Ladder Monitor Specifications

Hakko Electronics Co., Ltd.

Record of Revisions

Reference numbers are shown at the bottom left corner on the back cover of each manual.

Printing Date	Reference No.	Revised Contents
March, 2003	1045NE0	First edition

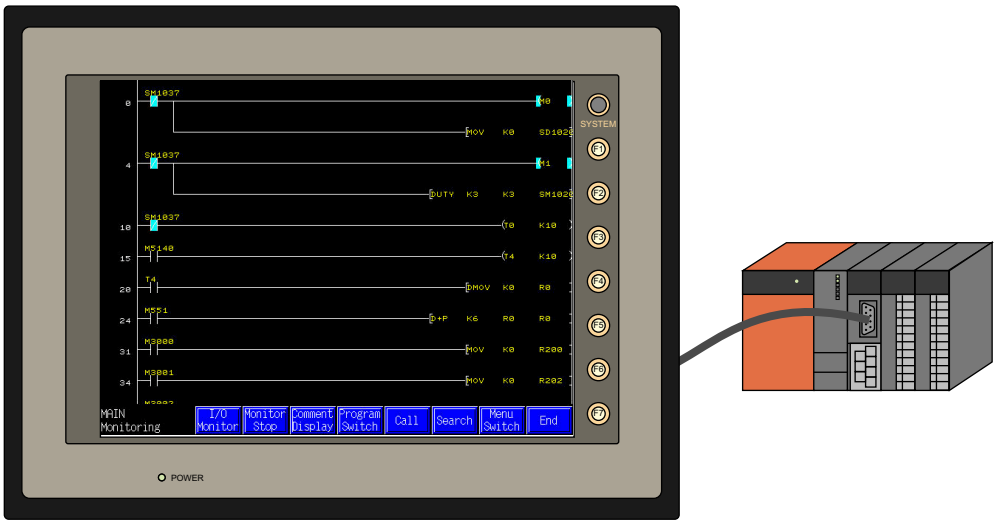
Outline

You can monitor the data from the PLC on the screen of the V7 series when communicating with the PLC.

The monitor supports both ladder format and I/O monitor format.

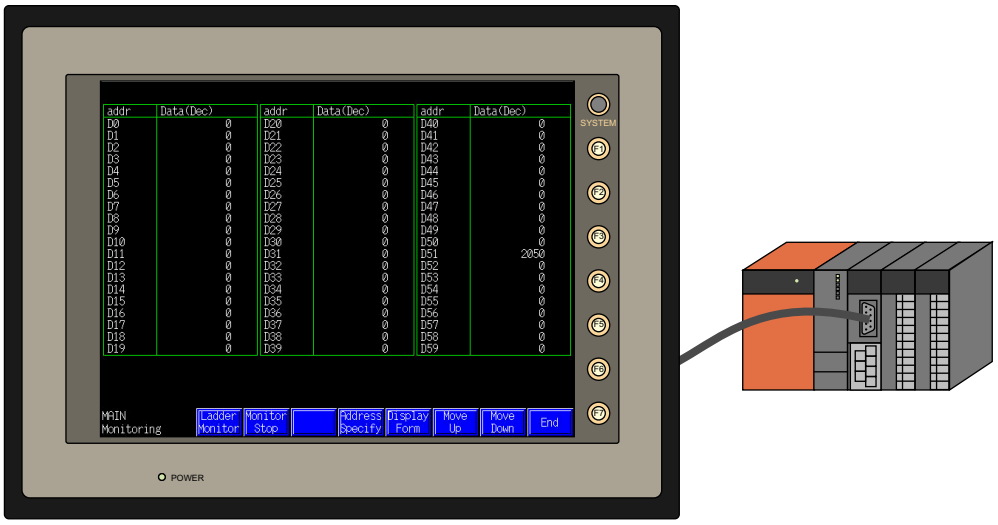
Ladder Monitor

Display the ladder sequence on the screen.



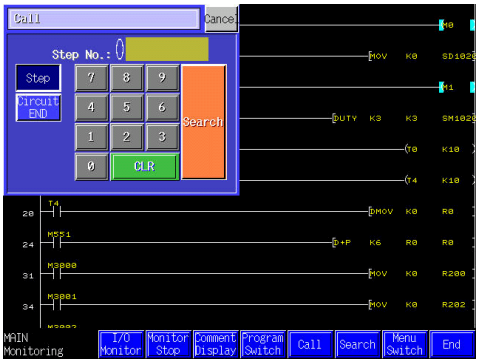
I/O Monitor

Monitor the PLC data with an I/O list display.



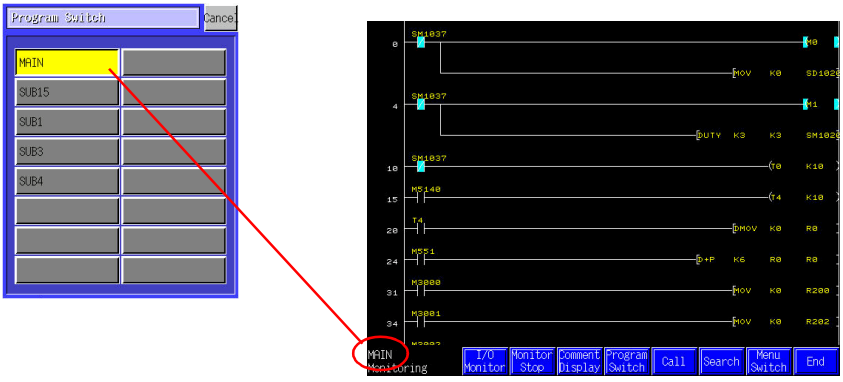
Call and Search

When ladder monitoring, you can use Call to specify the step number, or Search to specify and search for the desired device and address.



