

MITSUBISHI
GRAPHIC OPERATION TERMINALS
MELSEC-GOT

OPERATION MANUAL

F940GOT-SWD-E, F940GOT-LWD-E



F940

Foreword

- This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of the communication facilities of F940GOT.
- Before attempting to install or use the communication facilities of F940GOT this manual should be read and understood.
- If in doubt at any stage of the installation of the communication facilities of F940GOT always consult a professional electrical engineer who is qualified and trained to the local and national standards which apply to the installation site.
- If in doubt about the operation or use of the communication facilities of F940GOT please consult the nearest Mitsubishi Electric distributor.
- This manual is subject to change without notice.

GRAPHIC OPERATION TERMINAL F940GOT

OPERATION MANUAL

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Guidelines for the safety of the user and protection of the graphic operation terminal

- a This manual provides information for the use of the Graphic Operation Terminal F940GOT. The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;
- b Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with regards to automated equipment.
- c Any commissioning or service engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill that job. These engineers should also be trained in the use and maintenance of the completed product. This includes being completely familiar with all associated documentation for the said product. All maintenance should be carried out in accordance with established safety practices.
- d All operators of the completed equipment should be trained to use that product in a safe and co-ordinated manner in compliance to established safety practices. The operators should also be familiar with documentation which is connected with the actual operation of the completed equipment.

Note : Note: the term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

Notes on the symbology used in this manual

At various times through out this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of equipment. Whenever any of the following symbols are encountered its associated note must be read and understood. Each of the symbols used will now be listed with a brief description of its meaning.

Hardware warnings



- 1 Indicates that the identified danger **WILL** cause physical and property damage.



- 2 Indicates that the identified danger could **POSSIBLY** cause physical and property damage.



- 3 Indicates a point of further interest or further explanation.

Software warning



- 4 Indicates special care must be taken when using this element of software.



- 5 Indicates a special point which the user of the associate software element should be aware of.



- 6 Indicates a point of interest or further explanation.

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1. Introduction

This section describes the product configuration and the system configuration of the graphic operation terminal.

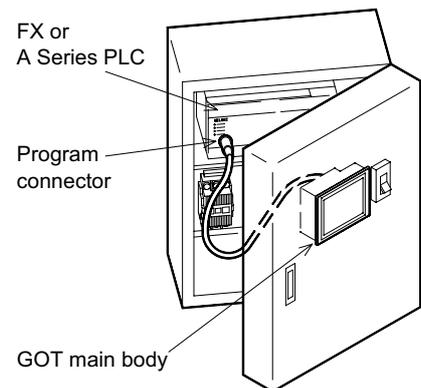
1.1 Outline

The graphic operation terminal (hereafter abbreviated to GOT) is to be mounted on the face of a control panel or operations panel, and connected to the programming port of an FX or A series programmable controller (hereafter abbreviated to PLC (except the A0J2))

Various devices can be monitored and PLC data changed through the screens of the GOT.

There are several display screens built-in to the GOT which offer various functions. In addition user defined screens can be created.

The user defined screens and the built-in screens (system screens) have the following respective functions.



User screens

- Screen display function

The following functions can be assigned to each screen. Also the available screens can be limited using the security function.

Both software packages, FX-PCS-DU/WIN-E (V2.00) available for DU, and the SW□D5C-GOTRE-PACK ("□" indicates a numeric not less than "1".) available for GOT can be used to create user screens.

Display function

- Up to 500 user defined screens can be displayed. In screen creation, two or more screens can be overlaid or changed over arbitrarily.
- Simple graphics such as straight lines, circles and rectangles can be displayed, along with numerics and English, Japanese, Chinese and Korean text. Also bitmaps can be imported and displayed on screen the F940GOT-SED-E can display screen components in 8 colors.

Monitor function

- Set values and current values of word devices in the PLC can be displayed in numerics or bar graphs for monitoring.
- The specified range of the screen components can be displayed in reverse in accordance with the ON/OFF status of bit devices in the PLC.

Data change function

- The numeric data being monitored can be changed.

Switch function

- By manipulating the operation keys in the GOT, bit devices in the PLC can be set to ON and OFF.
The display panel face can be assigned as touch keys to offer the switch function.

System screens

- Monitor function

List program (only in the FX Series)

- Programs can be read, written and monitored in the form of an instruction list program.

Buffer memory (only in the FX_{2N} and FX_{2NC} Series)

- The contents of buffer memories (BFMs) of special blocks can be read, written and monitored.

Device monitor

- The ON/OFF status of each device and the set value and the current value of each timer, counter and data register in the PLC can be monitored and changed.
- Specified bit devices can be forced ON or OFF.
Unlike the monitor function described previously, the screen data can be edited by inputting a desired device No. from the keyboard.

- Data sampling function

The current value of specified data registers are acquired in a constant cycle or when the trigger condition is satisfied.

- The sampling data can be displayed in the form of list or graph.
- The sampling data can be output to a printer in the form of list.

- Alarm function

Alarm messages can be assigned to up to 256 consecutive bit devices in the PLC. When a bit device becomes ON, the assigned message is displayed (overlapped) on the user screen.

In addition, a specified user screen can be displayed by setting a corresponding bit device to ON.

- When a bit device becomes ON, a corresponding message is displayed on the user screen. The message list can be also displayed.
- Up to 1,000 alarms (turning ON of bit devices) can be stored as the alarm history.
- The alarm frequency each device can be stored as historical data.

* As to 2), the alarm history can be output to a printer using the screen creation software.

- Other functions

Many other functions are built in.

- A real-time clock is built in, current time and data can be set and displayed.
- The GOT can function as an interface to enable data communication between the PLC and a personal computer in which the relay ladder creation software is operating. At this time, the GOT screen can also be displayed.
- The screen contrast and the buzzer sound volume can be adjusted.

■ Important point

Display screens can be created using the following software.

Screens for DU:

FX-PCS-DU/WIN-E V2.00 or later (The F940 main body is compatible from its first version.)

Screens for GOT-A900:

SW□D5C-GOTRE-PACK ("□" indicates a numeric "1" or more.) (For the F940 main body, V1.10 or later)

1.2 Function list

The functions described in the previously are divided into six modes shown in the table below. The operator can use each function by selecting a corresponding mode.

Mode	Function	Outline of function	Reference sections	Remarks
Screen mode	User screen display	Character display <ul style="list-style-type: none"> ▪Characters such as text, numerics and external characters are displayed. ▪Japanese, English, Korean and Chinese (continental) are displayed. 	3,9,10,12	Note 1
		Graphic display <ul style="list-style-type: none"> ▪Graphic such as straight lines, circles rectangles and bitmaps are displayed. 	3,9,10,12	
		Monitor function <ul style="list-style-type: none"> ▪Set values and current values of word devices (T, C, D, V and Z) in the PLC can be displayed in the form of numeric, bar graph, trend graph and panel meter. ▪The color of specified area on the screen is inverted in accordance with the ON/OFF status of bit devices (X, Y, M, S, T and C) in the PLC. 	3,9,10,12	
		Data change function <ul style="list-style-type: none"> ▪Set values and current values of word devices (T, C, D, V and Z) in the PLC can be changed in the form of numeric, bar graph, trend graph and panel meter. 	3,9,10,12	
		Switch function <ul style="list-style-type: none"> ▪The ON/OFF status of bit devices (X, Y, M, S, T and C) in the PLC can be controlled in the format of momentary, alternate and set/reset. 	3,9,10,12	
		Screen changeover <ul style="list-style-type: none"> ▪The display screen can be changed over from the PLC or a touch key. 	3,11,13	
		Recipe function (data file transfer) <ul style="list-style-type: none"> ▪Data saved in the GOT can be transferred to the PLC. 	3,10,12	
		Security function (screen protection function) <ul style="list-style-type: none"> ▪Screens are displayed only when the entry code is entered. (This function is available also in the system screens.) 	2	

Mode	Function	Outline of function	Reference sections	Remarks
HPP mode	Program (list)	▪Programs can be read/written/monitored in the instruction list program format.	4	Valid in FX Series
	Parameter	▪Parameters for the program capacity, the memory latch range, etc. can be read/written.		Valid in FX Series
	BFM monitor	▪Buffer memories (BFMs) in special blocks for the FX2N/FX2NC Series can be monitored, and their set values can be changed.		Valid in FX2N/FX2NC Series
	Device monitor	▪The ON/OFF status of bit devices as well as current values and set values of word devices can be monitored using device Nos. and comment expression.		Note 1
	Current value/set value change	▪Current values and set values of word devices can be changed using device Nos. and comment expression.		
	Forced ON/OFF	▪Bit devices (X, Y, M, S, T and C) in the PLC can be forcedly set to ON or OFF.		
	State monitor	▪State (S) Nos. in the ON status are automatically displayed for monitoring (valid only when the MELSEC FX Series is connected).		Valid in FX Series
	PLC diagnosis	▪The error information in the PLC can be read and displayed.		Valid in FX Series

Mode	Function	Outline of function	Reference sections	Remarks
Sampling mode	Condition setting	▪Conditions of up to four devices to be sampled and the sampling start/end time can be set.	5	
	Result display	▪The sampling result can be displayed in the form of list or graph.		
	Data clear	▪The sampling data can be cleared.		
Alarm mode	Status display	▪Alarms currently occurred are displayed in the list in the order of occurrence.	6	
	History	▪The alarm history is saved together with the occurrence time in the order of occurrence.		
	Frequency	▪The number of occurrences of each alarm is stored.		
	History clear	▪The alarm history is deleted.		
Test mode	Screen list	▪User screens are displayed in the order of screen No.	7	
	Data file	▪The data used in the recipe function can be changed.		
	Debug operation	▪The operations can be checked to know whether key operations, screen changeover, etc. have been correctly performed on the displayed user screen.		
Other mode	Time switch	▪A specified bit device can be kept ON for a specified time.	8	Note 2
	PC transfer	▪The screen data, the data sampling result and the alarm history can be transferred between the GOT and the screen creation software.		
	Printer output	▪The sampling result and the alarm history can be output to a printer.		
	Entry code	▪The entry code to protect programs in the PLC can be registered.		
	Environment setting	▪The initial setting can be specified for the system language, the connected PLC, the serial transfer, the title screen, the menu screen call, the current time, the backlight extinguishing time, the buzzer sound volume, the LCD contrast, the screen data clear, etc.		

Note 1: External characters and comments can be created using the screen creation software (FX-PCS-DU/WIN-E).

Note 2: The function is valid only when the FX-PCS-DU/WIN-E is used.

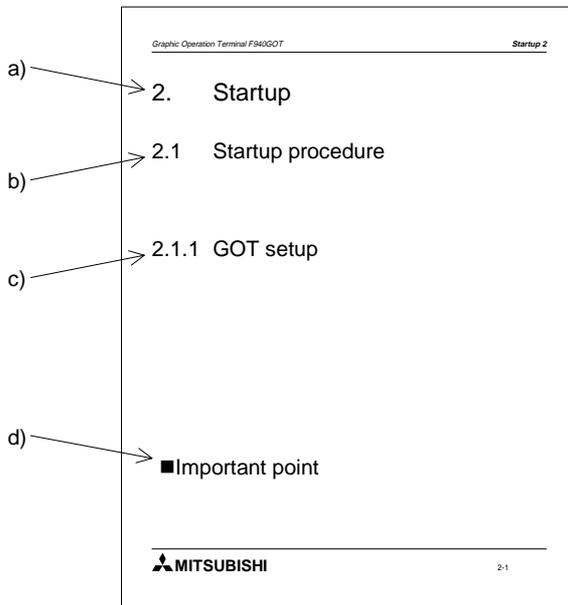
* When the PLC is connected via a computer link unit, some functions are restricted.

1.3 Format of manual

1.3.1 Contents described in manual

This manual is described in the following format. Use each element of the format for index.

Example:



a) Section title

Sections 2 to 8 describe operations. Sections 9 to 13 describe the contents required to create screens.

b) Title

The title explains the contents of each paragraph.

c) Sub title

d) Important point

Terms used in the text are explained and supplemented.

1.3.2 Abbreviations used in text

The following terms may be abbreviated in the text.

- 1) MELSEC FX or A Series unit may be abbreviated as "programmable controller" or "PLC".
- 2) The software kit to create display screens FX-PCS-DU/WIN-E or SW□D5C-GOTRE-PACK may be abbreviated as "software to create screens" or "screen creation software".
- 3) A general-purpose computer may be abbreviated as "PC".
- 4) A floppy disk may be abbreviated as "FD". A floppy disk drive may be abbreviated as "FDD".
- 5) The graphic operation terminal F940 Series may be abbreviated as "GOT".
- 6) Devices inside the PLC may be abbreviated as "X" (input), "Y" (output), "M" (auxiliary relay), "S" (state), "T" (timer), "C" (counter) and "D" (data register). Output contacts of X, Y, M, S, T and C are called "bit devices". T, C and D are called "word devices". All of them may be called "devices".

1.4 Expressions and basic operations of operation keys

The operation keys are expressed as follows in the text.

1.4.1 Expressions of operation keys

- 1) Touch keys on the screen which are actuated when being touched by fingers are enclosed with frame.

USER SCREEN MODE , PROGRAM LIST

- 2) Cursor control keys to be pressed may be expressed as follows.

▲ , ▼ → ▲ , ▼

- 3) When a same key is pressed several times or a same operation is repeated, the following expression may be used.

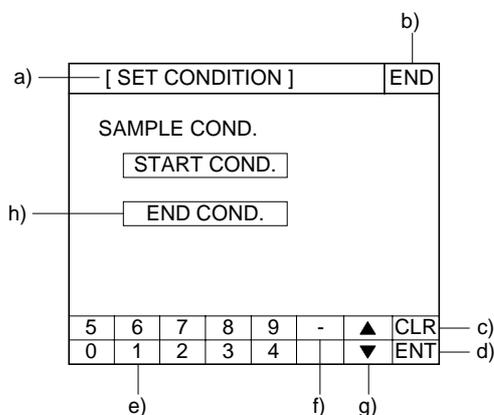
▲ , MORE

- 4) When an arbitrary numeric within the range of 0 to 9 is to be entered, the following expression may be used.

0 to 9

1.4.2 Basic operations

The common operations in the GOT are shown below.



- a) Function display
The selected mode or function is displayed here.
- b) END key
This key terminates the displayed function, and returns to the previous screen.
- c) CLR (clear) key
This key cancels the input of characters and numerics.
- d) ENT (enter) key
This key determines the input of alphabets and numerics.
- e) Ten-key pad
This pad allows to enter numerics.
- f) - (minus) key
- g) ▲ and ▼ (cursor control) keys
- h) SET key
When this key is pressed after a character or numeric has been entered, the keyboard is displayed.

1.5 System configuration

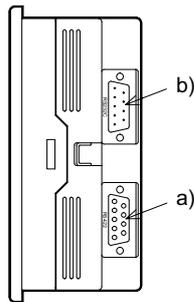
This paragraph describes connection of the GOT to a PLC and peripheral unit.

1.5.1 Enlarged view of connector

A PLC and peripheral unit can be connected to the following communications ports in the GOT.

1) Communications ports in the GOT

There are communications ports on the side of the GOT.



a) PLC connector (RS-422 connector) D-sub 9-pin, female

This connector allows communication with an FX/A Series PLC.

b) PC connector (RS-232C connector) D-sub, 9-pin, male

This connector links a personal computer with the screen data created using the screen creation software for data transfer.

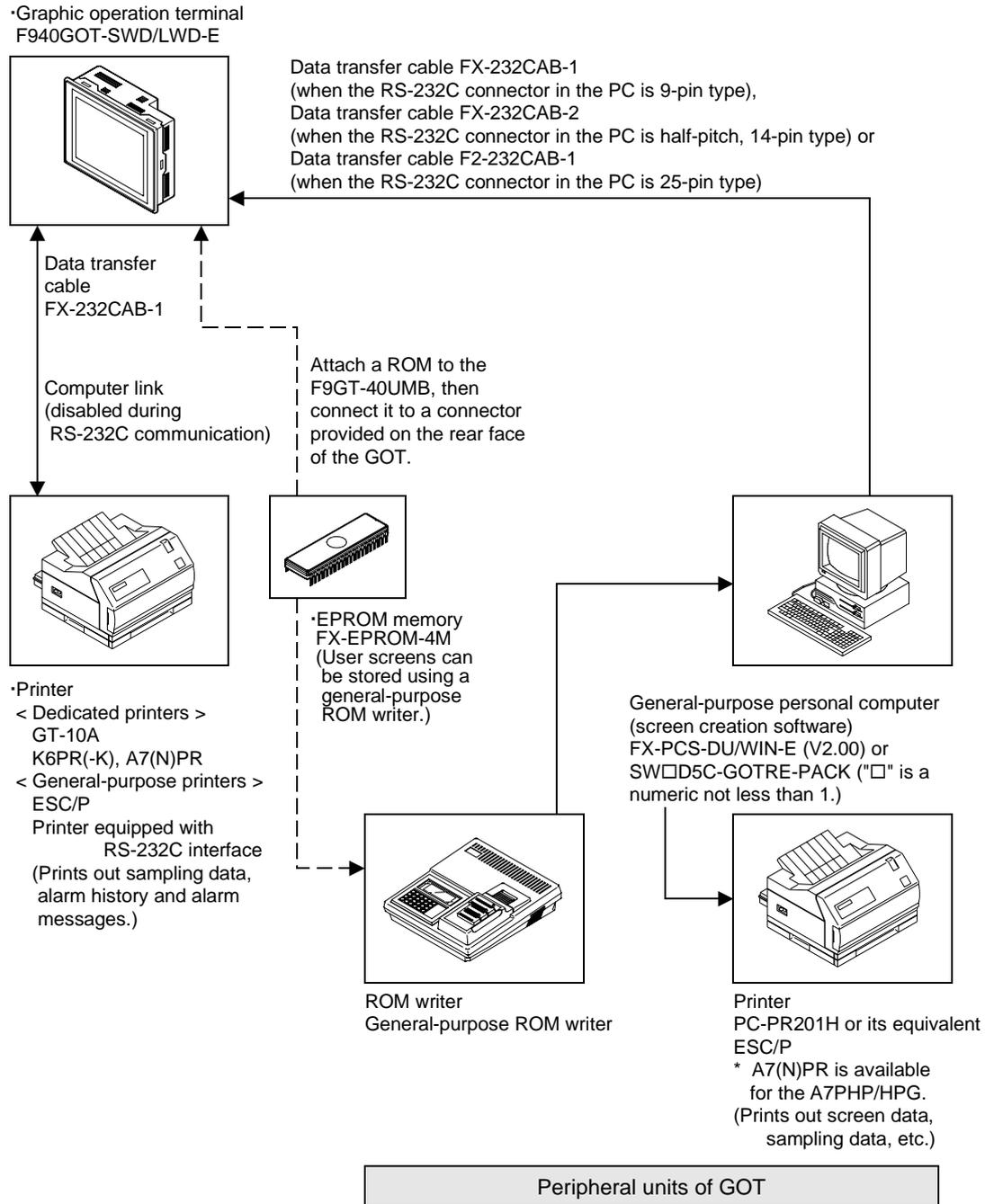
When the RS-232C connector in the PC is the 9-pin type, use a data transfer cable FX-232CAB-1. When the RS-232C connector in the PC is the half-pitch, 14-pin type, use a data transfer cable FX-232CAB-2.

This connector is used also when a data transfer cable FX_{2N}-232-BD is used for an FX_{2N} Series PLC or when 1:N connection is adopted with "CPU PORT" in an FX/A Series PLC.

* When a PLC is connected via a computer link unit, use either of the connectors a) or b) above.

1.5.2 Connection of peripheral units of GOT

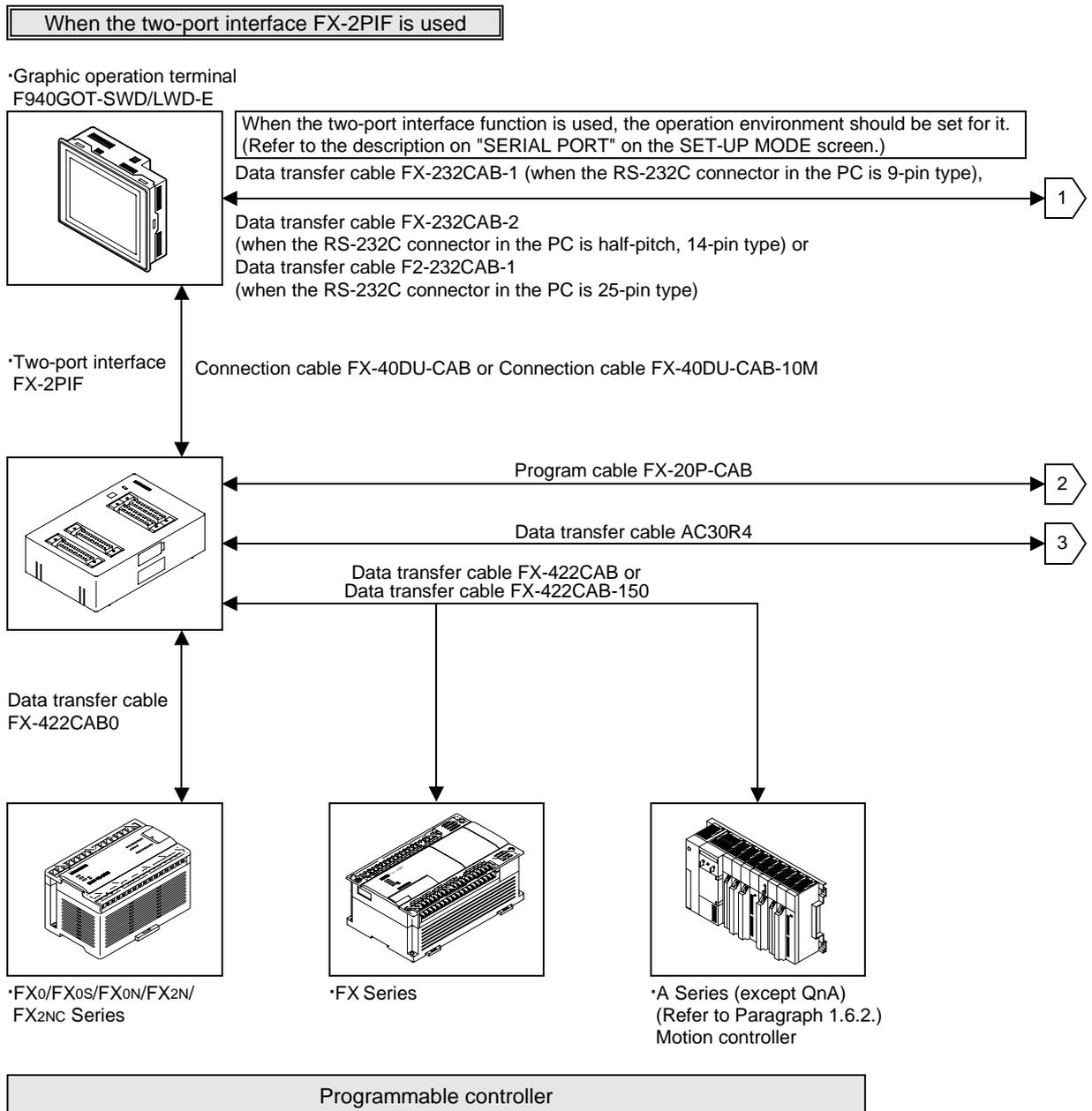
The figure below shows the system configuration required to use the GOT with peripheral devices.

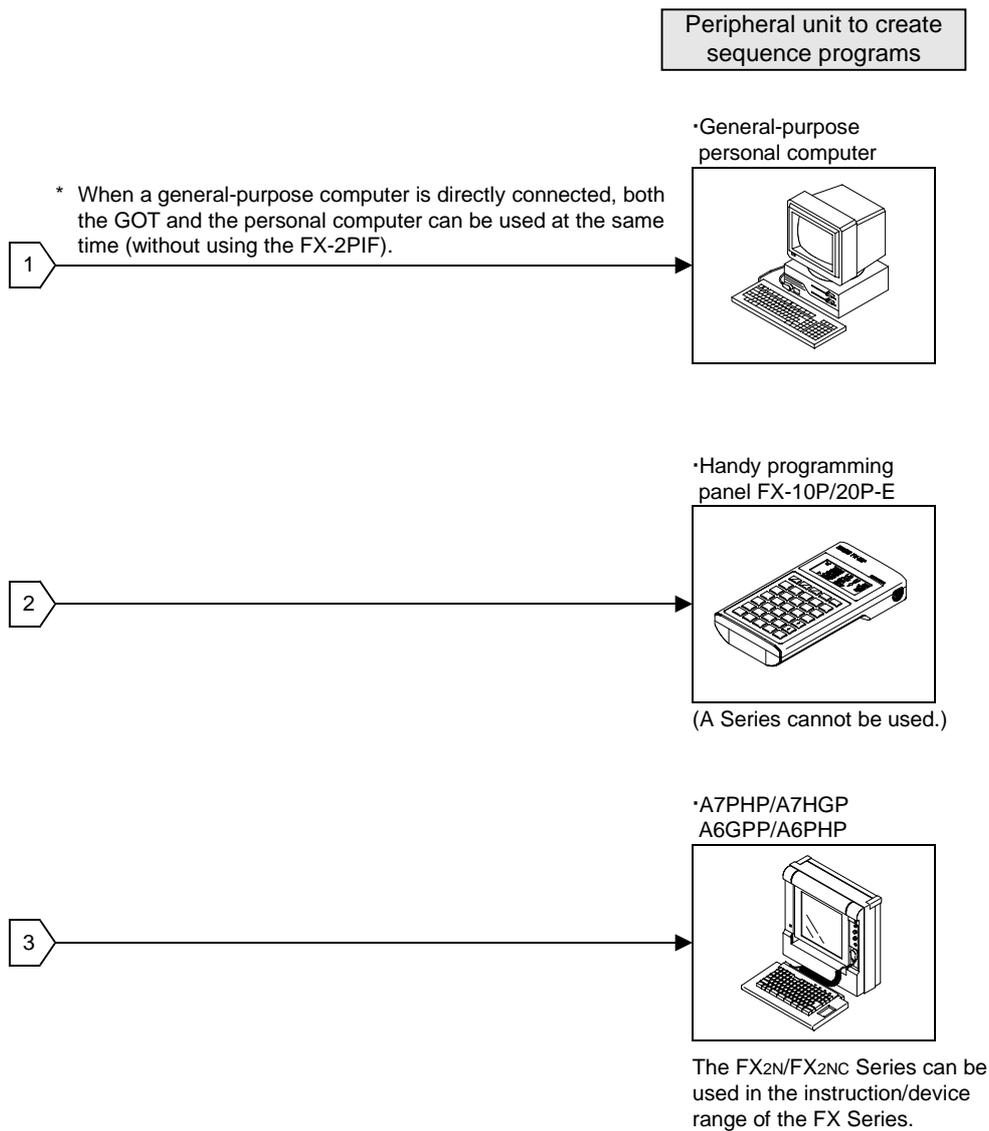


1.5.3 Connection of peripheral units of PLC

When a general-purpose personal computer is directly connected to the GOT, the two-port interface FX-2PIF (two-port interface function) is not required.

When one GOT and one peripheral unit for sequence program creation are used for one PLC, the two-port interface FX-2PIF is required. The system configuration required in this case is shown below.





1.6 Connection of PLC

1.6.1 Setting of connected PLC

Set the connected PLC in "PLC TYPE" of "SET-UP MODE" described in Paragraph 2.2.

Connectable PLC	Connection type
MELSEC FX/FX2C/FX0/FX0S/FX0N/FX2N/ FX2NC Series manufactured by MITSUBISHI	CPU direct (CPU PORT)
MELSEC A Series manufactured by MITSUBISHI	CPU direct (CPU PORT) or computer link (LINK PORT)
SYSMAC C Series manufactured by OMRON	Computer link (LINK PORT)
FLEX-PC N Series manufactured by FUJI ELECTRIC	
PLC manufactured by Allen-Bradley Co., Inc.	Available soon
PLC manufactured by Siemens AG	
Micro computer board	RS-232C port

- For the wiring to the PLC, refer to the hardware manual supplied together with the F940GOT.

1.6.2 Connection of MELSEC FX/A Series (CPU PORT)

Connect the GOT to the programming connector in the PLC, and perform communication.

This communication method is easy because sequence programs, setting and interface are not required once the connected PLC is set in the operation environment setting (on the SET-UP MODE screen).

Series name	Connection type
FX/FX2C/FX0/FX0S/FX0N/FX2N/FX2NC Series	CPU PORT (RS422) (In 1:N connection, select "CPU PORT (RS232C)" for the second and fourth PLCs.)
FX2N (when FX2N-232-BD is used)	CPU PORT (RS232) (In 1:N connection, select "CPU PORT (RS232C)" for the second and fourth PLCs.)
AnN,AnA,AnS,AnSJ,AnSH,A1SJH,A2C,A2CJ,A0J2H,AnU,AnUS,A2USH,A1FCCPU	CPU PORT (RS422) (In 1:N connection, select "CPU PORT (RS232C)" for the second and fourth PLCs.)
Motion controller A171SCPU-S3 A171SHCPU A172SHCPU A272UHCPU	CPU PORT (RS422) (In 1:N connection, select "CPU PORT (RS232C)" for the second and fourth PLCs.)

1.6.3 Connection of MELSEC A Series (LINK PORT)

When the GOT is connected to the MELSEC A Series PLC via a computer link unit, the following setting is required.

- Setting of computer link unit
Set the communication format of the computer link unit as shown below.

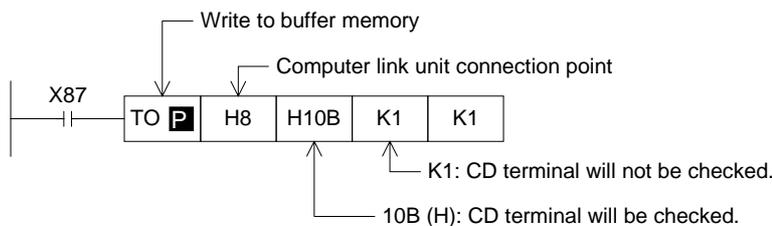
Used port	When RS-422 is used	When RS-232C is used
Mode setting switch No.	5 RS-422: Format 1 RS-232C: No-procedure *1	1 RS-422: No-procedure RS-232C: Format 1 *1
Transmission speed	19200bps	
Data bit	7 bits	
Stop bit	1 bit	
Parity bit	Even	
Sum check	Provided	
Write during run	Possible	
Station No.	00 to 0F (in accordance with setting in GOT) *2	

*1 For wiring to the PLC, refer to the hardware manual supplied together with the F940GOT.

*2 The GOT station No. can be set in "SET-UP MODE" (Refer to Paragraph 2.2.).

- Caution: When RS-232C is connected the GOT does not control CD signals. Accordingly, when the RS-232C is connected, the buffer memory in the computer link unit should be set so that CD signals are not checked.

Example: When I/O signals in the computer link unit are 80 (H) to 9F (H)



- Restriction of functions
When a computer link unit is connected, the following functions are disabled in the GOT.
 - Index registers (V and Z) cannot be monitored, and their current values cannot be changed.
 - When the RS-232C is connected, the printer output function of the GOT is disabled.

1.6.4 Connection of SYSMAC C Series

When the GOT is connected to the SYSMAC C Series PLC manufactured by OMRON, the following setting is required.

- Setting of host link unit
Set the communication format of the host link unit as shown below.

Used port	When RS-422 is used	When RS-232C is used
Transmission speed	19200bps	
Data bit	7bit	
Stop bit	2bit	
Parity bit	Even	
Communication mode	Host link mode	
Command level	Level 1, 2 or 3	
Procedure	1:N procedure	
Unit No.	00 to 15 (BCD) (in accordance with setting in GOT) *1	

* Only a model in which these set items are offered can be connected to the GOT.

*1 The GOT station No. can be set in "SET-UP MODE" (Refer to Paragraph 2.2.).

Setting example: Set the communication format while referring to setting examples of each host link unit in the C Series.

- In the case of CQM1-CPU . . . Setting by data memory (DM)

Set item	Set value	Remarks
Standard communication condition (RS232C: DM6645)	0001H	Mode specification: Host link Communication condition: In accordance with DM6646
Communication condition (RS232C: DM6646)	0304H	Transmission format: 7 data bits and 2 stop bits Parity: Even Transmission speed: 19,200 bps
Send delay time (RS-232C: DM6647)	0000H (initial status)	0 second
Unit No. (RS-232C: DM6648)	00XXH	xx: Two-digit BCD (in accordance with setting in GOT)

- In the case of host link unit attached to C200H base . . . Setting by each switch (when C200H-LK201-V1/C200H-LK202-V1 is used)

Setting of switches on front face (common between C200H-LK201-V1 and C200H-LK202-V1)

Set item	Switch setting		Remarks
Unit No.	SW1	*1	Upper digit BCD
	SW2	*1	Lower digit BCD
Transmission speed	SW3	6	19200bps
Communication condition	SW4	2	7-bit ASCII and 2 stop bits Parity: Even Command level: 1, 2 or 3

*1 Equivalent to station No. setting in the GOT

Setting of switches on rear face (C200H-LK201-V1)

Set item	Switch setting		Remarks
Procedure	DIP. SW No.3	ON	1:N procedure
5 V power supply	DIP. SW No.4	OFF	5 V is not supplied.
CTS changeover	Selector switch	Up side	External

(C200H-LK202-V1)

Set item	Switch setting		Remarks
Procedure	Right selector switch	Lower side	1:N procedure
Connection of terminal resistor	Left selector switch	Up side	Provided

- Cautions
 - Operation mode of the SYSMAC C Series
 - When changing the current value and the set value of each device in the C Series PLC, the PLC should be set to the monitor mode.
 - If the GOT is connected and the C Series PLC is started up in the running mode, the GOT sets automatically the PLC to the monitor mode so that the data can be changed.

Mode of PLC at startup	GOT operation
Running mode	The GOT changes over the PLC from the running mode to the monitor mode to enable data change.
Monitor mode	The PLC remains in the monitor mode, and data change is enabled.
Program mode	The PLC remains in the program mode, and data change is enabled.

- Forced setting to ON/OFF in the HPP Mode (GOT function)
In the HPP mode of the GOT, the forced ON/OFF function is available. This function is available also when the C Series PLC is connected as the host unit.
However, have in mind that the forced ON/OFF function offers the following operation in the C Series PLC.
- * The forced setting/resetting function in the C Series PLC holds the current ON/OFF status without regard to a sequence program.
The forced ON/OFF function described here sets a specified bit to ON/OFF. If a sequence program gives an ON/OFF command after that, the status of the specified bit device which has been set forcedly to ON/OFF is changed.
Forced ON: Data "1" is specified. (The specified bit is set to ON.)
Forced OFF: Data "0" is specified. (The specified bit is set to OFF.)
- Restriction in functions
When a host link unit is connected, the following GOT functions are disabled or restricted.
 - Because the GOT switch function (which sets a bit to ON/OFF) uses a host link command, FK command (which sets/resets multi points forcedly), the switch function is not available in models which do not support the FK command.
 - The set values of timers (T) and counters (C) cannot be monitored nor changed.
 - When the RS-232C is connected, the printer output function of the GOT is disabled.

- When connecting the FLEX-PC N Series, the following setting is required in the link unit.
 - Setting of link unit or built-in RS-232C

Connection type of used port	RS-422 (link port)	RS-232 (link port)	RS-232C (CPU port)
Mode	3: Set by command Start-stop synchronization, non-procedure	1: Set by command Start-stop synchronization, non-procedure	-
Transmission speed	19200(bps)		
Data bit	7 bits (JIS)		8bit (HEX)
Parity bit	Even		Odd
Station No.	00 to 15 (in accordance with setting in GOT)		-

Setting example: In the N Series, set the communication format while referring to setting examples shown below.

In the case of NJ-RS4

Switches on front face

Set item	Description		Remarks	
Mode set	MODE SW	3	Set by command, start-stop synchronization	No-procedure
Station No.	Station No. setting switch x 10	*1	Upper digit	
	x 1	*1	Lower digit	

*2 Align it with the station No. setting in the GOT.

Switches on rear face

Set item	Description		Remarks
Terminal resistor	Selector switch 1	ON	Receive line is provided.
	Selector switch 2	ON	Send line is provided.
Communication condition	DIP. SW	1 : OFF 2 to 8 : ON	Set by switch 19,200 bps, 7 data bits, 1 stop bit, even parity

In the case of NJ-RS2

Switches on rear face

Set item	Description		Remarks	
Mode	MODE. SW	1	Set by command, start-stop synchronization	No-procedure
Communication condition	DIP. SW	1 : OFF 2 to 8 : ON	Set by switch 19,200 bps, 7 data bits, 1 stop bit, even parity	

NJ-CPU-B16 Setting by parameter (50H)

Parameter (50H): 0057H Communication speed: 19,200 bps
 Stop bit: 1 bit
 Character table: 8 bits
 Parity: Odd

- When connecting the FLEX-PC, have in mind the following restrictions.
 - The set values of timers (T) and counters (C) cannot be monitored nor changed.
 - When the RS-232C is connected, the printer output function of the GOT is disabled.

1.6.5 Connection by general-purpose communication

The GOT can be connected to a general controller such as a micro computer board. (The connected controller is hereafter referred to as "host (unit)".)

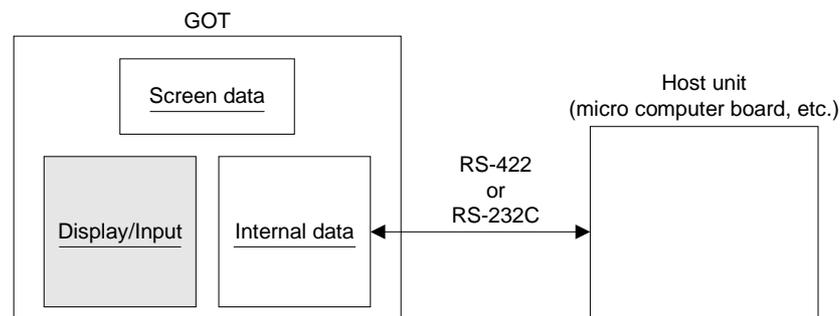
- Outline

In general-purpose communication, the host unit is connected to the GOT via the RS-422/RS-232C and functions as the parent station in communication. Inside the GOT, there is a data area to hold word data and bit data. The host unit can read and write the data area using communication commands.

The contents of display and control in the GOT are determined by the screen data created using the screen creation software in the personal computer. The screen data specifies the layout of objects displayed on the screen, and specifies actions to be performed by pressing of touch keys.

The GOT is equipped with the function to display the word data in the form of numerics and bar graphs, the function to access the data for changing the status of the bit data using switches, etc. The target of access at this time is the data area inside the GOT. The data location to be accessed is specified by the screen data.

Accordingly, to display the data stored in the host unit on the screen, the host unit should transfer the data to the data area inside the GOT using write commands. The transfer destination is a location specified by the screen data. The data change result by manipulation of keys can be transferred from the data area inside the GOT to the host unit if the host unit gives read commands. In general-purpose communication, interrupt codes can be sent as change triggers.



- **Communication setting**

The setting related to communication can be performed using the screen creation software or the GOT main body. (As to the screen creation software, refer to the operation manual of the software.)

To use general-purpose communication, select "SET-UP MODE", "PLC TYPE" and "UNIVERSAL" in this order in the GOT main body.

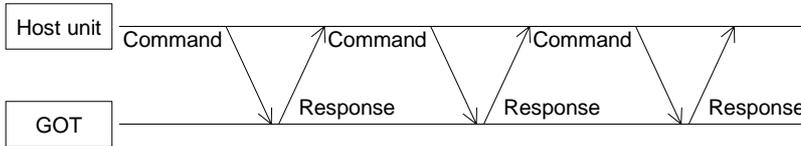
To set the baud rate, the data length, the stop bit length and the parity, select "SET-UP MODE" and "SERIAL PORT (RS-232C)" in this order in the GOT main body.

Set each parameter to an either value shown below.

Baud rate	19,200 / 9,600 / 4,800 / 2,400 / 1,200 / 600 or 300 bps
Data length	8 or 7 bits
Stop bit length	1 or 2 bits
Parity	Even, odd or none

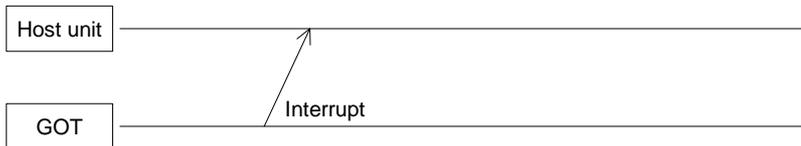
- Communication procedure

In communication between the GOT and the host unit, the host unit sends a command, and the GOT sends back a response. While the GOT is sending the response to the host unit, the GOT cannot receive new commands.



When an error occurs, the GOT sends back a NAK code as a response. The contents of the error can be checked by reading a special memory.

As an exception, when the GOT gives a notification for interrupt, the GOT sends an interrupt code. However, while the GOT is sending a response, it does not send an interrupt code. In such a case, immediately after sending a response, the GOT sends an interrupt code. The GOT may send an interrupt code while receiving a command.



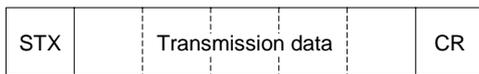
When an event such as change in the ON/OFF status of a specific bit and screen change over has occurred, the GOT sends an interrupt code. The table below shows the correspondence between the interrupt code and the event type.

Event type	Interrupt code (hexadecimal)
M8000 is changed to ON.	50
M8000 is changed to OFF.	51
M8000 is changed to ON.	52
M8000 is changed to OFF.	53
⋮	
M8000 is changed to ON.	7E
M8000 is changed to OFF.	7F
⋮	
M8000 is changed to ON.	B2
M8000 is changed to OFF.	B3
The display screen is changed over.	20
Input of a numeric is completed.	21
Transfer of a data file is completed.	22

- Transmission statement configuration
Transmission statements sent and received between the GOT and the host unit are classified into the following three formats. Type 1 and Type 2 can replace each other. When the sum is not attached to a command, use Type 1. When the sum is attached, use Type 2.

Type 1 (without the sum)

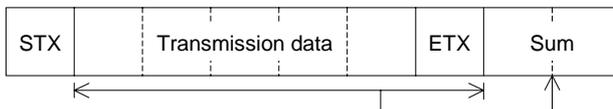
When a command is Type 1, a response to it will be Type 1 or Type 3.



Type 2 (with the sum)

The targets of the sum are the entire text and ETX. The result of addition (excluding STX) is converted into an ASCII code and sent. The sum consists of the upper digit and the lower digit in this order.

When a command is Type 2, a response to it will be Type 2 or Type 3.



Type 3

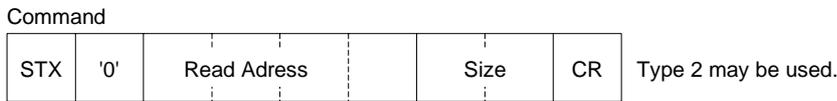
This type of format consists of only one character. This format is used for responses (ACK or NAK) and interrupt codes.



The table below shows characters available in statements. Interrupt codes include unused codes.

	Character code (hexadecimal)
STX	02
ETX	03
CR	0D
ACK	06
NAK	15
'0' to '9'	30 to 39
'A to 'F'	41 to 46
Interrupt code	20 to 2F
Interrupt code	50 to 7F
Interrupt code	80F to FF Valid only when data length is 8 bits

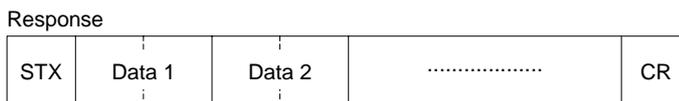
- Command
Use the following commands for communication with the GOT.
- **Read . . . Read the data stored in the GOT.**



"0" at the head indicates a read command.

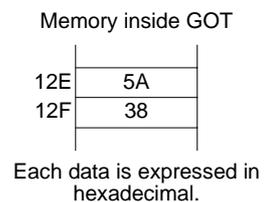
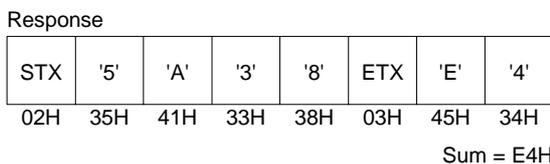
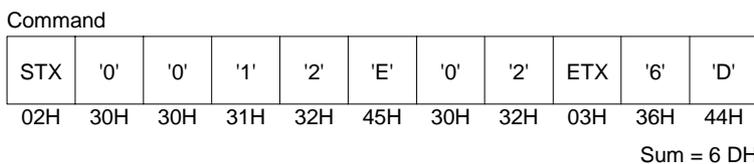
Read address :Using ASCII codes, specify the head address (hexadecimal) of the data stored in the GOT. The read address should be specified in turn from the upper digit.

Size :In the unit of byte, specify the size of the read data (01H to FFH). The maximum allowable size is 255 bytes. "FFH" indicates 255 bytes. The size should be specified in the order of upper digit and lower digit (in ASCII codes). For example, enter "8 + A" to specify 8AH bytes (= 138 bytes).



Data :The data stored in the specified address is stored in turn. One-byte data is converted into ASCII codes, and stored in the order of upper digit and lower digit.

Example: When 2-byte data is read from the address 12EH (format = Type 2)



12EH stores the upper side of the word data D151. 12FH stores the lower side of the word data D151. The value of D151 is 5A38H (= 23096).

- Write . . . Overwrite the data stored in the GOT.

Command

STX	'1'		Write Address		Size	Data 1	Data 2	-----	CR
-----	-----	--	---------------	--	------	--------	--------	-------	----

Type 2 may be used.

"1" at the head indicates a write command.

Write address: Using ASCII codes, specify the head address (hexadecimal) of the data stored in the GOT. The write address should be specified in turn from the upper digit.

Size: In the unit of byte, specify the size of the write data (01H to FFH). The maximum allowable size is 255 bytes. "FFH" indicates 255 bytes. The size should be specified in the order of upper digit and lower digit (in ASCII codes).

Data: Sort the write data in the ascending order of address. Convert one-byte data into ASCII codes, and sort it in the order of upper digit and lower digit. The maximum allowable number of data is 255 (510 after converted into ASCII codes).

Response

ACK

Example: When 2-byte data is written to the address 120H (format = Type 2)

Command

STX	'1'	'0'	'1'	'2'	'0'	'0'	'2'	'3'	'E'	'7'	'5'	ETX	'3'	'D'
02H	31H	30H	31H	32H	30H	30H	32H	33H	45H	37H	35H	03H	33H	44H

Response

ACK
06H

Memory inside GOT

120	3E
121	75

Each data is expressed in hexadecimal.

120H stores the upper side of the word data D144. 121H stores the lower side of the word data D144. The value of D144 after write is 3E75H (= 15989).

- Memory map

The data stored in the GOT is classified into two types, word data (D) and bit data (M). An address is assigned to each data, and each data is laid out as follows.

When specifying data using the screen creation software, use the device (D or M) No. When specifying data from the host unit, use the address.

< Word data >

There are 4,096 word devices, a serial number (0 to 4,095) is assigned to each of them. Each word data is sorted in the order of upper side and lower side. In the case of a double word (32 bits) data, data is stored from the higher address to the lower address.

0000	D0 (H)
0001	D0 (L)
0002	D1 (H)
0003	D1 (L)
⋮	
1FFE	D4095 (H)
1FFF	D4095 (L)

< Bit data >

There are 2,048 bit devices, a serial number (0 to 2,047) is assigned to each of them. Each address stores 8-bit data.

	b7	b6	b5	b4	b3	b2	b1	b0
2000	M 7	M 6	M 5	M 4	M 3	M 2	M 1	M 0
2001	M 15	M 14	M 13	M 12	M 11	M 10	M 9	M 8
⋮								
20FF	M2047	M2046	M2045	M2044	M2043	M2042	M2041	M2040

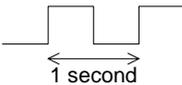
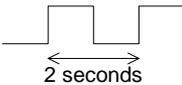
< Special memory >

In addition, there are 16 word devices and 64 bit devices for special purpose.

2100	D8000 (H)
2101	D8000 (L)
2102	D8001 (H)
2103	D8001 (L)
⋮	
211E	D8015 (H)
211F	D8015 (L)

	b7	b6	b5	b4	b3	b2	b1	b0
2200	M8007	M8006	M8005	M8004	M8003	M8002	M8001	M8000
2201	M8015	M8014	M8013	M8012	M8011	M8010	M8009	M8008
2202	M8023	M8022	M8021	M8020	M8019	M8018	M8017	M8016
2203	M8031	M8030	M8029	M8028	M8027	M8026	M8025	M8024
2204	M8039	M8038	M8037	M8036	M8035	M8034	M8033	M8032
2205	M8047	M8046	M8045	M8044	M8043	M8042	M8041	M8040
2206	M8055	M8054	M8053	M8052	M8051	M8050	M8049	M8048
2207	M8063	M8062	M8061	M8060	M8059	M8058	M8057	M8056

Each data indicates the following contents.

Device	Description
M8000 to M8049	Interrupt output When the bit data status is changed, the GOT sends an interrupt code to the host unit. When the data length is 7 bits, interrupt codes M8024 to M8049 are not output. Even if the host unit overwrites this data, the GOT does not output interrupt codes.
M8050	1-second cycle clock 
M8051	2-second cycle clock 
M8052 to M8063	Unused
D8000, D8001	32-bit counter of 100 ms The time after the power is turned on is counted in units of 100 ms. The lower word is stored in D8000. The upper word is stored in D8001.
D8002	Contents of communication error This device indicates the contents of an error occurred in communication with the host unit. 0: No error 1: Parity error 2: Framing error 3: Overrun error 4: Incorrect format of statement 5: Incorrect command
D8003 to D8015	Unused

- Program example

This program writes "31,000" to D10, and "15,600" to D11. In hexadecimal, "31,000" is expressed as "7918H" and "15,600" as "3CF0H".

D10

D11

10' Sample program

20'

500 TO=3000 : 'Counter waiting for receive (to be adjusted in accordance with speed of computer)

530 ERFLG=0

610 STX\$=CHR\$ (2)

620 STX\$=CHR\$ (13)

630 ACK\$=CHR\$ (6)

640 NAK\$=CHR\$ (&H15)

1000 * DATASEND : 'Send of statement

1010 CLOSE#1

1020 OPEN" COM1:" AS#1

1030 SENDDATA\$=" 100140479183CF0" : 'Send statement

1040 PRINT#1, STX\$;SENDDATA\$;CR\$;

1100 * RECO : 'Receive of first character

1110 RVCNT=1

1120 GOSUB *JYUSHIN

1130 IF ERFLG=99 THEN GOTO *ERRORFIN1

1140 BUF\$=RCV\$

1150 HED\$=LEFT\$ (BUF\$,1)

1160 IF HED\$=ACK\$ THEN GOTO *FIN

1170 * ERROFIN1

1180 PRINT "Error code is sent back."

1190 GOTO *FIN

1700 * ERRORFIN1

1710 PRINT "No response"

2000 * FIN

2010 CLOSE#1

2020 END

2100 * JYUSHIN : 'Waiting for receive

2110 FORI=1 TO T0

2120 RCV\$=""

2130 IF LOC (1)=>RVCNT THEN GOTO *BUFIN

2140 NEXT

2150 IF RCV\$=" " THEN ERFLG=99

2160 RETURN

2200 * BUFIN : 'Read of receive data

2210 RCV\$=INPUT\$ (RVCNT, #1)

2220 RETURN

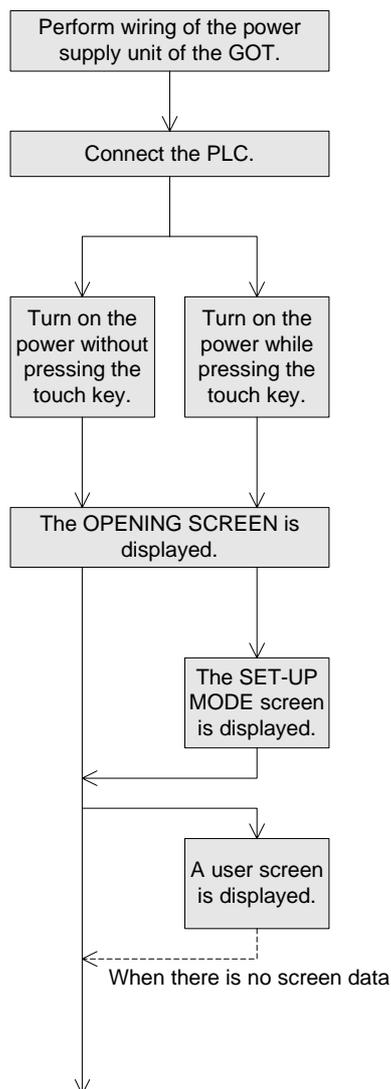
2. Start up

This section describes the startup procedure from turning ON the power of the GOT to selection of the mode.

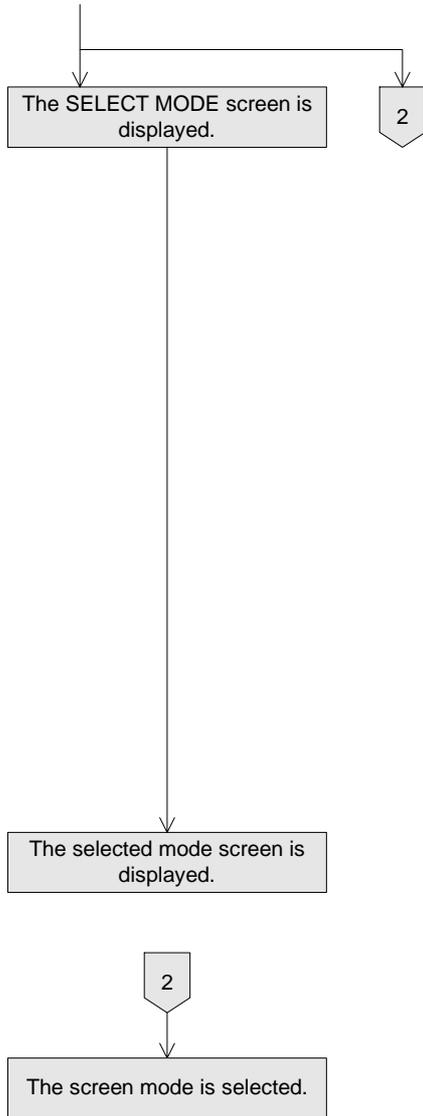
This section describes also the environment setting important to use of the GOT. Make sure to read this section carefully.

2.1 Start up procedure

This paragraph describes the start up procedure from turning ON the power of the GOT to selection of the mode.



- Perform wiring of the power supply unit of the GOT.
- Connect the GOT and the PLC with an optional connection cable.
- Turn on the power of the GOT. When the power is turned on while the upper left corner (which functions as a touch key) of the screen of the GOT is pressed and held for 1 second or more, the SET-UP MODE screen is displayed.
- The OPENING SCREEN screen indicating the model name, the version, etc. is displayed for the period set in "OPENING SCREEN" on the SET-UP MODE screen.
- On the SET-UP MODE screen, set the used mode, the connected PLC name, etc. The operation environment can be set on the OTHER MODE screen also.
- Connect the GOT and the PLC with an optional connection cable.



- The SELECT MODE screen is displayed. Each menu item on the screen functions as a touch key. When a desired one is pressed, the corresponding mode is selected.
 - * This SELECT MODE screen can be called also by pressing a corner of the screen set in "MAIN MENU CALL KEY" on the SET-UP MODE screen.

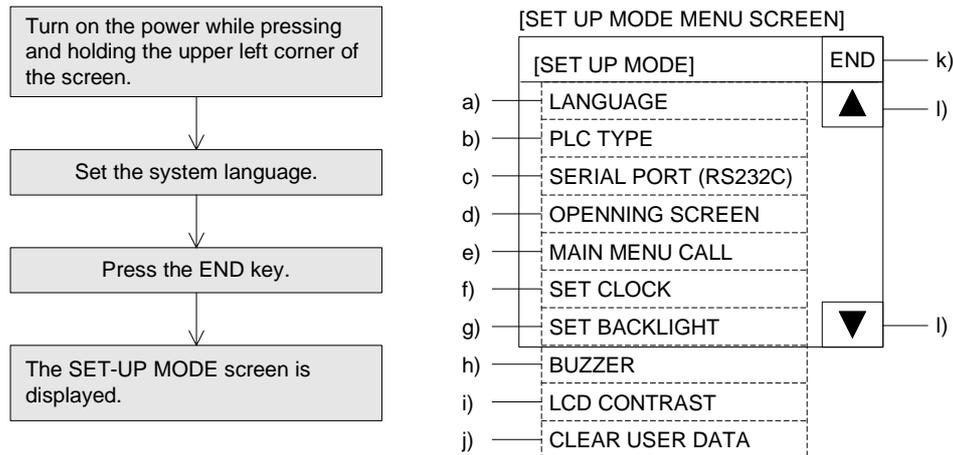
[SELECT MODE]	
[SELECT MODE]	END
USER SCREEN MODE	
HPP MODE	
SAMPLING MODE	
ALARM MODE	
TEST MODE	
OTHER MODE	

- The selected mode screen is displayed.
- If the menu call key is not set in "MAIN MENU CALL KEY" on the SET-UP MODE screen, the user screen mode is selected.

2.2 Operation environment setting

The operation environment setting function performs initial setting important to operating the GOT. The SET-UP MODE screen can be displayed by turning on the power while pressing and holding the upper left corner of the screen in accordance with "2.1 Startup procedure" or by selecting SET-UP MODE on the OTHER MODE screen.

If an entry code has been registered using the security function (to protect screens), the operation environment can be set only when an entry code input by the user is equivalent to the registered entry code.



The areas enclosed with broken lines function as touch keys. (Broken lines are not actually displayed on the screen.)

- a) LANGUAGE
Allows to set the language displayed on the system screens such as Japanese and English.
- b) PLC TYPE
Allows to set the connected PLC type.
- c) SERIAL PORT
To be selected when a printer is connected to the GOT or when communication is performed between the GOT and a micro computer board.
- d) OPENING SCREEN
Allows to set the duration in which the OPENING SCREEN screen is displayed immediately after the power is turned on.
- e) MAIN MENU CALL KEY
Allows to set the position of the touch key which calls the SELECT MODE screen from the screen mode (in which a user screen is displayed).
- f) SET CLOCK
Allows to set the time used in the time switch and the time display.
- g) SET BACKLIGHT
Allows to set the time the backlight is automatically turned off, after a period of continuous idle time.
- h) BUZZER
Allows to set the buzzer sound issued when a key is pressed.

- i) LCD CONTRAST
Allows to set the LCD brightness.
- j) CLEAR USER DATA
Deletes the user screen data.
- k) END
Exits the SET-UP MODE screen.
- l) Cursors
Change over the menu item on the SET-UP MODE screen.

■Important point

When the items a) to e), g) and h) above are set in the GOT and the screen data created using the screen creation software is transferred, the operation environment setting selected in the screen creation software becomes valid. In such a case, set the operation environment in the GOT again or align from the beginning the setting of the items a) to e), g) and h) above with that in the screen creation software.

Each setting screen is displayed as shown below. On each screen, when the END key at the upper right corner is pressed after setting is completed, the SET-UP MODE screen is displayed.

[LANGUAGE]

[LANGUAGE]	END
SYSTEM LANGUAGE:	
ENGLISH	a)
CHARACTER SET:	
JAPANESE	b)

- Set the language used on the system screens and the user screens.

a) SYSTEM LANGUAGE

Allows to set the language displayed on the system screens and in error messages.

b) CHARACTER SET

Allows to set the language displayed on the user screens. JAPANESE, CHINESE and KOREAN are available. Only one language can be selected at a time.

[PLC TYPE]

[PLC TYPE]	END	
PLC TYPE:	FX SERIES	a)
CONNECTION:	CPU PORT	b)
STATION #:	* *	c)

a) PLC TYPE

Allows to select any one among FX SERIES, A SERIES, C SERIES (manufactured by OMRON), N SERIES (manufactured by FUJI ELECTRIC) and UNIVERSAL (general-purpose communication).

b) CONNECTION

Allows to set the connection method of the PLC selected in 1) above.

- CPU PORT: The GOT is connected directly to the program connector in the PLC (RS-422 or RS-232C).

The FX Series, the A Series, a motion controller and the N Series are available.

- LINK PORT (RS422): The GOT performs communication in accordance with the RS-422 via a link unit. The A Series, the C Series and the N Series are available.

- LINK PORT (RS232C): The GOT performs communication in accordance with the RS-232C via a link unit.

The A Series, the C Series and the N Series are available.

c) STATION #

Allows to set the station No. of the link unit connected to the GOT when "LINK PORT" is selected in 2) above.

- Select the connected PLC type.
- The areas on the screen enclosed with solid lines function as touch keys. Every time a touch key is pressed, the displayed contents are changed over.

[SERIAL PORT]

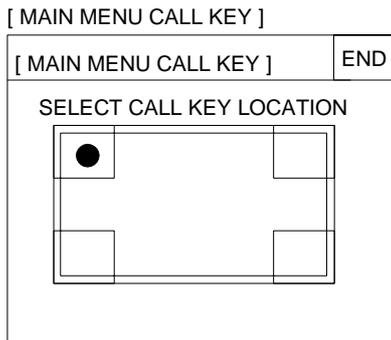
[SERIAL PORT]		END
SPEED:	9600 bps	
DATA BIT:	7 bit	
STOP BIT:	1 bit	
PARITY:	Even	
HANDSHAKING:	XON/XOFF	
PRINTER:	DON'T USE	

- Set the serial communication parameters for the printer used to print out alarm messages and sampling data.
- Make sure to set "PRINTER" to "USE" when a printer is connected.
When it is set to "USE", the two-port interface function is not available.
- The areas enclosed with broken lines function as touch keys.
Every time a touch key is pressed, the displayed contents are changed over.
- When "LINK PORT (RS232C)" is selected on the PLC TYPE screen, a printer cannot be connected.

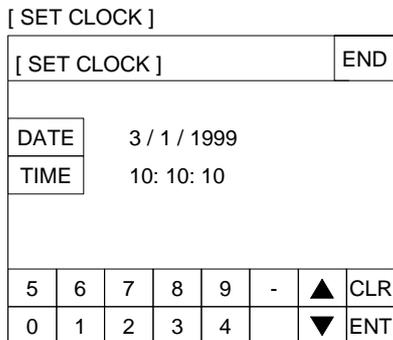
[OPENNING SCREEN]

[OPENNING SCREEN]								END
<div style="border: 1px dashed black; display: inline-block; padding: 2px;">DISPLAY TIME</div> 4 SEC.								
5	6	7	8	9	-	▲	CLR	
0	1	2	3	4		▼	ENT	

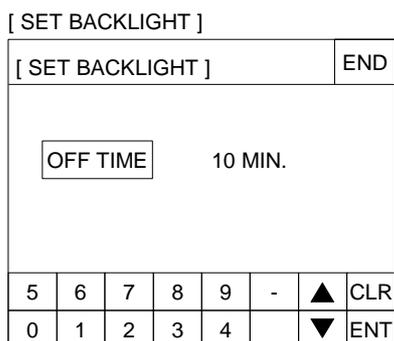
- Set the duration in units of seconds in which the OPENNING SCREEN indicating the model name, the version, etc. is displayed immediately after the power is turned on.
- When the touch key "DISPLAY TIME" is pressed, the time can be set using the ten-key pad displayed at the bottom of the screen.
- Enter the desired display time using the ten-key pad displayed at the bottom of the screen, then press the ENT key to register the input time.
 - * If "DISPLAY TIME" is set to "0", the screen mode is selected immediately after the power is turned on and a user screen is displayed.
It is recommended to set 1 second or more for the FX Series and 4 seconds or more for the A Series.



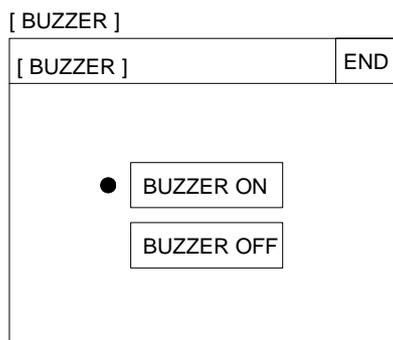
- Set the menu call key which changes over the screen mode (in which a user screen is displayed) to the SELECT MODE screen.
The menu call key is mesh type, and 2 × 2 in size.
- One or two corners can be selected among the four corners of the screen.
- **When the menu call key is not set, only the screen mode is available. Any other mode is not available.**
- If another touch key is assigned to the corners to which the menu call key has been assigned, the menu call function is disabled.



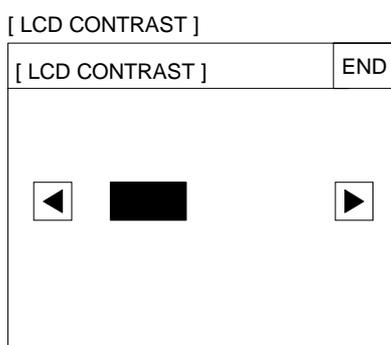
- Set the time used in the time switch, the sampling mode and the alarm mode.
- When "DATE" or "TIME" is selected, date or time can be entered using the ten-key pad displayed at the bottom of the screen. Enter the desired date or time, and press the ENT key to register it.



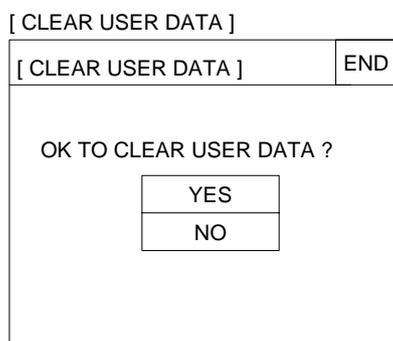
- Set the time at which the display backlight turns off. When a touch key is not pressed or the user screen is not changed over within the specified OFF time, the backlight is turns off.
- When "OFF TIME" is pressed, the OFF time can be set within the range of 0 to 99 minutes using the ten-key pad displayed at the bottom of the screen. Enter the desired time, and press the ENT key to register it.
- The service life of the backlight is 25,000 hours.
- The specified bit of the control device (system information) should be set to ON so that the backlight OFF function is enabled. (Refer to Paragraph 9.6.)



- Set whether or not the buzzer is to sound when a key is pressed or an error occurs.
- Select "BUZZER ON" or "BUZZER OFF".

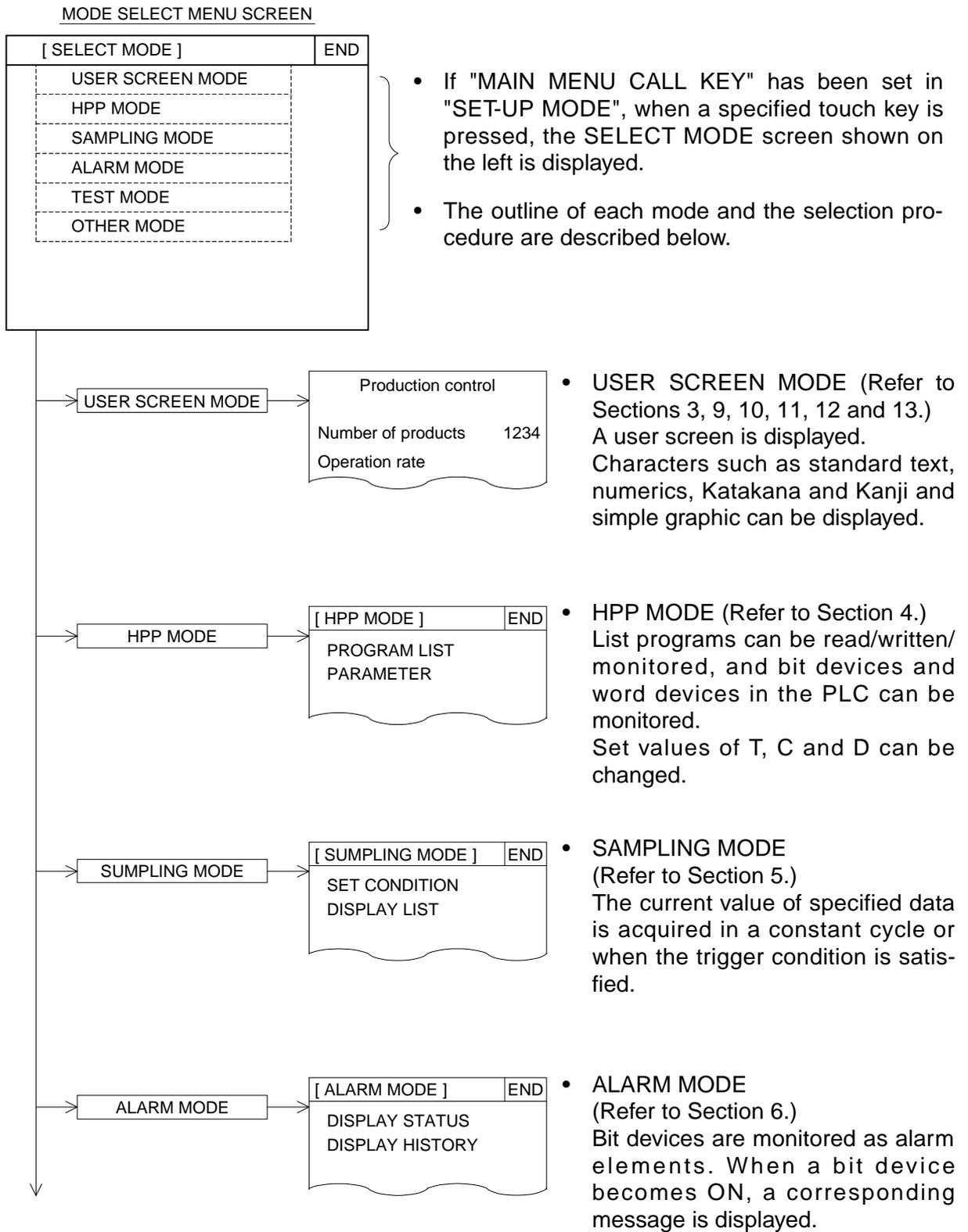


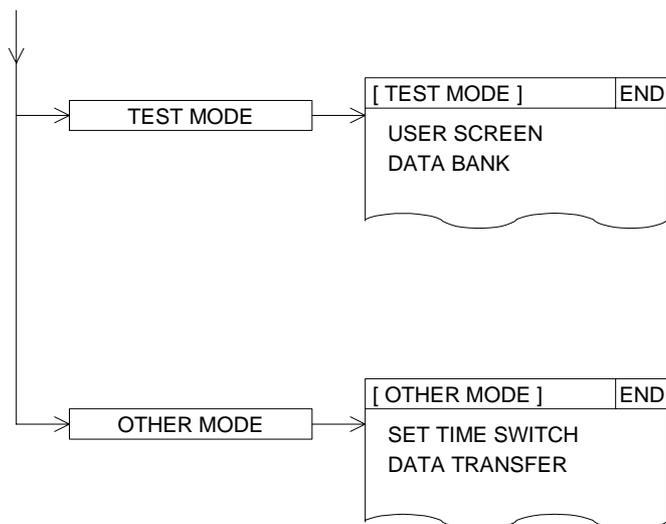
- The LCD brightness can be set in 15 steps.
When the ◀ key is pressed, the LCD becomes darker.
When the ▶ key is pressed, the LCD becomes brighter.



- The screen data stored in the GOT can be cleared.
- When "YES" is selected, the message "NOW CLEARING USER DATA" is displayed and key is accepted.
- When the message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed, the data is cleared completely. After that, the screen mode is automatically selected.

2.3 Each mode selection procedure





- **TEST MODE** (Refer to Section 7.)
The contents of the user screens can be confirmed. In addition, data files can be edited, and debugging can be performed.

- **OTHER MODE**
(Refer to Section 8.)
Setting of the time switch, printer output, entry code, operation procedure, etc. can be performed.

2.4 Security function (screen protection function)

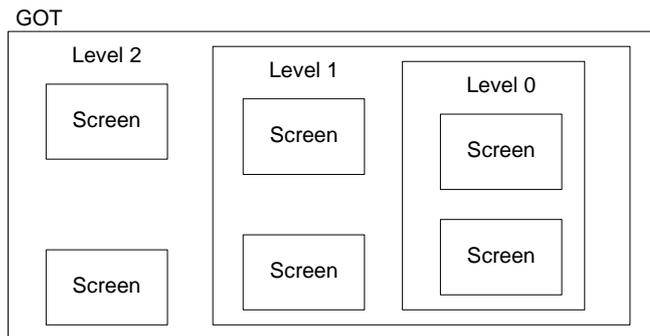
In the user screen mode, screens can be set so that they only open to certain operators who know an entry code. This is so that general operators cannot perform unnecessary operations. This function is called security function (screen protection function).

1) Outline of security function

To use the security function, the security level should be set for each user screen.

Set the level within the range of 0 (lowest) to 15 (highest). When any entry code has not been registered, all screens can be displayed (In this case, the security level is "0").

An entry code can be set using the screen creation software.



- An entry code can be set using up to 8 numerics.

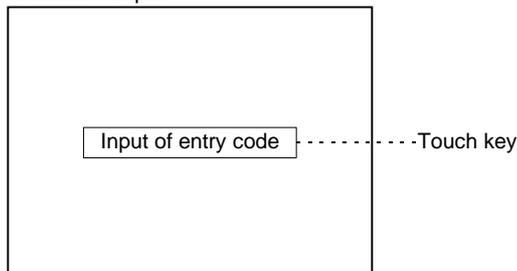
By entering a correct entry code, the user can display and manipulate the screens whose security level is equivalent to or lower than the entered entry code

2) Input of entry code

To enter an entry code, the entry code input screen should be displayed.

To display the entry code input screen, a touch key should be provided on the screen.

Screen example

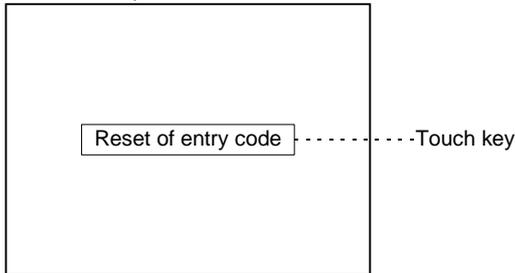


- To set this touch key, enter "FF68" to the key code.
- When the touch key is pressed, the entry code input screen is displayed.
- When a screen whose entry code level is higher is tried to be displayed, an alarm sound is issued three times. Set a touch key, and enter an entry code.
- When an entry code has been registered to the screen to be displayed at first in the screen mode (the screen No. 0 when screens have been created using the FX-PCS-DU/WIN-E or the screen No. 1 when screens have been created using the SW□D5C-GOTRE-PACK), the entry code input screen is displayed even if a touch key to enter an entry code is not provided so that an entry code can be entered.

