.391
M0017	YE Output	1.8* 1.392
M0018	YF Output	1.6* 1.393
M0021	7SW Input (temp)	1.21* 1.61
M0022	4SW Input (temp)	1.22* 1.58
M0023	1SW Input (temp)	1.23* 1.55
M0024	0SW Input (temp)	1.24* 1.54
M0025	ASW Input	1.29* 1.177 1.190
M0026	DSW Input	1.30* 1.180 1.190
M0027	GSW Input	1.31* 1.183 1.190
M0028	JSW Input	1.32* 1.186 1.190
M0031	8SW Input (temp)	1.33* 1.62
M0032	5SW Input (temp)	1.34* 1.59
M0033	2SW Input (temp)	1.35* 1.56
M0034	/SW Input (temp)	1.36* 1.66 1.71 1.243 1.258 1.402 1.402
M0035	BSW Input	1.37* 1.178 1.190
M0036	ESW Input	1.38* 1.181 1.190
M0037	HSW Input	1.39* 1.184 1.190
M0038	KSW Input	1.40* 1.187 1.190
M0041	9SW Input (temp)	1.41* 1.63
M0042	6SW Input (temp)	1.42* 1.60

(7) Parameter setup print

Automatic Control Program (Header)

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Sample-2 - Parameters**PC Information**

PC Type	NB
PC Version	None
Memory Capacity	8k steps
Sequence Memory	2917 steps
Sequence Memory Free	5145 steps
File Register Memory	0 steps
Mem Cassette/Card type	None

PC Definition

PC Definition	
Fixed cycle scan time(ms)	0
User watch dog (x10 ms)	25
Remote Run / Stop	
Run Address	No
Stop Address	No
PC Operation mode	
Enable EEPROM writing	Yes
Monitor battery error	Yes
Reset Latch relays	No
Stop PC on non fatal fault	No
Freeze I/O when PC stopped	No

Memory Area Definition

File Registers	
Number of file register blocks	0
Memory backup range on power fail	
Unlatched Range	WM060
Unlatched Range	WL000
Unlatched Range	D0000

Input Filtering

WX0	
X000	No Filter
X001	No Filter
X002	Default
X003	Default
X004	No Filter
X005	Default
X006	Default
X007	Default
X008	Default
X009	Default
X00A	Default
X00B	Default
X00C	Default
X00D	Default
X00E	Default
X00F	Default
WX1	
X010	Default
X011	Default
X012	Default
X013	Default
X014	Default
X015	Default
X016	Default
X017	Default

Automatic Control Program (Header)

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Sample-2 - Parameters

X018	Default
X019	Default
X01A	Default
X01B	Default
X01C	Default
X01D	Default
X01E	Default
X01F	Default
WX2	
X020	Default
X021	Default
X022	Default
X023	Default
X024	Default
X025	Default
X026	Default
X027	Default
X028	Default
X029	Default
X02A	Default
X02B	Default
X02C	Default
X02D	Default
X02E	Default
X02F	Default
WX3	
X030	Default
X031	Default
X032	Default
X033	Default
X034	Default
X035	Default
X036	Default
X037	Default
X038	Default
X039	Default
X03A	Default
X03B	Default
X03C	Default
X03D	Default
X03E	Default
X03F	Default
WX4	
X040	Default
X041	Default
X042	Default
X043	Default
X044	Default
X045	Default
X046	Default
X047	Default
X048	Default
X049	Default
X04A	Default
X04B	Default
X04C	Default
X04D	Default
X04E	Default
X04F	Default
WX5	

Automatic Control Program (Footer)

Automatic Control Program (Header)

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Sample-2 - Parameters

X050	Default
X051	Default
X052	Default
X053	Default
X054	Default
X055	Default
X056	Default
X057	Default
X058	Default
X059	Default
X05A	Default
X05B	Default
X05C	Default
X05D	Default
X05E	Default
X05F	Default
WX6	
X060	Default
X060	Default
Expn	
WX04	Default
WX05	Default
WX06	Default
WX07	Default
WX08	Default
WX09	Default
WX0A	Default
WX0B	Default
WX0C	Default
WX0D	Default
WX0E	Default
WX0F	Default
WX10	Default
WX11	Default
WX12	Default
WX13	Default
WX14	Default
WX15	Default
WX16	Default
WX17	Default
WX18	Default
WX19	Default
WX1A	Default
WX1B	Default
WX1C	Default
WX1D	Default
WX1E	Default
WX1F	Default
NB High Speed Counter Configuration	
Reset Signal Edge	No
Clear Interrupt	No
HS Counter Config 0	
Counters Used	Yes
Filter	No
Single Phase	No
Auto Reset	No
32 Bit	No
HS Counter Config 1	
Counters Used	No

Automatic Control Program (Footer)

Automatic Control Program (Header)

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Sample-2 - Parameters

Filter	No
Single Phase	No
Auto Reset	No
HS Counter Config 2	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
32 Bit	No
HS Counter Config 3	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
HS Counter Config 4	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
32 Bit	No
HS Counter Config 5	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
HS Counter Config 6	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
32 Bit	No
HS Counter Config 7	
Counters Used	No
Filter	No
Single Phase	No
Auto Reset	No
Expansion Parameters Setting	
Input filter of interrupt/pulse	No

(8) Data print

Automatic Control Program (Header)

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Sample-3 - File Registers

Address	Tag	ASCII Text (Low...High)
R0000		
R0010		
R0020		
R0030		
R0040		
R0050		
R0060		
R0070		
R0080		
R0090		
R00A0		
R00B0		
R00C0		
R00D0		
R00E0		
R00F0		
R0100		
R0110		
R0120		
R0130		
R0140		
R0150		
R0160		
R0170		
R0180		
R0190		
R01A0		
R01B0		
R01C0		
R01D0		
R01E0		
R01F0		
R0200		
R0210		
R0220		
R0230		
R0240		
R0250		
R0260		
R0270		
R0280		
R0290		
R02A0		
R02B0		
R02C0		
R02D0		
R02E0		
R02F0		
R0300		
R0310		

Automatic Control Program (Footer)

Appendix 1 Differences Between Windows Loader and MS-DOS/ LITE/N Loaders

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Appendix 1-1 File Saved Using MS-DOS/LITE/N Loaders	App.1-1
Appendix 1-1-1 Compatibility of Program Files	App.1-1
Appendix 1-1-2 Compatibility of Comment Files	App.1-2
Appendix 1-2 Functions of Windows Loader	App.1-4
(1) About functions not supported by Windows PC loader	App.1-4
(2) About option and utility functions supported by Windows PC loader	App.1-4

Appendix 1 Differences Between Windows Loader and MS-DOS/ LITE/N Loaders

Appendix 1-1 File Saved Using MS-DOS/LITE/N Loaders

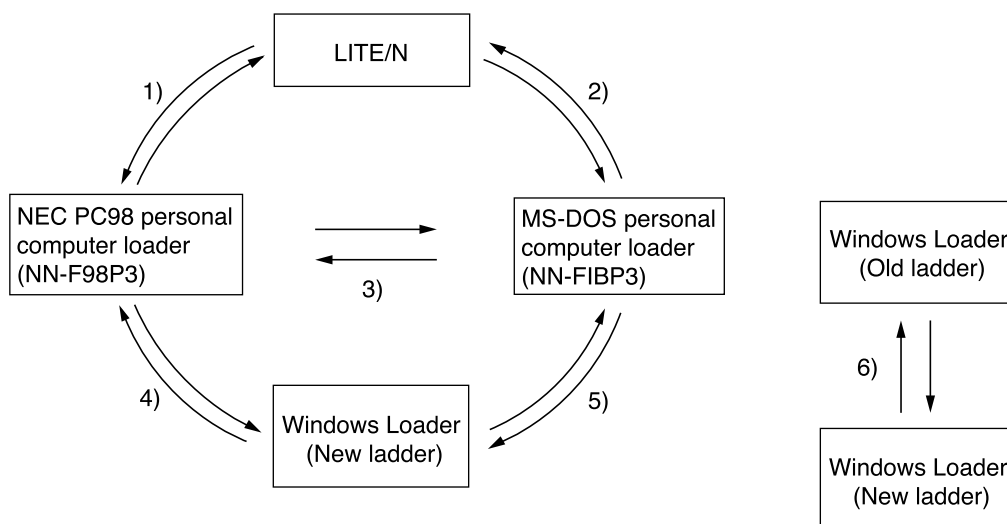
- The table below compares data (programs and comments) created by PC loaders for MS-DOS and Windows. Note that in the Windows loader, the term "tag" is used in place of the term "comment." Note that in the Windows loader, the term "tag" is used in place of the term "comment."

MS-DOS version		Windows version		
		Old ladder program (Ver. 1.XX)		Ladder program (Ver. 2.00 or later)
Name	File extension	Name	File extension	File extension
Program	*.PMA	Ladder	*.LAD	*.Fxl
Comment	*.CTD	Tag	*.TAG (Common)	

- The Windows Loader cannot directly read data (programs and comments) created by the LITE/N Loader. To read a program file by the Windows version, read and store the file first by the MS-DOS Loader. A comment file can be converted into the DOS format by the optional function of the MS-DOS version. The compatibility between the above files is explained below.