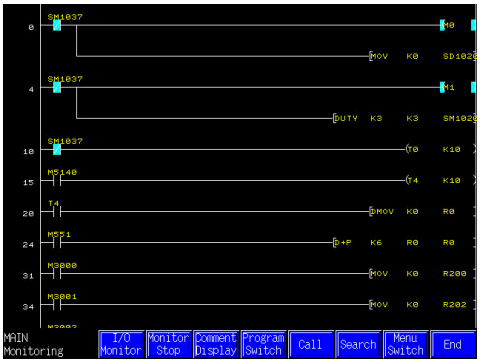
Program Switch

You can switch between up to 16 programs for display.

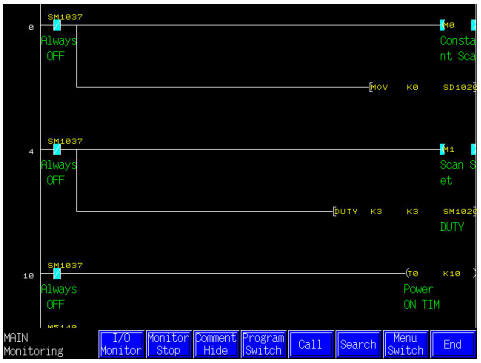


Comment Display

You can select whether the comment in the ladder is to be displayed or hidden.



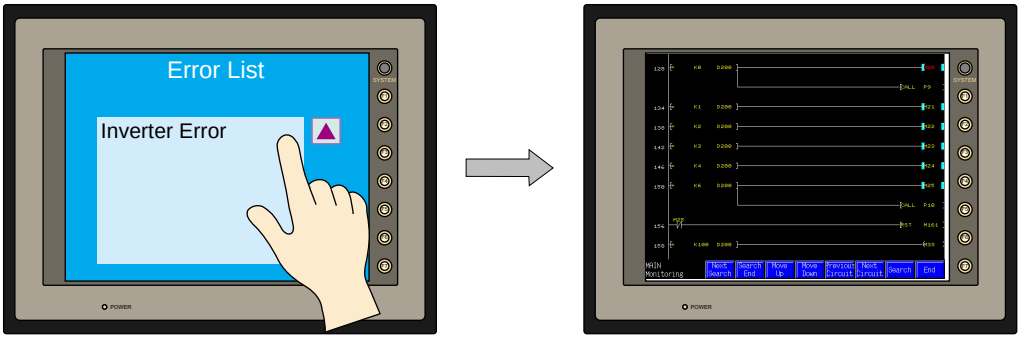
Comment Hide



Comment

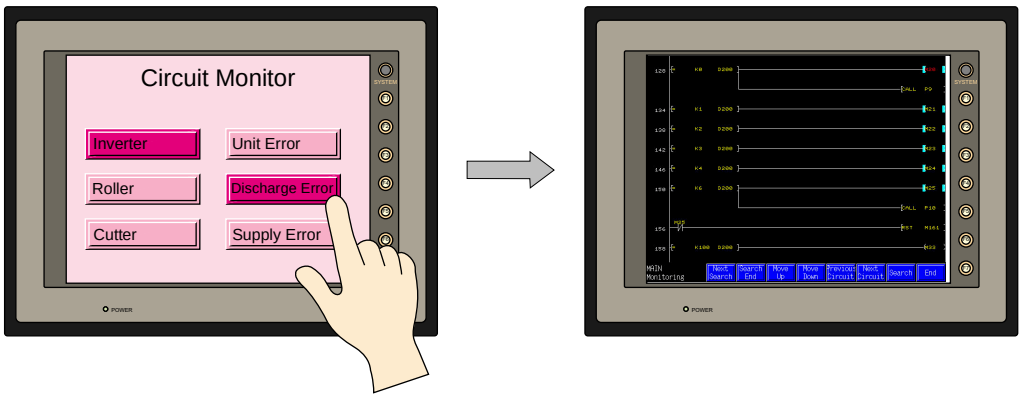
Search from Relay Sampling and Relay Mode Screens

When you touch an error message in relay sampling or relay mode, the coil of the bit device supported on the ladder is searched and displayed.



Search from Switch Screen

When displaying the ladder monitor screen by the screen change switch ([Functions: Screen No.]), if [Lamp Memory] is assigned to that switch, the coil of the bit device of the [Lamp Memory] is searched and displayed automatically.



Supported Models and Versions

The systems or PLCs supported for the ladder monitor function are as follows:

System

In addition, be sure to purchase a ladder monitor expansion memory cassette “V7EM-L” to use the ladder monitor function. Only a system with the ladder monitor expansion memory cassette installed supports the ladder monitor function.