3) Reset of entry code

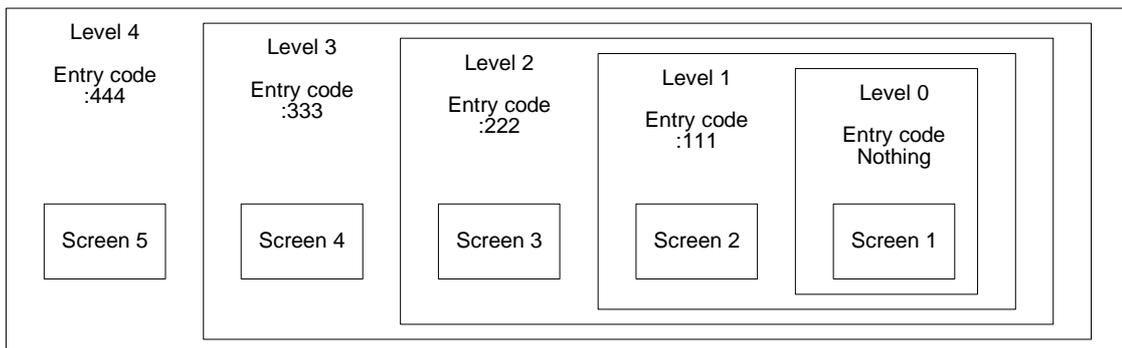
To reset an entry code and return to the initial setting (in which security is valid), a touch key should be provided on the screen.

Screen example



- To set this touch key, enter "FF69" to the key code.
- The entry code is reset also when the power of the F940GOT is turned off. When the power is turned on at the next time, the security is valid.
- It is recommended to lay out the entry code input key and the entry code reset key on the same screen.

4) Use example



- Suppose that the security level is set in the screen creation software for Screens 1 to 5 shown above.
- In this case, Screen 1 is displayed when the power is turned on (Level 0).
- When an entry code "222" is entered, Screens 1 to 3 can be displayed and manipulated.
- When an entry code "444" is entered while Screens 1 to 3 are displayed, Screens 1 to 5 can be displayed and manipulated.
- When the entry code is reset while Screens 1 to 5 are displayed, Screen 1 is displayed (initial status).
- * In the use example shown above, the levels and the screen Nos. are consecutive for easy understanding. The levels and the screen Nos. are not necessarily consecutive.

Example: Screen 1 : Level 3
 Screen 2 : Level 7
 Screen 3 : Level 5
 Screen 10 : Level 2

3. Screen Mode

This section describes the screen mode in which user screens are displayed. Confirm the outline of and the operating procedures in the screen mode. For the contents related to the screen design, refer to Sections 9 to 13.

3.1 Outline of screen mode

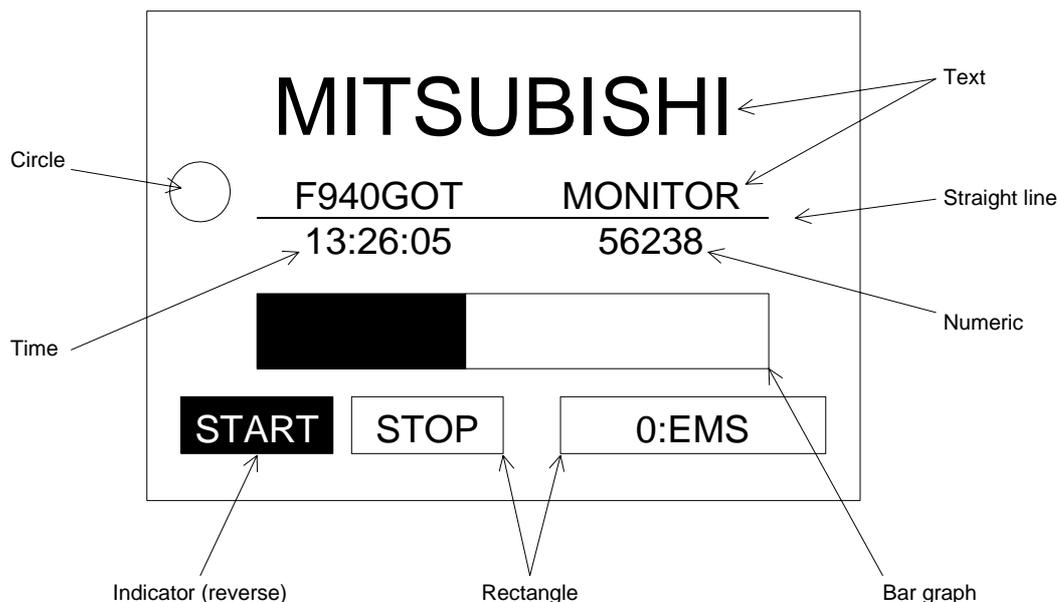
In the screen mode, screens created by the user using the screen creation software are displayed. In addition, alarm messages are displayed.

On one display screen, characters, straight lines, rectangles, circles, etc. which are classified in accordance with their functions are combined and displayed.

When there are two or more user screens, they can be changed over using the operation keys in the GOT or using the PLC. (The user can set arbitrarily the condition to change over the screens and the screen to be displayed next.)

On one screen, the following elements can be displayed. (In the display example below, only a part of the available functions are used.)

Examples of display screen

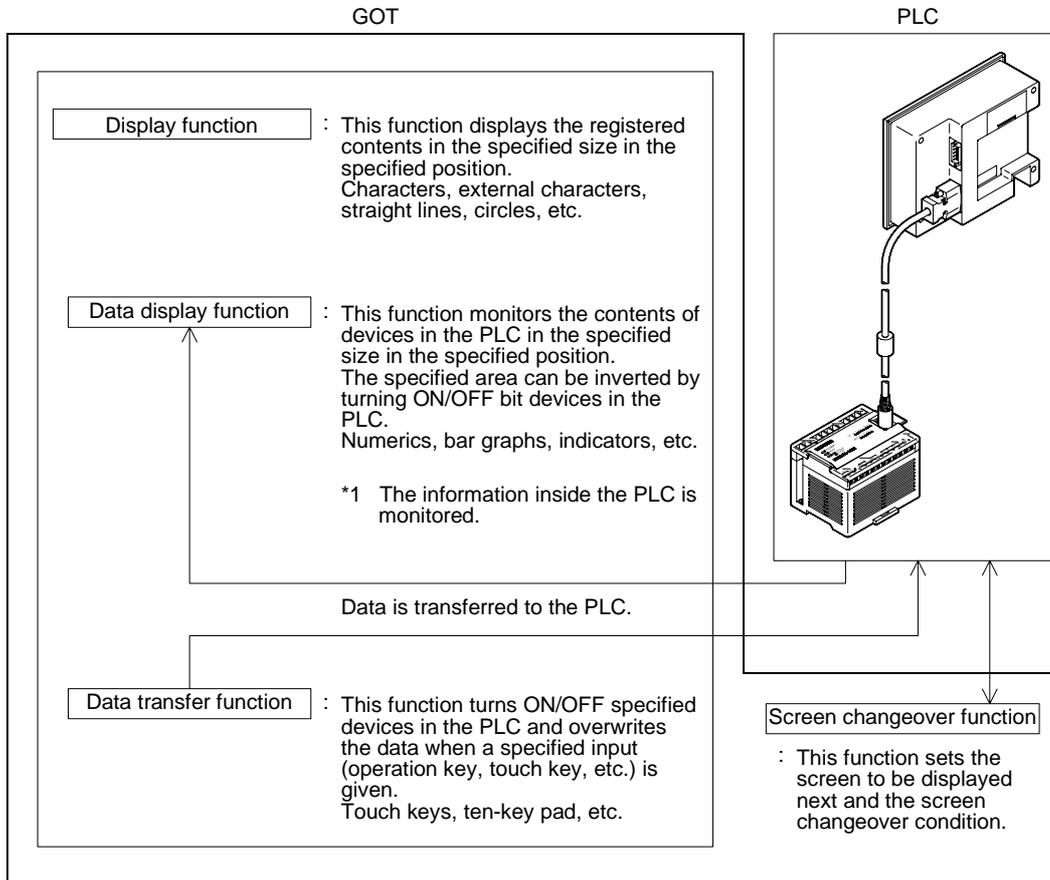


In the F940GOT-SWD-E, eight colors are available to create screens.

The functions used in the display example in the previous page can be mainly classified into four types.

The classified functions have the roles shown below.

(For the details of each function, refer to Sections 10 and 12.)



*1 A part of the data display function can change set values and current values of word devices (T, C, D, Z and V) on the screen. The operating procedure is described in the next page.

3.2 Change of displayed data

Among the data displayed on the user screen, numeric data indicating set values and current values of word devices in the PLC can be changed by key operation.

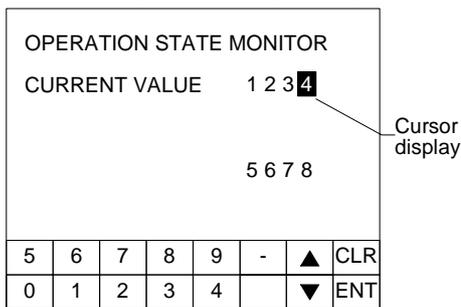
In the screen creation software FX-PCS-DU/WIN-E, "Number" and "Ascii" can be changed. In the screen creation software SW□D5C-GOTRE-PACK, "Numerical Input" and "Ascii input" can be changed.

3.2.1 Common contents in data change

This paragraph describes the common contents in change of numeric data and ASCII code data.

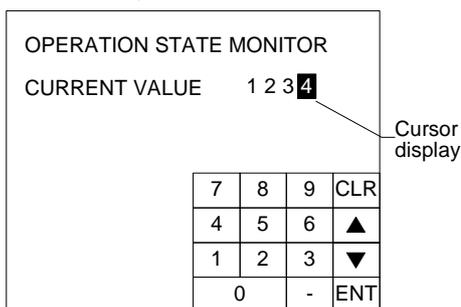
- By touching a numeric or an ASCII code on the display screen, it can be changed.
 - *1 In the FX-PCS-DU/WIN-E, "Number" and "Ascii" should have been set to "PERMIT".
In the SW□D5C-GOTRE-PACK, "Numerical input" and "Ascii Input" can be changed.
- A numeral can be entered using two methods. In the first method, the keyboard for numeric input is always displayed. In the second method, the keyboard can be called when an input is required.

[When the keyboard is always displayed]



- When a numeric or an ASCII code displayed on the screen is touched, the cursor is displayed and the numeric or the ASCII code can be changed using the on screen keyboard. When the SW□5DC-GOTRE-PACK is used, "Project Unit" in "Auxiliary Setting" in "Common Setting" should have been set so that the key window is open.

[When the keyboard is called]



- Press the CLR key to cancel the input. Press the ENT key to execute the input.
- When selecting another numeric or ASCII code, touch it on the screen or select it using the ▲ and ▼ keys.
- If the keyboard is not displayed on the screen, when a numeric or an ASCII code displayed on the screen is touched, the ten-key pad is displayed as shown on the left so that numerics can be entered.
- To enter a numeric in hexadecimal or change the keyboard design, select an appropriate keyboard using the "Keyboard" object.

- **When Katakana characters and standard text are to be entered using ASCII codes, make sure that the keyboard to input Katakana characters and text is always displayed on the screen. When the keyboard is used in the SW□D5C-GOTRE-PACK, the keyboard should be created using key codes for touch switches. When the keyboard is called, only 0 to 9 can be entered.**

Data change condition: Numeric and ASCII codes cannot be changed in the following cases.

1) GOT status

- While change is forbidden (when the screen is created using the screen creation software FX-PCS-DU/WIN-E)
When the data change target object is set to "FORBID", it cannot be changed.
Countermeasures: Set the object to "PERMIT".
- When the input value is outside the range from the lower limit to the upper limit
The upper limit and the lower limit are provided to indicate the allowable data setting range. If the input value is outside this range, it is not accepted.
Countermeasures: Change the upper/lower limit value.
- When "*****" is displayed on the screen
When a device No. not present in the PLC is monitored, the numeric data is displayed as "*****" on the screen.
Countermeasures: Change the device No. whose numeric data is to be monitored on the screen.

To take the countermeasures above, numeric setting should be changed in the screen creation software.

2) PLC status

- When an EPROM memory is mounted in the FX/A Series PLC, set values of timers, counters and current values of file registers cannot be changed.
- When an EEPROM memory is mounted in the FX Series PLC or while the FX/A Series PLC is running, set values of timers and counters and current values of file registers cannot be changed.
- When an entry code is registered in the FX/A Series PLC, set values of timers and counters and current values of file registers cannot be changed. Reset the entry code.

■ Important point

Timing of data change for "Number" ("Numerical Input") and "Ascii" ("Ascii Input")

The data is changed in the PLC at the following timing times.

When new data is entered and the ENT key is pressed, the new data is transferred to the PLC. When the CLR key is pressed before the ENT key, the entered new data is ignored and the existing data is kept registered.

Layout of "Number" ("Numerical Input") and "Ascii" ("Ascii Input")

A touch key can occupy 12 (horizontal direction) x 20 (vertical direction) dots. When a touch key occupies an area equivalent to or more than the half of 12 x 20 dots, it is recognized as touch key.

When half- or full-width numerics and ASCII codes are laid out, a touch key may not be recognized as touch key depending on its position. In such a case, change the layout, display the touch key with a frame or display the touch key in a size whose vertical dimension is twice or larger. (Refer to Paragraphs 10.5.1 and 12.5.1.)

3.3 Numeric setting completion flag

When data is changed for "Number" ("Numerical Input") and "Ascii" ("Ascii Input"), the following devices become ON signifying the setting of the completion flags.

At this time, the ID code is written to the PLC so that a device whose data is changed can be identified.

3.3.1 When FX-PCS-DU/WIN-E is used

1) Completion flag

When a screen is created using the FX-PCS-DU/WIN-E, a control device (described in Paragraph 9.6.1) MO+5 becomes ON as the completion flag.

Control device

- MO+5

"O" indicates the head control device No.

For example, when the head control device is set to M10, M15 functions as the numeric setting completion flag.

* Control devices can be set using the screen creation software.

Operation

- When a current or set value of a word device is changed using the following objects, the flag becomes ON.

Object names: "Data Change" and "Keyboard"

(The flag does not become ON when the "Data+1", "Data-1" or "Constant" object is used.)

ON timing: The flag becomes ON when the ENT key of the "Data Change" or "Keyboard" object is pressed. The flag does not become ON when any other key is pressed.

- While the touch key code is set to "000D" (Write destination device: Execute), MO+5 becomes ON in the same way when the touch key is pressed.

2) User ID

The user ID is assigned to each "Number" and "Ascii" in the order of creation.

The user ID is assigned from "1" to each "Number" and "Ascii" on each screen. When data is changed, the user ID is written to the control device DO+7.

Control device

- DO+7

"O" indicates the head control device No.

By checking the current value of DO+7, the user can know which "Number/Ascii" has been changed.

3.3.2 When SW□D5C-GOTRE-PACK is used

1) Completion flag

When a screen is created using the SW□D5C-GOTRE-PACK, the system information (described in Paragraph 9.6.2) write device DO+5 b3 becomes ON as the completion flag.

System information

- DO+4 b3
"O" indicates the head write device No.

Operation

- When "Project Unit" in "Auxiliary Setting" in "Common Setting" in the screen creation software is set so that the key window is open and the ENT key is pressed on the ten-key window, the flag becomes ON.
- While the touch key code is set to "000D", the flag becomes ON when the touch key is pressed.

2) User ID

The user ID can be assigned to each "Numerical Input" and "Ascii Input" using the screen creation software.

The programmer can set arbitrarily the user ID within the range of 1 to 165535. The user ID is written to the following device in the PLC.

System information

- DO+3
"O" indicates the head write device No.
By checking the current value of DO+3, the user can know which "Numerical Input/Ascii Input" has been changed.

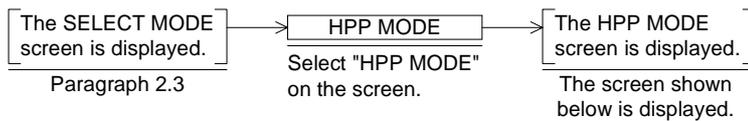
4. HPP Mode

In the HPP mode, sequence programs (list format) can be edited, devices can be monitored, and set values and current values can be changed from the GOT to the connected PLC.

4.1 Outline of HPP mode

This paragraph describes the operation procedure to change over to the HPP mode and each function available in the HPP mode.

◆Basic operation



[HPP MODE MENU]	
[HPP MODE]	END
PROGRAM LIST	a)
PARAMETER	b)
DEVICE MONITOR	c)
LIST MONITOR	d)
ACTIVE STATE MONITOR	e)
BFM MONITOR	f)
PC DIAGNOSIS	g)

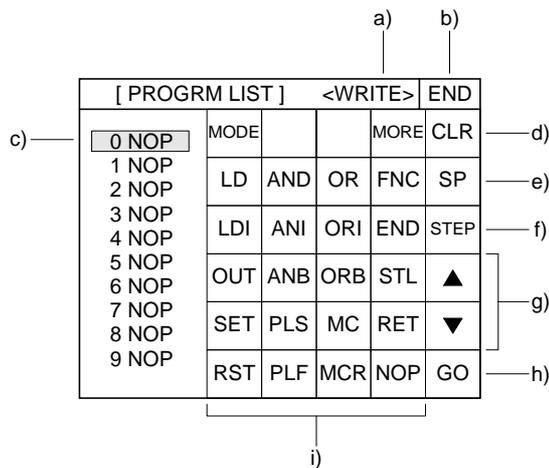
- All of the following functions except c) are valid only when the FX Series PLC is connected.
 - a) PROGRAM LIST (Paragraph 4.2)
Sequence programs stored in the PLC can be edited in the instruction list format.
 - b) PARAMETER (Paragraph 4.3)
Parameters stored in the PLC can be edited.
 - c) DEVICE MONITOR (Paragraph 4.4)
The ON/OFF status and the set value/current value of arbitrary devices in the PLC can be monitored. In addition, the ON/OFF status can be forcibly set to ON/OFF and the set values/current values can be changed.
 - d) LIST MONITOR (Paragraph 4.5)
Sequence programs stored in the PLC are displayed, and the ON/OFF status of each instruction is displayed. (Current values of word devices cannot be displayed.)
 - e) ACTIVE STATE MONITOR (Paragraph 4.6)
The reference Nos. of states (S) ON in the FX PLC are displayed.
 - f) BFM MONITOR (Paragraph 4.7)
The contents can be displayed and changed for buffer memories in special blocks connected to the FX2N/FX2NC PLC.
 - g) PC DIAGNOSIS (Paragraph 4.8)
The error information of the FX Series PLC is displayed.
- When computer link connection is performed, monitoring and the set value change ranges are restricted. For the details, refer to Section 1.

4.2 PROGRAM LIST

When the MELSEC FX Series PLC manufactured by MITSUBISHI is connected, sequence programs stored in the PLC can be read/written/inserted/deleted in the instruction list format.

- Program list
 - Program all clear: All programs stored in the PLC are cleared.
 - Read: Devices can be read by specifying step Nos. or giving instruction words.
 - Write: Programs can be written. (While the PLC is running, programs cannot be written.)
 - Insertion: Programs can be inserted.
 - Deletion: Programs can be deleted by one instruction at a time.
- Program list monitor
Refer to Paragraph 4.5.

- Outline of keyboard operations
The outline of keyboard operations are described below.



- a) Function display
The function (READ, WRITE, INSERT or DELETE) is displayed. Press the MODE key to change over the function.
- b) END key
Terminates the program list and returns to the HPP MODE screen.
- c) Bar
Indicates the edit position (line).
- d) CLR key
Cancels the key currently being manipulated. This key does not delete instructions.
- e) SP key
Enters space.
Use this key to write a set value of a timer or counter or write an application instruction.
- f) STEP key
Displays the list from the entered step No.
- g) Cursor control keys
Move up and down the bar c) to change over the edit line.
- h) GO key
Determines the key operation.

i) Instruction/device keys

- Input of instruction

When the MORE key is pressed, instruction words are changed over.

<Instruction word input keyboard>

MODE			MORE	CLR
LD	AND	OR	FNC	SP
LDI	ANI	ORI	END	STEP
OUT	ANB	ORB	STL	▲
SET	PLS	MC	RET	▼
RST	PLF	MCR	NOP	GO

← "MORE" →

MODE			MORE	CLR
MPS	MRD	MPP	P	SP
LDP	ANDP	ORP	I	STEP
LDF	ANDF	ORF	INV	▲
				▼
				GO

When an instruction word is entered, the device input keyboard is automatically displayed.

The keyboard type is selected as shown below in accordance with the entered instruction word.

<Device input keyboard 1>

MODE				CLR
X	M	V	Z	SP
Y	S	K	H	STEP
T	C	P	I	▲
D				▼
				GO

<Application instruction input keyboard 1>

MODE				CLR
D	P			SP
				STEP
8	9			▲
4	5	6	7	▼
0	1	2	3	GO

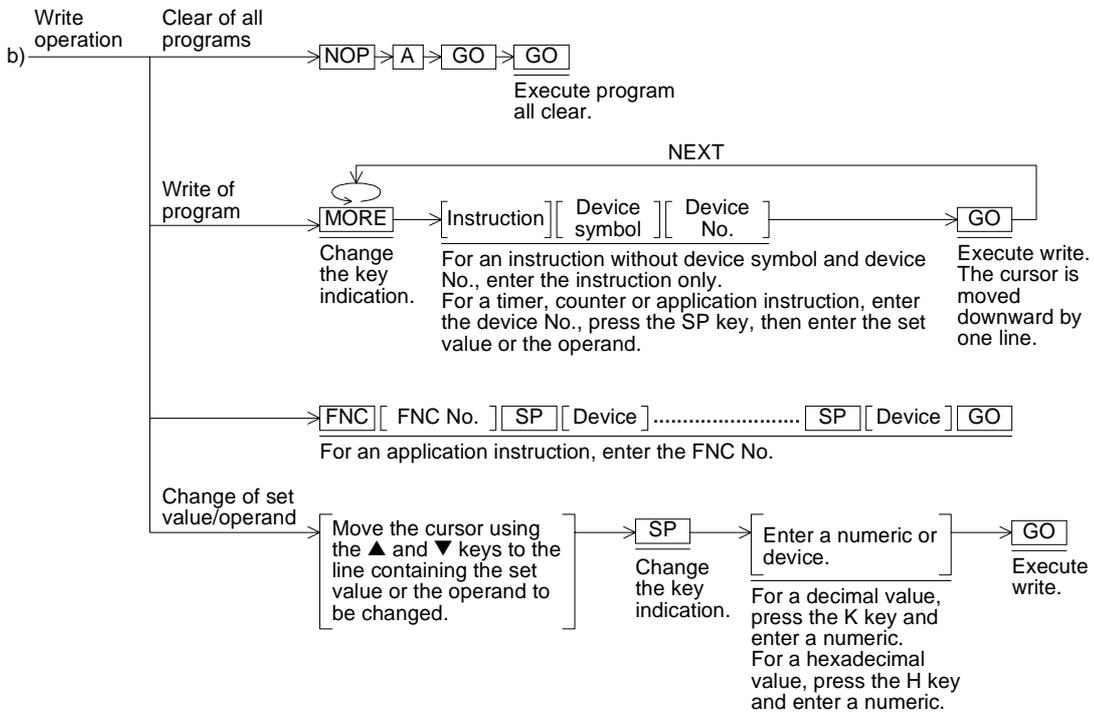
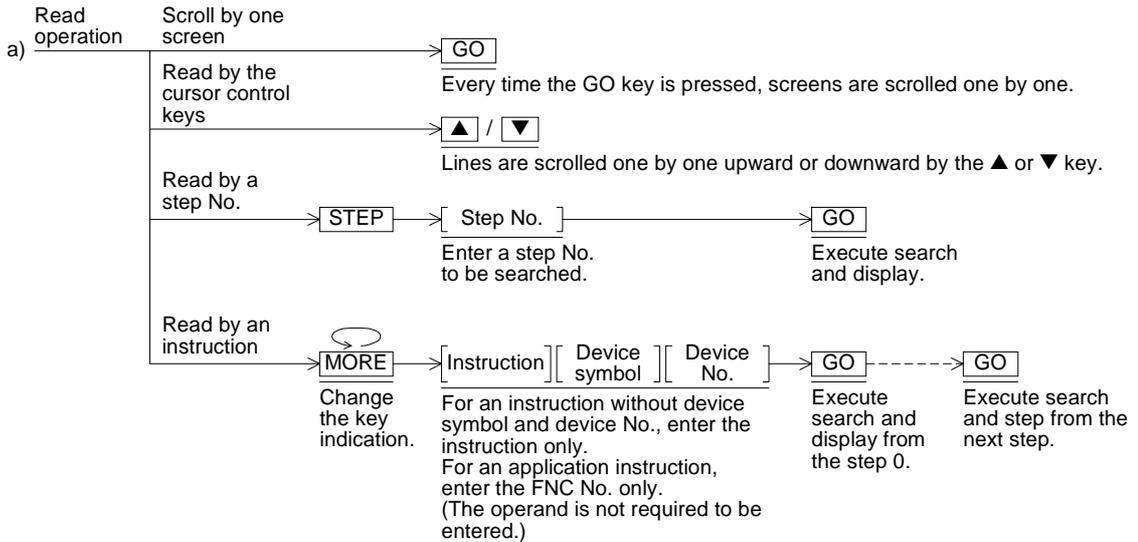
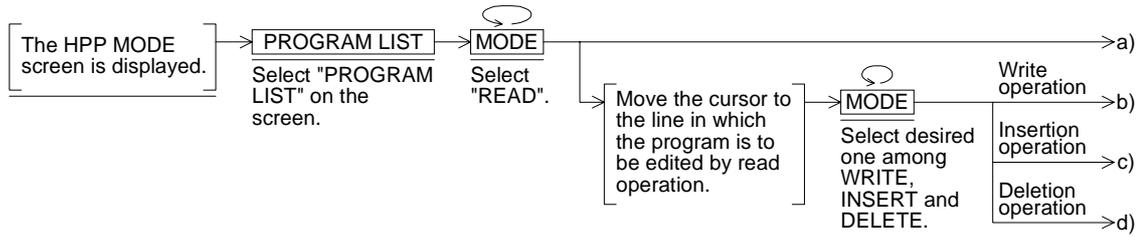
<Device input keyboard 2>

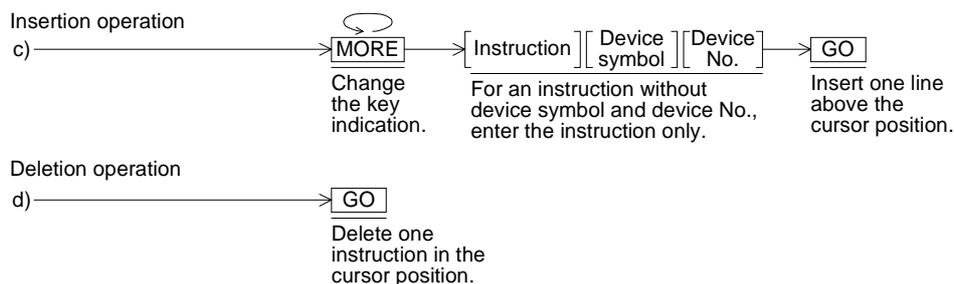
MODE				CLR
		V	Z	SP
				STEP
8	9			▲
4	5	6	7	▼
0	1	2	3	GO

<Application instruction input keyboard 2>

MODE				CLR
X	M	V	Z	SP
Y	S			STEP
8	9			▲
4	5	6	7	▼
0	1	2	3	GO

◆Basic operation





■Important point

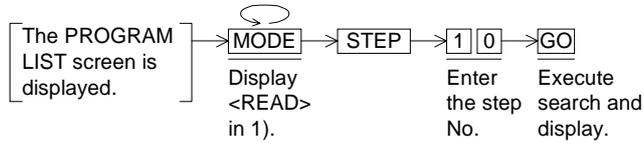
- 1) While an instruction, device symbol or device No. is entered, the input can be canceled by pressing the CLR key if the GO key has not been pressed yet.
An instruction determined by pressing of the GO key in the write or insertion operation can be changed (overwritten) by write of a program.
- 2) To create a new program, perform the write operation.
- 3) To enter an application instruction, enter the FNC No.
- 4) While the PLC is running, only the read operation can be performed.
When performing write, insertion or deletion of a program, stop the PLC.
- 5) Programs can be edited only while a RAM or EEPROM (whose write-protect switch is set to OFF) is used in the PLC.

Operation example 1 (read by a step No.)

Read operation of step No. 10

SCREEN

[PROGRAM LIST]		<READ>	END
0 LD X000			
1	⋮		
2			
3			
4			
5			
6			
7			
8			
9			



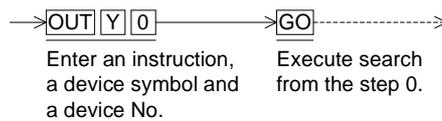
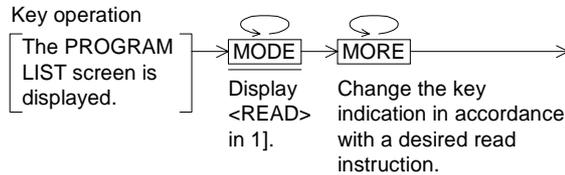
[PROGRAM LIST]		<READ>	END
10 LD X000			
11	⋮		
12			
13			
14			
15			
16			
17			
18			
19			

Operation example 2 (read by an instruction)

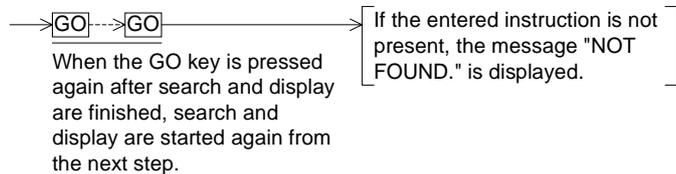
Read operation of OUT Y000

SCREEN

[PROGRAM LIST]		<READ>	END
0 LD X000			
1	⋮		
2			
3			
4			
5			
6			
7			
8			
9			



[PROGRAM LIST]		<READ>	END
20 OUT Y000			
21	⋮		
22			
23			
24			
25			
26			
27			
28			
29			



Important point

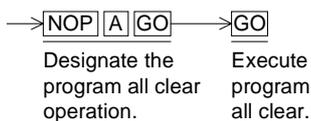
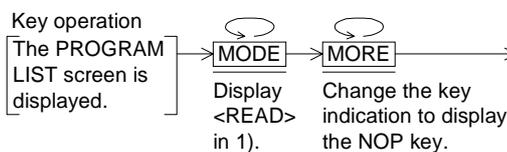
- 1) When there is an instruction occupying several steps in the step No. entered in the operation example 1, the head line of the instruction is search and displayed.
- 2) The read operation can be performed without regard to the memory type and the operation status (running or stop) of the PLC main body.

Operation example 3 (program all clear)

Program all clear operation

SCREEN

[PROGRAM LIST]		<WRITE>	END
0	LD X000		
1			
2			
3			
4			
5			
6			
7			
8			
9			



[PROGRAM LIST]		<WRITE>	END
0	NOP		
1	NOP		
2	NOP		
3	NOP		
4	NOP		
5	NOP		
6	NOP		
7	NOP		
8	NOP		
9	NOP		

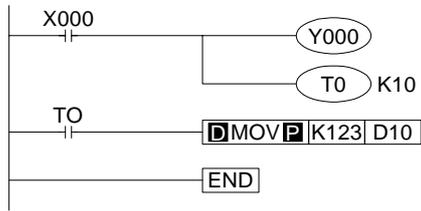
■Important point

- 1) Stop the PLC before performing the program all clear operation.
- 2) The all clear operation is enabled only when a RAM or EEPROM (whose write-protect switch is set to OFF) is used as the memory in the PLC.

Operation example 4 (write of a program)

Write operation for a program example shown below
 Example of program to be written

Circuit program



Program list

```

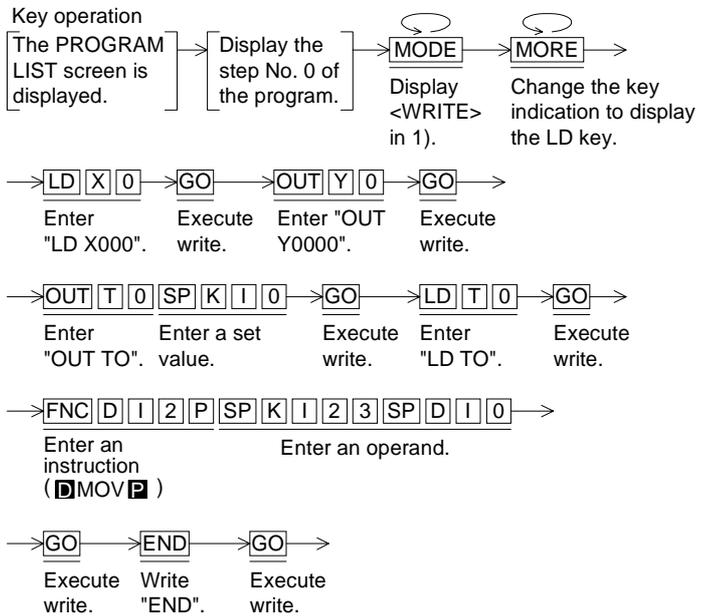
0 LD X000
1 OUT Y000
2 OUT T0
  K10
5 LD T0
6 DMOV P K123 D10
  D10
11 END
    
```

1)

SCREEN

[PROGRAM LIST]	<WRITE>	END
0 NOP		
1 NOP		
2 NOP		
3 NOP		
4 NOP		
5 NOP		
6 NOP		
7 NOP		
8 NOP		
9 NOP		

[PROGRAM LIST]	<WRITE>	END
0 LD X000		
1 OUT Y000		
2 OUT T0		
K 0		
5 LD T0		
6 DMOV P		
K 123		
D 10		
15 END		
16 NOP		



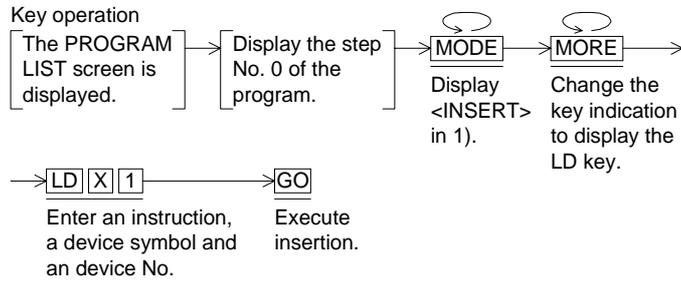
Important point

- 1) Stop the PLC before performing the program write operation.
- 2) The write operation is enabled only when a RAM or EEPROM (whose write-protect switch is set to OFF) is used as the memory in the PLC.
- 3) If there is a program in the PLC when a new program is written, the existing program is overwritten.

Operation example 5 (insertion of a program)
 Insertion of "LD X001"

SCREEN

[PROGRAM LIST]		<INSERT>	END				
0	LD X000						
1							
2							
3							
4							
5							
6							
7							
8							
9							

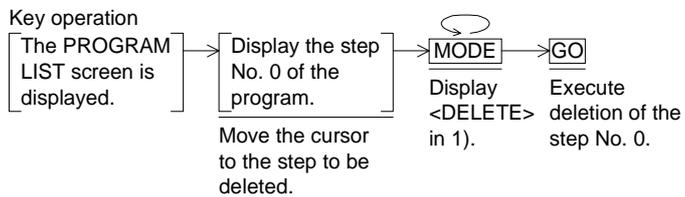


[PROGRAM LIST]		<INSERT>	END				
0	LD X001						
1	LD X000						

Operation example 6 (deletion of a program)
 Deletion of the step No. 0

SCREEN

[PROGRAM LIST]		<DELETE>	END				
0	LD X001						
1	LD X000						



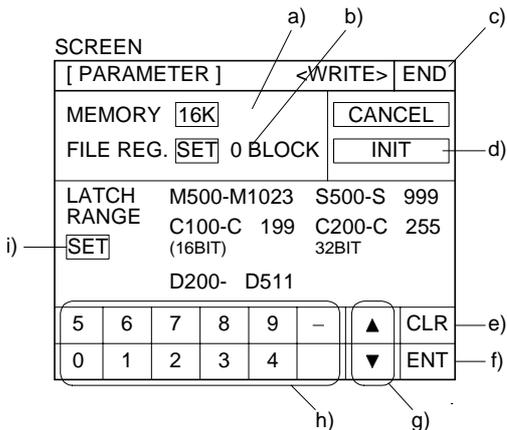
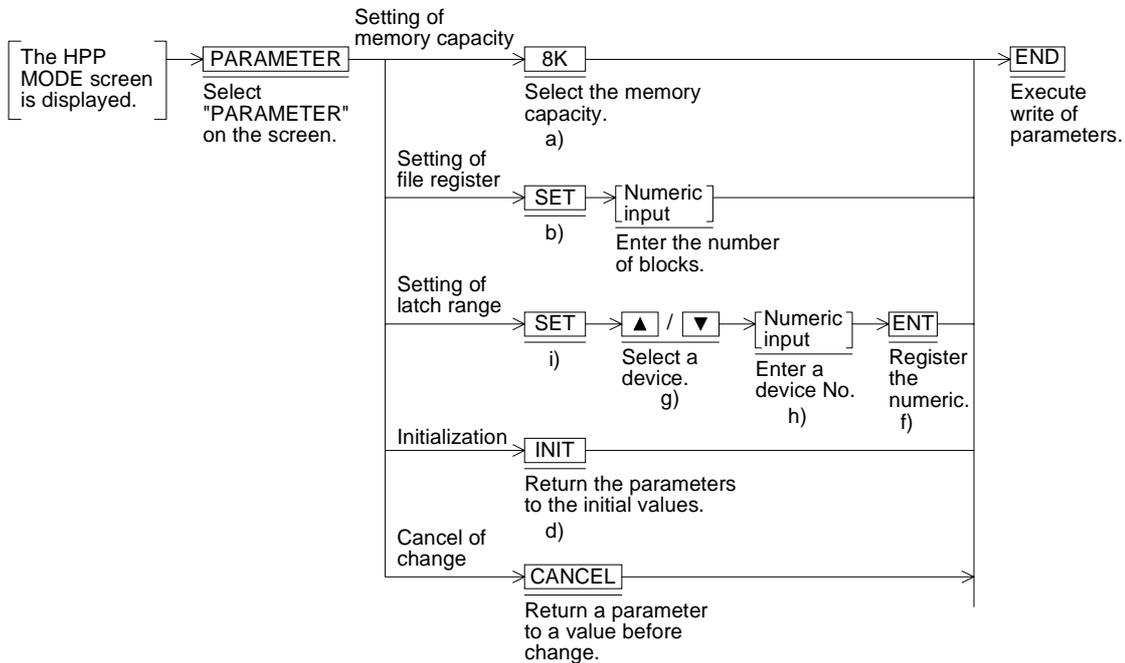
[PROGRAM LIST]		<DELETE>	END				
0	LD X000						
1							
2							
3							
4							
5							
6							
7							
8							
9							

■Important point

- 1) The program insertion/deletion operation is enabled only while the PLC is stopped.
- 2) The program insertion/deletion operation is enabled only when a RAM or EEPROM (whose write-protect switch is set to OFF) is used as the memory in the PLC.
- 3) In the operation example 5, an instruction is inserted above the cursor position. In the operation example 6, an instruction in the cursor position is deleted.

4.3 PARAMETER

◆Basic operation



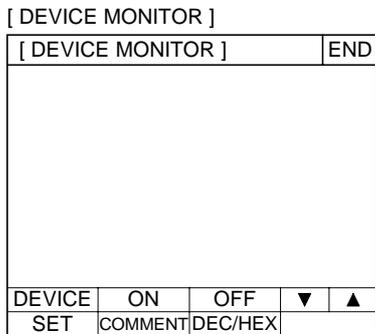
• This function is valid only in the FX Series.

■Important point

- 1) In setting of the memory capacity, the allowable setting range varies depending on the memory of the connected PLC main body (automatic recognition).
- 2) In setting of the file register, the allowable setting range of the number of blocks varies depending on the selected memory capacity.
(One block occupies 500 steps. Up to 14 blocks are allowed when the memory capacity is set to 16 K steps.)
- 3) In setting of the latch range, the allowable setting range of device No. varies depending on the connected PLC main body.
- 4) Change of each parameter is executed when the END key is pressed.
- 5) Change of each parameter is enabled only while the PLC main body is stopped.
- 6) Change of each parameter is enabled only while a RAM or EEPROM (whose write-protect switch is set to OFF) is used as the memory in the PLC main body.
- 7) After entering a numeric, press the CLR key to cancel the entered numeric.

4.4 DEVICE MONITOR

The ON/OFF status and the set value/current value of arbitrary devices in the PLC can be monitored. In addition, the ON/OFF status can be forcibly set to ON/OFF and the set values/current values can be changed.



When "DEVICE MONITOR" is selected on the HPP MODE screen, the DEVICE MONITOR screen shown on the left is displayed.

Function keys are provided at the bottom of the screen. Each function key is actuated when touched.

DEVICE :Allows to specify the device No. to be monitored.

ON/OFF :Turns ON/OFF forcibly the specified device.

SET :Executes change of the current value/set value.

COMMENT:Changes over the monitor display.

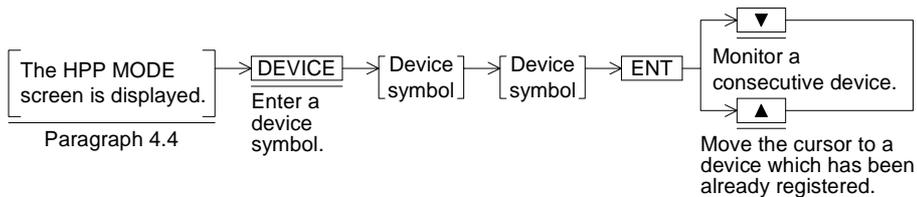
4.4.1 Device/comment monitor

Symbols such as X and Y and comments can be displayed for monitoring. Comments can be created using the screen creation software FX-PCS-DU/WIN-E.

Number of devices monitored and displayed on the screen

Bit device	Word device
14 devices/screen	7 devices/screen (3 devices/screen for timers and counters)

◆Basic operation



When the DEVICE key is pressed, the device symbol list is displayed as shown on the left.

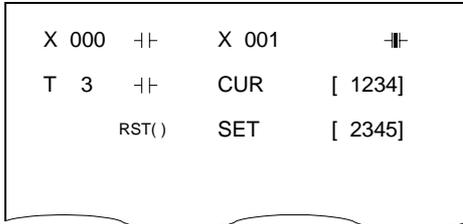
X	Y	M	S	CLR
T	C	D16	D32	▲
Z	V			▼
				ENT

M 100				
C	D	E	F	CLR
8	9	A	B	▲
4	5	6	7	▼
0	1	2	3	ENT

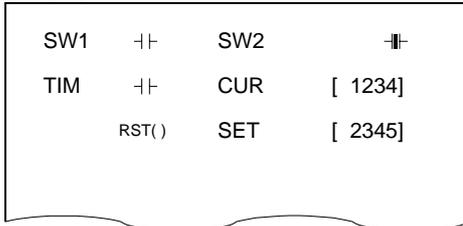
Operation example

Monitor of the ON/OFF status of inputs X000 and X001 and monitor of the current value and the set value of timer T3

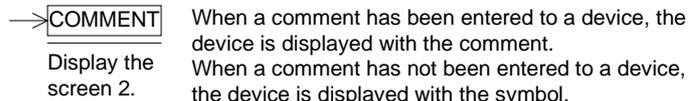
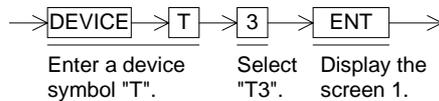
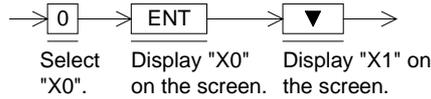
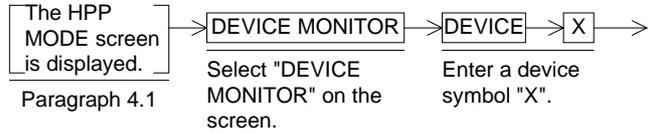
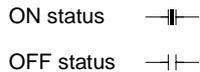
Display the screen 1



Display the screen 2



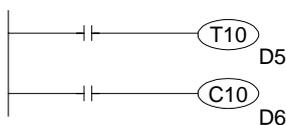
The ON/OFF status of each monitored device is indicated as follows.



When a comment has been entered to a device, the device is displayed with the comment. When a comment has not been entered to a device, the device is displayed with the symbol. This comment display function is valid only when comments have been created using the screen creation software FX-PCS-DU/WIN-E.

Important point

1) Monitor function when timers and counters are indirectly specified



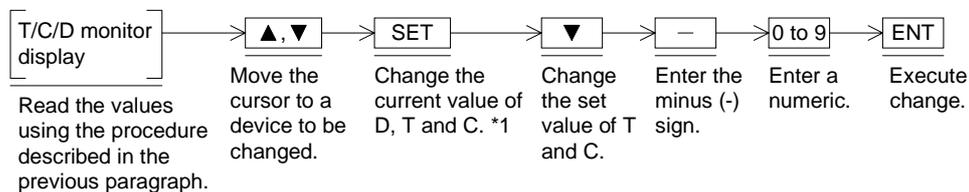
If a data register is used for the set value of a timer/counter as shown in the program on the left, the contents of the data register is monitored as the set value of the timer/counter when monitoring is performed.

When the set value is changed (as described on the next page), the contents of the data register are overwritten.

4.4.2 Changing of set values and current values of T, C and D

Set values and current values of word devices (T, C, D, V and Z) in the PLC can be changed.

◆Basic operation



*1 When the SET key is pressed, the cursor is moved to a current or set value and the numeric input keyboard is displayed at the bottom of the screen.

Example: D0 [1000] ← Cursor

Numeric (decimal) input keyboard

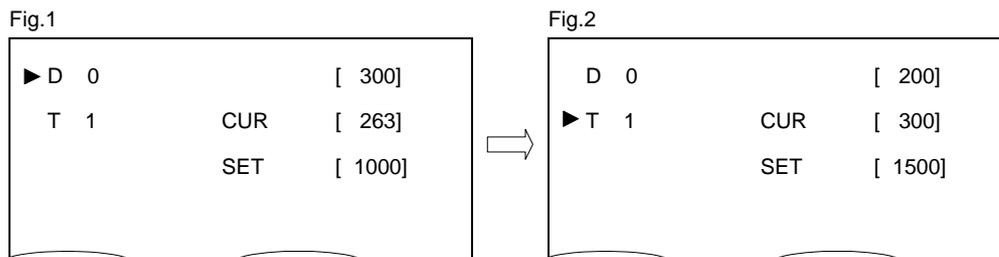
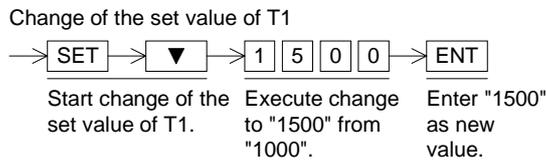
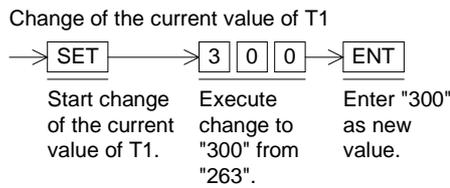
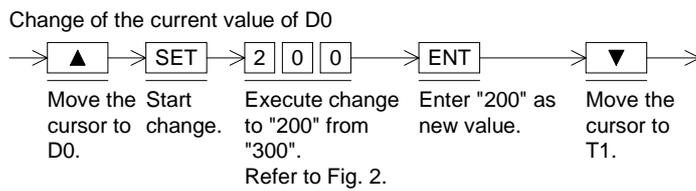
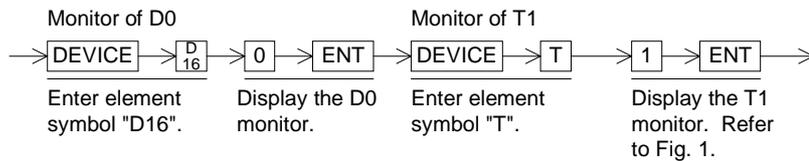
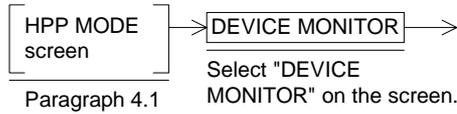
5	6	7	8	9	-	▲	CLR
0	1	2	3	4		▼	ENT

■Important point

- 1) Changing of set values of T and C and file registers
 They can be changed when a RAM is used as the memory in the PLC.
 They cannot be changed when an EPROM or EEPROM cassette is used.

Operation example

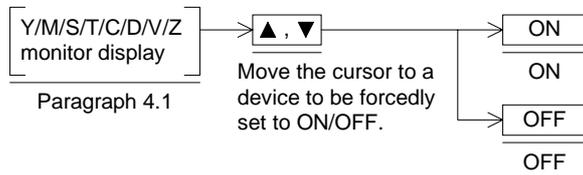
Change the current value of data register D0 from 300 to 200, change the current value of T1 from 263 to 300 and change the set value of T1 from 1000 to 1500



4.4.3 Forced ON/OFF

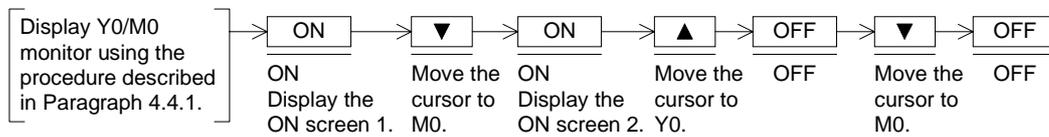
Bit devices (Y, M and S) and word devices (T and C) can be forced ON/OFF. When T, C, D, V or Z is forcedly set to OFF, its current value is reset to "0".

◆Basic operation



Operation example

Forced ON/OFF of output Y0 and auxiliary relay M0



Display the ON screen 1.

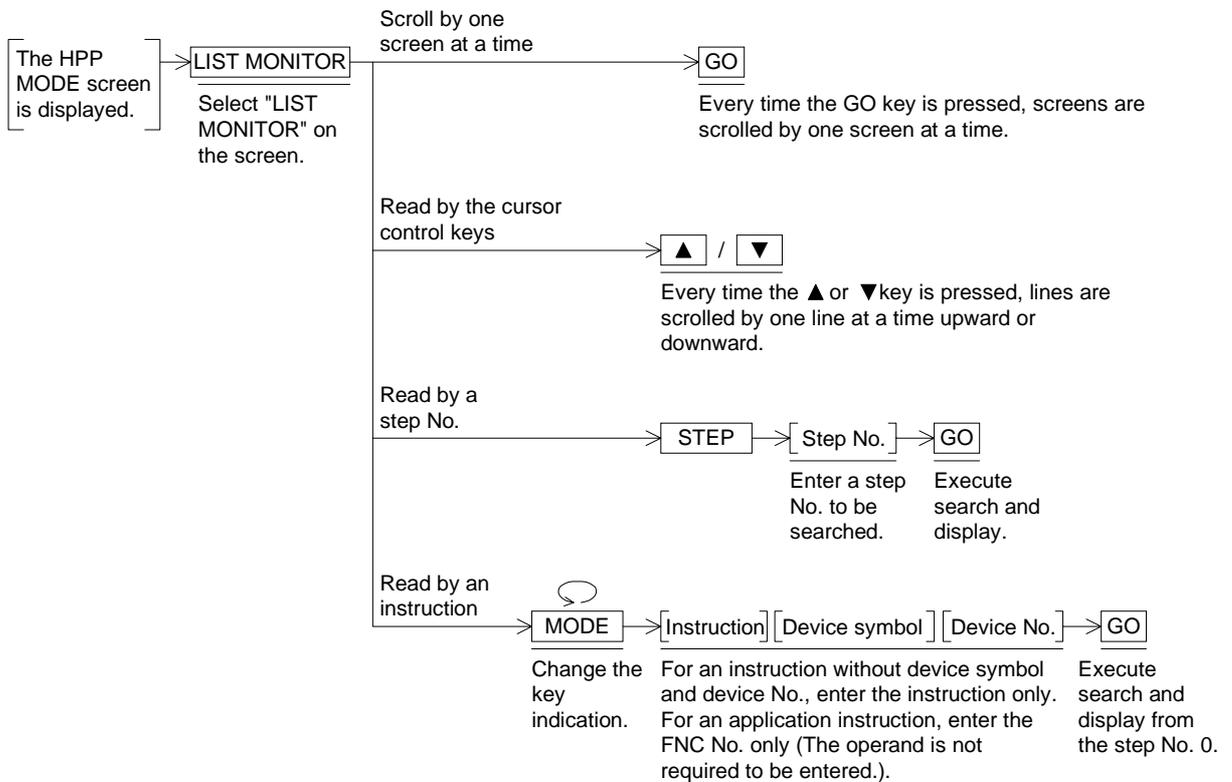
▶ Y 000 -||- M 0 -||-				
DEVICE	ON	OFF	▲	▼
SET	COMMENT			

Display the ON screen 2.

Y 000 -||- ▶ M 0 -||-				
DEVICE	ON	OFF	▲	▼
SET	COMMENT			

4.5 LIST MONITOR

◆Basic operation



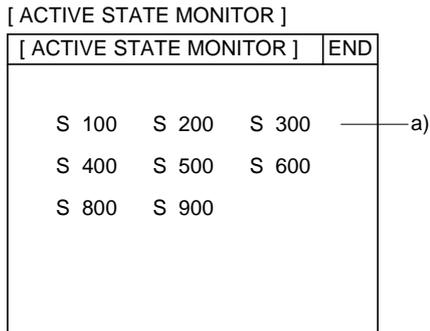
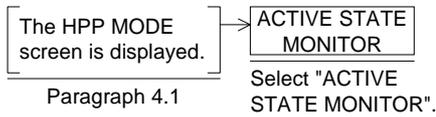
■Important point

- 1) List monitor can be performed without regard to the memory type and the operation status (running or stop) of the PLC.

4.6 ACTIVE STATE MONITOR

Up to eight state Nos. in the ON status can be monitored.
This function is valid in the FX Series only.

◆Basic operation



a) Active state
State Nos. in the ON status are displayed in the list.

- When there are not state Nos. in the ON status, the message "NO ACTIVE STATE" is displayed.
- When the special auxiliary relay M8047 (step ladder monitor valid) is not ON in the sequence program, the message "M8047 IS NOT ON" is displayed.
- When there are more than 8 state Nos. in the ON status, all 8 Nos. are displayed from the smallest one in the ascending order. Excessive state Nos. are not displayed.

4.7 BFM MONITOR

The contents of buffer memories can be read / written to by special blocks connected to the FX_{2N}/FX_{2NC} PLC.

The model of the connected special blocks are automatically recognized and the contents of the buffer memories are displayed together with the name and the unit. Accordingly, operations can be checked without performing any manual procedure.

- Applicable special blocks
Analog input: FX_{2N}-4AD, FX_{2N}-4DA, FX_{2N}-4AD-PT and FX_{2N}-4AD-TC
High-speed counter: FX_{2N}-1HC
Pulse output: FX_{2N}-1PG

◆Basic operation

- Serial block Nos. are assigned to special blocks connected to the FX_{2N}/FX_{2NC} Series basic unit. "0" is assigned to the special block nearest to the basic unit. Up to eight special blocks can be monitored and set.
For each available special block, its model name is displayed.
For each unavailable special unit (such as the FX-10GM and the FX-20GM), "UNKNOWN" is displayed.
When any special block is not connected, "NONE" is displayed.
- When a special block to be monitored is selected, the buffer memory list is displayed as shown below.

[4DA]						(BLOCK 1)	END
OUTPUT MODE						(0mA to 20mA)	CH1
OUTPUT DATA						[0.000](mA)	CH2
DATA HOLDING						HOLD	CH3
OFFSET DATA						[0.000](mA)	CH4
GAIN DATA						[20.000](mA)	INIT
G/O ADJUST						FORBID	
ERR STATUS						UNDEFINED	
5	6	7	8	9	-	▲	CLR
0	1	2	3	4		▼	ENT

- The set value can be entered using the touch keys on the screen.
To enter a numeric, use the ten-key pad displayed at the bottom of the screen.
- The DETAIL key is provided for the FX_{2N}-1PG, etc. so that the contents of the buffer memories can be monitored to details.

■Important point

- Setting of the buffer memories
The contents of the buffer memories set using this function are treated as follows when the power of the special block is turned off.
 - FX_{2N}-4AD, FX_{2N}-4DA, FX_{2N}-4AD-PT and FX_{2N}-4AD-TC
The setting contents are saved in the built-in EEPROM, and kept stored even if the power is turned off.
 - FX_{2N}-1HC and FX_{2N}-1PG
The setting contents are saved in the built-in RAM, so they are deleted when the power is turned off.

When the buffer memories have been set using a sequence program (TO instruction), the setting by the sequence program has the priority.

Use the buffer memory monitor function to perform the initial setting of special blocks and monitor buffer memories.

5. Sampling Mode

This section describes the sampling mode in which the contents of data registers always changing are acquired at a constant time interval (in a constant cycle) or in the ON/OFF condition (trigger) of bit devices.

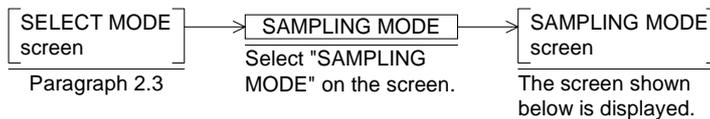
The acquired data can be displayed in graph or list format.

The acquired data can be printed in the other mode of the GOT or using the user screen creation software. The sampling mode can be used to manage the data on the operation rate of machines and the production status.

5.1 Outline of sampling mode

The contents of the specified 4 data registers (16 bits) are acquired in a constant cycle or by the trigger condition. The data in up to 2,000 registers can be acquired in a constant cycle, and the data in up to 2,000 registers can be acquired by the trigger condition.

◆ Basic operation



[SAMPLING MODE]	END
SET CONDITION	a)
DISPLAY LIST	b)
DISPLAY GRAPH	c)
CLEAR DATA	d)

- When "SAMPLING MODE" is selected, the screen shown on the left is displayed. On this screen, the sampling condition can be set, the results displayed, and the acquired data cleared.

a) SET CONDITION (Paragraph 5.2)

Data registers to be sampled, the sampling timing (trigger or constant cycle), the sampling start time and the sampling end time can be set.

b) DISPLAY LIST (Paragraph 5.3)

The sampling time (hour, minute and second) and the sampling result are displayed in the form of list.

c) DISPLAY GRAPH (Paragraph 5.3)

The sampling result is displayed in the form of trend graph.

d) CLEAR DATA (Paragraph 5.4)

All of the data acquired by sampling is cleared.

- The data acquired by sampling can be used not only in the sampling mode but also in the following ways.
 - In the screen mode (in which user screens are displayed), the system screens for the condition setting and the result display of the sampling mode can be displayed.
 - In "PRINT OUT" on the OTHER MODE screen, the sampling data can be printed out. When the sampling data is read using the screen creation software, the sampling data can be output to a printer connected to a general-purpose computer.
 - The sampling data can be saved to FDs and the HD using the screen creation software.
 - The saved sampling data can be converted into the text format (.txt) using the screen creation software FX-PCS-DU/WIN-E. In this way, the sampling data can be processed using a commercial software.

■Important point

- 1) The registered sampling condition and the acquired sampling data are backed up by the battery. Even when the power of the GOT is turned off, the setting contents are stored.
- 2) If a function shown below is selected while sampling is performed, the task may be paused or aborted and the sampling data may be cleared. The sampling data can be cleared by setting a control bit device to ON or selecting "CLEAR DATA" on the SAMPLING MODE screen. (Refer to Paragraph 5.4.)

Mode	Function	Sampling	Sampling data
Other mode	Current time	Sampling is paused while the time is set. (Sampling is continued when the time is displayed but not set.)	The data acquired until sampling is paused is saved. When time setting is finished, the data starts to be acquired again.
	Transfer to PC *1 Read/collation	Sampling is continued.	The sampling data is saved even while data is being read and collated.
	Transfer to PC *1 Write	Sampling is aborted.	The data acquired until sampling aborted is saved.

*1 Communication with the screen creation software such as transfer of user screen data

- 3) The sampling condition related to time is managed by "SET TIME SWITCH" in "SET-UP MODE".
Accordingly, when performing sampling related to time, make sure that the time is correct, then start sampling.

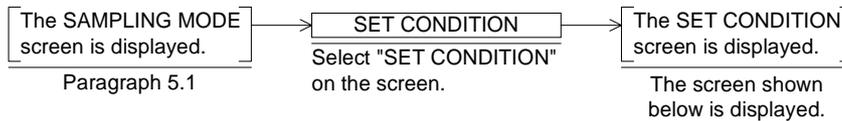
5.2 Outline of sampling condition setting

The sampling condition should be set before starting.

This paragraph describes the outline of condition setting such as the sequence and the contents of setting.

For the operating procedures, refer to the next page and later.

◆ Basic operation



- On the SET CONDITION screen, "SAMPLE COND.", "START COND.", "END COND." and "SAMPLING DEV." can be set. Each item functions as a touch key. When a desired item is touched, the corresponding setting screen is displayed.

[SET CONDITION]		END
SAMPLE COND.	DEVICE M 0 OFF → ON	a)
START COND.	DEVICE M 0 OFF → ON	b)
END COND.	NUMBER 0	c)
SAMPLING DEV.	D100	d)

a) SAMPLE COND. (Paragraph 5.2.1)

- Set the sampling condition. When the condition set here is satisfied, data on a specified data register is acquired. The sampling condition can be set to "DEVICE" or "CYCLIC".
 - DEVICE : Data is acquired when a bit of X, Y, M, S, T or C becomes ON (OFF → ON) or OFF (ON → OFF).
 - CYCLIC : Data is acquired at a constant time interval.

b) START COND. (Paragraph 5.2.2)

- Set the timing to start sampling.
 - DEVICE : Sampling is started when a bit of X, Y, M, S, T or C becomes ON (OFF → ON) or OFF (ON → OFF).
 - TIME : Sampling is started at the specified date and time (date, hour, minute and second). The time set in "SET TIME SWITCH" in "OTHER MODE" is used as the reference.
- If the start condition set here is not satisfied, sampling is not performed even if the sampling condition is satisfied.
 - * When the start condition has not been set, specify M8000 (FX Series) or M9036 (A Series) which is always ON while the PLC is running.

c) END COND. (Paragraph 5.2.3)

- Set the timing at which sampling is finished.

NUMBER: Sampling is finished when sampling has been performed by the specified number of times.

Trigger (DEVICE): 2,000 times maximum

Constant cycle (CYCLIC): 2,000 times maximum

DEVICE : Sampling is finished when a specified bit device becomes ON or OFF.

TIME : Sampling is finished at the specified date and time (date, hour, minute and second). If the end time is not reached even after sampling has been performed more than 2,000 times, the data acquired so far is deleted from the oldest one and the latest data is acquired.

d) SAMPLING DEV. (Paragraph 5.2.4)

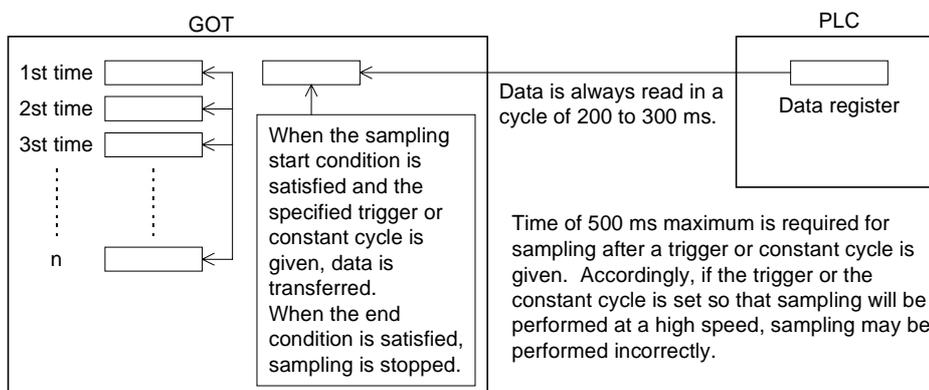
- Specify a data register (16 bits) whose data is to be acquired.

Only one device can be specified here. Then, data on four registers, D (specified one), D+1, D+2 and D+3, will be acquired.

- The set condition is backed up by the battery even if the power of the GOT is turned off or another mode is selected.

■ Important point

- Mechanism and responsibility of sampling
Sampling is performed in the following way.



* It is recommended to take the sampling time of 1 second or more both for a trigger and a constant cycle.

5.2.1 SAMPLE COND.

Set the timing at which sampling is performed. When the sampling condition set here is satisfied, a specified data register is accessed and its data is stored.
The sampling condition, trigger (DEVICE) or constant cycle (CYCLIC) can be selected.

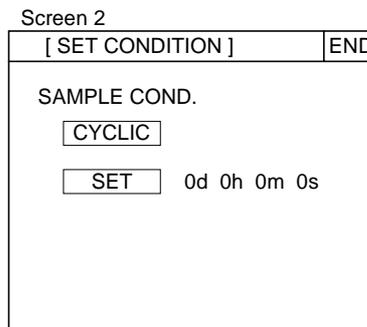
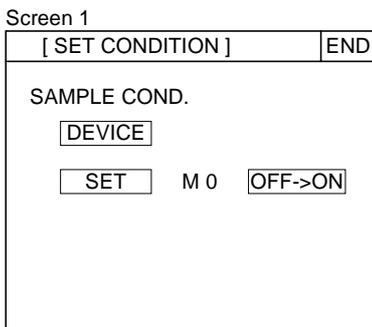
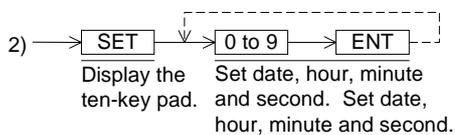
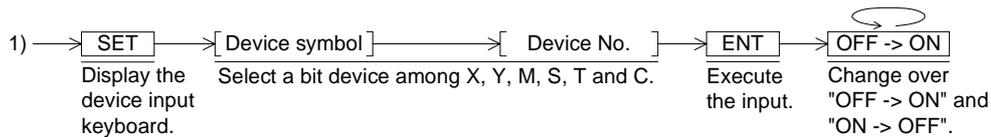
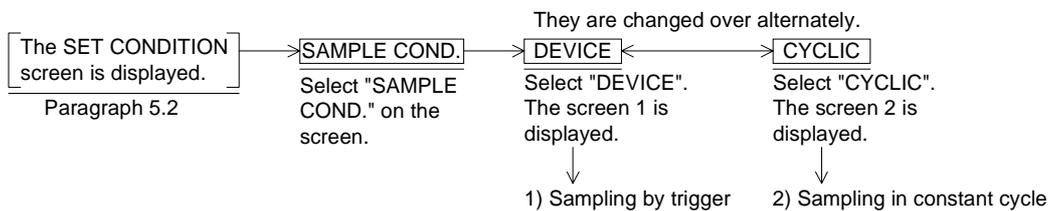
- Sampling by trigger

When X, Y, M, S, T or C becomes ON (OFF → ON)  or OFF (ON → OFF) , sampling is performed. (D, Z and V cannot be specified.)

- Sampling in constant cycle

A cycle (time interval) can be set within the range of 1 second to 10 days, 23 hours, 59 minutes and 59 seconds. Sampling is performed at the specified time interval.

◆ Basic operation



5.2.2 START COND.

Set the timing at which sampling is started. (Even if the sampling condition (trigger or constant cycle) is satisfied, sampling is not performed if the start condition is not satisfied.)

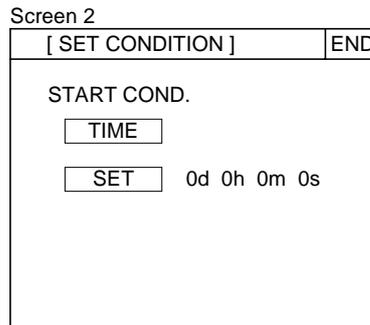
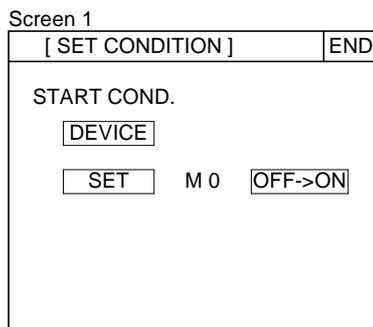
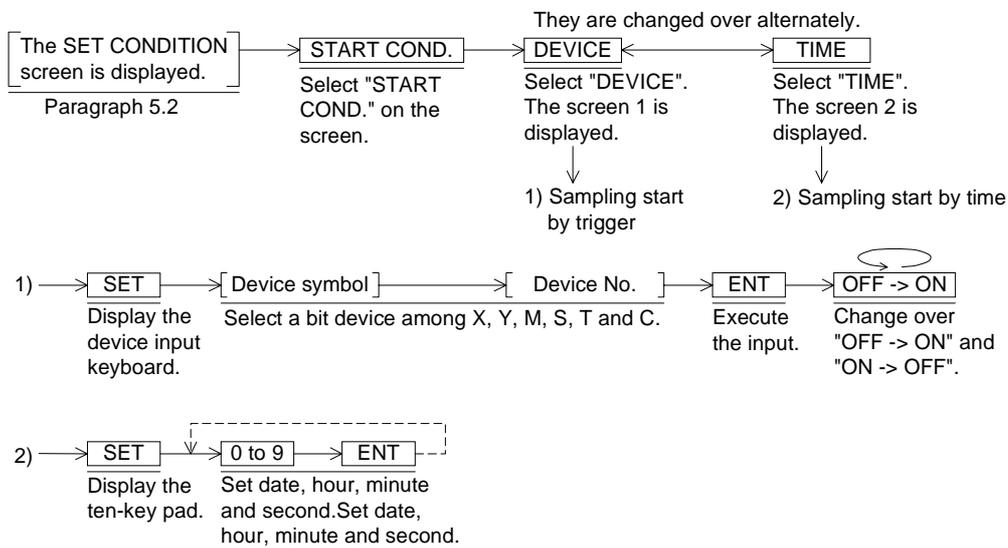
- Sampling start by trigger

When X, Y, M, S, T or C becomes ON (OFF → ON)  or OFF (ON → OFF) , sampling is started. (D, Z and V cannot be specified.)

- Sampling start by time

The time can be set within the range of 1 second to 31 days, 23 hours, 59 minutes and 59 seconds. When the specified time has come, sampling is started.

◆ Basic operation

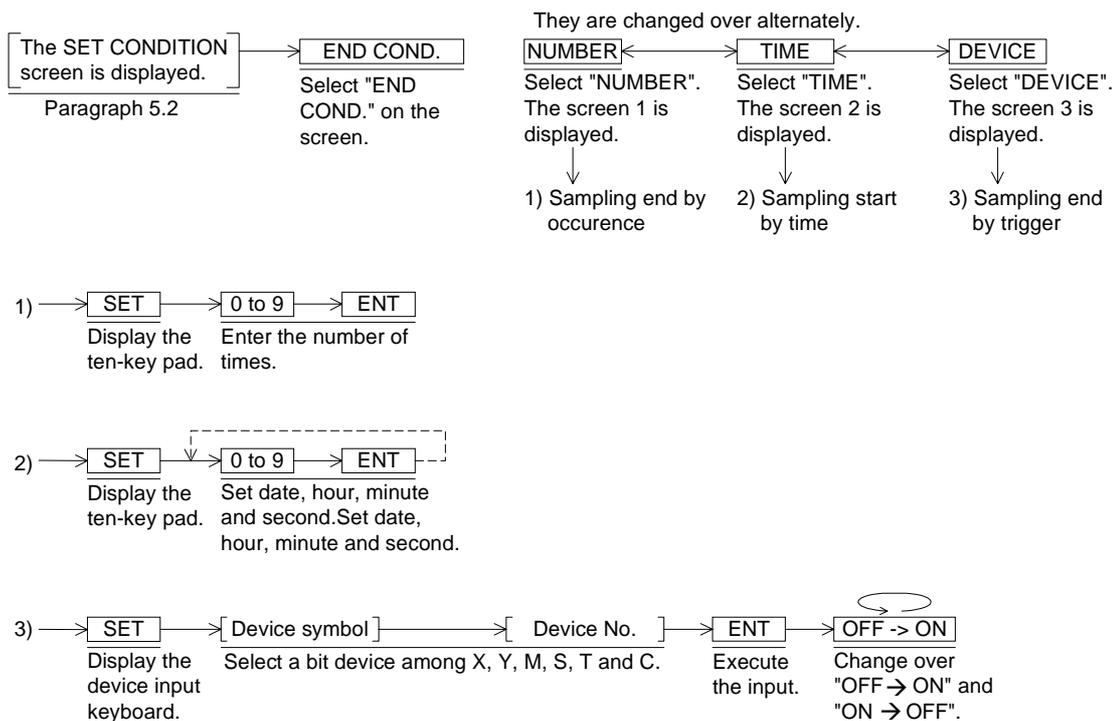


5.2.3 END COND.

Set the timing at which sampling is finished. When the end condition is satisfied, sampling is finished.

- Sampling end by occurrence
Sampling is finished after the specified number of times (2,000 times maximum).
- Sampling end by time
Sampling is continued until the specified time. However, when data on more than 2,000 times has been acquired, the data acquired so far is deleted from the one acquired at the 1st time and new data is saved (that is, the sampling data is shifted).
- Sampling end by trigger
Sampling is finished when the specified device No. becomes ON or OFF. However, when data on more than 2,000 times has been acquired, the data acquired so far is deleted from the one acquired at the 1st time and new data is saved.

◆Basic operation



Screen 1

[SET CONDITION]	END
END COND.	
[NUMBER]	
[SET]	0 TIMES

Screen 2

[SET CONDITION]	END
END COND.	
[TIME]	
[SET]	0d 0h 0m 0s

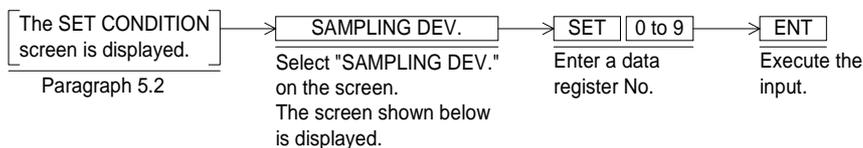
Screen 3

[SET CONDITION]	END
END COND.	
[DEVICE]	
[SET]	M 0 [OFF -> ON]

5.2.4 SAMPLING DEV.

Set a data register to be treated as the target of sampling. Only a data register can be specified. Data will be acquired from four consecutive data registers beginning from the one set here.

