

FUJI PROGRAMMABLE CONTROLLER

MICREX-F

**Loader Software Package
for Personal Computer
(Windows)**

USER'S MANUAL

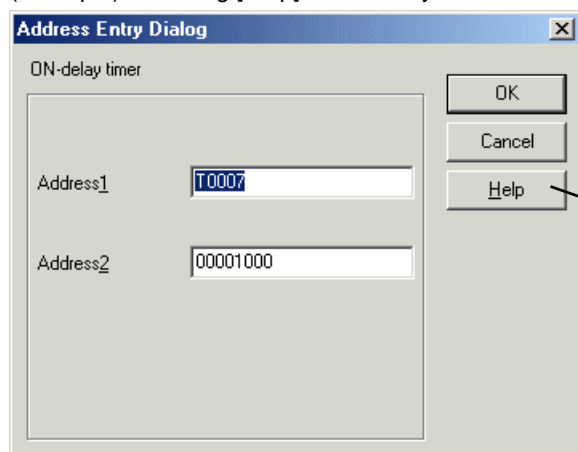
Type: NL4N-WNSB

When you unpack this product, check that nothing has been damaged during transportation. If there is any problem, please contact your dealer.

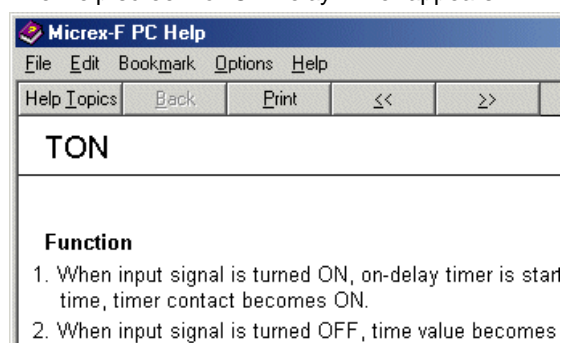
This User's Manual explains MICREX-F series personal computer Loader (for windows). Read this manual carefully to ensure correct operation.

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



The Help screen for On Delay Timer appears.



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

Name	Manual No.	Remarks
F55 series <HARDWARE>	FEH150	Explains about F55 series Hardware
F70/F70S series <HARDWARE>	FEH063	Explains about F70/70S series Hardware
F120S/F140S/F150S series <HARDWARE>	FEH084	Explains about F120S/F140S/F150S series Hardware
MICREX-F series <INSTRUCTION>	FEH160	Explains MICREX-F series Software
MICREX-F series <COMMUNICATION>	FEH161	Explains MICREX-F series T-Link, P-Link

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.

*Microsoft, Windows are trademarks of Microsoft Corporation in the USA and other countries.

Preface

Special Notes

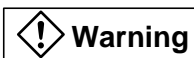
The following shows the relationship between PLC models and applicable software versions.
PLC models not described in this table cannot be used.

Model	Version			
	1.00.031...	1.10.026...	1.2X.XXX...	
F30	X	O	O	
F50, F50H	X	O	O	
F55 (main unit version 0.999 or earlier) Note 1)	X	O	O	
F55 (main unit version 1.001 or later)	O	O	O	
F60	X	O	O	
F70, F70S	O	O	O	
F80, F81	X	X	O	
F80H	X	O	O	
F100, F105	X	X	O	
F120, F125	X	X	O	
F120H	X	O	O	
F120S, F140S, F150S	O	O	O	

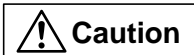
Note 1: Handled as “F80H” by the personal computer loader.

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

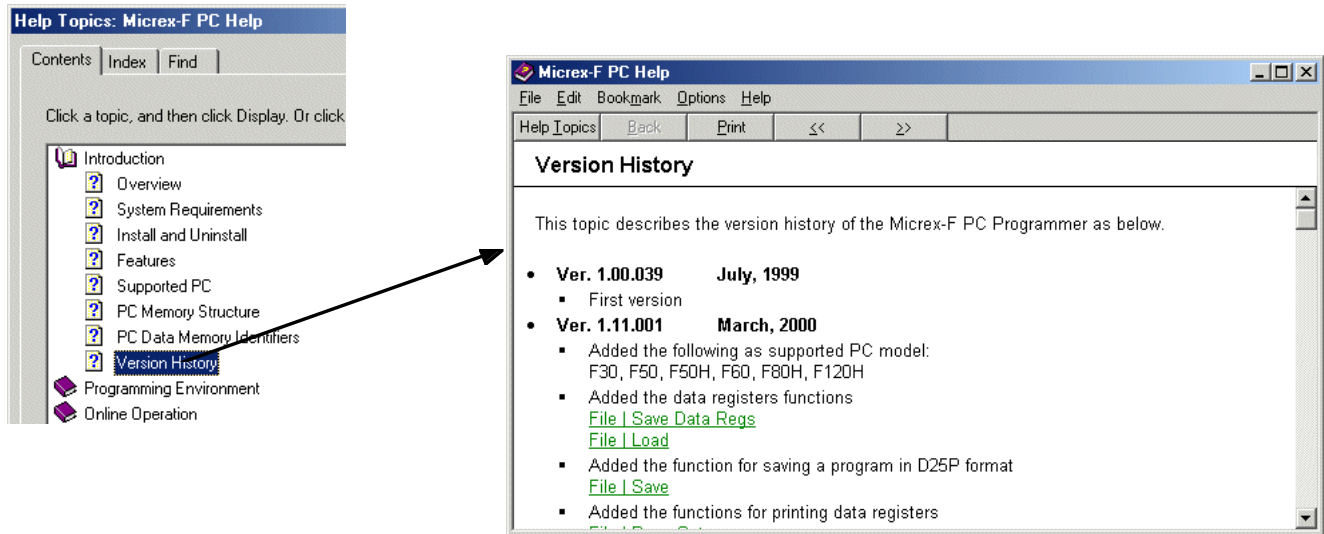
- ◇ Do not use one found damaged or deformed when unpacked, otherwise, failure or erratic operation might be caused.
- ◇ Do not shock the product by dropping or tipping it over, otherwise, it might be damaged or troubled.
- ◇ Do not leave the product in places where it is exposed to direct sunlight or 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.

*Manual No. is shown on the cover.

Printed on	*Manual No.	Revision contents
Jun. 1999	FEH147	First edition (Products Version1.00.XXX...)
Mar. 2000	FEH147a	Second edition (Products version 1.00.XXX...) <ul style="list-style-type: none"> • F30, F50, F50H, F60, F80H and F120 H have been additionally supported. • Data save and transfer functions have been added. • Print function has been reinforced (data print, ladder print with cross reference, etc.) • Text save function for RAS data has been added. • Duplex operation function is supported. • Loader network function is supported (only P-link and PE-link). • Sampling trace function and status latch function are supported. • Tag name duplicate use permit mode has been added.
Dec. 2000	FEH147b	Third edition (Product Version 1.2X.XXX...) <ul style="list-style-type: none"> • Windows ME, 2000, NT4.0 (SP6 or later) are supported. • F80 and other models dropped from production have been supported. • Edit function has been reinforced (insert blank row, merge and divide lines, change tags on the ladder diagram, etc.) • Block diagram has been supported. • Trigger function has been supported. • Data display function has been reinforced (with D25P format display). • Instruction search function has been added. • Display and print functions for multiple tag rows have been added. • Display and save functions for previous RAS generations have been added.
Jun. 2001	FEH147c	Fourth edition (PDF manual for CD) (Product Version 1.3.0.XXX...)
Apr. 2004	FEH147d	Fifth edition (Product Version 1.3.1.XXX...) <ul style="list-style-type: none"> • Windows XP is supported. • Abbreviation for programmable controller is changed from PC to PLC.

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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Section 1 Introduction

1-1 How to Use This Manual

The MICREX-F PLC Programmer is a Windows-based programming tool for the MICREX-F Series PLCs. 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 MICREX-F PLC 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 PLC and the personal computer.

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

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

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.

1-2 Operating Environment

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 ME
 - Microsoft Windows NT4.0 (Service Pack 6 or later)
 - Microsoft Windows 2000
 - Microsoft Windows XP
- 32 MB of memory or more.
- 10 MB of available hard disk or more.
- A pointing device, such as the mouse or track ball.
- A display device of 800 x 600 dots or more.
- A CD drive.

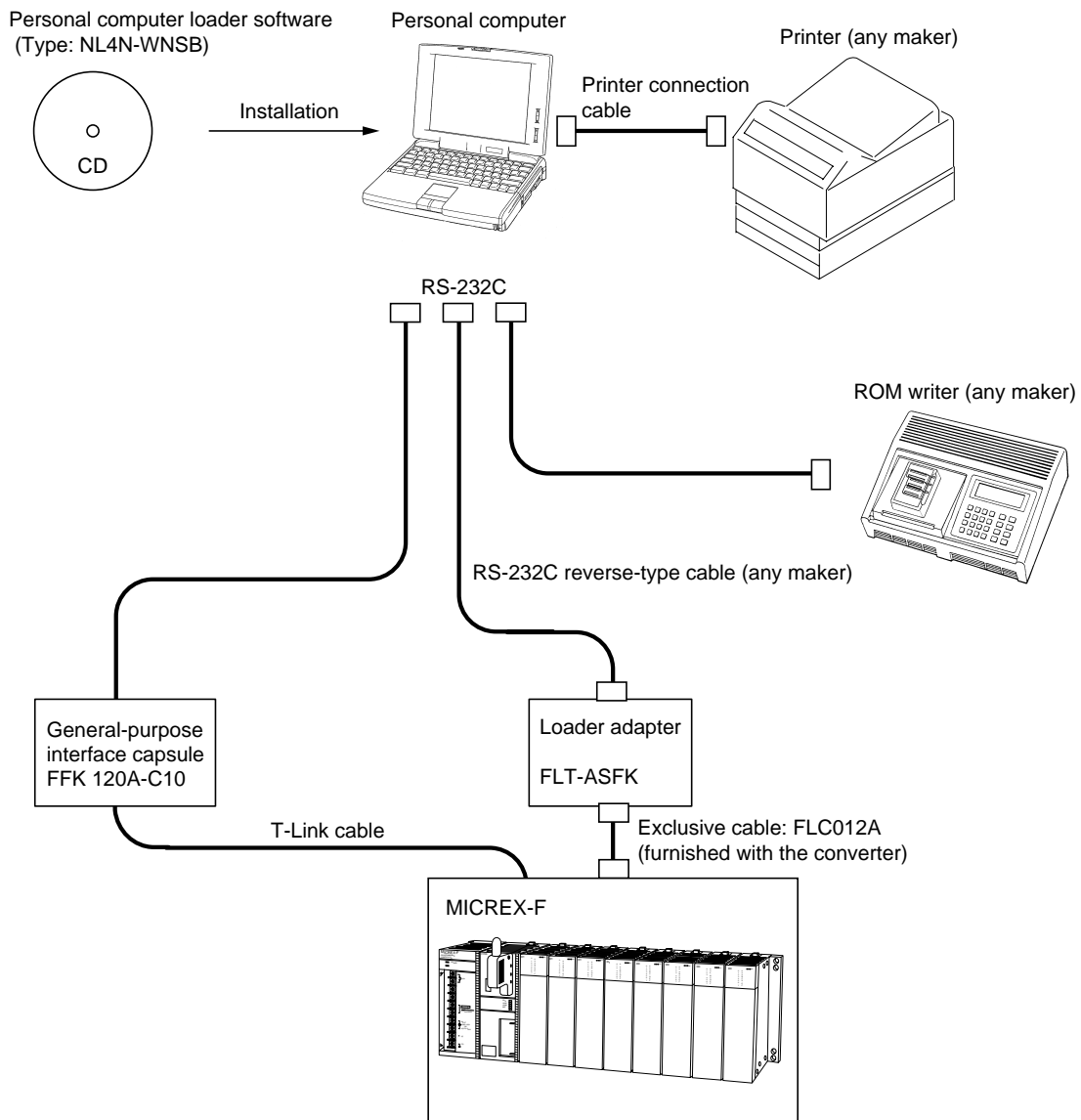
Note:

A program file saved with using a D25(LITE) can not be opened.

The capacity of a floppy disk in D25 defaults to 1.2MB. This diskette formatting is not generally readable on PCs. Please save the program file in 720KB formatted(2DD) using the D25 and open the file using the Micrex-F PLC Programmer.

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 MICREX-F Series PLCs.



1-3 Personal Computer Loader System Configuration

[Cable connection with the PC]

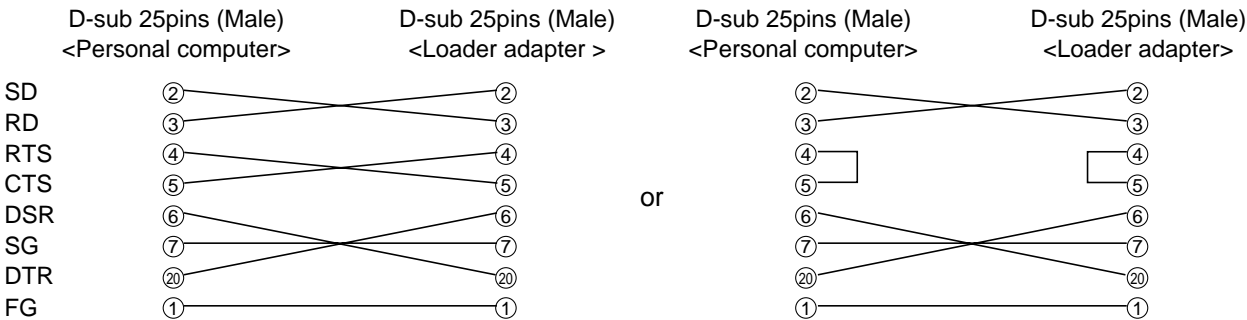
Use the cable specified below to connect between the personal computer and the loader adapter (or general-purpose interface capsule).

The loader adapter (general-purpose interface capsule) has a D-sub 25-pins (female) connector.

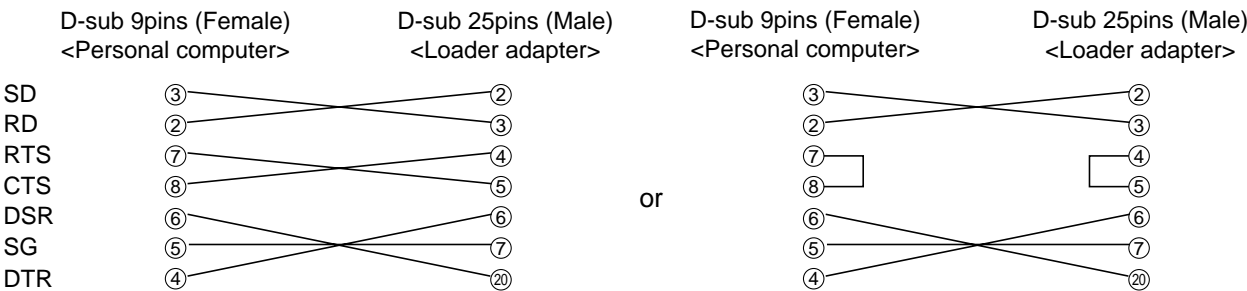
For cable connection between the personal computer and the ROM writer, refer to the specifications of the cable for connection between the personal computer and the PROM writer.

(Connecting RS-232C Cable)

(1) D-sub 25pins / D-sub 25pins



(2) D-sub 9pins / d-sub 25pins



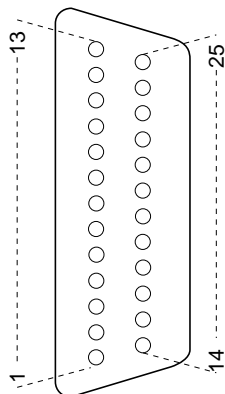
* Even when any other cables are connected, they do not affect the software operation.

1-3 Personal Computer Loader System Configuration

(Reference)

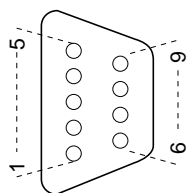
The pins arrangement of the cable connector to be connected to the personal computer is as follows.

(1) D-sub 25-pins connector



Pin No.	Signal name	Signal direction Personal computer-Loader adapter	Description
1	FG		Frame ground
2	SD	⇒	Send data
3	RD	⇐	Receive data
4	RTS	⇒	Send request
5	CTS	⇐	Clear to send
6	DSR	⇐	Data set ready
7	SG		Signal ground
20	DTR	⇒	Data terminal ready

(2) D-sub 9-pins connector



Pin No.	Signal name	Signal direction Personal computer-Loader adapter	Description
2	RD	⇐	Receive data
3	SD	⇒	Send data
4	DTR	⇒	Data terminal ready
5	SG		Signal ground
6	DSR	⇐	Data set ready
7	RTS	⇒	Send request
8	CTS	⇐	Clear to send

[Printer]

Use a printer which is compatible with Windows.

Use a printer cable which suits the personal computer used.

1-3 Personal Computer Loader System Configuration

[ROM writer]

Use an ROM writer which meets the following specifications.

(ROM writer recommended product)

Maker	Type
AVAL DATA Corporation	PECKER-11
ADVANTEST	R4945

(ROM writer specifications)

- The ROM writer shall be capable of sending and receiving data of Intel (extended Intel) HEX format or Motorola format using an RS-232C.
- The ROM writer shall be capable of controlling the XON/OFF flow (software flow).

(Connection cable specifications)

Use an RS-232C cable whose terminals are connected as shown below. In this manual, it is assumed that the ROM writer has a D-sub 25-pins (female) connector. When the ROM writer connector has a different number of pins, refer to the User's Manual of ROM Writer.

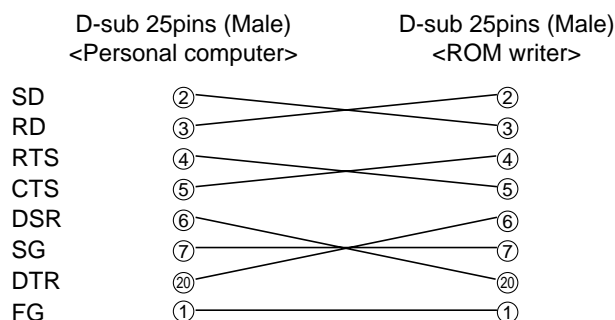
(Recommended product)

D-sub 25-pins/D-sub 9-pins type for DOS/V

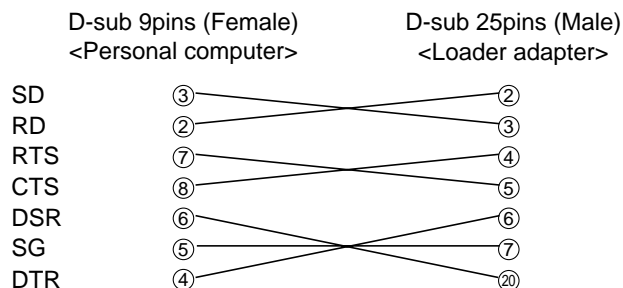
Maker	Type
Tokyo Needs Co., Ltd.	NCR-AR1

(Connecting RS-232C Cable)

(1) D-sub 25-pins / D-sub 25-pins



(2) D-sub 9-pins / D-sub 25-pins



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 an old 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

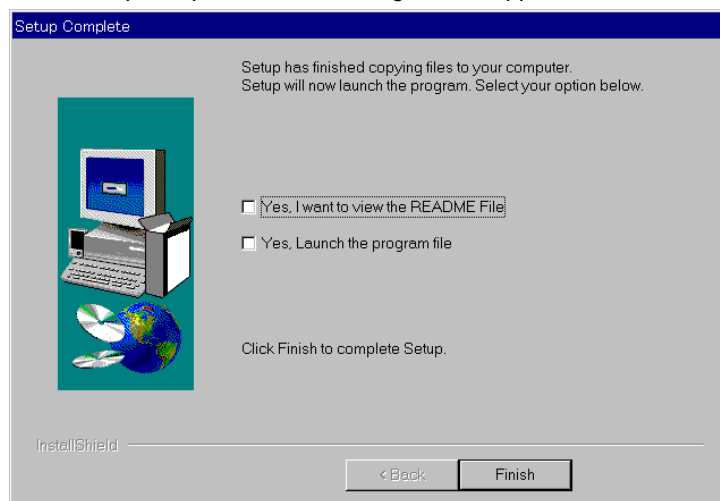
- ◇ Before installing the personal computer loader software, close all the Windows programs that are open.
- ◇ Insert the CD into CD drive.
CD automatically runs, and item selection dialog box appears.
- ◇ Left-click the [PLC Programmer Setup].
{Install Shield Wizard Preparing} working box appears on 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\Micrex-F 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.



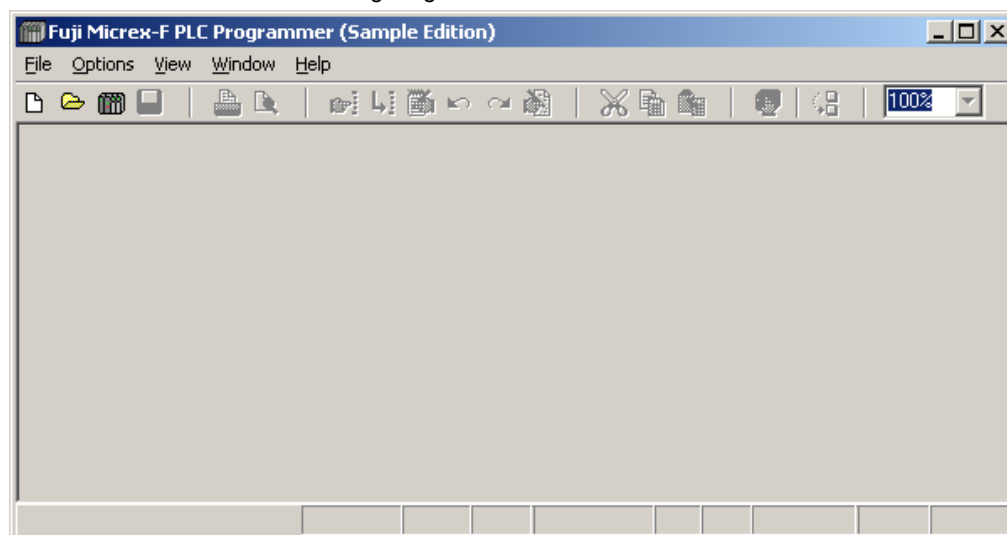
- ◇ The {Select Program Folder} dialog box is displayed. To change the default folder of the "MICREX-F PLC Programmer," enter an appropriate program folder name in the text box. Left-click the [Next >] button.
- ◇ The {Start Copying Files} dialog box is displayed. Confirm the content of the display and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

1-4 Method of Installation

◇ When setup completes, the following screen appears.

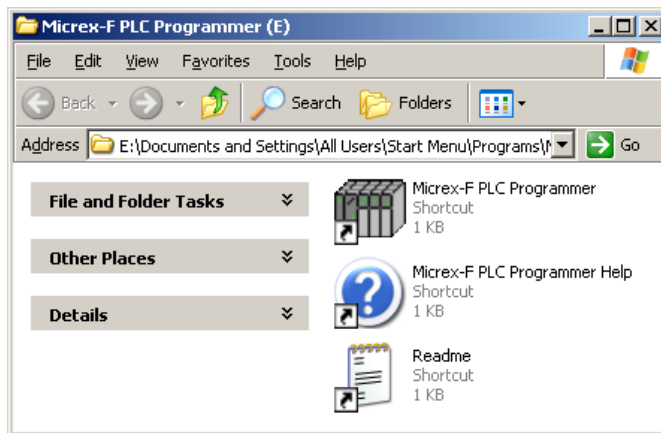


Check the box associated with the operation to be executed next, and left-click the [Finish] button. When the box of [Yes, launch the program file] is checked and the [Finish] button is left-clicked, the personal computer loader is activated as shown in the following diagram.



1-4-3 Group of programs installed

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

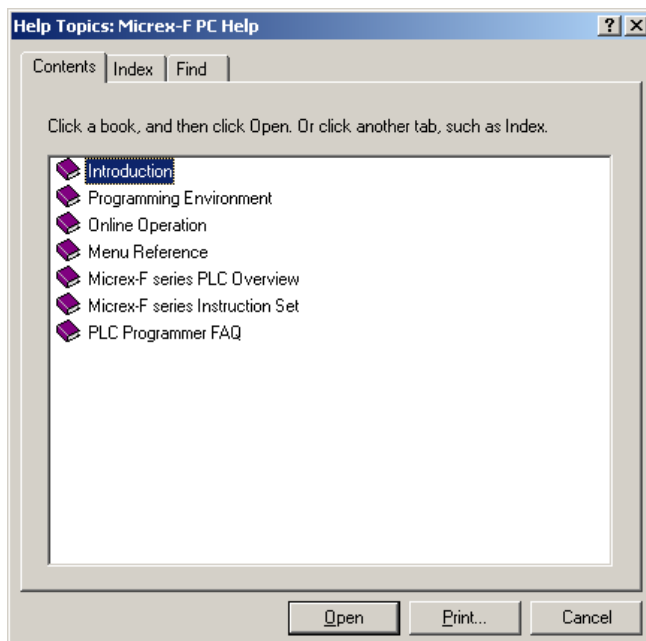


- **MICREX-F PLC Programmer**

This is the loader software.

- **MICREX-F PLC 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.



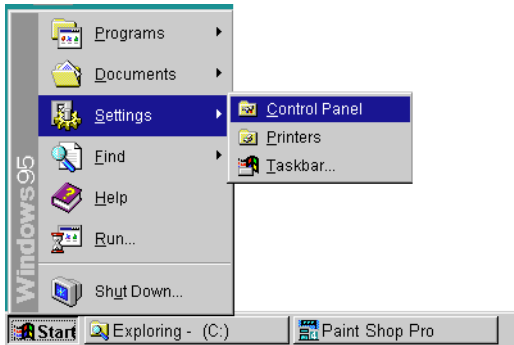
- **Please Read**

This is a file which contains the current supplementary explanations to the loader software. It is recommended that the user read through the file.

1-5 Uninstall

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.

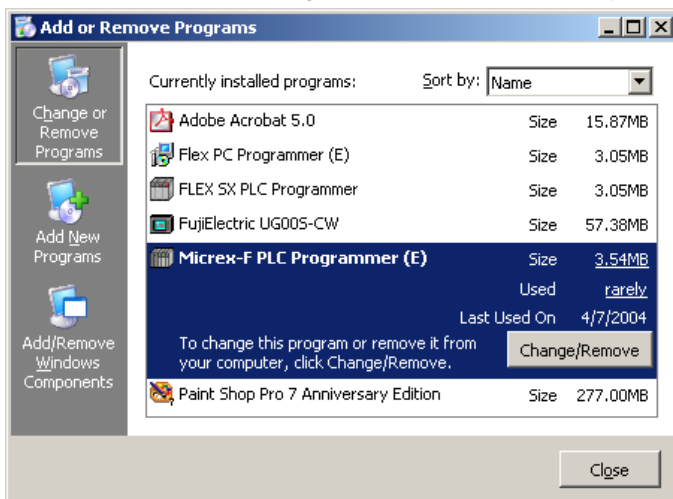
- ◇ Select [Control Panel] from the [Set] submenu of the [Start] menu.



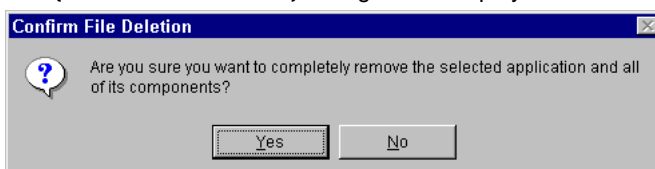
- ◇ Left-double-click the [Add/Remove Programs] icon in the {Control Panel} dialog box.



- ◇ Select [MICREX-F PLC Programmer] from the list displayed on the screen and left-click the [Add/Remove] button.

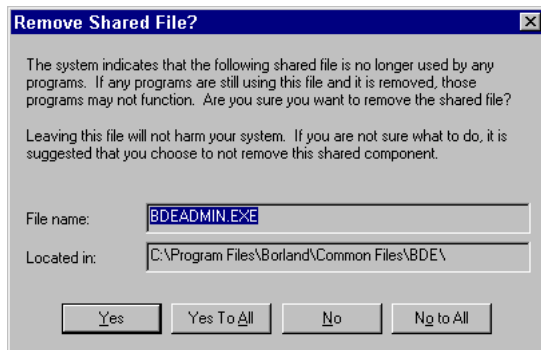


- ◇ The {Confirm File Deletion} dialog box is displayed. Left-click the [Yes] button.

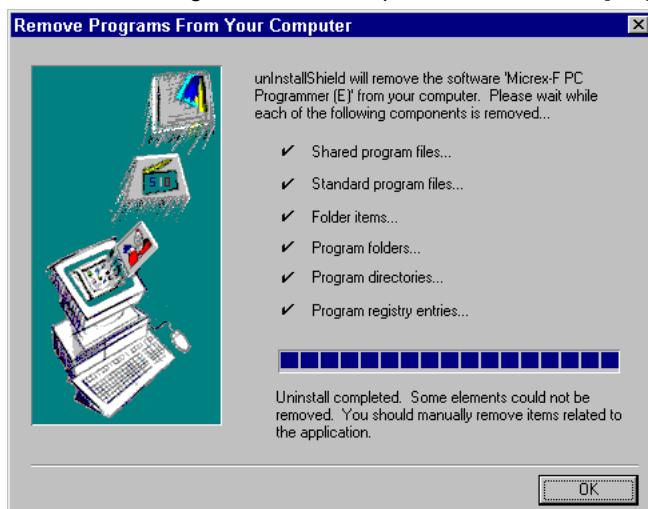


- ◇ The uninstall operation is started.

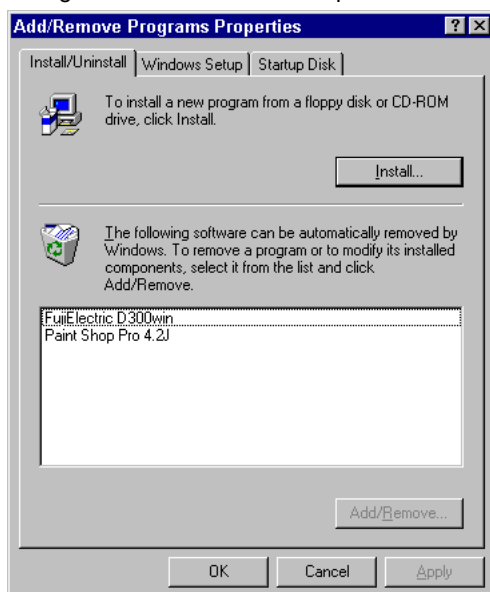
During this operation, the {Remove Shared File?} dialog box may be displayed as shown below. In this case, if you remove the shared file, it can happen that some programs do not function and in the worst case, Windows might fail to work. Normally, select either [No] or [No to All.]



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

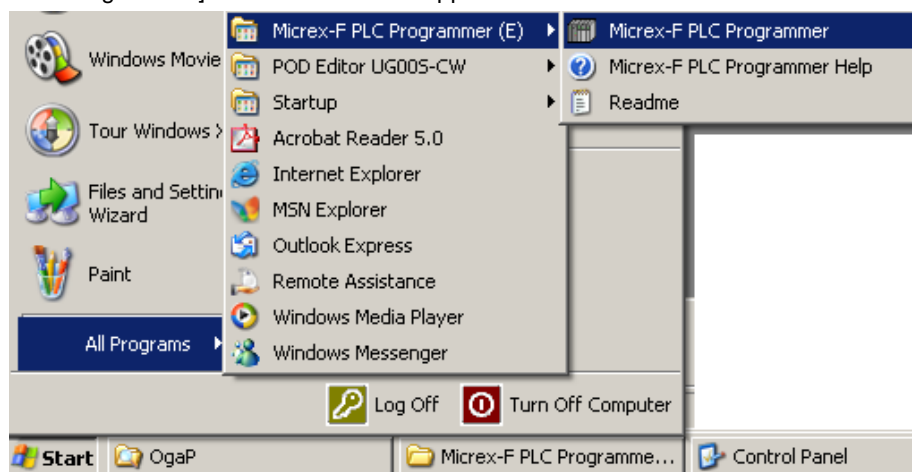


- ◇ The {Add/Remove Programs Properties} dialog box is displayed again. Left-click the [Cancel] button to close the dialog box. Now the uninstall operation is completed.

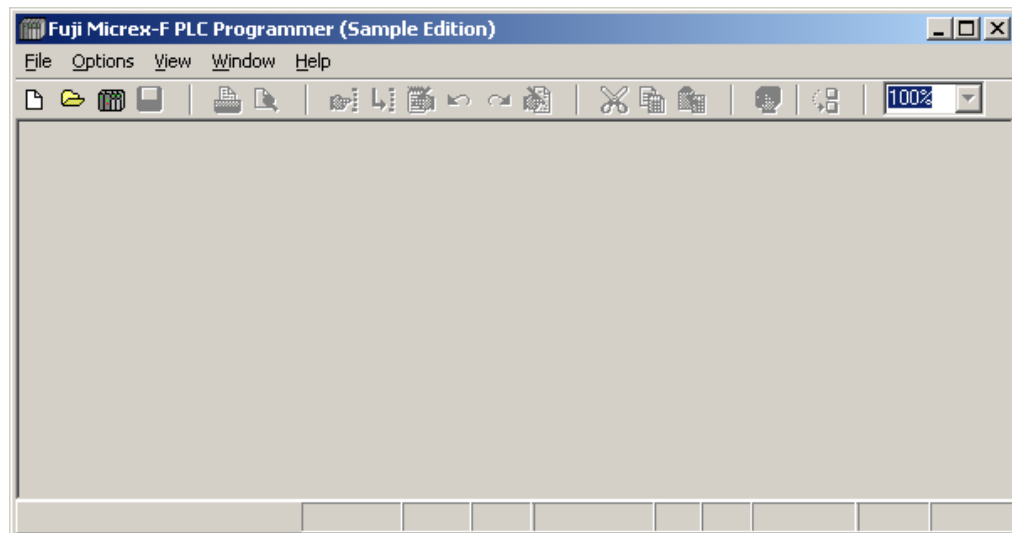


1-6 Starting the Personal Computer Loader

- ◇ First, select [MICREX-F PLC Programmer] from the [Program] submenu of the [Start] menu. Then, select [MICREX-F PLC Programmer] from the menu that appears on the screen.



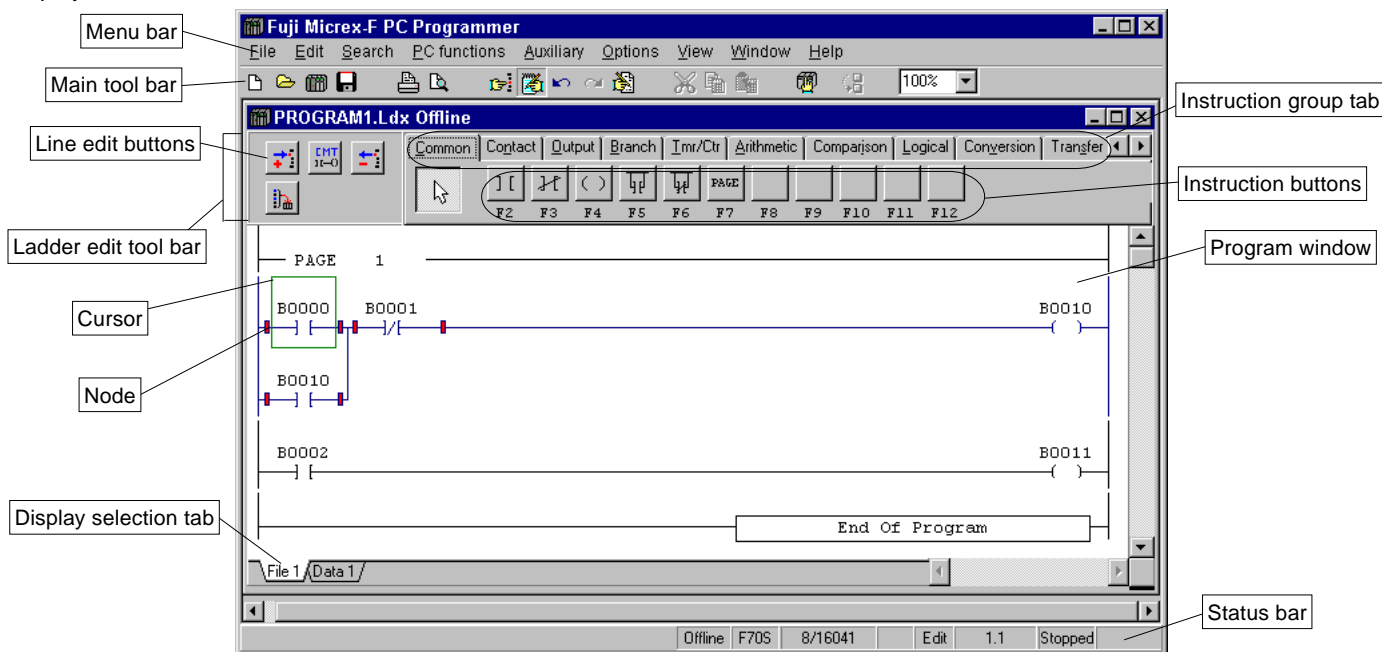
- ◇ The personal computer loader starts. From this screen, the user can perform desired offline and online operations. For the methods of offline and online operations, refer to "Section 2" and the subsequent sections.



1-7 Screen Configuration

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

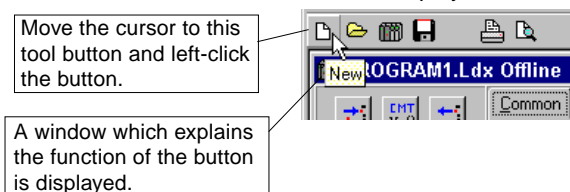
• Menu bar

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.

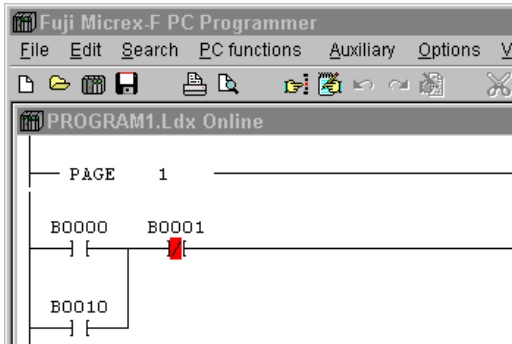


1-7 Screen Configuration

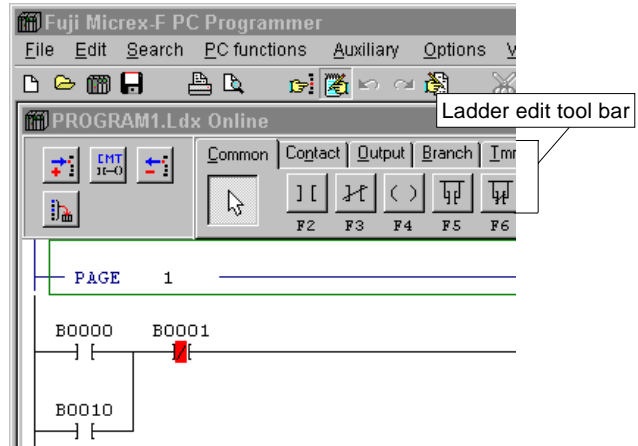
- **Ladder edit tool bar**

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.

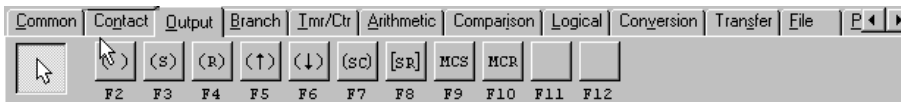
- **Instruction group tab**

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



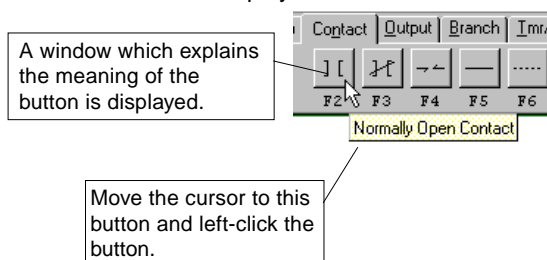
When [Output] is selected



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.



1-7 Screen Configuration

- **Cursor**

The cursor indicates the currently selected item to be edited (in the example given below, [Normally Open Contact] of address {B0000}). 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 can be moved to a node by <Ctrl> + < arrow> keys.

The cursor is displayed only in the [Edit] mode.

- **Node**

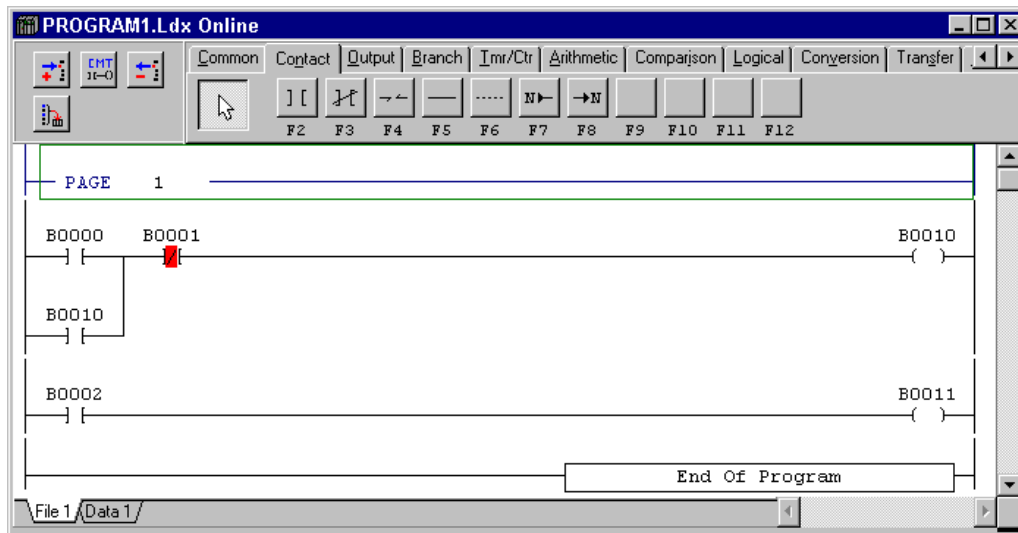
The node is a small square box displayed before and after each instruction. It is used for addition, deletion, etc. of an instruction. The node is displayed only in the [Edit] mode and only for the line currently selected.

- **Program window**

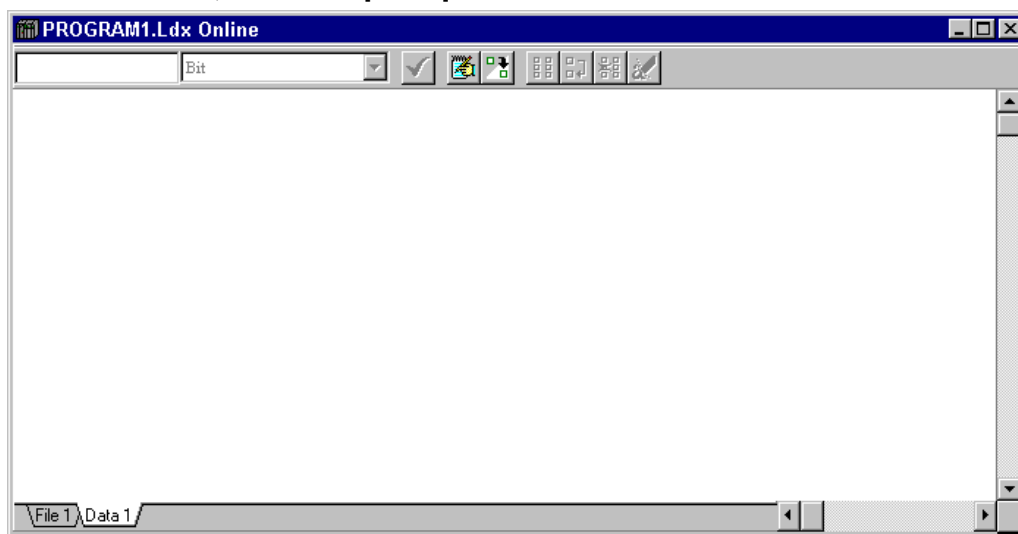
The program window is the entire screen area in which the ladder program that is being edited (or monitored) is displayed.

- **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.



1-7 Screen Configuration

• 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.

Continuous Force on an element				Online	F70S	8/16041		Mon	1.0	Running	No Fault
1)	2)	3)	4)	5)	6)	7)	8)	9)			

- 1) Displays the help message for the tool bar button selected.
- 2) Indicates online display, offline display, or modem display.
- 3) Indicates the PLC model selected.
- 4) Indicates the number of program steps currently used and the total number of program steps that can be used with the PLC model selected.
- 5) Not used.
- 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) Indicates whether the PLC is in [operation] or [out] of operation.
- 9) Indicates the PLC operating condition ([Normal], [Fatal fault], [Nonfatal fault]).

1-7-2 Window types

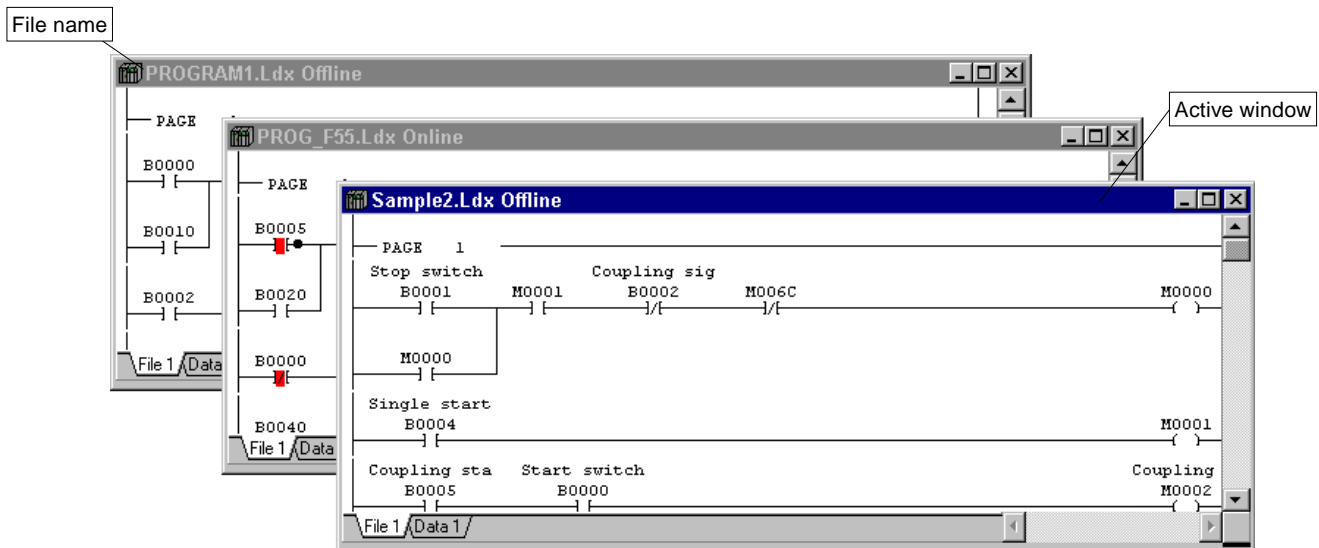
There are two types of windows-the offline window and the online window.

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 PLC. 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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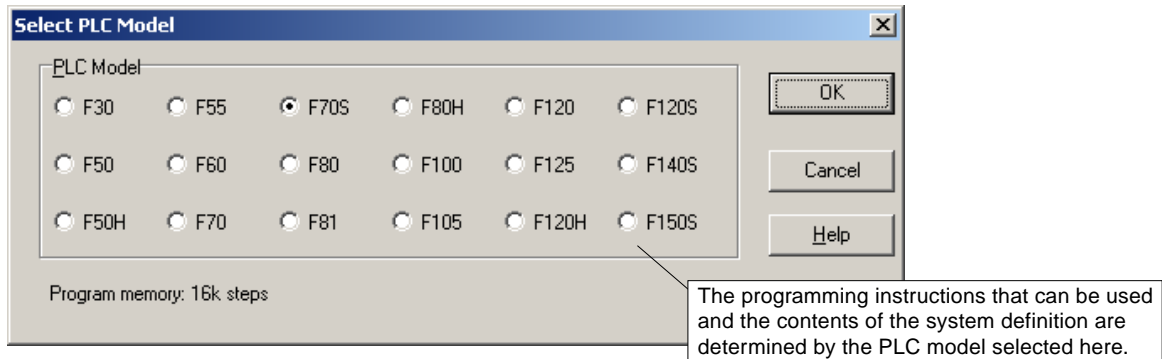
Section 2 Offline Operations

2-1 Preparations for Programming

2-1-1 Opening a new file

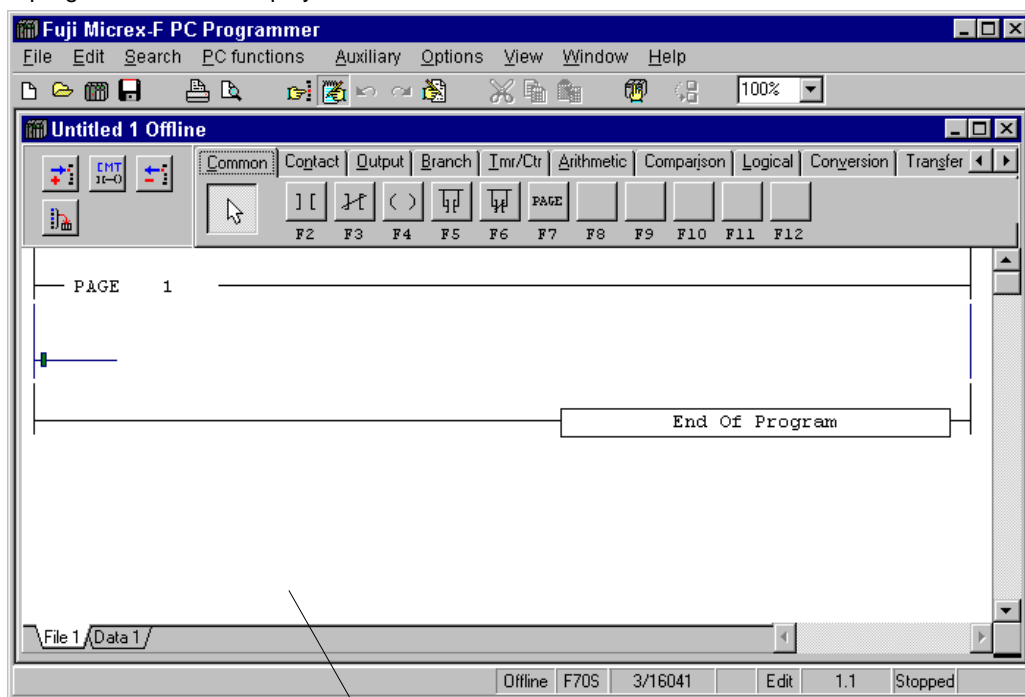
To create a new program, start the personal computer loader and open a new file (program window) by the following operations.

- ◇ Select the [New] command from the [File] menu. The {Select PLC 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 PLC model, left-click the [OK] button. A program window is displayed in the main window of the loader.



2-1 Preparations for Programming

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 PLC 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		PLC functions	Starts or stops the online-connected processor.
Step execution		PLC Function	Executes the program step by step.
Insert Line		Edit	Inserts a line block starting point which is necessary when preparing 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.
Insert block diagram		Edit	Allocates the area to create a new block diagram.
Download changes to PLC		Edit	Downloads ladder lines changed in an online window to a PLC.

2-1 Preparations for Programming

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.

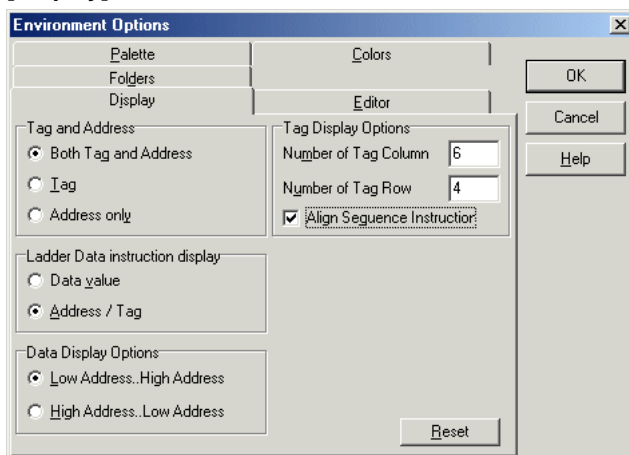


The tag is a label (name) which is in one-to-one correspondence with an address. It corresponds to a comment in the MS-DOS-based loader.

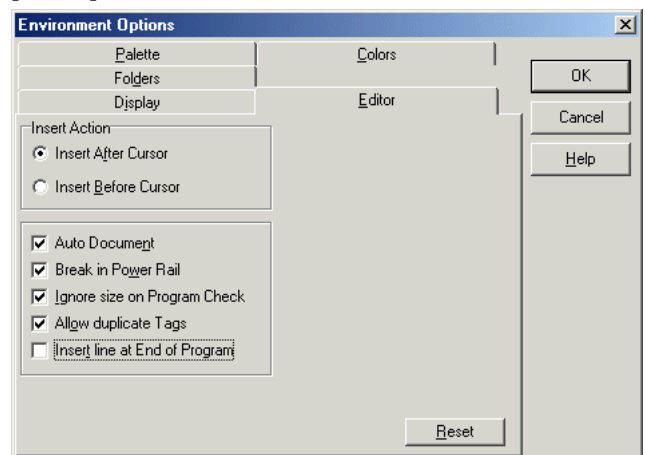
(1) Setting program editor

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

[Display] tab



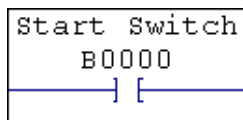
[Editor] tab



1) Setting display option

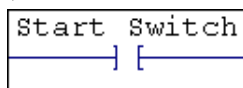
[Both Tag and Address] option button

Displays an address and a tag above the instruction symbol.



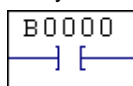
[Tag] option button

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.)



[Address only] option button

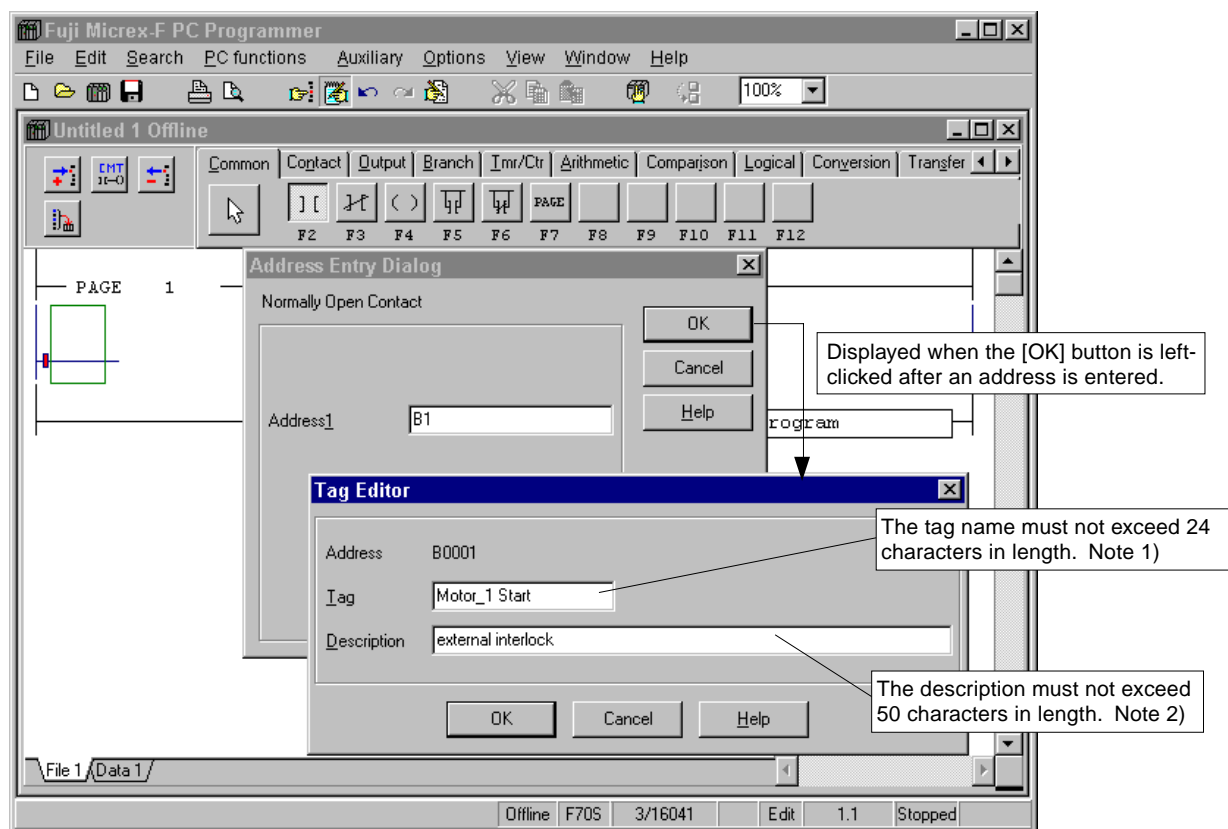
Displays only an address above the instruction symbol.



2-1 Preparations for Programming

2) Setting automatic tag entry

When the [Auto Document] box is checked, the {Untitled 1 Offline} dialog box shown below is displayed during program editing.



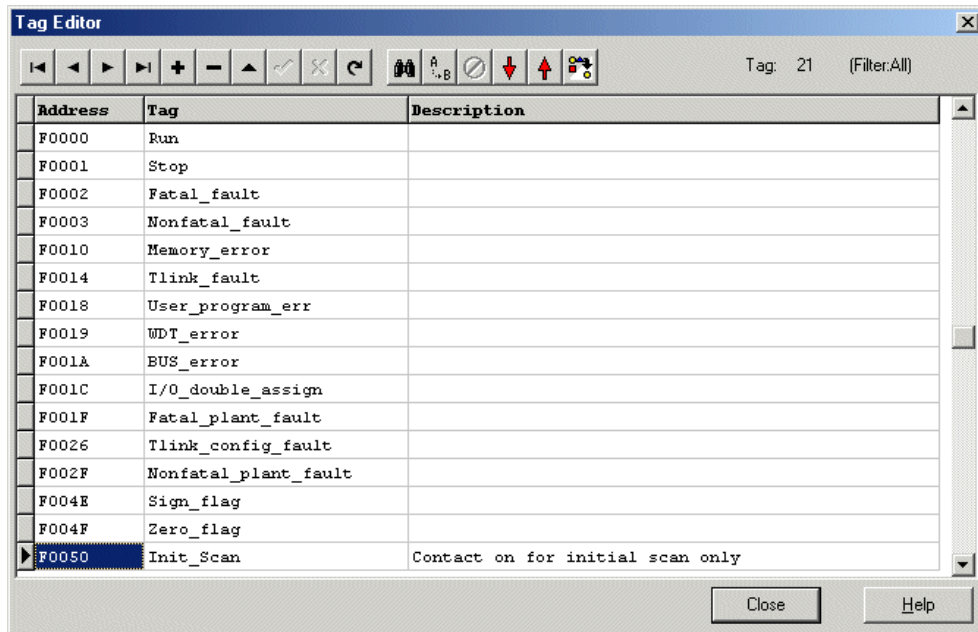
Note 1: In a tag name, the comma (,) cannot be used.

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.

2-1 Preparations for Programming

<Tag Editor>

There are two methods of entering a tag name. One is using the {Untitled 1 Offline} dialog box described above, and the other is using [Tag Editor].

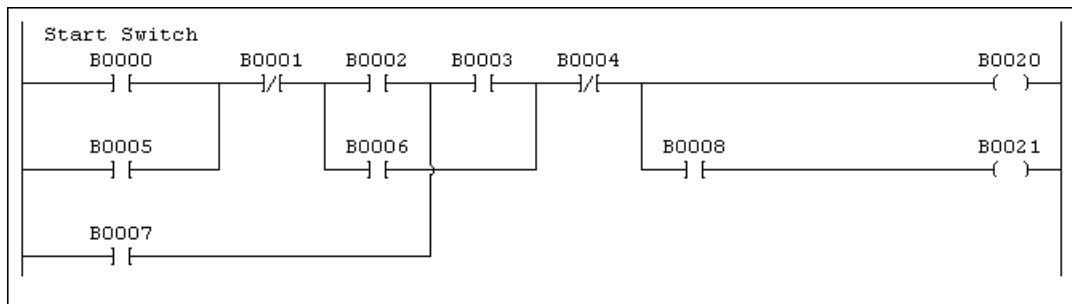


For the method of using [Tag Editor], refer to “2-5 Tag Edit.”

2-2 Programming

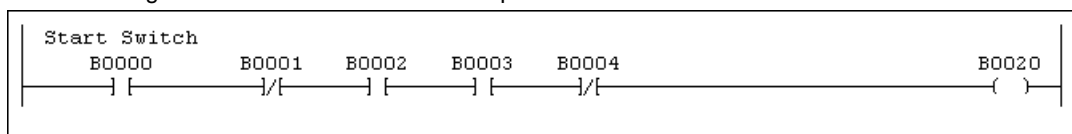
2-2-1 Writing contacts and outputs

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



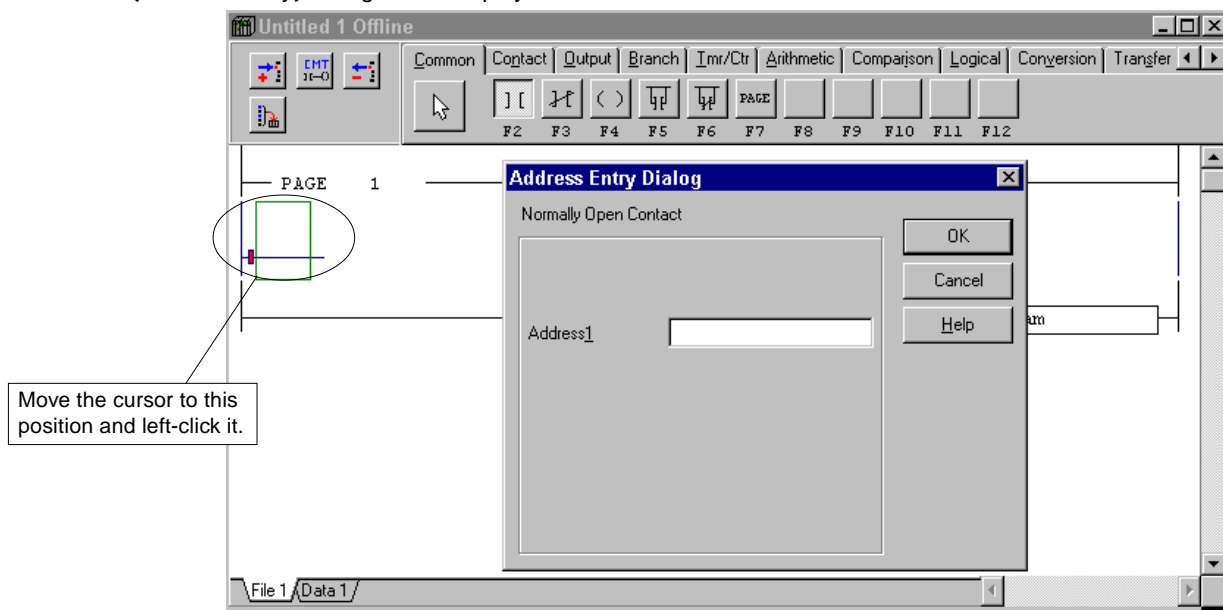
(1) Writing a series line

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

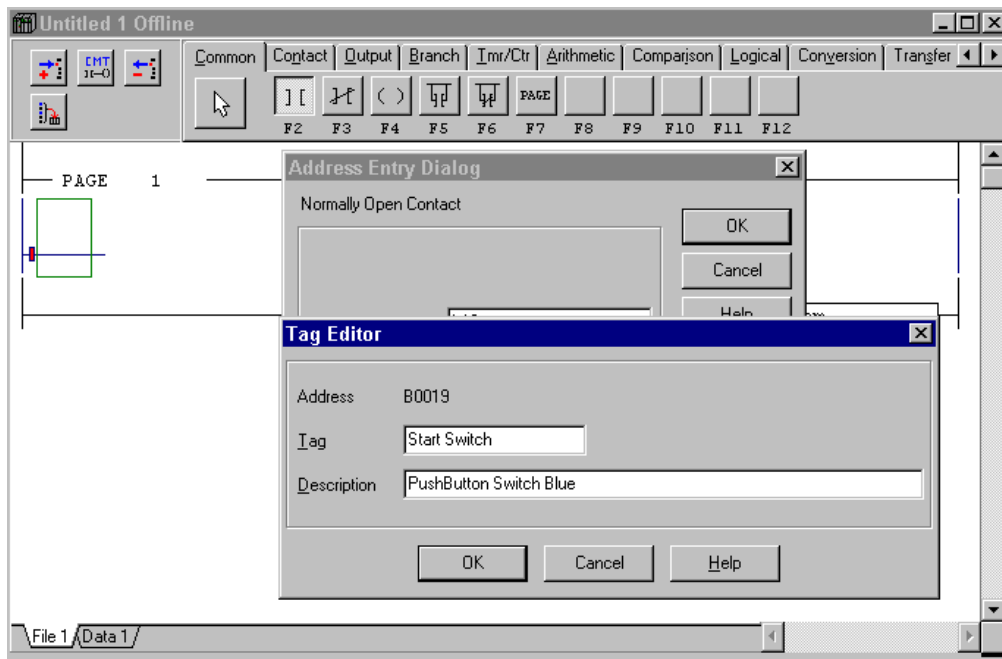


1) Writing contacts

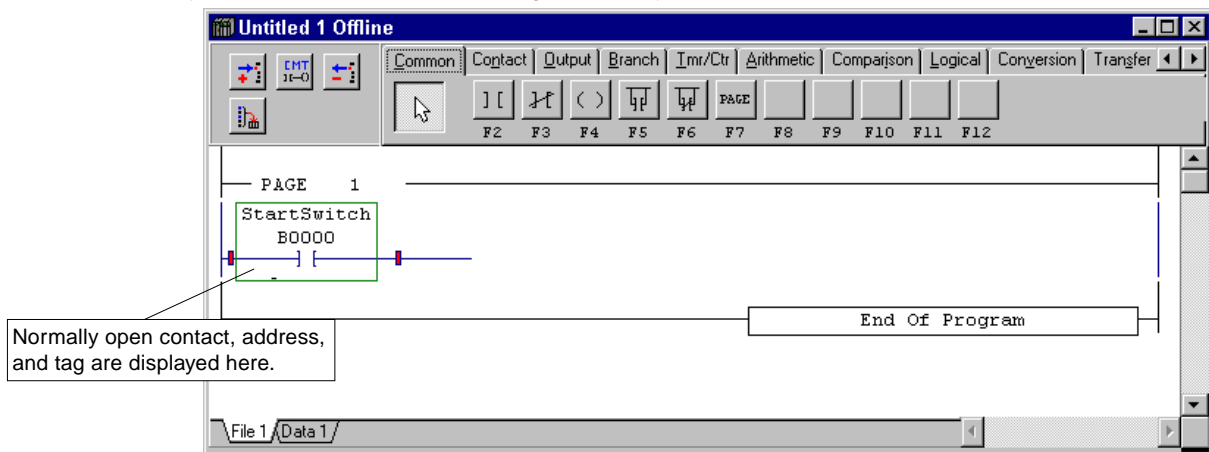
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [Normally Open Contact] button.
 - ◇ Move the cursor to the position in which to describe an instruction and left-click that position.
- The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
 - In this example, <B0> is entered.
 - ◇ Left-click the [OK] button.
- When in the {Environment Options} dialog box the [Auto Document] box has been checked, the {Untitled 1 Offline} dialog box as shown in the following diagram is displayed. When the [Auto Document] box has been unchecked, the {Untitled 1 Offline} dialog box is not displayed and the contact is described in the program window.



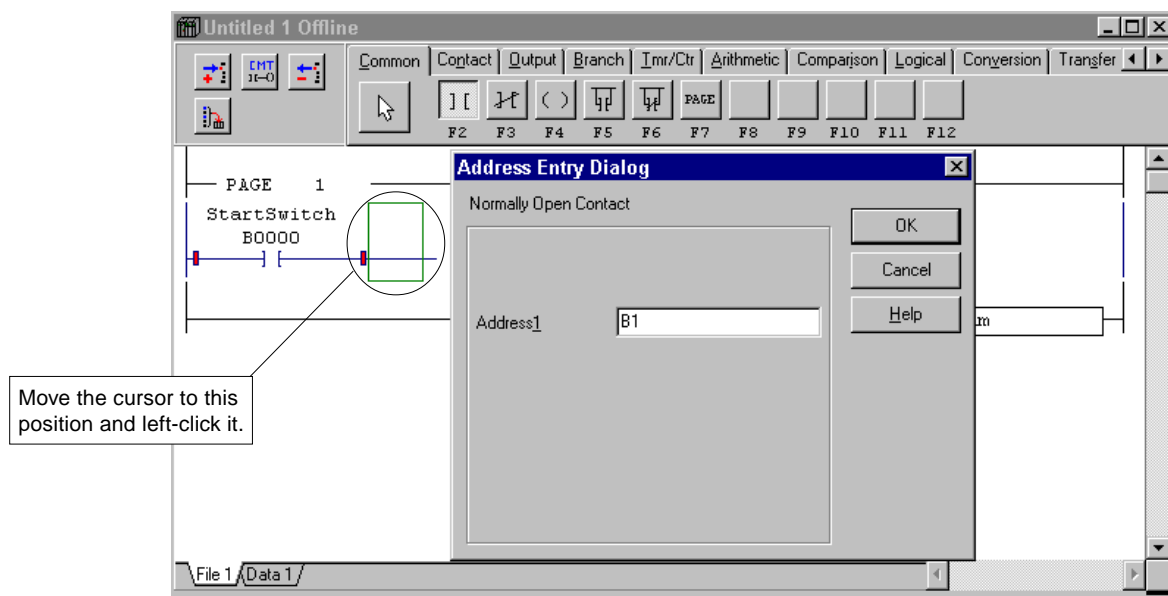
- ◇ Enter a tag name in the [Tag] text box as required.
In this example, <Start Switch> is entered.
- ◇ Enter a description in the [Description] text box as required.
In this example, <Pushbutton Switch Blue> is entered.
- ◇ Left-click the [OK] button.
The normally open contact, address, and tag are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

2-2 Programming

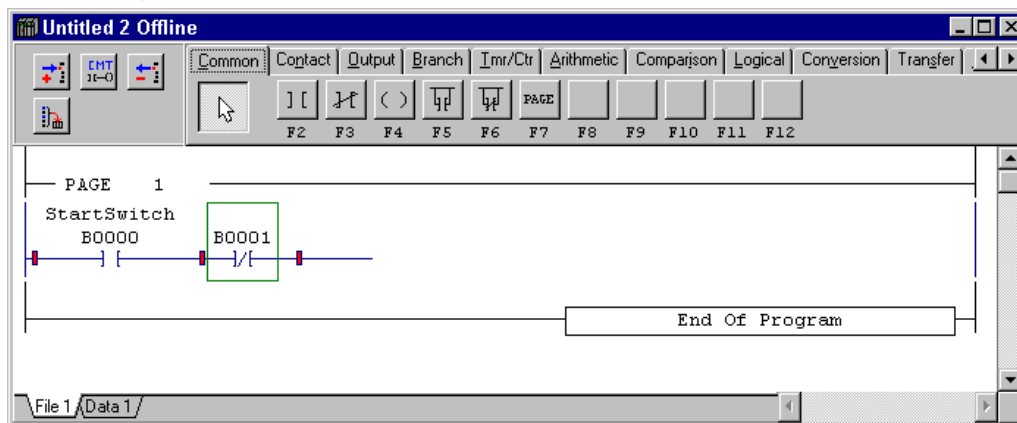


- ◇ Enter the address of the contact in the [Address] text box.