Appendix 1-1-1 Compatibility of Program Files

This section describes how to read a file saved using the LITE/N and MS-DOS loader on this Windows loader. Basically, any program prepared by any loader can be exchanged between different loaders through the PC. The use of files saved using the above loaders is shown as follows.



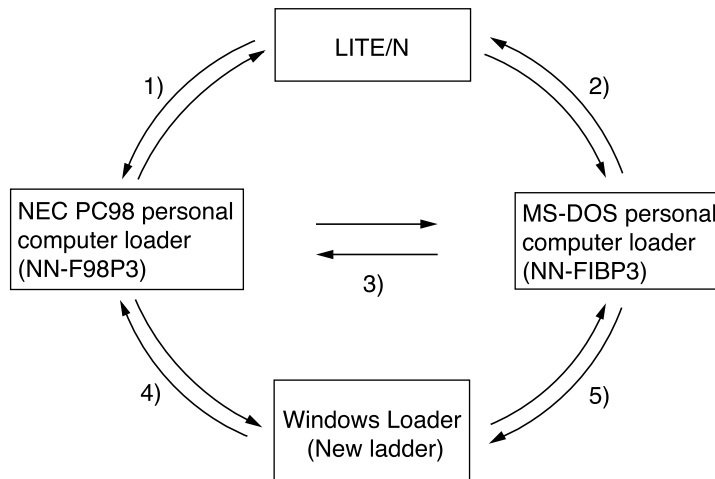
- As long as the floppy disk is of 1 MB format (sometimes expressed as 1.2 MB or 1.25 MB format), floppy disk data can be shared between them. Though the LITE/N is capable of handling floppy disks of 1 MB format, it is incompatible with floppy disks of 1.44 MB format.
- Same as explained in 1), above.
- Floppy disk data can be shared between them as long as they both can handle the format of the floppy disk. For the floppy disk formats (1 MB, 1.44 MB) that can be handled, ask the maker of the personal computer.
- If the personal computer can handle 1MB floppy disks, the Windows Loader can read a program file (*.PMA) created by the NEC PC98 PC Loader with no conversion. When this program is saved, a Windows file (*.Fxl) is newly created. The NEC PC98 Loader cannot read the *.Fxl file directly. For the NEC PC98 Loader to read the file, save the file with the extension .PMA.

- 5) Same as explained in 4), above. It is necessary to check the compatibility of floppy disk format between them.
- 6) The Windows Loader of the new ladder version (Ver. 2.XX) can read a program file created by that of the old ladder version (Ver. 1.XX) without conversion. When this program is saved, a new ladder version file (*.Fxl) is newly created. The PC Loader of the old ladder version cannot read this file. If the file is saved with the extension .LAD, however, the PC Loader of the old ladder version can read the file.

Appendix 1-1-2 Compatibility of Comment Files

Here, the method of handling comment files prepared by the LITE/N or MS-DOS loader using the Windows loader is explained.

The use of files prepared and saved to floppy disks by the individual loaders is as shown in the following diagram.



- 1) Files can be shared between them as long as the floppy disk is of 1 MB format (sometimes expressed as 1.2 MB or 1.25 MB format). (Note, however, that comment files prepared by some versions of loader cannot be read by the counterpart loader. For further details, refer to the manual of LITE/N or MS-DOS personal computer loader.) Though the LITE/N is capable of handling floppy disks of 1 MB format, it is incompatible with floppy disks of 1.44 MB format.
- 2) Same as 1) if the personal computers handle 1MB floppy disks
- 3) Files can be shared between them as long as both loaders can handle the format of the floppy disks that contain those files. For the format of floppy disks that can be handled (1 MB, 1.44 MB), ask the maker of the personal computer. Note that comment files prepared by some versions of loader cannot be read by the counterpart loader.
- 4) If the personal computer can handle 1MB floppy disks, the Windows Loader can read a comment file (*.CTD) created by the NEC PC98 PC Loader with no conversion. When this program is saved, a Windows file (*.TAG) is newly created. The NEC PC98 Loader cannot read the *.TAG file directly. For the NEC PC98 Loader to read the file, save the file with the extension .PMA..
- 5) Same as 4). The floppy disk format should be checked. For the MS-DOS Loader to read a comment file (*.TAG) saved by the Windows Loader, convert the file in the Windows Loader by the procedure of 4).

<When reading comment files prepared by the MS-DOS loader>

The Windows version program loader can read comment files that are prepared by the MS-DOS version program loader (hereinafter called "the MS-DOS loader"), in the following manner. (However, only those files with the new extension can be read.)

- 1) Using the explorer, copy the program file (with extension ".PMA") and comment files (with extension ".CTD") that have been prepared by MS-DOS loader in the same folder.
- 2) Using the explorer, make sure the program file and comment files that have been copied in 1) have the same name. Extensions may not be changed.
- 3) In the ordinary procedure, open the program file of above 2) with the Windows loader.
Comment files are automatically read.
Then, when the program is saved, new files for the Windows loader (program file ".Fxl" and tag file ".TAG") are created.

Reference:

If the program is saved by specifying extension .PMA, a MS-DOS Loader comment file (*.CTD) is created automatically.

(1) About functions not supported by Windows PC loader

The Windows Loader (V2.00.XXX) does not support the following functions:

- 1) Trigger PC stop
- 2) Trigger monitor stop
- 3) Range-specified execution
- 4) Simulation
- 5) PC number setting (Initial setup)
- 6) Remote station number setting (Remote operation)

(2) About option and utility functions supported by Windows PC loader

The Windows Loader does not support the following option and utility functions:

- 1) [SFC]
- 2) [CAD i/f]
- 3) [Comment File Converter] (Option)
- 4) [Remote Control] (Option)
(Windows version: [Options] - [Modem Connection])
- 5) [Comment Transfer] (Utility)
- 6) [JPCN-1 Parameter Setup] (Utility)

Appendix 2 Environment Setting

Page

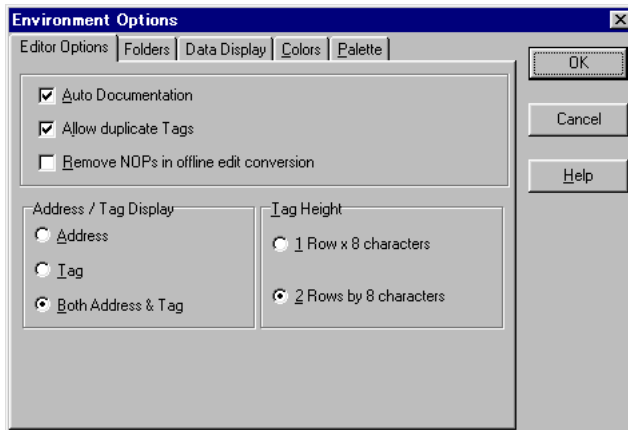
Appendix 2-1 Environment Options	App.2-1
(1) Edit Option	App.2-1
(2) Setting of Folders	App.2-3
(3) Colors	App.2-3
(4) Palette	App.2-4
(5) Data display setup	App.2-4

The Environment Options consists of tabs, for setting program edit/display, setting program file folders, setting program display colors, and setting instructions which can be used by [Common] on the ladder edit tool bar. The method of using each of the tabs is explained below.

- ◇ Select the [Environment...] command from the [Option] menu.
The {Environment Options} dialog box is displayed.

