

# ***FATEC***

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**Graphic Operation Terminal (GOT2000 Series)  
Basic Training Textbook  
(for GT Works3)**

# ● SAFETY PRECAUTIONS ●

(Make sure to read before training)

When designing a system, always read the relevant manuals and give due consideration to safety. In addition, pay careful attention to the following points for proper handling during training.

## [Precautions during training]

### **Danger**

- To prevent electric shock, do not touch the terminal block while the power is supplied.
- When opening the safety cover, turn off the power, or make sure that it is sufficiently safe.

### **Caution**

- Follow the instructor's directions during training.
- Do not remove training machine units or change wiring without permission.  
Doing so could cause a breakdown, faulty operation, injury, or fire.
- Turn the power OFF before mounting or removing a unit.  
Doing so while the current is ON could cause a breakdown or electric shock.
- If the training machine emits a strange odour or sound, press the "Power Switch" or the "Emergency Switch" to stop the machine.
- If any trouble occurs, contact the instructor right away.

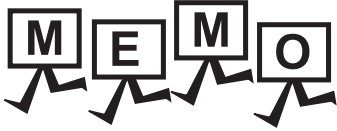


## REVISIONS

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## **Introduction**

This textbook is a "basic edition".

Practice how to use Mitsubishi Graphic Operation Terminal exercising the training in this textbook.

### **[Basic edition]**

Learn basic subjects relating to Mitsubishi graphic operation terminal skills.

Course content:

1. GOT2000 series function, performance and system configuration
2. GOT basic operation and setup procedures
3. Figure and basic object function  
(Text, numerical display, numerical input, lamp display, comment display, touch switch, etc.)
4. Sequence program monitor (ladder) and device monitor functions

### **[Practice edition]**

Learn efficient methods to create control screens using Mitsubishi Graphic Operation Terminal.

Course content:

1. GOT operation and GT Designer3 basic operation
2. How to use advanced object functions  
(Layer, graph, comment display, language switching, library, parts movement, alarm function)

### **Relevant manuals**

The following table lists the relevant manuals for this product.  
Refer to this table as needed.

	Manual title	Manual number (model name code)
(1)	GT Works3 Installation Instructions	Included in the product
(2)	GT Designer3 (GOT2000) Screen Design Manual (Sold separately)*	SH-081220ENG (1D7ML9)
(3)	GOT2000 Series MES Interface Function Manual For GT Works3 Version1	SH-081228ENG
(4)	GOT2000 Series Connection Manual (Mitsubishi Products) For GT Works3 Version1 (Sold separately)*	SH-081197ENG (1D7MJ8)
	GOT2000 Series Connection Manual (Non-Mitsubishi Products 1) For GT Works3 Version1	SH-081198ENG
	GOT2000 Series Connection Manual (Non-Mitsubishi Products 2) For GT Works3 Version1	SH-081199ENG
	GOT2000 Series Connection Manual (Microcomputers, MODBUS/Fieldbus Products, Peripherals) For GT Works3 Version1	SH-081200ENG
(5)	GOT2000 Series User's Manual (Hardware) (Sold separately)*	SH-081194ENG (1D7MJ5)
	GOT2000 Series User's Manual (Utility) (Sold separately)*	SH-081195ENG (1D7MJ6)
	GOT2000 Series User's Manual (Monitor) (Sold separately)*	SH-081196ENG (1D7MJ7)
(6)	GT Converter2 Version3 Operating Manual For GT Works3	SH-080862ENG (1D7MB2)
(7)	GT SoftGOT2000 Version1 Operating Manual	SH-081201ENG

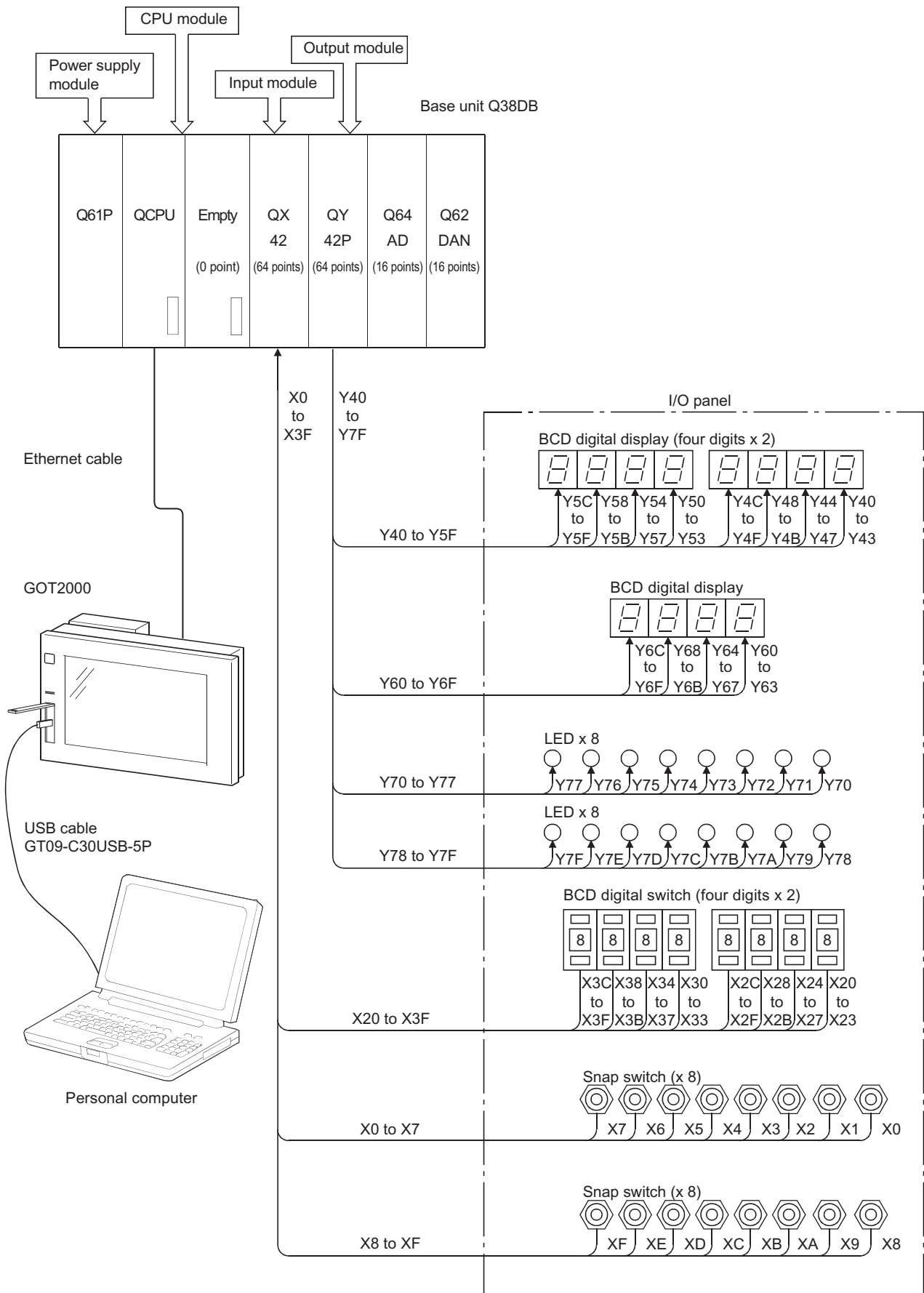
\* Stored in GT Works3 in PDF Format.

### **Copyright notice**

GOT is a registered trademark of Mitsubishi Electric Corporation.

Other company and product names herein are either trademarks or registered trademarks of their respective owners.

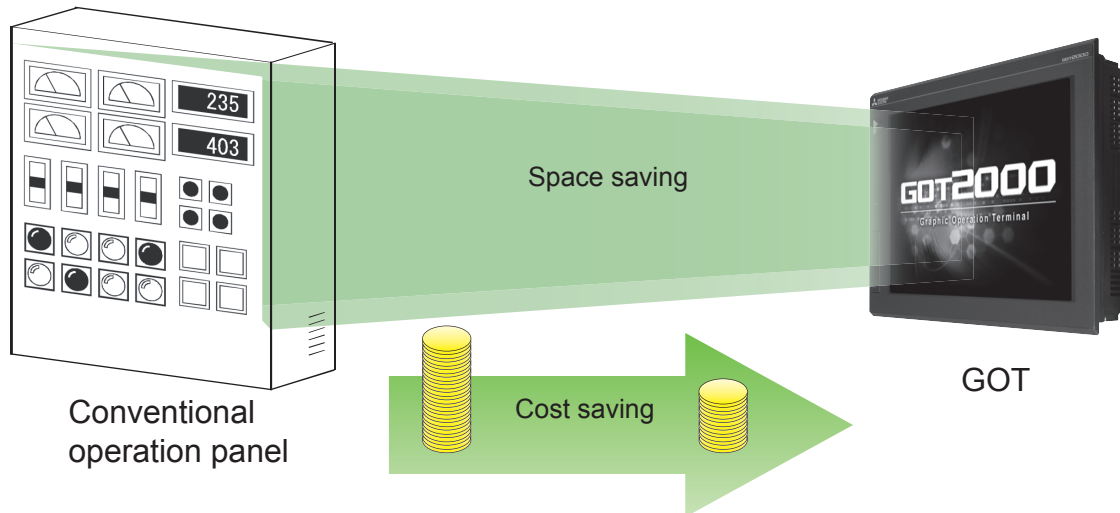
**System configuration in this textbook**



# 1. What is the GOT?

## 1.1 About the GOT

The GOT (Graphic Operation Terminal) is an electronic device used as an electronic operation panel to operate/display different operations such as switch operation, lamp display, data display and message display, which had been conventionally implemented with a control box.



### Advantages of using the GOT

- (1) Downsizing the operation panel**  
The GOT replaces physical switches and lamps with graphical ones, saving I/O points on the PLC and reduces the size of operation panel.
- (2) Reducing wiring costs**  
The graphical user interface of the GOT eliminates the time and cost of wiring components inside the operation panel.
- (3) Standardizing operation panels**  
GOTs are flexible, allowing you to build or modify projects without changing the PLC program or system wiring, which facilitates standardization of operation panels.
- (4) Value-added HMI (Human Machine Interface)**  
GOT can also display graphics, text and alarms in addition to switches and lamps, contributing the value addition to entire equipment.

### POINT

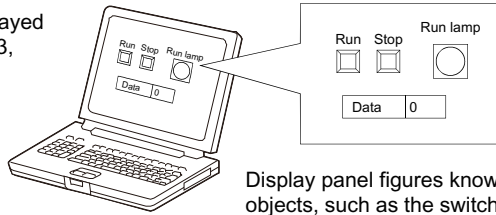
#### What is the GOT?

**"G"** ...Graphic **"O"** ...Operation **"T"** ...Terminal

The GOT (Graphic Operation Terminal) is a programmable display manufactured by Mitsubishi Electric Corporation.

# 1.2 Procedures for monitoring the PLC CPU by GOT

- 1) Create a screen to be displayed in GOT using GT Designer3, software

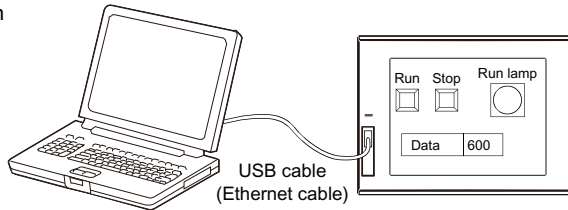


Display panel figures known as objects, such as the switch, lamp, and numerical display, etc., are pasted to create the screen.

Personal computer



- 2) Transfer the created screen data to GOT.

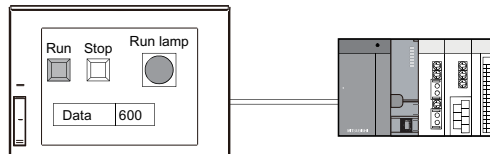


Personal computer

GOT



- 3) Start monitoring after connecting to PLC CPU.



GOT

PLC CPU

# 1.3 GOT2000 series features

## (1) High-speed processing

Easily operate the screens even during high-load processing, such as logging, script, alarm or device data transfer. (Monitor performance is 2-fold or higher\*<sup>1</sup>)

\*<sup>1</sup> Compared to GOT1000 series GT16 models.

## (2) Increased memory capacity

- Design screens without worrying about the data capacity.
- The compression technology allows up to 128 MB of actual space to be used without an SD card.\*<sup>1</sup>

\*<sup>1</sup> An SD card may be required depending on the project data.

## (3) Easy operations with gesture function (GT27 only)

Use intuitive gestures to zoom in/out and to scroll.

- Screen Gestures  
Zoom in to easily operate small and hard to reach switches. After zooming in, scroll the display to show the area you want to operate.
- Object Gestures  
Scroll or zoom in and out the displayed contents of the objects by gestures such as a flick.  
(Applicable objects: Alarm display (user), alarm display (system), simple alarm display, historical trend graph, historical data list display, and document display)

## (4) Crisp display with outline fonts and PNG images

Customize screen designs using parts library and fonts that are crisp even when enlarged or reduced.

## (5) Enhanced lineup (The white model is only for GT27 and GT25.)

- The new white model GOT provides an additional color option.
- The flush frame without the USB port can be cleaned very easily.
- The GOT can be installed vertically for extra flexibility when installed in confined spaces.

## (6) 2-point press operation prevents incorrect operations (GT27 only)

Prevent accidental operations by designating two pressing points for critical operations.

For the details of the features of the GOT2000 series, refer to the following manuals.

 GOT2000 Series User's Manual (Hardware)

 GOT2000 Series User's Manual (Utility)

 GOT2000 Series User's Manual (Monitor)

# 1.4 GOT function list

The following table shows the function list for each GOT model.

For the details of functions, supported controllers, and connection types, please refer to the GOT2000 series manual or Help.

●: Supported —: Not supported

Category	Function name	Necessary devices <sup>*1</sup>	GT27	GT25	GT21	GT SoftGOT2000	
Hardware specifications	Screen size	15"	●	—	—	—	
		12.1"	●	●	—	—	
		10.4"	●	●	—	—	
		8.4"	●	●	—	—	
		5.7"	●	—	●	—	
		4.3" Wide	—	—	●	—	
		4.5"	—	—	●	—	
		3.8"	—	—	●	—	
	Resolution	XGA 1024 × 768		●	—	—	Flexible resolution 640 to 1920 × 480 to 1200
		SVGA 800 × 600		●	●	—	
		VGA 640 × 480		●	●	—	
		QVGA 320 × 240		—	—	●	
		Other		—	—	GT2104-R: 480 × 272 GT2104-P: 384 × 128 GT2103: 320 × 128	
	Color	65536 colors		●	●	●	●
		Monochrome (black/white) 32 shade grayscale		—	—	●	—
		Touch panel simultaneous press (two points)		●	—	—	—
		Human sensor		● <sup>*10</sup>	—	—	—
	Memory	Memory for storage (ROM)		Other than below: 57 MB GT2705: 32 MB	32 MB	GT2105, GT2104-R: 9 MB GT2104-P: 6 MB GT2103: 3 MB	57 MB
		Memory for operation (RAM)		Other than below: 128 MB GT2705: 80 MB	80 MB	—	—
	Interface	RS-232		●	●	●	● <sup>*12</sup>
		RS-422/485		●	●	●	● <sup>*12</sup>
		Ethernet		●	●	●	● <sup>*11</sup>
		USB host		●	●	—	● <sup>*13</sup>
		USB device		●	●	●	—
		SD card slot		●	●	● <sup>*14</sup>	● <sup>*13</sup>
		Extension interface, side interface	Communication units, option units		● <sup>*11</sup>	● <sup>*11</sup>	—

●: Supported —: Not supported

Category	Function name	Necessary devices *1	GT27	GT25	GT21	GT SoftGOT2000
Screen design	Figure		●	●	●	●
	Logo text		●	●	●	●
	Touch switch		●	●	●	●
	Lamp		●	●	●	●
	Numerical display, numerical input		●	●	●	●
	Text display, text input		●	●	●	●
	Date display, time display	(Battery)	●	●	●	●
	Comment display		●	●	●	●
	Parts display	(SD card or USB memory)	●	●	●*16	●
	Parts movement	(SD card or USB memory)	●	●	●*16	●
	Historical data list display	(SD card or USB memory)	●	●	●*16	●
	Simple alarm display		●	●	●	●
	System alarm display		●	●	—	●
	Alarm display (user)	(SD card, USB memory, or battery)	●	●	●*16	●
	Alarm display (system)	(SD card, USB memory, or battery)	●	●	—	●
	Recipe display (record list)		●	●	—	●
	Line graph		●	●	●	●
	Trend graph		●	●	●	●
	Bar graph		●	●	●	●
	Statistic bar graph		●	●	●	●
	Statistic pie graph		●	●	●	●
	Scatter graph		●	●	●	●
	Historical trend graph	(SD card or USB memory)	●	●	●*16	●
	Graphical meter		●	●	—	●
	Level		●	●	●	●
	Panelmeter		●	●	●	●
Slider		●	●	●	●	
Document display	SD card		●	●	—	●

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5 DRAWING FUNDAMENTALS  
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●: Supported —: Not supported

Category	Function name	Necessary devices <sup>*1</sup>	GT27	GT25	GT21	GT SoftGOT2000		
Screen design	Functions performed on background GOT	Logging	(SD card, USB memory, or battery)	●	●	● <sup>*6</sup>	●	
		Recipe	(SD card or USB memory)	●	●	● <sup>*16</sup>	●	
		Device data transfer		●	●	●	●	
		Trigger action		●	●	●	●	
		Time action	(SD card or USB memory)	●	●	●	●	
		Hard copy	File output	SD card or USB memory	●	●	● <sup>*6</sup>	●
			Serial printer output		●	●	● <sup>*6</sup>	● <sup>*2</sup>
			PictBridge printer output	Printer unit	●	●	—	● <sup>*2</sup>
		Project, screen script		●	●	●	●	
		Object script		●	●	—	●	

●: Supported —: Not supported

Category	Function name	Necessary devices *1	GT27	GT25	GT21	GT SoftGOT2000	
Screen design	Functions used with peripheral devices						
	Barcode function		●	●	●*6	●	
	RFID function		●	●	●*6	●	
	GOT Mobile function	License, (SD card)	●	●	—	—	
	VNC server function	License	●	●	—	—	
	Remote personal computer operation function (Ethernet)	License	●	●	—	—	
	Remote personal computer operation function (Serial)	RGB input unit or Video/RGB input unit	●*8	—	—	—	
	Video display function	Video input or Video/RGB input unit	●*8	—	—	—	
	RGB display function	RGB input unit or Video/RGB input unit	●*8	—	—	—	
	Multimedia function	Multimedia unit, CF card	●*8	—	—	—	
	External I/O function	External I/O unit	●	●	—	—	
	Operation panel function	External I/O unit	●	●	—	●	
	RGB output function	RGB output unit	●*8	—	—	—	
	Report function	Serial printer output	(SD card or USB memory)	●	●	●*6	●*3
		PictBridge printer output	SD card or USB memory, printer unit	●	●	—	●*3
	Sound output function	Sound output unit	●	●	—	●	
	Server function, client function		●	●	—	—	
	Mail send function		●	●	—	●	
	FTP server function	(SD card or USB memory)	●	●	●*15	—	
	File transfer function (FTP transfer)	SD card or USB memory	●	●	●*15	—	
	File transfer function (GOT internal transfer)	SD card or USB memory	●	●	—	—	
	MES interface function	License, (SD card)	●	●	—	—	
Wireless LAN function	(Wireless LAN communication unit)	●	●	—	—		
USB mouse, USB keyboard		●	●	—	●		

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●: Supported —: Not supported

Category	Function name	Necessary devices <sup>*1</sup>	GT27	GT25	GT21	GT SoftGOT2000
GOT functions	Base screen		●	●	●	●
	Overlap window		●	●	●	●
	Superimpose window		●	●	●	●
	Dialog window		●	●	●	●
	Mobile screen		●	●	—	—
	Key window		●	●	●	●
	Language switching		●	●	●	●
	System information		●	●	●	●
	Operator authentication function	(SD card or USB memory)	●	●	● <sup>*16</sup>	●
	Operation log	SD card or USB memory	●	●	—	●
	Startup logo		●	●	●	●
	KANA KANJI conversion		●	●	—	●
	FA transparent		●	●	●	—
	SoftGOT-GOT link	License key	●	●	—	●
	Backup/Restoration	SD card or USB memory	●	●	● <sup>*6</sup>	—
	Multi-channel function		● <sup>*9</sup> Four channels (Up to three units)	● Four channels (Up to three units)	● <sup>*6</sup> Two channels (No units can be mounted.)	—
	Station No. switching		●	●	●	●
	GOT network interaction		●	●	—	●
	Screen gesture function		●	—	—	—
	Object gesture function		●	—	—	—
Security key authentication function		●	●	—	—	
IP filter function		●	●	—	—	
File manager	(SD card or USB memory)	●	●	—	—	
Vertical display <sup>*5</sup>		● (Rotate 90° to left)	● (Rotate 90° to left)	● (Rotate 90° to right)	—	

●: Supported —: Not supported

Category	Function name	Necessary devices *1	GT27	GT25	GT21	GT SoftGOT2000
Maintenance functions	Device monitor		●	●	●	—
	Sequence program monitor (Ladder)	SD card or USB memory	●	●	—	—
	Sequence program monitor (SFC)	SD card or USB memory	●	●	—	—
	Network monitor		●	●	—	—
	Intelligent module monitor		●	●	—	—
	Drive recorder	(SD card or USB memory)	●	●	—	—
	Servo amplifier monitor		●	●	—	—
	R motion monitor		●	●	—	—
	Q motion monitor		●	●	—	—
	Motion SFC monitor	SD card or USB memory	●	●	—	—
	CNC monitor		●*4	●*4	—	—
	CNC data I/O	SD card or USB memory	●*4	●*4	—	—
	CNC machining program edit		●*4	●*4	—	—
	Log viewer	(SD card or USB memory)	●	●	—	—
	FX list editor		●	●	●*7	—
	FX ladder monitor		●	●	—	—
	iQSS utility	SD card or USB memory	●	●	—	—
System launcher		●	●	—	—	
MELSEC-L troubleshooting		●	●	—	—	

- \*1 Necessary units when using GT27, GT25, GT23, or GT21 are shown. Parenthesized devices are required depending on conditions of use.
- \*2 Data is output to the printer that is recognized by the personal computer.
- \*3 CSV files are saved in the virtual drive of the personal computer so that it is recommended to output the files to printers.
- \*4 Only the GOTs with SVGA or higher resolution are supported.
- \*5 Remote personal computer operation function (Ethernet) cannot be used.  
The following screens are displayed horizontally:  
Utility screen, monitor and data management screens that are displayed from the utility screen (sequence program monitor), video camera images in the multimedia and video display functions  
For the details of other GOT operations when placed vertically, please refer to the appropriate manuals or Help.
- \*6 Excluding GT2103-PMBLS.
- \*7 GT2104-RTBD only.
- \*8 Excluding GT2705.
- \*9 To use multiple units such as extension units, barcode readers, or RFID controllers with a GT2705, the total current consumption of the units should be less than the value that the GT2705 can provide. For the details, please refer to an appropriate GOT2000 series manual.
- \*10 GT2715, GT2712 only.
- \*11 For the applicable units and interface boards, please refer to appropriate manuals.
- \*12 Use the standard interface of the personal computer
- \*13 When using functions that require a USB memory or SD memory card, a virtual drive in the personal computer is used.
- \*14 GT2103 requires an SD memory card unit (GT21-03SDCD) separately. GT2103-PMBLS does not allow for SD cards.
- \*15 GT2104-R, GT2103-PMBD only.
- \*16 On GT2103-PMBLS, only the functions that do not require SD card can be used.

# 1.5 Equipment required for using GOT

## ● GOT external appearance and interface

[Front face]

**Human sensor**  
The GOT detects an operator and displays its screen automatically. When no one is around, the backlight turns off to save energy.  
\* GT27 (15" and 12.1" only)

**USB device**  
Data can be transferred without opening the cabinet.  
\* The USB device is on the rear face for the white model and GT21.

**USB host**  
Screen data can be transferred and data in the GOT can be retrieved using a USB memory. A USB mouse and keyboard can be connected.  
\* GT27 and GT25 only. The USB host is on the rear face for the white model.



**Simple design**  
The stylish and simple design with a linear motif is sleek and complements any machine design.



**LED backlight**  
The long life cycle minimizes maintenance and replacement costs.

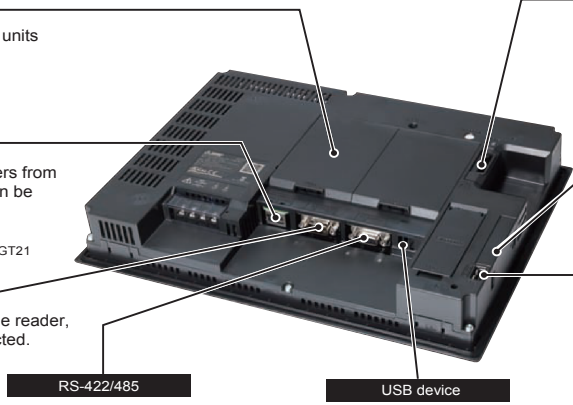
[Rear face]

**Extension interface**  
Communication and option units can be mounted.  
\* GT27 and GT25 only

**Ethernet**  
Up to four types of controllers from different manufacturers\* can be connected simultaneously by Ethernet.  
\* Up to two types of controllers for GT21

**RS-232**  
Various FA devices, barcode reader, serial printer can be connected.

\* This image is GT2712.



**SD card slot**  
A large amount of data including alarms and logging data can be saved.

**Side interface**  
A wireless LAN communication unit can be mounted.  
\* GT27 and GT25 only

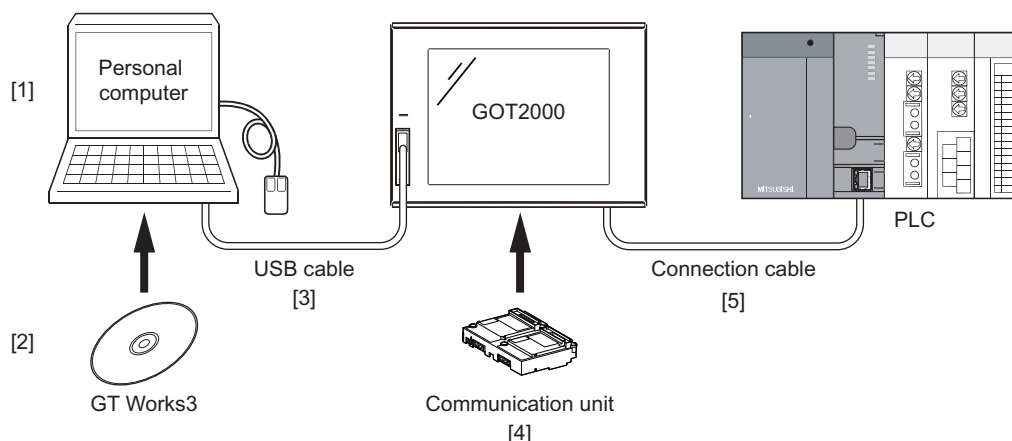
**USB host**  
A USB memory can be mounted to save alarms and logging data. A USB mouse and keyboard can be connected.  
\* GT27 and GT25 only

**RS-422/485**  
Various FA devices can be connected.

**USB device**  
The GOT can be connected to a personal computer to transfer data.  
\* White model only

## ● Required equipment

The equipment required to connect the GOT to the PLC CPU is shown below.



Equipment name	Application
[1] Personal computer	Device to be used for writing the data stored in GOT.
[2] GT Works3	Device to be used for writing the data stored in GOT.
[3] USB cable	Cable to connect with the personal computer and GOT.
[4] Communication unit	Unit to connect the PLC CPU connection cable.*1
[5] Connection cable	Cable to connect with the GOT and PLC CPU.*2

\*1 The communication unit varies depending on the PLC connection type.

When the GOT is connected with a PLC by using an interface built in the GOT (Ethernet interface, RS-232 interface, or RS-422/485 interface), no communication unit is required.

\*2 The connection cable varies depending on the connection type.

The connection cables used for each connection type are shown below.

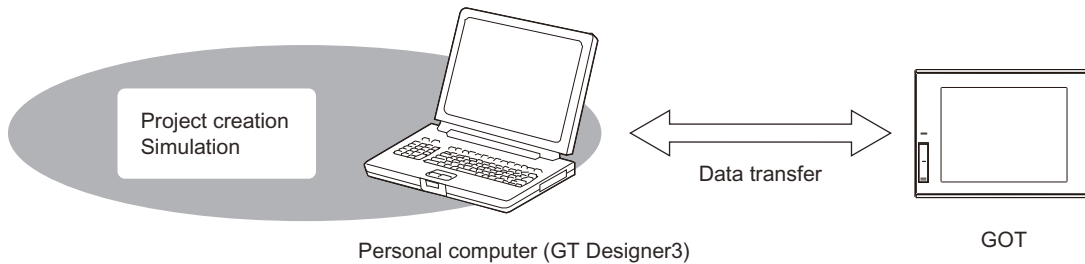
Connection type	Connection cable*1
Ethernet connection, CC-Link IE Field Network connection	Ethernet cable
Direct CPU connection	RS-232 cable
For RS-232 connection	
For RS-422 connection	RS-422 cable RS-232/422 conversion cable
Computer Link connection	RS-232 cable
For RS-232 connection	
For RS-422 connection	RS-422 cable RS-232/422 conversion Cable
Bus connection	Bus connection cable
CC-Link connection	CC-Link dedicated cable
MELSECNET/H connection, MELSECNET/10 connection, CC-Link IE Controller Network connection	Optical fiber cable
For optical fiber cable connection	
For coaxial cable connection	Coaxial cable

\*1 The connection cables are exclusive products. (Only the Ethernet connection cable is commercially available.)

● **What is GT Designer3**

GT Designer3 is software to create screens for GOT2000 series and GOT1000 series.

This software enables you to create and simulate a project, and transfer data between the GOT and a personal computer.

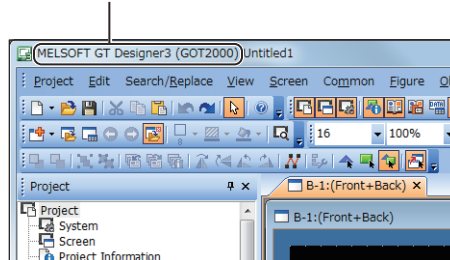


GT Designer3 consists of the following drawing software.

- GT Designer3 (GOT2000): Drawing software for GOT2000 series
- GT Designer3 (GOT1000): Drawing software for GOT1000 series

The supported drawing software is started for making project, depending on the selection of GOT type. The title bar of the window indicates which drawing software you are operating.

The name of the drawing software in operation is displayed.



This textbook uses GT Designer3 (GOT2000) for explanation.

● Operating environment for GT Designer3

Item	Description
Model	Personal computer that Windows runs on.
OS (English, Simplified Chinese, Traditional Chinese, Korean, German, or Italian version)	<ul style="list-style-type: none"> <li>• Microsoft Windows 10 Enterprise (32 bit, 64 bit)<sup>*1*2*4*6</sup></li> <li>• Microsoft Windows 10 Pro (32 bit, 64 bit)<sup>*1*2*4*6</sup></li> <li>• Microsoft Windows 10 Home (32 bit, 64 bit)<sup>*1*2*4</sup></li> <li>• Microsoft Windows 8.1 Enterprise (32 bit, 64 bit)<sup>*1*2*4*5*6</sup></li> <li>• Microsoft Windows 8.1 Pro (32 bit, 64 bit)<sup>*1*2*4*5*6</sup></li> <li>• Microsoft Windows 8.1 (32 bit, 64 bit)<sup>*1*2*4*5</sup></li> <li>• Microsoft Windows 8 Enterprise (32 bit, 64 bit)<sup>*1*2*4*5*6</sup></li> <li>• Microsoft Windows 8 Pro (32 bit, 64 bit)<sup>*1*2*4*5*6</sup></li> <li>• Microsoft Windows 8 (32 bit, 64 bit)<sup>*1*2*4*5</sup></li> <li>• Microsoft Windows 7 Ultimate (32 bit, 64 bit)<sup>*1*2*3*4</sup></li> <li>• Microsoft Windows 7 Enterprise (32 bit, 64 bit)<sup>*1*2*3*4</sup></li> <li>• Microsoft Windows 7 Professional (32 bit, 64 bit)<sup>*1*2*3*4</sup></li> <li>• Microsoft Windows 7 Home Premium (32 bit, 64 bit)<sup>*1*2*4</sup></li> <li>• Microsoft Windows 7 Starter (32 bit)<sup>*1*2</sup></li> <li>• Microsoft Windows Vista Ultimate (32 bit) Service Pack1 or later<sup>*1*2</sup></li> <li>• Microsoft Windows Vista Enterprise (32 bit) Service Pack1 or later<sup>*1*2</sup></li> <li>• Microsoft Windows Vista Business (32 bit) Service Pack1 or later<sup>*1*2</sup></li> <li>• Microsoft Windows Vista Home Premium (32 bit) Service Pack1 or later<sup>*1*2</sup></li> <li>• Microsoft Windows Vista Home Basic (32 bit) Service Pack1 or later<sup>*1*2</sup></li> <li>• Microsoft Windows XP Professional (32 bit) Service Pack3<sup>*1*2</sup></li> <li>• Microsoft Windows XP Home Edition (32 bit) Service Pack3<sup>*1*2</sup></li> </ul>
CPU	Intel Core 2 Duo Processor 2.0 GHz or more recommended.
Memory	<ul style="list-style-type: none"> <li>• For a 64-bit OS: 2 GB or more recommended</li> <li>• For a 32-bit OS: 1 GB or more recommended</li> </ul>
Display	Resolution XGA (1024 × 768 dots) or higher.
Hard disk space	<ul style="list-style-type: none"> <li>• For installation: 5 GB or more recommended</li> <li>• For execution: 512 MB or more recommended</li> </ul>
Display color	High Color (16 bits) or higher.