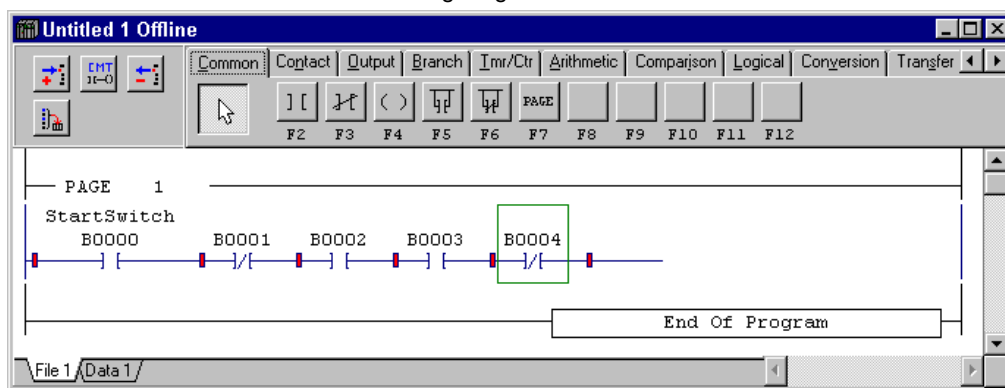
In this example, <B1> is entered.

- ◇ 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 Document] box has been checked, the {Untitled 1 Offline} dialog box is displayed. The explanation about this shall be omitted here.

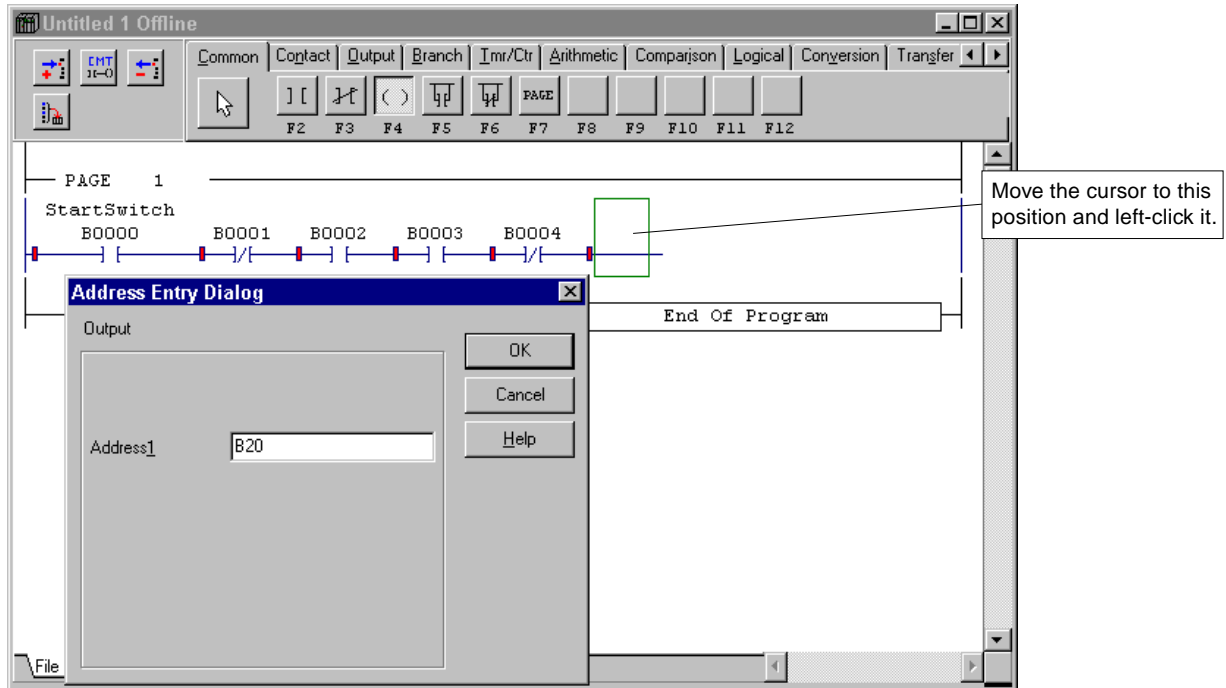


- ◇ In the same way as described above, write normally open contacts "B0002" and "B0003" and normally closed contact "B0004" as shown in the following diagram.

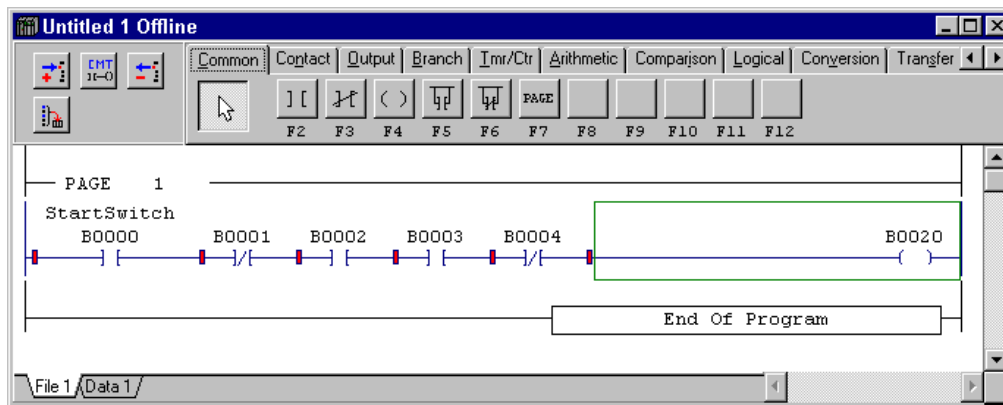


3) Writing outputs

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



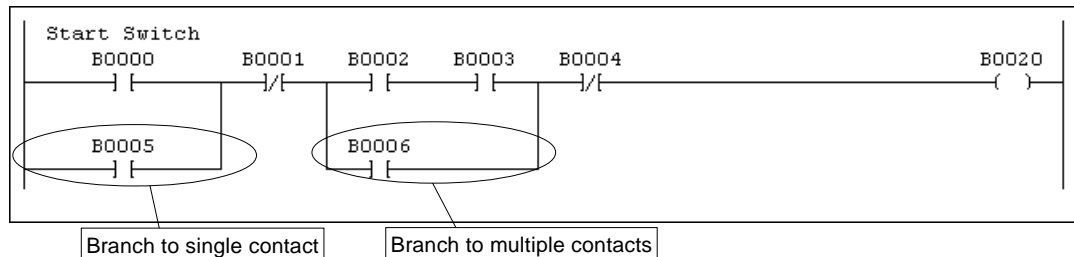
- ◇ Enter the address of the output in the [Address] text box.
- In this example, <B20> is entered.
- ◇ Left-click the [OK] button.
- As shown below, the output is connected in series to the normally closed contact.



2-2 Programming

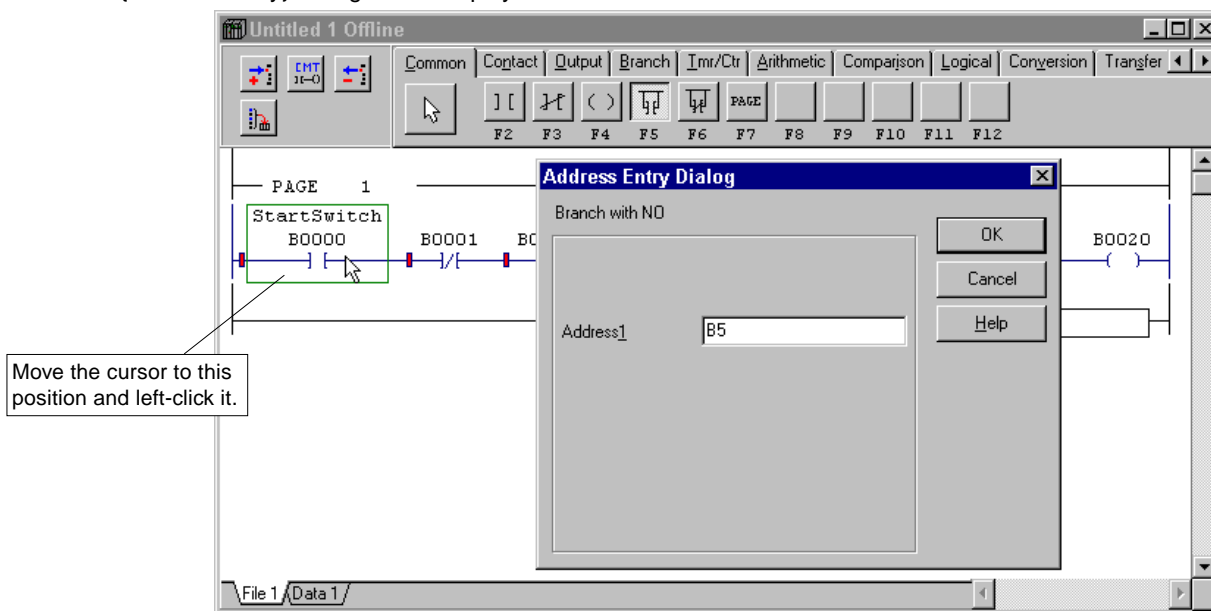
(2) Writing branches

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

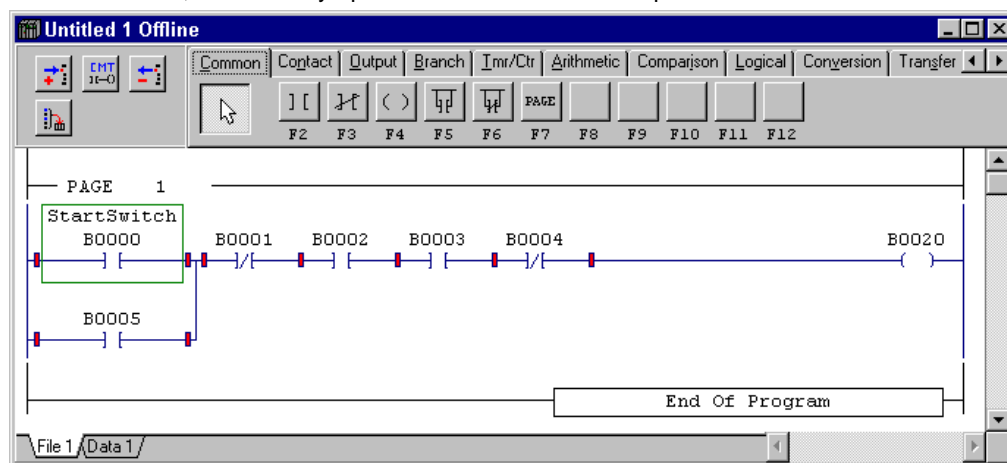


1) Writing branch to single contact

- ◇ Left-click the [Common] or [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Branch with NO] button.
- ◇ Move the cursor to the contact (B0000) in the position in which to describe an instruction, and left-click that position. (In this case, a green instruction selection frame is displayed.)
The {Address Entry} dialog box is displayed.



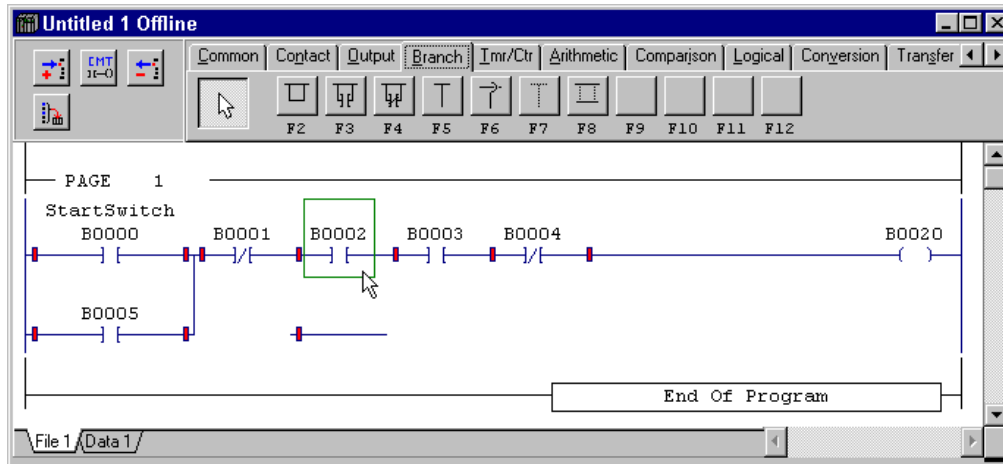
- ◇ Enter the address of the branch in the [Address] text box.
In this example, <B5> is entered.
 - ◇ Left-click the [OK] button.
- As shown below, the normally open contact is connected in parallel with the contact.



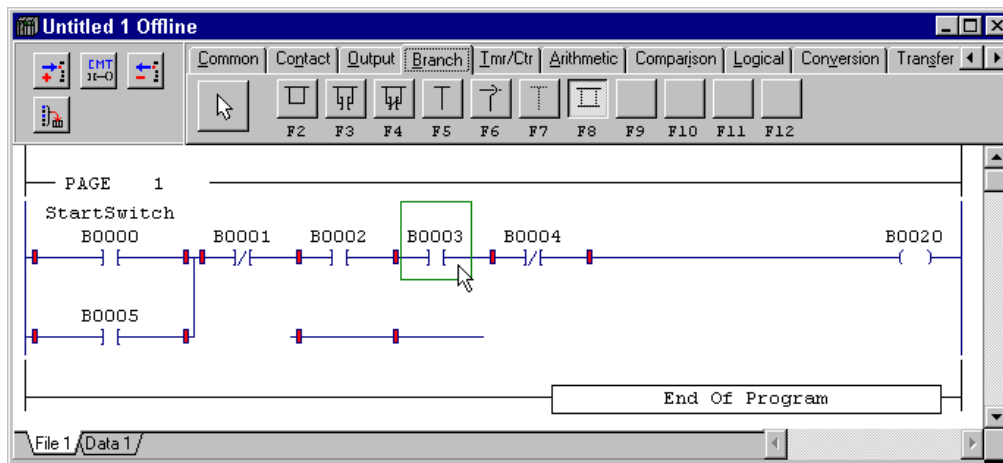
2) Writing branch to multiple contacts

<Description of pass>

- ◇ Left-click the [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [Pass Below] button.
 - ◇ Move the cursor to the contact (B0002) above the position in which to describe a branch, and left-click that position. (In this case, a green instruction selection frame is displayed.)
- As shown in the following diagram, a “pass” is displayed.




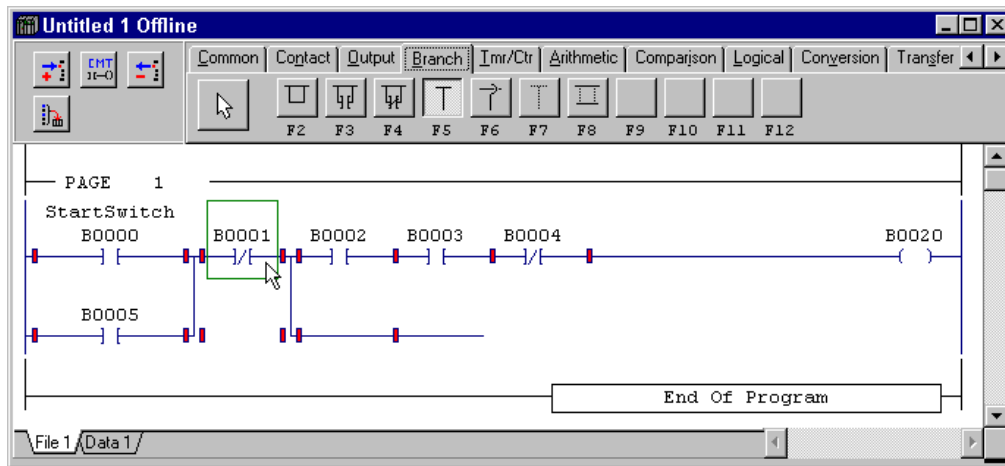
- ◇ In the same way as described above, describe “passes” below contact (B0003) as shown below.



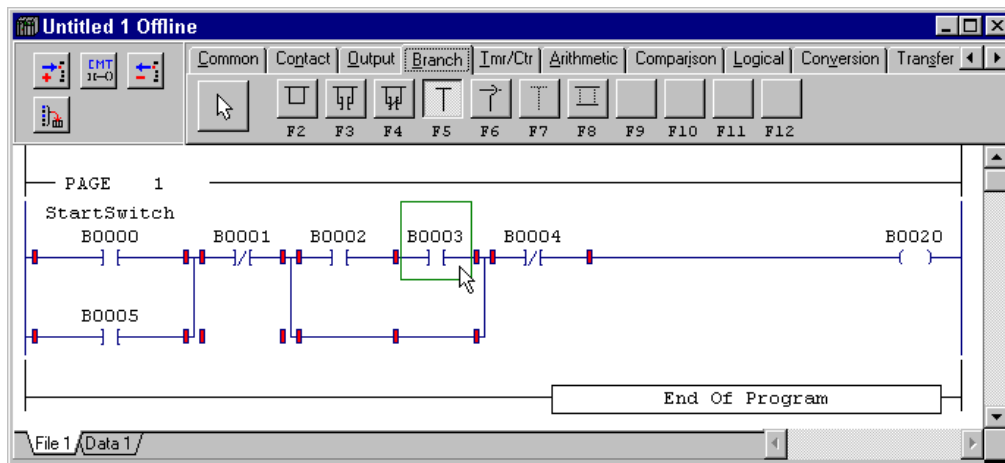
2-2 Programming

<Description of branch down>


- ◇ Left-click the  [Branch Down] button.
 - ◇ Left-click a selected contact (B0001) in this example.
- A branch is described downward from the right end of the selected contact.

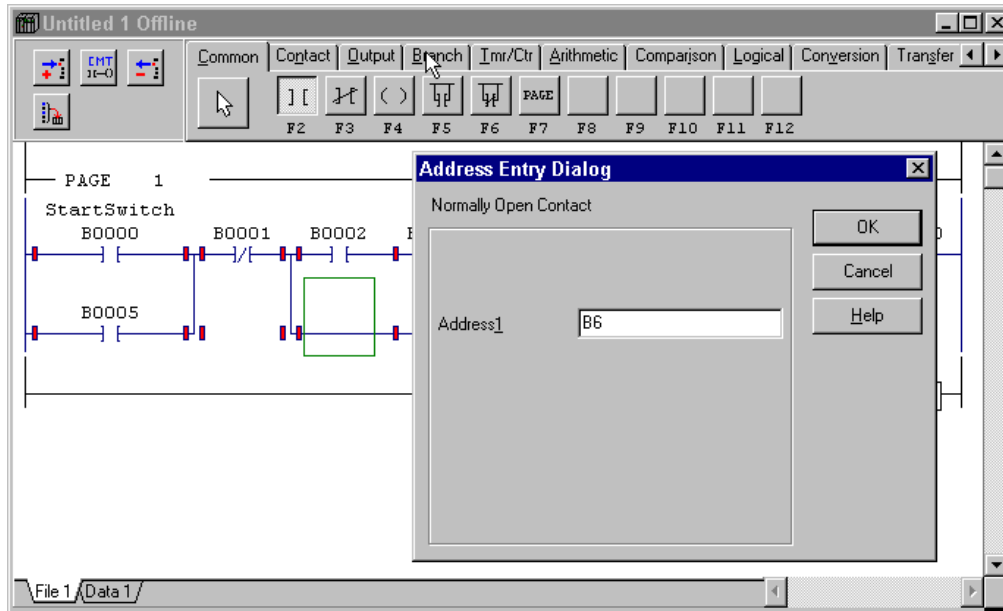


- ◇ In the same way as described above, describe a branch down from the right end of another contact (B0003) in this example.

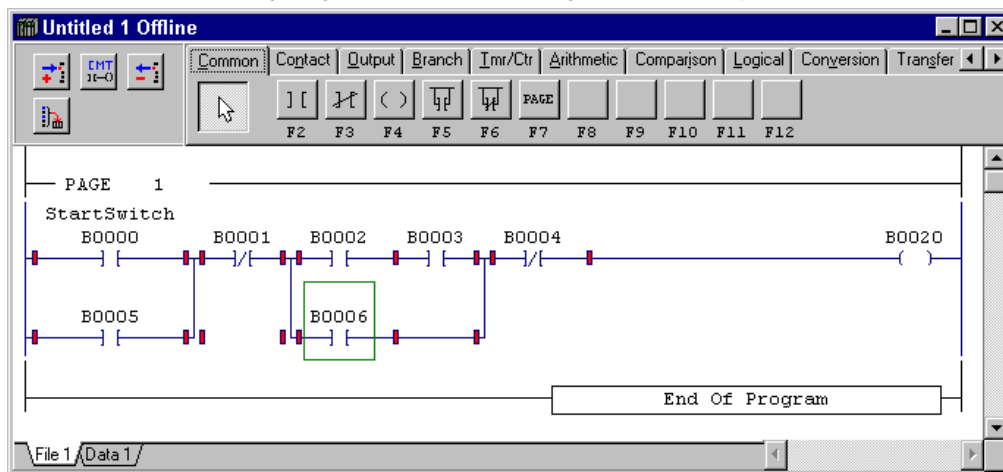


<Changing pass to contact>

- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the  [Normally Open Contact] button.
 - ◇ Move the cursor to the pass that is to be changed to a contact, and left-click the pass.
- The {Address Entry} dialog box is displayed.



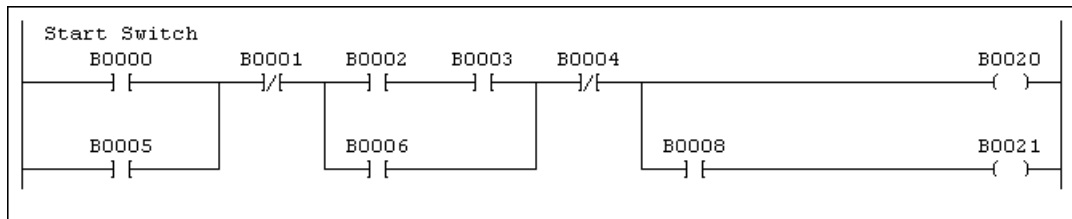
- ◇ Enter the address of the contact in the [Address] text box.
- In this example, <B6> is entered.
- ◇ Left-click the [OK] button.
- As shown in the following diagram, the pass is changed to a normally open contact.




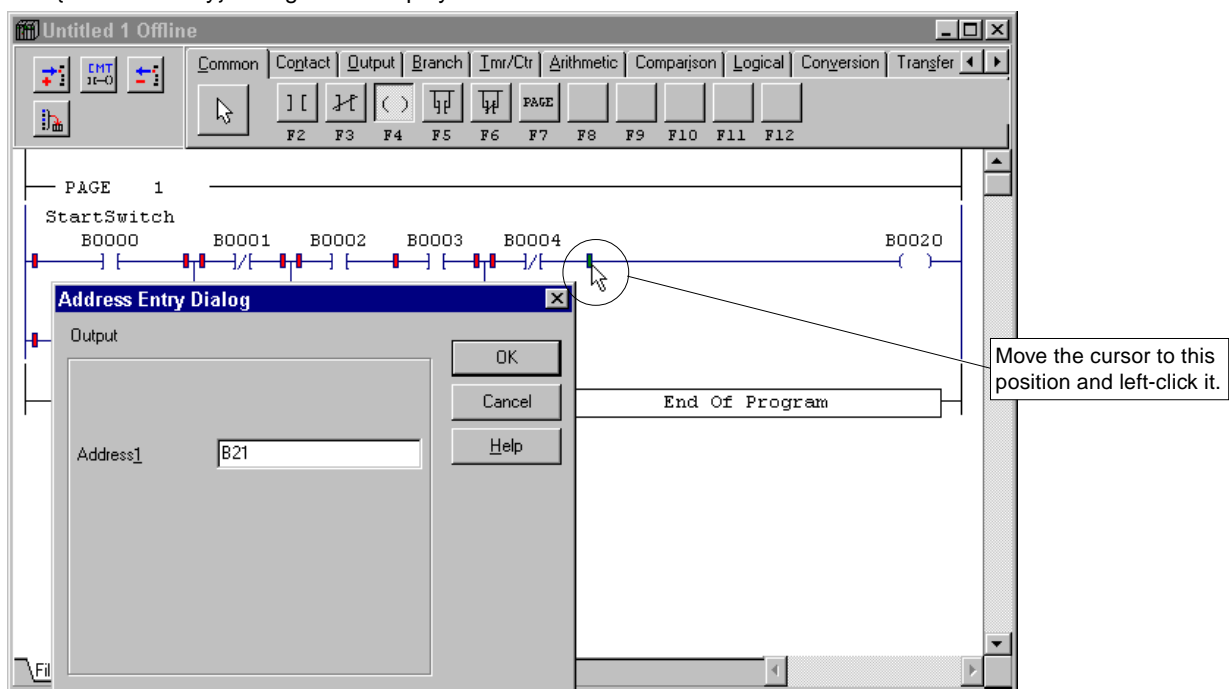
2-2 Programming

(3) Writing branch outputs

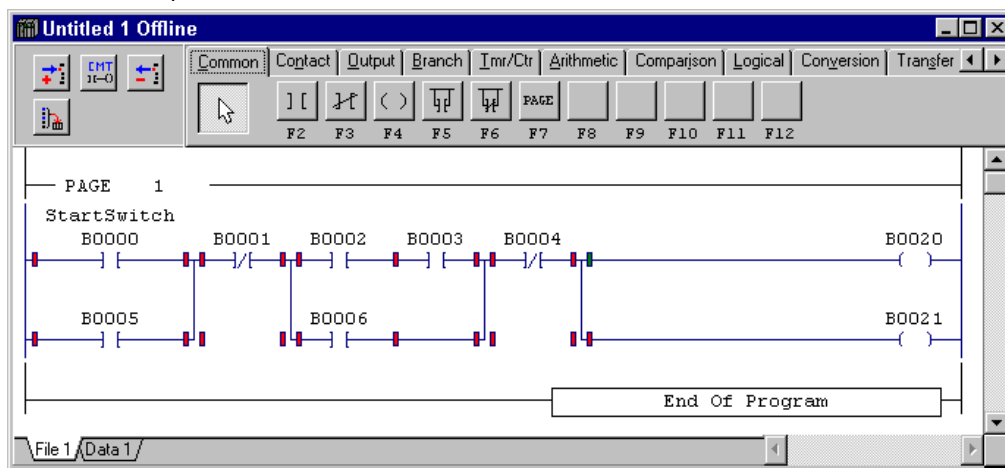
Here, the method of writing a branch output shown below is explained.



- ◇ 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 node at the position in which to describe an instruction, and left-click that node. The {Address Entry} dialog box is displayed.

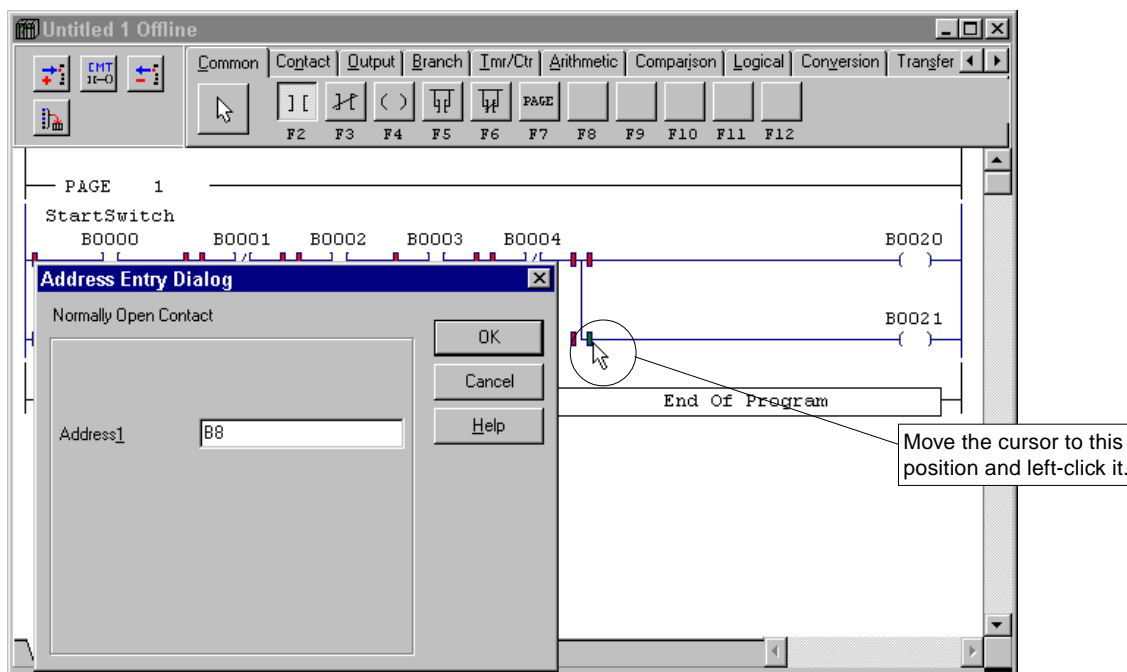


- ◇ Enter the address of the output in the [Address] text box. In this example, <B21> is entered.
- ◇ Left-click the [OK] button. The branch output is connected as shown below.

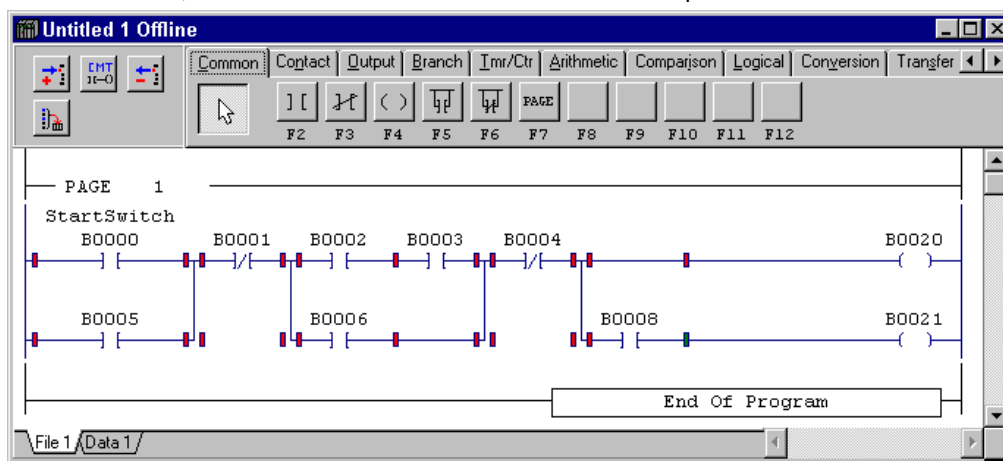


<Writing contact “B0008”>

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



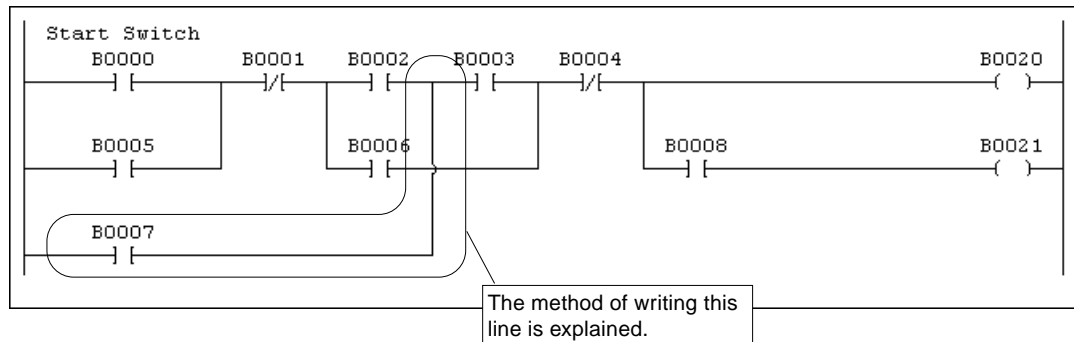
- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B8> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is connected to the left side of output “B0021.”



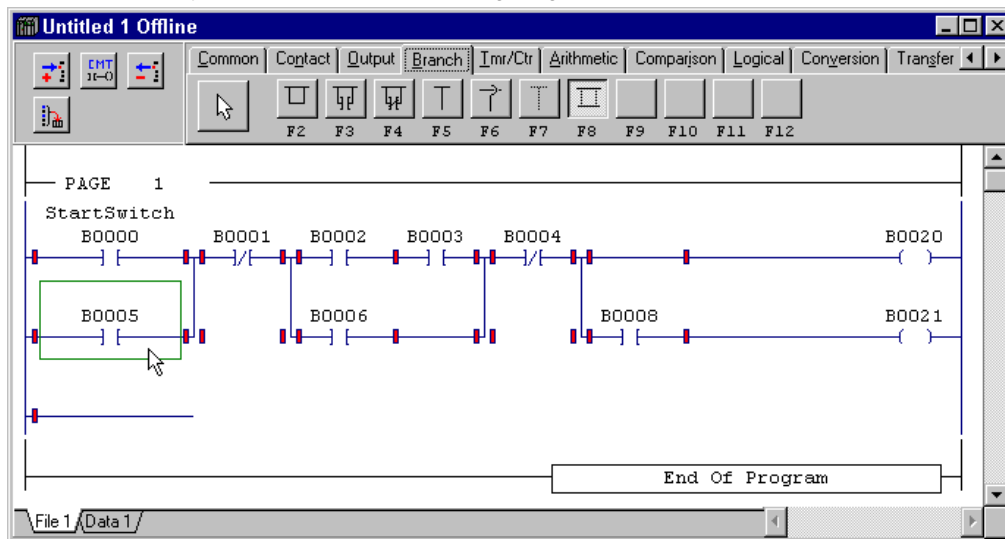
2-2 Programming

(4) Writing branch skip lines

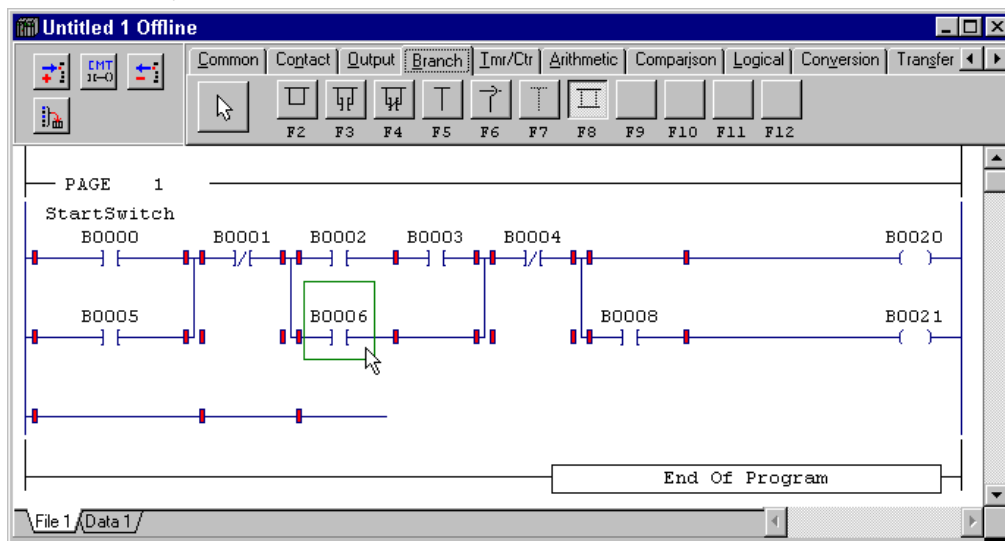
The method of writing a branch skip line is explained below.




- ◇ Left-click the [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Pass Below] button.
- ◇ Move the cursor to the contact (B0005) above the position in which to describe a branch contact, and left-click the contact.
- ◇ A "pass" is displayed as shown in the following diagram.

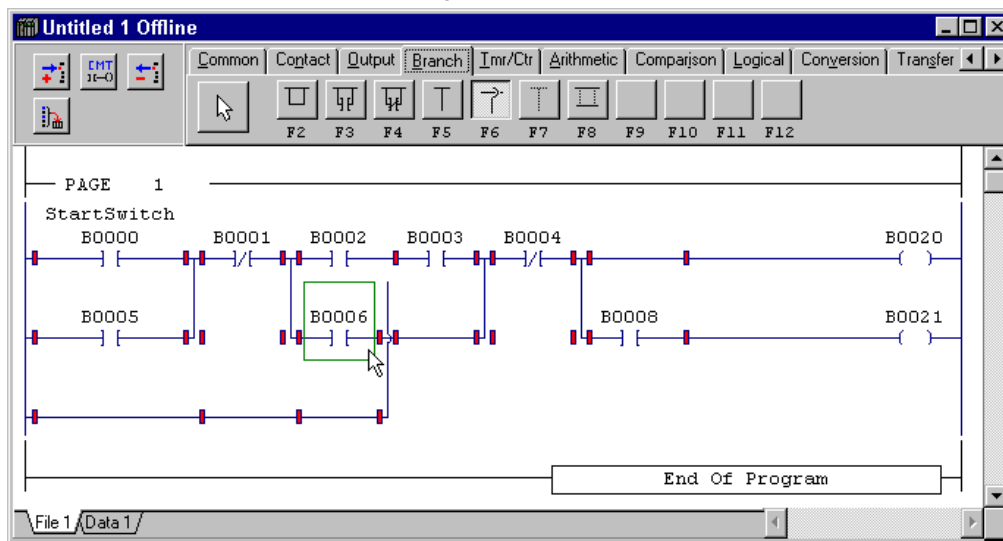


- ◇ In the same way as described above, describe the "pass" to the position below contact (B0006).




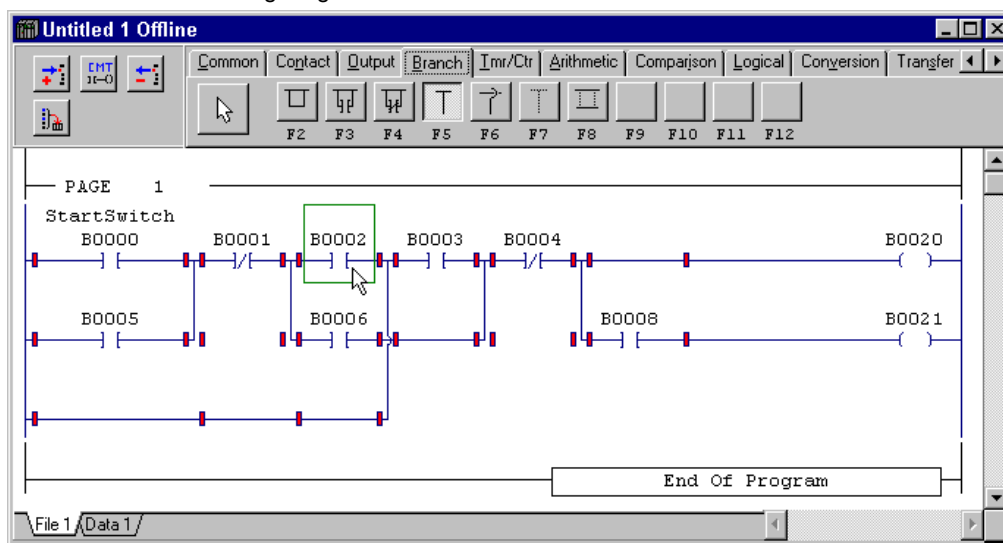
1) Writing branch skip

- ◇ Left-click the  [Branch Skip] button.
- ◇ Move the cursor to contact (B0006) and left-click the contact.
- ◇ A "branch skip line" is described at the right end of the selected contact (B0006) as shown in the following diagram.




2) Writing branch down

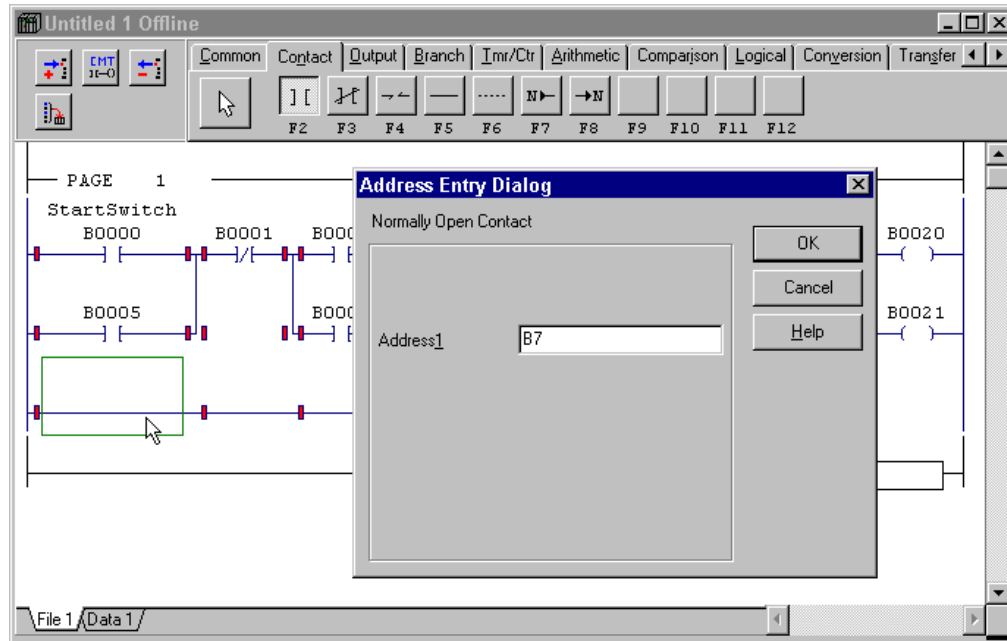
- ◇ Left-click the  [Branch Down] button.
- ◇ Move the cursor to contact (B0002) and left-click the contact.
- ◇ A branch down is described from the right end of the selected contact (B0002) and connected to the branch skip as shown in the following diagram.



2-2 Programming

3) Changing pass to contact

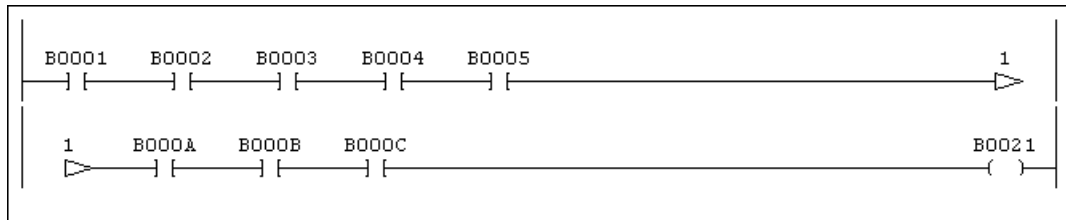
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Normally Open Contact] button.
- ◇ Move the cursor to the pass that is to be changed to a contact, and left-click that pass.
The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B7> is entered.
- ◇ Left-click the [OK] button.
The pass is changed to a contact.

2-2-2 Writing a returning

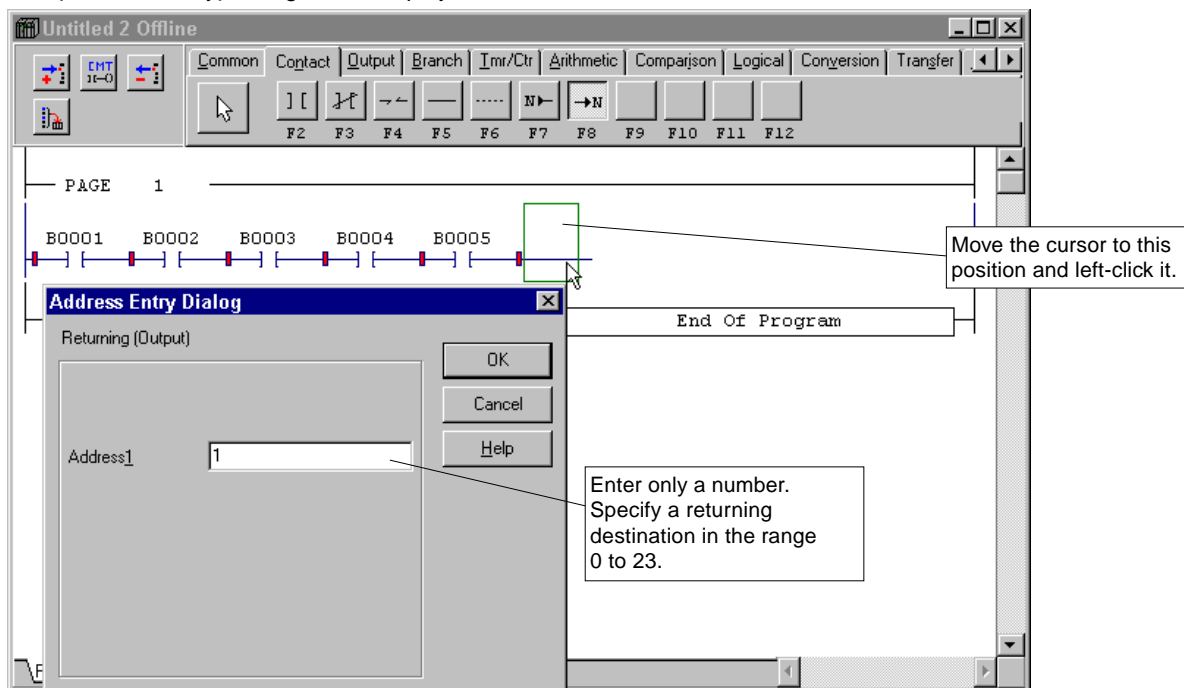
The method of describing a “Returning” instruction is explained below.



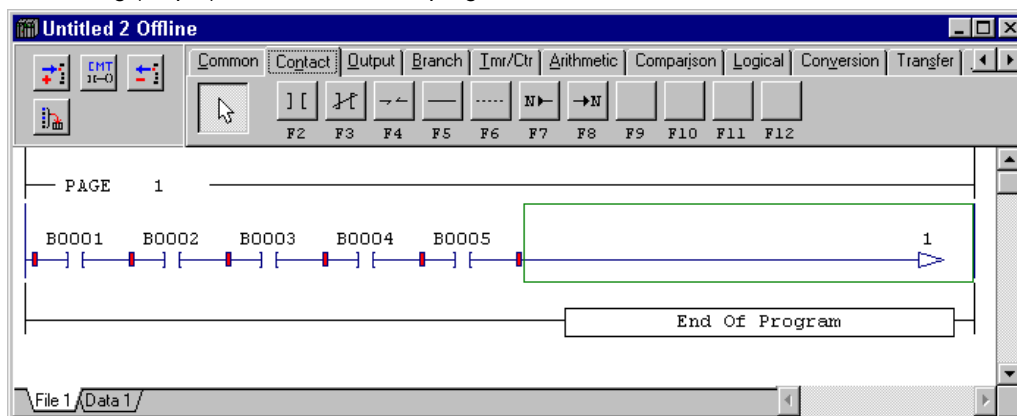
(1) Writing returning (output)

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

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



- ◇ Enter a returning destination number in the [Address] text box. In this example, <1> is entered.
- ◇ Left-click the [OK] button. A returning (output) is described in the program window.




2-2 Programming

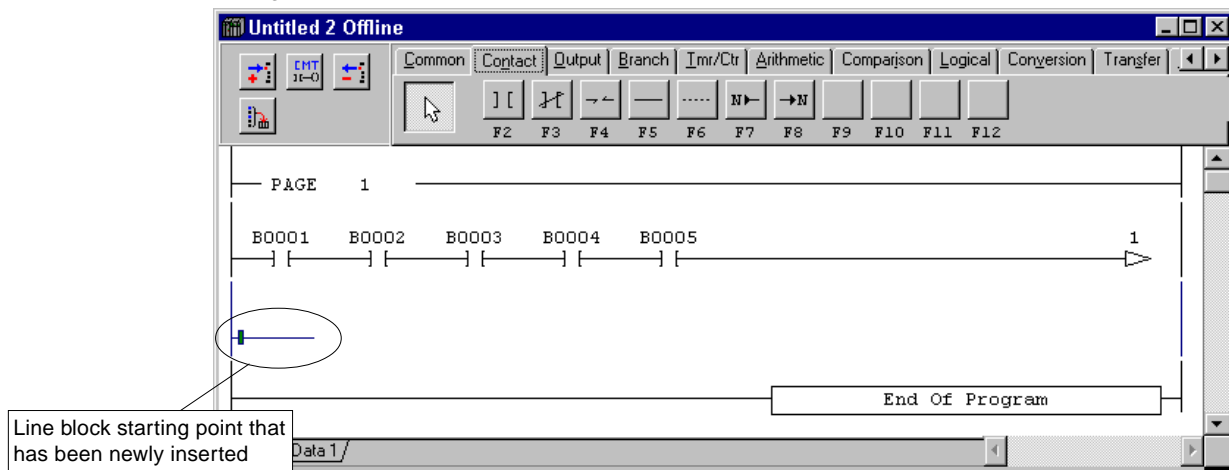
(2) Writing returning (input)

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


1) Preparing line block starting point

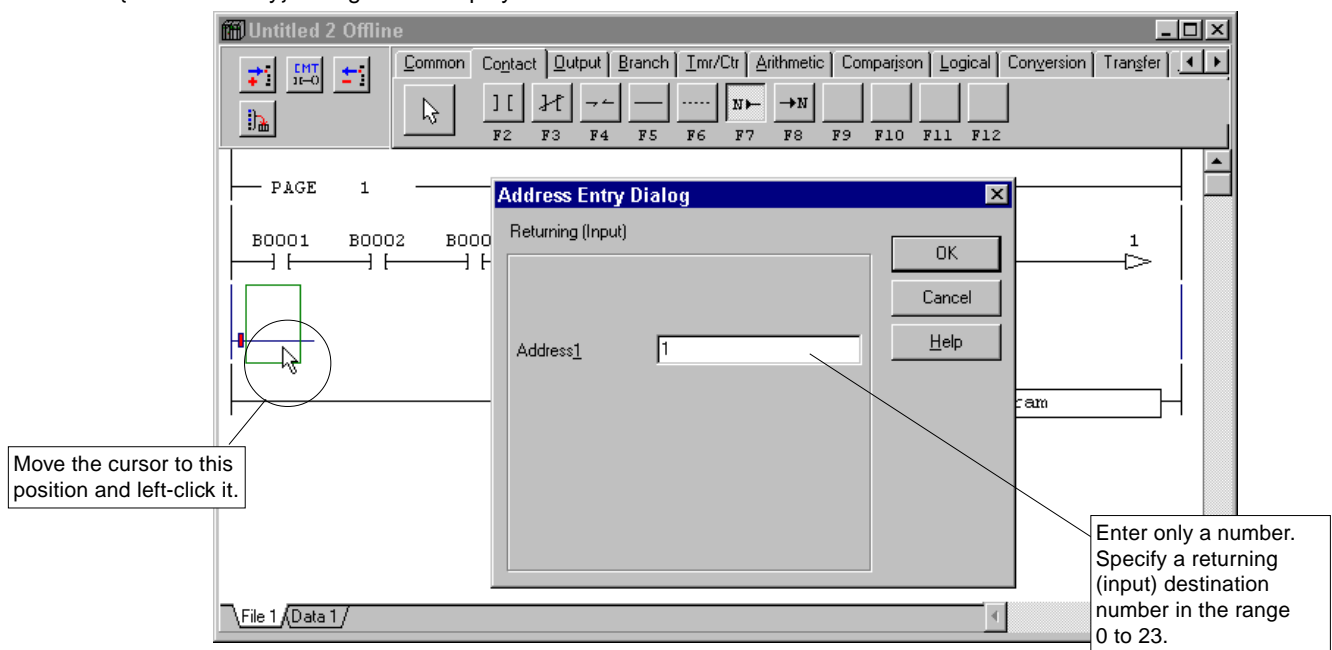
Since a returning (output) and a returning (input) cannot be prepared in the same line block, it is necessary first to insert a line block starting point for preparing a new line.

- ◇ Left-click the line (symbol) above the position in which to insert a line block starting point.
 - ◇ Left-click the  [Insert Line] button on the ladder edit tool bar.
- A line block starting point is inserted.

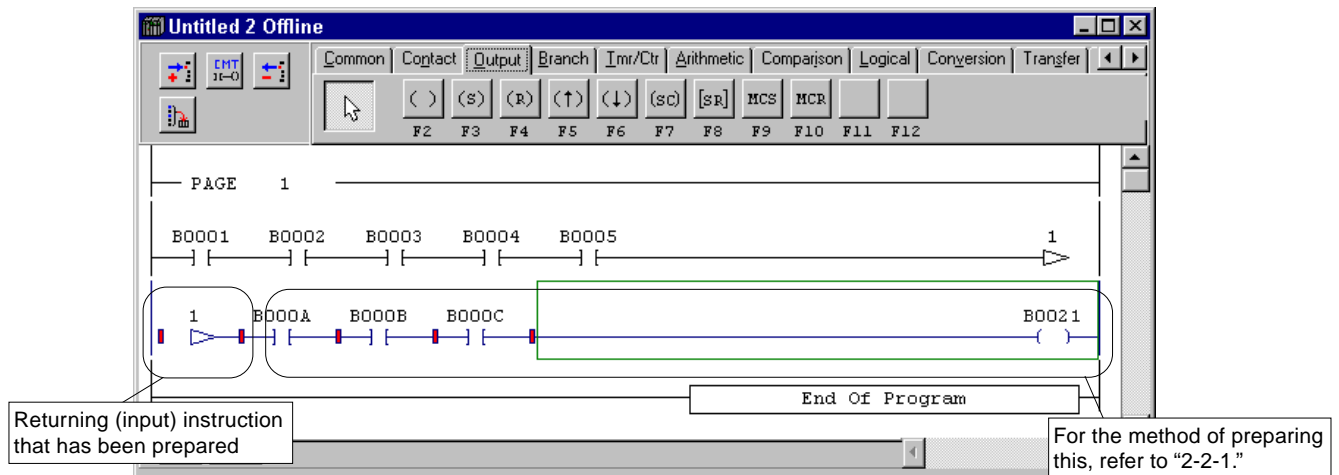


2) Writing returning (input)

- ◇ Left-click the [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the  [Returning (Input)] 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.

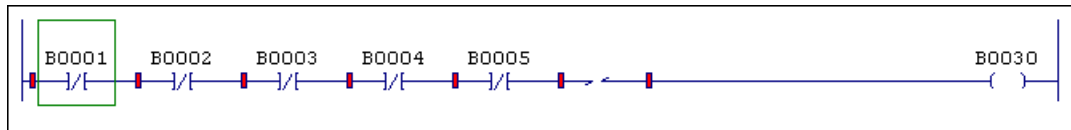


- ◇ Enter a returning (input) destination number in the [Address] test box.
 - In this example, <1> is entered.
 - ◇ Left-click the [OK] button.
- A returning (input) is described in the program window.

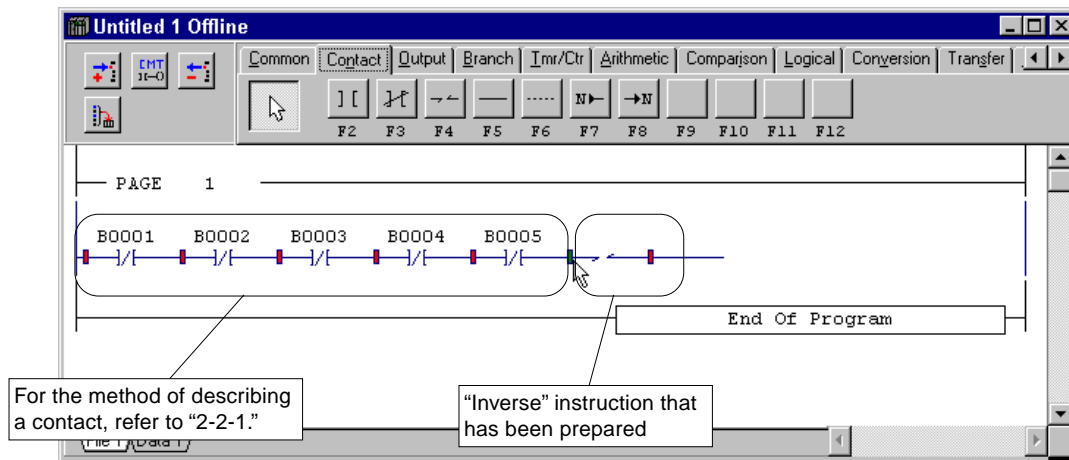


2-2-3 Writing Inverse instruction

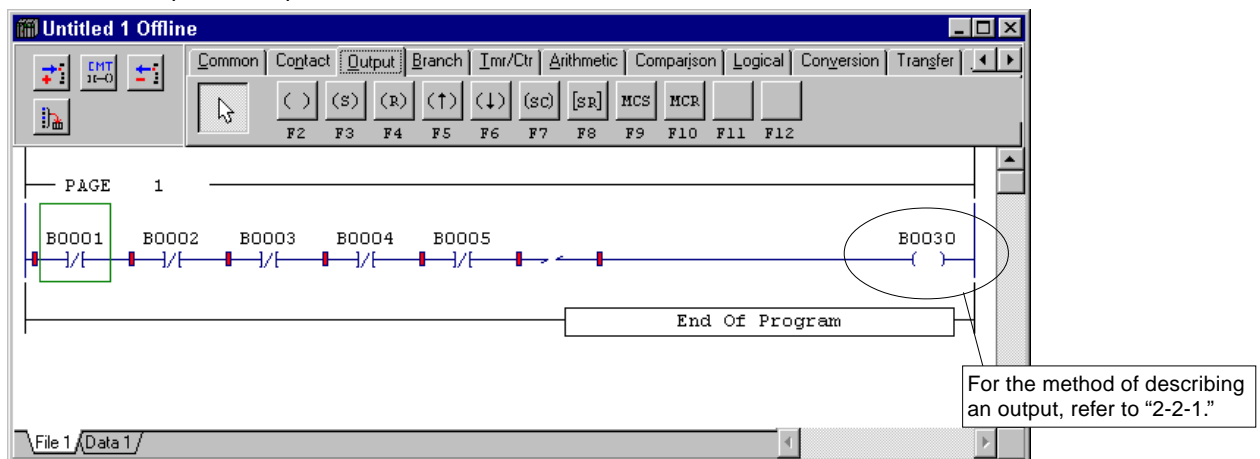
The method of describing an "Inverse" instruction is explained below.



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



- ◇ Write in the output to complete the line.



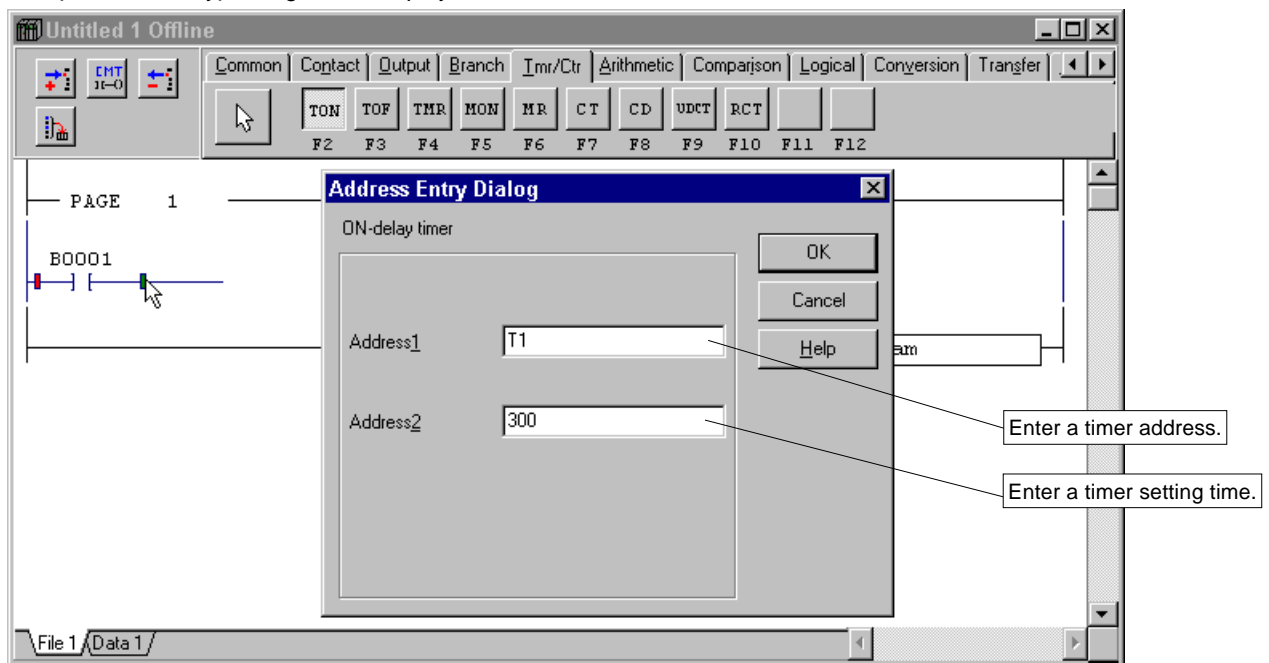
2-2 Programming

2-2-4 Writing ON-delay timer

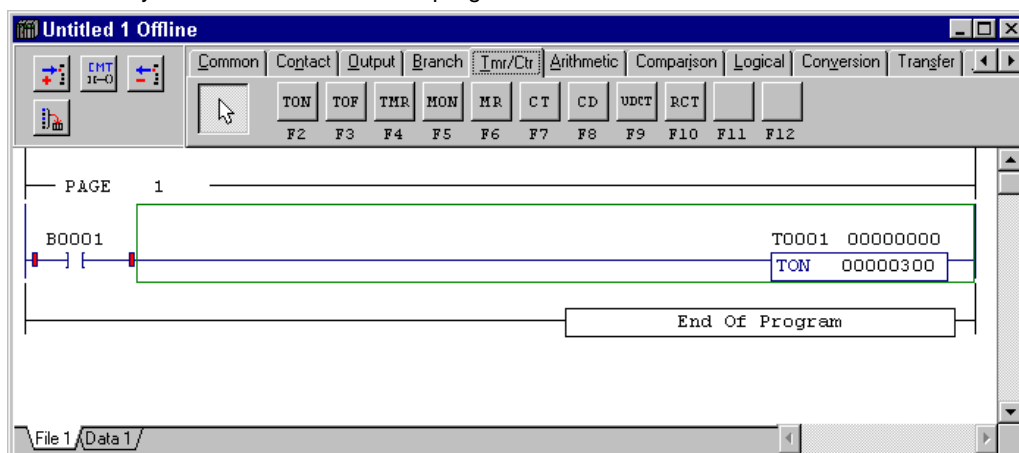
The method of describing an “ON-delay timer” is explained below.



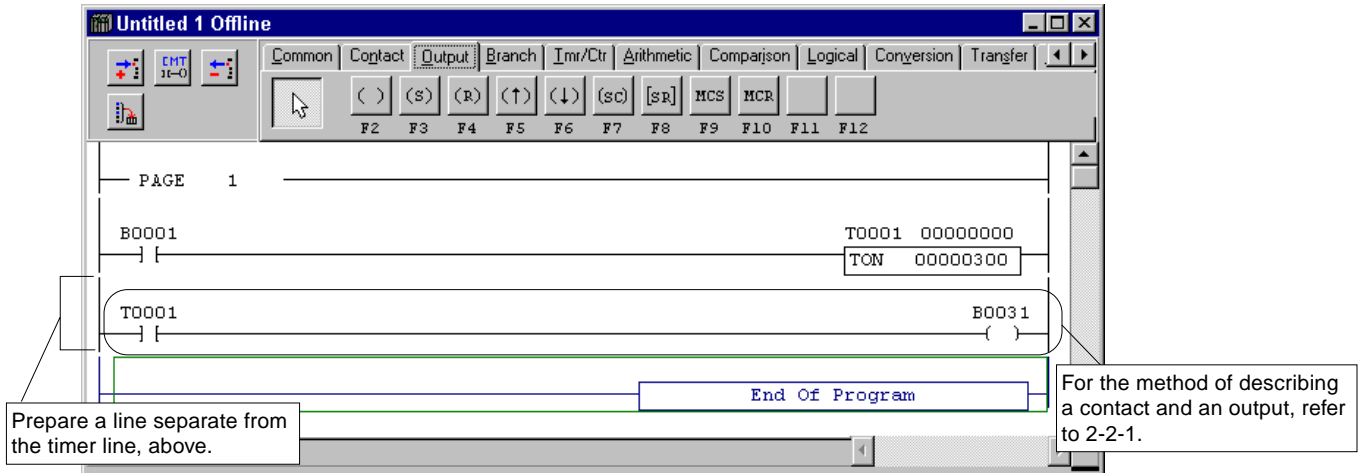
- ◇ Left-click the [Tmr/Counter] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [ON-Delay Timer] button.
 - ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.
- The {Address Entry} dialog box is displayed.



- ◇ Enter a timer address in the [Address 1] text box. The timer identifier “T” has been described automatically. In this example, <1> 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.

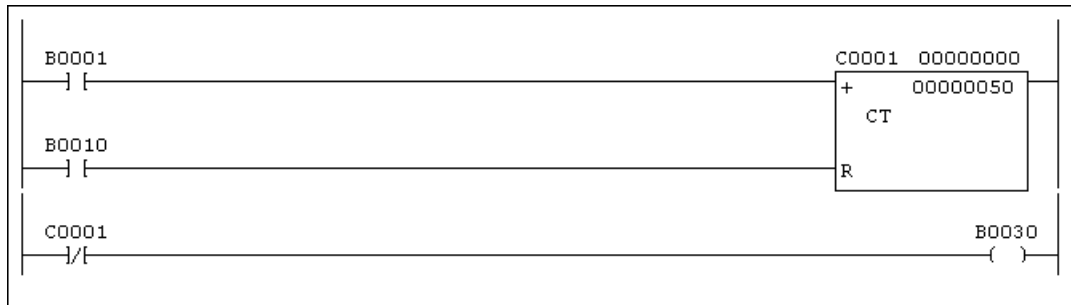


- ◇ Write in a timer output contact and an output line to complete the line block.

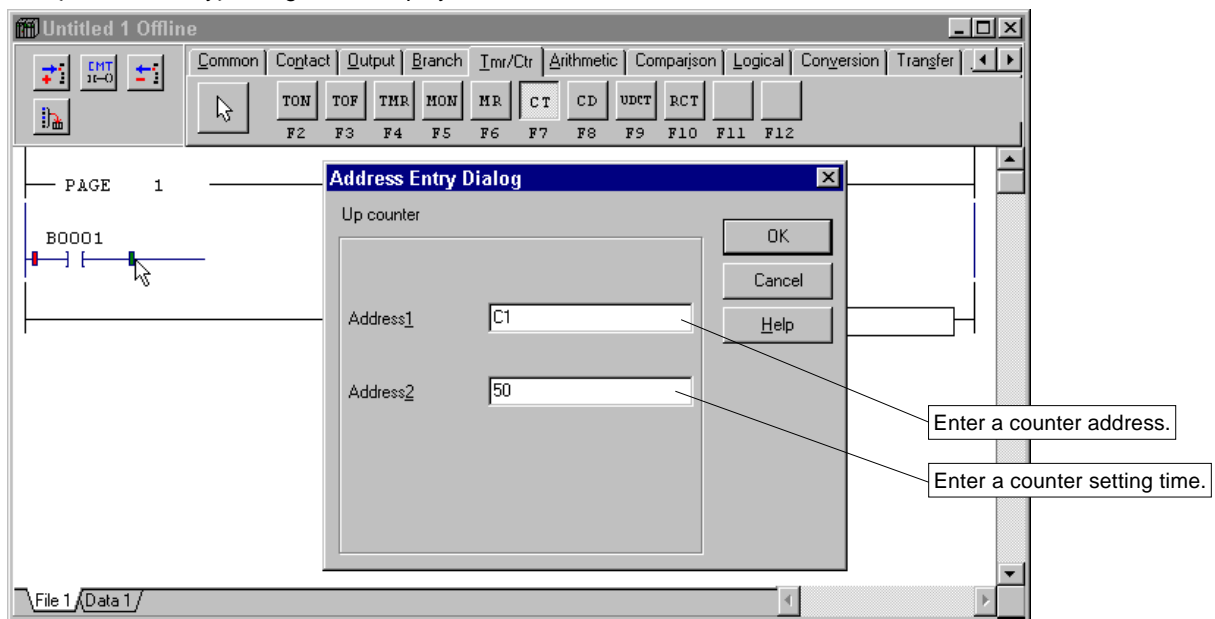


2-2-5 Writing Up counter

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



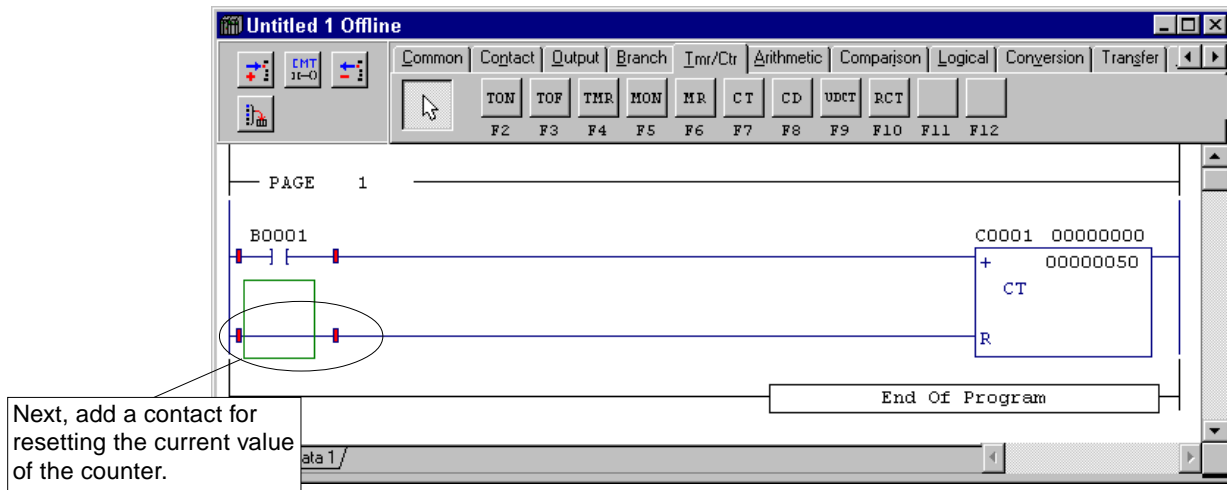
- ◇ Prepare a normally open contact (address: B0001) beforehand.
 - ◇ Left-click the [Tmr/Ctr] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [CT] [Up Counter] button.
 - ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.
- The {Address Entry} dialog box is displayed.