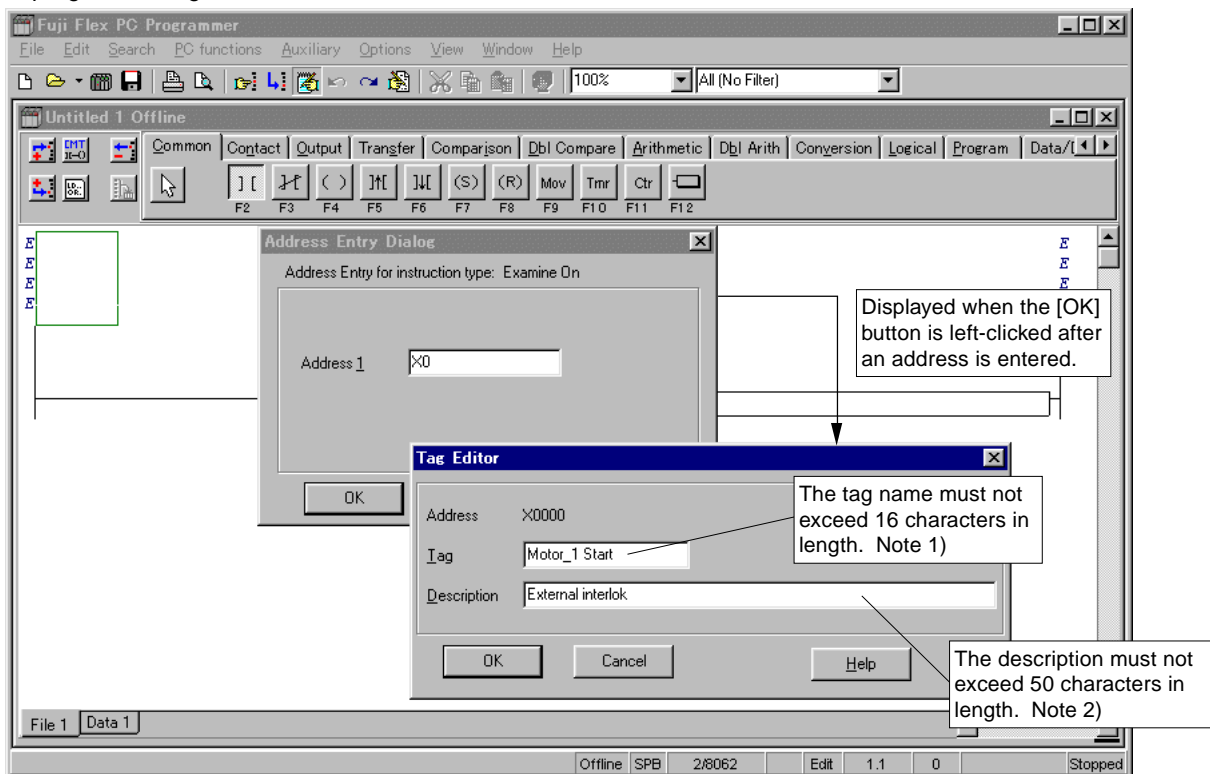
(1) Edit Options

- ◇ Left-click the [Edit Option] tab.
The items to set to display the program are displayed.



1) Aut Documentation

When the [Auto Documentation] box is checked, the {Tag Editor} dialog box shown below is displayed during program editing.



- Note: 1) In a tag name, the quotation marks (" and '), comma (,), and period (.) cannot be used. The same tag name cannot be set for two or more different addresses either.
- 2) In a description, the comma (,) cannot be used. If a comma is included in the description, it is automatically deleted when the description is added to the data base. Note that the description is not displayed on a ladder program.

2) Allow duplicate Tags

When the [Allow duplicate Tags] box is checked, it is permissible to input a tag of the same name for different addresses.

3) [Remove NOPs in offline edit conversion

When this checkbox is ON, unnecessary NOP generated by deletion during the offline edit of a ladder program is deleted at line conversion (when the cursor is positioned from the line under edit to another line).

4) Address/Tag Display

Set display of address and tag to ON or OFF.

- **[Address & Tag]**

Address and Tag are displayed above the instruction symbol.

```
Start Sw
it ch
X0000
| |
```

- **[Tag]**

Displays only a tag above the instruction symbol. (Note, however, that when no tag has been set for the instruction address, the instruction address is displayed.)

```
Start Sw
it ch
| |
```

- **[Address]**

Displays only an address above the instruction symbol.

```
X0000
| |
```

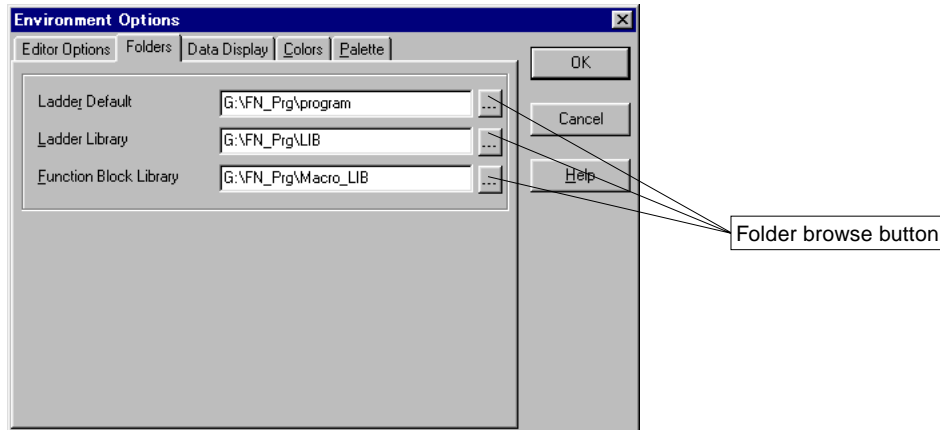
5) Tag display height

Eight characters are displayed for the number of tag lines.
The number of tag lines is one or two.

(2) Setting of Folders

◇ Left-click the [Folders] tab.

Items to set for the saving of a user program, the registration of a ladder library and a function block library, the addition of a password, etc. are displayed.



1) Ladder Default

When a file is opened, the folder set here is opened.

If the Environment Options have not been set, the folder in which the software has been installed is opened.

2) Ladder Library

When [Edit] - [Copy to Library...] or [Edit] - [Paste from Library] is executed, the folder set here is opened.

If the Environment Options have not been set, the folder in which the software has been installed is opened.

3) Function Block Library

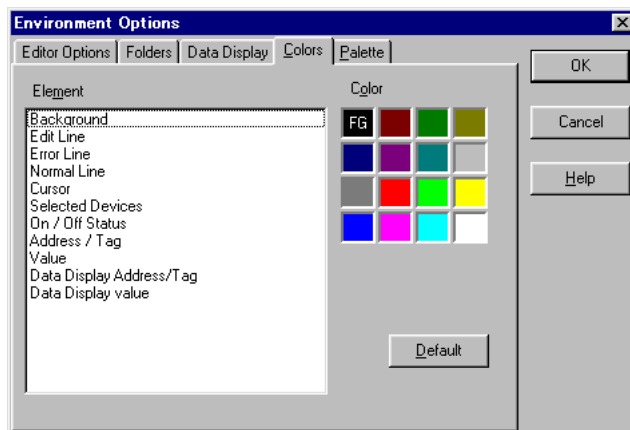
When [PC functions] - [Function Blocks] is executed, the folder set here opens.

If the environment has not been set, the install folder of this software is opened.

(3) Colors

◇ Left-click the [Colors] tab.

Set colors in which to display a ladder program.



Select the element to be changed from the element list at the left by left-clicking it.

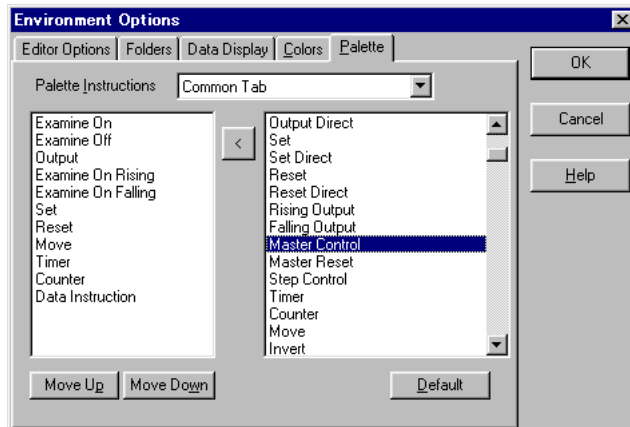
Left-click a desired color, and the FG mark moves to the selected color to set it.

(4) Palette


- ◊ Left-click the [Palette] tab.

Set instruction buttons which can be used with the [Common] tab of the [Instruction group] tab on the ladder edit tool bar.

[Common] tab



Setup to 11 instruction buttons (F2 to F11) for each of the selection types (Normal, Shift key down, and Ctrl key down with instruction word list).

Left-click one of the instructions listed at the right and left-click the  button, and the selected instruction is assigned to the selected item at the left.

In the instruction assignment table, instructions are assigned to F2 to F12 from top downward.

The positions of instructions in the instruction assignment table can be changed by left-clicking the [Move Up] or [Move Down] button.

Any instruction in the instruction assignment table can be deleted by left-clicking it and pushing the <Delete> key.

(5) Data display setup

Setting the data display options

Set the order of ASCII characters for data display in an ASCII format.