Item	Model and Version
System	All V7 series + expansion memory cassette “V7EM-L”
System program	1.210 or above
Editor	V-SFT Ver. 2.1.4.0 or above
Ladder monitor program*	(Required)
Ladder data*	(Required)

*** For more information about the ladder monitor program, refer to P-8. For the ladder data, refer to P-9.**

PLC

PLC Selection	PLC Models Supported
Mitsubishi: QnH(Q) series Link*	Q02(H) CPU, Q06H CPU
Mitsubishi: QnH(Q) series CPU	Q12H CPU, Q25H CPU

*** Ladder monitor is also available when [Connection] is [1:n].**

However, you can monitor only one target PLC.

For information about the setting procedure, refer to “ 1. Registering Ladder Monitor Screen” on P-5.

Setting Procedure

Follow the steps below to use the ladder monitor function.

1. Registering the ladder monitor screen (see below on this page)

   The screen is registered on the editor automatically.

   *** You can not modify any settings except the design.**

   You also can not create a new ladder monitor screen. You should use auto registration.

2. Installing the expansion memory cassette (refer to P-8)

   Install the ladder monitor expansion memory cassette “V7EM-L” into the system.

3. Transferring the screen data (refer to P-8)

   Transfer the screen data to the system. At this point, the ladder monitor program ì.ldpî is also transferred automatically.

4. Transferring the ladder data (refer to P-9)

   Create the ladder data from a project file on the connected PLC and transfer it.

   The ladder data must be transferred, otherwise the ladder monitor function will not operate.

5. Connecting to the PLC

   Connect the system with the PLC to communicate.

1. Registering Ladder Monitor Screen

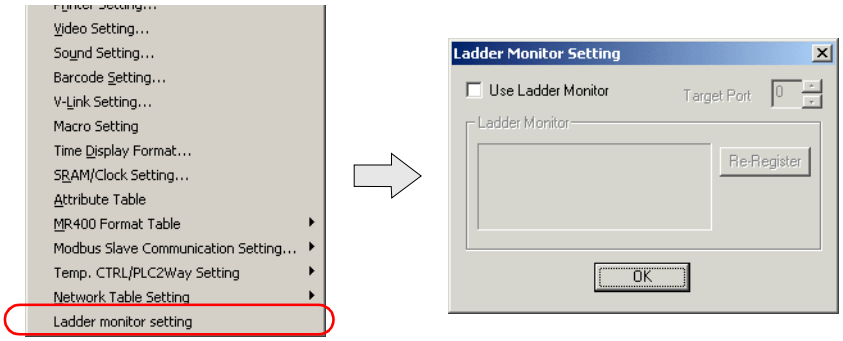
The ladder monitor uses one screen and eight multi-overlaps. The registration procedure is as follows:

1) Make sure the [PLC Type] in the screen data information is one of the following models.

   [Mitsubishi: QnH(Q) series Link]
   [Mitsubishi: QnH(Q) series CPU]

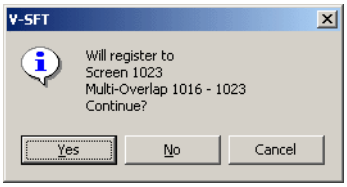
2) Select [Ladder Monitor Setting] from the [System Setting] menu.

   The [Ladder Monitor Setting] dialog is displayed.



3) Check [☐ Use Ladder Monitor].

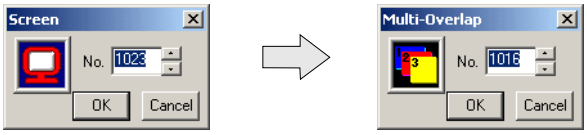
The following confirmation dialog is displayed.



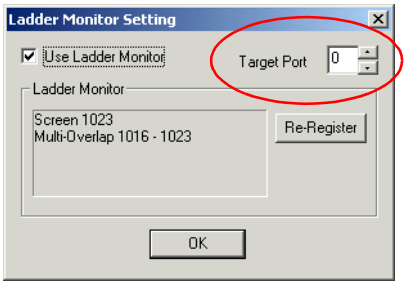
4) If you select [Yes]:
The screen and multi-overlaps are registered at the location confirmed.

If you select [No]:
You can specify the top number of the register target for the screen and multi-overlap.

Specify the desired number.



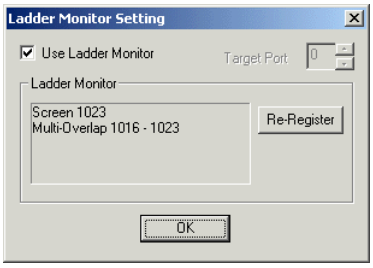
About the [Target Port] field
When [PLC Type] is [Mitsubishi: QnH (Q) series Link] and [Connection] is [1:n], only one target PLC is available for ladder monitoring. Specify the PLC to be monitored by designating the [Target Port] number.
When selecting [Mitsubishi: QnH (Q) series CPU], or when [Connection] is [1:1], this setting is prohibited.

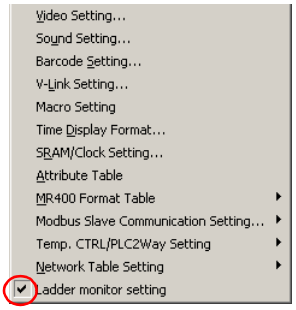


If you select [Cancel]:
[☐Use Ladder Monitor] is not checked.