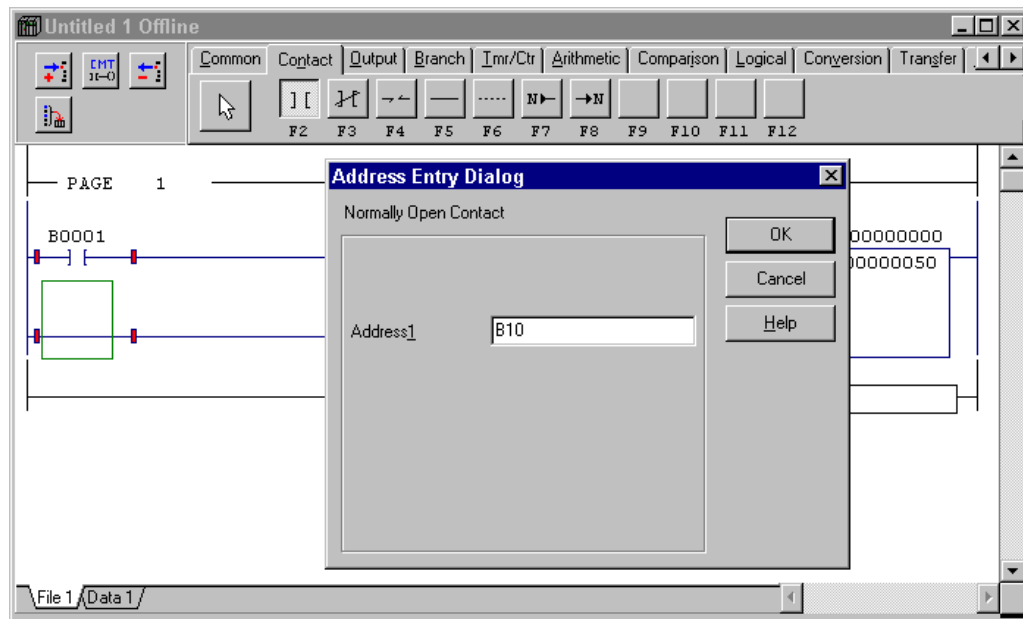
- ◇ Enter a counter address in the [Address 1] text box. The counter identifier “C” has been described automatically. In this example, <1> is entered.

2-2 Programming

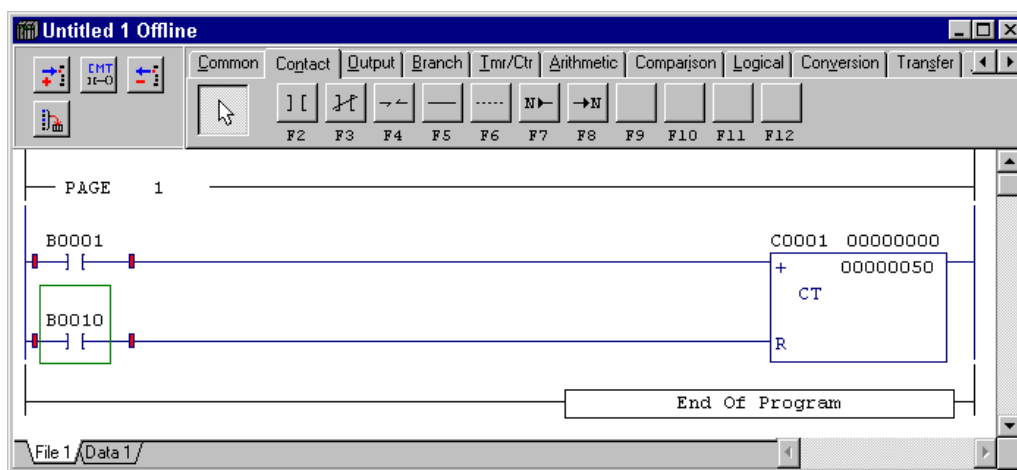
- ◇ Enter a counter setting time in the [Address 2] text box.
In this example, <50> is entered.
- ◇ Left-click the [OK] button.
An “Up counter” is described in the program window.



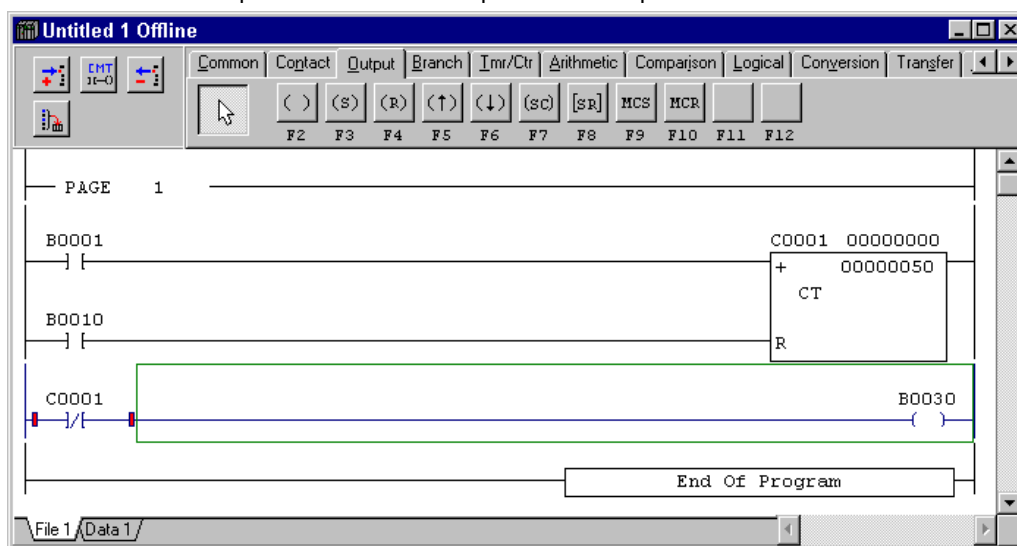
- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Normally Open Contact] button.
- ◇ Move the cursor to the node in which to describe an instruction, and left-click that node.
The {Address Entry} dialog box is displayed.



- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B10> 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 Programming

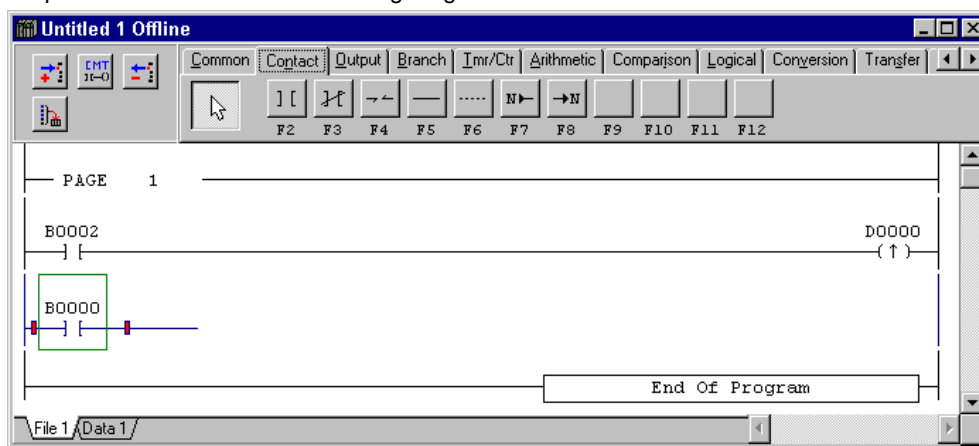
2-2-6 Writing a shift register

The method of describing a “shift register” (SR) is explained below.



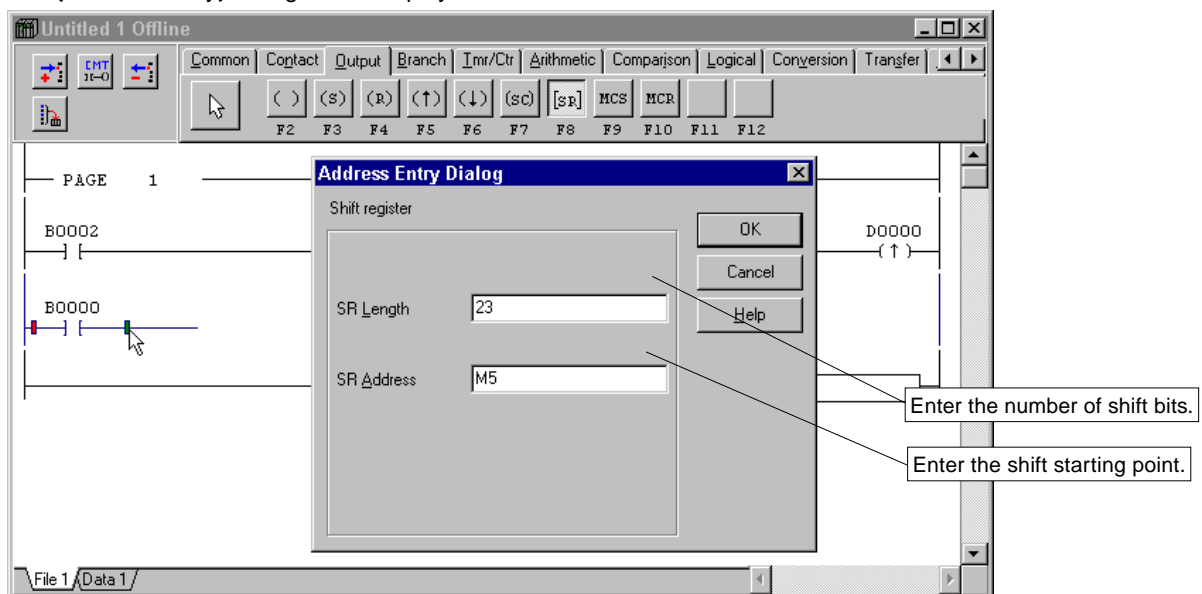
- ◇ Prepare a differentiation line (pulse line) which provides a clock signal for the shift register.
- ◇ Describe a contact which provides an input signal for the shift register. (Use a line different from the differentiation line.)

Prepare a line shown in the following diagram beforehand.



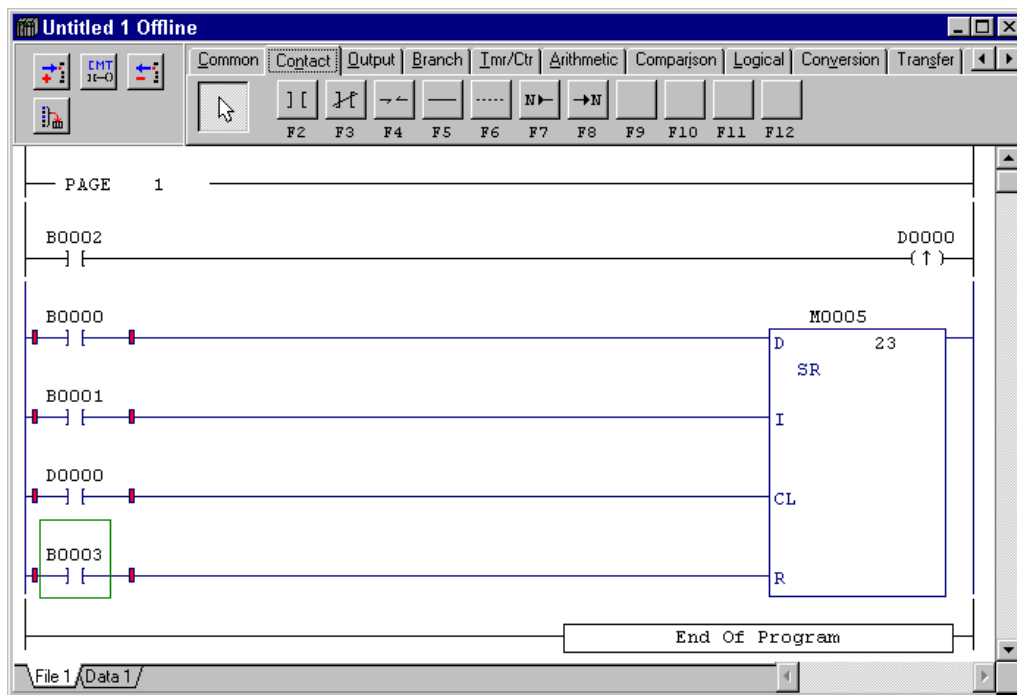
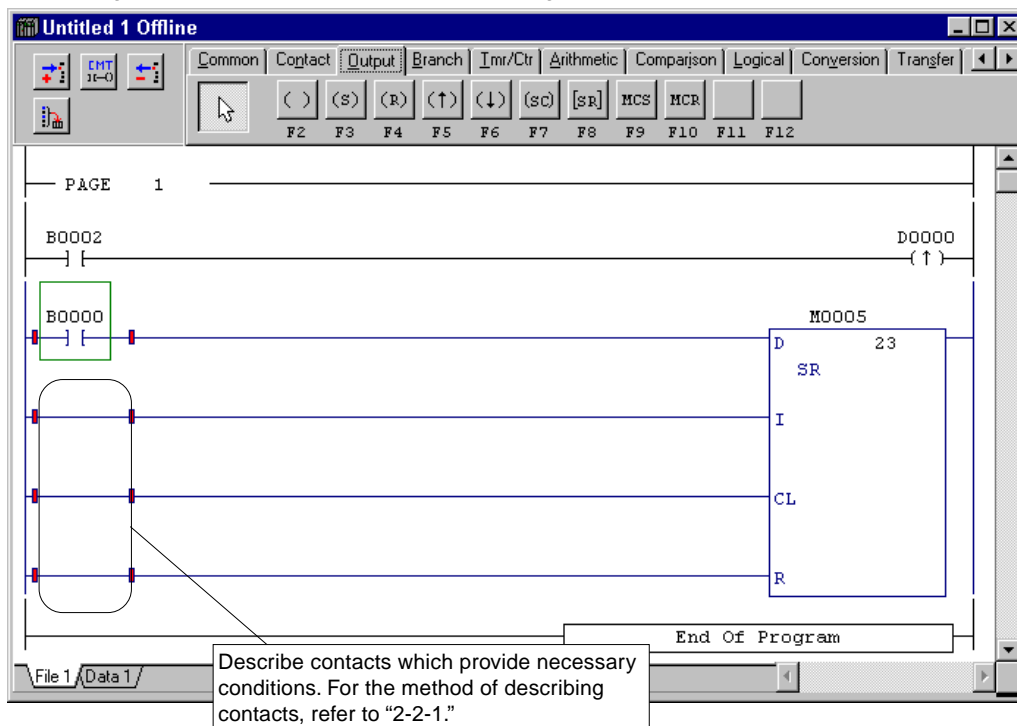
<Writing shift register instruction>

- ◇ Left-click the [Output] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [SR] [Shift register] button.
 - ◇ Move the cursor to the node in which to describe an instruction, and left-click the node.
- The {Address Entry} dialog box is displayed.



2-2 Programming

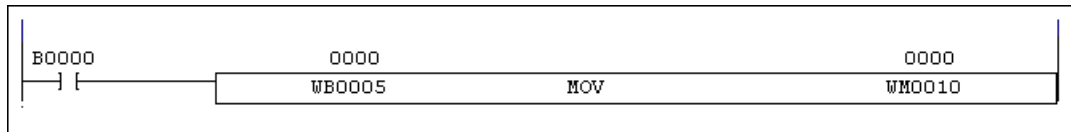
- ◇ Enter the number of shift bits in the [SR Length] text box.
In this example, <23> is entered.
 - ◇ Enter a memory address from which to start the shift in the [SR Address] text box.
In this example, <M5> is entered (shift from M0005 to M001B).
 - ◇ Left-click the [OK] button.
- A “shift register” instruction is described in the program window.



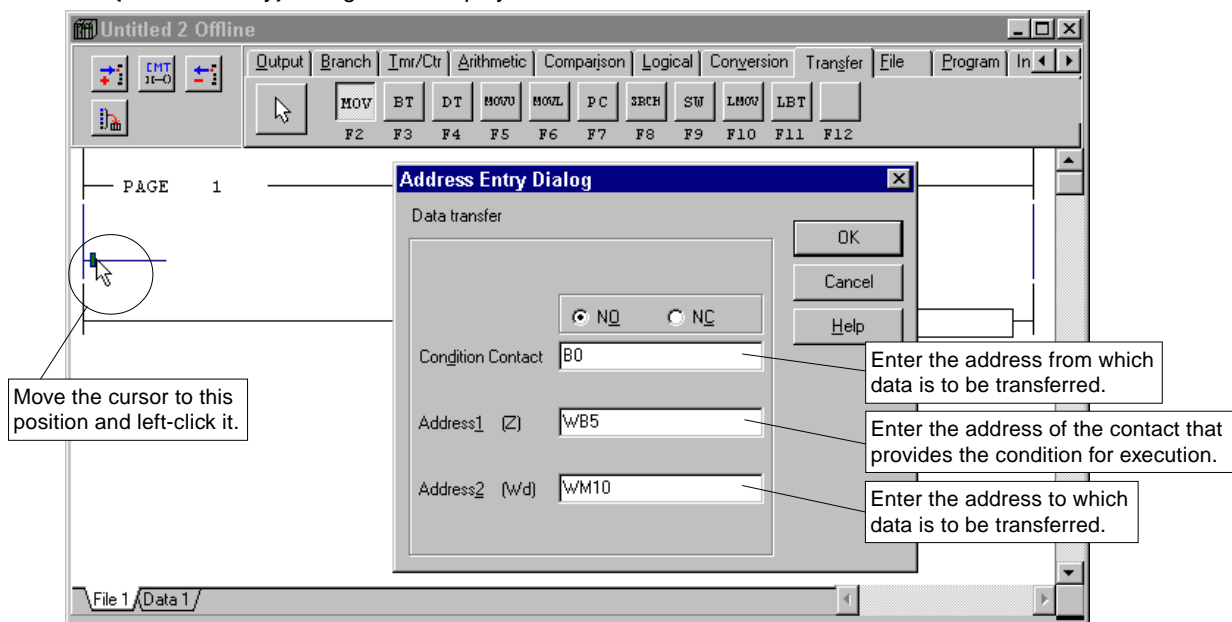
2-2 Programming

2-2-7 Writing Data Transfer (MOV) instruction

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 **MOV** [MOV] button.
- ◇ Move the cursor to the node in which to describe the instruction, and left-click the node. The {Address Entry} dialog box is displayed.



- ◇ Select either the optional [NO] or [NC] (contact) button.
- ◇ Enter the address of the contact that provides the condition for execution of the instruction in the [Condition Contact] text box. In this example, <B0> is entered.

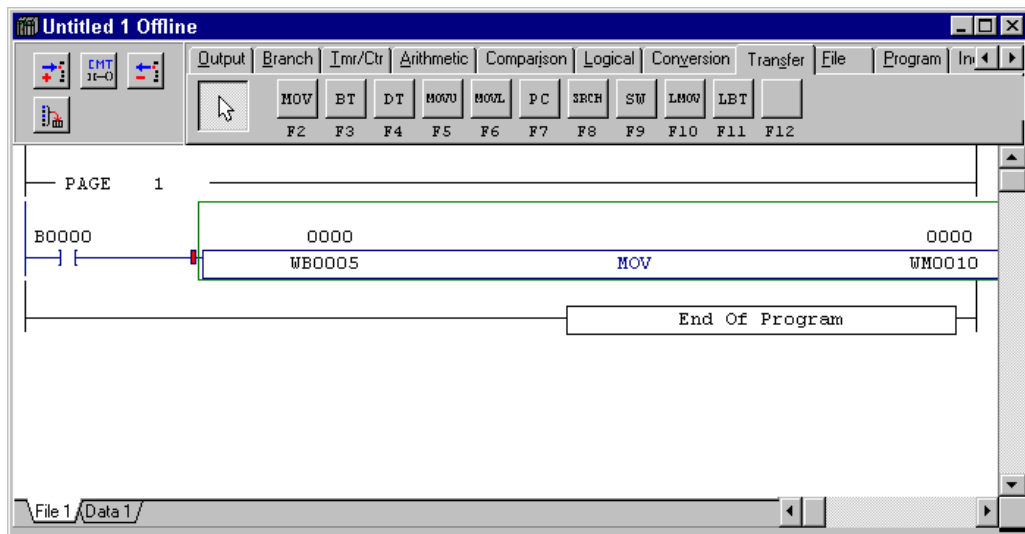


Method of describing the condition for execution of instruction

- When the instruction is to be executed “unconditionally,” leave the [Condition Contact] text box blank.
- When a “Returning (input)” instruction is used as the condition for execution of the instruction, enter the returning (input) number in the [Condition Contact] text box.

- ◇ Enter the address from which to transfer data in the [Address 1] text box. In this example, <WB5> 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.

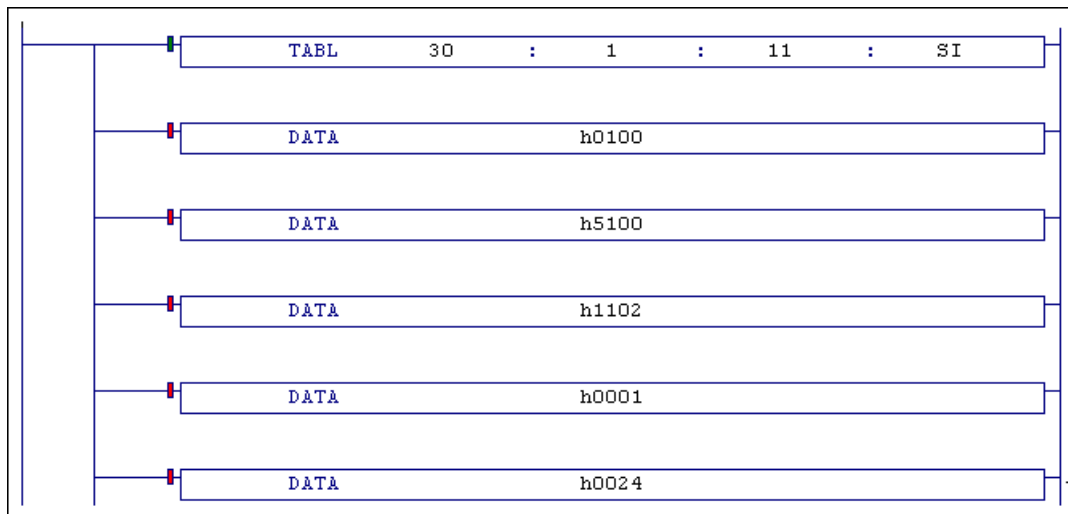
2-2 Programming



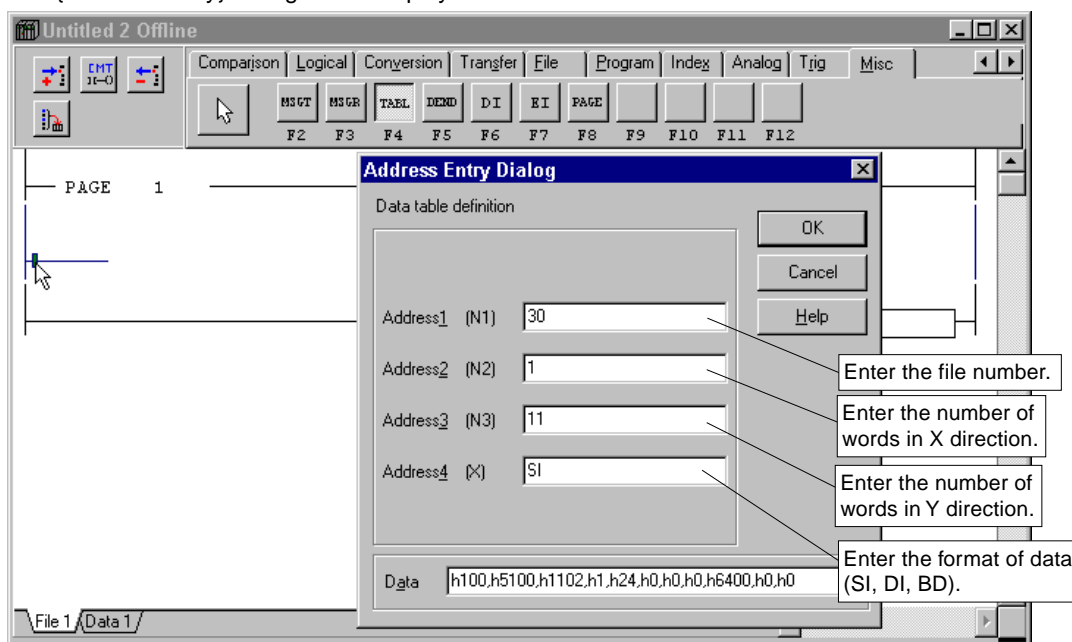
2-2 Programming

2-2-8 Writing Data Table Definition (TABL)

The method of describing "Data Table Definition" (TABL) instruction is explained below.



- ◇ Left-click the [Misc] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the **TABL** [TABL] (Data Table Definition) button.
- ◇ Move the cursor to the node in which to describe the instruction, and left-click the node. The {Address Entry} dialog box is displayed.



- **Entry in Data (A)**

Describe the data items of the DATA statement, each separated by a comma (,).

For data of SI or DI type, prefix an "h" to each data item.

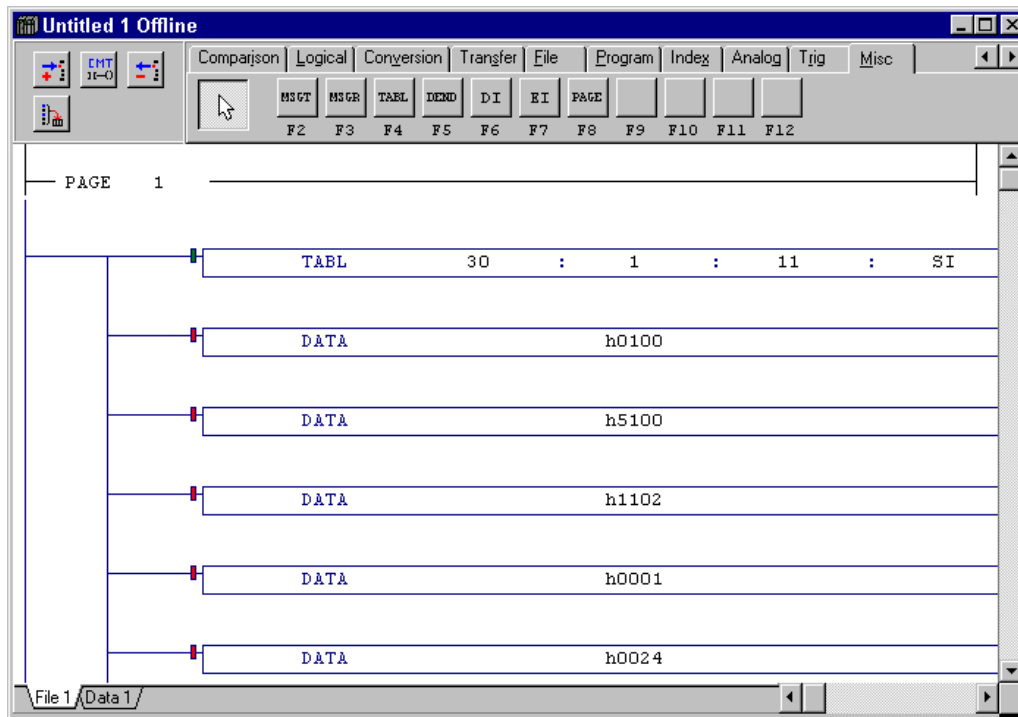
For data of BD type, do not prefix an "h."

For DI-type data, each data item entered must be a numerical value five digits or more in length. (For example, write h00000, not h0.)

- ◇ Enter the appropriate data in each of the text boxes.

- ◇ Left-click the [OK] button.

Data Table Definition (TABL), and Data (DATA) are described as shown in the following diagram.



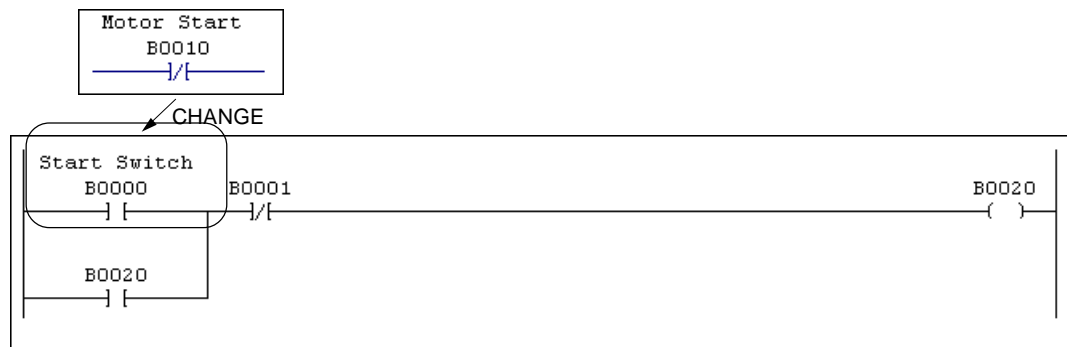
Note: With the data table definition (TABL), data end (DEND) is required at the end of the DATA statement.

2-3 Program Modification

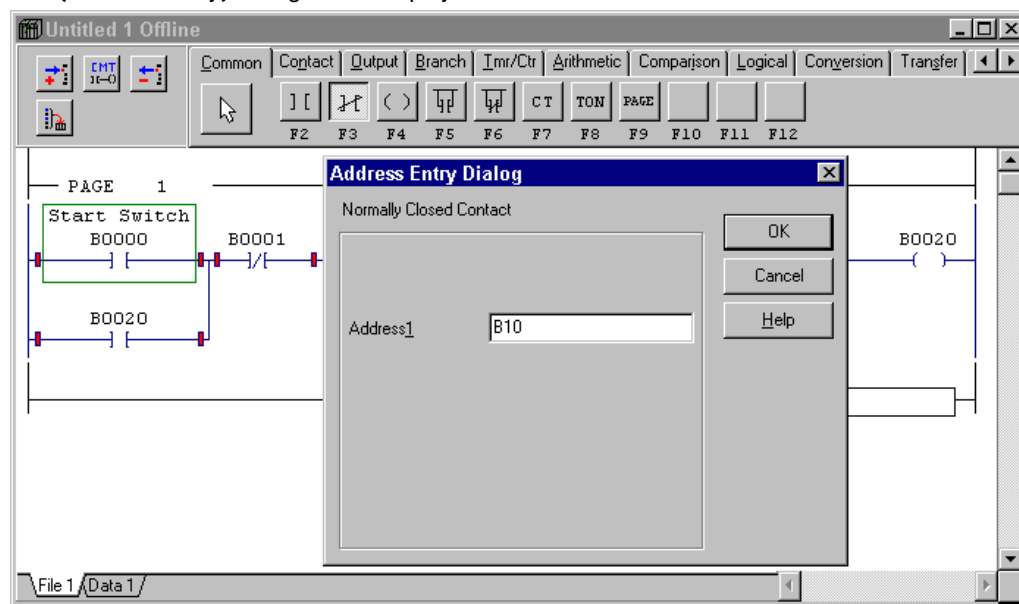
Here, the method of modifying or changing a program that has been prepared is explained.

2-3-1 Changing instructions/addresses

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

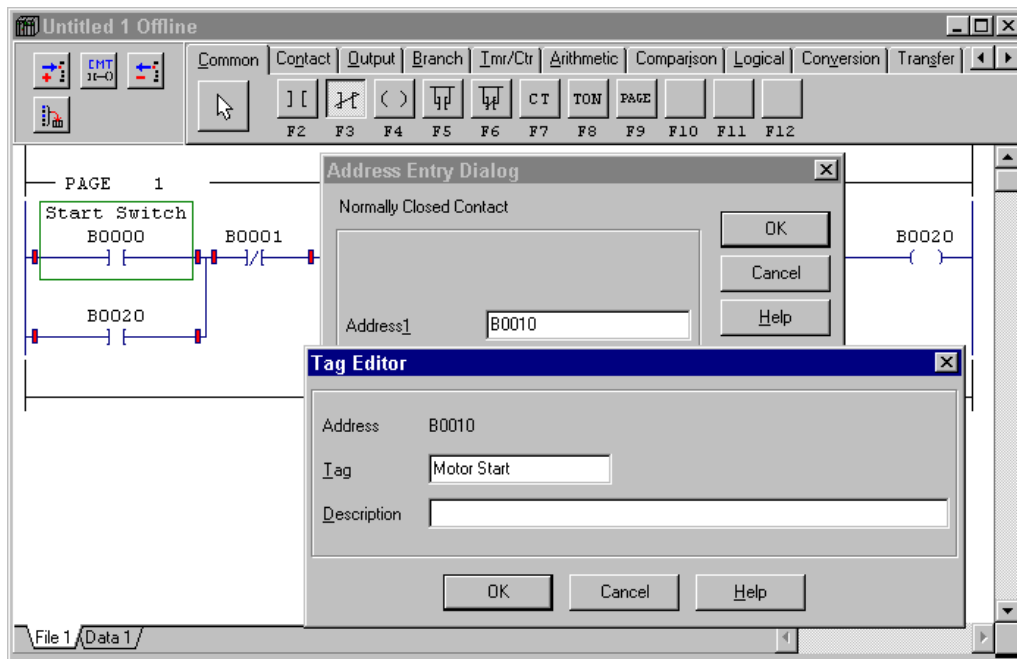


- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar. (To change an instruction too, previously select the new instruction button by left-clicking it.)
- ◇ Left-click the [Normally Closed Contact] button.
- ◇ Move the cursor to the instruction (symbol)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

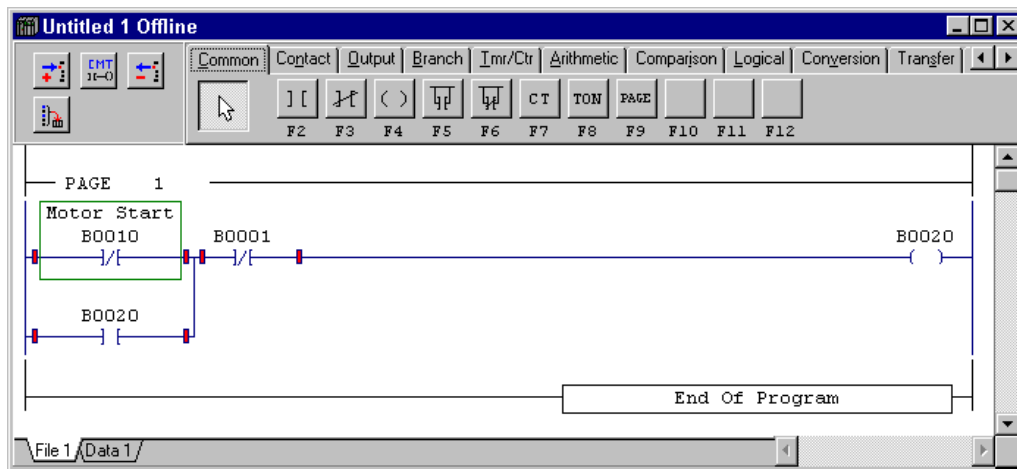


- ◇ Change the address that is displayed in the [Address] text box (the address that has been entered). In this example, <B10> is entered.
- ◇ Left-click the [OK] button. The {Tag Edit} dialog box is displayed. Note, however, that the {Tag Edit} dialog box is not displayed when the [Auto Document] box has been checked in the environment setting session.

2-3 Program Modification



- ◇ Enter a tag name in the [Tag] text box.
In this example, <Motor Start Switch> 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 ("B0000: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".

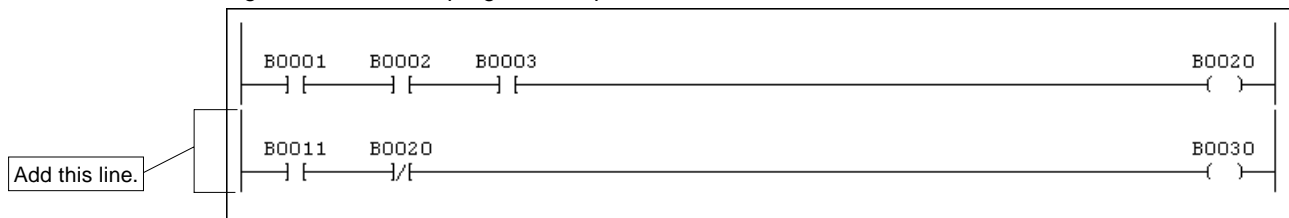
2-3 Program Modification

2-3-2 Addition of lines/instructions

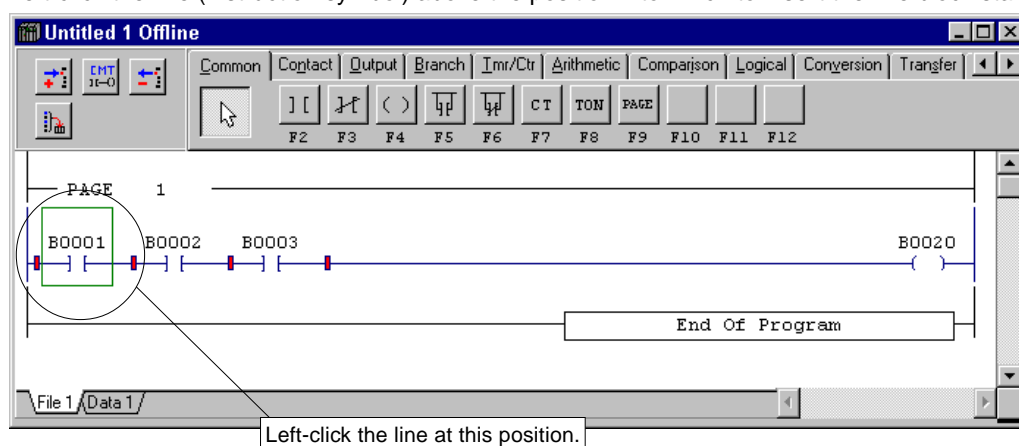
Here, the method of adding a new line or instruction to an existing program is explained.

(1) Inserting a new line

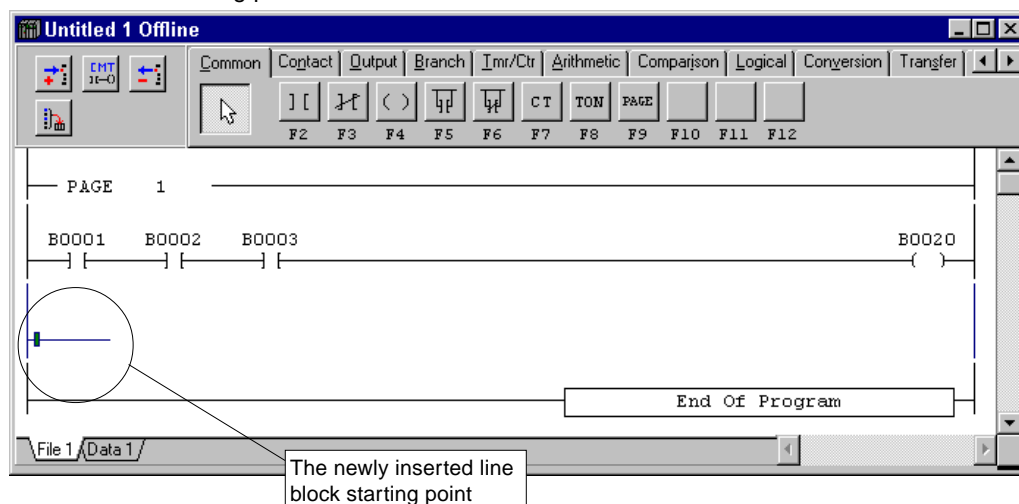
The method of inserting a new line into a program is explained below.



- ◇ Left-click the [Selection tool] button on the ladder edit tool bar.
- ◇ Left-click the line (instruction symbol) above the position into which to insert the line block starting point.



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

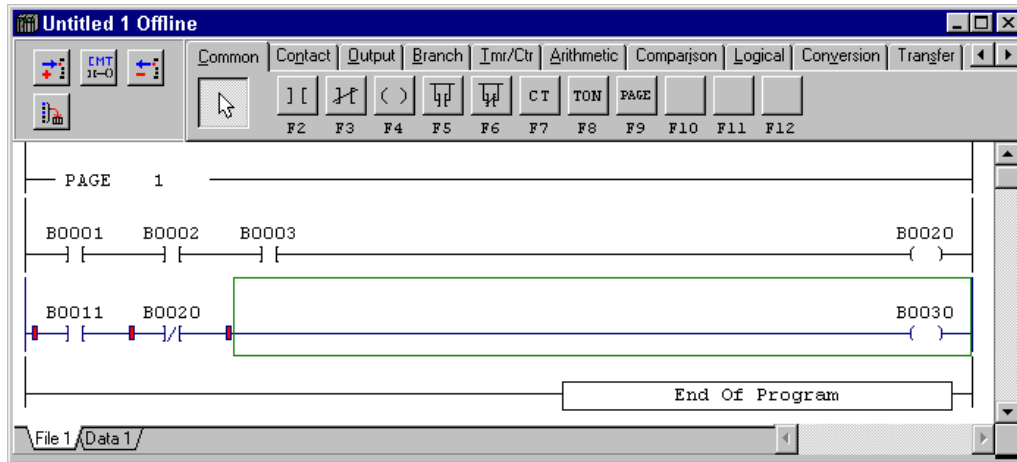


Position of [line insertion]

By using [Editor Options] of the [Environment Options] menu, it is possible to specify whether a line is to be inserted before or after the line on which the cursor is positioned.

2-3 Program Modification

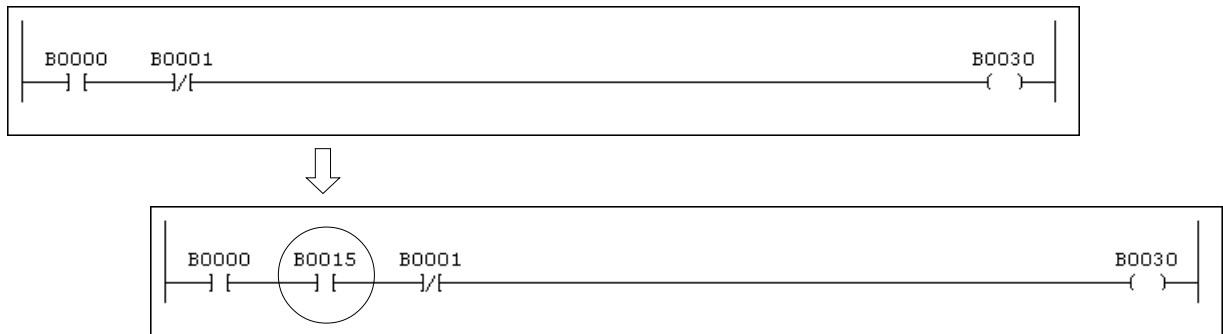
- ◇ Write a contact and an output at the newly inserted "line block starting point" as shown in the following diagram.



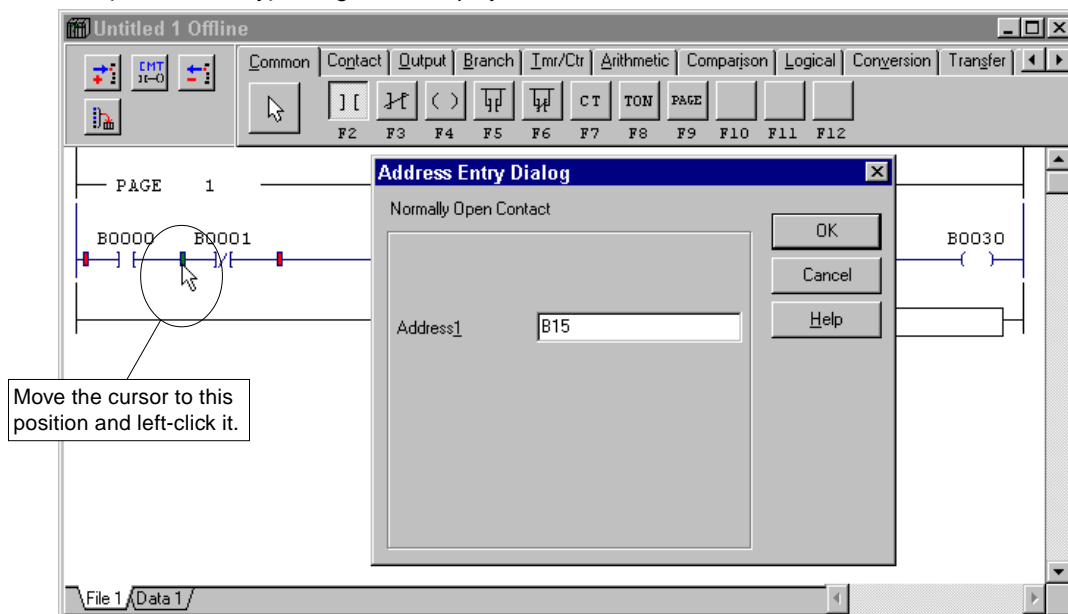
(2) Inserting a new contact

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

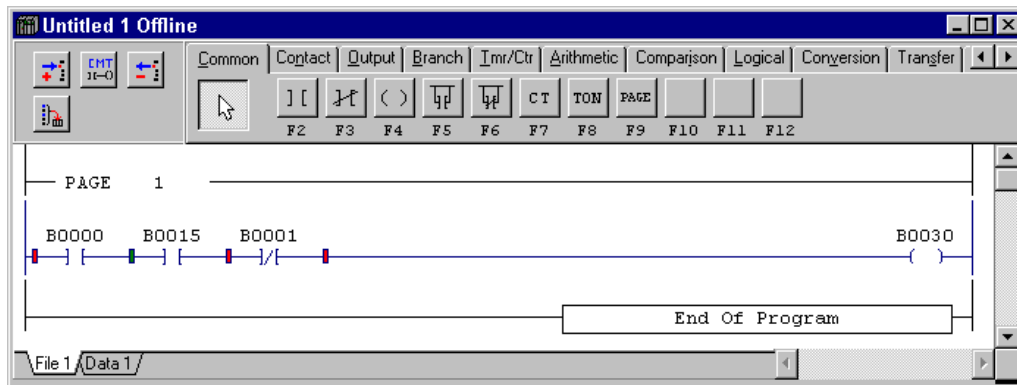


- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Normally Open Contact] button.
- ◇ Move the cursor to the node into which to insert the instruction, and left-click the node.
The {Address Entry} dialog box is displayed.

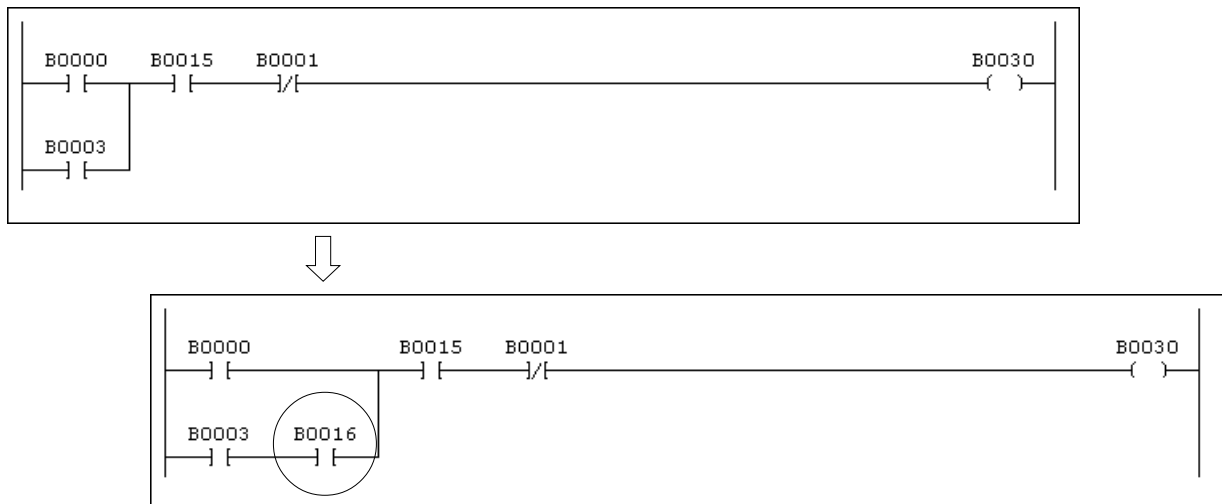



2-3 Program Modification

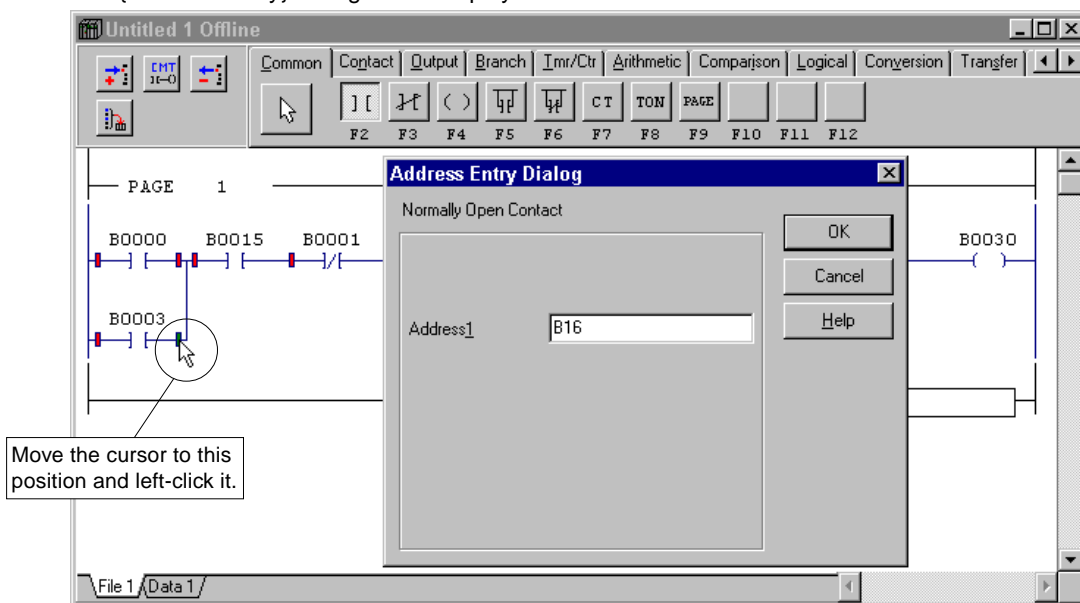
- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B15> is entered.
- ◇ Left-click the [OK] button.
The contact is inserted in series between contacts as shown in the following diagram.



2) Inserting series contact into branch line

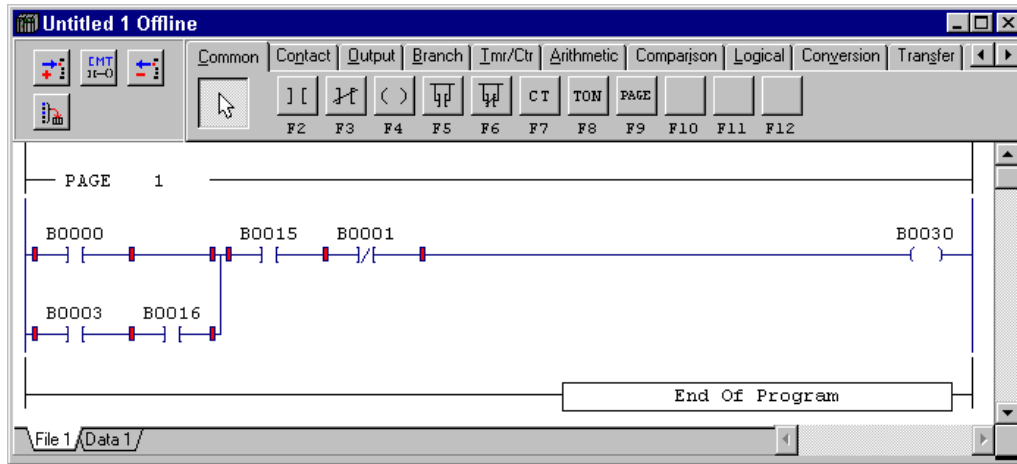


- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the  [Normally Open Contact] button.
- ◇ Move the cursor to the node into which to insert the instruction, and left-click the node.
The {Address Entry} dialog box is displayed.

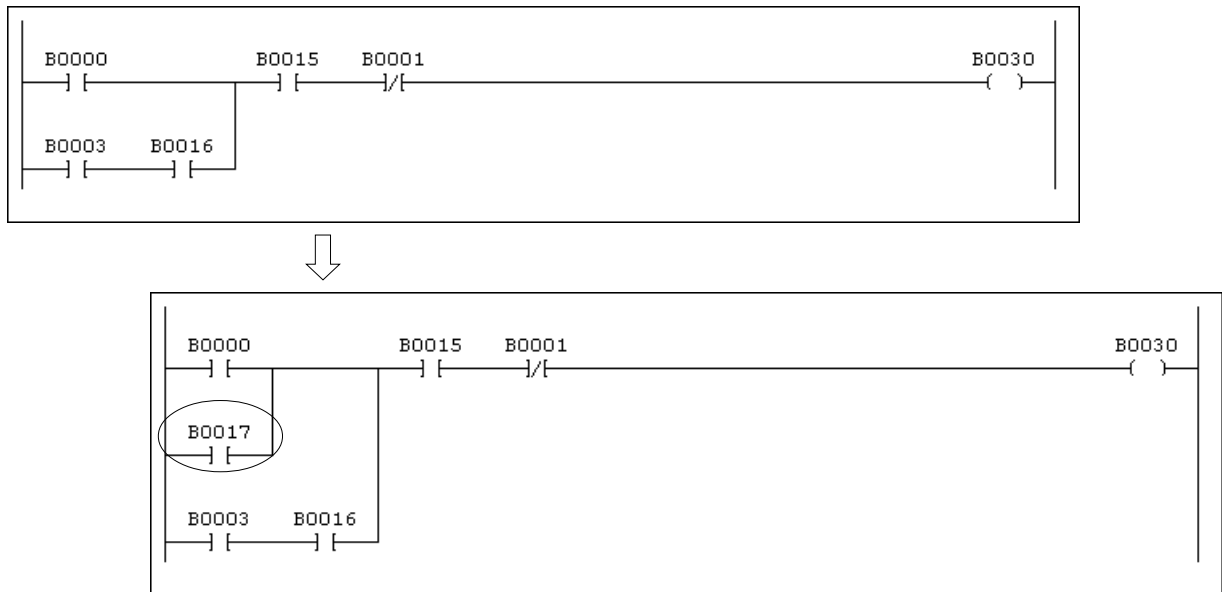


2-3 Program Modification

- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B16> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is inserted and the “branch down” shifts to the right.

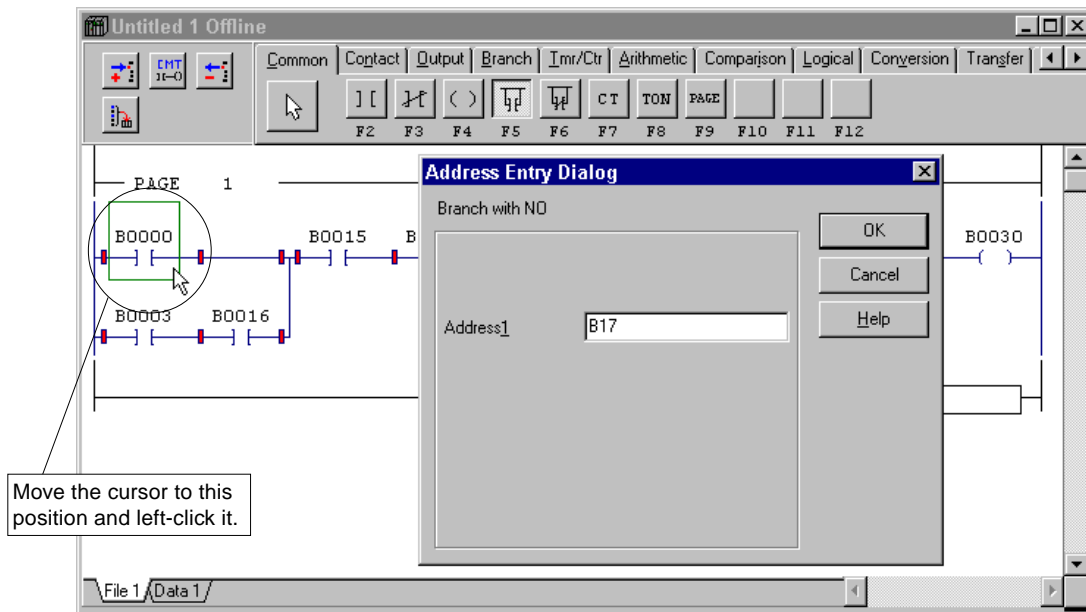


3) Inserting branch contact into branch line

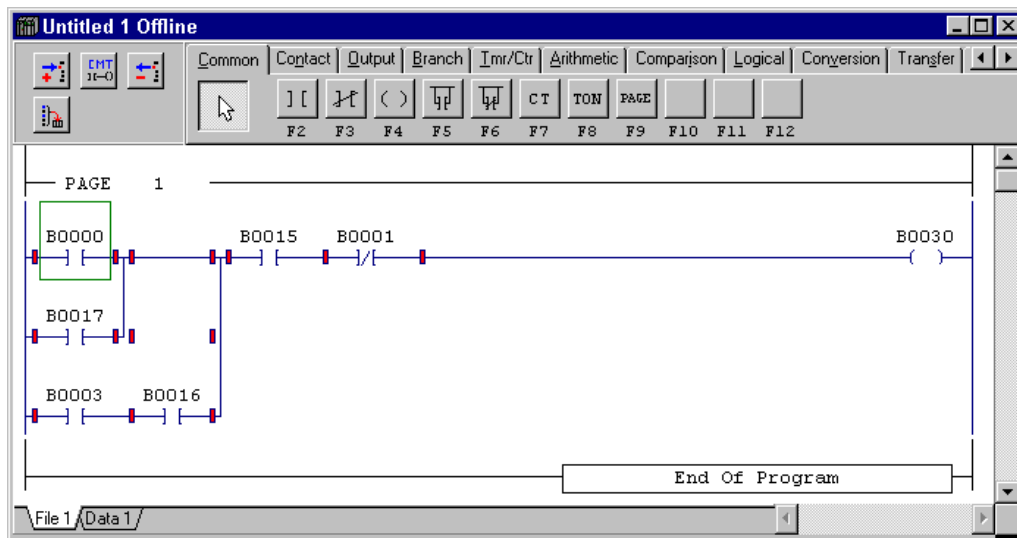


- ◇ Left-click the [Common] or [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Branch with NO] button.
- ◇ Move the cursor to the node into which to insert the instruction, and left-click the node.
The {Address Entry} dialog box is displayed.

2-3 Program Modification



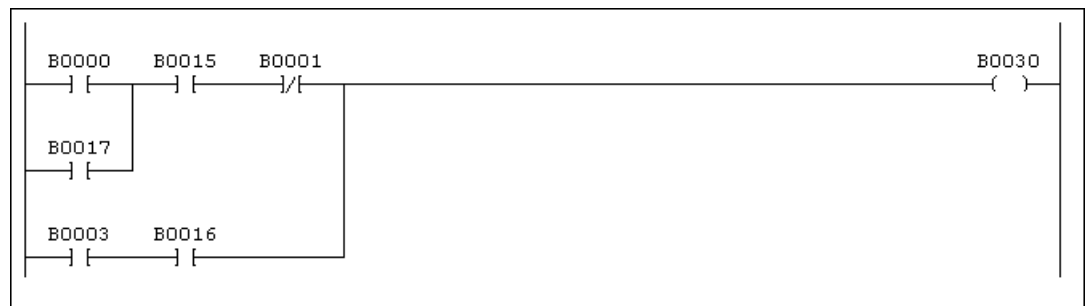
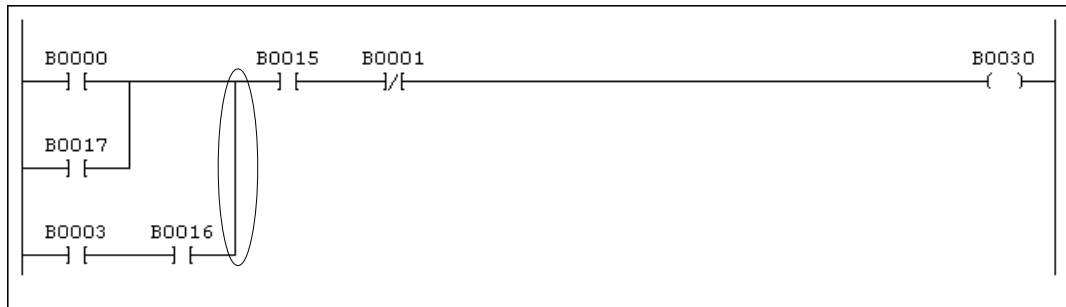
- ◇ Enter the address of the contact in the [Address] text box.
In this example, <B17> is entered.
- ◇ Left-click the [OK] button.
As shown below, the contact is inserted in parallel between the upper and lower contacts.



2-3 Program Modification

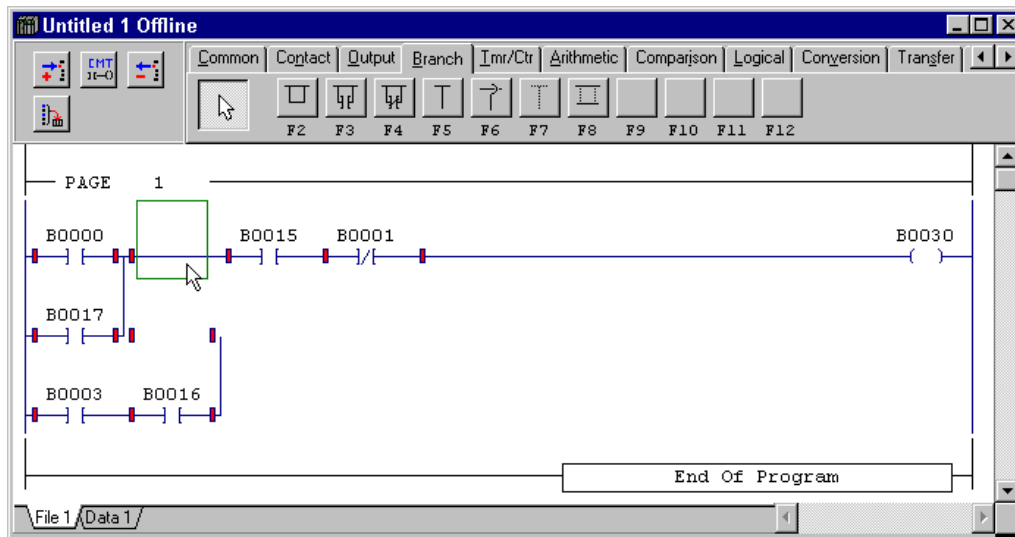
(3) Editing connecting lines

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



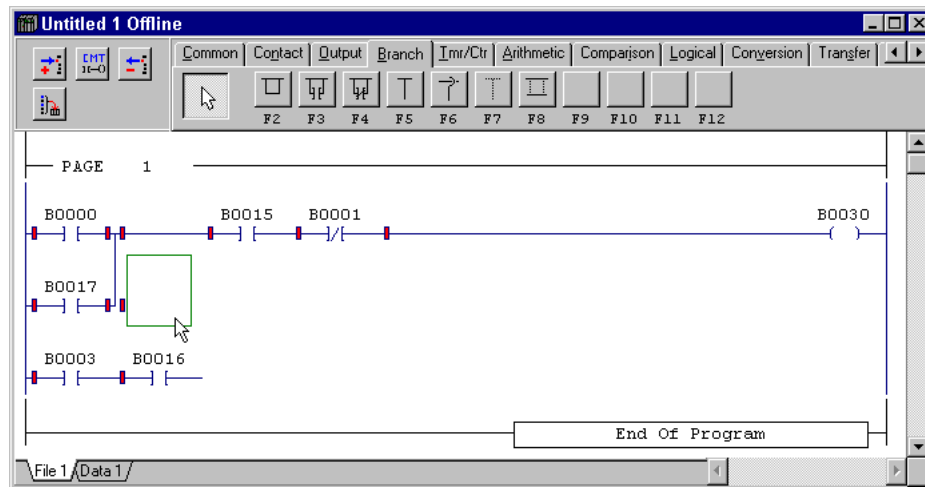
1) Deleting vertical connecting line

- ◇ Left-click the [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the [Branch Clear] button.
 - ◇ Left-click the instruction symbol located at the top, left of the vertical connecting line to be deleted.
- As shown in the following diagram, the vertical connecting line is deleted.



2-3 Program Modification

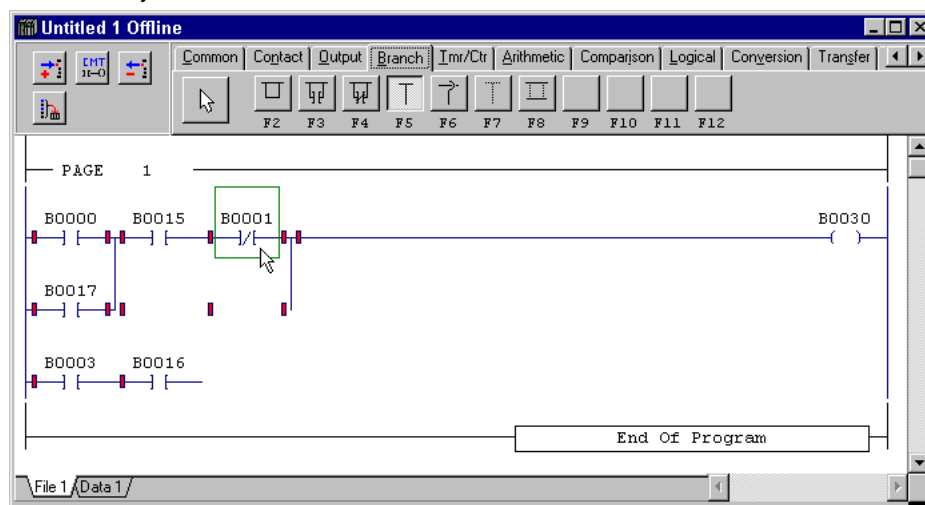
- ◇ In the same way as described above, delete the remaining vertical connecting lines to prepare the line shown in the following diagram.



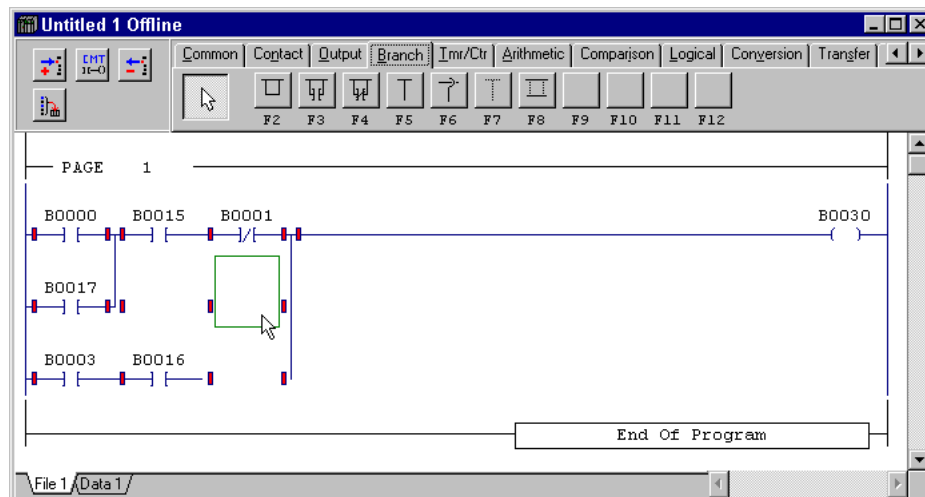
2) Inserting a vertical connecting line

- ◇ Left-click the [Branch] tab of the [Instruction group] tab on the ladder edit tool bar.
- ◇ Left-click the [Branch Down] button.
- ◇ Left-click the instruction symbol (B15) located at the top, left of the position in which to describe a vertical connecting line.


As shown in the following diagram, the vertical connecting line is described from the right end of the selected instruction symbol downward.

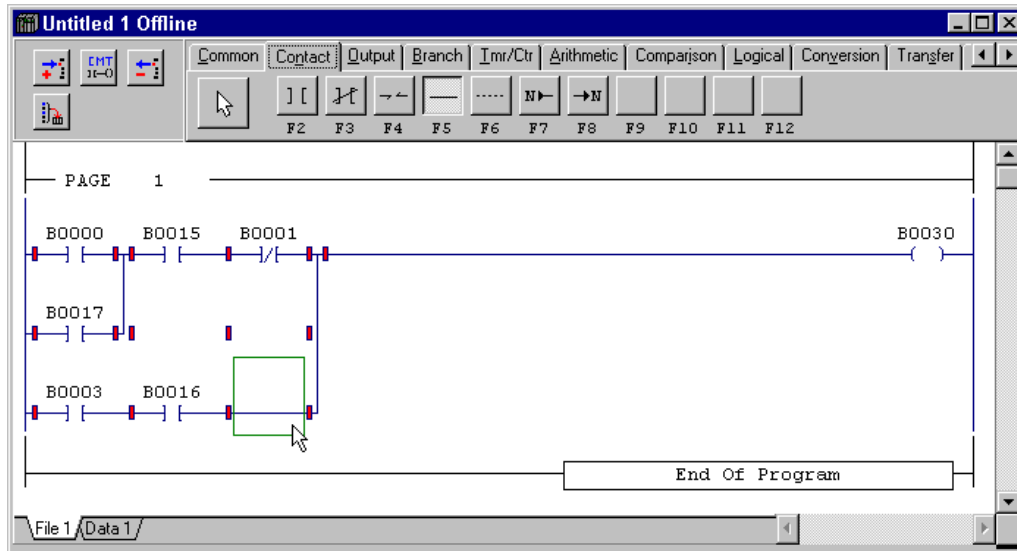


- ◇ In the same way as explained above, describe the remaining vertical connecting lines to prepare the line shown in the following diagram.