When the [Lower Byte – Higher Byte] option button is ON

WM010	Data 1	10	ASCII 2-byte display
D0010	Data 2	76543210	ASCII 8-byte display
D0020	Data 3	FEDCBA9876543210	ASCII 16-byte display

When the [Higher Byte – Lower Byte] option button is ON

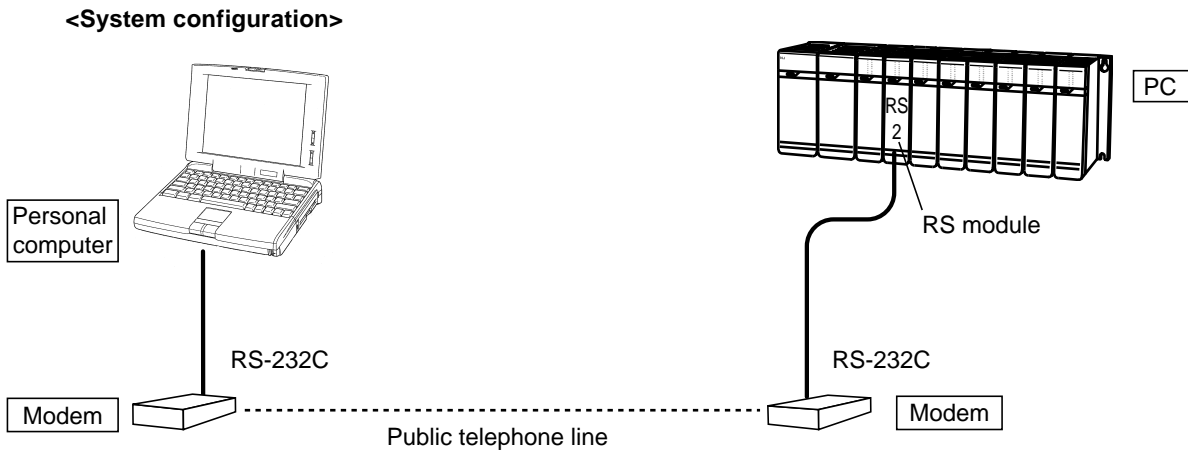
WM010	Data 1	01	ASCII 2-byte display
D0010	Data 2	01234567	ASCII 8-byte display
D0020	Data 3	0123456789ABCDEF	ASCII 16-byte display

Appendix 3 Modem Connection

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(1) Requirements of modem used	App.3-3
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(1) Using an RS-232C module (NB-RS1, NJ-RS2, NS-RS1)	App.3-6
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Appendix 3-3 RS-232C Cable Connection	App.3-10

Here, the method of using a modem to connect the personal computer online to the PC via a public telephone line.



<Modem>

Use a modem which is available on the market. Note that modems more or less differ in the AT commands (the commands for setting modem operations) according to the maker or model. (For details, refer to the instruction manual of the modem purchased.)

<Modem-PC connection>

The modem-PC connection depends on the PC model. Normally, the following RS-232C interface module is used with the CPU unit.

- NB Series
Use NB-RS1 (Ver. 0020 or later). The version label is on the left side of NB-RS1.
- NJ Series
Use NJ-RS2 (Ver. 0020 or later). The version label is at the front bottom of NJ-RS2.
- NS Series
Use NS-RS1 (Ver. 0120 or later). The version label is at the front bottom of NS-RS1.

NJ-CPU-B16, NS-CPU-B32, and NS-CPU-B64 allow a modem to be connected to the RS-232C port of the CPU. However, the modem should have a function to store the initial settings in nonvolatile memory.

Here, the preparations (initialization, etc.) required of the modem on the PC side are explained.

Appendix 3-1-1 Using an RS-232C module (NB-RS1/NJ-RS2/NS-RS1)

(1) The modems used for remote operation (MS-DOS version) or listed in (2) do not require initial settings. When one of the modems is used, the RS-232C module (NB-RS1/NJ-RS2/NS-RS1) automatically initializes the modem.

<Settings of the RS-232C interface module>

Set the MODE switch to 6.

(2) The modems that are supported are as shown below.

Maker	Type
AIWA	PV-AF24V5, PV-BF144M2, PV-EF2880, PV-PF3360
OMRON	ME1414BIII, ME5614

(3) The RS-232C module (NB-RS1/NJ-RS2/NS-RS1) uses the following AT commands. When using a modem other than the recommended ones above, make sure that the modem supports these commands. A modem not supporting the commands cannot be connected through the RS-232C module.

AT&FE0V0Q0(CR)
 AT\N3\J0&D2S0=3(CR)
 ATQ1(CR)

• Meanings of commands (Note that the meanings may more or less differ according to the model.)

Command	Function	Meaning
AT&F	Initializes the memory.	
ATE0	Sets command echo function.	Echo not returned
ATV0	Sets result code display mode.	Result code displayed in number
ATQ0	Sets result code output to DTE	Result code output to DTE
ATQ1		Result code not output to DTE
AT\N3	Sets MNP mode.	MNP automatic selection mode set preferentially
AT\J0	Adjusts DTE data speed automatically.	DTE data speed fixed at speed before start of communication even if communication speed between modems varies
AT&D2	Detects RS-232C DTR signal	When DTR signal turns from On to Off, modem in data mode cuts off line and turns AT command mode. When DTR is Off, automatic receive function is invalid.
ATS0=3	Sets automatic receive and number of times of receive calls.	Automatic receive is effected after third ring signal is detected.

(4) Sequence of switching on power supply

Since the RS-232C module starts initializing the modem immediately after power-on, be sure to turn on the modem first. The power is supplied to the RS-232C module when the PC power is turned on.

Appendix 3-1-2 Using the RS-232C port of CPU (NJ-CPU-B16/NS-CPU-B32/NS-CPU-B64)

When the RS-232C port of NJ-CPU-B16/NS-CPU-B32/NS-CPU-B64 is used, the CPU does not initialize the modem. So initialize the PC-side modem using the personal computer.

For this initialization, use the software attached to the modem or "Hyper Terminal" of Windows ME.

(1) Requirements of modem used

Select a modem which meets the following requirements.

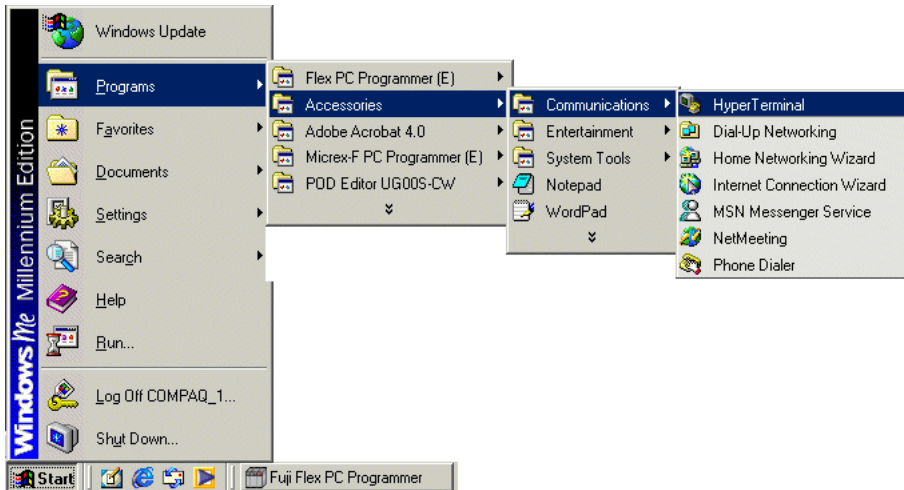
- The AT commands are supported.
- The automatic receive function is provided.
- The interface with external devices is an RS-232C.
- Data compression function (MNP Class 4 or higher) is provided.
- Error control function (MNP Class 4) is provided.
- Terminal speed fixing function is provided.
- Function that retains contents of setting (unvolatile memory) is provided.

(2) Initialization of modem

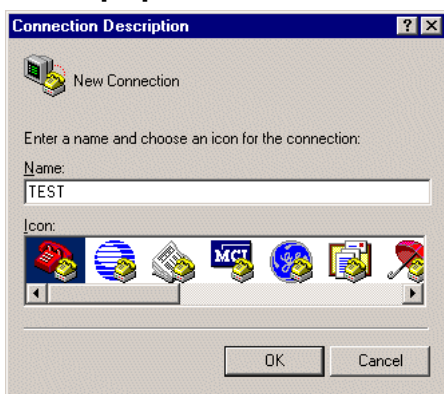
Use the personal computer to initialize the modem.

Here, the method of initializing Aiwa's modem PV-BW5601 using the "Hyperterminal" (standard accessory of Windows 95) is explained.

- ◇ Select [Start] - [Program] - [Accessories] - [Hyperterminal] from the desktop of Windows 95.
- ◇ The "Hyperterminal" window opens. Left-click [Hypertrm.exe].



- ◇ The {Connection Description} dialog box is displayed. Enter any name (e.g., TEST) in the [Name] text box and left-click the [OK] button.

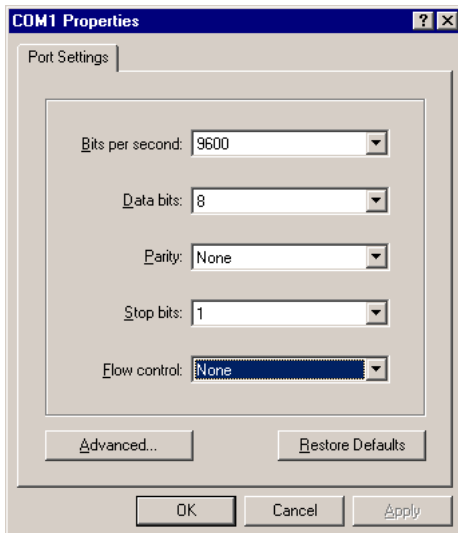


Appendix 3-1 Preparation of Modem on PC Side RS-232C port of CPU

- ◇ The {Phone Number} dialog box is displayed. Left-click the [Down] button of the [Connect using] text box, select the personal computer RS-232C port number (in this example, "Direct to Com 1") from the list that is displayed, then left-click the [OK] button.