5) Click [OK] to complete the registration.

[Ladder Monitor Setting] on the [System Setting] menu is checked.





6) At the end, create a switch ([Function: Screen]) on the desired screen to call the registered screen.

Once you have registered, if you change the register target for the screen or multi-overlaps, go to [System Setting], [Ladder Monitor Setting], and click [Re-Register]. Then repeat the steps from 3) to 5) above. Do not move manually.

Do not change or modify the auto registered screen data. Otherwise, operation is not guaranteed.

The ladder is displayed on the display area. You can not change the size of the display area. Note that the display area is automatically registered with a pre-determined size.

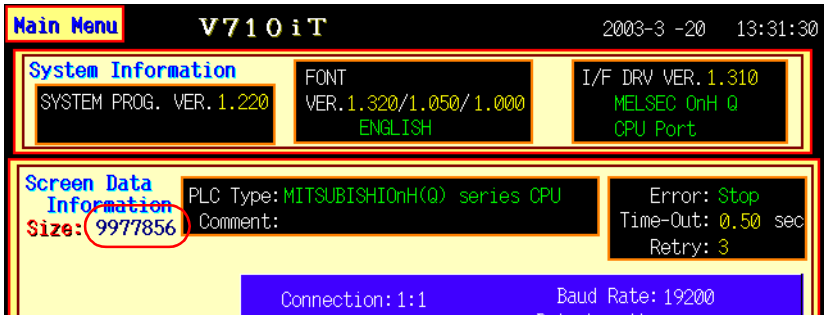
For information about the registered screen data and the operating method of each screen, refer to “ Ladder Screen Configuration” on P-11.

2. Expansion Memory Cassette “V7EM-L”

The ladder monitor expansion memory cassette “V7EM-L” must additionally be installed to use the ladder monitor function.

☞ For information about the installation procedure of the expansion memory cassette, refer to the operation manual attached to the expansion memory cassette.

When the “V7EM-L” is installed, 4 MB is added to the display capacity of the screen data of the system.



☺ When the “V7EM-L” is installed, the 4 MB of memory are available as screen data capacity for functions other than the ladder monitor function. The added 4 MB can be used freely for the screen data.

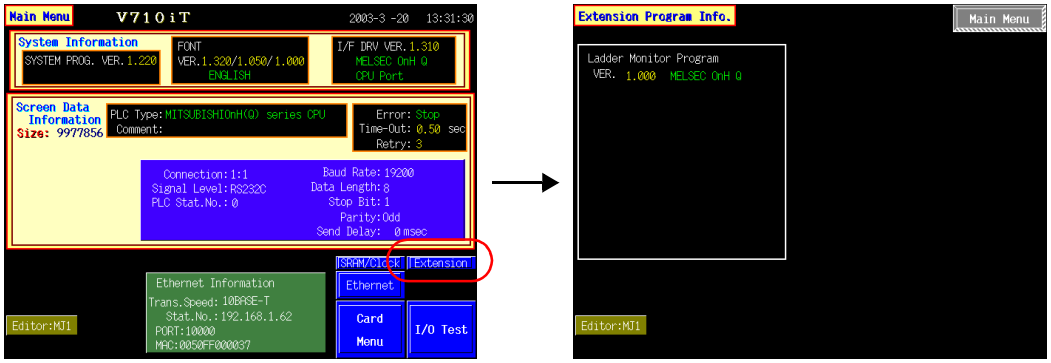
3. Transferring Screen Data

1) Click the [Transfer] icon. Or select [Transfer] from the [File] menu. The [Transfer] dialog is displayed.

2) Select [Screen Data] for [Transfer Data], and click [PC->].

3) Transfer starts. At this point, the program file (file name: MelQnH.ldp) for the ladder function is also automatically transferred to the system.

4) When the transfer is complete, the “Extension Program Info.” switch appears on the bottom right of the [Main Menu] screen of the system. When you press it, the version number and file name of the ladder monitor program are displayed.



4. Transferring Ladder Data

To display the ladder monitor format on the system, you need to convert the sequence data in the PLC to a displayable format and transfer it to the system.

The data created from the sequence data is called “ladder data”.

- File name extension:

  [*.ldm]

- Storage target:

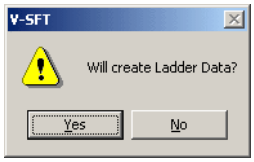
  Expansion memory cassette “V7EM-L”

♦ Creating and transferring procedure

1) Click the [Transfer] icon. Or select [Transfer] from the [File] menu. The [Transfer] dialog is displayed.

2) Select [Ladder Data] for [Transfer Data], and click [PC->].

3) The following confirmation dialog is displayed.

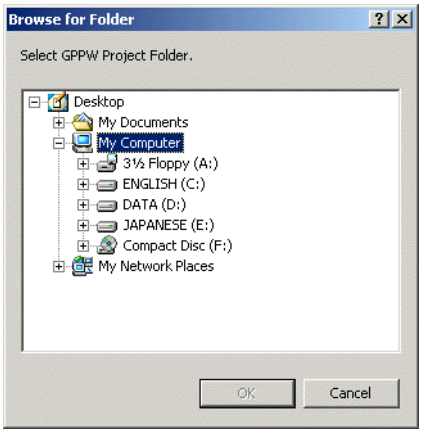


4) If you have not created the ladder data, click [Yes].