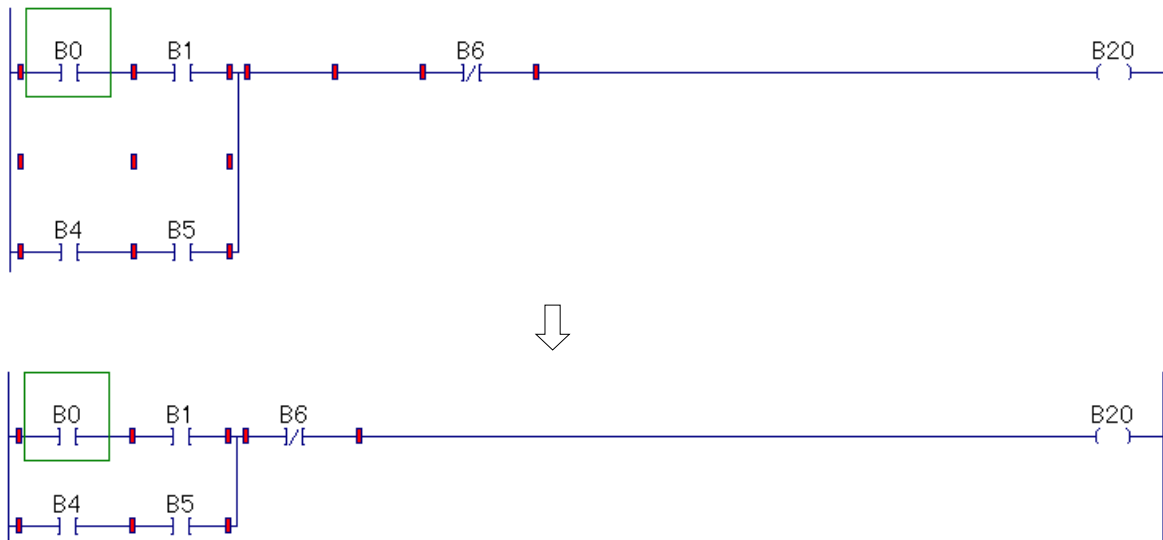
3) Writing horizontal connecting line (pass)

- ◇ Left-click the [Contact] tab of the [Instruction group] tab on the ladder edit tool bar.
 - ◇ Left-click the  [Pass] button.
 - ◇ Left-click the blank part in which to describe a pass (horizontal connecting line).
- As shown in the following diagram, a pass is described.



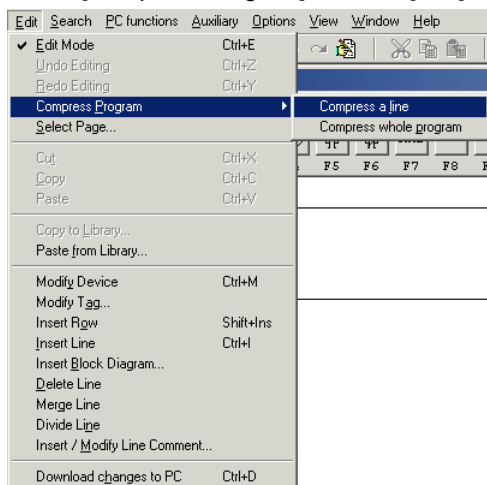
(4) Compressing a program (deleting blanks)

If a line can be compressed vertically (horizontally) after deleting unnecessary blanks during programming, it is compressed upward (to the left). The method of compressing a program is explained below.



2-3 Program Modification

- ◇ Select [Compress Program] from the [Edit] menu and then select [Compress a line] or [Compress whole program].

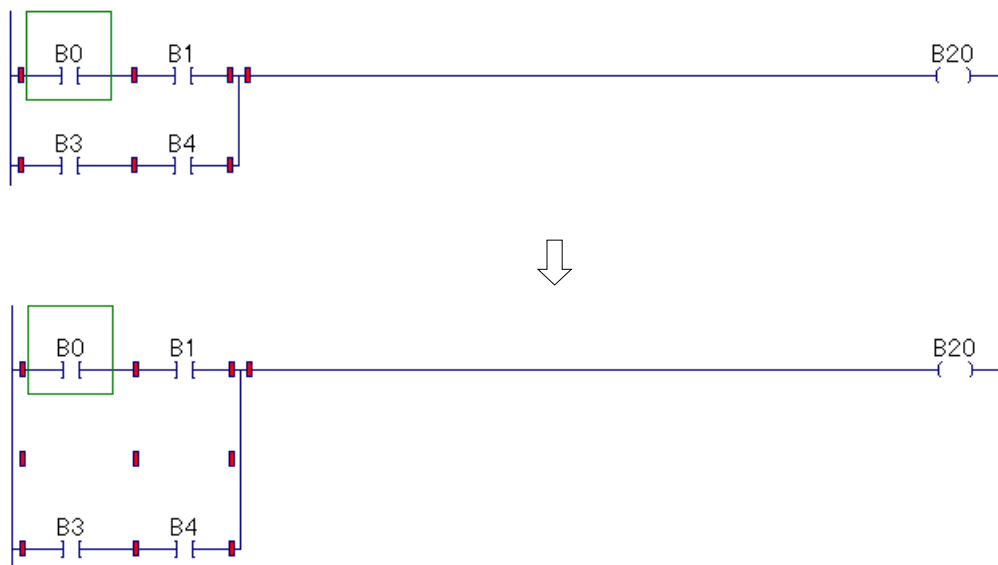


- When [Compress a line] is selected, only the line at the current cursor position is compressed.
- When [Compress whole program] is selected, all the lines are compressed.

(5) Inserting a row (blank row)

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

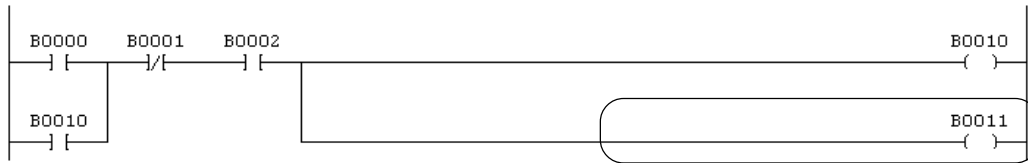
(The operation is different from line insertion.) If a parallel line is created, editing can be made easily.




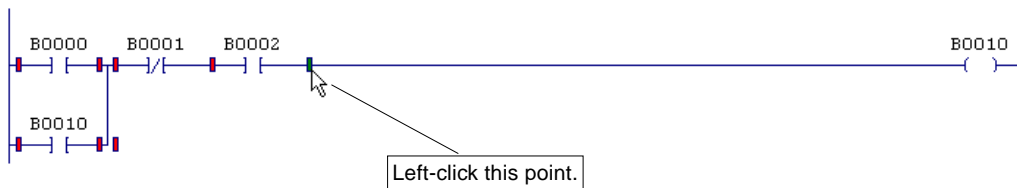
- ◇ Select [Insert Row] from the [Edit] menu. A blank row is created under the instruction line at the current cursor position.

(6) Creating an OR circuit of coils

Here, the method of creating an OR circuit of coils is explained.

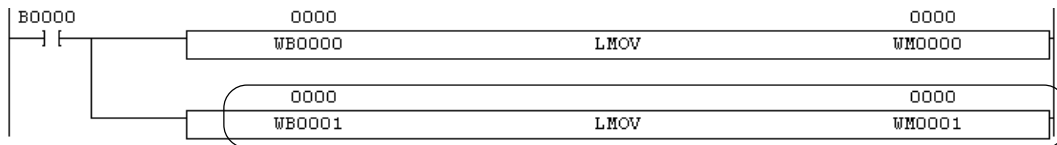


- ◇ Move the cursor to the circuit to be edited.
- ◇ Left-click the  [Coil] button.
- ◇ Left-click the node at which a coil is to be connected.
Then an OR circuit of coils is created.



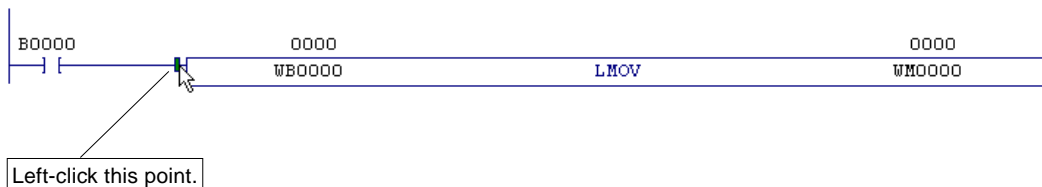
(7) Creating an OR circuit of data instructions

Move the cursor to the circuit to be edited.



- ◇ Left-click the [Data Instructions] button.
- ◇ Left-click the node at which data instructions are to be connected,
- ◇ Then an OR circuit of data instructions is created.

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.

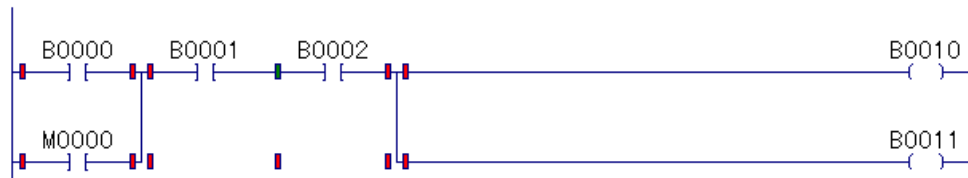


2-3 Program Modification

(8) Deleting contacts and outputs

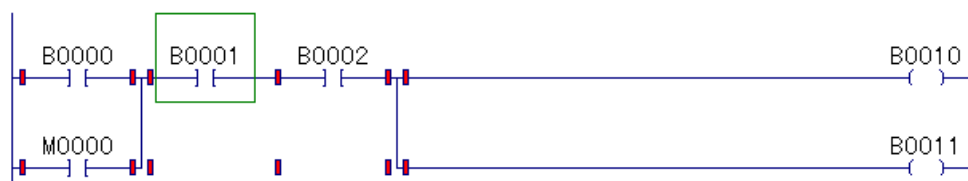
A contact and output can be deleted by selecting it with the mouse and then pressing the [DEL] key. However, the output at the 1st row of the line cannot be deleted.

Example: Deleting a contact or output in the following line

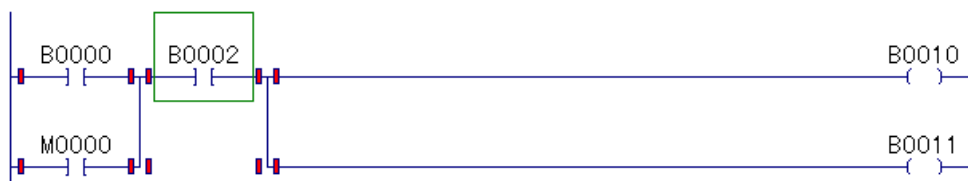


• Deleting contact B1



◇ Select B1 with the mouse.




◇ Press the [DEL] key.

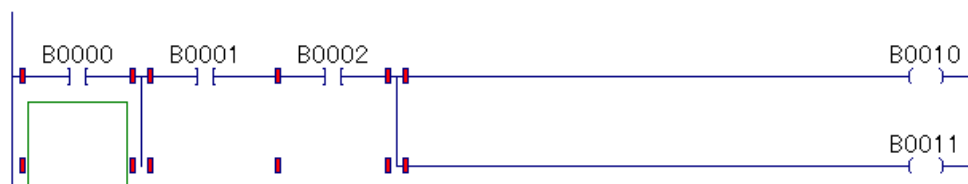



• Deleting contact M0

In this case, the connecting line remains even if the [DEL] key is used. Therefore, use the  [Blank] and  [Clear vertical connection] buttons instead of it.

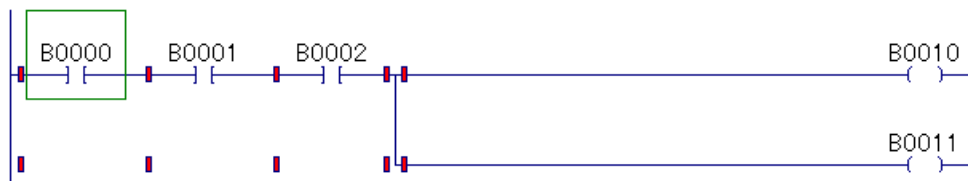
◇ Left-click the  [Blank] button of the [Contact(N)] tab.

◇ Left-click the M0. M0 is deleted.



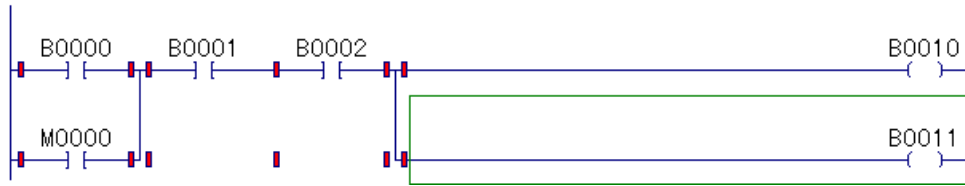
◇ Left-click the  [Clear vertical connection] button of the [Parallel(B)] tab.

◇ Left-click the B0. the vertical line is deleted.

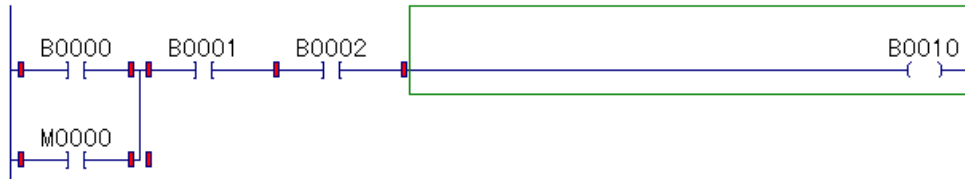


• Deleting output B11

- ◇ Select B11 with the mouse.



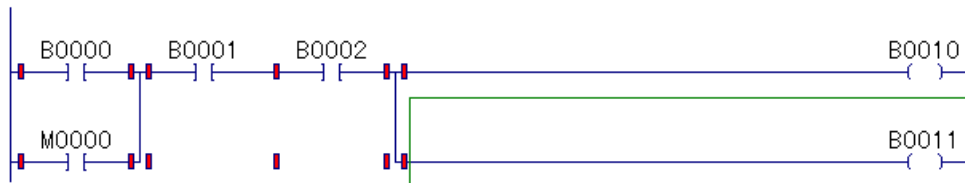
- ◇ Press the [DEL] key.



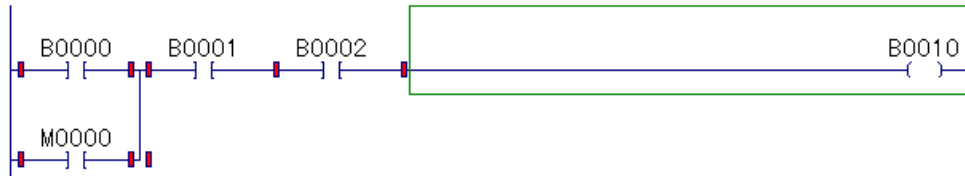
• Deleting output B10

Since the output at the 1st row cannot be deleted directly, delete the output at the 2nd row first and then change the address of the output at the 1st row from B10 to B11.

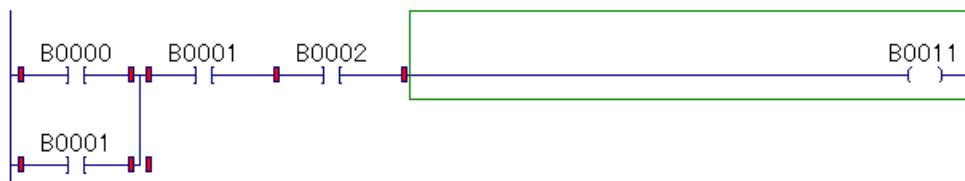
- ◇ Select B11 with the mouse.



- ◇ Press the [DEL] key.



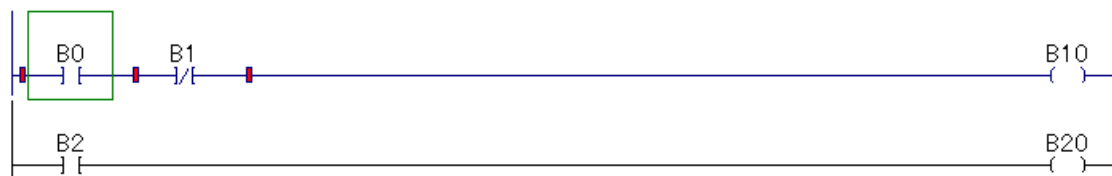
- ◇ Double-click B10 and change the address to B11.



(9) Merging lines

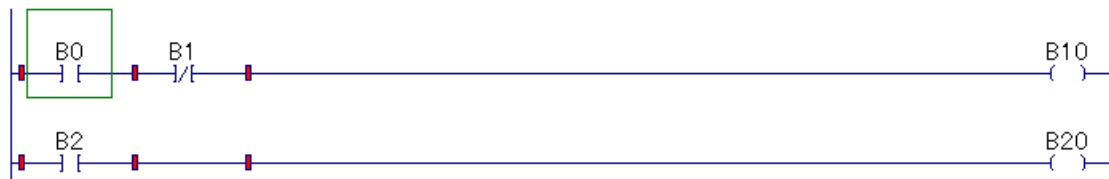
This function is used to merge two independent lines to make a single line. It is used to make vertical connection of two independent lines.


- ◇ Position the cursor on a line to make vertical connection.

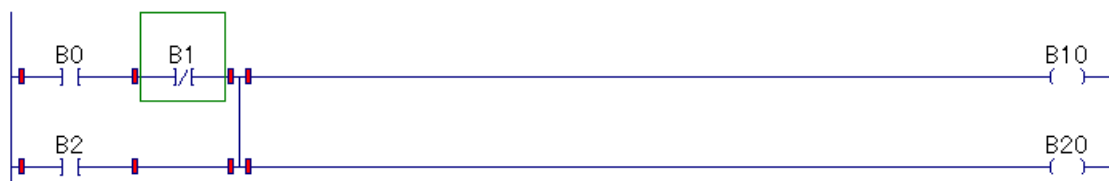


2-3 Program Modification

- ◇ Select [Merge Line] from the [Edit] menu. The line at the current cursor position and the line just below it are merged to form a single line.




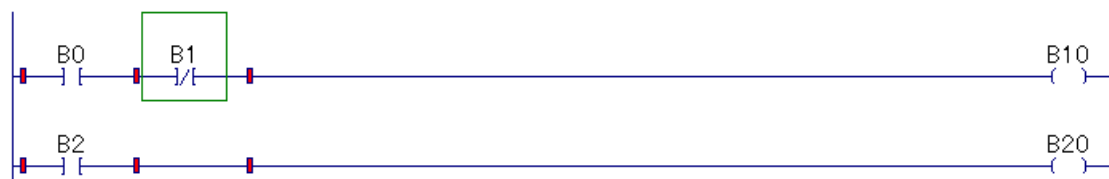
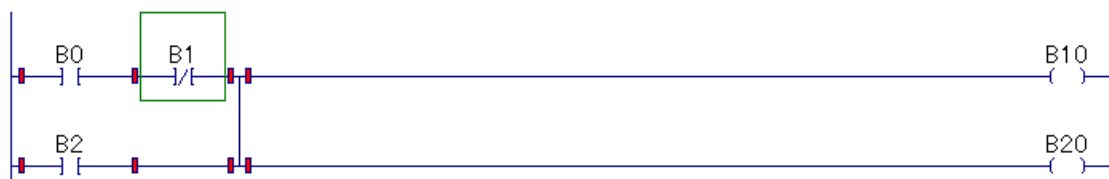
- ◇ Left-click the [Parallel] tab of the [Instruction group] tab in the Ladder edit tool bar.
- ◇ Left-click the  [Vertical connection] button.
- ◇ Move the cursor to B1 (contact B) and then left-click it. A vertical connecting line is drawn.



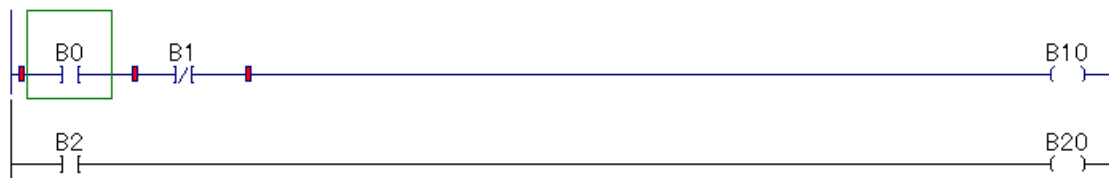
(10) Dividing lines

This function performs an operation opposite to {Merging lines} in the previous section. Use this function after clearing a vertical connecting line.

- ◇ Left-click the [Parallel] tab of the [Instruction group] tab of the Ladder edit tool bar.
- ◇ Left-click the  [Clear vertical connection] button.
- ◇ Move the cursor to B1 (B contact) and then left-click it. The vertical connecting line is cleared.



- ◇ Select [Divide Line] from the [Edit] menu. The line at the current cursor position and the line just below it are divided into two lines.

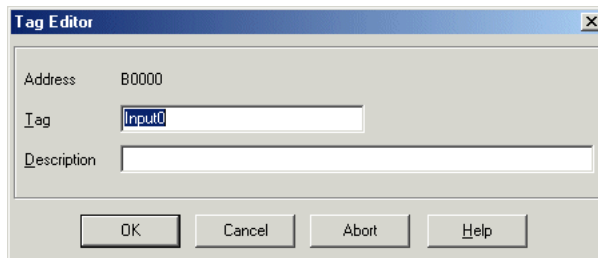


2-3-3 Changing tags

The following explains the procedure for changing a tag in the Ladder screen.



- ◇ Move the cursor to B0.
- ◇ Select [Modify Tag] from the [Edit] menu. The {Tag Editor} dialog box is displayed.

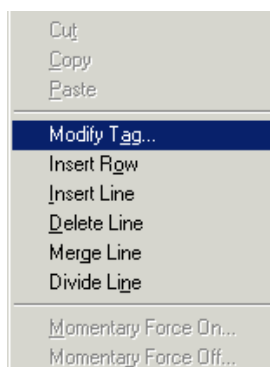


- ◇ Input <Switch 0> in the [Tag] text box.
- ◇ Left-click the [OK] button. The tag is changed.



About the {right-click} menu

A tag can also be changed by moving the cursor to B0, pressing the right mouse button to display the {Right click menu} (see below), then selecting [Modify Tag].

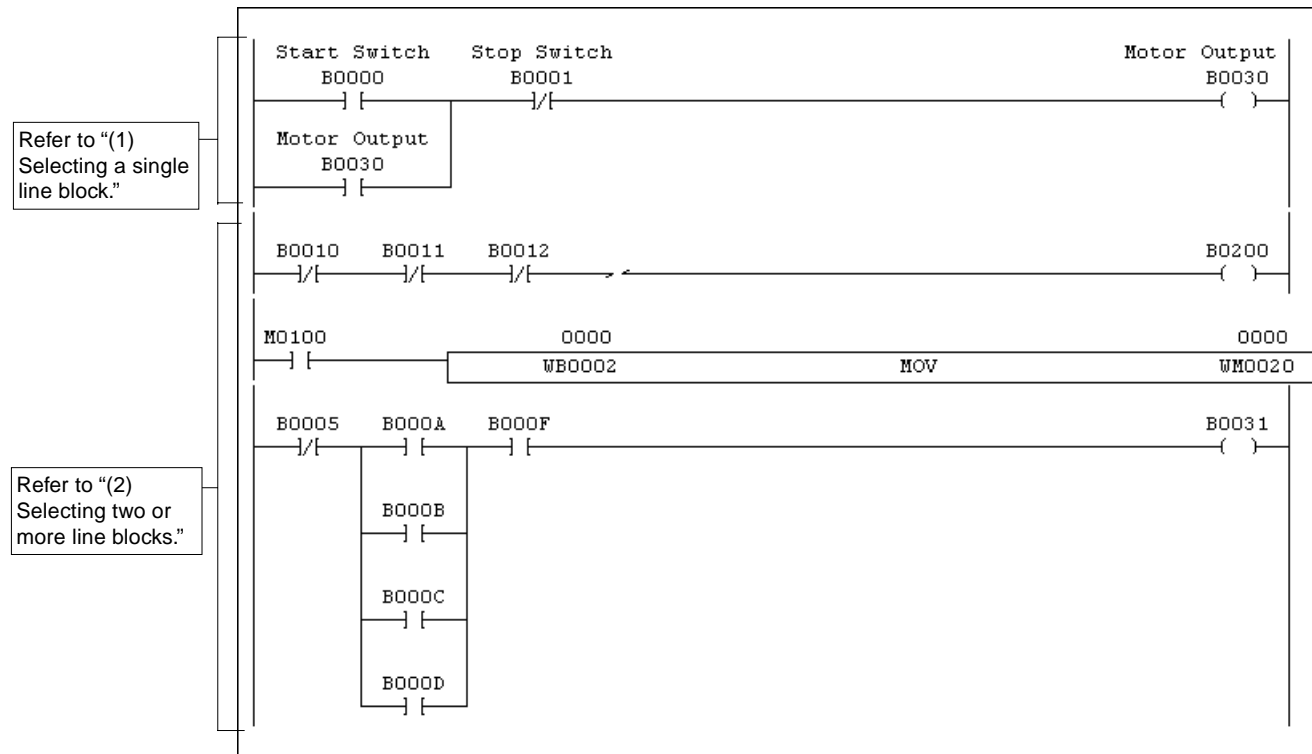


2-4 Line Copy/Insert/Delete

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.

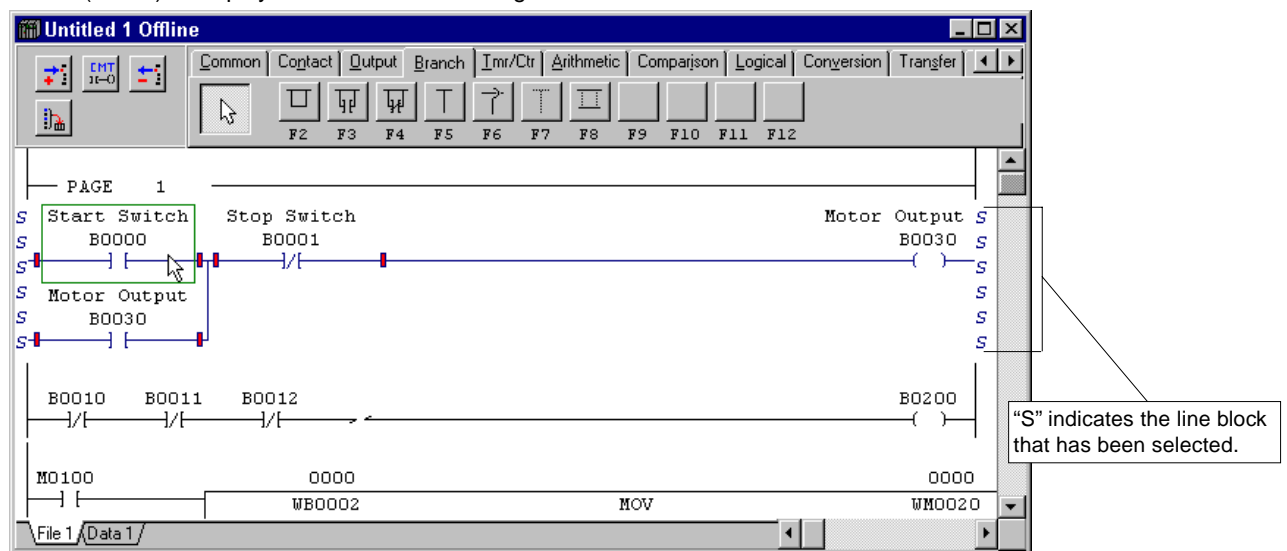
2-4-1 Selecting a line block

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.
- An "S" (select) is displayed on the bus on the right and left of the line block selected.

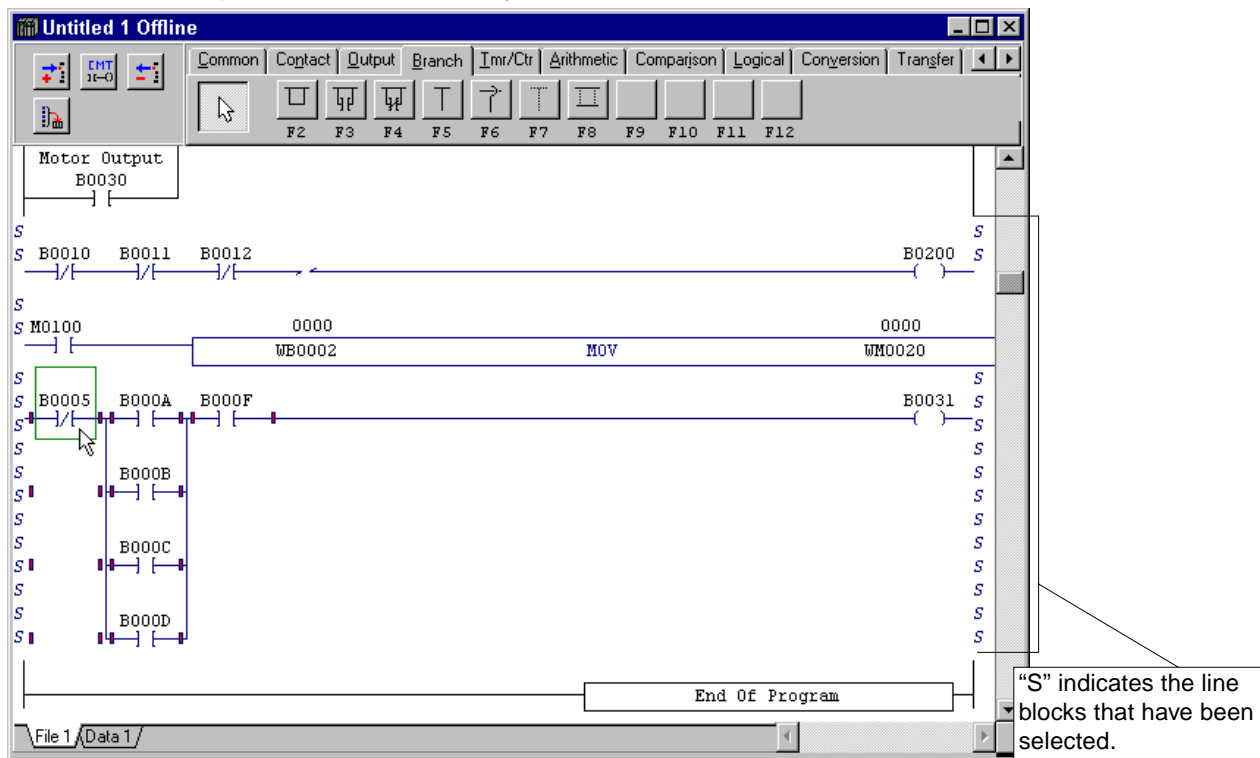


* Releasing select status

To release the select status, move the cursor to the selected line block and left-click it.

(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 the last line block to be selected is outside the program window, use the [Scroll] bar, [Arrow] buttons, <Page up> and <Page down> keys to cause it to be displayed.)
- "S" (select) is displayed on the buses on the right and left of the selected line blocks.



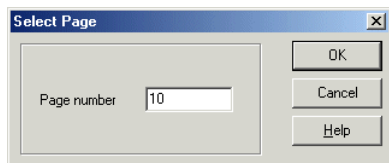
* Releasing select status

To release the select status, move the cursor to any one of the selected line blocks and left-click the line block.

(3) Selecting a line block with page specification

This function is used when selecting all the lines in a page with page specification.

- ◇ Select [Select Page] from the [Edit] menu.
The {Select Page} dialog box is displayed.



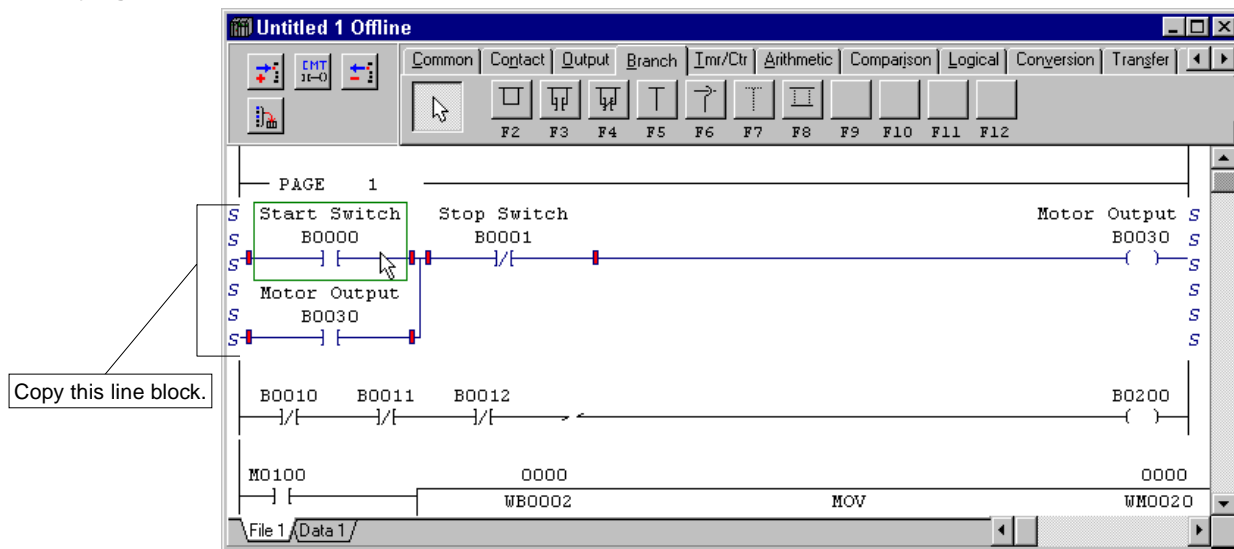
- ◇ Input a page number in the [Page number] text box and then left-click the [OK] button.


2-4 Line Copy/Insert/Delete

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



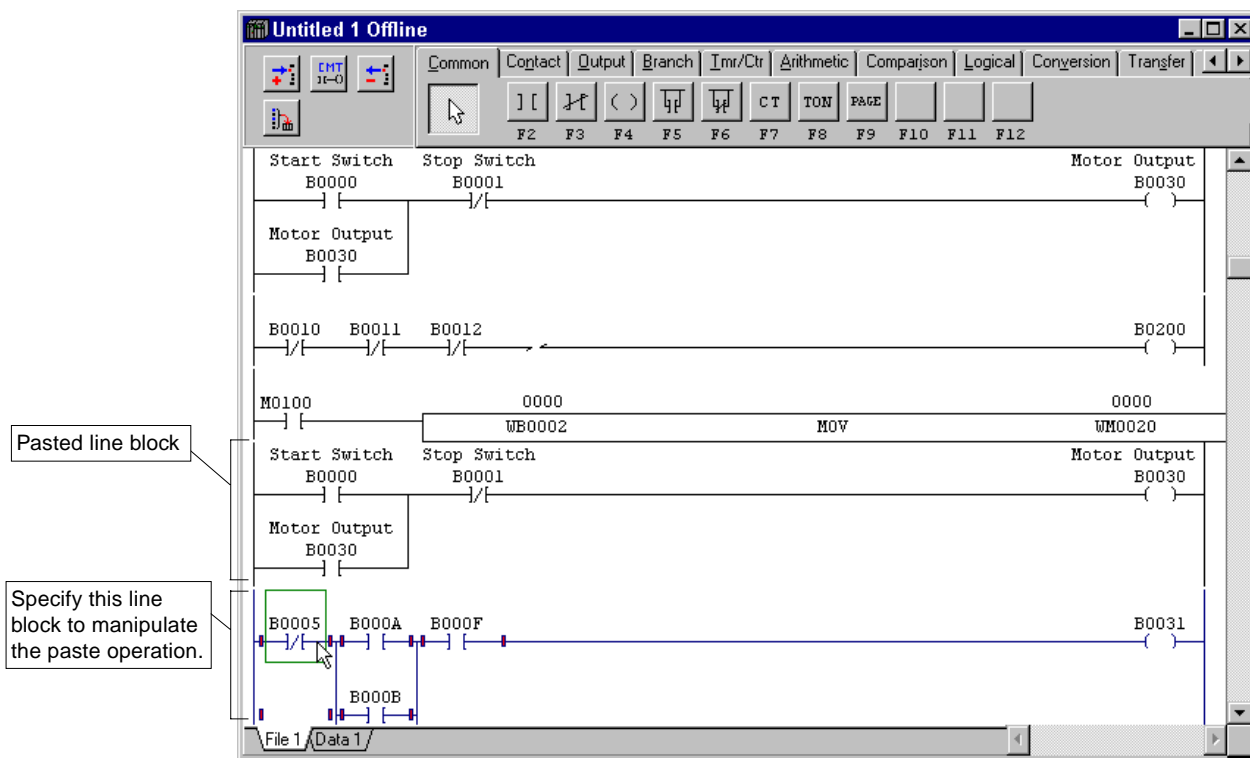
- ◇ Select a line block to be copied.
(For the method of selecting a line block, refer to “2-4-1.”)
- ◇ Left-click the  [Copy] button in the main window. (Alternatively, use the [Copy] command in the [Edit] menu or the <Ctrl> + <C> keys.)
The selected line block is copied to the clipboard.

(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 “B0005” (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.)

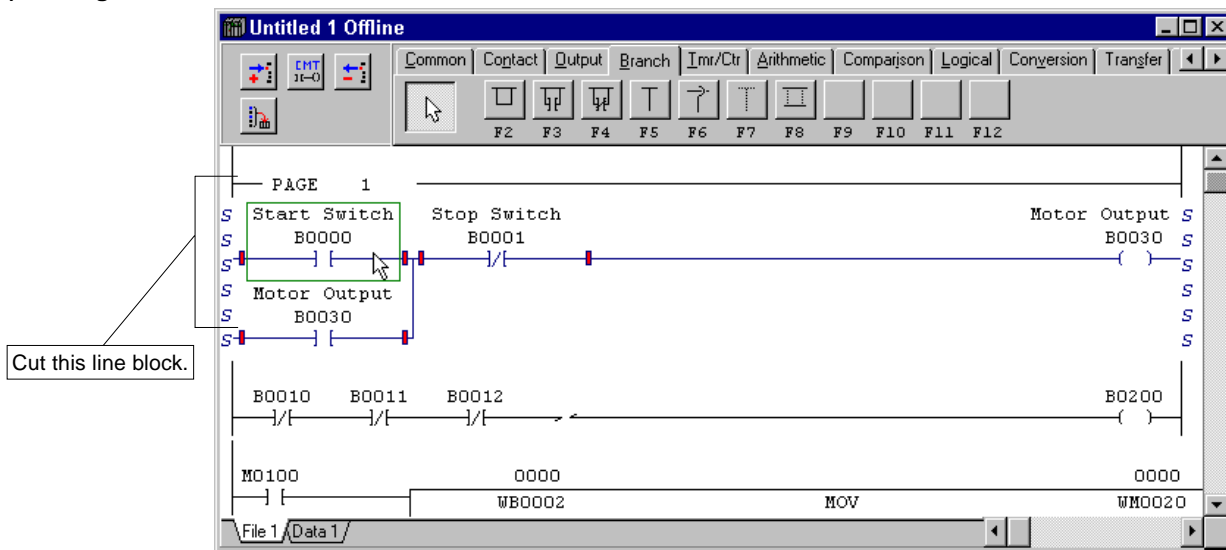
As shown in the following diagram, the copy of the line block is inserted before the line block at the specified paste location.




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

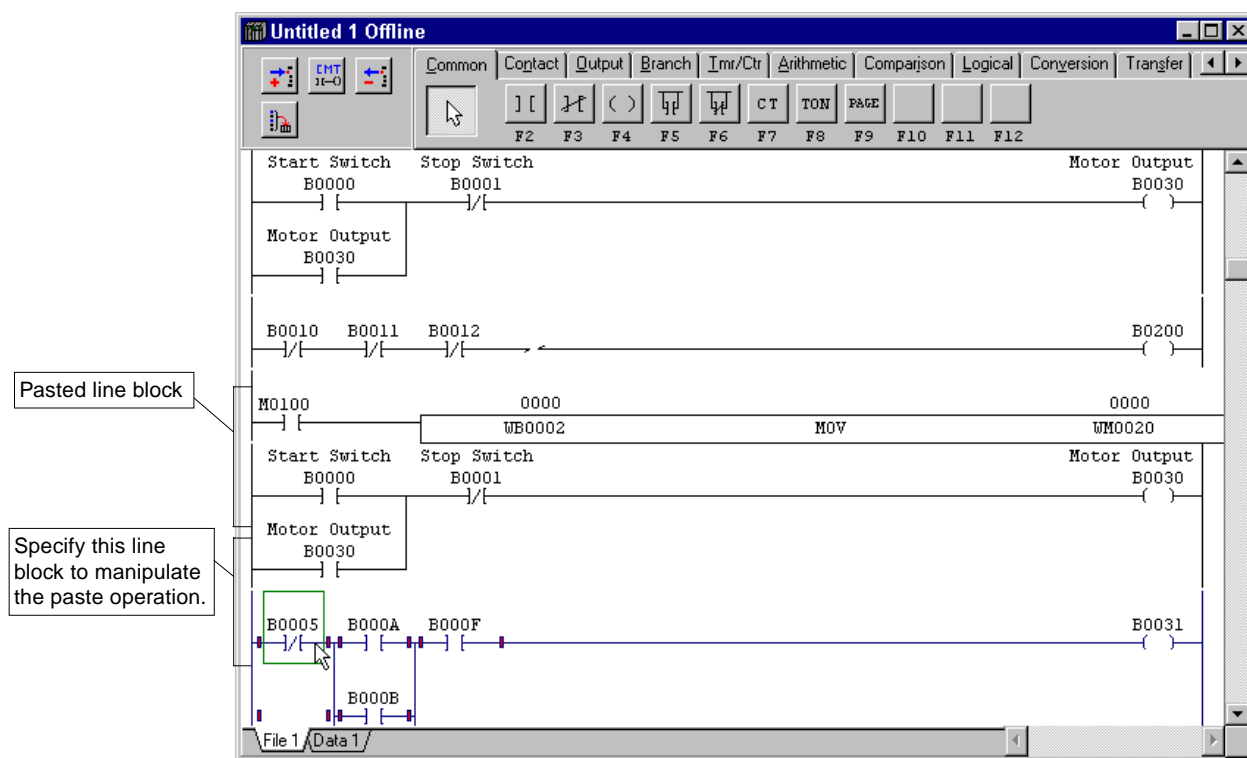


- ◇ Select a line block to be cut.
(For the method of selecting a line block, refer to “2-4-1.”)
- ◇ Left-click the  [Cut] button in the main window. (Alternatively, use the [Cut] command in the [Edit] menu or the <Ctrl> + <X> keys.)
The selected line block is copied to the clipboard, and the line block 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 “B0005” (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.

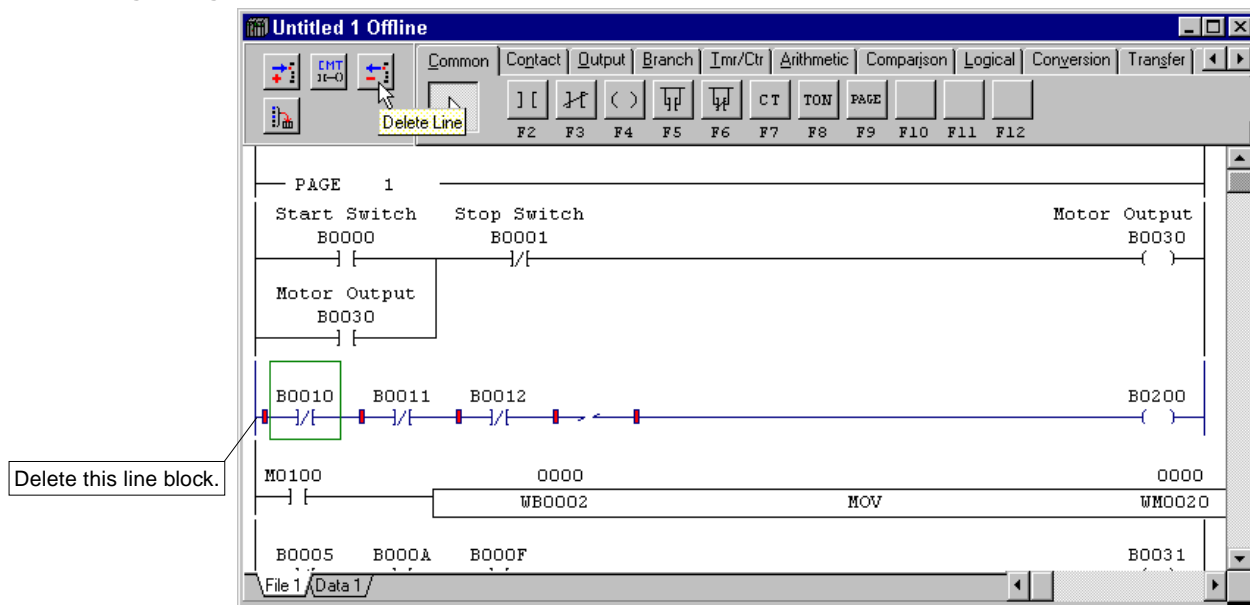



2-4 Line Copy/Insert/Delete

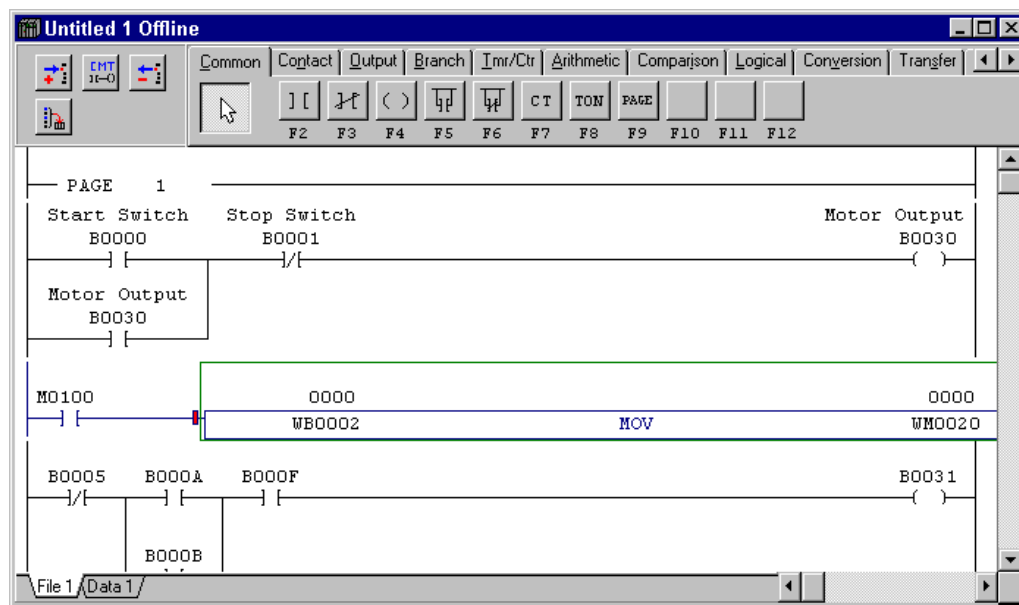
2-4-4 Deleting a line block

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.

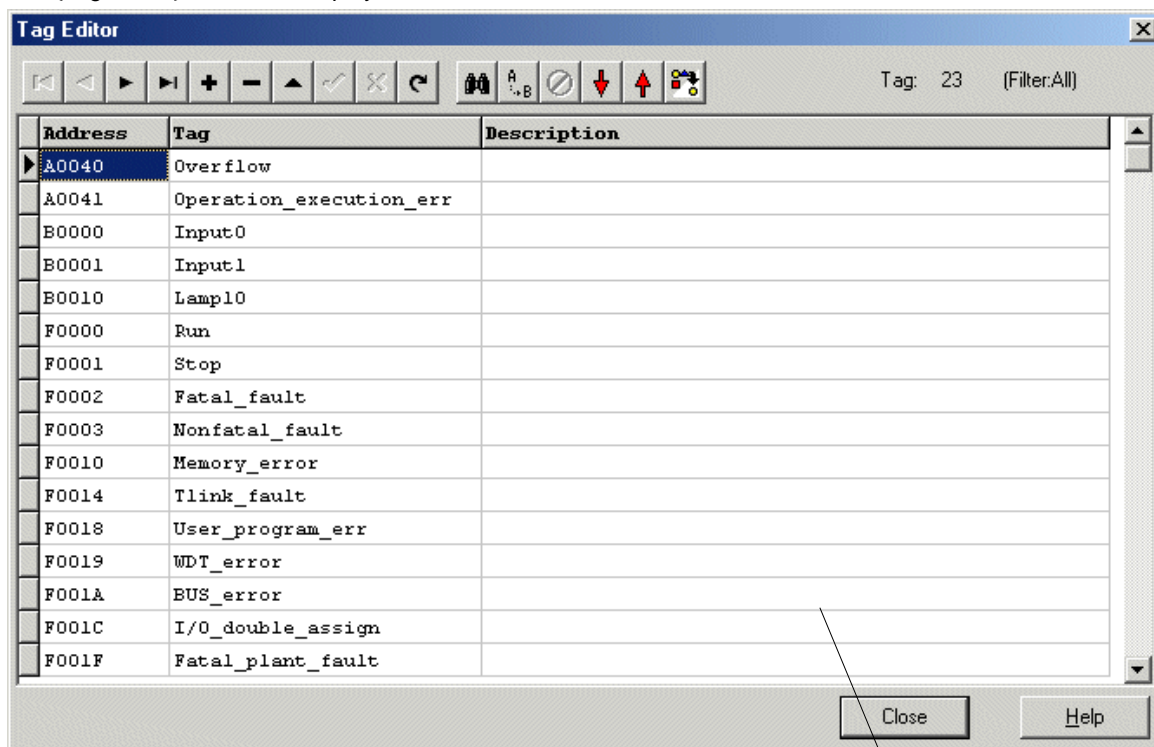
2-5-1 Outline of Tag Editor

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 [Edit Tag] command from the [Auxiliary Functions] menu in the main window.

The {Tag Editor} window is displayed.



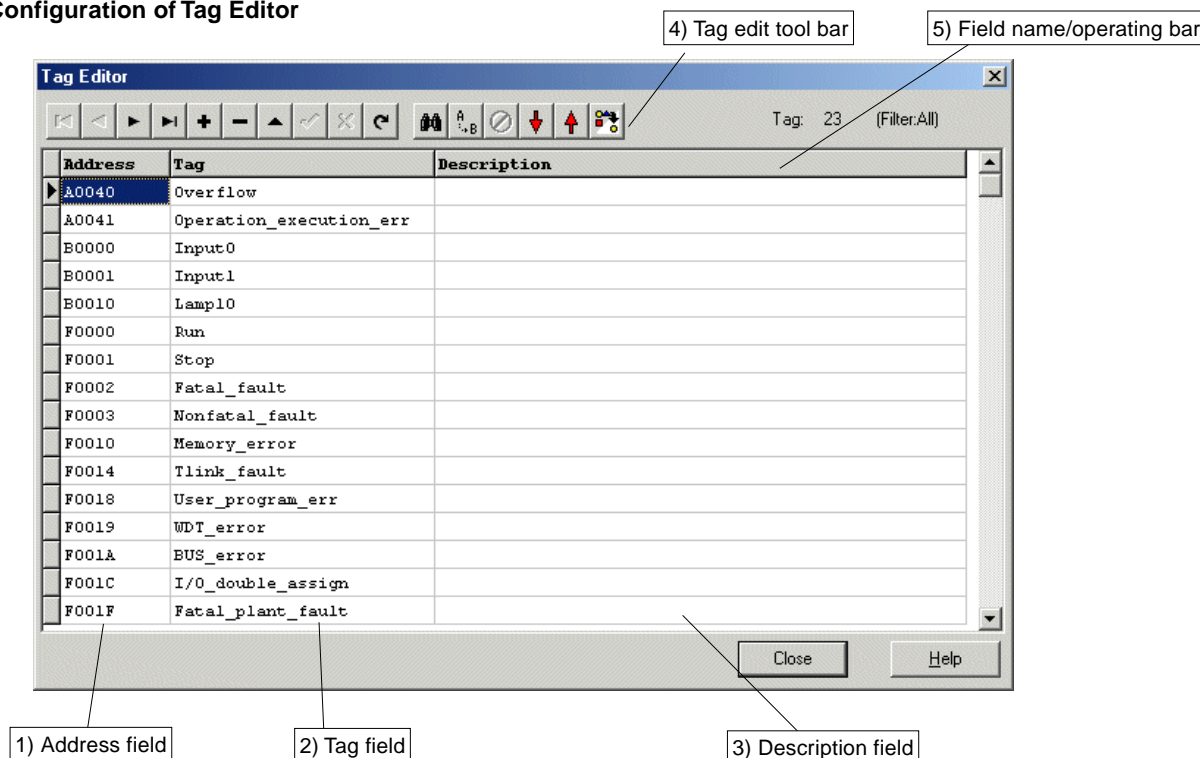
{Tag Editor} window in initial state

2-5 Tag Editor

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 PLC memory are described in this field. Describe "addresses" within the PLC memory capacity.

2) Tag field

"Tags" are described in this field. Each tag must be within 24 characters in length. The quotation marks (" and '), comma (,), and period (.) cannot be used in tag names. Any tag name must not consist entirely of numeric characters. It must not be the associated address either. The same tag name cannot be set for different addresses.

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.
- ☒ [Find] Searches for an address or a tag from database.
- ☒ [Replace] Replaces a tag or explanation of database.
- ☒ [Forward/Replace] Executes search and replace above and then perform Forward/Replace.
- ☒ [Backward/Replace] Executes search and replace above and then perform Backward/Replace.
- ☒ [Filter] Used to limit the tags to be displayed and edited using the address identifier.

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
B0037	Sol_valve_No.2 ON	

<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
B0037	Sol_valve_No.2 ON	

Tag	Address	Description
Sol_valve_No.2 ON	B0037	

(2) Inserting a new tag

- ◇ Left-click the  [Insert record] button on the tag edit tool bar or push the <Insert> key. A blank record is inserted.

Newly inserted record

Tag	Address	Description
Sol_valve_No.2 ON	B0037	
Sol_valve_No.3 ON	B0038	
*		
Error code No.1	B003A	
Error code No.2	B003B	

- ◇ 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 Tag Editor

2-5-3 Importing 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 PLC address (e.g., B0, B0010, M20, C15, etc.).
- For [Tag], describe a tag which does not exceed 24 characters in length.
If it exceeds 24 characters in length, only 24 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.

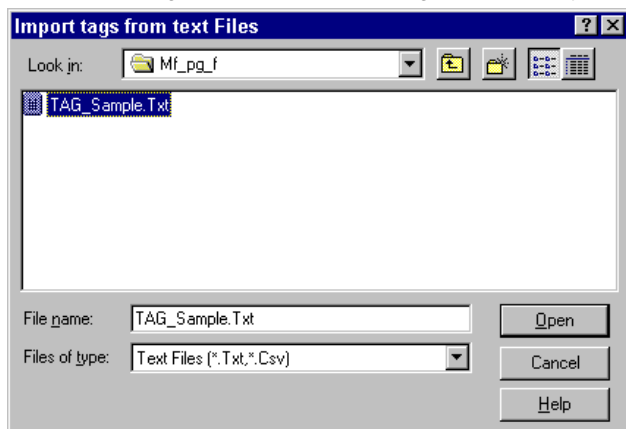
2) Example of description of text data

```
B003D,Errer code No.4,  
B003E,Stop indicator ON,  
B003F,Running indicator ON,  
F0000,Firm exection,  
F0001,firm OFF,  
F0050,Init_Scan,Contact on for initial scan only  
M0002,Coupling,  
M0008,Punch,  
M0009,Stoper board descent,  
M000E,Hold board down,  
M000F,Hold board up,  
M003F,Plate detection support,  
WB0040,Set up Data 1,Reception Data
```

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.

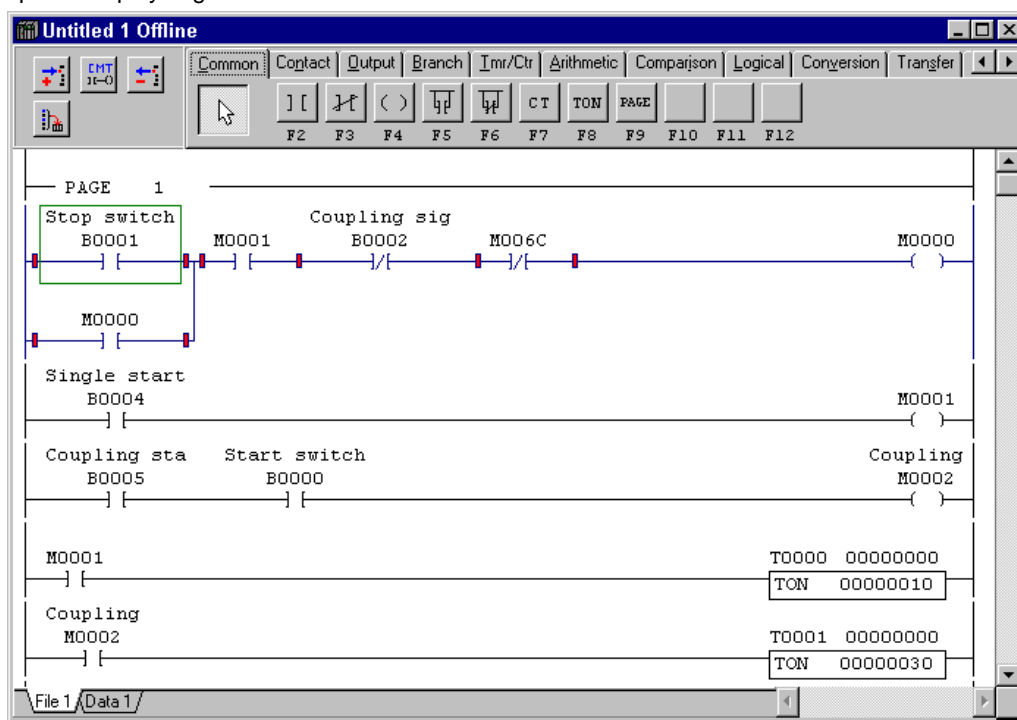


- ◇ Select a drive and a folder to which the file is to be saved from the [Look in] list box.
 - ◇ Select from or enter in the [File name] list box a text filename to be input.
 - ◇ Left-click the [Open] button.
- The text file (data) is input to the specified tag file.

(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.




2-6 Find/Replace Functions

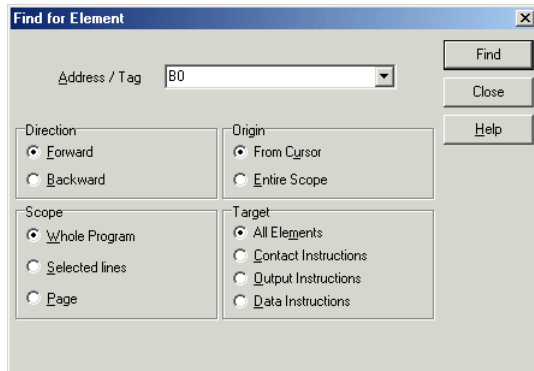
It is possible to retrieve or replace an instruction address and a tag in the program that is being displayed in the program window.

2-6-1 [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 {Find for Element} 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 "Serch 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 "Cursor position" or "Beginning of selected scope of search" 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."
- Page : Only a specified page is searched. Enter a page number to be searched in the [Page Number] box.

Target:

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/Step Control/Master Control/Timer/Counter instructions).
- Data Instructions : All instructions, other than the contact instructions and output instructions shown above, are searched for.

(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.

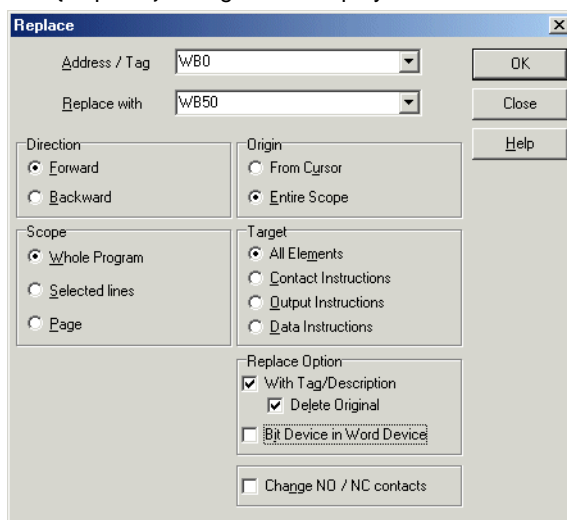
- ◇ By selecting the [Search Next] command from the [Search] menu, it is possible to continue the search operation.

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.



Consecutive addresses can be specified as the Origin address for Replace, like "B10-B-2F." Specify only the starting address as the Target address for Replace.

- ◇ 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."

2-6 Find/Replace Functions

Replace option :

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

When [With Tag/Description(G)] 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(L)] 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
WB0	Analog 0CH
WB50	Reserved

This tag is changed

Delete Original not selected

(After replacement)

Address	Tag
WB0	Analog 0CH
WB50	Analog 0CH

Delete Original selected

Address	Tag
WB0	Analog 0CH
WB50	Analog 0CH

Deleted

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

Change NO/NC 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
 ¥ Word address → Word address
 ¥ Tag → Address
 (bit/word)
 ¥ Address → Tag
 (bit/word)

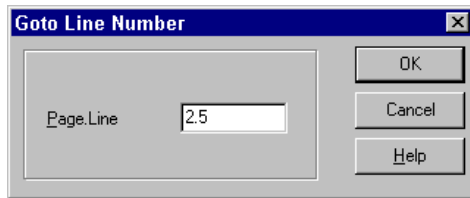
¥ Bit address ~~→~~ Word address
 ¥ Word address ~~→~~ Bit address

2-6 Find/Replace Functions

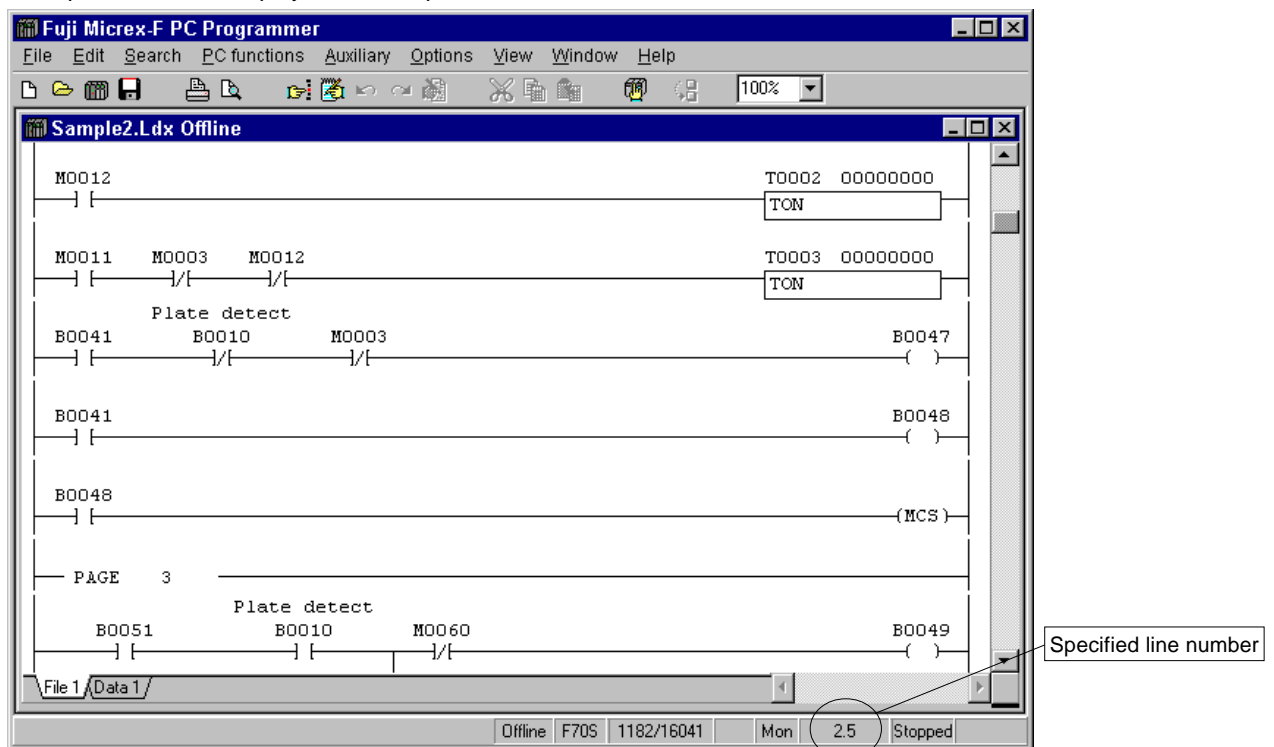
2-6-3 Line Search function

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 [Page.Line] text box.
 - ◇ Left-click the [OK] button.
- The specified line is displayed at the top of the screen.



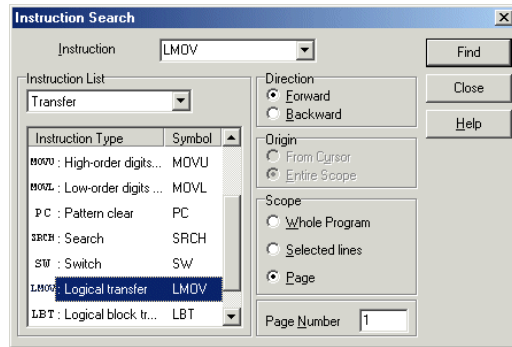
2-6 Find/Replace Functions

2-6-4 Instruction Search function

The following explains the procedure for searching for an instruction in the program currently displayed in the program window.

- ◇ Display the program to be searched for in the window.
- ◇ Select the [Instruction Search...] from the [Search] menu.

The {Instruction Search} dialog box is displayed.



- ◇ Select an instruction group with [Instruction List], select an instruction ([LMOV] in the example above), then left-click the [Find] button to start search.
- If the instruction is found, the line is displayed at the top of the screen. Since the dialog box remains the same, left-click the [Find] button again to search for the following instruction.
- If it is not found, the [Not Found] message box is displayed.

<Explanation of Search dialog box>

{Direction}, {Origin}, and {Scope} are the same as those in 2-6-1, "Address/tag search function."

System definition is unnecessary as long as the MICREX-F series is used as it is. It is necessary whenever the system is expanded (with P/PE link, direct access, protection against system failure, etc.).



In this manual, the method of display of each of the dialog boxes for system definition and the method of operation in each dialog box are explained.

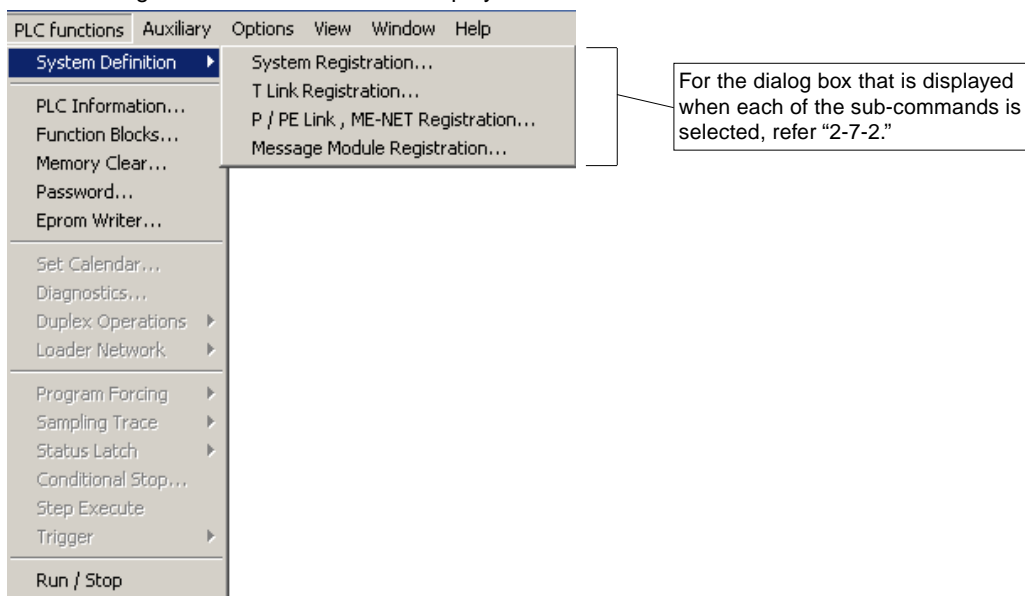
For a detailed explanation of system definition, refer to the "User's Manual <Instructions>."

2-7-1 Display of dialog box in system definition

Here, the method of display of the dialog box for system definition is explained.

System definitions are registered in the program file. Therefore, it is necessary first to open the program (file) for system definition.

- ◇ Open the program (file).
- ◇ Select the [Define System] command from the [PLC Functions] menu.
The following four sub-commands are displayed.



- ◇ Select the appropriate sub-command.

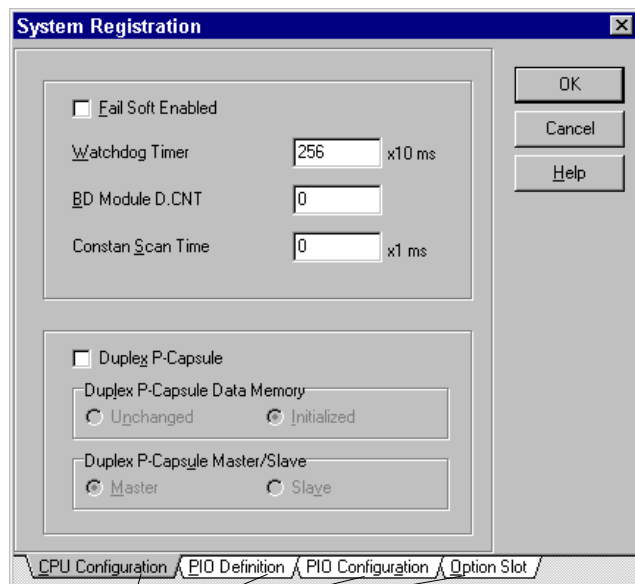
2-7 System Definition

2-7-2 Operation in system definition dialog box

There are roughly four types of dialog box which are provided for system definition. Here, the method of operation in each of those dialog box is explained, together with an example of display of each dialog box.

(1) System Registration dialog box

This is a dialog box for defining operations of the entire PLC system, processor, and modules of the base board on which the processor is mounted (direct access, etc.) the appropriate tab.

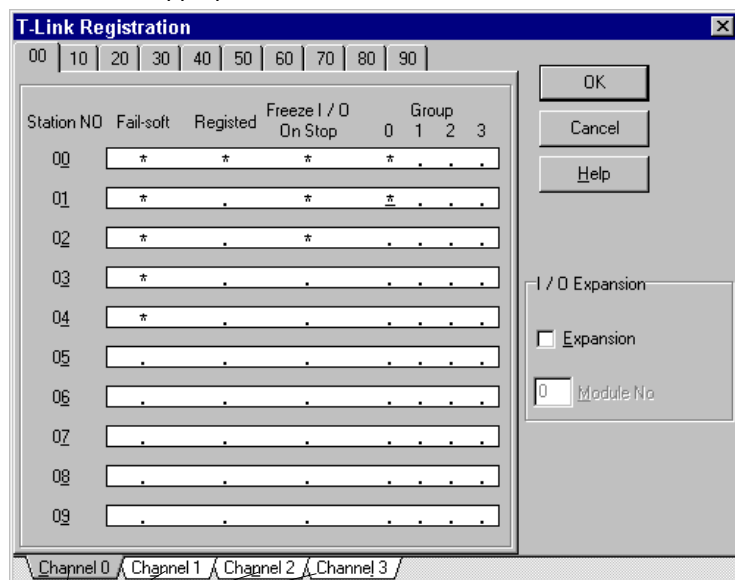


Left-click the tab to define each item.

(2) T-Link Registration dialog box

This is a dialog box for defining operations of the individual devices that are connected to the T-Link.