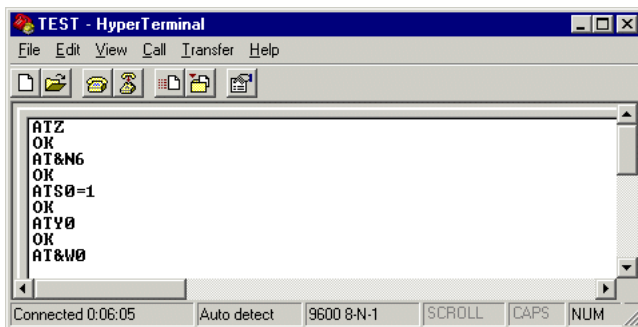


- ◇ The {Com1 Properties} dialog box is displayed. Set "9600" for Bits per second, "8" for Data bits, "None" for Parity, "1" for Stop bits, and "None" for Flow control, then left-click the [OK] button.



- ◇ The text entry screen appears. Enter the following text correctly.

ATZ (Return)
AT&N6 (Return)
ATS0=1 (Return)
ATY0 (Return)
AT&W0 (Return)

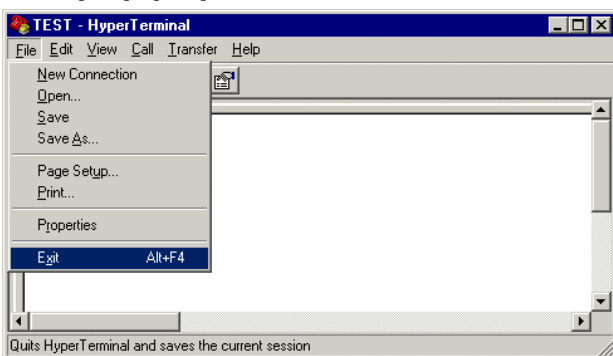


<Meanings of AT commands used>

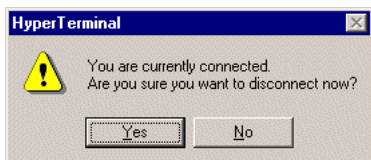
The above AT commands have the meanings described below (AT commands for AIWA's modem PV-BW5601). The commands may differ depending on the model. Use a command of the same function. For details, refer to the manual of your modem.

Command	Function	Meaning
ATZ	Resetting the modem (Same as ATZ0)	The modem is reset to the status specified by the Yn command.
AT&N6	Setting the fixed communication speed	9600bps
ATS0=1	Setting auto termination and ringing count	An incoming call is answered when the first ringer signal is received.
ATY0	Specifying the initial modem status after power-on or reset	The modem settings are stored at nonvolatile memory 0.
AT&W0	Setting storage in nonvolatile memory	The command settings are stored at nonvolatile memory 0.

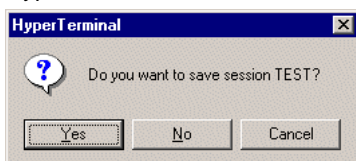
- ◇ Select [File] - [Exit] from the main menu.



- ◇ The dialog box for confirming disconnection is displayed. Left-click the [Yes] button.



- ◇ The dialog box for confirming saving of the session is displayed. Left-click the [Yes] button to terminate the Hyperterminal.




The modem needs to be initialized when the current settings are to be changed or when they have disappeared or right after the modem is purchased. Normally, once the modem is initialized, there is no need to re-initialize it.

Appendix 3-1-3 Preparations for Modem Connection on PC Side

After initializing the modem, prepare for connection of the modem.

(1) Using an RS-232C module (NB-RS1, NJ-RS2, NS-RS1)

Set the baud rate, data bit, parity bit, and stop bit with the DIP switches.

	Start bit length + Stop bit length + Data bit length+ Parity bit length = 10
	Start bit length 1
	Stop bit length 1 or 2 (Set 1)
	Data bit length 7 or 8 (Normally set 8)
	Parity bit length None: 0, Yes (Even/Odd): 1 (Normally set 0)

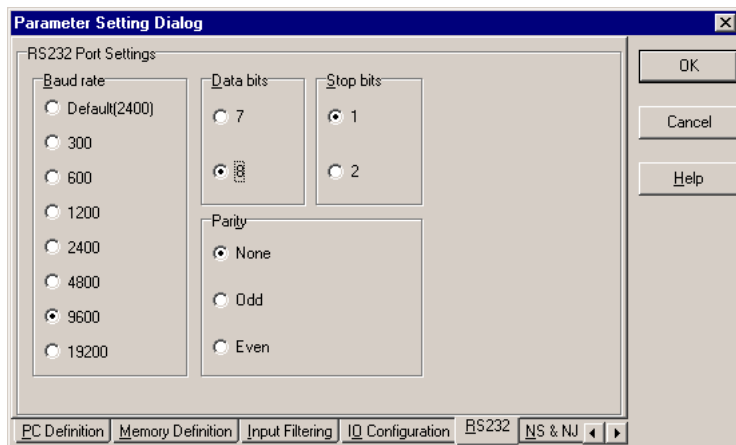
Set the BAUD/CHARACTER switch as follows:

- 8: Initialization ON: By switch
 - 7: Parity OFF: None
 - 6: Even/Odd OFF: Odd
 - 5: Data bit length OFF: 8 bits
 - 4: Stop bit length ON: 1 or OFF: 2 (Normally set 1)
 - 3-1: Baud rate 1200 to 9600
- | | 1 | 2 | 3 | BPS |
|--|-----|-----|-----|------|
| | OFF | ON | OFF | 1200 |
| | ON | ON | OFF | 2400 |
| | OFF | OFF | ON | 4800 |
| | ON | OFF | ON | 9600 |

- ◇ Connect the modem and the RS-232C module using the RS-232C cable provided with the modem (if not available, straight cable on the market).
 - ◇ Switch on the modem power supply.
 - ◇ Turn on the power of the PC.
- Now everything is ready. Go on to the PC loader operations.

(2) Using the RS-232C port of CPU (NJ-CPU0B16, NS-CPU-B32, NS-CPU-B64)

Select [PC functions] - [System Parameters] - [RS-232C] to set the CPU by using the PC loader.



- ◇ Connect the modem and the RS-232C module using the RS-232C cable provided with the modem (if not available, straight cable on the market).
- ◇ Turn on the power of the modem.
- ◇ Turn on the power of the PC. Now everything is ready. Go on to the PC loader operations.

Here, the manipulation required on the personal computer loader side is explained.

Appendix 3-2-1 Modem connection

- ◇ Select [Options] - [Modem Connect...] from the main menu.
The {Modem setup and dailling} dialog box is displayed. Set the following items.

• Phone Number

Enter the phone number of the communication counterpart. It is possible to enter a comment after the phone number with a space of one character inserted between them. The comment after the space is not transmitted to the modem.

To register the phone number, left-click the [Entry] button.

It is possible to register a maximum of 10 phone numbers. Any of the phone numbers that have been registered can be called by list box.

To delete any of the registered phone numbers, select it from the list of phone numbers and push the <Delete> key.

• Modem initialization string

This command is used to initialize the modem on the personal computer side. During modem connection, the command set here is transmitted to the modem. The default is [AT&FS0=0S7=60].

It is also possible to set any command and transmit it to the modem. In this case, however, do not include a phone number in the command.

To register the command that has been entered, left-click the [Entry] button.

It is possible to register a maximum of five commands. Any of the registered commands can be called by list box.

To delete any of the registered commands, select it from the list of commands and push the <Delete> key.

<Meanings of AT commands used>

The meaning of the above default AT command is as follows. The AT commands may differ from one modem type to another. In this case, select a command having the same function.

For details, refer to the manual of the modem used.

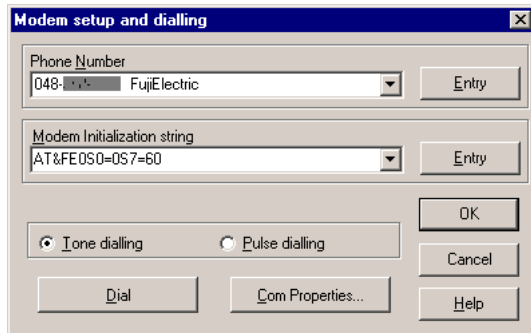
Command	Function	Meaning
AT&F	Initializes the modem.	
ATS0=0	Sets automatic reception/number of reception calls.	Without automatic reception
ATS7=60	Sets wait time for detection of carrier from counterpart modem.	60 seconds

• Tone dialling/Pulse dialling

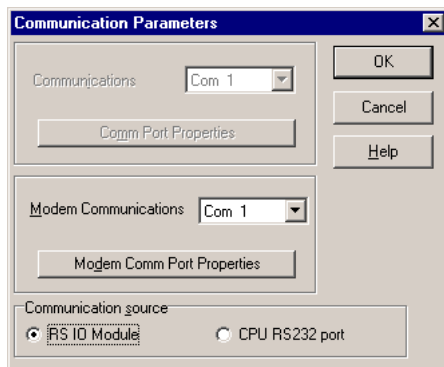
Select either of the following according to the line used.