◆Basic operation



[SAMPLING SET SCREEN]

[SET CONDITION]										END
SAMPLING DEV.										
SET										D 0
5	6	7	8	9	-	▲	CLR			
0	1	2	3	4		▼	ENT			

5.3 Display of sampling result

The sampling result can be displayed in the form of a list or trend graph.

5.3.1 DISPLAY LIST

The sampling result is displayed in the form of list. Four sets of data are displayed on each screen.

◆Basic operation



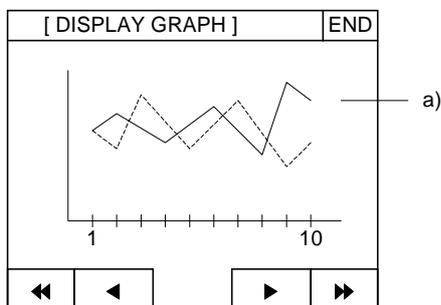
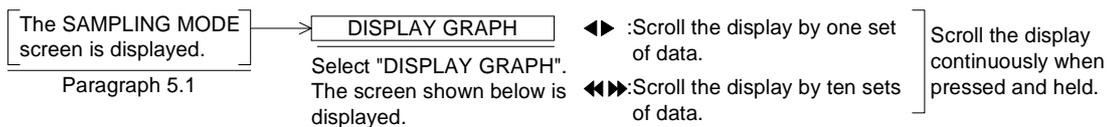
[DISPLAY LIST]			END
a)	NUMBER	TIME	▲
	1	13:00:00 0 0	▲
		0 0	
	2	13:01:00 0 0	
		0 0	
	3	13:02:00 0 0	▼
		0 0	
	4	13:03:00 0 0	▼
		0 0	

- a) NUMBER (Sample number)
- b) TIME (time when sampling was performed)
- c) Sampling result
The result is displayed in the following order.
DO DO+1
DO+2 DO+3
("O" indicates a data register No. specified in "SAMPLING DEV.")

5.3.2 DISPLAY GRAPH

The sampling result is displayed in the form of trend graph.

◆Basic operation

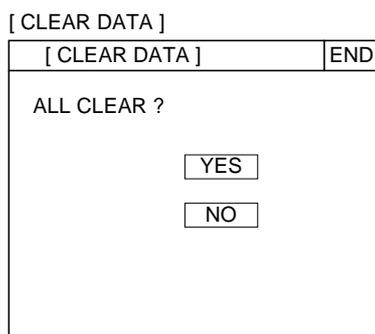
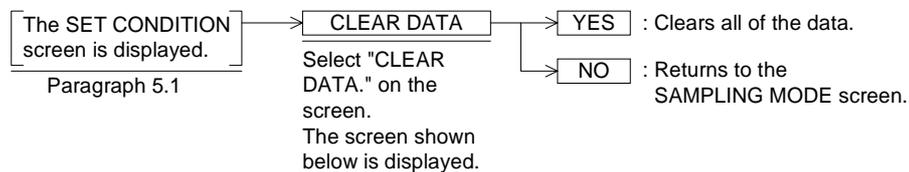


- a) Sampling result
DO DO+1
DO+2 DO+3
("O" indicates a data register No. specified in "SAMPLING DEV.")
In "DISPLAY GRAPH", values within the range

5.4 CLEAR DATA

All of the data acquired by sampling can be cleared.

◆Basic operation



■Important point

- "CLEAR DATA" clears only the sampling data. The data set on the SET CONDITION screen is not cleared.
- When the message "COMPLETED!" is displayed, the sampling data is cleared.
- When "CLEAR DATA" is executed while sampling is being performed, all of the acquired data is cleared and sampling is stopped.

5.5 Control signals in PLC

The sampling data can be cleared and the sampling status can be monitored from the PLC without manipulating the GOT.

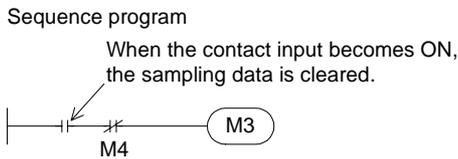
5.5.1 When screen creation software DUWIN is used

- Eight auxiliary relays (M) are occupied for communication between the GOT and the PLC. They are called control devices, and M0 to M7 are assigned (For the details, refer to Paragraph 9.6.).
- When the screen creation software is used, device Nos. M0 to M7 can be changed.
- In the sampling mode, M3 and M4 are used.

Example: When the head control device No. is set to M0

M3: Clears the sampling data. (It is used as a coil.)

M4: Remains ON while sampling is performed. (It is used as a contact.)



When M3 becomes ON during sampling, sampling is aborted and the acquired data is cleared. It is recommended to provide a b contact of M4 for interlock so that the acquired data is not cleared during sampling.

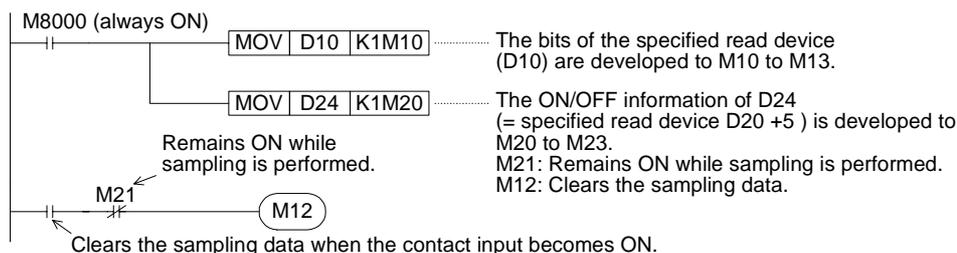
5.5.2 When screen creation software GOT-A900 is used

- Word devices are occupied for communication between the GOT and the PLC. (Refer to Paragraph 9.6.2.)
- Read devices and write devices are set for communication, and the following devices are used in the sampling mode.

Read device : When the third bit (b2) of the specified word device becomes ON, the sampling data is cleared.

Write device : The second bit (b1) of the fifth word device from specified word device (which is regarded as the first word device) remains ON while sampling is performed.

Example: When D10 is assigned as a read device and D20 as a write device



6. Alarm Mode

This section describes the alarm function in the GOT which monitors up to specified consecutive 256 bit devices and displays alarm messages created by the user on the screen or displays a specified screen when the monitored bit devices become ON.

The alarm function is very useful. By using the alarm function, alarm messages and the list of current alarms can be displayed, the alarm history can be stored, the machine status can be monitored, and troubleshooting can be facilitated.

6.1 Outline of alarm function

The GOT monitors up to 256 consecutive bit devices (X, Y, M, S, T and C) in the PLC which have been preliminarily specified as alarm devices.

Alarm devices can be assigned and alarm messages (comments) can be created using the screen creation software.

- When the FX-PCS-DU/WIN-E is used

Alarm devices : Can be set in "Alarms" in "View".

Alarm messages : Can be created in "Alarms" in "View".

- When the SW□D5C-GOTRE-PACK is used

Alarm devices : Can be created in "Alarm History Common Setting" in "Common Setting".

Alarm messages : Can be created in "Create Comment" in "Screen Creation Setting".

When an alarm device set by the screen creation software above becomes ON from OFF, a corresponding alarm message can be displayed and output to the printer in the screen mode (in which user screens are displayed) and the alarm mode (in which system screens are displayed).

6.1.1 Alarm function in screen mode

When an alarm has occurred (that is, when a specified alarm device becomes ON), the alarm can be indicated by an operation shown in the table below. The indication method varies depending on the used screen creation software. Check the table below.

- In the screen mode (while a user screen is displayed)

Notification method	FX-PCS-DU/WIN	SW□D5C-GOTRE-PACK
Window display (comment window display)	✓	Either one can be selected.
Screen changeover (changeover of base screen)	✓	
Flow display	✗	✓
Printing by printer	✓	✓

* Printing by printer is available except for the data transferred from the screen creation software.

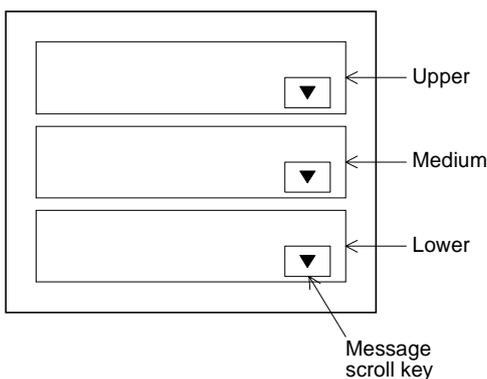
*1 Note: Displayed when the DETAIL key is pressed on the system screen.

1) Window display (comment window display)

In the case of FX-PCS-DU/WIN-E

If "window display" is selected as the alarm notification method, when an alarm device becomes ON, an alarm message corresponding to the alarm device is displayed on the user screen in the screen mode.

- Using the screen creation software, alarm messages can be created and alarm display positions can be selected among upper, medium and lower.



- An alarm message can be displayed in up to 10 full-width or 20 half-width characters.
- When two or more alarm devices have become ON, the alarm messages can be scrolled using the message scroll keys. When two or more errors have occurred in the system, the error messages are displayed in the same way.
- **When alarm devices have become OFF, the window is closed.**

- This window is displayed in the screen mode (while a user screen is displayed). When the display is changed over to a system screen (the alarm mode), the window disappears. However, if an alarm device is ON, the window is displayed again when the display is changed over to a user screen (the screen mode) again.

In the case of SW□D5C-GOTR-PACK

By setting "Detail Display Destination" in "Basic Setting" in "Alarm History Common Setting" in the software to "Comment Window", detailed comment messages corresponding to alarm devices can be displayed.

In this case, the object "Alarm History" or "Alarm List" is displayed on the user screen, and detailed comment messages are displayed when a touch key whose key code has been set to "FFB8 (detail display)" is pressed.

Alarm history display : Refer to Paragraph 12.3.5.

Alarm list display : Refer to Paragraph 12.3.6.

2) Screen changeover (changeover of base screen)

If "screen changeover" is selected, when a specified alarm device becomes ON from OFF, a user screen displayed at that time in the screen mode is changed over to a screen of specified No. (When the SW□D5C-GOTRE-PACK is used, a screen of specified No. is displayed when the DETAIL key is pressed.)

The display can be returned from the specified screen to the previous screen using the following procedure.

- In the case of the FX-PCS-DU/WIN-E
Set "Destination Screen" to "DU memory" in the "Change Screen" object of the changed-over screen.
- In the case of the SW□D5C-GOTRE-PACK
Set "Destination Screen" to "Upper Hierarchy" in "Change Screen" of the changed-over base screen.

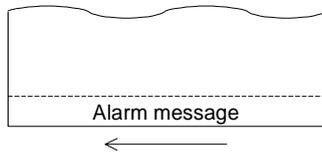
3) Printing

When an alarm has occurred, the date of occurrence and a corresponding alarm message can be printed.

Alarm messages should have been entered in half-width characters. The communication condition of the used printer should have been set in "SERIAL PORT" in "SET-UP MODE" in the GOT.

4) Flow display (valid when the SW□D5C-GOTRE-PACK is used)

When an alarm device becomes ON, a corresponding alarm message is displayed at the bottom of the user screen.



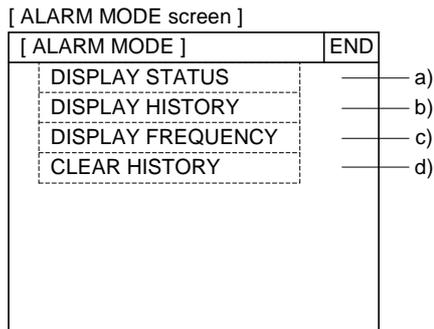
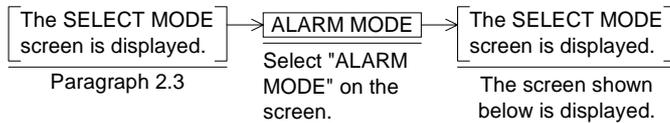
- A message is flown from the right to the left.
- When two or more alarms have occurred, corresponding messages are displayed in the ascending order of alarm device No.
- When alarm devices become OFF, alarm messages disappear.
- Alarm messages are displayed transparently on the user screen, so keys on the user screen are effective.

It can be set by editing "Common Setting"- "Auxiliary Setting"- "Screen" in the screen creation software whether or not the flow display is to be performed. (In the initial value, the flow display is effective.)

6.1.2 Alarm function in alarm mode

In the alarm mode, the alarm function described below is offered.

◆Basic operation



a) DISPLAY STATUS

Displays the list of messages corresponding to alarm devices which are ON currently. Alarm devices in the ON status can be reset from the GOT.

b) DISPLAY HISTORY

Stores and displays alarm occurrence date/time and alarm messages in the order of occurrence.

Up to 1,000 alarms can be stored.

c) DISPLAY FREQUENCY

Stores the number of ON (frequency) of each alarm device, and displays the frequency in the order of alarm device No.

Up to 32,767 cases can be stored.

d) CLEAR HISTORY

Clears all of the alarm history and the alarm frequency.

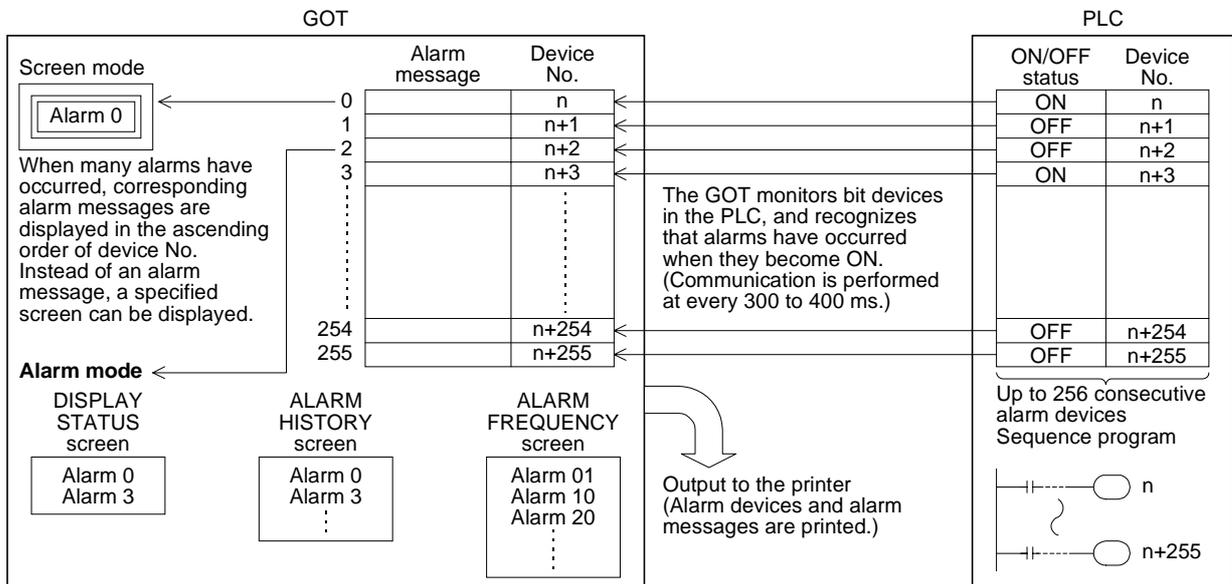
The system screens a) to d) (Nos. 1008 to 1011) can be displayed also in the screen mode.

6.2 Operation when alarms have occurred

The figure below shows the outline of operation performed when alarms have occurred.

When a bit device assigned as an alarm device becomes ON (OFF → ON), the GOT recognizes that an alarm has occurred.

When two or more alarms have occurred, the GOT recognizes them one by one in turn.



- The ON/OFF status of alarm devices are read every time communication is performed (at every 300 to 400 ms) between the GOT and the PLC when the FX-PCS-DU/WIN-E is used or at the time interval (variable within the range of 600 to 100 ms) set by "Monitor Cycle" in "Alarm History Common Setting" when the SW□D5C-GOTRE-PACK is used.
- Inside the GOT, alarm messages are displayed (overlying on the user screens) or a specified screen is displayed in the screen mode, alarm devices are stored in the history and their frequencies are counted in the alarm mode in accordance with the contents set preliminarily in the screen creation software.
- When two or more alarms have occurred, they are sorted in the ascending order of alarm device No. in the alarm list and stored in the alarm history in the order of occurrence. When the SW□D5C-GOTRE-PACK is used, the alarm history can be stored in the order of occurrence (from the oldest one) or in the reverse order of occurrence (from the latest one).
- In the alarm history and the alarm frequency, up to the following number of cases can be stored respectively. They are stored even if the power is turned off.

Alarm history : Up to 1,000 cases

If 1,001 or more alarms have occurred, the record is updated while excessive alarms are deleted from the oldest one. (When the SW□D5C-GOTRE-PACK is used, it can be set so that excessive alarms are deleted from the latest one.)

Alarm frequency: Up to 32,767 cases

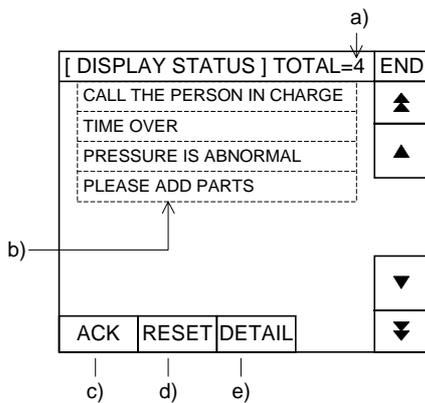
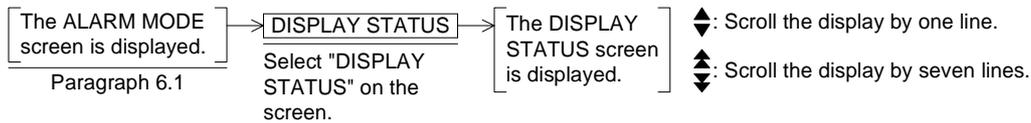
Even if more alarms have occurred, 32,767 cases remain stored.

- If an alarm has occurred in any mode other than the screen mode, the occurrence history and the frequency are recorded. The display can be changed over to a specified screen, and the alarm can be output to the printer. (However, the alarm message does not overlay the base screen displayed at that time.)

6.3 Alarm list

This paragraph describes the operating procedure to display the alarm list in the alarm mode. In alarm status, alarm devices in the ON status are displayed together with corresponding alarm messages. Alarms can be confirmed (using the ACK key) and alarm devices reset. The alarm list is displayed in the ascending order of alarm device No.

◆ Basic operation



a) Number of alarm devices in the ON status

b) Alarm message

- When the FX-PCS-DU/WIN-E is used, comments created in "Alarms" are displayed.
- When the SW□D5C-GOTRE-PACK is used, comments which are created in "Comment Creation" and specified by "Comment No." in "Alarm History Common Setting"-"Device Monitor"-"Edit" are displayed.

c) ACK key

d) RESET key

e) DETAIL key to display a detailed message

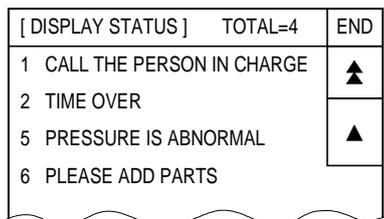
- The ACK, RESET and DETAIL keys can be set using the screen creation software.

	FX-PCS-DU/WIN	SW□D5C-GOTRE-PACK
ACK key	✓	✗
RESET key	✓	✓
DETAIL key	✗	✓

1) Confirmation operation (valid when the FX-PCS-DU/WIN-E is used)

The operator can perform this operation to confirm that alarms have occurred.

Place the cursor in an alarm to be confirmed using the scroll keys, and press the ACK key c).



If the alarm device is OFF when the ACK key is pressed, the corresponding alarm message is deleted from the alarm list and alarm messages after that are shifted upward.

If the alarm device is ON when the ACK key is pressed, the corresponding message remains displayed.

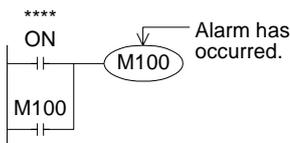
To reset (set to OFF) an alarm message, perform the reset operation described below.

2) Reset operation

An occurred alarm (auxiliary relay in the ON status) can be reset to OFF. Place the cursor in an alarm to be reset using the scroll keys, and press the RESET key 4). When the alarm device (auxiliary relay) is reset, the corresponding alarm message is deleted from the list.

However, when the RESET key is set together with the ACK key, the corresponding alarm message in the list is not deleted even if the alarm device is set to OFF. In such a case, perform the confirmation operation described above.

In the sequence program shown below in which an auxiliary relay becomes ON again even if it is set to OFF once by the reset operation, the alarm device cannot be reset to OFF.



For example, even if M100 is reset to OFF, M100 will become ON again if the contact **** is ON.

Change the program so that the contact **** which causes the alarm device M100 to become ON is set to OFF.

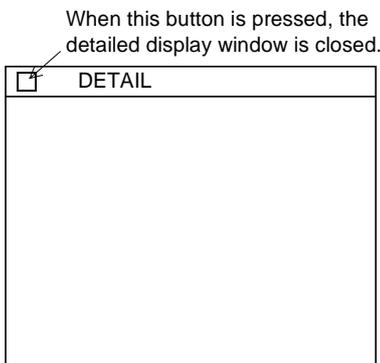
* To make the reset operation effective, make sure to set the reset function effective in the alarm setting in the screen creation software.

3) Detail display (valid when the SW□D5C-GOTR-PACK is used)

The alarm message list (comment window) or the base screen can be changed over to the detailed display.

To enable the detailed display, "Detail Display Destination" in "Alarm History Common Setting" in the screen creation software should be set to "Comment Window" or "Base Screen".

- When "Comment Window" is selected



- Place the cursor in an alarm message to be displayed to details, and press the DETAIL key. Then, the detailed display window is open as shown on the left.
- Comments which are created in "Comment Creation" and specified by "Comment No." in "Alarm History Common Setting"- "Device Monitor"- "Edit" are displayed.

*When the FX-PCS-DU/WIN-E is used, comments in the alarm list are displayed.

- When "Base Screen" is selected
The screen of screen No. specified in "Detail Display No." in "Alarm History Common Setting"- "Device Monitor"- "Edit" is displayed.

6.4 Alarm history display

This paragraph describes the operating procedure to display the alarm history in the alarm mode.

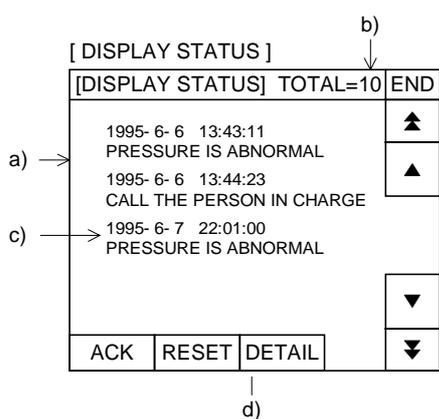
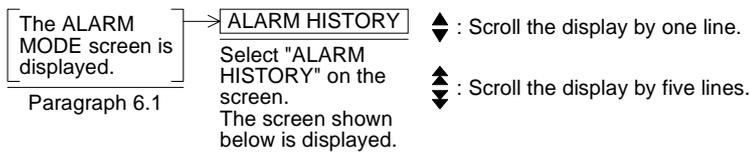
In the alarm history, alarm devices which have become ON so far are displayed together with the date of occurrence and corresponding alarm messages in the order of occurrence.

Up to 1,000 cases can be stored in the alarm history. When more alarms have occurred, excessive alarm history data is deleted from the oldest one and the latest data is stored. (The alarm history is displayed from the oldest alarm.)

When the SW□D5C-GOTRE-PACK is used, the order of display (from the oldest alarm or from the latest alarm) can be specified in "Alarm History Common Setting".

The alarm history can be deleted using the procedure described in "6.6 Alarm history clear".

◆Basic operation



- a) Five alarms in the order of occurrence
- b) Total number of alarms stored in the history
- c) Date of alarm and corresponding alarm message
- d) DETAIL key to display alarm messages to details

* The ACK key is provided so that the operator can confirm that alarms have occurred.
 The RESET key resets occurred alarms (auxiliary relays in the ON status) to OFF.
 Even if the RESET key is pressed, corresponding alarms are not deleted from the history.
 For the DETAIL key, refer to "(3) Detail display" in the previous paragraph.

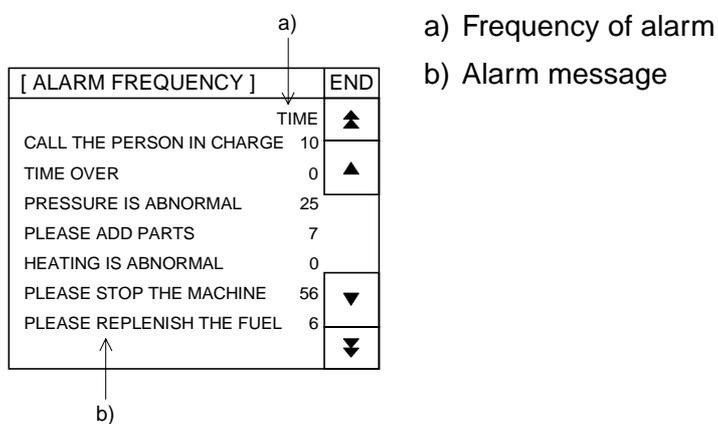
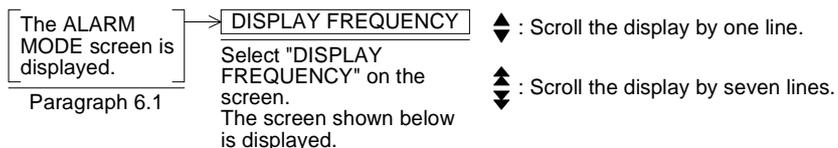
6.5 Alarm frequency display

This paragraph describes the operating procedure to display the alarm frequency in the alarm mode.

The frequency (number of occurrences) of each alarm is displayed in the ascending order of alarm device No.

Up to 32,767 cases can be stored.

◆Basic operation



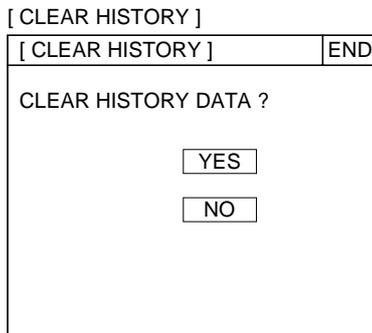
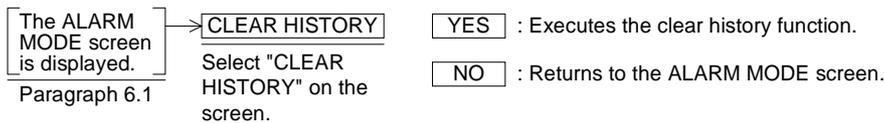
- a) Frequency of alarm
- b) Alarm message

6.6 Alarm history clear

This paragraph describes the operating procedure to clear the alarm history in the alarm mode.

The clear history function deletes both the alarm history and the alarm frequency result.

◆Basic operation

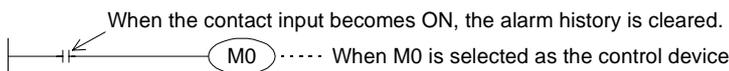


- When the message "COMPLETED!" is displayed, the history has been cleared.
- By setting a control device (system information) to ON, the alarm history can be cleared from the PLC.

When the screen creation software for DU (FX-PCS-DU/WIN-E) is used

When the first bit (b0) of a control device becomes ON, the alarm history is cleared.

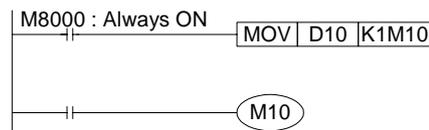
Example: When M0 is selected as the control device



When the screen creation software for GOT-A900 (SW□D5C-GOTRE-PACK) is used

When the first bit (b0) of the head read device (word device) becomes ON, the alarm history is cleared.

Example: When D10 is selected as the head read device



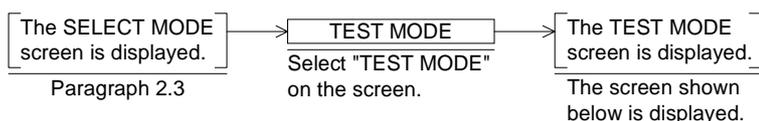
By using a device specified in "History Clear Trigger" in "Alarm History Common Setting" in the screen creation software, the alarm history can be cleared in the same way.

7. Test Mode

This section describes the test mode in which the user screen list can be displayed, data files can be edited, and debugging can be performed to confirm key operations.

7.1 Outline of test mode

◆ Basic operation



[TEST MODE]	
[TEST MODE]	END
USER SCREEN	a)
DATA BANK	b)
DEBUG	c)

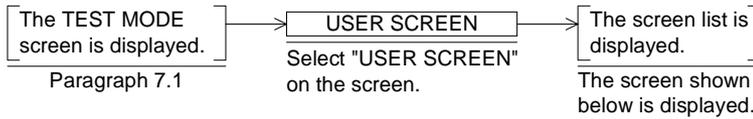
- a) **USER SCREEN**
The list of user screens displayed in the screen mode can be displayed.
- b) **DATA BANK**
Data files created using the screen creation software can be changed.
- c) **DEBUG**
Touch key operations and screen changeover operations can be checked.

7.2 USER SCREEN

When "USER SCREEN" is selected on the TEST MODE screen, the list of user screens displayed in the screen mode can be displayed.

Transferred screen data can be checked whether they are normal, and display images can be checked.

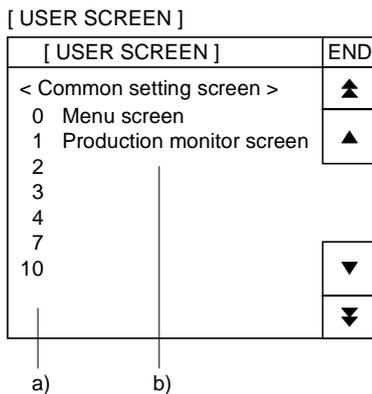
◆ Basic operation



< Common setting screen > : Displays the screens written in the common setting in the screen creation software.

Individual screen : When an area indicating a screen No. and a screen name is pressed, the corresponding screen is displayed.
When a screen contains incorrect data and cannot be displayed, "X" is displayed on the side of the screen.

◆ : Scroll the display by one line. ◆◆ : Scrolls the display by five lines.



- a) Screen No.
- b) Screen name

- When a screen to which "X" is added in the individual screen list is pressed, the message window "BAD OBJECT EXISTS." is displayed. In such a case, correct the screen using the screen creation software.

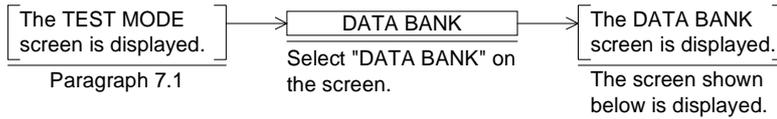
7.3 DATA BANK

Data files created using the screen creation software can be edited.

By selecting the test mode and select "DATA BANK" on the screen, data saved in data files can be changed.

The amount of data and the number of files can be set using the screen creation software. The function described here is available only to change the data saved in data files.

◆Basic operation



BANK : Allows to specify a file No. The screen No. currently edited is displayed on the screen.

SET : Displays the keyboard and allows to change the data indicated by the cursor.

◆ : Move the cursor. ⬆️⬆️⬆️ : Scroll the display by 14 files.

[DATA BANK SCREEN]			
[DATA BANK SCREEN]			END
a) ▶	D 0[	10]	D 7[80]
	D 1[	20]	D 8[90]
	D 2[	30]	
	D 3[	40]	
	D 4[	50]	
	D 5[	60]	
	D 6[	70]	
c) —	SET	BANK	▼ ▼ ▲ ▲
b) —	BANK NUMBER=7/BANK TOTAL=10		

a) Cursor

b) SET
Designates the data to be edited.

c) BANK
Allows to select a file to be edited.

- WATCH

When the WATCH key is pressed, effective settings for screen changeover on the currently displayed user screen are displayed.

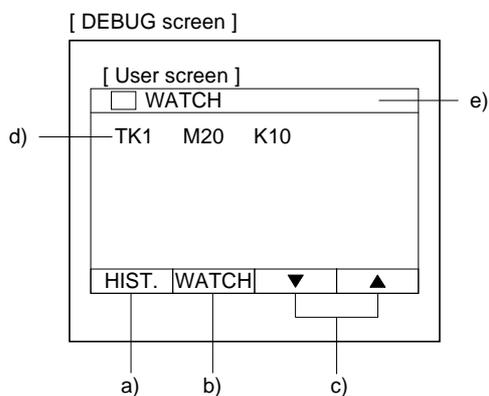
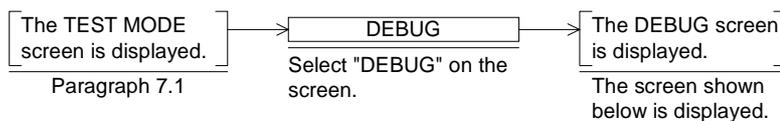
Touch key Nos., bit device conditions and changeover destinations are displayed in this order.

< Display example >

TK1 M10 K50 : If M10 is ON when the touch key 1 is pressed, the screen is change over to the screen No. 50.
The changeover destination is expressed in the same way as the history list.

Touch key No. ↑ ↑ ↑
Bit device condition ↑ ↑ ↑
Changeover destination ↑ ↑ ↑

◆ Basic operation



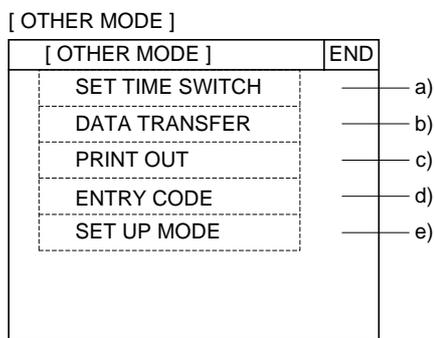
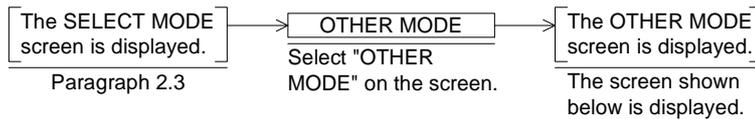
- a) HIST.
Displays the history list of switch operations and screen changeover operations.
- b) WATCH
Displays effective settings for screen changeovers.
- c) Cursor control keys
- d) History/watch list
The history/watch list is displayed using abbreviations described in the previous page.
- e) Window movement
When the area e) is touched and an arbitrary position is touched next, the window is moved to the latter position.

8. Other Mode

This section describes the other mode in which convenient functions such as time switch, printer output and operation environment are offered.

8.1 Outline of other mode

◆ Basic operation



- In the other mode, the following functions are offered.
 - a) SET TIME SWITCH
Turns on the specified bit device during the specified time.
This function is valid when the screen creation software FX-PCS-DU/WIN-E is used.
 - b) DATA TRANSFER
Transfers user screens, the alarm history and the sampling data between the screen creation software.
 - c) PRINT OUT
Prints out the sampling data, the alarm history, etc.
 - d) ENTRY CODE
Registers an entry code to protect sequence programs in the PLC.
 - e) SET UP MODE
Allows to set the environment required to operate the GOT such as the system language and the connected PLC.

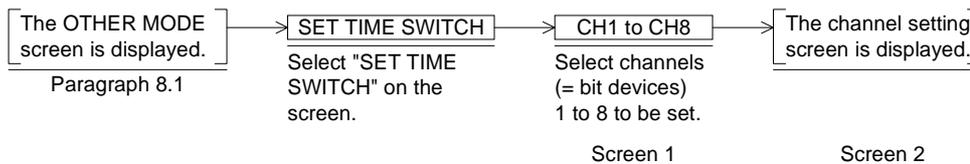
8.2 SET TIME SWITCH

Set the time switch using the clock function built in the GOT.

This function turns on up to 8 consecutive bit devices during the set time when the specified day of the week and the time have come.

Target bit devices can be specified using the screen creation software FX-PCS-DU/WIN-E.

◆Basic operation



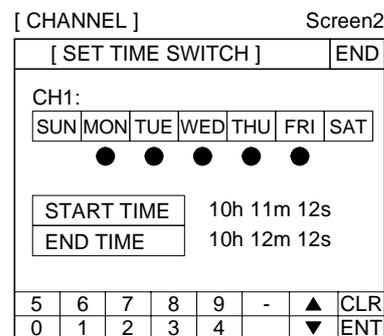
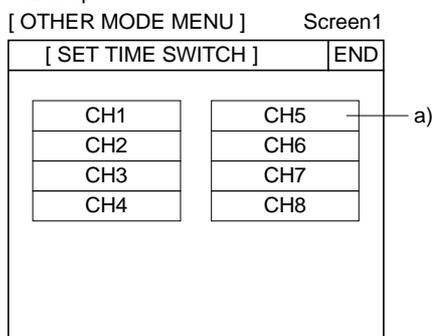
Day of the week : Select desired days of the week by pressing them. "●" is added to selected days of the week.

When a day of the week marked with "●" is pressed again, selection is canceled.

START TIME : Set the time at which the specified bit devices become ON. The devices will remain ON from the start time to the end time on the selected days of the week.

END TIME : If the end time is earlier than the start time, the specified bit devices remain ON until the following day (even if the following day is not selected).

< Example >



a) Target bit devices

Specify up to 8 consecutive devices.

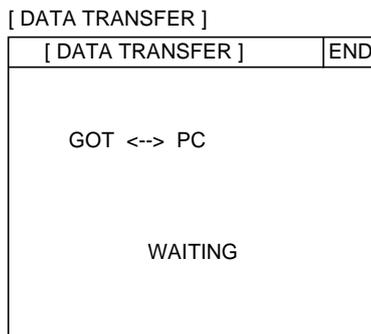
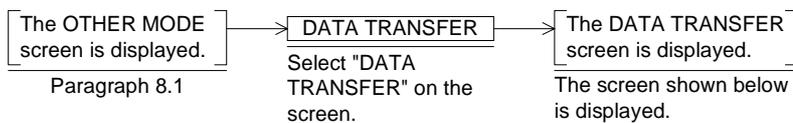
- In the setting on the screen 2, (CH1) M100 will remain ON from 10h 11m 12s to 10h 12m 12s on Monday to Friday.

8.3 DATA TRANSFER

The screen data, the sampling data and the alarm history can be transferred (read/written) between the GOT and a peripheral unit for screen creation (personal computer).

◆Basic operation

- By the following operation, the DATA TRANSFER screen is displayed.
The following screen is displayed also without regard to the screen displayed at that time when the screen data is transferred from a personal computer to the GOT. And when transfer is finished, the screen No. 0 is displayed when the DU/WIN-E is used or the screen No. 1 is displayed when the GOT-A900 is used.



■Important point

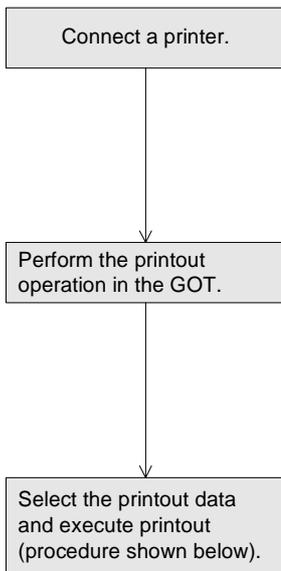
- Data transfer to personal computer during sampling
Have in mind the following contents when transferring the data from/to a personal computer while sampling is performed.
 - PC → GOT : Sampling currently performed is aborted.
The sampling data acquired so far is saved.
 - PC ← GOT : Sampling is continued, and the acquired sampling data is saved.
 - PC ↔ GOT : Sampling is continued, and the acquired sampling data is saved in the same way as "PC ↔ GOT".

8.4 PRINT OUT

The sampling data and the alarm history can be printed.

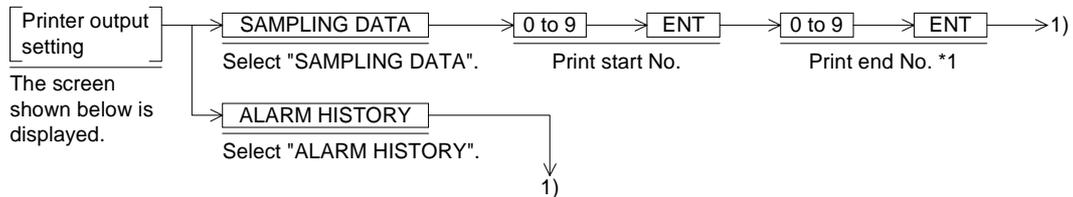
Because the communication setting can be performed in accordance with each printer, diversified printers equipped with RS-232C interface can be used.

The communication setting for the printer can be performed in "SET-UP MODE" in the GOT or using the screen creation software.

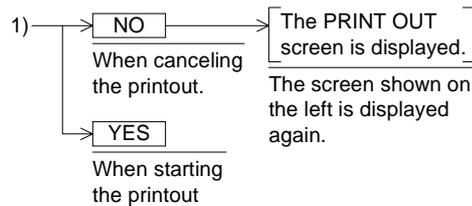
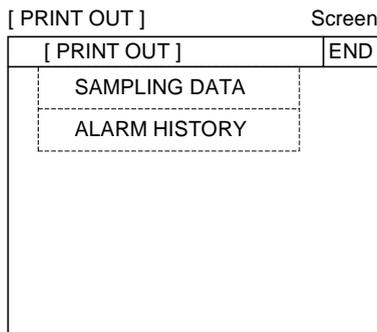


- Connect a printer to the GOT, and power up.
- Manipulate the GOT, and select "PRINT OUT" on the OTHER MODE screen.
- Select the data to be printed out. The sampling data and the alarm history are available. For the sampling data, the print range can be set.

◆ Basic operation



*1 Print end No., do not enter a numeric larger than the value displayed on the screen. (The value displayed on the screen indicates the total number of sampled data.)



Examples of printout

- Sampling data

```
***** SAMPLING DATA *****
*
* COND. :M 200 OFF->ON *
*
*
*
* START : 27/ 2/1999 19:45:20 *
*
*****
```

NUMBER	TIME	DATA			
1	19:45:23	0	-675	558	7
2	19:45:47	27	0	7142	612
3	19:46:31	262	-765	0	1276
4	19:46:44	262	0	0	0
5	19:47:25	-7329	271	842	6926

↑ Sampling device 1
 ↑ Sampling device 2
 ↑ Sampling device 3
 ↑ Sampling device 4

- Alarm history

```
***** ALARM HISTORY *****
*
* TOTAL : 5 *
*
*
*
* START : 27/ 2/1999 19:48:04 *
*
*****
```

NO.	DATE	TIME	MESSAGE
1	27/ 2/1999	19:48:04	TROUBLE #2
2	27/ 2/1999	19:48:08	TROUBLE #1
3	27/ 2/1999	19:48:12	TROUBLE #3
4	27/ 2/1999	19:48:17	TROUBLE #5
5	27/ 2/1999	19:48:22	TROUBLE #3

8.5 ENTRY CODE

When an entry code is registered to the PLC, changes to the set values of timers and counters in the screen mode and the monitor mode are forbidden. However, the current values can be changed.

ENTER

Allows to register an entry code to the PLC.

This entry code is shared by other peripheral units. Enter an 8-digit (FX Series) or 6-digit (A Series) hexadecimal numeric.

INPUT ENTRY CODE: ○○○○○○○○

The entered entry code becomes effective when the power of the GOT is turned off, then turned on again.

DELETE

Deletes the existing entry code.

The existing entry code can only be deleted after it was first been entered in the unit.

UNLOCK

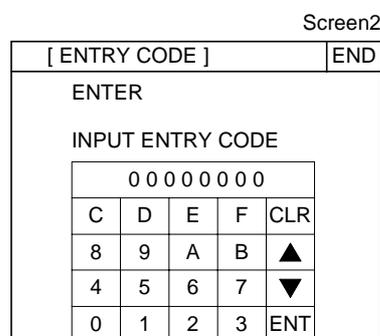
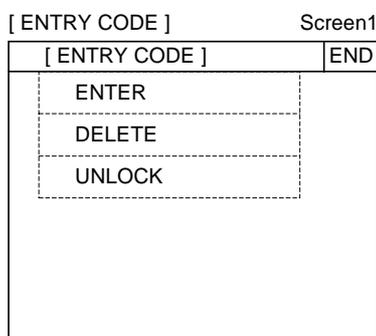
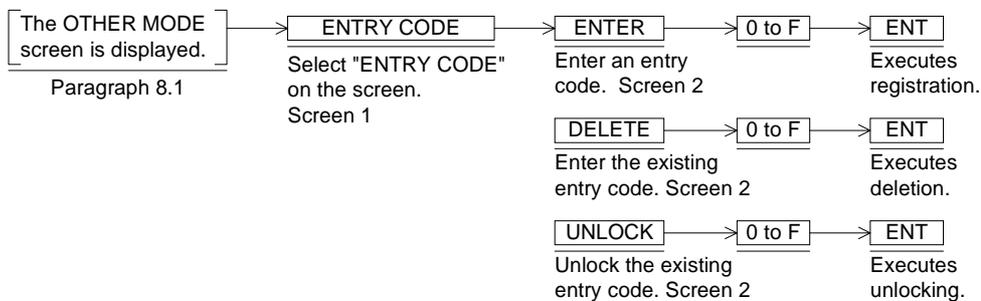
Unlocks temporarily the existing entry code. (The entry code is kept registered.)

The unlock function is valid until the power of the GOT is turned off.

Note:

When you have forgotten the existing entry code, execute "all clear" in a peripheral unit. However, have in mind that all of the data including programs in the PLC are deleted by "all clear". It is recommended not to forget the entry code.

◆Basic operation

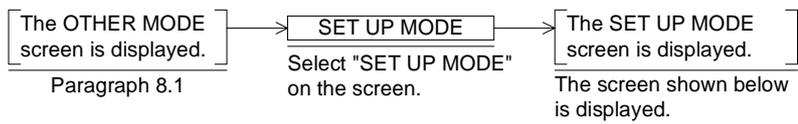


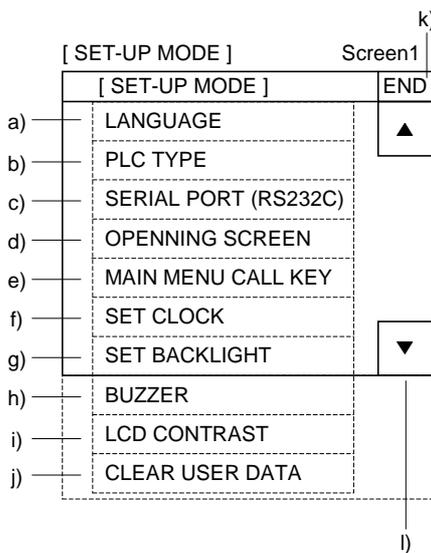
8.6 SET UP MODE

Set the operation environment required to operate the GOT such as the system language and the connected PLC.

For the detailed setting contents, refer to "2. Start up".

◆Basic operation





Areas enclosed with broken lines indicate touch keys. (Broken lines are not actually displayed on the screen.)

- a) LANGUAGE
Allows to set the language such as Japanese or English used in the system screens.
- b) PLC TYPE
Allows to set the connected PLC type.
- c) SERIAL PORT
To be set when a printer is connected to the GOT or when transfer is performed with a micro computer board.
- d) OPENNING SCREEN
Allows to set the duration in which the title screen is displayed immediately after the power of the GOT is turned on.
- e) MAIN MENU CALL KEY
Allows to set the positions of the touch key which calls the SELECT MODE screen in the screen mode (that is, while a user screen is displayed).
- f) SET CLOCK
Allows to set the time used as the reference for the time switch and the time display.
- g) SET BACKLIGHT
Allows to set the time at which the backlight is turned off after a continued idle period.
- h) BUZZER
Allows to set whether or not a buzzer sound is issued when a key is pressed.
- i) LCD CONTRAST
Allows to set the LCD contrast.
- j) CLEAR USER DATA
Deletes the entire user screen data.
- k) END
Terminates the operation environment setting.
- l) Cursor
Changes over selection of the menu item.

9. Creation of Display Screens

Display screens for the F940GOT can be created using the screen creation software for DU and the screen creation software for GOT-A900 shown below.

- Software for DU
FX-PCS-DU/WIN-E V2.00 or later (compatible with the Windows95)
- Software for GOT-A900
SW□D5C-GOTRE-PACK ("□" indicates a numeric not less than 1.)
(compatible with the Windows95 and the WindowsNT)



- a) Data can be read from and written to the F940GOT using the screen creation software for DU.
- b) Data can be read from and written to the F940GOT using the screen creation software for GOT-A900.

This section describes the compatibility of data when these screen creation software are used. For the operating procedures for the software, refer to the software operation manual offered separately.

9.1 Outline of compatibility of screen data

Display screens for the F940GOT can be created using either the software for DU or the software for GOT-A900. The differences between these two are shown below.

Screen creation software for DU (FX-PCS-DU/WIN-E)		F940GOT	Screen creation software for GOT-A900 (SW1D5C-GOTRE-PACK)
a)	Functions dedicated to DU	Indicator, Overlay Screen, Buzzer, Data Setting and Send Data Bank	
		External character	
		Sampling condition setting	
		Time switch	
		Device comment	
b)	Common functions	Common area	
c)	Functions dedicated to A900		Line Freeform, Polygon, Sector, Arc, Scale and Paint
			Data List, Level and Part Movement
			Report
			Hard copy
			Voice
			Debug
			Window screen and station No. changeover

- a) Functions dedicated to the screen creation software for DU (Refer to Paragraph 9.1.1.)
 These functions of the F940GOT are supported by only the screen creation software for DU.
 These functions cannot be read nor written using the screen creation software for GOT-A900.
- b) Common functions (Refer to Paragraph 9.1.2.)
 These functions are supported by both the screen creation software for DU and the screen creation software for GOT-A900.
 However, some function names are different and some functions are restricted in each software. Refer to "9.1.2 Common functions".
- c) Functions dedicated to the screen creation software for GOT-A900 (Refer to Paragraph 9.1.3.)
 These functions are supported by only the screen creation software for GOT-A900. They are not supported by the F940GOT nor the screen creation software for DU.

9.1.1 Functions dedicated to screen creation software for DU

The functions shown below are effective only when the screen creation software for DU is used.

These functions are not available when the screen creation software for GOT-A900 is used.

1) Screen display

Lamp: The specified area on the screen can be inverted (Or colors can be replaced.).

Buzzer: When a specified bit device in the PLC becomes ON, the GOT issues buzzer sound.

Send Data Bank: When a specified touch key is pressed, the current value of a 16-bit data register in the GOT is transferred to a data register (D) in the PLC.

External character: Symbols of 16 x 16 bits created by the user can be displayed.

2) Sampling condition setting

The condition of the sampling function explained in Section 5 can be set.

*The condition can be set in the F940GOT main body.

3) Time switch

The time switch function explained in Section 8 can be set.

4) Device comment

This is the device monitor function in the HPP mode explained in Section 4. By using this function, comments can be displayed instead of device Nos.

■ Important point

Note : When the functions (1) to (4) above are used, they are treated as follows in the screen creation software for GOT-A900.

- Read of data to the software for GOT-A900
The screen data excluding the functions (1) to (4) above is read.
Even when the data is read, the screen data in the F940GOT main body is not changed.
- Write of data to the F940GOT
The function (1) to (4) above cannot be set.
When data is written from the screen creation software for GOT-A900 to the F940GOT using the functions (1) to (4) above, the functions (1) to (4) in the F940GOT are deleted.
Accordingly, the functions (1) to (4) should be set again using the screen creation software for DU.

Background color of screen

- When the screen data created using the screen creation software for DU is read using the screen creation software for GOT-A900, every background color of the screen is converted into black.
- In the screen creation software for GOT-A900, the background color is black in any case.
To change the background color, paint the entire screen using the "Paint" object.

9.1.2 Common functions

The functions shown below are available in both the screen creation software for DU and the screen creation software for GOT-A900. The table below shows the difference in names in accordance with the setting contents of the set items (attributes).

When the functions shown below are read or written using the other software, their names are automatically converted.

In this manual, different function names are used in accordance with the screen creation software from Section 10.

Display function

Name in screen creation software for GOT-A900	Difference in set item (attribute)	Name in screen creation software for DU
Numerical Display	←When setting is forbidden	Number
Numerical Input	←When setting is permitted	
Ascii Display	←When setting is forbidden	Ascii
Ascii Input	←When setting is permitted	
Comment	In case of word device→	Library Text
	In case of bit device→	Text Indicator
Part Display	In case of word device→	Library Image
	In case of bit device→	Image Indicator
Lamp		Label Indicator
Panelmeter	Shape displayed on screen is different.	Panel Meter Circle Graph
Clock	Japanese is not available in screen creation software for GOT-A900.	Date
	Japanese is not available in screen creation software for GOT-A900.	Time
Trend	Sampling is available in background processing.	Trend Graph (Sampling)
Line		Trend Graph (Total)
Statistics	In case of bar graph→	Proportional Bar Graph
	In case of circle graph→	Proportional Pie Graph
Bar	Reference value is equivalent to upper or lower value. Only one data can be set at a time.→	Bar Graph
Line	Line type cannot be selected.→	Line
Rectangle	Line type cannot be selected.→	Box
Circle	Ellipse is not available.→	Circle
Bit map	←Saved in parts file.	Image
Text	Name is different.	Text

Make sure to read the next page also.

Key functions

Name in screen creation software for GOT-A900	Difference in set item (attribute)	Name in screen creation software for DU
Bit operation (bit momentary)	Names are different.	Switch (momentary)
(bit ALT)		Switch (alternate)
(bit SET)		Switch (set)
(bit RST)		Switch (reset)
Base changeover	←Bit condition, etc. cannot be converted.	Change Screen
Word operation (Indirect + Fixed value)	Names are different.	Increment
(Indirect + Fixed value)		Decrement
(Fixed value)		Write Constant

Others

Name in screen creation software for GOT-A900	Difference in set item (attribute)	Name in screen creation software for DU
Parts	Only bit map is converted. →	Image library
Comment	Names are different.	Text library
System information	←Role of each device is different.	Control device
Pass word	Names are different.	Entry code

- In detail setting (attribute) of each function, the set value/current value of word devices can be specified in the software for DU, and only the current value of word devices can be specified in the software for GOT-A900.

- The table below shows the settings specific to the screen creation software for GOT-A900 among the common items. These settings are not available in the F940GOT. (These settings are not supported by the screen creation software for DU, either.)

Display frame	The display frame can be selected among only images built in the system software. (On the other hand, in the A900GOT Series, arbitrary images can be selected.)
Arithmetic operation	The arithmetic operation function is not supported except some objects. In Numerical Display and Numerical Input, arithmetic operation can be performed only while the gains and the offset are specified (that is, while the arithmetic operation formula is fixed).
Display trigger	Only "Always" is available as the display trigger except in some objects. In line graphs, the display trigger is used to specify the sampling cycle.
Range specification	The color and the blink attribute cannot be changed over by a value of a word device. Only the range in the normal status can be specified.
Security	The security in the unit of screen is available, but the security in the unit of object is not supported. The available number of security levels is 15 in the same way as the A900GOT.
Multi-device monitor	In objects (such as Line Graph) monitoring two or more devices, only consecutive devices can be assigned. Random assignment is not available.

9.1.3 Functions dedicated to screen creation software for GOT-A900

The functions shown below are dedicated to the screen creation software GOT-A900. The functions are not supported by the F940GOT. (For the details of these functions, refer to the operation manual of the screen creation software for GOT-A900.)

1) Screen display

- Line Freeform : Displays a line indicating a zigzag or polygon in one stroke.
In the F940GOT, two or more lines can be used to display such a figure.
- Polygon : Displays a polygon.
In the F940GOT, two or more lines can be used to display a polygon.
- Sector : Displays a sector.
- Arc : Displays an eclipse.
- Scale : Displays the scale for bar graphs and panel meters
In the F940GOT, the scale function is given to bar graphs and meters.
- Paint : Paints (fills) a specified area (which may be a polygon).
In the F940GOT, boxes and circles can be filled.
- Data List : Displays the data list in the form of table.
- Level : Displays the level within a specified image range.
In the F940GOT, the level can be expressed in the form of bar graph (box).
- Part Movement : Moves displayed parts on a specified trace.

2) Printer output

- Report : Outputs the data to the printer in accordance with a specified format.
- Hard Copy : Outputs the display screen as it is to the printer.

3) Voice output

- Voices can be output.
In the F940GOT, buzzer sounds can be issued.

4) Window screen

- A window can overlay the display screen.

5) Station No. changeover

- When two or more A900GOT units access the PLC, the A900GOT unit No. which is to access the PLC can be specified.
In the case of F940GOT, up to four units can access the PLC without specifying the station No.

9.2 Transfer of screen data

Pay rigid attention to the cautions below when the screen data created using the screen creation software for DU is read/written using the screen creation software for GOT-A900 or when the screen data created using the screen creation software for GOT-A900 is read/written using the screen creation software for DU.

If unavailable setting is contained in the screen data, an alarm message is displayed when the screen data is read. In such a case, check the contents of the read screen data.



1) Screen data

- Read/write of the functions dedicated to the screen creation software for DU (Refer to Paragraph 9.1.1.)
 - a) Software for DU:
No problems are expected in both read and write.
 - b) Software for GOT-A900:
If the F940GOT has dedicated functions, such functions are not read.
- Setting of display screen changeover (Refer to Paragraph 9.1.2.)
 - a) Software for DU:
Names and contents of the functions are automatically converted into those used in the software.
 - b) Software for GOT-A900:
Names and contents of the functions are automatically converted into those used in the software.
- Functions dedicated to the screen creation software for GOT-A900 (Refer to Paragraph 9.1.3.)
 - a) Software for DU:
These functions cannot be set in the F940GOT. (That is, these functions cannot be read nor written.)
 - b) Software for GOT-A900:
These functions cannot be set in the F940GOT. (That is, these functions cannot be read or written.)

2) Setting of display screen changeover

- Screen No. (Refer to Paragraph 9.4.2.)
 - a) Software for DU:
Screen Nos. are automatically converted into Nos. 0 to 499, then transferred (in both read and write).
 - b) Software for GOT-A900:
Screen Nos. are automatically converted into Nos. 1 to 500, then transferred (in both read and write).
- * **When the No. of a screen to be displayed is specified from the PLC, a converted screen No. is transferred to the F940GOT. Accordingly, the used sequence program is required to be changed.**
- Handling of common setting screen
The contents set on the common setting screen in the screen creation software for DU are treated as the screen No. 501 in the screen creation software for GOT-A900. However, the screen No. 501 is treated as a user screen, so the contents of the screen No. 501 are not shared by all screens in the same way as the screen creation software for DU. The screen overlay function (overlap window 1 or 2) or the screen call function should be used so that the contents of the screen No. 501 are shared by all screens.

9.3 Use of data in FX-50DU-TK(S)-E

By using the screen creation software FX-PCS-DU/WIN-E, the screen data in the FX-50DU-TK(S)-E can be converted and used for the F940GOT.

The compatibility of the data in such a case is described below.

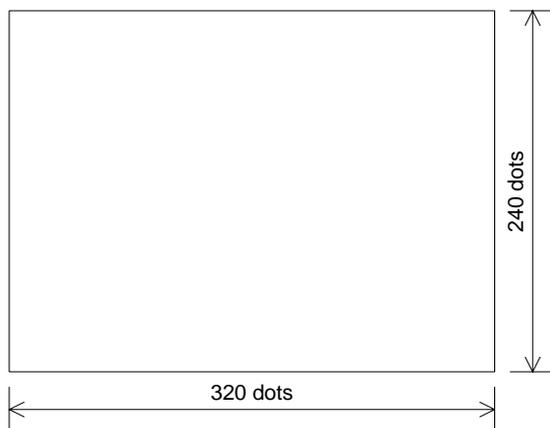
- How to use the screen data
When the model is changed from FX-50DU to F940GOT using the FX-PCS-DU/WIN-E (V2.00 or later), the screen data is converted so that it can be used in the F940GOT.
- Cautions on conversion
Pay close attention to the following cautions during conversion.
 - 1) Alarm function
The alarm notification method, "Overlap", "Change Screen" or "Print" can be selected for each alarm in the 50DU. In the F940GOT, only one alarm notification method can be selected for all alarms (That is, one alarm notification method is used for every alarm.)
When the data in the 50DU is converted and used in the F940GOT, the alarm notification method selected in the head alarm device in the 50DU is adopted for every alarm.
 - 2) Display of user screens
 - a) Image, Library Image and Image Indicator
When a black-and-white image is selected as an image to be used using the functions above, the image can be displayed in colors other than black and white in the 50DU by specifying the colors.
In the F940GOT, the same operation can be performed using the "Indicator" function.
 - b) Number and Ascii
Only numerics and character codes can be changed on the display screen.
Data can be changed while "Permit" is selected in "Number" and "Ascii". When a numeric or character code on the screen is touched, the keyboard for data change is displayed to enable data change. (Each numeric and character code displayed on the screen, functions as a touch key.)
 - c) Keyboard
The display position of the keyboard for numerics and text can be moved on the screen in the F940GOT.
 - 3) Screen changeover function
In the F940GOT, if the key condition and the input condition are set to "Always" when the screen is changed over from the PLC (screen changeover using a control device in the PLC), the priority is always given to screen changeover by a control device in the PLC.
Accordingly, if both the key condition and the input condition are set to "Always" in the setting of screen changeover in the 50DU, the setting of screen changeover or the used sequence program should be changed. (Refer to Sections 11 and 13.)

9.4 Concept on screen display

- To display a screen
 - Each screen should be created using characters and graphics.
When the screen creation software for DU is used: Refer to Section 10.
When the screen creation software for GOT-A900 is used: Refer to Section 12.
- To change over screens
 - Screen changeover should be set.
When the screen creation software for DU is used: Refer to Section 11.
When the screen creation software for GOT-A900 is used: Refer to Section 13.

9.4.1 Screen display position

The screen size is shown below.



- The display position can be specified in the unit of dot.

9.4.2 Number of display screens and screen Nos.

- Up to 500 screens can be displayed.
- A screen No. is assigned to each display screen.
When the screen creation software for DU is used: Nos. 0 to 499
When the screen creation software for GOT-A900 is used: Nos. 1 to 500
- * Though the first screen No. is different, it is automatically converted while it is read in accordance with the used software.

9.4.3 Number of display elements and data capacity

Each display element is managed as screen data. The allowable number of screens and capacity are restricted as shown below.

Item	Description
Total screen data size	512 KB (including user screens, external characters, etc.)
Number of displayable screens	User screens: Up to 500 screens FX-PCS-DU/WIN-E: Nos. 0 to 499 SW[D5C-GOTRE-PACK: Nos. 1 to 500 System screens: 25 screens (Nos. 1001 to 1030)
Data size per screen	Up to 16,000 byte

9.4.4 Attribute of display element

The display elements shown in Paragraph 9.1.2 are equipped with detailed set items (attributes).

Representative attributes are explained below.

Display position:

Specify the X and Y coordinates of the display position.

Because the mouse is used for the screen creation software, coordinates specified by the mouse are registered.

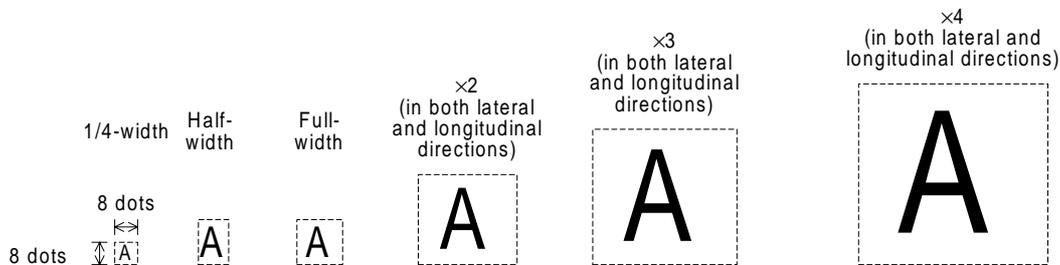
Character size:

Half-width character: 8×16 dots

Full width character: 16×16 dots

1/4-width character: 8×8 dots

$\times 0.5$ to $\times 4$ of full-width size in the lateral and longitudinal directions: Available only in alphabets, numerics characters



Color specification:

Color: White, black, red, blue, yellow, green, purple and light blue

Black-and-white: Black and white

- FX-PCS-DU/WIN-E: Display color, background color, needle color and frame color
- SW□D5C-GOTRE-PACK: Character color, plate color and frame color

Screen background color:

FX-PCS-DU/WIN-E: Eight colors or two colors (black and white) can be specified.

SW□D5C-GOTRE-PACK: Only black can be specified.

Device specification (specification of devices in the PLC):

- Word device:
 - Timer (T), counter (C), data register (D) and index register (V and Z) In the A Series, link register (W) and file register (R) are also available.
- Bit device:
 - Input (X), output (Y), auxiliary relay (M), state (S), timer (T) and counter (C)
 - In the A Series, F and B are also available.

Upper/lower limit:

Set the upper limit (maximum value) and the lower limit (minimum value) of displayed word devices.

Word devices are displayed within the range determined by the upper and lower limits.

9.5 Screen call function and overlay function

In the F940GOT, user screens can be overlaid.

The screen call function which allows to specify the screens to be overlaid using the screen creation software and the overlay function which allows to specify the screens to be overlaid from the PLC are available.

1) Screen call function (For the details, refer to Paragraph 9.5.1.)

Screens to be overlaid can be specified preliminarily using the screen creation software.

The base screen and up to five other screens can be overlaid at a time.

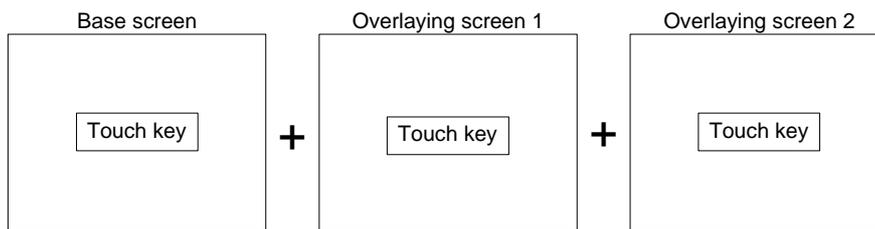
2) Overlay function (For the details, refer to Paragraph 9.5.2.)

When screens to be overlaid are specified from the PLC (Refer to Sections 11 and 13.), the base screen and up to two other screens can be overlaid at a time.

When this overlay function is used together with the screen call function, the screen call function is effective only for the base screen. The screen call function is not effective for the second and third screens to be overlaid.

(If the screen call function is used for the second and third screens, the base screen selected in the screen call function is overlaid by the overlay function.)

- In each of the screen call function and the overlay function, when other functions such as touch keys and numeric change are displayed, such other functions are effective on all of the overlaid screens. If such other functions are displayed in a same position, a function on the top screen is effective.



The base screen is located at the bottom.
If touch keys are displayed in a same position, the touch key on the overlying screen 2 located at the top is effective.

9.5.1 Screen call function

When the screen call function is used, screens are overlaid as shown below in accordance with the used screen creation software.

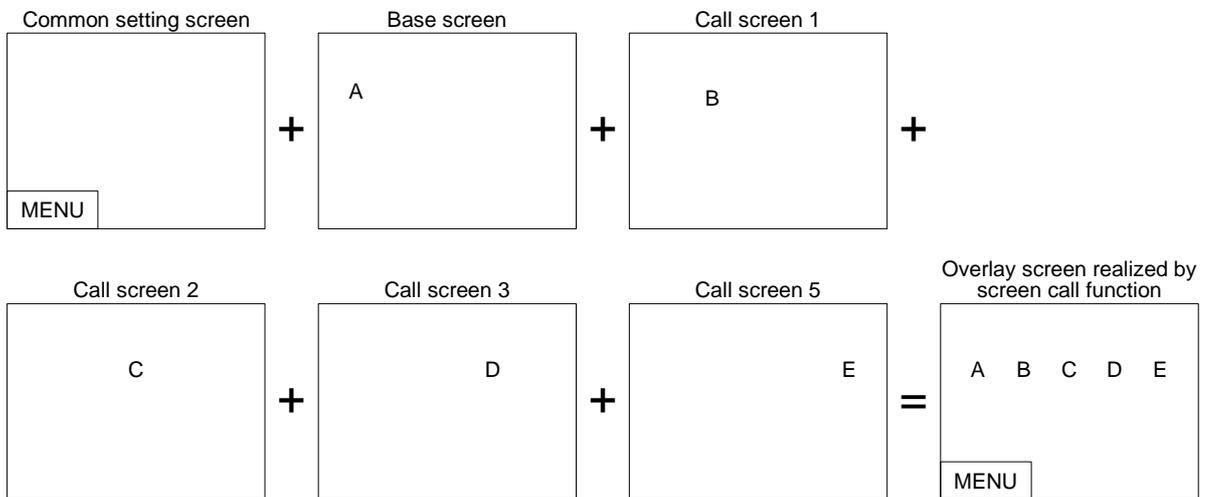
1) FX-PCS-DU/WIN-E for DU

When this software is used, 500 user screens Nos. 0 to 499 and the common setting screen for all screens can be overlaid.

The common setting screen for all screens (which is abbreviated as "common setting screen") is always overlaid by other screens.

Accordingly, when the screen call function is used, the common setting screen, the base screen and up to four other screens (that is, up to 6 screens in total) can be overlaid.

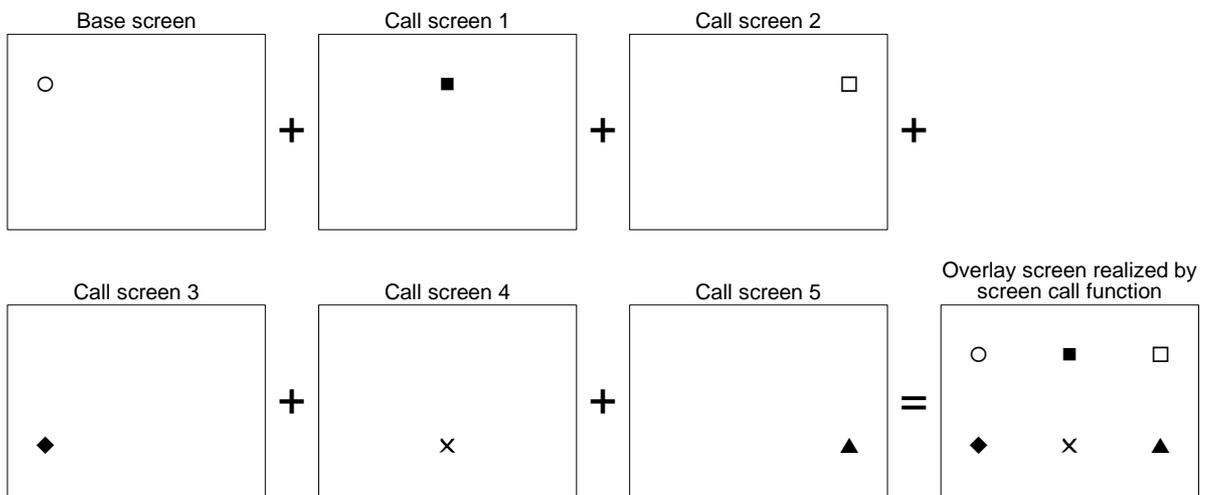
Display example



2) SW□D5C-GOTRE-PACK for GOT-A900

When this software is used, 500 user screens Nos. 1 to 500 can be overlaid.

When the screen call function is used, the base screen and up to five other screens (that is, up to 6 screens in total) can be overlaid.



9.5.2 Overlay function

The base screen and up to two other screens (3 screens in total) can be overlaid. Perform the following setting in accordance with the used screen creation software.

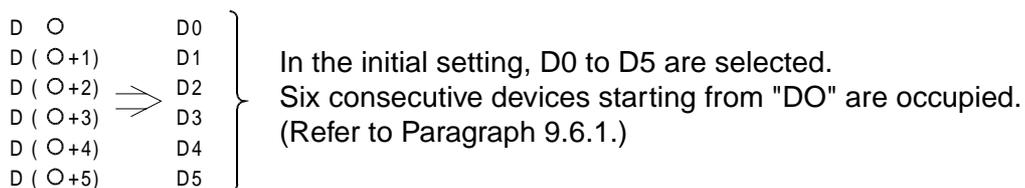
1) Setting in the FX-PCS-DU/WIN-E

Use control devices to realize screen overlay (Refer to Paragraph 9.6.1.).

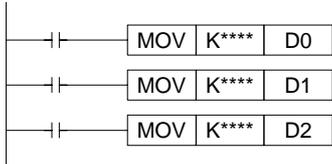
Bit devices and data devices are available as control devices. Only devices necessary for the overlay function are described here.

Data register (D), timer (T) and counter (C)

The screen Nos. to be overlaid can be specified using the contents of word devices set as control devices. The screen Nos. of the screens currently displayed can be monitored in the PLC.



D0 to D2 specify the screen Nos. to be displayed. D3 to D5 specifies the screen Nos. of the screens currently displayed.

F940GOT(FX-PCS-DU/WIN)	Sequence program
D0: Specifies the screen No. of the screen to be displayed as the first one. D1: Specifies the screen No. of the screen to be displayed as the second one. D2: Specifies the screen No. of the screen to be displayed as the third one.	 <p>When overlay is not performed, enter "-1" to both D1 and D2.</p>
D3: Stores the screen No. of the screen currently displayed. D4: Stores the screen No. of the second screen when two or three screens are overlaid. D5: Stores the screen No. of the third screen when three screens are overlaid.	<p>Monitoring in a peripheral unit User screen Nos. (0 to 500) and system screen Nos. (1,000 ~) are stored. When overlay is not performed, "-1" is stored in D4 and D5.</p>

■ Important point

- In the FX-PCS-DU/WIN-E, three screens can be overlaid even if the "Overlay Screen" object is used. In this case, however, the overlay function described here is not available.

In screen overlay, the screen specified by a word device is treated as the base screen, and the screens specified by "DO +1" and "DO +2" overlay the base screen. When overlaying screens, make sure to set "Destination Screen" of the "Change Screen" object to "PLC data register" and write the screen Nos. to be overlaid to word devices (D+0, D+1 and D+2) as shown in the table below. **When screen overlay will not be performed, enter "-1" or "FFFF (H)" to word devices.**

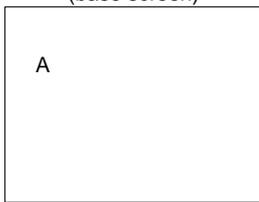
D+0	D+1	D+2	
Screen No.	-1	-1	Base screen
Screen No.	Screen No.	-1	Base screen + Overlaying screen 1
Screen No.	-1	Screen No.	Base screen + Overlaying screen 1
Screen No.	Screen No.	Screen No.	Base screen + Overlaying screen 1 + Overlaying screen 2

In the description below, data devices set as initial values are used.
Data devices: D0, D1 and D2

a) No overlay

- Only the screen specified by the control word device D0 is displayed.