1	WHAT IS THE GOT?
2	GOT OPERATION
3	ABOUT GT Designer3
4	FROM GOT SCREEN CREATION UP TO THE TEST
5	DRAWING FUNDAMENTALS
6	ABOUT DEBUG
	APPENDICES



Item	Description
Other software	<p>To use the simulation function on a personal computer, one of the following software applications must be installed.</p> <ul style="list-style-type: none"> <li>• GX Simulator3 (included in GX Works3 Version1.007H or later)</li> <li>• GX Simulator2 (included in GX Works2 Version1.12N or later)</li> <li>• GX Simulator Version 5.00A or later</li> <li>• MT Simulator2 Version1.70Y or later</li> </ul> <p>The required software version depends on the controller to be simulated.*8</p>
	<p>To use the document display function, the following software must be installed.</p> <ul style="list-style-type: none"> <li>• Document Converter</li> <li>• Ghostscript GPL8.50 to 9.15*7 (Free software)</li> </ul> <p>To use the files of Microsoft Word, Microsoft Excel, or Microsoft PowerPoint, the following software also must be installed.</p> <ul style="list-style-type: none"> <li>• PostScript printer driver supplied with Windows</li> <li>• Microsoft Office 2003, Microsoft Office XP, Microsoft Office 2000 (Required only when the files of Microsoft Word, Microsoft Excel, or Microsoft PowerPoint are used)</li> </ul>
	<p>To use the remote personal computer operation function (Ethernet), the following software must be installed.</p> <ul style="list-style-type: none"> <li>• VNC server software (UltraVNC 1.0.5, 1.0.5.6, 1.1.9.6, or 1.2.1.1)</li> <li>• Windows terminal server function (Windows Server 2003)</li> <li>• Terminal service function software (RDPGateway(rdp2vnc))</li> </ul>
	<p>To use the remote personal computer operation function (Serial), one of the following software must be installed.</p> <ul style="list-style-type: none"> <li>• Remote Personal Computer Operation Driver (MES_2X)</li> <li>• Remote Personal Computer Operation Driver (TSC-DD)</li> </ul> <p>Use the software compatible with the personal computer OS used for the remote personal computer operation function (Serial).</p>
	<p>To use the VNC server function, the following software must be installed.</p> <ul style="list-style-type: none"> <li>• VNC client software (UltraVNC 1.1.9.6, 1.0.9.6.2, or 1.0.8.2)</li> </ul>
	<p>To use the multimedia function, the following software must be installed.</p> <ul style="list-style-type: none"> <li>• Multimedia Interaction Tool</li> <li>• Multimedia Interaction FTP Service</li> <li>• Quick Time Player or QuickTime 7 Pro</li> </ul>
	<p>To display Help, the following software must be installed.</p> <ul style="list-style-type: none"> <li>• Internet Explorer7 or later recommended</li> </ul>
	<p>To display PDF manuals, the following software must be installed.</p> <ul style="list-style-type: none"> <li>• Adobe Reader7 or later recommended</li> </ul>
	Other hardware

- \*1 For installation, the standard user or administrator account is required.  
For installation on Windows XP, the administrator authority is required.  
To interact GT Designer3 with other MELSOFT applications which are used under the administrator authority, use GT Designer3 under the administrator authority.
- \*2 The following functions are not supported.
- Application start in Windows compatibility mode
  - Fast user switching
  - Change your desktop themes (fonts)
  - Remote desktop
  - DPI setting other than the normal size (For Windows XP and Windows Vista)
  - Setting the size of text and illustrations on the screen to any size other than [Small-100%] (For Windows 10, Windows 8.1, Windows 8, and Windows 7)
- \*3 Windows XP Mode is not supported.
- \*4 The touch feature is not supported.
- \*5 Modern UI Style is not supported.
- \*6 Hyper-V is not supported.
- \*7 Versions 8.50, 8.71, and 9.15 of the software are validated by our company.
- \*8 The following shows the software versions that simulates the PLC CPU.

• Software version of GX Simulator

PLC CPU compatible with simulation	Software version of GX Simulator
QCPU (A mode), ACPU, motion controller CPU (A series)	Version5.00A or later
QnACPU	Version5.40E or later
FX0 series, FX0N series, FX0S series, FX1 series, FX1N series, FX1NC series, FX1S series, FX2 series, FX2C series, FX2N series, FX2NC series	Version5.40E or later
QCPU (Q mode) (except for Q00J, Q00, and Q01CPU)	Version5.40E or later
Q00JCPU, Q00CPU, Q01CPU	Version6.00A or later
Q02PHCPU, Q06PHCPU	Version7.20W or later
Q12PHCPU, Q25PHCPU	Version6.10L or later
Q12PRHCPU, Q25PRHCPU	Version6.20W or later
FX3U series, FX3UC series	Version7.08J or later
FX3G series	Version7.22Y or later
Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	Version7.23Z or later

• Software version of GX Simulator2

PLC CPU compatible with simulation	Software version of GX Simulator
FX0 series, FX0N series, FX0S series, FX1 series, FX1N series, FX1NC series, FX1S series, FX2 series, FX2C series, FX2N series, FX2NC series	Version1.24A or later
QCPU (Q mode) (except for Q00J, Q00, and Q01CPU)	Version1.12N or later
Q00JCPU, Q00CPU, Q01CPU	Version1.12N or later
QnPHCPU	Version1.87R or later
FX3U, FX3UC, FX3G series	Version1.24A or later
FX3GC series	Version1.77F or later
FX3S series	Version1.492N or later
Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	Version1.12N or later
Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU	Version1.492N or later
L02CPU, L26CPU-BT	Version1.24A or later
L02CPU-P, L26CPU-PBT	Version1.62Q or later
L06CPU	Version1.98C or later
L02SCPU, L26CPU	Version1.98C or later
L02SCPU-P, L06CPU-P, L26CPU-P	Version1.492N or later
Q50UDEHCPU, Q100UDEHCPU	Version1.31H or later

- Software version of GX Simulator3

PLC CPU compatible with simulation	Software version of GX Simulator3
R04CPU, R08CPU, R16CPU, R32CPU, R120CPU	Version1.007H or later
R08PCPU, R16PCPU, R32PCPU, R120PCPU	Version1.010L or later
R08SFCPU, R16SFCPU, R32SFCPU, R120SFCPU, R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, R120ENCPU	Version1.020W or later
FX5U series, FX5UC series	Version1.025B or later

- Software version of MT Simulator2

PLC CPU compatible with simulation	Software version of MT Simulator2
Q172DSCPU, Q173DSCPU	Version1.70Y or later

● **List of software applications included in GT Works3**

- (a) GT Designer3 (GOT2000) Version1  
This software is used to create screens for GOT2000 series.
- (b) GT Designer3 (GOT1000) Version1  
This software is used to create screens for GOT1000 series.
- (c) GT Designer2 Classic  
This software is used to create screens for GOT900 series.
- (d) GT Simulator3 Version1  
This software is used to simulate the operation of a GOT2000/GOT1000/GOT900 series GOT on a personal computer by connecting with GX Simulator or a PLC CPU.
- (e) GT SoftGOT2000 Version1  
This software has the functions equivalent to the functions of the GOT2000 series and is used to display lamps, data, and messages on a personal computer and panel controllers.
- (f) GT SoftGOT1000 Version3  
This software has the functions equivalent to the functions of the GOT1000 series and is used to display lamps, data, and messages on a personal computer or the like.
- (g) GT Converter2 Version3  
This software is used to convert the project data created by existing screen editor software into those available for use on GT Designer3 or GT Designer2 Classic.
- (h) Document Converter  
This software is used to convert documents created on a personal computer (such as Microsoft Word and Microsoft Excel) to GOT-compatible formats.
- (i) Data Transfer Tool, Multimedia Interaction Tool, and other tools
- (j) Help and manual list  
This list displays the PDF versions of the relevant manuals.

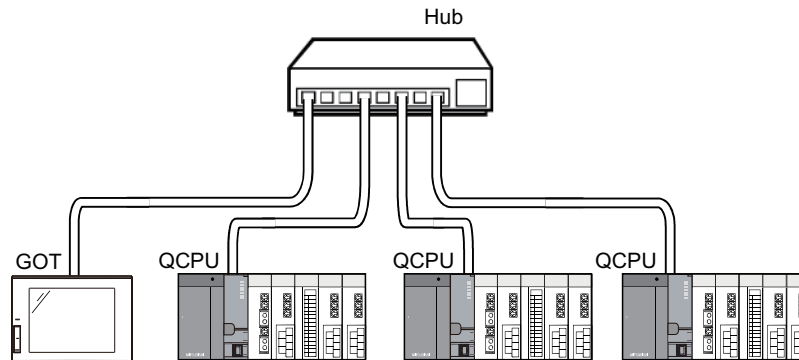
# 1.6 Applicable connection type between the GOT and the PLC CPU

The GOT can perform monitoring by connecting it to the PLC using the following connection types. Therefore, the connection type suitable for the system configuration or usage can be selected.

### (1) Ethernet connection

GOT can be connected to the Ethernet connection.

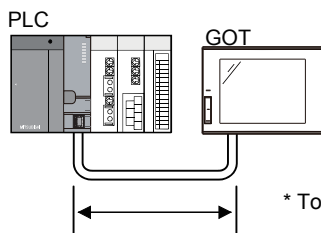
The networks can be configured with commercially available products such as hubs and cables.



### (2) Direct CPU connection

Direct CPU connection is a method using a RS-232/RS-422 to connect a GOT.

Because no other equipment is required to connect the GOT to the PLC, this is the most economical connection type.



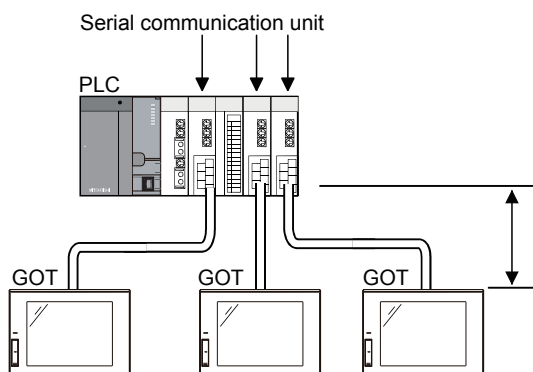
Maximum distance when a RS-232 cable is used: 3 m  
Maximum distance when a RS-422 cable is used: 30.5 m\*

\* Total length of a RS-422 connector conversion cable and a RS-422 cable.

### (3) Computer link connection

Computer link connection is a method using a computer link module or a serial communication module mounted together with a PLC CPU.

Connection of multiple GOTs is available depending on the model type of the computer link module or the serial communication module mounted with the PLC CPU.



Maximum distance when a RS-232 cable is used: 15 m  
Maximum distance when a RS-422 cable is used: 1200 m

#### (4) Bus connection

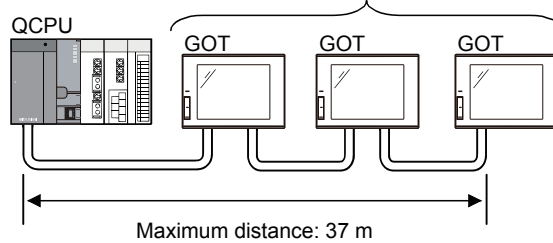
Bus connection is a method using an extension connector of a base unit to connect a GOT (connection by I/O bus).

This connection type enables the fastest response to a PLC CPU among all GOT connection types.

By occupying one stage of the extension base unit, up to maximum five GOTs can be connected.\*1

\*1 QCPU (High Performance model or models in higher class)

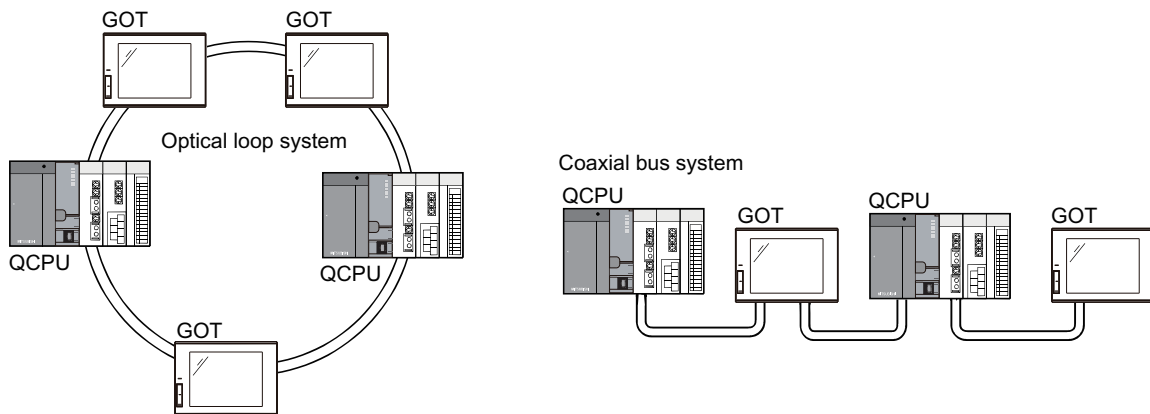
Connection to multiple GOTs is possible.



#### (5) CC-Link IE Controller Network, MELSECNET/H, or MELSECNET/10 connection

The GOT is connected to a CC-Link IE Controller Network system, MELSECNET/H network system, or MELSECNET/10 (PLC to PLC) network system as a normal station.

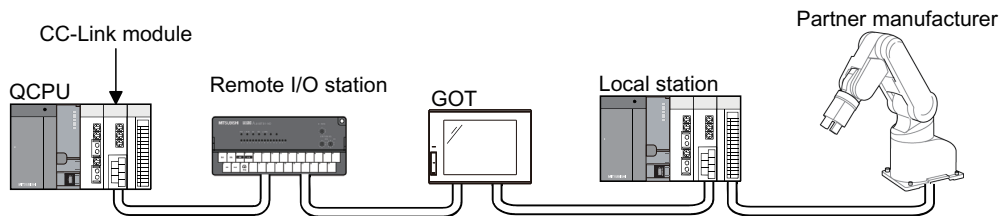
The cyclic data of the CC-Link IE Controller Network, MELSECNET/H, or MELSECNET/10 (PLC to PLC network) and the devices of PLC CPUs in the same network can be monitored.



#### (6) CC-Link connection

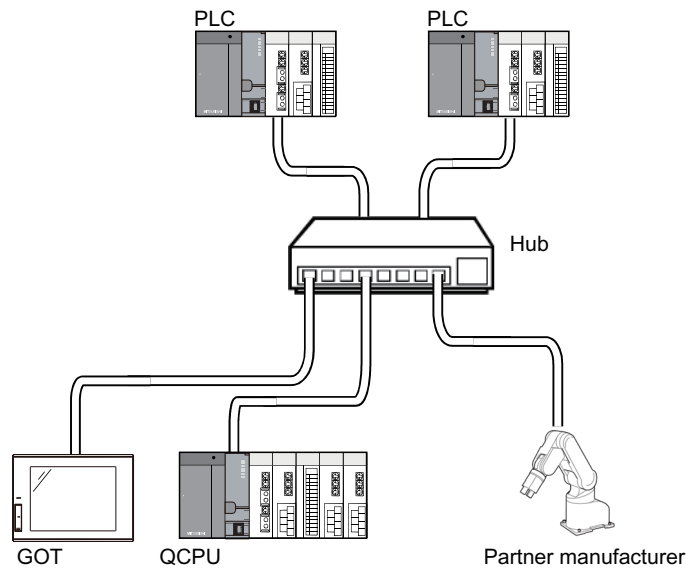
GOT can be connected to the network as an intelligent device station of the CC-Link System.

The cyclic data of the CC-Link System and devices of the PLC CPU on the master or local station can be monitored.



**(7) CC-Link IE Field Network connection**

CC-Link IE Field Network is a high-speed and large-capacity Field Network that handles a mix of control data and management data of devices. Additionally, distribution of controllers, I/O control, motion control, and safety functions can be seamlessly set.



**(8) Applicable connections with third party PLCs**

GOT can monitor third party PLCs.

The system construction without regarding to PLC manufacture is available.

Refer to the product catalogue or manual about PLC models that can be connected.

## 1.7 Connection to equipment other than the PLC

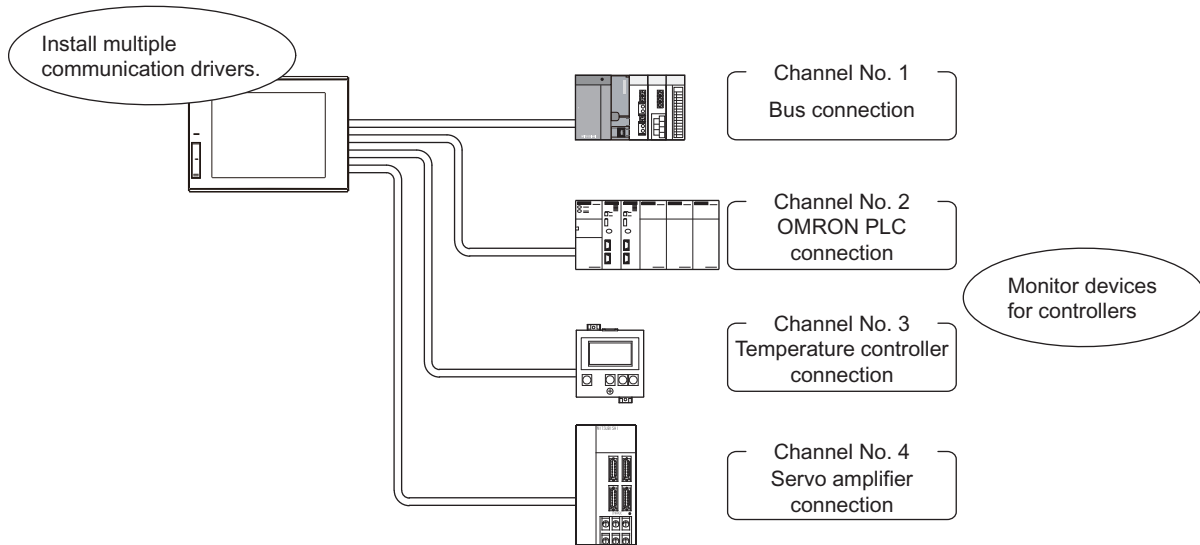
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- (1) **Microcomputer**  
Data can be read and written from a personal computer, microcomputer board, PLC to GOT virtual devices.
- (2) **Bar-code reader**  
The data read with the bar-code reader can be written to PLC CPU.
- (3) **Temperature controller, Inverter, Servo amplifier, CNC**  
The controllers can be monitored and modification in parameters is also possible.



## 1.8 Multi-channel function

The GOT which installs multiple communication drivers can monitor up to maximum four (four channels) controllers (PLC CPU, temperature controller, inverter, etc.).



To use the multi-channel function, read the GOT2000 Series Connection Manual (Mitsubishi Electric Products) and select systems and the communication units to be mounted on a GOT.

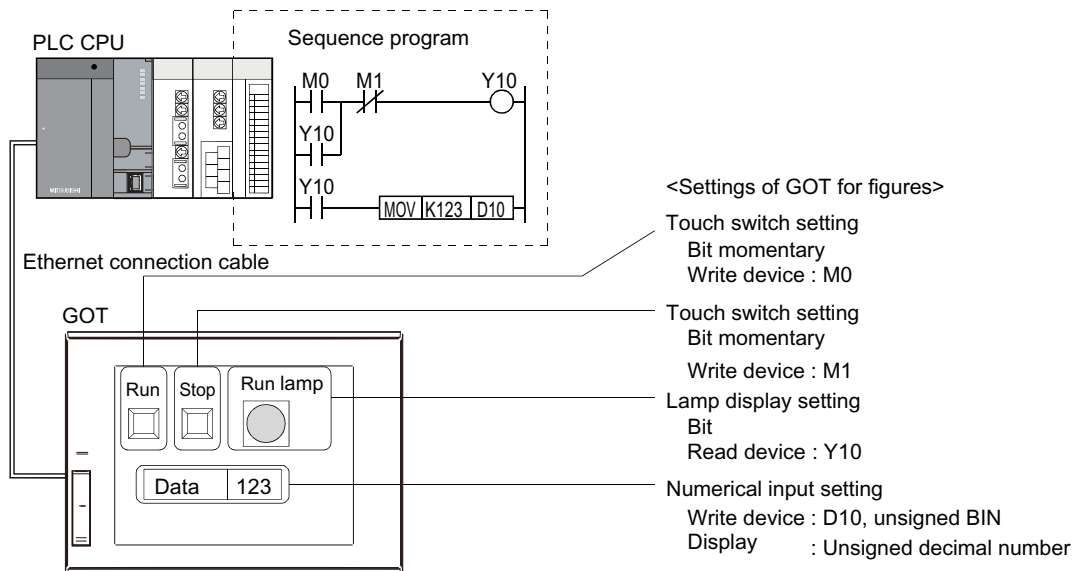
# 2. GOT operation

GOT enables reading and writing to PLC CPU devices (bit, word) with the switches, lamp, numerical display/input, message display, etc. on the GOT screen.

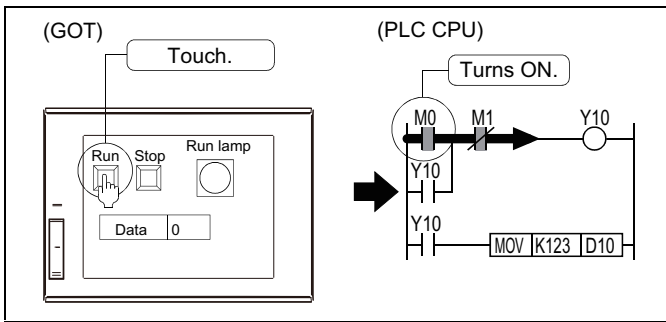
## 2.1 Summary of operation

With GT Designer3, display pane figures called objects, such as the touch switch, lamp, and numerical display, etc., are pasted on the GOT screen.  
 GOT functions can be executed by setting operation functions of the PLC CPU device memory (bit, word) to each pasted object.  
 This chapter explains the GOT operation in connection with the PLC CPU when the touch switch or numerical display are set as shown below.

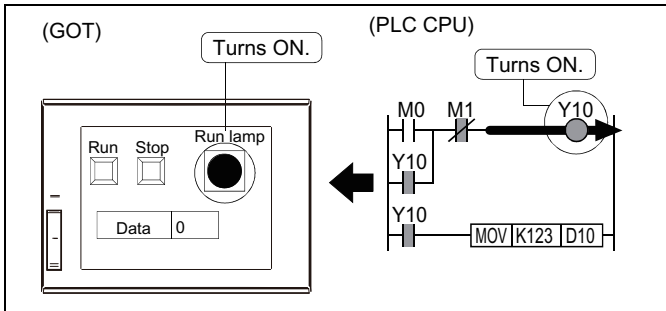
### <System example>



<Action description>

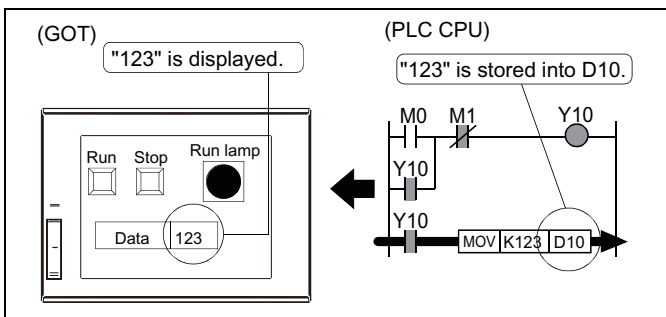


1. While the touch switch "Run" on the GOT is being touched, the bit device "M0" has been ON.



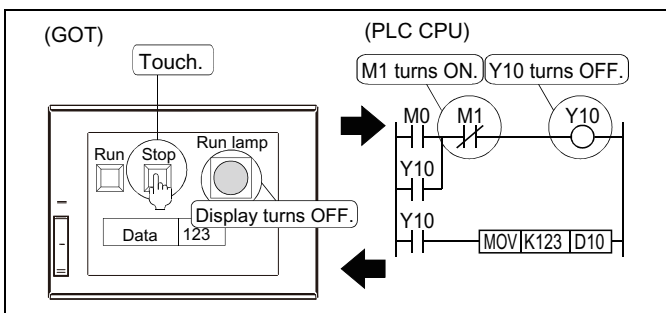
2. When the bit device "M0" turns ON, the bit device "Y10" turns ON.

Also, the ON figure is displayed on Run Lamp in which the monitor device has been set to the bit device "Y10".



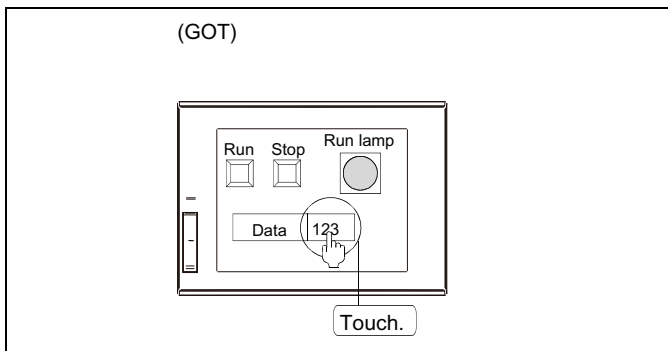
3. As the bit device "Y10" has been ON, "123" is stored into the word device "D10".

"123" is also displayed in the numerical display on the GOT in which the monitor device has been set to the word device "D10".

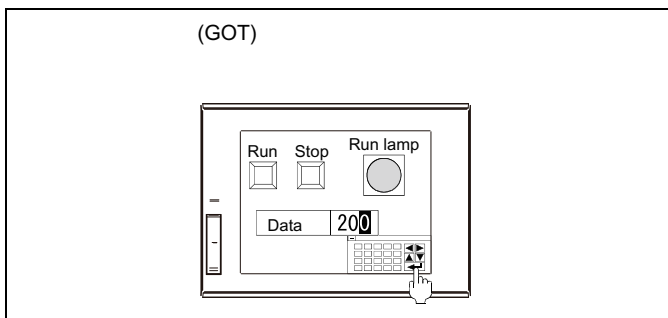


4. While the touch switch "Stop" on the GOT is being touched, the PLC CPU bit device "M1" has been ON.

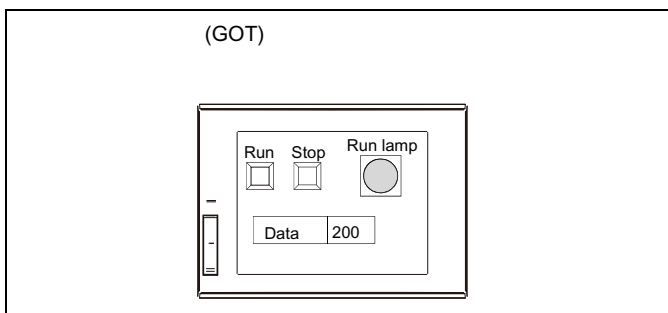
The PLC CPU bit device "Y10" turns OFF, and Run Lamp turns OFF.



5. To change the value of the word device "D10", touch the numerical input on the GOT.



6. Input the numerical value on the key window to be displayed.  
To store the value, touch the [Enter] button.



7. The input numerical value is reflected (D10: 123 → 200), and the key window is closed.

## POINT

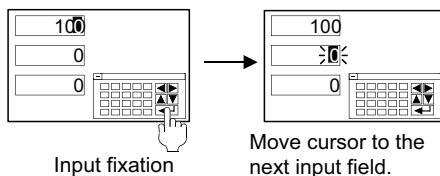
The display and operation of the cursor and key window for numerical input can be changed through settings.

### (1) Display or non-display of the cursor, and key window

- When establishing conditions or switching screens, the cursor and key window are displayed, and when establishing the operating conditions, the cursor and window key are not displayed.
- The key window is displayed on touch input and not displayed at pressing the [Enter] button.

### (2) Cursor key operations

The input order can be set to the multiple numerical input.



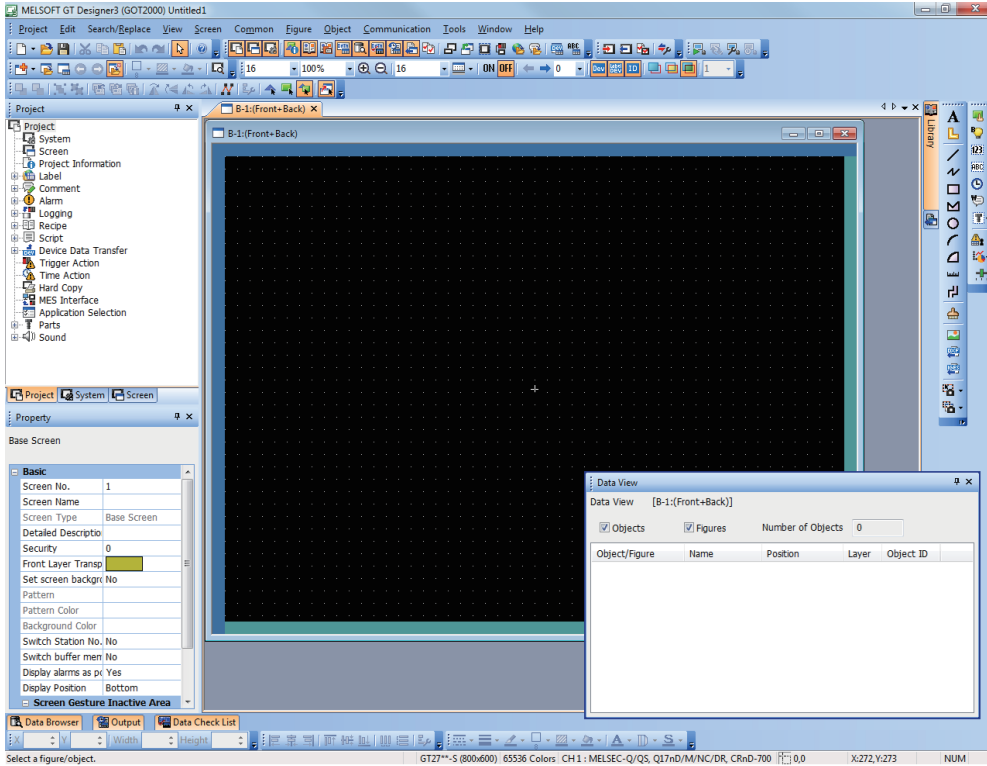
For the operation setting methods of cursor and key window for numerical input, refer to the GT Designer3 (GOT2000) Screen Design Manual.