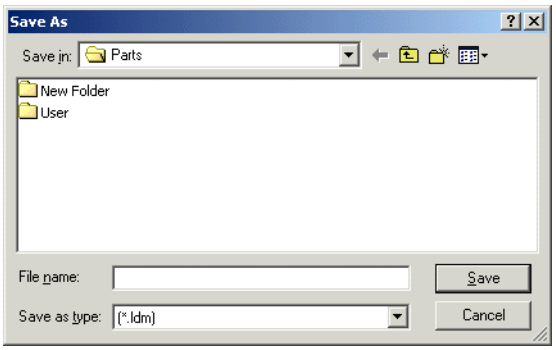
   If you have already created the ladder data, click [No]. Then go to step 7).

5) The [Browse for Folder] dialog is displayed.

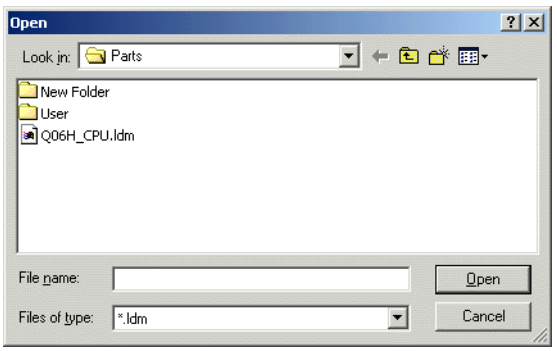
   Select the folder with the name of the project file of the PLC actually to be connected, and click [OK].



6) The [Save As] dialog is displayed.
Enter the desired file name and click [Save]. Then go to step 8).



7) If the ladder data exists, click [No] at step 4). The [Open] dialog is displayed.
Select the appropriate ladder data file, and click [Open].



8) The ladder data created or selected is transferred to the system.

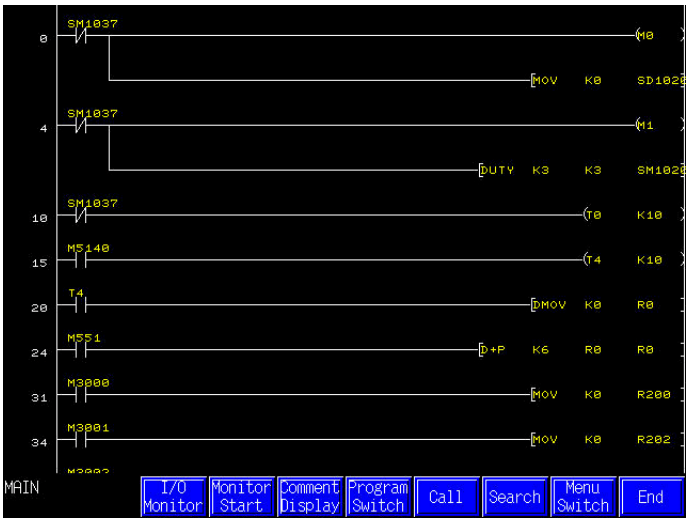
Ladder Screen Configuration

This section explains about the ladder monitor screen to be registered automatically.

The registered screen data is the screen set for the ladder monitor screen.
You can not edit it. You should use the screen as it was auto registered.
Note that operation is not guaranteed if you change or modify it.

Ladder Monitor

When displaying the ladder monitor screen, the screen as shown below is displayed first.



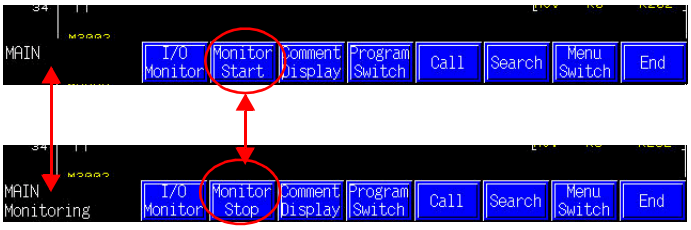
[I/O Monitor]

For information about the setting procedure, refer to P-16.

[Monitor Start] / [Monitor Stop]

Press [Monitor Start] to start monitoring. It displays “Monitoring” in flashing text on the bottom left of the screen.