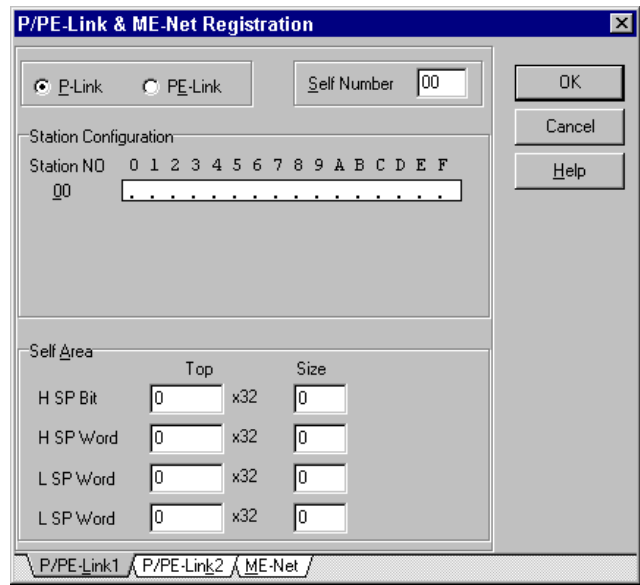
◇ Left-click the appropriate items.



Left-click the same tab as the channel number of the T-Link interface (card) used.

(3) P/PE-Link & ME-NET Registration dialog box

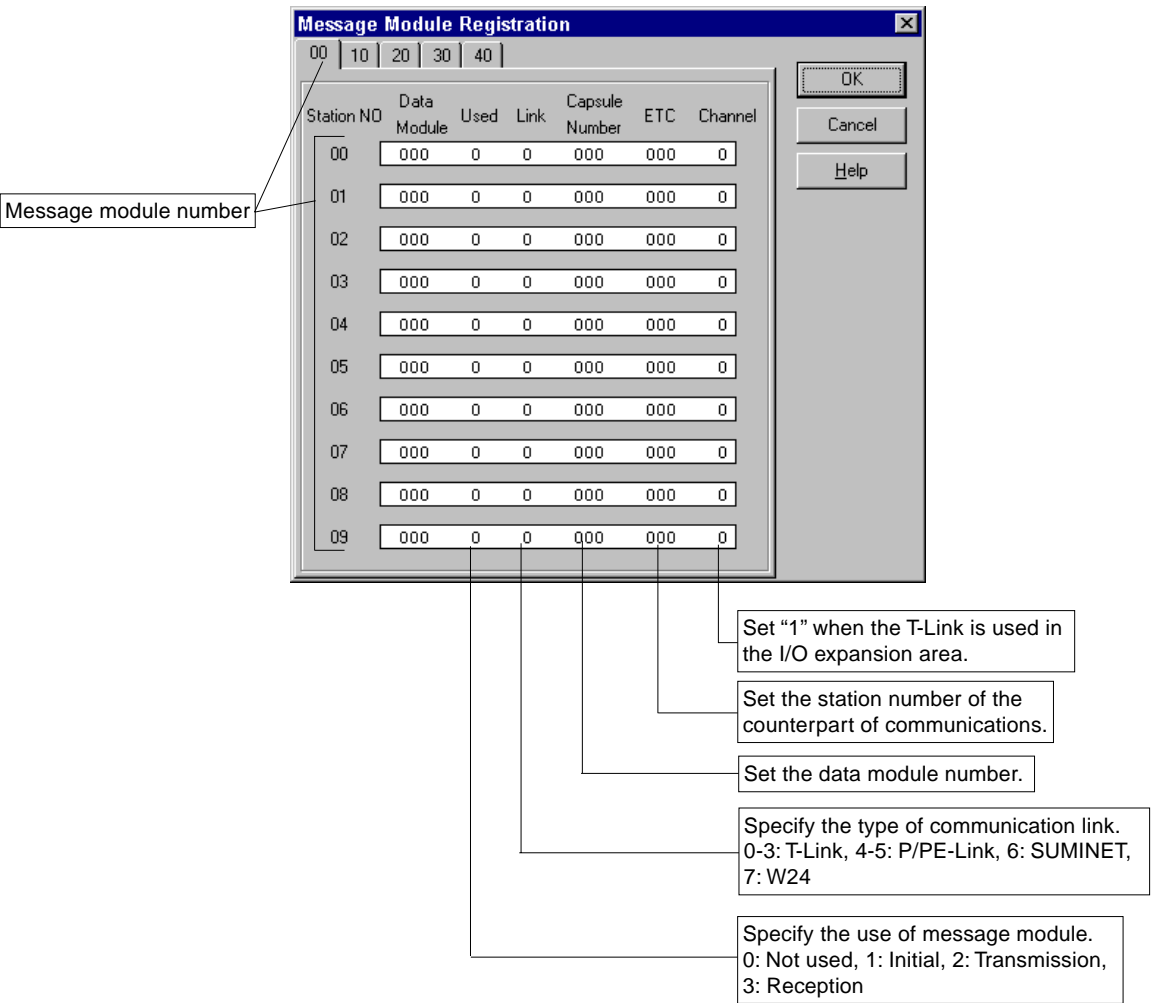
This is a dialog box for defining a P/PE-Link and ME-Net interface module (card).



The dialog box is titled "P/PE-Link & ME-Net Registration". It features two radio buttons at the top: "P-Link" (selected) and "PE-Link". To the right is a "Self Number" field with the value "00". Below these are "OK", "Cancel", and "Help" buttons. The "Station Configuration" section contains a "Station NO" field with "00" and a row of 16 checkboxes labeled 0 through F. The "Self Area" section contains four rows of fields: "H SP Bit", "H SP Word", "L SP Word", and "L SP Word", each with a value of "0" and a multiplier of "x32". At the bottom, there are three tabs: "P/PE-Link1", "P/PE-Link2", and "ME-Net".

(4) Message Module Registration dialog box

This is a dialog box for defining message communications.



The dialog box is titled "Message Module Registration". It has a tabbed interface with tabs labeled "00", "10", "20", "30", and "40". The "00" tab is active, showing a table with the following columns: "Station NO", "Data Module", "Used", "Link", "Capsule Number", "ETC", and "Channel". The table contains 10 rows, numbered 00 to 09. A callout box labeled "Message module number" points to the "Station NO" column. To the right of the table are "OK", "Cancel", and "Help" buttons. Below the dialog box, five callout boxes provide instructions for the table columns:

- Set "1" when the T-Link is used in the I/O expansion area.
- Set the station number of the counterpart of communications.
- Set the data module number.
- Specify the type of communication link. 0-3: T-Link, 4-5: P/PE-Link, 6: SUMINET, 7: W24
- Specify the use of message module. 0: Not used, 1: Initial, 2: Transmission, 3: Reception

2-8 Program Save/Open

Here, the method of saving a program which is being prepared and the method of opening a program which has been saved are explained.

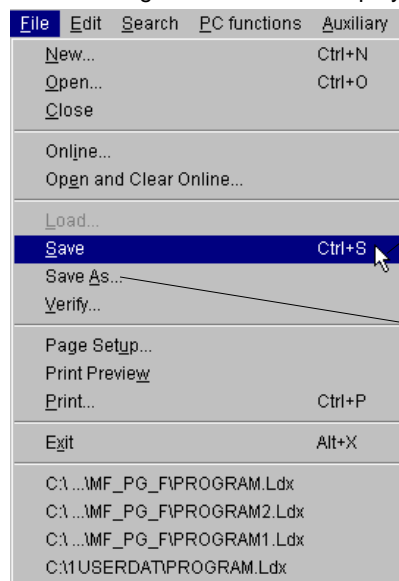
2-8-1 Saving a program

The method of saving a program which is being prepared (the content of the active program window) is explained below.

(1) Saving a program to a file

- ◇ Select the [File] menu.

The following commands are displayed.

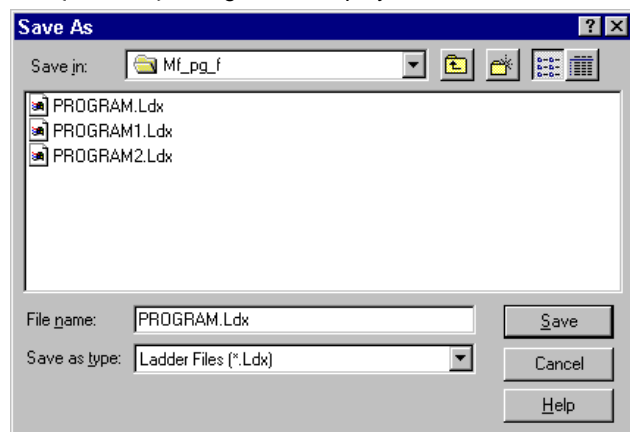


Saves the program to a program file.
When the program that has been saved to a program file once is modified and this command is executed, the original program file is overwritten.

Saves the program as a new program file.
It is possible to rename the program and save it to a file different from the drive/folder to which it has been saved.

- ◇ Select the [Save As...] command.

The {Save As} dialog box is displayed.



- ◇ Select a drive/folder to which the program is to be saved from the [Save in] list box or create a new folder.
- ◇ Enter the file name to which the program is to be saved in the [File name] text box.
- ◇ Left-click the [OK] button.
The program is saved as a new file.

(2) Contents of file during program save

When a program is saved in a file, the following contents are saved at the same time.

• To save in ladder file (.Ldx) format:

<*.LDX file>

- Information about the PLC model
- System definitions
- Ladder program

<*.TAG file>

- Address/tag name and descriptive statement

<*.CCT file>

- Line comment (text statement only; the instruction that points to the position of display of line comment is saved in "*.LDX file."

<*.CFG file>

- Configuration file (print environment setting, etc.)

• To save in D25P loader file (.Pgs) format:

<*.PGS file>

- To save in D25P loader file (.Pgs) format: Information about the PLC model
- System definition
- Ladder program

<*.CMM file>

- Comment files management file

<*.C?? file>

- Comment files with the following identifiers

Identifier	Description
.CMM	Comment files management file
.CB1	Comment file with B identifier
.CM1	Comment file with M identifier
.CK1	Comment file with K identifier
.CT1	Comment file with T identifier
.CC1	Comment file with C identifier
.CD1	Comment file with D identifier
.CF1	Comment file with F identifier
.CA1	Comment file with A identifier
.CL1	Comment file with L identifier
.CS1	Comment file with S identifier
.CBW	Comment file with WB identifier
.CMW	Comment file with WM identifier
.CKW	Comment file with WK identifier
.CFW	Comment file with WF identifier
.CAW	Comment file with WM identifier
.CLW	Comment file with WL identifier
.CSW	Comment file with WS identifier
.CST	Comment file with TS identifier
.CRT	Comment file with TR identifier
.CSC	Comment file with CS identifier
.CRC	Comment file with CR identifier
.CDB	Comment file with BD identifier

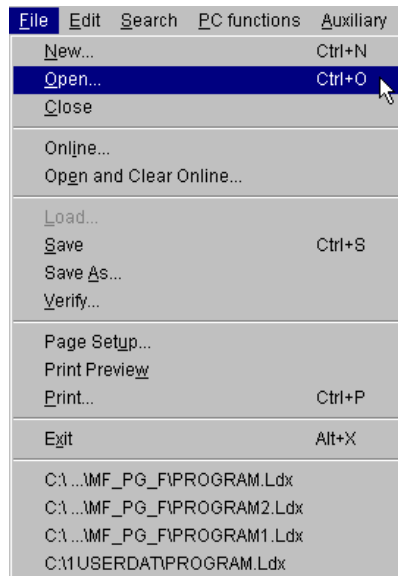
2-8 Program Save/Open

2-8-2 Opening a program file

The method of opening a program file which has been saved is explained below.

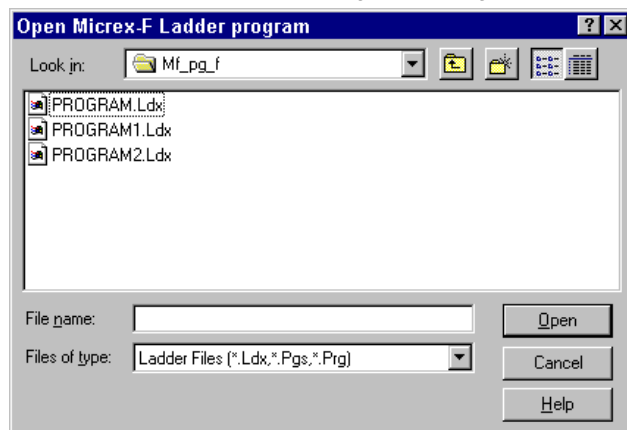
- ◇ Select the [File] menu.

The following commands are displayed.



- ◇ Select the [Open...] command.

The {Open Micrex-F Ladder Program} dialog box is displayed.



- ◇ Select the drive/folder to which the program file has been saved from the [Look in] list box.
- ◇ Select or enter the saved file name in the [File name] text box.
- ◇ Left-click the [Open] button.

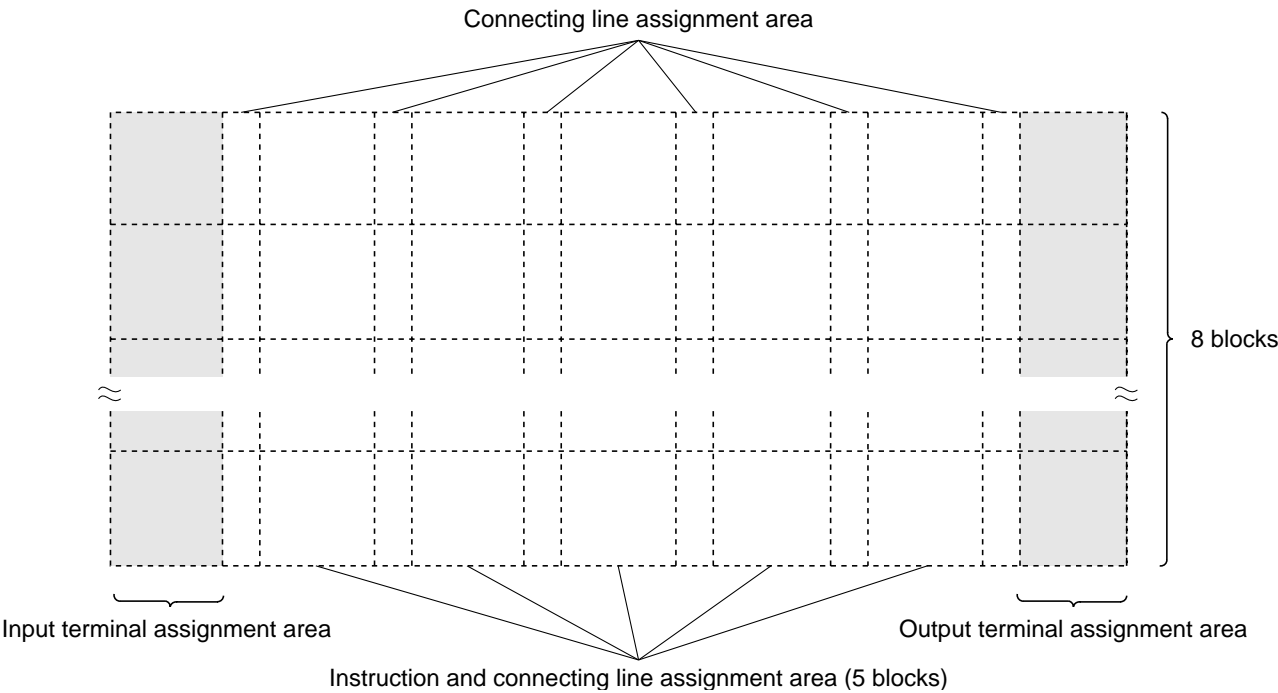
The program file is displayed in the window.


2-9 Block Diagram Instruction



The following explains editing of the block diagram.




2-9-1 Edit area in block diagram

The edit area for a single line in the block diagram is shown below. Inputs, outputs, and instructions, etc. are assigned to this area.



Input terminal assignment area: Only  [Block diagram input] can be assigned.

Output terminal assignment area: Only  [Block diagram output] and  [Output] can be assigned.

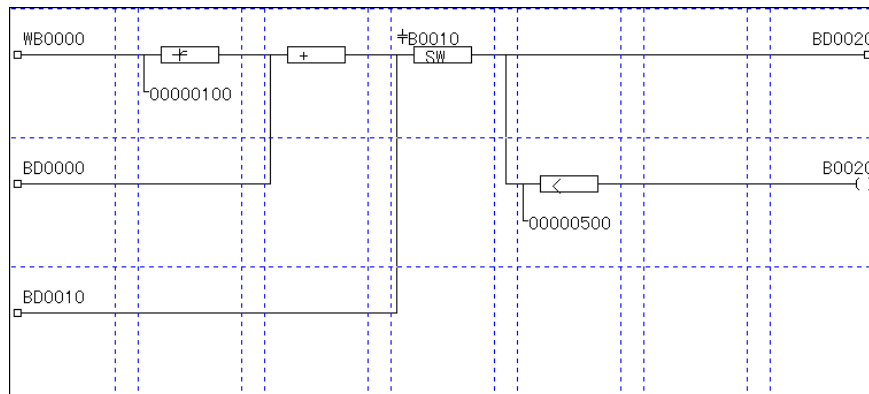
Connecting line assignment area: Only  [Vertical connection],  [Jump], and  [Path] can be assigned.

Instruction/connecting line assignment area: Instructions and connecting lines can be assigned.

2-9 Block Diagram Instruction

2-9-2 Example of editing of block diagram

The following explains the procedure for creating a block diagram using the following line as an example. In this case, the tag input is omitted.

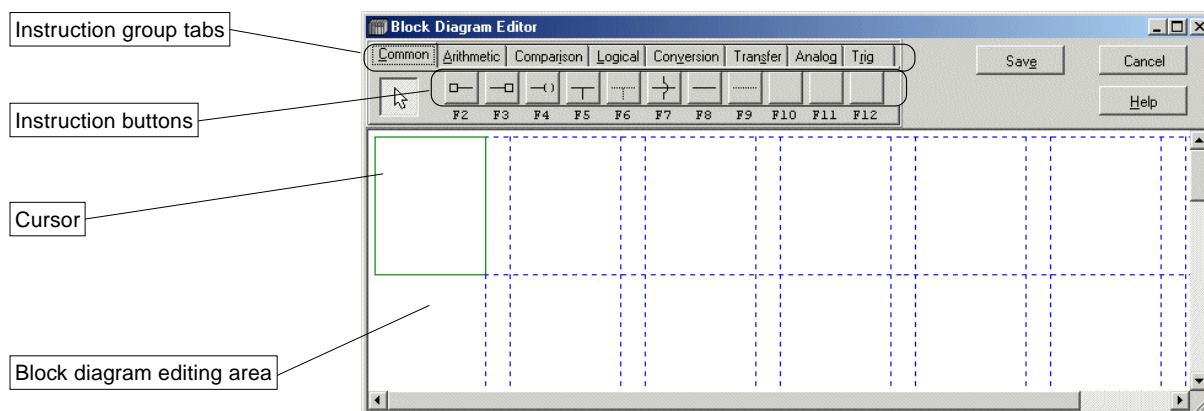



<Program description>

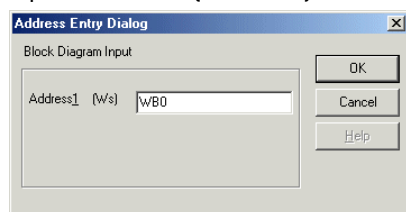
- 1) Data input from WB0 is limited to 100.
- 2) Data of 1) and data of BD0 are added.
- 3) SW of B10 is ON: The result of 2) is output to BD20 and used as an input of a comparison instruction.
SW of B10 is OFF: The contents of BD10 is output to BD20 and used as an input of a comparison instruction.
- 4) If the result of 3) is smaller than 500, B20 is turned ON; otherwise, B20 is turned OFF.

<Example of operation>

- ◇ Select [Insert Block Diagram] from the [Edit] menu.
The "Block Diagram Editor" window is displayed.

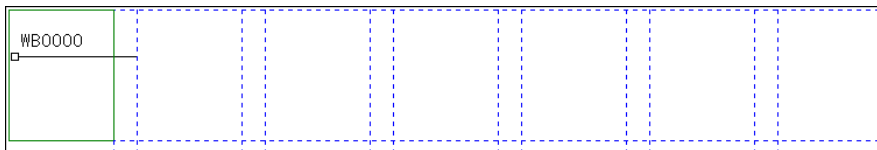



- ◇ Basically, input a program from the left to right, from the top downward.
Left-click  [Input block diagram] from the [Common] tab.
- ◇ Move the cursor to the upper left portion in the block diagram and then left-click it.
The {Address Entry Dialog} box is displayed.
Input <WB0> for {Address1} and then left-click the [OK] button.

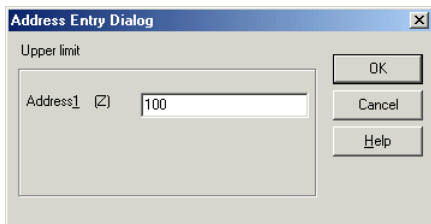


2-9 Block Diagram Instruction

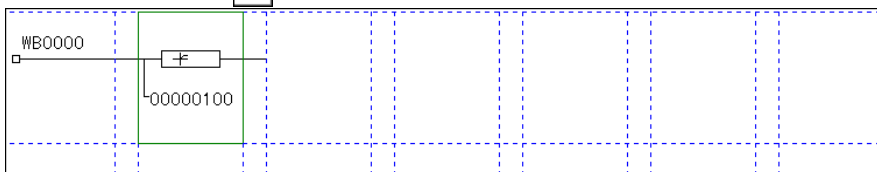
- ◇ As shown below, block diagram input {WB0} is displayed.





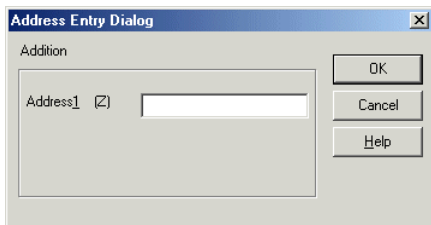
- ◇ Left-click the  [Upper limit] button of the [Analog] tab.
- ◇ Move the cursor to the right of {Block diagram input} and then left-click it. The {Address Entry Dialog} box is displayed. Input <100> in {Address1} and then left-click the [OK] button.



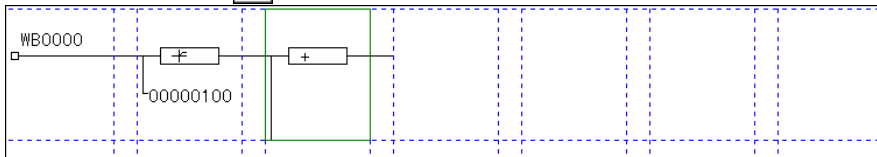
- ◇ As shown below, the  {Upper limit} instruction is connected.




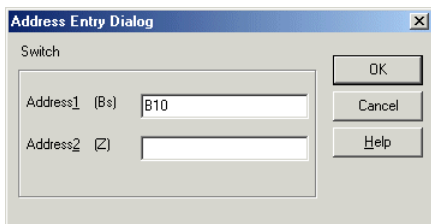
- ◇ Left-click the  [Addition] button of the [Arithmetic] tab.
- ◇ Move the cursor to the right of the {Upper limit} instruction and then left-click it. The {Address Entry Dialog} box is displayed. The address will be input later when connecting  {Block diagram input}. In this case, left-click the [OK] button without inputting any data.



- ◇ As shown below, the  {Addition} instruction is connected.

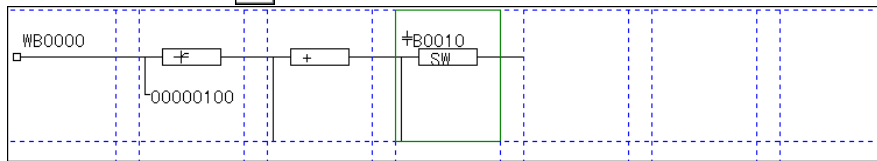



- ◇ Left-click the  [Switch] button of the [Transfer] tab.
- ◇ Move the cursor to the right of the {Addition} instruction and then left-click it. The {Address Entry Dialog} box is displayed. Input <B10> in {Address1}, leave {Address 2} blank (it will be input later) and then left-click the [OK] button.

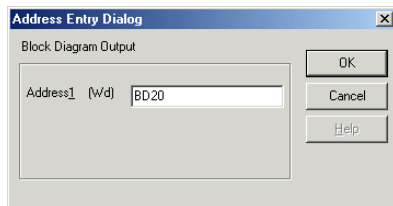


2-9 Block Diagram Instruction

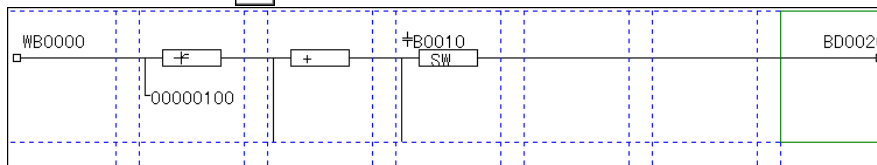
- ◇ As shown below, the  {Switch} instruction is connected.




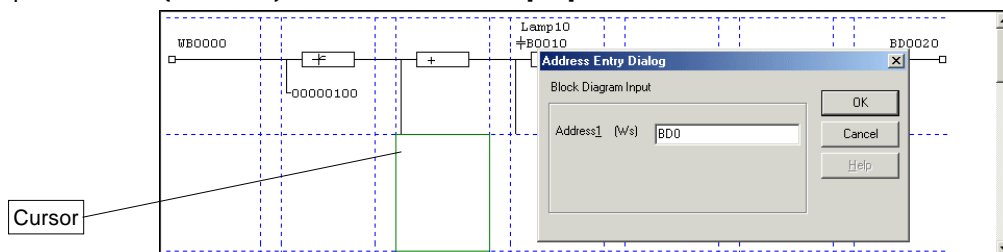
- ◇ Left-click the  [Block diagram output] button of the [Common] tab.
- ◇ Move the cursor to the right of the {SW} instruction and then left-click it. The {Address Entry Dialog} box is displayed. Input <BD20> in {Address1} and then left-click the [OK] button.




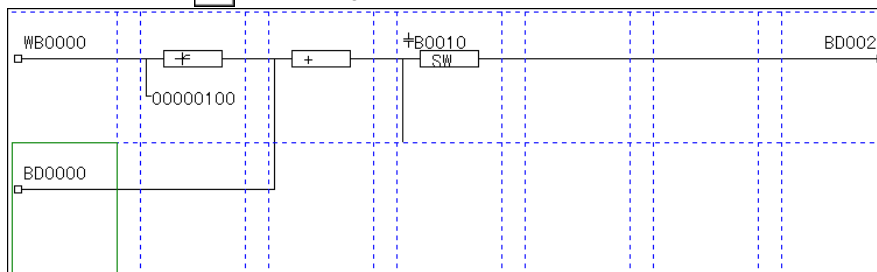
- ◇ As shown below, the  {Block diagram output} is connected.




- ◇ Connect the {Block diagram input} for the {Addition} instruction. Left-click the  [Block diagram input] button.
- ◇ Move the cursor below the {Addition} instruction and then left-click it. The {Address Entry Dialog} box is displayed. Input <BD0> in {Address1} and then left-click the [OK] button.



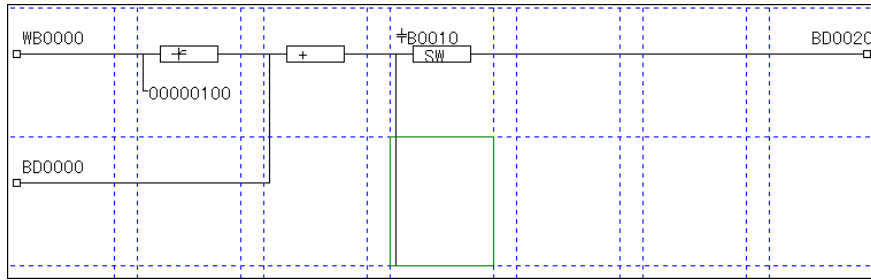
- ◇ As shown below,  {Block diagram input} is connected to the {Addition} instruction.




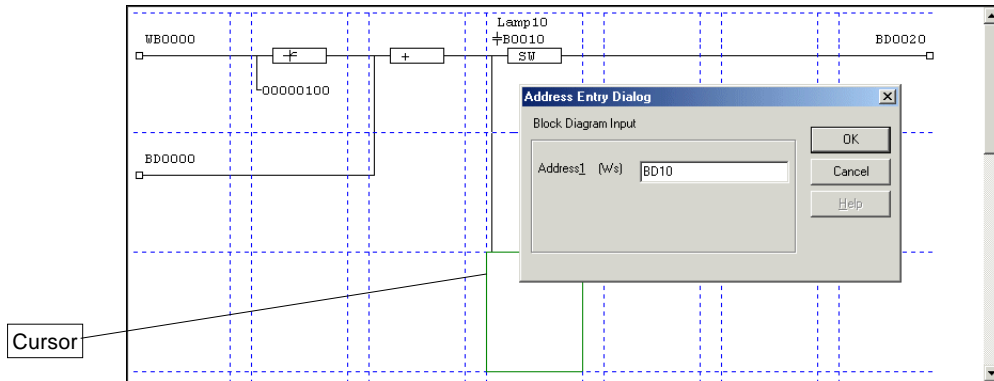
- ◇ Extend the vertical connecting line of {SW}. Left-click the  [Vertical connection] button.


2-9 Block Diagram Instruction

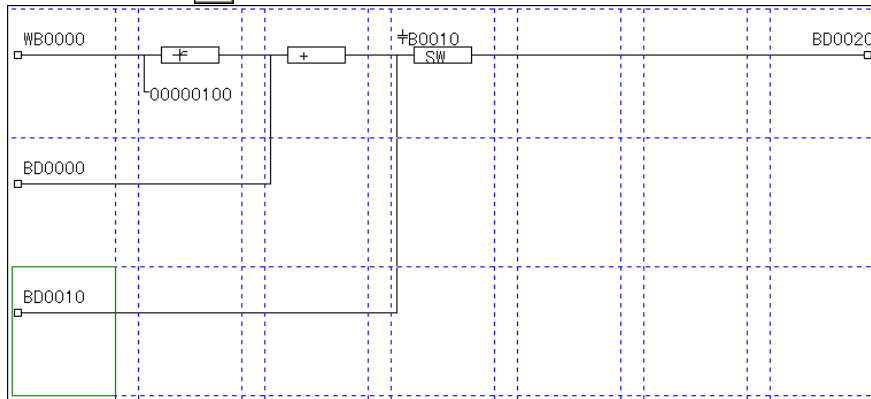
- ◇ Move the cursor below the {SW} instruction.
A vertical connecting line is connected.




- ◇ Connect {Block diagram input} to the vertical connecting line.
Left-click the  [Block diagram input] button.
- ◇ Move the cursor below the vertical connecting line and then left-click it.
The {Address Entry Dialog} box is displayed.
Input <BD10> in {Address1} and then left-click the [OK] button.

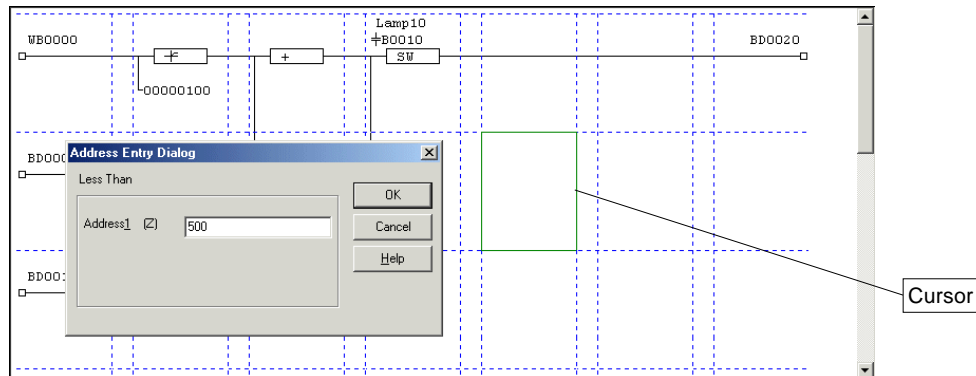


- ◇ As shown below,  {Block diagram input} is connected to the vertical connecting line.

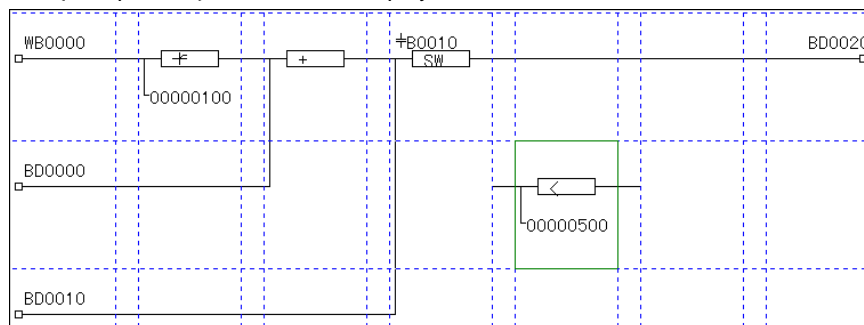



2-9 Block Diagram Instruction

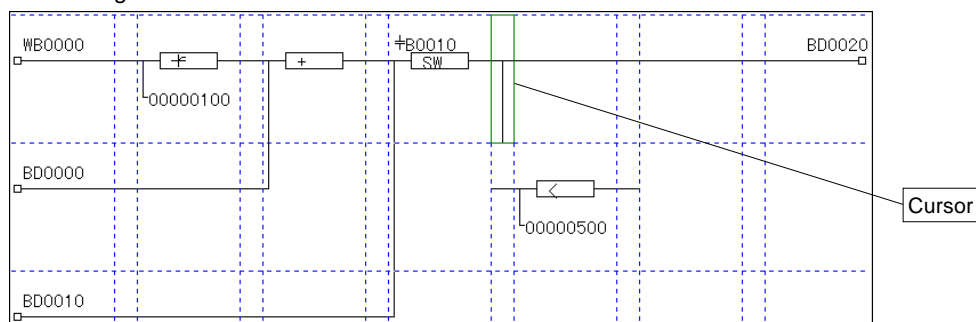
- ◇ Place the {Comparison} instruction.
- Left-click the  [Comparison result is smaller] button of the [Comparison(I)] tab.
- ◇ Move the cursor to the bottom right portion of the {SW} instruction.
- The {Address Entry Dialog} box is displayed.
- Input <500> in {Address1} and then left-click the [OK] button.




- ◇ The {Comparison} instruction is displayed as shown below.

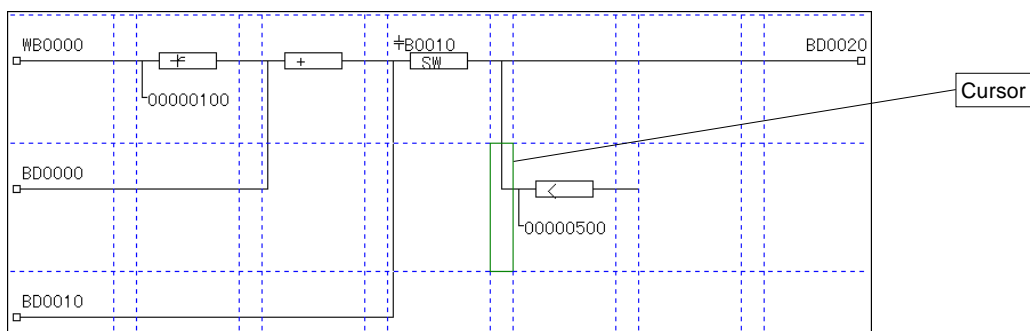



- ◇ Connect the output of the {SW} instruction and the input of the {Comparison} instruction.
- Left-click the  [Vertical connection] button of the [Common(C)] tab.
- ◇ Move the cursor to the {Vertical connection assignment area} to the right of the {SW} instruction. A vertical connecting line is connected.

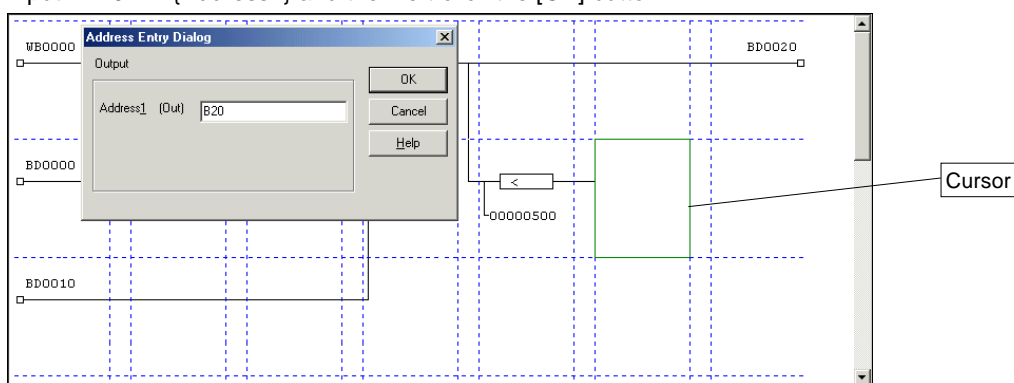


- ◇ Left-click the  [Vertical connection] button again.
- ◇ Move the cursor below the vertical connecting line and then left-click it.
- As shown below, a vertical connecting line and the input of the {SW} instruction are connected.

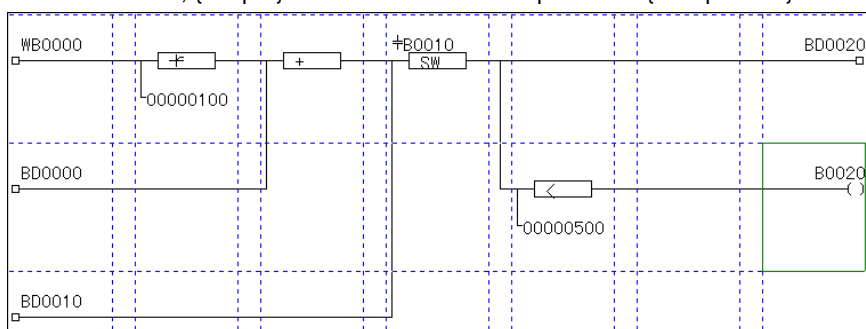
2-9 Block Diagram Instruction



- ◇ Left-click the  [Output] button.
- ◇ Move the cursor to the right of the {Comparison} instruction and then left-click it. The {Address Entry Dialog} box is displayed. Input <B20> in {Address1} and then left-click the [OK] button.



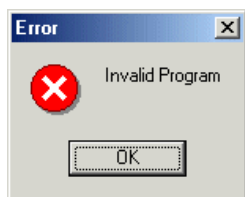
- ◇ As shown below, {Output} is connected to the output of the {Comparison} instruction.



- ◇ Left-click the [Save] button. The {Block Diagram Editor} window closes. The block diagram created is inserted into the Ladder edit screen.



If the [Save] button is left-clicked before completing creation of a line, an error results. In this case, the edit screen cannot be closed.



2-9 Block Diagram Instruction

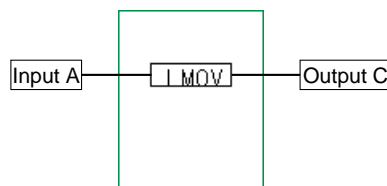
2-9-3 Notes on editing block diagram

(1) Instructions that can be connected to each terminal

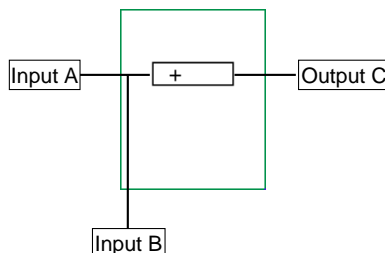
Instructions are categorized into the following three types according to the number of I/O terminals and the type of output.

- 1) 1 input (WORD), 1 output (WORD) type ... INV, LMOV instructions, etc.
- 2) 2 inputs (WORD), 1 output (WORD) type ... Addition, subtraction, a maximum, AND instructions, etc.
- 3) 2 inputs (WORD), 1 output (output) type ... Comparison, TBIT instructions, etc.

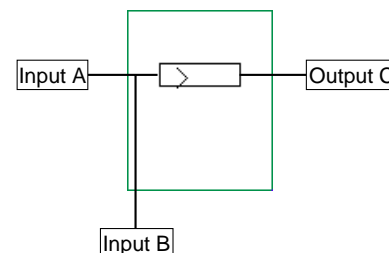
Example of 1)







Example of 2)



Example of 3)



- For {Input A}, only  [Block diagram input] or a connecting line can be connected.
- For {Input B},  [Block diagram input] and a connecting line can be connected and an address or constant can be input.
- For {Output C},  [Block diagram output] or a connecting line can be connected for cases 1) and 2), and only  [Output] can be connected for case 3).


(2) Deleting instructions, connecting lines, etc.

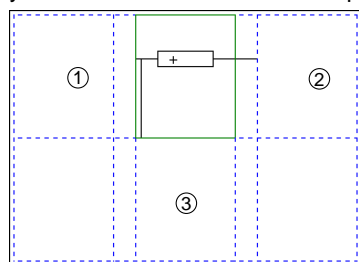
To delete, move the cursor to the cell (frame) and then press the [DEL] key.


(3) Inserting instructions, connecting lines, etc.

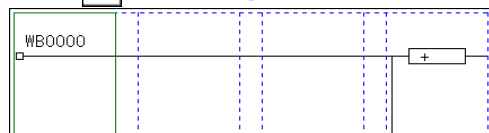
There is no insertion function. Overwrite is possible.


(4) Arranging block diagram input (output)

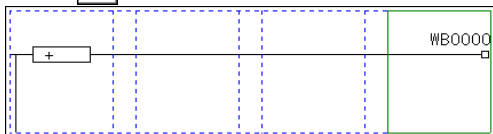
For block diagram input (output), a connecting line is automatically connected to input (output) terminal assignment area. It is not necessary to use  [Path] to connect connecting lines. When it is placed under a 2 input type instruction, it is vertically connected to an instruction input.




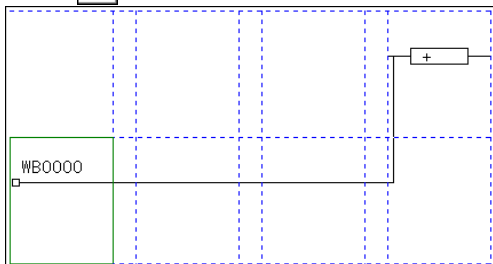
When  [Block diagram input] is placed in cell 1)





When  [Block diagram output] is placed in cell 2)

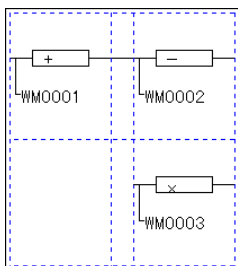





When  [Block diagram input] is placed in cell 3)

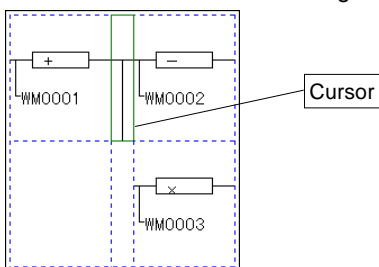




(5) Right-angled connection of block diagram (right-angled connection of a vertical line and a horizontal line)

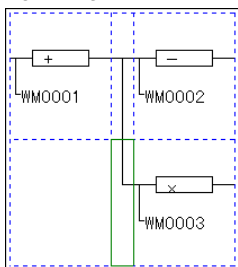
In the line below, follow the steps below to make right-angled connection of the output of  [Addition] and the input of  [Multiplication].



- ◇ Left-click the  [Vertical connection] button of the [Common] tab.
- ◇ Move the cursor to the {Vertical connection assignment area} between  [Addition] and  [Subtraction] and the left-click it. A vertical connecting line is connected.



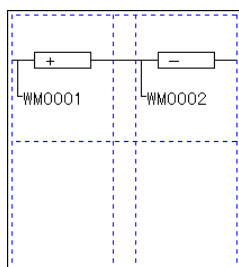
- ◇ Left-click the  [Vertical connection] button again.
- ◇ Move the cursor below the vertical connecting line and then left-click it. As shown below, the vertical connecting line and the input of the  [Multiplication] instruction is connected in the right angle.






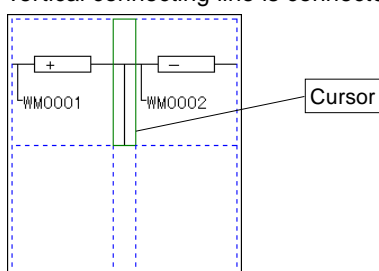
2-9 Block Diagram Instruction




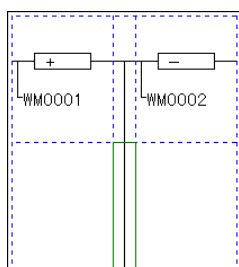
Follow the steps below to write the [Multiplication] instruction later.





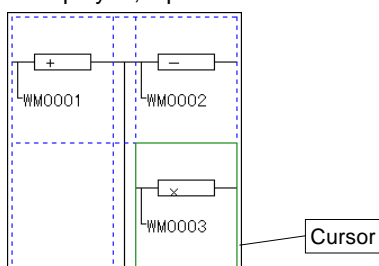
- ◇ Left-click the  [Vertical connection] button of the [Common] tab.
- ◇ Move the cursor to the {Vertical connection assignment area} between  [Addition] and  [Subtraction]. A vertical connecting line is connected.





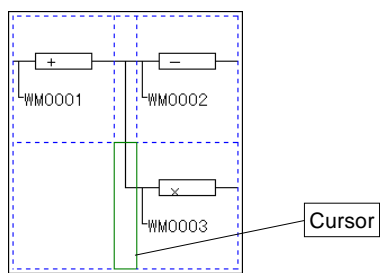
- ◇ Left-click the  [Vertical connection] button.
- ◇ Move the cursor below the vertical connecting line and then left-click it. A vertical connecting line is connected.



- ◇ Left-click the  [Multiplication] button of the [Arithmetic operation] tab.
- ◇ Move the cursor under the  [Subtraction] instruction and then left-click it. When the {Address Entry Dialog} box is displayed, input an address and then left-click the [OK] button.

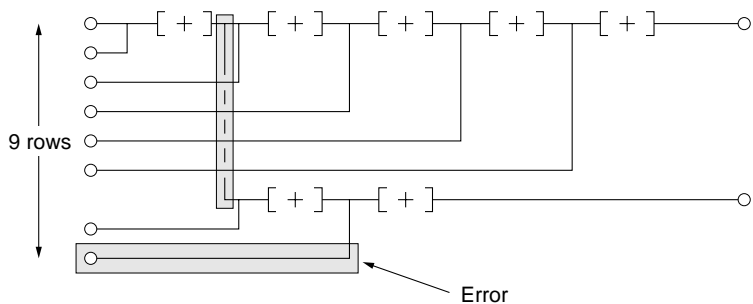


- ◇ Left-click the  [Vertical connection] button of the [Common] tab.
- ◇ Move the cursor to the vertical connecting line to the right of the  [Multiplication] instruction and then left-click it. The vertical connecting line changes to right-angled connection.

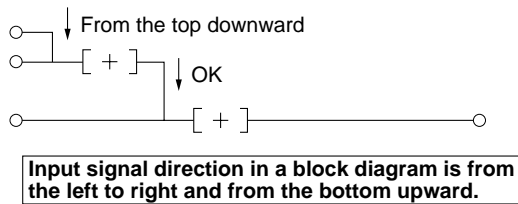


2-9-4 Limitations on block diagram

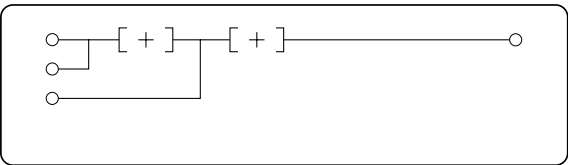
1) A line consisting of 9 rows or more cannot be created.



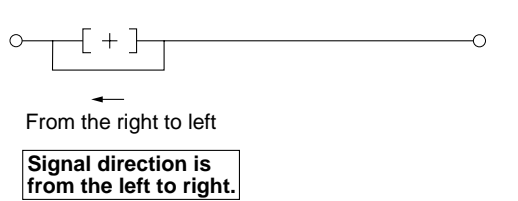
2) For the leftmost symbol, a line in which an input signal flows from the top downward cannot be created.



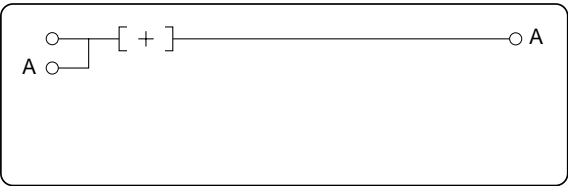
Solution



3) A line in which a signal flows from the right to left cannot be created.



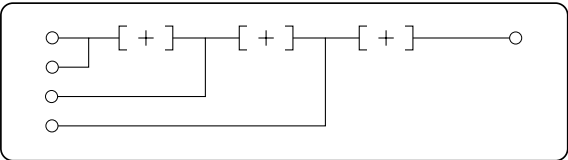
Solution



4) A line in which outputs are ORed cannot be created.
This is a logical error which must not be done.



Solution



Section 3 Online Operations

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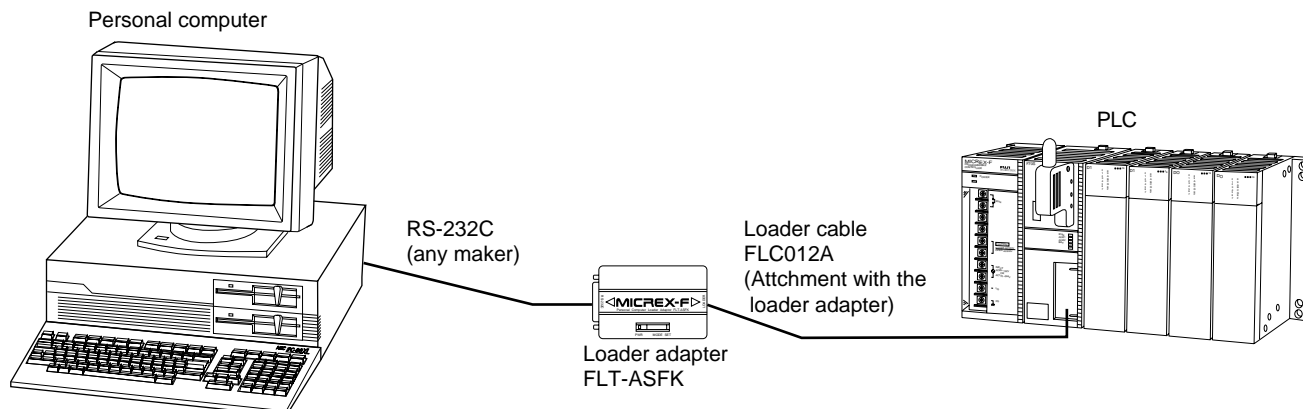
Section 3 Online Operations

3-1 Preparations for Online Connection

3-1-1 Hardware system configuration

There are two methods for connecting the PC Loader online to the PLC.

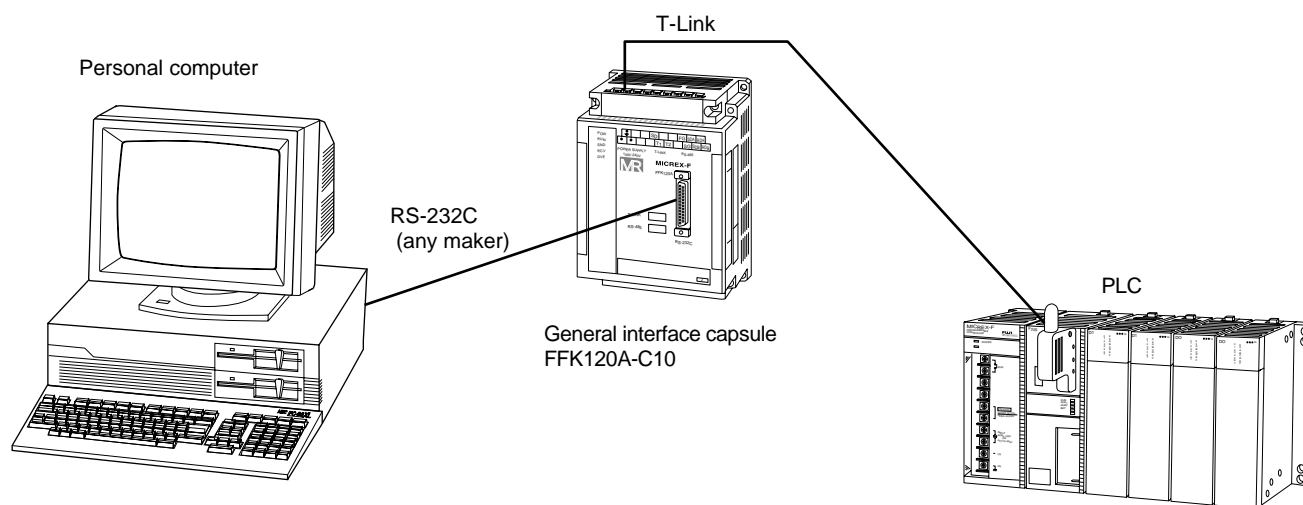
(1) System using loader adapter (Type: FLT-ASFK) to connect to PC loader connector



- Note

The loader adapter cannot be used with T-Link converter (FRC100A-G02), loader outlet (FTC020T), or Programmable Operation Display (UD30 series) with built-in PLC functions.

(2) System using general-purpose interface capsule (Type: FFK120A-C10) to connect to the PLC via T-Link



3-1 Preparations for Online Connection

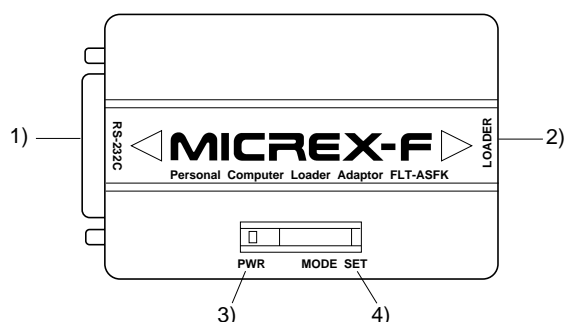
3-1-2 Setting switches

Before turning on the system power supply, set the switches of the loader adapter (or general-purpose interface capsule). The system recognizes the switch settings only when the system power supply is on. Normally, the following switch settings are recommended.

- Baud rate: 9600 or 19200 or 38400 bps
- Data bit: 8 bits
- Parity bit: None
- Stop bit: 1 bit

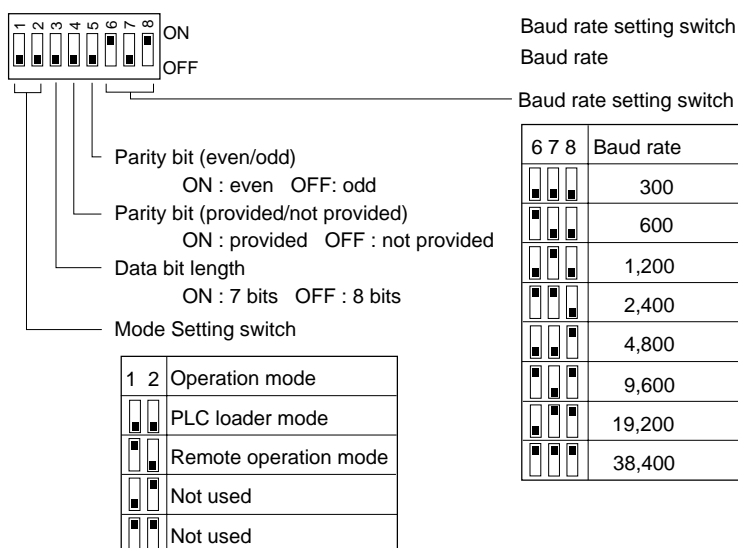
(1) Setting loader adapter (Type: FLT-ASFK)

• Component parts



- 1) D-sub25-pin connector (female)
Connect an RS-232C cable (any maker) to this connector.
- 2) Loader connector
Connect the furnished loader cable to this connector.
- 3) Power indicator lamp
Indicates that the adapter power supply is on.
- 4) Mode setting switch
Used to set a mode of operation of the adapter.
(The diagram shows factory settings.)

• Setting mode setting switch



Note:

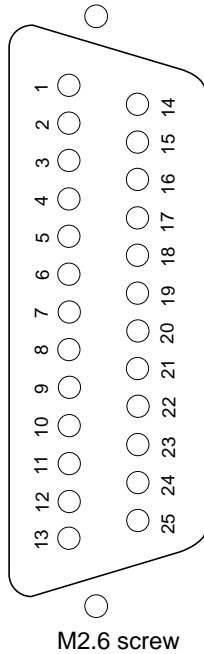
- The other RS-232C settings are as follows.
Start bit : 1
Stop bit : 1
- The factory settings are as follows.
Operation mode : PLC loader mode
Data bit length : 8 bits
Parity bit : None
Baud rate: 9600 bps
- A baud rate of 19,200 or higher cannot be set unless the RS-232C of the personal computer used is compatible with that baud rate.
- A baud rate of 38,400 cannot be set unless the load adapter, as well as the RS-232C, is compatible with that baud rate. The baud rate of the load adapter is indicated in the baud rate table on the back of the load adapter.

3-1 Preparations for Online Connection

• Connector pins and signal names

The RS-232C interface connector pin arrangement and signal names are as follows.

<Pin arrangement as viewed from front>



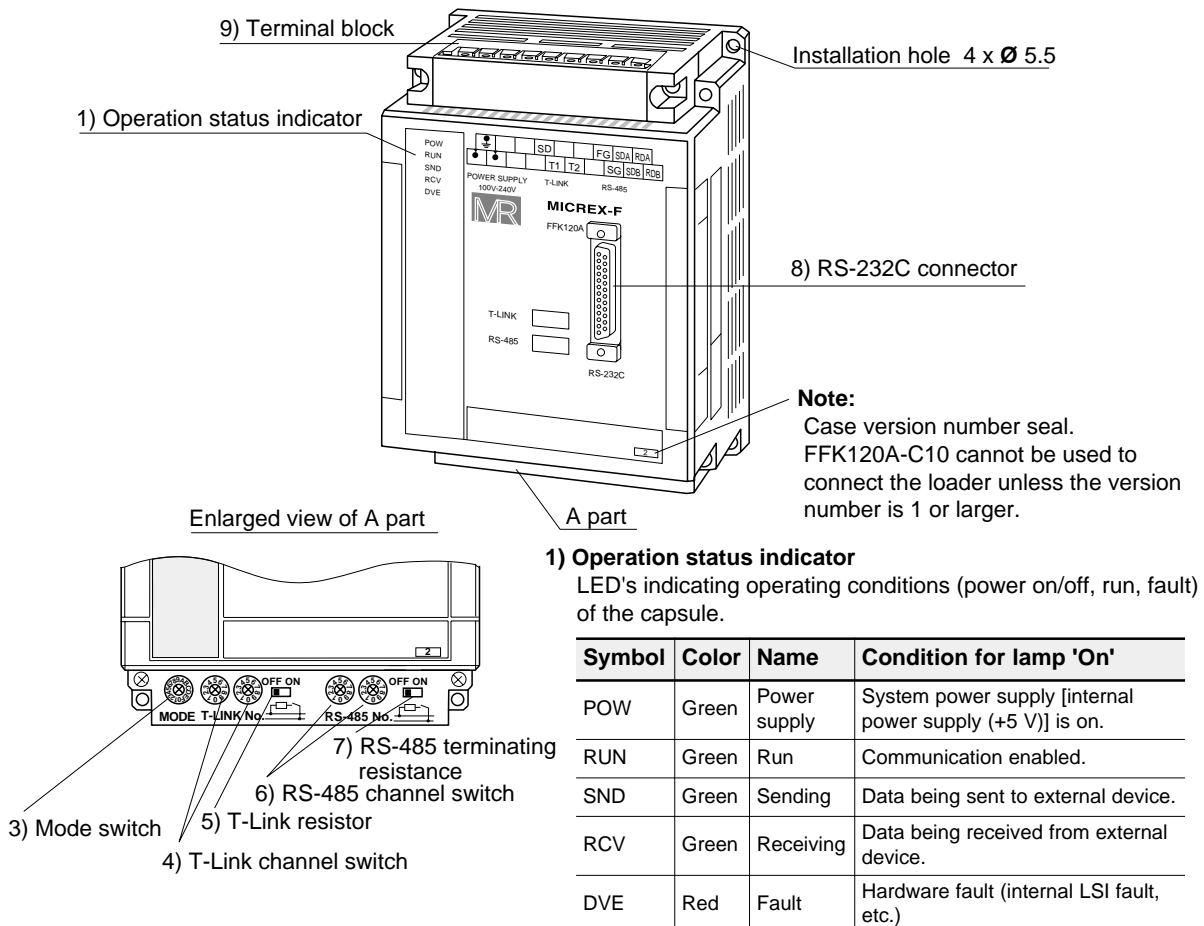
<Signal name>

Pin No.	Signal name	Signal direction FFK - Personal computer	Description
1	FG		Frame ground
2	SD	⇒	Send data
3	RD	⇐	Receive data
4	RTS	⇒	Request to send
5	CTS	⇐	Clear to send
6	DSR	⇐	Data set ready
7	SG		Signal ground
20	DTR	⇒	Data terminal ready

The adapter connector is a female type. Use a male connector for the cable.

(2) Setting general-purpose interface capsule (Type: FFK120A-C10)

• Component names



3-1 Preparations for Online Connection

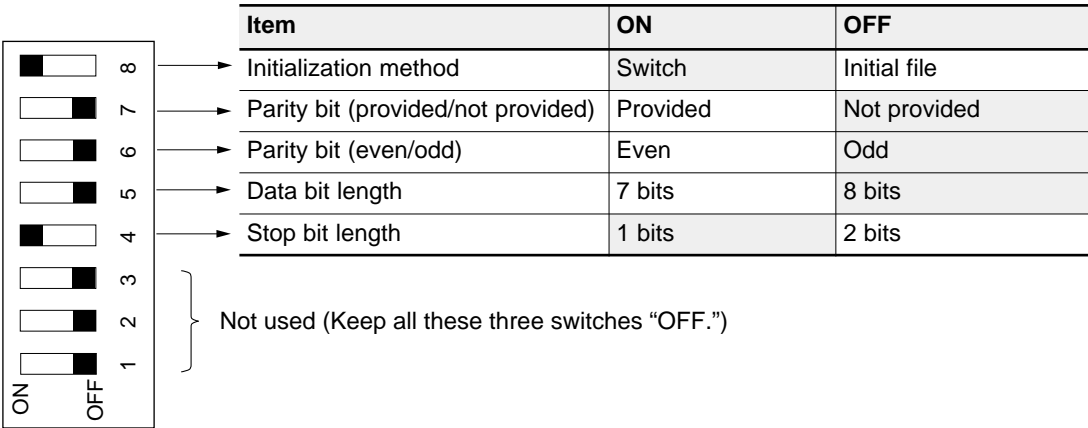
2) Setting RS-232C parameters

Set the character configuration switch and the baud rate setting switch according to the RS-232C parameter settings on the loader side.

For a detailed explanation of the method of setting the switches, refer to the User's Manual (FH088) for FFK120A-C10.

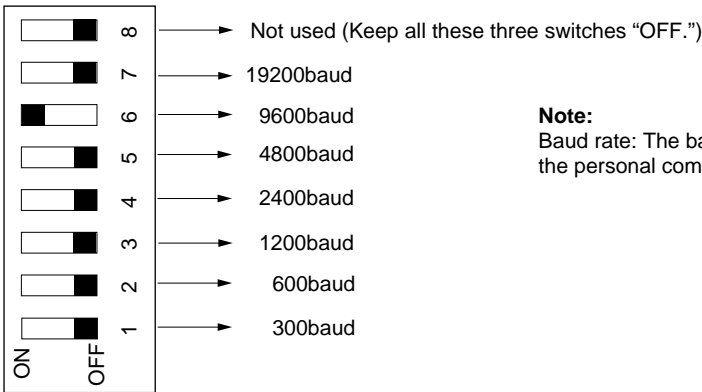
The following diagrams show the switch settings during factory shipment.

• Character Formation switch



• Baud rate setting switch

Set only one of these switches to "ON."



Note:
Baud rate: The baud rate of 19,200 cannot be set unless the personal computer RS-232C used is compatible with that baud rate.

3) Setting MODE switch

This switch is used to set the mode of operation of the general-purpose interface capsule. When the personal computer loader is used, set the switch to "B."



4) Setting T-Link address

Setting a T-Link address is unnecessary when the general-purpose interface capsule is used for the personal computer loader. Even if any T-Link address is set, it is ignored.

3-1 Preparations for Online Connection

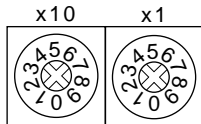
5) T-Link terminating resistor ON/OFF switch

When the interface capsule is the T-Link end terminal, set this switch to ON to connect the internal terminating resistance. (The switch is set to OFF during factory shipment.)

6) RS-485 channel switch RS-485 transmission line station number switch

In a 1:N configuration, when the interface capsule is used as a slave (N-side station) by RS-485, set a station number for the interface capsule. The switch setting is valid only when the MODE switch described above is set to 2, 3, or C. In any other mode, the switch setting is ignored.

The setting range is from 00 to 99. Use care not to set the same number for more than one interface capsule. (The switch is set to "00" during factory shipment.)



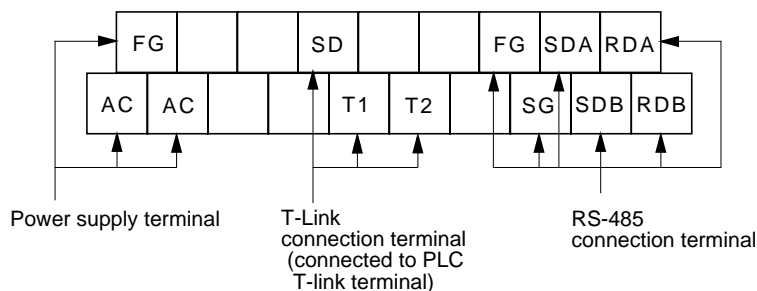
7) RS-485 transmission line terminating resistor ON/OFF switch

When interface capsules are the terminal stations of an RS-485 transmission line, set this switch to ON to connect the internal terminating resistance. For both the send and receive lines, two terminating resistances are connected at the same time.

(The switch is set to "OFF" during factory shipment.)

8) Terminal block

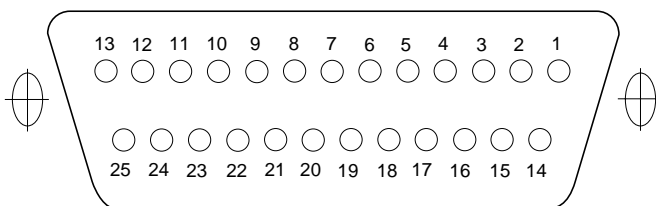
The terminal base of the interface capsule has three terminals, one each for power supply, T-Link connection, and RS-485 transmission line connection.



9) RS-232C connector

- Connector pin arrangement and signal names

<Pin arrangement viewed from front>



The adapter connector is a female type.
Use a male connector for the cable.

<Signal name>

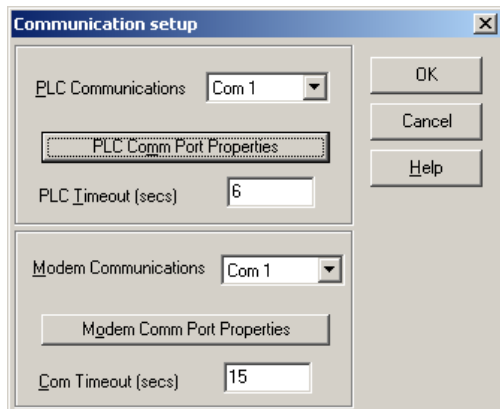
Pin No.	Signal name	Signal direction Interface capsule	External device	Description
1	FG			Frame ground
2	SD	⇒		Send data
3	RD	⇐		Receive data
4	RTS	⇒		Request to send
5	CTS	⇐		Clear to send
6	DSR	⇐		Data set ready
7	SG			Signal ground
20	DTR	⇒		Data terminal ready

3-1 Preparations for Online Connection

3-1-3 Setting communication parameters for the loader

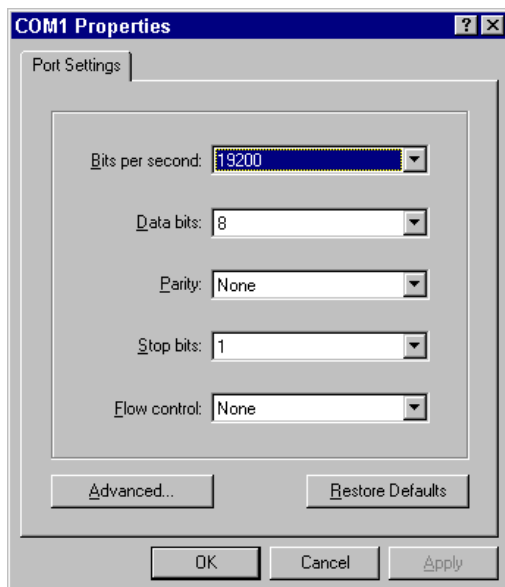
Here, the procedure for adjusting communication parameters of the personal computer loader to those of the loader adapter (or general-purpose interface capsule) is explained.

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



Increase [Communication timeout(second)(T)] as required. When reading a large program, input a value which is greater than 100 or 200.

- ◇ Set port parameters. Set the same communication parameters as those of the loader adapter (or general-purpose interface capsule). Select [None] for [Flow control]. 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.

3-2 Online Connection

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

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

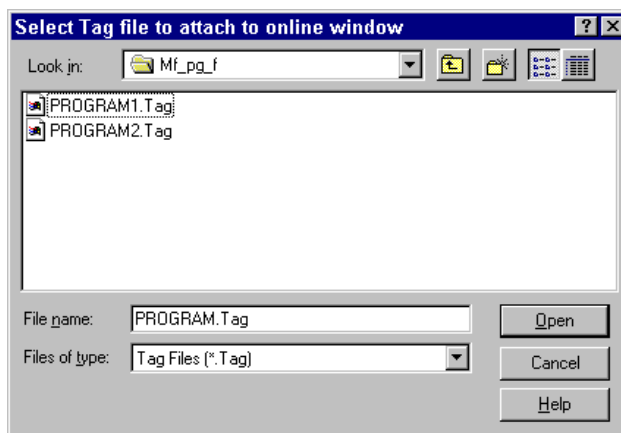
After finishing "3-1 Preparations for online connection," use the following procedure for online connection.

- ◇ 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.