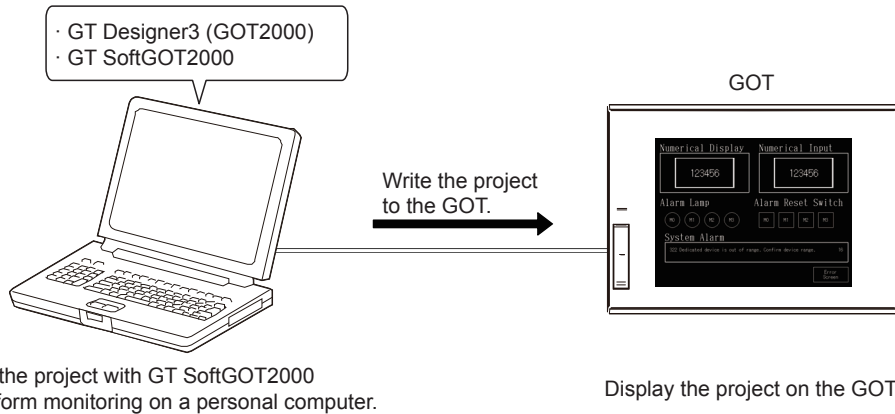
# 3. About GT Designer3

## 3.1 About GT Designer3

GT Designer3 (GOT2000) is the software to create screens for GOT2000 series.



Write the created project into a GOT or open it using GT SoftGOT2000.

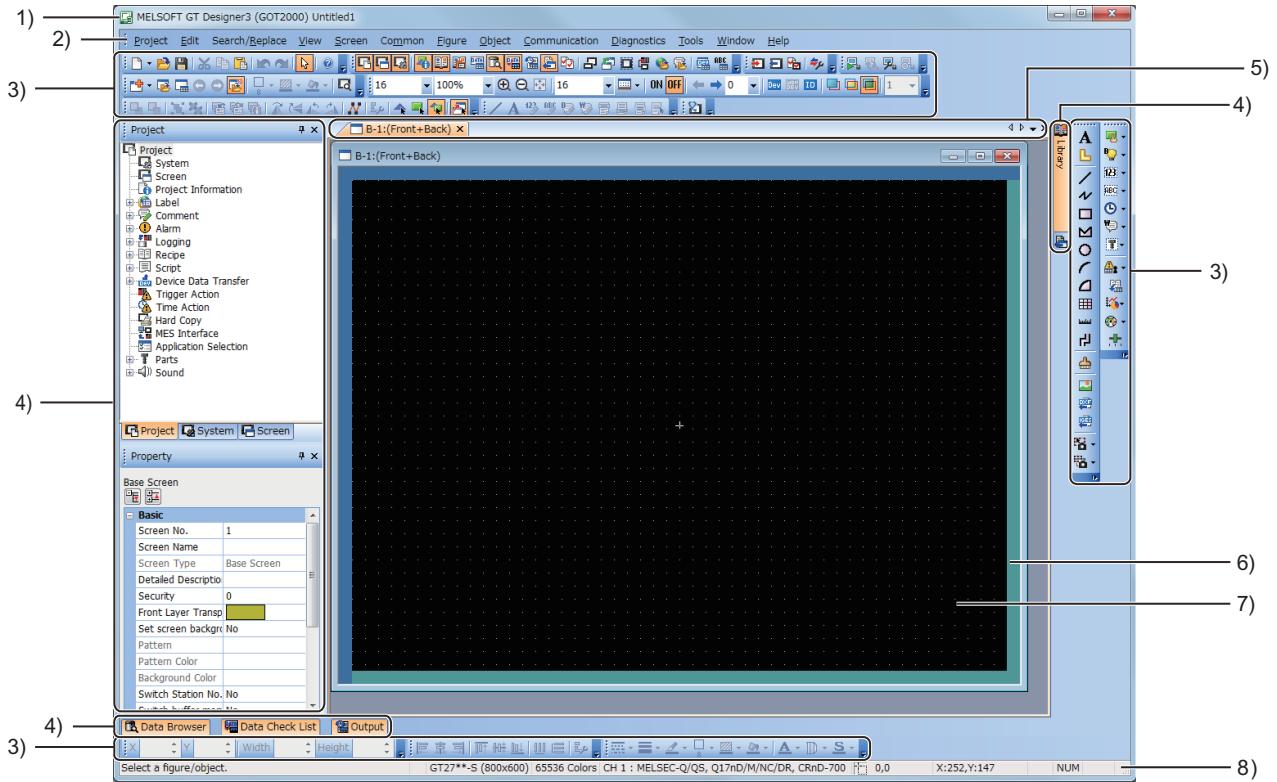


- (1) Creating or editing a GOT1000 project**  
To create or edit a GOT1000 project, use GT Designer3 (GOT1000).  
GT Designer3 (GOT1000) can be installed from the DVD-ROM or CD-ROM of GT Works3.
- (2) Creating or editing a GOT900 project**  
To create or edit a GOT900 project, use GT Designer2 Classic.  
GT Designer2 Classic can be downloaded from the MITSUBISHI ELECTRIC FA Global Website.

## 3.2 GT Designer3 screen configuration and features

### 3.2.1 Screen layout of GT Designer3

The following shows the screen layout, toolbars, and windows of GT Designer3.



Item	Description
1) Title bar	Displays the software name. The title bar displays a project name (workspace format) and a file name with a full path (single file format) according to the format in which the project is being edited.
2) Menu bar	GT Designer3 can be operated from pull-down menus.
3) Toolbar	GT Designer3 can be operated by buttons.

Item	Description	
4) Docking window	A window that can be docked with the screen of GT Designer3. The docking location can be customized. The following shows the types of windows that can be docked.	
	[Utilize (Screen)] window	Searches a screen of another project which can be utilized.
	[Project] window	Displays the list of the settings of the whole project.
	[System] window	Displays the list of settings such as the GOT type settings, environmental settings, and controller settings.
	[Screen] window	Displays the list of created base screens and window screens. You can create a new base screen or window screen and edit existing screens.
	[Property] window	Displays the list of settings of a selected screen, figure, or object. You can edit the settings without opening the setting dialog of a figure, object and others.
	[Library] window	Displays the list of figures and objects registered in the library. You can utilize or edit the figures and objects and create a new figure or object in the library.
	[Data Browser] window	Displays the list of the settings in the project. You can search or edit the settings of a figure, object and others.
	[Data Check List] window	Displays the list of data check results.
	[Output] window	Displays the list of the change history when the project is converted because of change of the GOT type or other reasons.
	[Controller Type List] window	Displays the connection status of each channel.
	[Data View] window	Displays the list of the figures and objects on the screen editor. You can select a figure or object on the [Data View] window.
	[Screen Image List] window	Displays the list of the images of base screens and window screens. You can create a new base screen or window screen and edit existing screens.
[Category List] window	Displays the list of categories and figures and objects classified in each category. You can edit a category and execute batch change to the settings of devices by the category.	
[Parts Image List] window	Displays the list of the images of registered parts. You can create a new part or edit the existing parts.	
5) Editor tab	Displays the tabs of the windows and screen editors which are displayed on the work window.	
6) Temporary area	By arranging unnecessary objects on this area temporarily, you can create and edit screens easily.	
7) Screen editor	Creates a screen to be displayed on the GOT by arranging figures and objects on the screen editor.	
8) Status bar	Displays the following contents according to the position of the mouse cursor, a selected figure, or object. <ul style="list-style-type: none"> <li>• Description of the item over which the mouse cursor is moved.</li> <li>• The GOT type, color settings, and controller settings of the project being edited.</li> <li>• Coordinates of a selected figure or object</li> </ul>	



## 3.2.2 Features of GT Designer3

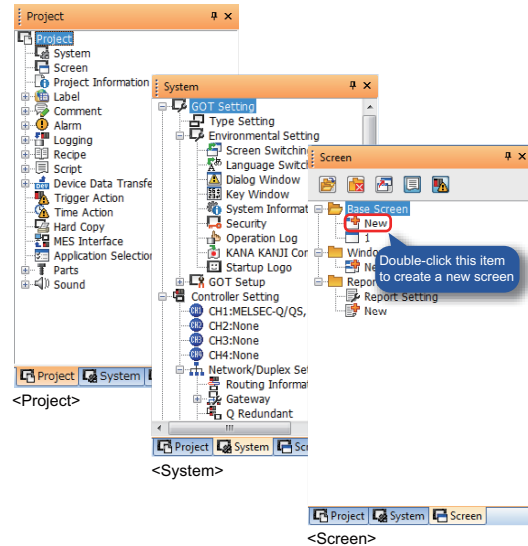
The following shows the features of GT Designer3.

### (1) Categorized setting items enable users to select an item easily. (Work tree)

Setting items in a project are categorized into "Project", "System", and "Screen" so that users can find an appropriate item easily.

Since all setting items are displayed, users can quickly find the one.

New screens or comments can be created just by double-clicking [New].



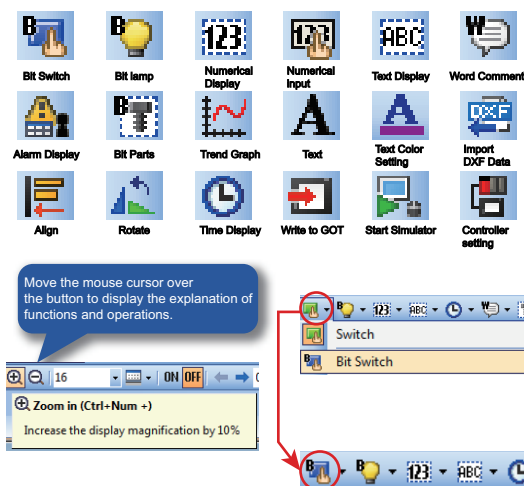
### (2) User-friendly icons and learning function improve efficiency. (Toolbar)

Simply designed colorful icons and easy explanations enable first-time users to design screens easily.

Since previous selections are stored, drawings can be efficiently executed.

For example, when creating a switch, select the bit switch from the menu or toolbar to switch the button at the top to the bit switch button.

From the next time, users do not need to select the bit switch from the sub menu. A bit switch can be created with just one click on the button.

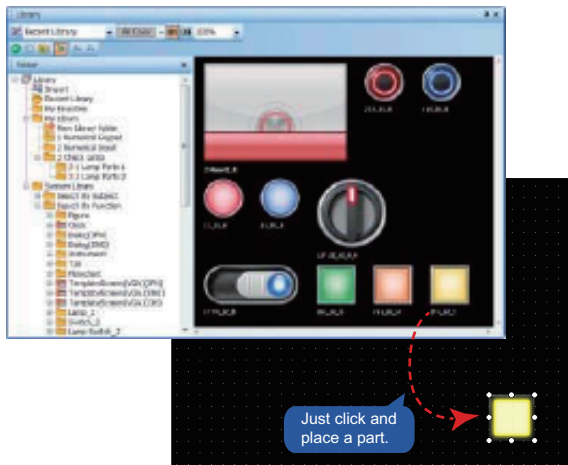


**(3) Parts to be used frequently can be registered. (Library)**

The tree view enables users to easily search for an item in the library.

Objects can be selected not only from [Appearance], but also from [Function] or [Recently Used Library].

Just by selecting parts from the library and placing them on the editor, a beautiful screen can be created easily.

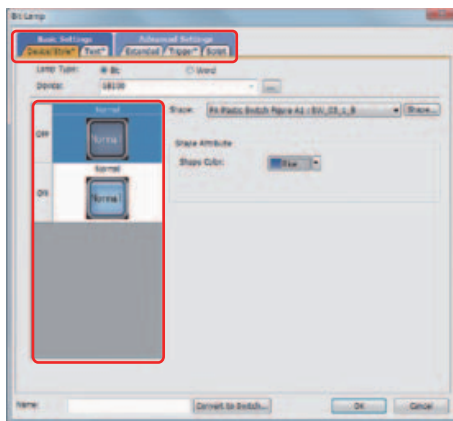


**(4) Users can intuitively configure settings or perform operations. (Dialog)**

User-friendly terms and display items enable users to intuitively configure settings and perform operations.

An asterisk "\*" displayed on a tab enables users to identify which setting has been modified.

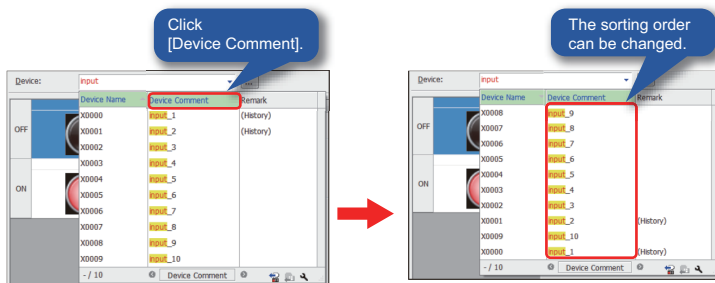
Users can configure the settings by checking the ON/OFF states of a lamp, touch switch, or other objects by displaying the display image from different range.



**(5) Input assist New**

It search device comments and device definitions with keywords, and narrow down utilizable devices.

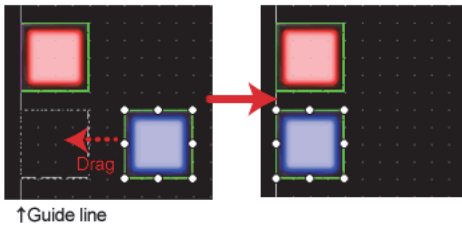
Every click on the header switches the display order of the items, in order of the ascending order, descending order, and no sort.



**(6) Easy alignment (Editor)**

When a figure or object is dragged to move, the line display target exists in the horizontal or vertical direction for easy alignment of objects.

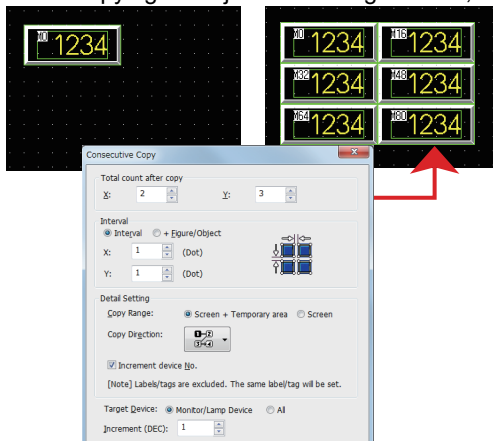
You can place figures and objects with the help of guidelines (auxiliary lines).



**(7) Easy placement using the consecutive copy (Editor)**

Figures or objects can be copied for a specified number all at once.

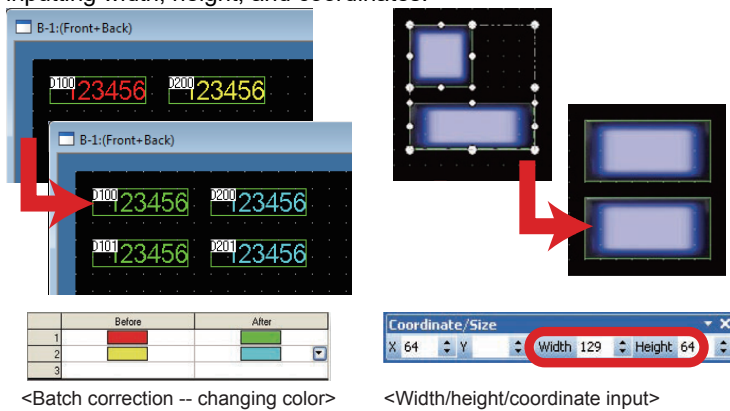
When copying an object containing devices, set the increment to assign device numbers.



**(8) Easy correction with [Batch Edit] (Editor)**

The settings of devices, colors, figures, channel numbers, and networks can be configured all at once using [Batch Edit].

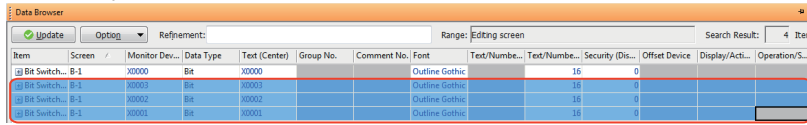
In [Width/height/coordinate input], change the size of selected objects and rearrange them all at once by inputting width, height, and coordinates.



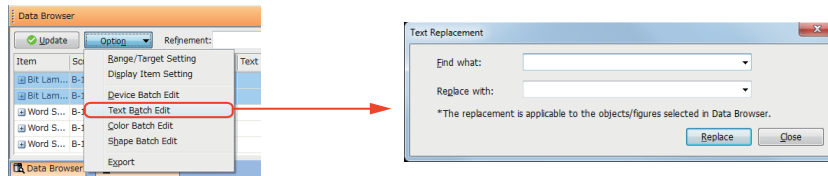
**(9) Data browser New**

The common setting, figures, and objects set in the project are displayed in a list.

The targets to be displayed in the data browser can be changed and the displayed settings can be changed collectively.



Example) When the [Text Batch Edit] is selected from the menu



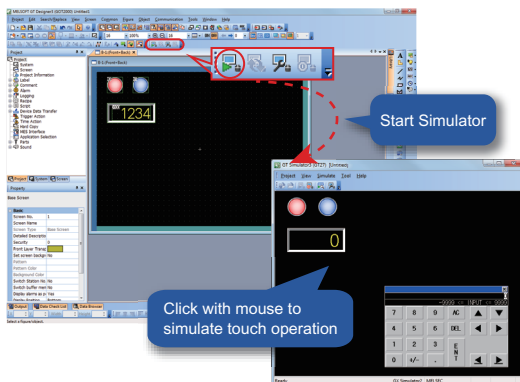
**(10) Simulation with just one click (Simulator)**

Use a personal computer to check the screen data operation. (Check alarms, monitor screen transition and devices.)

Data can be effectively debugged during the correction of a screen.

\*: One of the following is required separately.

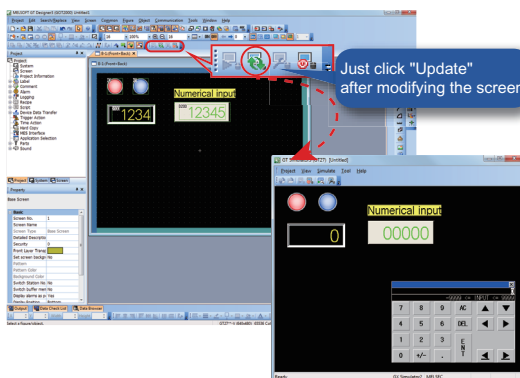
- CPU connection (RS232)
- CPU connection (USB)
- MT Simulator2
- GX Works2 and GX Simulator2



Even though a screen is being created (before the file is saved), the screen operation can be simulated with one click.

The following conventional operations are not required.

- Saving a file
- Starting the simulator
- Opening the file

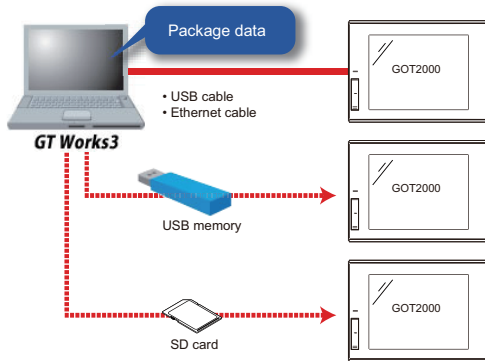


**(11) The required data is selected automatically. (Communication with the GOT)**

GT Designer3 (2000) selects the required system application, communication driver, and special data automatically from the project setting, adds them to the package data<sup>\*1</sup>, and while transferring it to GOT. The following shows the three methods for transferring data to the GOT.

- (a) Transferring data using cables
  - USB cable
  - Ethernet cable
- (b) Transferring data using a USB memory
- (c) Transferring data using an SD card

\*1 The package data consists of a project, basic system application, extended system application, and communication driver.



**(12) Effective use of screen assets (Data utilization (Project))** New

Use keywords to search for utilizable data from past projects or the provided sample projects. Even though users do not realize the setting content of the project, they can effectively create a new project by simply selecting utilizable data.

**Specify search range**  
Select "Sample Project" to reuse

**Select or input a keyword**  
Select a prepared keyword or input an arbitrary keyword

**Search results are displayed**

Choose the applicable project from the search result.

Procedure: [Project] ⇒ [New] ⇒ [Utilize Data]

## 3.3 How to use Help

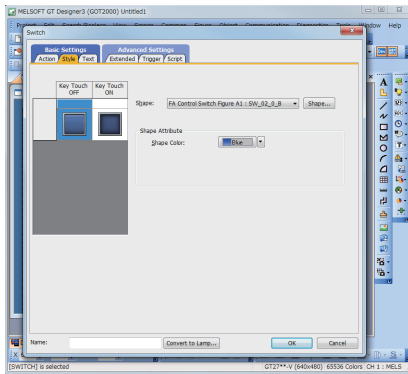
### 3.3.1 Displaying Help

(1) **Displaying Help from the menu**

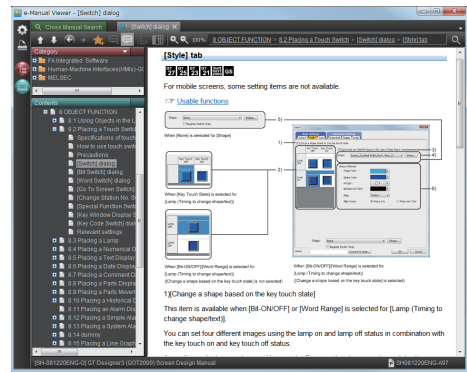
To display Help, select [Help] → [GT Designer3 Help] from the menu.

(2) **Displaying a page corresponding to the operation status of GT Designer3**

To display a page corresponding to the operation status of GT Designer3, press [F1] key while operating GT Designer3.



Press [F1] key while displaying the [Style] tab in the [Switch] dialog.



The page corresponding to the [Style] tab in the [Switch] dialog is shown.

(3) **Precautions in displaying Help**

(a) Relationship between Help and screen design software

The Help displayed in GT Designer3 (GOT2000) is for GT Designer3 (GOT2000).

To view Help of GT Designer3 (GOT1000), switch the screen design software mode from GT Designer3 (GOT2000) to GT Designer3 (GOT1000).

To switch the screen design software mode, use one of the following methods.

- Create a new project.
- Open GOT1000 project data.
- Select [Project] → [Start GT Designer3 (GOT1000)] from the menu.

(b) Switching the screen design software mode while Help is displayed

While Help is displayed, switching the screen design software mode cannot switch Help.

To switch Help, switch the screen design software mode, and then display Help.

(c) Starting GT Designer3

GT Designer3 starts in the mode used last time.

(The first startup of GT Designer3 activates GT Designer3 (GOT2000).)

To switch the screen design software mode, use one of the following methods.

- Create a new project.
- Open GOT1000 project data.
- Select [Project] → [Start GT Designer3 (GOT1000)] from the menu.

### 3.3.2 Using Help

Help is viewable using e-Manual Viewer.

For information on how to use e-Manual Viewer, refer to the following.

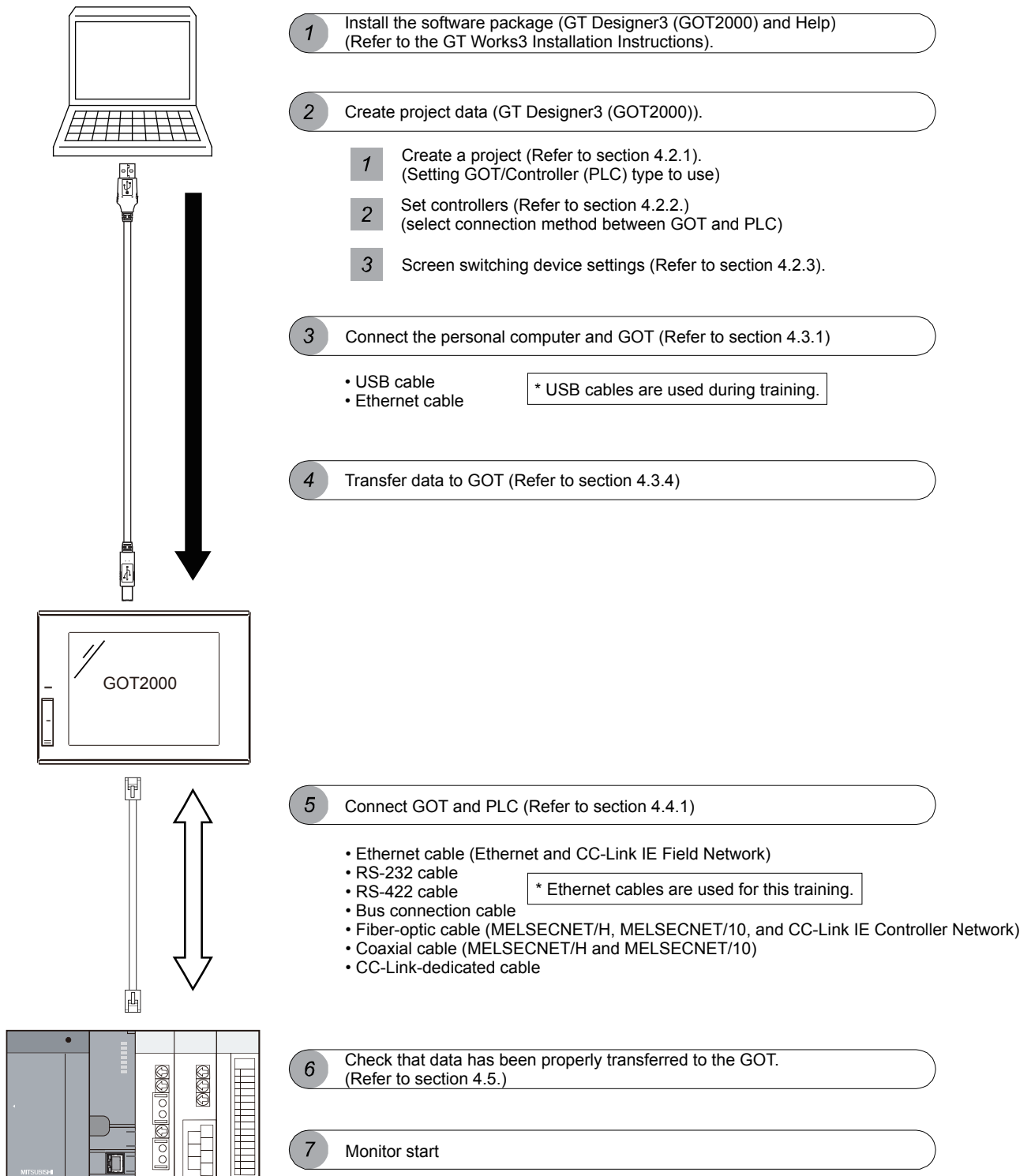
 e-Manual Viewer Help



# 4. From GOT screen creation up to the test

## 4.1 Preparation before using the GOT

This section describes the procedure of creating screens up to monitoring of PLC by the GOT.





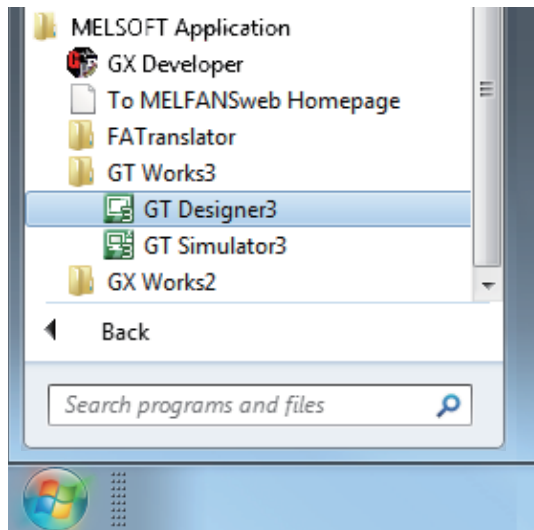
## 4.2 Screen creation

### 4.2.1 Project creation

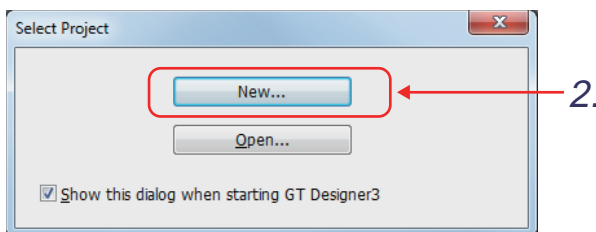
Projects comprise all the data and settings displayed in one GOT.

The screens displayed in the GOT and connection method with the PLC are set in a project wizard.

In this section, the settings for the type of GOT used for training and the type of PLC connected to the GOT are described.

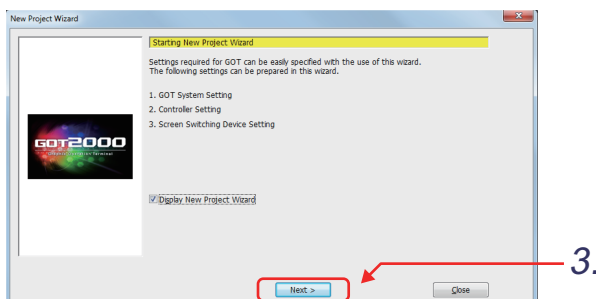


1. Click [Start] → [All Programs] → [MELSOFT Application] → [GT Works3] → [GT Designer3] menus to run GT Designer3 (GOT2000).



2. The screen on the left is displayed when GT Designer3 (GOT2000) is started.

Click the  button.



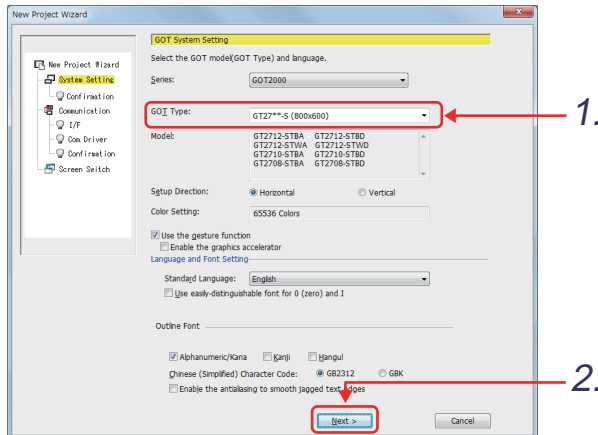
3. The initial screen of [New Project Wizard] is displayed. (When no new wizard appears, go to section 4.2.2.)

Click the  button.

Various settings that can be made on the project wizard are described on the following pages.

## (1) System settings for GOT

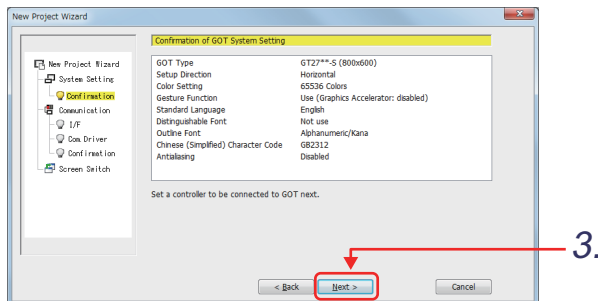
The GOT type to be used and the color are set.



1. When the left screen appears, set the GOT type and the color as follows.

GOT Type: **GT27\*\*-S (800x600)**

2. After the selection is made, click the **Next >** button.

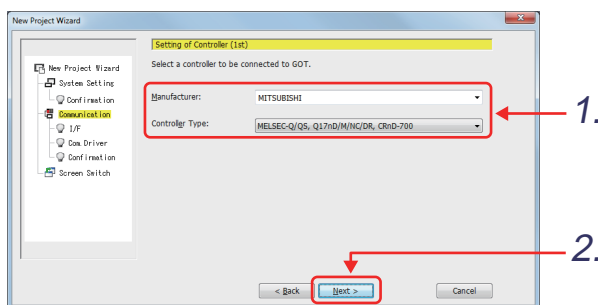


3. The left screen is displayed. Confirm the settings. Click the **Next >** button.

## (2) Communication Settings

The connection method for the device to be connected to GOT is set.  
(The settings made here can be changed later.)

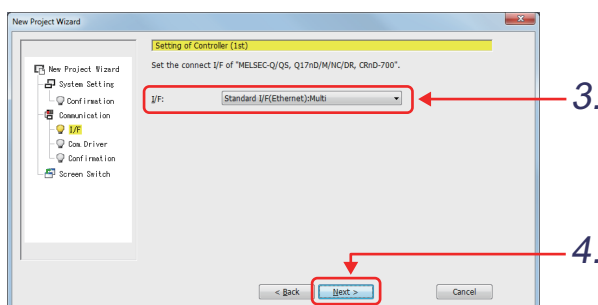
For details on communication settings, refer to section 4.2.2.



