Section 3 Online Operations

3-1-1 Hardware system configuration

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

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

Personal computer

RS-232C
(any maker)

Loader cable
FLC012A
(Attchment with the
loader adapter)

PC

◁MICREX-F▷

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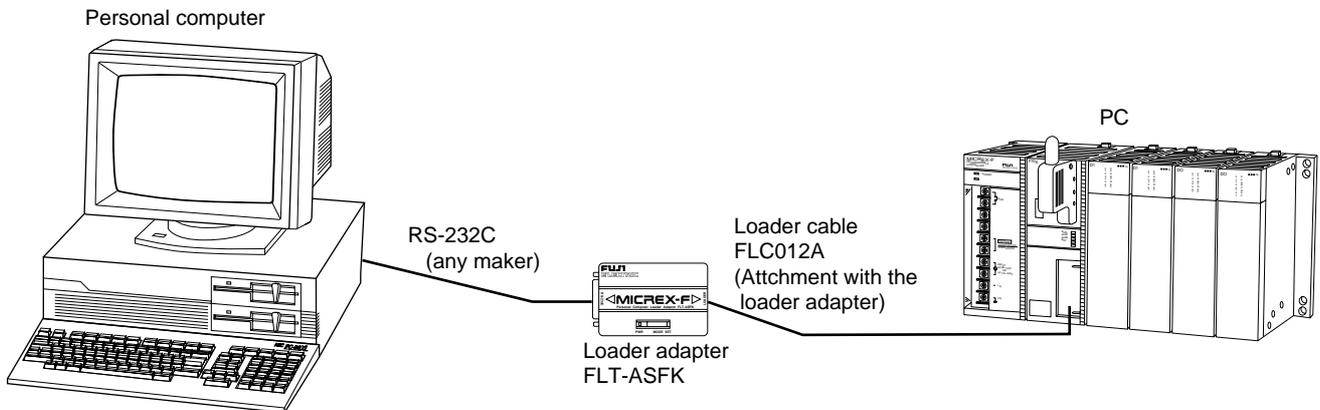
• Note
  The loader adapter cannot be used with T-Link converter (FRC100A-G02), loader outlet (FTC020T), or Programmable
  Operation Display (UD30 series) with built-in PC functions.

---

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

T-Link

Personal computer

RS-232C
(any maker)

General interface capsule
FFK120A-C10

PC
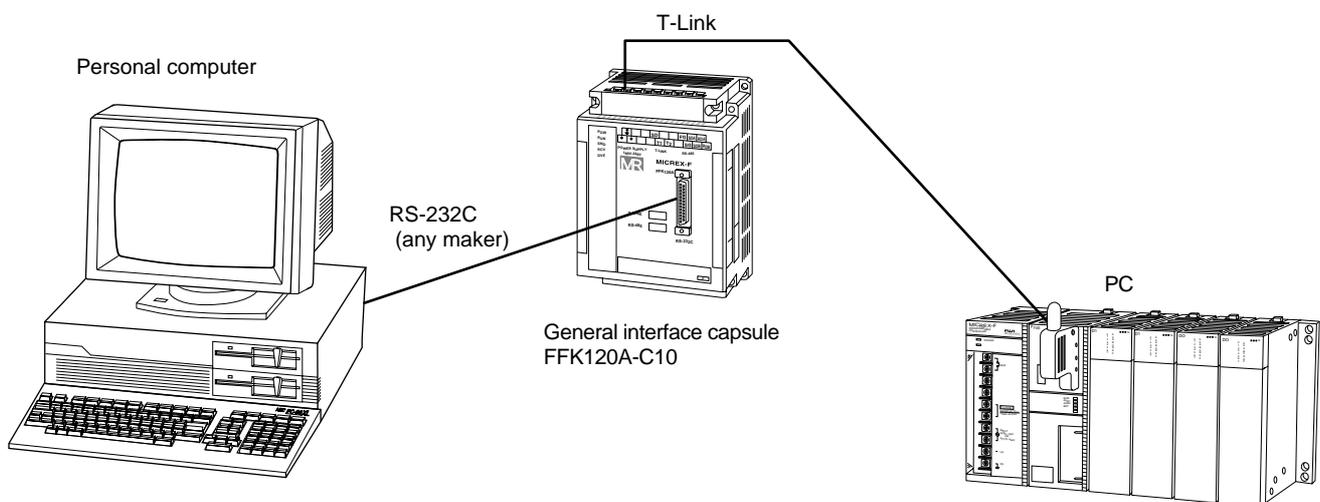
3-1 Preparations for Online Connection

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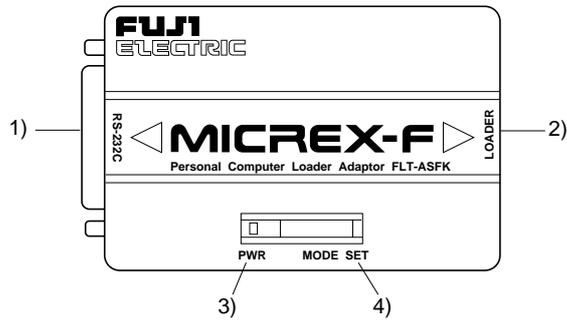
1) D-sub25-pin connector (female)
   Connect an RS-232C cable (any maker) to this connector.
2) Loader connector
   Connect the furnished loader cable to this connector.
3) Power indicator lamp
   Indicates that the adapter power supply is on.
4) Mode setting switch
   Used to set a mode of operation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

• Setting mode setting switch

Parity bit (even/odd)
    ON : even   OFF: odd
Parity bit (provided/not provided)
    ON : provided   OFF : not provided
Data bit length
    ON : 7 bits   OFF : 8 bits
Mode Setting switch

1 2	Operation mode
	PC loader mode
	Remote operation mode
	Not used
	Not used

Baud rate setting switch
Baud rate

Baud rate setting switch

6 7 8	Baud rate
	300
	600
	1,200
	2,400
	4,800
	9,600
	19,200
	38,400
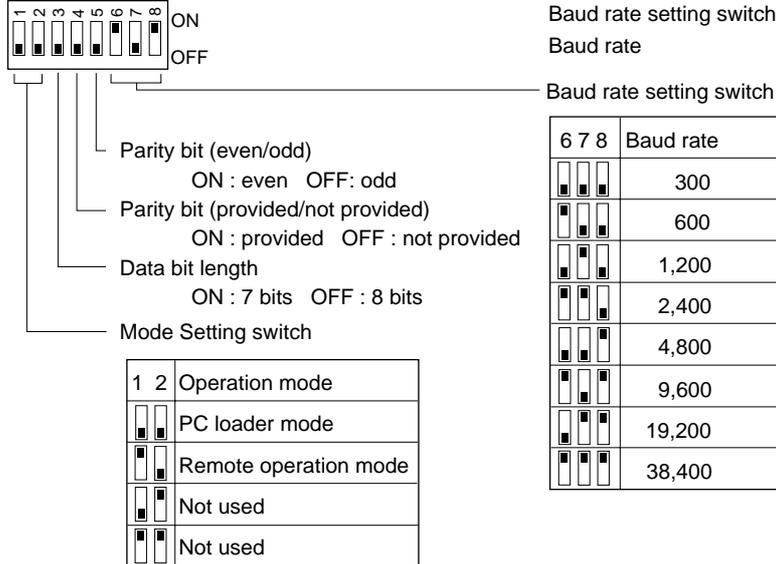
Note:
- The other RS-232C settings are as follows.
        Start bit : 1
        Stop bit : 1
- The factory settings are as follows.
        Operation mode : PC loader mode
        Data bit length : 8 bits
        Parity bit : None
        Baud rate: 9600 bps
- A baud rate of 19,200 or higher cannot 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.

• Connector pins and signal names

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

<Pin arrangement as viewed from front>

M2.6 screw

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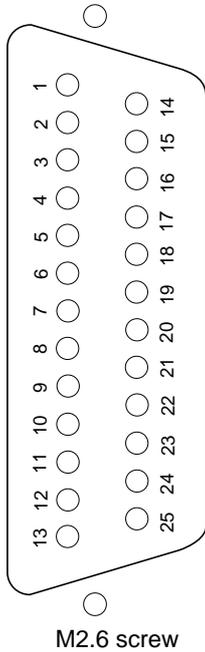
Pin No.	Signal name	Signal direction FFK - Personal computer	Description
1	FG		Frame ground
2	SD	$\Longrightarrow$	Send data
3	RD	$\Longleftarrow$	Receive data
4	RTS	$\Longrightarrow$	Request to send
5	CTS	$\Longleftarrow$	Clear to send
6	DSR	$\Longleftarrow$	Data set ready
7	SG		Signal ground
20	DTR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

9) Terminal block

Installation hole 4 x ¿5.5

1) Operation status indicator

8) RS-232C connector
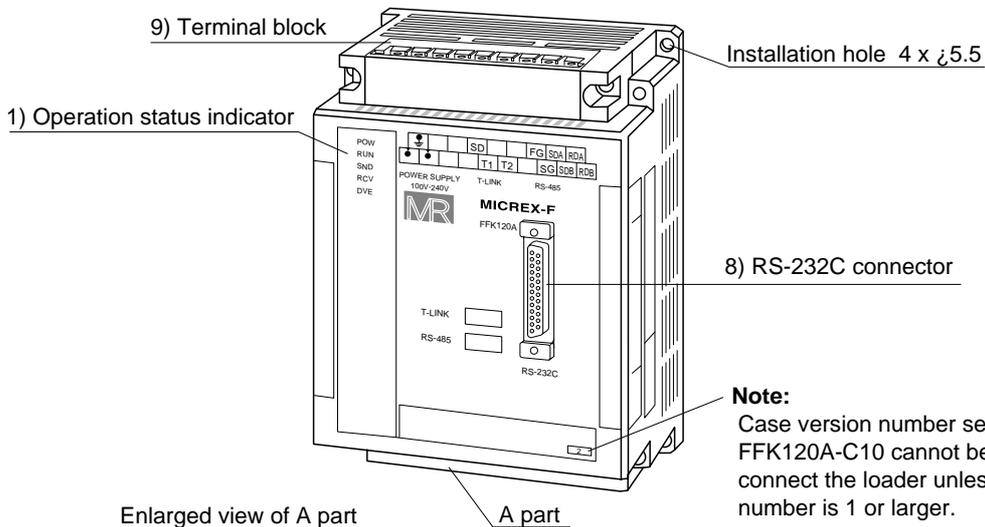
Note:
Case version number seal.
FFK120A-C10 cannot be used to connect the loader unless the version number is 1 or larger.

Enlarged view of A part

A part

7) RS-485 terminating resistance
6) RS-485 channel switch
5) T-Link resistor
4) T-Link channel switch
3) Mode switch
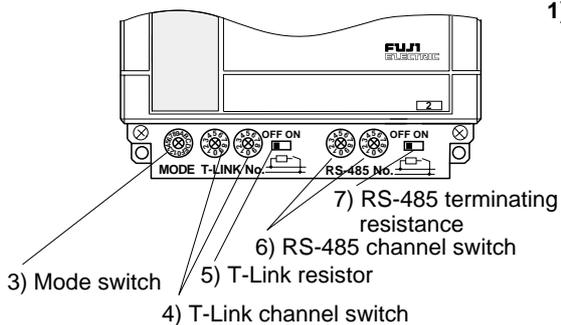
1) Operation status indicator
LED's indicating operating conditions (power on/off, run, fault) of the capsule.

Symbol	Color	Name	Condition for lamp 'On'
POW	Green	Power supply	System power supply [internal power supply (+5 V)] is on.
RUN	Green	Run	Communication enabled.
SND	Green	Sending	Data being sent to external device.
RCV	Green	Receiving	Data being received from external device.
DVE	Red	Fault	Hardware fault (internal LSI fault, etc.)

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

Item	ON	OFF
Initialization method	Switch	Initial file
Parity bit (provided/not provided)	Provided	Not provided
Parity bit (even/odd)	Even	Odd
Data bit length	7 bits	8 bits
Stop bit length	1 bits	2 bits

Not used (Keep all these three switches "OFF.")
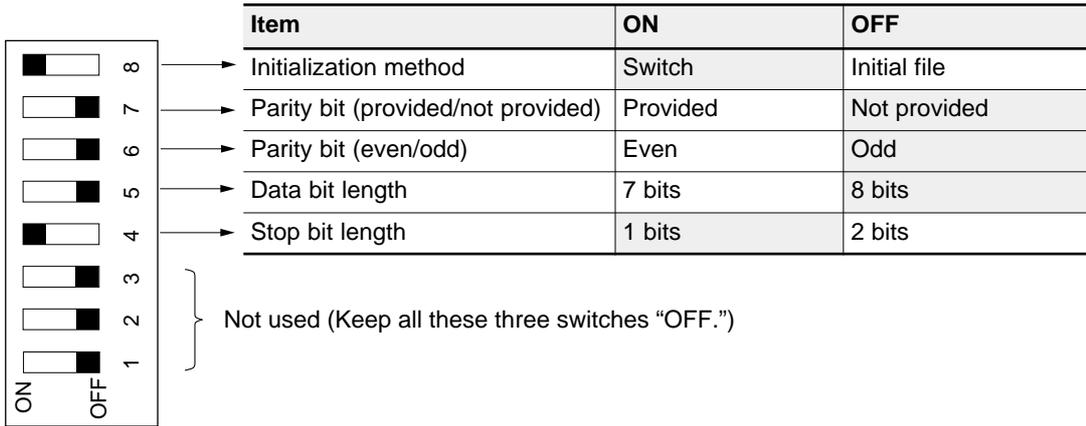
• Baud rate setting switch

Set only one of these switches to "ON."

8 → Not used (Keep all these three switches "OFF.")
7 → 19200baud
6 → 9600baud
5 → 4800baud
4 → 2400baud
3 → 1200baud
2 → 600baud
1 → 300baud
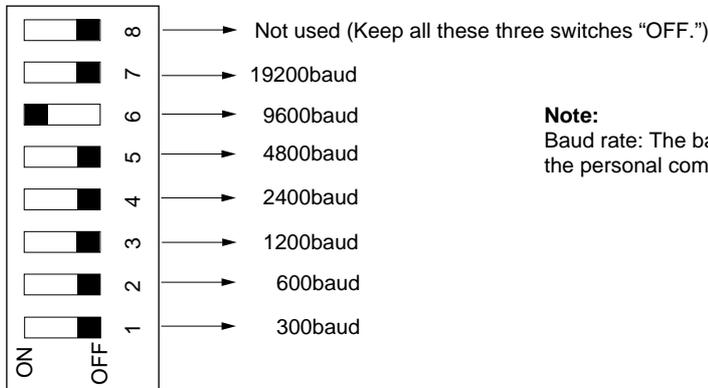
Note:
Baud rate: The baud rate of 19,200 cannot be set unless the personal computer RS-232C used is compatible with that baud rate.

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.

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.)
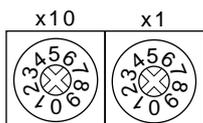
7) RS-485 transmission line terminating resistor ON/OFF switch
When interface capsules are the terminal stations of an RS-485 transmission line, set this switch to ON to connect the internal terminating resistance. For both the send and receive lines, two terminating resistances are connected at the 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.
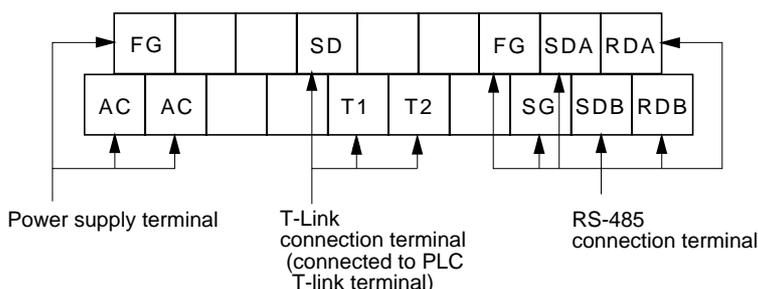
9) RS-232C connector
• Connector pin arrangement and signal names

<Pin arrangement viewed from front>
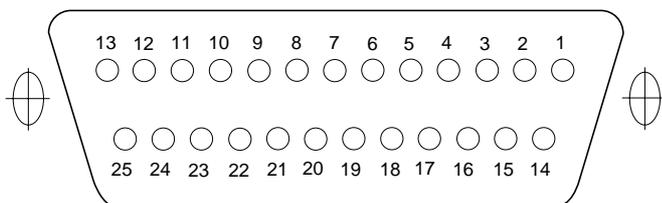
The adapter connector is a female type.
Use a male connector for the cable.