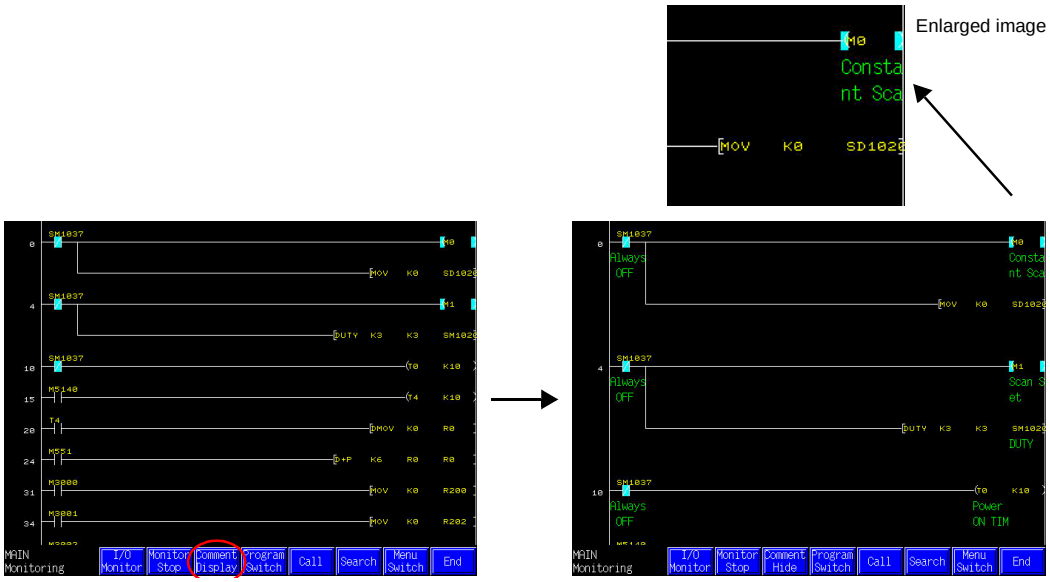
Press [Monitor Stop] to stop monitoring. The text “Monitoring” disappears.



Even if you stop monitoring, the display remains on the ladder monitor screen. When the ladder monitor screen is re-displayed by scrolling or screen switching, etc., it changes to the monitor stop screen.

[Comment Display] / [Comment Hide]

Press [Comment Display] to display the comment on the ladder screen. The switch is changed to [Comment Hide].



Up to 12 single-byte characters are available to display for the comment. When exceeding six single-byte characters, two lines are used.

For [English/Western Europe], comments are displayed in the size of X:1, Y:1.

For [HK fonts], comments are displayed in 12 point size.

Press [Comment Hide] to delete the comment on the ladder screen. The switch is changed to [Comment Display].

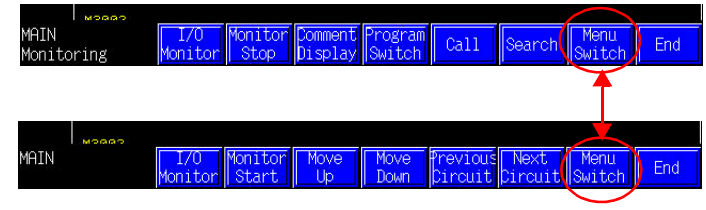
[Program Switch]

Press this switch to display the program switch overlap (refer to P-2). If multiple programs are set other than the “MAIN” program, when you press the switch of each program, the screen is changed to the specified program.

The text “MAIN” on the bottom left means that “MAIN” program is displayed. The text here always shows the name of the program that is currently displayed.

[Menu Switch]

Each time you press this switch, one of the two kinds of menu switches are switched and displayed.



[Move Up] / [Move Down]

Scroll the ladder display.

[Previous Circuit] / [Next Circuit]

Scroll the ladder display to show the step number at the top of the screen.

[End]

Press this to restore the original screen (which had the switch to call the ladder monitor screen).

[Call]

Press [Call] to display the calling overlap as shown below.

[Step]

When you press this, the display will be ON. The value entered using the numeric keypad is recognized as the step number which makes it the calling target.

[Circuit END]

When you press this, the display will be ON. Press [Circuit END] and [Search] to call the END of the ladder circuit.

[Search]

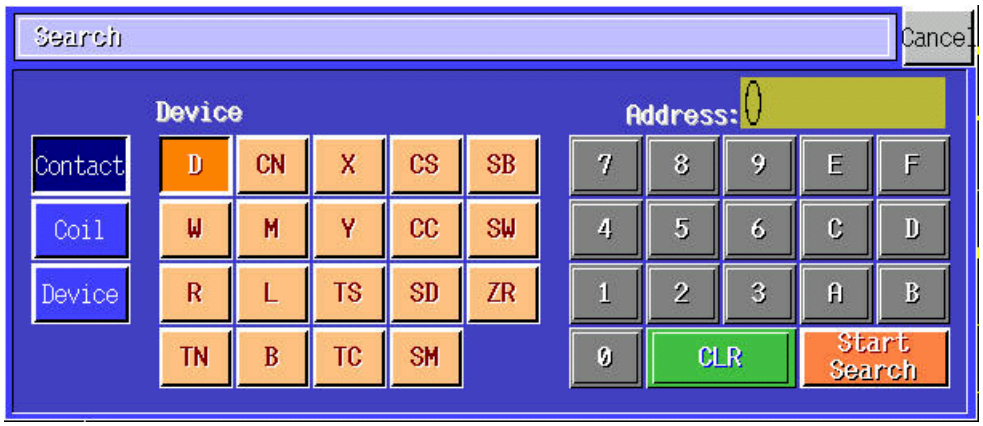
Press this to search and display from near the specified step number. It searches from the current display location and below, or displays the END of the circuit.

[Cancel]

Press this to delete the overlap.

[Search]

Press [Search] to display the overlap as shown below, the switch on the screen is changed to the switch for searching.



[Contact]

When you press this, the display will be ON. The search target is restricted to Contact only.

[Coil]

When you press this, the display will be ON. The search target is restricted to Coil only.

[Device]

When you press this, the display will be ON. The search target is the entire device.