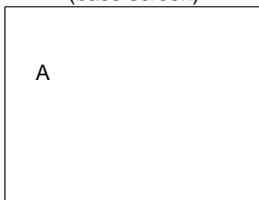
Screen specified by D0
(base screen)



b) Overlay of two screens

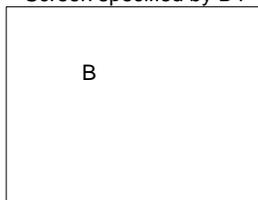
- Two screens specified by the control word devices D0 and D1 are displayed.
- Or two screen specified by the control word devices D0 and D2 can be displayed.

Screen specified by D0
(base screen)

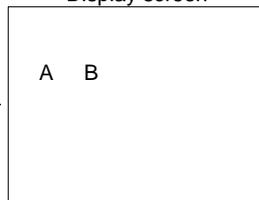


+

Screen specified by D1



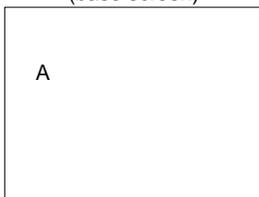
Display screen



c) Overlay of three screens

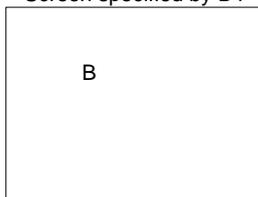
- Three screens specified by the control word devices D0, D1 and D2 are displayed.

Screen specified by D0
(base screen)



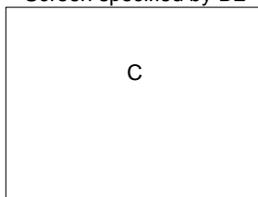
+

Screen specified by D1

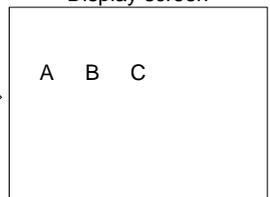


+

Screen specified by D2



Display screen



• Example of screen overlay

Screen overlay: Each process is monitored. When a material has run short, the material name is displayed on the screen, and a message is displayed to notify necessity of supplement of the material.

- Line selector switch
Line 1 input: X0
Line 2 input: X1
- Sensor (for bolt count)
Line 1 input: X2
Line 2 input: X3
- Supplement confirmation button: X4

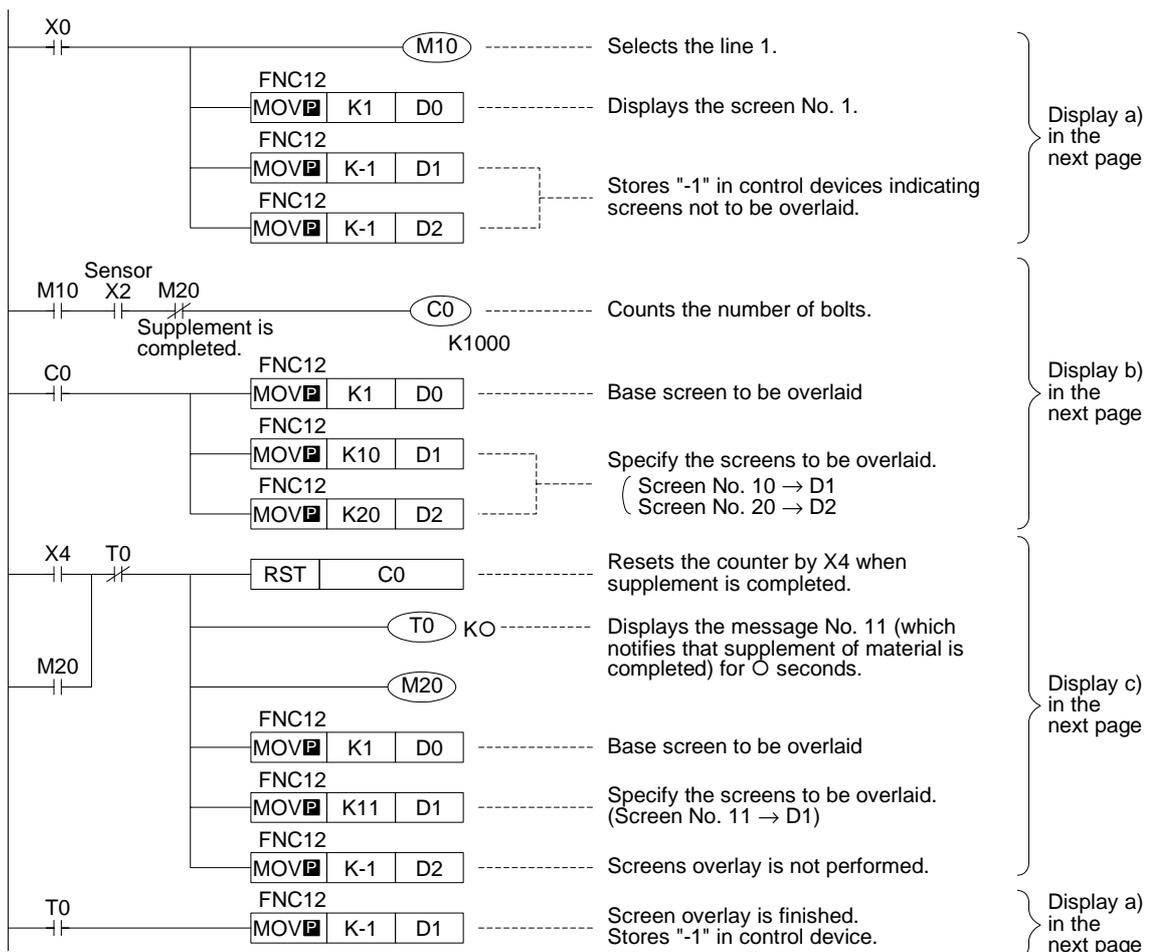
Program in PLC

Control devices

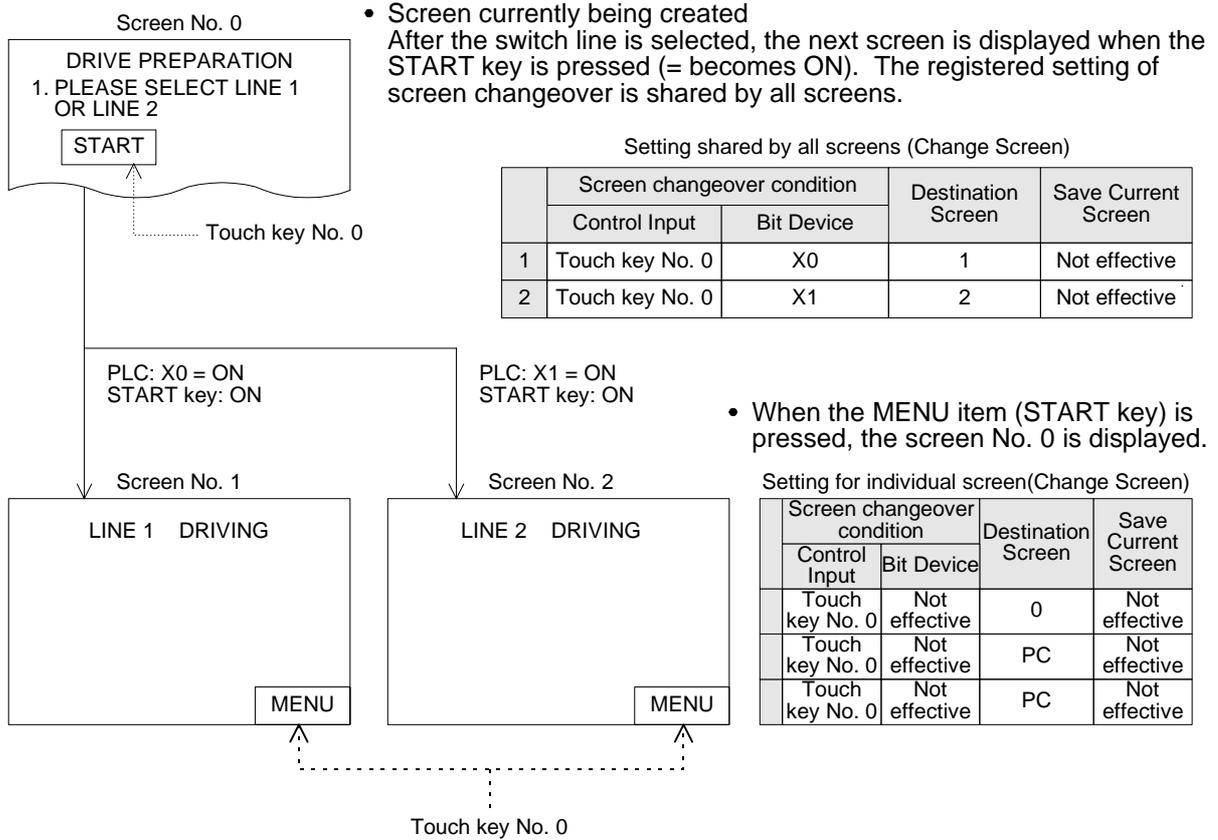
Data devices: Word devices to specify screen Nos. to be overlaid

D 0 D0
 D (0+1) ⇒ D1
 D (0+2) D2

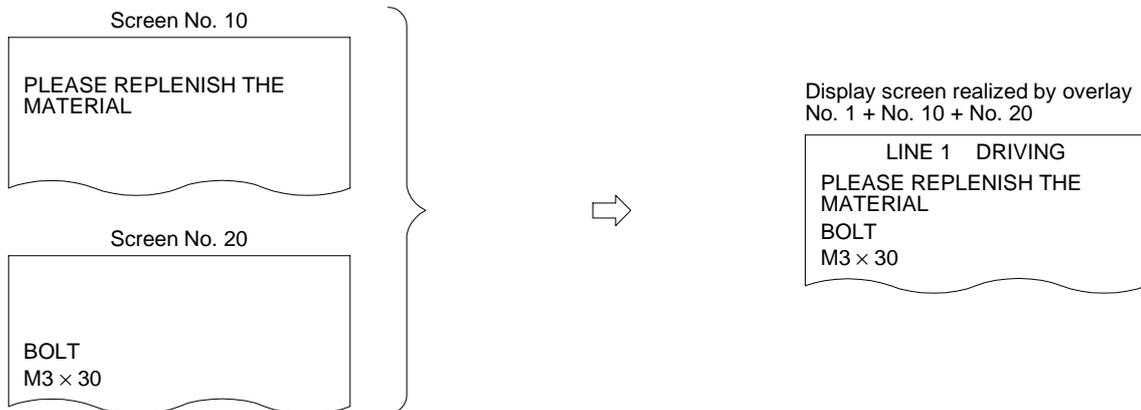
Line selector switch



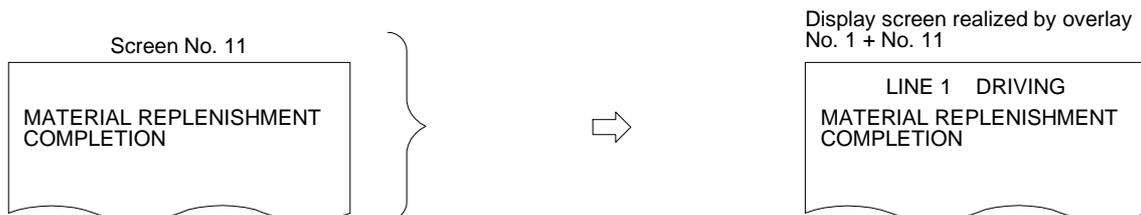
In the program above, the line 1 is selected. Even if the line 2 is selected, screens can be overlaid in the same way.



- Overlay of three screens: The screens Nos. 10 and 20 overlay the screen No. 1. In this overlay example, the line 1 (screen No. 1) is adopted.



- Overlay of two screens: The screen No. 11 overlays the screen No. 1.



2) Setting in the SW□D5C-GOTRE-PACK

In overlay, use word devices for "Change Screen".

Set the base screen No. and the overlaying screen (= overlap window) Nos. in accordance with the contents of the word devices set in "Change Screen".

Setting of word devices for screen changeover

Base screen: Word device (The initial value is set to D0.)

Overlap window 1: Word device (The initial value is not set.)

Overlap window 2: Word device (The initial value is not set.)

The base screen, the overlap window 1 and the overlap window 2 can be specified using arbitrary word devices. (The word devices may not be consecutive.)

When overlay is not performed, enter "0" to the specified devices or perform setting so that overlap windows are not used.

The screen Nos. currently displayed can be checked using "Write Device" in "System Information" in the screen creation software. (Refer to Paragraph 9.6.)

Write devices: Head word device

"Head + 1" word device

"Head + 2" word device

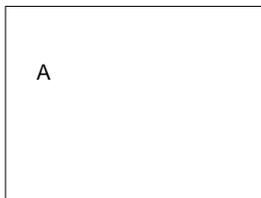
The specified screens are overlaid as shown below.

Base screen	Overlap window 1	Overlap window 2	
Screen No.	0	0	Base screen
Screen No.	Screen No.	0	Base screen + Overlap window 1
Screen No.	0	Screen No.	Base screen + Overlap window 1
Screen No.	Screen No.	Screen No.	Base screen + Overlap window 1 + Overlap window 2

a) No overlay

- Only the base screen is displayed.

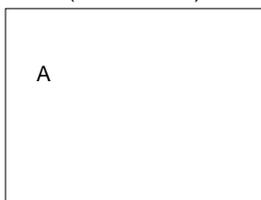
Screen No. specifying the
base screen
(Base screen)



b) Overlay of two screens

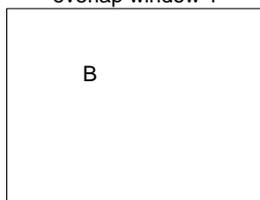
- Two screens specified by D0 and D1, the base screen and the overlap window 1, are overlaid.
- Or two screens specified by D0 (base screen) and D2 (overlap window 2) can be overlaid.

Screen No. specifying the
base screen
(Base screen)

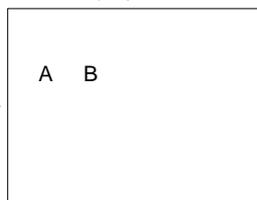


+

Screen No. specifying the
overlap window 1



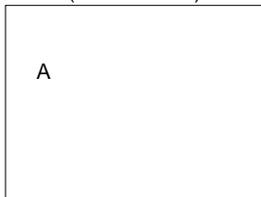
Display screen



c) Overlay of three screens

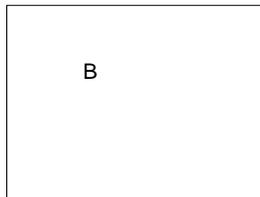
- Three screens specified by D0, D1 and D2, the base screen, the overlap window 1 and the overlap window 2, are overlaid.

Screen No. specifying the
base screen
(Base screen)



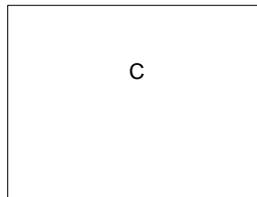
+

Screen No. specifying the
overlap window 1

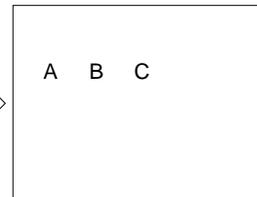


+

Screen No. specifying the
overlap window 2



Display screen



• Example of screen overlay

Screen overlay: Each process is monitored. When a material has run short, the material name is displayed on the screen, and a message is displayed to notify necessity of supplement of the material.

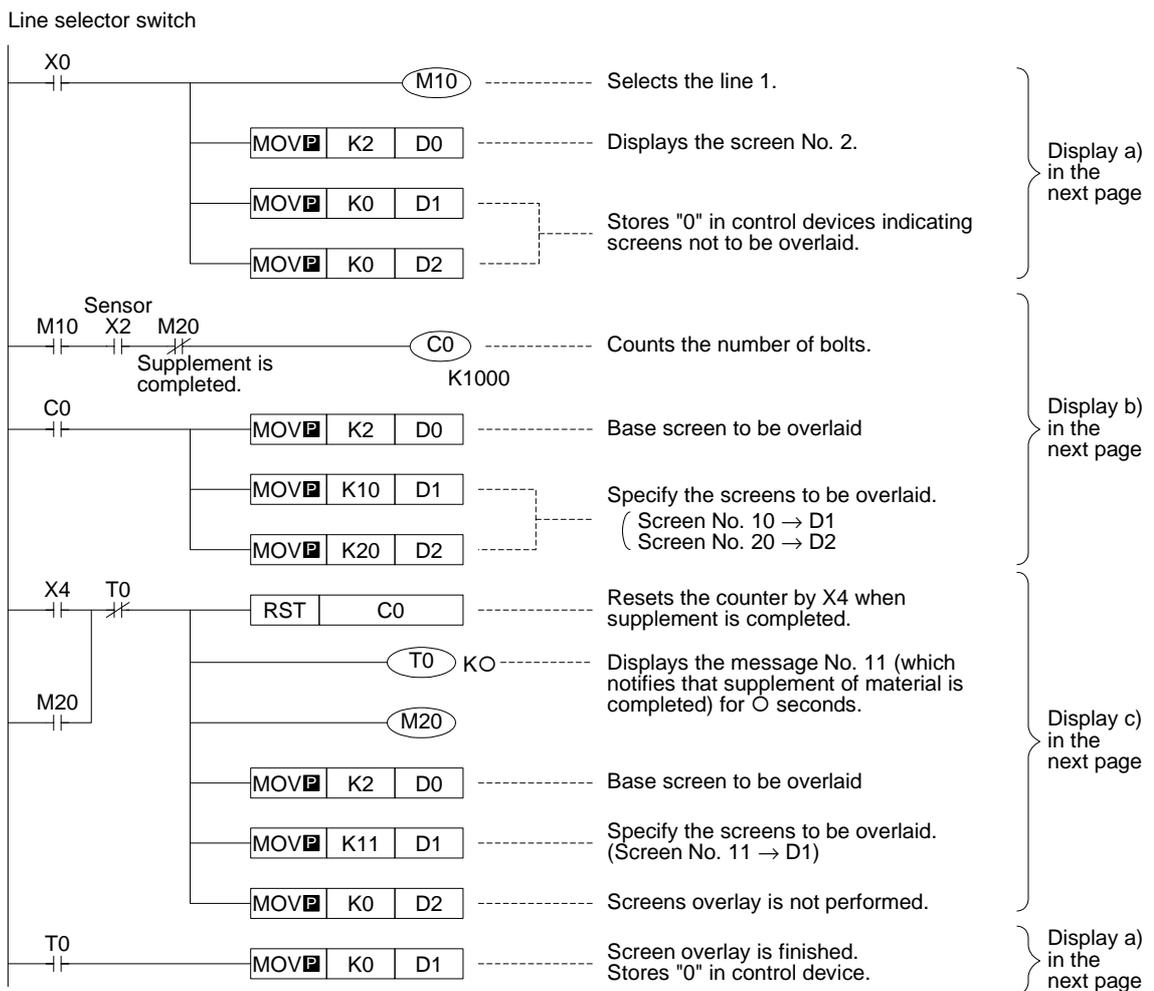
- Line selector switch
Line 1 input: X0
Line 2 input: X1
- Sensor (for bolt count)
Line 1 input: X2
Line 2 input: X3
- Supplement confirmation button: X4

Program in PLC

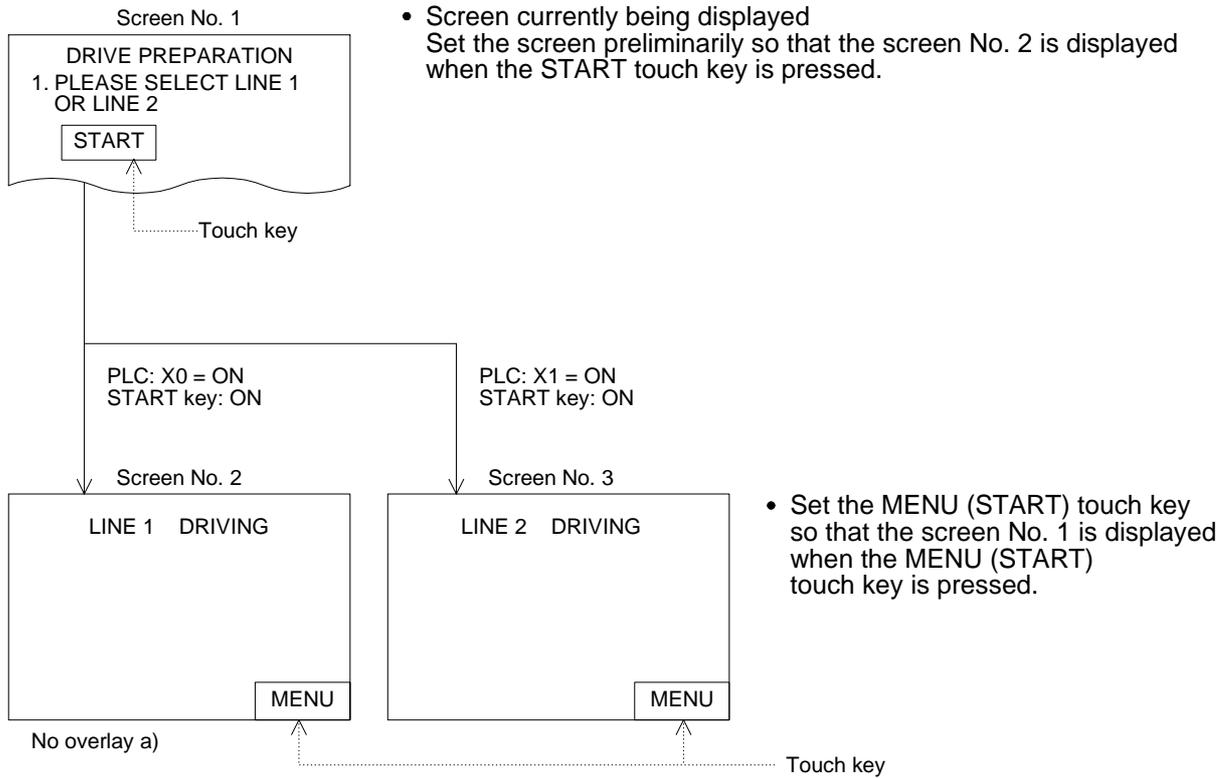
Screen changeover

Word devices: Word devices to specify screen Nos. to overlay/be overlaid

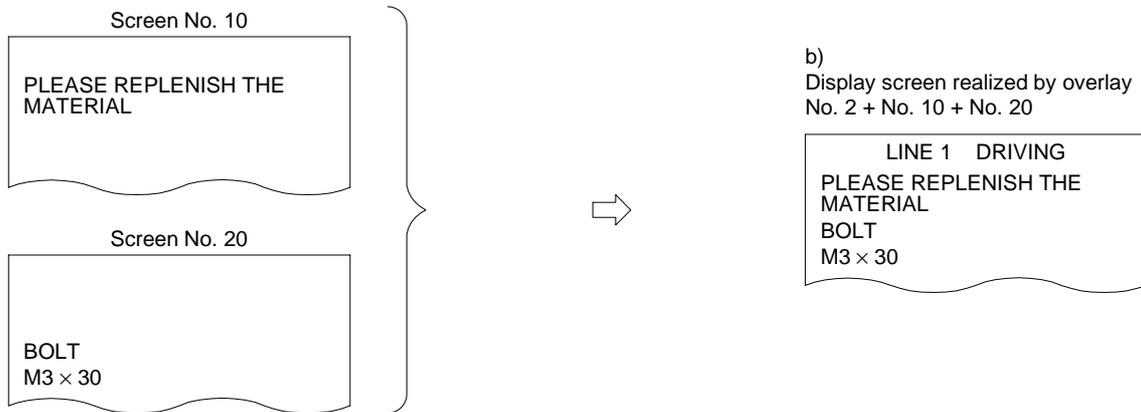
Base screen D0 }
 Overlap window 1 D1 } Set them in "Change Screen" in "Common Setting" in the
 Overlap window 2 D2 } SW□D5C-GOTRE-PACK.



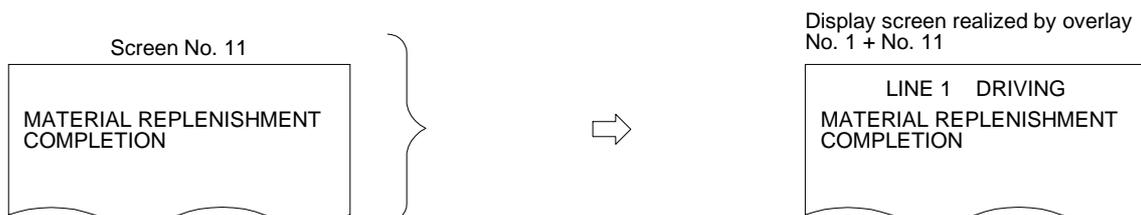
In the program above, the line 1 is selected. Even if the line 2 is selected, screens can be overlaid in the same way.



- Overlay of three screens: The screens Nos. 10 and 20 overlay the screen No. 1. In this overlay example, the line 1 (screen No. 2) is adopted.



Overlay of two screens: The screen No. 11 overlays the screen No. 2.



9.6 Control devices and system information

Devices are required to be assigned to change over the display screen of the GOT from the PLC and read the status information including the battery status in the GOT and the alarm occurrence data from the PLC. The term "control device" is used in the FX-PCS-DU/WIN-E. The term "system information" is used in the SW□D5C-GOTRE-PACK.

9.6.1 Control device (setting in FX-PCS-DU/WIN-E)

- Bit devices: Eight bit devices (X, Y, M, S, T and C) in the PLC are occupied. M0 to M7 are specified when the GOT is shipped from the factory.
- Word devices: Seven word devices (D, T and C) in the PLC are occupied. D0 to D7 are specified when the GOT is shipped from the factory.

Details of bit devices

- Occupied bit devices are used for communication using ON/OFF signals.

[When the auxiliary relay M0 is assigned]

	Auxiliary relay	Contents of control	Reference paragraph
*1	M0	When this bit device becomes ON from OFF, the alarm history is cleared.	6.7
*2	M1	This bit device remains ON while a device assigned by the alarm function remains ON.	6.2
*1	M2	When this bit device becomes ON, the backlight of the display screen is turned OFF after a specified time.	---
	M3	When this bit device becomes ON from OFF, the data acquired in the sampling mode is cleared.	5.5
*2	M4	This bit device remains ON while sampling is performed in the sampling mode.	5.5
	M5	This bit device becomes ON as a flag when setting of a number is completed.	3.3
	M6	This bit device becomes ON when the backup battery power of the GOT has dropped.	---
	M7	Unused	---

*1 The PLC gives instructions to the GOT. Coils are turned on/off in programs in the PLC.

*2 The GOT transmits the information to the PLC. Contacts are used in programs in the PLC.

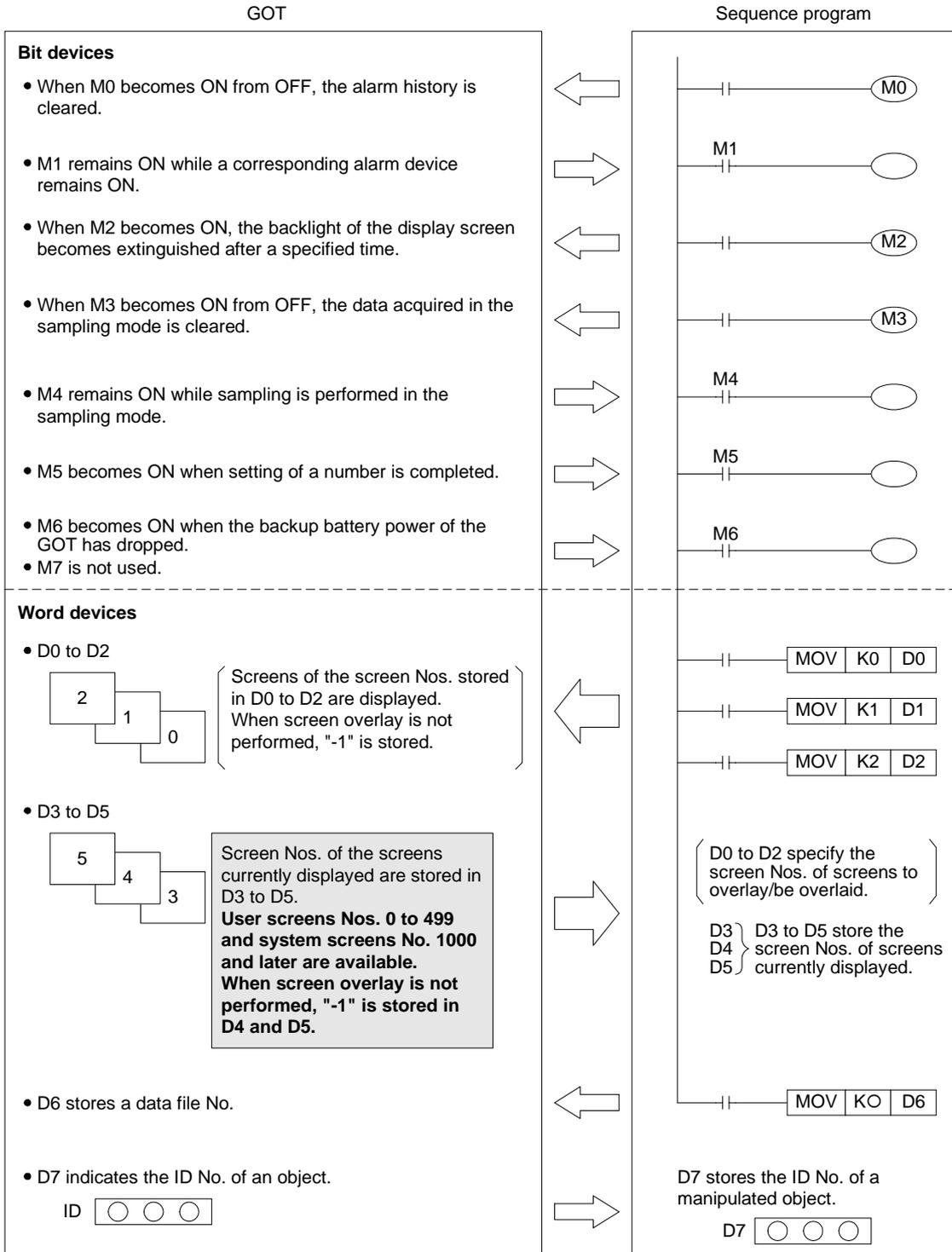
Details of word devices

- Occupied word devices (which may be called data devices) are used to specify the screen Nos. to be displayed and confirm the screens currently displayed.

[When the data register D0 is assigned]

Data register	Contents of control	Reference paragraph
D0 D1 D2	These word devices specify the screen Nos. to be displayed in the screen mode. D0: Specifies the screen No. of the base screen displayed when only one screen is displayed. D1: Specifies the screen No. of the overlaying screen 1 displayed when two screens are displayed. D2: Specifies the screen No. of the overlaying screen 2 displayed when three screens are displayed.	11.4.2 9.5
D3 D4 D5	These word devices store the screen Nos. of the screens currently being displayed in the screen mode. D3: Stores the screen No. of the base screen currently being displayed. D4: Stores the screen No. of the second screen currently being displayed. D5: Stores the screen No. of the third screen currently being displayed.	9.5
D6	This word device specifies a file No. to be read/written.	10.8
D7	This word devices indicates the ID of the object whose input is completed.	10

- Control devices execute the following operations.
When bit devices M0 to M7, data devices D0 to D6 are assigned



9.6.2 System information (setting in software for GOT-A900)

The following word devices can be specified as system information devices for read and write.

- Read devices:
One or two 16-bit word devices are occupied.
(The number of occupied devices can be changed using the screen creation software.)
No devices are set when the F940GOT is shipped from the factory.
- Write devices:
Five 16-bit word devices are occupied.
(Fifteen word devices are occupied in principle in the screen creation software. However, write devices not used in the F940GOT can be used as general word devices.)
No devices are set when the F940GOT is shipped from the factory.

Details of read devices

- Head of specified word devices:
Reads the GOT information to its bits 0 to 2 (b0 to b2).
"Head +1" of specified word devices:
Specifies the recipe No. to be read from/written to the PLC using the recipe function.

[When the data register D10 is assigned]

Data register		Contents of control	Reference paragraph
D10	b0	When b0 becomes ON from OFF, the alarm history in the GOT is cleared.	6.7
	b1	When b1 becomes ON, the backlight of the display screen becomes extinguished after a specified time.	---
	b2	When b2 becomes ON from OFF, the data acquired in the sampling mode is cleared.	5.5
D11		Specifies the recipe No. to be read from/written to the PLC using the recipe function.	12

Details of write devices

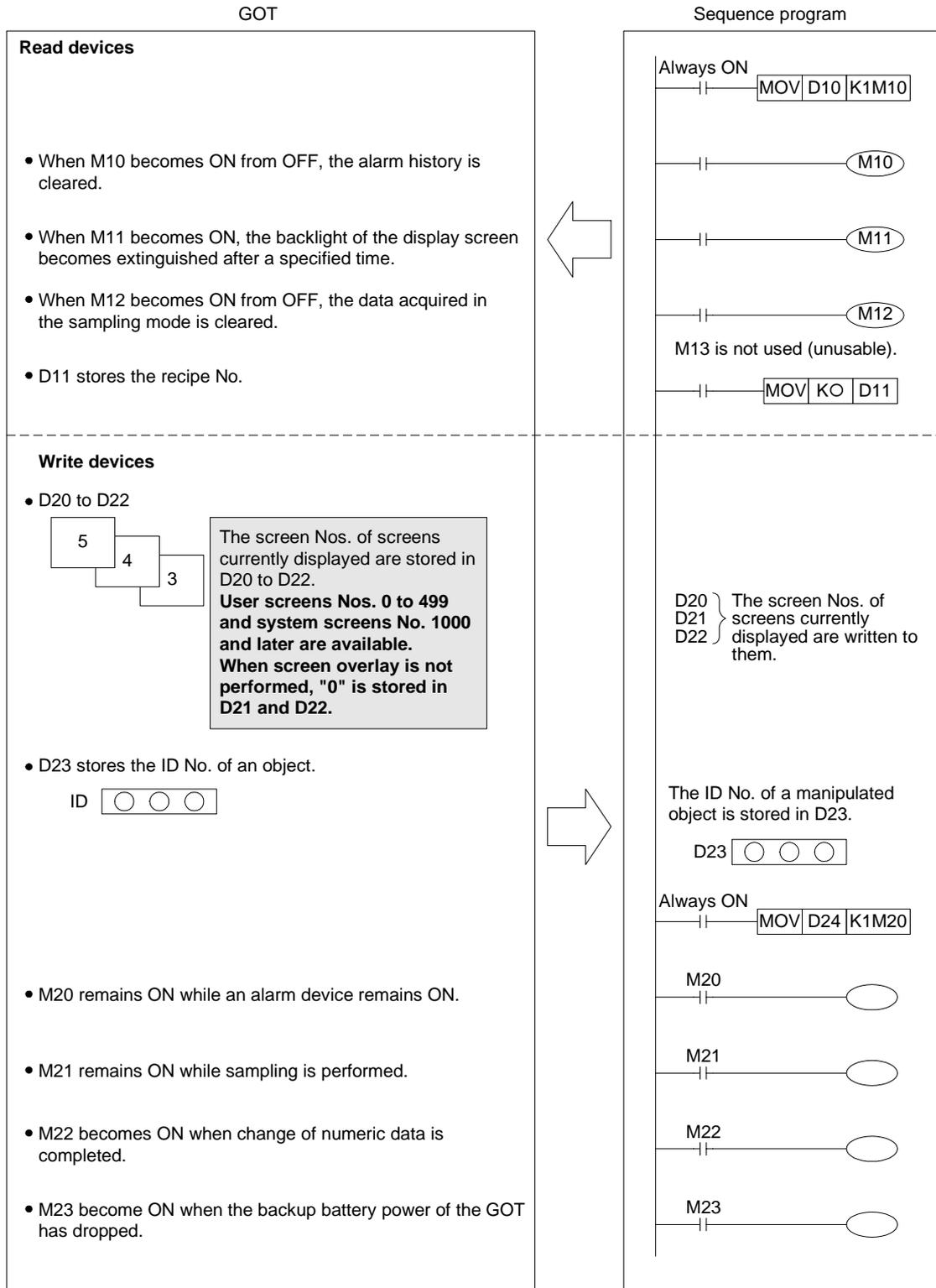
- Head to "Head +4" of specified word devices: Store the screen Nos. currently displayed.
"Head +5" of specified word devices: Turns ON/OFF its bits 0 to 3 (b0 to b3) to control the GOT.

[When the data register D20 is assigned]

Data register	Contents of control		Reference paragraph
D20 D21 D22	These data registers store the screen Nos. currently displayed in the screen mode. D20: Stores the screen No. of the base screen currently displayed. D21: Stores the screen No. of the second screen (overlap window 1) when two screens are overlaid. D22: Stores the screen No. of the third screen (overlap window 2) when three screens are overlaid.		9.5
D23	Stores the ID of an object whose input is completed.		12
D24	b0	b0 remains ON while a device assigned in the alarm function remains ON.	6.2
	b1	b1 remains ON while sampling is performed in the sampling mode.	5.5
	b2	b2 becomes ON when numeric input is completed.	3.3
	b3	b3 becomes ON when the backup battery power of the GOT has dropped.	---
D25 to D34	Unused (They can be used as general word devices in sequence programs.)		---

- Devices assigned for system information execute the following operations.

When read devices : D10 (b0 to b2 are developed to M10 to M12.)
 D11
 Write devices : D20 to D24 (b0 to b3 are developed to M20 to M23.)) are assigned.



10. Creation of Display Screens (FX-PCS-DU/WIN-E)

This section describes elements in constructing user screens using the screen creation software for DU (FX-PCS-DU/WIN-E).

Created user screens are displayed in the screen mode (described in Section 3). For specification of screens to be displayed, refer to Section 11.

10.1 Element list

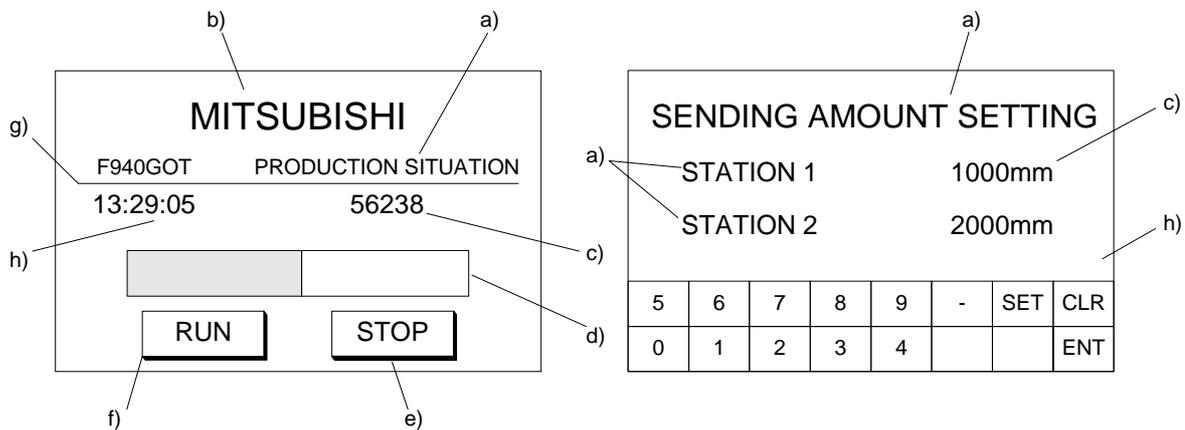
Elements for constructing screens are referred to as "Objects" in the screen creation software for DU.

◆Display example

The figure below shows an example of screen display.

Only a few some objects are used in the example below.

Some objects are displayed on the screen, and others are not. Some objects are only available in certain models.



Display objects : Display the data in a specified size in a specified position.

Object name	Description	Use example
Text	Displays alphabets, numerics, Katakana, Hiragana, Kanji (JIS level 1), symbols, external characters created by the user or symbols created by the user. (External characters can be registered using the screen creation software.) External characters are available only in the screen creation software for DU.	a), b)
Line	Displays a line connecting specified two points.	f)
Box	Displays a box on the screen.	---
Filled Box	Displays a boxed filled with a specified color on the screen.	---
Circle	Displays a circle on the screen.	---
Filled Circle	Displays a circle filled with a specified color on the screen.	---
Image	Displays an image stored in the image library in a specified position on the screen.	---
Date	Displays the year, month, day and day of the week.	---
Time	Displays the hour, minute and second.	g)

Data display objects: Display the contents of devices in the PLC.

Object name	Description	Use example
Library Text	Displays a text stored in the text library. The text to be displayed can be specified using a word device (T, C, D, V or Z).	---
Number	Displays a word device (current value/set value of timer/counter or D, V or Z) in the PLC in a specified position for monitoring.	c)
Bar Graph	Displays a word device (current value/set value of timer/counter or D, V or Z) in the PLC in a specified position in the form of bar graph for monitoring.	d)
Circle Graph	Displays a word device (current value/set value of timer/counter or D, V or Z) in the PLC in a specified position in the form of circle graph for monitoring.	---
Proportional Bar Graph	Displays up to 8 consecutive word devices in the form of proportional bar graph.	---
Proportional Pie Graph	Displays up to 8 consecutive word devices in the form of proportional pie graph.	---
Panel Meter	Displays a word device in the form of panel meter.	---
Indicator	Inverts a specified area on the screen by setting to ON/OFF a bit device in the PLC.	---
Label Indicator	Displays specified characters when a specified bit device becomes ON.	---
Text Indicator	Displays two types of texts alternately in accordance with the ON/OFF status of a bit device in the PLC. Texts stored in the text library can be specified for display.	---
Image Indicator	Displays two types of images alternately in accordance with the ON/OFF status of a bit device in the PLC. Images stored in the image library can be specified for display.	---
Overlay Screen	Allows a specified screen to overlay another screen when a bit device in the PLC becomes ON or OFF.	---
Library Image	Displays an image stored in the image library. The image to be displayed can be specified using a word device (T, C, D, V or Z).	---
Trend Graph (Sampling)	Displays word devices in the PLC sampled at a constant time interval in the form of trend graph. Up to 4 devices can be displayed.	---
Line Graph	Acquires the data stored in a word device at each specified timing, displays a line graph of the acquired data within the display range, then allows scroll of the line graph.	---
Ascii	Allows a character code to be specified from the PLC, and displays a corresponding character such as alphabet, numeric, Katakana, Hiragana and Kanji. The shift JIS code and ASCII code are available as character codes.	---

Data transfer objects: Transfer data when a key is pressed.

Object name	Description	Use example
Switch	Controls the ON/OFF status of a bit device in the PLC from a touch key.	---
Touch Key	Allows a specified area on the screen to function as a key when pressed. The "Touch Key" object is usually combined with a function offered for touch keys such as "Switch" and "Data Setting".	e)
Send Data Bank	Stores the data on up to 4,000 data registers in the PLC. When a specified input is given, data can be read from or written to corresponding data registers.	---
Write Constant	When a specified touch key is pressed, set data is written to a word device in the PLC.	---
Data Setting	Allows to change a specified word device in the PLC. When a key is pressed, the ten-key pad is displayed on the screen so that a specified numeric can be changed using this key pad.	---
Increment	Adds "1" to the data of a specified word device in the PLC.	---
Decrement	Subtracts "1" from the data of a specified word device in the PLC.	---
Keyboard	Displays the keyboard dedicated to numeric change on the screen.	h)
Buzzer	Issues buzzer sound in the GOT in accordance with the ON/OFF status of a bit device in the PLC.	---

Screen changeover object

Object name	Description	Use example
Change Screen	Allows to specify the screen changeover condition, the changeover destination, etc.	---

10.2 Registration of object

In the screen creation software for DU, objects can be registered (for screen creation) to all screens or only one screen at a time.

- **Setting for all screens (common setting)**

An object registered in the setting for all screens is shared by all screens. By one registration operation of an object, the object is registered to all screens.

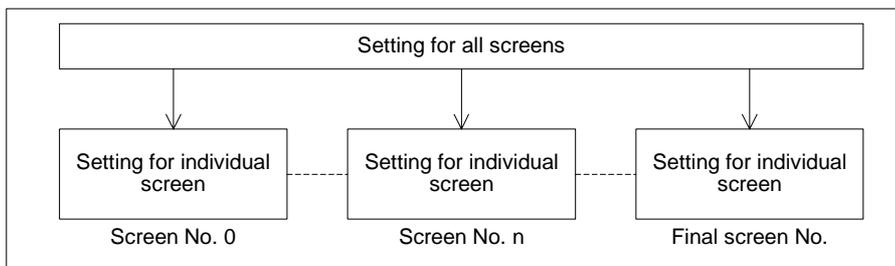
Available objects: All objects

- **Setting for individual screen**

An object can be registered for an individual screen at a time. Only the functions of the object registered on the screen currently displayed in the screen mode are effective. When the display screen is changed over, objects registered on the newly displayed screen become effective.

Available objects: All objects

- The figure below shows the relationship between the setting for all screens and the setting for individual screen.



On the screen displayed in the screen mode, both objects registered in the setting for all screens and the objects registered in the setting for individual screen are effective.

■ Important point

When an object is registered in the setting for all screens, it acts as if one screen overlays by the screen call function.

10.3 Display objects

This paragraph describes in details the objects related to display of characters and images on the screen.

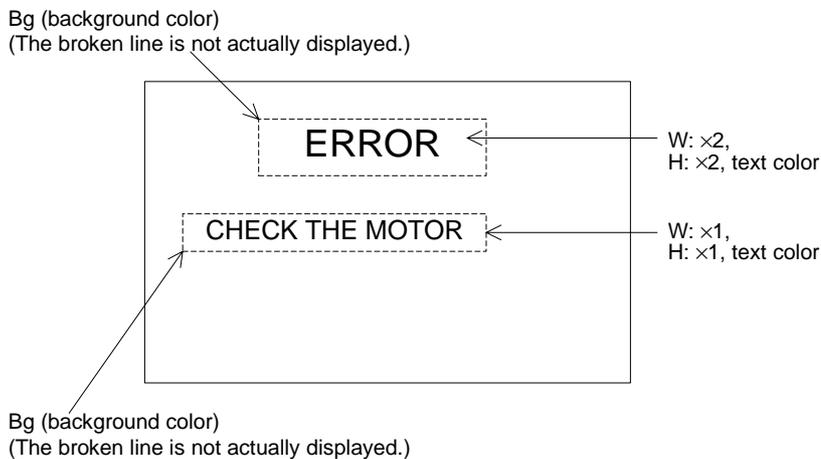
10.3.1 Text

An object used to display characters is called "Text". The "Text" object is used to give messages indicating the operation status and the error status to the operator.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates of the start point in the unit of dots.
Bg, Text and Bg Transparent	Enter the background color and the text color. (Initial values: White and black) When "Bg Transparent" is made effective with a check mark, the setting of "Bg" is not effective.
Character Size	Enter the width (W) and the height (H). The available sizes are $\times 0.5$, $\times 1$, $\times 2$, $\times 3$ and $\times 4$.
Shift	The text can be shifted to the right, the left or the center.
Text	Enter the characters to be displayed. Available characters are alphabets, numerics, Katakana, Hiragana and Kanji (JIS level 1 and external characters). The text may occupy two or more lines.

◆Display example



10.3.2 Line

The "Line" object displays a line on the screen.

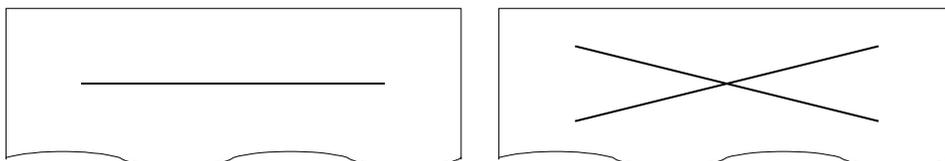
◆Contents of setting

Attribute	Contents of setting
Start Position	Enter the X and Y coordinates of the start point of the line in the unit of dot.
End Position	Enter the X and Y coordinates of the end point of the line in the unit of dot.
Color	Enter the display color. (Initial value: Black)

◆Display example

- A line is drawn in solid line.

Example:



- Use a line to draw a polygon except square and rectangle.

10.3.3 Box

The "Box" object displays a rectangle having specified two diagonal points.

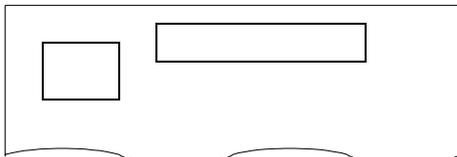
◆Contents of setting

Attribute	Contents of setting
Start Position	Enter the X and Y coordinates of one diagonal point in the unit of dot.
End Position	Enter the X and Y coordinates of the other diagonal point in the unit of dot.
Color	Enter the display color. (Initial value: Black)

◆Display example

- A square or rectangle is drawn in solid line.

Example:



- Use a line to draw a rectangle whose one angle is not 90° or a rectangle whose one edge is not horizontal nor vertical.

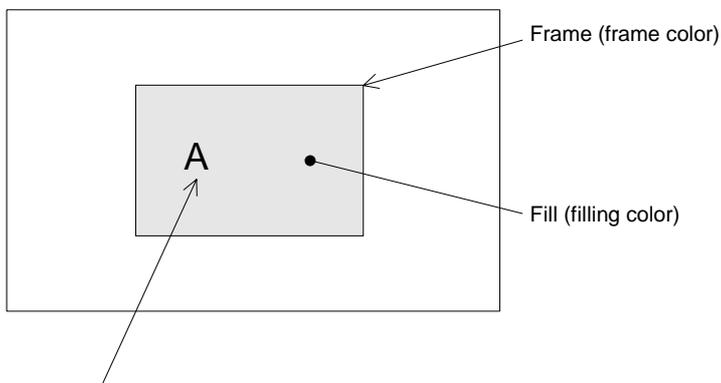
10.3.4 Filled Box

The "Filled Box" object displays a filled rectangle having specified two diagonal points.

◆ Contents of setting

Attribute	Contents of setting
Start Position	Enter the X and Y coordinates of one diagonal point in the unit of dot.
End Position	Enter the X and Y coordinates of the other diagonal point in the unit of dot.
Frame and Fill	Enter the frame color and the filling color. (Initial values: Black and white)

◆ Display example



- When the "Text" or "Number" object is combined, fill the box at first, then create an object to be displayed on it. If the "Filled Box" object is created later, the text or the number is hidden under it.
- Use a line to draw a rectangle whose one angle is not 90 degrees or a rectangle whose one edge is not horizontal nor vertical.

■ Important point

- Filling of entire screen
When the entire screen is to be filled, it is recommended to specify the screen color in the header setting in the screen creation software.

10.3.5 Circle

The "Circle" object displays a circle on the screen.

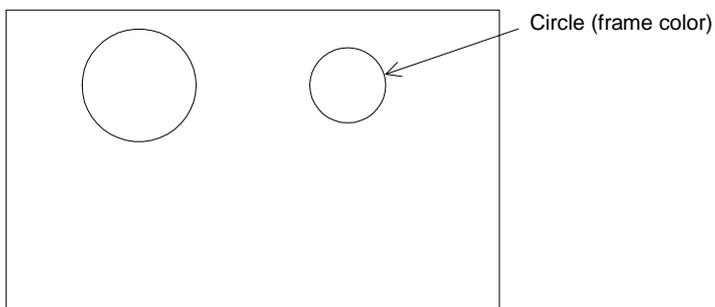
◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates of the center position in the unit of dot.
Radius	Enter the radius in the unit of dot.
Circle	Enter the display color. (Initial value: Black)

◆Display example

- A circle is displayed in continuous line.

Example:



- Use the "Filled Circle" object to display a circle whose inside is filled.

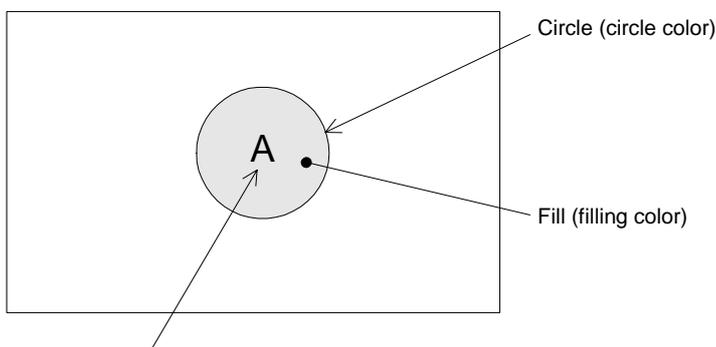
10.3.6 Filled Circle

The "Filled Circle" object displays a filled circle on the screen.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates of the center in the unit of dot.
Radius	Enter the radius in the unit of dot.
Circle and Fill	Enter the circle color and the filling color. (Initial values: Black and white)

◆Display example



- When the "Text" or "Number" object is combined, fill the circle at first, then create an object to be displayed on it. If the "Filled Circle" object is created later, the text or the number is hidden under it.

10.3.7 Image

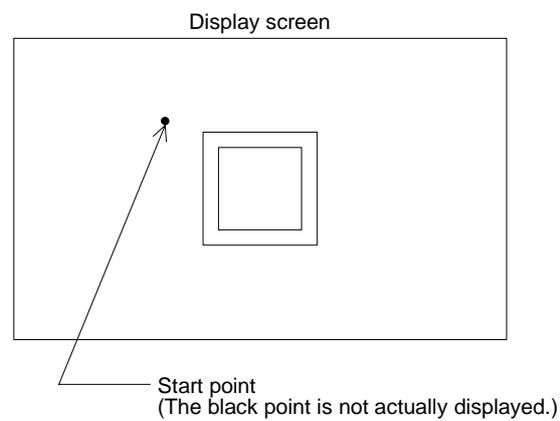
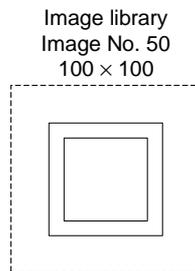
The "Image" object displays an image set in the image library on the screen.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates of the start point in the unit of dot.
Bg and Fg	Enter the background color and the image color. (Initial values: White and black)
No.	Enter the image No. of an image in the image library to be displayed.

◆Display example

"Image" object	
Image No.	No.50



- The specified image stored in the image library (described in Paragraph 10.7) is displayed from the specified start point.
- The image is displayed in the same size as that of the image stored in the image library.
- Images can be registered to the image library using the screen creation software.

10.3.8 Date and time

The "Date/Time" object displays the year, month, day, day of the week and time on the screen.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Text	Enter the background color and the text color. (Initial values: White and black)
Character Size	Enter the width (W) and the height (H) of characters. The available sizes are ×0.5, ×1, ×2, ×3 and ×4.
Format	Select the display format.
Frame	Select the display frame. (Initial value: No frame)
Frame Color	Enter the display frame color. The area inside the frame is filled with the background color.

◆Display example

Date

Standard European format :31/DEC/1998(THU)

Short European format :31/DEC/1998

Standard USA format :DEC/31/1998(THU)

Short USA format :DEC/31/1998

Time

Standard English format :12:00:30

Short English format :12:00

■Important point

- Displayed date and time
The date and the time set in the operation environment setting in the GOT main body are displayed.

10.4 Data display objects

This paragraph describes in details the data display objects which display the contents of devices in the PLC.

10.4.1 Library Text

The "Library Text" objects displays a text stored in the text library on the screen in accordance with the current value or the set value of a word device (T, C, D, V or Z).
Because two or more texts can be displayed on one screen, the number of screens can be saved.

◆ Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Text	Enter the background color and the text color. (Initial values: White and black)
Character Size	Enter the width (W) and the height (H) of characters. The available sizes are ×0.5, ×1, ×2, ×3 and ×4.
Word Device	Enter a word device in the PLC which stores a text No. to be displayed. Enter "Data Size" and "Displayed Value (Current or Preset)" also.
Start No.	The monitor value plus this start No. is regarded as the text No. of a text to be displayed.
Frame	Select the frame to be displayed around the text. (Initial setting: No frame)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.

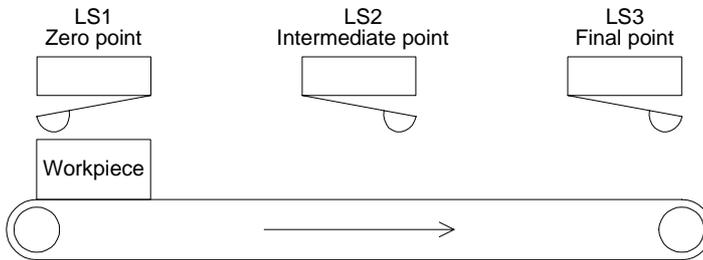
← 1)

1) Frame: Displayed around the text

Display form				
	No frame	Single frame	Double frame (keyboard)	Double frame (trimming)

◆Display example

- The displayed text is changed in accordance with the ON/OFF status of the limit switches L1 to L3 provided in the carrying line shown below.



- The "Library Text" object is used in this example. To specify the text No. stored in the text library, the data register D10 is used.

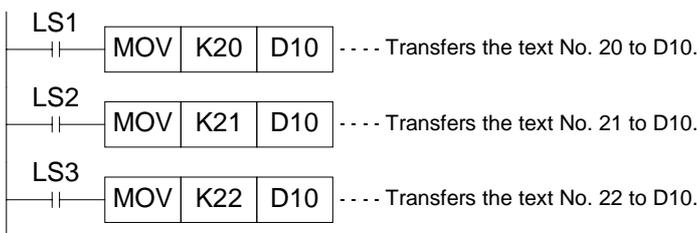
- Library Text

Word Device : D10
 Data Size : 16 bits
 Displayed Value : Current

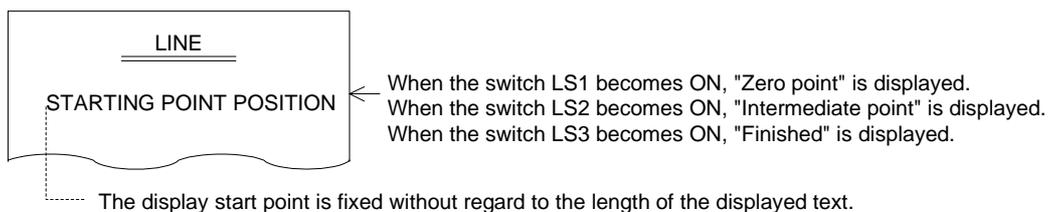
- Text library

0
 ⋮
 20 Zero point
 21 Intermediate point
 22 Finished
 ⋮
 ↑ Text No.

- Sequence program



- Display in the F940GOT



10.4.2 Number

The "Number" object displays the data stored in a word device in the PLC.

◆ Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates in the unit of dot.	
Bg and Fg	Enter the background color and the numeric color. (Initial values: White and black)	
Character Size	Enter the width (W) and the height (H) of characters. The available sizes are $\times 0.5$, $\times 1$, $\times 2$, $\times 3$ and $\times 4$.	
Digits and Decimal Point At	Enter the total number of digits. Enter the number of digits after decimal point.	←1)
Format	Set the numerical display format. (Initial value: None)	←2)
Word Device	Enter a word device whose data is to be displayed as a numeric. Enter "Data Size" and "Displayed value (Current or Preset)" also.	
Style	Select the numeric format among "Decimal (with/without sign)", "Decimal (leading 0) (with/without sign)", "Hexadecimal", "Octal", "Binary" and "Real".	←3)
Shift	Select the layout among "Right", "Center" and "Left".	←4)
Gain 1, Gain 2 and Offset	(Monitor value \times Gain 1 / Gain 2) + Offset The result of this arithmetic operation is displayed.	←5)
Data Changeable	Set whether or not the data of the specified device can be changed using the keys.	←6)
Minimum Value and Maximum Value	Set the lower limit and the upper limit of a numeric which can be entered to a word device while "Data Changeable" is made effective with a check mark. Select "Direct" (to enter a desired value) or "Indirect" (to enter a desired data register).	←7)
User ID and Destination ID	These attributes are effective while "Data Changeable" is made effective with a check mark. Enter an object to be displayed next when a cursor control key is pressed.	←8)
Frame	Select the frame to be displayed around the numeric. (Initial setting: No frame)	
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.	

1) Digits

- Maximum allowable number of digits: 12 (Each of "-" (minus sign) and a decimal point is counted as one digit.

Example:)

High-speed counter	to	C235 (32 bits)	If data whose number of digits exceeds the maximum allowable number of digits is specified to be displayed, "?" is displayed.
-2147483648		-2147483648	
11 digits		10 digits	

Number of digits after decimal point (Decimal Point At)

- Enter the number of digits after a decimal point for a case where a decimal point is displayed.

Example: When the displayed numeric is "2000"

2000: Decimal Point At = 0 20.00: Decimal Point At = 2
 200.0: Decimal Point At = 1 2.000: Decimal Point At = 3

2) Format

When the display format is set, a numeric is displayed as follows.

A half-width character "#" in the specified format is replaced with a numeric in actual display. Characters except "#" are displayed as they are.

Example: ##.##ms -> A numeric of three digits is displayed. 12.3ms

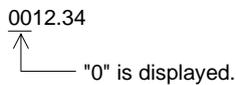
The number of "#" in the specified format is regarded as the total number of digits, and the number of digit after decimal point is regarded as "0".

3) Style

- Decimal (leading 0), Decimal or Hexadecimal
- When "Decimal (leading 0)" is selected, "0" is displayed in upper digits up to the specified total number of digits.

Example:

When the total number of digits is set to 7 and the number of digits after decimal point is set to 2

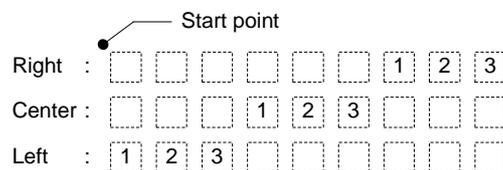


- A numeric is displayed horizontally.

4) Shift

- When the number of digits of a numeric to be displayed is smaller than the value set to "Digits", the numeric is automatically shifted to the position set here.

Example: When "Digits" is set to "9" and the displayed numeric has 3 digits



5) Gain 1, Gain 2 and Offset

The value obtained by the calculation "(Monitor value X Gain 1 / Gain 2) + Offset" is displayed.

Example: When the monitor value is 1000 (current value of D100), "Gain 1" is set to 10, Gain 2 is set to 2 and "Offset" is set to 3

$(1000 \times 10 / 2) + 3 = 5003 \rightarrow$ "5003" is displayed.

When a numeric is entered (Refer to Section 3.), the result of the following arithmetic operation is stored in the specified word device.

$(\text{Input value} - \text{Offset}) / \text{Gain 1} \times \text{Gain 2}$

6) Data Changeable

- When this attribute is made effective (with a check mark), data can be changed if the "Increment", "Decrement", "Data Setting" or "Keyboard" object is combined.
- For the operating procedure, refer to Paragraph 3.2.

7) Minimum Value and Maximum Value

Specify the input range adopted when "Data Changeable" is made effective.

8) User ID (Refer to Paragraph 3.3.)

A serial No. is automatically assigned to each registered "Number" object in the order of registration.

By checking this No., the changed "Number" object can be detected.

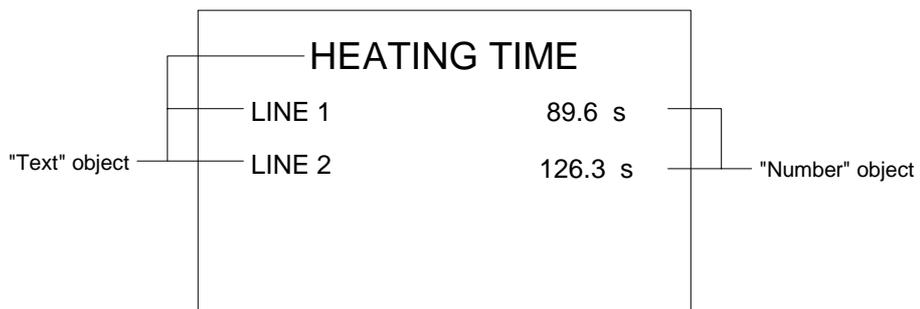
When input is completed, the user ID No. of the changed "Number" object is stored in the control device "DO+7".

Destination ID

This attribute allows to specify the change order of "Number" objects.

By entering the user ID No., the change order can be arbitrarily specified.

◆Display example



10.4.3 Bar Graph

The "Bar Graph" object displays the value of a specified word device (current value/set value of T or C or D, V or Z) in the PLC in the form of bar graph.

A numeric which is rather difficult to understand in the form of number can be displayed in the form of bar graph so that it can be easily understood at a glance.

◆Contents of setting

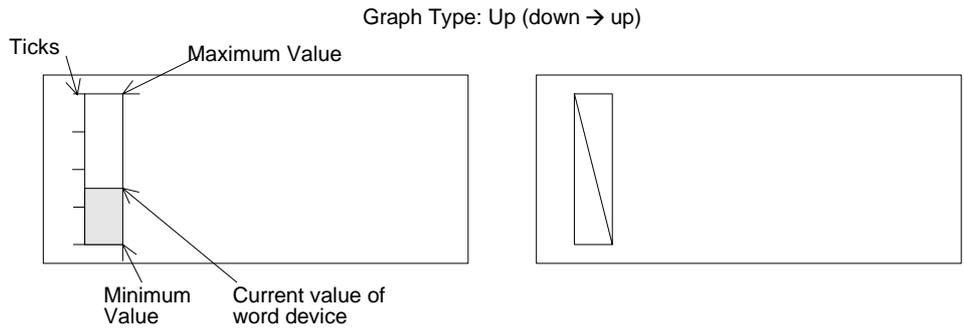
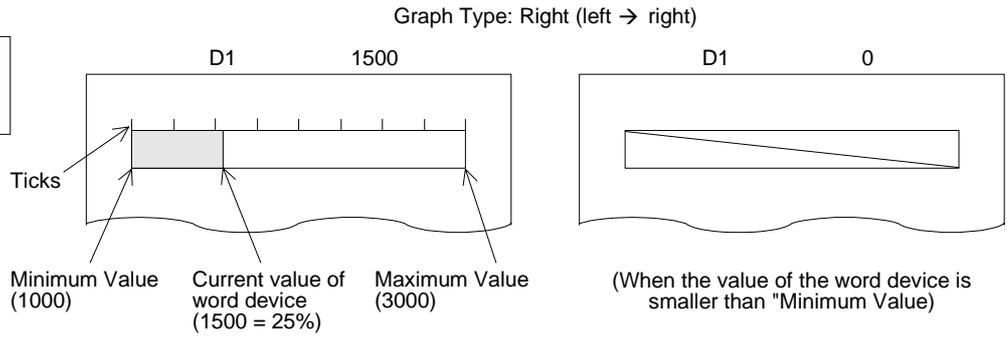
Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Size	Enter the width (W) and the height (H) of the bar graph in the unit of dot. The allowable minimum value is 8 W x 16 H.
Bg and Fg	Enter the background color and the display color. (Initial values: White and black)
Graph Type	Select the graph type among "Right" (left → right), "Up" (down → up), "Left" (right → left) and "Down" (up → down). 1)
Word Device	Enter a word device whose value is to be displayed in the bar graph. Enter "Data Size" and "Displayed value (Current or Preset)" also.
Minimum Value and Maximum Value	Enter the minimum value (0%) and the maximum value (100%) of the data. "Direct" (to enter a value directly) or "Indirect" (to enter a data register) can be selected. 1)
Ticks	Enter the number of ticks on the scale attached to the bar graph. 2)
Scale Position	Select the position among "Right", "Up", "Down" and "Left". 2)
Frame	Select the frame displayed around the bar graph. (Initial value: No frame)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.

1) Graph Type

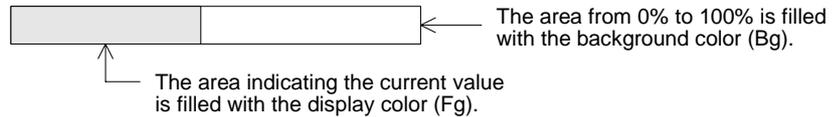
- Bar graph type
Right (left → right)Up (down → up)
Left (right → left)Down (up → down)
- The value entered to "Minimum Value" is regarded as the 0% value. The value entered to "Maximum Value" is regarded as the 100% value. The value of the specified word device is represented in %.
If the value of the specified word device is outside the range specified by "Minimum Value" and "Maximum Value", a diagonal line is drawn in the bar graph.

Example:

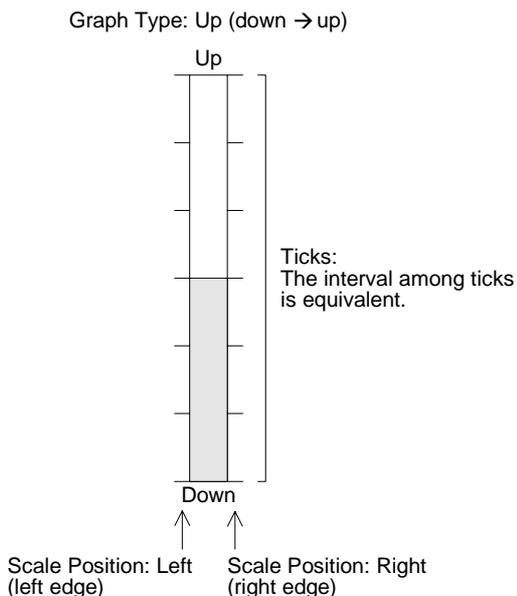
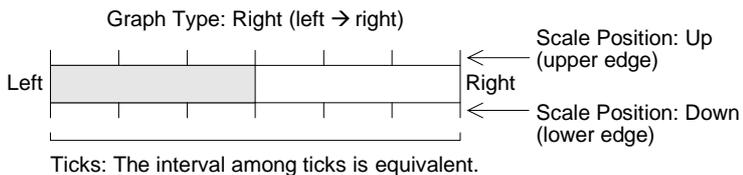
Word Device: D1
 Minimum Value: 1000
 Maximum Value: 3000



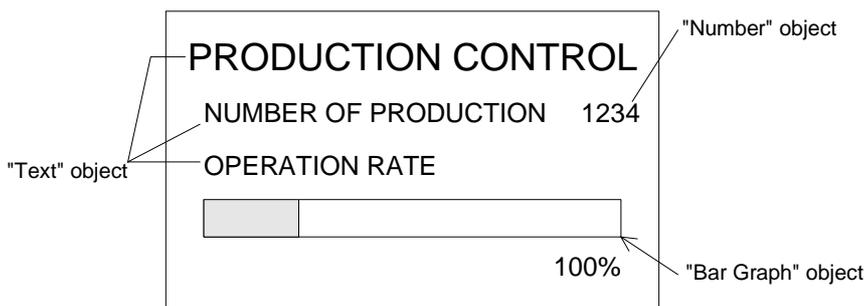
In the case of "Left" (right → left) or "Down" (up → down), the "Maximum Value" position and the "Minimum Value" position is exchanged each other from the positions shown on the right.



2) Ticks and Scale Position



◆ Display example

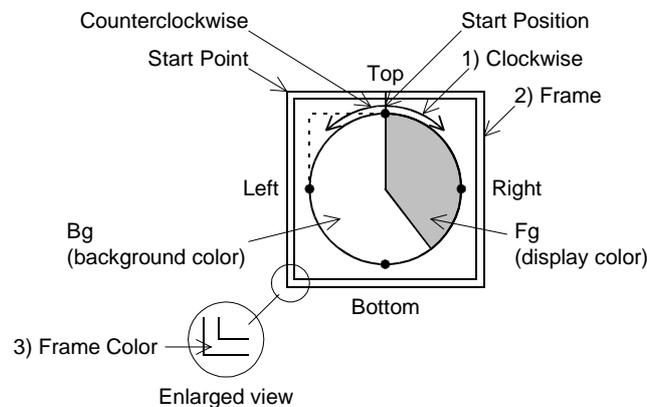


10.4.4 Circle Graph

The "Circle Graph" object displays the current value or the set value of a specified word device in the PLC.

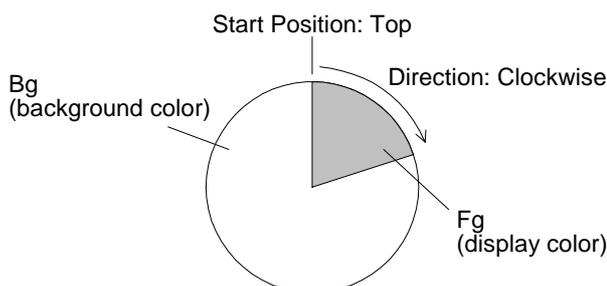
◆ Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates of the center in the unit of dot.
Radius	Enter the radius in the unit of dot. The allowable minimum value is 16 dots.
Bg and Fg	Enter the background color and the display color. (Initial values: White and black)
Start Position	Select the start position among "Top", "Right", "Bottom" and "Left".
Direction	Select "Clockwise" or "Counterclockwise".
Word Device	Enter a word device whose value is to be displayed in the circle graph. Enter "Data Size" and "Displayed value (Current or Preset)" also.
Minimum Value and Maximum Value	Enter the minimum value (0%) and the maximum value (100%) of the data. "Direct" (to enter a value directly) or "Indirect" (to enter a data register) can be selected.
Ticks	Enter the number of ticks of the scale attached to the circle graph.
Frame	Select the frame displayed around the circle graph. (Initial value: No frame)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.