<Signal name>

Pin No.	Signal name	Signal direction Interface capsule	External device	Description
1	FG			Frame ground
2	SD	$\Rightarrow$		Send data
3	RD	$\Leftarrow$		Receive data
4	RTS	$\Rightarrow$		Request to send
5	CTS	$\Leftarrow$		Clear to send
6	DSR	$\Leftarrow$		Data set ready
7	SG			Signal ground
20	DTR	$\Rightarrow$		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 4) from the [PC Communications] list.
Then, left-click the [PC Comm Port Properties] button.
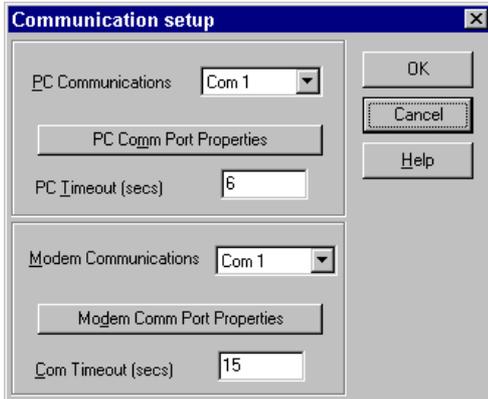
☞ Increase [Communication timeout(second)(T)] as required. When reading a large program, input a value which is greater than 100 or 200.

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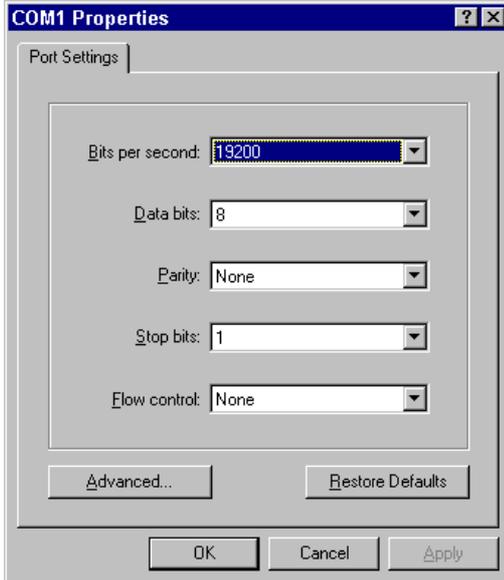
☞ [Bits per second] in the dialog box is the same in meaning as "baud rate."
Normally, select [1] for [Stop bit].

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

Here, the method of connecting the personal computer online to the PC is explained.
This online connection is necessary when monitoring/editing PC programs, saving PC programs to the personal computer, transferring personal computer programs to the PC, and so on.
After finishing "3-1 Preparations for online connection," use the following procedure for online connection.

◊ Select [File] - [Online] from the menu bar.
   (Alternatively, left-click the [▦] [Online] button on the main tool bar.)
◊ The {Select tag file to attach to online window} dialog box is displayed. If there are tag files for online display, select the tag file to be displayed.
   If there is no tag file to be displayed, keep the initial string [No Tag File is Required] set in the [File name] text box.
   Left-click the [Open] button.

☞ A tag is like a label which can be attached to any PC address.
   For a detailed explanation of tags, refer to "Section 2."
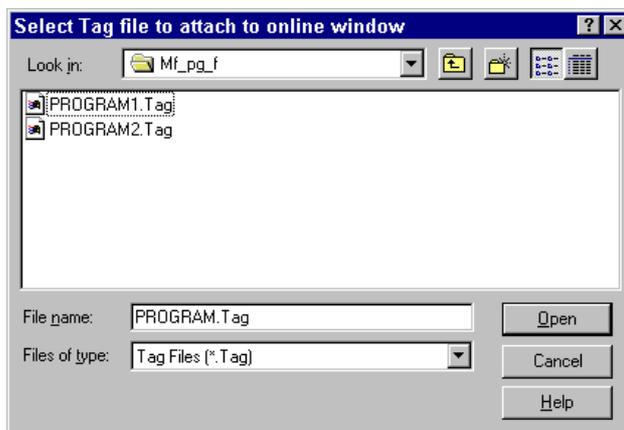
◊ Reading status is indicated on the progress dialog. When the reading is completed, the PC ladder program is displayed on the screen. The screen displayed at this time is called an [online window].
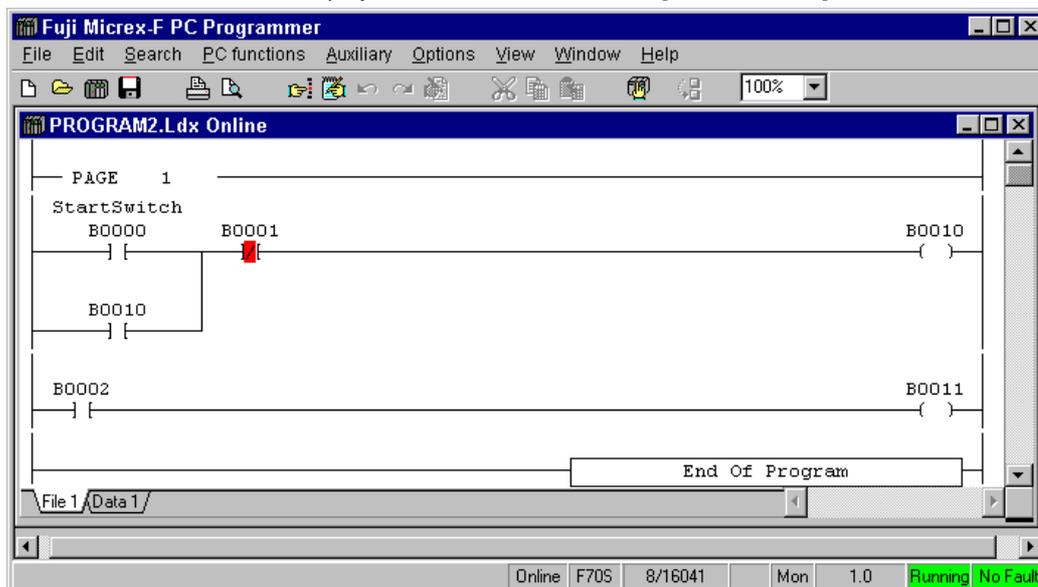
3-2 Online Connection

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
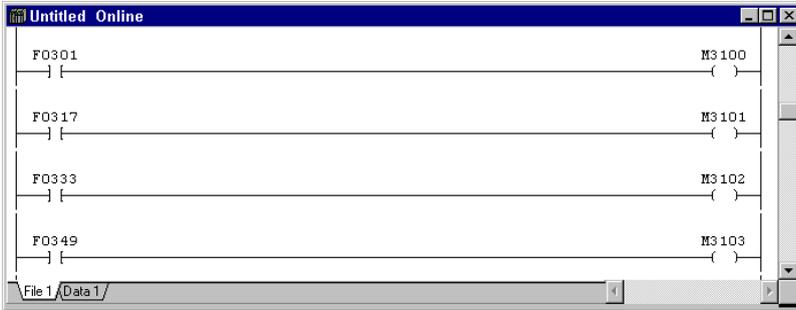
Data sheet screen
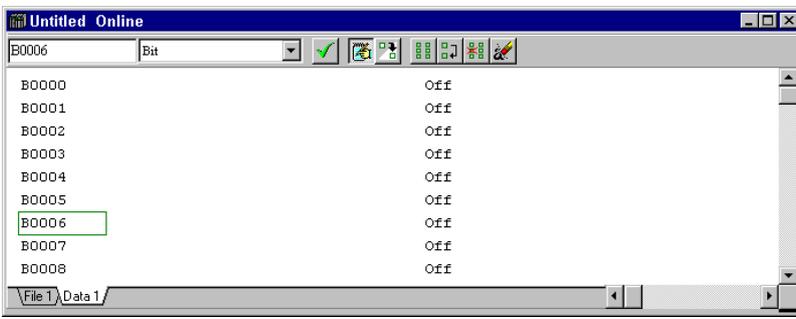
Window separation
When the window separation part under the vertical scroll bar on the right of a window is dragged, the window is separated into two.
Position the cursor on the window separation part, and it will change to the ⬍ mark. While pressing the left side button of the mouse, move the cursor in the direcation above.

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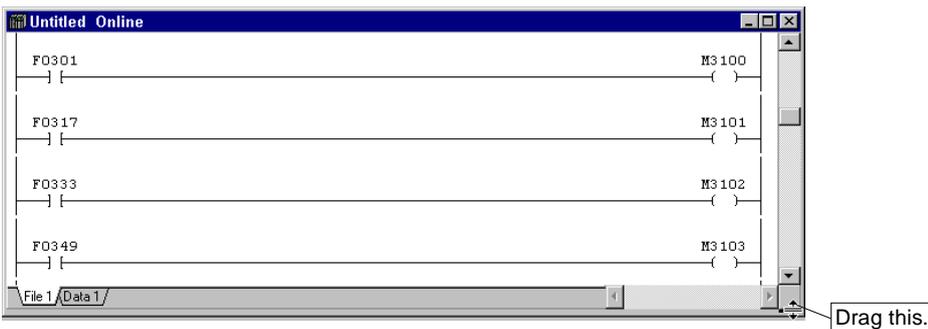
Sample window separation
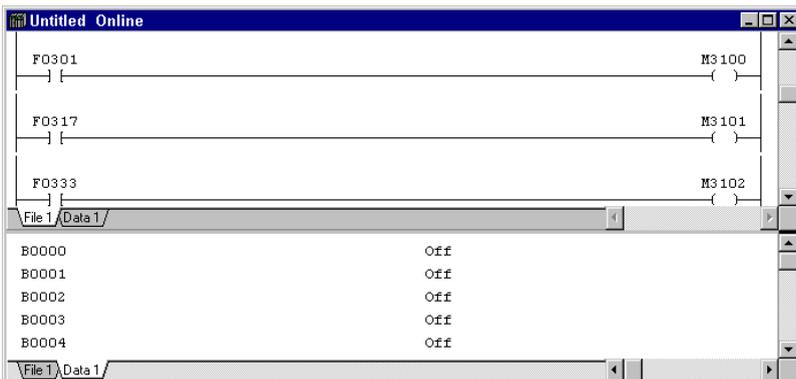
To restore the original window, double-click the window separation part. Or move it to the lowermost position.

3-8

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

Warning ⊠

⚠ Online PC has incorrect model ID in the system definition.
To correct the model indication close and then re-open the online window.
PC Model : F55

[OK]
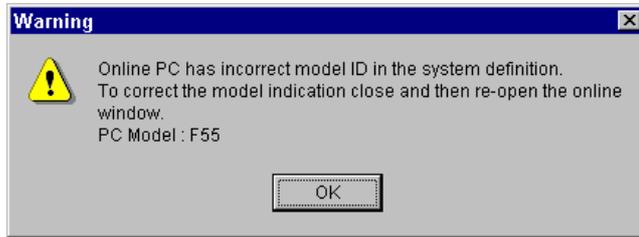
This can occur when, for example, a program with the wrong PC model setting is transferred to the PC.

☞ While a PC 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.)

| Online | F70S | 8/16041 | | Mon | 1.0 | Running | No Fault |

This frame turns yellow.   Status bar
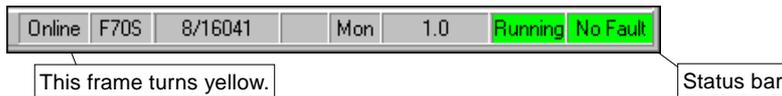
While the "Online" frame is yellow, the ON/OFF conditions of contacts and outputs in the program and data values in data instructions instruction data may not be displayed correctly. In this case, increase the magnification of display or reduce the display area to decrease the number of instructions which are displayed on the screen at a time.
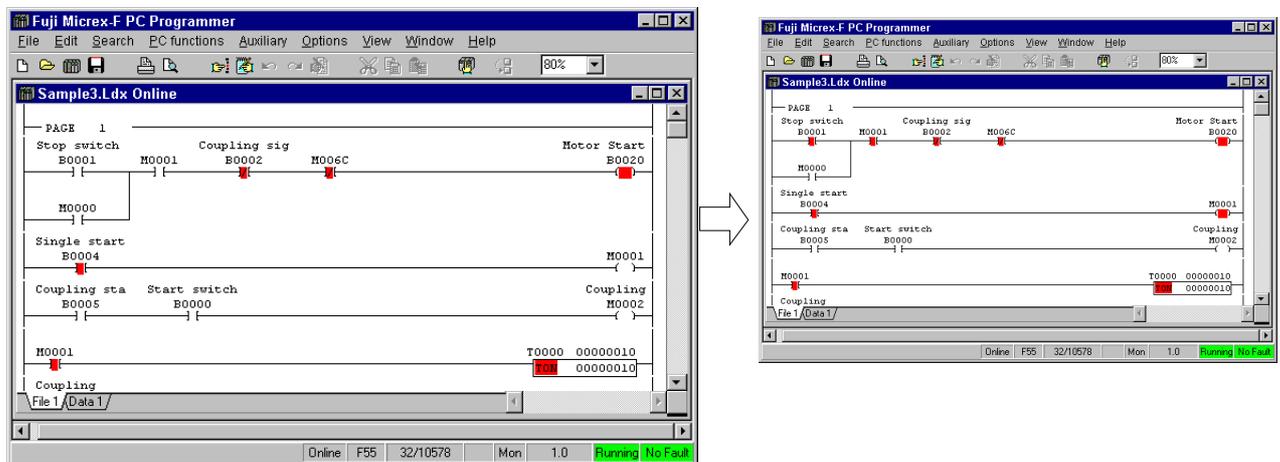
When the normal condition of display is recovered, the yellow color of the "Online" frame disappears.

3-3 Save PC Content to File

3-3-1 Save PC program
Here, the method of saving a PC program to a file in the disk is explained.
After selecting the online window, use the following procedure to save the program.

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

☞ For [Save as type], either of the following two can be selected:
  • Ladder file (*.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)

Save As	? X
Save in:	Mf_pg_f

PG2_2_1.Ldx   PROGRAM3.Ldx
PROG_F55.Ldx   PROGRAM4.Ldx
PROGRAM.Ldx   Sample1.Ldx
PROGRAM1.Ldx   Sample2.Ldx
PROGRAM10.Ldx Sample3.Ldx
PROGRAM2.Ldx   Sample4.Ldx

File name: PROGRAM10.Ldx   Save

Save as type: Ladder Files (*.Ldx)   Cancel
Ladder Files (*.Ldx)
Dos Ladder Files (*.Pgs)   Help
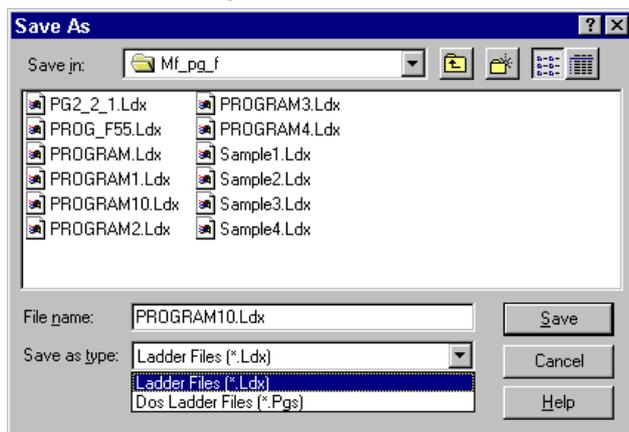
• Example of saving as a D25P loader file (*.Pgs)

Save As	? X
Save in:	Mf_pg_f

File name: PROGRAM10.Pgs   Save

Save as type: Dos Ladder Files (*.Pgs)   Cancel
Ladder Files (*.Ldx)
Dos Ladder Files (*.Pgs)   Help
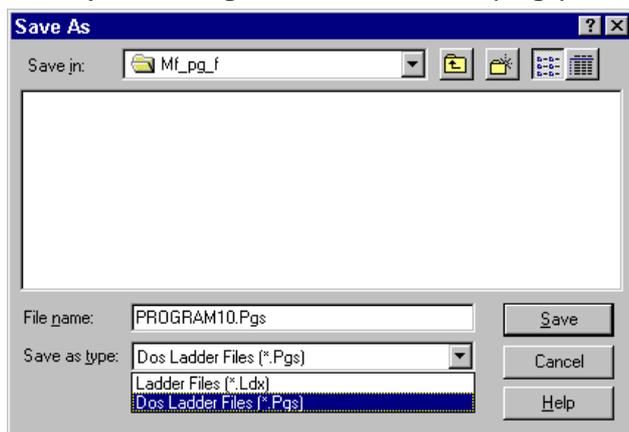
☞ To save as a D25P loader file (*.Pgs), the length of the file name must be 8 single-byte characters or less.
Because D25P is an MS-DOS application, it cannot deal with file names that are longer than 8 characters.
If saved by a file name longer than 8 characters, D25P references the file by a file name shortened to 8 characters or less.