1. When the left screen appears, set manufacturer and the device to be connected as follows.

Manufacturer: MITSUBISHI  
Controller Type: MELSEC-Q/QS, Q17nD/  
M/NC/DR, CRnD-700

2. Click the **Next >** button.



3. When the left screen appears, set the connection I/F as follows.

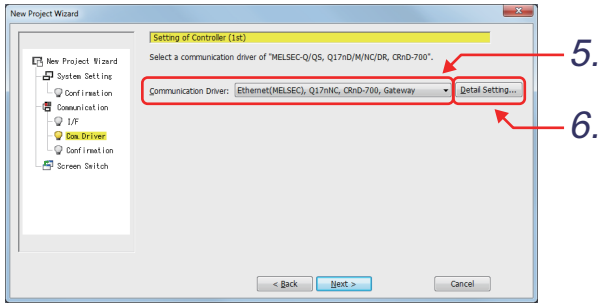
I/F: Standard I/F(Ethernet): Multi

4. Click the **Next >** button.



(Next page)

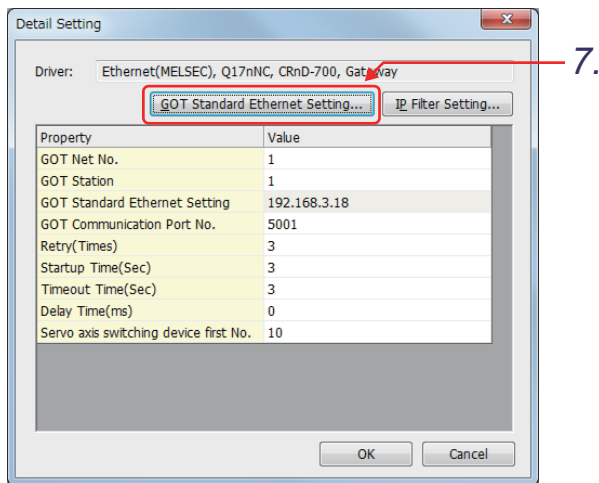
(From previous page)



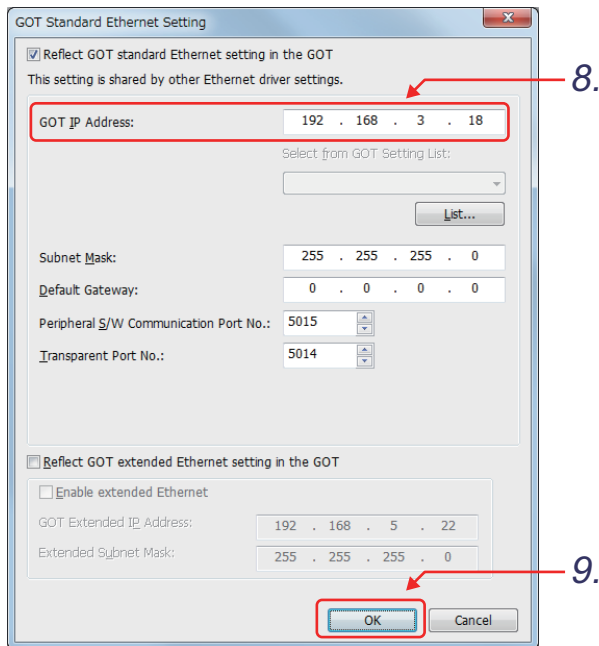
5. When the left screen appears, set the communication driver as follows.

Communication Driver:  
Ethernet(MELSEC),  
Q17nNC, CRnD-700,  
Gateway

6. Click the **Detail Setting...** button.



7. On the screen shown left, click the **GOT Standard Ethernet Setting...** button.



8. On the screen shown left, set the GOT IP address as follows.

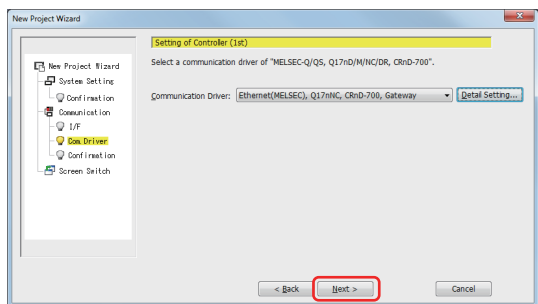
GOT IP Address: 192.168.3.18

9. Click the **OK** button to return to the [New Project Wizard] dialog.



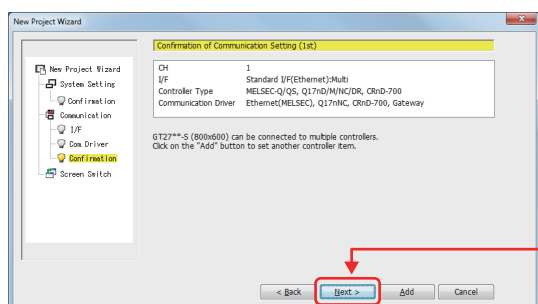
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10. Click the **Next >** button.

10.



11. The left screen is displayed.  
Confirm the settings.

Click the **Next >** button.

11.

## POINT

If GT Designer3 (GOT1000) starts while GT Designer3 is running, start GT Designer3 (GOT2000) by using one of the following methods.

- (1) Click [Project] → [Start GT Designer3 (GOT2000)] from the menu of GT Designer3 (GOT1000).
- (2) Select [GOT2000] and click the [Next] button in the [New Project Wizard] dialog of GT Designer3 (GOT1000).

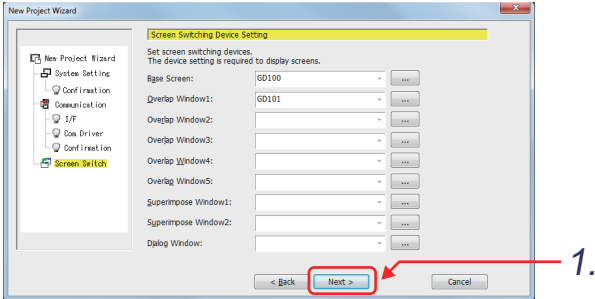
### (3) Setting of Screen Switch Device

The device for switching the screens displayed on GOT is set.  
(The settings made here can be changed later.)

Refer to section 4.2.3 for details on screen switching device settings.

1. When the left screen appears, the screen switching device is set as follows.

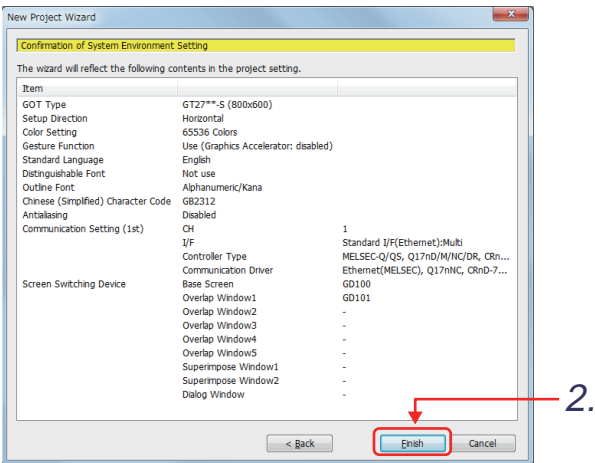
<b>Base Screen</b>	<b>: GD100</b>
Overlap Window1	<b>: GD101</b>
Overlap Window2	: - (no setting)
Overlap Window3	: - (no setting)
Overlap Window4	: - (no setting)
Overlap Window5	: - (no setting)
Superimpose Window1	: - (no setting)
Superimpose Window2	: - (no setting)
Dialog Window	: - (no setting)



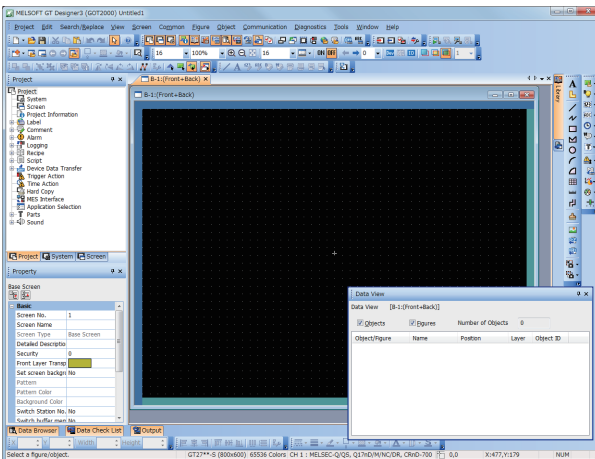
Click the **Next >** button.

2. The left screen is displayed. Confirm the settings.

Click the **Finish** button.



3. Base screen1 is created. The screen is ready for drawing.



## POINT

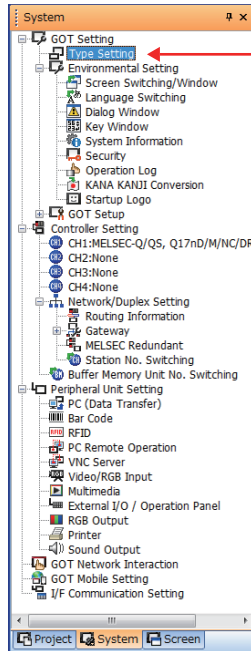
Up to 32 characters can be entered as a project name, regardless of whether they are one-byte or two-byte characters.

## Remark

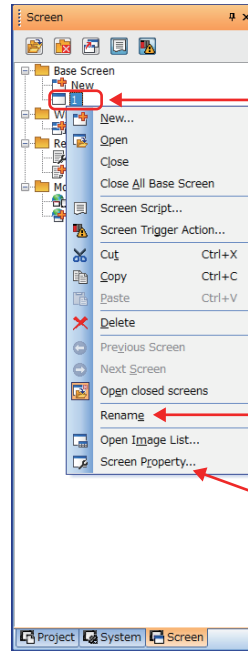
### (1) Changing the GOT type or screen title

The GOT type and screen title settings can be changed in the docking window.

- Changing the GOT type
- Changing the screen title



Double-click this item.



1. Right-click this item.

2. Change the screen title.

• Change the screen title directly.

• Change the screen title in the [Screen Property] dialog.

- (2) For the details of the GOT type and screen title settings, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## 4.2.2 Communication settings

### POINT

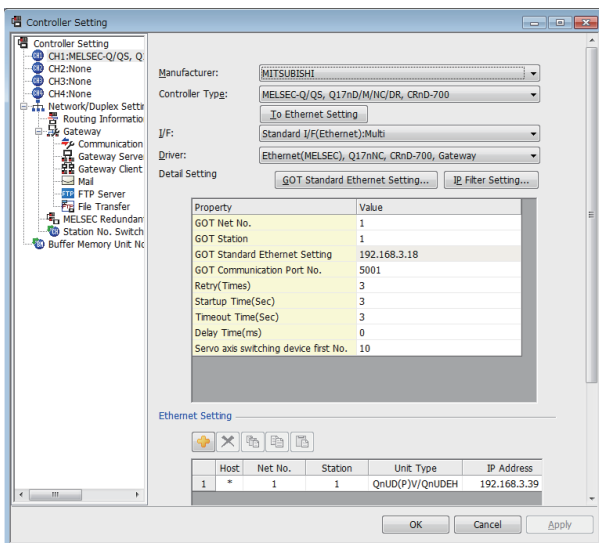
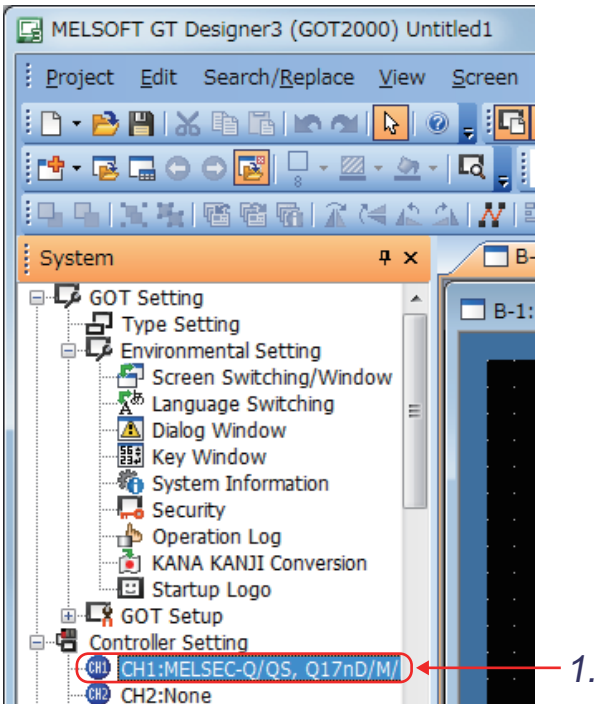
Settings described in this section are not required when settings are made on the new project wizard (Section 4.2.1).

The GOT and PLC CPU communication settings are performed.

When using the GOT for the first time, set the channel number and communication driver for the communication interface, and write the settings to the GOT.

This section explains how to connect the GOT to the Ethernet port built in a Q(nUDV)CPU via Ethernet.

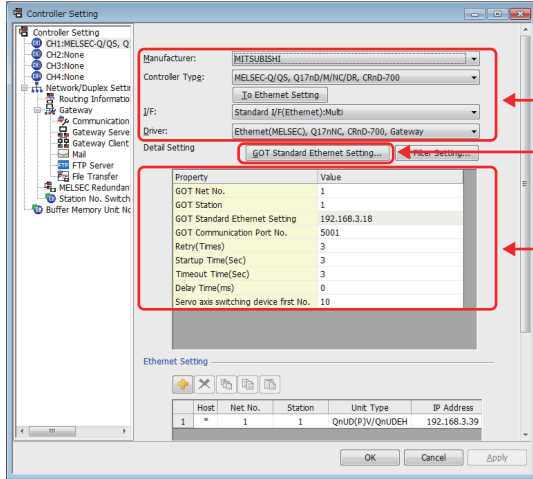
1. Double-click [CH1] in the [Controller Setting] menu in the system tree.



(Next page)

2. The [Controller Setting] dialog appears.

(From previous page)



3. Configure the controller setting.  
Set the items as shown below.  
(Settings for this item have already been performed in the new project wizard described in section 4.2.1.)

Manufacturer: MITSUBISHI  
Controller Type: MELSEC-Q/ QS, Q17nD/  
M/NC/DR, CRnD-700  
I/F: Standard I/F(Ethernet):Multi  
Driver: Ethernet(MELSEC), Q17nNC,  
CRnD-700, Gateway

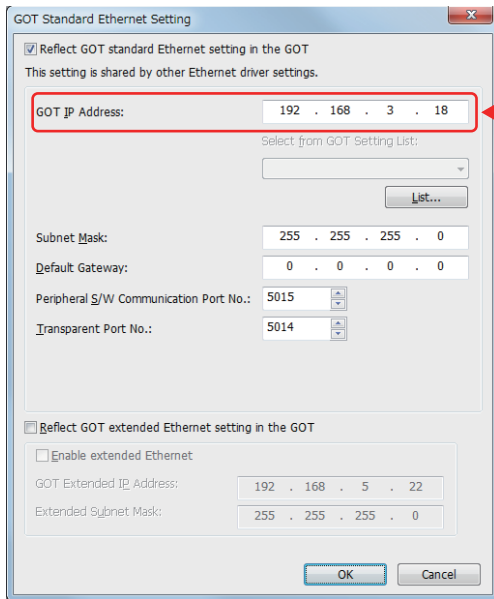
4. Configure the detail setting as follows.

GOT Net No.: 1  
GOT Station: 1  
GOT Communication Port No.: 5001  
For the other items, use their default setting.

5. Click the **GOT Standard Ethernet Setting...** button.

6. On the screen shown left, set the GOT IP address as follows.  
(Settings for this item have already been performed in the new project wizard described in section 4.2.1.)

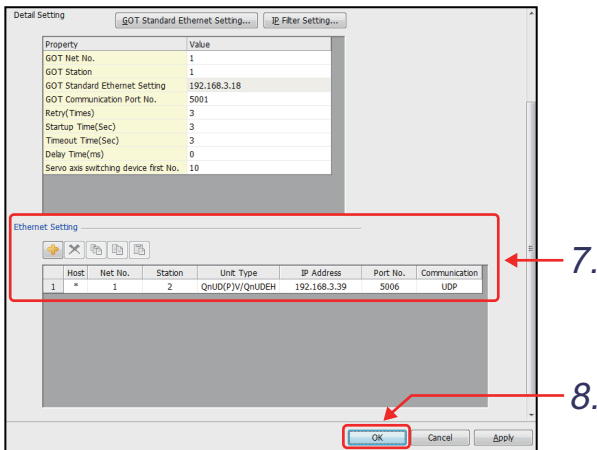
GOT IP Address: 192.168.3.18  
For the other items, use their default setting.



(Next page)



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7. Configure the Ethernet setting as follows.

Net No.: 1 (Virtual)  
Station: 2 (Virtual)  
Unit Type: QnUD(P)/QnUDEH  
IP Address: 192.168.3.39  
Port No.: 5006  
Communication: UDP

8. Click the  button.

## POINT

### Ethernet setting

When the GOT is connected to the Ethernet port built in the QnUDVCPUs or other PLC CPUs via the Ethernet connection, the setting items [Net No.] and [Station] do not exist on the PLC side. However, virtual values need to be set for the items when the device setting is configured on the GOT side as [Net No.] and [Station] are used to identify the CPU.

Setting virtual values is required only for the Ethernet connection with built-in Ethernet PLCs. For the QJ71E71 connection, the Net No. and station number set to the module are required.

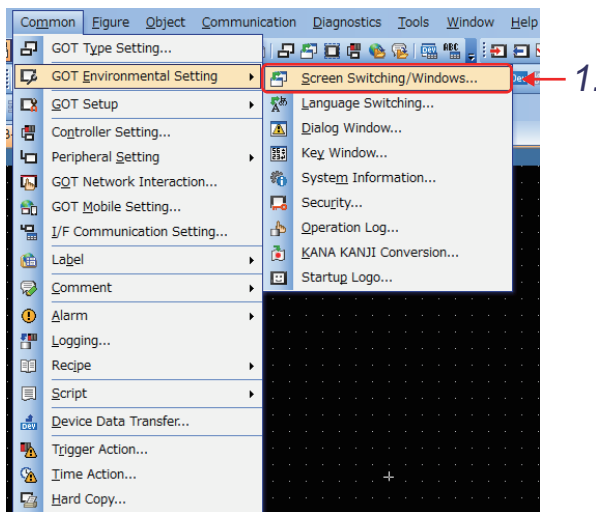
## Remark

- For the details of [Controller Setting], refer to the GOT2000 Series Connection Manual (Mitsubishi Products).
- [Controller Setting] can also be performed with the GOT Utility.
- For the details of [Controller Setting] in the utility, refer to the GOT2000 Series User's Manual (Utility).

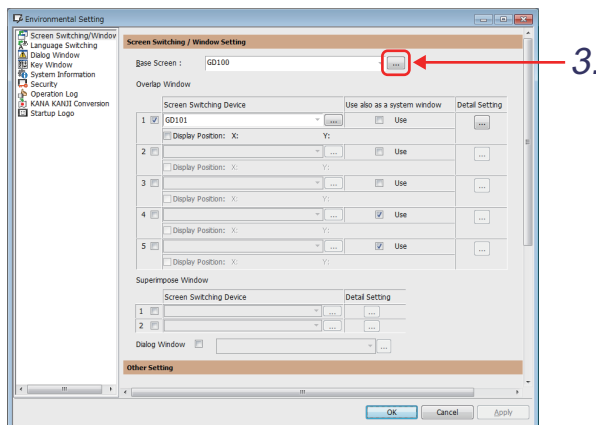
## 4.2.3 Screen switching device settings

This section explains screen switching device settings.

Set the base screen switching device to "D0", and the Overlap window1 screen switching device to "D1".



1. Click on the [Common] – [GOT Environmental Setting] – [Screen Switching/Windows] menu.



2. The [Environmental Setting] dialog box is displayed.
3. Click the  button and set a screen switching device for the current base screen.



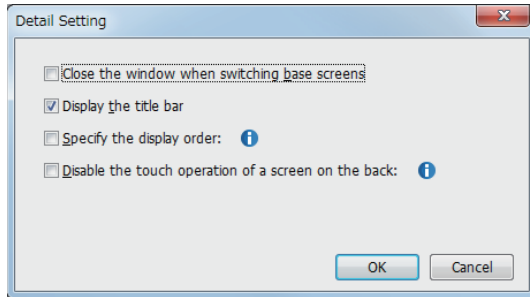
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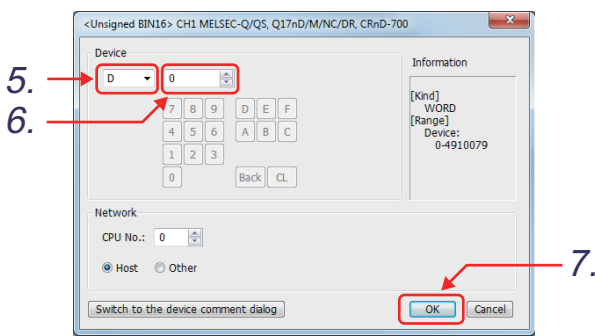


## POINT

In the [Detail Setting] dialog box, the following contents can be set.



- [Close the window when switching base screens]  
Closes the overlap window automatically without [X] when the base screen is switched.
- [Display the title bar]  
Displays a title bar on the overlap window.
- [Specify the display order]  
Select a stacking order number for the overlap window.
- [Disable the touch operation of a screen on the back]  
Displays the overlap window in the front regardless of the setting of Specify the display order and disables the touch operation on the screens behind the overlap window. Select this item, and then select a condition for disabling the touch operation.

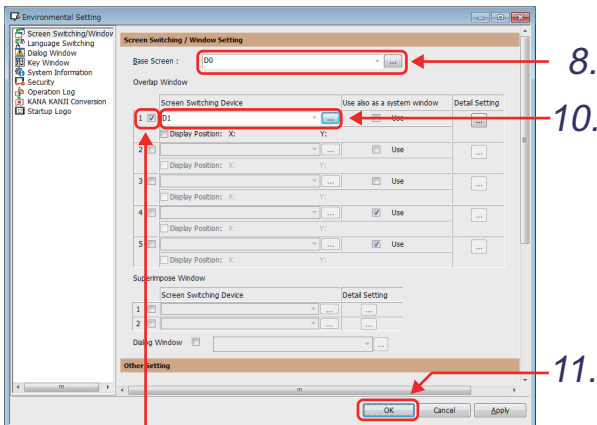


4. The device dialog box is displayed.

5. Click and set to "D".

6. Click and set to "0".

7. After settings are completed, click the button.



8. Check that "D0" is set in the switching device.

9. Check "Overlap Window 1" and set the switching device to enable Overlap window.

10. Click the button and set the "Screen Switching Device" to "D1".

11. Click the button.

9.

## POINT

### (1) Screen switching device settings

With the screen switching device, refer to the following to set the devices to be used.

#### (a) GOT internal device (GD)

It is recommended to use a GD device when screens are not switched by a PLC CPU.

Switch between screens with a specific touch switch ([Go To Screen Switch]).

With the screen switching device, the internal device (GD100) is set by default.

#### (b) PLC CPU device (D,W, etc.)

It is recommended to use this device to control screen switching from the PLC CPU.

Screen switching can also be performed by the touch switch (screen switching switch).

### (2) GOT internal devices

They are devices kept in the internal of GOT.

The internal devices of GOT are classified into the following types.

- GOT bit register (GB) : Bit register located inside the GOT and used as bit devices.
- GOT data register (GD) : Data register located inside the GOT and used as word devices.
- GOT special register (GS) : Special register located inside the GOT, which stores internal information, communication status error information, etc.  
By monitoring GS with the object function, various information of the GOT can be checked.  
Writing values by a user, controls the GOT operations.

### (3) Using an overlap window as the system window

System window includes test windows, remote screens of the remote personal computer operation (Ethernet), and window screens which are used for system applications.

Use the system window by assigning any overlap window.

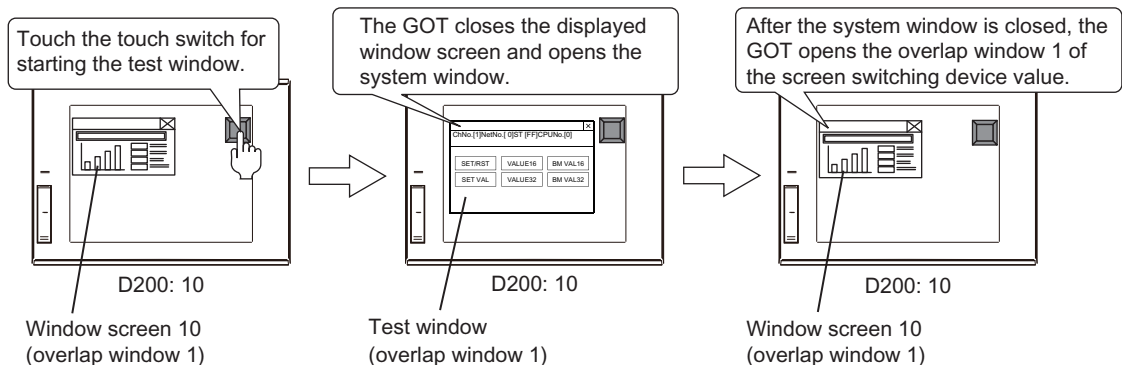
You can also display the window screen with an overlap window for which the system window is assigned when the system window is not used.

If the system window is called while a window screen is displayed with the overlap window, the GOT closes that window screen and opens that system window.

After the system window is closed, the window screen whose screen No. is the same as the value of the screen switching device is displayed again.

Example) Switching between a system window and a window screen

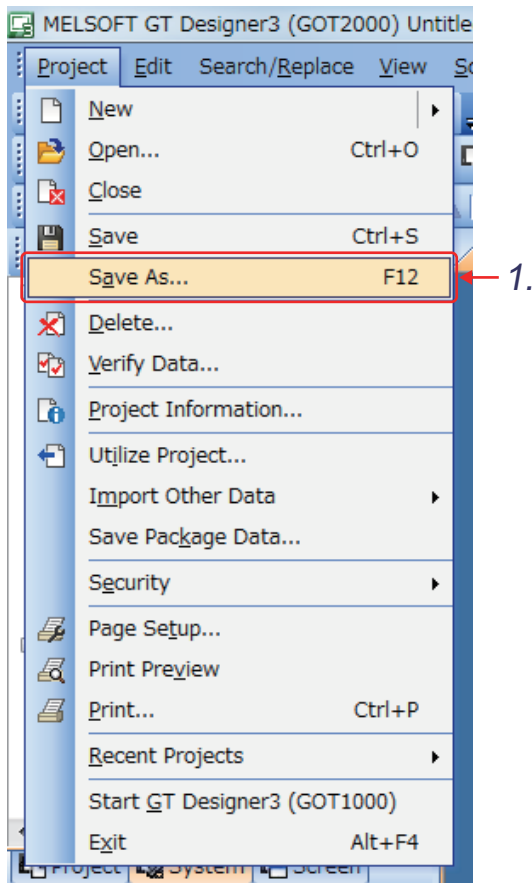
(Overlap window 1 is used as the system window and D200 is set for the screen switching device.)



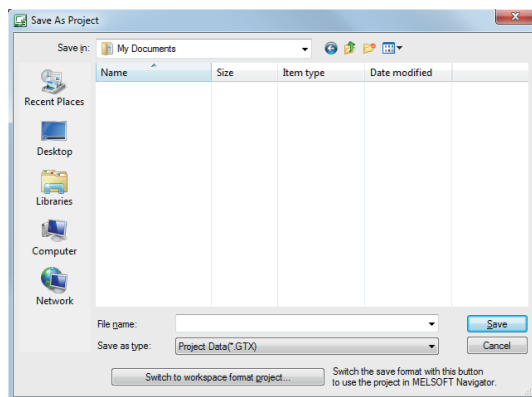
## 4.2.4 Saving the project data

This section explains the operations to save the created project data.  
This section explains to save a project to a desktop with an example.

1. Click on the [Project] – [Save As] menu.

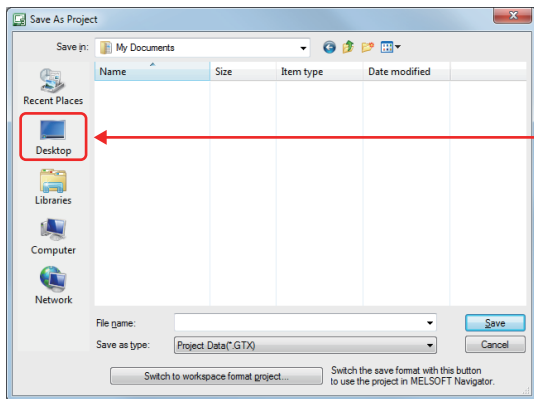


2. The [Save As Project] dialog appears.

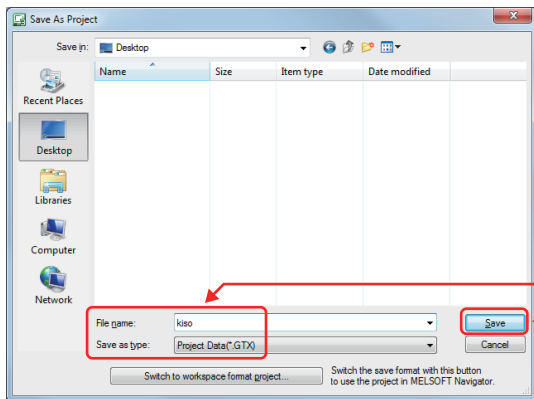


(Next page)

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3. Select "Desktop" for [Save in].



4. Set the file name of the project to be saved as follows.

File name : "kiso"

Save as type : Project Data(\*.GTX)

5. Click the  button to save the project.

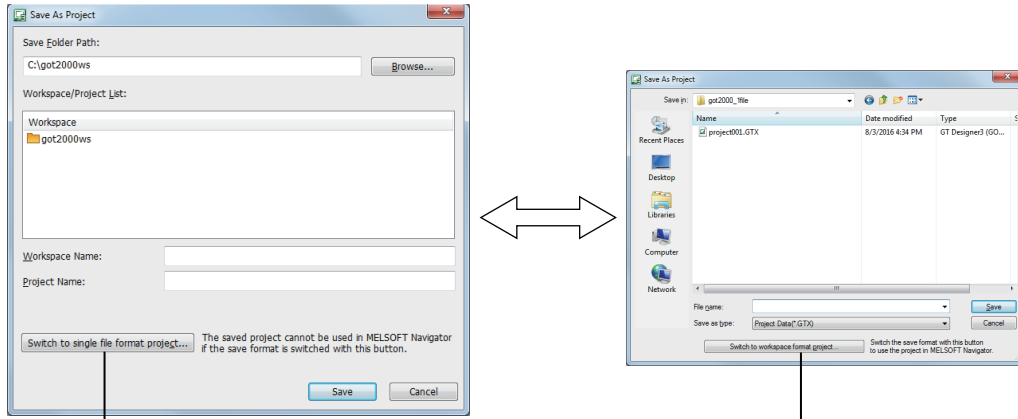
## Remark

Select [Project] → [Save As] from the menu to display the [Save As Project] dialog.

- Single file format: Save the project in the [Save As Project] dialog.
- Workspace format: Save the project in the [Save As Project] dialog.

In this textbook, the project is saved in the single file format.

If the [Save As Project] with Workspace Format Project dialog appears, click the [Switch to single file format project] button to switch the dialog to [Save As Project] with Single File Format.



Switching to the [Single File format Project..] dialog

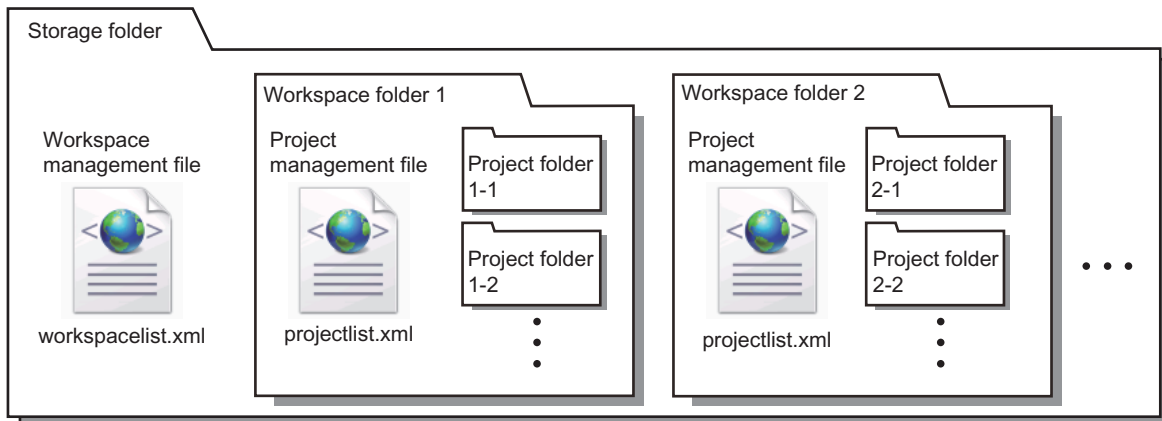
Switching to the [Workspace format Project..] dialog

For information on how to save a project in the workspace format, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## HINT



The workspace format project is the file format to manage multiple projects in the workspace. The workspace format project consists of multiple folders and files as the figure below.