- Tone dialing
- Pulse dialing

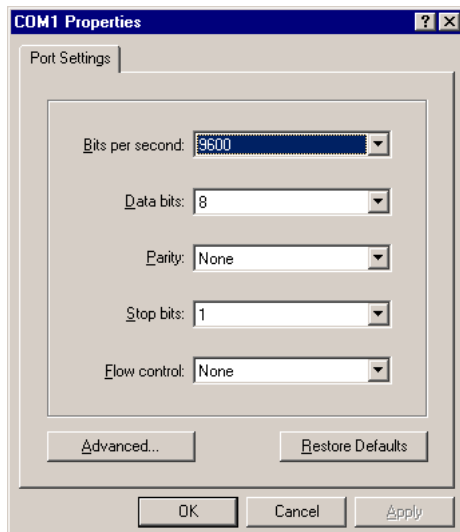
Set the RS-232C interface next. Left-click the [Com Properties...] button.



- ◇ The {Communication Parameters} dialog box is displayed. Select the RS-232C port used from [Modem Communications].
- ◇ Set the communication module. Select whether to use an RS I/O module (NB-RS1/NJ-RS2/NS-RS1) or RS-232C port (NJ-CPU-B16/NS-CPU-B32/NS-CPU-B64).
- ◇ Next, left-click the [Modem Comm Port Properties] button.

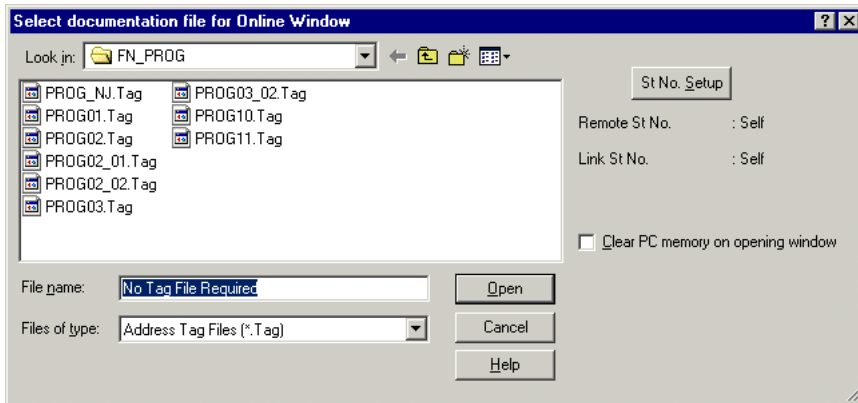


- ◇ The {COM1 Properties} dialog box is displayed. Set {Bits per second}, {Data bits}, and {Parity} to those values which have been set for the RS-232C on the PC side. Set {Stop bits} to {1} and {Flow control} to {None}. After all items are set, left-click the [OK] button.

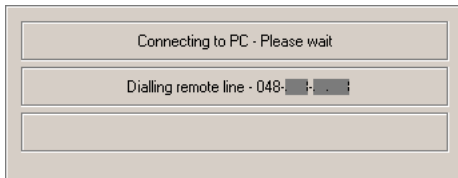


- ◇ The {Communication Parameters} dialog box is displayed again. Left-click the [OK] button.
- ◇ The {Modem setup and dialling} dialog box is displayed again. Left-click the [Dial] button.

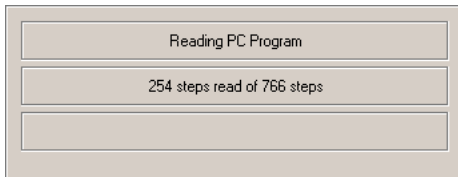
- ◇ The {Select documentation file for Online Window} dialog box is displayed. Select a tag file or “No Tag File Required”, and left-click the [Open] button.



- ◇ When connection to the modem starts, the {Dialling remote line} message is displayed.



- ◇ When connection to the modem is completed, reading online information from the PC starts.



- ◇ When this is completed, the online window is displayed. The subsequent operations are exactly the same as the ordinary online operations.

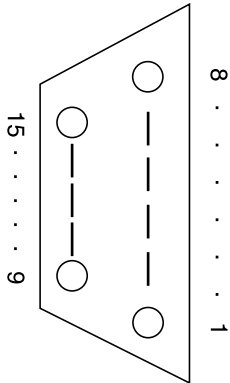
Appendix 3-2-2 Modem Disconnection

To disconnect the modem, select [Options] - [Modem Hangup] from the main menu.

When using an RS-232C module, use the cable provided with the modem. If no cable is attached to the modem, use an RS-232C cable (straight connection type) on the market.

When using the RS-232C port of CPU, prepare the following connection cable.

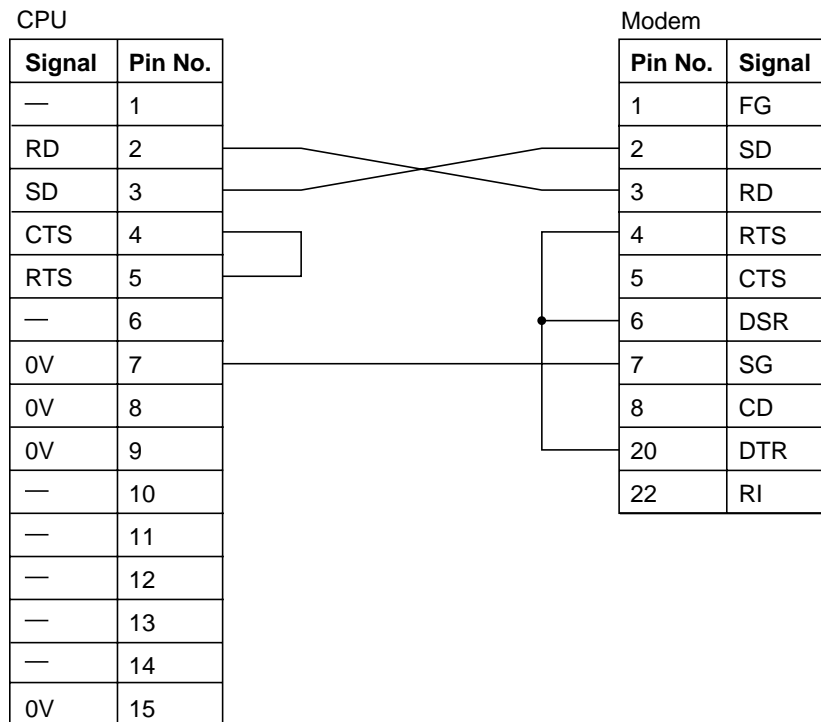
• Pin arrangement of CPU RS-232C



CPU-side connector
 15-pin female D-subconnector
 Engagement screw size: M2.6
 Hirose Electric ROAD-15S-LNA(05)

Pin No.	Signal	Signal direction		Description
		CPU	Modem	
1	—			Reserved (Do not connect)
2	RD	←		Receive data
3	SD		→	Send data
4	CTS	←		Ready to send
5	RTS		→	Request to send
6	—			Reserved (Do not connect)
7	0V	—		GND signal
8	0V	—		GND signal
9	0V	—		GND signal
10	—			Reserved (Do not connect)
11	—			Reserved (Do not connect)
12	—			Reserved (Do not connect)
13	—			Reserved (Do not connect)
14	—			Reserved (Do not connect)
15	0V		—	GND signal

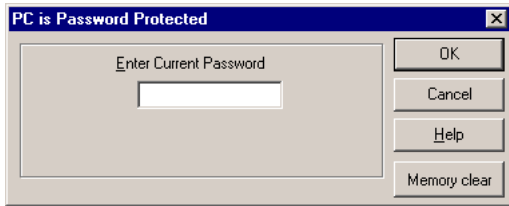
• Example of cable connections



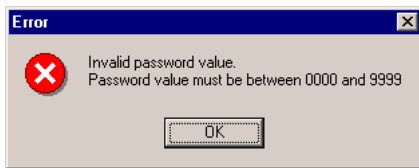
Appendix 4 Password

	Page
Appendix 4-1 Setting a New Password	App.4-1
Appendix 4-2 Opening a Program with Password	App.4-3
Appendix 4-3 Changing/Deleting a Password	App.4-4

The password is the function that prevents an unauthorized person from looking at the program that has been prepared. It is a four-digit number in the range 0000 to 9999. When an attempt is made to read, transfer, or check a program which is provided with a password, the dialog box that prompts you to enter the password is displayed.



If the right password is not entered, an error message is displayed. In this case, the attempted operation cannot be performed.



A password is saved as a part of a program and can be attached to any of the following.

- Online program (in the PC)
- PROM

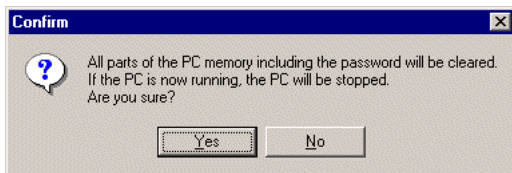
A file with an extension .LAD or .FXL does not accept a password.



Note that if you forget the password, you cannot read the program. A password in the PC can be erased by clearing the memory. However, the program will be also deleted. When erasing the password together with the program from the PC, select [File] - [Online] from the menu bar to display the [Select documentation file for Online Window] dialog. On this dialog, click [Clear PC memory on opening window] to ON for online connection.