◆ Display example

When "Start Position" is set to "Top" and "Direction" is set to "Clockwise"

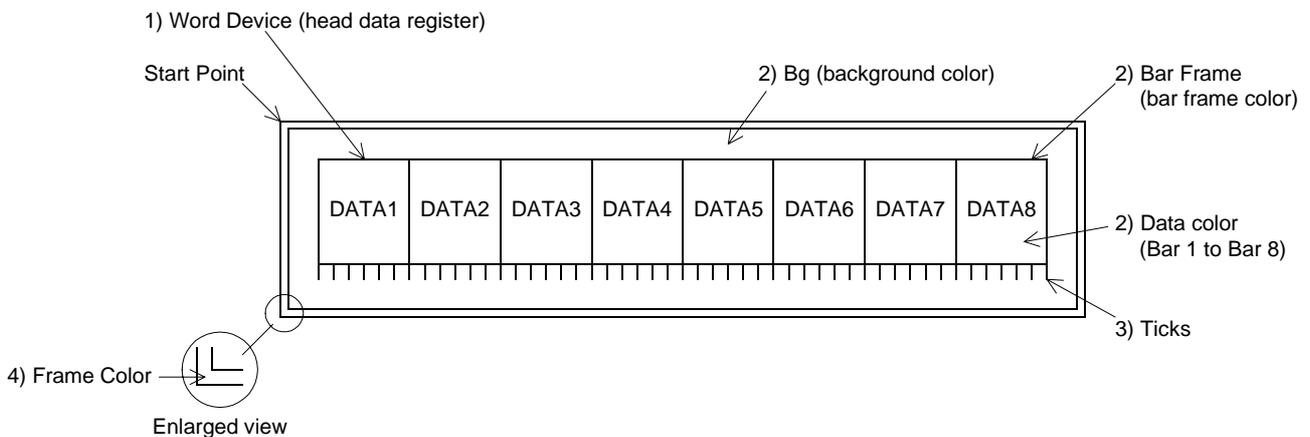


10.4.5 Proportional Bar Graph

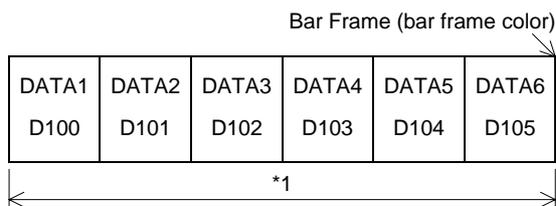
The "Proportional Bar Graph" object displays the current value of specified word devices in the form of proportional bar graph as the ratio against 100%.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Size	Enter the width (W) and the height (H) of the bar graph in the unit of dot.
Graph Type	Select the graph type between "Vertical" and "Horizontal".
Word Device	Enter the top word device in the PLC from which consecutive word devices are to be displayed in the proportional bar graph. Enter "Data Size" also. ← 1)
Nbr Of Devices	Enter a numeric from 1 to 8 as the number of word devices to be displayed in the proportional bar graph. ← 1)
Bar 1, Bar 2, Bar 3, Bar 4, Bar 5, Bar 6, Bar 7, Bar 8 and Bar Frame	Enter the display color of each data and the bar frame color. ← 2)
Ticks	Enter the number of ticks on the scale attached to the proportional bar graph. ← 3)
Frame	Select the frame displayed around the proportional bar graph. (Initial value: No frame) ← 4)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color. ← 4)



◆Display example



Setting example:
Word Device: D100
Nbr Of Devices: 6

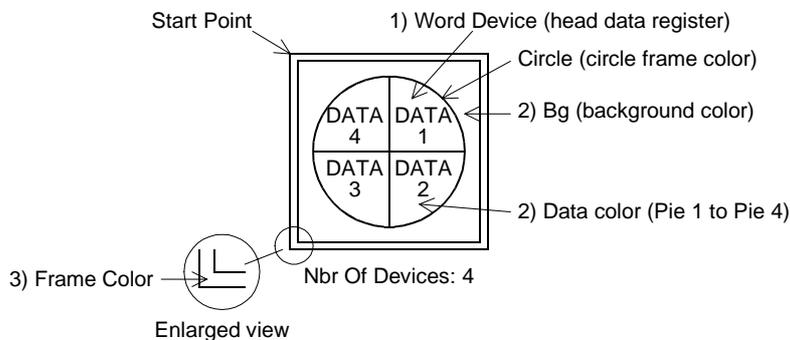
*1 The display size in the horizontal direction is regarded as 100%. The ratio of each data against 100% is represented.

10.4.6 Proportional Pie Graph

The "Proportional Pie Graph" object displays the current value of specified word devices in the form of proportional pie graph as the ratio against 100% (= 360°).

◆ Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates of the center in the unit of dot.	
Radius	Enter the radius in the unit of dot.	
Word Device	Enter the top word device from which the specified number of consecutive word devices are displayed in the proportional pie graph. Enter "Data Size" also.	← 1)
Nbr Of Devices	Enter a numeric from 1 to 8 as the number of word devices to be displayed in the proportional pie graph.	← 1)
Pie 1, Pie 2, Pie 3, Pie 4, Pie 5, Pie 6, Pie 7, Pie 8 and Circle	Enter the display color of each data and the circle frame.	← 2)
Ticks	Enter the number of ticks of the scale attached to the proportional pie graph.	
Frame	Select the frame displayed around the proportional pie graph. (Initial value: No frame)	← 3)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.	← 3)

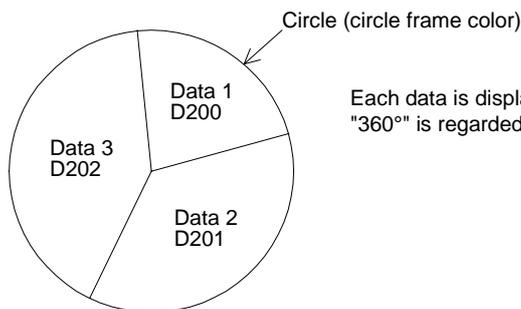


◆ Display example

Setting example:

Word Device: D200

Nbr Of Devices: 3



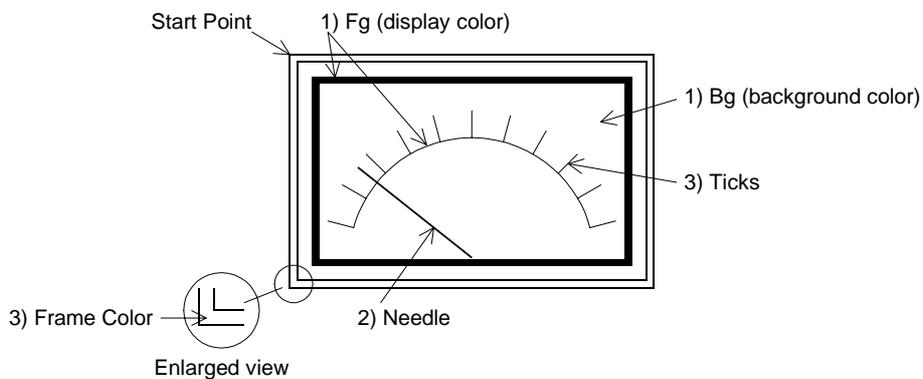
Each data is displayed clockwise from the top of the circle from the data 1 (D200). "360°" is regarded as 100%. The ratio of each data against 100% is represented.

10.4.7 Panel Meter

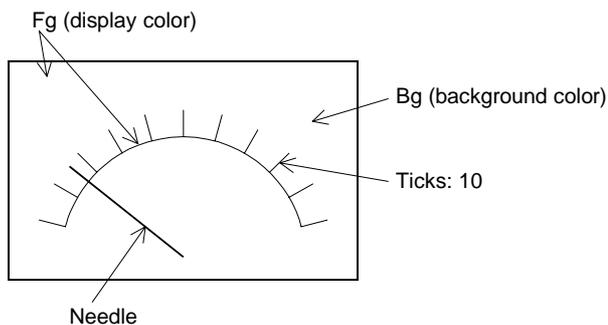
The "Panel Meter" object displays the value of a specified word device in the form of panel meter.

◆Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates in the unit of dot.	
Size	Enter the width (W) and the height (H) in the unit of dot. The "vertical:horizontal" ratio is fixed to "3:4".	
Bg and Fg	Enter the background color and the display color. (Initial values: White and black)	← 1)
Needle	Enter the needle color.	← 2)
Word Device	Enter a word device whose value is to be displayed in the form of panel meter. Enter "Data Size" and "Displayed value (Current or Preset)" also.	
Minimum Value and Maximum Value	Enter the minimum value (0%) and the maximum value (100%). "Direct" (to enter a direct value) or "Indirect" (to enter a data register) can be selected.	
Ticks	Enter the number of ticks of the scale attached to the panel meter within the range of 2 to 11.	← 3)
Frame	Enter the frame displayed around the panel meter. (Initial setting: No frame)	← 4)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.	← 4)



◆Display example



10.4.8 Indicator

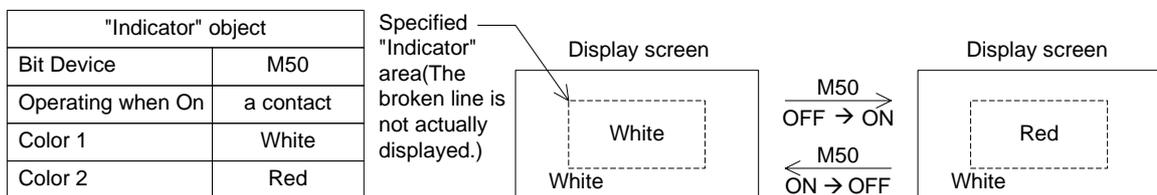
The "Indicator" object exchanges the display color and the background color within in the specified area on the screen in accordance with the ON/OFF status of a specified bit device.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Size	Enter the width (W) and the height (H) in the unit of dot.
Color 1 and Color 2	Enter the colors to be exchanged. (Initial values: Black and white)
Bit Device	Enter a bit device to be referred to (positive logic or negative logic).

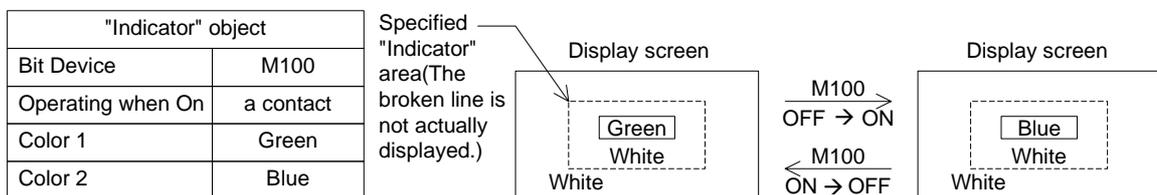
◆Display example

- When any object is not located within the area specified for the "Indicator" object



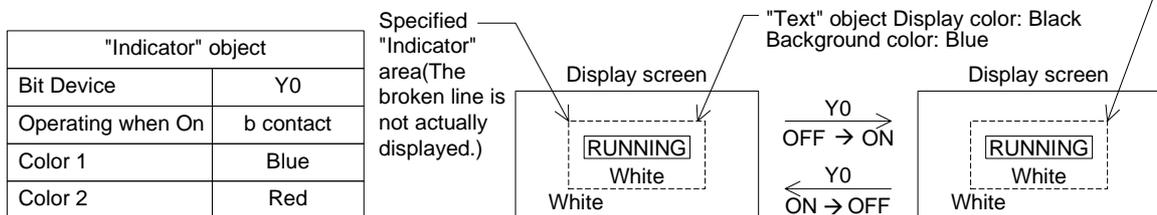
- When M50 becomes ON (a contact), the color of the specified area is exchanged between the color 1 and the color 2 of the "Indicator" object.

- When an object is located within the area specified for the "Indicator" object



- When M100 becomes ON (a contact), the color of the specified area is exchanged between the color 1 and the color 2 of the "Indicator" object.
- Even within the specified area, any color other than green and blue is not exchanged.

- When an object is located within the area specified for the "Indicator" object



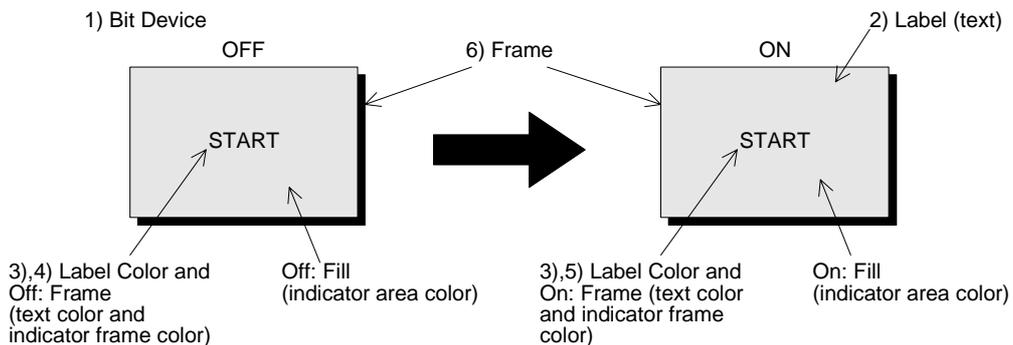
- When Y0 becomes OFF (b contact), the color within the specified area is exchanged between the color 1 and the color 2 of the "Indicator" object.
- In the example above, the display color of the "Text" object is black, so is not exchanged. The background color of the "Text" object is blue. In this case, this background color is exchanged between blue and red. The background color is blue while Y0 is OFF, and red while Y0 is ON.
- Create the "Indicator" object so that it is located at the top in the display. (Create an object whose color is to be exchanged at first, then create the "Indicator" object.)

10.4.9 Label Indicator

The "Label Indicator" object changes over the displayed image ("Library Image" object) in accordance with the ON/OFF status of a specified bit device.

◆ Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates in the unit of dot.	
Size	Enter the width (W) and the height (H) in the unit of dot.	
Bit Device	Enter a bit device to be referred to.	← 1)
Label	Enter a text to be displayed inside the indicator. The character size can be specified.	← 2)
Label Color	Enter the color of the text. (Initial value: Black)	← 3)
Off: Frame and Fill	Enter the indicator frame color and the indicator area color displayed while the specified bit device is OFF. (Initial values: Black and white)	← 4)
On: Frame and Fill	Enter the indicator frame color and the indicator area color displayed while the specified bit device is ON. (Initial values: Black and white)	← 5)
Frame	Select the frame. (Initial value: No frame) The frame is displayed in "Off: Frame" color or "On: Frame" color.	← 6)



10.4.10 Text Indicator

The "Text Indicator" object changes the displayed text in accordance with the ON/OFF status of a specified bit device (X, Y, M, S, T or C) in the PLC. Texts to be displayed can be entered directly or selected using the text No. stored in the text library.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Text	Enter the background color and the display color. (Initial values: White and black) The background color can be entered for the ON status and the OFF status respectively.
Character Size	Enter the width (W) and the height (H) of characters. The available sizes are x0.5, x1, x2, x3 and x4.
Bit Device	Enter a bit device to be referred to.
Text Off	Enter a text No. or text itself to be displayed while the specified bit device is OFF.
Text On	Enter a text No. or text itself to be displayed while the specified bit device is ON.
Frame	Select the frame displayed around the text. (Initial setting: No frame)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.

◆Display example

"Text Indicator" object	
Bit Device	Y0
Text On	10
Text Off	11

- Sequence program



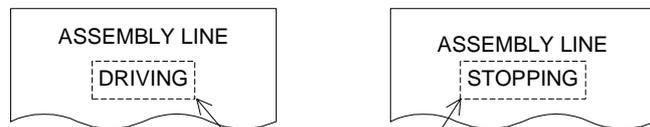
TEXT LIBRARY	
0	CHECK
...	...
9	MOTOR DRIVE
10	DRIVING
11	STOPPING
12	CYLINDER OFF
...	...

↑ Text No.

- GOT screen

While Y0 is ON
The text No. 10 stored in the text library is displayed.

While Y0 is ON
The text No. 10 stored in the text library is displayed.



Bg (background color) (The broken line is not actually displayed.)

"ASSEMBLY LINE" is displayed using the "Text" object.
The displayed text can be changed over on the same screen.

- In the example above, the displayed texts are specified using the text No. stored in the text library. Instead of this method, a text to be displayed while the specified bit device is ON and a text to be displayed while the specified bit device is OFF can be entered directly.

10.4.11 Image Indicator

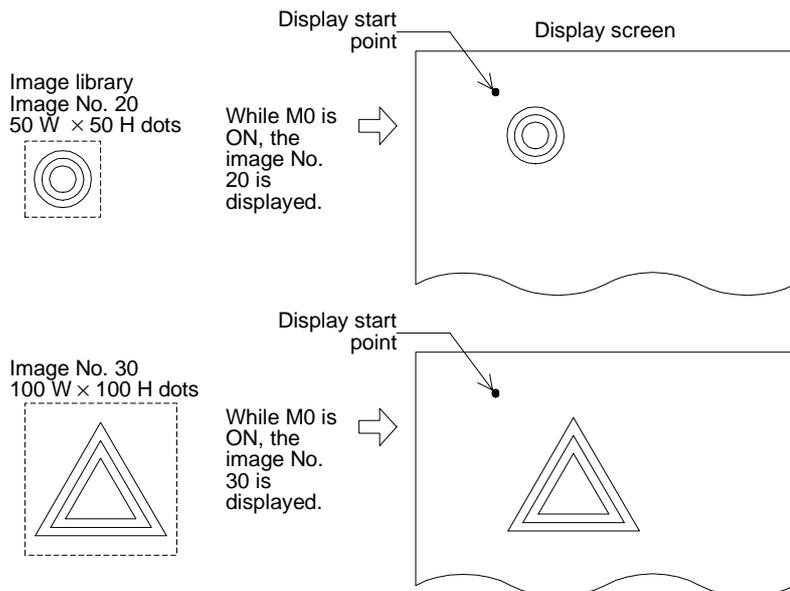
The "Image Indicator" object changes over the displayed image in accordance with the ON/OFF status of a bit device (X, Y, M, S, T or C) in the PLC. Images to be displayed can be entered directly or selected using the image No. stored in the image library.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Fg	Enter the background color and the display color. (Initial values: White and black)
Bit Device	Enter a bit device to be referred to.
Image Off	Enter the image No. of an image to be displayed while the specified bit device is OFF.
Image On	Enter the image No. of an image to be displayed while the specified bit device is ON.

◆Display example

"Image Indicator" object	
Bit Device	M0
Image On	20
Image Off	30



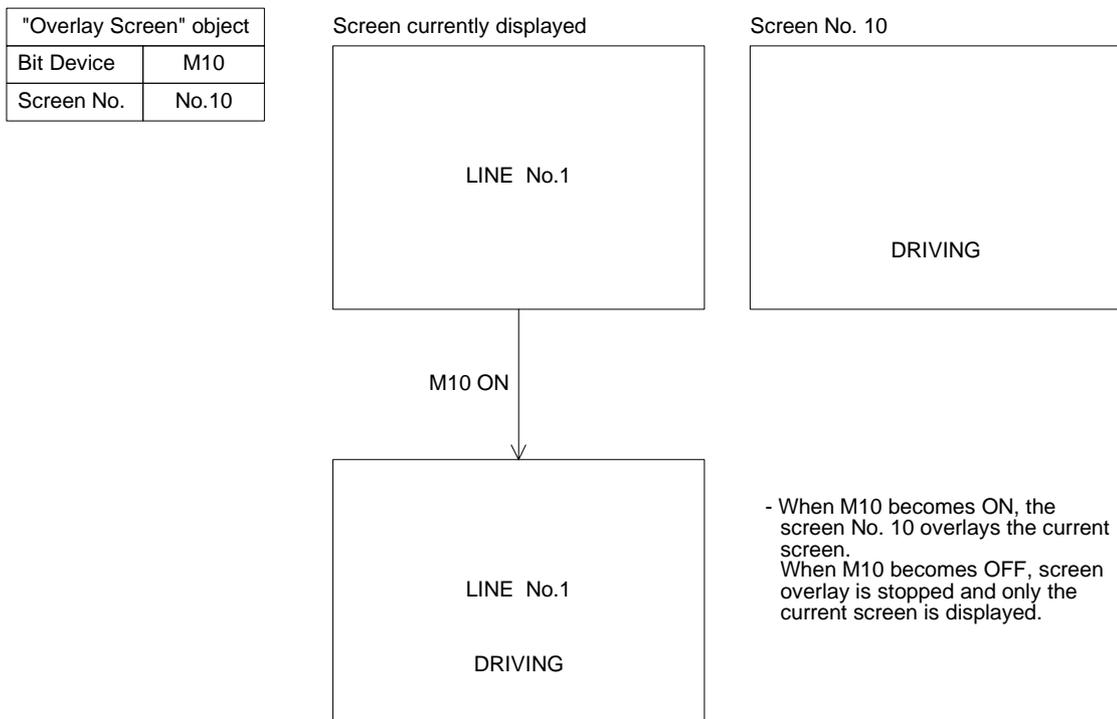
10.4.12 Overlay Screen

The "Overlay Screen" object allows a specified screen to overlay the screen currently displayed while a certain bit device is ON.

◆Contents of setting

Attribute	Contents of setting
Bit Device	Enter a bit device to be referred to.
Screen No.	Enter a screen No. to overlay the current screen.

◆Display example



- Up to three screens can be displayed by screen overlay including the current screen. When screen overlay is performed using a control device, screens cannot be overlaid.
- All objects provided on overlaid screens are effective. If touch keys are displayed in a same position, the priority is given to the key on the top screen.

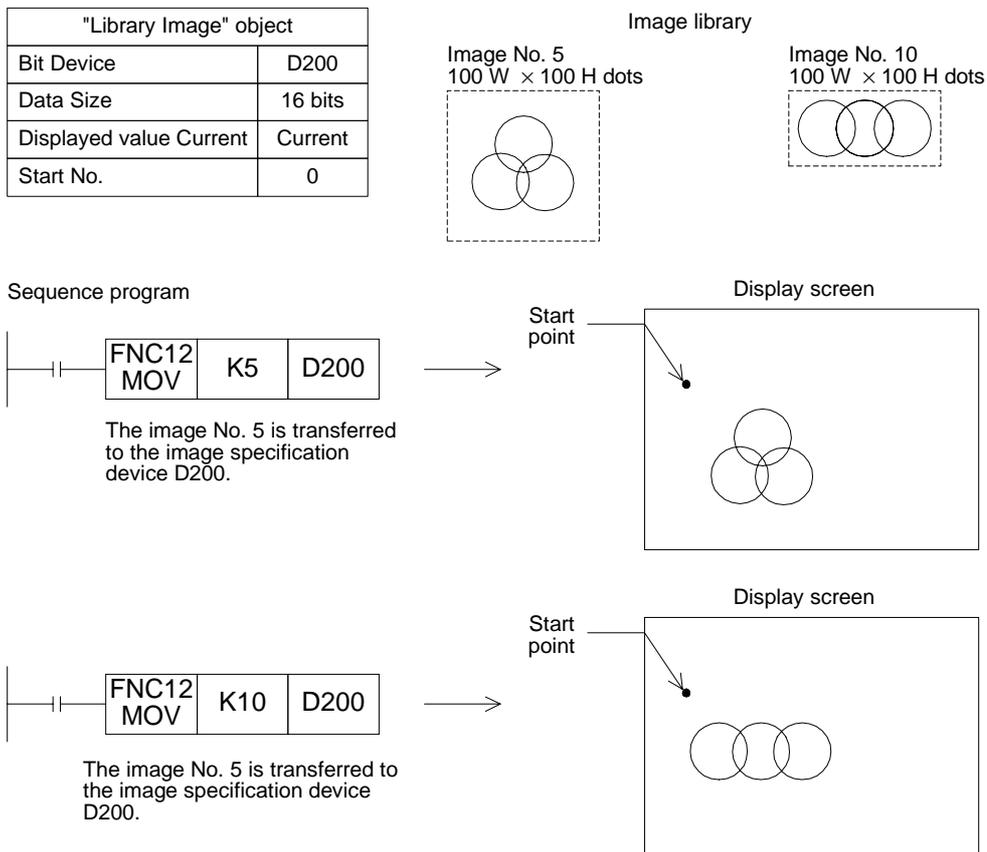
10.4.13 Library Image

The "Library Image" objects displays an image stored in the image library in accordance with the current value or the set value of a specified word device (T, C, D, V or Z). Because two or more images can be displayed on one screen, the number of screens can be saved.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Fg	Enter the background color and the display color. (Initial values: White and black)
Word Device	Enter a word device storing an image No. to be displayed. Enter "Data Size" and "Displayed value" (Current of Preset) also.
Start No.	The monitored value plus this start No. are regarded as the image No. of an image to be displayed.

◆Display example



- The image No. 5 or 10 is displayed in accordance with the executed sequence program.
- Both the images No. 5 and 10 are displayed from the same start position.
- Each image is displayed in the same size as stored in the image library.
- In the example above, if "Start No." is set to "10", the image No. 15 (5 + 10) and the image No. 20 (10 + 10) are displayed alternately.

10.4.14 Trend Graph (Sampling)

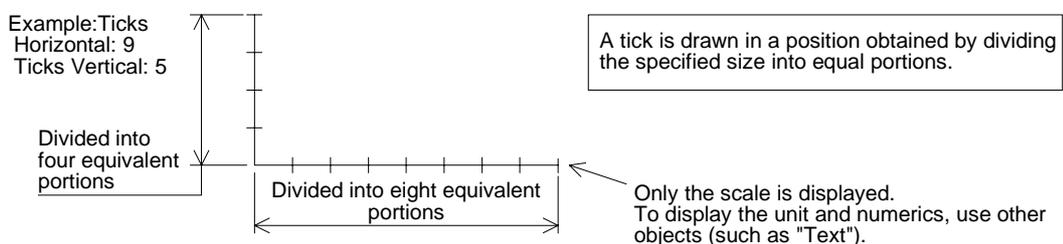
The "Trend Graph (Sampling)" object acquires the current value of up to four 16-bit data registers in the PLC at a specified time interval, and displays the acquired values in the form of trend graph.

◆Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates in the unit of dot.	
Size	Enter the width (W) and the height (H) in the unit of dot.	
Scale Color	Enter the scale color. (Initial value: Black)	
Word Device	Enter the head of consecutive word devices to be sampled. Enter "Data Size" also.	
Sampl. Cycle	Enter the sampling cycle within the range of 1 to 65,535 seconds).	
Direction	Select "Right" or "Left".	
Shown Devices	Enter the line type and the line color indicating four word devices.	←3)
Ticks Horizontal	Enter the number of ticks of the scale in the horizontal direction within the range of 2 to 50.	←1)
Ticks Vertical	Enter the number of ticks on the scale in the vertical direction within the range of 2 to 50.	←1)
Minimum Value and Maximum Value	Enter the minimum value (0%) and the maximum value (100%) of the graph. "Direct" (to enter a value directly) or "Indirect" (to enter a device) can be selected.	←2)
Save Result in Memory	Set whether or not the sampling result is to be saved in the memory. Sampling is continued even if the display screen is changed over.	
Clear Trigger	Enter a bit device which clears the data saved in the memory (None/OFF/ON).	
Frame	Select the frame displayed around the trend graph. (Initial setting: No frame)	←4)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.	←4)

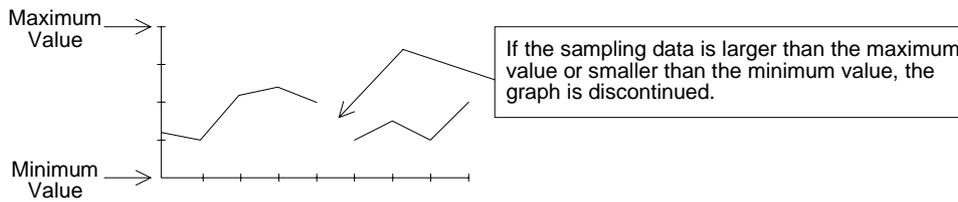
1) Ticks

- Enter the number of ticks on the scale in the horizontal and vertical directions respectively. The available range is 2 to 10 in both directions.



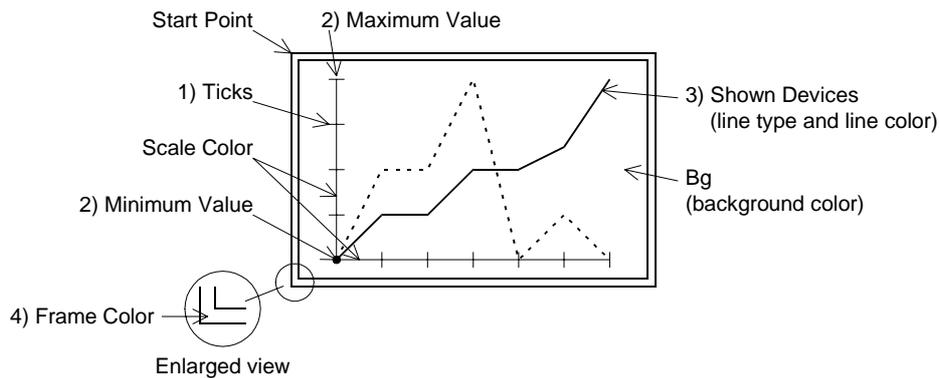
2) Minimum Value and Maximum Value

- Set the sampling data range to be displayed in the vertical axis.



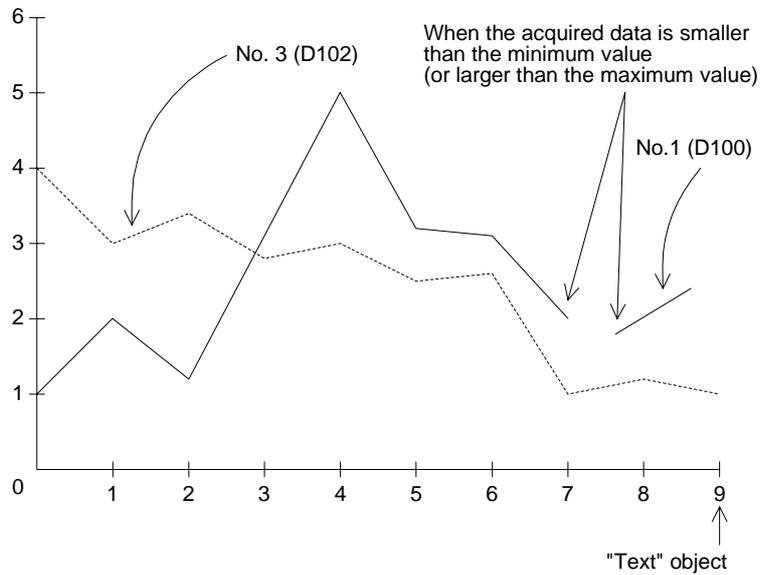
3) Shown Devices

- Select the line type for each trend graph.
- Select the line type for four data registers starting from the one specified in "Word Device".
 - None : Trend graph is not displayed. (Sampling is performed.)
 - Unbroken : Trend graph is displayed in continuous line (— — — —).
 - Broken : Trend graph is displayed in broken line (- - - - -).
 - Dotted : Trend graph is displayed in dotted line (· · · · ·).
 - Dashed : Trend graph is displayed in alternate long and short dash line (- - — - -).
- A desired color can be assigned to each line.



◆Display example

"Trend Graph (Sample)" object	
Word Device	D100
Sampl. Cycle	3
Ticks Horizontal	10
Ticks Vertical	7
Minimum Value	0
Maximum Value	1000
Shown Device: No. 1	Solid Red
Device: No. 1	None
Device: No. 1	Dotted Blue
Device: No. 1	None
Scale Color:Black	



- The word devices D100 to D103 are sampled every 3 seconds, and trend graphs are displayed.
- Numerics 0 to 9 in the scale are created using the "Text" object.
- If the data acquired by sampling is smaller than the minimum value or larger than the maximum value, it is not displayed in the graph and the graph is discontinued.
- When the line type is set to "None", the graph is not displayed on the screen.

10.4.15 Trend Graph (Total)

The "Trend Graph (Total)" object displays the current value of consecutive word devices in up to four lines.

◆Contents of setting

Attribute	Contents of setting	
Position	Enter the X and Y coordinates in the unit of dot.	
Size	Enter the width (W) and the height (H) in the unit of dot.	
Scale Color	Enter the scale color. (Initial value: Black)	
Word Device	Enter the head of consecutive word devices. (The current value is displayed for timers and counters.) Enter "Data Size" also.	←1)
Direction	Select "Right" or "Left".	←4)
Shown Devices	Enter the type and the color of up to four lines.	←4)
Ticks Horizontal	Enter the number of ticks of the scale in the horizontal direction within the range of 2 to 50.	←2)
Ticks Vertical	Enter the number of ticks of the scale in the vertical direction within the range of 2 to 50.	←2)
Minimum Value and Maximum Value	Enter the minimum value (0%) and the maximum value (100%) of the graph. "Direct" (to enter a value directly) or "Indirect" (to enter a device) can be selected.	←3)
No Display Value	When the acquired data is equivalent to a value entered here, the acquired data is not displayed.	←5)
Frame	Select the frame displayed around the trend graph. (Initial setting: No frame)	
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.	

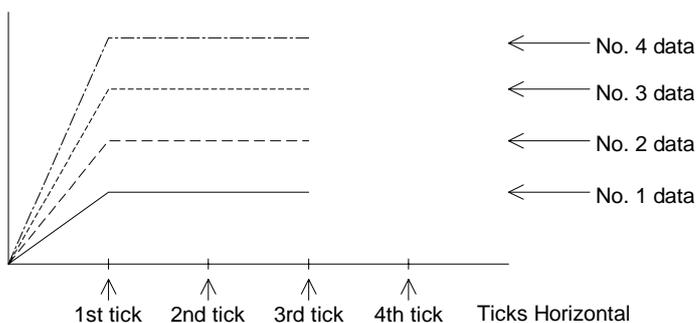
1) Word Device

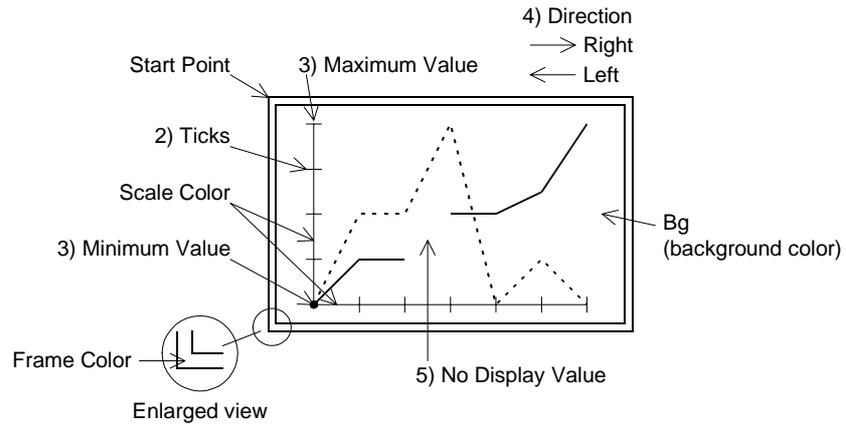
Word devices as many as the number of lines multiplied by the number of ticks in the horizontal direction of the scale are displayed in the form of trend graph.

The number of word devices shown at each tick is equivalent to the number of lines specified in "Shown Devices".

Assignment of word devices to points in trend graph

Word device	D	D+1	D+2	D+3	D+4	D+5	D+6	D+7	.....
Line No.	No.1	No.2	No.3	No.4	No.1	No.2	No.3	No.4	.....
Tick in horizontal axis	1st tick				2nd tick				.....





10.4.16 Ascii

The "Ascii" object displays characters corresponding to specified word devices (T, C, D, V or Z). Arbitrary characters can be displayed on one base screen.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Bg and Text	Enter the background color and the display color. (Initial values: White and black)
Character Size	Enter the width (W) and the height (H) of characters. The available sizes are x0.5, x1, x2, x3 and x4.
Word Device	Enter the head of word devices storing character codes to be displayed.
Data Length	1 word (16 bits) corresponds to one full-width character or two half-width characters. Up to 12 words (= 12 full-width characters or 24 half-width characters) can be displayed. *1 Consecutive devices only can be specified. *2 Each of high-speed counters C200 to C255 occupies 32 bits, and is regarded as 2 words. The text length shall be up to 20 words.
Data Changeable	Set whether or not the data can be changed using keys.
User ID Destination ID	These IDs are effective when "Data Changeable" is made effective. An object to be displayed next when a cursor control key is pressed.
Frame	Select the frame displayed around the characters. (Initial setting: No frame)
Frame Color	Enter the frame color. The area inside the frame is filled with the background color.

Refer to Paragraph 3.3.

Alphabets, numerics, etc. which can be specified using shift JIS codes (for Japanese) or ASCII codes (for half-width characters) (For character codes, refer to the appendix.)

◆How to specify character codes

- Refer to the Appendices for further details about ASCII.
- Reading the ASCII table
This section describes how to read ASCII using the Appendix as an example.
One ASCII character is displayed by combining both the vertical and horizontal axes.
.....The vertical axis shows the last digit of the code.

Example Select "A" Horizontal axis H40 Vertical axis 1 → ASCII H41 (hexadecimal expression)
Select "b" Horizontal axis H50 Vertical axis 1 → ASCII H62 (hexadecimal expression)

Higher Bit Lower Bit	1	2	3	4	5	6	7
0		(SP)	0	@	P	@	p
1		!	1	A	Q	a	q
2		"	2	B	R	b	r
3		#	3	C	S	c	s

◆Storage of word device

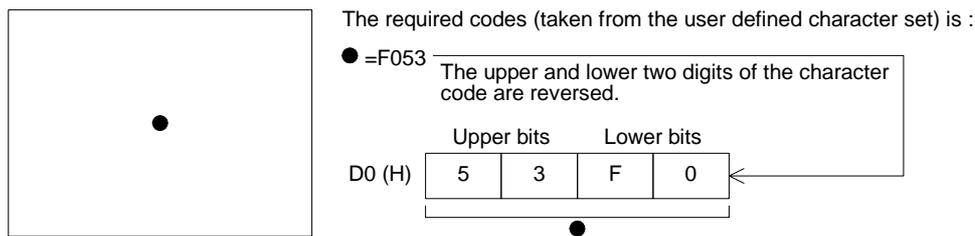
- Character codes are stored in word devices in the PLC. The stored data is displayed from the lower 8 bits as shown below.

Example 1 : When two half-width characters (ASCII codes) are displayed
 Word Device : D0
 Data Length : 1

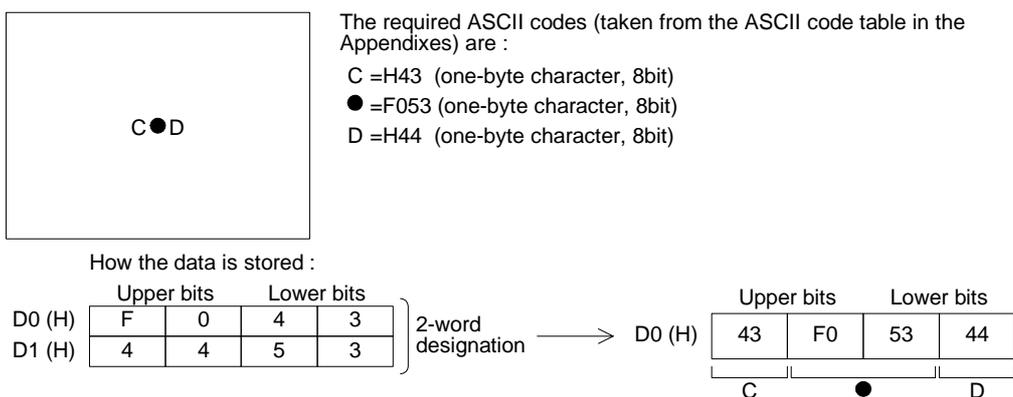


- A character to be displayed at first should be specified using lower 8 bits.

Example 2 : When one full-width character is displayed
 Word Device : D0
 Data Length : 1



Example 3 : When one full-width character and two half-width characters are displayed
 Word Device : D0
 Data Length : 2 (D0 and D1)



■Important point

When the character code is set to "H0" (either for full-width or half-width), characters after that are not displayed on the screen.
 To insert space in a text, store "H8140" (for full-width) or "H20" (for half-width) to the specified word device.
 To display an external character registered in the screen creation software, store "F040" to "F0C0" to the specified word device.

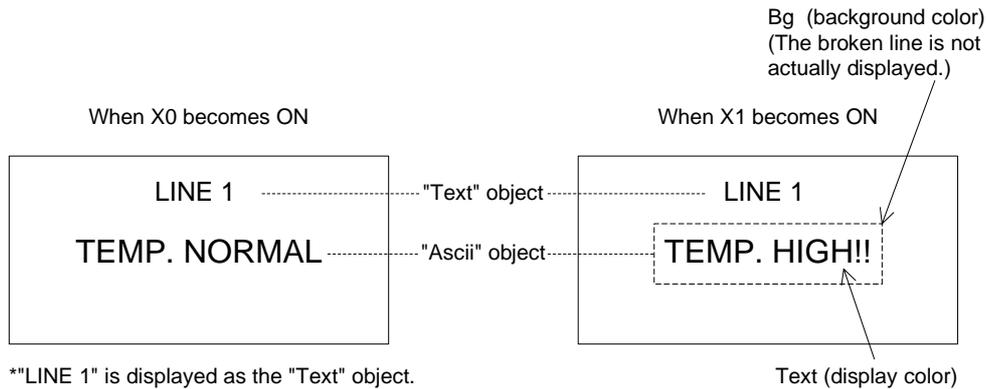
◆Display example

- "RUN" or "STOP" are displayed as the "Ascii" objects using three data registers D100 to D102.

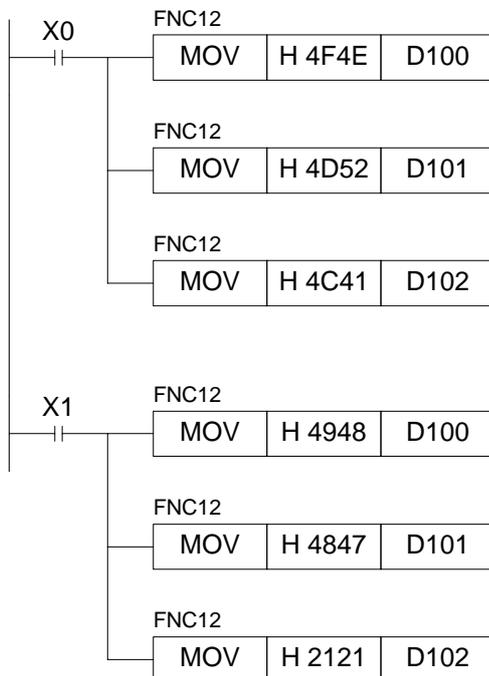
When X0 becomes ON, "NORMAL" is displayed.

When X1 becomes ON, "HIGH!!" is displayed.

- "Ascii" object
Character Size: W: ×2, H: ×2
Word Device: D100
Data Length: 3
- Display



- Sequence program



Storage status of data registers

	Upper	Lower	
D100	4F	4E	(H)
D101	4D	52	(H)
D102	4C	41	(H)

Storage status of data registers

	Upper	Lower	
D100	49	48	(H)
D101	48	47	(H)
D102	21	21	(H)

■Important point

The "Ascii" object displays specified texts on one screen as shown above. Accordingly, the screen is not required to be changed over or to be overlaid.

10.5 Data transfer objects

This paragraph describes in details the objects which turn on/off bit devices and change word devices in the PLC. The objects described in this paragraph are combined with touch keys on the screen.

The following functions can be assigned to touch keys.

- Switch
- Send Data Bank
- Write Constant
- Increment
- Decrement
- Data Setting
- Change Screen

Buzzer (Only this object has nothing to do with touch keys.)

10.5.1 Touch Key

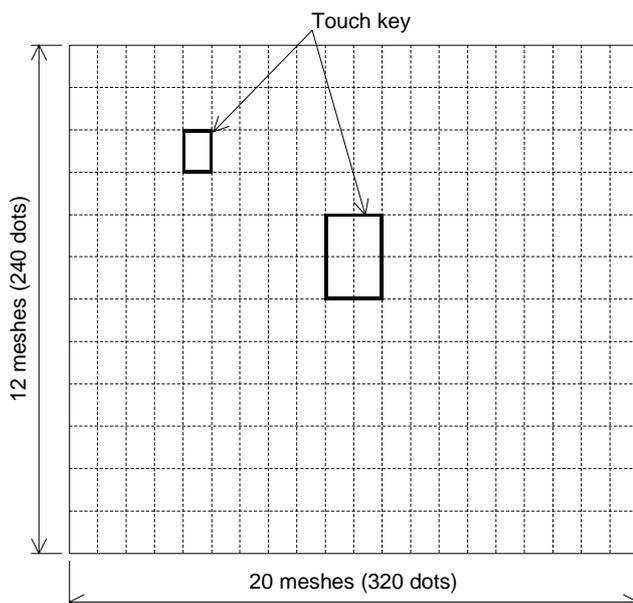
A specified area on the screen can be set as a touch key which functions as an operation key when pressed.

The "Touch Key" object allows to specify an area which functions as a touch key. To each touch key, functions offered by the objects "Switch", "Send Data Bank", "Write Constant", "Increment", "Decrement", "Data Setting" or "Change Screen" can be assigned.

◆Contents of setting

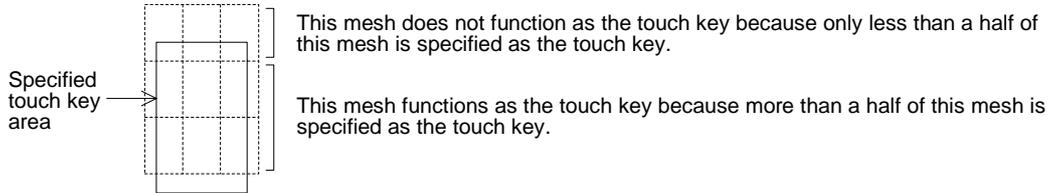
Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Size	Enter the width (W) and the height (H) in the unit of dot.
Reverse On Touch	Set whether or not the touch key frame is changed over when pressed (None/Key/Bit). When "Bit" is selected, specify a bit device for changeover.
Trigger	Enter a bit device which makes the touch key effective.
Key Code	Enter a 16-bit hexadecimal value. It is used as a code when a character is entered or when a special operation is performed.
Auto repeat and Simul. press	Set the operation.
Label	Enter a text to be displayed inside the touch key. The character size can be specified.
Label Color	Enter the label color. (Initial value: Black)
Key Type	Select the touch key frame shape.
Frame Color	Enter the display color and the background color. (Initial values: Black and white) For the background color, enter the color in the ON status and the color in the OFF status respectively.

1) Size



- The entire screen is divided into "meshes" as shown on the left. The touch key area can be specified in the unit of mesh.
- The entire screen consists of 20 W x 12 H meshes. One mesh consists of 16 x 20 dots.
- Broken lines are not actually displayed on the screen.

- A touch key can be set in the unit of dot. When more than a half of a mesh is set as a touch key, the mesh is recognized as the touch key.



2) Reverse On Touch

When this item is made effective, the touch key is reversed instantaneously when pressed.

3) Trigger

Enter a bit device in the PLC. (Initial value: None)

The touch key is effective only while this bit device remains ON.

4) Key Code

When a key code is entered, the touch key is dedicated to registration of entry code for the security function or display of the system screen.

Mode/screen	Function screen display	Key code
HPP mode	DEVICE MONITOR screen	FF11
	BFM MONITOR screen	FF12
SELECT MODE screen		FF14
Other mode	SET CLOCK screen	FF64
Entry code registration screen		FF68
Entry code reset		FF69

For other key codes, refer to the appendix.

5) Auto repeat and Simul. press

Auto repeat: Repeats the ON/OFF operation at a constant cycle while the touch key is pressed and held.

Simul. press: Specifies whether or not the touch key is effective when it is pressed simultaneously together with another touch key.

Only two keys can be made effective when pressed simultaneously.

Three or more keys cannot be made effective when pressed simultaneously.

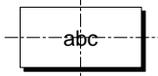
6) Label

Enter a text to be displayed inside the touch key.

Up to 20 full-width characters or 40 half-width characters can be displayed.

<Display example:>

-In the case of 1 line



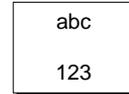
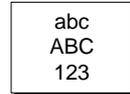
When a text is located in the center

-In the case of 2 lines



When the first and third lines are blank and a text is displayed in the second line

-In the case of 3 lines



When the second line is blank and texts are displayed in the first and third lines respectively

If a text is longer than the touch key, the text is extruded.



When a text is displayed in 1 line

7) Key Type

- Select whether or not the area specified as the touch key is enclosed with a frame.
- Select "No frame" or select one among the following five frames.

Frame shape						
	No frame	Shaded	Double frame (keyboard)	Double frame (trimming)	Double frame (shaded)	Double frame (bold)

8) Additional functions

The following functions can be assigned to a touchkey.

- Switch (Refer to Paragraph 10.5.2.)
- Increment (Refer to Paragraph 10.5.5.)
- Decrement (Refer to Paragraph 10.5.6.)
- Write Constant (Refer to Paragraph 10.5.4.)
- Send Data Bank (Refer to Paragraph 10.5.3.)
- Data Setting (Refer to Paragraph 10.5.7.)
- Change Screen (Refer to Paragraph 10.5.9.)

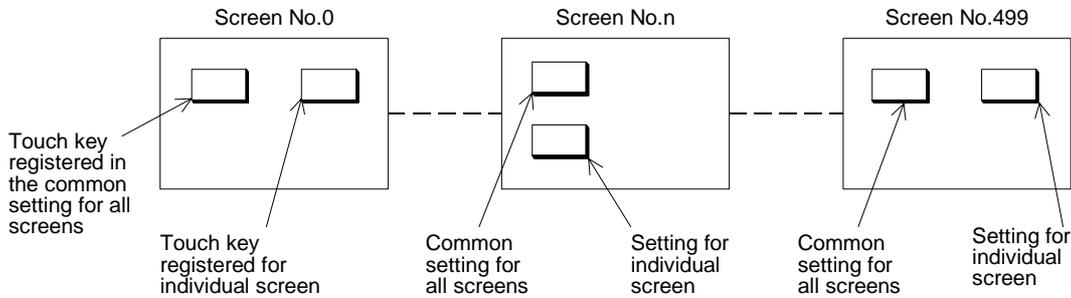
Two or more of these functions can be set to a touch key.

Only one of these function can be set to a touch key.
(The functions above can be combined.)

◆Use example 1

- 1) Relationship between the common setting for all screens and the setting for individual screens

A touch key registered in the common setting is displayed in the same size and same position in any screen.



To display a name on a touch key, register a desired name using the "Text" or "Ascii" object.

Note: If a touch key registered in the common setting for all screens and a touch key registered for individual screen are displayed in the same position, the priority is given to the former one. Pay close attention in specifying the key area.

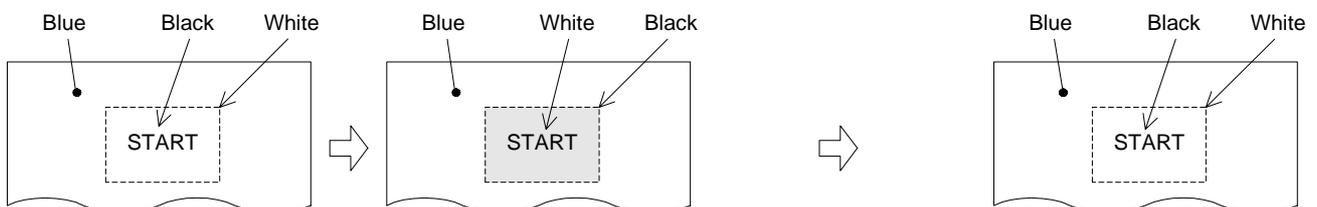
◆Use example 2

Example: When the "Touch Key" and "Indicator" objects are combined
On the screen, "START" is displayed as the "Text" object.

- 1) When the touch key is pressed, the switch function assigned to the touch key sets Y0 to ON. The output form of Y0 is set to "Alternate".
- 2) The touch key area is inverted by the "Lamp" object so that turning on of the switch can be confirmed.

"Switch" object	
Control Input	Touch Key
Bit Device	Y0
Operation	Alternate

"Indicator" object	
Bit Device	Y0
Operating when	a On
Display color	White
Background color	Black



- Press the START touch key.
- The area enclosed with broken line is specified as the "Indicator" object.
- By the switch function assigned to the touch key, Y0 becomes ON. By the indicator function, the touch key color is changed from white into black. Even if pressing of the START touch key is released, Y0 remains ON because its output form is alternate, and the indicator remains in the changed status (= white text in black background).
- When the START touch key is pressed again, Y0 becomes OFF and the indicator is returned to the former status (= black text in white background).

10.5.2 Switch

The "Switch" object allows a touch key in the GOT to control the ON/OFF status of a bit device in the PLC.

The "Switch" object offers the switch function as a pushbutton switch, etc.

◆Contents of setting

Attribute	Contents of setting
Control Input	Enter a key name which actuates the switch function.
Bit Device	Enter a bit device to be driven by the key specified in "Control Input".
Operation	Select the operation mode among "Momentary", "Alternate", "Set" and "Reset".

1) Operation

- Select the output operation mode.

Momentary : Turns on/off the controlled bit device in accordance with the ON/OFF status of the control input key.

Alternate : Turns on/off the controlled bit device every time the control input key becomes ON from OFF.

Set : Forces ON forcedly the controlled bit device when the control input key becomes ON. The controlled bit device remains ON until a reset input is given.

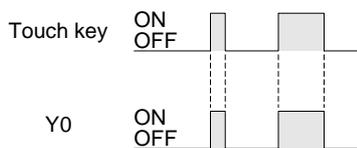
Reset : Forces OFF forcedly the controlled bit device when the control input key becomes ON.

Operation examples of "Momentary" and "Alternate"

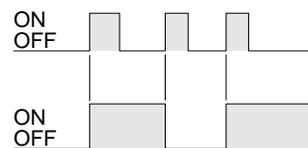
When a touch key is pressed, Y0 in the PLC is output.

- Switch Control Input: 0 key
Bit Device: Y0

When "Operation" is set to "Momentary"



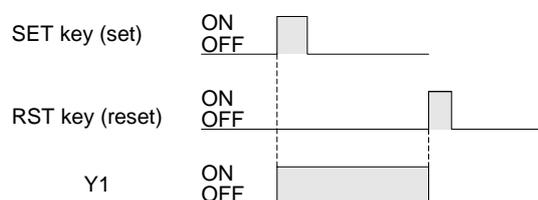
When "Operation" is set to "Alternate"



Operation examples of "Set" and "Reset"

When the SET key is pressed, Y1 is set. When the RST key is pressed, the Y1 is reset.

- Switch Control Input: SET key, RST key
Bit Device: Y1 (set), Y1 (reset)



■Important point

1) Controlled bit device

If "Operation" is set to "Momentary", the controlled bit device becomes OFF when the display screen is changed over.

If the "Switch" object is registered in the common setting for all screens, it is effective on all screens.

2) If two or more keys are pressed simultaneously

If two or more switch functions are registered, and two keys are simultaneously pressed both functions will be executed.

If three or more keys are pressed simultaneously, only the first two pressed will be effective.

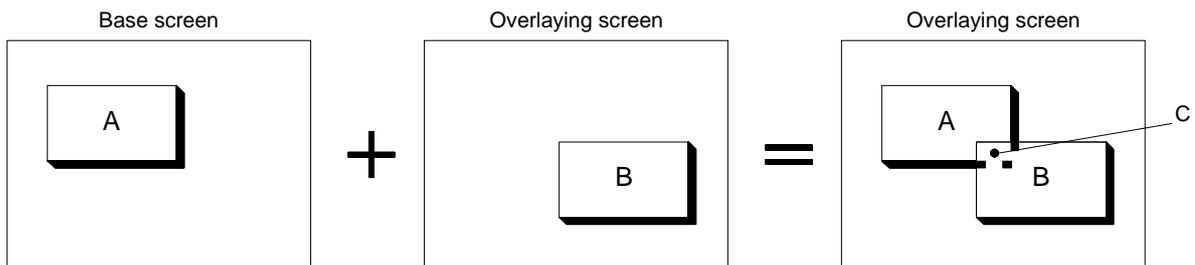
3) If two or more functions are assigned to one touch key

Two or more switch functions can be registered to one touch key.

4) If screens are overlaid

If screens are overlaid using control devices, the screen call function or the "Overlay Screen", the switch functions are effective on all of the base screen and the overlaying screens. If switches are overlaid, the switch on the top screen is effective. Pay close attention so that switches do not are not overlaid.

Example



Composed screen realized by overlay

In the switch areas A and B on the composed screen realized by overlay, each switch is effective. However, if the area C is pressed, the switch B located on the top is effective.

10.5.3 Send Data Bank (recipe function)

The GOT can store up to 4,000 16-bit data corresponding to data registers in the PLC. By giving a command through a touch key, the data can be read from/written to the PLC. For data files, refer to "10.6 Data file".

◆Contents of setting

Attribute	Contents of setting
Control Input	Enter a key which actuates data transfer.
Bank No.	Enter a data file No. to be transferred. Select "Direct" or "Indirect".
Function	Select "DU → PLC" or "PLC → DU".

1) Bank No.

Enter a file No created using the screen creation software (when selecting "Direct").
Or file No. can be specified using a control device "D0+6" (when selecting "Indirect").

2) Function

Specify the data file transfer direction.

DU → PLC: Writes data stored in a data file in the GOT to a data register in the PLC.

PLC → DU: Writes data stored in a data register in the PLC to a data file in the GOT.

■Important point

- Data file transfer condition
"✓" indicates that transfer is enabled.

PLC	FX Series		A Series	
PLC memory type	✓:RAM ✗:EEPROM	✗:EPROM *1	✓:RAM	✓:EPROM
	*1 When the read/write destination is a data register, data can be transferred without regard to the memory type.			
PLC operation status	✓:RUN	✓:STOP	✓:RUN	✓:STOP
GOT memory type	✓:Flush memory		✓:Flush memory	
PLC entry code	✗:While entry code is registered (while write is inhibited)	✓:While entry code is unlocked or is not registered	✗:While entry code is registered (while write is inhibited)	✓:While entry code is unlocked or is not registered

10.5.4 Write Constant

The "Write Constant" object writes a fixed constant to the PLC when a touch key is pressed.

The "Write Constant" object is convenient: When it is used, sequence programs such as transfer instructions are not required.

◆Contents of setting

Attribute	Contents of setting
Control Input	Enter a key which actuates write of a constant.
Constant	Enter a fixed value to be written to a word device.
Word Device	Enter a word device to which the fixed value is written. Enter "Data Size" and "Changed Value" (Current or Preset) also.

■Important point

1) Write constant to a timer/counter

Even if "0" is written to the current value or set value of a timer/counter, the output contact in the PLC is not reset. (Though the current value or set value becomes 0, the output contact does not become OFF.)

To reset a timer/counter, execute an RST instruction in the sequence program or reset the timer/counter using the switch function.

2) Data file transfer condition

"✓" indicates that transfer is enabled.

PLC	FX Series	A Series
PLC memory type	✓:RAM ✗:EPROM *1 ✗:EEPROM *1 When the read/write destination is a data register, data can be transferred without regard to the memory type.	✓:RAM ✓:EPROM
PLC operation status	✓:RUN ✓:STOP	✓:RUN ✓:STOP
GOT memory type	✓:Flush memory	✓:Flush memory
PLC entry code	✗:While entry code is registered (while write is inhibited)	✓:While entry code is unlocked or is not registered
	✓:While entry code is registered (while write is inhibited)	✗:While entry code is unlocked or is not registered

10.5.5 Increment

The "Increment" object adds "1" to the data of a specified word device when a touch key is pressed.

◆ Contents of setting

Attribute	Contents of setting
Control Input	Enter a key which actuates increment.
Word Device	Enter a word device to which 1 is added. Enter "Data Size" and "Changed Value" (Current or Preset) also.
Constant	Enter a constant to be added. (Initial value: 1)

◆ Use example

1) Increment/decrement of the "Number" object

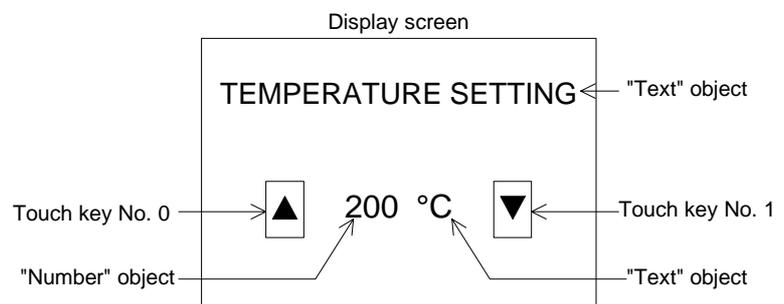
- "1" is added to or subtracted from the data of the "Number" object displayed on the screen.

"Number" object	
Word Device	D100
Digits	3
Decimal Point At	0
Data Size	16 bits
Displayed value	Current
Style	Decimal
Data Changeable	Effective (with a check mark)
Minimum Value	50
Maximum Value	300

"Increment" object	
Control Input	Touch key No. 0
Word Device	D100
Data Size	16 bits
Displayed value	Current

"Decrement" object	
"Decrement" object (Control Input)	Touch key No. 1
Word Device	D100
Data Size	16 bits
Displayed value	Current

- "▲" and "▼" on the touch keys are created using the "Text" object.
- Every time the touch key No. 0 (▲) is pressed, "1" is added to the current value of the "Number" object (D100). Every time the touch key No. 1 (▼) is pressed, "1" is subtracted from the current value of the "Number" object (D100).
- When the current value of D100 becomes larger than the maximum value or smaller than the minimum value, the error message "SET NUMBER IS INCORRECT." is displayed.
- The touch key No. is automatically assigned to each touch key when the touch key is created.



- When "Data Changeable" is made effective for the "Number" object, the data of the "Number" object can be directly changed. (Refer to Paragraph 3.3.)When the "Number" object is touched, the ten-key pad is displayed.

■ Important point

Refer to the "Decrement" object described in the next paragraph.

10.5.6 Decrement

The "Decrement" object subtracts "1" from the data of a specified word device when a touch key is pressed.

The contents of setting are equivalent to those for the "Increment" object.

◆Contents of setting

Equivalent to those for the "Increment" object.

■Important point

1) Data change condition

"✓" indicates that data change is enabled.

PLC	FX Series	A Series
PLC memory type	✓:RAM ✗:EPROM *1 ✗:EEPROM *1 When the read/write destination is a data register, data can be transferred without regard to the memory type.	✓:RAM ✓:EPROM
PLC operation status	✓:RUN ✓:STOP	✓:RUN ✓:STOP
GOT memory type	✓:Flush memory	✓:Flush memory
PLC entry code	✗:While entry code is registered (while write is inhibited) ✓:While entry code is unlocked or is not registered	✗:While entry code is registered (while write is inhibited) ✓:While entry code is unlocked or is not registered

10.5.7 Data Setting

The "Data Setting" object displays automatically the ten- or sixteen-key pad (keyboard) and allows to change the set value or the current value of a specified word device when a specified touch key is pressed.

Because the key pad is displayed only when it is required, the screen can be used efficiently. The "Data Setting" object is called the keyboard call type. The "Keyboard" object described later is called the keyboard resident type. These objects can be used in accordance with the situation.

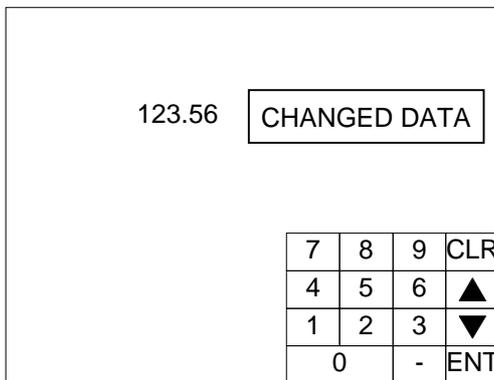
◆Contents of setting

Attribute	Contents of setting	
Control Input	Enter a key which displays the keyboard.	
User ID	Enter the user ID of an object whose data is to be changed.	←3)
Position	Enter the keyboard display position.	←2)
Keyboard Type	Enter the keyboard type.	←1)

1) Position

Enter the X and Y coordinates of the start point from which the keyboard is displayed.

2) Keyboard Type



3) User ID

Enter the ID No. of the "Number" or "Ascii" object whose data is to be changed. The object having this ID can now be changed.

■Important point

Data change

The data can be changed without using the "Data Setting" function. When the displayed "Number" or "Ascii" object is touched, the ten-key pad is displayed to enable data change. (Refer to Paragraph 3.3.)

◆Display example

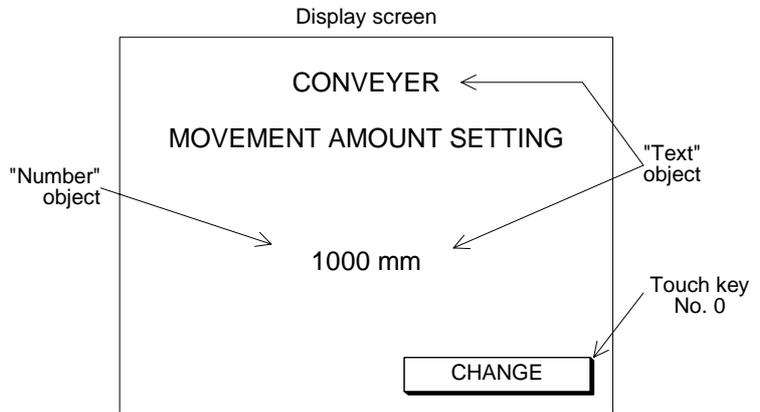
- The keyboard manipulation procedure is described below using an example.

Display example:

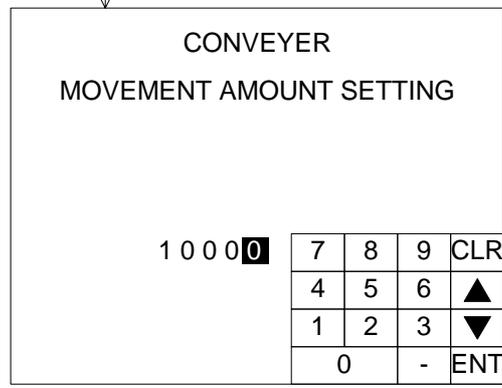
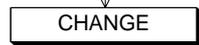
- The data of the "Number" object set as follows is changed.

"Data Setting" object	
Control Input	Touch key No. 0
Word Device	D100
Data Size	16 bits
Changed Value	Current
Keyboard Type	DEC8x4 (8x4 mesh for decimal input)

"Number" object	
Digits	D100
Decimal Point At	6
Displayed value Current	0
Data Size	16 bits
Changed Value	Current
Style	Decimal
Data Changeable	Effective (with a check mark)
Minimum Value	-20000
Maximum Value	20000

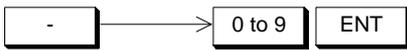


- When the touch key No. 0 is pressed, the keyboard is displayed in the specified position.
- Characters "CHANGE TRAVEL" on the touch key is created using the "Text" object.



- When the "Number" object is pressed, its lowest digit is highlighted to indicate that data can be changed.

- Enter a new data using the keyboard.



When entering a minus data

Enter a desired new data.

Press the CLR or ENT key to register the input and clears the keyboard from the screen.

Confirm the new value is displayed in the "Number" object in which the cursor is located.

■Important point

1) Rule on data change

- When changing the data, make sure to display the "Number" object whose "Word Device" is equivalent to "Word Device" of the "Data Setting" object on the same screen. The following restriction is imposed on data change.
 - 1 "Data Changeable" of the "Number" object should be made effective with a check mark when the "Number" object is registered. If it is not made effective, the keyboard is not displayed even when the touch key to call the keyboard is pressed.
 - 2 The data of the "Number" object can be changed within the range determined by "Minimum Value" and "Maximum Value".
 - 3 When a hexadecimal value (H) is displayed on the screen, make sure to use the keyboard for hexadecimal input. When a decimal value is displayed, any keyboard can be used.

2) Timing of data change

- When the ENT key is pressed, the entered data is written to the PLC. The condition for data change is equivalent to that for the "Increment" and "Decrement" objects. Even while data is changed, monitors for numerics, bar graphs, etc. on the screen are operating.

10.5.8 Keyboard

The "Keyboard" object displays a keyboard for numerical input used to change the data of the "Number" object.

The "Keyboard" object always displays a keyboard on the screen. On the other hand, when the "Data Setting" object is used, a keyboard is displayed only when it is called.

◆Contents of setting

Attribute	Contents of setting
Position	Enter the X and Y coordinates in the unit of dot.
Type	Select the keyboard type.

- Type
Select one among the following keyboards.
[Keyboards dedicated to input of decimal values]

DEC 8 × 4

7	8	9	CLR
4	5	6	^
1	2	3	v
0	-	ENT	

DEC 8 × 8

7	8	9	CLR
4	5	6	^
1	2	3	v
0	-	ENT	

DEC 16 × 2

5	6	7	8	9	-	^	CLR
0	1	2	3	4		v	ENT

DEC 16 × 4

5	6	7	8	9	-	^	CLR
0	1	2	3	4		v	ENT

- [Keyboards dedicated to input of hexadecimal values]

HEX 10 × 4

C	D	E	F	CLR
8	9	A	B	^
4	5	6	7	v
0	1	2	3	ENT

HEX 10 × 8

C	D	E	F	CLR
8	9	A	B	^
4	5	6	7	v
0	1	2	3	ENT

- [Keyboards dedicated to input of ASCII codes]

ALPHANUM1 16 × 5

A	B	C	D	E	F	BS	CLR
G	H	I	J	K	7	8	9
L	M	N	O	P	4	5	6
Q	R	S	T	U	1	2	3
V	W	X	Y	Z	0	-	ENT

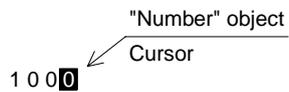
ALPHANUM2 16 × 5

A	B	C	D	E	F	G	CLR
H	I	J	K	L	M	N	BS
O	P	Q	R	S	T	U	^
V	W	X	Y	Z		SP	v
ABC	abc	NUM	SYM				ENT

◆Use example

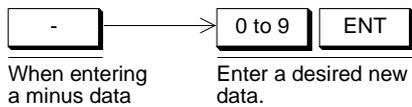
The keyboard manipulation procedure is described below.

- When the displayed "Number" object is pressed, its lowest digit is highlighted to indicate that it can be changed.



- When there are other "Number" objects, move the cursor to a "Number" object whose data is to be changed next.

Enter a new data using the keyboard.



■Important point

1) Rule on data change

- When changing the data, make sure to display the "Number" object whose "Word Device" is equivalent to "Word Device" of the "Data Setting" object on the same screen. The following restriction is imposed on data change.
 - 1 "Data Changeable" of the "Number" object should be made effective with a check mark when the "Number" object is registered. If it is not made effective, the keyboard is not displayed even when the touch key to call the keyboard is pressed.
 - 2 The data of the "Number" object can be changed within the range determined by "Minimum Value" and "Maximum Value".
 - 3 When a hexadecimal value (H) is displayed on the screen, make sure to use the keyboard for hexadecimal input. When a decimal value is displayed, any keyboard can be used.

2) Timing of data change

- When the ENT key is pressed, the entered data is written to the PLC. The condition for data change is equivalent to that for the "Increment" and "Decrement" objects. Even while data is changed, monitors for numerics, bar graphs, etc. on the screen are operating.

3) Data change condition

"✓" indicates that data change is enabled.

PLC	FX Series	A Series
PLC memory type	✓:RAM ✗:EPROM *1 ✗:EEPROM *1 When the read/write destination is a data register, data can be transferred without regard to the memory type.	✓:RAM ✓:EPROM
PLC operation status	✓:RUN ✓:STOP	✓:RUN ✓:STOP
GOT memory type	✓:Flush memory	✓:Flush memory
PLC entry code	✗:While entry code is registered (while write is inhibited) ✓:While entry code is unlocked or is not registered	✗:While entry code is registered (while write is inhibited) ✓:While entry code is unlocked or is not registered

10.5.9 Change Screen

The "Change Screen" object changes over the currently displayed screen to a specified screen.

◆ Contents of setting

Attribute	Contents of setting
Control Input	Enter a key which actuates screen changeover.
Bit Device	Enter a bit device which actuates screen changeover.
Destination Screen.	Specify the changeover destination. Select one among "Direct", "PLC data register" and "DU memory".
Save Current Screen in DU-Memory	Set whether or not the screen No. before changeover is to be stored in the memory.

◆ Use example

Refer to "11. Change Over of Display Screen".

10.5.10 Buzzer

The "Buzzer" object issues buzzer sounds in the GOT when a specified bit device in the PLC becomes ON.

◆ Contents of setting

Attribute	Contents of setting
Bit Device	Enter a bit device to be referred to.
Mode	Select one among "One Time", "Three Times" and "Continuous".

◆ Contents of operation

One Time: When a specified bit device becomes ON from OFF, a short buzzer sound is issued once (in the same way as when a key is pressed).

Three Times: When a specified bit device becomes ON from OFF, a short buzzer sound is issued three times (in the same way as when an error has occurred).

Continuous: When a specified bit device becomes ON from OFF, buzzer sound is issued continuously.

■ Important point

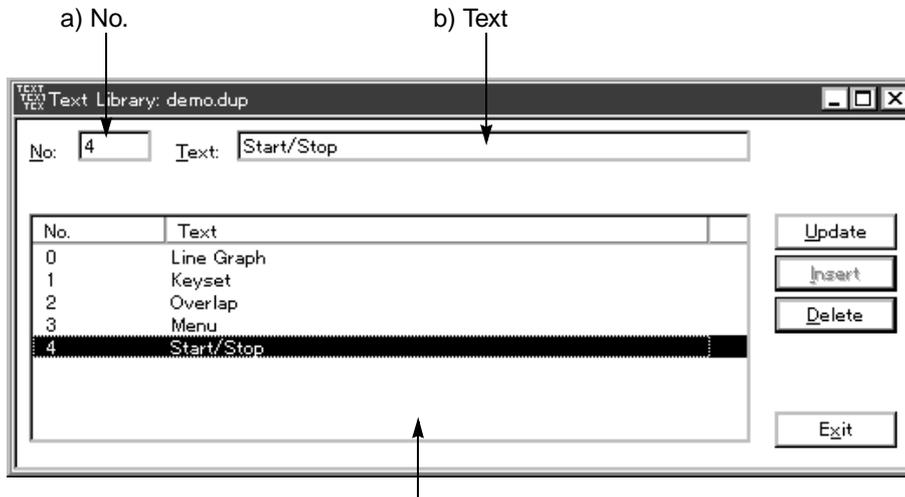
- Sequence program
If the ON time of a specified bit device is extremely short (such as in a high-speed input or a device converted into a pulse), the GOT may not recognize the ON status.

The GOT refers to the ON/OFF status in the PLC at every 200 to 300 ms. A bit device specified in the "Buzzer" object should remain ON for 300 ms or more.

10.6 Text library

The text library stores texts to be displayed by the "Library Text" and "Text Indicator" objects. The text library data is stored in the flush memory.

- Texts stored in the library can be created using the screen creation software. The figure below shows the Text Library screen.



The Nos. and character strings already registered are displayed in the list.

a) No.

A registration No. assigned to each registered text is used to display the "Library Text" and "Text Indicator" objects in the F940GOT.

Up to 2,000 texts (Nos. 0 to 1999) can be registered in the library.

b) Text

Enter a text to be registered in the library.

Up to 10 full-width characters (Kanji of JIS level 1, Katakana, Hiragana, alphabets, numerics and symbols) and 20 half-width characters (Katakana, alphabets, numerics and symbols) can be entered to each text.