3-3-2 Saving PC data

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

  ◊ Select [File] - [Save 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.

Save Data Registers Dialog

Module ID	CS
Start Address(Y)	0000
End Address(Z)	0511

```
* WM0000 - WM0511
* WK0000 - WK0063
* CS0000 - CS0511
```

OK
Cancel
Help

Add to List
Overwrite Item
Enable / Disable
Delete from List
Clear List

◦ All
◉ Partial
◦ All+Program

File Name C:\1USERDAT\MF_PG_F\abc.APD Browse...
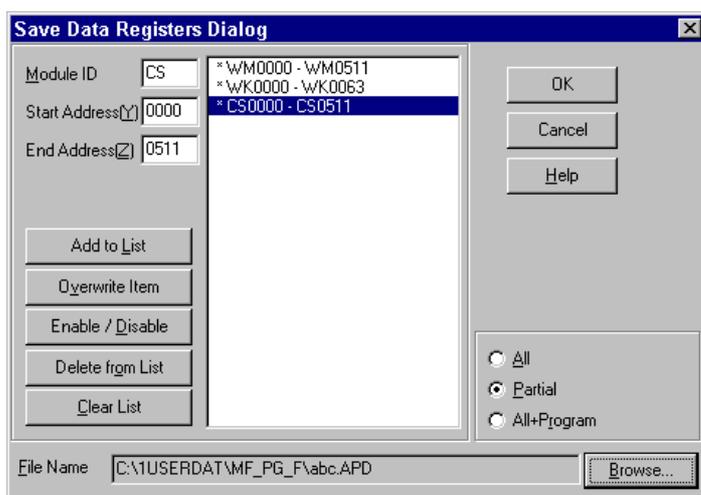
3-4 Transfer Contents of File to the PC

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

Here, the method of transferring a program which has been saved in a file in the disk to the PC is explained. (The program that is transferred to the PC is overwritten on the program in the PC.)
The appropriate online window must be opened before the program can be transferred. First, open the online window using the procedure described in 3-2.

☞ The transfer of a program from the personal computer to the PC cannot be effected when the PC is in either of the following conditions. Make the PC ready as described below.
  • With a PC model whose operation mode can be changed by a key switch (e.g., 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 PC is in operation.
    Measure to take: Stop the PC from the loader. For the method of stopping the PC, refer to 3-5.

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

◊ Select [File] - [Load...] from the menu bar.
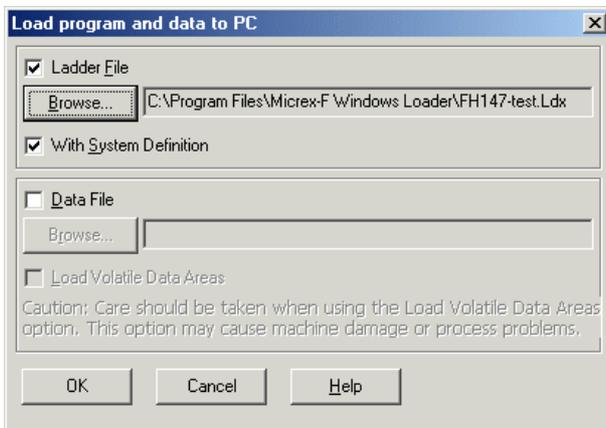
◊ When the {Load program and data to PC} dialog box is displayed, check the [Ladder File] box and click the [Browse...] button.
◊ The {Load PC from file - Ladder file} dialog box is displayed.
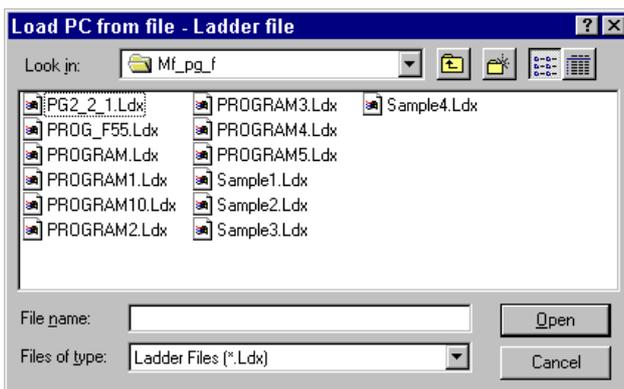
◊ Left-click the file to be transferred, then left-click the [Open] button.
◊ When returned to the {Load program and data to PC} dialog box, left-click the [OK] button.
  When the program transfer is completed, the program that has been transferred is displayed in the online window. At the same time, the file nameis displayed on the bar at the top of the online window.

File name

```
PROGRAM5.Ldx Online                                              _ □ ✕

    PAGE    1

    B0000   B0001                                              B0010
    ┤ ├      █ ├●                                              ( )

    B0010
    ┤ ├

    B0002                                                      B0011
    ┤ ├                                                        ( )

  File 1 / Data 1 /
```
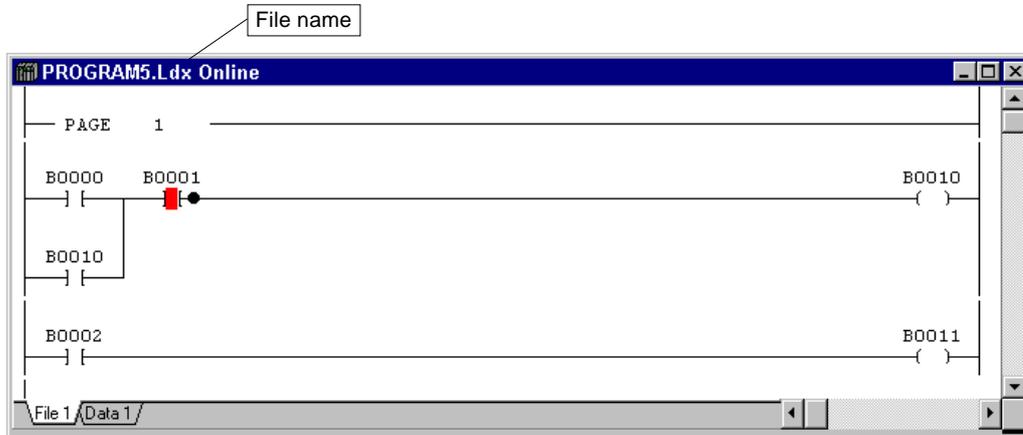
3-4-2 Transfer contents of data file to the PC

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

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

```
Load program and data to PC                                    ✕

  ☑ Ladder File
    Browse... │                                              │

  ┌─ ☑ Data File ───────────────────────────────────────────┐
  │  Browse... │                                           │ │
  │                                                          │
  │  ☐ Load Volatile Data Areas                              │
  │                                                          │
  │  Caution: Care should be taken when using the Load Volatile Data Areas
  │  option. This option may cause machine damage or process problems.  │
  └──────────────────────────────────────────────────────────┘

    OK          Cancel          Help
```
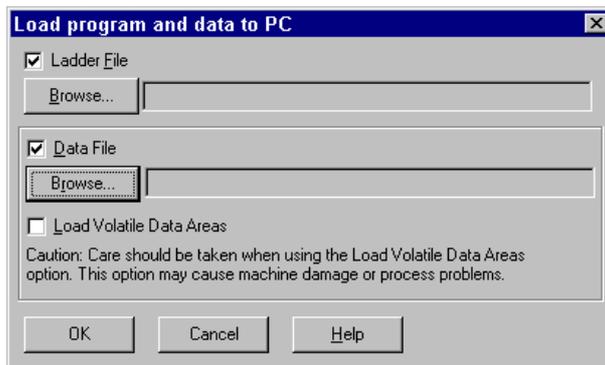
◊ When the {Load program and data to PC} dialog box is displayed, select [Data File] and click the [Browse...] button.
◊ The {Load PC from file - Data file} dialog box is displayed.
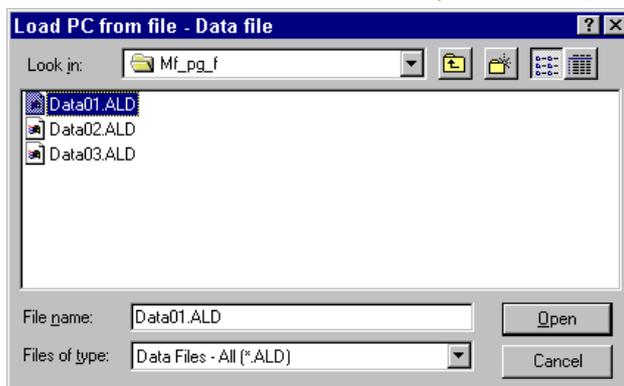
```
Load PC from file - Data file                            ? ✕

  Look in:  📁 Mf_pg_f        ▼  🔼  📁  ⊞ ▦

  📄 Data01.ALD
  📄 Data02.ALD
  📄 Data03.ALD


  File name:    Data01.ALD                              Open

  Files of type:  Data Files - All (*.ALD)      ▼      Cancel
```

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

3-4 Transfer Contents of File to the PC

> ⚠ **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

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

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

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

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

Warning ☒

⚠ PC is currently Stopped. Do you want to start the PC?

[Yes]   [No]

RUN →

STOP ←

Warning ☒

⚠ PC is currently Running. Do you want to stop the PC?

[Yes]   [No]
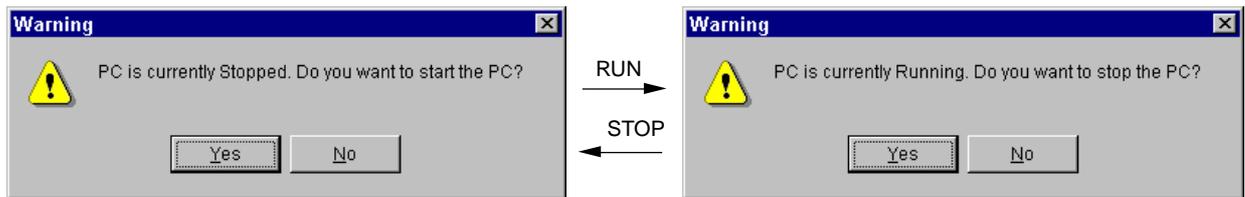
3-6 Change Online Program

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

☝ With a PC whose operation mode can be selected by a key switch (e.g., 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.

| Online | F70S | 19/16041 | | Mon | 1.0 | Running | No Fault |

Monitor Mode   Edit

| Online | F70S | 19/16041 | | Edit | 1.0 | Running | No Fault |
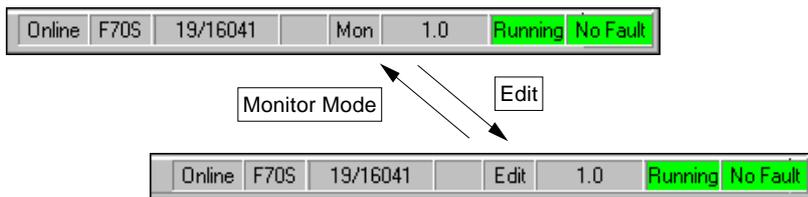
◊ Edit (change) the program. (For the method of editing a program, refer to Section 2.)

☝ While the program is being edited, various symbols are displayed on the right and left power rails in the ladder program. The meanings of those symbols are explained below. Each time an edited line is transferred the PC, the associated symbol disappears.

• M ... Indicates that the line is being changed.
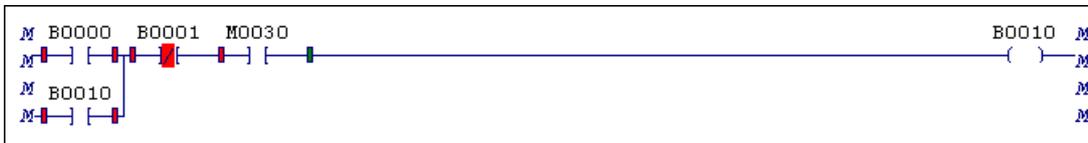
• I ..... Indicates that the line is being inserted.
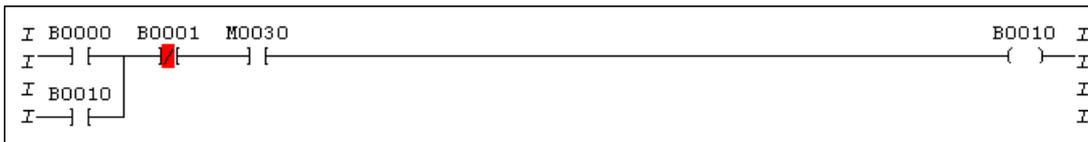
• S .... Indicates that the line is being selected.
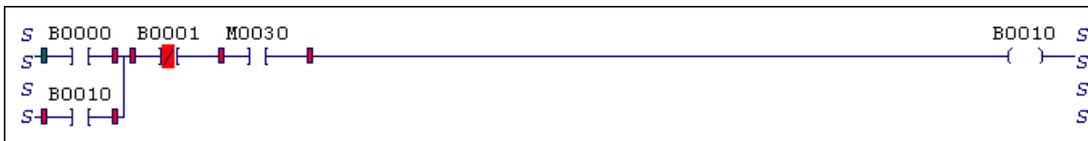
- D ... Indicates that the line is being deleted.

```
D B0000  B0001  M0030                                          B0010 D
D──┤├────┐ █┤────────────┤├──────────────────────────────( )──D
D B0010      │                                                      D
D──┤├────────┘                                                      D
```
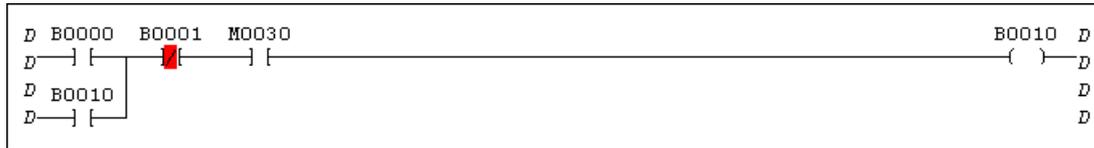
◊ Select [Edit] - [Download changes to PC] from the menu bar to transfer the edited program to the PC. (Alternatively, left-click the [icon] [Download to PC] button on the main tool bar.

⚠ **Caution**

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

Warning ✕

⚠ PC is now running !
Do you wish to download changes to PC?
Care should be taken when downloading
This could cause PC to stop through a program error

[OK]   [Cancel]   [Help]
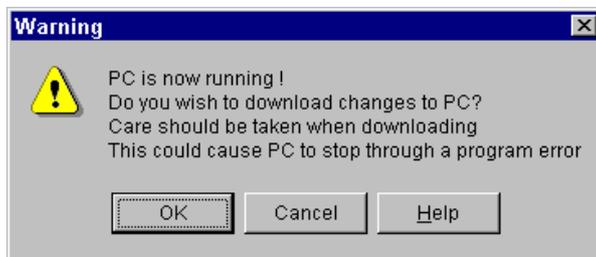
3-7 PC Memory Clear

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

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

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


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

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

◊ Select [PC Functions] - [Memory Clear...] from the menu bar.
◊ The {Memory Clear} dialog box is displayed. Check the box associated with the item to be cleared.
  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.
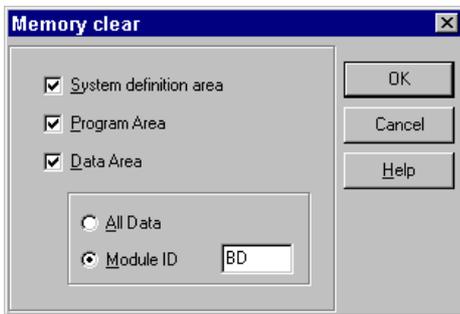
◊ If the PC is running, the following warning message is displayed. After confirming that there is no problem, left-click the [Yes] or [Ignore] button.
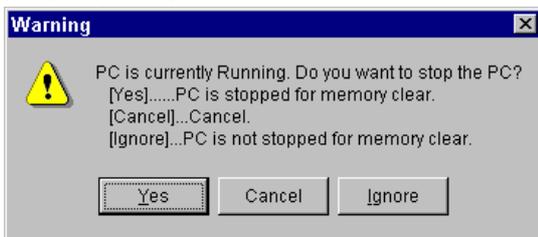
◊ Specified memory is cleared, and returns to the online window.