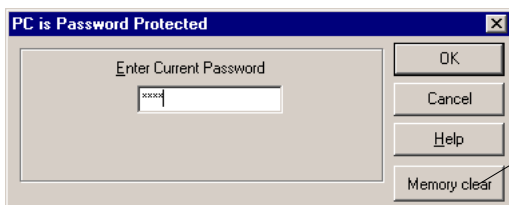
If you attempt online connection with a password not erased, the following confirmation dialog appears.



Left-click [Yes] to clear the memory.



If you have forgotten your password and need to clear the PC memory, click [Memory clear] on the password confirmation dialog to erase the password with the program.

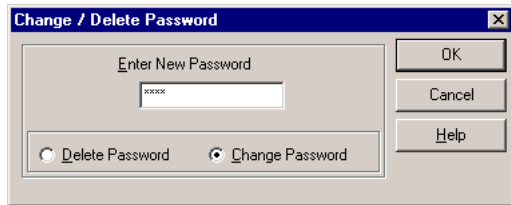


With a PC whose operation mode can be changed by a key switch (e.g., NJ or NS), set the key switch in the {TERM} position. When the key switch is in the {RUN} or {STOP} position, it is impossible to set or change a password.

The methods of setting, changing, and deleting a password for online program are explained.

Here, the method of setting a password for a program without password is explained. First, open the program window of the program for which a password is to be set.

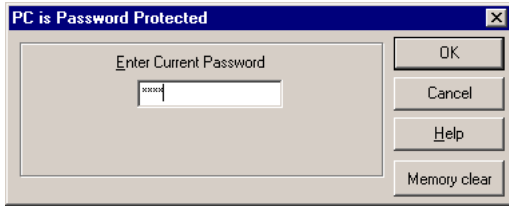
- ◇ Select [PC Functions] - [Password...] from the menu bar.
- ◇ The {Change/Delete Password} dialog box is displayed. Enter any 4-digit number (0000-9999) in the text box. Note that on the screen the entered number is displayed as ****. Left-click the [OK] button.



- ◇ Now, the password has been set (written in the program).

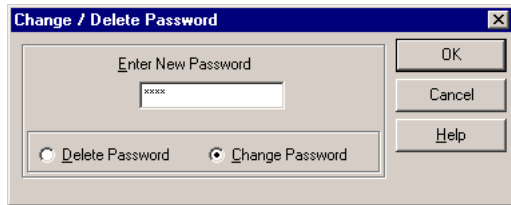
Here, the procedure for opening (reading) a program with a password is explained.

- ◇ Open the online window. The dialog box that prompts you to enter the password is displayed. Enter the password in the text box and left-click the [OK] button. When the right password is entered, the program window opens.



Here, the procedure for changing/deleting an existing password is explained. In the following explanation, it is assumed that the program with the password has already been opened.

- ◇ Select [PC Functions] - [Password] from the menu bar.
- ◇ The {Change/Delete Password} dialog box is displayed. Select [Delete Password] (or [Change Password]). To change the password, enter a new password in the text box. Left-click the [OK] button.



A password can be deleted or changed even when the PC is in operation.

- ◇ This is all for the change/deletion of the password.

When the password has been deleted, it is no longer necessary to enter the password in order to open the program next time and after.

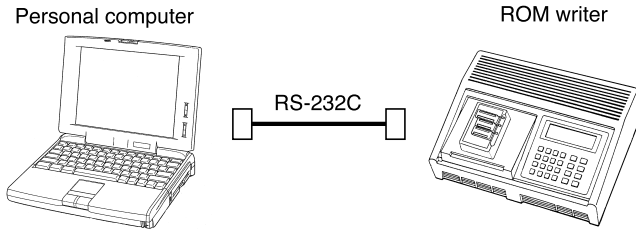
Appendix 5 PROM Writer Transfer

Page

Appendix 5-1 Preparation for PROM Writer Move	App.5-3
Appendix 5-2 Transfer to the PROM Writer	App.5-5
Appendix 5-2-1 Write into the PROM Writer	App.5-5
Appendix 5-2-2 Collation with the PROM Writer	App.5-6
Appendix 5-2-3 Read from the PROM Writer	App.5-7

This appendix explains how to transfer a program created by a personal computer to a PROM writer on the market for creating a PROM.

<System configuration>



The transfer function for a PROM writer is disabled when NB0 is selected for the PC model or on an online program window.

<Dedicated adapter for mounting on PROM writer>

To mount a memory cassette on a PROM writer, the following adapter is needed:

- For EPROM cassette: NN-CNPA-EP
- For EEPROM cassette: NN-CNPA-EE

<ROM writer>

Use the following ROM writer on the market:

(Recommended ROM writer)

Manufacturer	Model
AVAL DATA	PECKER-11
ADVANTEST	R4945

(ROM writer specifications)

- The ROM writer shall be able to transmit or receive data of the Intel hexadecimal format or Motorola format through the RS-232C interface.
- The ROM writer shall support XON/XOFF (software flow).

<Connection cable>

Use an RS-232C cable of the following connections. The ROM writer connector is a 25-pin female D-subconnector. If the number of pins is different, refer to the manual of the ROM writer.

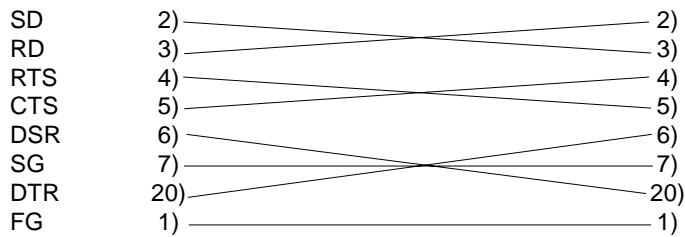
(Recommended)

25-pin or 9-pin D-subconnector for DOS/V machines

Manufacturer	Model
Tokyo Needs Co.,ltd	NCR-AR1

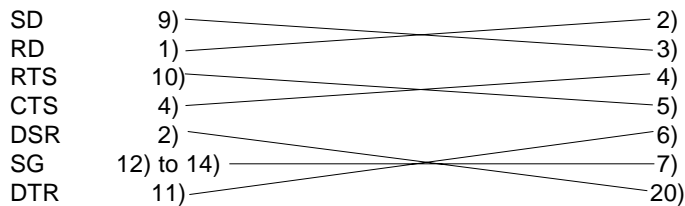
25-pin D-subconnector (male)
<Personal computer>

25-pin D-subconnector (male)
<ROM writer>



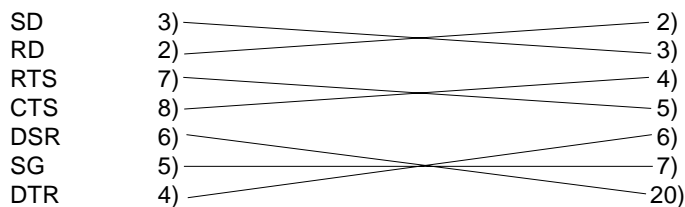
14-pin half-pitch D-subconnector (male)
<Personal computer>

25-pin D-subconnector (male)
<ROM writer>

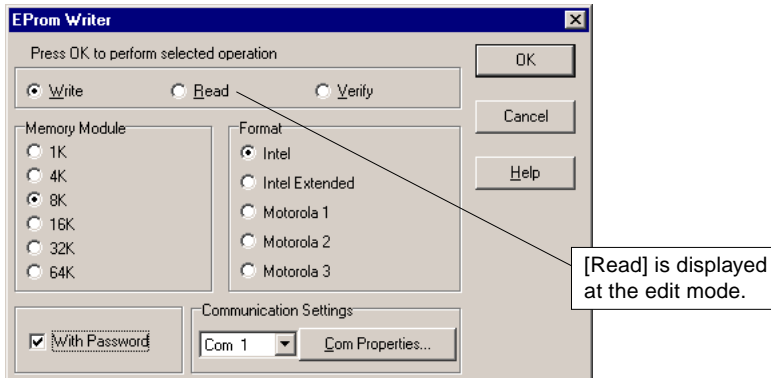


9-pin half-pitch D-subconnector (female)
<Personal computer>

25-pin D-subconnector (male)
<ROM writer>



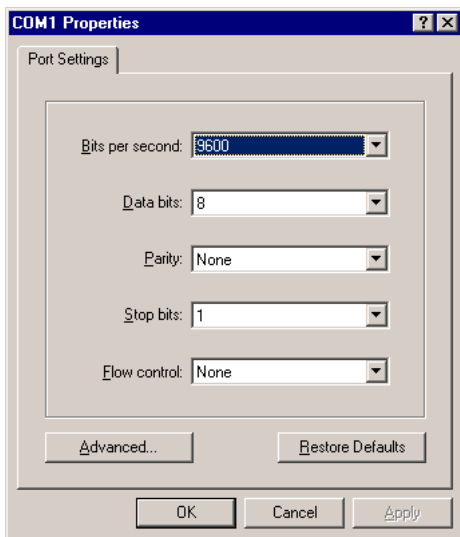
- ◇ Select [PC functions] - [Eprom Writer...] from the menu bar. The [Eprom writer transfer] dialog appears. Set the memory size, transfer format, and password (with/without).