[Each Device] / [Each Address]

Select each switch and press the search target device and address. The display will be ON.

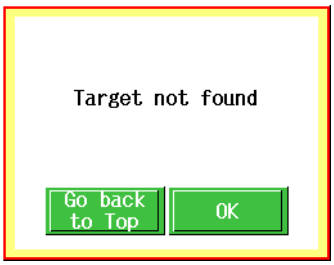
[Start Search]

Press this to start searching.

When the target address is found, it is displayed in red.

Press [Next Search] to search the same address with the same condition (refer to the next page).

When there is no corresponding address, the overlap as shown below is displayed.



If you press [OK], the overlap disappears.

If you press [Go back to Top], the overlap disappears and simultaneously the ladder display is restored showing the top step number.

[Next Search]

This switch is enabled during search after you press the [Start Search] switch.

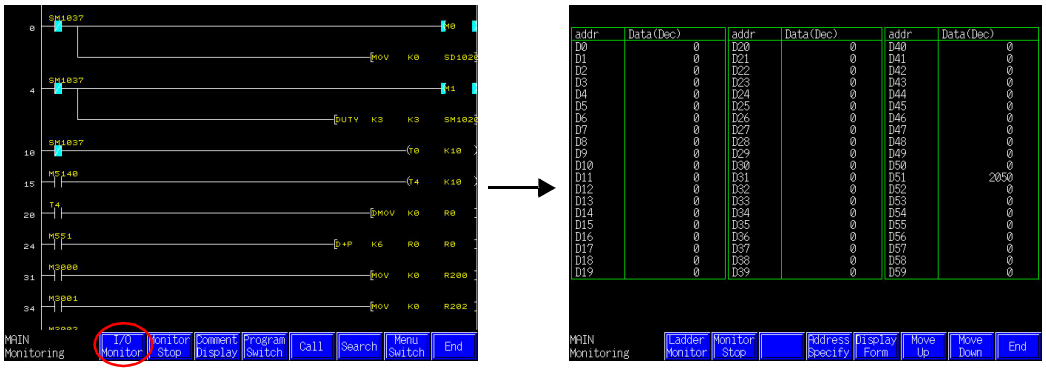
If you press this when the search target is displayed in red, search for the next target device is enabled.

[Search End]

Press this to restore the menu switch to its original status.

I/O Monitor

When ladder monitoring, if you press the [I/O Monitor] switch, the screen on the right as shown below is displayed.



[Ladder Monitor]

Press this to display the ladder monitor screen. For information about the setting procedure, refer to P-11.

[Monitor Start] / [Monitor Stop]

Press [Monitor Start] to start monitoring. The text “Monitoring” is displayed on the bottom left of the screen.

Press [Monitor Stop] to stop monitoring. The text “Monitoring” disappears.

[Specify Address]

If you press this, the overlap as shown below is displayed.

[Each Device] / [Each Address]

Select each switch and press the search target device and address. The display will be ON.

[Monitor]

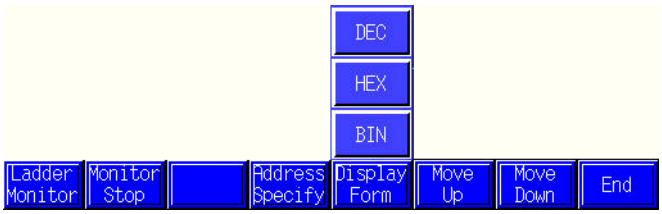
Press this to display the device monitor with the specified address displayed at the top.

When the specified value is too large, only the devices which can be displayed within the maximum range of the connected PLC are automatically displayed.

At the same time, the overlap disappears.

[Display Form] (DEC, HEX, BIN)

Press [Display Form] and then select the desired data display form (DEC, HEX, BIN) to display the data in the specified format during monitoring.



[Move Up] [Move Down]

Scroll the I/O monitor display.

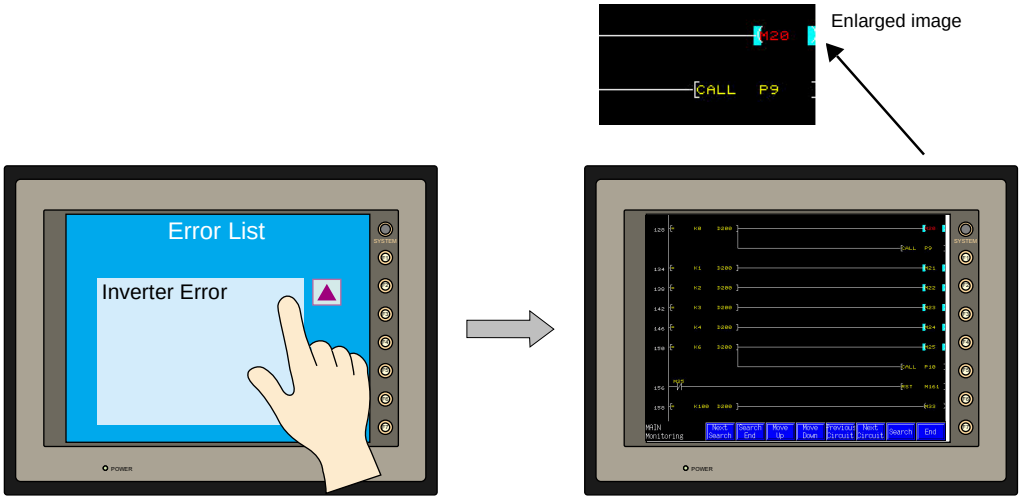
[End]

Press this to restore the original screen (which had the switch to call the ladder monitor screen).