3-7-2 Clearing PC 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.

Warning

⚠ Continuing will clear the PC memory - do you want to continue?

[Yes] [No]

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

Warning

⚠ PC is currently Running. Do you want to stop the PC?
[Yes]......PC is stopped for memory clear.
[Cancel]...Cancel.
[Ignore]...PC is not stopped for memory clear.

[Yes] [Cancel] [Ignore]
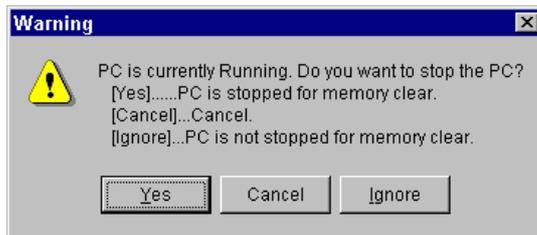
◊ Specified memory is cleared and return to the online window.

3-8 Displaying and Setting Data

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

[Data 1] tab
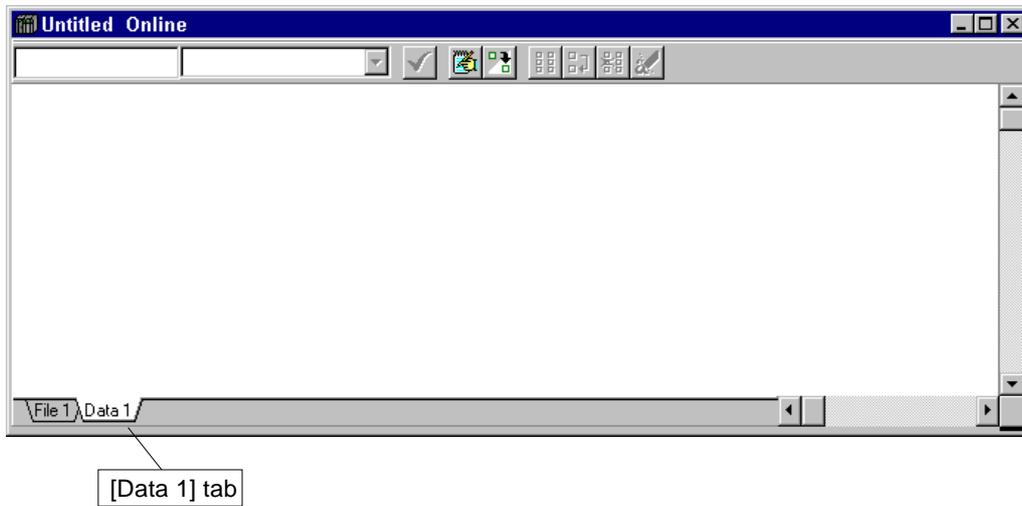
3-8-1 Displaying data
Here, the method of displaying the PC memory area in bits and in words is explained.

<Display in bits>
◊ Enter the address to be displayed. Left-click below [Address] of the data display window. (A green-colored frame is displayed.)
Next, enter the address in the text box at the top, left of the screen.
Then, left-click the [Arrow] button and select [Bit] from the data format list.

Text box

[Arrow] button

Green-colored frame
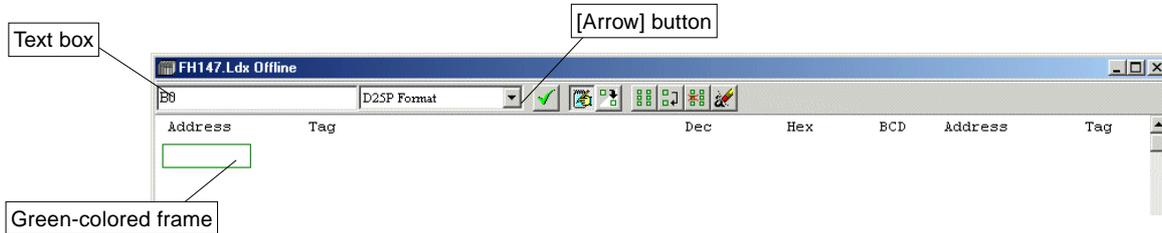
☞ **Data format**
Use a suitable data format depending on the situation.
- Bit area display .... Select [Bit].
- WORD area display .... Select [D25P Format].

Bit
D25P Format
Bit
BCD
Hexadecimal
Signed integer
unsigned integer
Ascii
BCD (Double)
Hex (Double)
Signed Int (Double)
Unsigned Int (Double)
Ascii (Double)

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

```
FH147-test.Ldx Online                                              _|□|x|
B0000              Bit              ▼  ✓ 🖼 🔁 🔲 🔲 🔲 🖋
   Address      Tag                        Dec    Hex    BCD   Address   Tag   ▲
   B0000     Input0                        Off
```
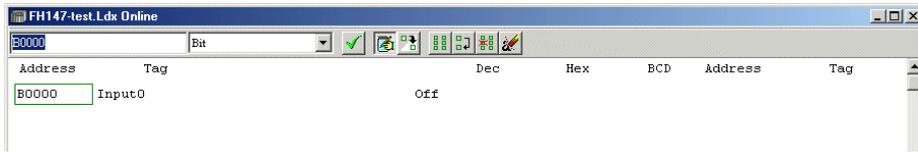
<Display in words>
◊ In the data display window, left-click the part right under the part in which the address was entered in the above operation. (In this example, a green-colored frame is displayed under address "B0000.")
Next, enter the address in the text box at top, right of the screen.
Then, left-click the arrow button to select [D25P Format] from the data format list.

```
FH147-test.Ldx Online                                              _|□|x|
WM1               D25P Format       ▼  ✓ 🖼 🔁 🔲 🔲 🔲 🖋
   Address      Tag                        Dec    Hex    BCD   Address   Tag   ▲
   B0000     Input0                        Off
```
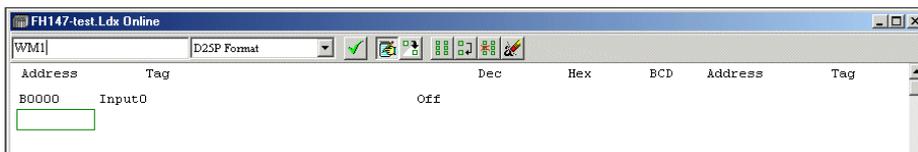
◊ Left-click the ✓ [Enter] button. The status of the specified word is displayed.

```
FH147-test.Ldx Online                                              _|□|x|
WM1               D25P Format       ▼  ✓ 🖼 🔁 🔲 🔲 🔲 🖋
   Address      Tag                        Dec    Hex    BCD   Address   Tag   ▲
   B0000     Input0                        Off
   WM0001                 0000000000000000   0    0000   0000
```
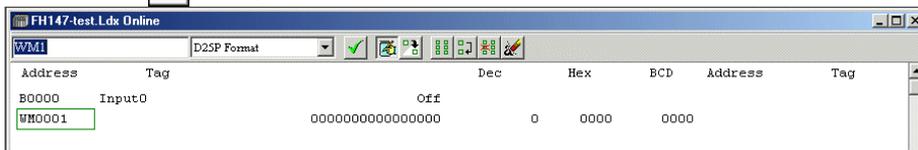
3-8-2 Setting data
In order to set any data, it is necessary first to display the memory address at which to set data. For the method of displaying data, refer to the preceding paragraph 3-8-1.
In the following explanation, it is assumed that the memory address has been displayed.

<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.)

```
FH147-test.Ldx Online                                              _|□|x|
Off               Bit              ▼  ✓ 🖼 🔁 🔲 🔲 🔲 🖋
   Address      Tag                        Dec    Hex    BCD   Address   Tag   ▲
   B0000     Input0                        Off
   WM0001                 0000000000000000   0    0000   0000
   M0005                               Off                          ────── Green-colored frame
```
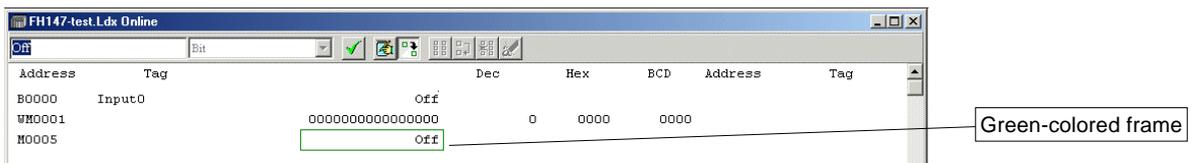
◊ Enter "1" (or "ON") or "0" (or "OFF") in the text box at top, right of the screen. Then, left-click the ✓ [Enter] button. The specified address bit is turned on or off

```
FH147-test.Ldx Online                                              _|□|x|
1                 Bit              ▼  ✓ 🖼 🔁 🔲 🔲 🔲 🖋
   Address      Tag                        Dec    Hex    BCD   Address   Tag   ▲
   B0000     Input0                        Off
   WM0001                 0000000000000000   0    0000   0000
   M0050                               On
```
Text box
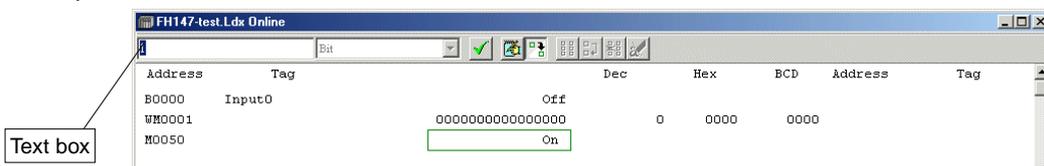
3-8 Displaying and Setting Data

\<Setting word data>

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

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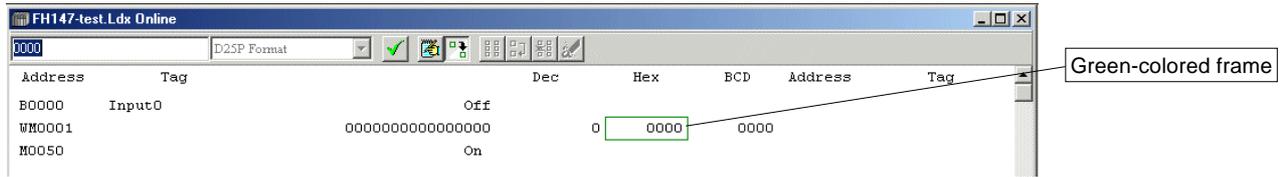
◊ Enter word data to be set (e.g., "F00F") in the text box at top, right of the screen and left-click the ☑ [Enter] button. The word data is set at the specified address.

Text box
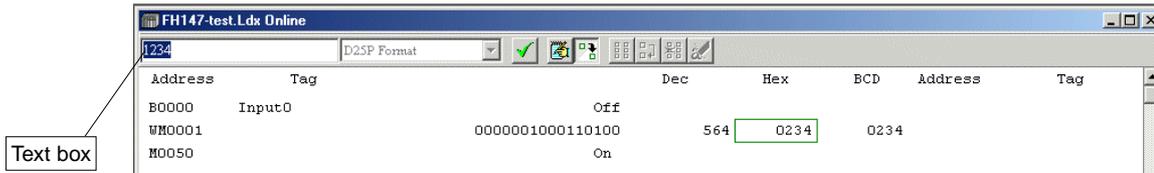
☞ When the PC is running and when the specified address is the one where a program output or instruction data has been written, the program operation is given precedence.

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


Here, the method of forcing any input/output of the PC 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.
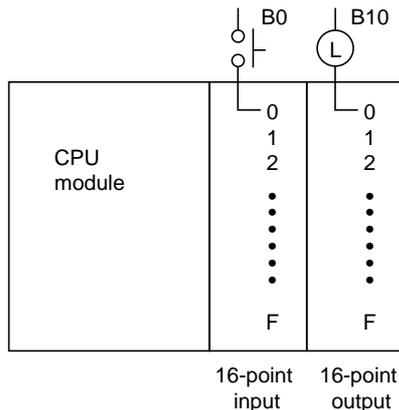

The continuous forced set/reset function enables the following:
- Forcing the ladder program input to be turned on/off regardless of the on/off status of the actual input.
- Turning on/off the actual output regardless of the on/off status of the ladder program output.
- The forced set/reset/cancel commands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

☞ With PCs 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.
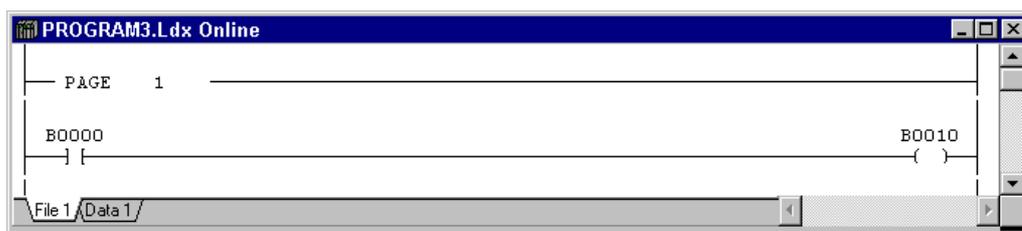

(1) Continuous forced set of input/output
◊ Select [PC Functions] - [Program Forcing] - [Continuous Force On...] from the menu bar.
◊ The {Continuous Force Address On} dialog box is displayed. Enter any input or output address (tag name will do) in the [Tag/Address] text box and left-click the [OK] button.

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"

Indication of forced setting of input "B0"

• Example of forced setting of output "B10"
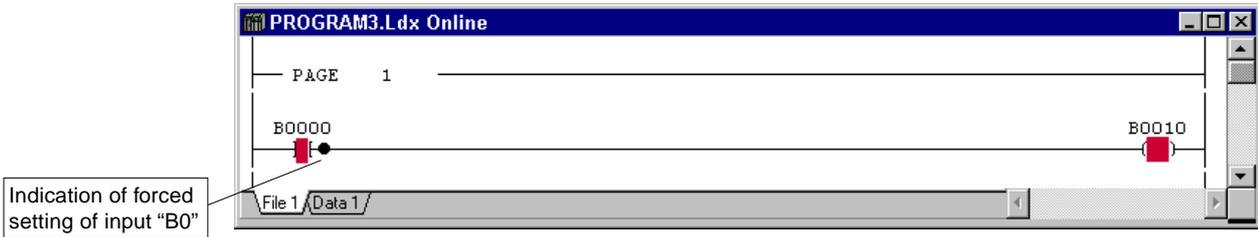
Indication of forced setting of output "B10"
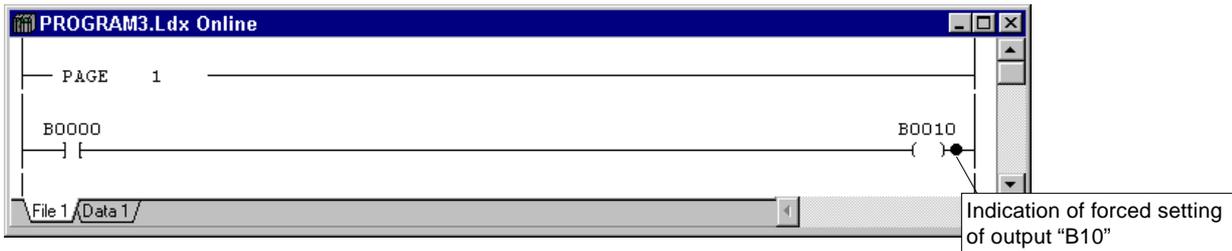
(2) Continuous forced reset of input/output

◊ Select [PC 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.
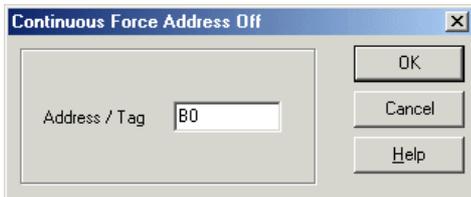
◊ The specified address is forced to be reset. In this case, an open circle (o) indicating that the address has been forced to be reset is displayed at the side of the symbol of the specified address.