■Important point

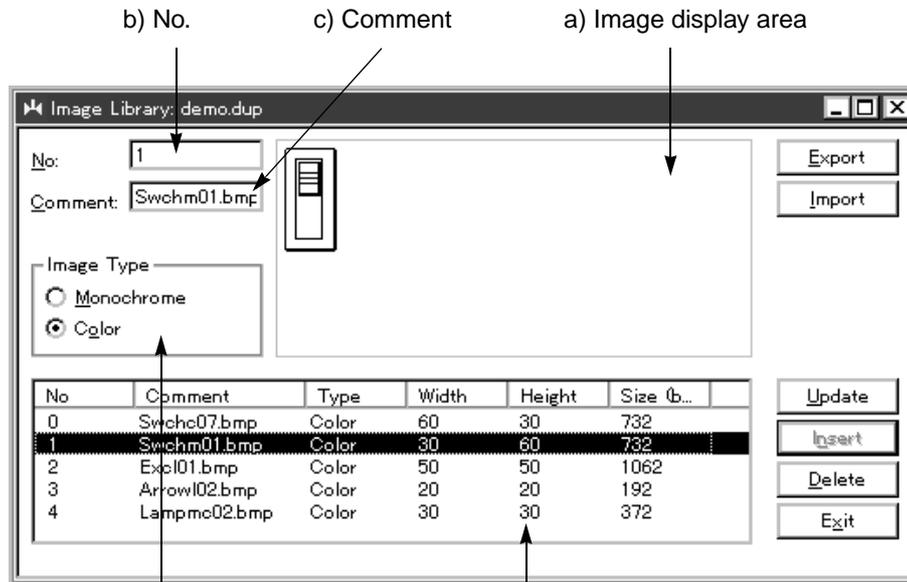
In the "Library Text" and "Text Indicator" objects, "W (width)" and "H (height)" of the character size can be set to $\times 1$ to $\times 4$ respectively.

When "H" is set to " $\times 0.5$ " for alphabets, numerics or Katakana characters, characters are displayed in the size whose height is a half of the half-width size. At this time, make sure to enter half-width characters to a text to be registered in the text library. If a text consisting of full-width characters is registered in the text library and displayed in the size "W: $\times 0.5$, H: $\times 0.5$ " on the screen, it cannot be displayed correctly.

10.7 Image library

The image library stores images to be displayed by the "Library Image", "Image Indicator" and "Image" objects. The image library data is stored in the flush memory.

- Images stored in the library can be displayed in the form of list in "Image Library", "View" in the screen creation software. The figure below shows the Image Library screen.



Displays the color type of the graphic displayed on the right area.

The Nos., comments, types and sizes already registered are displayed in the list.

a) Image display area

An image stored in the image library is displayed.

b) No.

A registration No. assigned to each registered image is used to display the "Library Image", "Image Indicator" and "Image" objects in the F940GOT.

Up to 2,000 images (Nos. 0 to 1999) can be registered in the library.

c) Comment

The comment shown here can be used to estimate the contents of an image.

10.8 Data file

Data files store the data to be transferred by the "Send Data Banks" object.

- Data files can be created using the screen creation software. The figure below shows the Data Banks screen to create data files.

a) Head Address b) Number of Banks c) Bank Size

d) Bank Value e) Format

f) Operating when (write trigger)
g) Operating when (read trigger)

	Bank 0	Bank 1	Bank 2
D100	10	500	96
D101	20	400	3245
D102	30	300	234
D103	40	200	56
D104	50	100	2365

The data values of the data file registered are displayed in the table.

How to look at the table

- Longitudinal axis (data register)
Displays from the head address entered by the bank size entered.
- Lateral axis (bank)
Displays from 0 to the number of banks entered.

- a) Head Address
Enter the head No. of data registers in the PLC used to transfer the data between the GOT and the PLC.
To clear all of the registered contents, enter "0".
In the FX Series PLC, file registers (D1000 to D2999, D6000 to D7999) can be specified also. (The file register specifications vary depending on the model and the version. Before setting, confirm the device range of the connected PLC.)
- b) Number of Banks
Enter the number of data files.
- c) Bank Size
Enter the number of data saved in one file.
- d) Bank Value
Enter the data value using a decimal or hexadecimal value in accordance with the setting of "5) Format". A value within the range which can be set by word devices in the PLC can be entered.
In the FX Series PLC, a value in the 16-bit range which can be set to word devices can be entered. (Decimal value: -32,768 to +32,767, hexadecimal value: 0 to FFFF)
- e) Format
Select "Decimal" or "Hexadecimal" as the format of data displayed in the registered data file list and entered to "Bank Value".
- f) Operating when (write trigger)
Enter a bit device in the PLC which triggers data transfer (write) from a file register in the F940GOT to a data register in the PLC.
- g) Operating when (read trigger)
Enter a bit device in the PLC which triggers data transfer (read) from a data register in the PLC to a file register in the F940GOT.

■Important point

- Available number of files and data size
A value within the range of 1 to 4000 can be entered to b) Number of Banks and c) Bank Size.
However, the number of files is limited as follows, and less than 4,000 files may be available.
 - **Bank Size x Number of Banks shall be equivalent to or less than 4,000.**
 - **Data register (D) in the PLC shall be more than "Bank Size".**

Example: In the FX PLC (There are 1,000 data registers from D0 to D999.)

Bank Size: 3000 Number of Banks: 1 Head Address: D0	}	Cannot be set. (Because the bank size is 3,000 while the number of registers in the PLC is 1,000.)
---	---	--

11. Changeover of Display Screen (FX-PCS-DU/WIN-E)

The previous Section 10 describes creation of one screen.

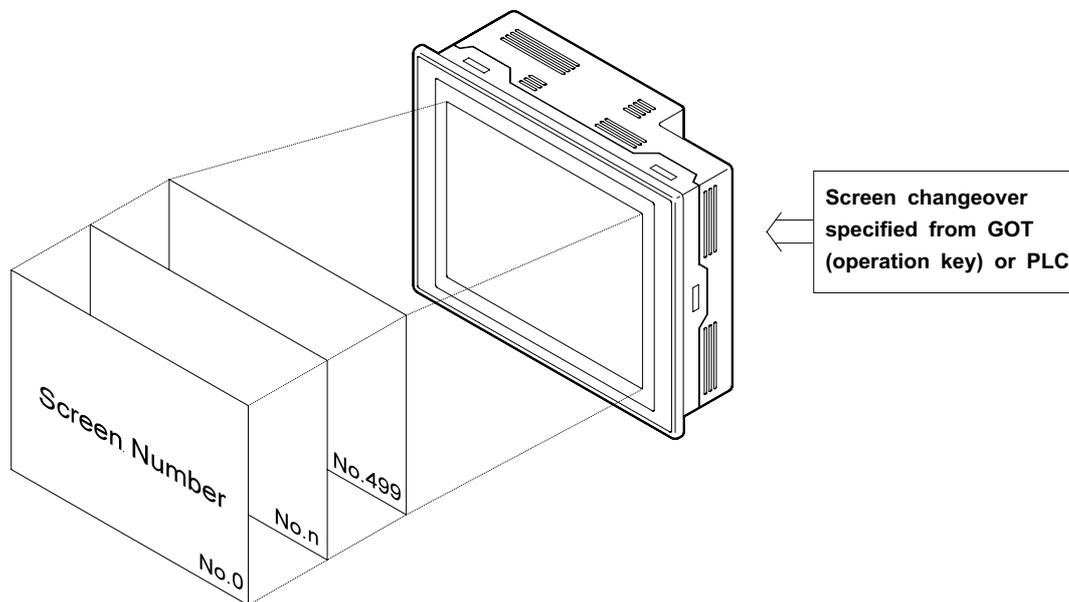
Section 11 describes how to change over two or more screens.

Screen changeover can be arbitrarily specified using operation keys in the GOT or from the PLC.

11.1 Outline of changeover of display screen

In the F940GOT, up to 500 screens can be created. A number from 0 to 499 is assigned to each screen to control each screen.

A screen to be displayed next after the currently displayed screen should be specified using operation keys in the GOT or from the PLC.



Not only user screens (No. 0 to 499) but also system screens (No. 1001 to 1030) in the alarm mode or the other mode can be displayed. (Refer to Paragraph 11.6.)

■Important point

1) Creation of the user screen No. 0

In the screen mode in which user screens are displayed, the screen No. 0 is always displayed immediately after the power is turned on.

Accordingly, the screen No. 0 should be created. If the screen No. 0 is not registered, the error message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed.

2) Screen Nos. may not be consecutive.

The screen Nos. may not be consecutive in such a way as "0, 1, 2, 3 . . ."

When there is a possibility that some screens may be inserted in the future, inconsecutive screen Nos. can be used.

However, it is recommended to use consecutive screen Nos. because mistakes may be reduced in screen changeover when screen Nos. are consecutive.

11.2 "Change Screen" object

Use the "Change Screen" object to change over screens.

The "Change Screen" object is important. It allows to specify a screen to be displayed next after the currently displayed screen when the trigger condition (operation key in the GOT and bit device in the PLC) is satisfied.

11.2.1 Contents of setting

In the "Change Screen" object, the following three main items are to be set.

- 1) Condition
Set the condition which triggers screen changeover.
- 2) Destination Screen
Set the destination screen to be displayed when the trigger condition is satisfied.
- 3) Save Current Screen
Set whether or not the screen No. of the currently displayed screen is to be stored in the memory before screen changeover.

Condition

Set the condition to trigger screen changeover.

An operation key in the GOT and a bit device in the PLC can be set here. When both of them are satisfied, the display screen is changed over.

Set item		Description
Control Input (in GOT)	Touch key	Common setting for all screens: Touch keys Nos. 50 to 99 Setting for individual screen: Touch keys Nos. 0 to 49
	None	There is no condition for operation key.
Bit Device (in PLC)	Bit device	Bit device X, Y, M, S, T or C (a contact or b contact)
	None (Always Change)	There is no condition for PLC.

When both "Control Input" and "Bit Device" are satisfied, the display screen is changed over.

Destination Screen

Set the specification method of the destination screen to be displayed after the currently displayed screen.

When 1] Condition is satisfied, the screen is displayed in accordance with the specification method set here.

Set item	Description
Direct	When this item is selected, the No. of a screen to be displayed next (one among user screens NO. 0 to 499 and system screens No. 1001 to 1030) can be entered here directly.
PLC data register	When this item is selected, a screen (one among the screens Nos. 0 to 499 and 1001 to 1030) stored in control devices (data registers D+0 to D+2) in the PLC is displayed next. * The control devices can be selected using the screen creation software.
DU memory	When this item is selected, a screen stored in the memory in the GOT is displayed next.

Save Current Screen

Set whether or not the screen No. of the currently displayed screen is to be stored in the memory before screen changeover. To save it, add a check mark.

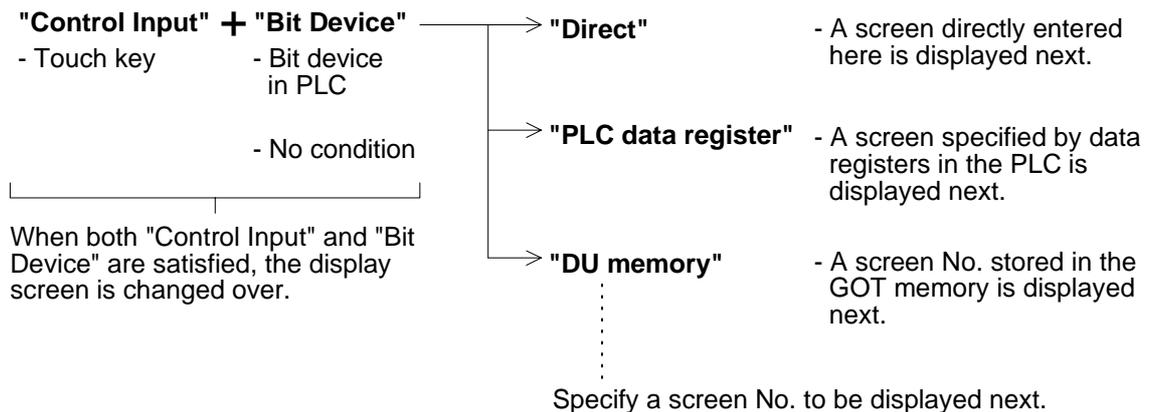
The screen No. saved by this function is regarded as the screen No. to be displayed when "DU memory" is selected in "2) Destination Screen".

11.2.2 Operation of screen changeover

The "Change Screen" object can be registered for each individual screen or for all screens (common setting).

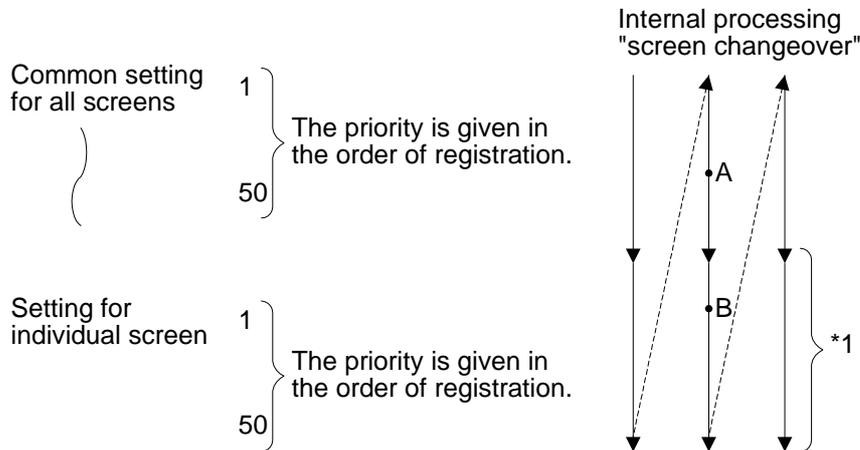
- Registration of the "Change Screen" object
 - Setting for individual screens
 The setting is effective only while the registered screen is displayed.
 Up to 50 objects in total can be registered including the "Change Screen", "Switch", "Send Data Bank", "Increment", "Decrement" and "Data Setting" objects.
 - Common setting for all screens
 The setting is effective on any screen.
 Up to 50 objects in total can be registered including the "Change Screen", "Switch", "Send Data Bank", "Increment", "Decrement" and "Data Setting" objects.
 - * Up to 50 objects in total can be registered including the setting for individual screen and the common setting for all screens.

Condition



11.2.3 Timing of screen changeover

Inside the GOT, whether or not the screen changeover condition specified by the "Change Screen" object is satisfied, it is checked in the order of the common setting for all screens and the setting for individual screens. When the specified condition is satisfied, the next screen is displayed.



- For example, even if the screen changeover condition for individual screen is satisfied at the point A earlier than satisfaction of the screen changeover condition for all screens at the point B, the priority is given to the common setting for all screens and the screen specified by the common setting for all screens is displayed.
If two or more screen changeover conditions are satisfied at the same time, the screen is changed over in accordance with the setting of an object with highest priority.
- *1 When screen changeover is performed, the "Change Screen" object for the previous individual screen is replaced with the "Change Screen" object for the new individual screen.
- Screen changeover is performed in accordance with the priority as described above.
If the screen changeover condition is equivalent, the object registered later is ignored.

11.3 Screen changeover by touch key

This paragraph describes screen changeover using a touch key.

When a touch key is used for screen changeover, the screen display is changed over to the specified destination when the touch key becomes ON. Enter an arbitrary touch key to "Control Input" in "Condition". Select "Direct" in "Destination Screen", and enter a desired screen No. to "Screen No."

Set item	Description
Control Input (in GOT)	Available touch keys Common setting for all screens: Touch keys Nos. 50 to 99 Setting for individual screen: Touch keys Nos. 0 to 49 } 50 keys in all
Bit Device	Do not select "Bit Device". (Do not enter any bit device No.)
Screen No.	Enter the screen No. of a screen to be displayed next among user screens Nos. 0 to 499 and system screens Nos. 1001 to 1030.

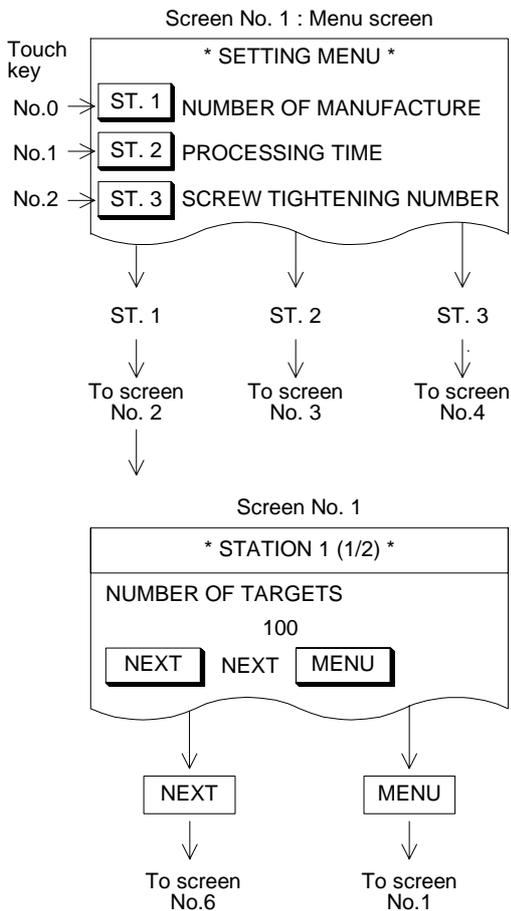
Example of screen changeover using touch keys

- Examples of screen changeover using touch keys are shown below. Set the "Change Screen" object for all screens (common setting) and for individual screen.
 - Common setting for all screens
 In this example, the screen No. 0 is displayed from any screen when the MENU key is pressed.
 Characters "MENU" are displayed by the "Text" object.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 50	Not specified	0	Not effective

← For screen changeover by screen No. stored in memory, refer to Paragraph 11.5.

- Setting for individual screen



- Screen No. 0 is created, and screen changeover is set as follows.
 Screen No. 0 is a menu screen.
 When either of the ST. 1 to ST. 3 keys is pressed, a corresponding screen is displayed.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 0	Not specified	1	Not effective
2	Touch key No. 1	Not specified	2	Not effective
3	Touch key No. 2	Not specified	3	Not effective

- Characters "ST. 1" to "ST. 3" are displayed by the "Text" object.

- Screen changeover for screen No. 1 is set as follows.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 0	Not specified	1	Not effective

- When the "▼" key is pressed, screen No. 6 is displayed without regard to the ON/OFF status of bit devices in the PLC.
- When the MENU key is pressed, screen No. 0 is displayed in accordance with the setting of the "Change Screen" object set for all screens.

■Important point

- 1) Change of displayed data
If "100" on screen No. 1 is a "Number" object, the value "100" can be changed. (Refer to Paragraph 3.2.)
- 2) Specification of touch key
When selecting "Control Input" in "Condition", enter a desired touch key No.
A touch key No. starting from 0 is assigned automatically for each screen in the order of creation.
On the common screen, a touch key No. starting from 50 is assigned.

11.4 Screen changeover from PLC

From the PLC, the display screen can be changed over using bit devices and word devices (data registers).

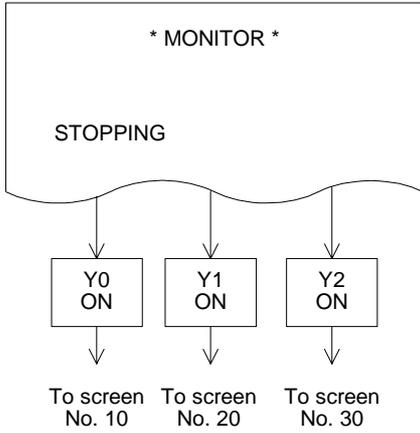
11.4.1 Screen changeover using bit devices

This paragraph describes the method to display a specified screen when a bit device (X, Y, M, S, T or C) becomes ON or OFF.

Set item	Description
Control Input	Do not enter any touch key.
Bit Device	Make "Bit Device" effective with a check mark, and enter a desired bit device (X, Y, M, S, T or C). In "Active when", select "On" (a contact) or "Off" (b contact).
Screen No.	Enter the screen No. of a screen to be displayed next among user screens (Nos. 0 to 499) and system screens (Nos. 1000 to 1030).

Display of screen by bit device

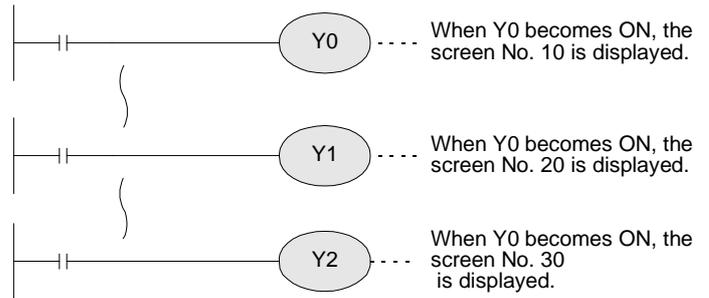
- An example of screen changeover by ON/OFF of a bit device in the PLC is shown below. In this example, the "Change Screen" object is set for an individual screen.
 - Setting for individual screen



- Screen No. 0 is created, and the "Change Screen" object is set as follows.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Not specified	Y0/On	10	Not effective
2	Not specified	Y1/On	20	Not effective
3	Not specified	Y2/On	30	Not effective

- Example of sequence program



- If either of Y0, Y1 and Y2 (a contact) becomes ON while screen No. 0 is displayed, a corresponding screen is displayed.

11.4.2 Screen changeover by data

The display screen can be changed over by specifying the screen No. using a word device (Only data registers are available.) in the PLC.

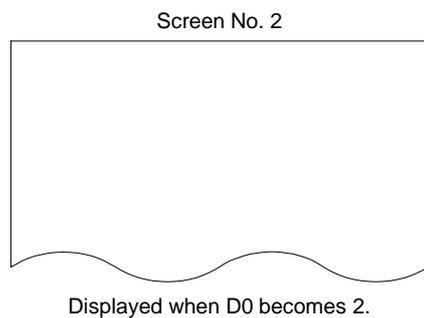
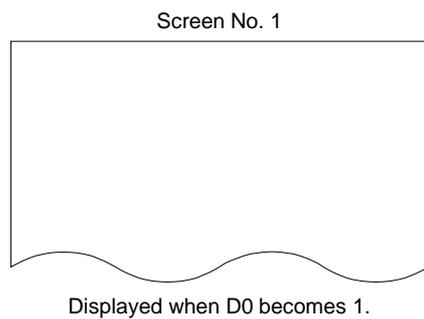
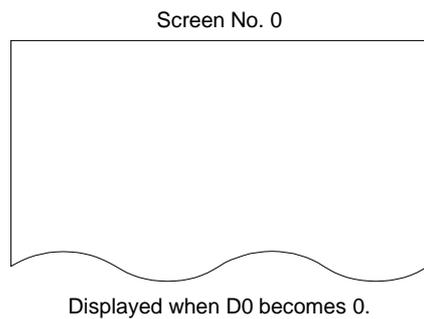
Set item	Description
Control Input Bit Device	Do not enter any touch key or bit device.
Destination Screen: PLC data register	Specify a desired screen No. using a data register (control word device) for screen specification in the PLC. The data register can be set using the screen creation software. The initial value is D0. When the data in the register is changed, screen changeover is performed and the specified screen is displayed.

Example of screen changeover by data register

- An example of screen changeover by a data register (word device) is shown below. The "Change Screen" object is set for all screens (common setting).

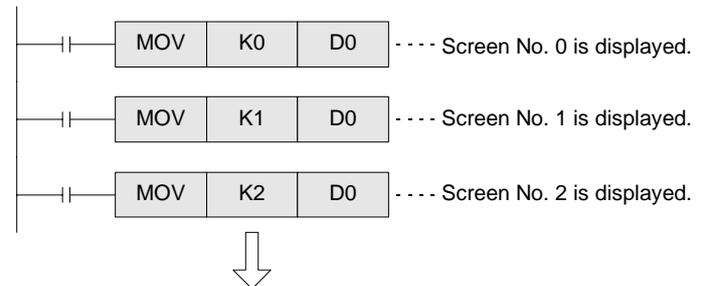
- Common setting for all screens
The display is changed over to a screen having the No. specified by a data register in the PLC without using the screen changeover condition.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 50	Not specified	0	Not effective



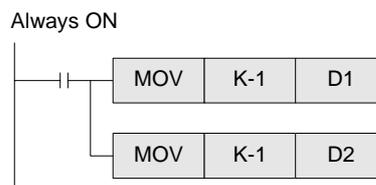
- Immediately after the GOT has been put into screen mode, the screen No. 0 is always displayed. When the sequence program shown below is executed, the screen is changed over.

- Example of sequence program



Though all of screens to be displayed can be specified from the PLC, the sequence program becomes long when many screens are specified.

- When screens will not be overlaid, enter "-1" to D1 and D2.



Important point

- Combination of other types of screen changeover
When screen changeover by data registers is used together with screen changeover by another method (bit devices or touch keys), the priority is always given to screen changeover by data registers ("PLC data register") if both "Control Input" and "Bit Device" are not set because the changeover condition is not given.
When using different types of screen changeover together, refer to "11.7 Application of screen changeover".

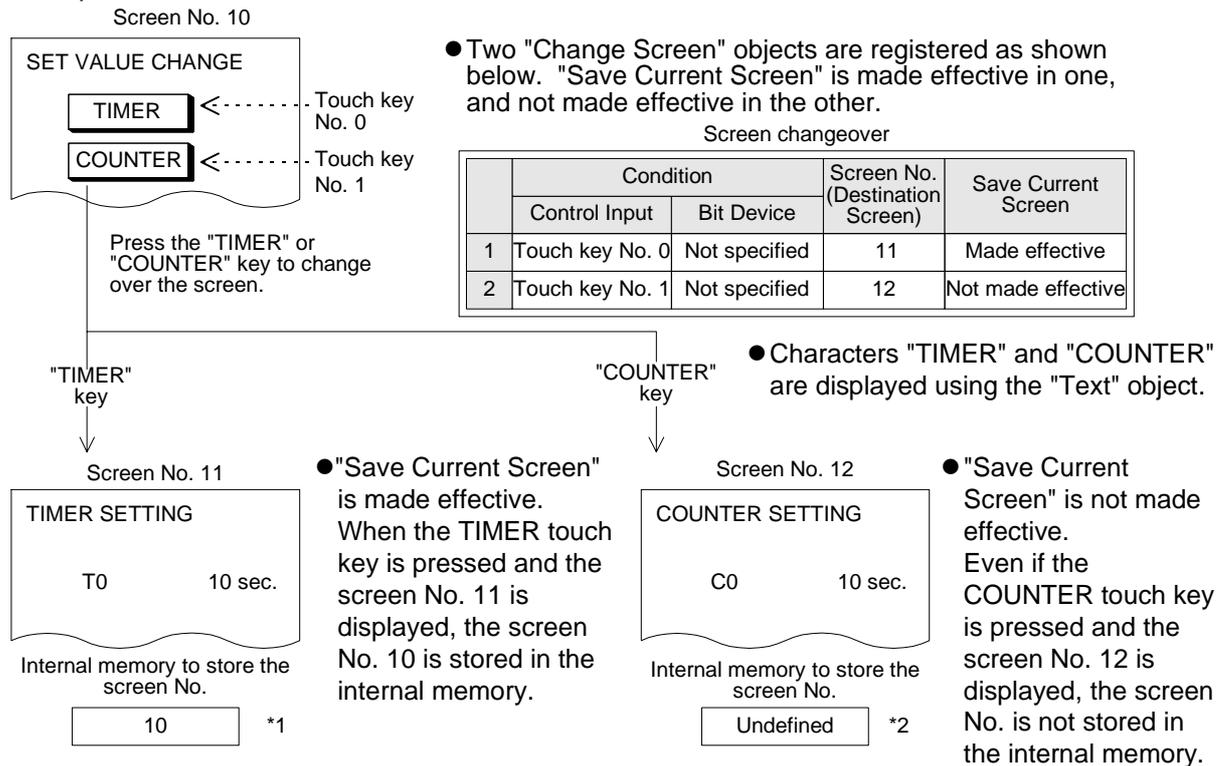
11.5 Screen changeover by screen No. stored in memory

This paragraph describes the method to display a screen stored in the memory using the screen No. storage function.

The screen No. storage function can be set in the "Change Screen" object.

Only when "Save Current Screen" of the "Change Screen" object is made effective with a check mark, a screen No. displayed just before screen changeover is stored in the memory in the GOT.

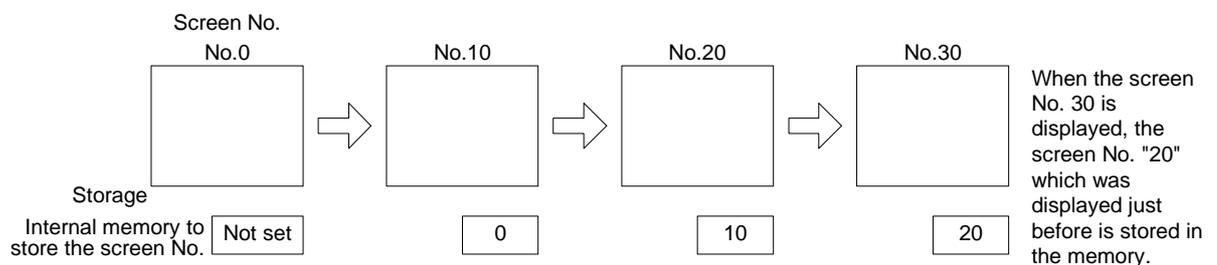
Example



*1 Contents stored in the screen No. storage memory

The screen No. storage memory in the GOT can store only one screen at a time. Accordingly, when "Save Current Screen" is made effective on a newly displayed screen, the contents of the memory is updated.

Example: Suppose that the screens are changed over as follows.

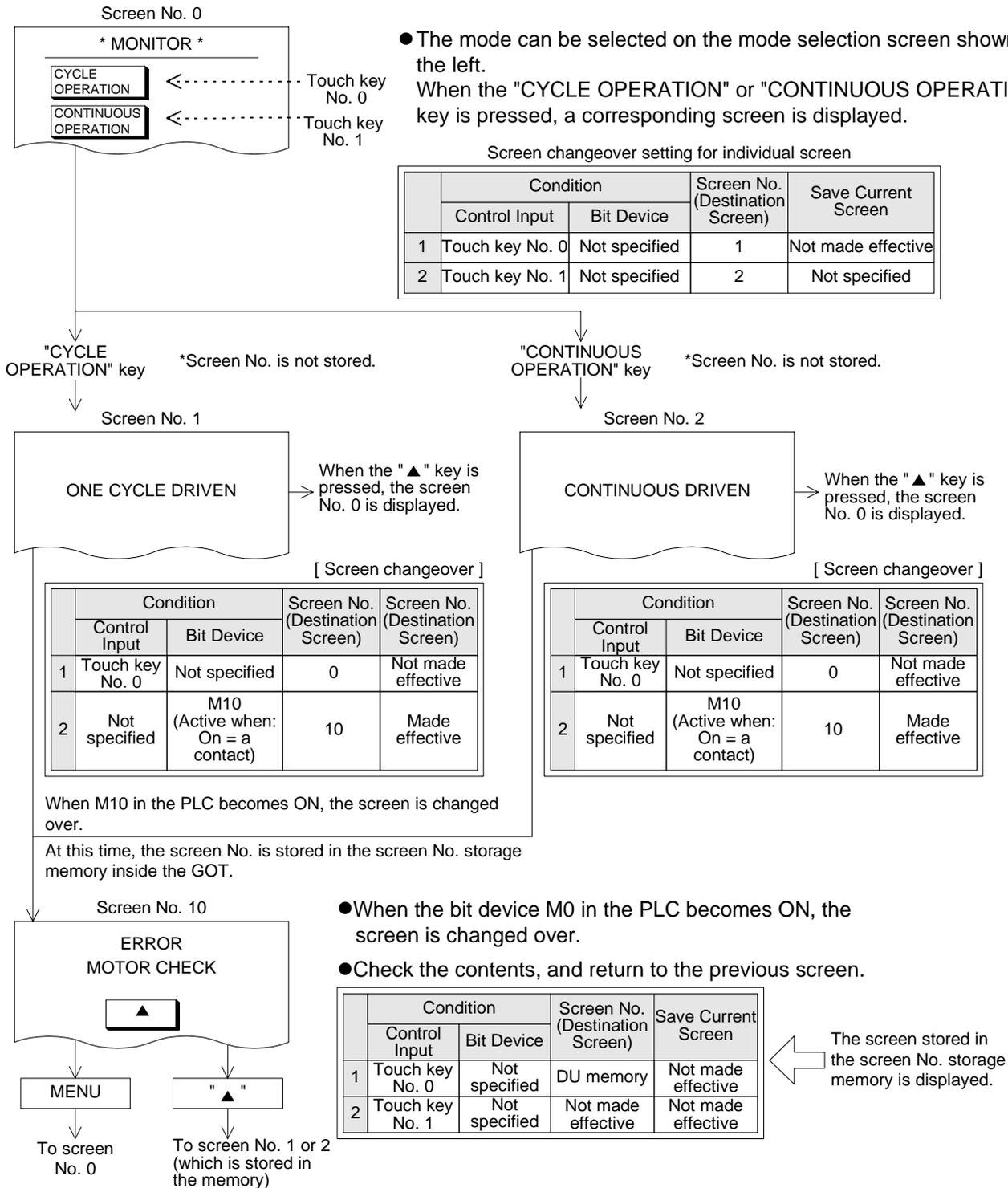


*2 Keeping of the contents stored in the screen No. storage memory

The contents stored in the screen No. storage memory is kept only while the power is turned on in the GOT main body. When the power is turned off, the memory is cleared.

Example of screen changeover by screen No. stored in memory:

An example of screen changeover by screen No. stored in memory is shown below. In the example below, an abnormality occurs in the machine in the operation mode, an error message is displayed, then the previous screen is displayed.



Use the screen No. storage function when one screen has been specified among two or more screens, and the screen that was displayed prior to the screen changeover is to be displayed again.

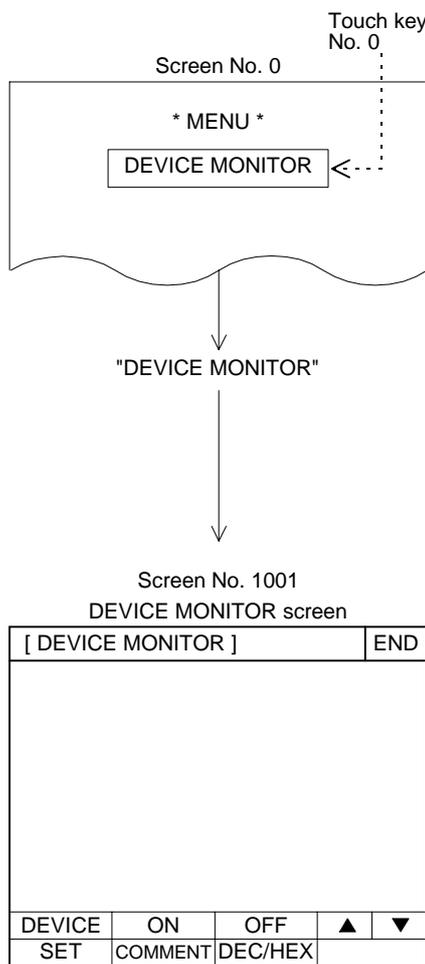
11.6 Changeover to system screen

Function screens built in the GOT such as the HPP MODE screen, the SAMPLING MODE screen, the ALARM MODE screen and the OTHER MODE screen can be displayed as user screens.

11.6.1 Display of system screen

This paragraph describes the method to display a system screen as a user screen (that is, display a system screen in the screen mode) and the caution on this method.

- **A system screen can be displayed by specifying a corresponding screen No. using the "Change Screen" object. In this case, "Save Current Screen" should be made effective so that the previous user screen can be displayed after the system screen.**



- Screen No. 0 is created as follows. The "Change Screen" object is set so that screen No. 1001 (DEVICE MONITOR screen) is displayed when the touch key No. 0 (DEVICE MONITOR) is pressed.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 0	Not specified	1001	Not effective

Make sure to set "Save Current Screen" effective. ↗

- For the operating procedures of each system screen, refer to description on each mode.
- When the END key is pressed, the previous screen (screen No. 0 in this example) is displayed again.

For the system screen No., refer to the appendix.

11.7 Application of screen changeover

This paragraph describes an application example of screen changeover.

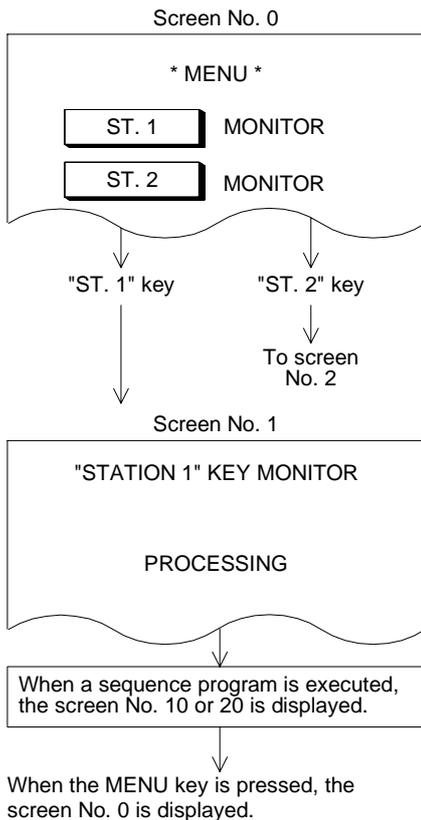
Example of screen changeover by touch key in the GOT and word device in the PLC

- In the example below, screen changeover by touch key and screen changeover by word device in the PLC are used together.
 - Common setting for all screens
The "Change Screen" object is set so that screen No. 0 is displayed when the MENU key is pressed.
This setting is suitable to read a certain screen such as the menu screen.
Characters for menu items are displayed using the "Text" object.

When the MENU key is pressed, the menu screen (screen No. 0) is displayed.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 50	Not specified	0	Not effective

- Setting for individual screen



- Screen No. 0 is created, and the "Change Screen" object is set as follows.

	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Touch key No. 0	Not specified	1	Not effective
2	Touch key No. 1	Not specified	2	Not specified

- It is set so that screen No. 1 is displayed by a data register (word device) in the PLC. The initial value of the data register for screen changeover is D0.

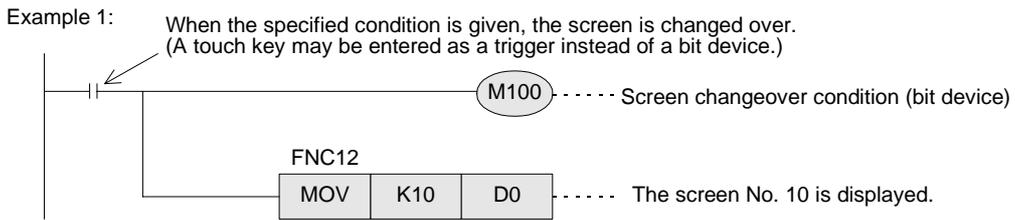
	Condition		Screen No. (Direct)	Save Current Screen
	Control Input	Bit Device		
1	Not specified	M100	PLC data register	Not effective

If "Bit Device" is not specified, both "Control Input" and "Bit Device" are not specified. Accordingly, the screen is changed over immediately by a data register in the PLC.

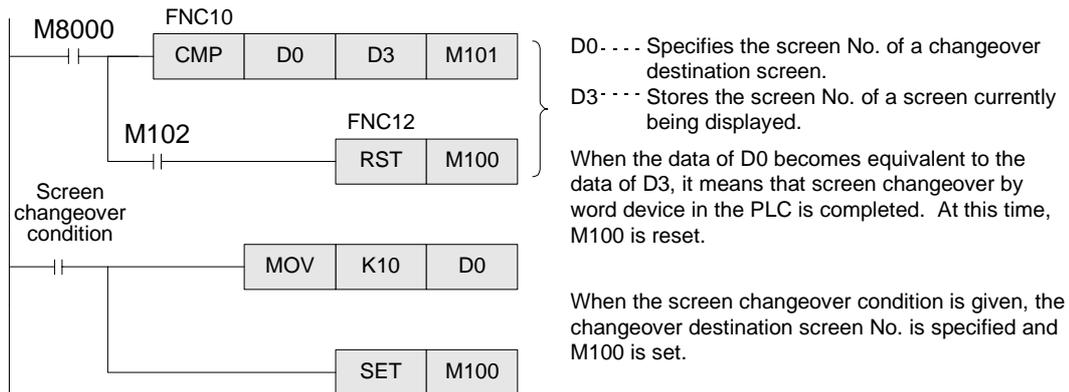
For the condition to make screen changeover by data register effective, enter "Control Input" or "Bit Device" as shown in the program example 1 in the next page.

Continued in sequence program examples on the next page.

• Sequence program examples



Example 2: When it should be confirmed that screen changeover has been securely performed by the specified condition, make a program shown below.



Combination of the "Switch" object and the "Change Screen" object

- There may be a case in which one touch key is required to function both as a switch and a control input for screen changeover. In such a case, the "Switch" object and the "Change Screen" object can be used together.

12. Creation of Display Screen (SW□D5C-GOTRE-PACK)

This section describes the elements constructing user screens created using the screen creation software for GOT-A900 (SW□D5C-GOTRE-PACK).

Created user screens are displayed in the screen mode described in Section 3. For specification of screens to be displayed, refer to Section 13.

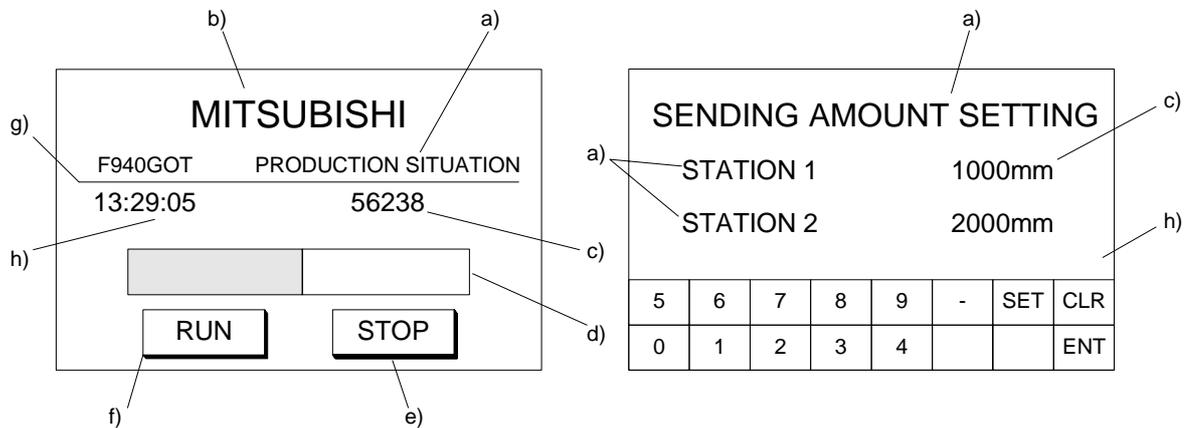
12.1 Element list

The elements constructing user screens are referred to as "Figures" and "Objects" in the screen creation software for GOT-A900 (SW□D5C-GOTRE-PACK).

◆Display example

The figures below show display examples of the screen.

Only some objects are used in the examples below. Have in mind some objects are displayed on the screen and others are not.



Figures: Display figures and characters in specified positions.

Figure	Description	Use example
Text	Displays characters such as alphabets, numerics, Katakana, Hiragana and Kanji (JIS level 1) and symbols.	a), b)
Line	Displays a straight line connecting specified two points.	f)
Rectangle	Displays a rectangle whose every edge is 90°. The rectangle can be filled.	
Circle	Displays a circle. The circle can be filled.	
Figure Data	Displays a figure in the BMP or DXF format.	

■Important point

Refer to detailed set items of each figure/object (Refer to the HELP file in the creation software file for the attribute.), then set each figure/object.

Objects: Display and allow to change the contents of devices in the PLC.

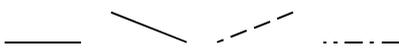
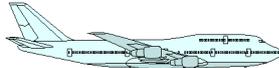
Function	Description	Use example
Numerical Display	Displays the data stored in a word device in the form of numeric.	c)
Ascii Display	Regards the data stored in consecutive word devices as character codes (ASCII codes or shift JIS codes), and displays a corresponding text.	-
Clock	Displays the clock data stored in the F940GOT in the form of "time/date".	g)
Comment	Displays a comment in accordance with the ON/OFF status of a bit device or a specified range of a word device. A displayed comment may occupy two or more lines.	-
Alarm History	Displays the contents of the alarm history stored in the F940GOT.	-
Alarm List (user alarm)	Displays comments in accordance with bit devices in the ON status in the order of priority.	-
Part Display	Displays parts in accordance with the ON/OFF status of a bit device or the data of a word device. A figure in the BMP file format can be displayed as a part.	-
Lamp	Changes the lighting color of a lamp in accordance with the data of a device.	-
Panelmeter	Displays the data of a word device in the form of panel meter as a ratio against the minimum and maximum values.	-
Line	Acquires the data stored in a word device at each specified timing, displays a line graph of the acquired data within the display range, then allows scroll of the line graph.	-
Trend	Acquires the data of two or more word devices at a time, and displays the acquired data in the form of trend graph.	-
Bar	Displays the data stored in two or more word devices in the form of bar graph.	d)
Statistics	Acquires the data of two or more word devices, and displays the acquired data in the form of statistical graph indicating the ratio of the data of each word device against the entire data.	-
Touch Key	Turns on/off a bit device, allows to change the data of a word device or changes over the screen display when touched.	e)
Numerical Input	Writes an arbitrary numeric to a specified word device.	c)
Ascii Input	Writes an arbitrary character code to a specified word device.	-

12.2 Figure display function

The table below shows the type and the attribute of displayable figures.

1) Available types

The table below shows the type of displayable figures and characters.

Figure	Display example	Available attributes
Line		Line Style and Line Color
Rectangle		Line Color and Foreground
Circle		
Figure data in BMP/DXF format	 This is a display example of a BMP file.	-
Text	ABC ABC abc abc	Character color, size and shift

2) Available attributes

The table below shows available attributes.

Attribute	Display example	
Line Style (Only continuous line is available for a circle.)	Continuous ————, Broken - - - - - , Dotted , Alternate long and short dash line — — — — — , Alternate long and two short dashes line — — — — — ,	
Line Width	——— 1 dot	
Color	256 colors	
	Display status in GOT	F940GOT-SWD-E Displayed in 8 colors F940GOT-LWD-E Any color other than black is displayed as white.
Foreground	256 colors	
	Display status in GOT	F940GOT-SWD-E Displayed in 8 colors F940GOT-LWD-E Any color other than black is displayed as white.

12.3 Data display function

The ON/OFF status of bit devices in the PLC and the current value of word devices in the PLC can be displayed.

12.3.1 Display of numerics

The "Numerical Display" object displays the data of word devices in the PLC in the form of numeric.

◆Contents of setting

1) Number of digits

- Maximum allowable number of digits: 12 (Each of a minus sign (-) and a decimal point is counted as 1 digit.)

High-speed counter	to	C235 (32 bits)
-2147483648		-2147483648
└──────────┘		└──────────┘
11 digits		10 digits

If data whose number of digits exceeds the maximum allowable number of digits is specified to be displayed, "?" is displayed.

Number of digits after decimal point

- Enter the number of digits after a decimal point for a case where a decimal point is displayed.

Example: When the displayed numeric is "2000"

2000: Number of digits after decimal point = 0

200.0: Number of digits after decimal point = 1

20.00: Number of digits after decimal point = 2

2.000: Number of digits after decimal point = 3

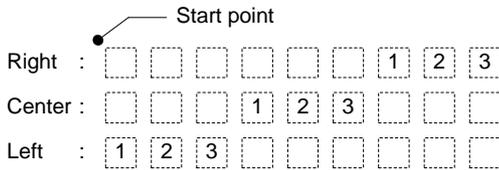
2) Style

- Select one style for decimal with sign, decimal without sign, hexadecimal, octal, binary and real.
- Zero suppression
When the zero suppression function is not used, "0" is displayed in each blank digit position to the left of the data. The number of "0" is displayed will depend on the specified total number of digits.
Example:
When the total number of digits is set to 7 and the number of digits after decimal point is set to 2
00012.34:"0" is displayed in these digits.
- A numeric is displayed horizontally.

3) Shift

- When the number of digits of a numeric to be displayed is smaller than the specified total number of digits, the numeric is automatically shifted to the right, the center or the left in accordance with the setting.

Example: When the specified total number of digits is set to 9 and the displayed numeric is a 3-digit value

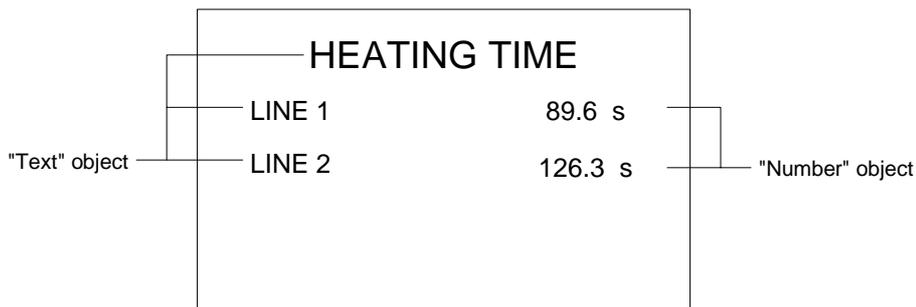


4) Gain 1, gain 2 and offset

The value obtained by the calculation "(Monitor value x Gain 1 / Gain 2) + Offset" is displayed.

Example: When the monitor value is 1000 (current value of D100), the gain 1 is set to 10, the gain 2 is set to 2 and the offset is set to 3
 $(1000 \times 10 \div 2) + 3 = "5003"$ is displayed.

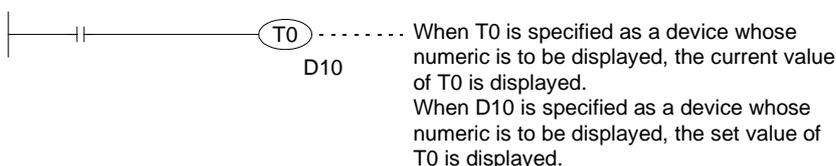
◆Display example



■Important point

- Display of numerics for timers and counters
 When a device whose numeric is to be displayed is set to a timer or counter, its current value is displayed.

To display the set value of a timer/counter, specify indirectly the set value of a timer/counter to be displayed as shown below, then display the value of the specified data register.



12.3.2 ASCII code display function

The "Ascii Display" object displays characters corresponding to specified word devices (T, C, D, V or Z) in the PLC.
 Arbitrary characters can be displayed on one base screen.

◆Contents of setting

Alphabets, numerics, etc. which can be specified using shift JIS codes (for Japanese) or ASCII codes (for half-width characters) (For character codes, refer to the appendix.)

◆How to specify character codes

- Refer to the Appendices for further details about ASCII.
- Reading the ASCII table
 This section describes how to read ASCII using the Appendix as an example.
 One ASCII character is displayed by combining both the vertical and horizontal axes.
The vertical axis shows the last digit of the code.

Example Select "A" Horizontal axis H40 Vertical axis 1 → ASCII H41 (hexadecimal expression)
 Select "b" Horizontal axis H50 Vertical axis 1 → ASCII H62 (hexadecimal expression)

Higher Bit Lower Bit	1	2	3	4	5	6	7
0		(SP)	0	@	P	@	p
1		!	1	A	Q	a	q
2		"	2	B	R	b	r
3		#	3	C	S	c	s

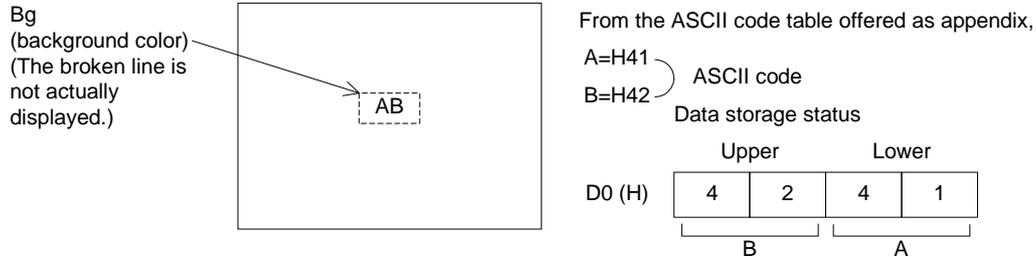
◆Storage of word device

- Character codes are stored in word devices in the PLC. The stored data is displayed from the lower 8 bits as shown below.

Example 1 : When two half-width characters (ASCII codes) are displayed

Word Device : D0

Data Length : 1

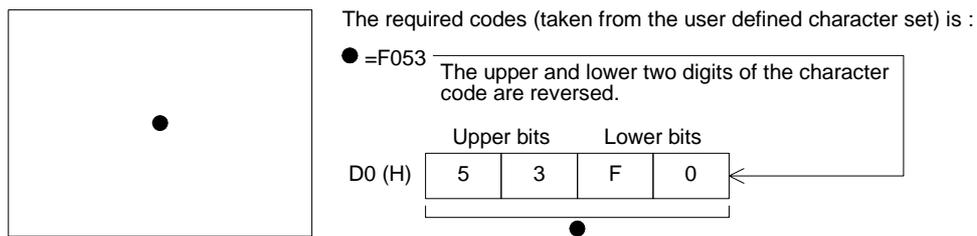


- A character to be displayed at first should be specified using lower 8 bits.

Example 2 : When one full-width character is displayed

Word Device : D0

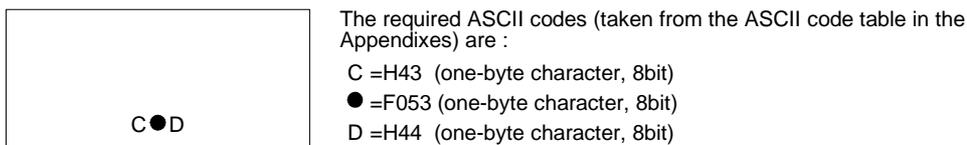
Data Length : 1



Example 3 : When one full-width character and two half-width characters are displayed

Word Device : D0

Data Length : 2 (D0 and D1)



How the data is stored :



■Important point

When the character code is set to "H0" (either for full-width or half-width), characters after that are not displayed on the screen.

To insert space in a text, store "H8140" (for full-width) or "H20" (for half-width) to the specified word device.

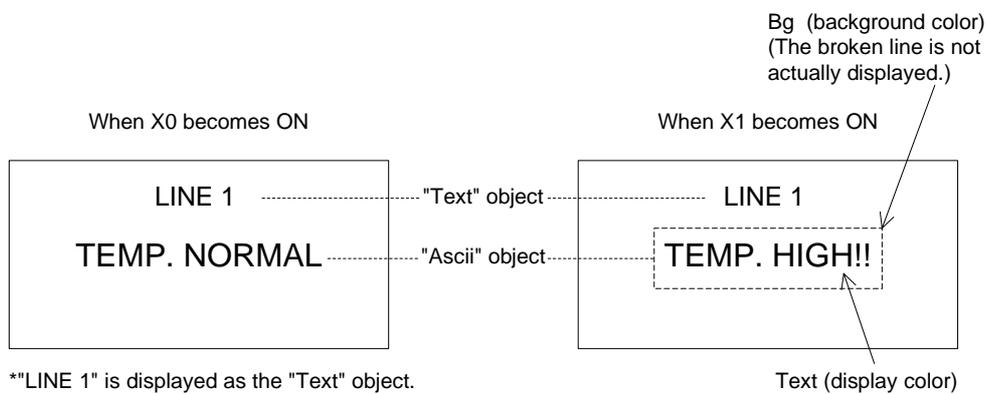
◆Display example

"RUN" or "STOP" are displayed as the "Ascii Display" objects using three data registers D100 to D102.

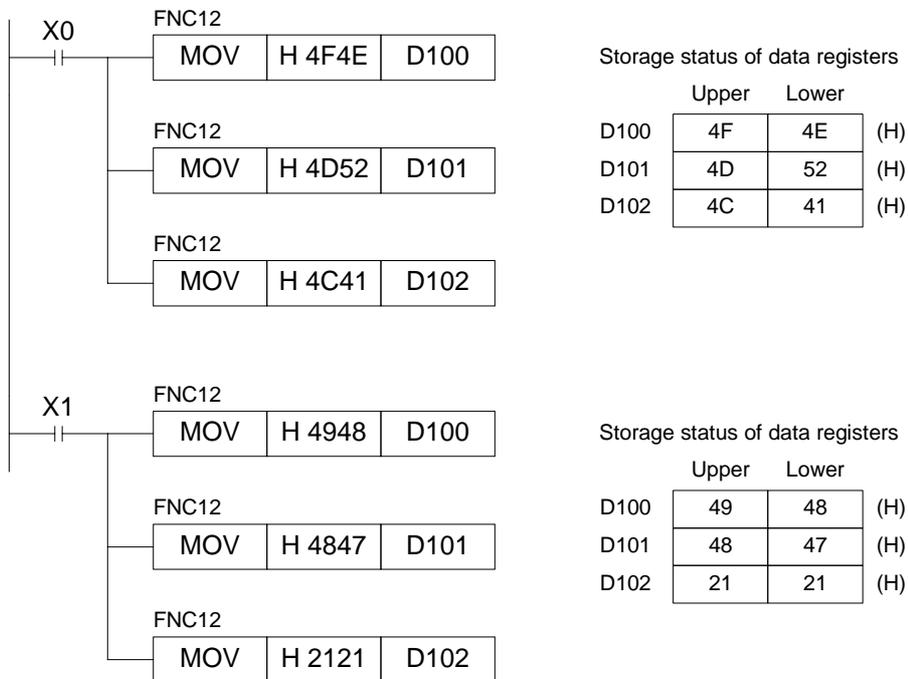
When X0 becomes ON, "RUN" is displayed.

When X1 becomes ON, "STOP" is displayed.

- "Ascii Display" object (Specification example in the edit mode)
 - Character size : W: ×2, H: ×2
 - Character attribute : Rotate
 - Word device : D100
 - Data length : 3
- Display



- Sequence program



■Important point

The "Ascii Display" object displays specified texts on one screen as shown above. Accordingly, the screen is not required to be changed over nor screens are not required to overlay/be overlaid.

12.3.3 Clock display function

The "Clock" object displays the date and the time of the clock built in the F940GOT

◆Contents of setting

Date: YY/MM/DD
DD/MM/YY
MM/DD/YY (One of them can be selected.)
Time: HH:MM (fixed)

◆Display example

Date: 98/11/2 (YY/MM/DD)
2/11/98 (DD/MM/YY)
11/2/98 (MM/DD/YY)
Time: 16:28

■Important point

- Displayed date and time
The displayed date and time are equivalent to those set in the operation environment setting in the GOT main body.
- The current clock data in the F940GOT cannot be transferred to the PLC.
When controlling the time in the PLC, use the RTC (real-time clock) function of the PLC.

12.3.4 Comment display function

The "Comment" object displays specified texts in accordance with the ON/OFF status of a bit device (X, Y, M, S, T or C) in the PLC or the current value of a word device (D, T or C). Texts entered directly (available only for bit devices) or texts created in "Create Comment" in the screen creation software can be displayed.

◆Contents of setting

1) Specification method

- Bit device (X, Y, M, S, T or C)
- Word device (D, T, C or GD)

2) Display contents

Bit device:

Text to be displayed while a specified bit device is ON

Text to be displayed while a specified bit device is OFF

(Enter directly a text to be displayed. Or specify the comment No. created in "Create Comment". Refer to Paragraph 12.7)

Word device:

The comment No. can be specified using the current value of a specified word device.

Display color:

Enter the color of text to be displayed.

The color for the ON status and the color for the OFF status can be entered respectively.

When the ON/OFF status is not changed, the color set in the comment list is used.

Creation of comment:

A comment to be displayed in accordance with the specified comment No. can be created in "Create Comment" in "Screen Setting" of the screen creation software.

◆Display example

Comment	
Bit device	Y0
Comment No. for ON status	10
Comment No. for OFF status	11

COMMENT	
0	CHECK
⋮	⋮
9	MOTOR DRIVE
10	DRIVING
11	STOPPING
12	CYLINDER OFF
⋮	⋮

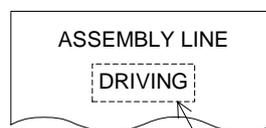
Comment No.
(Refer to Paragraph 12.7.)

• Sequence program



• GOT screen

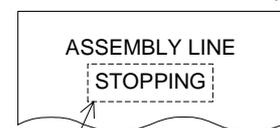
While Y0 is ON
The comment No. 10 is displayed.



Display color (text color) and background color (The broken line is not actually displayed.)

Characters "ASSEMBLY LINE" are displayed using the "Text" object. On the same screen, displayed characters can be exchanged between "RUNNING" and "STOPPED".

While Y0 is OFF
The comment No. 11 is displayed.



- In the example above, comments registered in the comment list are displayed. Instead of entering the comment Nos., texts to be displayed in the ON/OFF status can be entered directly.
- When a word device is specified, the current value of the word device is regarded as the comment No. to be displayed.

12.3.5 Alarm history display function

When an alarm device set in the screen creation software becomes ON, a message corresponding to the alarm device as well as the date and time at which the alarm device became ON are displayed on a user screen. The date and time at which the alarm device became OFF can be also displayed.

◆Contents of setting

Common setting: Equivalent to the setting displayed in the alarm mode described in Section 6
 Basic setting: Figure (with a frame), frame color, color inside frame and title color

Display setting : Number of display lines (of alarm history), sort (from the oldest one/from the latest one), character size and recovery column (whether or not the recovery column is to be displayed)_Display format: Title (which may be changed)

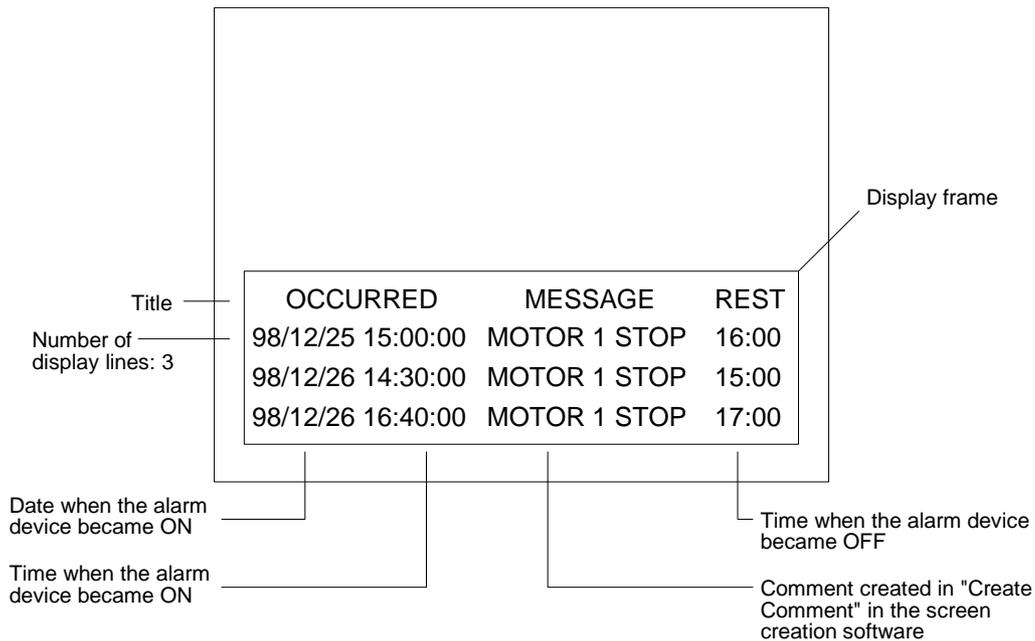
Width (display size in the horizontal direction: full-width x width)

Color (The display color and the title color are set in the basic setting.)

Contents (Date, time and characters can be specified.)

Characters (to be displayed when characters are selected as contents)

◆Display example



- Combination of touch keys
If touch key is placed on an alarm history screen and assigned a key code from the table below, it will perform its respective operation, also shown in the table.

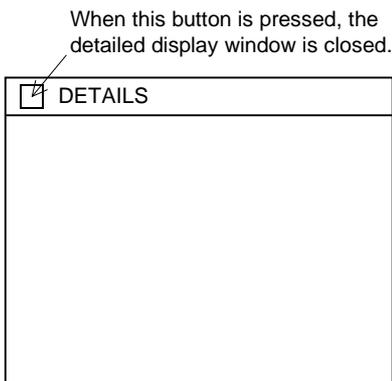
Key codes used for the alarm history display function

Key code	Operation
FFB0	Displays the cursor.
FFB1	Deletes the cursor.
FFB2	Moves the cursor upward.
FFB3	Moves the cursor downward.
FFB8	Displays the detailed information of the alarm selected by the cursor.

When a touch key to which "FFB8" (detailed information display function) is assigned, the alarm message (comment window) or the base screen is changed over, and the detailed information is displayed.

To display the detailed information, "Detail Display Destination" in "Alarm History Common Setting" of the screen creation software should be preliminarily set to "Comment Window" or "Base Screen".

- When "Comment Window" is selected



- Move the cursor to an alarm message to be displayed in detail, and press the DETAIL key. Then, the detailed display window is open as shown on the left.
- A comment in the comment list specified by "Detail Display No." in "Alarm History Common Setting"- "Device Monitor"- "Edit" of the screen creation software is displayed.

- Changeover of the base screen
A screen specified by "Detail Display No." in "Alarm History Common Setting"- "Device Monitor"- "Edit" of the screen creation software is displayed.

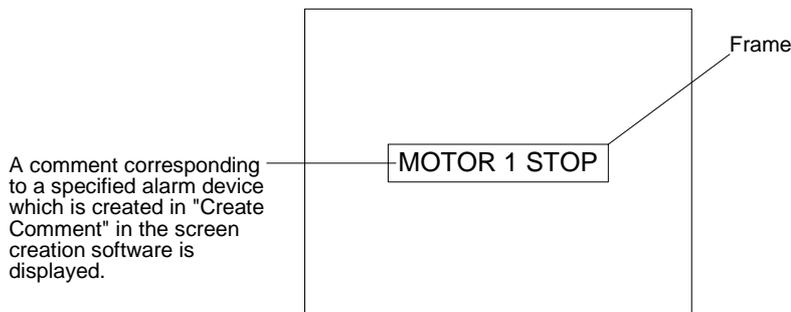
12.3.6 Alarm list display function

When a specified device becomes ON, a corresponding message is displayed.
By using the alarm list display function, the setting different from that in the alarm mode described in Section 6 or in the alarm history display function can be performed.

◆Contents of setting

- Basic setting : Figure (with a frame), frame color, color inside frame and display size
- Display setting : Number of devices (When a device specified here becomes ON, a corresponding message is displayed.)
- Storage of number of occurrences (The number of times of becoming ON of a specified device can be stored in a word device.)
- Head comment No. (No. of comment created in "Create Comment" in the screen creation software)
- Number of displayed comments (When two or more comments are displayed, they are displayed in the ascending order of device No.)
- Display order (ascending/descending)
- Option : Detailed display (comment window/changeover of base screen)
- Save in memory (Even while the alarm list function is not displayed on the screen, the ON/OFF status of alarm devices can be acquired.)
- Date/time display (The date/time when a specified device became ON can be displayed.)

◆Display example



- Combination of touch keys
If a touch key on the alarm list is assigned with a key code from the table below, it will perform its respective operation, also shown in the table.

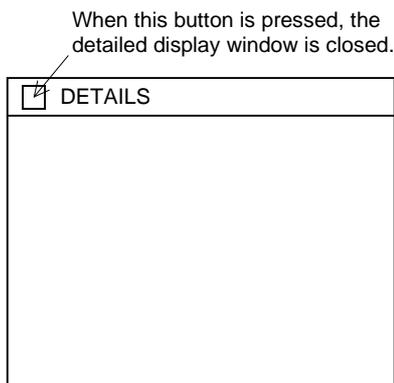
Key codes used for the alarm list display function

Key code	Operation
FFB0	Displays the cursor.
FFB1	Deletes the cursor.
FFB2	Moves the cursor upward.
FFB3	Moves the cursor downward.
FFB8	Displays the detailed information of the alarm selected by the cursor.
FFBB	Resets the alarm in a line in which the cursor is located"

When a touch key to which "FFB8" (detailed information display function) is assigned, the alarm message (comment window) or the base screen is changed over, and the detailed information is displayed.

To display the detailed information, "Detail Display Destination" in "Alarm List Display Setting" of the screen creation software should be preliminarily set to "Comment Window" or "Base Screen".

- When "Comment Window" is selected



- Move the cursor to an alarm message to be displayed in detail, and press the DETAIL key. Then, the detailed display window is open as shown on the left.
- A comment in the comment list specified by "Detail Display No." in "Alarm List Display Setting"- "Detail Display Setting" of the screen creation software is displayed.

- Changeover of the base screen
A screen specified by "Detail Display No." in "Alarm List Display Setting"- "Option" of the screen creation software is displayed.

12.3.7 Part display function

The "Part Display" object displays figures in accordance with the ON/OFF status of bit devices in the PLC and the current value of word devices in the PLC.

By using the part display function, figures created by the user can be displayed.

◆Contents of setting

1) Specification method

Bit device (X, Y, M, S, T or C)

Word device (D, T, C or GD)

2) Contents of display

Bit device:

Part No. of a figure to be displayed while a specified bit device is ON

Part No. of a figure to be displayed while a specified bit device is OFF

Word device:

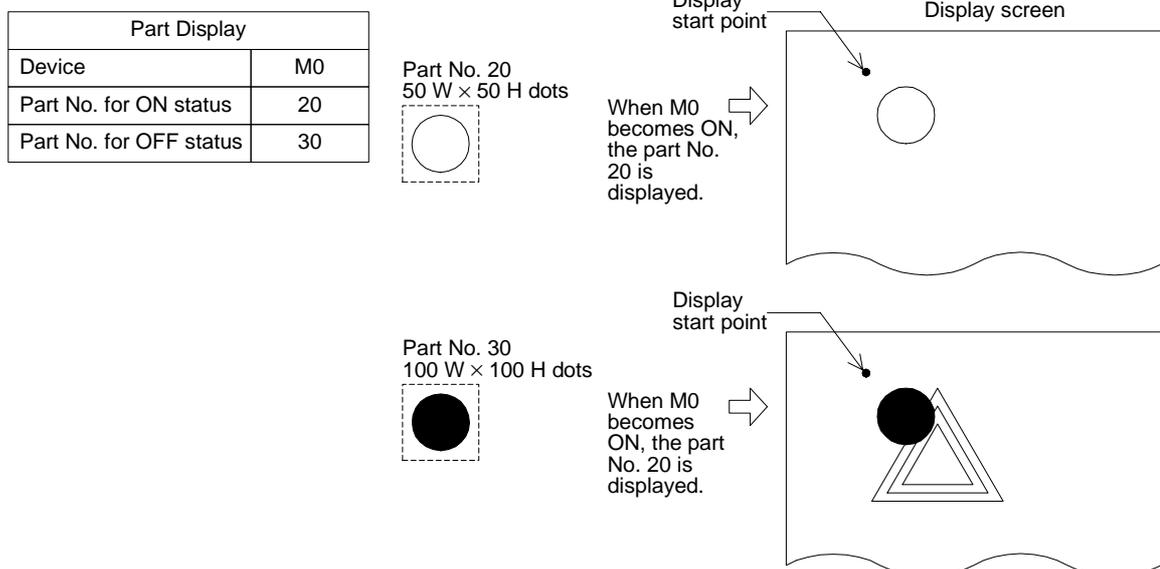
Part No. of a figure which is equivalent to the current value of a specified word device

Creation of displayed figure:

Figures can be created and registered using the screen creation software.

Figures can be stored in BMP files, etc.

◆Display example



- The specified part is displayed in the same size as registered in the screen creation software.

12.3.8 Lamp display function

The "Lamp" object changes over the displayed figure in accordance with the ON/OFF status of a specified bit device in the PLC.

By using the lamp display function, figures built in the screen creation software can be displayed.

◆Contents of setting

- 1) Specification method
Bit device (X, Y, M, S, T or C)
- 2) Contents of display

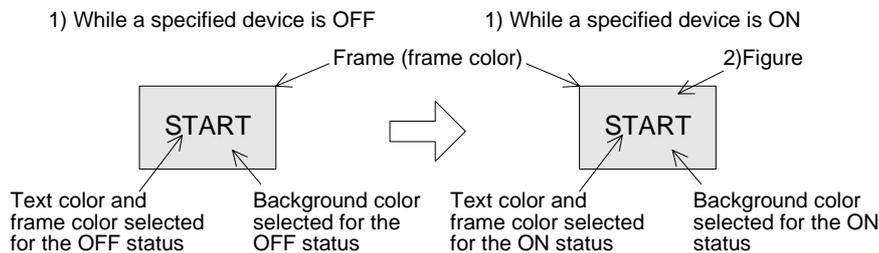
Bit device : Figure to be displayed when a specified bit device becomes ON
 Figure to be displayed when a specified bit device becomes OFF
 Displayed figure: Register a figure to be displayed using the screen creation software.
 A figure can be selected among figures built in the screen creation software.

Text : Text can be displayed inside a figure.

Color : The text color, the frame color and the background color can be specified.

◆Display example

When a bit device is specified



■Important point

Display of figures created by the user

To display figures created by the user, use the part display function described in the previous paragraph.

12.3.9 Panel meter display function

The "Panelmeter" object displays the current value of a word device in the form of panel meter.

◆Contents of setting

1) Specification method

16-bit or 32-bit word device (D, T, C or GD)

2) Contents of display

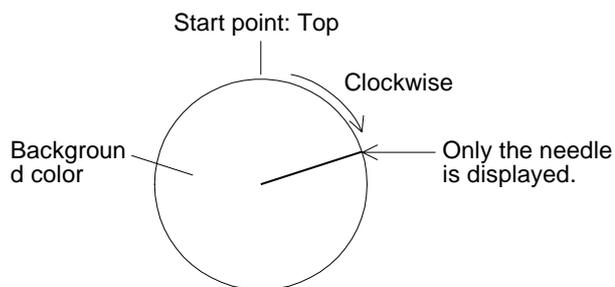
Meter type :Circle

Number of ticks :Ticks are provided on the panel meter.

Color :The meter needle color, the frame color, etc. can be specified.

- The meter needle is moved clockwise.

◆Display example



12.4 Graph display function

Specified word devices can be displayed in the form of graph.