Example of opening a workspace format project from MELSOFT Navigator

### Folder and file operations of the workspace format project **Note**

If you manipulate (move, rename, copy, or delete) a folder or file in a workspace format project by using Windows Explorer or other tools on a personal computer, the project cannot be opened with GT Designer3. Manipulate folders or files in a workspace format project by using the following procedure.

#### (1) Moving a project

1. Open a project to be moved.
2. Select [Project] → [Save As] from the menu and select the destination in [Save Folder Path] to save the project.
3. Delete the original project.

#### (2) Changing a project name

1. Open the project to change the name.
2. Select [Project] → [Save As] from the menu to save the project after changing the name.
3. Delete the original project.

#### (3) Copying a project

1. Open the project to be copied.
2. Select [Project] → [Save As] from the menu to save the project after changing the name.

#### (4) Deleting a project

1. Select [Project] → [Delete] from the menu to display the [Delete Project] dialog.
2. Select a project to be deleted from [Workspace/Project List] and click the [Delete] button. The selected project is deleted.

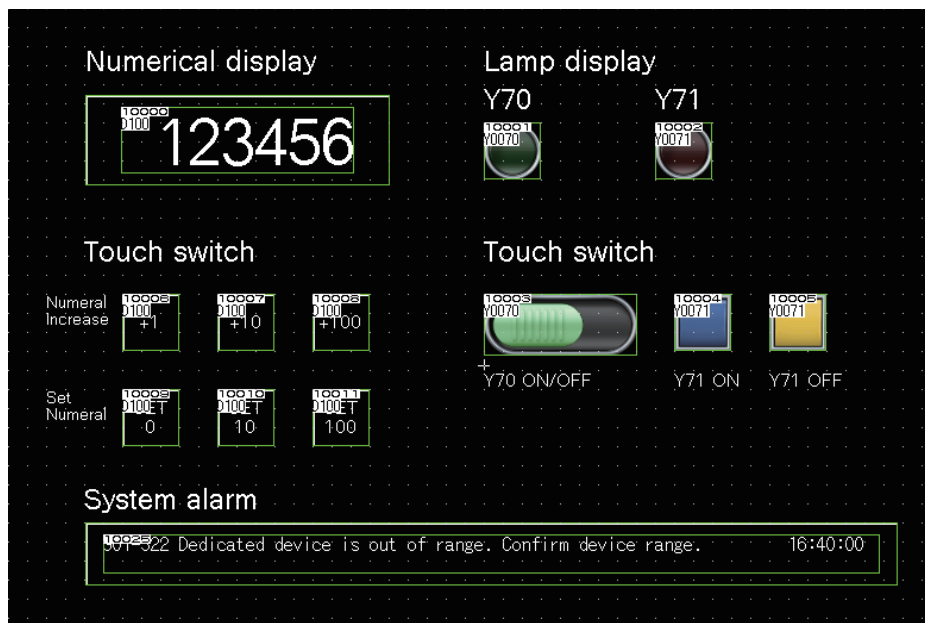


## 4.2.5 Reading screens

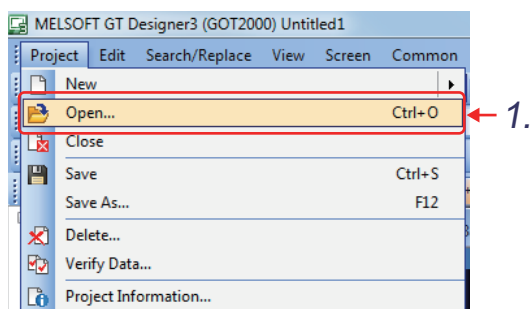
In this section, training is performed using screen prepared beforehand.  
(Specific creation methods for screen are explained in chapter 5.)

### Remark

Screen data is loaded from the project named "school" for which the settings described in sections 4.2.1 and 4.2.2 are configured.



### (1) Opening the project

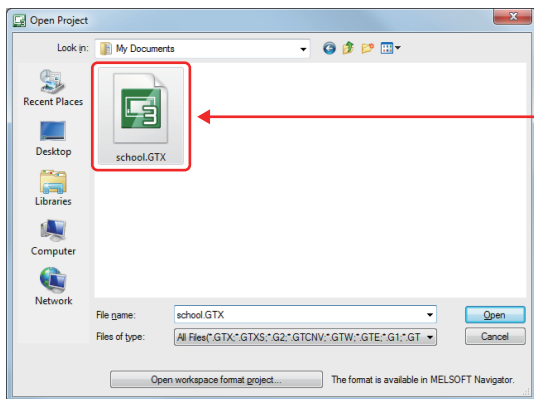


1. Click on the [Project] – [Open] menu.

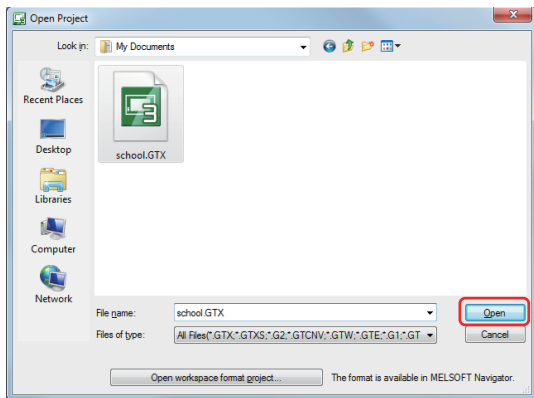


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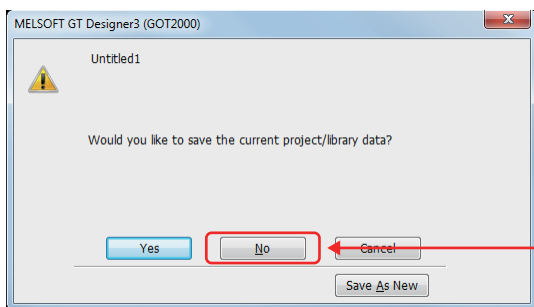
(From previous page)



2. The [Open Project] dialog box appears and select "school.GTX".



3. Click the  button.

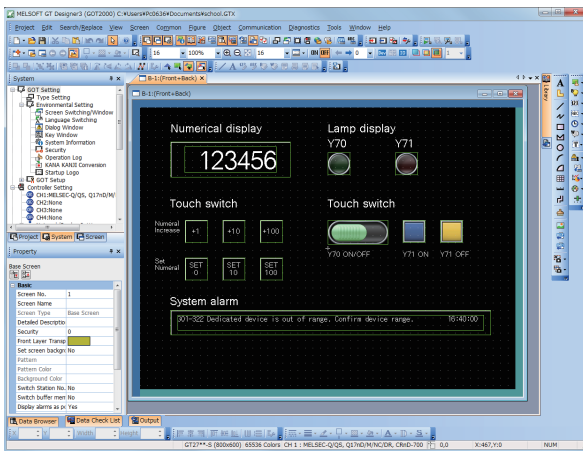


4. As the dialog box to confirm whether to save the project data created this time appears, click the  button.



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5. The screen is read.

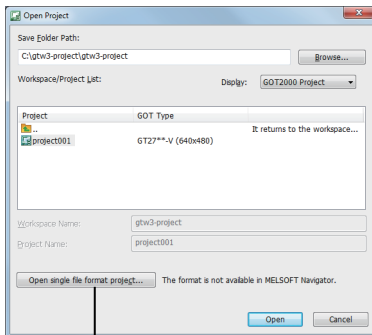


Select [Project] → [Open] from the menu to display the [Open Project] dialog.

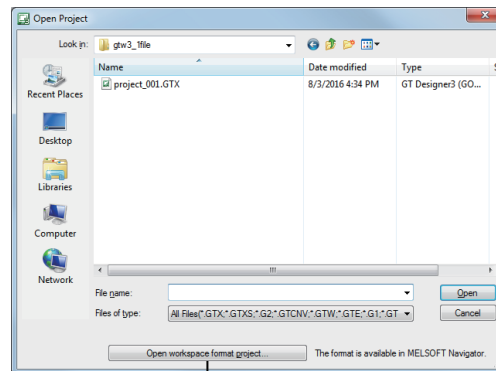
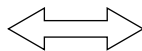
- Workspace format: Open the project from the [Open Project] dialog (workspace format).
- Single file format: Open the project from the [Open Project] dialog (single file format).

In this textbook, a project in the single file format is opened.

If the [Open Project] dialog (workspace format) appears, switch the dialog to the [Open Project] dialog (single file format) using the [Open single file format project] button.



Switching to the [Open Project] dialog  
(single file format)



Switching to the [Open Project] dialog  
(workspace format)

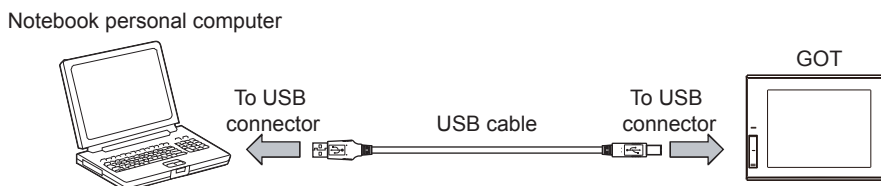
For information on how to save a project in the workspace format, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## 4.3 Data transfer (personal computer to GOT)

This section explains procedures for writing data created on GT Designer3 to the GOT.

### 4.3.1 Connection from a personal computer to GOT

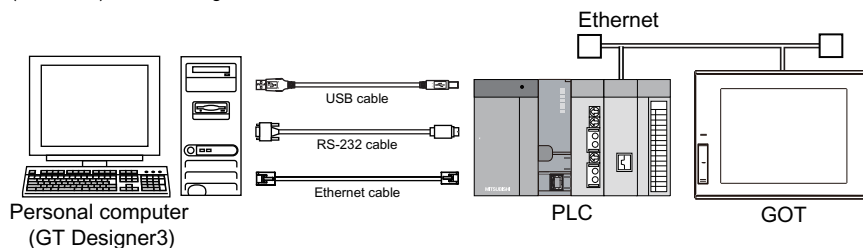
Connect the personal computer and GOT.



#### Remark

To connect the personal computer and GOT, RS-232<sup>\*1</sup> or Ethernet can be used in addition to the USB cable. Use of the USB cable enables the data to be transferred at higher speed and reduces the operation time as compared with RS-232 communication.

\*1 When using an RS-232 cable, connect the personal computer and GOT via a PLC. For the details, refer to the GT Designer3 (GOT2000) Screen Design Manual.



## 4.3.2 About data types transferred to the GOT

To operate the GOT, it is necessary to transfer the following types of data to the GOT.

Data type	Outline	Data transfer timing
Boot OS	The program needed to control GOT hardware, and during communication between GOT and personal computers. As the BootOS has been installed to the GOT at the factory, installing the BootOS is usually unnecessary.	<ul style="list-style-type: none"> <li>When restoring the factory default settings to the GOT (Installing the BootOS is usually unnecessary.)</li> </ul>
Package data	Data consists of a project, standard system applications, extended system applications, communication drivers, and special data.	<ul style="list-style-type: none"> <li>When using GOT for the first time</li> <li>When changing screens or settings</li> <li>When changing the functions to be used (extended system applications) or communication type</li> <li>When upgrading the versions of system applications</li> </ul>
Project data (Required)	Data for user-made monitor screens, such as screen data, comments, common settings, etc.	
Standard system applications (Required)	Applications to operate the GOT and display the utility.	
Extended system applications	Applications to enable some functions of the GOT, such as the system monitor function and the logging function.	
Communication driver (Required)	Drivers required for the GOT to communicate with controllers.	
Special data	Special data is used for the intelligent module monitor, R motion monitor, Q motion monitor, or servo amplifier monitor.	
Resource data	All types of data created in the GOT main unit, such as recipe file, alarm log file, etc.	<ul style="list-style-type: none"> <li>Varies depending on each GOT function</li> </ul>

\*1 For the extended system applications, refer to section 6.1.

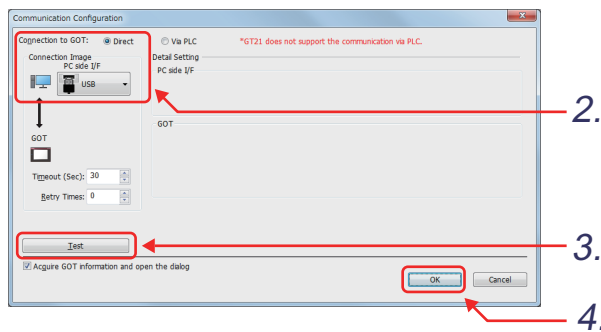
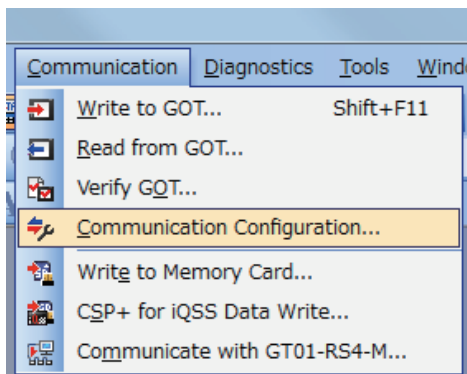
### POINT

**With GOT, data exchange between the personal computer and GOT is expressed in the following terms.**

- Write: Write package data or install the BootOS to the GOT from a personal computer.
- Read: Load project data, package data, resource data, or drive information to a personal computer from the GOT.

### 4.3.3 Communication settings

Settings for communication between the personal computer and the GOT are performed.



1. Click on the [Communication] – [Communication Configuration] menu.

2. In the [Communication Configuration] dialog, set the connection method and the connection interface as shown below.

Connection to GOT: Direct

PC side I/F: USB

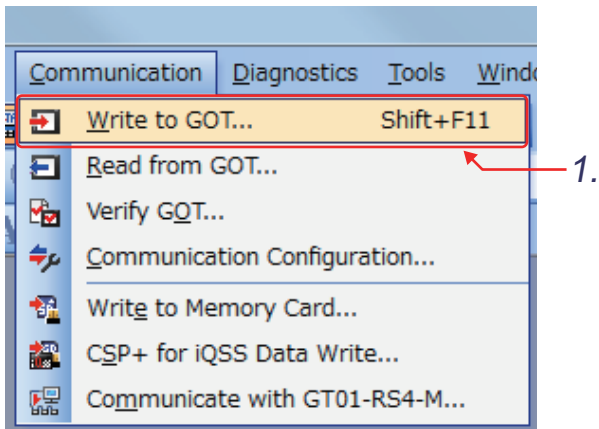
(In training, to connect the personal computer and GOT with the USB cable)

3. Click the  button. The message "Successfully connected" appears.

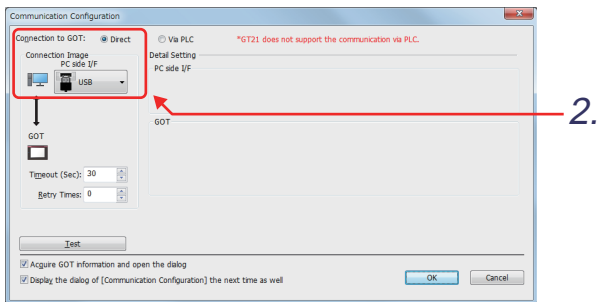
4. Click the  button.

### 4.3.4 Writing the package data

This section describes how to write package data to the GOT.



1. Click [Communication] → [Write to GOT] from the menu.



2. When the [Communication Configuration] dialog appears, configure the settings as follows and click the **OK** button.

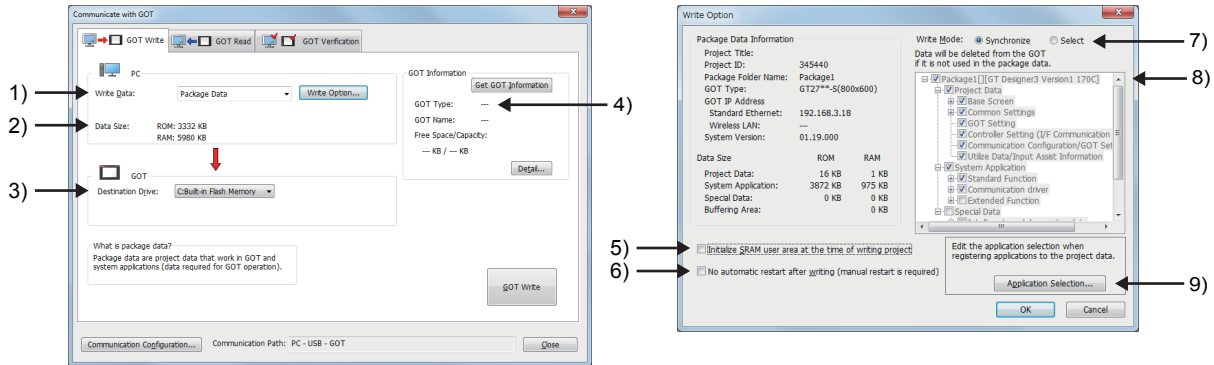
Connection to GOT: Direct  
PC side I/F: USB



(Next page)

- The [Communicate with GOT] dialog appears.  
Click the [Write Option] button to display the [Write Option] dialog.

<[Communicate with GOT] dialog box>

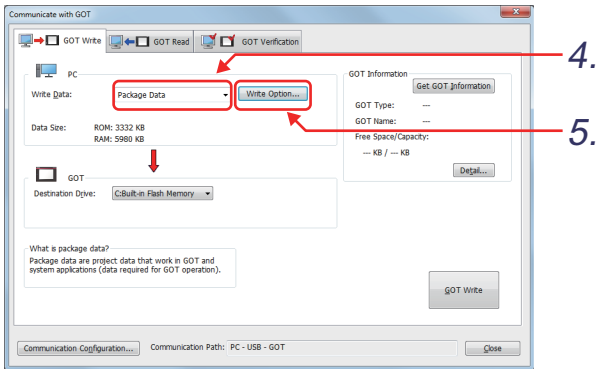


- Write Data:**  
Select the type of the data to be written to the GOT.
- Data Size:**  
Displays the size of the data to be written to the GOT.
- Destination Drive:**  
Select a GOT drive to which the project data or system applications are written.
- GOT Type:**  
Select a GOT type. The GOT type set in [GOT Type Setting] of the project data is fixed.
- Initialize SRAM user area at the time of writing project:**  
Initialize the SRAM user area when the package data is written to the GOT.
- No automatic restart after writing (manual restart is required):**  
The GOT does not restart automatically after the package data is written to the GOT.  
When this item is selected, the GOT is required to be restarted manually after writing.
- Write Mode:**  
Select the write mode of the package data.
  - [Synchronize]  
Only the required data is written according to the difference with the package data which has already been written to the GOT.  
The data which is not related to the package in the GOT is deleted.
  - [Select]  
Only the data selected in the package data tree is written.
- Package data tree:**  
The data included in the package data is displayed in the tree.  
When [Select] is selected for [Write Mode], the data can be added or deleted.
- Application Selection... button:**  
This button is displayed only when [Synchronize] is selected for [Write Mode].  
Clicking this button displays the [Application Selection] dialog.

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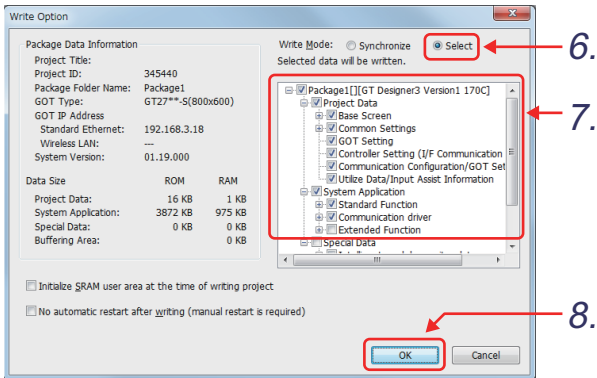


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4. Select [Package Data] in [Write Data].

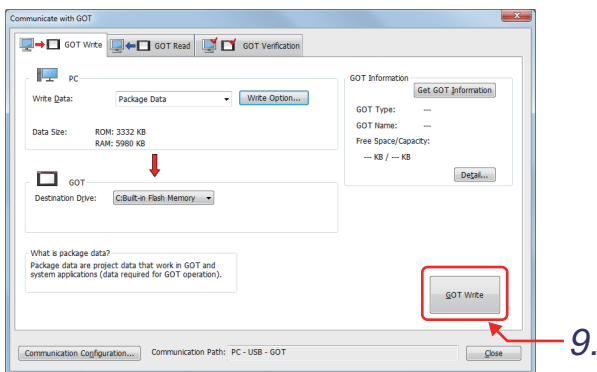
5. Click the  button.



6. Select [Select] of [Write Mode].

7. Select the data to write.

8. Click the  button.

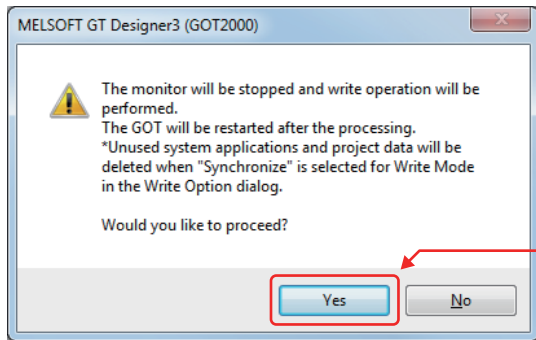


9. Click the  button.

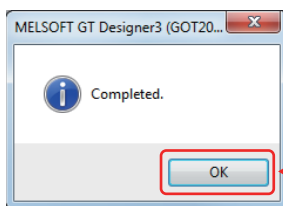


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10. Click the  button to write the screen data.

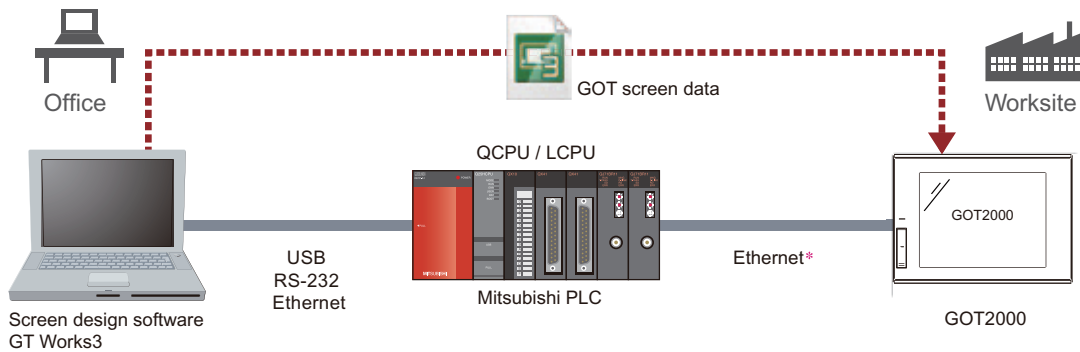


11. When writing the data is completed, a completion message appears. Click the  button. After writing the data has been completed, the GOT restarts automatically.

## POINT

### Transferring data via a PLC

GOT screen data can be transferred from a personal computer to the GOT via a PLC. Editing GOT screen data during startup can be performed without changing cables.



\* This feature does not apply to a GOT connected to a CPU's built-in Ethernet port.

For the details, refer to the GT Designer3 (GOT2000) Screen Design Manual.

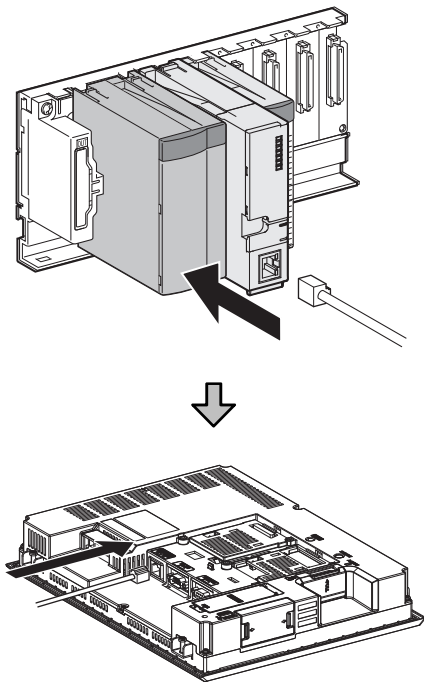
## 4.4 Connection to PLC CPU (Ethernet connection)

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### 4.4.1 Connecting the cable

---

This section explains connection procedures for connecting the GOT and PLC CPU with the Ethernet connection cable.



1. Power OFF the PLC CPU and GOT.
2. Connect the Ethernet connection cable to the PLC module.
3. Connect the Ethernet connection cable to the GOT.

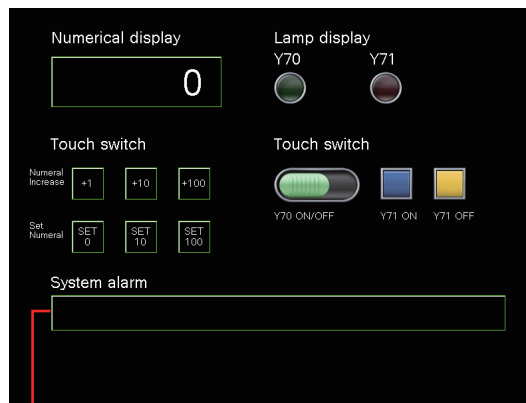
# 4.5 Checking whether data has been properly transferred to the GOT

## 4.5.1 System alarm

The system alarm is a function used to display error codes and error messages when error occurs in the PLC, GOT, servo amplifier, communication system, etc.

Error messages displayed in the system alarm do not need to be registered. (They are registered in GOT.)

If the system alarm is set in the screen beforehand, displaying system alarm allows a user to check how the error occurred and its cause.



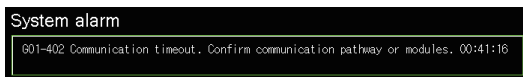
System Alarm display area

- Under normal conditions



When nothing appears in the System Alarm, communication is normal.

- When an error occurs



When an error message appears in the System Alarm, check whether there is a cable disconnection and the condition of the PLC.

### POINT

Error messages to be displayed in the system alarm can be checked by using the following methods besides setting the system alarm.

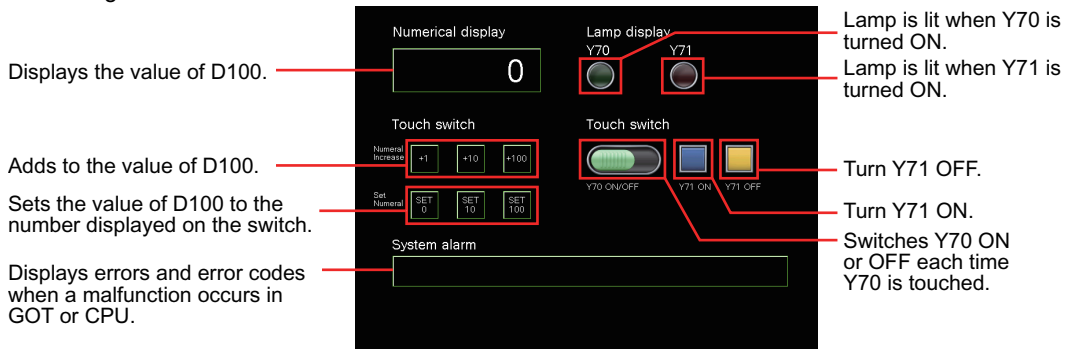
- [Maintenance] tab of the utility menu of the GOT
- [System alarm]
- [Batch self check]

With [Batch self check], the error message history can also be checked.

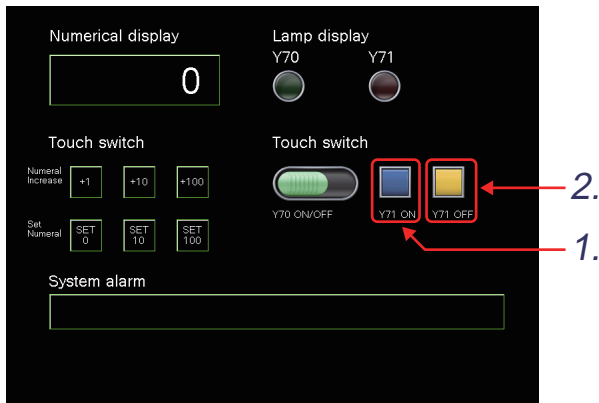
## 4.5.2 Executing the monitor

Operate the screen written to the GOT, and monitor the PLC.

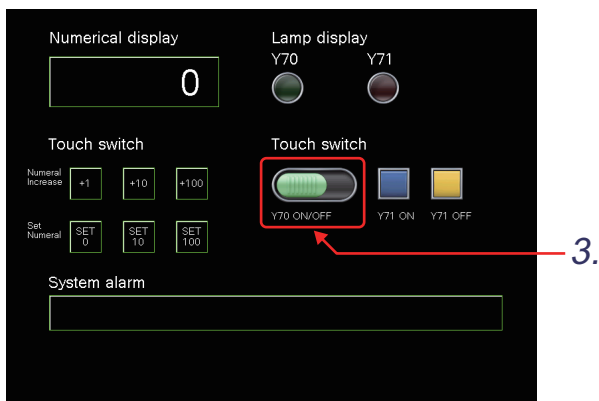
GOT Operation Image



### (1) Monitoring/changing the bit device (Y70, Y71) values

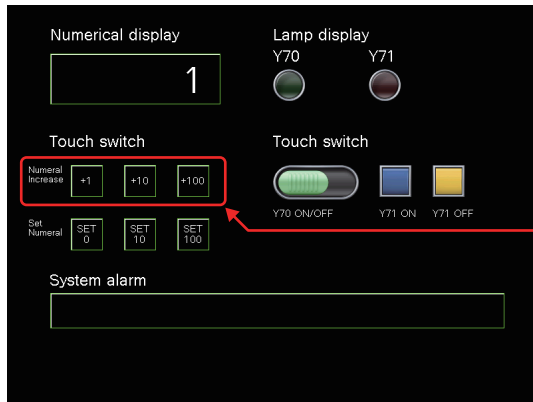


1. When the [Y71 ON] switch is touched, the Y71 becomes ON.
2. When the [Y71 OFF] switch is touched, the Y71 goes OFF.

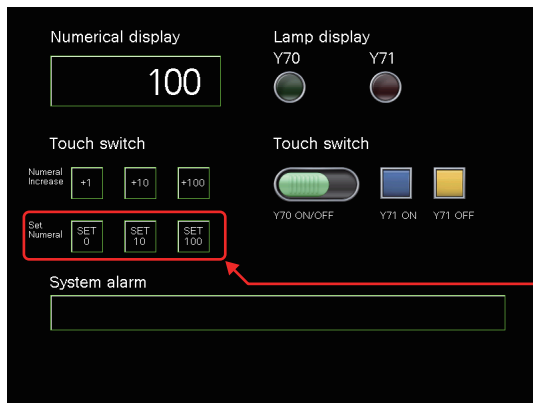


3. Each time the [Y70 ON/OFF] switch is touched, the Y70 goes ON/OFF.

## (2) Monitoring/changing the word device (D100) values

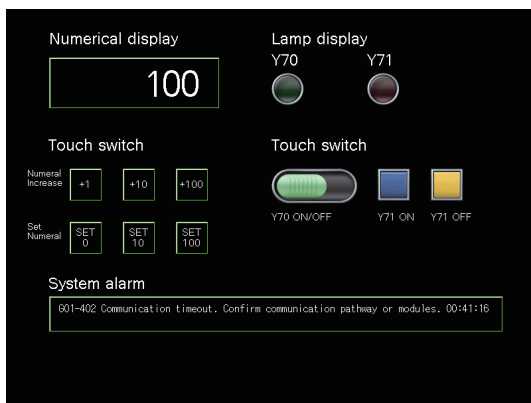


1. To perform addition on the value of D100, touch a [Numerical Increase] switch.



2. When the [Set Numerical] switch is touched, the D100 value is set.

## (3) Displaying the error message

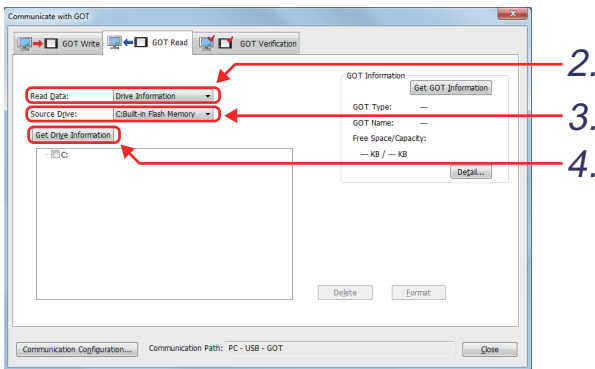
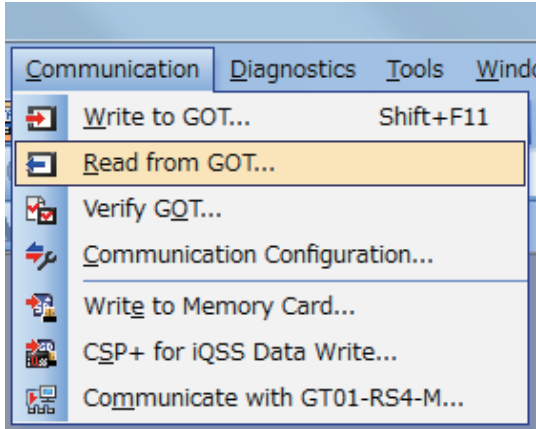


1. Power OFF the training machine and power OFF the PLC.
2. The error message appears in the system alarm.

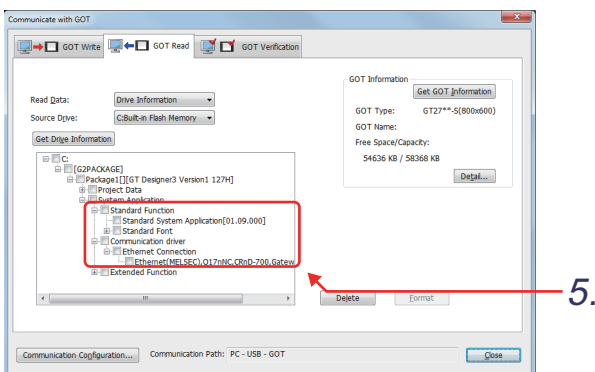
**Checking package data**

Check whether the package data has been properly written to the GOT using GT Designer3.