**• Example of forced resetting of input "B0"**


Indication of forced setting of output "B10"
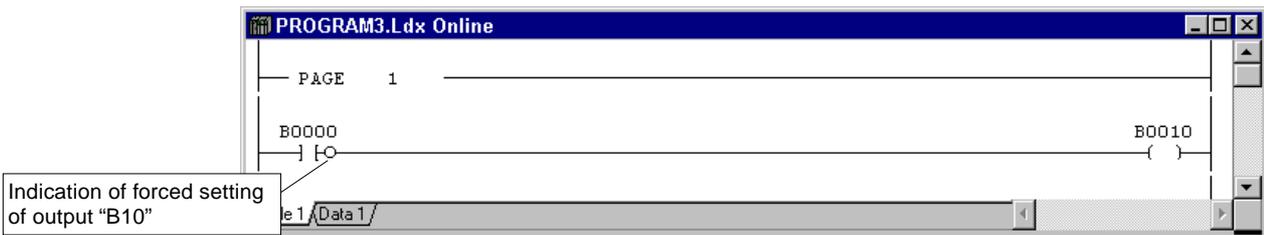
• Example of forced resetting of output "B10"


Indication of forced setting of output "B10"
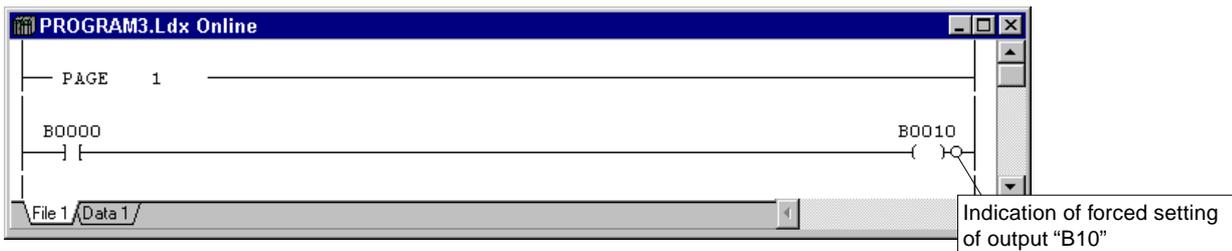
(3) Canceling continuous forced set/reset

The forced set/reset remains valid till the PC 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 [PC 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.
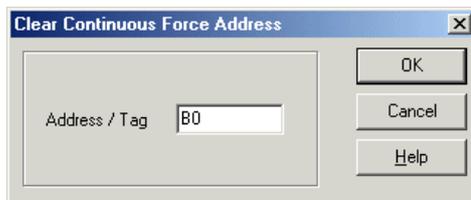
(4) Confirming continuous forced set/reset setting

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 [PC 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.
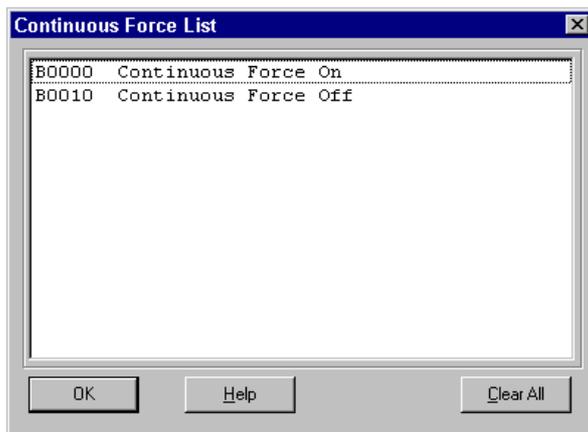
(5) Operation during continuous forced set/reset

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 PC 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 PC 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 an 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 [PC 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 [PC 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 PC when some trouble has occurred with the PC is explained.

◊ Activate the diagnostic information screen. Select [PC 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 PC 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 PC running state.

This button allows display selection as follows: [Present] to [1 generation before] to [2 generations before] ..
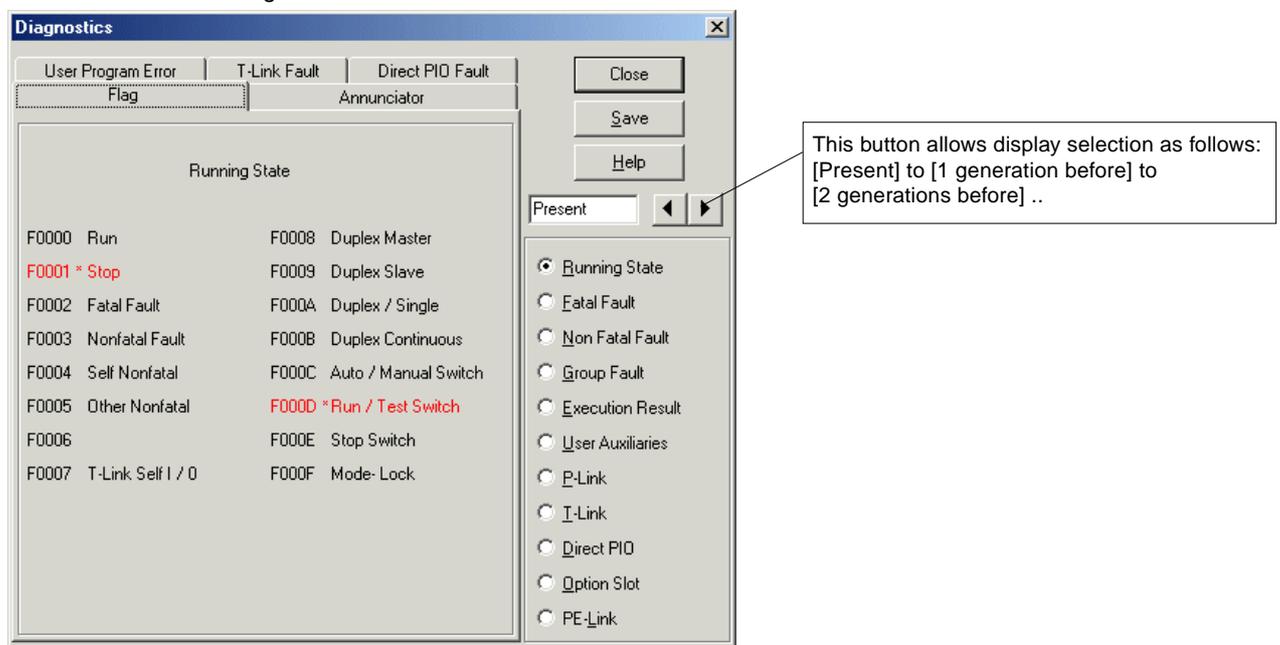
☞ **About status display**

{Present} is the current PC status display.
{1 generation before} is the PC status display present just before the PC is last turned OFF.
{2 generations before} is the PC status display present just before the PC is turned OFF before it is last turned OFF.
• The number of generations depends on the PC 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 PC.

3-10 PC Diagnosis

• **Fatal Fault**

Indicates the cause of a fatal fault of the PC.

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

Fatal Fault Condition

F0010	Memory Error	F0018	User Program Error
F0011	Micro Diag Error	F0019	WDT Error
F0012	Aux-Power Fault	F001A	Bus Error
F0013	Power Fault	F001B	Duplex Setup Error
F0014	T-Link Fault	F001C	I / O Area Double
F0015	Option Error	F001D	Too Many Capsule
F0016	System Stack Error	F001E	I / O Area Over
F0017	Push / Pop Error	F001F	Plant Fault

Close
Save
Help

Present ◄ ►

○ Running State
● Fatal Fault
○ Non Fatal Fault
○ Group Fault
○ Execution Result
○ User Auxiliaries
○ P-Link
○ T-Link
○ Direct PIO
○ Option Slot
○ PE-Link

• **Nonfatal Fault**

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

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

Non Fatal Fault Condition

F0020	Battery Error	F0028	
F0021	Duplex T-Link is cut	F0029	I / O Configure Fault
F0022	Option Error	F002A	
F0023		F002B	Invalid Block No.
F0024	T-Link Fault	F002C	Sync Bus Error
F0025	P / PE Link Fault	F002D	Sync Configure Error
F0026	T-Link Config Fault	F002E	Long Execution Cycle
F0027	P / PE Link Config Fault	F002F	Plant Fault

Close
Save
Help

Present ◄ ►

○ Running State
○ Fatal Fault
● Non Fatal Fault
○ Group Fault
○ Execution Result
○ User Auxiliaries
○ P-Link
○ T-Link
○ Direct PIO
○ Option Slot
○ PE-Link

• Group Fault

　Indicates the content of a group fault.
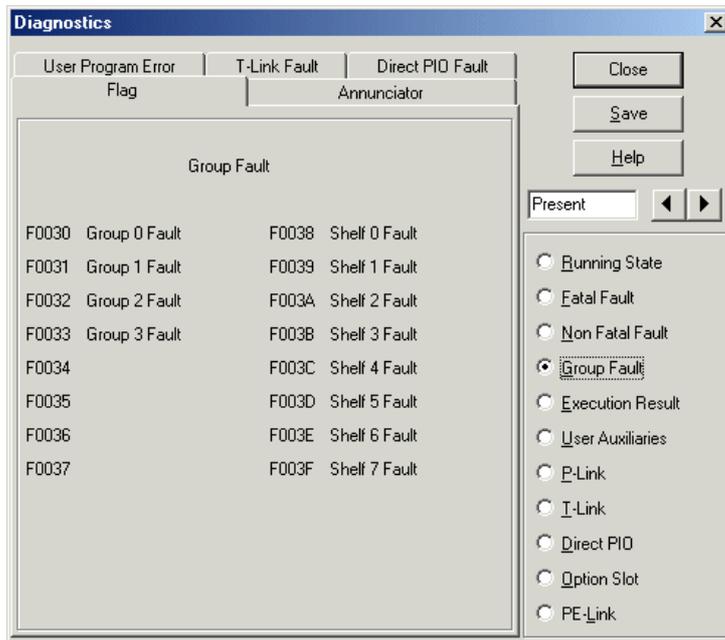

• Execution Result

　Indicates the status of execution results flags.
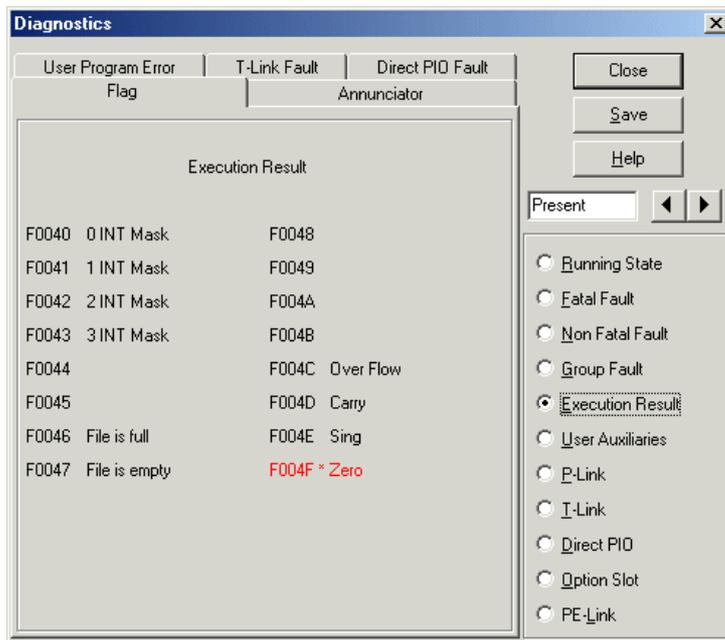
3-10 PC Diagnosis

- **User Auxiliaries**

   Indicates the conditions of the PC clock, etc.
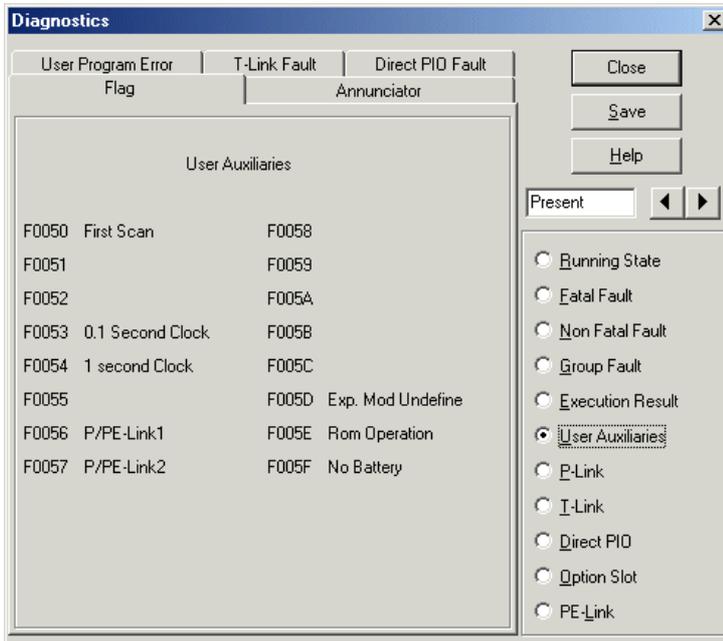
- **P-Link**

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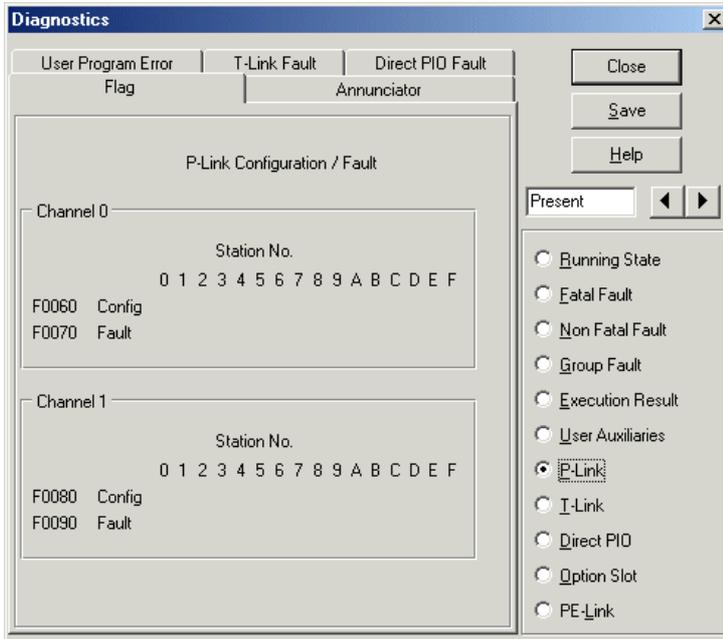
•**T-Link**

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.
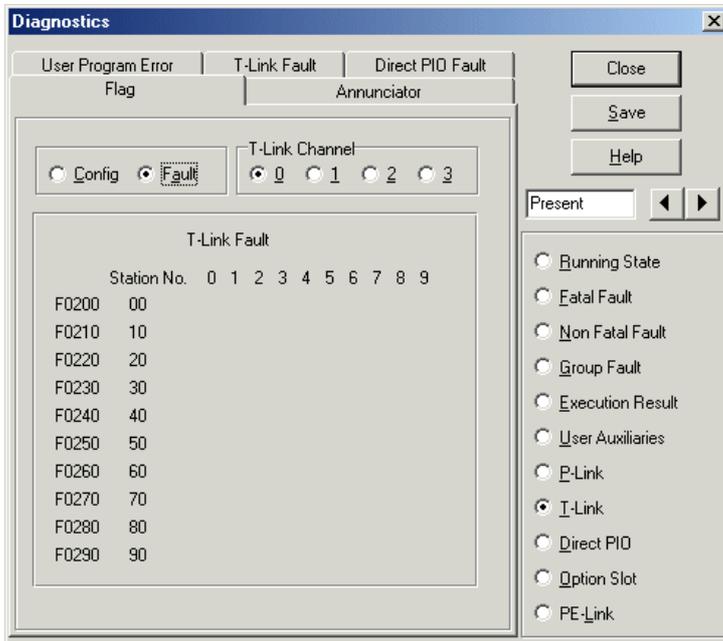
• **Direct PIO**