- Trend graph: Paragraph 12.4.1
 - Line graph: Paragraph 12.4.2
 - Bar graph: Paragraph 12.4.3
 - Statistics graph: Paragraph 12.4.4
- Bar graph
Pie graph

12.4.1 Trend graph

The "Trend" object displays the current value of consecutive word devices in up to four lines.

◆Contents of setting

Display direction : Right or left

Number of lines : 1 to 4

Number of points : 1 to 50

Monitored devices : 16-bit or 32-bit word devices (D, T, C or GD)

Line type : _____, - - - - - , - - - - - , _____, - - - - -

Color : Graph color, frame color, scale color

◆Display example

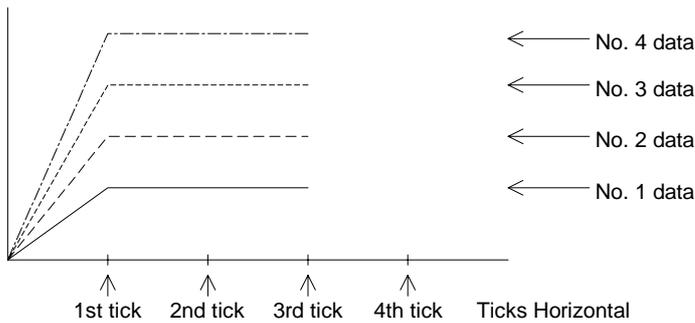
1) Word device

The current value of word devices as well as a certain amount of historical data is displayed in the form of a trend graph.

The number of word devices shown at each tick is equivalent to the specified number of lines.

Assignment of word devices to points in trend graph

Word device	D	D + 1	D + 2	D + 3	D + 4	D + 5	D + 6	D + 7	.....
Line No.	No.1				No.2				.....
Tick in horizontal axis	1st tick	2nd tick	3rd tick	4th tick	1st tick	2nd tick	3rd tick	4th tick	.....



12.4.2 Line graph

The "Line" object acquires the current values of up to four 16-bit data registers in the PLC at a specified time interval, and displays the acquired data in the form of line graph.

◆Contents of setting

Display direction : Right or left

Number of lines : 1 to 4

Number of points : 1 to 50

Monitored devices : 16-bit or 32-bit word devices (D, T, C or GD)

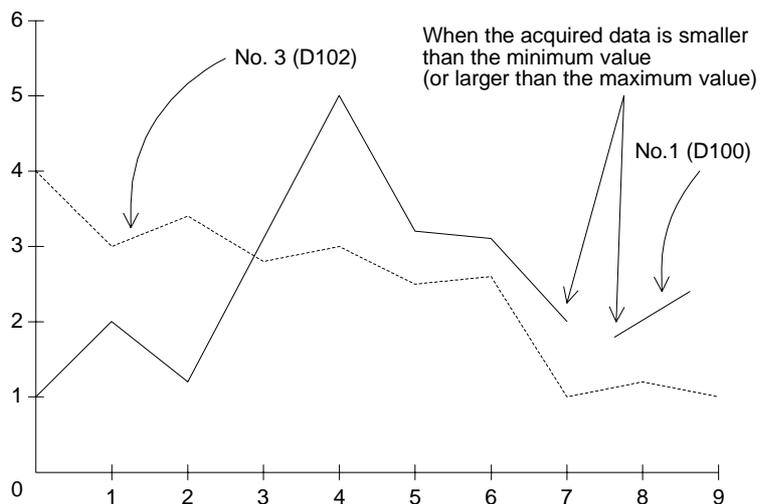
Line type : _____, - - - - - , - - - - - , - - - - - , - - - - -

Color : Graph color, frame color, scale color

Display condition : Constant cycle (which can be set arbitrarily in the unit of 100 ms)

◆Display example

"Trend Graph (Sample)" object	
Word Device	D100
Display condition	30
Ticks Horizontal	10
Ticks Vertical	7
Minimum Value	0
Maximum Value	1000
Shown Device: No. 1	Continuous Red
Device: No. 2	Dotted Blue
Device: No. 3	None
Device: No. 4	None
Scale Color:Black	



- Word devices D100 and D101 are acquired at every 3 seconds, and displayed in the form of line graph.
- If the acquired data is smaller than the minimum value (0) or larger than the maximum value (1000), it is not displayed in the graph and the graph is discontinued.

■Important point

Sampling time

It is recommended to set the sampling time to 1 second or more.

12.4.3 Bar graph

The "Bar" object displays a word device in the PLC in the form of bar graph. A numeric which is rather difficult to understand in the form of number can be displayed in the form of bar graph so that it can be easily understood at a glance.

◆Contents of setting

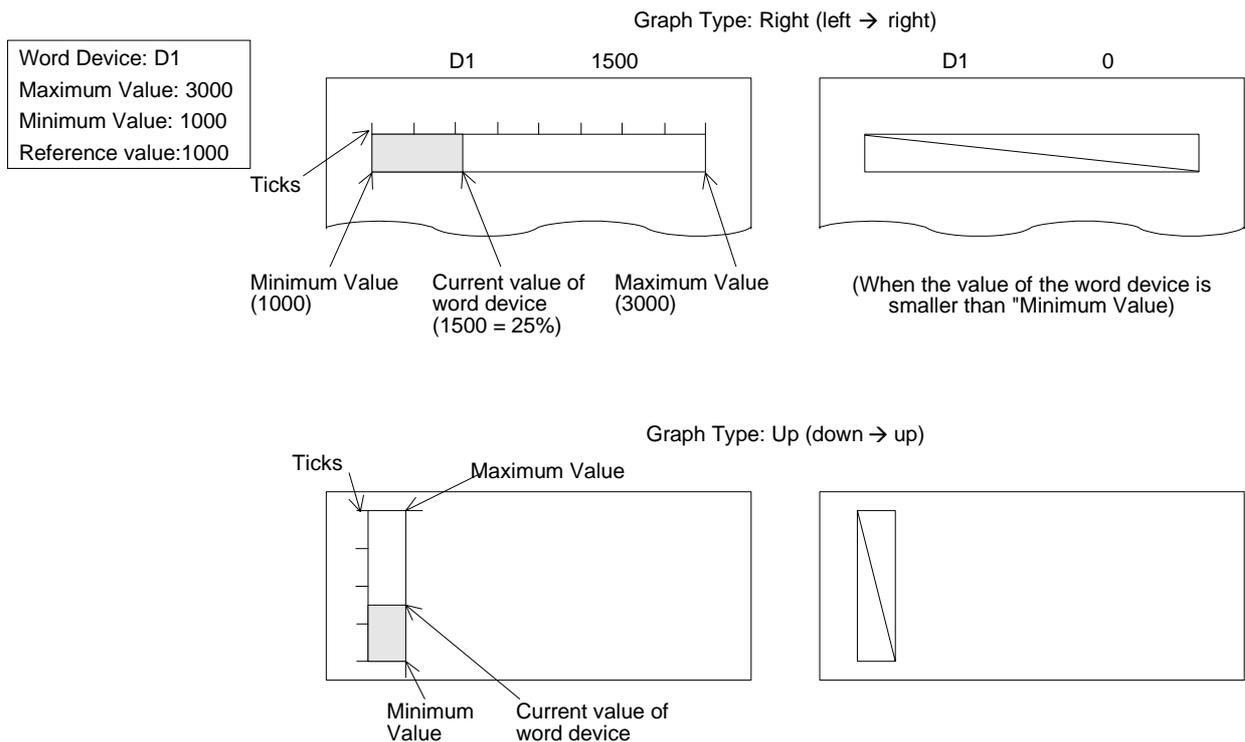
Display direction : Vertical or horizontal

Monitored device : Word device (T, C, D or GD)

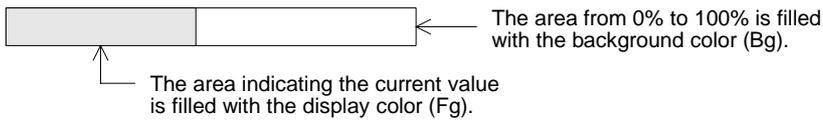
Number of ticks : 2 to 11

Color : Graph color, frame color and scale color

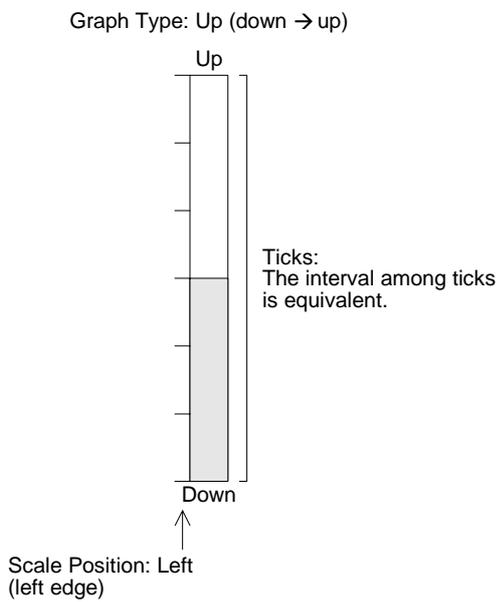
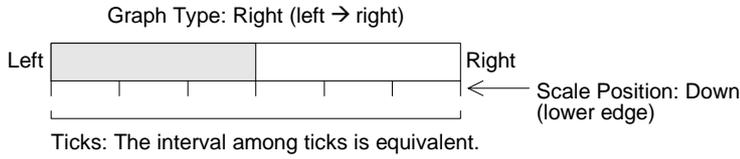
- Bar graph type: Horizontal (left -> right) or vertical (down -> up)
- The entered minimum value is regarded as 0%, and the entered maximum value is regarded as 100%. The acquired data is represented in % against 100%.
If the acquired data is larger than the maximum value or smaller than the minimum value, a diagonal line is drawn in the bar graph.



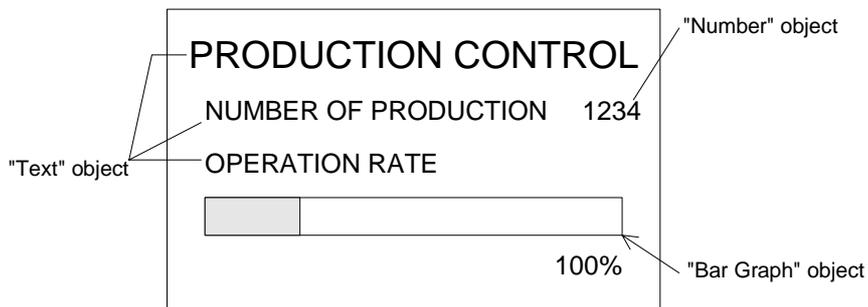
The bar graph is displayed from the specified reference value position.



Number of ticks and scale position



◆Display example



12.4.4 Statistics graph display function

The "Statistics" object displays the current value of specified word devices in the form of statistical bar graph or pie graph as the ratio against 100%.

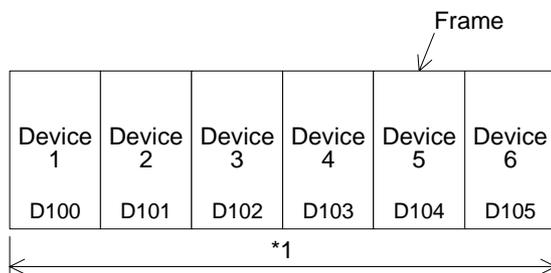
◆Contents of setting

Graph type : Bar graph or pie graph
 Monitored devices : Word devices (D, T, C or GD)
 Color : Graph color and scale color

◆Display example

Setting example: Bar graph

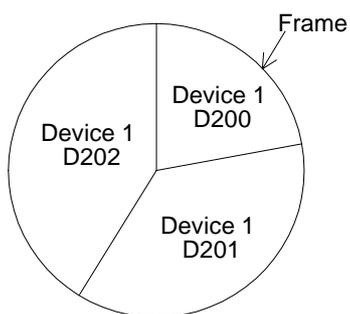
Head word device : D100
 Number of devices : 6



*1 The specified width is regarded as 100%. The ratio of the current value of each device is displayed in %.

Setting example: Pie graph

Head word device : D200
 Number of devices : 3



A point located at the top of the circle is regarded as the start point. From the device 1 (D200 in this example), each device is displayed clockwise.

"360°" is regarded as 100%. The ratio of the current value of each device against 100% is represented.

12.5 Touch keys

- Touch keys offer the following functions

Function	Description	Reference section/paragraph
Bit function	Turns on/off a bit device when touched.	12.5.2
Word function	Allows to change the value of a word device when touched.	12.5.3
Base screen changeover function	Changes over the base screen when touched.	13
Numerical/ASCII input key creation function	Allows to create keys to enter numerics and ASCII codes.	12.5.4

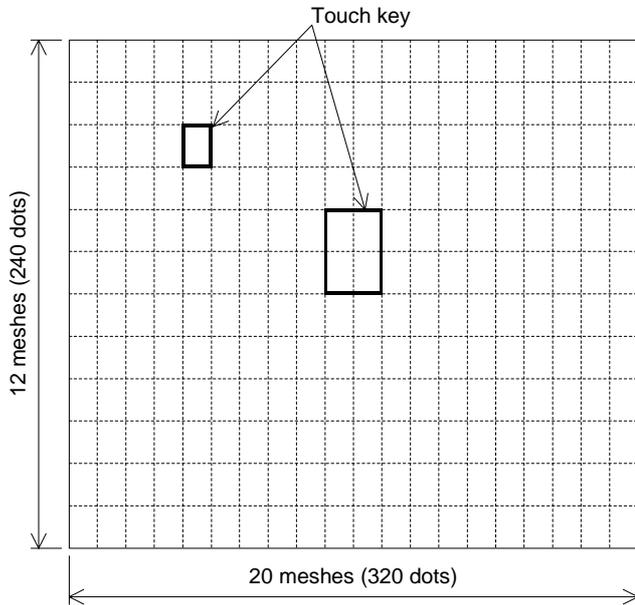
- Two or more functions shown above can be assigned to one touch key. In such a case, the priority is given to the assigned functions as follows.

Contents of function	Quantity	Priority given when two or more functions are assigned
Bit momentary	20	First priority ↓ Last priority
Bit SET	20	
Bit RST	20	
Bit ALT	20	
Word SET	20	
Base screen changeover	1	
-	50 maximum	

12.5.1 Common items for all touch keys

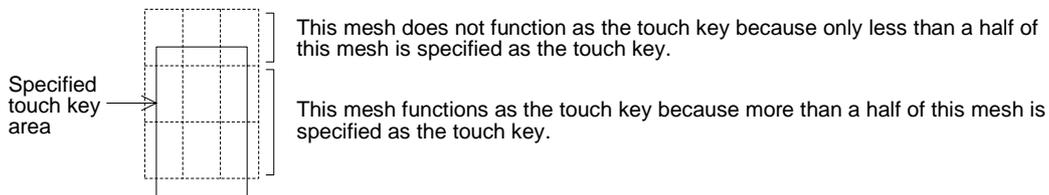
This paragraph describes the common contents shared by each function assigned to touch keys.

1) Size



- The entire screen is divided into "meshes" as shown on the left. The touch key area can be specified in the unit of mesh.
- The entire screen consists of 20 W x 12 H meshes. One mesh consists of 16 x 20 dots.
- Broken lines are not actually displayed on the screen.

- A touch key can be set in the unit of dot. When more than a half of a mesh is set as a touch key, the mesh is recognized as the touch key.



2) Display changeover

Key : When a specified position is touched, the display frame, the text and the color can be changed.

Bit : When a specified bit device becomes ON or OFF, the display frame, the text and the color can be changed.

3) Figure

- Select whether or not the area specified as the touch key is enclosed with a frame.
- Select "No frame" or select one among the following five frames.

Frame shape						
	No frame	Shaded	Double frame (keyboard)	Double frame (trimming)	Double frame (shaded)	Double frame (bold)

- By turning on/off the touch switch, the displayed figure and color can be specified.

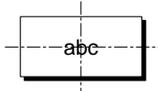
4) Text

Enter a text to be displayed inside the touch key.

Up to 20 full-width characters or 40 half-width characters can be displayed.

<Display example:>

-In the case of 1 line



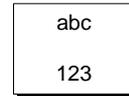
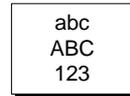
When a text is located in the center

-In the case of 2 lines



When the first and third lines are blank and a text is displayed in the second line

-In the case of 3 lines



When the second line is blank and texts are displayed in the first and third lines respectively

If a text is longer than the touch key, the text is extruded.



When a text is displayed in 1 line

5) Operation setting

Bit device : When the touch key is pressed, a specified bit device is turned on or off.
(Paragraph 12.5.2)

Word device: When the touch key is pressed, the current value of a specified word device can be changed. (Paragraph 12.5.3)

Base screen: When the touch key is pressed, the display screen is changed over.
(Section 13)

6) Simultaneous press

Set whether or not the touch key is effective when it is pressed simultaneously together with another touch key.

Only two keys can be made effective when pressed simultaneously.

Three or more keys cannot be made effective when pressed simultaneously.

7) Trigger

Always : The touch key always offers the assigned functions.

ON : While a specified bit device is ON, the touch key offers the assigned functions.

OFF : While a specified bit device is OFF, the touch key offers the assigned functions.

12.5.2 Bit function

The bit function allows a touch key in the GOT to control the ON/OFF status of a bit device in the PLC.

The bit function allows a touch key to act as a switch such as a pushbutton switch.

◆Contents of setting

1) Operation mode

- Select one among the following output operation modes.

Bit momentary: Turns on/off the controlled bit device in accordance with the ON/OFF status of the control input key.

Bit ALT : Turns on/off the controlled bit device every time the control input key becomes ON from OFF (alternate type switch).

Bit SET : Forces ON the controlled bit device when the control input key becomes ON. The controlled bit device remains ON until a reset input is given.

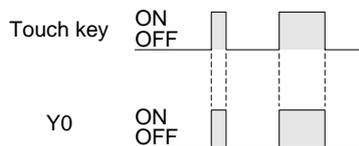
Bit RESET : Forces ON the controlled bit device when the control input key becomes ON.

Operation examples of "Momentary" and "Bit ALT"

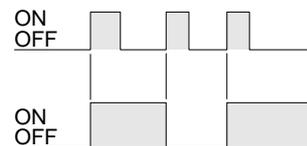
When a touch key is pressed, Y0 in the PLC is output.

-Switch Control input: Touch key
Controlled bit device: Y0

When "Operation" is set to "Momentary"



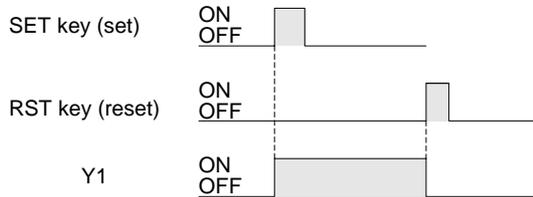
When "Operation" is set to "Alternate"



Operation examples of "Bit SET" and "Bit RST"

When the SET key is pressed, Y1 is set. When the RST key is pressed, the Y1 is reset.

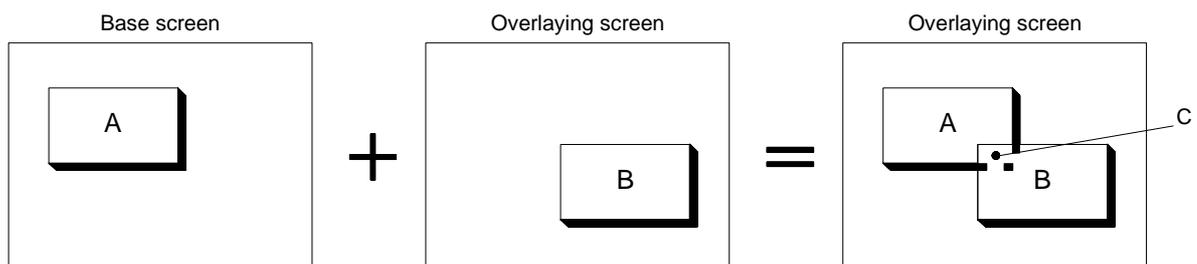
- SwitchControl input: SET key, RST key
Controlled bit device: Y1 (set), Y1 (reset)



■Important point

- 1) Controlled bit device
If "Operation" is set to "Momentary", the controlled bit device becomes OFF when the display screen is changed over.
- 2) If two or more keys are pressed simultaneously
If two or more switch functions are registered, and two keys are pressed, both functions will be executed.
If three or more keys are pressed simultaneously, only the first two pressed will be effective.
- 3) If objects are assigned to one touch key
If two or more switch functions are assigned or another object is assigned to one touch key, the priority is given to a function/object registered earlier (while the screen is created).
- 4) If screens are overlaid
If screens are overlaid using control devices or the screen call function, the switch functions are effective on all of the base screen and overlaying screens. If switches are overlaid, the switch on the top screen is effective. Pay rigid attention so that switches do not are not overlaid.

Example



In the switch areas A and B on the composed screen realized by overlay, each switch is effective. However, if the area C is pressed, the switch B located on the top is effective.

12.5.3 Word function

The word function writes a fixed constant to the PLC when a touch key is pressed. The word function is convenient: When it is used, sequence programs such as transfer instructions are not required.

◆Contents of setting

Word device : D, T, C or GD

Operation type: Fixed value (A specified constant is written to a word device.)
 Indirect (The current value of a specified word device is written.)

■Important point

- 1) Write of a constant to a timer/counter
 Even if "0" is written to the current value or set value of a timer/counter, the output contact in the PLC is not reset. (Though the current value or set value becomes 0, the output contact does not become OFF.)
 To reset a timer/counter, execute an RST instruction in the sequence program or reset the timer/counter using the bit function.
- 2) Constant write condition
 "✓" indicates that write of constant is enabled.

PLC	FX Series	A Series
PLC memory type	✓:RAM ✗:EPROM *1 ✗:EEPROM *1 When the read/write destination is a data register, data can be transferred without regard to the memory type.	✓:RAM ✓:EPROM
PLC operation status	✓:RUN ✓:STOP	✓:RUN ✓:STOP
GOT memory type	✓:Flush memory	✓:Flush memory
PLC entry code	✗:While entry code is registered (while write is inhibited)	✓:While entry code is unlocked or is not registered

12.5.4 Creation of keys to enter numerics and ASCII codes

This function sets a touch key as a key to enter a numeric/ASCII code.

◆Contents of setting

Key code: Refer to the key code list shown in the appendix.

- When a key code shown in the appendix is assigned to a touch key, a corresponding numeric or alphabet (ASCII code) can be entered by pressing the touch key.
- When entering ASCII codes (described in Paragraph 12.6.2), touch keys to which key codes are assigned should be laid out to create the keyboard for ASCII code input.

12.6 Data input function

The ON/OFF status of bit devices and the current value of word devices in the PLC can be displayed.

12.6.1 Numerical input function

The data of word devices in the PLC can be displayed in the form of numerics.

◆Contents of setting

1) Number of digits

- Maximum allowable number of digits: 12 (Each of "-" (minus sign) and a decimal point is counted as one digit.)

High-speed counter	to	C235 (32 bits)
-2147483648		-2147483648
11 digits		10 digits

If data whose number of digits exceeds the maximum allowable number of digits is specified to be displayed, "?" is displayed.

Number of digits after decimal point

- Enter the number of digits after a decimal point for a case where a decimal point is displayed.

Example: When the displayed numeric is "2000"

2000: Number of digits after decimal point = 0
 200.0: Number of digits after decimal point = 1
 20.00: Number of digits after decimal point = 2
 2.000: Number of digits after decimal point = 3

2) Style

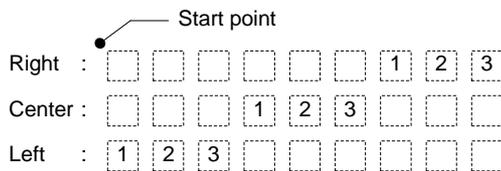
- Select one style among decimal with sign, decimal without sign, hexadecimal, octal, binary and real.
- Zero suppression
 When the zero suppression function is not used, "0" is displayed in each digit position to the left of the data. The number of "0"s will depend on the specified total number of digits.
 Example:
 When the total number of digits is set to 7 and the number of digits after decimal point is set to 2
 0012.34 ← "0" is displayed in these digits.
- A numeric is displayed horizontally.

3) Shift

- When the number of digits of a numeric to be displayed is smaller than the specified total number of digits, the numeric is automatically shifted to the right, the center or the left in accordance with the setting.

Example:

When the specified total number of digits is set to 9 and the displayed numeric is a 3-digit value



4) Gain 1, gain 2 and offset

The value obtained by the calculation "(Monitor value x Gain 1 / Gain 2) + Offset" is displayed.

Example:

When the monitor value is 1000 (current value of D100), the gain 1 is set to 10, the gain 2 is set to 2 and the offset is set to 3

$(1000 \times 10 \div 2) + 3 \rightarrow "5003"$ is displayed.

5) User ID (Refer to Paragraph 3.3.)

An ID can be assigned to the numerical input function.

When a device data specified by the "Numerical Input" object is changed (by pressing of the ENT key), the ID No. is stored in the write device "DO+3" in the system information. By checking this ID No., the changed "Numerical Input" object can be detected.

Make sure to assign an ID different from IDs for other numerical inputs.

Destination ID

This attribute allows to specify the change order of "Numerical Input" objects.

12.6.2 ASCII code input function

The ASCII code input function allows to specify and change characters using word devices (T, C, D, V or Z) in the PLC. Arbitrary characters can be displayed and changed on one base screen.

◆**Contents of setting**

Alphabets, numerics, etc. which can be specified using shift JIS codes (for Japanese) or ASCII codes (for half-width characters) (For character codes, refer to the appendix.)

◆**How to specify character codes**

- Refer to the Appendices for further details about ASCII.
- Reading the ASCII table
 This section describes how to read ASCII using the Appendix as an example.
 One ASCII character is displayed by combining both the vertical and horizontal axes.
The vertical axis shows the last digit of the code.

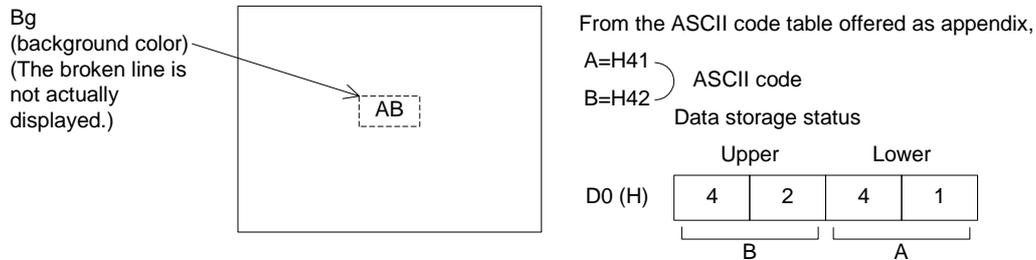
Example Select "A" Horizontal axis H40 Vertical axis 1 → ASCII H41 (hexadecimal expression)
 Select "b" Horizontal axis H50 Vertical axis 1 → ASCII H62 (hexadecimal expression)

Higher Bit \ Lower Bit	1	2	3	4	5	6	7
0		(SP)	0	@	P	@	p
1		!	1	A	Q	a	q
2		"	2	B	R	b	r
3		#	3	C	S	c	s

◆Storage of word device

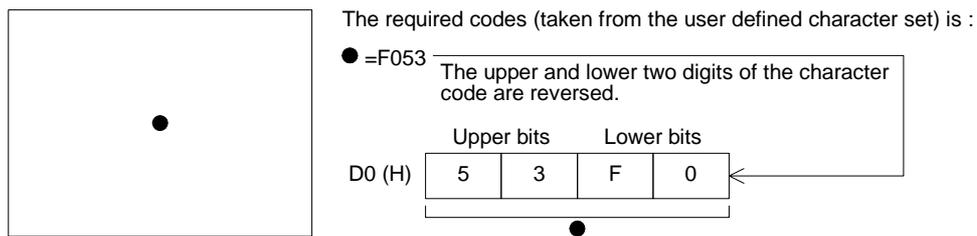
- Character codes are stored in word devices in the PLC. The stored data is displayed from the lower 8 bits as shown below.

Example 1 : When two half-width characters (ASCII codes) are displayed
 Word Device : D0
 Data Length : 1

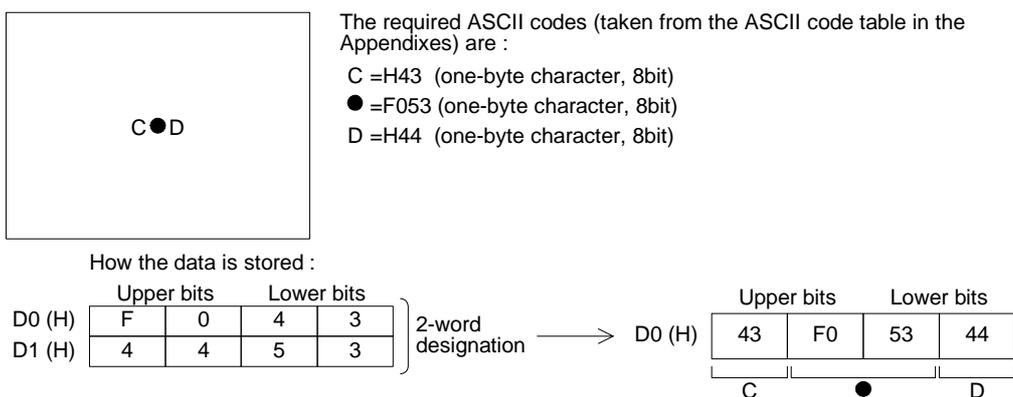


- A character to be displayed at first should be specified using lower 8 bits.

Example 2 : When one full-width character is displayed
 Word Device : D0
 Data Length : 1



Example 3 : When one full-width character and two half-width characters are displayed
 Word Device : D0
 Data Length : 2 (D0 and D1)



■Important point

When the character code is set to "H0" (either for full-width or half-width), characters after that are not displayed on the screen.
 To insert space in a text, store "H8140" (for full-width) or "H20" (for half-width) to the specified word device.

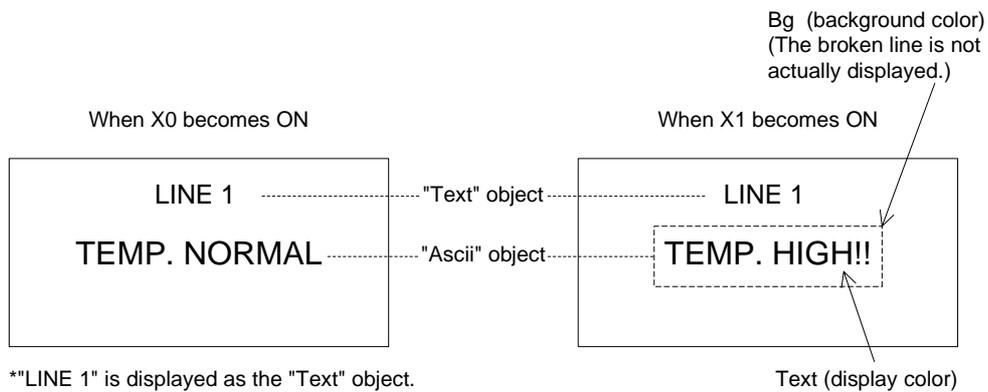
◆Display example

"RUN" or "STOP" are displayed as the "Ascii Display" objects using three data registers D100 to D102.

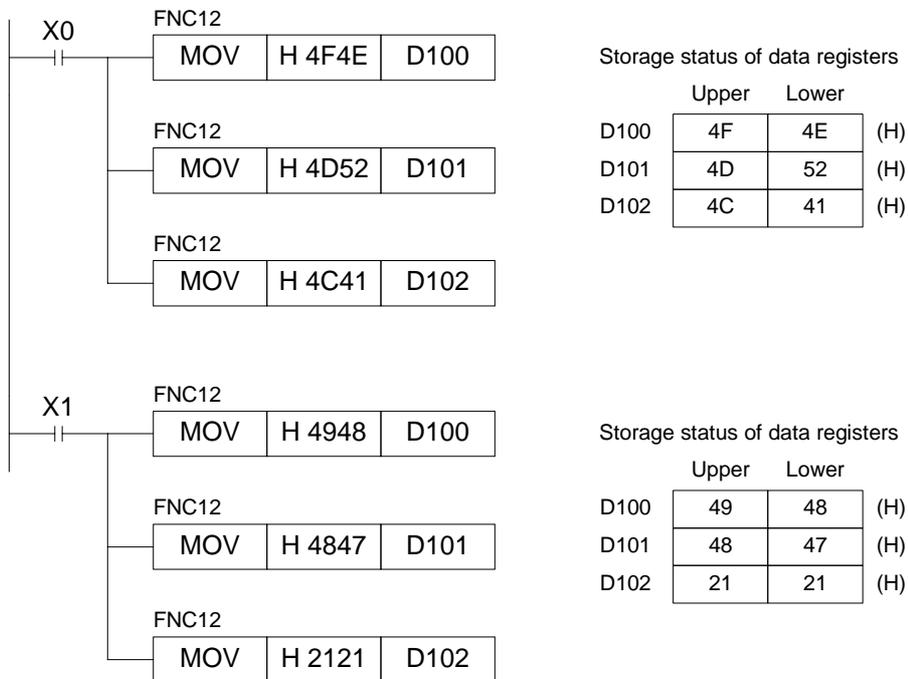
When X0 becomes ON, "RUN" is displayed.

When X1 becomes ON, "STOP" is displayed.

- "Ascii Display" object (Specification example in the edit mode)
 - Character size : W: ×2, H: ×2
 - Character attribute : Rotate
 - Word device : D100
 - Data length : 3
- Display



- Sequence program



■Important point

The "Ascii Display" object displays specified texts on one screen as shown above. Accordingly, the screen is not required to be changed over or to be overlaid.

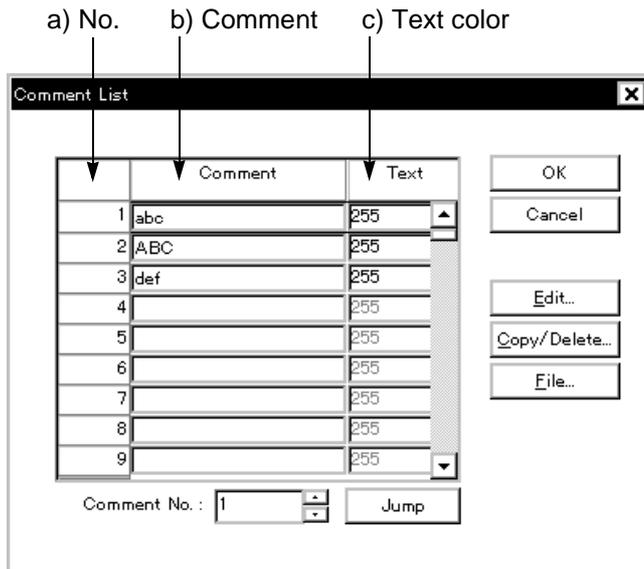
12.7 Creation of comment

Comments (texts) displayed by the comment display function, the alarm list display function and the alarm history display function can be created.

The comment list data is stored in the flush memory built in the F490GOT.

- Comments can be created in "Draw" in "Comment" in the screen creation software.

Screen of screen creation software



a) No.

This is an ID No. used by the comment display function, the alarm list display function and the alarm history display function. Comments Nos. 0 to 32767 can be registered.

b) Comment

Enter a text to be registered in the comment list.

Up to 256 full-width characters (Kanji at JIS level 1, Katakana, Hiragana, alphabets, numerics and symbols) or up to 512 half-width characters are available for one comment.

c) Text color

Enter the text color.

If the text color attribute is changed in the comment display function, the priority is given to that. The color set on this screen is ignored.

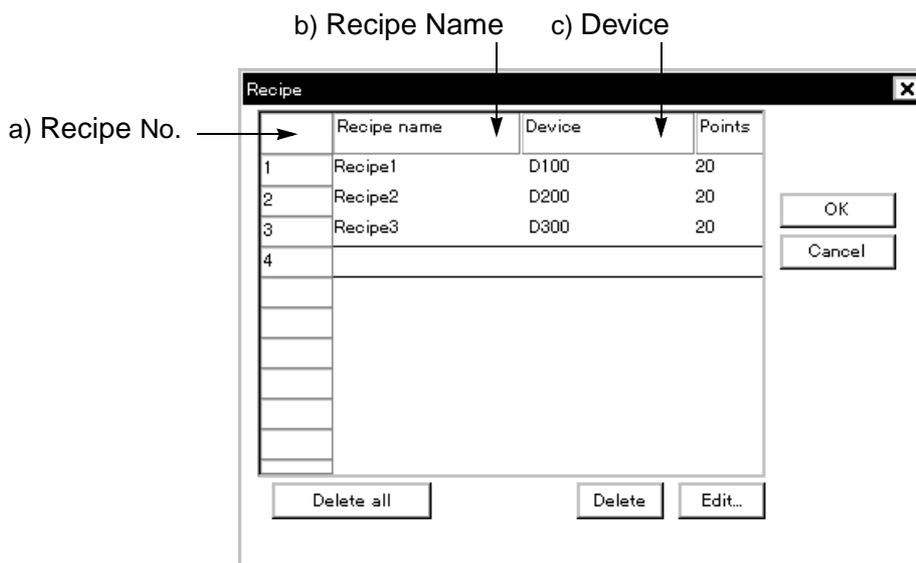
12.8 Recipe function

The GOT have built-in registers which correspond to 4,000 16-bit word devices in the PLC. By setting to ON/OFF a bit device in the PLC, the data in the GOT can be read from/written to a specified word device in the PLC.

By using the recipe function, the initial setting data such as machine processing data and positioning data can be transferred to the PLC.

- The recipe function can be set in "Recipe" in "Common" in the screen creation software.

Screen of screen creation software



a) Recipe No.

This is a recipe file No. Two or more recipe files can be created as far as the total number of devices is 4,000 or less.

b) Recipe Name

Enter an arbitrary recipe name.

The recipe name is used to facilitate recognition of each recipe in the screen creation software. The recipe name cannot be displayed on the GOT screen.

c) Device

Enter the head of word devices in the PLC to which the data in the GOT is transferred. Word devices starting from the head word device as many as the specified number of devices (4) Number) are occupied.

Devices can be set using the EDIT key 5).

- 1) Number
Enter the number of devices to which the data in the GOT is to be transferred.
The number of devices (1 to 4,000) set for the recipe No. 1 is used for all other recipes starting from the recipe No. 2.
 - 2) EDIT key (for detailed setting)
This key allows to set each recipe file in details.
 - 1 Contents of operation
Set 2) Recipe Name, 3) Device and 4) Number.
 - 2 Read trigger
When a specified bit device becomes ON or OFF, the contents of word devices starting from the one set in 3) Device as many as the number set in 4) Number are transferred to the memory built in the GOT.
 - 3 Write trigger
When a specified bit device becomes ON or OFF, the data set in "4 Receipt device" are transferred to word devices starting from the one set in 3] Device.
 - 4 Recipe device
Enter the value of a device to be written to the PLC.
When data is read using "2 Read trigger", this value is overwritten by the read value.
- *1 The write trigger cannot be omitted. The read trigger can be omitted when read is not required.

13. Creation of Display Screens (SW□D5C-GOTRE-PACK)

The previous Section 12 describes creation of one screen.

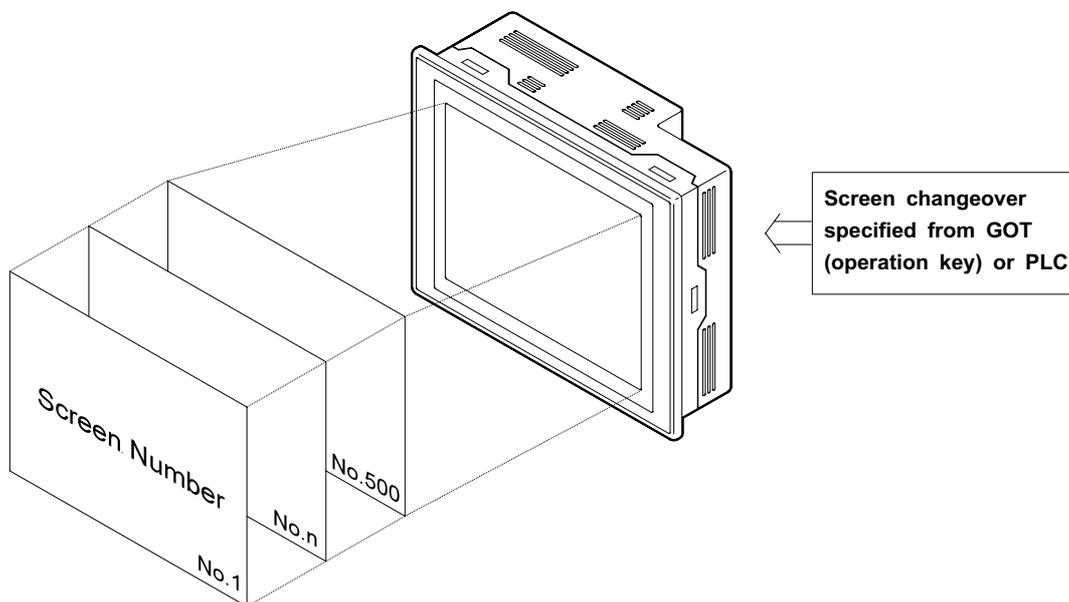
Section 13 describes how to change over two or more screens.

Screen changeover can be arbitrarily specified using operation keys in the GOT or from the PLC.

13.1 Outline of changeover of display screen

In the F940GOT, up to 500 screens can be created. A number from 1 to 500 is assigned to each screen to control each screen.

A screen to be displayed next after the currently displayed screen should be specified using operation keys in the GOT or from the PLC.



Not only a user screen (No. 1 to 500) but also a system screen (No. 1001 to 1030) in the alarm mode or the other mode can be displayed.

■Important point

1) Creation of the user screen No. 1

In the screen mode screen No. 1 is always displayed immediately after the power is turned on.

Accordingly, screen No. 1 should be created. If screen No. 1 is not registered, the error message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed.

2) Screen Nos. may not be consecutive.

The screen Nos. may not be consecutive in such a way as "1, 2, 3 . . ."

When there is a possibility that some screens may be inserted in the future, inconsecutive screen Nos. can be used.

However, it is recommended to use consecutive screen Nos. because mistakes will be less frequent in screen changeover when screen Nos. are consecutive.

13.2 Changeover of display screen

To changeover the display screen, perform the following setting using the screen creation software.

13.2.1 Contents of setting

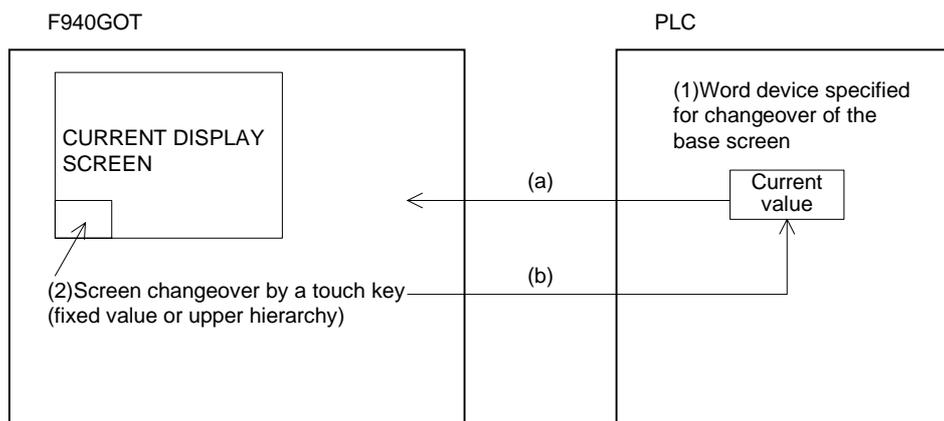
- 1) Changeover of the base screen (set in "Change Screen" in "Common Setting" in the screen creation software)
Specify the screen No. of a screen to be displayed using the current value of a word device in the PLC.
Even if the screen is not changed over from the PLC, this setting is registered in the screen data and occupies one word device.
- 2) Screen changeover using a touch key (set in "Operation Setting" in "Touch Key" in the screen creation software)
The screen is changed over when a touch key is pressed.
The screen No. of a screen to be displayed can be directly specified (fixed value) or the previous screen displayed (upper hierarchy).

13.2.2 Contents of screen changeover operation

Screens are changed over as follows.

- 1) Changeover of the base screen
Common setting can be performed for all screens. This common setting is effective while a user screen (No. 1 to 500) is displayed. As the initial value, the data register D0 is assigned. When the current value of the data register D0 (initial value) or another specified register is overwritten by a sequence program, the display screen is changed over.
- 2) Screen changeover using a touch key
Setting for each user screen (No. 1 to 500) can be performed.
For each screen, up to 50 touch keys can be registered.

Outline of screen changeover



- a) The F940GOT always monitors the current value of a word device set for "1) Changeover of the base screen", and displays a screen corresponding to the monitored current value.
- b) If "2] Screen changeover using a touch key" is set, when the touch key is pressed, the F940GOT writes automatically the fixed value (directly entered value) or the upper hierarchy value (previously displayed screen No.) to a word device specified for "1) Changeover of the base screen" and displays a screen corresponding to the written value.

13.3 Changeover of base screen (changeover from PLC)

The screen No. of a screen to be displayed can be specified using the current value of a word device (D, T or C) in the PLC.

The word device can be set in "Change Screen" in "Common Setting" in the screen creation software. By performing this setting only once, a screen to be displayed next can be specified from the PLC for any screen because the setting is effective to all screens.

13.3.1 Outline of changeover of base screen

- The setting for changeover of the base screen can be performed using the screen creation software.

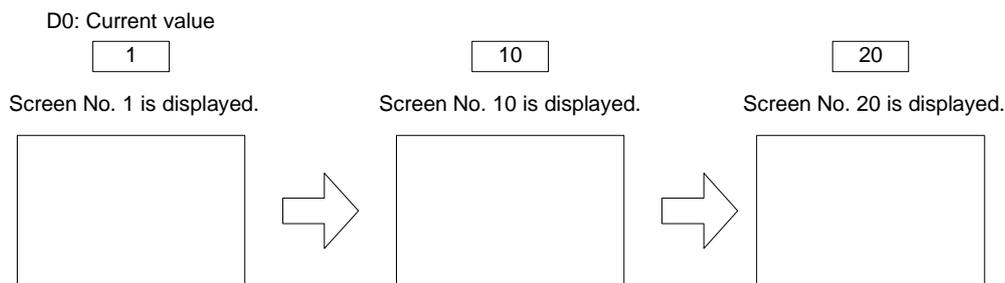
Setting for screen changeover

Base screen : Whose screen No. is equivalent to the current value of a word device D, C or T (initial value = D0)

Overlap window 1: Screen overlaying the base screen (initial value = none)

Overlap window 2: Screen overlaying the overlap window 1 (For screen overlay, refer to Paragraph 9.5.2.)

Example: When the word device D0 is used to change over the base screen



- When the display screen is changed over using a touch key as described in the next paragraph, the screen No. specified by the touch key is stored as the current value of the word device specified for "changeover of the base screen". However, when a system screen (No, 1001 to 1030) is displayed using a touch key, the screen No. is not stored. For changeover to a system screen, refer to Paragraph 13.5.

■Important point

Word device used to specify the base screen

If a word device used to specify the base screen, is not located in the battery backup area (keep area, latch area), when the power of the PLC is turned off or when the PLC becomes the stop status, the current value of the word device becomes 0. In this case, the error message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed because the user screen starts from the screen No. 1. It is recommended to use a word device in the battery backup area.

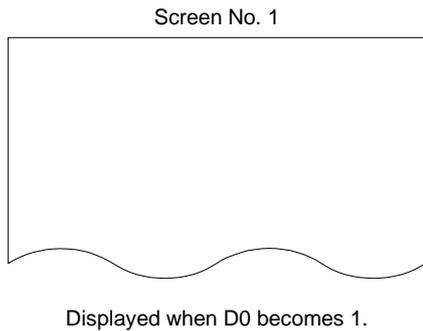
13.3.2 Example of changeover of the base screen

- An example of changeover of the base screen is shown below. Setting for changeover of the base screen (in "Change Screen" in Common Setting" in the screen creation software)

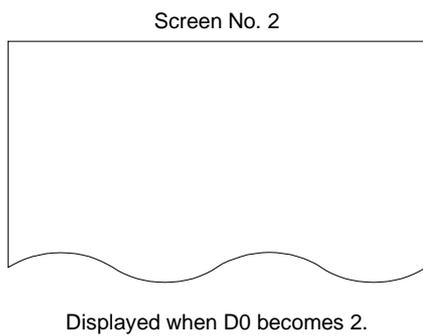
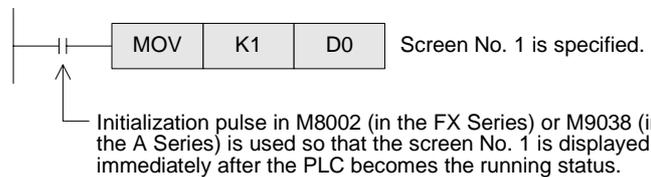
Base screen : D0 (initial value)

Overlap window 1: Not set (Screen overlay will not be performed.)

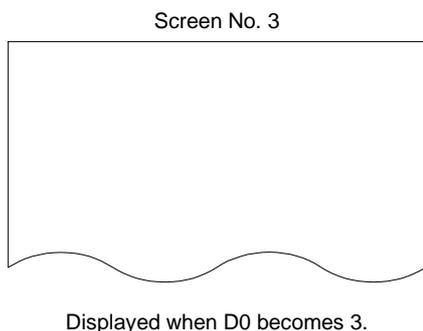
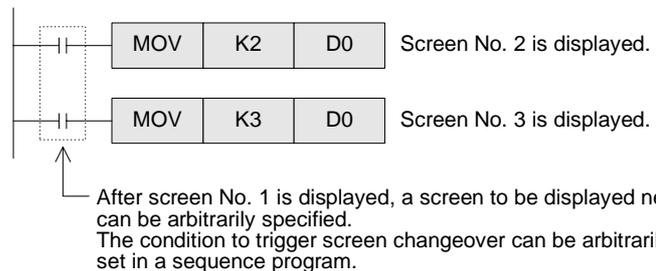
Overlap window 2: Not set (Screen overlay will not be performed.)



- Immediately after the GOT becomes the screen mode, screen No. 1 is always displayed. (If the screen No. 1 has not been created, the error message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed.)



- When the sequence program shown below is executed, the screen is changed over in accordance with the specification.



- In this example, the word device D0 used to specify the base screen, is not located in the battery backup area. Accordingly, if the screen mode is selected in the GOT while the PLC is in the stop status, the error message "DISPLAY SCREEN IS NOT AVAILABLE." is displayed. If the error message is not desired, use a word device in the battery backup area.

13.4 Screen changeover by touch key

To change over the display screen using a touch key provided on the screen, two methods are available. In the fixed value method, the screen No. of a screen to be displayed next can be directly entered. In the upper hierarchy method, the previously displayed screen is displayed next.

Touch key — Fixed value :Allows to enter the screen No. of a screen to be displayed next.
 — Upper hierarchy :Returns to the previous screen.

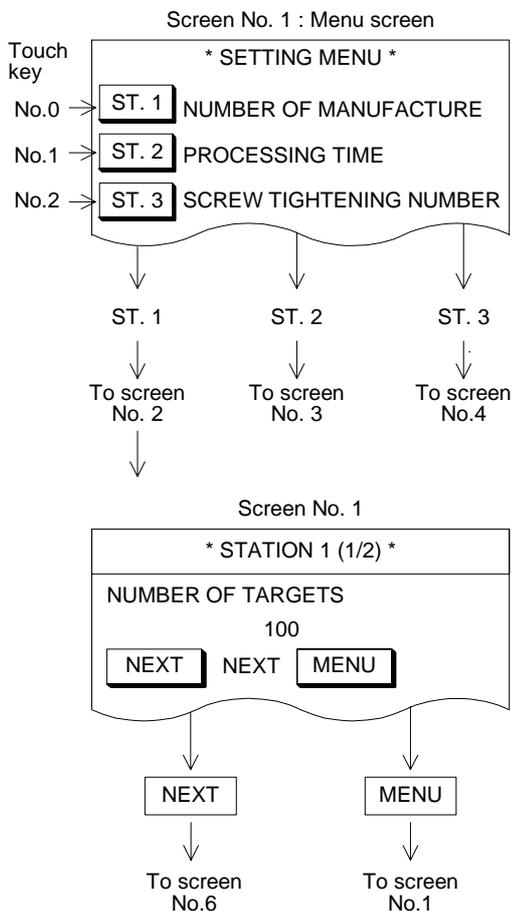
- Only one method (fixed value or upper hierarchy) can be assigned to one touch key. (A function other than the screen changeover function such as the bit ON/OFF function can be assigned to a touch key to which either the fixed value method or the upper hierarchy method has been assigned.)
- Touch keys can be set for each screen.

13.4.1 Changeover using a fixed value

When a touch key is pressed, the screen set to the touch key is displayed.

Touch key (fixed value):Enter one among the following screen Nos.
 Screen Nos. 1 to 500 (user screen)
 Screen Nos. 1001 to 1030 (system screen):Refer to the appendix.

Example of screen changeover using touch keys



- Screen No. 1 is created, and screen changeover is set so that a corresponding screen is displayed when either of the ST. 1 to ST. 3 keys is pressed.

ST. 1 key :Fixed value = 2
 ST. 2 key : Fixed value = 3
 ST. 3 key : Fixed value = 4

* Characters "ST. 1" to "ST. 3" are set as touch keys or "Text" objects.

- When the ST. 1 key is pressed, the screen No. 2 is displayed in accordance with the assigned fixed value.

NEXT key : Fixed value = 6
 MENU key : Fixed value = 1

When the MENU key is pressed, the screen No. 1 is displayed in accordance with the assigned fixed value. Or the previous screen is displayed in accordance with the upper hierarchy specification described in the next paragraph.

13.4.2 Changeover to upper hierarchy

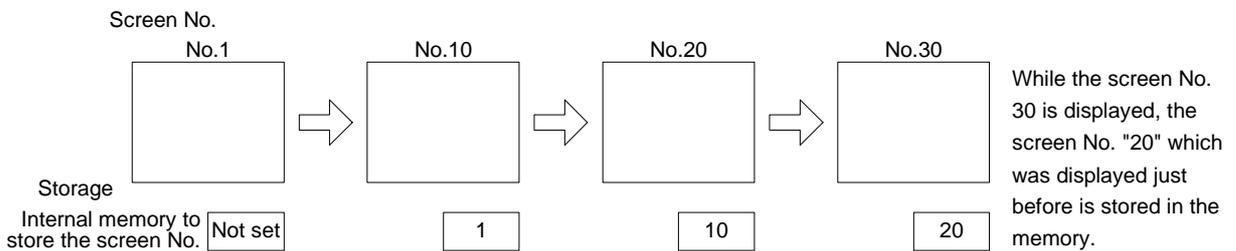
By pressing a touch key provided on the screen, the previous. This function is useful to return to the previous screen in such a case that an abnormality had occurred in the machine and an error message was displayed. (Refer to Paragraph 13.6.)

Touch key (upper hierarchy): Enter one among the following screen Nos.
 Screen Nos. 1 to 500 (user screen)
 Screen Nos. 1001 to 1030 (system screen): Refer to the appendix.

Contents stored in the screen No. storage memory

The GOT has one screen No. storage memory which stores the previous screen without regard to the setting at that time.

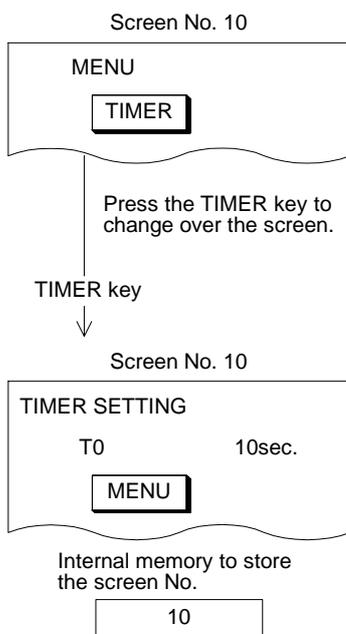
Example: Suppose that the screens are changed over as follows.



Keeping of the contents stored in the screen No. storage memory

The contents stored in the screen No. storage memory is kept only while the power is turned on in the GOT main body. When the power is turned off, the memory is cleared.

Example of screen changeover to upper hierarchy



- The screen No. 10 is set so that it will be changed over to the screen No. 11 or the screen No. 12 in accordance with the fixed value assigned to the touch keys.

TIMER key : Fixed value = 11

COUNTER key : Fixed value = 12

- The screen No. 11 is set so that it will be returned to the previous screen (screen No. 10) in accordance with the upper hierarchy setting assigned to the touch key.

MENU key: Upper hierarchy

13.5 Changeover to system screen

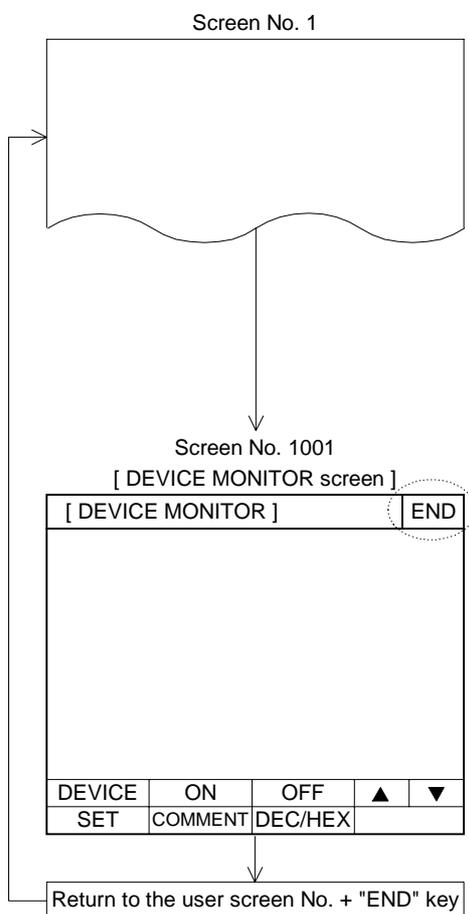
Function screens built in the GOT such as the HPP MODE screen, the SAMPLING MODE screen, the ALARM MODE screen and the OTHER MODE screen can be displayed as user screens.

13.5.1 Display example of system screen

This paragraph describes the method to display a system screen as a user screen (that is, display a system screen in the screen mode) and the caution on this method.

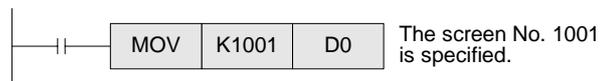
- A system screen can be displayed by specifying a corresponding screen No. shown in the next page. In this case, the following setting is required so that the previous user screen can be displayed after the system screen.

1) When a system screen is displayed as the base screen (from the PLC)

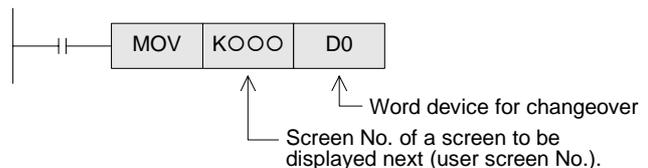


- When the sequence program shown below is executed while the screen No. n is displayed, the screen No. 1001 (DEVICE MONITOR screen) is displayed.

- Word device to change over the base screen of the GOT: D0
- Sequence program



- To return to the previously displayed user screen from a system screen, execute a program which specifies the screen to be returned and press the END key provided at the upper right corner of the system screen. Then, the previous user screen is displayed again.



- A sequence program to return to a user screen can be executed at any time while a system screen is displayed.

2) When a system screen is displayed using a touch key

- Specify a desired screen No. within the range of Nos. 1001 to 1030 in the same way as specification of a user screen.
- When the END key provided at the upper right corner of the system screen is pressed, the previous user screen is automatically displayed again. (That is, the setting to return to the previous screen is not required.)

13.6 Application of screen changeover

This paragraph describes application examples of screen changeover.

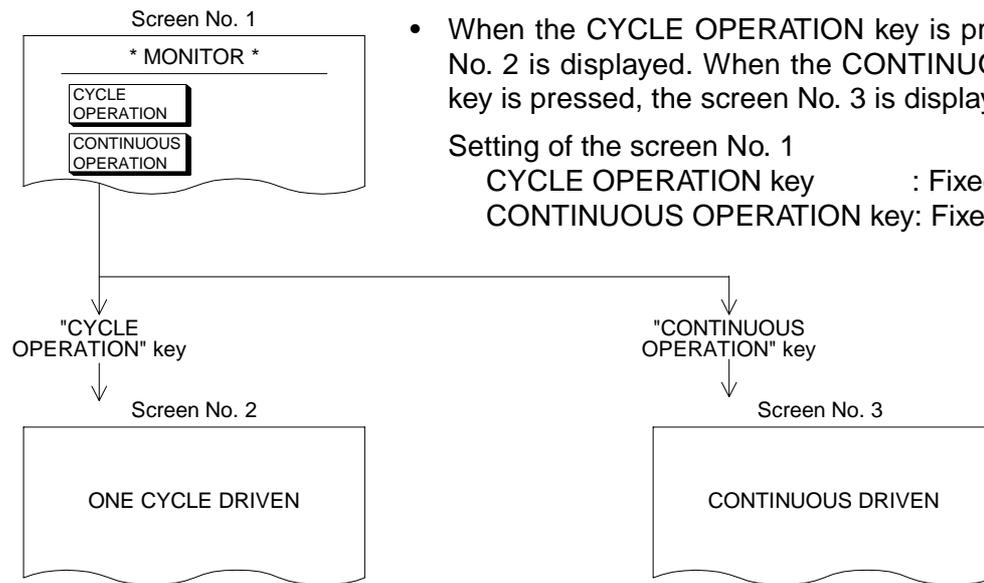
13.6.1 Application example 1

In the example below, an abnormality occurs in the machine in the operation mode, an error message is displayed, then a previous screen is displayed.

Changeover of the base screen

Word device specifying the changeover destination: D0 (initial value)

.....It is registered as the common setting for all screens.



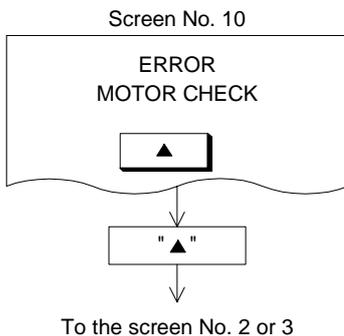
- When the CYCLE OPERATION key is pressed, the screen No. 2 is displayed. When the CONTINUOUS OPERATION key is pressed, the screen No. 3 is displayed.

Setting of the screen No. 1

CYCLE OPERATION key : Fixed value = 2

CONTINUOUS OPERATION key: Fixed value = 3

- When the program shown in the next page is executed while the screen No. 2 or 3 is displayed, the screen No. 10 is displayed by the base screen changeover function.



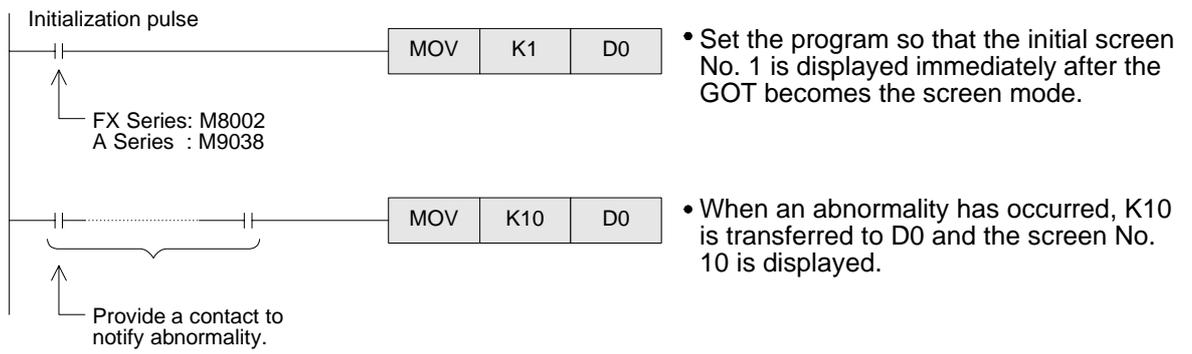
- To return to the previous screen (screen No. 2 or 3) from the screen No. 10, use the upper hierarchy function of a touch key.

Setting of the screen No. 10

PREVIOUS key: Upper hierarchy

- When the previous screen is to be displayed, as shown in this example, use the upper hierarchy function on a touch key.

- Program example for application example 1



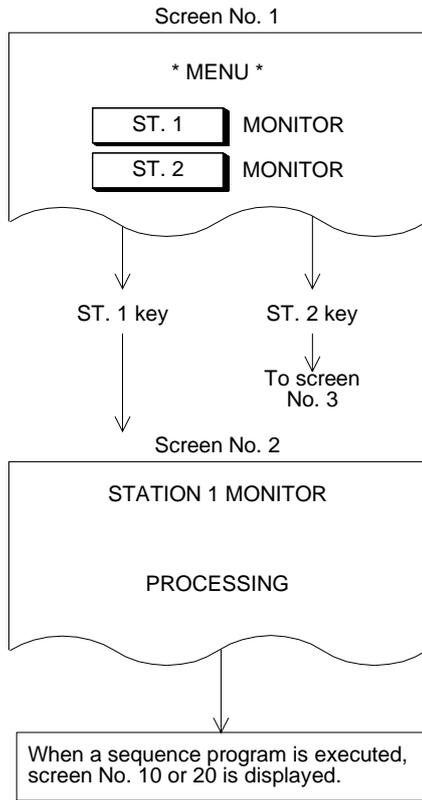
13.6.2 Application example 2

In the example below, changeover of the base screen and screen changeover using touch keys is combined.

Changeover of the base screen

Word device specifying the changeover destination: D0 (initial value)

.....It is registered as the common setting for all screens.



- When the ST. 1 key is pressed, screen No. 2 is displayed. When the ST. 2 key is pressed, the screen No. 3 is displayed.

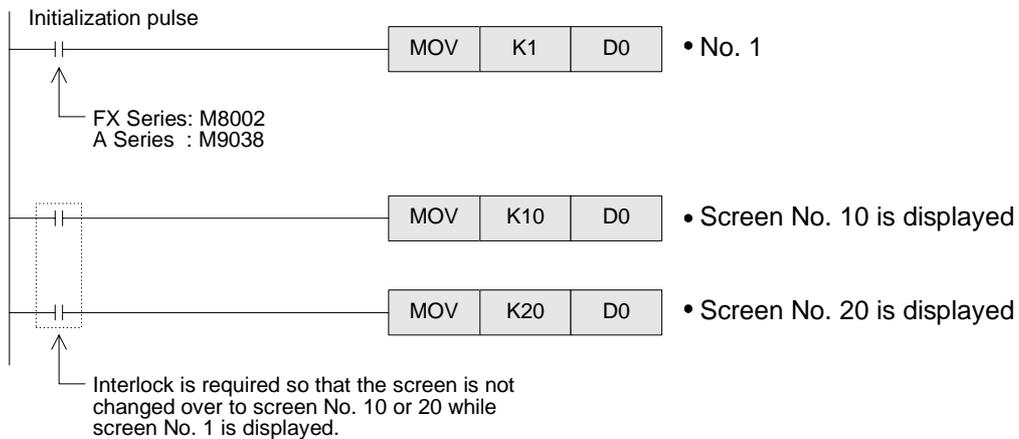
Setting of screen No. 1

ST. 1 key : Fixed value = 2

ST. 2 key : Fixed value = 3

- When the sequence program shown below is executed while screen No. 2 is displayed, the screen No. 10 or 20 is displayed by the base screen changeover function.

- Program example for application example 2



14. Additional Functions (in Ver. 3.00 or Later)

This section describes the functions added in Ver. 3.00 and later.

14.1 Outline of additional functions

- Applicable version

Product model name	Version	Remarks
F940GOT-SWD-E F940GOT-LWD-E	V3.00	Manufacturer's serial No. 97****~ (manufactured in July, 1999 or later)

To use the additional functions, the following screen creation software is required.
 SW□D5C-GOTRE-PACK: Ver. A (□ = 2 or larger, manufactured in July, 1999 or later)
 FX-PCS-DU/WIN-E: To be supported in the near future.

- Contents of additional functions
 - 1) Connection to bar code reader → Paragraph 14.2
The ASCII code data from the bar code reader can be stored in word devices in the PC by way of the F940GOT.
 - 2) Connection to SLC500 Series PC manufactured by Allen-Bradley → Paragraph 14.3
The CPU (RS-232C) in the SLC500 Series PC can be connected.
* When the connected PC is set to RS-232C, a bar code reader cannot be connected.
While the screen data is transferred from a personal computer or while a printer is used in the other mode in the GOT, communication with a bar code reader is disabled.
 - 3) Connection to MELSEC-QnA Series PC → Paragraph 14.4
CPU direct connection (RS422) or computer link unit connection (RS-422/232C) is available.
 - 4) Screen hard copy function → Paragraph 14.5
The screen being displayed can be output to a printer by a touch switch or command from a bit device in the PC.
 - 5) Additional key codes available in alarm history object → Paragraph 14.6
 - 6) Ten-key window display position can be specified. → Paragraph 14.7

14.2 Connection to bar code reader

14.2.1 Communication specifications

The F940GOT can be connected to a bar code reader which satisfies the communication specifications and the communication format shown below.

For the wiring, refer to the hardware manual of the F940GOT main unit and the manual of the bar code reader.

- Communication specifications

Communication port	RS-232C
Baud rate	9,600 bps
Data length	8 bits
Stop bit length	1 bit
Parity	Even

- Communication format

Data	CR(0DH)
------	---------

Data: ASCII code
 Header: None
 End code: CR (0DH)

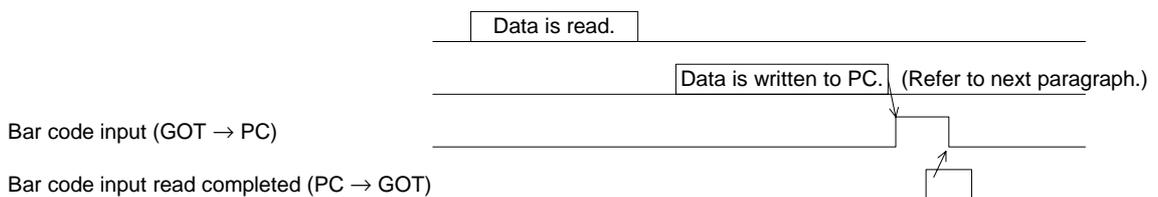
14.2.2 Setting of system information (control devices)

When a bar code reader is connected, the system information (control devices) are required to be set.

Set the system information in "Common Setting" in the screen creation software.

	System information SW□D5C-GOTR-PACK	Control device FX-PCS-DU/WIN
Bar code input	b5 of "head write device +4"	MO + 8
Bar code input invalid	b5 of "head read device"	MO + 9
Bar code input read completed	b6 of "head read device"	MO + 10
	Refer to Paragraph 9.6.2.	Refer to Paragraph 9.6.1.

- Bar code input (GOT → PC)
 Because this signal becomes ON when the data read by the bar code reader is stored in the PC, the write timing can be confirmed using this signal. To set to OFF this bar code input signal, set to ON the bar code input read completed signal.
- Bar code input read completed (PC → GOT)
 This signal sets the bar code input signal from ON to OFF.
- Bar code input invalid (PC → GOT)
 When this bit becomes ON after a bar code is input, the bar code input becomes invalid. The data read by the GOT is cleared.



- In the following condition, the data read by the bar code reader is not written to the PC.
When the bar code input invalid signal is ON
When the bar code input read complete signal remains ON
When the bar code input signal is ON

14.2.3 Write to PC

Set word devices in the PC to which ASCII codes of the bar code reader are written from the GOT.

- Set the word devices using the screen creation software.
SW□D5C-GOTRE-PACK
- Set the word device in "Bar Code Reader" in "Common Setting".
FX-PCS-DU/WIN-E
To be supported in the near future.
- Specification of word devices
D, T, C, GD: FX Series When connecting a PC manufactured by another
D, W, TN, CN, R, Z, V, GD: A Series company, specify word devices suitable to the PC.
* When the FX Series PC is connected, C200 to C255 are not available.
- Number of devices (number of specified words)
One word stores two characters of the ASCII code data sent from the bar code reader.
Two to 32 word devices can be specified.
- Example of storage
The ASCII data from the bar code reader is stored in the word devices specified above. If the read data is smaller than the specified number of devices, space (20H) is stored in unused word devices.

Example: Data read from bar code reader: 1234567

Head device of write destination: D100 Number of devices: 6

Write destination device	Stored data	ASCII code
D100	7	
D101	H3231	21
D102	H3433	43
D103	H3635	65
D104	H2037	7
D105	H2020	

Space (20H) is stored after "7".

On the contrary, if the read data is larger than the specified number of devices, the excessive data is not stored.

Example: Data read from bar code reader: 1234567

Head device of write destination: D100 Number of devices: 2

Write destination device	Stored data	ASCII code
D100	7	
D101	H3231	21

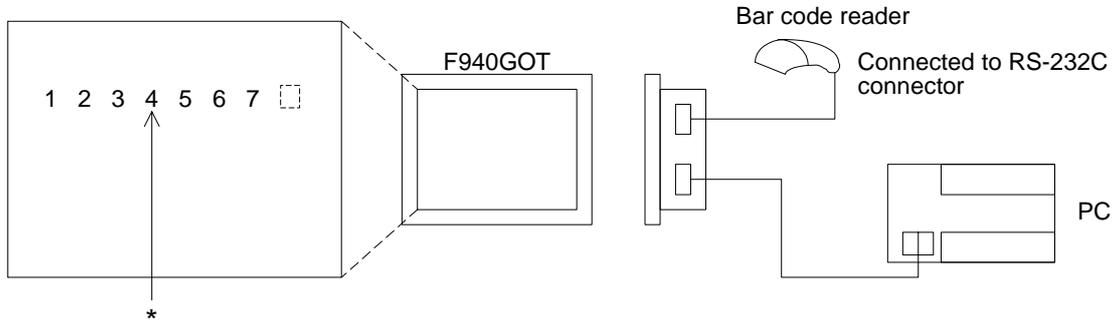
↑
"3" to "7" are not stored.

← The number of all ASCII codes including excessive ASCII codes is stored. Refer to this, and judge whether the data is correctly written.

To the specified head word device, the number of all read ASCII codes is stored without regard to the specified number of devices.