1. Click [Communication] - [Read from GOT] from the menu.



2. The [Communicate with GOT] dialog appears. Select [Drive Information] in [Read Data].
3. Select [C:Built-in Flash Memory] in [Source Drive].
4. Click the **Get Drive Information** button.



5. The list of the items that have been written to the drive is displayed in the tree.

When the following items can be checked, the package data has been properly written to the GOT.

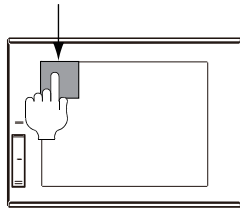
- Standard System Application
- Communication driver:  
Ethernet(MELSEC),Q17n  
NC,CRnD-700,Gateway

**POINT**

**Checking that the GOT recognizes the connected equipment**

Check that the GOT recognizes the connected equipment with the GOT utility.  
To avoid problems, always perform checks.

Utility call key  
Hold down the upper left corner  
for two seconds.



Communication setting			
	ChNo.	Interface/Unit name	Driver
Standard I/F	I/F-1	0	RS422/485
	I/F-2	0	RS232 <input type="checkbox"/> 5V supply
	I/F-3	9	USB
	I/F-4		Ethernet
Extend I/F	1st	0	None
	2nd	0	None
	3rd	0	None

Definition of ChNo.  
 0:None    1-4:FA device connection    5-8:External device  
 9:PC connection    A:Other connection

4.

Assign Ethernet I/F	Channel-Driver assign	OK	Cancel	Apply
---------------------	-----------------------	----	--------	-------

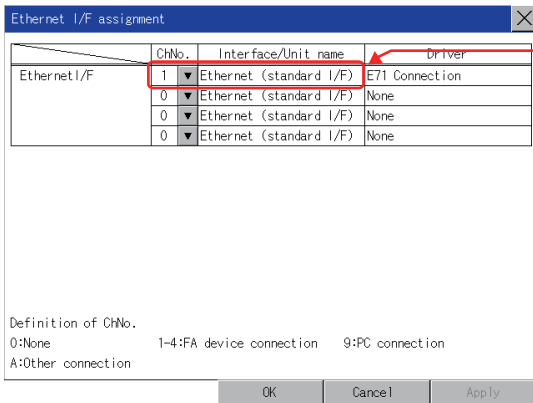


(Next page)

1. Power ON the GOT.
2. The screen described in section 4.3.3 appears. Hold down the upper left corner on the GOT monitor screen for two seconds.
3. The utility screen appears. Touch [Controller] in the [GOT basic set] tab.
4. In [Communication setting], touch [Assign Ethernet I/F].



(From previous page)



5. In [Ethernet I/F assignment], check that the Ethernet I/F setting of the channel No. 1 has been set to [Ethernet (standard I/F)].

## POINT

**When the target communication driver is not set, perform one of the following operations.**

**(1) Change the communication driver settings**

- Touch the [Channel - Driver assign] button in the "Communication setting" screen.
- In the "Channel - Driver assign" screen, touch the [Change assignment] button.
- The communication drivers installed on the GOT are displayed. Select the target communication driver and touch the [OK] button.

The GOT automatically restarts after this setting is executed.

If project data has been written to the GOT, the GOT starts monitoring a controller after the restart.

Execute this setting after carefully confirming the safety.

**(2) Reinstalling the target communication driver using GT Designer3**

If you do not find the target communication driver when performing the above operation, install it using GT Designer3.

# 5. Drawing fundamentals

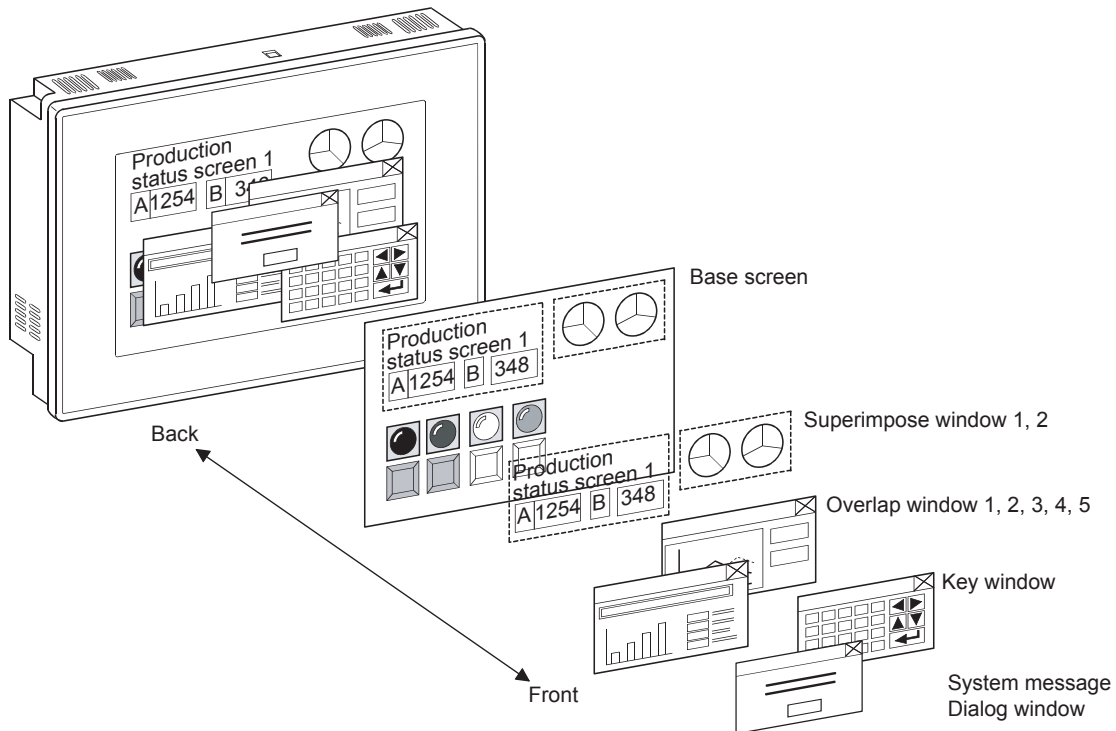
This chapter explains how to create screens on the GOT.

The screen data created in this chapter works with the sequence program described in section 5.12.

## 5.1 Switching the screen to be displayed

### 5.1.1 The screen type

The GOT2000 comprises the following screen types.



**(1) Base screen**

The basic screen display on the GOT.

**(2) Window screen**

A screen overlapped the base screen. The following screen types are available.

- Superimpose window : A window superimposed on a base screen and displayed as a part of the base screen.
- Overlap window : A pop-up window displayed over a base screen. Displaying the title bar enables you to move and delete the window manually.
- Key window : A pop-up window displayed on a base screen for the input by the numerical input function. Two types of key windows are provided: standard key window and user-created key window.
- Dialog window : A window displaying error messages, warning messages, and the GOT system messages in the foreground. While a dialog window is displayed, other screens cannot be operated.

## Remark

- Up to 4096 base screens and up to 1024 window screens can be created.
- For base screens and window screens, the range of registerable screen numbers is 0 to 32767.
- For the display position setting of window screens, refer to the GT Designer3 (GOT2000) Screen Design Manual.

### 5.1.2 Screen switching device

The screen switching device is set to switch the base screens or to display the window screen on the GOT. Set a screen switching device for each of the following screens.

- Base screen
- Overlap window 1 to 5
- Superimpose window 1, 2
- Dialog window

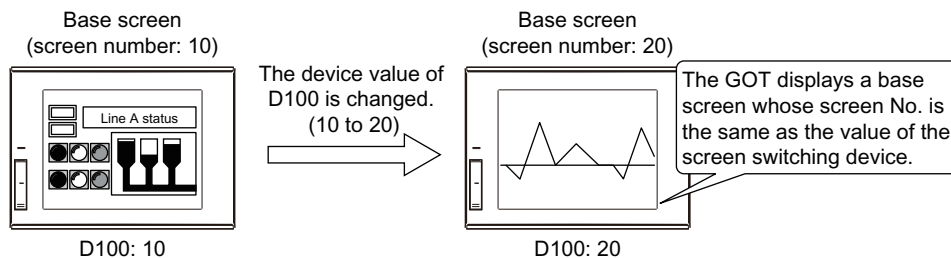
## Remark

- For information on how to set the screen switching devices, refer to 4.2.3.

#### (1) Screen switching of base screens

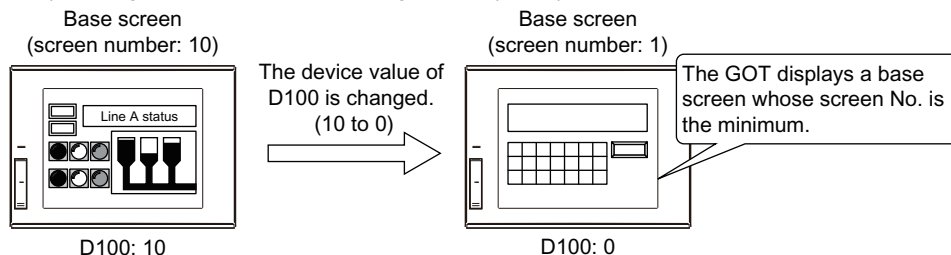
The GOT displays a base screen whose screen No. is the same as the value of the screen switching device.

Example) Storing 20 in the screen switching device (D100) while displaying the base screen whose screen No. is 10



If the value of the screen switching device is 0, the GOT displays a base screen whose screen No. is the minimum.

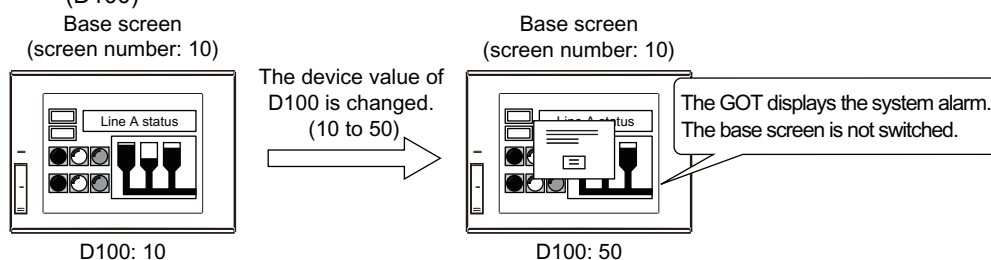
Example) Storing 0 in the screen switching device (D100) if the minimum screen No. is 1



If the screen number which does not exist is stored in the screen switching device, the system alarm is displayed.

In that case, the screen is not switched.

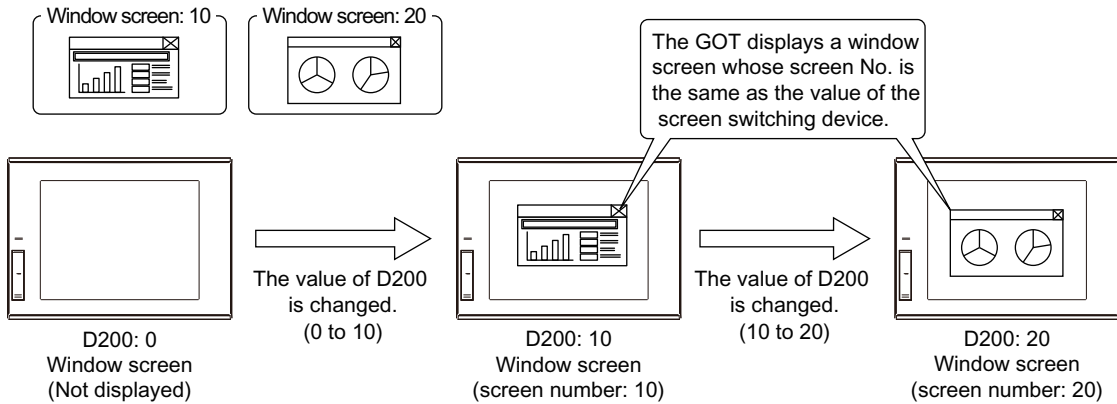
Example) Storing the screen No.50 of the base screen which does not exist in the screen switching device (D100)



**(2) Screen switching of overlap windows and superimpose windows**

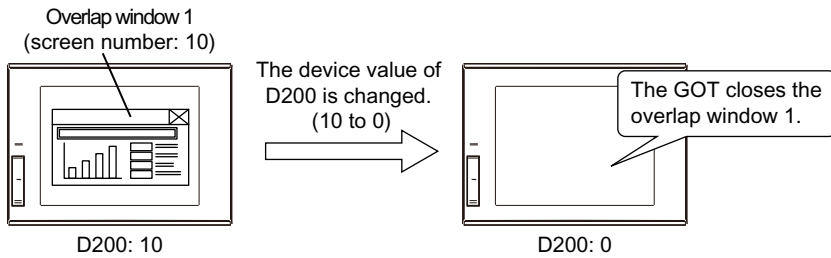
The GOT displays the window screen whose screen No. is the same as the value of the screen switching device as an overlap window or a superimpose window.

Example) Setting D100 for the screen switching device of an overlap window



When the screen switching device stores the value set to [Screen No. of the window screen to be hidden] in [Environment Setting] window, the GOT closes the target overlap window or superimpose window.

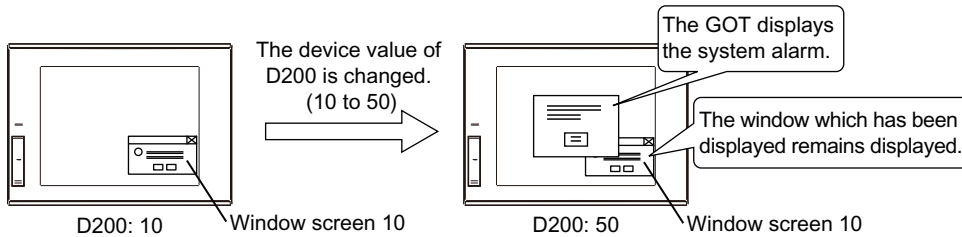
Example) Storing 0 in the screen switch device (D200) while displaying the overlap window 1 ([Screen No. of the window screen to be hidden]: 0)



If the screen number which does not exist is stored in the screen switching device, the system alarm is displayed.

In that case, the screen is not switched and the window which has been displayed remains displayed.

Example) Storing the screen No.50 of the window screen which does not exist in the screen switching device (D200)



### (3) Screen switching of dialog windows

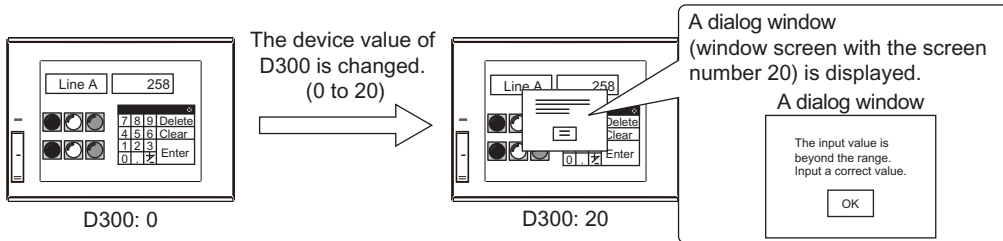
The following two methods are available to display a created dialog window.

- Displaying a created dialog window as a new message

Storing the screen number of the created dialog window to the screen switching device enables the display of the dialog window.

Storing 0 to the screen switching device closes the displayed dialog window.

Example) Storing the screen number of the window screen 20 to the screen switching device (D300) for the dialog window



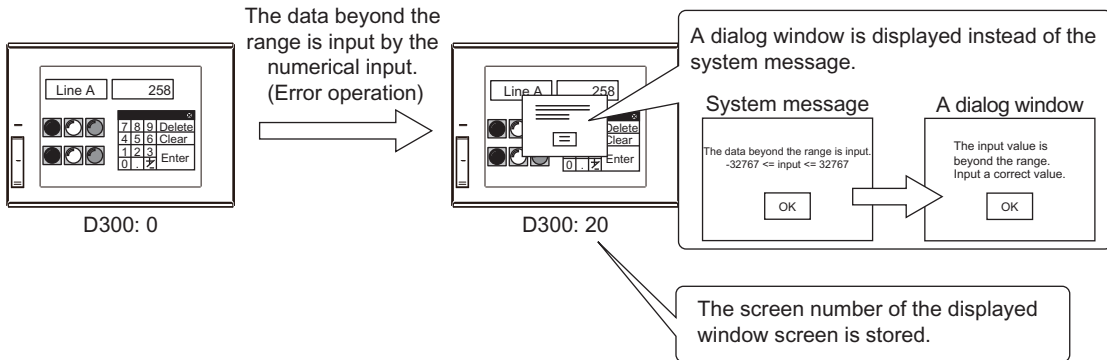
- Displaying a created dialog window instead of the system message of the GOT

A created dialog window can be displayed instead of the system message of the GOT.

This is called the system message replacement display.

Storing 0 to the screen switching device closes the displayed dialog window.

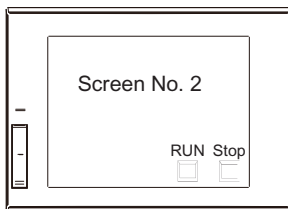
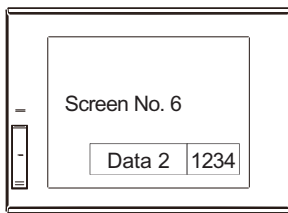
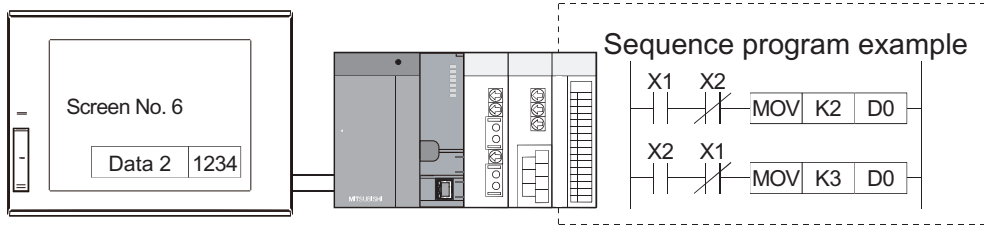
Example) Displaying the window screen with the screen number 20 instead of the system message at an error operation (Screen switching device (dialog window): D300)



### 5.1.3 Base screen switching with the sequence program

GOT display screen is switched when the screen switching device value is written with the sequence program.

Example: When the switching device for base screen is D0



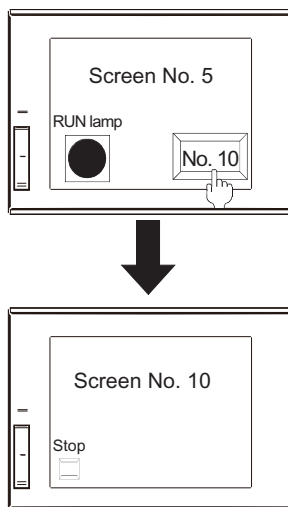
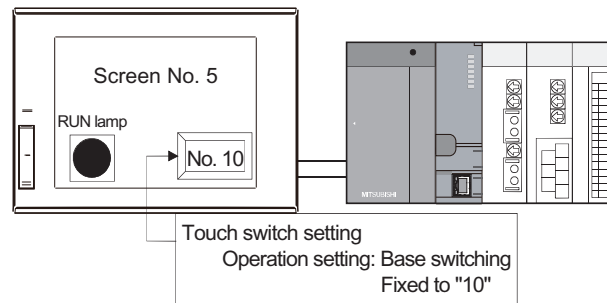
The current value of D0 is stored six because the GOT displays screen No. 6.  
Turn on X1 with the sequence program, and D0 value is changed to two.

The GOT displays screen No. 2 because D0 value is changed to two.

## 5.1.4 Base screen switching with the touch switch

GOT display screen is switched when the screen switching device value is written with the touch switch.

Example: In the case of device for base screen switching: D0



The current value of D0 is stored five because the GOT displays screen No. 5.

Set both of X1 and X2 in OFF with sequence program, and touch No. 10 touch switch.

The GOT displays screen No. 10 because the current value of D0 is changed to 10 with the touch switch.

## 5.1.5 Window screen display and switching

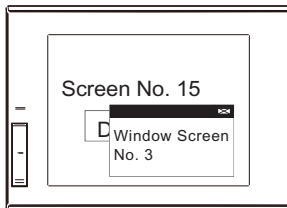
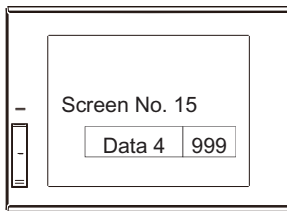
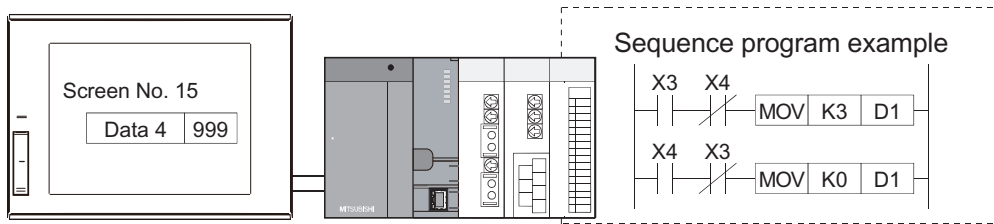
The window screen is displayed by writing the same No. as the window No. of the screen to be displayed into the switching device used in overlap windows 1 to 5.

Two types of writing in the screen switching device are available: writing with the sequence program, and writing with the GOT touch switch.

### POINT

When "zero" is written in the screen switching device, the window screen is not displayed.

Example: When the switching device for base screen is D0, and that for overlap window 1 is D1.



The current values of the switching device are the below because the GOT displays only base screen No. 15.

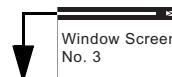
D0 = "15"


D1 = "0"

Turn ON X3 with the sequence program, and D1 value is changed to three.

The GOT displays window screen No. 3 because D1 value is changed to three.

When closing the window screen, operate either of the following methods.



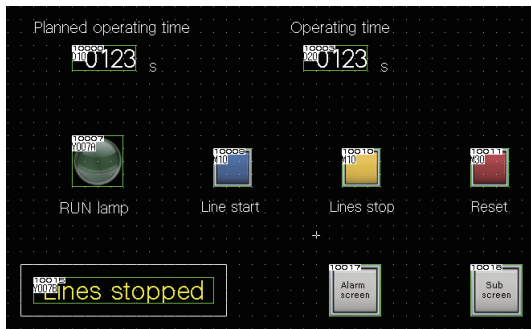
- Touch  in the upper right corner of the window screen.
- Write "zero" as the D1 value in the overlap window1 screen switching device.



**[Screens to be created]**

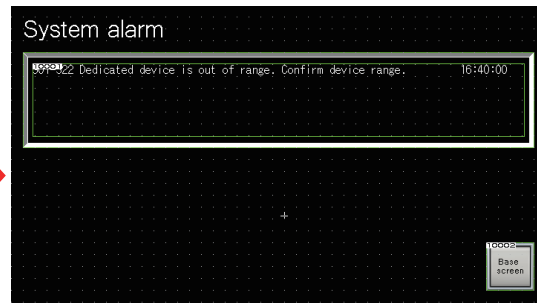
Screens to be created in this chapter and a summary of screen switching are as follows:

"→" refers to the screen switching (page switching) operation.



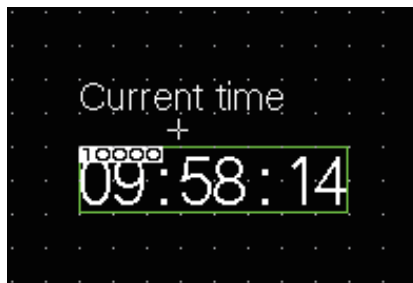
Base Screen No. 1

(Sets objects such as switch, lamp, numerical display, etc.)



Base Screen No. 2

(Displays the error which occurred in GOT or PLC.)



Window Screen No. 1

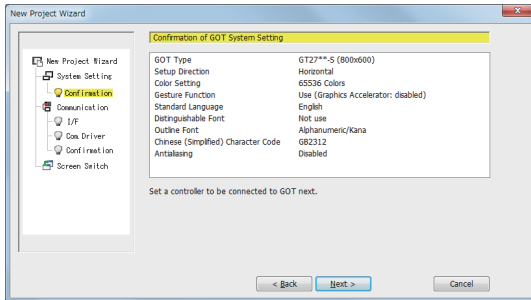
(Displays over the base screen. Shows current time.)

# 5.2 Before creating the screen

## 5.2.1 Operations before creating the screen

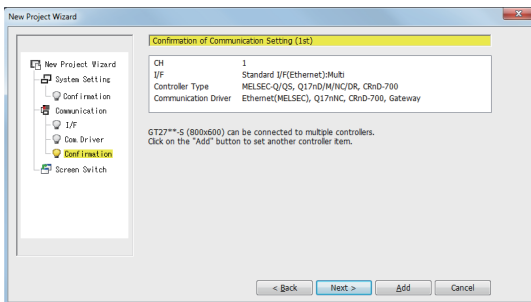
Set the project using [New Project Wizard] in the following manner:

### (1) System Settings for GOT



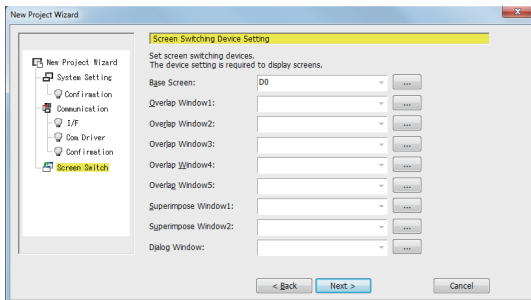
GOT Type: **GT27\*\*S (800x600)**  
Color Setting: 65536 Colors

### (2) Confirmation



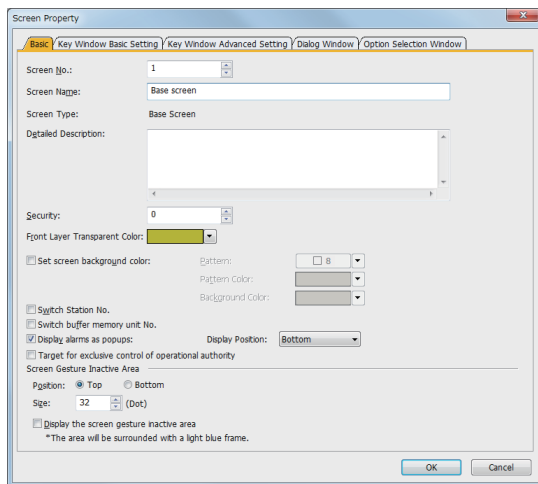
Controller Type: MELSEC-Q/QS, Q17nD/M/NC/  
DR, CRnD-700  
I/F: Standard I/F(Ethernet):Multi  
Communication Driver: Ethernet(MELSEC),  
Q17nNC, CRnD-700,  
Gateway

### (3) Screen Switching Device Setting



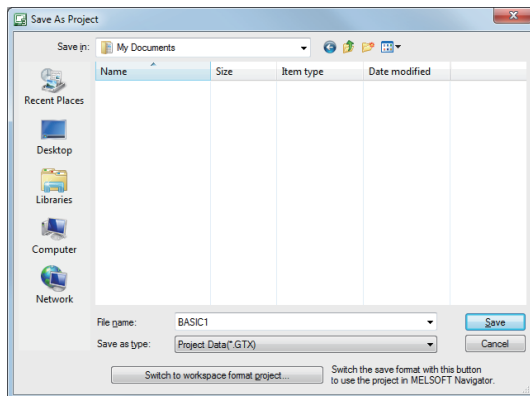
Base Screen: **D0**

#### (4) Screen Property



Enter "Base screen".

#### (5) Saving project data Save the project data.







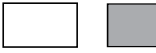




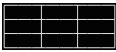
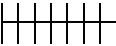

Select [Project] - [Save As] from the menu and save the current project with the name "BASIC1".

## 5.2.2 Figure drawing

This section describes how to draw figures and how to edit the figures arranged on the screen.

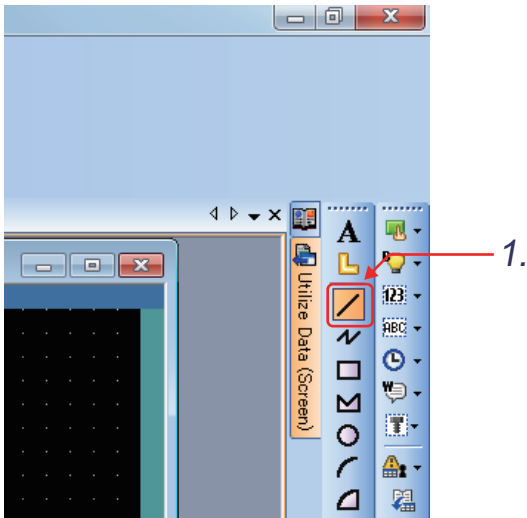
### (1) Types of drawable figures


The following figures can be drawn on GT Designer3:

Shape	Drawing example	Reference
Text		(5) Text settings
Logo text		-
Line		(2) Drawing line, rectangle, and circle
Line free form		(3) Drawing polygon and line free form
Rectangle		(2) Drawing line, rectangle, and circle
Polygon		(3) Drawing polygon and line free form
Circle (including ellipse)		(2) Drawing line, rectangle, and circle
Arc (including elliptic arc)		(4) Drawing arc and sector
Sector		(4) Drawing arc and sector
Table		-
Scale		-
Piping		-


## (2) Drawing line, rectangle, and circle

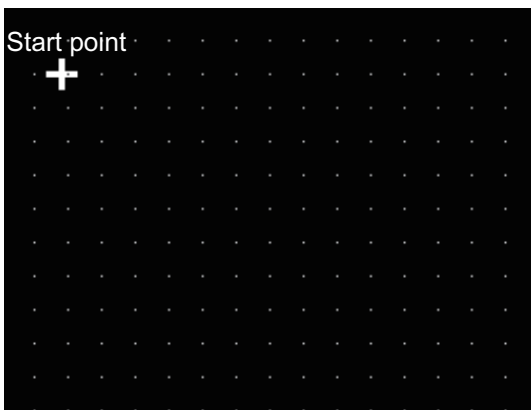
This section describes how to draw a line using an example.