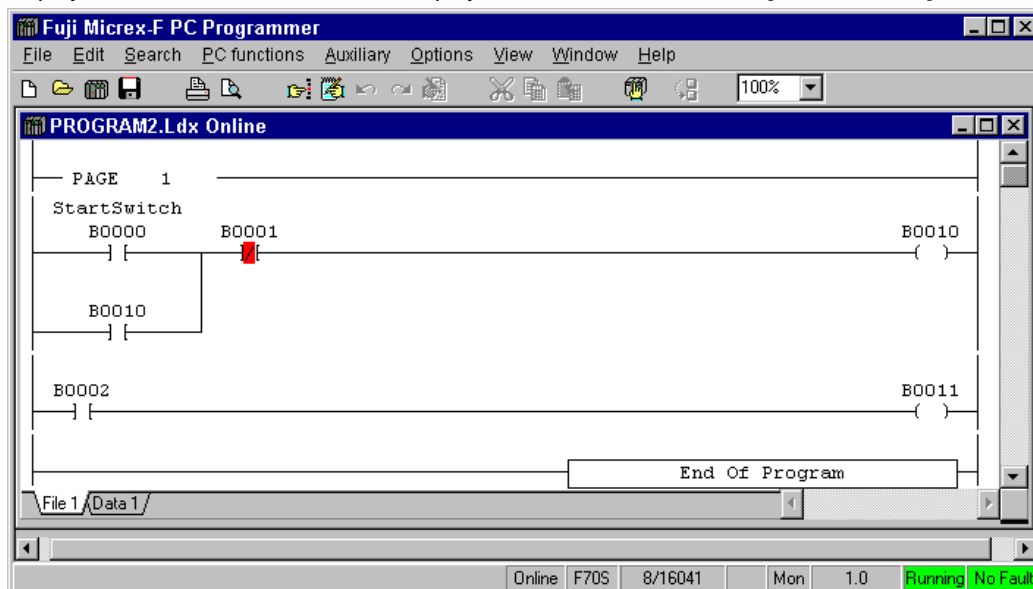


A tag is like a label which can be attached to any PLC address.

For a detailed explanation of tags, refer to "Section 2."



- ◇ Reading status is indicated on the progress dialog. When the reading is completed, the PLC ladder program is displayed on the screen. The screen displayed at this time is called an [online window].



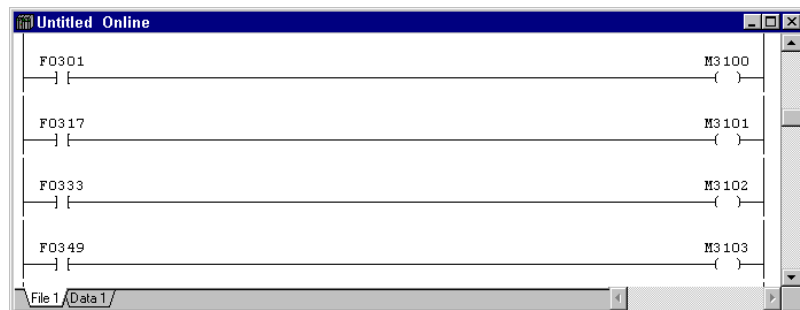
3-2 Online Connection

Changing sheet displayed on the window

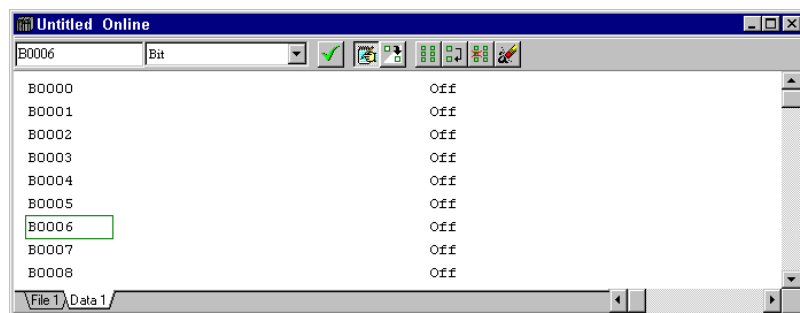
[File 1] and [Data 1] tags are displayed at lower left on the program window so that you can change between "ladder sheet" and "data sheet" screens.

Left-clicking either tag displays the corresponding sheet.

Ladder program sheet screen



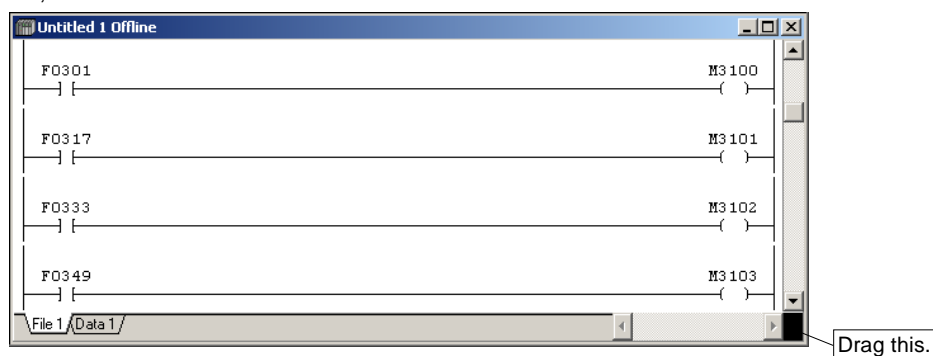
Data sheet screen



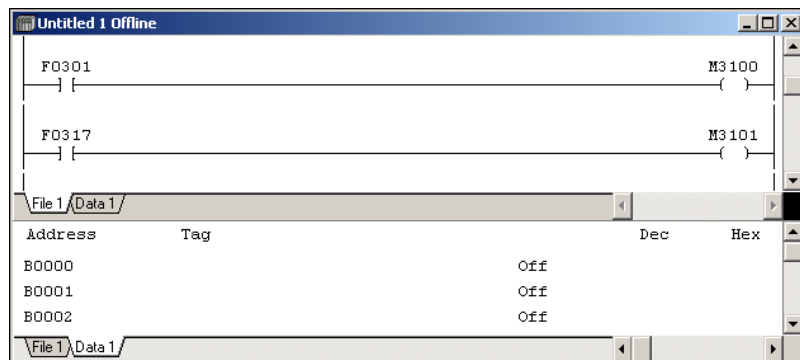
Window separation

When the window separation part under the vertical scroll bar on the right of a window is dragged, the window is separated into two.

Position the cursor on the window separation part, and it will change to the $\frac{\boxplus}{\boxminus}$ mark. While pressing the left side button of the mouse, move the cursor in the direction above.



Sample window separation

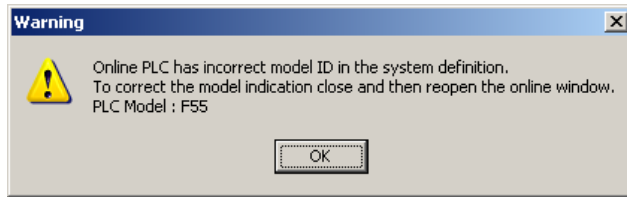


To restore the original window, double-click the window separation part. Or move it to the lowermost position.

3-2 Online Connection



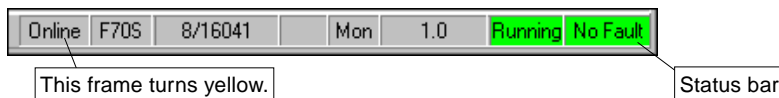
When the PLC is started after the personal computer is online-connected to the PLC with the PLC kept stopped, the following dialog box may appear. In this case, close (not minimize) the online window once, then reopen it.



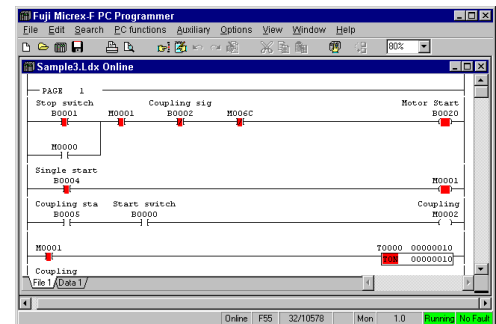
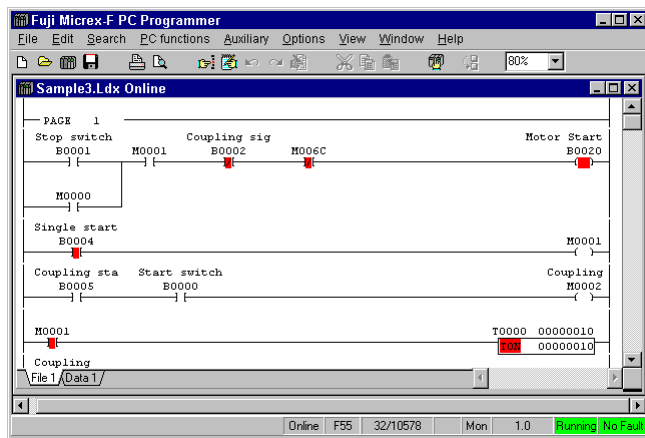
This can occur when, for example, a program with the wrong PLC model setting is transferred to the PLC.



While a PLC program is being monitored, the “Online” frame on the status bar may turn yellow. (This tends to occur easily when there are many contacts/outputs and data instructions which are being displayed on the screen, especially when they are displayed in maximum size on a high-definition display device or displayed in reduced size by changing the magnification of program display.)



While the “Online” frame is yellow, the ON/OFF conditions of contacts and outputs in the program and data values in data instructions instruction data may not be displayed correctly. In this case, increase the magnification of display or reduce the display area to decrease the number of instructions which are displayed on the screen at a time.



When the normal condition of display is recovered, the yellow color of the “Online” frame disappears.

3-3 Save PLC Content to File

3-3-1 Save PLC program

Here, the method of saving a PLC 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.

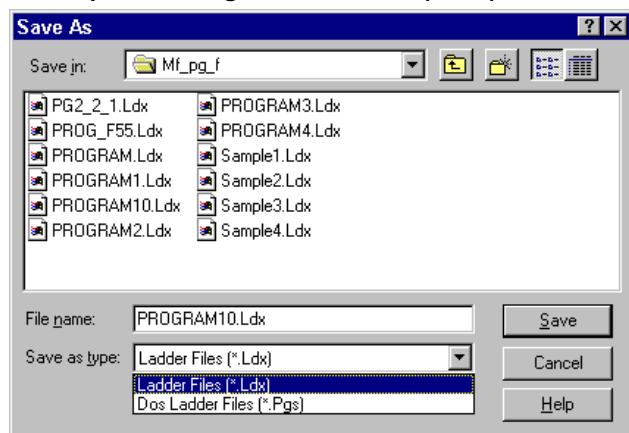


For [Save as type], either of the following two can be selected:

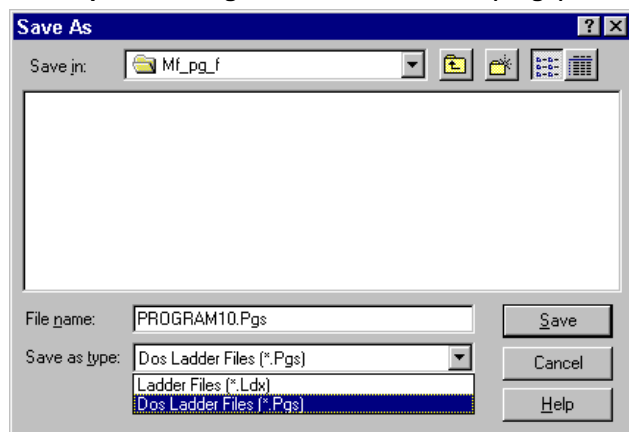
- Ladder file (*.Ldx): Saved file for the Windows loader
- D25P loader file (*.Pgs): Saved file for the MS-DOS/LITE loader

- ◇ Enter any file name in the [File name] text box and left-click the [Save] button.
Enter extension ".LDX" or ".Pgs" according to the type of the file to be saved.

• Example of saving as a ladder file (*.Ldx)



• Example of saving as a D25P loader file (*.Pgs)



To save as a D25P loader file (*.Pgs), the length of the file name must be 8 single-byte characters or less. Because D25P 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, D25P references the file by a file name shortened to 8 characters or less.

3-3 Save PLC Content to File

3-3-2 Saving PLC data

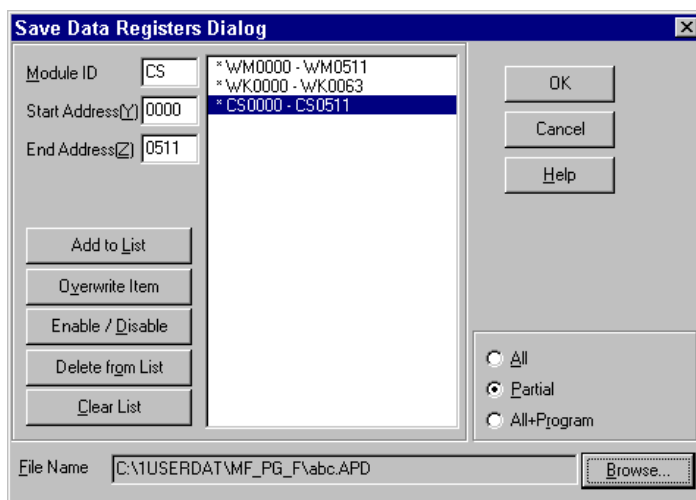
Here, the method of saving PLC data in a personal computer is explained.
After selecting the online window, use the following procedure to save the data.

- ◇ Select [File] - [Save Data Regs...] from the menu bar.
- ◇ The {Save Data Registers} dialog box is displayed. For saving method, [All], [Patial] or [All + Program] can be selected.



With the F30, F50, F50H, F80, F100, and F120 (V04 or earlier) series, All data + Program cannot be selected. None of [All], [Partial] and [All + Program] can save the data existing in the up bit area of the timer or counter.

- ◇ To save data, the file name must be set. Click the [Browse...] button and set a folder and a file name. Extension is automatically added, although it changes with the saving method selected.



3-4 Transfer Contents of File to the PLC

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

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

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 PLC cannot be effected when the PLC is in either of the following conditions. Make the PLC ready as described below.

- With a PLC model whose operation mode can be changed by a key switch (e.g., F70S or F120S), the key switch is in the {RUN} or {STOP} position.
Measure to take: Set the key switch in the {TERM} position.

- The PLC is in operation.

Measure to take: Stop the PLC from the loader. For the method of stopping the PLC, refer to 3-5.

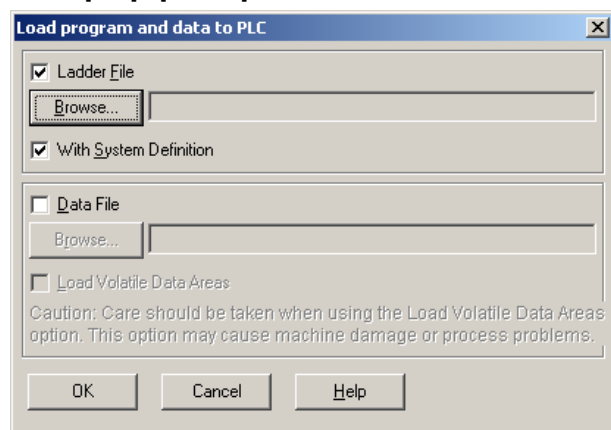


It is possible to transfer file to PLC which is saved by PLC Programmer (*.Ldx file).

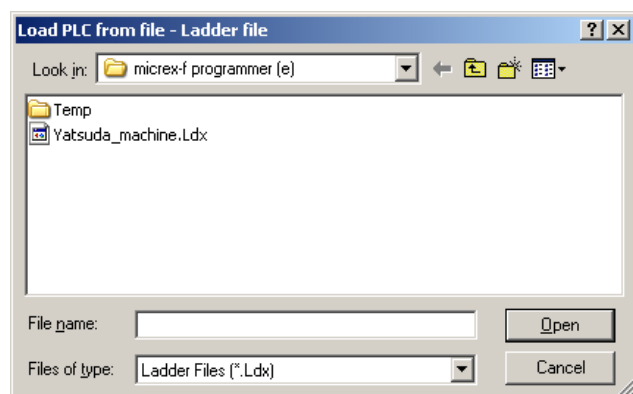
In case of other file (*.Pgs, *.Prg), open this file by PLC Programmer, then save as *.Ldx file.

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

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

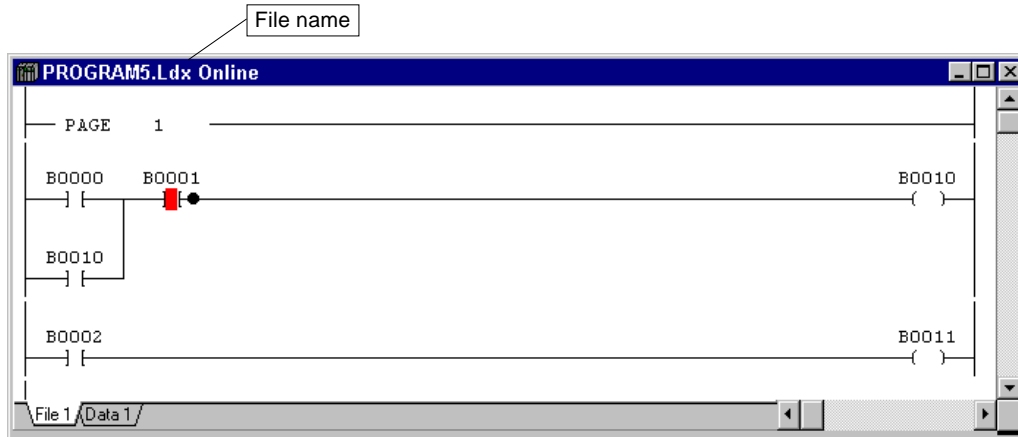


- ◇ When the {Load program and data to PLC} dialog box is displayed, check the [Ladder File] box and click the [Browse...] button.
- ◇ The {Load PLC from file - Ladder file} dialog box is displayed.



3-4 Transfer Contents of File to the PLC

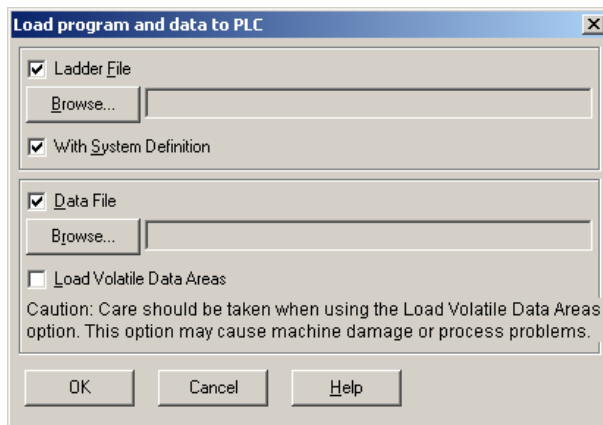
- ◇ Left-click the file to be transferred, then left-click the [Open] button.
 - ◇ When returned to the {Load program and data to PLC} dialog box, left-click the [OK] button.
- When the program transfer is completed, the program that has been transferred is displayed in the online window. At the same time, the file name is displayed on the bar at the top of the online window.



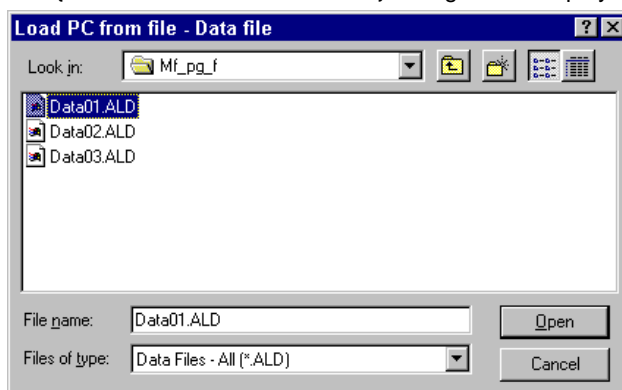
3-4-2 Transfer contents of data file to the PLC

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

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



- ◇ When the {Load program and data to PLC} dialog box is displayed, select [Data File] and click the [Browse...] button.
- ◇ The {Load PLC from file - Data file} dialog box is displayed.



- ◇ Left-click the file to be transferred, then left-click the [Open] button.
- ◇ When returned to the {Load program and data to PLC} dialog box, left-click the [OK] button.

3-4 Transfer Contents of File to the PLC



Caution

Be careful when the [Load Volatile Data Areas] box is checked, because B (I/O) area data is also transferred, which may cause external devices to malfunction and a dangerous condition to occur, depending on the content of the data.

Volatile data memory areas: WB, WM, WF, WA, WD, WL, W21 to W24, and W120 to W125

Nonvolatile data memory area: WK, WS, W9, TS, TR, CS, CR, BD, W25, W26, and W30 to W109


3-5 Start/Stop the PLC

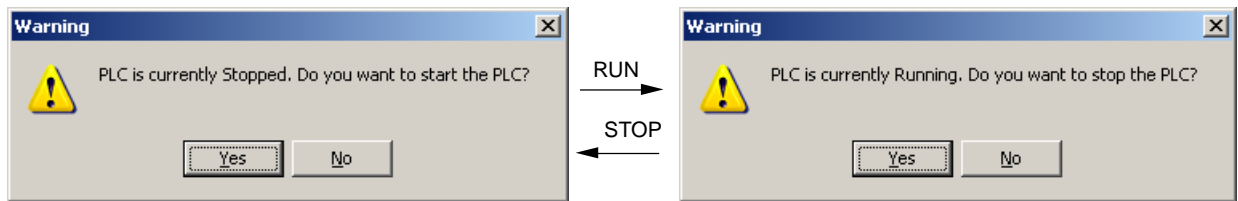
Here, the method of starting/stopping the PLC from the loader is explained.



With a PLC model whose operation mode can be changed by a key switch (e.g., F70S or F120S), set the key switch in the {TERM} position. If the key switch is in the {RUN} or {STOP} position, the PLC cannot be started/stopped with the loader.

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


- ◇ Select [PLC 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 PLC is displayed. Left-click the [Yes] button to start (stop) the PLC.



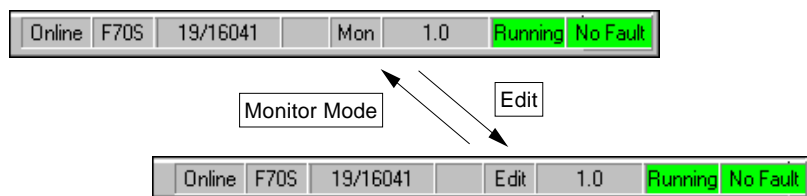
3-6 Change Online Program

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

With a PLC whose operation mode can be selected by a key switch (e.g., F70S or F120S), 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.)

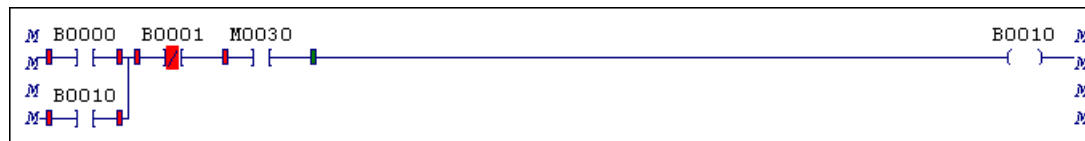
The current screen mode is displayed on the status bar at the bottom of the window.



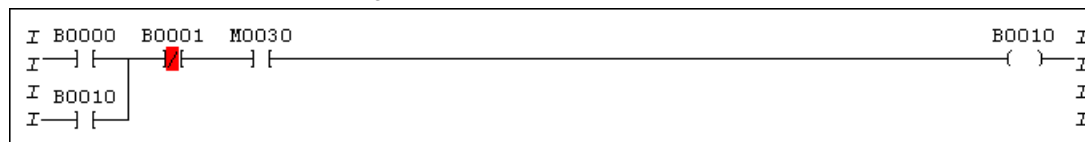
- ◇ Edit (change) the program. (For the method of editing a program, refer to Section 2.)

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 to the PLC, the associated symbol disappears.

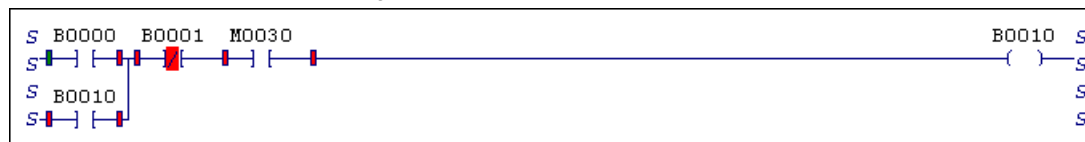
- M ... Indicates that the line is being changed.



- I Indicates that the line is being inserted.

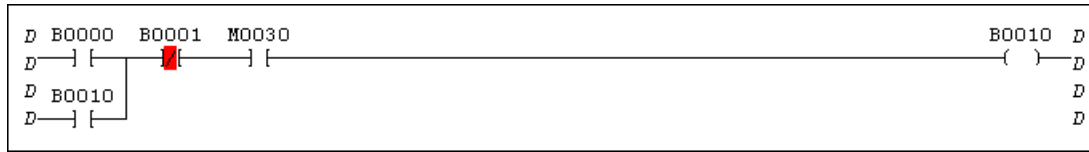



- S Indicates that the line is being selected.



3-6 Change Online Program

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



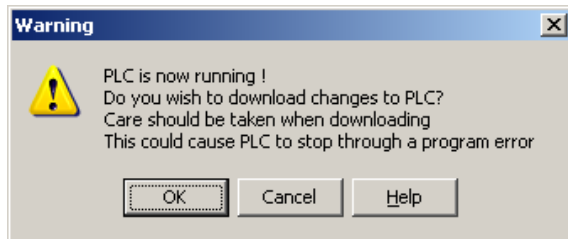
- ◇ Select [Edit] - [Download changes to PLC] from the menu bar to transfer the edited program to the PLC.
(Alternatively, left-click the  [Download to PLC] button on the main tool bar.

Caution

When downloading changes to a running PLC, care should be taken as this could cause a program error, which in turn can cause the PLC to stop or the system to malfunction.

Especially, in case of transfer after plural circuit change, program are written for several scans. Please note that CPU runs with changed program and unchanged program mixed several scans.

When an attempt is made to transfer a changed program to the PLC, a dialog box for confirmation is displayed. Left-click the [OK] button, and the changed program is transferred to the PLC.




3-7 PLC Memory Clear

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

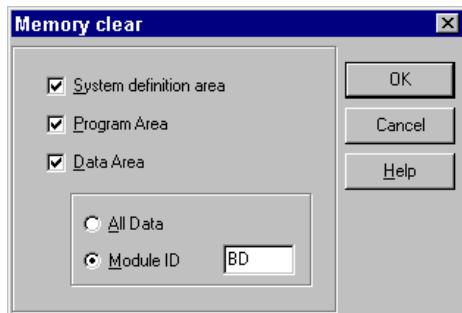
- 1) Clearing the PLC memory with the online window kept open
- 2) Clearing the PLC memory without opening the online window

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

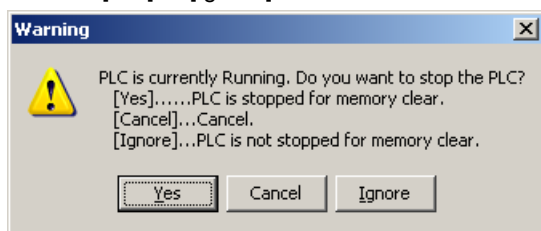
 With a PLC whose operation mode can be changed by a key switch (e.g., F70S or F120S), set the key switch in the {TERM} position. When the key switch is in the {RUN} or {STOP} position, the PLC memory cannot be cleared from the loader.

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

- ◇ Select [PLC Functions] - [Memory Clear...] from the menu bar.
- ◇ The {Memory Clear} dialog box is displayed. Check the box associated with the item to be cleared. When you check the Data Area box, select either [All Data] or [Module ID]. When you select [Module ID], enter the appropriate module name (WM, WK, BD, W30, etc.) in the [Module ID] text box. Now, left-click the [OK] button.



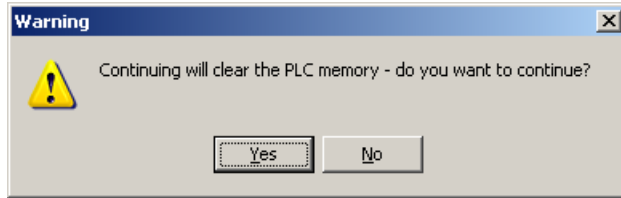
- ◇ If the PLC is running, the following warning message is displayed. After confirming that there is no problem, left-click the [Yes] or [Ignore] button.



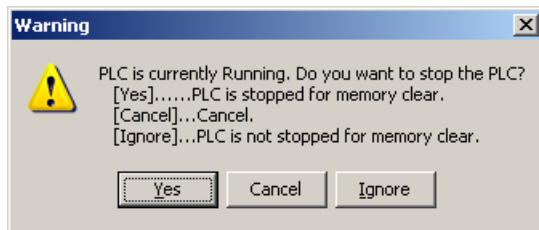
- ◇ Specified memory is cleared, and returns to the online window.

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

- ◇ Select [File] - [Open and Clear Online...] from the menu bar.
- ◇ The following warning message is displayed. Left-click the [Yes] button.



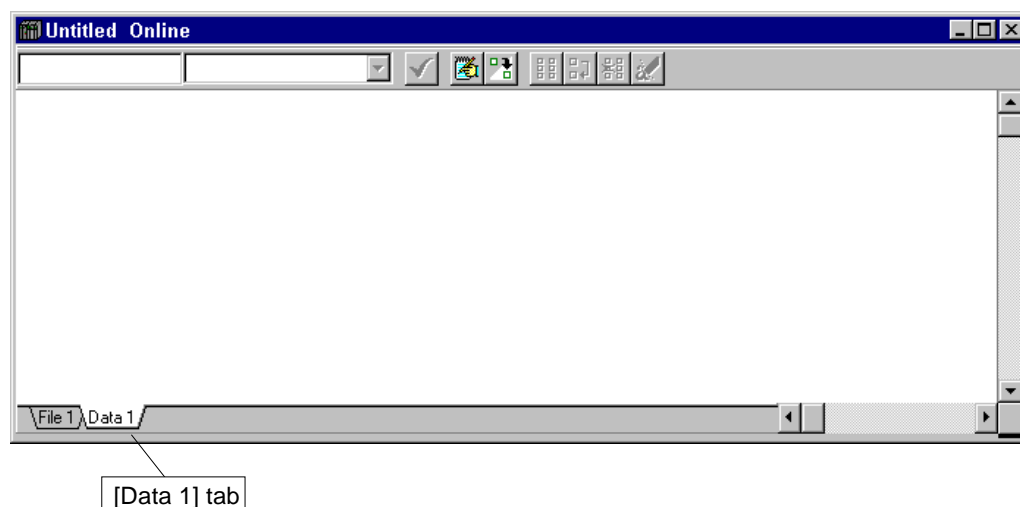
- ◇ When the PLC is running, the following warning message is displayed. After confirming that there is no problem, left-click the [Yes] or [Ignore] button.



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

3-8 Displaying and Setting Data

Here, the method of displaying (monitoring) and setting data of any address of the PLC 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

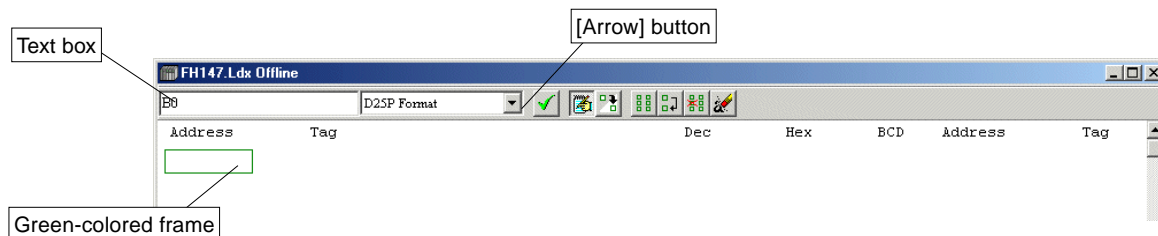
Here, the method of displaying the PLC memory area in bits and in words is explained.

<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.

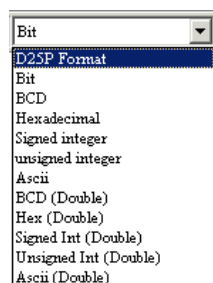
Then, left-click the [Arrow] button and select [Bit] from the data format list.



Data format

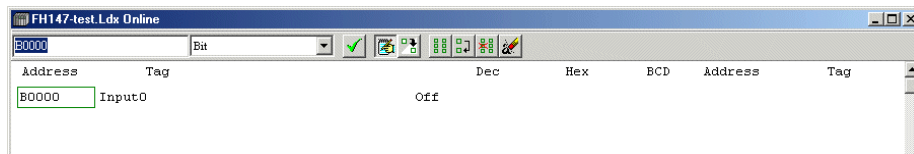
Use a suitable data format depending on the situation.

- Bit area display Select [Bit].
- WORD area display Select [D25P Format].



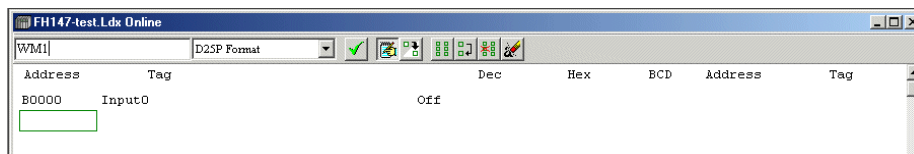
3-8 Displaying and Setting Data

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

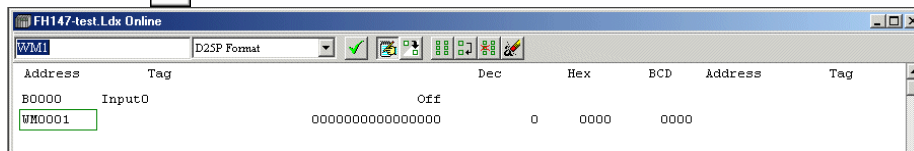


<Display in words>

- ◇ 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 "B0000.")
Next, enter the address in the text box at top, right of the screen.
Then, left-click the arrow button to select [D25P Format] from the data format list.



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



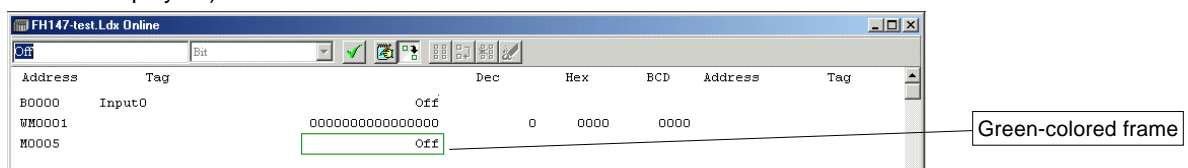
3-8-2 Setting data

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.

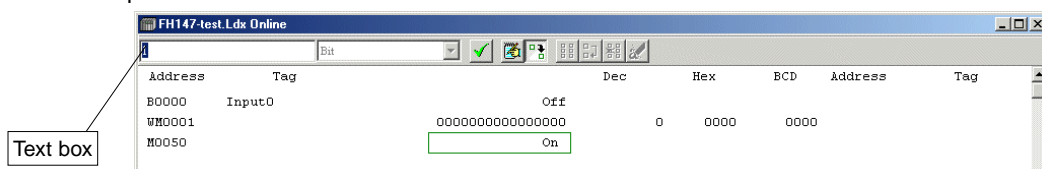
In the following explanation, it is assumed that the memory address has been displayed.

<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.)



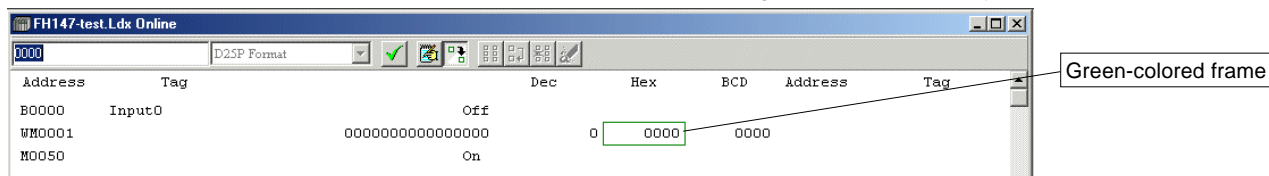
- ◇ Enter "1" (or "ON") or "0" (or "OFF") in the text box at top, right of the screen. Then, left-click the ☒ [Enter] button. The specified address bit is turned on or off



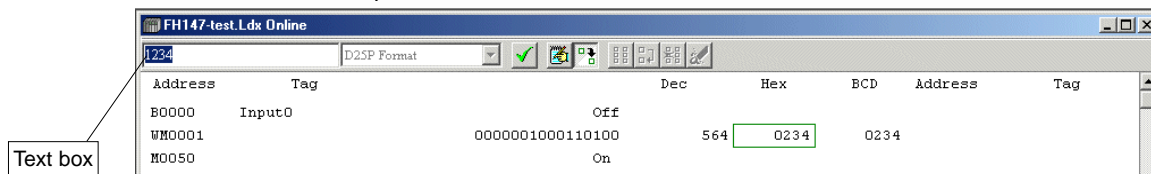
3-8 Displaying and Setting Data

<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 PLC 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.

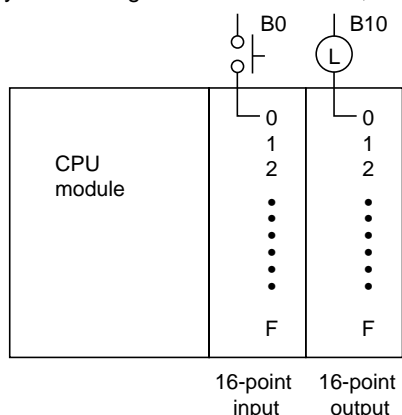
Similarly, in the setting of data at an address which has been specified as an external output of the PLC, the external output is given precedence.

Here, the method of forcing any input/output of the PLC that is in or out of operation to be turned on or off is explained. There are two types of forced set/reset: [Continuous forced set/reset] and [Momentary forced set/reset].

- [Continuous forced set/reset] is used by an I/O module to turn ON/OFF address B actually connected.
- [Momentary forced set/reset] is used to forcibly turn ON/OFF the internal memory (M, K, etc.).
- An a-contact becomes the conducting state by forced set and non-conducting state by forced reset.
- A b-contact becomes the non-conducting state by forced set and conducting state by forced reset.

3-9-1 Continuous forced set/reset

Continuous forced set/reset is possible only for areas in which an input or output module actually exists in area B. In the system configuration shown below, for example, forced set/reset is allowed in the area from B0 to B1F.



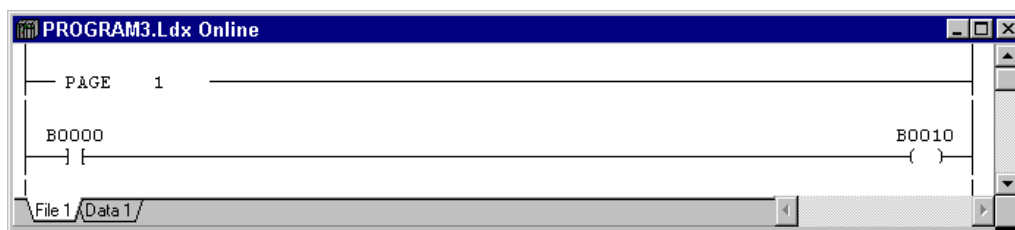
The continuous forced set/reset function enables the following:

- Forcing the ladder program input to be turned on/off regardless of the on/off status of the actual input.
- Turning on/off the actual output regardless of the on/off status of the ladder program output.
- The forced set/reset/cancel commands from the Loader are reflected at the end of scanning on the PLC side.
- The forced set/reset state is retained until it is canceled.



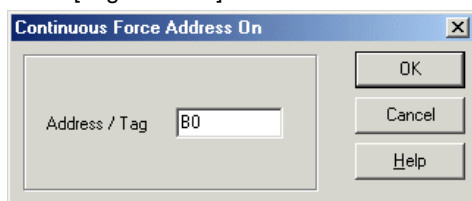
With PLCs which allow operation switching by key SW (for example, F70S and F120S), set the key SW to position {TERM}. With position {RUN} or {STOP}, continuous forced set/reset cannot be performed from the Loader.

The following explains the procedure for continuous forced set/reset of input/output using the following program as an example.



(1) Continuous forced set of input/output

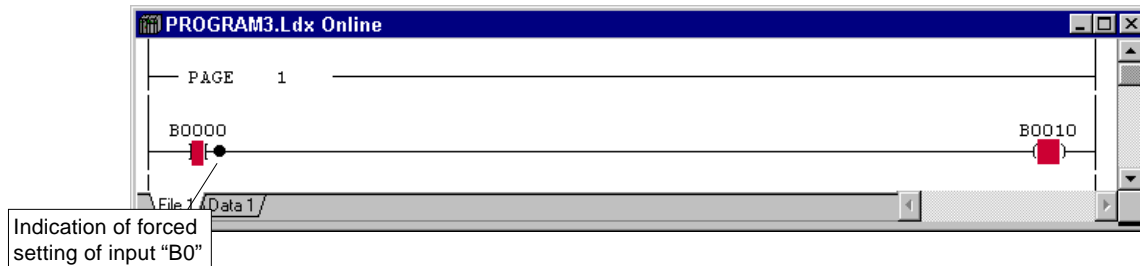
- ◇ Select [PLC Functions] - [Program Forcing] - [Continuous Force On...] from the menu bar.
- ◇ The {Continuous Force Address On} dialog box is displayed. Enter any input or output address (tag name will do) in the [Tag/Address] text box and left-click the [OK] button.



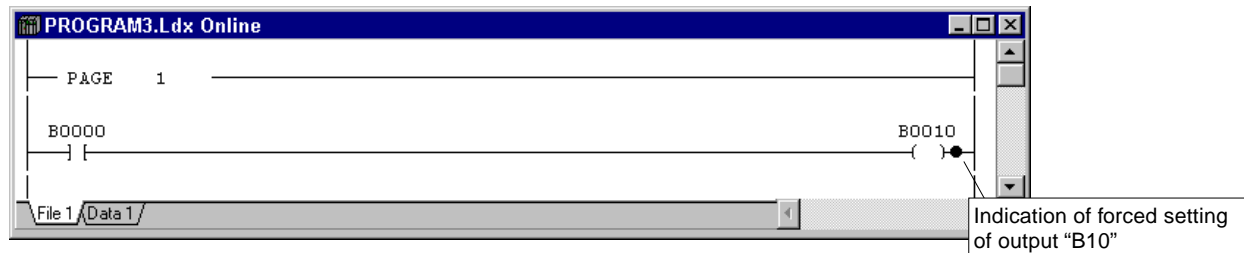
3-9 Forced Set/Reset

- ◇ The specified address is forced to be set. In this case, a filled circle (●) indicating that the address has been forced to be set is displayed at the side of the symbol of the specified address.

- **Example of forced setting of input “B0”**

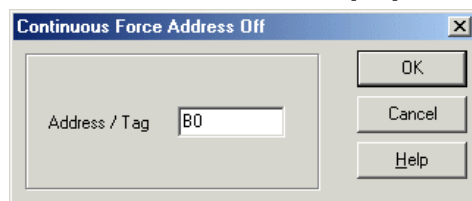


- **Example of forced setting of output “B10”**



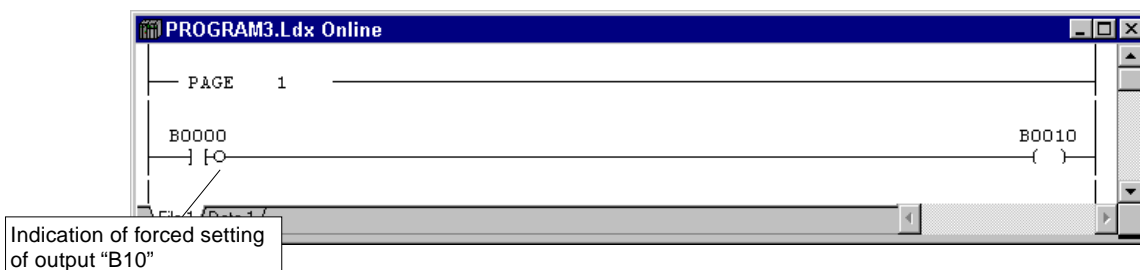
(2) Continuous forced reset of input/output

- ◇ Select [PLC Functions] - [Program Forcing] - [Continuous Force Off...] from the menu bar.
- ◇ The {Continuous Address Force Off} dialog box is displayed. Enter any input or output address (tag name will do) in the text box and left-click the [OK] button.

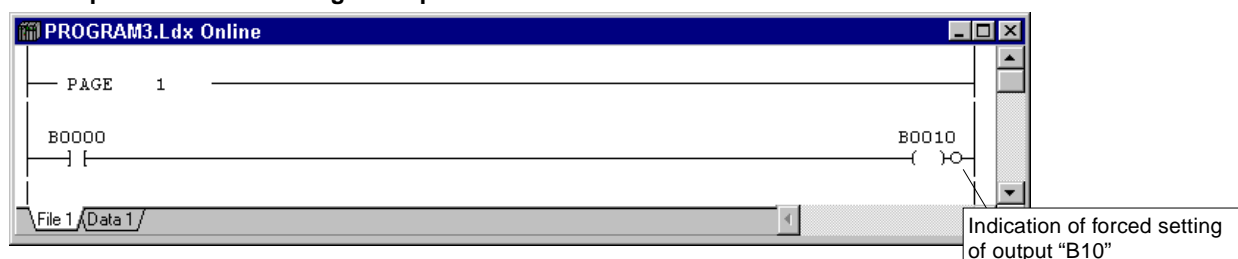


- ◇ The specified address is forced to be reset. In this case, an open circle (○) indicating that the address has been forced to be reset is displayed at the side of the symbol of the specified address.

- **Example of forced resetting of input “B0”**



- **Example of forced resetting of output “B10”**

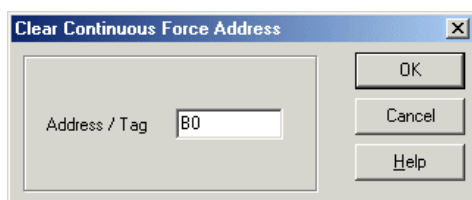


(3) Canceling continuous forced set/reset

The forced set/reset remains valid till the PLC power supply is switched on/off or it is cleared from the loader. Here, the method of clearing forced set/reset on a point-by-point basis is explained. For the method of clearing forced set/reset of all points at a time, refer to (4).

- ◇ Select [PLC Functions] - [Program Forcing] - [Continuous Force Clear...] from the menu bar.
- ◇ The {Continuous Force Clear} dialog box is displayed. Enter any input or output address (tag name will do) in the text box and left-click the [OK] button.

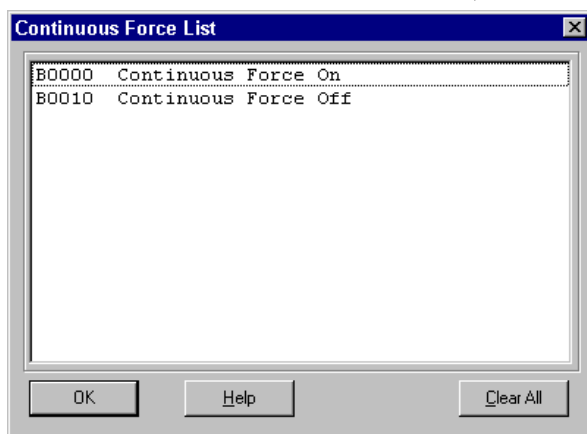
The forced set/reset condition is cleared and the mark indicating forced set/reset disappears.



(4) Confirming continuous forced set/reset setting

The following describes the procedure for making forced set/reset setting for multiple locations, for checking which address is currently being continuous-forced set/reset, and for canceling continuous forced set/reset.

- ◇ Select [PLC Functions] - [Program Forcing] - [View Continuous Forces...] from the menu bar.
- ◇ The {Continuous Force List} dialog box is displayed.
 - To view only the status of the addresses, left-click the [OK] button and close the dialog box.
 - To clear all the forced set/reset addresses, left-click the [Clear All] button first, then left-click the [OK] button.



(5) Operation during continuous forced set/reset

After the forced set/reset function is performed, the operations of various components of the system become as shown in the following table.

	F55 series	Other series
Input LED	Displays the forced set/reset status.	Displays the actual input.
Output LED	Displays the ladder diagram output status.	Displays the forced set/reset status.
Conduction/nonconduction of ladder diagram input contact	Displays the forced set/reset status.	
Conduction/nonconduction of ladder diagram output point	Displays the result of program execution.	
Actual output	Puts out the forced set/reset status.	

3-9 Forced Set/Reset

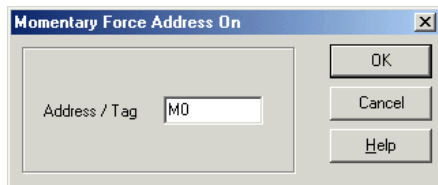
3-9-2 Momentary forced set/reset

Basically, momentary forced set/reset can be used for bit memory areas other than F, L, and SC. The momentary forced set/reset function enables the following:

- Forcibly turn ON/OFF the contact address of internal memory (M, K, etc.) using a Ladder program.
- The forced set/reset command from the Loader is reflected at the end of scanning on the PLC side.
- For area B connected to the actual input, the forced set/reset command is effective only for 1 scan and the actual input state is resumed for subsequent scans.
- For area B connected to the actual input, the forced set/reset command is received but a new output state results at the time an output instruction is executed by the program. While there is no output instruction by the program or PLC is stopped, the command state is continued.
- For internal memory used only as a contact (or internal memory currently not used by the program), forced set/reset is retained.
- For internal memory currently used as a destination of an output, the forced set/reset command is received but a new output state results at the time an output instruction is executed by the program.

(1) Momentary forced set

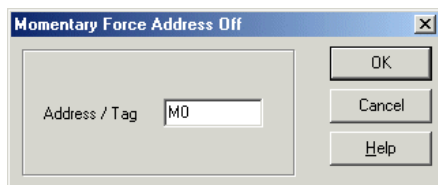
- ◇ Select [PLC functions], [Force On/Off], then [Momentary Force On] from the menu bar.
- ◇ The {Momentary Force On} dialog box is displayed. Input an address (or tag name) in the text box and then left-click the [OK] button.



- ◇ The specified address is forcibly set. There is no special indication of forced set. The conducting state of a contact is displayed (in case of an a-contact).

(2) Momentary forced reset

- ◇ Select [PLC functions], [Force On/Off], then [Momentary Force Off] from the menu bar.
- ◇ The {Momentary forced reset} dialog box is displayed. Input an address (or tag name) in the text box and then left-click the [OK] button.



- ◇ The specified address is forcibly reset. There is no special indication of forced reset. The non-conducting state of a contact is displayed (in case of an a-contact).

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

- ◇ Activate the diagnostic information screen. Select [PLC Functions] - [Diagnostics] from the menu bar. The RAS display consists of the following five types of display tabs.

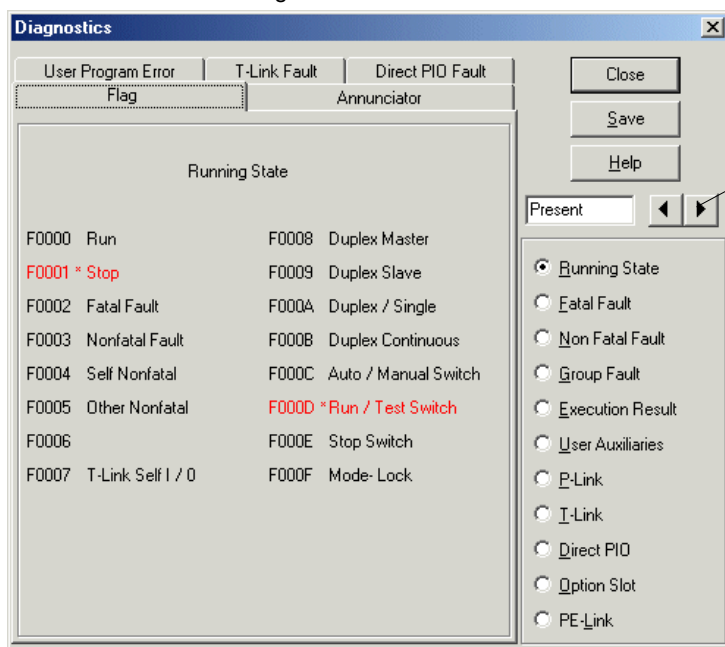
- Flag
- Annunciator
- User Program Error
- T-Link Fault
- Direct PIO Fault

[Flag]

Indicates the status of the PLC flag relays (F area). Each of the items whose relay is ON is marked with an asterisk (*). To change the item to be displayed, left-click the appropriate selection box at the right of the dialog box. (For a detailed description of the flag relay, refer to the "Manual of Instructions," No. FEH160.)

• Running State

Indicates the PLC running state.



About status display

{Present} is the current PLC status display.

{1 generation before} is the PLC status display present just before the PLC is last turned OFF.

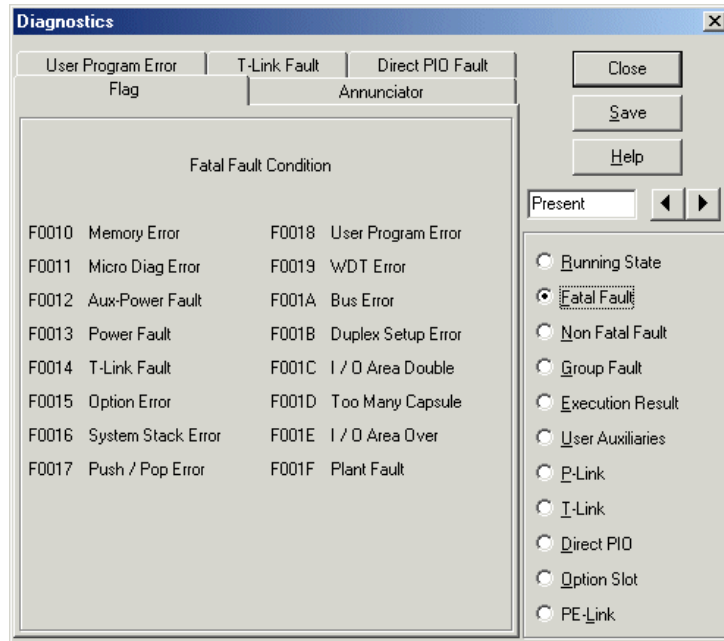
{2 generations before} is the PLC status display present just before the PLC is turned OFF before it is last turned OFF.

- The number of generations depends on the PLC model.
- With status display for previous generations, {Announce relay area}, {User program failure}, or other items may not displayed depending on the function of the PLC.

3-10 PLC Diagnosis

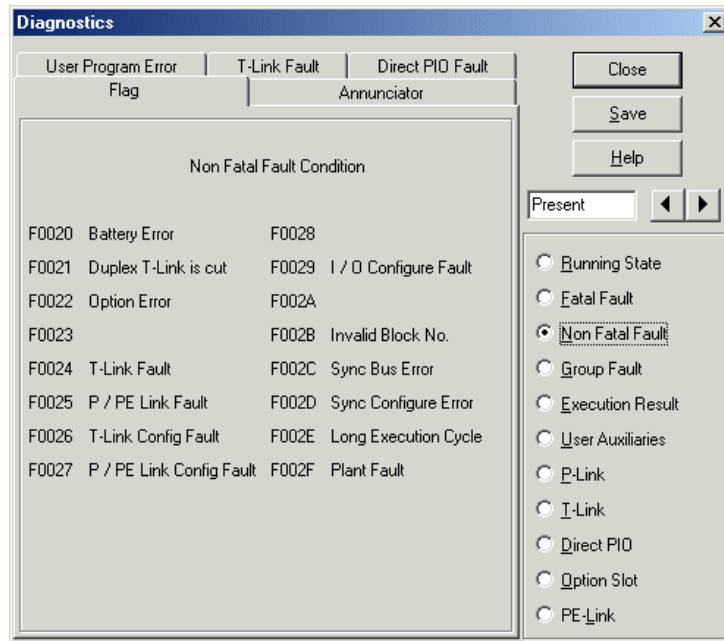
• Fatal Fault

Indicates the cause of a fatal fault of the PLC.



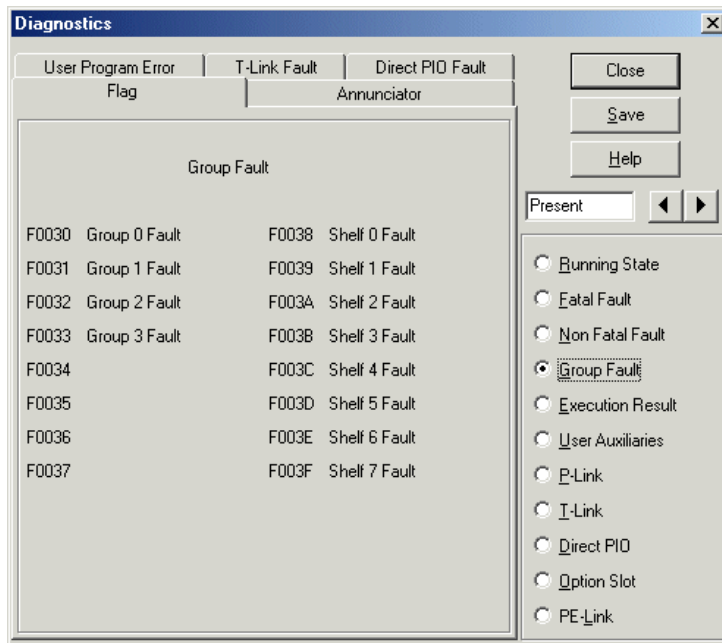
• Nonfatal Fault

Indicates the cause of a non-fatal fault of the PLC.



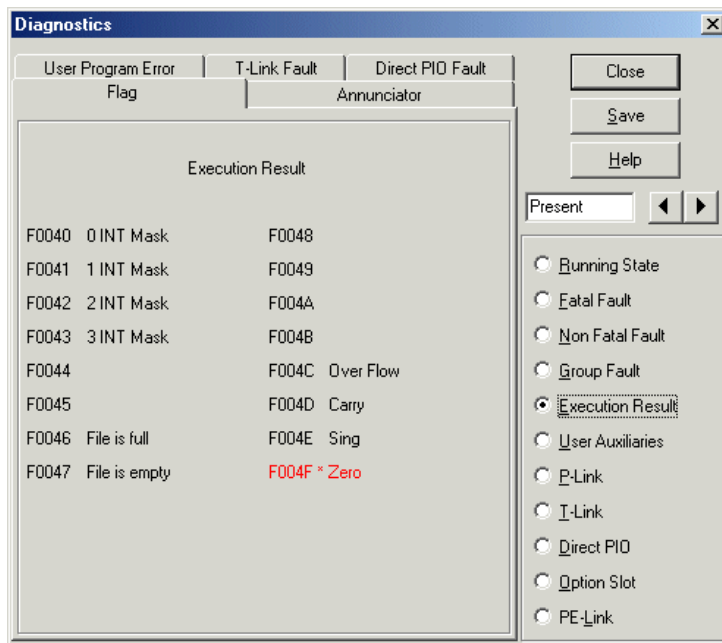
- **Group Fault**

Indicates the content of a group fault.



- **Execution Result**

Indicates the status of execution results flags.



3-10 PLC Diagnosis

• User Auxiliaries

Indicates the conditions of the PLC clock, etc.

The screenshot shows the 'Diagnostics' window with the 'User Program Error' tab selected. The 'Flag' sub-tab is active, displaying a list of error codes and their descriptions under the heading 'User Auxiliaries'. The list is organized into two columns. The right column contains radio buttons for selecting the fault type, with 'User Auxiliaries' currently selected.

Flag	Annunciator
F0050 First Scan	F0058
F0051	F0059
F0052	F005A
F0053 0.1 Second Clock	F005B
F0054 1 second Clock	F005C
F0055	F005D Exp. Mod Undefine
F0056 P/PE-Link1	F005E Rom Operation
F0057 P/PE-Link2	F005F No Battery

Buttons: Close, Save, Help

Present [] [] []

☐ Running State
☐ Fatal Fault
☐ Non Fatal Fault
☐ Group Fault
☐ Execution Result
☒ User Auxiliaries
☐ P-Link
☐ I-Link
☐ Direct PIO
☐ Option Slot
☐ PE-Link

• P-Link

Indicates the P-Link configuration and the condition of a P-Link fault.

The screenshot shows the 'Diagnostics' window with the 'T-Link Fault' tab selected. The 'Annunciator' sub-tab is active, displaying 'P-Link Configuration / Fault'. It shows configuration and fault status for Channel 0 and Channel 1, each with a table of station numbers (0-9, A-F) and corresponding flags. The right column contains radio buttons for selecting the fault type, with 'P-Link' currently selected.

Channel 0

Station No.															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F0060	Config														
F0070	Fault														

Channel 1

Station No.															
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F0080	Config														
F0090	Fault														

Buttons: Close, Save, Help

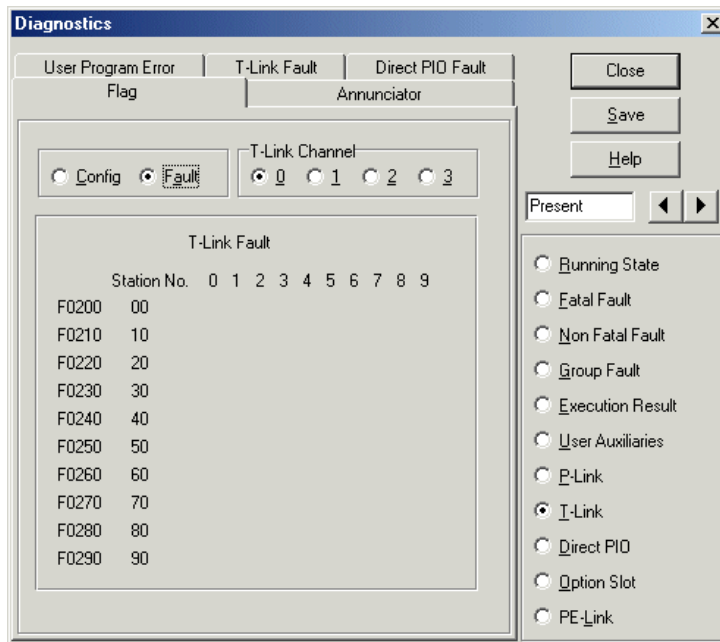
Present [] [] []

☐ Running State
☐ Fatal Fault
☐ Non Fatal Fault
☐ Group Fault
☐ Execution Result
☐ User Auxiliaries
☒ P-Link
☐ I-Link
☐ Direct PIO
☐ Option Slot
☐ PE-Link

• T-Link

Indicates the T-Link configuration and the condition of a T-Link fault.

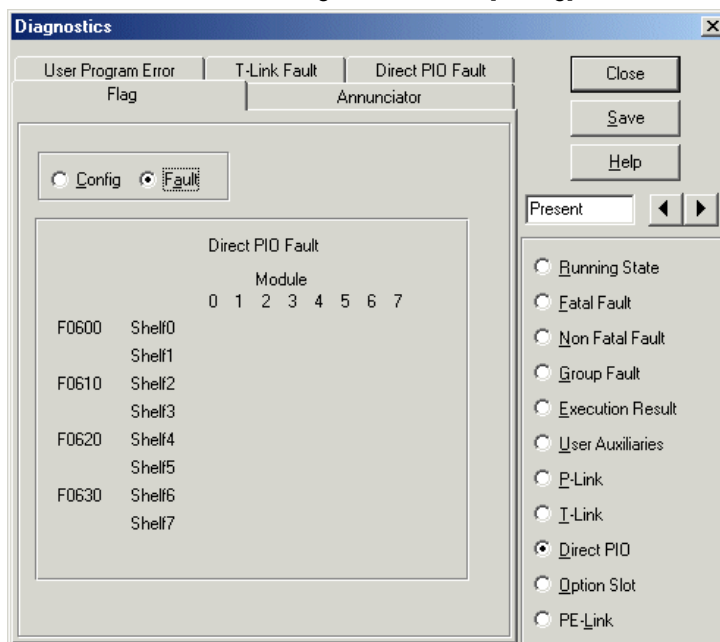
To check the T-Link configuration, select [Config]. To check the condition of a T-link fault, select [Fault]. Also, select the T-link channel (0-3) to be displayed.



• Direct PIO

Indicates the direct PIO configuration and the condition of a direct PIO fault.

To check the direct PIO configuration, select [Config]. To check the condition of a direct PIO fault, select [Fault].



3-10 PLC Diagnosis

• Option Slot

Indicates the option card configuration and the condition of an option slot fault.

The 'Diagnostics' window displays the 'Option Slot' configuration and fault status. The 'Annunciator' tab is selected, showing a table of slot configurations and a list of fault types on the right.

Config	Fault
F0680	F0690
Slot 0 *	Slot 0
Slot 1	Slot 1
Slot 2	Slot 2
Slot 3	Slot 3
Slot 4	Slot 4
Slot 5	Slot 5
Slot 6	Slot 6
Slot 7	Slot 7

On the right, the 'Option Slot' fault type is selected under the 'Present' section.

• PE-Link

Indicates the PE-Link configuration and the condition of a PE-Link fault. Select the PE-Link channel (0-1) to be displayed.

The 'Diagnostics' window displays the 'PE-Link' configuration and fault status. The 'Annunciator' tab is selected, showing a table of PE-Link configurations and a list of fault types on the right.

PE-Link Channel: ☒ 0 CH ☐ 1 CH

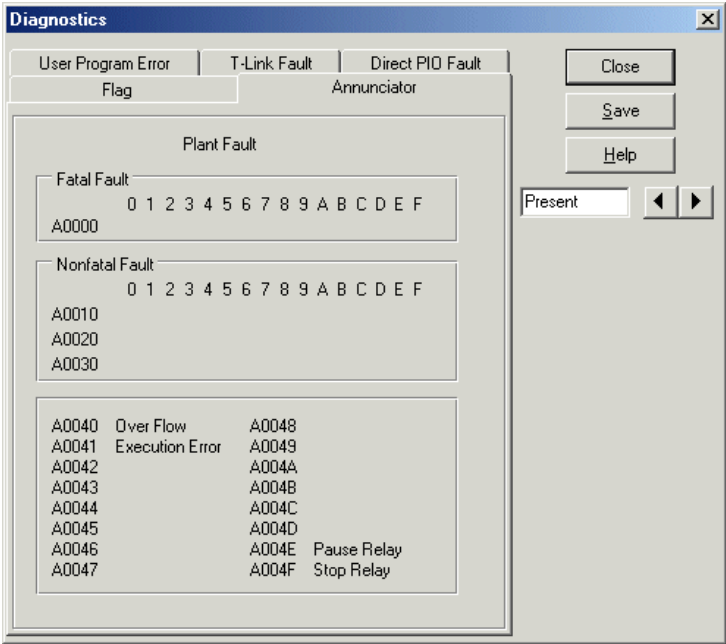
Config	Station No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F1100	00																
F1110	10																
F1120	20																
F1130	30																

Fault	Station No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
F1140	00																
F1150	10																
F1160	20																
F1170	30																

On the right, the 'PE-Link' fault type is selected under the 'Present' section.

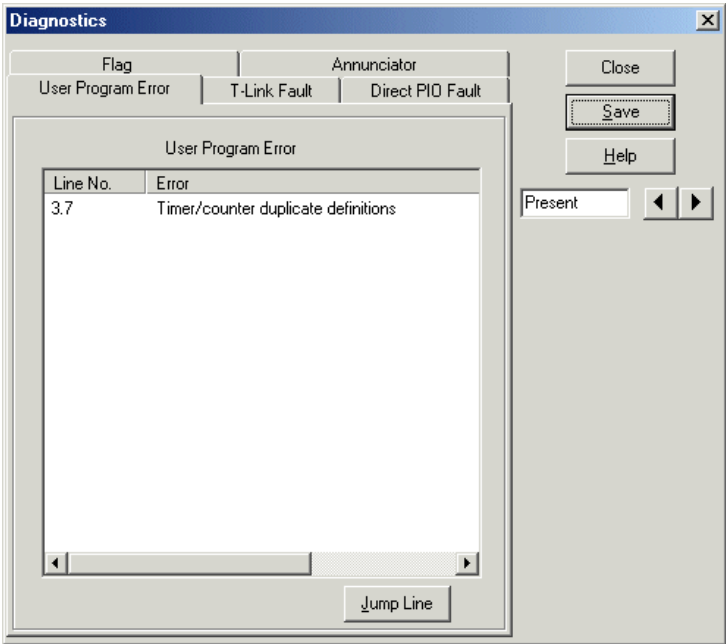
[Annunciator]

Indicates the status of the PLC annunciator.



[User Program Error]

Indicates the line number on which a user program error has occurred and the content of the user program error.



3-10 PLC Diagnosis

[T-Link Fault]

Indicates the fault of any of the devices connected to the T-Link.

The screenshot shows a 'Diagnostics' window with a tabbed interface. The 'T-Link Fault' tab is selected. The window displays the following information:

- Flag:** User Program Error, T-Link Fault (selected), Direct PIO Fault
- Annunciator:** Close, Save, Help
- T-Link Fault:** Channel No. 0, Station No. 55, Date/Time 99/11/25 15:39:26, Process I/O data transmission, Class Transmission error, Error Not responded
- T-Link Expanded I/O Information:** History No. 0, Next, Back

• Current/History

The PLC is capable of detecting and memorizing multiple faults. (The number of faults that can be memorized differs according to the PLC model. If the number of faults that have occurred exceeds the number of faults that can be memorized, the older fault information is discarded.) The PLC retains the fault information till its power supply is switched on/off.

To display the current fault information, select "Current."

To display the history of fault information, select "History."

To display the older history, left-click the [Back] button.

• Channel No.

Indicates the T-Link channel number.

• Station No.

Indicates the T-Link station number at which a fault has occurred.

• Date/Time

Indicates the date/time at which a fault occurred. This information is displayed only when the PLC has the calendar function.

• Process, Class, Error

Display the content of an error.

• T-Link Expanded I/O Information

Indicates the slot at which an I/O error has occurred on the T-Link expansion (FTL010 or NC1ET) base.

[Direct PIO Fault]

Indicates a fault of I/O connected to the PLC base.

• Current/History

The PLC is capable of detecting and memorizing multiple faults. (The number of faults that can be memorized differs according to the PLC model. If the number of faults that have occurred exceeds the number of faults that can be memorized, the older fault information is discarded.) The PLC retains the fault information till its power supply is switched on/off.

To display the current fault information, select "Current."

To display the history of fault information, select "History."

To display the older history, left-click the [Back] button.

• Date/Time

Indicates the date/time at which a fault occurred. This information is displayed only when the PLC has the calendar function.

• Mode

Indicates the mode of operation of direct PIO (Scan/Direct).

• Channel No.

"0" for the CPU. For the bus expansion unit (FDL), the channel number of the expansion unit (the first digit of the rotary switch).

• Station No.

"0" for the CPU. For the bus expansion unit (FDL), the station number of the expansion unit (the second and third digits of the rotary switch).

• Rack No.

"0" for the CPU. For the bus expansion unit (FDL), what number expansion unit it is as viewed from the CPU.

• Slot No.

Indicates the slot position on the CPU or FDL base board.

3-10 PLC Diagnosis

- **Error**

Indicates the content of an error.

<Display for F30, F50 and F50H series>

Flag: User Program Error, T-Link Fault, Direct PIO Fault

Annunciator: Close, Save, Help

Direct PIO Fault

Bus Error:

Retry count:

Error Address Information

Word Address	In/Out	I/O Kind	I/O Points

- **Bus error**

Indicates the content of a bus error.

- **Retry count**

Indicates how many times to retry in case of bus error.