14.2.4 Example of PC program

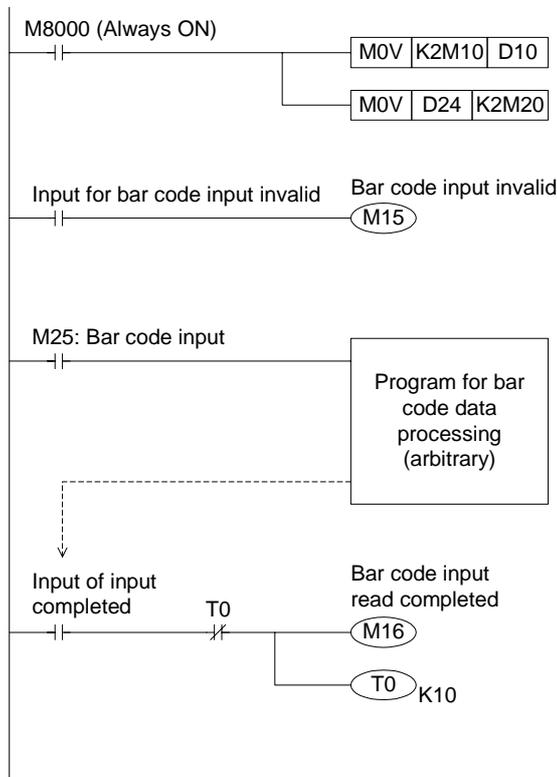
This paragraph describes a program example when the SW□D5C-GOTRE-PACK is used.



* The ASCII codes can be displayed on the screen using "ASCII Code Display" or "ASCII code input".

□ indicates space.

- Setting of system information
 Read device: D10 (b5 and b6 are occupied.)
 Write device: D20 (D24 b5 is occupied.)
- Write destination device and number of devices for bar code setting
 Write destination device: D50
 Number of devices: 5 (D50 to D54 are occupied.)



- The ON/OFF status of M10 to M17 is transferred to D10 (b7 to b0).
 (M15: Bar code input invalid, M16: Bar code input read completed)
- The ON/OFF status of D24 (b7 to b0) is transferred to M27 to M20.
 (M25: Bar code input)
- Make this program when the bar code input should be set invalid.
 (Make this program upon necessity.)
- When data is input from the bar code reader, M25 becomes ON.
 ASCII codes are written from the GOT to the write destination devices (D50 to D54).
 (The GOT automatically writes the ASCII codes. Any program for write is not required,)
- When data input (M25) from the bar code reader is finished, M16 becomes ON to indicate that read is completed.
 Then, the GOT sets M25 to ON, and the next data can be input.
- In this example, M16 remains ON only for 1 second.
 (While M16 remains ON, next bar code input data cannot be read.)

14.2.5 Troubleshooting

If data is not written normally, confirm the following points.

- When data is not written to the PC

Action 1: Confirm the version of the GOT and the screen creation software.

F940GOT: Ver. 3.00 or more

Screen creation software: SW□D5C-GOTRE-PACK (□ = 2 or larger, Ver. A)

FX-PCS-DU/WIN: To be supported in the near future.

Action 2: Confirm the bar code reader specifications.

Make sure that the contents in "14.2.1 Communication specifications" are satisfied.

Action 3: Confirm the wiring.

Action 4: Make sure that all of the bar code input signal, the bar code input invalid signal and the bar code input read completed signal assigned to the system information (control devices) are OFF.

If any signal is ON, data cannot be written.

* When the bar code input read completed signal becomes ON in the PC, the GOT sets to OFF the bar code input signal. (Refer to Paragraph 14.2.2.)

- When data is partially written to the PC

* After receiving the end code (CR: 0DH) from the bar code reader, the GOT writes data to the PC.

Accordingly, it does not usually occur that data is partially written.

Action 1: Confirm the setting of the bar code in the screen creation software.

Especially the number of devices may be small.

Action 2: Confirm the bar code reader specifications.

Action 3: The data may be interrupted while being transferred.

Check whether there is imperfect contact.

14.3 Connection to PC manufactured by Allen-Bradley

When connecting the SLC500 Series PC manufactured by Allen-Bradley, set the communication parameters and the RS-232C port as follows using an SLC500 Series peripheral tool. For connection, refer to the hardware manual of the GOT main unit and the instruction manual of the SLC500 Series.

14.3.1 Setting of communication

- Setting of RS-232C (channel 0) parameters
Set the system mode driver (DF1) to "half-duplex slave (DF1)".
Set other parameters to default values (initial values).
- Channel configuration of DF1 (half duplex slave)
Set the parameters as shown in the table below.
Set all parameters except shaded ones to default values.

Parameter	Set value
Diagnostic File	-
Baud Rate	19200
Parity	Even
Duplicate Packet Delection	Disabled
Station Adress	0
Error Delection	BCC
Poll Timeout	50
RTS Off Delay	0
RTS Send Delay	0
Message Retries	3
Control Line	No Handshaking
EOT Suppression	No

- Setting on GOT
When the connected PC is set to "SLC500 Series" in the screen creation software or "SET-UP MODE" in the GOT, the following setting is selected.
(The following setting is automatically selected when the PC model is set to "SLC500 Series". You do not have to set them manually.)

Baud rate	19200
Data length	8 bits
Stop bit	1 bit
Parity bit	Even
Control method	None

14.3.2 Device list

The table below shows the list of devices in the SLC500 Series compatible with the GOT. And have in mind the constraints described below.

- Device specification method

Use the following format to specify bit/word devices.

1) Bit device

---○○○□□□

- ---: Specify the device symbol (shown in the list below) in one or two alphabets.
- ○○○: Specify the file No. (shown in the list below) corresponding to each device in decimal. (*1)
- □□□: Specify the element (device No.) in decimal.

Example: To specify "B003064E"

Device symbol: B Element (device No.): 64
File No.: 3 Bit position: E

2) Word device

The specification method is equivalent to that for bit devices.

Example: To specify "N057129"

Device symbol: N Element (device No.): 129
File No.: 57

*1 The file Nos. 10 to 255 are required to be set in advance using the package software manufactured by Allen-Bradley.

- Support device list

Device name (symbol)	File No.	Available element (device No.) specification range
Bit (B)	3, 10 ~ 255	0 ~ 255
Timer coil (TT)	4, 10 ~ 255	0 ~ 255
Timer contact (TN)	4, 10 ~ 255	0 ~ 255
Timer set value (TP)	4, 10 ~ 255	0 ~ 255
Timer current value (TA)	4, 10 ~ 255	0 ~ 255
UP counter coil (CU)	5, 10 ~ 255	0 ~ 255
DOWN counter coil (CD)	5, 10 ~ 255	0 ~ 255
Counter contact (CN)	5, 10 ~ 255	0 ~ 255
Counter set value (CP)	5, 10 ~ 255	0 ~ 255
Counter current value (CA)	5, 10 ~ 255	0 ~ 255
Integer (N)	7, 10 ~ 255	0 ~ 255

Note: Shaded columns indicate word devices. Other columns indicate bit devices.

- Constraints in device specification

1. Word specification for bit devices and bit specification for word devices are not supported in the GOT in the same way as a case where another PC is connected.
2. The GOT supports only the devices shown above, and does not support other devices (that is, devices related to input image, output image, status, control, floating point and network)

Make sure to read the cautions described in the next page.

- Cautions

As described in the previous page, you are required to set devices to be used for the SLC500 Series. Accordingly, if devices to be monitored or set are not specified in the PC, a communication error may occur.

Especially, the GOT is always monitoring sampling devices in the sampling mode even if the sampling condition is not set. As a result, a communication error occurs if sampling devices are not present. In such a case, change sampling devices or set devices in the PC.

14.4 Connection to MELSEC-QnA Series

The MELSEC-QnA Series PC can be connected in the same way as the MELSEC-A Series PC.

14.4.1 CPU direct connection

- Applicable PC: QnA, Q2AS: CPU direct connection (RS-422)
- Connection method: CPU direct connection (RS-422)
 - For connection, refer to "Connection to A Series" in "1.6.2 Connection to MELSEC FX/A Series (CPU direct connection)".
- Caution: A personal computer can be connected using the built-in two-port interface function during CPU direct connection. In this case, only the SW□D5C(F)-GPPW is available as the ladder creation software.

14.4.2 Computer link connection

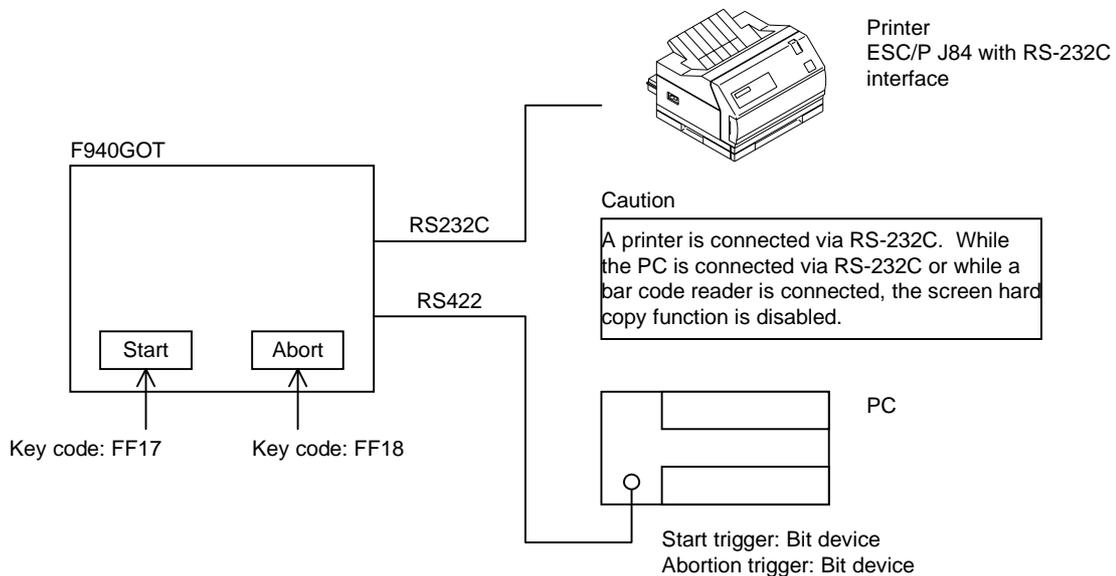
- Applicable serial communication unit: AJ71QC24, AJ71QC24-R2
AJ71QC24-R4, A1SJ71QC24, A1SJ71QC24-R2
- Connection method: CPU direct connection (RS-232C or RS-422)
 - Though this is computer link connection, make sure to select the "CPU direct connection" method
 - For connection, refer to "1.6.3 Connection to MELSEC A Series (computer link connection)".

14.5 Screen hard copy function

The screen image being displayed can be output to a printer connected to the RS-232C interface in the F940GOT.

14.5.1 Outline of hardware copy operation

- Set the hard copy function in "Hard Copy" in "Common Setting" in the SW□D5C-GOTRE-PACK (□ = 2 or larger, Ver. A).
- User screens (which are displayed in the screen mode) only can be output to a printer. System screens (which are displayed in the HPP, alarm, sampling and other modes) cannot be output to a printer.
- Output to a printer can be started/aborted by setting to ON/OFF a corresponding bit device in the PC or by pressing a corresponding touch switch.



- When starting printing, the GOT aborts communication with the PC for approximately 1 second while storing the displayed screen image in the internal memory. After that, the GOT automatically restarts communication.

14.5.2 Starting and aborting printing

1) Start and abortion by triggers

Printing start/abort command is given when a corresponding bit device in the PC specified in the screen creation software becomes ON.

The GOT monitors in a constant cycle whether these bit devices have become ON (monitoring cycle).

The monitoring cycle can be set in the unit of 1 second within the range from 1 to 60 seconds.

* If the bit device ON period is shorter than the monitoring cycle, it may not be recognized as a trigger. Make sure that the ON period is longer than the monitoring cycle. (Refer to a program example shown in the next page.)

2) Start and abortion by touch switches

Printing can be started and aborted by pressing touch switches.

Assign the following key codes to the touch switches.

Key code	Key code
Start: FF17	Abortion: FF18

3) Hard copy output signal

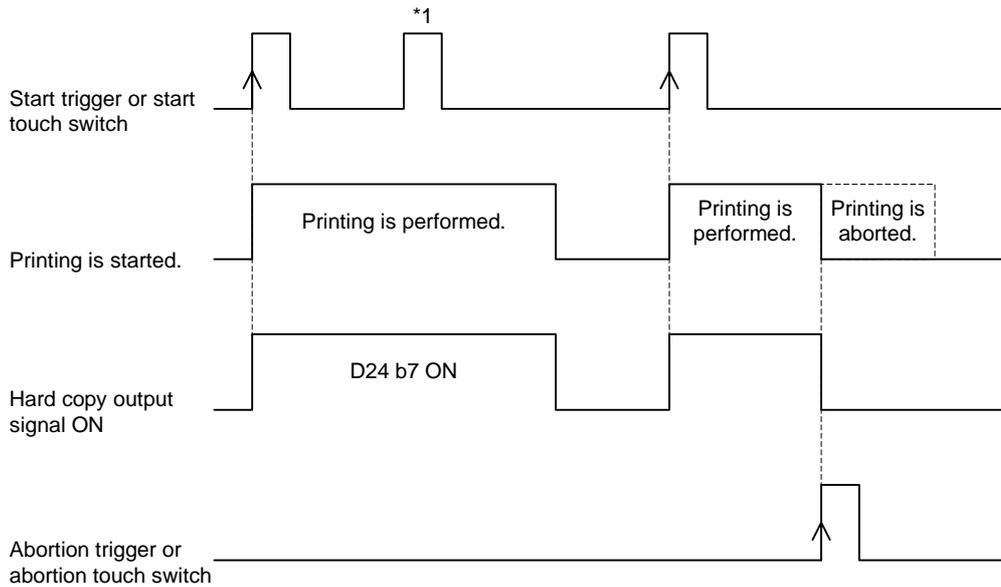
When printing is started by a trigger or touch switch, the bit of the following system information becomes ON. (Refer to "9.6.2 System information".)

System information	
Hard copy output signal	b7 of "word device specified as head write device +4" becomes ON.

For example, when D20 is assigned as the head write device (Refer to Paragraph 9.6.2.), b7 of D24 becomes ON.

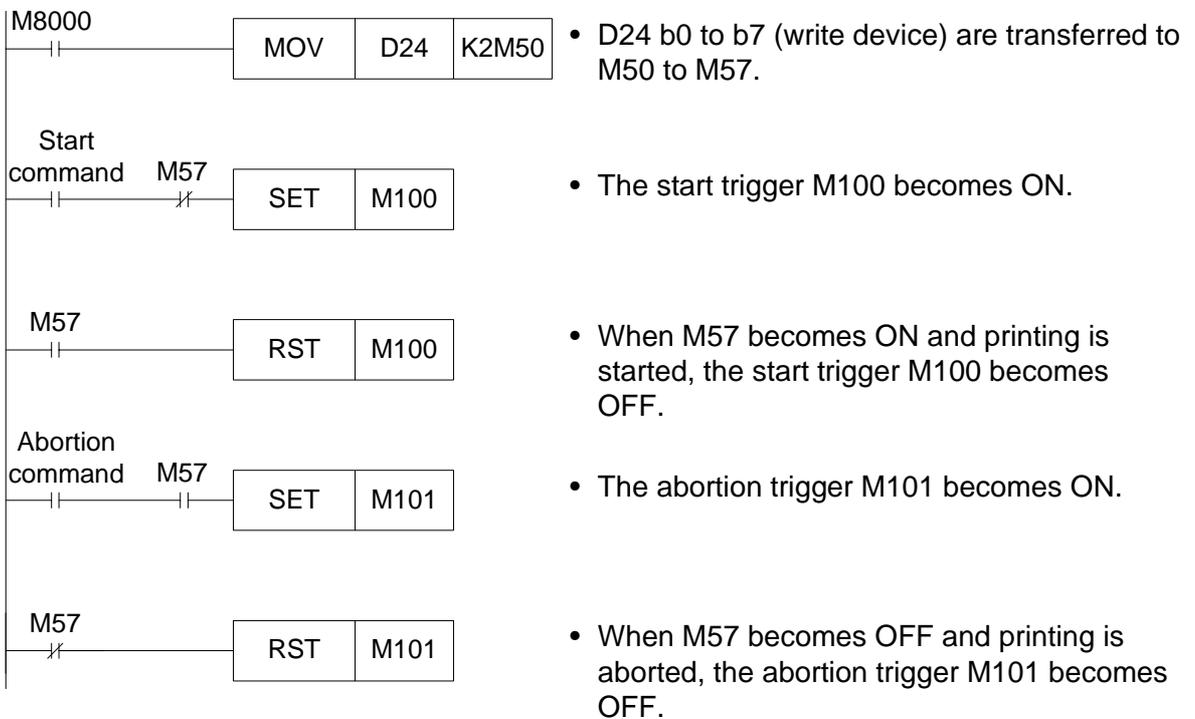
When printing is completed or an abortion command (trigger or touch switch) is given, this bit becomes OFF.

- Printing is performed at the following timing.



*1 If a printing start command is given while printing is performed, it is ignored and new printing is not performed.

- Sequence program example
 In the program below, a start trigger and an abortion trigger are used.
 Start trigger: Assigned to M100
 Abortion trigger: Assigned to M101



14.5.3 Printing image

All display screens are printed in black and white.

In the color type GOT, the display colors are converted and printed as follows.

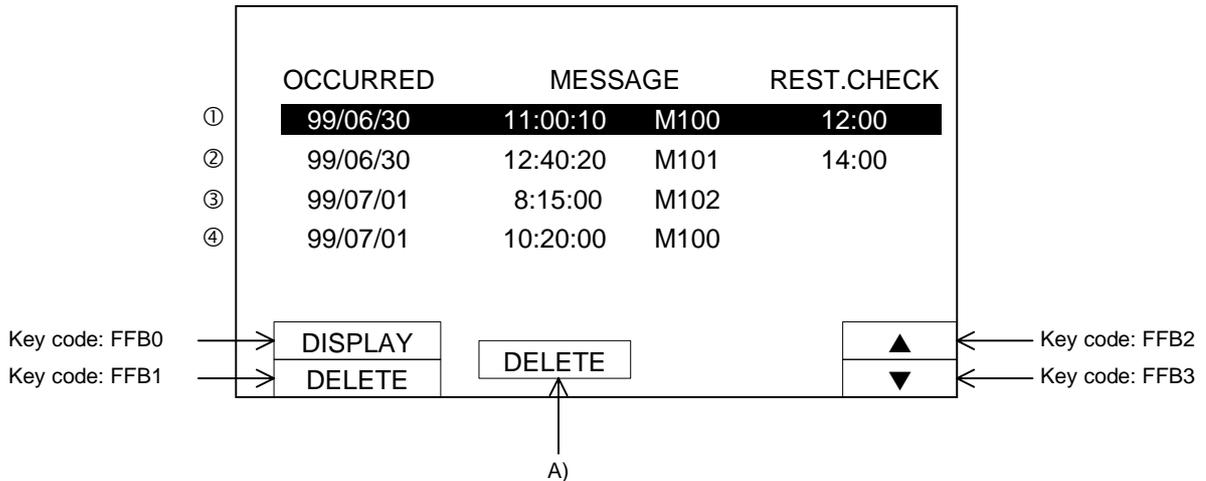
- Screen display colors: Black, red, blue and green → Printed in black
White, purple, yellow and white → Printed in white
 - Highlighting: Black and white of the display screen are reversed each other in printing.
 - Number of screens in one page: The number of screens to be printed in one page can be specified.
After the specified number of screens are printed, the printing page is changed.
- * In some printers, when printing has been aborted, line feeding and page changeover may not be performed by a next printing command.
After aborting printing, discharge a paper sheet once, then restart printing.

14.6 Additional key codes

When touch switches to which the following key codes are assigned are pressed on the screen on which the alarm history display function (Refer to Paragraph 12.3.5.) is displayed, the history can be deleted from the screen display .

Key code	Description of function
FFB6 (H)	Deletes an alarm selected by the cursor from the screen display if the alarm is recovered.
FFB7 (H)	Deletes all recovered alarms from the screen display without regard to the cursor position.

Display example



When the key code FFB6 is assigned to A):

- A) deletes the alarm ① in the cursor position from the screen display.
- A) does not delete neither the alarm ③ nor the alarm ④ even if the cursor is located in ③ or ④ because these alarms are not recovered yet.

When the key code FFB7 is assigned to A):

- A) deletes the alarm ① and ② from the screen display.
- Though the alarm items ① and ④ are same, A) does not delete the alarm item ④ because it is not recovered yet.

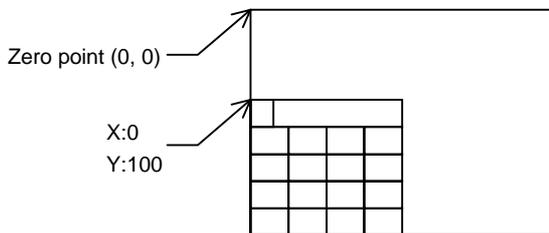
14.7 Key window display position specification

You can specify the initial display position of the ten-key window displayed to input numerics and change the ASCII data.

Conventionally, the ten-key window position was fixed at the lower right corner of the screen. (Refer to Section 3.)

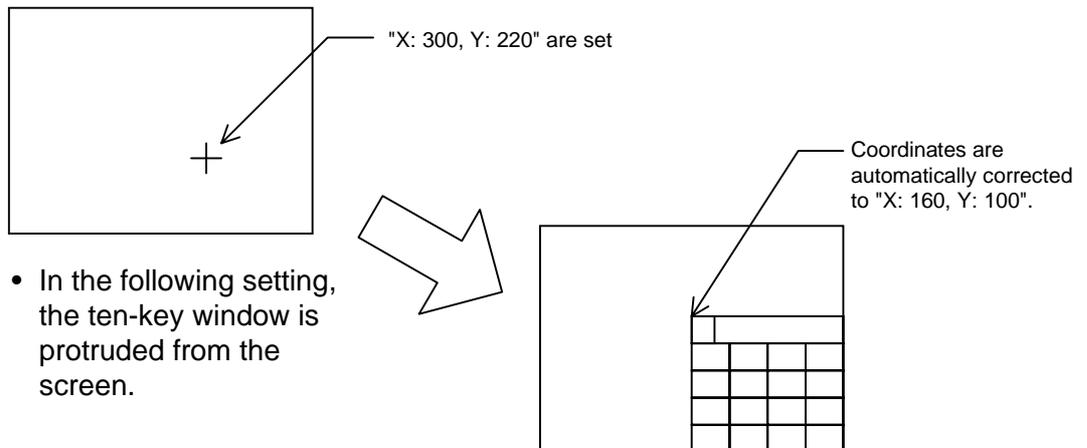
- You can specify the ten-key window display position for each screen in "Window Position" in "Screen Setting" in the screen creation software.
- Basic operation
 - When the ten-key window is opened and closed on the same screen, the ten-key window is displayed again in the previous position. If a screen is displayed for the first time, the ten-key window is displayed in the initial screen set for the screen.
 - When a screen (A) is displayed, another screen (B) is displayed, then the previous screen (A) is displayed again, the ten-key window is displayed in the initial position set for the screen (A) without regard to the ten-key window position displayed on the screen (B).
 - On a screen for which the ten-key window initial position is not set, the ten-key window is always displayed at the lower right corner.
 - When the ten-key window initial position is set in a position in which the ten-key window is protruded from the screen, the initial position start coordinate is corrected so that the entire ten-key window can be displayed on the screen. (Refer to the figure below.)

When "X: 0, Y: 100" are set



- The ten-key window is displayed in the position in which the upper left corner of the ten-key window is located in the specified coordinates. The zero point in this coordinate system is located at the upper left corner of the screen.

When "X: 160, Y: 100" or larger coordinates are set



- In the following setting, the ten-key window is protruded from the screen.

- The upper left corner coordinates are automatically corrected so that the entire ten-key window can be displayed on the screen.

15. Additional Functions (Ver. 3.10 and Later)

This section describes the functions added in Ver. 3.10 and later.

15.1 Outline of additional functions

- Applicable version

Table 15.1:

Product model name	Version	Remarks
F940GOT-SWD-E F940GOT-LWD-E	V3.10	

In order to use these additional functions, the following versions of the screen creation software are required.

SW□D5C-GOTRE-PACK Ver. H (manufactured in September, 1999)

FX-PCS-DU/WIN-E Ver. 2.30 or later

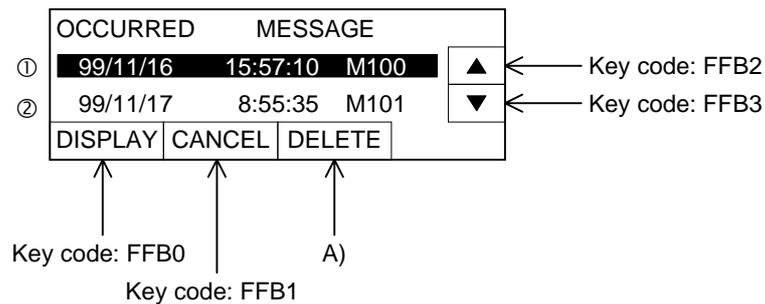
- Contents of additional functions
 - 1) Addition of the state monitor function → Refer to Paragraph 15.2.
This function can turn on or off specified bit devices and write constants in accordance with turning on or off of bit devices of the PLC or at a constant cycle.
 - 2) Addition of touch keys and indicators (lamps) → Refer to Paragraph 15.3.
 - 3) Addition of mesh patterns → Refer to Paragraph 15.4.
 - 4) Addition of keyboards displayed when data is changed → Refer to Paragraph 15.5.
 - 5) Addition of the key window creation function → Refer to Paragraph 15.6.

15.2 Additional key codes

When touch keys to which the following key codes are assigned are pressed on the screen on which the alarm history display function (Refer to Paragraph 11.3.5.) is displayed, the history can be deleted from the screen display.

Key code	Description of function
FFB6 (H)	Deletes an alarm selected by the cursor from the screen display if the alarm is recovered.
FFB7 (H)	Deletes all recovered alarms from the screen display without regard to the cursor position.

Display example



When the key code FFB6 is assigned to A) :

A) deletes the alarm ① where the cursor is located from the screen display if it has already recovered.

A) does not delete the alarm ① from the screen display if it has not recovered yet.

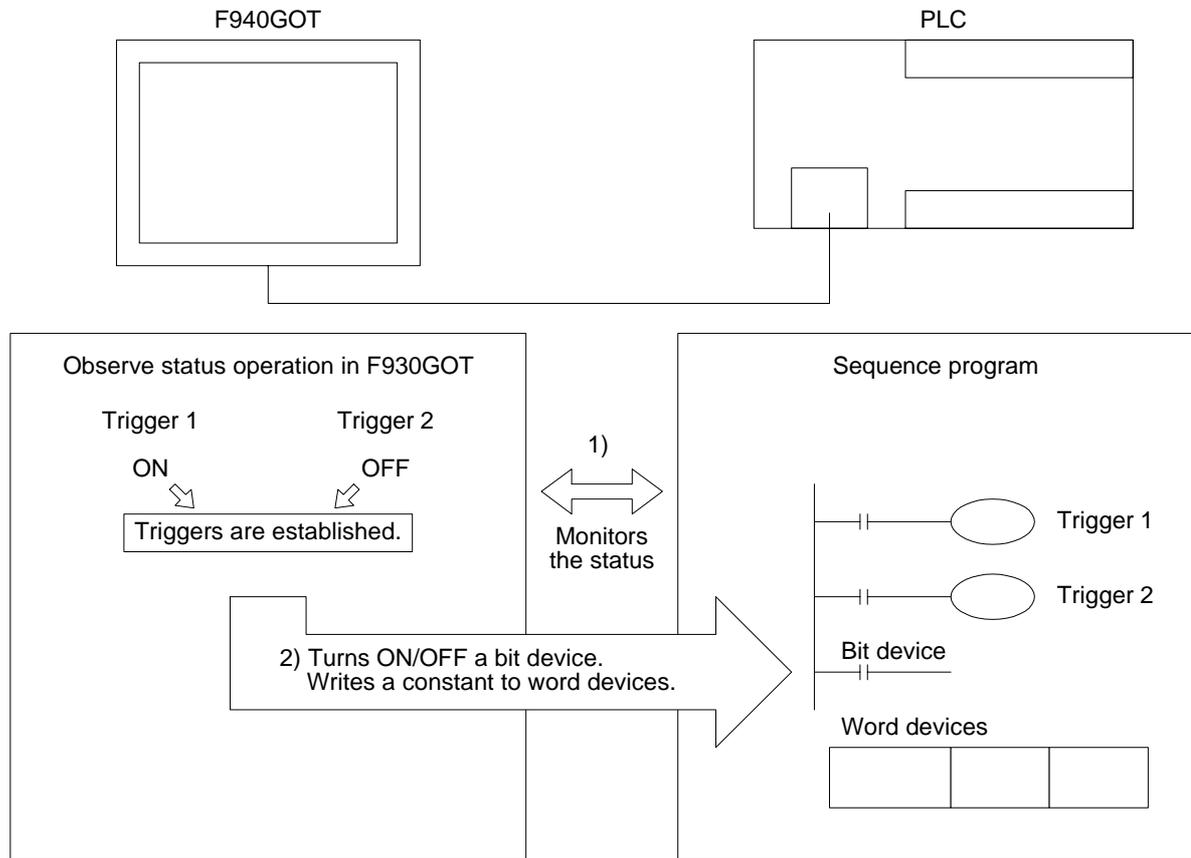
When the key code FFB7 is assigned to A) :

A) deletes all alarms which occurred in the past and have already recovered from the screen display.

15.3 Observe status function

The observe status function monitors the ON/OFF status of specified bit devices, then turns ON/OFF a bit device in the PLC or writes a numeric value to word devices in the PLC from the F940GOT in accordance with changes in the monitored ON/OFF status.

15.3.1 Outline of observe status function



- 1) The 940GOT monitors always or at a constant cycle whether the bit devices specified as triggers are ON or OFF. (The ON/OFF status for triggers can be specified using the screen creation software. Refer to the next page.)
- 2) When the specified triggers are established, the F940GOT turns ON/OFF a specified bit device or writes a constant to specified word devices.

15.3.2 Observe status cycle

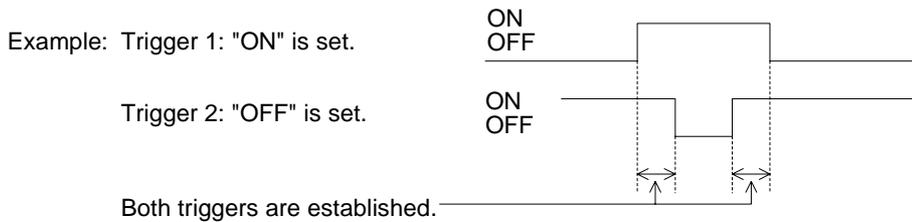
Set the cycle at which the F940GOT monitors whether the specified triggers are established. Select "always" or "constant cycle".

- Always:
Every time communication is performed between the F940GOT and the PLC, the F940GOT monitors whether the specified triggers are established at every 200 to 300 ms.
- Constant cycle: The cycle can be set to 1 to 60 seconds with the increment of 1 second. At the set cycle, the F940GOT monitors whether the specified triggers are established.

15.3.3 Setting the triggers

Set the triggers to be monitored. Up to two bit devices can be set.

- Trigger 1: Set ON or OFF of a bit device.
- Trigger 2: Set ON or OFF of a bit device.
- When the trigger 1 and the trigger 2 are set, the F940GOT performs the operation described in the next paragraph only when the both triggers are established.



- Make sure to set the trigger 1. And set the trigger 2 if necessary.

15.3.4 Setting the operation

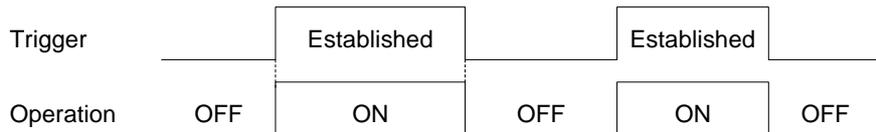
This paragraph describes the operation performed when the triggers set in the previous paragraph are established.

As the operation, a bit device can be turned ON/OFF or data can be written to word devices. One type of operation can be selected for the triggers set in the previous paragraph.

1) Operation of bit device

- Momentary

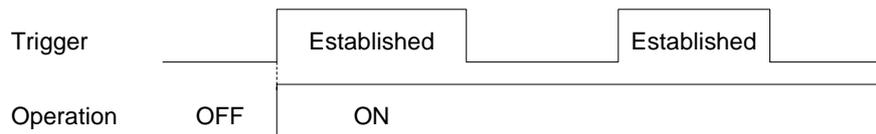
While specified triggers are established, a specified bit device remains ON.



- Set

When specified triggers become established, a specified bit device turns ON.

Even if the specified triggers become released after the specified bit device turns ON, it remains ON.



- Reset

When specified triggers become established, a specified bit device turns OFF.

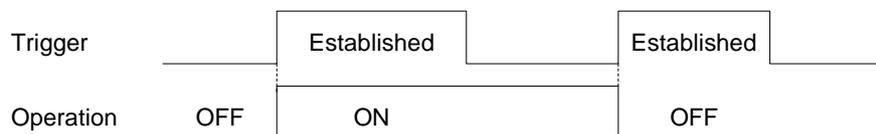
Even if the specified triggers become released after the specified bit device turns OFF, it remains OFF.



- Alternate

When specified triggers become established, the current status of a specified bit device is inverted.

(If the specified bit is ON, it turns OFF. If it is OFF, it turns ON.)



2) Operation of word devices

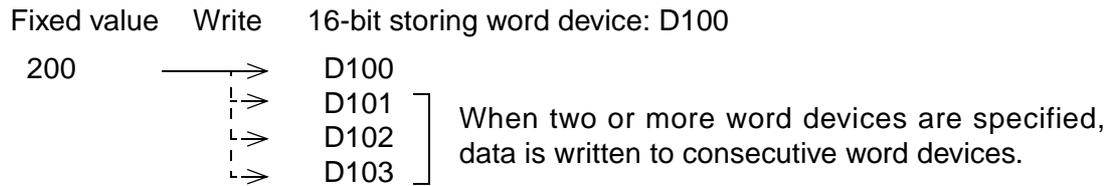
When specified triggers become established, a fixed value or a "fixed value + current value of indirectly specified word device" is written to specified word devices.

- Fixed

When specified triggers become established, a 16-bit or 32-bit value is written to specified word devices.

The fixed value should be decimal.

Operation example: When specified triggers become established, a fixed value "200" is written to D100 to D103.



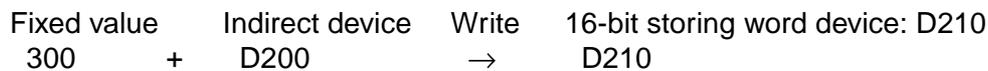
For the number of storing devices, refer to the next paragraph.

- Fixed + Indirect

When specified triggers become established, a fixed value added by the current value of an indirectly specified word device is written to specified word devices.

* The fixed value should be set. Setting of only an indirect device is disabled.

Operation example 1: When specified triggers become established, a fixed value (300) added by the current value of D200 is written to D210.



* When the current value of D200 is "100", "400 (= 300 + 100)" is written to D210.

- When 32-bit word devices are specified as storing devices, indirect devices should be also the 32-bit type (which occupies 2 points).

Operation example 2: When two or more storing devices are specified, the write operation FMOV or BMOV is available.

FMOV: A fixed value added by the current value of an indirect device is written to two or more storing devices.

Storing devices: D10 to D12 (16-bit) (3 points)

Indirect device: D100

Fixed value: 20



* When the current value of D100 is "30", "50 (= 20 + 30)" is written to D10 to D12.

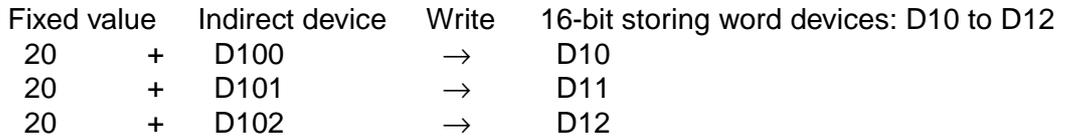
BMOV: A fixed value added by the current value of an indirect device is written to two or more storing devices.

Different from FMOV, the number of indirect devices is equivalent to that of storing devices. Indirect devices correspond to storing devices on the one-to-one basis.

Storing devices: D10 to D12 (16-bit) (3 points)

Indirect devices: D100 to D102

Fixed value: 20



* When the current value of D100 to D102 are "30", "40" and "50" respectively, the following values are written to D10 to D12.

20 + 30 = 50 (D10)

20 + 40 = 60 (D11)

20 + 50 = 70 (D12)

15.3.5 Trigger and number of devices

The table below shows the number of registration points available in the observe status function.

- Triggers can be registered for each project or screen (No. 1 to 500).

Maximum number of registered triggers	
For projects 40 points	80 points in total
For screens 40 points	

*When screens are overlapped or a screen is called, triggers registered on the base screen are valid.

- The table below shows the number of storing devices for one trigger.

Bit devices		For "Momentary", "Set", "Reset" and "Alternate" 1 to 40 points in total
Word devices	16-bit	For "Signed" and "Unsigned" 1 to 20 points in total
	32-bit	For "Signed" and "Unsigned" 1 to 10 points in total

- Many triggers and storing devices can be registered as shown above. However, the registered contents and the number of registered points give effect on the responsibility of the F940GOT. Confirm the cautions described in the next paragraph.

15.3.6 Cautions

When many registration points are registered or when many observe status operations are performed as described below, it takes considerable time until the operations are completed. As a result, the responsibility of the F940GOT may be affected.

- When "Momentary" is selected as the bit device operation and many storing devices are set And when many triggers are set for "Momentary"
- When many triggers are established and many write operations are often performed Especially when the observe status cycle is set to "always" or the cycle is set to a short period

Effect on F940GOT

- Effect on functions and objects which are actuated at a constant cycle
Functions which are cyclically actuated may not be actuated in accordance with the setting. For example, the observe status function (monitoring cycle), the sampling function, the alarm history/list function, the current time function and the trend graph function may be affected.
- Effect on transfer of the screen data
When the display is automatically changed over to the PLC transfer screen and the screen data is transferred, the message "Main unit processing error" may be displayed on the screen creation software side.
In such a case, change over the display to the PLC transfer screen by key operation. Then, the screen data can be sent and received.
- Effect on the monitoring function, the screen changeover function and the key operation
Specified operation may be delayed for screen changeover, monitoring and key operation in the same way as the description above.
- Effect on the built-in 2PIF function
When circuit monitoring, device batch processing or monitor registration is executed in a peripheral unit, a communication error may occur in the peripheral unit.

15.3.7 Use example (utilization of clock data)

The clock data built in the F940GOT can be transferred to a data register in the PLC for later utilization while a specified bit device is ON. The clock data built in the F940GOT is stored in the following registers. However, only the GOTR-PACK can handle these registers.

GD0: Current time (second)	GD1: Current time (minute)
GD2: Current time (hour)	GD3: Current time (day)
GD4: Current time (month)	GD5: Current time (year)
GD6: Current time (day of week)	

Example: When the clock data (year, month, day, hour, minute and second) is transferred to the register D100 in the PLC at every 30 seconds while M10 is ON

Select "Observe Status" in the screen creation software.

- 1) Select "Project", and set the cycle to 30 seconds.
- 2) Set the trigger 1 to "M10, ON".
- 3) Select "Word Set (16-bit)" as the operation, and set the number of points to "7".
- 4) Set "Storing Device" to "D100", "Fixed" to "0" and "Indirect Device" to "GD0".
- 5) Set the transfer method to "BMOV".

When this data is transferred to the F940GOT, the current time is stored in D100 at every 30 seconds while M100 is ON.

15.4 Addition of images for "Touch Key" and "Indicator" objects

More images are available for the "Touch Key" and "Indicator" objects.
Confirm additional images in the screen creation software.

15.5 Addition of shade patterns

When a rectangle or circle is created, it can be shaded.
Seven shade patterns Nos. 1 to 7 are added.

15.6 Addition of keyboards displayed when data is changed

When the "Numeric Input" or "ASCII Input" object is pressed, only the decimal keyboard is displayed in the former versions.

In Ver. 3.10 and later, the hexadecimal keyboard and the ASCII keyboard are also available. In addition, a new function is added so that you can create the keyboard window.

15.6.1 Keyboard display

If you would like to change the keyboard window displayed when changing the data, perform the following setting procedure using the screen creation software.

For data changes, refer to Section 3 also.

- In the case of SW□D5C-GOTRE-PACK
 - 1) Select "Key Window Screen No." in "Common Settings".
 - 2) In "Key Window Sheet No.", check "Select key window sheet No."

Decimal key window screen No. Hexadecimal key window screen No. ASCII key window screen No.	}	Set the screen No. to "1", "2" or "3" to each window.
---	---	---

*The screen No. setting above is effective only when you create the key window to be displayed.

If keyboards offered as standard are enough, input "1", "2" or "3" for each key window.

When you press the screen, the keyboard is selected and displayed in accordance with the type of the displayed object ("Numeric Input" or "ASCII Input") as follows.

- | | | |
|---|---|------------------------------------|
| - Numeric Input : <ul style="list-style-type: none"> Decimal number with sign Decimal number without sign Octal number Binary number Real number Hexadecimal number | } | Decimal keyboard is displayed. |
| - ASCII Input : | | Hexadecimal keyboard is displayed. |
| | | ASCII keyboard is displayed. |

15.7 Creation of key window

You can create and display any key window other than the hexadecimal, decimal and ASCII key windows offered as standard.

In the case of SW□D5C-GOTRE-PACK

- Screen creation procedure

1) In "New Screen" in "Screen", display the screen creation window.

2) Change "Screen Type" to "Window".

3) Input the screen No. to be created.

(You can create up to 500 screens from No. 1 to No. 500.)

The screen No. you input here is treated as the decimal/hexadecimal/ASCII key window screen No. in "Key Window Screen No." described in the previous paragraph.

- The key window screen Nos. are from 1 to 500 in the same way as base screens. "W" is added to the key window screen No. in the screen list in the test mode of the main body (Refer to Paragraph 7.2.) so that the key window screen No. can be distinguished from the base screen No.

4) Input the screen size.

X axis: Within range from 94 to 318 dots with the increment of 8 dots

Y axis: Within range from 81 to 220 dots with the increment of 8 dots

- *Once you open the screen, you can enlarge or diminish the screen using the mouse by selecting "Edit" in "Change size" in "Screen".

5) You can put characters and touch switches on each key window screen in the same way as base screens. However, the following objects are not available on key window screens.

- Numeric Input ("Numeric Display" is available.)
- Alarm History Display
- ASCII Input ("ASCII Display" is available.)
- Alarm List Display

- Rules and cautions on display

Operation is performed as follows depending on absence/presence of the screen No. of the key window to be displayed.

1) When the screen No. is not set in "Key Window Sheet No." or when the screen No. is set to "0"

- The decimal keyboard is always displayed without regard to the type of the displayed object ("Numeric Input" or "ASCII Input"). This operation is equivalent to that in Ver. 3.00 or former.

2) When the key window screen is created but it cannot be displayed due to errors on it or when there is not a key window having the screen No. specified to be displayed.

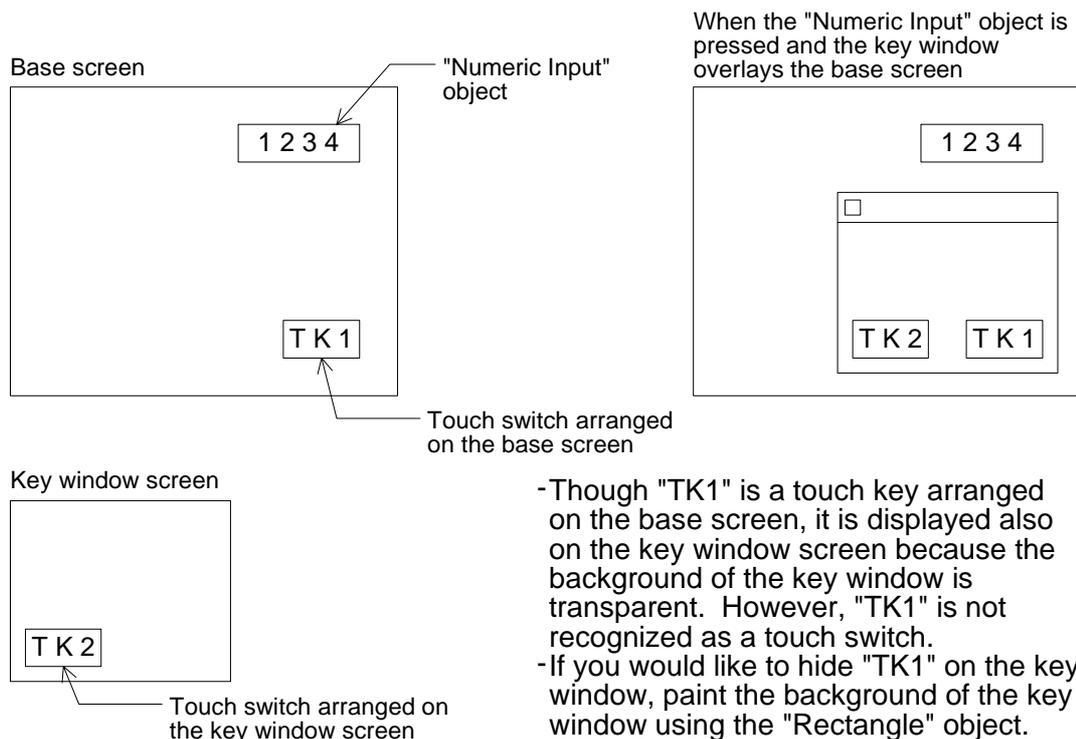
- "Numeric Input" (other than hexadecimal number): The decimal keyboard is displayed.
- "Numeric Input" (hexadecimal number): The hexadecimal keyboard is displayed.
- "ASCII Input": The ASCII keyboard is displayed.

The screen No. is set to "1", "2" or "3" in ***** while this operation is utilized.

3) When there is a key window having the screen No. set in "Key Window Sheet No."

- "Numeric Input" (other than hexadecimal number):
The key window having the screen No. specified in "DEC Key Sheet No." is displayed.
- "Numeric Input" (hexadecimal number):
The key window having the screen No. specified in "HEX Key Sheet No." is displayed.
- "ASCII Input":
The key window having the screen No. specified in "ASCII Key Sheet No." is displayed.

Because the background of the key window is transparent, have in mind the following contents.



- Though "TK1" is a touch key arranged on the base screen, it is displayed also on the key window screen because the background of the key window is transparent. However, "TK1" is not recognized as a touch switch.
- If you would like to hide "TK1" on the key window, paint the background of the key window using the "Rectangle" object.

16. Additional Function (Ver. 4.00 and Later)

This section describes the function added in the Ver. 4.00 and later.

16.1 Outline of additional function

- Applicable version

Table 16.1:

Product model name	Version	Remarks
F940GOT-SWD-E F940GOT-LWD-E	V4.00	

In order to use this additional function, the following version of the screen creation software is required.

SW4D5C-GOTRE-PACK Ver. A (manufactured in January, 2000)

- Contents of additional function
 - 1) Availability of alphabetic fonts

When "CHARACTER SET" in "LANGUAGE" in "SET-UP MODE" is set to "WEST EUROPE", the following nine languages can be displayed.
The system language is fixed to English.

 - Italian, English, Dutch, Swedish, Spanish, Danish, German, Portuguese and French

In order to display either of the above languages, create screens using the screen creation software started up on the OS (Windows) compatible with the corresponding language.

17. Additional Functions (V 4.10/5.00 or later)

This section describes the functions added in V 4.10/5.00 or later.

17.1 Outline of additional functions

- Applicable Versions and Models

Table 17.1:

Model name	Version V 4.10	Version V 5.00
F940GOT-SWD-E, F940GOT-LWD-E F940GOT-SBD-H-E, F940GOT-LBD-H-E	Produced in April, 2000 or later (Serial No.: 04**** or later)	Produced in June, 2000 or later (Serial No.: 06**** or later)

- Additional Functions

The table below shows the additional functions.

Confirm also the version of the screen creation software compatible with each function.

Table 17.2:

Function	Applicable GOT version		Screen creation software version*1	
	V4.10	V5.00	GOTR-PACK	DU/WIN
Connection to MELSEC-Q Series PLC Direct connection to CPU (RS-232C) and connection to serial communication unit (RS-422, RS-232C) are available.	✓	✓	SW4 Version 50F *2	V2.40
Connection to PLC manufactured by Siemens Connection to S7-300/400 Series PLC is available.	—	✓	To be supported in near future	V2.40
Connection to machine controller manufactured by YASKAWA ELECTRIC CORP.	—	✓	SW4 Version 50F	To be supported in near future
Two or more GOT units can be connected when micro computer board is used.	—	✓	SW1 Version 00A	V2.00
Numeric value/ASCII code input display function is added.	—	✓	SW3 Version 20C	To be supported in near future

*1 "GOTR-PACK" stands for SW□D5C-GOTRE-PACK (V). "DU/WIN" stands for FX-PCS-DU/WIN-E.

*2 The product "SW2, Version A or later" can be connected to the Q Series PLC when "PLC TYPE" is set to "A, QnA".

17.2 Connection to MELSEC Q Series PLC

17.2.1 Direct connection to CPU

- Applicable PLC: Q Series PLC
- Connection type: Direct connection to CPU (RS-232C)

When using the F943GOT-SWD/LWD-E equipped with two RS-232C interface ports, connect the software to create ladder programs (SW□D5C(F)-GPPW-E) to the upper connector and the PLC to the lower connector. In this case, by using the built-in two-port interface function, manipulation of the personal computer (only the SW□D5C(F)-GPPW-E) and the screen display are available at the same time.

(This function is available only in the F943GOT-SWD/LWD-E.)

17.2.2 Connection to serial communication unit

- Applicable serial communication unit: QJ71C24, QJ71C24-R2
- Connection type: Direct connection to CPU (RS-232C or RS-422)

Caution:

When connecting the GOT to a serial communication unit, select "direct connection to CPU" as the connection type. Though each of the QJ71C24 and the QJ71C24-R2 is equipped with two interface ports, the GOT can be connected to only an either port.

- Setting of serial communication unit

Set the communication format of the serial communication unit as shown below.

Table 17.3:

Used port	When RS-422 is used	When RS-232C is used
Communication protocol	5 RS-422: Format 5 RS-232C: No-procedure	5 RS-422: No-procedure RS-232C: Format 5
Transmission speed	19200 bps	
Data bit length	8 bits	
Stop bit length	1 bit	
Parity bit	Provided (odd)	
Sum check	Provided	
Write during run	Possible	
Station No.	00 to 0F (in accordance with setting in GOT)	

← The GOT station No. can be set in "SET-UP MODE".

17.3 Connection to PLC manufactured by Siemens

17.3.1 Direct connection to CPU

- Connected PLC
Direct connection to CPU (RS-232C)
For connection, the HMI adapter is required. (Refer to the connection example shown below.)

Table 17.4:

	Applicable CPU
S7-300 Series	312IFM, 313, 314IFM, 315, 315-2DP, 316
S7-400 Series	412-1, 413-1, 413-2DP, 414-1, 414-2DP, 416-2DP

However, 416-1 and 416-2DP do not support some devices.

For the details, refer to the Operation Manual of F940GOT-E offered separately.

- Setting of PLC
Set the MPI address of the PLC connected to the GOT using the programming software (STEP7) for the S7-300/400 Series PLC.

Table 17.5:

	MPI address
Personal computer (for programming)	0 (fixed in MPI network)
HMI adapter	1 (fixed)
PLC	2 to 31

The MPI address of the HMI adapter is "1", and the maximum MPI address is "31".

Accordingly, make sure to set the MPI address of the PLC inside the range from 2 to 31.

- Setting of GOT
Set the connected PLC, the connection type and the station No. as shown below.

Table 17.6:

PLC TYPE	SIEMENS S7-300
CONNECTION	CPU PORT (RS232C)
STATION #	MPI address (2 to 31) set in PLC Have in mind that station Nos. "0" and "1" are treated as "2".

17.3.2 Support device range list

Table 17.7:Support device range list

Device name (symbol)	Available setting range	
	Notation in PLC	Notation in GOT *1
Input relay (I)	I0.0 to I511.7	←
Output relay (Q)	Q0.0 to Q511.7	←
Bit memory (M)	M0.0 to M2047.7	←
Timer current value (T)	T0 to T511	←
Counter current value (C)	C0 to C511	←
Data register (D)	DB1.DBW0 to DB1.DBW65534 DB2.DBW0 to DB2.DBW65534 : DB1023.DBW0 to DB1023.DBW65534	D000100000 to D000165534 D000200000 to D000265534 : D102300000 to D102365534

* Word devices are shaded, and bit devices are not shaded.

*1 Notation used in the GOT

The device specification method is partially different. Refer to the next paragraph.

17.3.3 Device specification method and restraint in GOT

- Device specification method

Specify devices in the following formats.

1) Bit device

_□□□□☆

- In "_", specify the device symbol (shown in Table 16.7) in one alphabet.
- In "□□□□", specify the device No. (shown in Table 1) of the specified device in a decimal value in three or four digits.
- In "☆", specify the bit position. The available range is from 0 to 7.

Example: When specifying "M01205"

Device symbol = M

Device (byte) No. = 120

Bit position = 5

2) Timer (T) and counter (C)

The specification method is equivalent to that for bit devices except that the bit position (☆) is omitted.

Example: When specifying "T250"

Device symbol = T

Device (byte) No. = 250

3) Data register (D)

A data register consists of the block No. and the device No. as shown below.

□□□□□□□□□□

- In "□□□□", specify the block No. (shown in Table 16.7 in the previous page) of the data register in a decimal number in four digits.
- In "□□□□□", specify the device No. (shown in Table 16.7 in the previous page) of the data register in a decimal even number in five digits.

Example: When specifying "D102031004"

Device symbol = D

Block No. = 1020

Device No. = 31004

- Supplement

- As to data registers, define the data block using the STEP7 in advance for the CPU, and download it to the CPU.
- As to input and output relays, the English (IEC) notation is used in the GOT. However, when the German (SIMATIC) notation is selected in the STEP7, devices E, A and Z are equivalent to I, Q and C respectively.
- Because the F900 Series GOT does not distinguish the CPU type in the S7-300/400 Series, the device range is checked inside the range shown in Table 16.7 in the previous page.
("STEP7" is the name of the programming software for the S7-300/400 Series PLC.)

- Restraint on device specification

- Word specification for bit devices and bit specification for word devices are not supported in the F940GOT-E in the same way as connection to another PLC.

17.4 Connection to machine controller manufactured by YASUKAWA ELECTRIC CORP.

17.4.1 Direct connection to CPU

- Connected PLC
Direct connection to CPU (RS-232C or RS-422)
 - Applicable machine controller

Table 17.8:

Model	Condition
CP9200SH	· CN1, CN2, CN3 of MEMOBUS unit 217F
MP920	· MEMOBUS port PORT1, PORT2 of CPU unit · CN1, CN2, CN3 of MEMOBUS unit 217F
MP930	· MEMOBUS port PORT1, PORT2 of CPU unit

- Setting of machine controller
Set the machine controller as shown below.

Table 17.9:

Item	Set value
Protocol	MEMOBUS
Mode	RTU
Communication speed	19,200 bps
Data length	8 bits
Stop bit length	1 bit
Parity bit	Even
Slave address	1 to 31 (in accordance with station No. setting in GOT)

- Setting of GOT
Set the PLC type, the connection type and the station No. as shown below.

Table 17.10:

Connected PLC	CP9200SH manufactured by YASUKAWA
Connection type	Direct connection to CPU (RS-232C or RS-422)
Station No.	In accordance with slave address of machine controller. Make sure to set station No. inside range from 1 to 31. Station No. 0 is regarded as "No. 1".

17.4.2 Support device list

Table 17.11:

Device	Device No.	Number of points	Range	Radix	Bit	Word	Remarks
Input relay	IB	65535	00000 to 0FFFF	HEX	✓	—	Read only
Coil	MB	65535	00000 to 4095F	*1	✓	—	
Input register	IW	32767	00000 to 07FFF	HEX	—	✓	Read only
Holding register	MW	32767	00000 to 32767	DEC	—	✓	

*1 Word address (DEC) + Bit position (HEX)

*2 Input relays (IB) and input registers (IW) can be monitored only. They cannot be changed.

17.5 Additional function to connect two or more GOT units when micro computer boards are used

In the GOT unit V 5.00 or later, up to four GOT units can be connected at a time when micro computer boards (for general-purpose communication) are used.

(For connection on the one-to-one basis, refer to Paragraph 1.6.6.)

17.5.1 Setting when two or more GOT units are connected

When GOT units and micro computer boards are connected on the one-to-one basis

- Connection type

Perform either one among the followings.

- When using the screen creation software (DU/WIN-E), set the PLC type to "Universal".
- When using the screen creation software (GOTRE-PACK), set the PLC type to "My Computer".
- When using the GOT unit main body, select "SET-UP MODE" → "PLC TYPE", and select "UNIVERSAL".

- Setting of communication port

Perform either one between the followings.

- When using the screen creation software (DU/WIN-E), select "View" → "System Settings" → "Setup Data", then set the port to "RS232C" or "RS422".
- When using the GOT unit main body, select "SET-UP MODE" → "PLC TYPE", and set "CONNECTION" to "CPU PORT (RS232C)" or "CPU PORT (RS422)".

When using the screen creation software (GOTRE-PACK), you cannot set the communication port.

- Setting of communication speed, data length, stop bit length and parity bit

- When using the screen creation software (DU/WIN-E), select "View" → "System Settings" → "DU Printer".
- When using the GOT unit main body, select "SET-UP MODE" → "SERIAL PORT".

When using the screen creation software (GOTRE-PACK), you cannot set the communication condition.

For each set item, select an either value among them shown below.

Table 17.12:

Baud rate	19200, 9600, 4800, 2400, 1200, 600 and 300 (bps)
Data length	8 or 7 bits
Stop bit length	1 or 2 bits
Parity bit	Even, odd or none

Setting when two or more GOT units are connected

- When two or more GOT units are connected, you should set the station No. for each GOT unit.

Perform either one between the followings.

- When using the screen creation software (DU/WIN-E), select "View" → "System Settings" → "Setup Data", then set the station No.
- When using the GOT unit main body, select "SET-UP MODE" → "PLC TYPE", then set "STATION #".

When using the screen creation software (GOTRE-PACK), set the station No. using the GOT unit main body.

17.5.2 Communication procedure

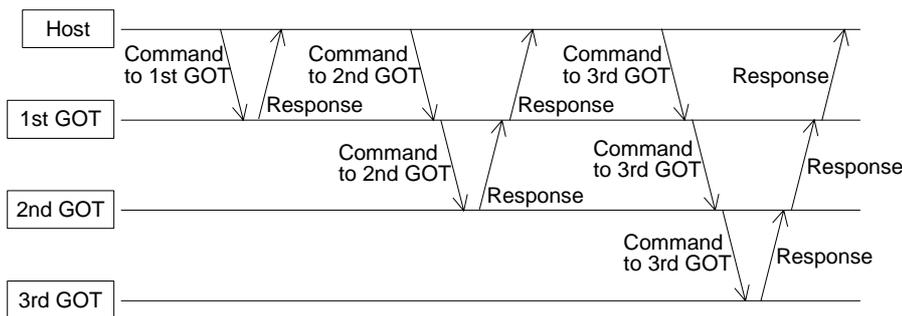
- When two or more GOT units are connected (with station No.)

Communication between the GOT units and the host unit is performed in the procedure in which the host unit sends a command with the station No., and the GOT having the specified station No. sends back a response to it.

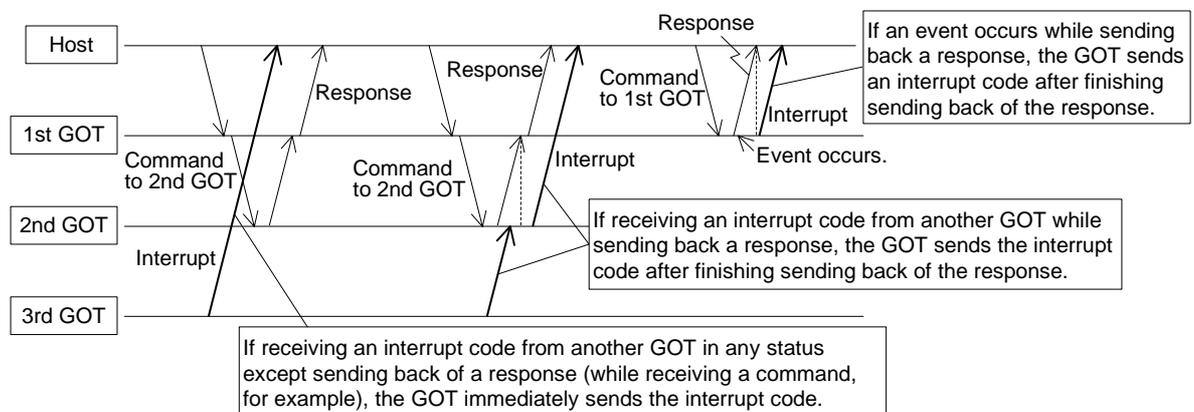
At first, the 1st GOT unit directly connected to the host unit performs the following to a command sent from the host unit.

- When receiving a command to itself, the 1st GOT unit sends back a response to it. Until sending back is completed, the 1st GOT unit does not receive any command from the host unit.
- When receiving a command to another GOT unit, the 1st GOT unit sends the command from the host unit as it is to the 2nd GOT unit connected to another port, and waits for a response to it.
 - When receiving a response, the 1st GOT unit immediately sends the response as it is to the host unit. Until sending of the response to the host unit is completed, the 1st GOT unit does not receive any command from the host unit.
 - The timeout time for response is 5 seconds. If a response is not given within 5 seconds after sending a command to the 2nd GOT unit, the 1st GOT unit is ready for receiving a command from the host unit.

The 2nd GOT unit and later GOT units perform the same processing as the 1st GOT unit.



As to notification of interrupt, when a certain event occurs in itself or receiving an interrupt code from another GOT unit, the GOT unit immediately sends the interrupt code to the host unit. However, while sending a response to the host unit, the GOT unit waits until sending is finished, then sends the interrupt code after sending is finished.



The interrupt code and the event type correspond each other in the same way as connection on the one-to-one basis. If two or more GOT units share the interrupt codes, you should set them properly so that they do not overlap.

- **Write with station No. ...Overwrite the data stored in the GOT having the specified station No.**

Command

STX	"B"	Station No.	Write address	Size	Data 1	-----	CR
-----	-----	-------------	---------------	------	--------	-------	----

Type 2 may be used.

"B" at the head indicates a write command.

Station No. :Using ASCII codes, specify the GOT station No. (decimal).
 For example, if the station No. is 01, input "0 + 1". If the station No. is 15, input "1 + 5".

Write address :Using ASCII codes, specify the head address of the data (hexadecimal) stored in the GOT.
 The write address should be specified in turn from the upper digit.

Size :In the unit of byte, specify the size of the write data (01H to FFH). The maximum allowable size is 255 bytes.

Data :Sort the write data in the ascending order of address.
 Convert 1-byte data into ASCII codes, and sort it in the order of upper digit and lower digit.
 The maximum allowable number of data is 256 (512 after converted into ASCII codes).

Response

ACK

Example: When 2-byte data is written to the address 120H in the GOT unit having the station No. 01 (format = Type 2)

Command

STX	"B"	"0"	"1"	"0"	"1"	"2"	"0"	"0"	"2"	"3"	"E"	"7"	"5"	ETX	"A"	"F"
02H	42H	30H	31H	30H	31H	32H	30H	30H	32H	33H	45H	37H	35H	03H	41H	46H

Response

ACK
06H

Memory inside GOT

120	3E
121	75

Each data is expressed in hexadecimal.

120H stores the upper side of the word data D144. 121H stores the lower side of the word data D144. The value of D144 after write is 3E75H (= 15989).

17.5.3 Communication command

When two or more GOT units are connected, use the following commands. (Refer to Paragraph 1.6.6.)

- **Read with station No. ... Read the data stored in the GOT having the specified station No.**

Command

STX	"A"	Station No.	Read address	Size	CR	Type 2 may be used.
-----	-----	-------------	--------------	------	----	---------------------

"A" at the head indicates a read command with station No.

Station No. :Using ASCII codes, specify the GOT station No. (decimal).
 For example, if the station No. is 01, input "0 + 1". If the station No. is 15, input "1 + 5".

Read address :Using ASCII codes, specify the head address of the data (hexadecimal) stored in the GOT.
 The read address should be specified in turn from the upper digit.

Size :In the unit of byte, specify the size of the read data (01 to FFH). The maximum allowable size is 255 bytes.
 The size should be specified in the order of upper digit and lower digit in ASCII codes.
 For example, if the size is 8AH (= 138) bytes, input "8 + A".

Response

STX	Data 1	Data 2	CR
-----	--------	--------	-------	----

Data :The data stored in the specified address is stored in turn.
 1-byte data is converted into ASCII codes, and stored in the order of upper digit and lower digit.

Example: When 2-byte data is read from the address 12EH in the GOT unit having the station No. 01 (format = Type 2)

Command

STX	"A"	"0"	"1"	"0"	"1"	"2"	"E"	"0"	"2"	ETX	"D"	"F"
02H	41H	30H	31H	30H	31H	32H	45H	30H	32H	03H	44H	46H

Sum = DFH

Response

STX	'5'	'A'	'3'	'8'	ETX	'E'	'4'
02H	35H	41H	33H	38H	03H	45H	34H

Sum = E4H

Memory inside GOT

12E	5A
12F	38

Each data is expressed in hexadecimal.

12EH stores the upper side of the word data D151. 12FH stores the lower side of the word data D151. The value of D151 is 5A38H (= 23096).

17.5.4 Memory map

In addition to the memory map described in Paragraph 1.6.6, the following addresses are added.

- Clock data

Version of GOT unit main body: V1.10 or later

Table 17.13:

3000	Clock (second) 0 to 59
3002	Clock (minute) 0 to 59
3004	Clock (hour) 0 to 23
3006	Clock (day) 0 to 31
3008	Clock (month) 0 to 12
300A	Clock (year) 1980 to 2079
300C	Clock (day of week) 0 (Sunday) to 6 (Saturday)

- Special memory

Version of GOT unit main body: V 5.00 or later

Table 17.14:

M8052	Interrupt code output prohibition flag While this bit is ON, GOT unit does not send interrupt codes to host unit.
D8002	Contents of communication error 100 or larger: Contents of communication error occurred in connected GOT unit (when two or more GOT units are connected) 101: Parity error 102: Framing error 103: Overrun error 104: Transmission sentence format is incorrect. 105: Timeout error (Command does not specify station No.) 106: Commands for connection of two or more GOT units are not available. (Port is occupied by bar code reader, printer, etc.)

17.6 Numeric Value/ASCII Code Input Display Function

By addition of the new function, the contents of the data being set is displayed on a key window called when the data is changed through input of numeric values or ASCII codes.

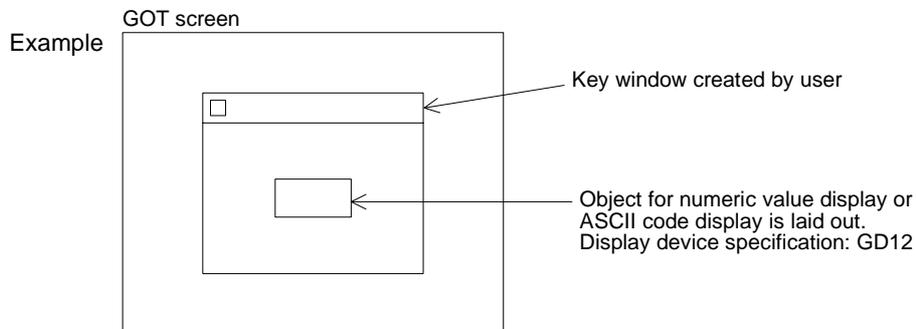
In the conventional version, the change target was sometimes hidden depending on the layout of an object for numeric value input or ASCII code input when the key window was called. By addition of the new function, the change target is always displayed so that data change is facilitated.

Only key windows created by the user can be displayed.

* The key window creation function is added in V 3.10 and later.

For the details, refer to Paragraph 16.6 of the Operation Manual of F940GOT-E.

When an object for numeric value display or ASCII code display is laid out on a key window created by the user and "GD12" is specified as the display device, the data being changed is displayed.



17.7 Initial Display Screen No. Write Function (This function is valid only when the SW□D5C-GOTRE-PACK is used.)

In the conventional version, when a screen created by the user was displayed in the screen mode, the screen No. 1 was always displayed.

In order to display the screen No. 1, the GOT wrote "1" to the register for screen changeover (base screen) of the PLC set by the screen creation software when the power was turned on.

In the new version, the new function is added so that the user can set whether the register for screen changeover is written or not when the power is turned on.

By this addition, when the power is turned on, an arbitrary user screen specified by the user can be displayed.

- Setting procedure

- 1) Select "AUXILIARY SETTING" in "SET UP MODE" in "OTHER MODE".
- 2) Select "WRITE" or "DOES NOT WRITE". The initial value is "WRITE".

WRITE:

Writes "1" to the register for screen changeover when the power is turned on.

DOES NOT WRITE:

Does not write "1" to the register for screen changeover when the power is turned on. In this mode, if a value is set in advance in the register for screen changeover, the screen No. 1 appears at first, then the screen corresponding to the current value of the register appears.

Appendix A:Key code

Higher Bit Lower Bit	1	2	3	4	5	6	7
0	Not available	(SP)	0	@	P	@	p
1		!	1	A	Q	a	q
2		"	2	B	R	b	r
3		#	3	C	S	c	s
4		\$	4	D	T	d	t
5		%	5	E	U	e	u
6		&	6	F	V	f	v
7		'	7	G	W	g	w
8		(	8	H	X	h	x
9		)	9	I	Y	i	y
A		*	A	J	Z	j	z
B		+	B	K	[	k	{
C		,<	C	¥	|	l	~
D		-	D	M	]	m	}
E		.	E	N	(SP)	n	
F		/	F	O	-	o	^C _R

(SP) : Space

Appendix B: System Screen No.

A system screen can be displayed when a corresponding screen No. shown below is specified.

Screen No.	Mode name	Function name (screen name)	Reference paragraph
1001	HPP mode	DEVICE MONITOR screen	4.4
1002		ACTIVE STATE MONITOR screen	4.6
1003		PC DIAGNOSIS screen	4.8
1004	Sampling mode	SET CONDITION screen	5.2
1005		DISPLAY LIST screen	5.3.1
1006		DISPLAY GRAPH screen	5.3.2
1007		CLEAR DATA screen	5.4
1008	Alarm mode	DISPLAY STATUS screen	6.4
1009		ALARM HISTORY screen	6.5
1010		ALARM FREQUENCY screen	6.6
1011		CLEAR HISTORY screen	6.7
1012	Test mode	DATA BANK screen	7.3
1013	Other mode	SET CLOCK (SET UP MODE) screen	2.2
1014		SET TIME SWITCH (SET UP MODE) screen	8.2
1015		SET BACKLIGHT (SET UP MODE) screen	2.2
1016		ENTRY CODE screen	8.5
1017		PRINT OUT (SAMPLING DATA) screen	8.4
1018		PRINT OUT (ALARM HISTORY) screen	8.4
1019		BUZZER (SET UP MODE) screen	2.2
1020		SERIAL PORT (SET UP MODE) screen	2.2
1021		LCD CONTRAST (SET UP MODE) screen	2.2
1022	HPP mode	PROGRAM LIST screen	4.2
1023		PARAMETER screen	4.3
1024		LIST MONITOR screen	4.5
1025		BFM MONITOR screen	4.7
1026	Test mode	USER SCREEN screen	7.2
1027	Other mode	LANGUAGE (SET UP MODE) screen	2.2
1028		PLC TYPE (SET UP MODE) screen	2.2
1029		OPENING SCREEN (SET UP MODE) screen	2.2
1030		MAIN MENU CALL KEY (SET UP MODE) screen	2.2
1031			
1032			

Appendix C:Key Code List

3) Key code list for numerics and ASCII codes

Key	Key code (H)	Key	Key code (H)	Key	Key code (H)	Key	Key code (H)
SP	0020	@	0040	'	0060	(Clear)	0088
!	0021	A	0041	a	0061		
"	0022	B	0042	b	0062		
#	0023	C	0043	c	0063		
\$	0024	D	0044	d	0064		
%	0025	E	0045	e	0065		
&	0026	F	0046	f	0066		
'	0027	G	0047	g	0067		
(	0028	H	0048	h	0068		
)	0029	I	0049	i	0069		
*	002A	J	004A	j	006A		
+	002B	K	004B	k	006B		
,	002C	L	004C	l	006C		
-	002D	M	004D	m	006D		
.	002E	N	004E	n	006E		
/	002F	O	004F	o	006F		
0	0030	P	0050	p	0070		
1	0031	Q	0051	q	0071		
2	0032	R	0052	r	0072		
3	0033	S	0053	s	0073		
4	0034	T	0054	t	0074		
5	0035	U	0055	u	0075		
6	0036	V	0056	v	0076		
7	0037	W	0057	w	0077		
8	0038	X	0058	x	0078		
9	0039	Y	0059	y	0079		
:	003A	Z	005A	z	007A		
;	003B	[	005B	{	007B		
<	003C		005C	|	007C		
=	003D	]	005D	}	007D		
>	003E	^	005E	~	007E		
?	003F	_	005F		007F		

4) Key code list used in each object

a) Key codes used in the numerical input function

Key code (H)	Application
000D	Executes write to a write destination device/Moves the cursor.
002D, 002E	“ - “, “ . “
0030 ~ 0046	Enters a numeric.
0082	Moves the cursor upward.
0083	Moves the cursor downward.

b) Key codes used in the ASCII code input function

Key code (H)	Application
000D	Executes write to a write destination device/Moves the cursor.
ASCII code/ shift JIS code	Enters a character.

c) Key codes used in the alarm list display function

Key code (H)	Application
FFB0	Displays the cursor.
FFB1	Deletes the cursor.
FFB2	Moves the cursor upward.
FFB3	Moves the cursor downward.
FFB8	Displays the detailed information.

d) Key codes used in the alarm history function

Key code (H)	Application
FFB0	Displays the cursor.
FFB1	Deletes the cursor.
FFB2	Moves the cursor upward.
FFB3	Moves the cursor downward.
FFB8	Displays the detailed information.
FFBB	Resets a specified device.

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation, use and/or programming of the products associated with this manual.

All examples and diagrams shown in this manual are intended as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety of possible applications, users must satisfy themselves as to the suitability of each specific application.

OPERATION MANUAL

F940GOT-SWD-E, F940GOT-LWD-E



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(MEE)

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