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].
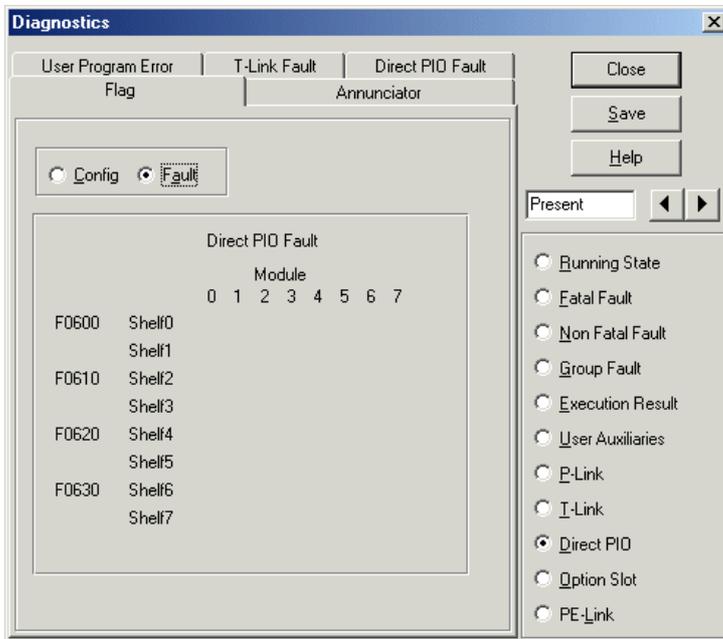
3-10 PC Diagnosis

• Option Slot

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

• 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.
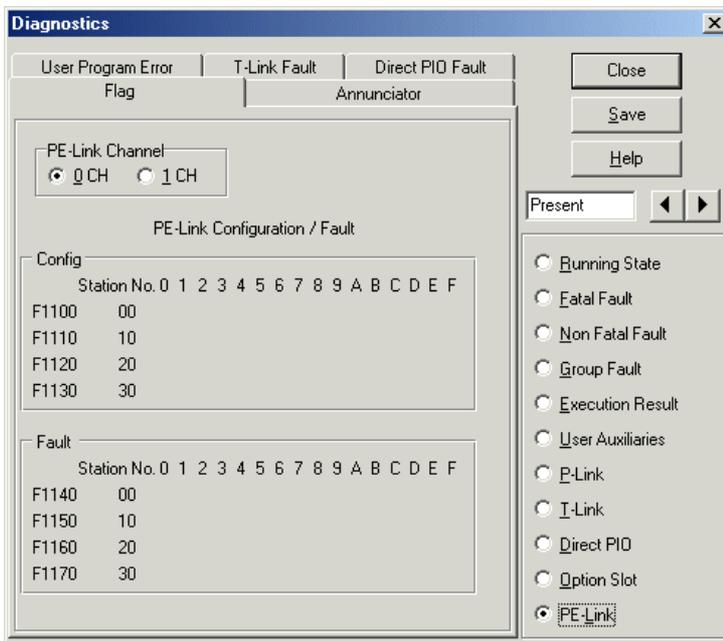
[Annunciator]

Indicates the status of the PC annunciator.

Diagnostics

| User Program Error | T-Link Fault | Direct PIO Fault |

| Flag | Annunciator |

Plant Fault

Fatal Fault
```
        0 1 2 3 4 5 6 7 8 9 A B C D E F
A0000
```

Nonfatal Fault
```
        0 1 2 3 4 5 6 7 8 9 A B C D E F
A0010
A0020
A0030
```

```
A0040   Over Flow          A0048
A0041   Execution Error    A0049
A0042                      A004A
A0043                      A004B
A0044                      A004C
A0045                      A004D
A0046                      A004E   Pause Relay
A0047                      A004F   Stop Relay
```

Close   Save   Help

Present ◄ ►
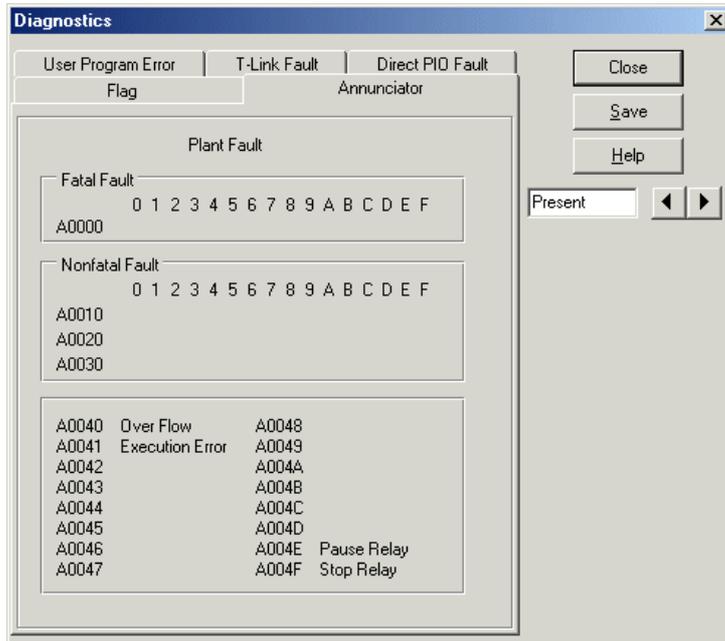
[User Program Error]

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

Diagnostics

| Flag | Annunciator |

| User Program Error | T-Link Fault | Direct PIO Fault |

User Program Error

Line No.	Error
3.7	Timer/counter duplicate definitions

Close   Save   Help

Present ◄ ►

Jump Line
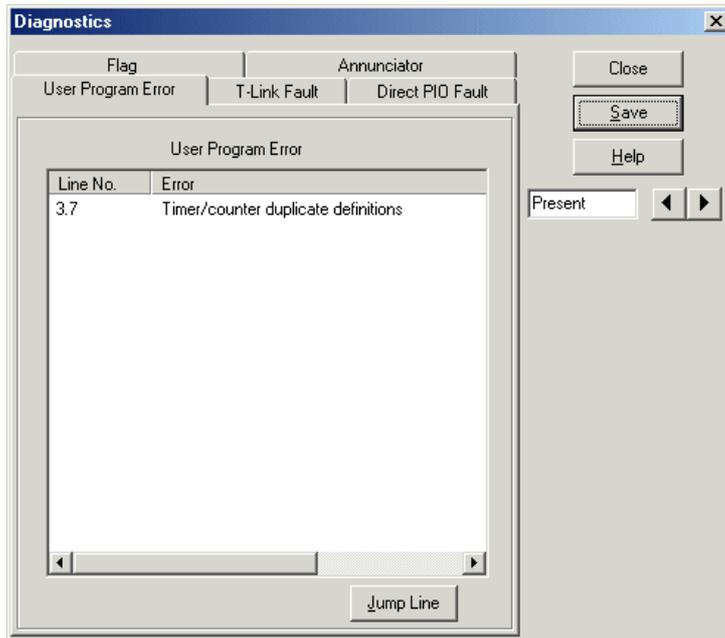
3-10 PC Diagnosis

[T-Link Fault]

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

• Current/History

The PC is capable of detecting and memorizing multiple faults. (The number of faults that can be memorized differs according to the PC 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 PC 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 PC 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 PC base.
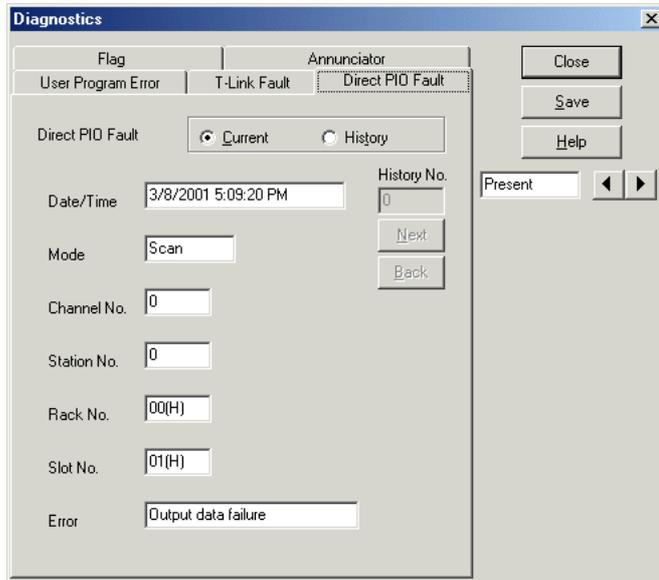
• **Current/History**
The PC is capable of detecting and memorizing multiple faults. (The number of faults that can be memorized differs according to the PC model. If the number of faults that have occurred exceeds the number of faults that can be memorized, the older fault information is discarded.) The PC 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 PC 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 PC Diagnosis

- **Error**

  Indicates the content of an error.

<Display for F30, F50 and F50H series>

- **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>

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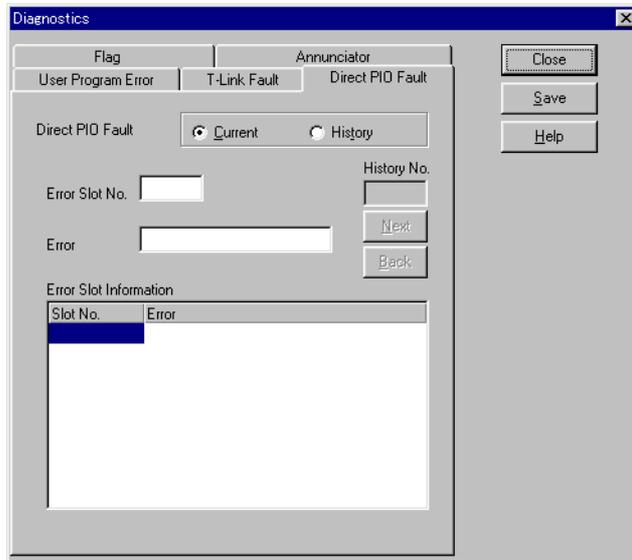
- **Error slot number**
     Displays the slot No. on which a bus error occurred.
- **Contents of error**
     The contents of the error are displayed.
- **Error slot information**
     Displays the information about the slot on which a bus error occurred in list form.

[Save RAS data]
     By left-clicking the [Save] button, you can save RAS data as a text file.
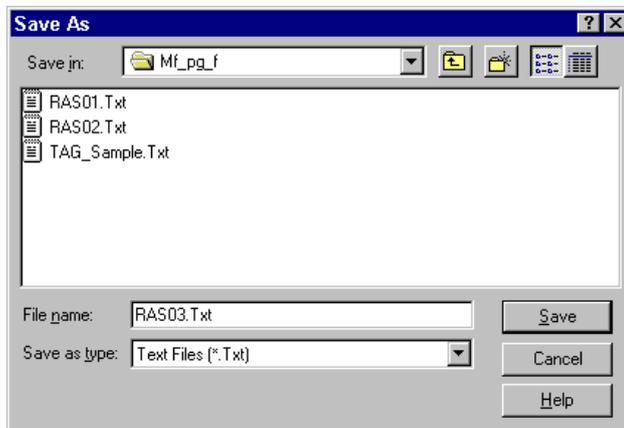
When the {Save as} dialog box is displayed, enter a folder in the [Save in] text box and a file name in the [File name] text box.

3-10 PC 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.
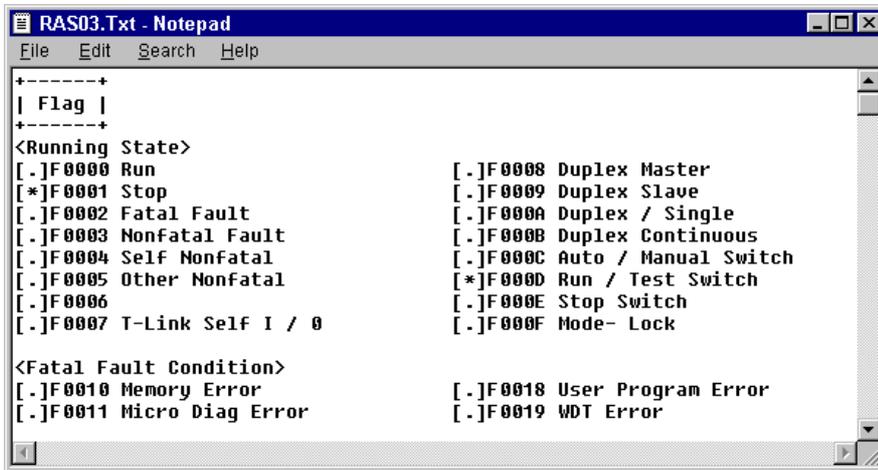
```
RAS03.Txt - Notepad
File   Edit   Search   Help

+------+
| 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
```

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 [PC functions] - [System definition] - [System registration] from the menu bar.
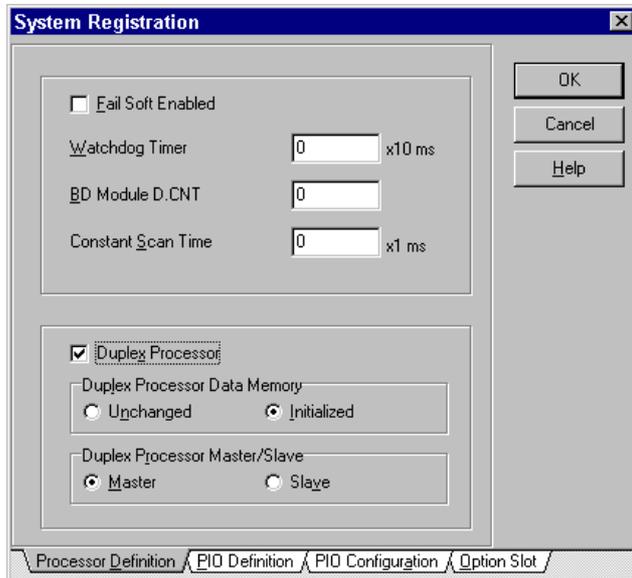
◊ Check the [Duplex Processor] box.
   [Duplex Processor Data Memory] box:
        Select a duplex mode: either "hot start" (Unchanged) or "cold start" (Initialized).
        For the F70S, F120H, and F120S to F150S series, only "cold start" (Initialized) is available. No data is passed
        when processors 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.
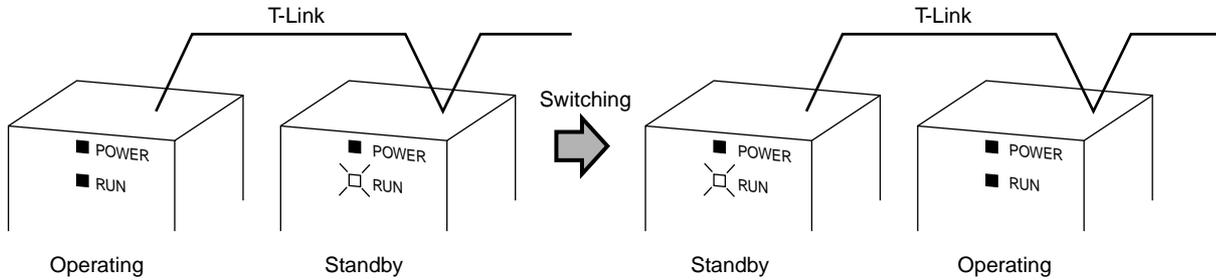
◊ For switching, select [PC functions] - [Duplex Operations] - [Master/Standby changeover] from the menu bar. Then the {Warning} dialog box is displayed.
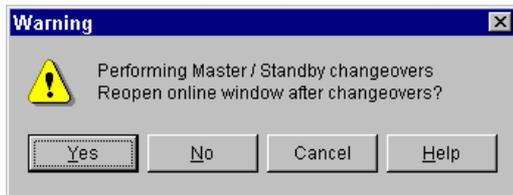
After switching the master and slave processors, select [Yes], [No] or [Cancel] for whether or not to open the online window for the processor that has newly become the master. [Cancel] stops the operation.