- **Error Address Information**

Word address : Top word address of occurred error station

In/Out : Indicates input/output type.

I/O Kind : Indicates kind, such as digital and analog.

I/O Points : Occupied I/O points

<Display for F60, F80, F81, F100 and F105 series>

Flag: User Program Error, T-Link Fault, Direct PIO Fault

Annunciator: Close, Save, Help

Direct PIO Fault

Bus Error:

Retry count:

Error Slot Information

Slot No.	Error

- **Bus error**

Indicates the content of a bus error.

- **Retry count**

Indicates how many times to retry in case of bus error.

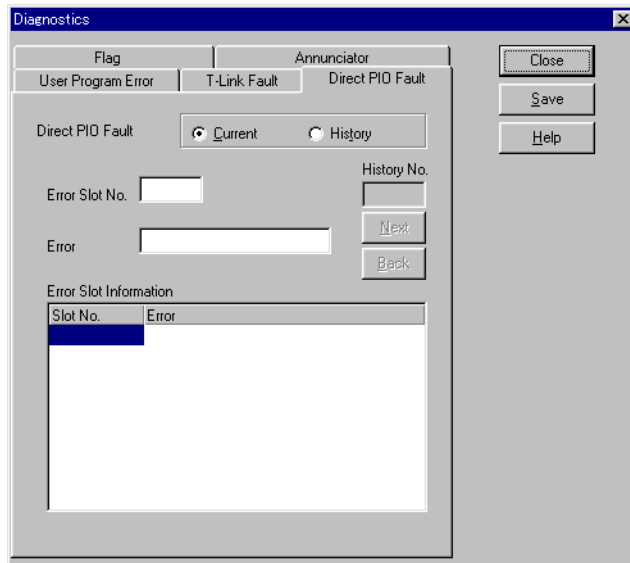
- **Slot No.**

Indicates the information of the slot where a bus error occurred.

Slot No. : Indicates the slot No. of the option plug (or I/O module) where an error occurred.

Error : Indicates the content of an error.

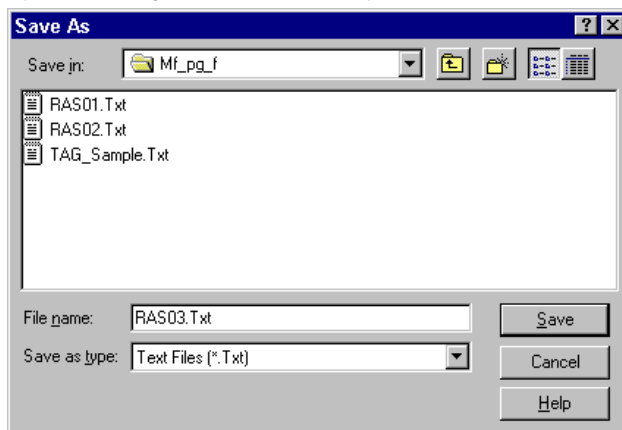
<Display for F120 and F125 series>



- **Error slot number**
Displays the slot No. on which a bus error occurred.
- **Contents of error**
The contents of the error are displayed.
- **Error slot information**
Displays the information about the slot on which a bus error occurred in list form.

[Save RAS data]

By left-clicking the [Save] button, you can save RAS data as a text file.

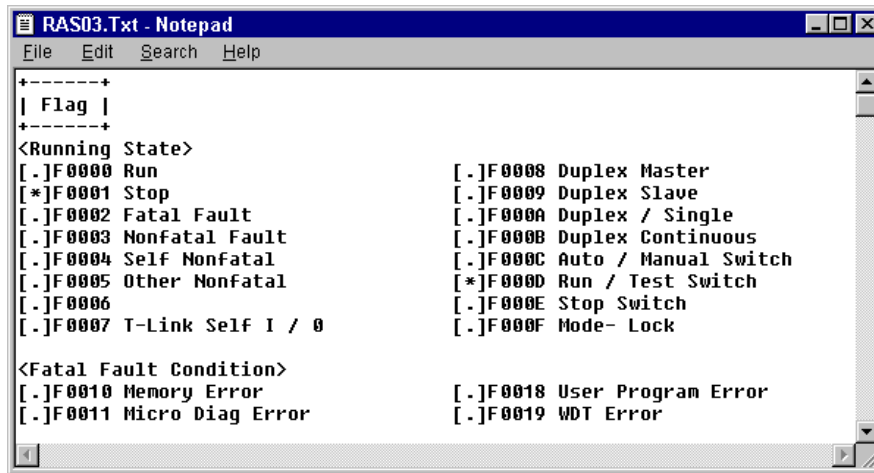


When the {Save as} dialog box is displayed, enter a folder in the [Save in] text box and a file name in the [File name] text box.

3-10 PLC Diagnosis

[Display (playback) saved RAS data]

The content of a saved RAS data file can be checked with a text editor, such as Windows' memo pad function under [Accessory]. To open an RAS data file, set the location (folder) where it is saved and then the file name.



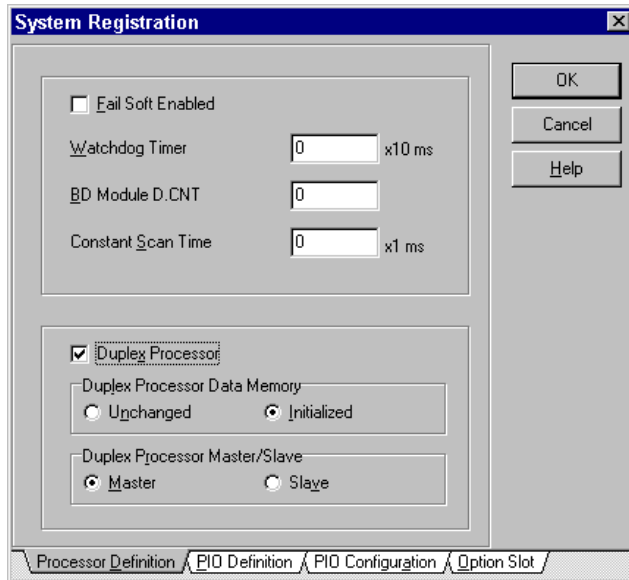
```
+-----+
| Flag |
+-----+
<Running State>
[.]F0000 Run           [.]F0008 Duplex Master
[*]F0001 Stop          [.]F0009 Duplex Slave
[.]F0002 Fatal Fault   [.]F000A Duplex / Single
[.]F0003 Nonfatal Fault [.]F000B Duplex Continuous
[.]F0004 Self Nonfatal [.]F000C Auto / Manual Switch
[.]F0005 Other Nonfatal [*]F000D Run / Test Switch
[.]F0006               [.]F000E Stop Switch
[.]F0007 T-Link Self I / 0 [.]F000F Mode- Lock

<Fatal Fault Condition>
[.]F0010 Memory Error  [.]F0018 User Program Error
[.]F0011 Micro Diag Error [.]F0019 WDT Error
```

3-11 Duplex-Processor Systems

Here, the setting method for configuring a duplex-processor system and functions of the system are explained. This function is available for the F70S, F120H, and F120S to F150S series. (Refer also to "MICREX-F series <COMMUNICATION>" (manual No. FEH161).)

- ◇ To set a duplex-processor system, select [PLC functions] - [System definition] - [System registration] from the menu bar.



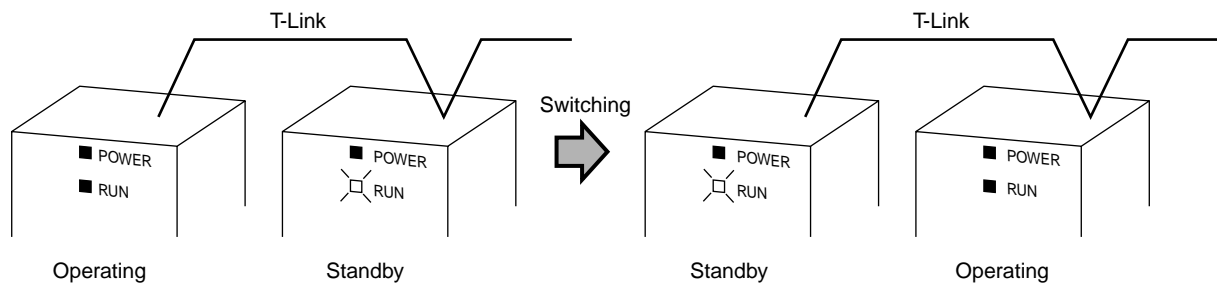
- ◇ Check the [Duplex Processor] box.
[Duplex Processor Data Memory] box:
Select a duplex mode: either "hot start" (Unchanged) or "cold start" (Initialized).
For the F70S, F120H, and F120S to F150S series, only "cold start" (Initialized) is available. No data is passed when processors are switched.
[Duplex Processor Master/Slave] box:
Select either [Master] processor (usually operating: station 0) or [Slave] processor (standby: station 1).

3-11 Duplex-Processor Systems

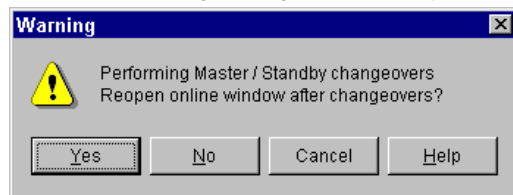
The following sections explain the functions that can be used for duplex-processor systems.

3-11-1 Switching master and slave processors

This function enables the user to switch the operating processor to standby status and the standby processor to operating status.



- ◇ For switching, select [PLC functions] - [Duplex Operations] - [Master/Standby changeover] from the menu bar. Then the {Warning} dialog box is displayed.



After switching the master and slave processors, select [Yes], [No] or [Cancel] for whether or not to open the online window for the processor that has newly become the master. [Cancel] stops the operation.

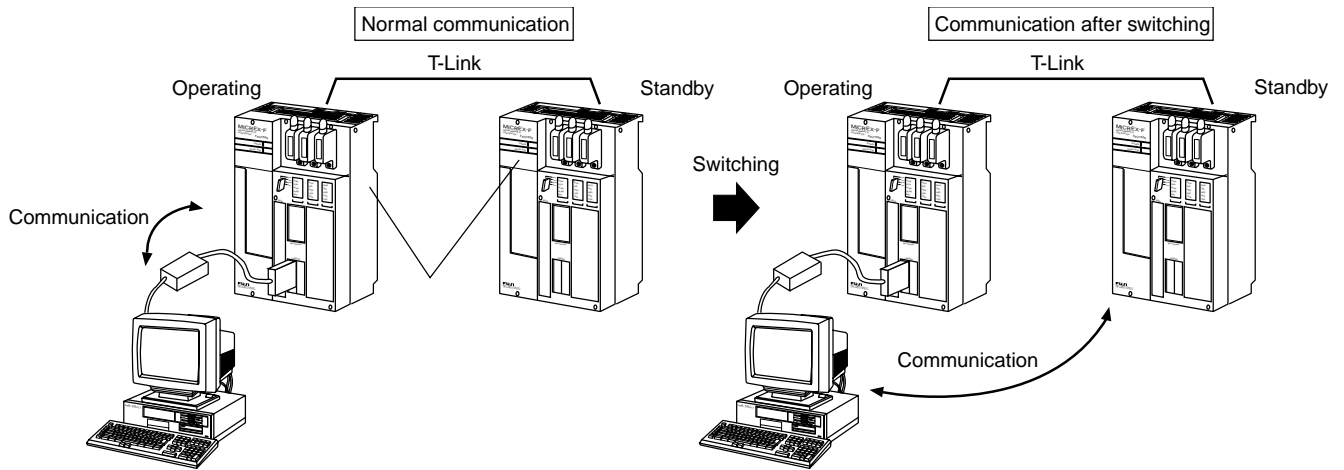


Even when master/slave switching is executed, the registered contents of system definitions are not changed.

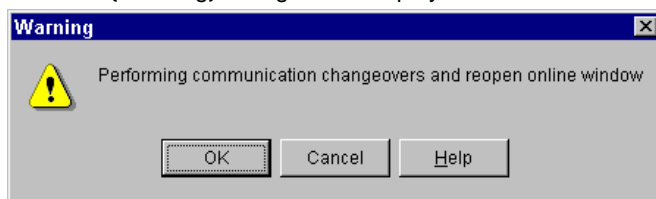
3-11 Duplex-Processor Systems

3-11-2 Switching communicating processor

The program loader usually communicates with the operating PLC. This function enables the user to switch the communicating PLC. It is useful to read or write the system definitions, programs, and data stored in the PLC that is in the standby status.



- ◇ For switching, select [PLC functions] - [Duplex operations] - [Communication changeover] from the menu bar. Then the {Warning} dialog box is displayed.



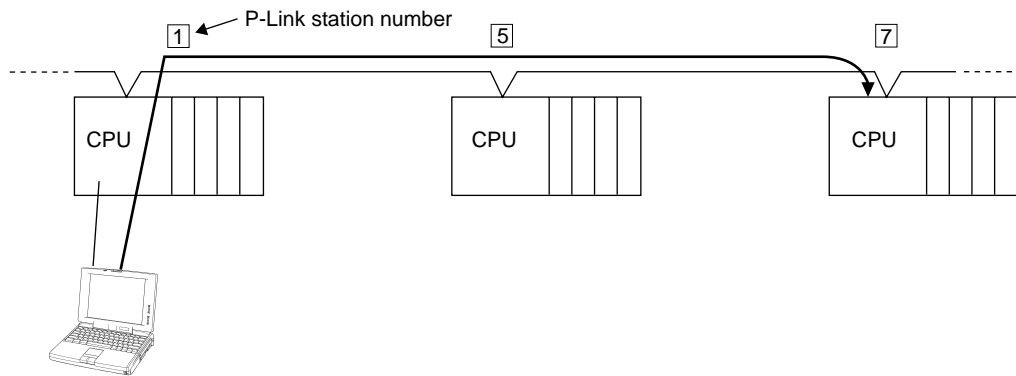
- ◇ After switching the communication processor, select [OK] or [Cancel] for whether or not to reopen the online window. [Cancel] stops the operation. When this function is re-executed after switching, the online window for the operating CPU is displayed.

3-12 Loader Network

Loader network is the function that connects a program loader to another CPU via P-link or PE-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 F70S, F120H, and F120S to F150S series CPU units. An older series of CPU (F105, F125, F205 and F225) cannot use this function but can coexist on the link.

Example:

Connecting a program loader connected to the CPU of P-link station 1 to a CPU of station 7 via the P-link

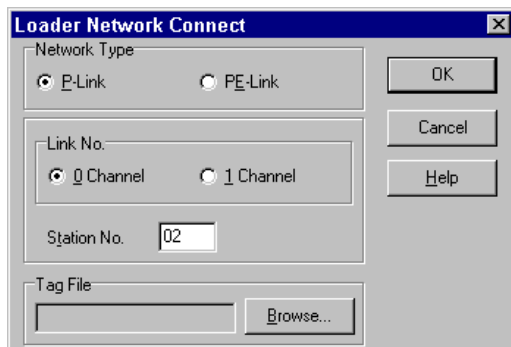


Loader software Version 1.10.XXX supports the loader network of P-link or PE-link. When connecting to another CPU, use the [Network Connect...] function.

To cancel the connection to another CPU and then connect to the local station, use the [Network Release] function.

3-12-1 Network Connect

- ◇ Select [PLC functions] - [Loader Network] - [Network Connect...] from the menu bar.
- ◇ Then the {Loader Network Connect} dialog box is displayed.



1) Network Type

Select the type of network to be used.

2) Link No.

Link No. is set when P-link or PE-link is used.

When the total number of P-link and PE-link cards that are set in the local station CPU is "1", select [0 Channel].

When the total number of P-link and PE-link cards that are set in the local station CPU is "2", the one nearer to the CPU becomes "channel 0" while the other becomes "channel 1".

According to which link the remote station, with which the program loader is to communicate, is connected, select link No.

3) Station No.

Set the station number for the CPU of the remote station with which the program loader is to communicate.

4) Tag File

This item is set for online display, when tag is also displayed on the screen.

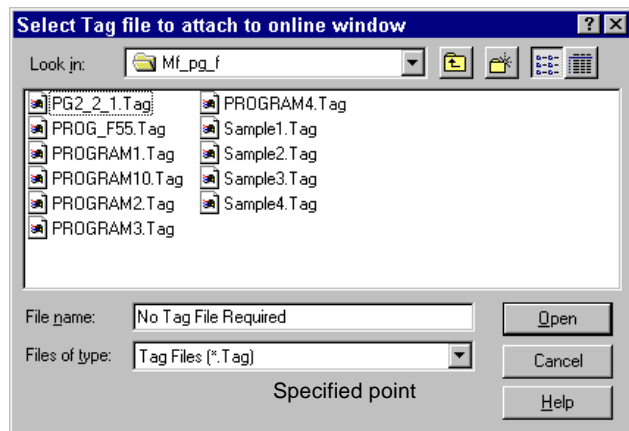
Left-click the [Browse...] button. Then, on the {Select Tag file to attach to online window} dialog box, select a tag you want to display and left-click the [Open] button to set a tag file.

- ◇ 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.

3-12 Loader Network

3-12-2 Network release

- ◇ Select [PLC functions] - [Loader Network] - [Network Release] from the menu bar.
- ◇ The {Select Tag file to attach to online window} dialog box is displayed.



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, and programs of the CPU of the local station will be 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.

3-13 Sampling Trace <Recording of Data History>

3-13-1 Outline of function

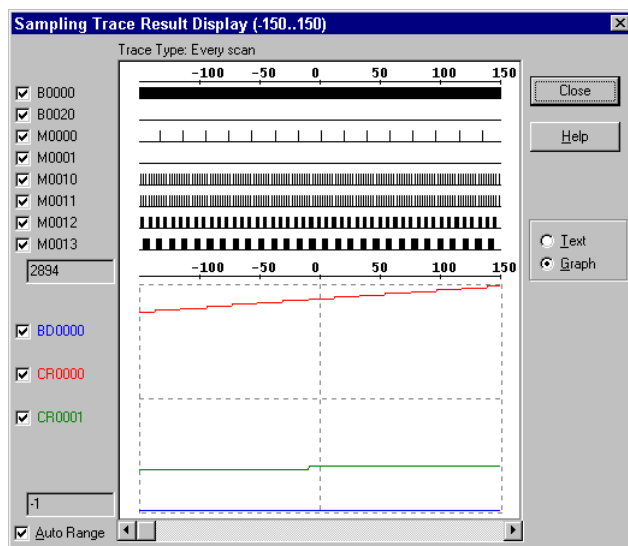
The sampling trace function enables the user to store the data preceding and following a specified point in the sampling trace memory of the program loader. When the sampling trace memory is monitored, the history of data alteration can be traced. Up to eight points of bit data (except SC area) or up to three points of word data to be sampled can be registered in the program loader. Sampling interval can be specified as a scan time or an arbitrary time (10 to 99,990ms). The point as the boundary can be specified by key input or an annunciator relay of the program. Because data alteration before and after a point can be monitored, this function is effectively used to inspect the factor of an event.



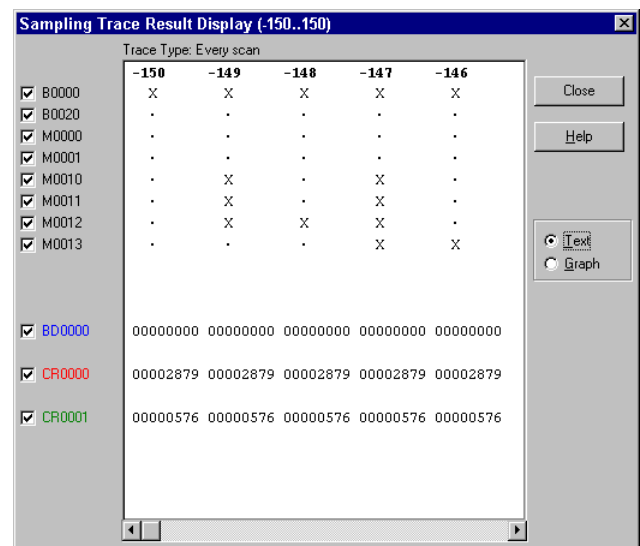
Following model of PLC support Sampling trace.
F70, F70S, F80H, F120 (since V05), F120H, F120S to F150S series

Example of sampling trace result display

1) Graph (timing chart) display

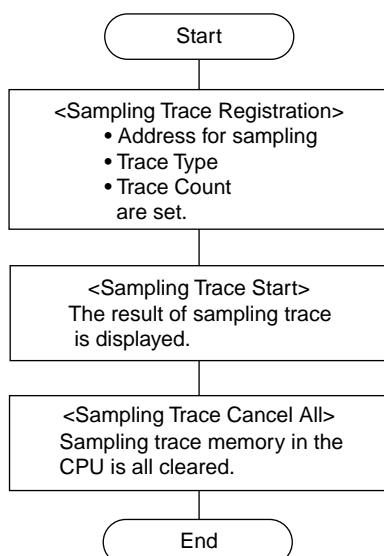


2) Text (ON/OFF) display



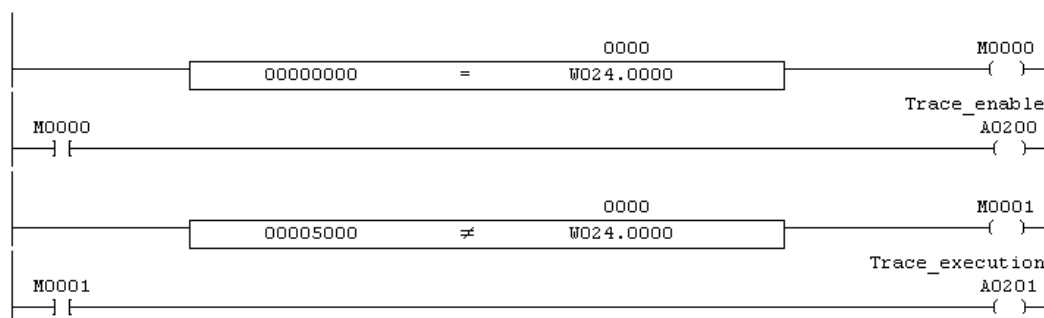
Sampling trace operation procedure

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



3-13 Sampling Trace <Recording of Data History>

The sampling trace function is explained below, using the following program as an example. Because this program uses W24 (direct access), direct access must be defined in system definitions.



A200 : Sampling trace enable flag
A201 : Sampling trace execution flag
W24.0 : Setting of direct access to I/O

Explanation of the program on the upper

- 1) When certain data other than "0" is input to input W24.0, sampling trace is started.
- 2) After that, when a data value of not less than 5000 is input, □□ pieces of W24.0 data are sampled from both the data before and after the point of the input at intervals of □□□□ ms.

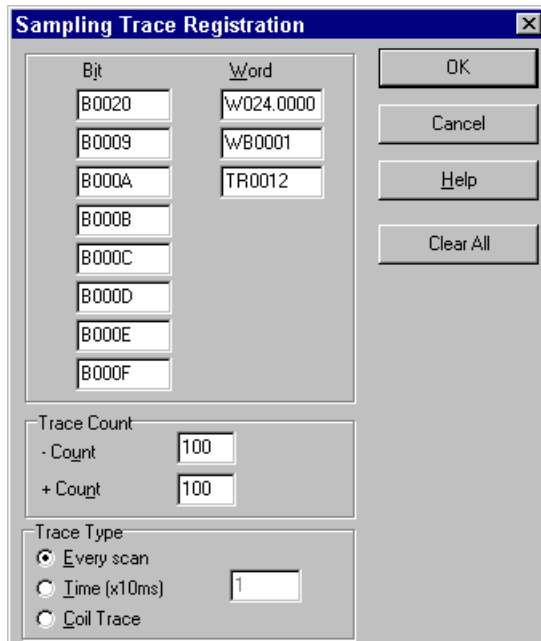
3-13 Sampling Trace <Recording of Data History>

3-13-2 Sampling trace registration

Here, the registration of sampling trace is explained.

As an example, an operation is registered which traces at every scan the data of W24.0 100 times before and after the specified point.

- ◇ Select [PLC functions] - [Sampling Trace] - [Sampling Trace Registration] from the menu bar.
The {Sampling Trace Registration} dialog box is displayed.
- ◇ After setting [Bit], [Word], [Trace Count] and [Trace Type], left-click the [OK] button.
Then the content of [Sampling Trace Registration] is set in the CPU.



The dialog box titled "Sampling Trace Registration" contains the following fields and controls:

- Bit**: A list of bit addresses: B0020, B0009, B000A, B000B, B000C, B000D, B000E, B000F.
- Word**: A list of word addresses: W024.0000, W00001, TR0012.
- Trace Count**:
 - Count: 100
 - + Count: 100
- Trace Type**:
 - ☒ Every scan
 - ☐ Time (x10ms): 1
 - ☐ Coil Trace
- Buttons**: OK, Cancel, Help, Clear All.

<Explanation of the dialog box>

[Bit] text box :

Set the bit address (except SC area) where sampling is performed (maximum 8 points).

[Word] text box :

Set the word address (including SC area) where sampling is performed (maximum 3 points),

[Trace Count] :

How many times to perform sampling is set in the range from 0 to 9999 times, in both plus and minus directions from the Data Point Address "0". However, the set count must be within the following range.

Note 1 : 8192 bytes (sampling data area in the processor) \leq (the number of bytes of bit data + the number of bytes of word data) \times (trace count + 1)

Number of bytes of bit data: Calculated regarding one point of bit address as one byte.

Number of bytes of word data: Calculated regarding one point in a 16-bit area as two bytes or one point in a 32-bit area as 4 bytes.

Note 2 : Trace count is the total of minus side sampling operations and plus side sampling operations.

Note 3 : Data Point Address "0" is set by the sequence program, using announce relays A200 and A201.

3-13 Sampling Trace <Recording of Data History>

[Trace Type]

For trace type, the following three options are available:

[Every scan]

Select this when data is sampled at each scan.

[Time [x10ms]]

Select this when data is sampled at arbitrary time intervals. Interval in the range from 10 ms to 99990 ms can be specified.

Set value: 1 to 9999 (x10 ms)

[Coil Trace]

In the case that A200 (Enable) is turned on, the sampling data when A202 (coil) is set is stored.

When A201 (Point Set) is set (point 0), sampling is started in the plus direction.

F120 does not support the [Coil Trace] function.

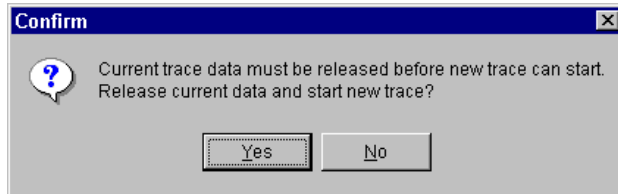
3-13 Sampling Trace <Recording of Data History>

3-13-3 Sampling trace execution

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



If a sampling trace is performed when the previous sampling trace data still remains in the CPU, the following {confirm} dialog box is displayed.



Left-clicking the [Yes] button cancels (clears) the existing trace data and starts the sampling trace.

(1) Methods of execution by the program loader

1)[None]option button

The sampling trace for the specified range is execute from the maximum address in the minus direction toward the plus direction sequentially.

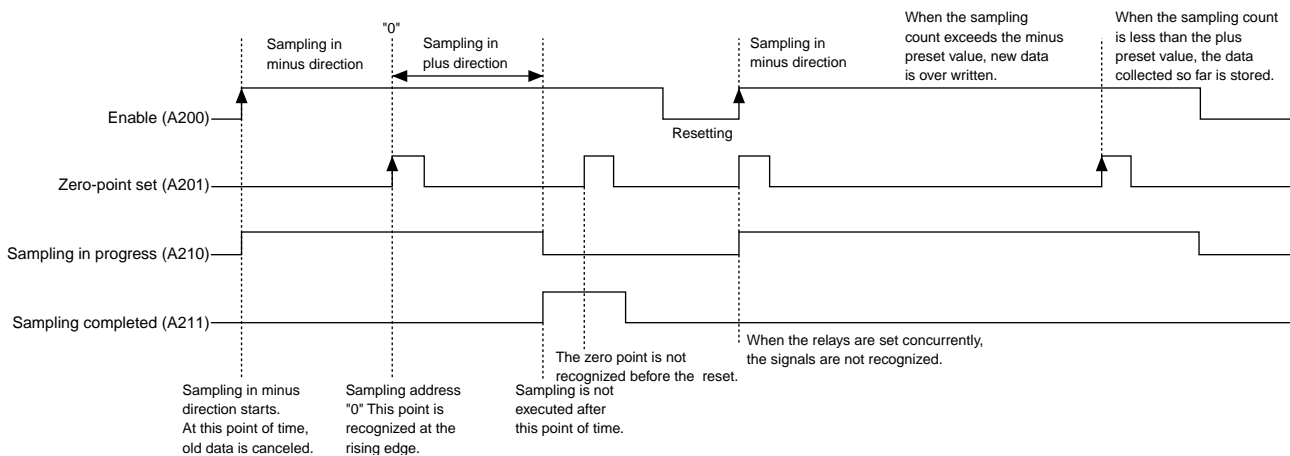
2)[On Address]/[Off Address]option button

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

3)When annunciator relay A200 is set, Sampling trace is started. Sampling trace is executed in the plus direction in the timing of A201 setting.

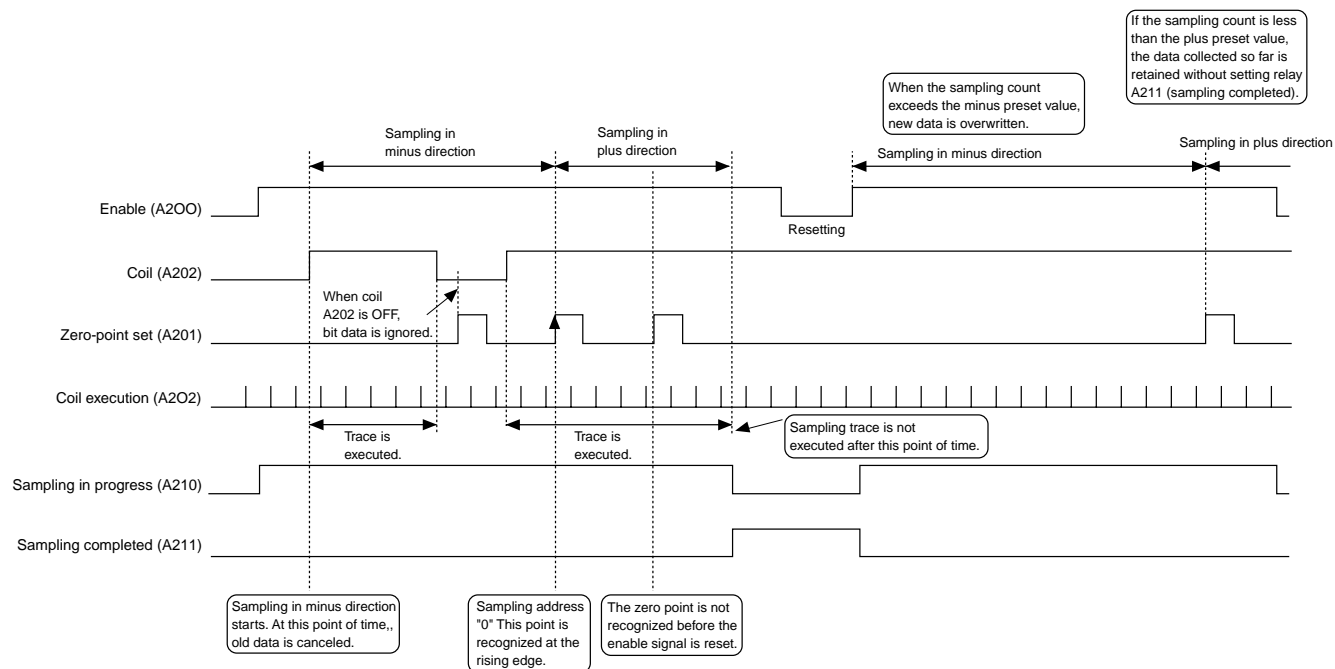
The operation timing chart is shown below.



3-13 Sampling Trace <Recording of Data History>

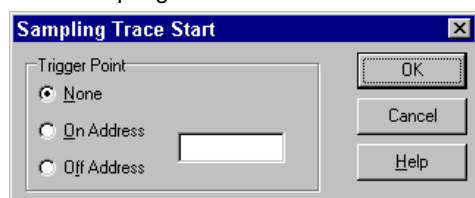
4) Coil trace (available only for the F80H and F120H series)

When annunciator relay A200 (enable) is set, a sampling trace is started. The data collected when coil A202 is set is sampled. Sampling trace is executed in the plus direction when A201 (zero-point set) is set. The operation timing chart is shown below.



Method 1

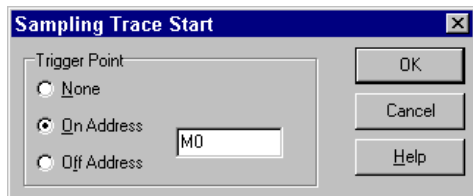
- ◇ Select [PLC functions] - [Sampling Trace] - [Sampling Trace Start...] from the menu bar. The {Sampling Trace Start} dialog box is displayed.
- ◇ Left-click the optional [None] button, then the [OK] button. Then sampling data collection is started.



3-13 Sampling Trace <Recording of Data History>

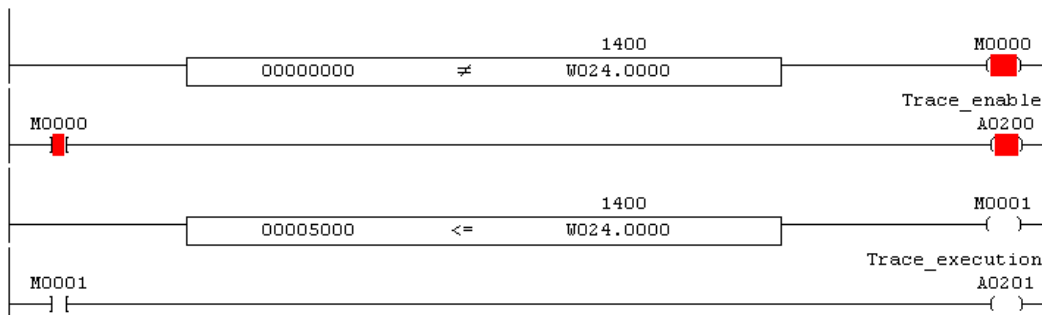
Method 2

- ◇ Select [PLC functions] - [Sampling Trace] - [Sampling Trace Start...] from the menu bar.
The {Sampling Trace Start} dialog box is displayed.
- ◇ After left-clicking the optional [On Address] or [Off Address] button, enter the specified bit address in the text box and left-click the [OK] button.

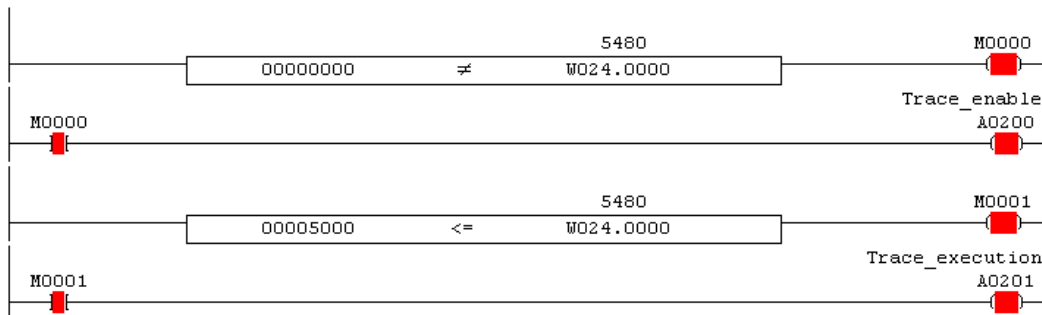


Method 3

- 1) When the data of W24.0 is smaller than 5000, A200 (trace enable) turns on to start collecting data (in the minus direction).

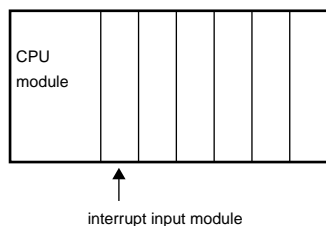


- 2) When the data of W24.0 becomes greater than 5000, A201 (trace execution) also turns on to start collecting data in the plus direction.



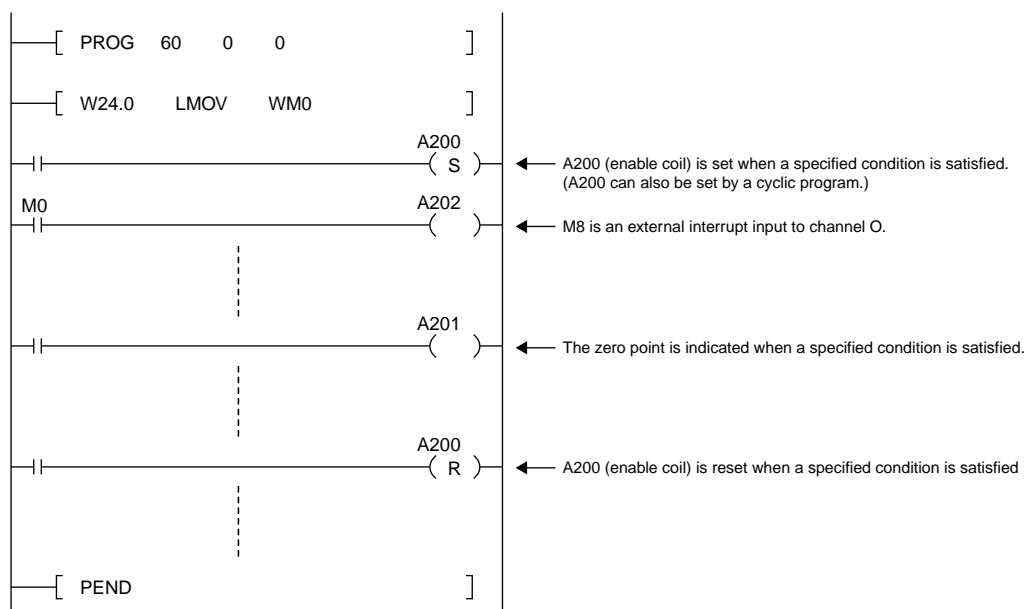
3-13 Sampling Trace <Recording of Data History>

Method 4



An interrupt signal is set in channel 0 of the DPI module (interrupt input module) that is mounted in slot 0. Each time external interrupt program PROG60 is started, the status of the specified relays and coils and the contents of word data are traced.

Example of Program



Use the coil trace function effectively for the following purposes:

1. Sampling various data for each external interrupt input signal
2. Sampling various data at each fixed-cycle interrupt
3. Sampling the various data that changes within a scan period

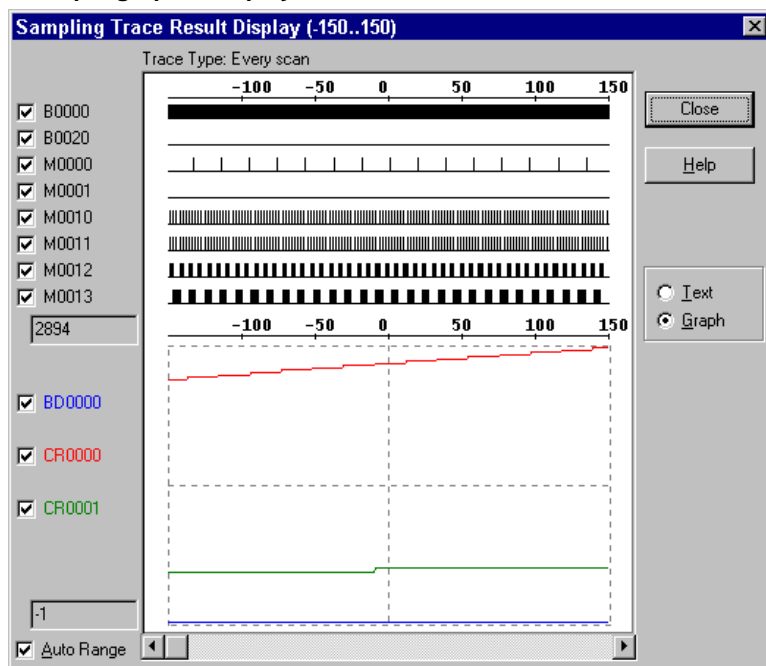
3-13 Sampling Trace <Recording of Data History>

3-13-4 Display of sampling trace

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

- ◇ Select [PLC functions] - [Sampling Trace] - [Sampling Trace Result Display] from the menu bar.
The {Sampling Trace Result Display} dialog box is displayed.
- ◇ Display mode can be changed over with optional [Text] and [Graph] buttons.
Also, by checking/unchecking the box on the right of the individual address, it can be set as whether or not to display the corresponding data.

<Sample graphic display>



<Sample text display>

The screenshot shows the 'Sampling Trace Result Display (-150..150)' window in Text mode. The window title is 'Sampling Trace Result Display (-150..150)'. The 'Trace Type' is set to 'Every scan'. The left sidebar is the same as in the graph mode. The main display area shows a table of data for the selected addresses. The 'Text' button is selected on the right. The 'Close' and 'Help' buttons are on the right.

	-150	-149	-148	-147	-146
B0000	X	X	X	X	X
B0020	.	.	.	.	.
M0000	.	.	.	.	.
M0001	.	.	.	.	.
M0010	.	X	.	X	.
M0011	.	X	.	X	.
M0012	.	X	X	X	.
M0013	.	.	.	X	X
BD0000	00000000	00000000	00000000	00000000	00000000
CR0000	00002879	00002879	00002879	00002879	00002879
CR0001	00000576	00000576	00000576	00000576	00000576

For text display, "." is indicated for OFF status of bit address and "X" for ON status.
Word address is indicated by hexadecimal (or BCD) value.

3-13 Sampling Trace <Recording of Data History>

3-13-5 Sampling trace cancel all

The [Sampling Trace Cancel All] function clears the [Sampling Trace Registration] data stored in the memory of the CPU as well as the collected trace data.

These data are also cleared when the power switch of the CPU is turned off.

- ◇ Select [PLC functions] - [Sampling Trace] - [Sampling Trace Cancel All] from the menu bar.
Then sampling trace data is all cleared.

3-14 Status Latch (Recording Data at a Point of Time)

3-14-1 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 PLC. The stored data can be monitored. Latch operation can be executed by the annunciator relay of a user program, an input switch in B area, or by key input on the program loader. This function can be effectively used to analyze the occurrence of a system event.



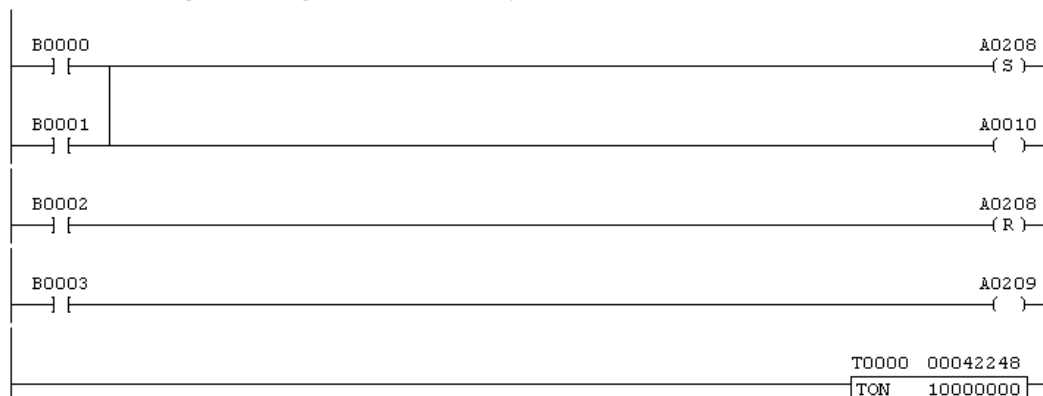
Following model of PLC support Sampling trace.

F70, F70S, F80H, F120 (since V05), F120H, F120S to F150S series

3-14 Status Latch (Recording Data at a Point of Time)

3-14-2 Creation of program

(1) Example of the program using annunciator relays



- 1) When contact B0 or B1 is turned ON, A208 is set and status latch operation becomes ready.
- 2) The timer current value at the time when B3 was turned ON is stored in the status latch memory of the PLC.
- 3) When B2 is turned ON, A208 is reset.



- 1) Status latch enable flag A208 may be a set coil *** or coil ***. However, if a set coil is used as shown in the above program, a reset circuit is required.
- 2) Status latch execution flag A209 must be a coil. If a set coil is used, the flag does not operate.

(2) Example of the program to execute status latch by operating external input switch B10



- 1) When the PLC starts operation, the timer starts counting.
- 2) The timer current value at the time that "B10" connected to the input card is turned ON is stored in the status latch memory of the PLC.



Input switch B10 is not required by the program.

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



- 1) When the PLC 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 PLC.

3-14 Status Latch (Recording Data at a Point of Time)

3-14-3 Status latch registration

The following example shows how to register timer current value TR0 in the status latch memory.

- ◇ Select [PLC functions] - [Status Latch] - [Status Latch Registration...] from the menu bar. The {Status Latch Registration} dialog box is displayed.
- ◇ After entering 0 (zero) 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.

	Start	End
BD		
TS		
TR	000	000
CS		
CR		
W		
W		
W		
W		
W		
W		
W		
W		
W		
W		
W		

Note:

For bit memory areas (B, M, K, D, F, A, S, T, C and L), registration is already made in advance.

<Explanation of the dialog box>

	Start	End
BD	*	
TS		
TR	000	019
CS		
CR		
W	030	099

*** (asterisk) is attached when all addresses of the area are to be latched.

Enter an address in the [Start] and [End] text boxes when a range in the area is specified.

For user file area, enter a file number (data module number) in this text box.
In this example, the range from W30.0 to W30.99 is specified.

[Clear All] button:

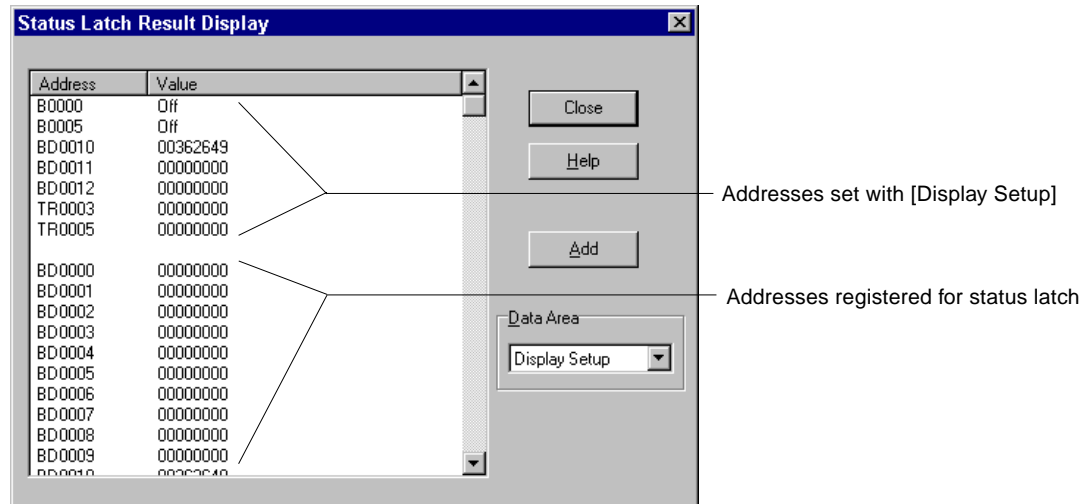
Clears all the ranges that are set on the screen.

3-14 Status Latch (Recording Data at a Point of Time)

[Display Setup] button

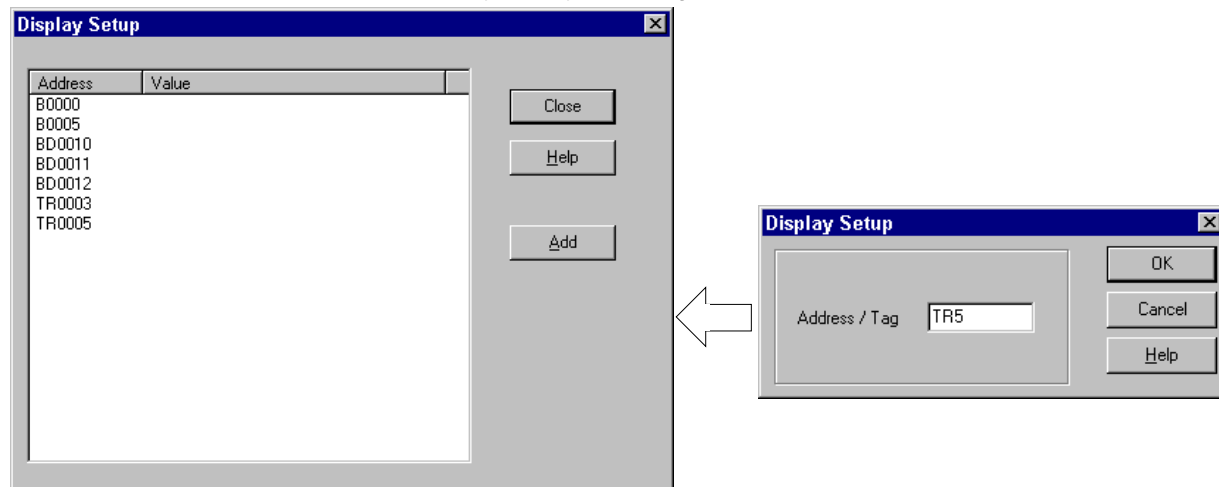
This button is used to display addresses for which status latch is specified or to selectively display the addresses in a bit area (B, M, K, etc.) that you want to check.

(Sample status latch result display)



After left-clicking the [Add] button, enter addresses in the text box of the [Display Setup] dialog box, and left-click the [OK] button.

Then the addresses that are to be selectively displayed are registered.



3-14 Status Latch (Recording Data at a Point of Time)

3-14-4 Status latch execution

Status latch can be executed by "1" a program, "2" operating an external input switch or "3" key operation on the program loader.

(1) Execution by a program

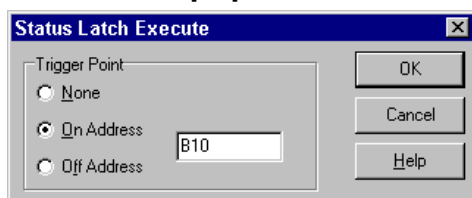
This method is explained, using the program shown in 1 of Section 3-14-2 as an example.

- 1) Turn ON B0 or B1 to set status latch enable flag.
- 2) Turn ON B3 to set status latch execution flag (A208). The current value TR0 of timer T0 at this point of time is stored in the status latch memory.

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

The following explanation is made, taking the program shown in 3-14-2 (2) for example.

- 1) Operate as follows from the program loader.
 - ◇ Select [PLC functions] - [Status Latch] - [Status Latch Execute...] from the menu bar.
 - ◇ The {Status Latch Execute} dialog box is displayed.
- After left-clicking the optional [On Address] button, enter an address for the external input switch in the text box, and left-click the [OK] button.



If status latch is executed when the previously registered data still remains in the CPU, the following {Confirm} dialog box is displayed.



Left-clicking the [Yes] button clears the data and registers new data.

- 2) Turn on the external input switch (B10), and the current value (TR0) of timer (T0) will be stored in the status latch memory.

3-14 Status Latch (Recording Data at a Point of Time)

(3) Method to operate keys of the program loader

The following explanation is made, taking the program shown in 3-14-2 (3) for example.

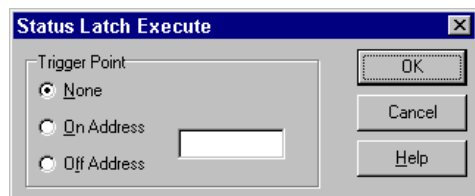
1) Operate as follows from the program loader.

◇ Select [PLC functions] - [Status Latch] - [Status Latch Execute...] from the menu bar.

The {Status Latch Execute} dialog box is displayed.

◇ Left-click the optional [None] button, then the [OK] button.

Then the current data is stored in the status latch memory.

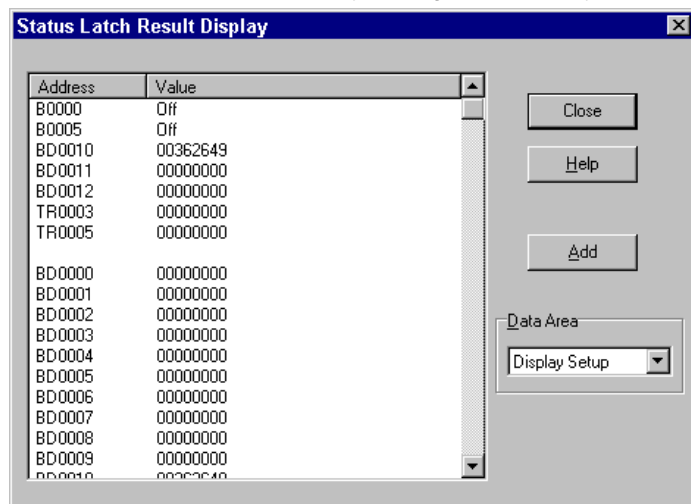


3-14-5 Status latch result display

Status latch data is displayed by using the following procedure.

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

◇ The {Status Latch Result Display} dialog box is displayed.



<Explanation of the dialog box>

[Data Area]

When "Display Setup" is selected, the addresses registered in 3-13-4 are displayed.

When "WB", "WM", "WR", etc., is selected, addresses for a specified type are displayed.

[Add] button

Used to add selective display to [Display Setup].

3-14 Status Latch (Recording Data at a Point of Time)

3-14-6 Status latch cancel all

The [Status Latch Cancel All] function clears the [Status Latch Registration] data stored in the CPU as well as the collected latch data.

These data are also cleared when the power switch of the CPU is turned off.

- ◇ Select [PLC functions] - [Status Latch] - [Status Latch Cancel All] from the menu bar.
Then status latch data is all cleared.

3-15 Trigger (Stop Monitor Screen)

The trigger function is a function which stops the monitor display at rising (or falling) of a contact (or output). (Trigger setting cannot be made for SC.)



Following model of PLC support Trigger.
F70, F70S, F80H, F120 (V05 or later), F120H, and F120S to F150S series

<Example of use>

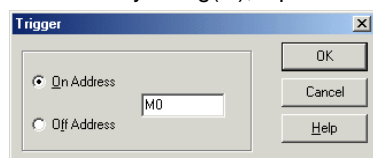
Any of B0 to B3, limit and photoelectric switches, etc., is sometimes turned ON. Since the ON/OFF condition cannot be perceived with a usual monitor, the following program is created to check which contact is ON with trigger applied.



3-15-1 Setting and completing trigger

The following explains the procedure for setting trigger based on the condition of {Rising of output M0}.

- ◇ Select [PLC functions(P)] - [Trigger(G)] - [Set trigger(S)] from the menu bar.
- ◇ The “trigger” dialog box is displayed.
Select Relay rising(O), input “M0” in the text box, then left-click the [OK] button.



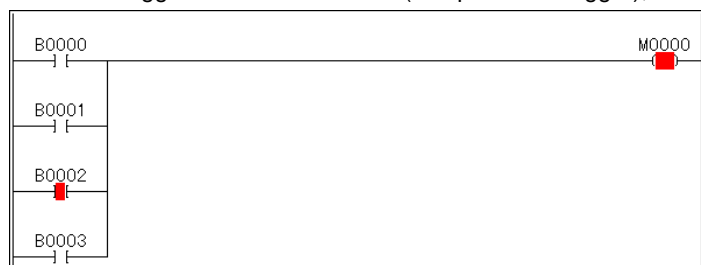
- ◇ During trigger execution, the trigger address and trigger conditions (ON at rising of relay and OFF at falling of relay) are displayed in the status bar at the bottom of the screen.



Trigger execution display

Green: Waiting for trigger
Red: Trigger completed

- ◇ When the trigger conditions are met (completion of trigger), the monitor display stops.



3-15 Trigger (Stop Monitor Screen)

3-15-2 Canceling trigger

- ◇ Select [PLC functions(P)] - [Trigger(G)] - [Cancel trigger(C)] from the menu bar. Trigger is canceled, the trigger execution display goes off, and monitoring is restarted.



Trigger can also be canceled by the following operation.

- The trigger setting is canceled by changing the screen through scroll, enlargement, reduction, or other screen change operation.
-

Section 4 Print Function

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Section 4 Print Function

4-1 Outline of Print Function

The print function consists of the following.

- 1) Common setting
- 2) Printout configuration setting
 - Ladder (program) printout
 - I/O device listing
 - Device use condition printout
 - Device cross-reference printout
 - System definition printout
- 3) Printer setting
- 4) Print preview

Here, the individual items shown above are explained.

4-1-1 Common setting

In the common setting, the heading, footer, margin, etc. which are common with items to be printed are set.

(1) Display of common setting dialog box and setting of contents

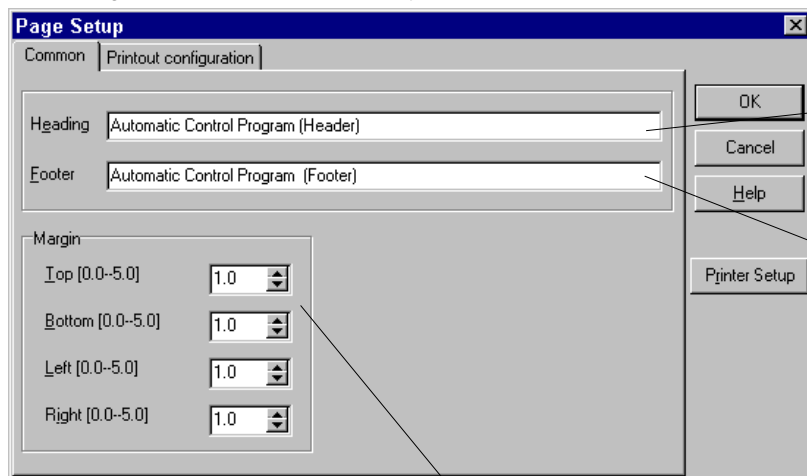
The common setting dialog box can be displayed by either of the following two methods.

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 [Common] 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 {Page Setup} dialog box is displayed.
- ◇ Left-click the [Common] tab.
The dialog box shown below is displayed.



Header:
The text that is printed at the top of the page.

Footer:
The text that is printed at the bottom of the page.

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

Margin:
Margin in cm.

4-1 Outline of Print Function

4-1-2 Printout configuration setting

In the printout configuration setting, it is possible to set a scope and content of printout for each item (shown below).

- Ladder (program) printout
- I/O device list printout
- Device use condition printout
- Device cross-reference printout
- System definition printout

(1) Display of printout configuration setting dialog box

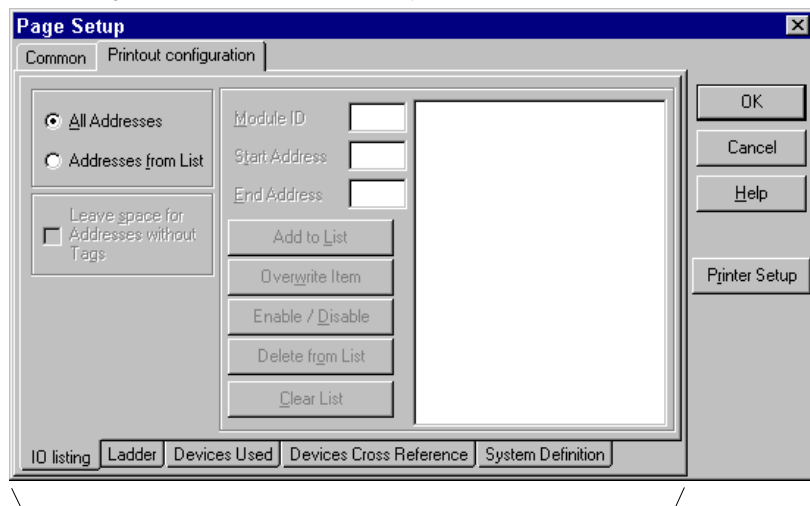
The printout configuration setting dialog box can be displayed by either of the following two methods.

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 [Printout configuration] tab. (Normally, this tab is automatically displayed in the {Page Setup} dialog box.
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 {Page Setup} dialog box is displayed.
- ◇ Left-click the [Printout configuration] tab. (Normally, this tab is automatically displayed in the {Page Setup} dialog box.
The dialog box shown below is displayed.

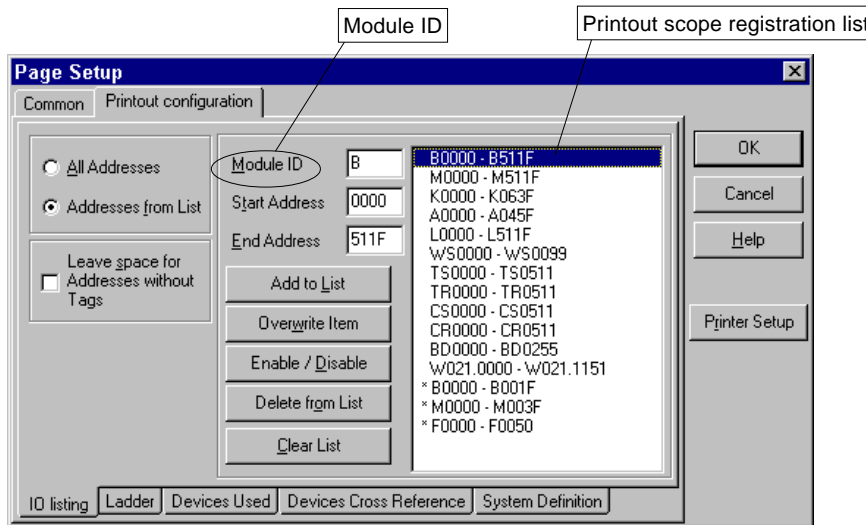


Set each item to be printed by left-clicking the associated tab.

4-1 Outline of Print Function

(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 (B, M, K, WB, WM, WK, W30, 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:

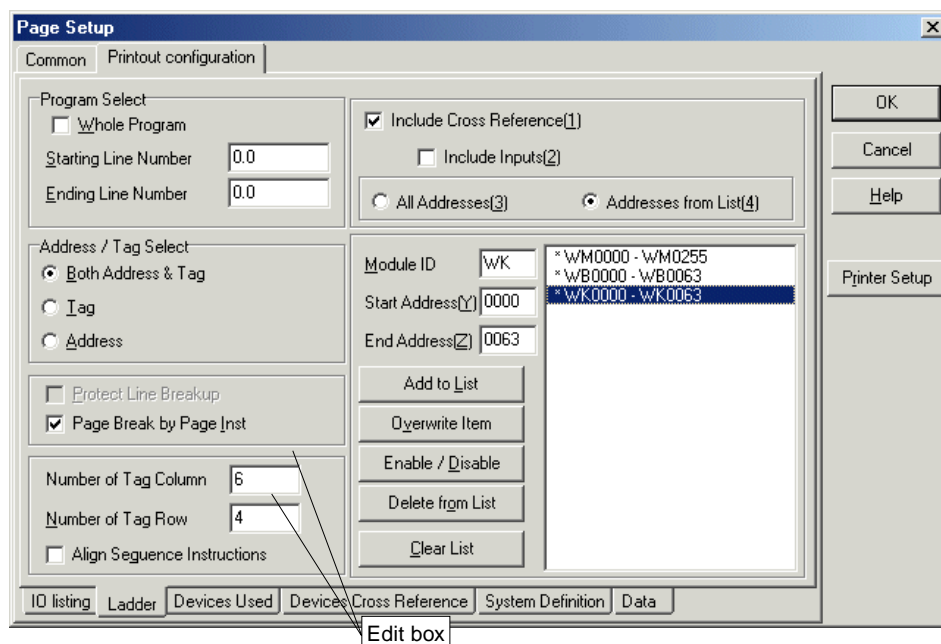
This button is used to delete all the items that have been registered in the "Printout Scope Registration List."

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

4-1 Outline of Print Function

(3) Setting of Ladder

When this item is selected, a 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.

[Page Break by Page Inst] check box :

To make form feed for each page instruction so that the page instruction be at the top of a page, set this check box to ON.

[Number of Tag Column], [Number of Tag Row] text boxes :

Specify the number of tag characters per row (6 to 24) and the number of rows (1 to 4).

[Align Sequence Instructions] check box:

Check this box when tag display width is fixed to the number of characters set in the [Specify Tag Width] edit box and sequence instructions are printed out at the same intervals.

4-1 Outline of Print Function

[Include Cross Reference (1)] check box:

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

When the [Include Inputs (2)] box is also checked, an input side cross-reference is added to the printout.

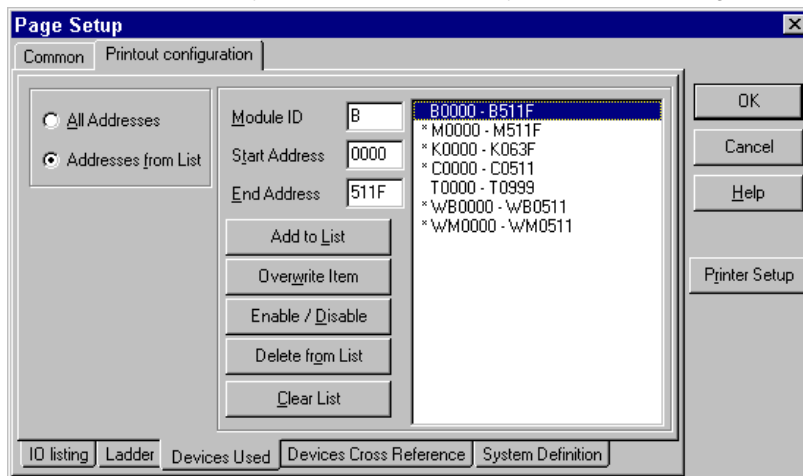
For a scope of addresses for cross-reference, left-click either [All Addresses (3)] or [Addresses from List (4)] optional button. When [Address from List (4)] is specified, the scope of memory addresses to be printed must be set.



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) 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.



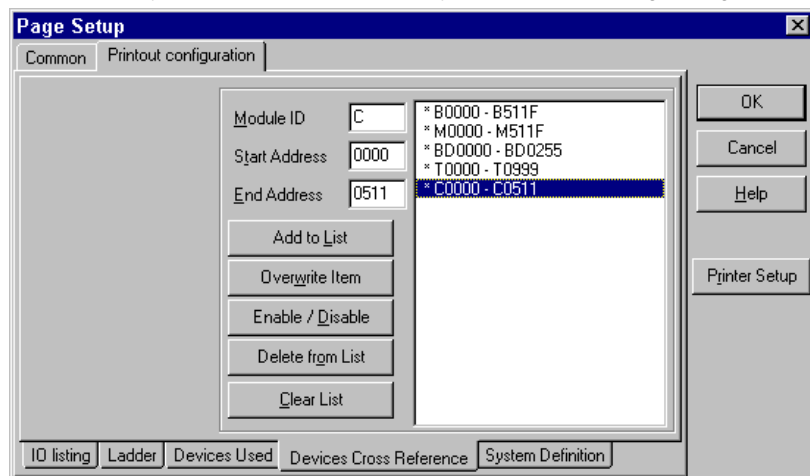
For the method of setting a scope of memory addresses to be printed in the dialog box, refer to "(2) Setting of IO Listing".

4-1 Outline of Print Function

(5) 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.



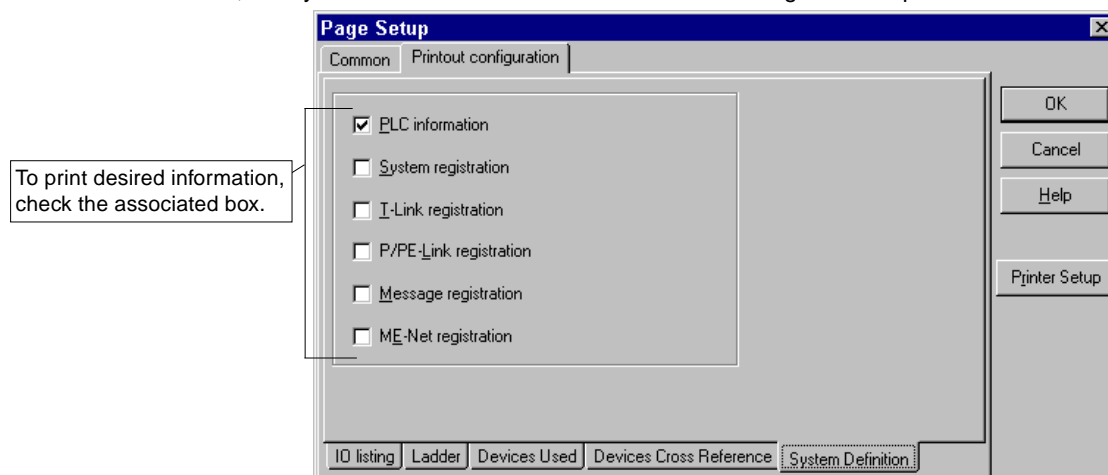
For the method of setting a scope of memory addresses to be printed in the dialog box, refer to “(2) Setting of IO Listing.”



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.

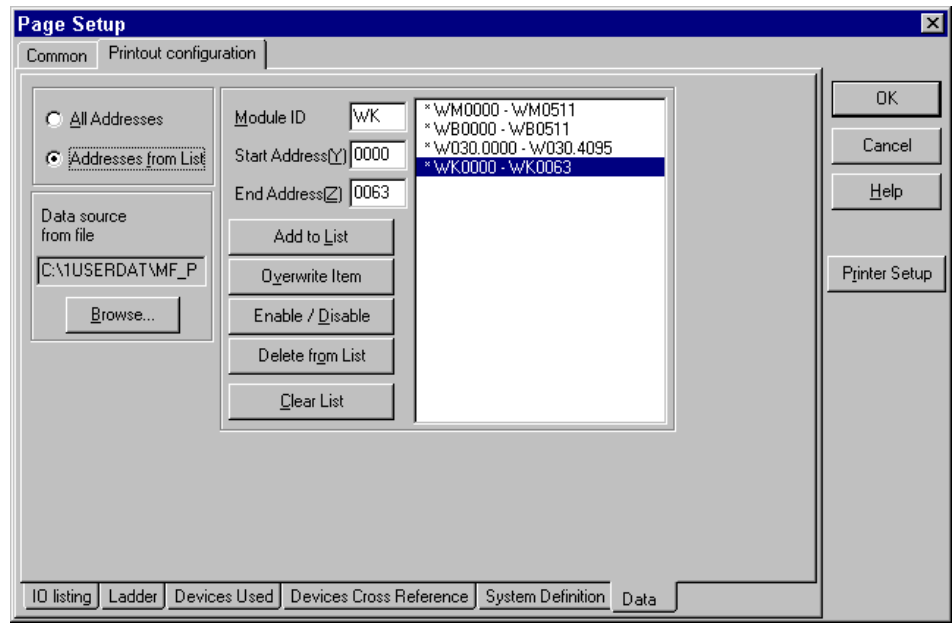
(6) Setting of System Definition

When this item is set, the system definition information that has been registered is printed.



(7) Setting Data Print


When this item is set, the content of the data file that has been saved with the data save command is printed out.



When the [Browse...] button is left-clicked, data files are displayed in the [Data file print] dialog box. From this list, select a data file to be printed.

For the scope of addresses, select either [All Addresses (3)] or [Addresses from List (4)].