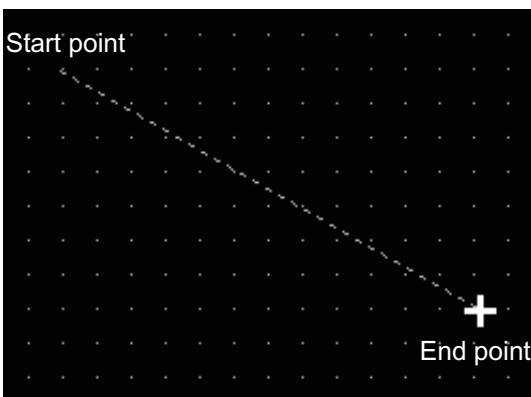
1. Click  on the toolbar (Figure).

Drawing rectangle: Click .

Drawing circle: Click .



2. Click the left mouse button at the starting point for drawing a line.

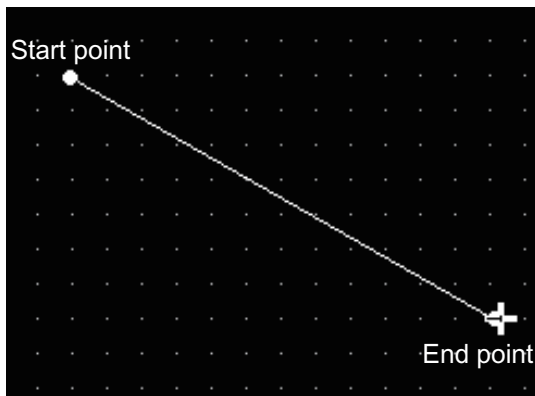


3. Drag and move the cursor to the end point.



(Next page)

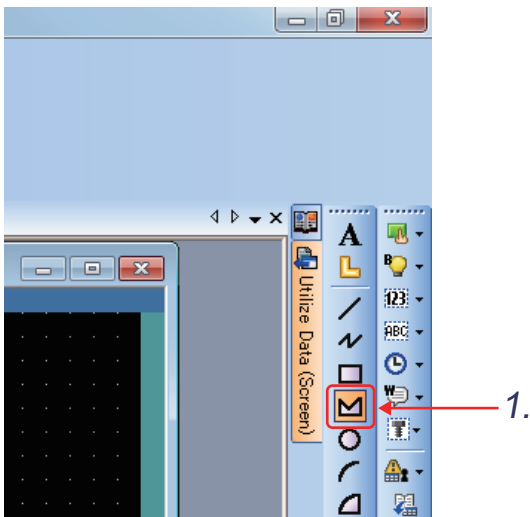
(From previous page)





4. Release the left mouse button to draw a line.

### (3) Drawing polygon and line free form

This section describes how to draw a polygon using an example.



1. Click  on the toolbar (Figure).

Drawing line free form: Click .

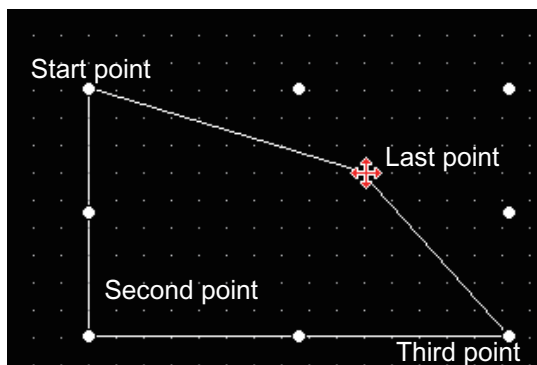
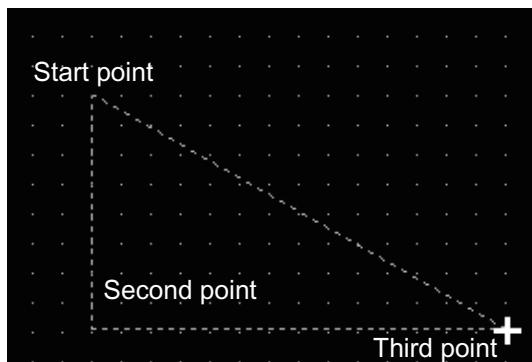
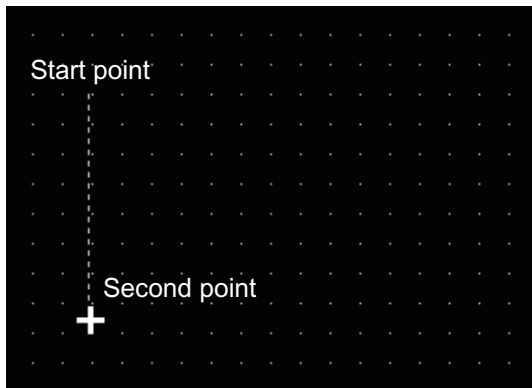


2. Click the left mouse button at the starting point for drawing a polygon.



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3. Drag and move the cursor to the second vertex.
4. Release the left mouse button to determine the second point.

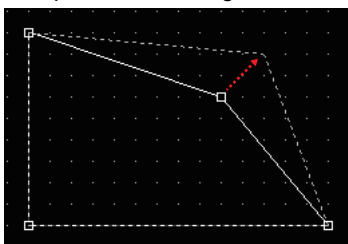
5. Click the left mouse button at the third vertex. Repeat this procedure to increase the number of vertices.

6. Double-click at the last vertex to form a polygon.

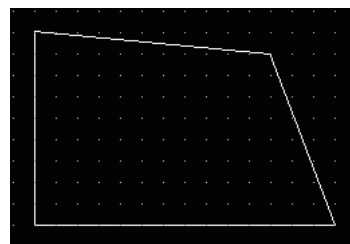
## POINT

### Editing a figure with the vertex edit handle

- (1) Select [Edit] → [Edit Vertices] from the menu and select a figure.
- (2) Drag the handle to change the vertex position and release the mouse button to determine the change of the vertex position of the figure.



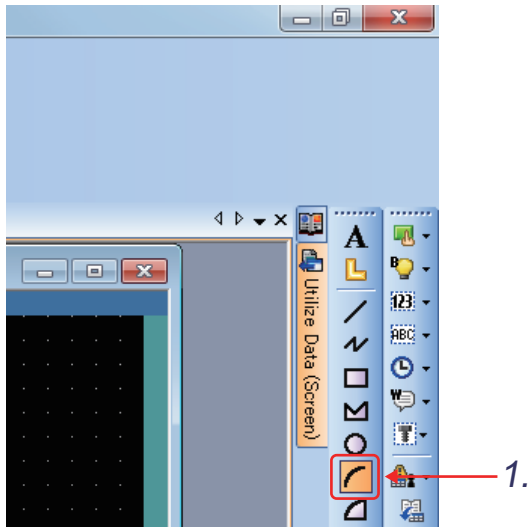
Drag a handle.





Release the mouse button.

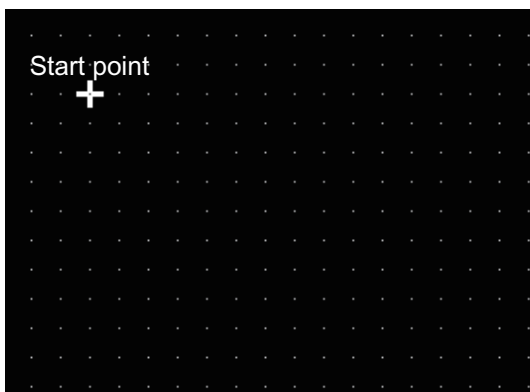
#### (4) Drawing arc and sector

This section describes how to draw an arc using an example.



1. Click  on the toolbar (Figure).

Drawing sector: Click .



2. Click the left mouse button at the starting point for drawing an arc.

#### POINT

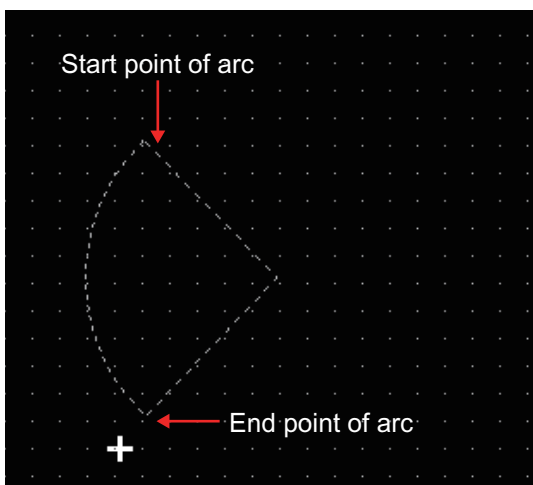
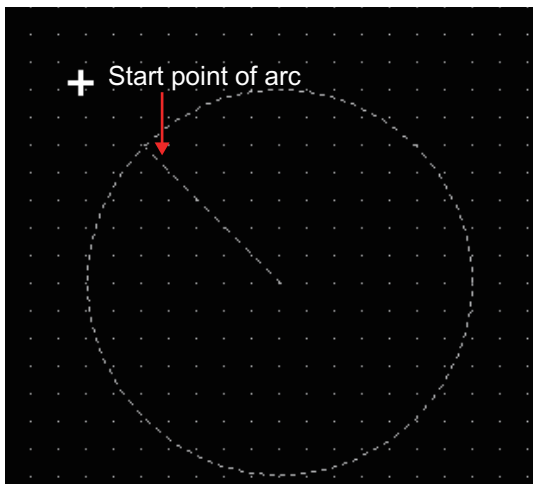
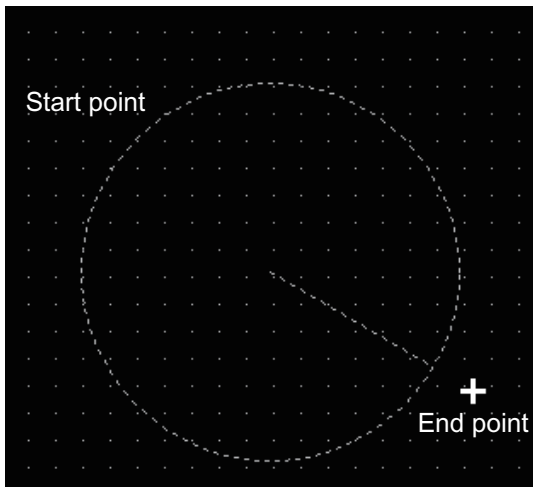
Set the starting point and the endpoint of a radius.



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3. Drag and move the cursor to the end point.
4. Release the left mouse button. A line from the center of the circle is drawn.

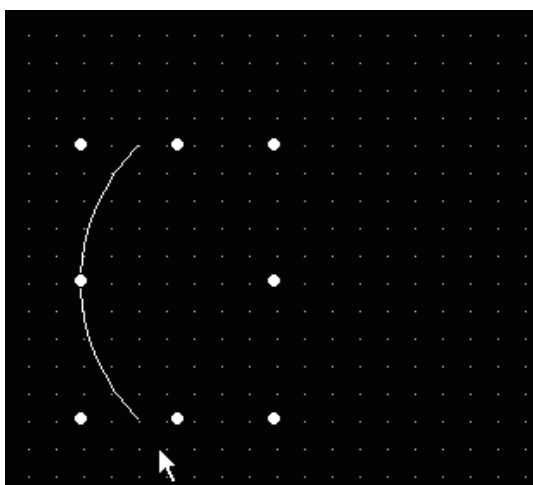
5. Drag and move the cursor to define the starting point of arc.

#### POINT

Set the starting point and the endpoint of an arc.

6. Click the mouse to determine the starting point of arc.
7. Drag and move the cursor to define the end point of arc.

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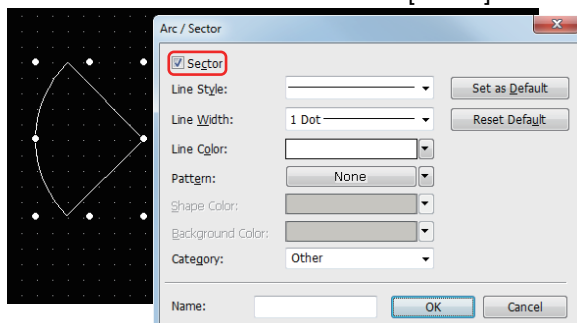


8. Click to form an arc.

### Remark

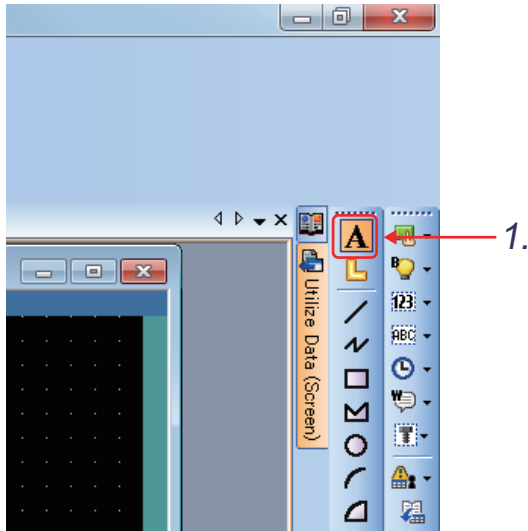
#### Drawing sector

Double-click the drawn arc and check [Sector] in the Arc/Sector dialog box to draw a sector.

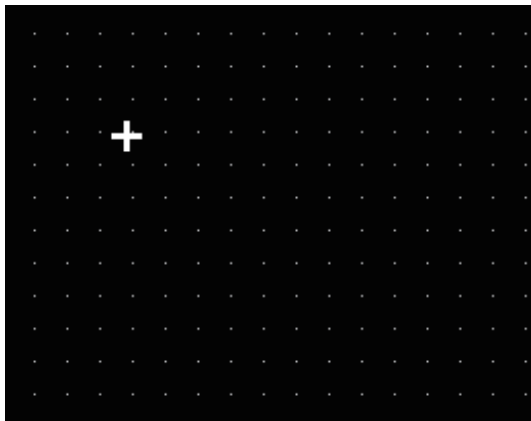


## (5) Text settings

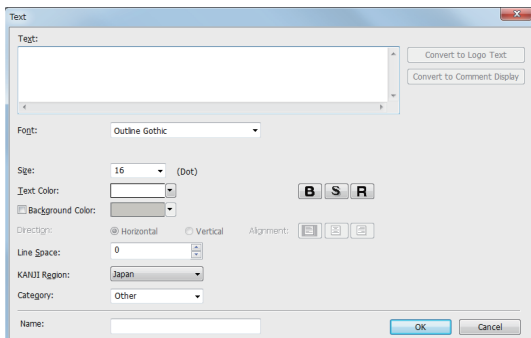
This section describes how to set a text (input a text).



1. Click **A** on the toolbar (Figure).



2. Click the left mouse button at the starting point for placing a text.

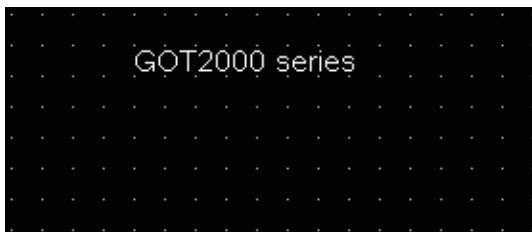
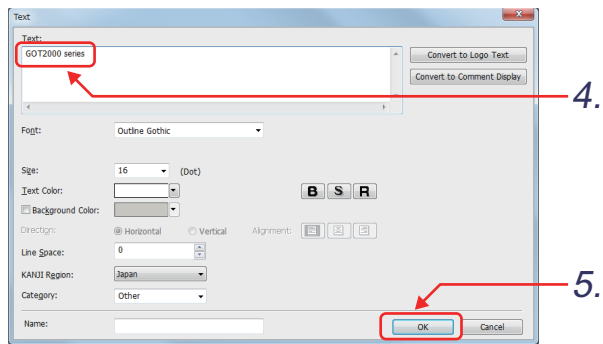


3. The setting dialog appears.



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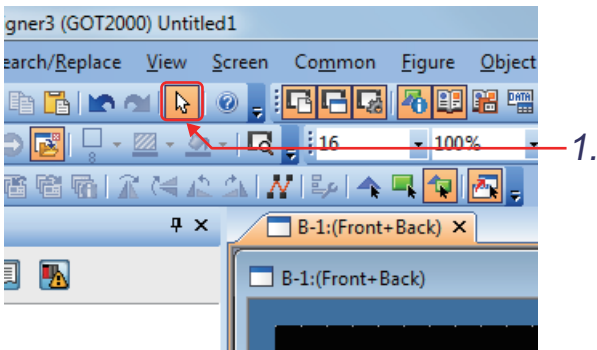
4. Enter a character string. Enter "GOT2000 series" here.


5. After entering the character string, click the [OK] button.

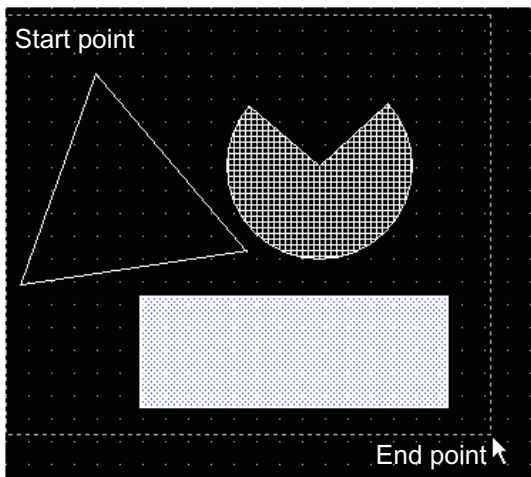
6. The character string is displayed.

### (6) Selecting data for editing

This section describes how to select the desired figure/object for editing.



1. Click  on the toolbar (Main).



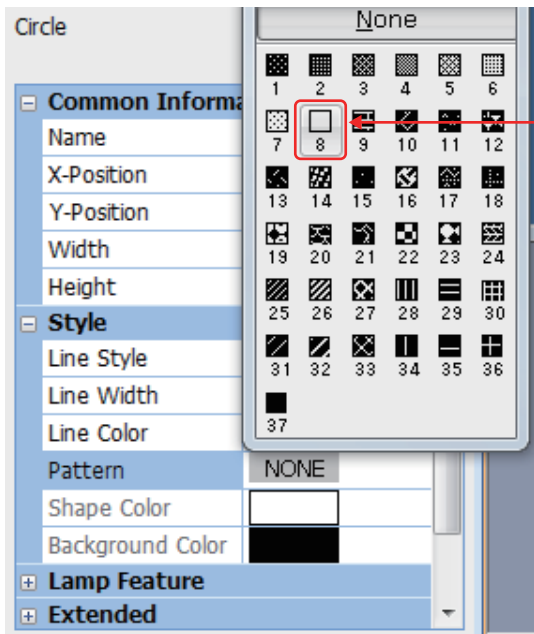
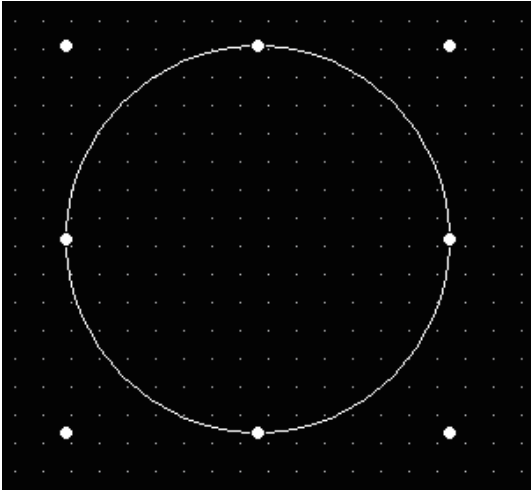
2. To select data, first click the left mouse button at the starting point to drag and move the cursor to the end point, and then release the left mouse button to include all the data necessary.

**(7) Changing attribute**

Change the attribute of the created figure on the property sheet.

This section describes how to change the color for a circle using an example.

1. Select the figure.



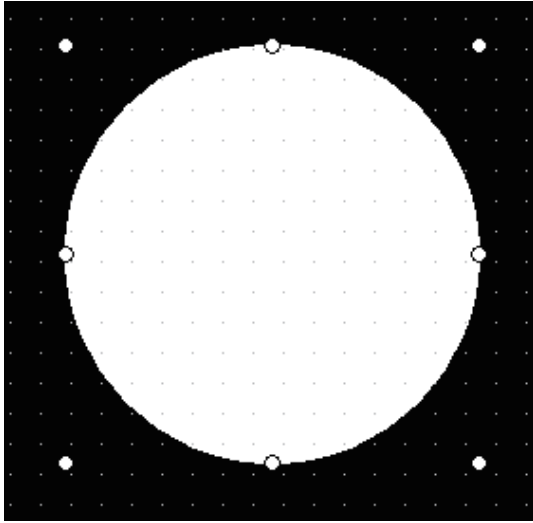
2. Change the attribute on the property sheet.

3. Change the pattern color from [None] to [Fill Color (White)] for the circle.



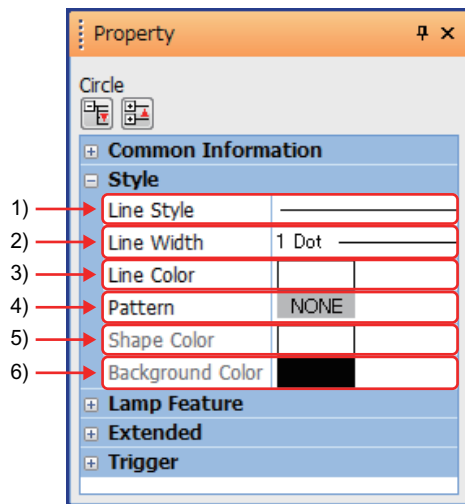
(Next page)

(From previous page)

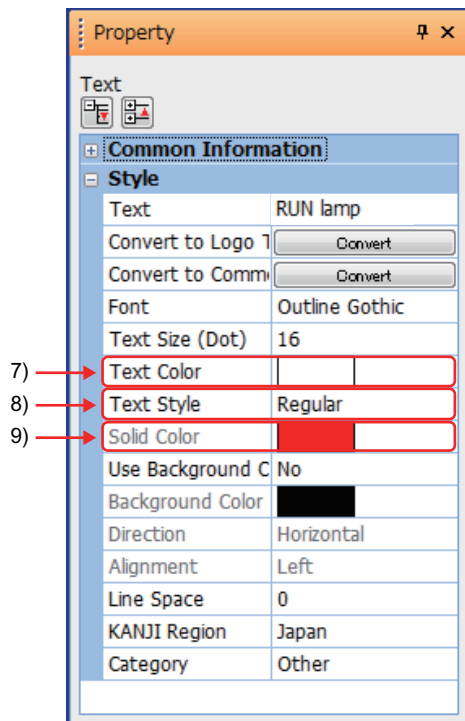


4. The changes made are reflected on the figure.

To change attributes other than the pattern figure color, use the following items of the property sheet.



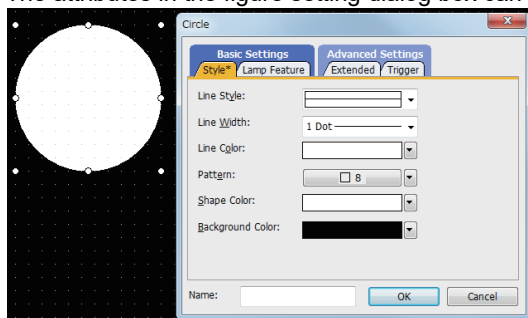
- 1) [Line Style]  
Select a line style of the figure.
- 2) [Line Width]  
Select a line width.
- 3) [Line Color]  
Select a line color.
- 4) [Pattern]  
Select a filling pattern for the figure.
- 5) [Shape Color]  
Select a fill color of the figure.
- 6) [Background Color]  
Select a background color for the figure.



- 7) [Text Color] (only when text is selected)  
Select a text color.
- 8) [Text Style] (only when text is selected)  
Select a text style.
- 9) [Solid Color] (only when text is selected)  
Select a text solid color.

## POINT

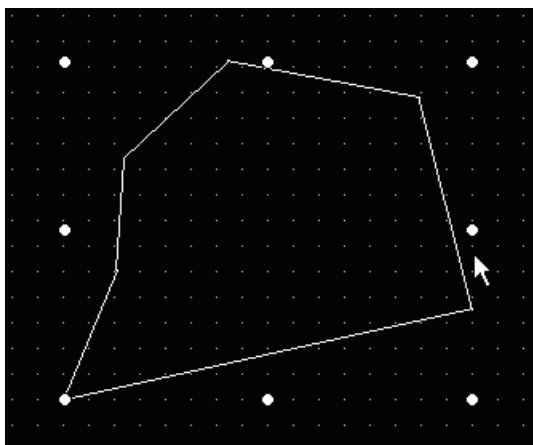
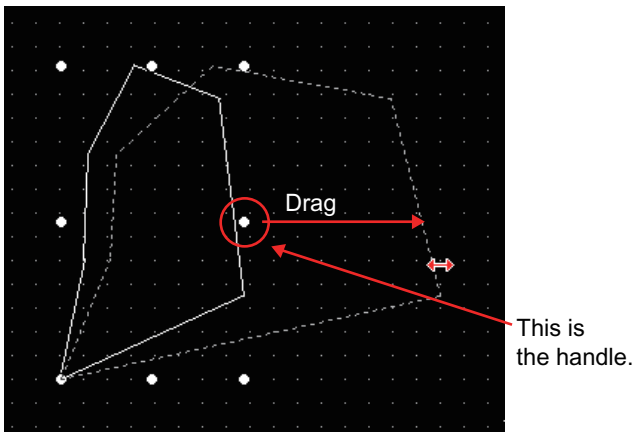
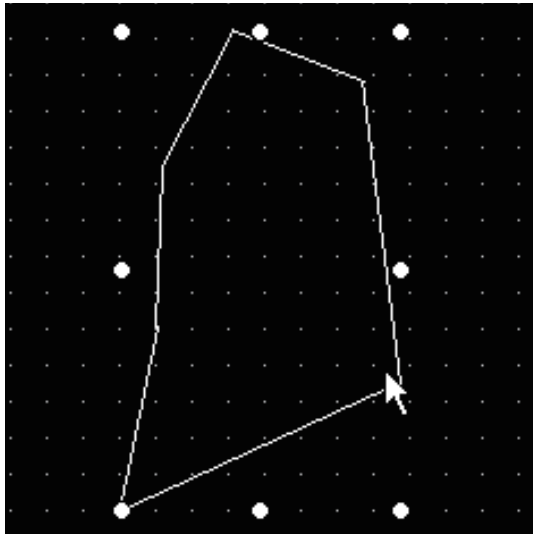
The attributes in the figure setting dialog box can also be changed by double-clicking the figure.





### (8) Size change

This section describes how to expand/reduce the size of figure/object.



1. Select a figure/object of which the size needs to be changed.

2. Click the left mouse button on the handle (•) on the direction to which the figure is expanded/reduced, and then drag the cursor.

3. Release the left mouse button to complete the size change of figure.

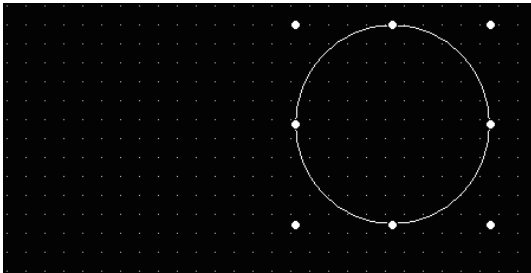
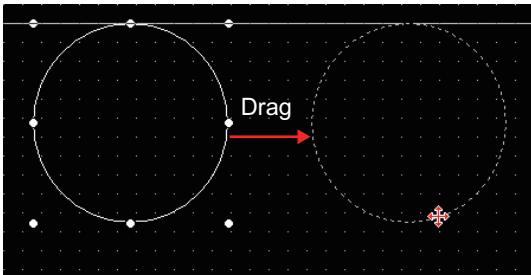
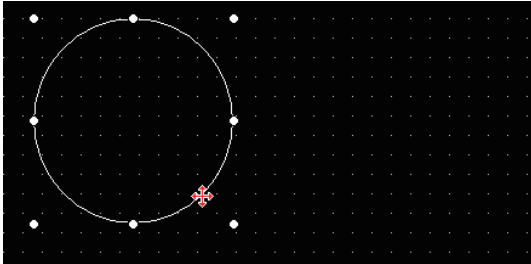
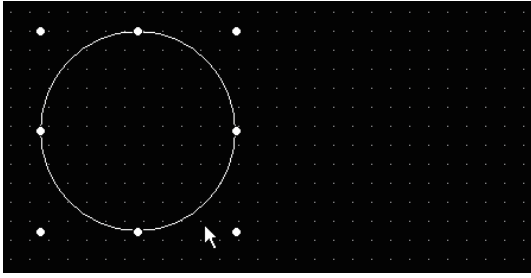
### POINT

Size changes as follows are possible using **Shift** key or **Ctrl** key.


- **Shift** key : Proportional transformation
- **Ctrl** key : Concentric transformation

### (9) Moving selected data

This section describes how to move the figure/object.



1. Select the figure/object to be moved.

2. Move the cursor to the figure/object to be moved to change the cursor shape into .

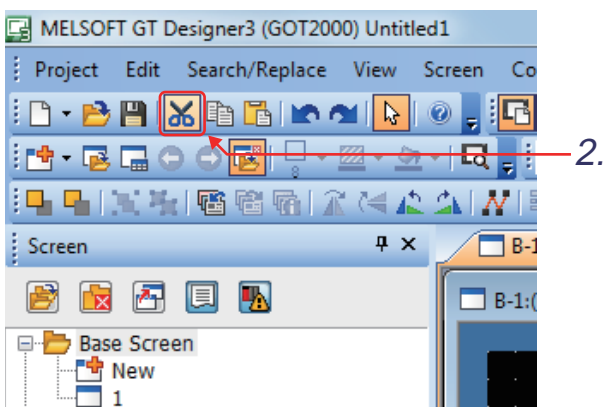
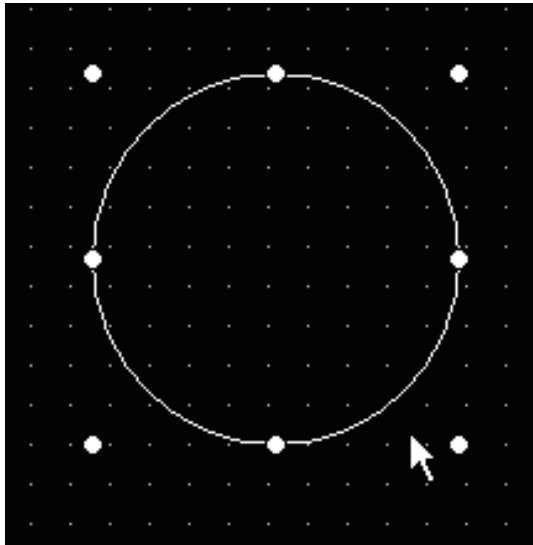
3. Click the left mouse button and drag the figure/object to the desired position.

4. Release the left mouse button to determine the position for displaying the figure/object.

### (10) Cutting, copying, pasting, or duplicating the selected data

The following shows how to cut, copy, paste, or duplicate a figure or object.

(a) Cut and paste



1. Select the desired figure/object.

2. For cutting, click  on the toolbar (Main).


(For copying, click )

### POINT

- Similar operations can also be performed by using the following keys. cut/copy can also be performed by using the following keys.


For cutting:  key +  key

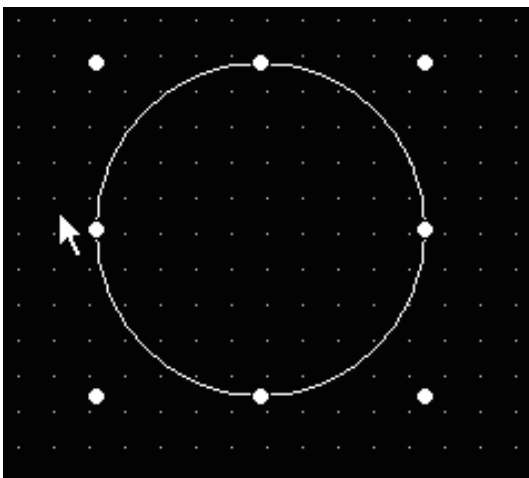
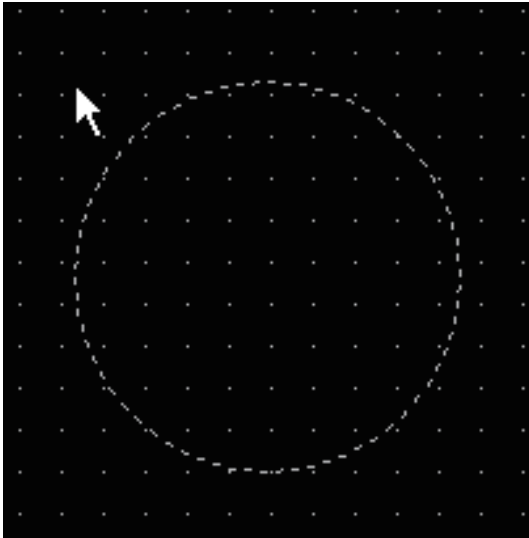
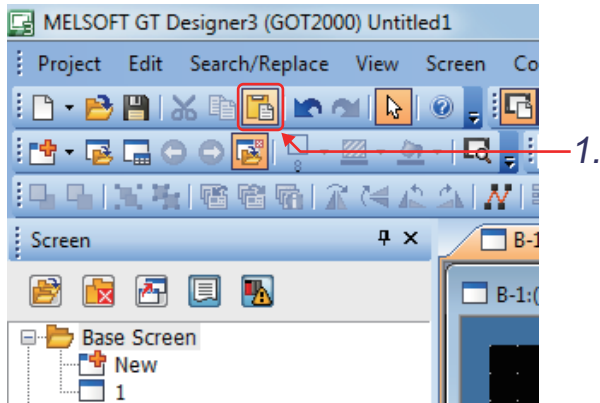
For copying:  key +  key

- Figure/object can be deleted by using  key.  
The deleted figure/object cannot be "pasted", but can be "undone".