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

3-11-2 Switching communicating processor

The program loader usually communicates with the operating PC. This function enables the user to switch the communicating PC. It is useful to read or write the system definitions, programs, and data stored in the PC that is in the standby status.
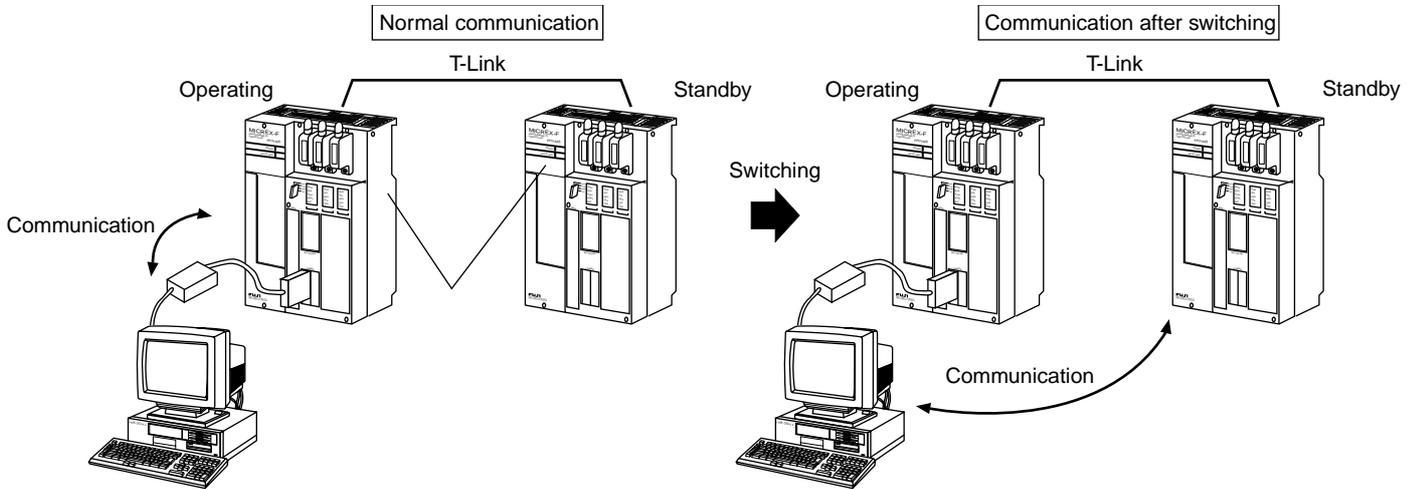
◊ For switching, select [PC functions] - [Duplex operations] - [Communication changeover] from the menu bar. Then the {Warning} dialog box is displayed.

◊ 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
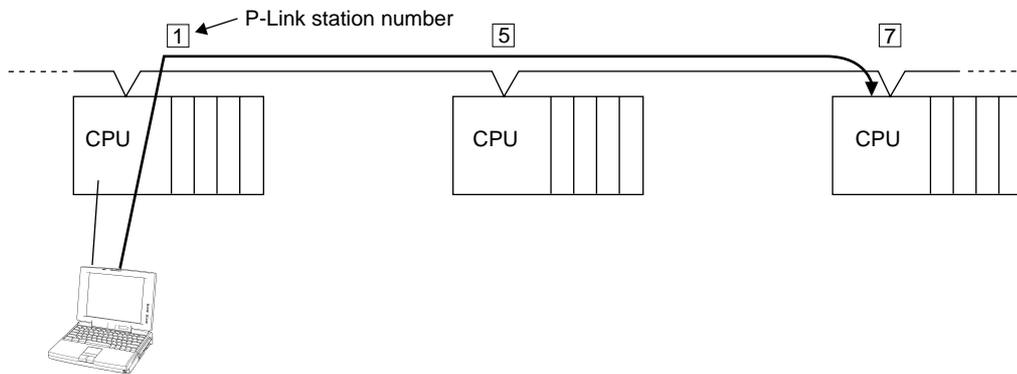
Loader software Version 1.10.XXX supports the loader network of P-link or PE-link. When connecting to another CPU, use the [Network Connect...] function.
To cancel the connection to another CPU and then connect to the local station, use the [Network Release] function.

3-12-1 Network Connect
◊ Select [PC functions] - [Loader Network] - [Network Connect...] from the menu bar.
◊ Then the {Loader Network Connect} dialog box is displayed.
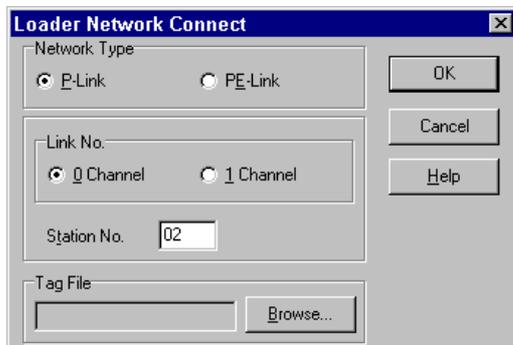
1) Network Type
Select the type of network to be used.

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

```
Select Tag file to attach to online window        [?][X]

Look in:  [📁 Mf_pg_f    ▼]  [🔼] [📁] [::] [▦]

  📄 PG2_2_1.Tag        📄 PROGRAM4.Tag
  📄 PROG_F55.Tag       📄 Sample1.Tag
  📄 PROGRAM1.Tag       📄 Sample2.Tag
  📄 PROGRAM10.Tag      📄 Sample3.Tag
  📄 PROGRAM2.Tag       📄 Sample4.Tag
  📄 PROGRAM3.Tag


File name:    [No Tag File Required        ]      [  Open  ]

Files of type: [Tag Files (*.Tag)      ▼]         [ Cancel ]

                    Specified point              [  Help  ]
```
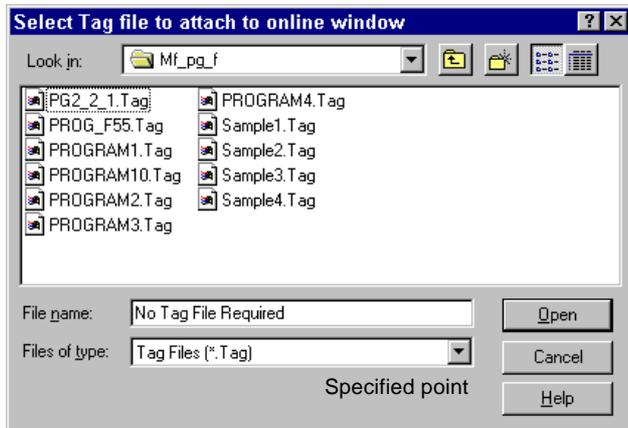
When no tag file needs to be displayed, keep "No Tag File Required" displayed in the [File name] text box.
When a tag file is to be displayed, set it in the [File name] text box.

◊ 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 PC support Sampling trace.
F70, F70S, F80H, F120 (since V05), F120H, F120S to F150S siries

Example of sampling trace result display

1) Graph (timing chart) display

2) Text (ON/OFF) display
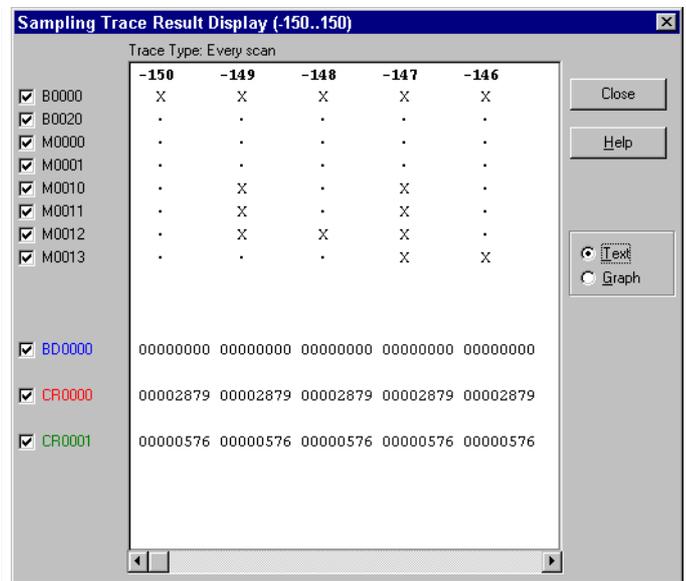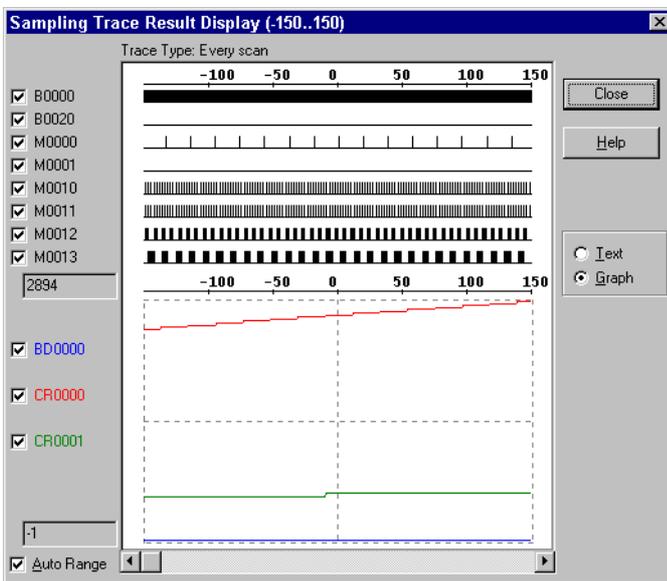
Sampling trace operation procedure

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

3-13 Sampling Trace <Recording of Data History)
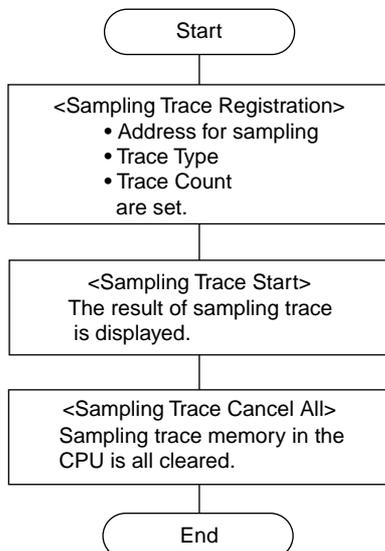
The sampling trace function is explained below, using the following program as an example. Because this program uses W24 (direct access), direct access must be defined in system definitions.

```
                                    0000              M0000
             |    00000000    =     W024.0000    |----( )----
                                              Trace_enable
  M0000                                          A0200
---| |---------------------------------------------( )----

                                    0000              M0001
             |    00005000    ≠     W024.0000    |----( )----
                                            Trace_execution
  M0001                                          A0201
---| |---------------------------------------------( )----
```
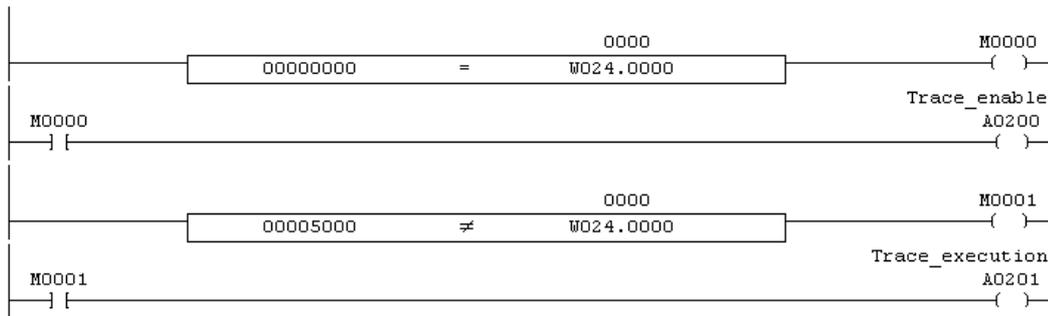
A200 : Sampling trace enable flag
A201 : Sampling trace execution flag
W24.0 : Setting of direct access to I/O

Explanation of the program on the upper
1) When certain data other than "O" 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.

3-13-2 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 [PC 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.

<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) ao (the number of bytes of bit data + the number of bytes of word data) x (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.

3-13-3 Sampling trace execution

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

Confirm ✕

? Current trace data must be released before new trace can start. Release current data and start new trace?

[Yes]   [No]

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 "O" 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 A20O (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.
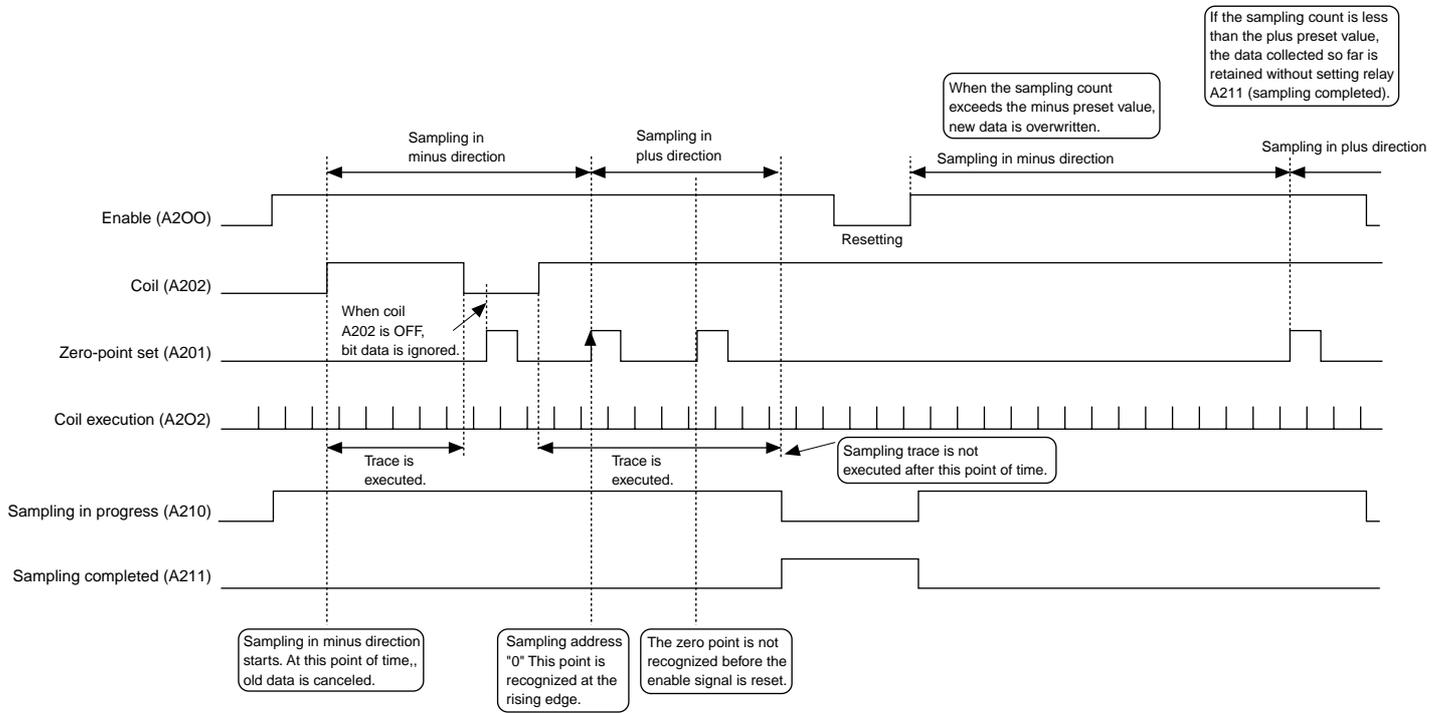
Method 1

◊ Select [PC 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.
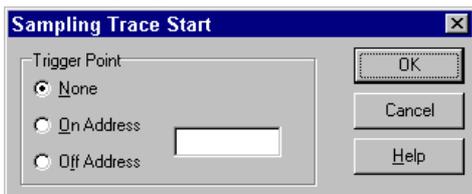
Method 2

◊ Select [PC 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.

```
Sampling Trace Start                    [X]
┌─Trigger Point──────────┐    ┌────────┐
│                        │    │   OK   │
│  ○ None                │    └────────┘
│                        │    ┌────────┐
│  ● On Address          │    │ Cancel │
│                 ┌────┐ │    └────────┘
│  ○ Off Address  │ M0 │ │    ┌────────┐
│                 └────┘ │    │  Help  │
└────────────────────────┘    └────────┘
```

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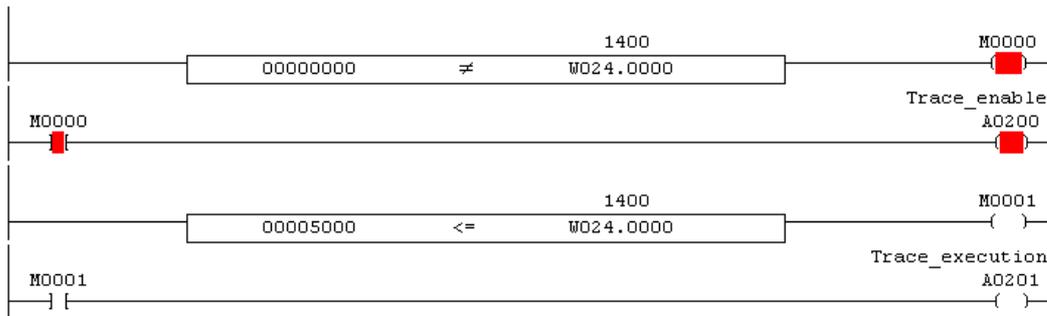
2) When the data of W24.0 becomes greater than 5000, A201 (trace execution) also turns on to start collecting data in the plus direction.