In either case, the data in the up bit area of timer (T) and counter (C) cannot be printed.

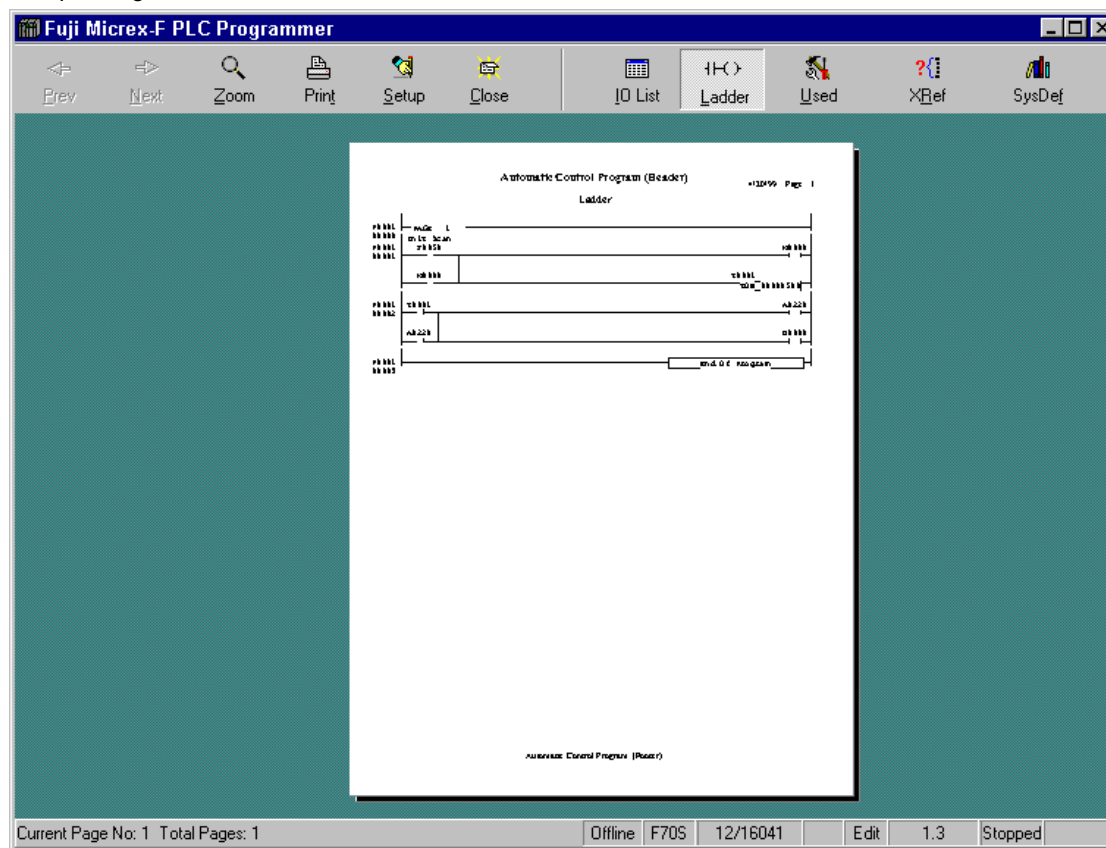
 For the method of setting the scope of memory addresses to be printed in the dialog box, refer to "(2) Setting of I/O Listing".

4-1 Outline of Print Function

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 Common” and “4-1-2 Printout configuration”) 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 Outline of Print Function

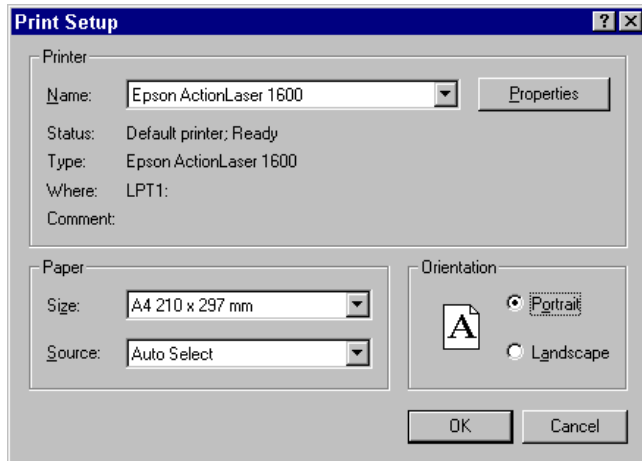
4-1-4 Printer Setup

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

<Display of the Printer Setup dialog box>

To cause the {Printer Setup} dialog box to be displayed, left-click the [Printer 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 {Printer Setup} dialog box is displayed.



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

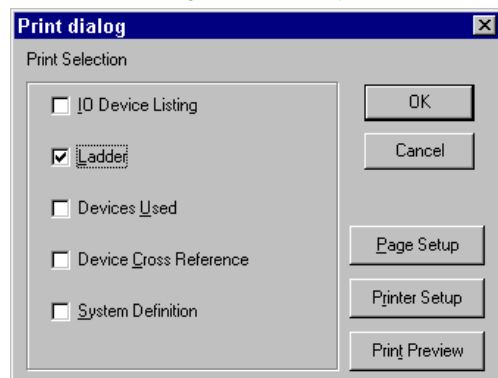
4-2 Print

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

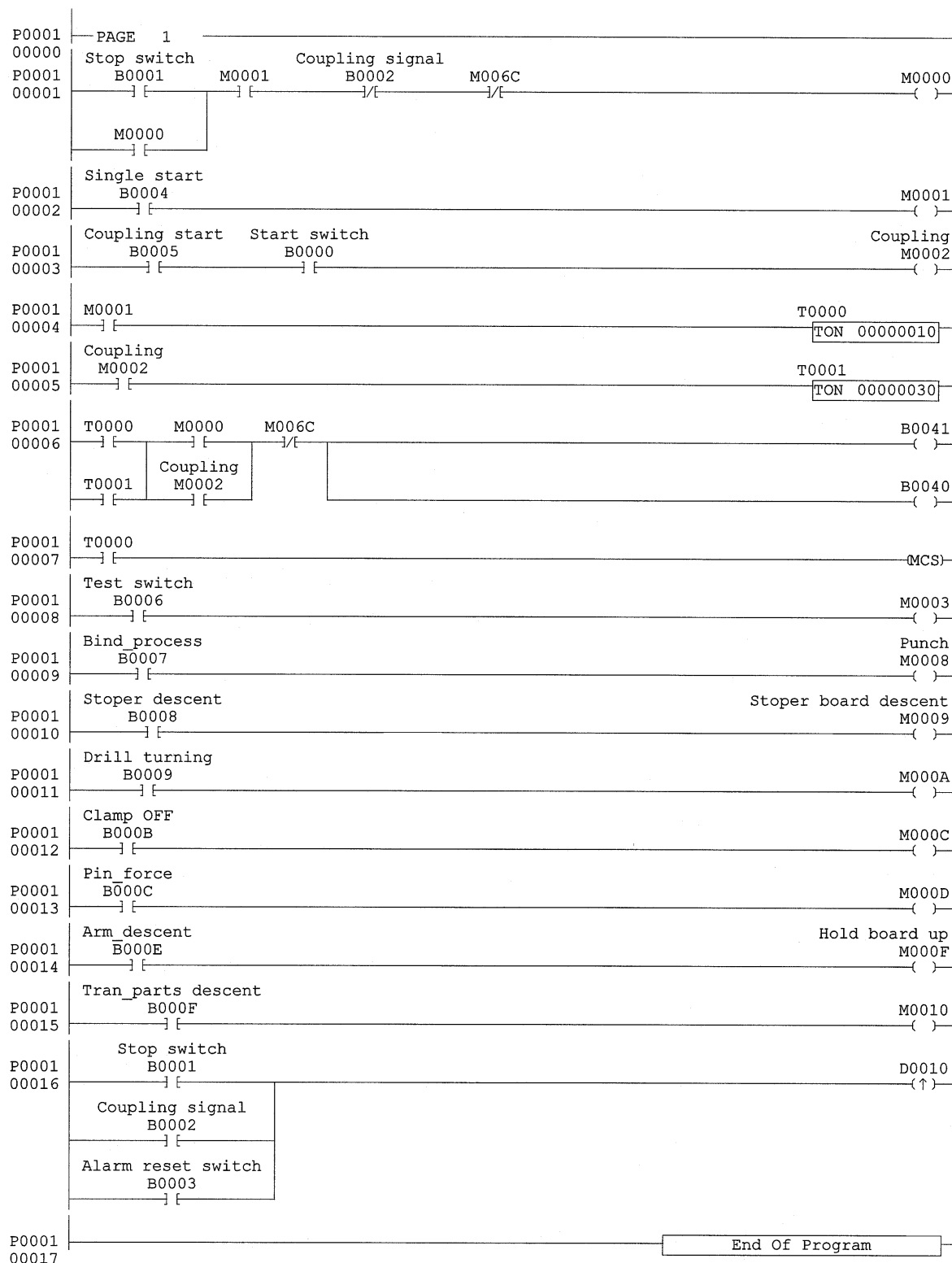
As a reference, examples of printout using the software are given below.

(1) Ladder printout

Automatic Control Program (Header)

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Sample2 - Ladder



Automatic Control Program (Footer)

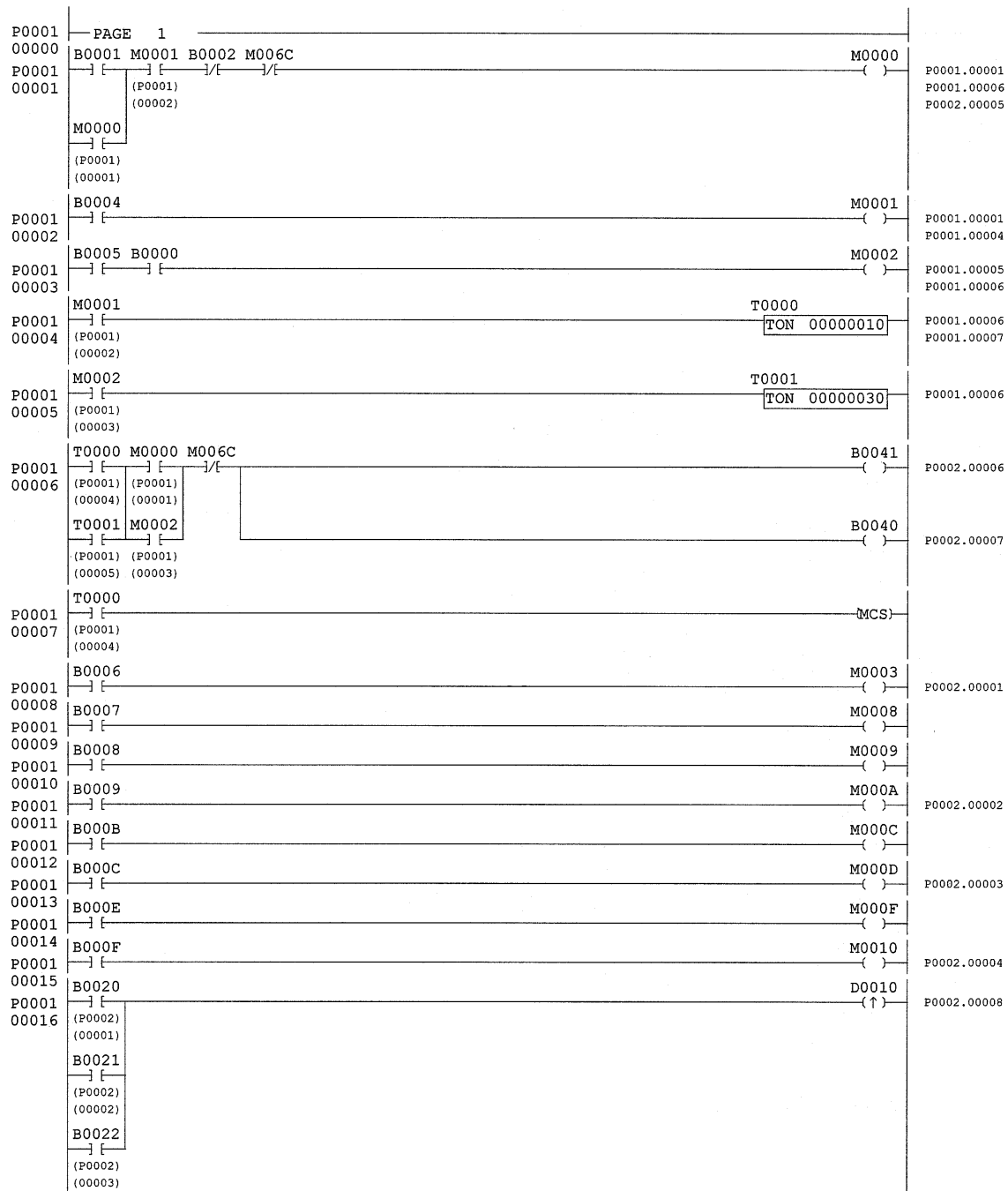
4-2 Print

Ladder printout (Cross Reference)

Automatic Control Program (Header)

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Sample2 - Ladder



Automatic Control Program (Footer)

(2) I/O device listing

Automatic Control Program (Header)

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Sample2 - IO Device Listing

Address	Tag	Description
A0040	Overflow	
A0041	Operation_execution_err	

Address	Tag	Description
B0000	Start switch	
B0001	Stop switch	
B0002	Coupling signal	
B0003	Alarm reset switch	
B0004	Single start	
B0005	Coupling start	
B0006	Test switch	
B0007	Bind process	
B0008	Stoper descent	
B0009	Drill turning	
B000A	Clamp ON	
B000B	Clamp OFF	
B000C	Pin_force	
B000D	Arm_rise	
B000E	Arm_descent	
B000F	Tran_parts descent	
B0010	Plate detection	
B0011	Hole detection	
B0014	Limit_SW_01_ON	
B0015	Stoper_limit_L	
B0016	Stoper_limit_U	
B001B	Limit_SW_02_ON	
B001C	Limit_SW_02_OFF	
B001D	Lift_up	
B001E	Lift_down	

Address	Tag	Description
F0000	Run	
F0001	Stop	
F0002	Fatal_fault	
F0003	Nonfatal_fault	
F0010	Memory_error	
F0014	Tlink_fault	
F0018	User_program_err	
F0019	WDT_error	
F001A	BUS_error	
F001C	I/O_double_assign	
F001F	Fatal_plant_fault	
F0026	Tlink_config_fault	
F002F	Nonfatal_plant_fault	
F004E	Sign_flag	
F004F	Zero_flag	
F0050	Init_Scan	Contact on for initial scan only
F0053	1/10s_clock	
F0054	1s_clock	

Address	Tag	Description
M0002	Coupling	
M0008	Punch	
M0009	Stoper board descent	
M000E	Hold board down	
M000F	Hold board up	
M003F	Plate detection support	

Address	Tag	Description
WB0040	Set up Data 1	Reception Data
WB0041	Set up Data 2	Reception Data
WB0042	Set up Data 3	Reception Data
WB0050	Indication Data 1	Reception Data
WB0051	Indication Data 2	Reception Data
WB0052	Indication Data 3	Tranmit Data

Automatic Control Program (Footer)

4-2 Print

(3) Device used printout

Automatic Control Program (Header)

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Sample2 - Devices Used

Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
B0000	x	x	x	x	x	x	x	x	x	x	.	x	x	.	x	x
B0010
B0020	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
B0030	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
B0040	x	x														

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

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

Address	0	1	2	3	4	5	6	7	8	9
T0000	x	x								

(4) Device cross-reference printout

Automatic Control Program (Header)

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Sample2 - Device Cross Reference

Range : B0000 - B0050

Address	Tag	# PageNo.LineNo # (* denotes Output)
B0000	Start switch	1.3
B0001	Stop switch	1.1
B0002	Coupling signal	1.1
B0004	Single start	1.2
B0005	Coupling start	1.3
B0006	Test switch	1.8
B0007	Bind_process	1.9
B0008	Stoper descent	1.10
B0009	Drill turning	1.11
B000B	Clamp OFF	1.12
B000C	Pin_force	1.13
B000E	Arm_descent	1.14
B000F	Tran_parts descent	1.15
B0020		1.16 2.1*
B0021		1.16 2.2*
B0022		1.16 2.3*
B0023		2.4*
B0040		1.6* 2.7
B0041		1.6* 2.6

Range : M0000 - M0050

Address	Tag	# PageNo.LineNo # (* denotes Output)
M0000		1.1 1.1* 1.6 2.5
M0001		1.1 1.2* 1.4
M0002	Coupling	1.3* 1.5 1.6
M0003		1.8* 2.1
M0008	Punch	1.9*
M0009	Stoper board descent	1.10*
M000A		1.11* 2.2
M000C		1.12*
M000D		1.13* 2.3
M000F	Hold board up	1.14*
M0010		1.15* 2.4

(5) System definition printout

Automatic Control Program (Header)

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Sample2 - System Definition

PC Information

PC Model	F70S
Program Memory	16041 Step
Program Memory Free	15993 Step

System Registration

Processor Definition

Fail Soft	No
WDT Time	0 *10ms
BD Module D.CNT	0
Constant Scan Time	0 *1ms
Duplex Processor	Not Enabled

PIO Definition

Shelf 0	Scan
	Reset Mode
Shelf 1	Reset Mode
Shelf 2	Reset Mode
Shelf 3	Reset Mode
Shelf 4	Reset Mode
Shelf 5	Reset Mode
Shelf 6	Reset Mode
Shelf 7	Reset Mode

PIO Configuration

	Slot Number															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Shelf 0
Shelf 1
Shelf 2
Shelf 3
Shelf 4
Shelf 5
Shelf 6
Shelf 7

Option Slot

	Slot Number					
	0	1	2	3	4	5
Option Slot

T-Link Registration : I/O Expansion

I/O Expansion	Not Enabled
---------------	-------------

T-Link Registration : Channel 0

F: Fail-Soft R: Registered I: Freeze IO on STOP 0..3: Group 0,1,2,3

ST.No.	F	R	I	0	1	2	3	ST.No.	F	R	I	0	1	2	3
00	50	.	.	.	.	.	.	.
01	51	.	.	.	.	.	.	.
02	52	.	.	.	.	.	.	.
03	53	.	.	.	.	.	.	.
04	54	.	.	.	.	.	.	.
05	55	.	.	.	.	.	.	.
06	56	.	.	.	.	.	.	.
07	57	.	.	.	.	.	.	.
08	58	.	.	.	.	.	.	.
09	59	.	.	.	.	.	.	.
10	60	.	.	.	.	.	.	.
11	61	.	.	.	.	.	.	.
12	62	.	.	.	.	.	.	.
13	63	.	.	.	.	.	.	.

Automatic Control Program (Footer)

Automatic Control Program (Header)

00/03/15 Page 2

Sample2 - System Definition

14	.	.	.	.	.	.	.	64	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	65	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	66	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	67	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	68	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	69	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	70	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	71	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	72	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	73	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	74	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	75	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	76	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	77	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	78	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	79	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	80	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	81	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	82	.	.	.	.	.	.	.
33	.	.	.	.	.	.	.	83	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	84	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	85	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	86	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	87	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	88	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	89	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	90	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	91	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	92	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	93	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	94	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	95	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	96	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	97	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	98	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	99	.	.	.	.	.	.	.

T-Link Registration : Channel 1

F: Fail-Soft R: Registered I: Freeze IO on STop 0..3: Group 0,1,2,3															
ST.No.	F	R	I	0	1	2	3	ST.No.	F	R	I	0	1	2	3
00	50	.	.	.	.	.	.	.
01	51	.	.	.	.	.	.	.
02	52	.	.	.	.	.	.	.
03	53	.	.	.	.	.	.	.
04	54	.	.	.	.	.	.	.
05	55	.	.	.	.	.	.	.
06	56	.	.	.	.	.	.	.
07	57	.	.	.	.	.	.	.
08	58	.	.	.	.	.	.	.
09	59	.	.	.	.	.	.	.
10	60	.	.	.	.	.	.	.
11	61	.	.	.	.	.	.	.
12	62	.	.	.	.	.	.	.
13	63	.	.	.	.	.	.	.
14	64	.	.	.	.	.	.	.
15	65	.	.	.	.	.	.	.
16	66	.	.	.	.	.	.	.
17	67	.	.	.	.	.	.	.
18	68	.	.	.	.	.	.	.
19	69	.	.	.	.	.	.	.
20	70	.	.	.	.	.	.	.
21	71	.	.	.	.	.	.	.
22	72	.	.	.	.	.	.	.

Automatic Control Program (Footer)

Automatic Control Program (Header)

00/03/15 Page 3

Sample2 - System Definition

23	.	.	.	.	.	.	.	73	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	74	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	75	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	76	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	77	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	78	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	79	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	80	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	81	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	82	.	.	.	.	.	.	.
33	.	.	.	.	.	.	.	83	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	84	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	85	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	86	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	87	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	88	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	89	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	90	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	91	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	92	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	93	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	94	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	95	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	96	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	97	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	98	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	99	.	.	.	.	.	.	.

T-Link Registration : Channel 2

F: Fail-Soft R: Registered I: Freeze IO on STop 0..3: Group 0,1,2,3															
ST.No.	F	R	I	0	1	2	3	ST.No.	F	R	I	0	1	2	3
00	50	.	.	.	.	.	.	.
01	51	.	.	.	.	.	.	.
02	52	.	.	.	.	.	.	.
03	53	.	.	.	.	.	.	.
04	54	.	.	.	.	.	.	.
05	55	.	.	.	.	.	.	.
06	56	.	.	.	.	.	.	.
07	57	.	.	.	.	.	.	.
08	58	.	.	.	.	.	.	.
09	59	.	.	.	.	.	.	.
10	60	.	.	.	.	.	.	.
11	61	.	.	.	.	.	.	.
12	62	.	.	.	.	.	.	.
13	63	.	.	.	.	.	.	.
14	64	.	.	.	.	.	.	.
15	65	.	.	.	.	.	.	.
16	66	.	.	.	.	.	.	.
17	67	.	.	.	.	.	.	.
18	68	.	.	.	.	.	.	.
19	69	.	.	.	.	.	.	.
20	70	.	.	.	.	.	.	.
21	71	.	.	.	.	.	.	.
22	72	.	.	.	.	.	.	.
23	73	.	.	.	.	.	.	.
24	74	.	.	.	.	.	.	.
25	75	.	.	.	.	.	.	.
26	76	.	.	.	.	.	.	.
27	77	.	.	.	.	.	.	.
28	78	.	.	.	.	.	.	.
29	79	.	.	.	.	.	.	.
30	80	.	.	.	.	.	.	.
31	81	.	.	.	.	.	.	.

Automatic Control Program (Footer)

Automatic Control Program (Header)

00/03/15 Page 4

Sample2 - System Definition

32	.	.	.	.	.	.	.	82	.	.	.	.	.	.	.
33	.	.	.	.	.	.	.	83	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	84	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	85	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	86	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	87	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	88	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	89	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	90	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	91	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	92	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	93	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	94	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	95	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	96	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	97	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	98	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	99	.	.	.	.	.	.	.

T-Link Registration : Channel 3

F: Fail-Soft R: Registered I: Freeze IO on STop 0..3: Group 0,1,2,3

ST.No.	F	R	I	0	1	2	3	ST.No.	F	R	I	0	1	2	3
00	50	.	.	.	.	.	.	.
01	51	.	.	.	.	.	.	.
02	52	.	.	.	.	.	.	.
03	53	.	.	.	.	.	.	.
04	54	.	.	.	.	.	.	.
05	55	.	.	.	.	.	.	.
06	56	.	.	.	.	.	.	.
07	57	.	.	.	.	.	.	.
08	58	.	.	.	.	.	.	.
09	59	.	.	.	.	.	.	.
10	60	.	.	.	.	.	.	.
11	61	.	.	.	.	.	.	.
12	62	.	.	.	.	.	.	.
13	63	.	.	.	.	.	.	.
14	64	.	.	.	.	.	.	.
15	65	.	.	.	.	.	.	.
16	66	.	.	.	.	.	.	.
17	67	.	.	.	.	.	.	.
18	68	.	.	.	.	.	.	.
19	69	.	.	.	.	.	.	.
20	70	.	.	.	.	.	.	.
21	71	.	.	.	.	.	.	.
22	72	.	.	.	.	.	.	.
23	73	.	.	.	.	.	.	.
24	74	.	.	.	.	.	.	.
25	75	.	.	.	.	.	.	.
26	76	.	.	.	.	.	.	.
27	77	.	.	.	.	.	.	.
28	78	.	.	.	.	.	.	.
29	79	.	.	.	.	.	.	.
30	80	.	.	.	.	.	.	.
31	81	.	.	.	.	.	.	.
32	82	.	.	.	.	.	.	.
33	83	.	.	.	.	.	.	.
34	84	.	.	.	.	.	.	.
35	85	.	.	.	.	.	.	.
36	86	.	.	.	.	.	.	.
37	87	.	.	.	.	.	.	.
38	88	.	.	.	.	.	.	.
39	89	.	.	.	.	.	.	.
40	90	.	.	.	.	.	.	.

Automatic Control Program (Footer)

Automatic Control Program (Header)

00/03/15 Page 5

Sample2 - System Definition

41	.	.	.	.	.	.	.	.	91	.	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	.	92	.	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	.	93	.	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	.	94	.	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	.	95	.	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	.	96	.	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	.	97	.	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	.	98	.	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	.	99	.	.	.	.	.	.	.	.

P-Link 1

Station No.	Configuration															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Self Number	00															
Shelf Area	Top				Size											
H SP Bit	0000				00 x32											
H SP Word	0000				00 x32											
L SP Word	0000				00 x32											
L SP Word	0000				00 x32											

P-Link 2

Station No.	Configuration															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Self Number	00															
Shelf Area	Top				Size											
H SP Bit	0000				00 x32											
H SP Word	0000				00 x32											
L SP Word	0000				00 x32											
L SP Word	0000				00 x32											

Message Registration

ST.No.	Data Module	Used	Link	Capsule No.	ETC	Channel
00	000	0	0	000	000	0
01	000	0	0	000	000	0
02	000	0	0	000	000	0
03	000	0	0	000	000	0
04	000	0	0	000	000	0
05	000	0	0	000	000	0
06	000	0	0	000	000	0
07	000	0	0	000	000	0
08	000	0	0	000	000	0
09	000	0	0	000	000	0
10	000	0	0	000	000	0
11	000	0	0	000	000	0
12	000	0	0	000	000	0
13	000	0	0	000	000	0
14	000	0	0	000	000	0
15	000	0	0	000	000	0
16	000	0	0	000	000	0
17	000	0	0	000	000	0
18	000	0	0	000	000	0
19	000	0	0	000	000	0
20	000	0	0	000	000	0
21	000	0	0	000	000	0
22	000	0	0	000	000	0
23	000	0	0	000	000	0
24	000	0	0	000	000	0
25	000	0	0	000	000	0
26	000	0	0	000	000	0
27	000	0	0	000	000	0
28	000	0	0	000	000	0

Automatic Control Program (Footer)

Automatic Control Program (Header)

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Sample2 - System Definition

29	000	0	0	000	000	0
30	000	0	0	000	000	0
31	000	0	0	000	000	0
32	000	0	0	000	000	0
33	000	0	0	000	000	0
34	000	0	0	000	000	0
35	000	0	0	000	000	0
36	000	0	0	000	000	0
37	000	0	0	000	000	0
38	000	0	0	000	000	0
39	000	0	0	000	000	0
40	000	0	0	000	000	0
41	000	0	0	000	000	0
42	000	0	0	000	000	0
43	000	0	0	000	000	0
44	000	0	0	000	000	0
45	000	0	0	000	000	0
46	000	0	0	000	000	0
47	000	0	0	000	000	0
48	000	0	0	000	000	0
49	000	0	0	000	000	0

ME-Net Registration	
Register Link	Module No.
ME-Net 1	000
ME-Net 2	000

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

	Page
Appendix 1-1 File Saved Using MS-DOS/LITE 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

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

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

The correspondence between files(program and comment) saved using the MS-DOS or LITE loader and files using Windows loader is as shown in the following table.

Note that in the Windows loader, the term "tag" is used in place of the term "comment."

MS-DOS/LITE loaders		Windows loader	
Name	File extension	Name	File extension
Program	*.PGS	Ladder	*.LDX
Comment	*.CMM, etc.	Tag	*.TAG

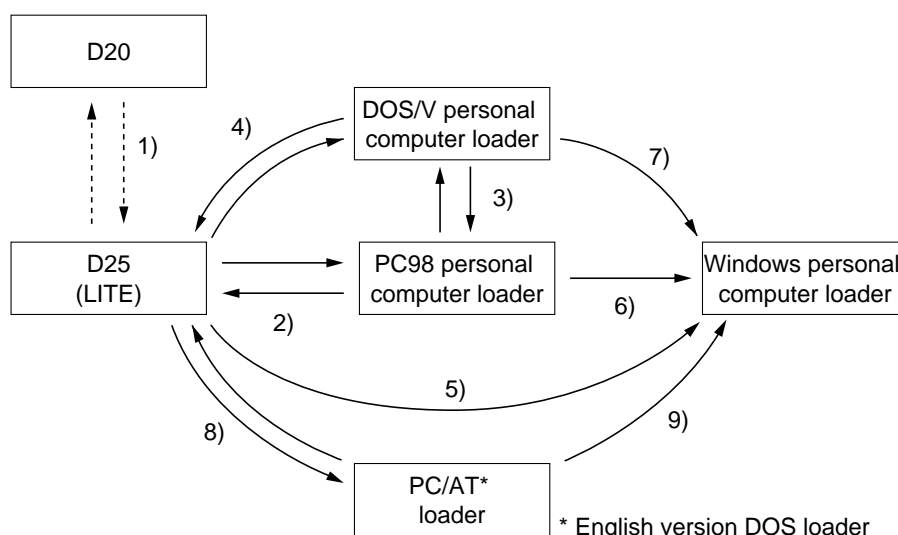
The compatibility between the above files is explained below.

Appendix 1-1-1 Compatibility of program files

This section describes how to read a file saved using the D20, D25(LITE), and MS-DOS loader(PC98,DOS/V,PC/AT) on this Windows loader.

Basically, any program prepared by any loader can be exchanged between different loaders through the PLC.

The use of files saved using the above loaders is shown as follows.



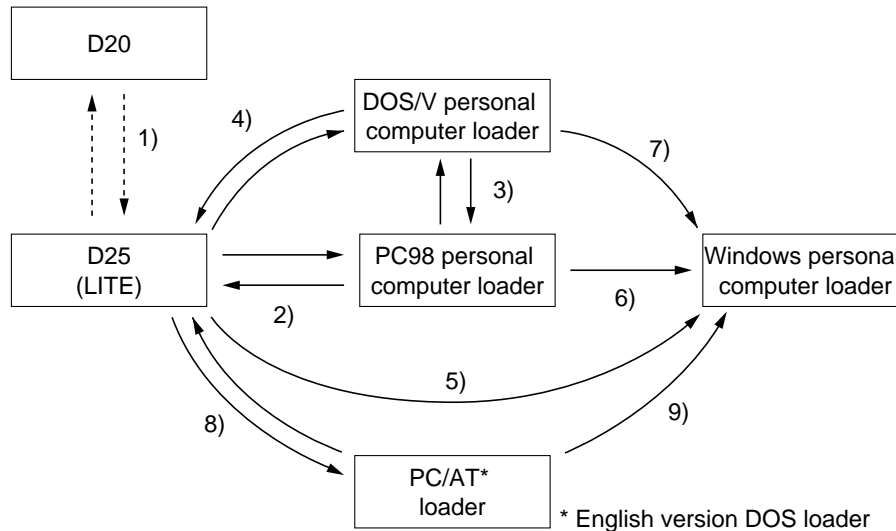
- 1) Floppy disk data can be shared between them when it is converted by the "D25 - D20 file conversion" function of LITE.
- 2) As long as the floppy disk is of 1 MB format (sometimes expressed as 1.2 MB or 1.25 MB format), floppy disk data can be shared between them. Though the LITE is capable of handling floppy disks of 1 MB format, it is incompatible with floppy disks of 1.44 MB format.
- 3) 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.
- 4) Same as explained in 2), above.
- 5) Format of a floppy disk in D25(LITE) defaults to 1MB. This diskette formatting is not generally readable on PC/AT compatibles. Please save the program file in 720KB format(2DD) using the D25 and open the file using the PC/AT loader.
Files(file extension: *.PRG, *.PGS) saved using the D25 in 2DD can be directly opened on the Windows loader. When this program is saved, a new file(file extension: *.LDX) for Windows is created. This *.LDX file cannot be read by the LITE. When files are saved by specifying extension " *.PGS", the LITE loader can read them.
- 6) Same as explained in 5), above. It is necessary to check the compatibility of floppy disk format between them.
- 7) Same as explained in 5), above. It is necessary to check the compatibility of floppy disk format between them.
- 8) Files saved using the D25 and PC/AT loader have compatibility if the floppy disk format is 720KB(2DD).
For information on the format please refer to the above 5)
- 9) Same as explained in 5) except 720KB and 1.44MB format are available.

Appendix 1-1 Data Prepared by MS-DOS/LITE Loaders

Appendix 1-1-2 Compatibility of comment files

Here, the method of handling comment files prepared by the D20, D25 (LITE), PC98 personal computer loader, or DOS/V personal computer 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 by converting them using the “comment definition floppy disk conversion” function of the LITE.
- 2) 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 or MS-DOS personal computer loader.) Though the LITE is capable of handling floppy disks of 1 MB format, it is incompatible with floppy disks of 1.44 MB format.
- 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) Same as explained in 2), above.
- 5) As long as the personal computer can handle floppy disks of 1 MB format, any new comment file prepared by the LITE (file extension: *.CMM, etc.) can be directly read by the Windows loader. When the new comment file is saved, a new file for the Windows (file extension: *.TAG) is created. This *.TAG file cannot be directly read by the LITE.
To convert the *.TAG file into the format that can be handled by the LITE, it is necessary first to convert it into a text file by executing [Auxiliaries] - [Tag to Text Conversion] - [Text File Output] selected from the main menu on the Windows side, then to convert the text file into the comment file format for LITE by executing the comment definition floppy disk conversion function (personal computer → D25) on the LITE loader side.
- 6) Same as explained in 5), above. It is necessary to check the compatibility of the floppy disk formats. To convert any comment file (*.TAG file) saved by the Windows loader into the format that can be handled by the MS-DOS loader, first convert it into a text file on the Windows loader side using the procedure described in <5> , then convert the text file into the comment file format for MS-DOS on the MS-DOS loader side using its optional comment file conversion function.
- 7) Same as explained in 6), above.

Appendix 1-1 Data Prepared by MS-DOS/LITE Loaders

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

The Windows version program loader can read comment files that are prepared by the LITE or 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 ".PRG" or ".PGS") and comment files (with extension ".CMM", etc.) that have been prepared by MS-DOS loader in the same folder.
Be careful, because there are several types of comment file. In other words, in addition to the file with extension ".CMM", there are other types of comment files that have different extensions corresponding to memory types (for example, ".CB1" for B area). Copy all the files that are different in extension but have the same name.
- 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 "*.LDX" and tag file "*.TAG") are created.

The following extensions are available for the comment files for the MS-DOS loader.

File classification	Conventional extension code	New extension code	File classification	Conventional extension code	New extension code
Management file	.CMT	.CMM	Comment (WK)	.CWK	.CKW
Comment (B)	.CB0	.CB1	Comment (WF)	.CWF	.CFW
Comment (M)	.CM0	.CM1	Comment (WA)	.CWA	.CAW
Comment (K)	.CK0	.CK1	Comment (WL)	.CWL	.CLW
Comment (T)	.CT0	.CT1	Comment (WS)	.CWS	.CSW
Comment (C)	.CC0	.CC1	Comment (TS)	.CTS	.CST
Comment (D)	.CD0	.CD1	Comment (TR)	.CTR	.CRT
Comment (F)	.CF0	.CF1	Comment (CS)	.CCS	.CSC
Comment (A)	.CA0	.CA1	Comment (CR)	.CCR	.CRC
Comment (L)	.CL0	.CL1	Comment (BD)	.CBD	.CDB
Comment (S)	.CSB	.CS1	Comment (SI)	.CSI	.CIS
Comment (WB)	.CWB	.CBW	Comment (DI)	.CWM	.CID
Comment (WM)	.CWM	.CMW	Comment (PG)	.CWM	.CGP

If extension ".PGS" is specified when saving the program, comment files (with extension ".CMM", etc.) for the MS-DOS loader are automatically created.

Appendix 1-2 Functions of Windows Loader

The current version (V1.00.XXX) does not support the following functions, which are supported by the MS-DOS loader.

- PLCs other than F55, 70, 70S, 120S, 140S, and 150S
- Display/edit of block diagram instructions
- Specification of duplexed processor
- Sampling trace, status latch
- One-step write during program run
- Page re-numbering
- Duplicate page check
- Used page check
- Loader network
- Save/restore of diagnostic information
- MCS marking
- Zero suppress
- Save data

V1.10.XXX supports the following functions:

- Adaptation to F30, F50, F50H, F60, F80H and F120H series
- Duplex-processor control
- Sampling trace and status latch
- Loader network (only P-link and PE-link)
- Diagnostic data save (current generation only) (saved as text file)
- Data save/transfer/print
- Ladder print with cross reference

For additional functions for later versions, refer to Help of the Loader Software.

Appendix 2 Environment Setting

	Page
Appendix 2-1 Environment Options	App.2-1
(1) Display tab	App.2-1
(2) Editor(E) tab	App.2-2
(3) Setting of folders	App.2-4
(4) Colors	App.2-5
(5) Palette	App.2-5

Appendix 2 Environment Setting

Appendix 2-1 Environment Options

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.

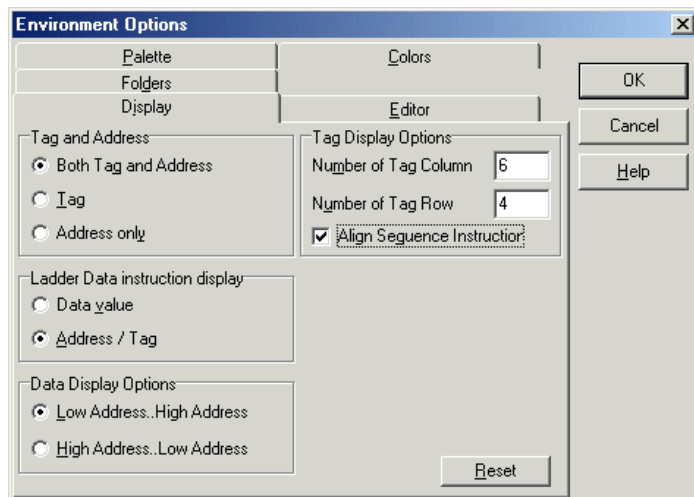
- ◇ Select the [Environment...] command from the [Option] menu.

The {Environment Options} dialog box is displayed.

(1) Display Tab

- ◇ Left-click the [Display] tab.

The items to set to display the program are displayed.

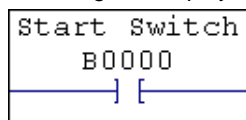


1) "Address/Tag" setting

Set display of address and tag to ON or OFF.

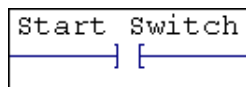
[Both Tag and Address]

Address and Tag are displayed above the instruction symbol.



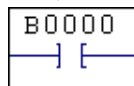
[Tag]

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.)



[Address only]

Displays only an address above the instruction symbol.

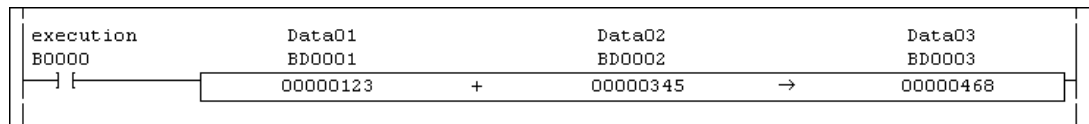


Appendix 2-1 Environment Options

2) Setting of Ladder Data instruction display

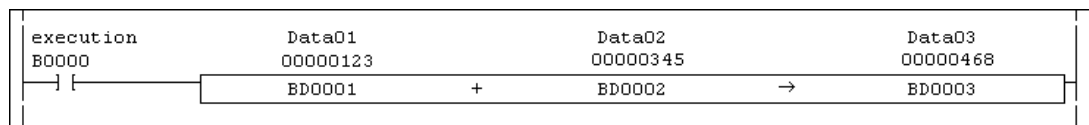
[Data value]

“Data” is displayed within the ladder data instruction frame, and “addresses” and “tags” are displayed above the frame.



[Address/Tag]

“Addresses” are displayed within the ladder data instruction frame, and “tags” and “data” are displayed above the frame



3) Setting of Data Display Options

In the display of data when a double size format (eg. Hex Double) is selected, this option configures the word order - low address, high address, or vice versa.

[Low Address..High Address] option button is check

WM0100 Data01 12345678 BCD (2word)

WM0100 Data02 5678 BCD

[High Address..Low Address] option button is unchecked

WM0100 Data01 56781234 BCD (2word)

WM0100 Data02 5678 BCD

4) “Tag Display Option” setting

Makes tag display for [Number of Tag Column] x [Number of Tag Row]. Characters exceeding this setting are not displayed.

Number of characters : 6 to 24

Number of tag rows : 1 to 4

If [Arrange sequence instructions] is checked, the tag display width is fixed by the specified number of characters and the gap between sequence instructions is equalized.

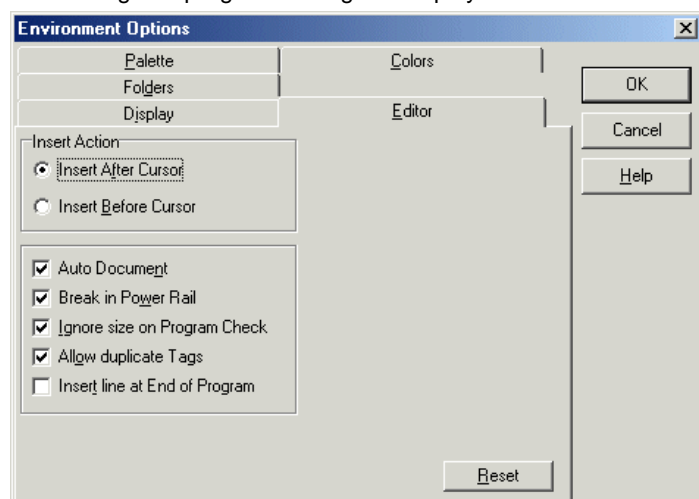
5) [Reset] button

When this button is left-clicked, the setting of editor tag is restored to the initial values at shipment (the setting just after installation).

(2) Editor(E) tab

◇ Left-click the [Editor] tab.


The settings for program editing are displayed.




Appendix 2-1 Environment Options

1) Setting of Insert Action

[Insert After Cursor] option button

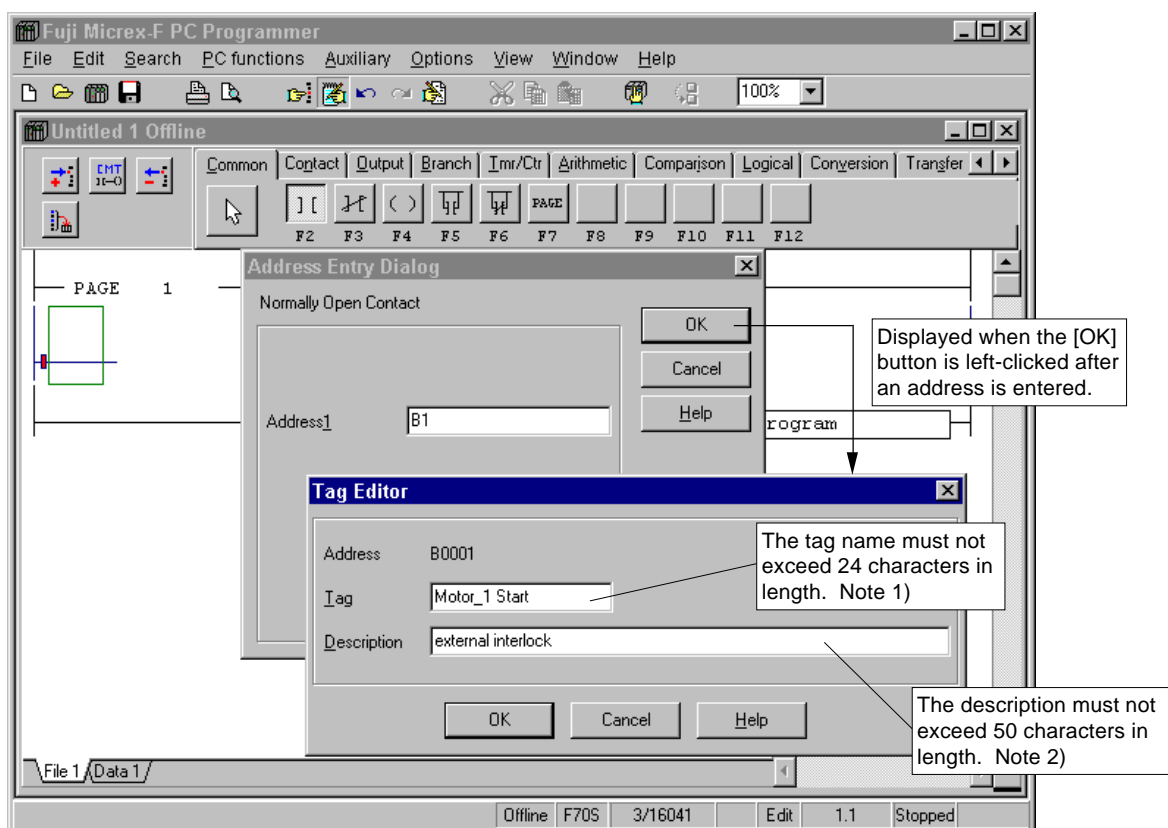
When the  [Insert Line] button on the ladder edit tool bar is left-clicked or [Edit] - [Insert Line] is executed, a new line block is inserted after the selected line.

[Insert Before Cursor] option button

When the  [Insert Line] button on the ladder edit tool bar is left-clicked or [Edit] - [Insert Line] is executed, a new line block is inserted before the selected line.

2) Setting automatic tag entry

When the [Auto Document] box is checked, the {Untitled 1 Offline} dialog box shown below is displayed during program editing.

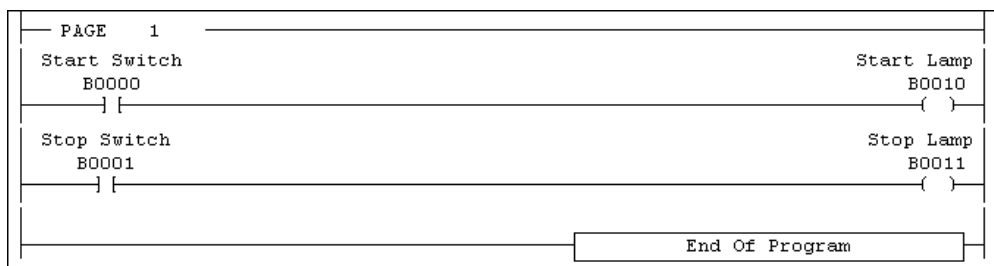


Note: 1) In a tag name, the quotation marks (" and '), comma (,), and period (.) cannot be used. The same tag name cannot be set for two or more different addresses either.

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.

3) Setting of Break in Power Rail

When the [Break in Power Rail] box is checked, the power rail at the left and right of loader has a small break between each line to indicate the line demarcation as shown below.



Appendix 2-1 Environment Options

4) Setting of Ignore size on Program Check

When the [Ignore size on Program Check] box is checked, the system does not check the size of the ladder before down loading to a PLC. In this case, the users are required to pay attention to the size of the program transferred.

5) Setting [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.

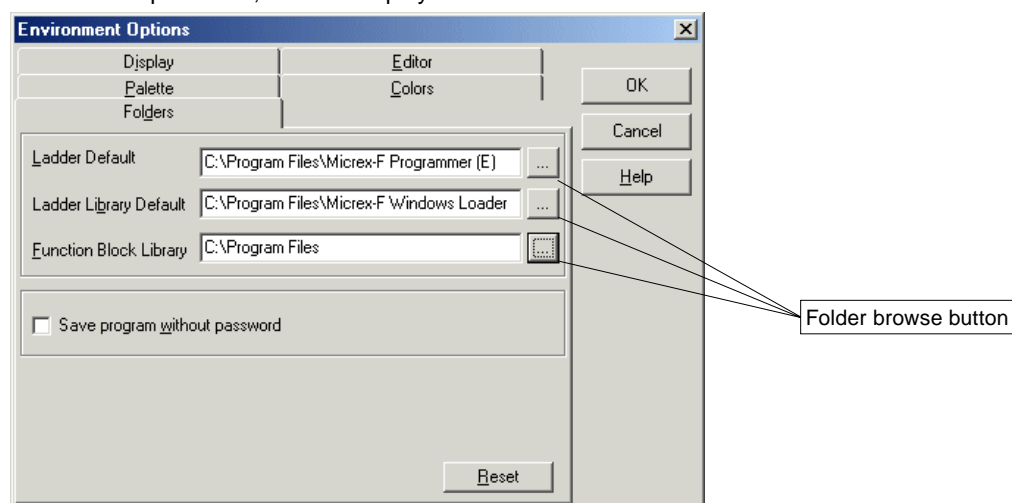
6) “Insert line at End of Program” setting

When the cursor is moved to the end of the program, a blank row is inserted automatically.

(3) Setting of Folders

- ◇ Left-click the [Folders] tab.

Items to set for the saving of an 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 Default

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 [PLC functions] - [Function Block...] 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.

4) Save Program without Password

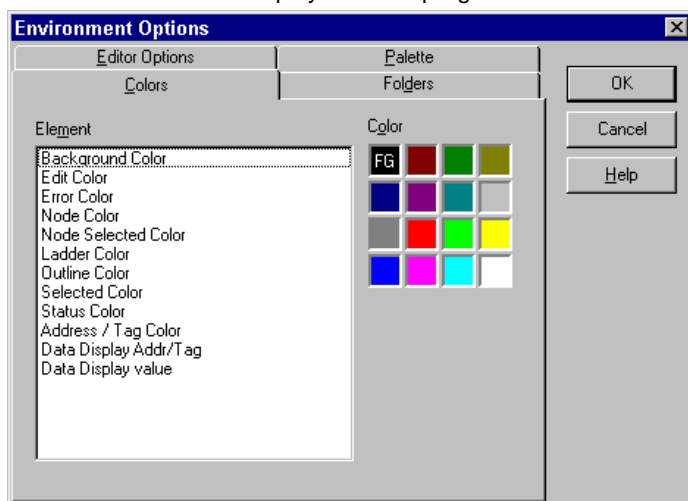
When this is unchecked, any program with password is provided with the password when it is saved to a file.

In the initial state, this item is unchecked.

Appendix 2-1 Environment Options

(4) Colors

- ◇ Left-click the [Colors] tab.
Set colors in which to display a ladder program.

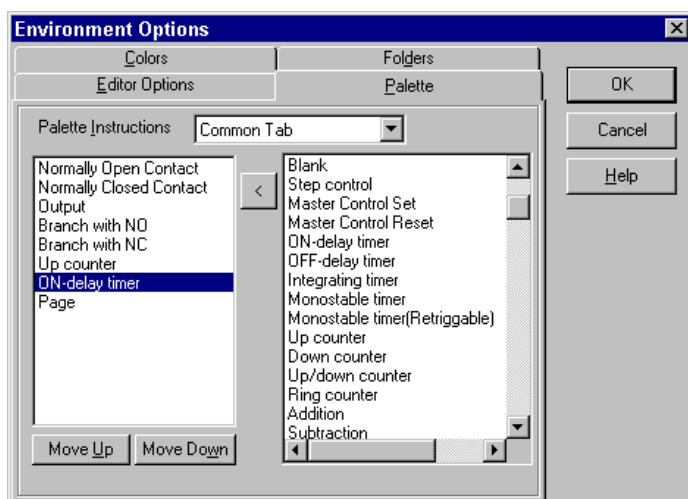



Select the element to be changed from the element list at the left by left-clicking it.
Left-click a desired color, and the FG mark moves to the selected color to set it.

(5) 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



Specify up to 11 instruction buttons (F2 to F11) for each of [Usual], [Shift key], and [Ctrl key].
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.

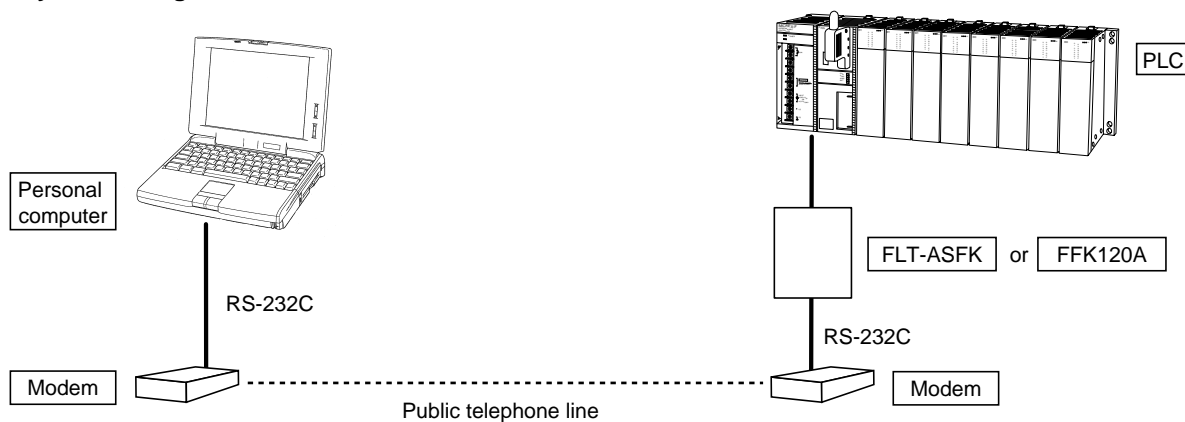
Appendix 3 Modem Connection

	Page
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Appendix 3 Modem Connection

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

<System configuration>



Note: When an FFK120A is used, it must be case version 1 or newer. The case version is indicated at bottom, right of the front part.

<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.)

Appendix 3-1 Preparation of Modem on PLC Side

Here, the preparations (initialization, etc.) required of the modem on the PLC side are explained.

Appendix 3-1-1 Modem already in use

- (1) When using a modem which has been used for remote operation by the MS-DOS loader (or LITE loader), no preparations, such as the initialization, are required of the modem. In this case, the FLT-ASFK (or FFK120A) needs to be set as follows. The FLT-ASFK (or FFK120A) initializes the modem automatically.

- **For FLT-ASFK**

Set the mode to "REMOTE" (SW1: ON, SW2: OFF).

- **For FFK120A**

Set the mode to "REMOTE OPERATION" (MODE SW: "8").

- (2) The modems that are supported are as shown below.

Maker	Type
AIWA	PV-A24MNP5, PV-A24VM5, PV-A24B5, PV-A24V5, PV-AF24V5, PV-BF144M2, PV-EF2880, PV-PF3360
OMRON	MD24FS4, MD24FS5, MD24FB5V, MD24FB10V, MD24XT10V, MD96XT10V, MD144XT10V, ME1414BIII

- (3) The AT commands used in FLT-ASFK and FFK120A are as shown below.

- **For FLT-ASFK**

ATE0V0Q0(CR)

AT\J0S0=3(CR)

ATQ1(CR)

- **For FFK120A**

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.

Appendix 3-1 Preparation of Modem on PLC Side

(4) Sequence of switching on power supply

As soon as the FLT-ASFK (or FFK120A) is switched on, it starts initializing the modem. Therefore, switch on the modem power supply first. The FLK-ASFK is switched on automatically when the loader cable is plugged to the PLC.

Appendix 3-1-2 Other modems

Even modems other than those shown above need not be initialized as long as the AT commands described above are supported.

Otherwise, the modem needs to be initialized.

(1) Requirements of modem used

Select a modem which meets the following requirements.

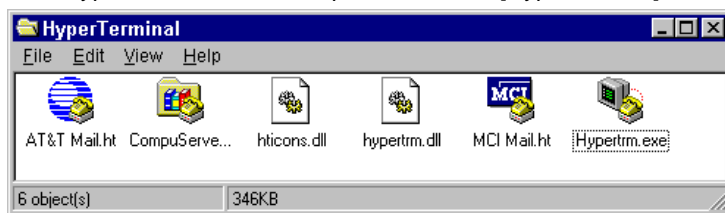
- The AT commands are supported.
- The automatic receive function is provided.
- The interface with external devices is an RS-232C.
- Data compression function (MNP Class 4 or higher) is provided.
- Error control function (MNP Class 4) is provided.
- Terminal speed fixing function is provided.
- Function that retains contents of setting (nonvolatile memory) is provided.

(2) Initialization of modem

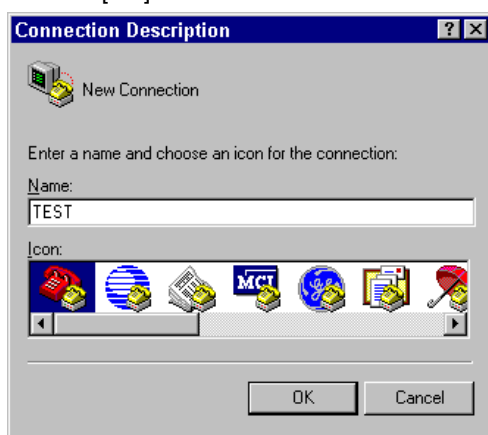
Use the personal computer to initialize the modem.

Here, the method of initializing Aiwa's modem PV-BW5605 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.

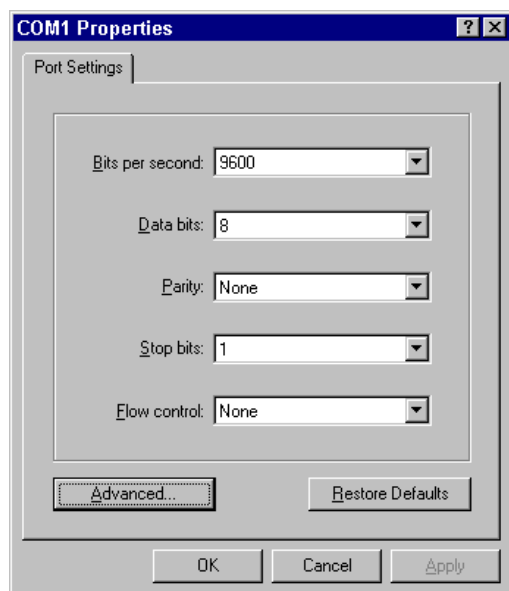


Appendix 3-1 Preparation of Modem on PLC Side

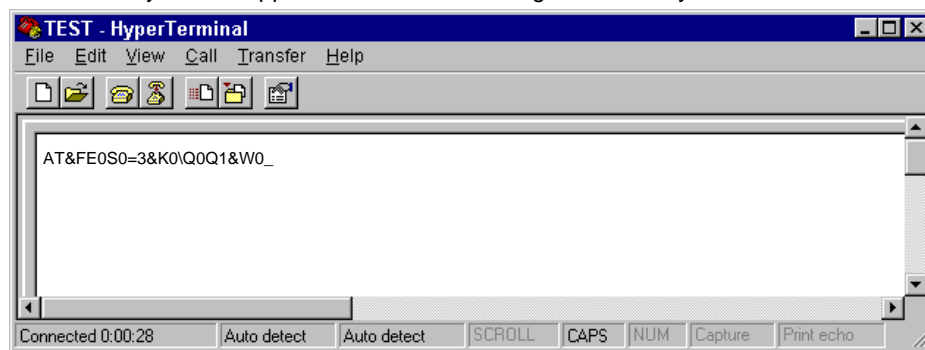
- ◇ The {Phone Number} dialog box is displayed. Left-click the [Down] button of the [Connect using] text box, select the personal computer RS-232C port number (in this example, "Direct to Com 1") from the list that is displayed, then left-click the [OK] button.



- ◇ 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 set values must be the same as those of the FLT-ASFK.



- ◇ The text entry screen appears. Enter the following text correctly.

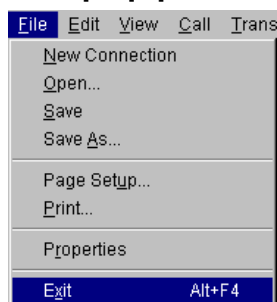


Appendix 3-1 Preparation of Modem on PLC Side

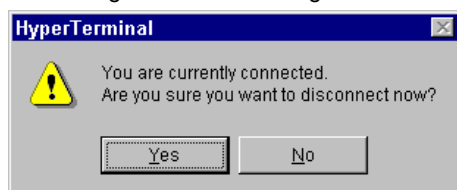
<Meanings of AT commands used>

Command	Function	Meaning
AT&F	Initializes the memory.	
ATE0	Sets command echo function.	Echo not returned
ATS0=3	Sets automatic reception/number of reception calls.	Automatic reception when 3rd call signal is detected
AT&K0	Sets DTE flow control.	Flow control not effected
AT\Q0	Sets DTE-DCE flow control.	Flow control not effected.
ATQ1	Sets output of result code to DTE.	Result code not output to DTE
AT&W0	Saves AT command settings.	Save to retain memory 0.

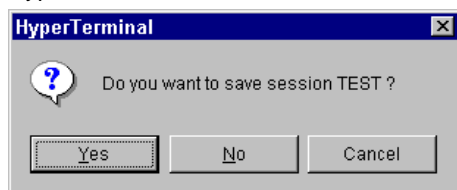
- ◇ Select [File] - [Disconnect Hyperterminal] from the main menu.



- ◇ 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.

(3) Setting of FLT-ASFK/FFK120A

Set the FLT-ASFK (or FFK120A) in the "Personal Computer Loader" mode. It does not operate in the "Remote Operation" mode.

•For FLT-ASFK

Set it in the "LOADER" mode (SW1: OFF, SW2: OFF).

•For FFK120A

Set it in the the "Personal Computer" mode (MODE SW: "B").

Appendix 3-1 Preparation of Modem on PLC Side

Appendix 3-1-3 Preparations for modem connection on PLC side

After initializing the modem, prepare for connection of the modem.

- ◇ Switch on the PLC power supply. Keep the FLT-ASFK (FFK120A) power supply off. When an FFK120A is used, connect the T-link cable to the PLC.

- ◇ Set the appropriate baud rate, data bit, and parity bit by the Dip switch of the FLT-ASFK (FFK120A).

For the FFK120A, set the stop bit to "1."

Use the following combination of data bit and parity bit.

Data bit	Parity bit
8	None
7	Even or odd

<Recommended settings>

Baud rate: 9600 or 19200

Data bit: 8

Parity bit: None

- ◇ Connect the modem and FLT-ASFK (FFK120A) using the RS-232C cable attached to the modem (if not attached, a straight cable of any maker).

- ◇ Switch on the modem power supply.

- ◇ Switch on the FLT-ASFK (FFK120A).

For the FLT-ASFK, connect the loader connector to the PLC connector. This is all for the preparations for modem connection. Proceed to the manipulation on the personal computer loader side.

Appendix 3-2 Manipulation on Personal Computer Loader Side

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 dialling} 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 left-clicking the  button.


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 left-clicking the  button.

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



With Aiwa's PV-BW5605 modem mentioned in Appendix 3-1-2, the maximum value of AT command "S7" is 55. When this modem is used, enter the following command in [Modem initialization string].

AT&FS0=0S7=55

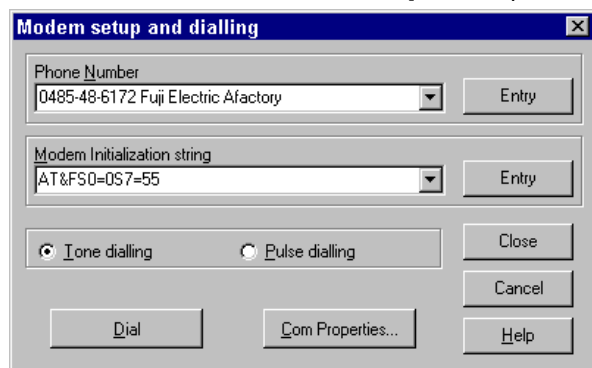
• Tone dialling/Pulse dialling

Select either of the following according to the line used.

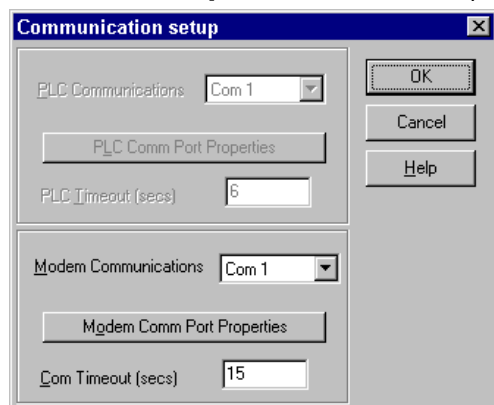
- Tone dialling
- Pulse dialling

Appendix 3-2 Manipulation on Personal Computer Loader Side

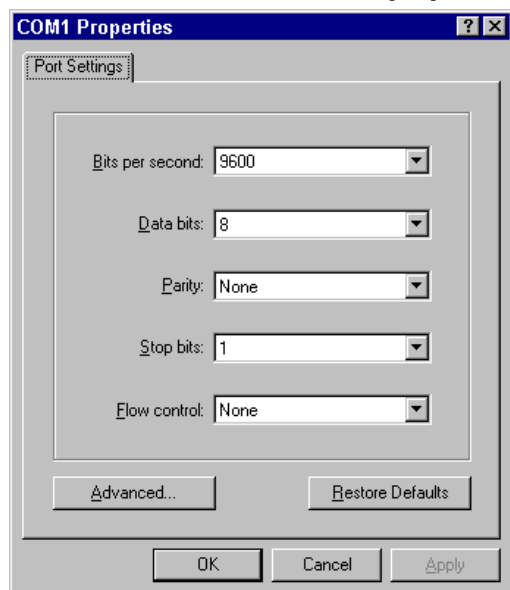
Next, set the RS-232C. Left-click the [Com Properties...] button.



- ◇ The {Communication setup} dialog box is displayed. Select the RS-232C port used from [Modem Communications]. Next, left-click the [Modem Comm Port Properties] button.



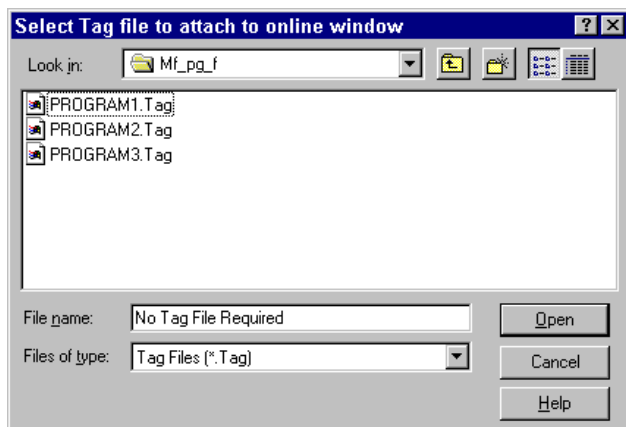
- ◇ The {COM1 Properties} dialog box is displayed. Set {Bits per second}, {Data bits}, and {Parity} to those values which have been set for the RS-232C (FLT-ASFK or FFK120A) on the PLC side. Set {Stop bits} to {1} and {Flow control} to {None}. After all items are set, left-click the [OK] button.



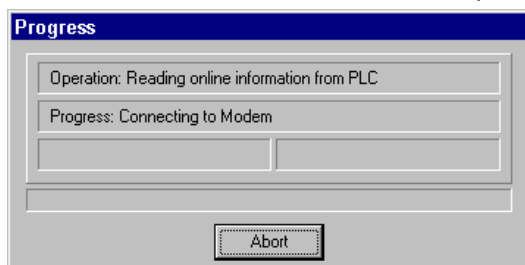
- ◇ The {Communication setup} dialog box is displayed again. Left-click the [OK] button.
- ◇ The {Model setup and dialling} dialog box is displayed again. Left-click the [Dial] button.

Appendix 3-2 Manipulation on Personal Computer Loader Side

- ◇ The {Select tag file to attach to 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 {Connecting to Modem} message is displayed.



When connection to the modem is completed, reading online information from the PLC 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.

Appendix 4 Password

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Appendix 4-2 Opening a Program with Password	App.4-3
Appendix 4-3 Changing/Deleting a Password	App.4-4

Appendix 4 Password

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 3FFF. 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 PLC)
- Offline program (*.LDX file)
- PROM



Note that if you forget the password, you cannot read the program. The password that has been attached to the PLC can be erased by clearing the memory. In this case, however, the program is erased at the same time. To erase the password for each of the PLC programs, select [File] - [Open and Clear Online...] from the menu bar.



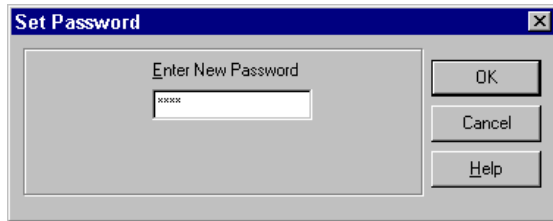
With a PLC whose operation mode can be changed by a key switch (e.g., F70S or F120S), set the key switch in the {TERM} position. When the key switch is in the {RUN} or {STOP} position, it is impossible to set or change a password.

The methods of setting, changing, and deleting a password for online program are explained.

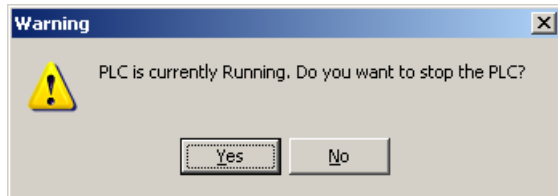
Appendix 4-1 Setting a New Password

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 [PLC Functions] - [Password...] from the menu bar.
- ◇ The {Set Password} dialog box is displayed. Enter any 4-digit number (0000-3FFF) in the text box. Note that on the screen the entered number is displayed as ****. Left-click the [OK] button.



- ◇ If the PLC is running, the {Warning} dialog box is displayed. (It is impossible to set/change a password while the PLC is running.) Left-click the [OK] button.



- ◇ Now, the password has been set (written in the program).

Appendix 4-2 Opening a Program with Password

Here, the procedure for opening (reading) a program with a password is explained.

- ◇ Open the online or offline 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.



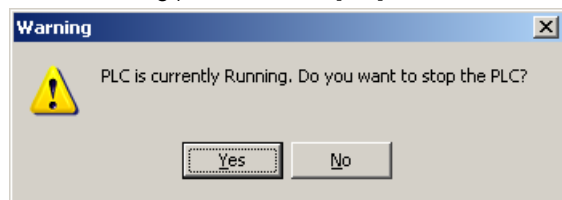
Appendix 4-3 Changing/Deleting a Password


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 [PLC 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.



- ◇ If the PLC is running, the {Warning} dialog box is displayed. (It is impossible to change/delete a password while the PLC is running.) Left-click the [OK] button.



 When a password is deleted, the {Warning} dialog box is not displayed. A password can be deleted even while the PLC is running.

- ◇ 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.

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