<Explanation of the dialog box>

- Communication Port: Select the personal computer communication port connected to the ROM writer.
- Memory Size: Set the memory size of the memory cassette. (1K/4K/8K/16K/32K/64K)
- Format: Select a transfer format. This format should be equal to that on the ROM writer side. (Intel, Extended Intel, Motorola 1/2/3)
- With Password: Check here to transfer the program with a password.

- ◇ Set the communication port next. Select the port and click the [Com Properties...] button. The {Com1 Properties} dialog box is displayed.

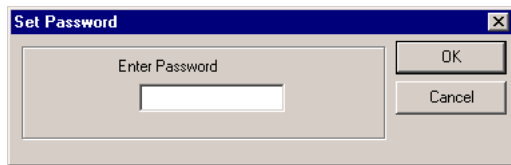


Set the communication port and click the [OK] button.

<Explanation of the dialog box>

- Flow control: Flow control means to set up handshake with the ROM writer by the RTS/CTS signal or Xon/Xoff character. Check here for flow control. This software supports both types of control. If this is not checked, flow control is disabled. For flow control, the ROM writer also need the flow control function.

- ◇ This completes preparations for write, read, and collation. Set the ROM writer to the send, receive, or collation mode and left-click the [OK] button to activate the transfer function.
- ◇ If the [With Password] check button is ON, a password prompt dialog appears.



- ◇ Enter the password and click the [OK] button.

Appendix 5-2-1 Write into the PROM Writer

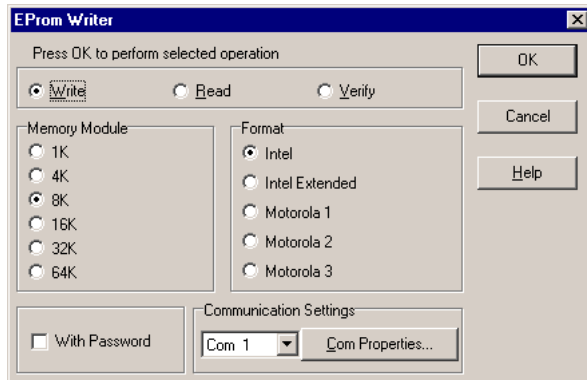
- ◇ Set the transfer format, ROM model, and other items on the ROM writer side for reception.

<Settings on ROM writer side>

Depending on the model of the memory cassette, set the ROM model as follows:

Memory cassette model	ROM model
N-MP1	Fujitsu MBM27C256A-15 or equivalent Memory cassette Ver. 30 or later: ST Micro (former SGS Thomson) M27C256B-12 or equivalent
N-MP4	
N-MP8	
N-MP16	
N-MBP1	
N-MBP4	
N-MBP8	
NB9VMPU-08	
N-MP32	Fujitsu MBM27C1001-15 or equivalent Memory cassette Ver. 30 or later: ST Micro (former SGS Thomson) M27C1001-12 or equivalent
N-MP64	
N-ME1	Oki Electric M5M28C64ARS-15 or equivalent Catalyst CAT28V64BP-15 or equivalent
N-ME4	
N-MBE4	
NB9VMEU-04	
N-ME8	ATMEL AT28C256-15 or equivalent
N-MBE8	
NB9VMEU-08	

- ◇ Select [PC functions] – [Eprom Writer Transfer] from the menu bar. The {Eprom Writer} dialog box is displayed.



Set [Write] and left-click the [OK] button.
This starts data transfer from the communication port to the ROM writer.



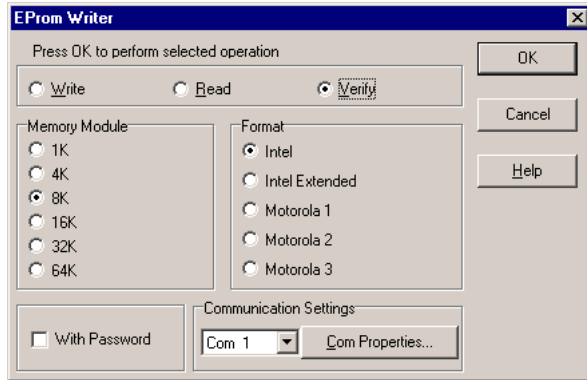
Read, write, and verify (collation) operations are valid for all program data. Program data includes not only ladder programs but also file register information.

Appendix 5-2-2 Collation with the PROM Writer

- ◇ Select [PC functions] - [Eprom Writer] from the menu bar.

The {EProm Writer} dialog box is displayed.

When collating the EPROM program with the contents of the program window, make sure that the contents of the {EProm Writer} dialog box match the settings of the PROM writer.

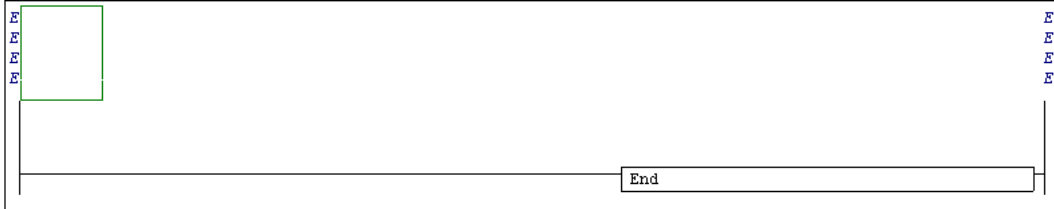



- ◇ Then set the ROM writer to the program send status.
- ◇ Select [Verify] and left-click the [OK] button. Then program collation starts. If the program does not match, a message is displayed.

Appendix 5-2-3 Read from the PROM Writer

A program transferred (read) from the ROM writer is overwritten on the current program window. If the PC model setting is different, the PC model setting on the ROM writer side is reflected on the program window. When saving only the program read from the ROM, first create a new offline window with no program as follows:

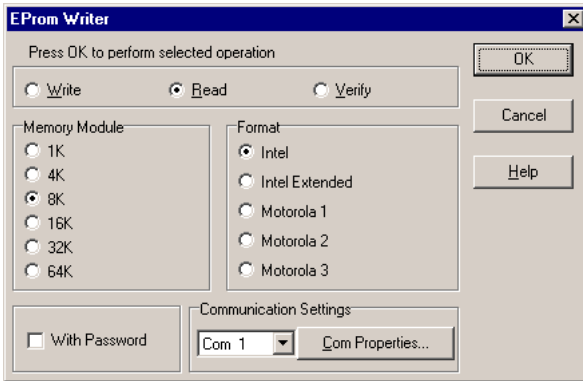
- ◇ Select [File] - [New...], choose a PC model, and left-click the [OK] button. (A new offline window opens.)



- ◇ Select [Edit] - [Delete Line] or click  [Delete Line] button to delete the line creation section at the top. (A program window is created with an END instruction only.)



- ◇ Select [PC functions] - [EProm Writer] from the menu bar. The {EProm Writer} dialog box is displayed.



- ◇ Set [Read] on the personal computer side, match the transfer format and other parameters with those of the ROM writer, and left-click the [OK] button.
- ◇ On the ROM writer side, transfer the EPROM contents into the internal RAM of the writer. Set the transfer format and other parameters and set the ROM writer to the send status.
- ◇ To stop reading in the middle, left-click the [Abort] button. Once all data has been read, the program window displays the read ladder program.

Appendix 6 Shortcut Key List

Page

Appendix 6-1 Shortcut Key List	App.6-1
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Shortcut key list

Appendix 6 Shortcut Key List

Appendix 6-1 Shortcut Key List

Edit Ladder

Select group for instruction speed bar

Enter instruction
Undo
Redo
Insert Line above Cursor
Insert Line below Cursor
Draw Line
Erase Line
Insert Line
Delete Line
Insert Row
Delete Row
Select Square Area
Select Line

Alphabetic key of group tab
C for Common
Allocated function key
Ctrl + Z
Ctrl + Y
Ctrl + I
Ctrl + Alt + I
Ctrl + Cursor
Ctrl + Alt + Cursor
Alt + Ins
Alt + Del
Ctrl + Ins
Ctrl + Del
Shift + Alt + Cursor
Shift + Cursor

Edit Instruction Word List

Insert Line
Delete Line
Select Line

Alt + Ins
Alt + Del
Shift + Cursor

Cut & Paste

Cut
Copy
Paste

Ctrl + X
Ctrl + C
Ctrl + V

Change or Shift Display

Switch File (Ladder)/Data Tab
To Left End of Line
To Right End of Line
Page Scroll

Ctrl + Tab
Home
End
PgUp/PgDn

Other

New
Open
Save
Exit
Print
Edit
Download to PC
Find
Replace
Search Next
Go to Line Number
Tag Editor
Decimal Display
Hex Display

Ctrl + N
Ctrl + O
Ctrl + S
Alt + X
Ctrl + P
Ctrl + E
Ctrl + D
Ctrl + F
Ctrl + H
Ctrl + L
Ctrl + G
Ctrl + T
Ctrl + K
Ctrl + H

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