Relay Mode and Relay Sampling Function

When an error occurs, if you touch the error message, the display changes to the ladder monitor display automatically and error bit searching (search target: coil) is run.

Because the error notice and search function are executed simultaneously, you can reduce the time for finding the reason for the error.



Setting Items

The [Relay] or [Relay Sampling] dialog

→ [Sub-Action: Ladder Display]

[System Setting] → [Ladder Monitor Setting]

→ Check [☐ Use Ladder Monitor].

(For information about the screen registration procedure, refer to P-5)

Operation Procedure

1. When an error occurs on the relay or relay sampling screen, the error message appears.

2. Press the error message on the screen.

3. The screen changes to the ladder monitor screen.

   At the same time, the search for the bit coil starts on the ladder.

4. As a result of the search, the bit corresponding to the error message is displayed in red.

   If you press the [End] switch, the screen is restored to the original error screen.

   If you search for the error bit again, press the [Next Search] switch.

Switch Function

If the lamp memory is set on the switch to call the ladder monitor screen, when you press that switch, the screen changes to the ladder monitor display and simultaneously the search for the lamp memory bit starts. (Search target: Coil).

If you create a change switch which flashes when an error occurs, you can easily create a screen available for the error notice and search without the relay or relay sampling link function.

Setting Items

[System Setting] → [Ladder Monitor Setting]

→ Check [☐ Use Ladder Monitor].

(For information about the screen registration procedure, refer to P-5)

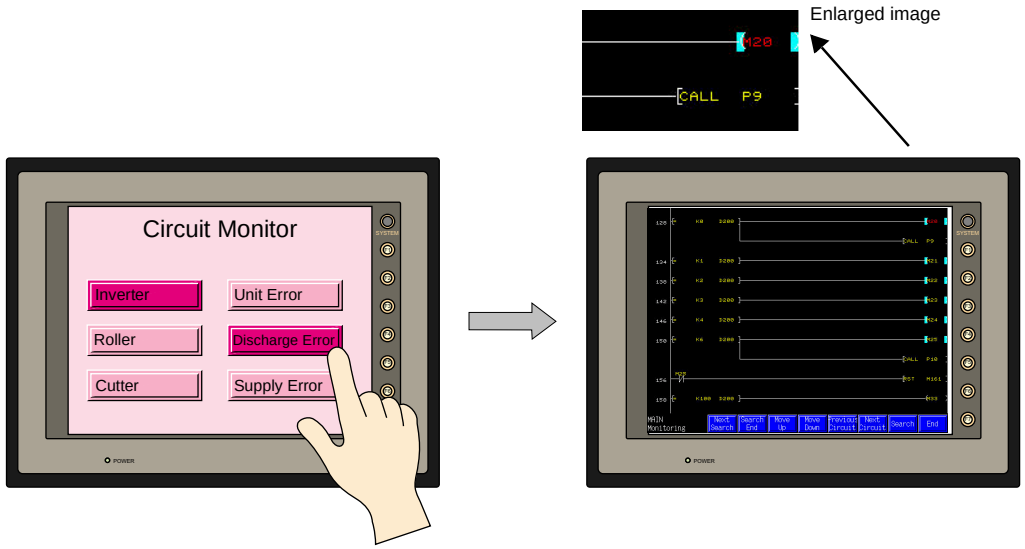
Switch [Function: Screen No.] (Switch to call the ladder screen)

→ Check [☐Lamp Memory], and specify the desired memory bit

Operation Procedure

1. Press the placed switch [Function: Screen No.].

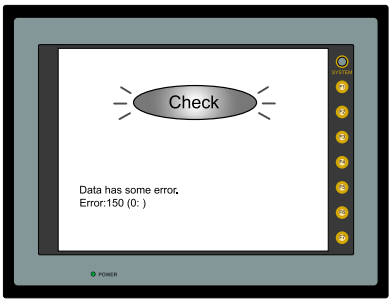
2. The screen changes to the ladder monitor screen.
   At the same time, the search for the bit coil starts on the ladder.



As a result of the search, the bit corresponding to the error message is displayed in red.

If you press the [End] switch, the screen is restored to the original error screen.

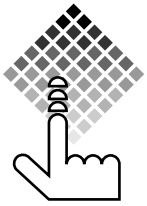
Error



Error Message	Explanation	Resolution
Data has some error. Error: xxx (0 :) └ Error No.	There is an error in the created data.	Refer to the Error No. below and follow the resolution.

♦ Error No.

Error No.	Explanation	Resolution
150	The ladder monitor program has not been registered yet.	Transfer the ladder monitor program (.ldp).
158	The setting model of the ladder monitor program differs from the model of the ladder data.	Transfer the ladder data (.ldp) of the correct model.
159	The ladder data from the PLC is incorrect.	Transfer the ladder data (.ldp) again.
209	The ladder data from the PLC has not been registered yet.	Transfer the ladder data (.ldp).



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