3-13 Sampling Trace <Recording of Data History)
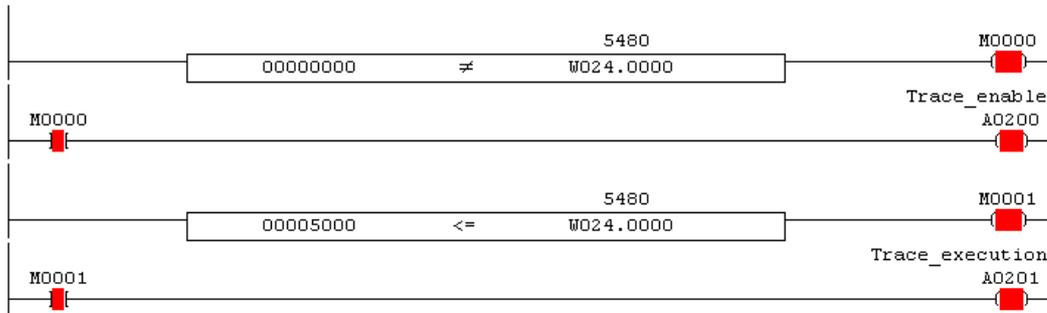
Method 4

interrupt input module
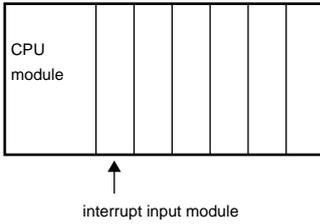
An interrupt signal is set in channel 0 of the DPI module (interrupt input module) that is mounted in slot 0. Each time external interrupt programoPROG60 is started, the status of the specified relays and coils and the contents of word data are traced.

Example of Program


```
─[ PROG    60    0    0              ]

─[ W24.0      LMOV      WM0          ]
                                 A200
─┤├─────────────────────────────( S )─────  A200 (enable coil) is set when a specified condition is satisfied.
                                              (A200 can also be set by a cyclic program.)
 M0                              A202
─┤├─────────────────────────────(   )─────  M8 is an external interrupt input to channel O.

                                 A201
─┤├─────────────────────────────(   )─────  The zero point is indicated when a specified condition is satisfied.

                                 A200
─┤├─────────────────────────────( R )─────  A200 (enable coil) is reset when a specified condition is satisfied

─[ PEND                              ]
```
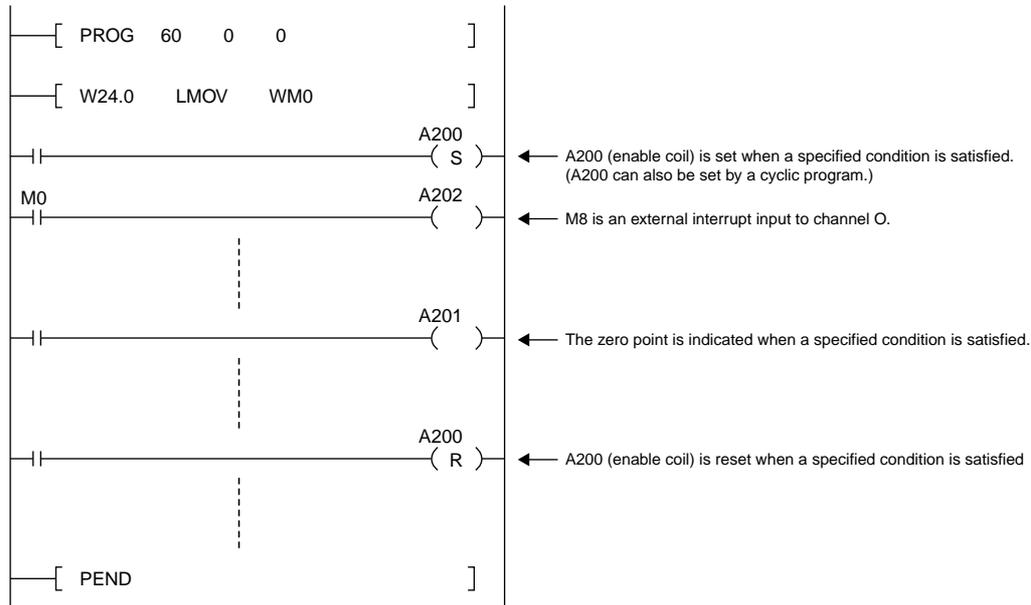
Use the coil trace function effectively for the following purposes:
1. Sampling various data for each external interrupt input signal
2. Sampling various data at each fixed-cycle interrupt
3. Sampling the various data that changes within a scan period

3-13-4 Display of sampling trace
The data collected by sampling trace can be read for graphic (time chart) display or text (ON/OFF) display.

◊ Select [PC functions] - [Sampling Trace] - [Sampling Trace Result Display] from the menu bar.
The {Sampling Trance 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>
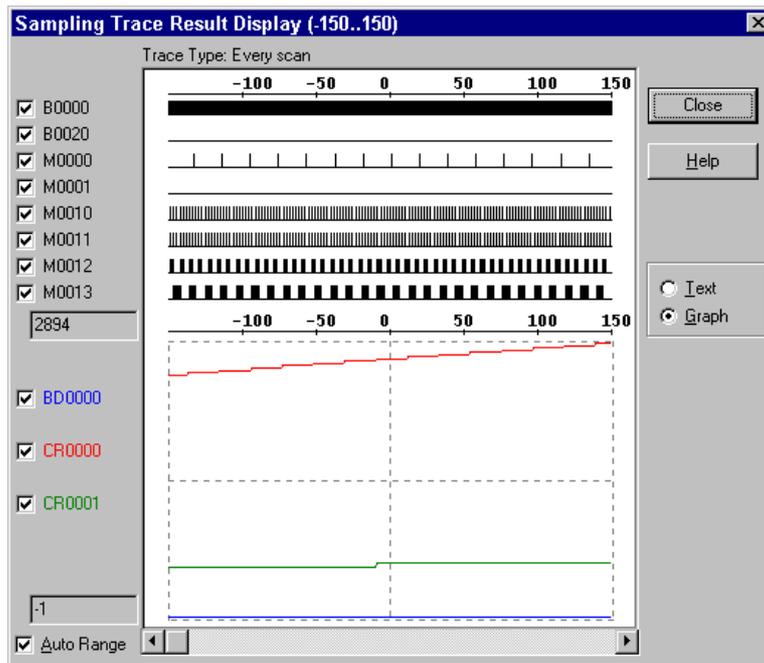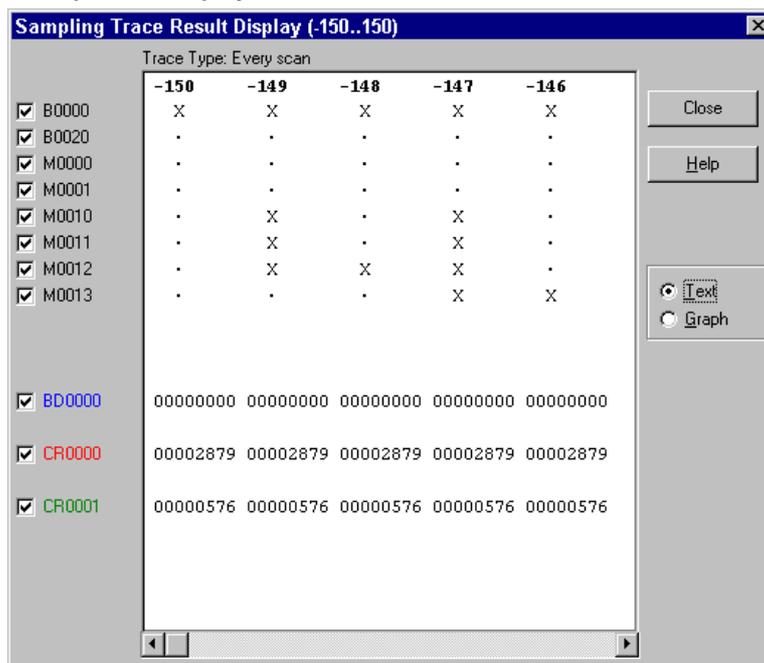
For text display, "." is indicated for OFF status of bit address and "X" for ON status.
Word address is indicated by hexadecimal (or BCD) value.

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 [PC 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 PC. 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 PC support Sampling trace.
F70, F70S, F80H, F120 (since V05), F120H, F120S to F150S siries

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

```
  B0000                                                    A0208
  ─┤ ├──┬────────────────────────────────────────────────(S)─
  B0001 │                                                  A0010
  ─┤ ├──┘                                                  ─( )─

  B0002                                                    A0208
  ─┤ ├──────────────────────────────────────────────────(R)─

  B0003                                                    A0209
  ─┤ ├──────────────────────────────────────────────────( )─

                                              T0000  00042248
  ─────────────────────────────────────────┤TON   10000000├─
```

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 PC.
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 B1O

```
                                              T0000  00065268
  ─────────────────────────────────────────┤TON   10000000├─
```

1) When the PC starts operation, the timer starts counting.
2) The timer current value at the time that "B1O" connected to the input card is turned ON is stored in the status latch memory of the PC.

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

```
                                              T0000  00065268
  ─────────────────────────────────────────┤TON   10000000├─
```

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

3-14-3 Status latch registration

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

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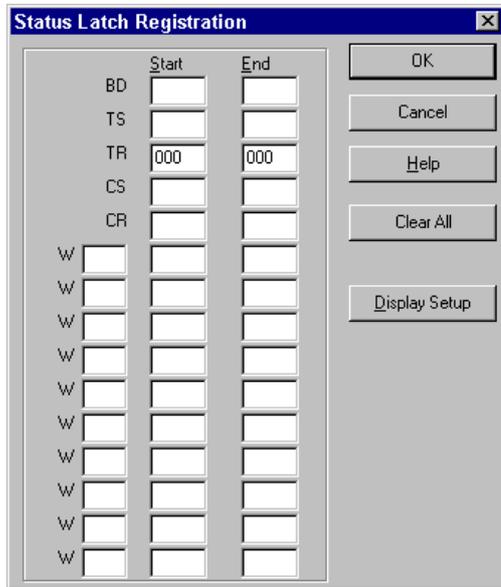
Note:
For bit memory areas (B, M, K, D, F, A, S, T, C and L), registration is already made in advance.

<Explanation of the dialog box>
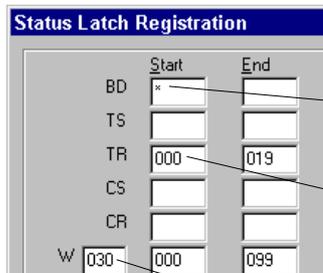
"*" (asterisk) is attached when all addresses of the area are to be latched.

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)

Addresses set with [Display Setup]

Addresses registered for status latch

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 exection 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 [PC 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.

Status Latch Execute

Trigger Point
- ○ None
- ● On Address B10
- ○ Off Address

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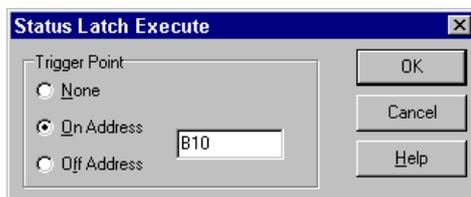
☞ If status latch is executed when the previously registered data still remains in the CPU, the following {Confirm} dialog box is displayed.

Confirm

? Current Latch data must be released before new Latch can started. Release current data and start new Latch?

Yes No

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 [PC 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.

```
┌─ Status Latch Execute ──────────────── ✕ ┐
│ ┌─Trigger Point─────────┐  ┌─────────┐    │
│ │  ● None               │  │   OK    │    │
│ │                       │  └─────────┘    │
│ │  ○ On Address         │  ┌─────────┐    │
│ │                ┌─────┐│  │ Cancel  │    │
│ │  ○ Off Address │     ││  └─────────┘    │
│ │                └─────┘│  ┌─────────┐    │
│ └───────────────────────┘  │  Help   │    │
│                            └─────────┘    │
└───────────────────────────────────────────┘
```

3-14-5 Status latch result display
Status latch data is displayed by using the following procedure.

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

```
┌─ Status Latch Result Display ──────────────────── ✕ ┐
│ ┌─────────────────────────────────┐  ┌──────────┐  │
│ │ Address   Value                │▲│ │  Close   │  │
│ │ B0000     Off                  │ │ └──────────┘  │
│ │ B0005     Off                  │ │ ┌──────────┐  │
│ │ BD0010    00362649             │ │ │  Help    │  │
│ │ BD0011    00000000             │ │ └──────────┘  │
│ │ BD0012    00000000             │ │               │
│ │ TR0003    00000000             │ │               │
│ │ TR0005    00000000             │ │ ┌──────────┐  │
│ │                                │ │ │  Add     │  │
│ │ BD0000    00000000             │ │ └──────────┘  │
│ │ BD0001    00000000             │ │               │
│ │ BD0002    00000000             │ │ ┌─Data Area─┐ │
│ │ BD0003    00000000             │ │ │           │ │
│ │ BD0004    00000000             │ │ │Display Setup▼│
│ │ BD0005    00000000             │ │ └───────────┘ │
│ │ BD0006    00000000             │ │               │
│ │ BD0007    00000000             │ │               │
│ │ BD0008    00000000             │ │               │
│ │ BD0009    00000000             │▼│               │
│ └─────────────────────────────────┘               │
└─────────────────────────────────────────────────────┘
```
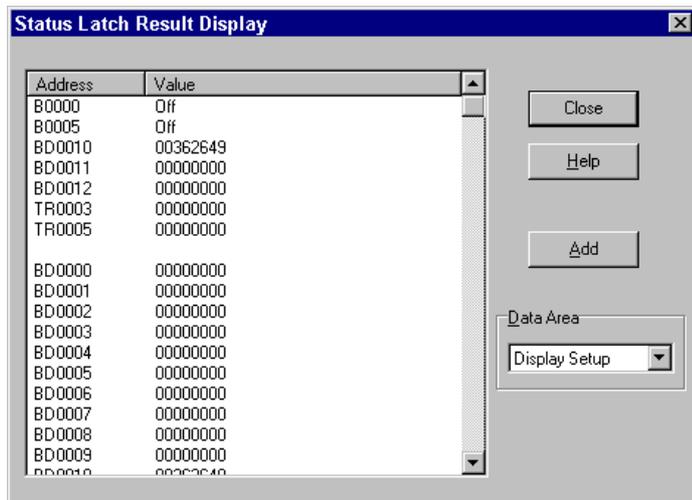
<Explanation of the dialog box>
[Data Area]
When "Display Setup" is selected, the addresses registered in 3-13-4 are displayed.
When "WB", "WM", "WR", etc., is selected, addresses for a specified type are displayed.

[Add] button
Used to add selective display to [Display Setup].

3-14-6 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 [PC 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.)

☞ Trigger-based PC
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.
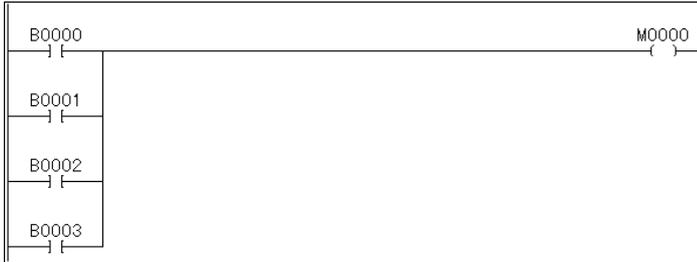
3-15-1 Setting and completing trigger
The following explains the procedure for setting trigger based on the condition of {Rising of output M0}.

◊ Select [PC functions(P)], [Trigger(G)], and then [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.
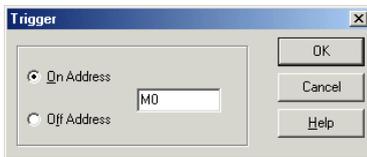
◊ During trigger execution, the trigger address and trigger conditions (ON at rising of relay and OFF at falling of relay) are displayed in the status bar at the bottom of the screen.

Trigger execution display
Green: Waiting for trigger
Red: Trigger completed

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

3-15-2 Canceling trigger

◊ Select [PC functions(P)], [Trigger(G)], then [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.