(b) Pasting

This section describes how to paste the cut or copied figure/object using an example.

1. Click  on the toolbar (Main).



2. A display range frame appears. Move it to the desired position.

3. Click the mouse button to paste the cut figure/object.

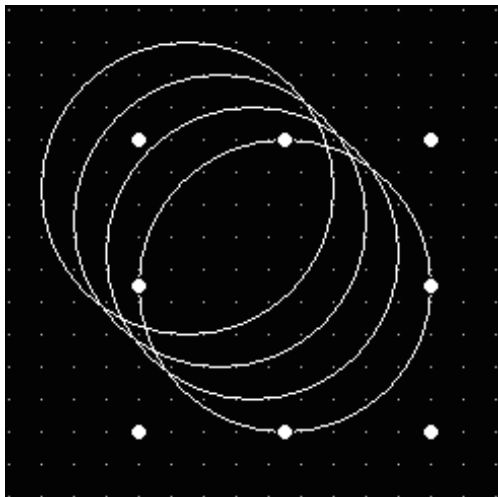
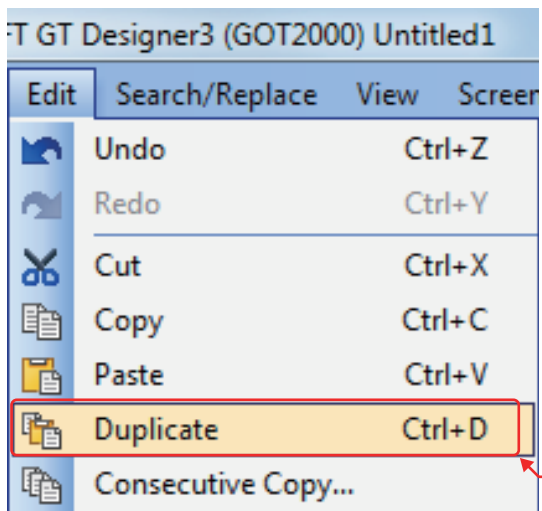
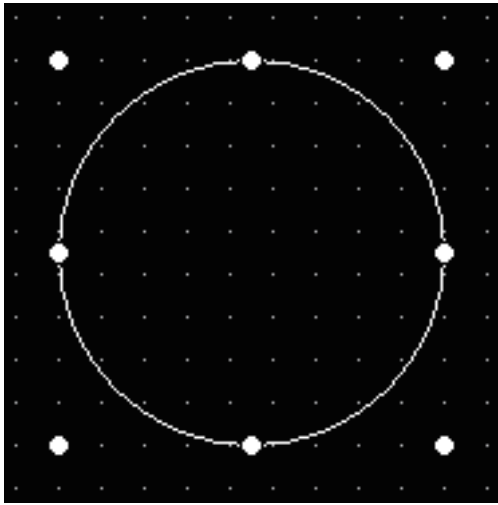
**POINT**

- Pasting can also be performed by using **Ctrl** + **V** keys.

(c) Duplicate

Copies and pastes a selected figure or object at a time.

Select a figure or an object placed on the screen editor and use [Duplicate].



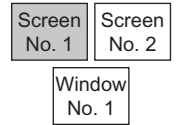
1. Select a figure or an object.

2. Select [Edit] → [Duplicate] from the menu.

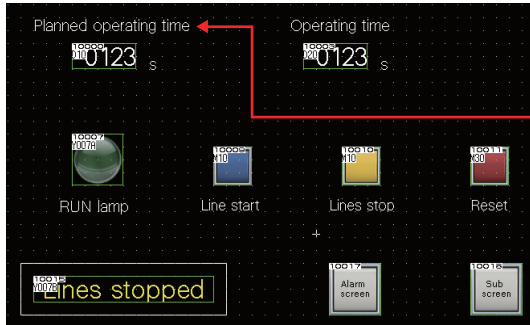
3. The selected figure or object is copied and pasted with a certain interval.

## 5.3 Text settings

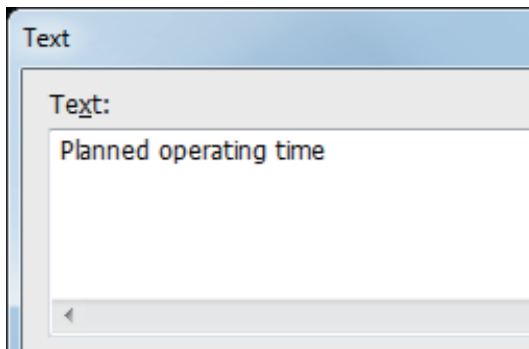
This section describes how to create actual screens.



The following characters will be placed on Base Screen No.1.



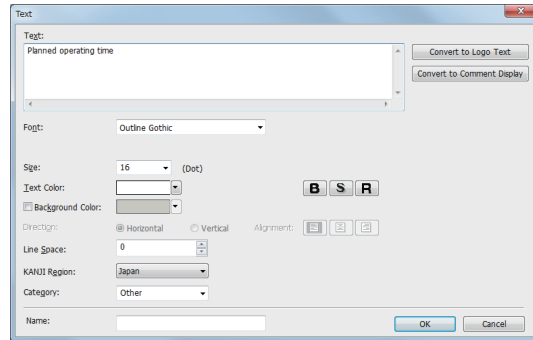
- (1) Click **A** on the toolbar (Figure), and then click any where on the drawing screen.
- (2) The [Text] dialog box appears.  
Enter "Planned operating time" on the [Text] dialog box.



### POINT

- Up to 512 characters can be entered in [Text] dialog box.
- A text can be entered on multiple lines.
- To start a new line (line feed), press the **Enter** key at the end of the current line.

**(3) Set the attributes for the entered characters.**



- (a) Style  
The following text styles are available.

Standard	Bold	Solid	Raised	Reverse	Rotate/Flip

- (b) Font

Font		Image
Classification	Type	
Outline font	Outline Square style	
	Outline Gothic	
Standard font	6 × 8 dots (Gothic)	
	12-dot Standard (Gothic)	
	16-dot Standard (Mincho)	
	16-dot Standard (Gothic)	
HQ font	12-dot HQ Mincho	
	12-dot HQ Gothic	
	16-dot HQ Mincho	
	16-dot HQ Gothic	
TrueType font	TrueType Mincho	
	TrueType Gothic	
	TrueType Numerical (Gothic)	
	TrueType Numerical (7-Segment)	
Windows font	The TrueType font and OpenType font that can be displayed on a personal computer (other than vertical fonts)	

- (4) Click the  button.  
"Planned operating time" is displayed on the screen.

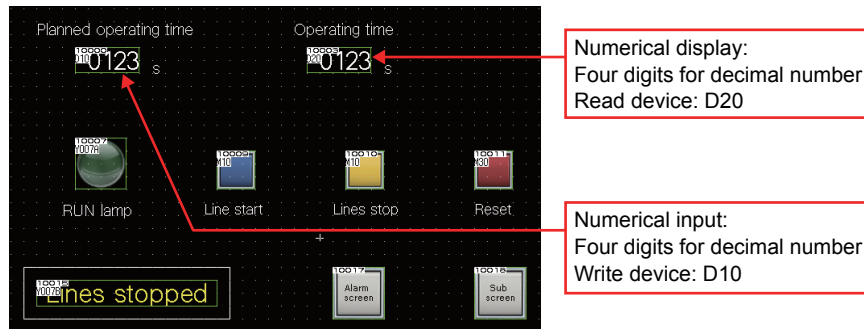




## 5.4 Numerical input/numerical display settings



This function is used to write or display the data stored in the devices of the controller. In this section, create a numerical display showing the operating time, and a numerical input for entering the planned operating time.

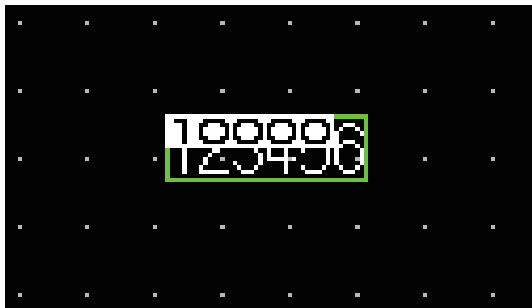
Screen No. 1	Screen No. 2
Window No. 1	



### 5.4.1 Numerical input settings

Making the settings of numerical input (D10)

- (1) Click ▾ of  on the tool bar (Object) and select , and then click any where on the drawing screen.



1. Move the cursor on to the screen, determine the position for display, and then click the mouse button.

2. The numerical input is placed.



An object can be placed with changing its size by clicking and dragging the cursor.

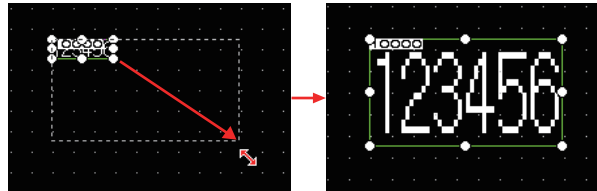
3. Double-click the placed numerical input.

## POINT

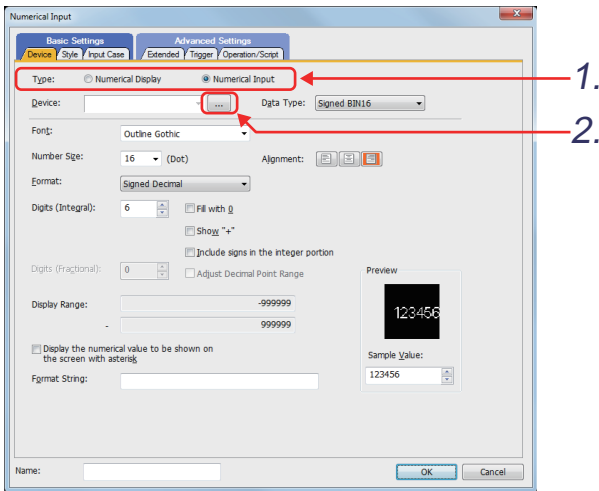
### (1) Changing the size of an object after being placed

This section describes how to change the size of arranged object.

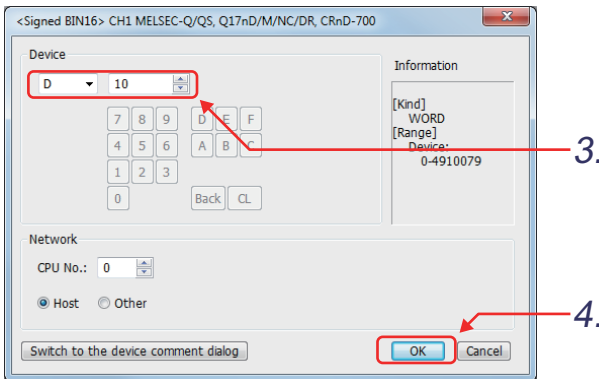
- Select the object to be changed in size.
- Position the cursor on the sizing handle, click and drag it to change the object size.



(2) Making basic settings

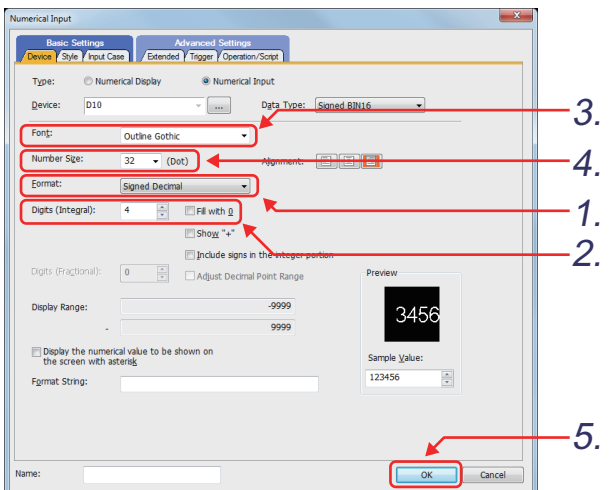


1. Set [Type] to [Numerical Input].
2. Click the  button.



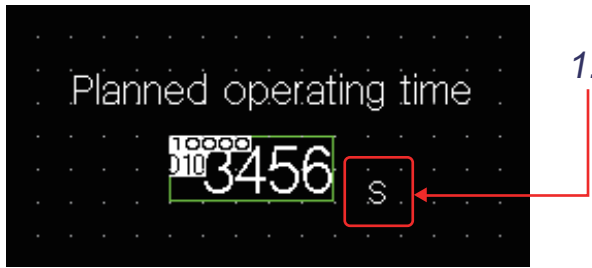
3. Set "D10" for [Device].
4. After setting is completed, click the  button.

(3) Setting the display format (to handle decimal number in a range of 0 - 9999)



1. Set [Format] to "Signed Decimal".
2. Set [Digits (Integral)] to "4".
3. Set [Font] to "Outline Gothic".  
(For GT27, the default setting of Font is Outline Gothic. )
4. Set [Number Size] to "32".
5. Click the  button.

(4) Making settings on the screen




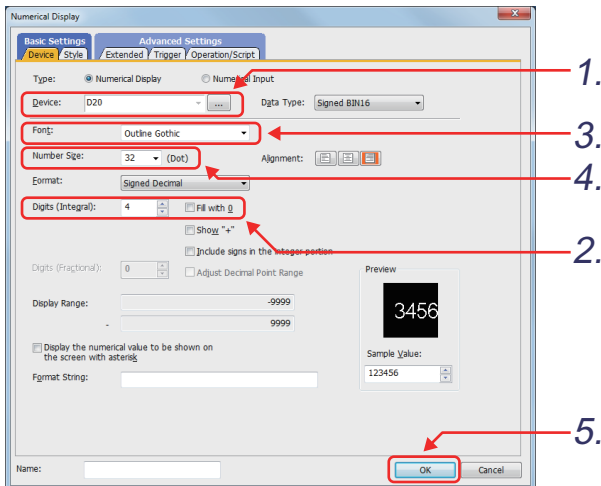
1. Use text figure to assign unit to numerical input.

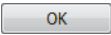
This completes the settings of the numerical input.

## 5.4.2 Numerical display settings

Making the settings of numerical display (D20)

- (1) Click  on the toolbar (Object), and then click any where on the drawing screen.
- (2) Double-click the numerical display, and make the settings as follows:  
(the same procedures as those described in section 5.4.1)



1. Set "D20" for [Device].
2. Select "4" for [Digits (Integral)].
3. Select "Outline Gothic" for [Font].
4. Set [Number Size] to "32".
5. Click the  button.

- (3) Making settings on the screens  
(the same procedures as those described in section 5.4.1)



1. Set a title and a unit by using text figures.

This completes the settings of the numerical display.

### 5.4.3 Key window

The key window has two types: GOT default key window (standard key window) and key window created by the user (user-created key window).

**(1) Standard key window**

The standard key window is a GOT default window for inputting numerical values and characters.

The type of the standard key window to be displayed changes automatically according to the data type of the input area (hexadecimal number, decimal number, octal number, binary number, or character string).

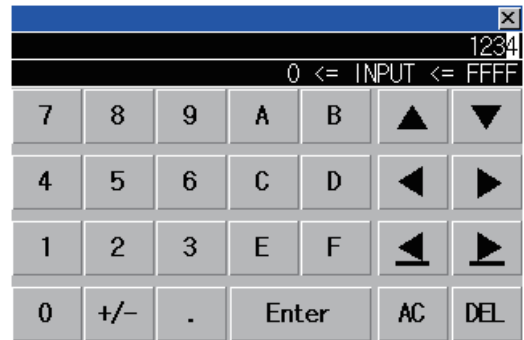
**(a) Key window for numeric values**

When the data type of the input area is hexadecimal number, octal number, or binary number, the key window for hexadecimal numbers is displayed.

When the data type of the input area is decimal number, the key window for decimal numbers is displayed.



Example) Key window for decimal numbers



Example) Key window for hexadecimal numbers

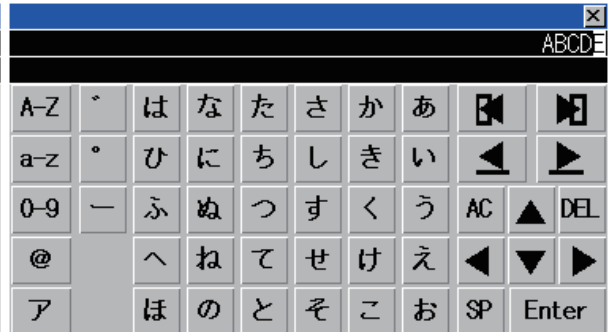
**(b) Key window for character strings (key window for alphabets and key window for kana)**

When the data type of the input area is character string, the key window for character strings is displayed.

Use the keys for switching character types sequentially and the keys for switching character types directly to switch the character type used in the key window.



Example) Key window for alphabets



Example) Key window for kana

**(2) User-created key window**

By displaying a user-created window screen as a key window, it can be used as the user's original key window.



Example) User-created key window (for text input)



Example) User-created key window (for numerical input (decimal))

**POINT**

By registering a user-created window screen as a key window, the key window for numerical input can be used as the user's original key window.

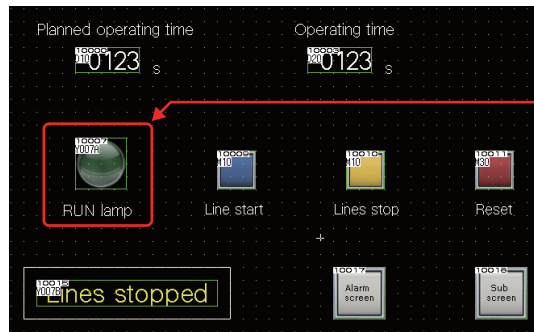
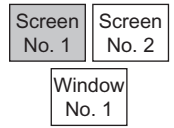
The registered key window is displayed instead of the standard key window.

For information on how to create a user's original key window, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## 5.5 Settings of lamps

This function is used to turn on/off the lamp depending on the bit device condition (on/off) or the value of word device.

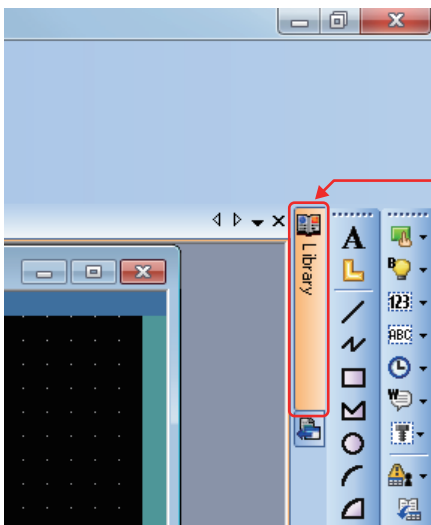
In this section, create a lamp that turns on when Y7A is on.



Lamp  
This lamp turns on when Y7A is turned on.

### (1) Using a lamp that is registered in the library

Use a lamp that is registered in the library of GT Designer3.

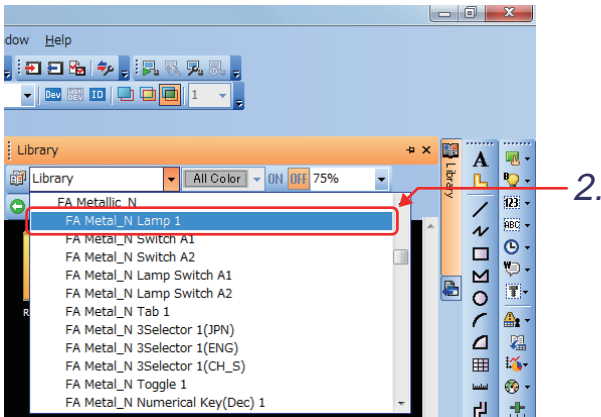


1. Touch the docked [Library] tab.

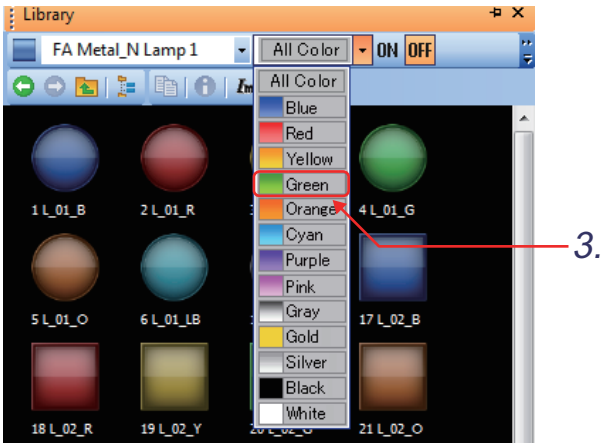
↓  
(Next page)



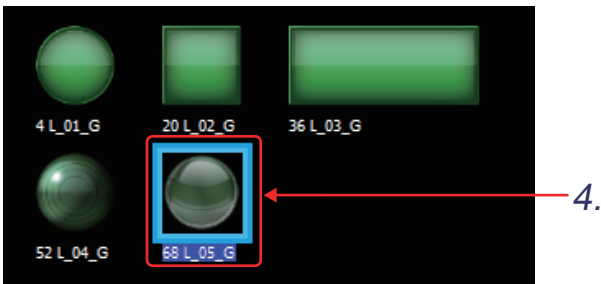
(From previous page)



2. Select [FA Metal\_N Lamp 1] in the [Library] folder.



3. Click the toolbar option and set the lamp color to "Green".

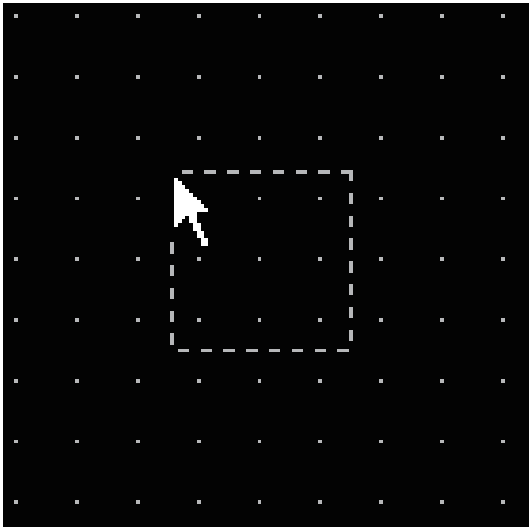


4. Click "68 L\_05\_G".



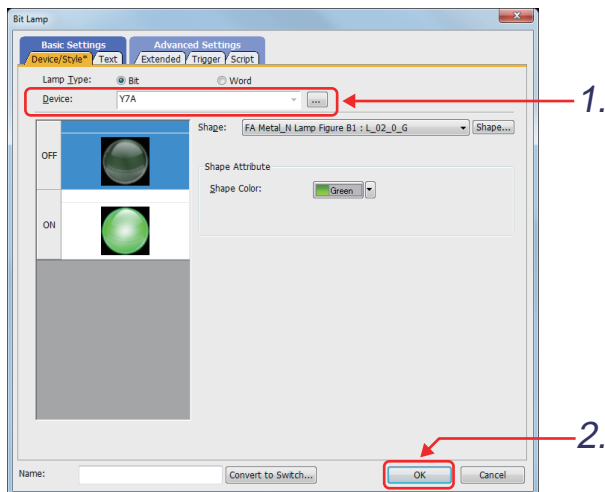
(Next page)

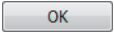
(From previous page)



5. On the screen, click the mouse button to place the lamp.
6. Double-click the placed lamp to display the setting dialog.

## (2) Settings of lamps



1. Set [Device] to "Y7A".
2. When setting is done, click the  button.

## (3) Making settings on the screen

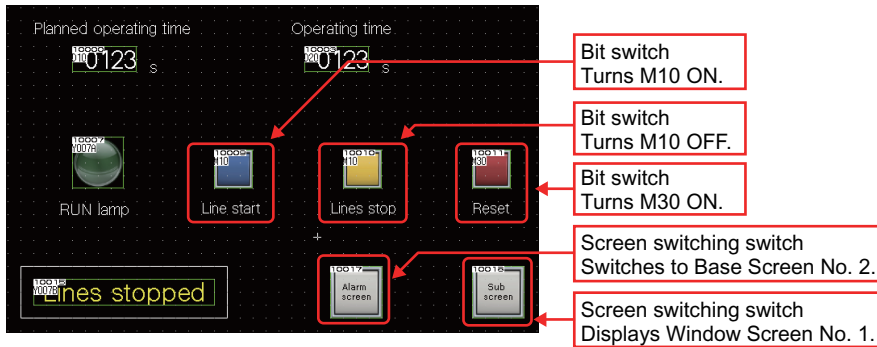
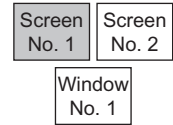


1. Use text figure to create title for Lamp.  
This completes the settings of the lamp display.

## 5.6 Touch switch settings

Make the settings for the switches which behave as follows when touched.

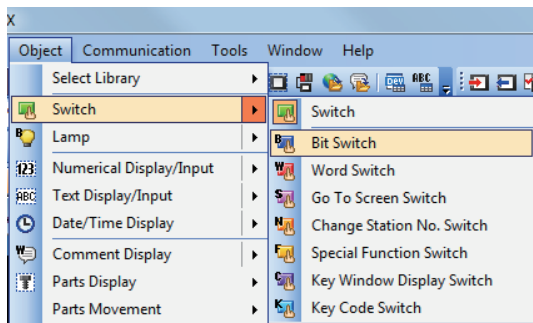
- Bit Switch : Turns bit device ON/OFF when touched.
- Go To Screen Switch : Switches base screen/window screen when touched.



### 5.6.1 Bit switch settings

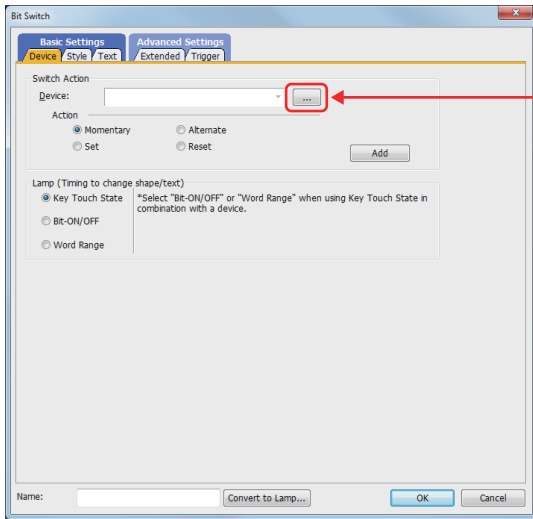
Creating a touch switch which turns the bit device (M10) ON when touched.

#### (1) Place a touch switch.

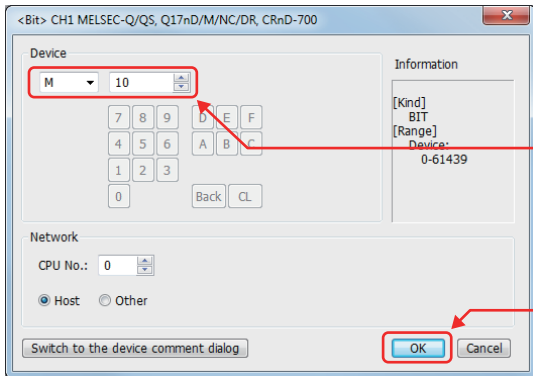


1. Click on the [Object] - [Switch] - [Bit Switch] menu.
2. Move the cursor to the position where the touch switch is placed, and click the mouse button.
3. The touch switch is placed.
4. Double-click the placed touch switch to display the setting dialog.

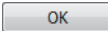
## (2) Bit switch settings

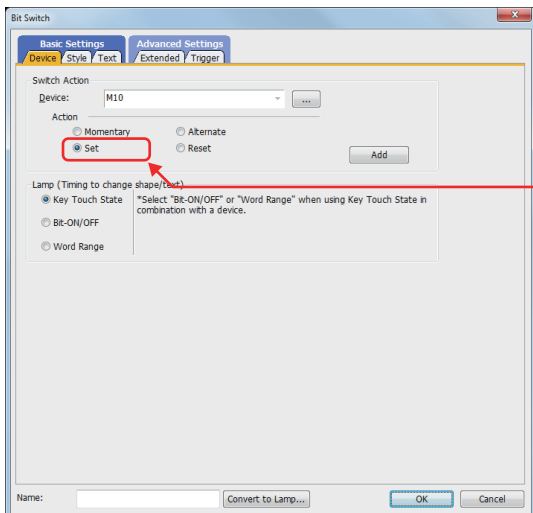


1. Click the  button in [Switch Action].



2. As the device setting dialog box appears, set the device to "M10".

3. After setting is completed, click the  button.

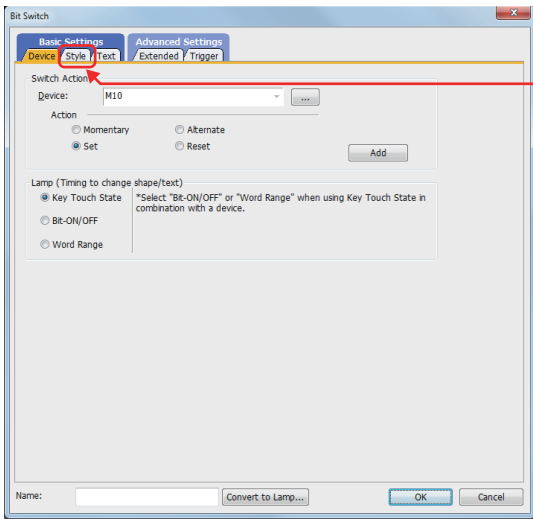


4. Set [Action].  
[Action] determines how the bit device will behave when touched.

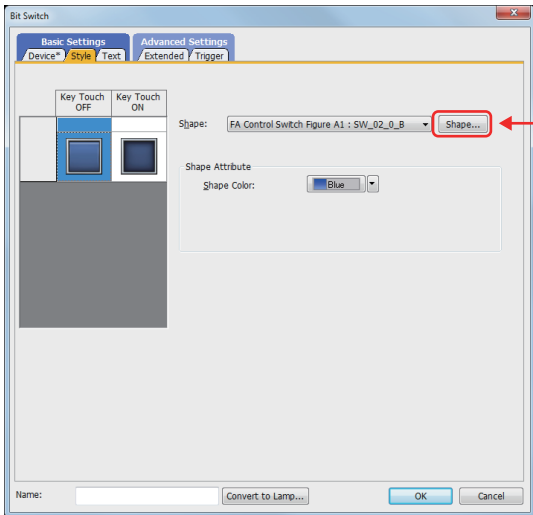
- Momentary : turns on while being touched (turns OFF when released)
- Alternate : toggles ON/OFF when touched
- Set : turns ON when touched
- Reset : turns OFF when touched

Select "Set" here.

### (3) Setting a display style



1. Click the [Style] tab.

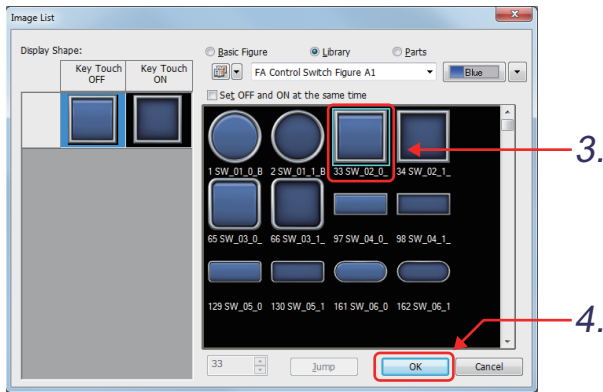


2. Click the **Shape...** button.

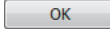


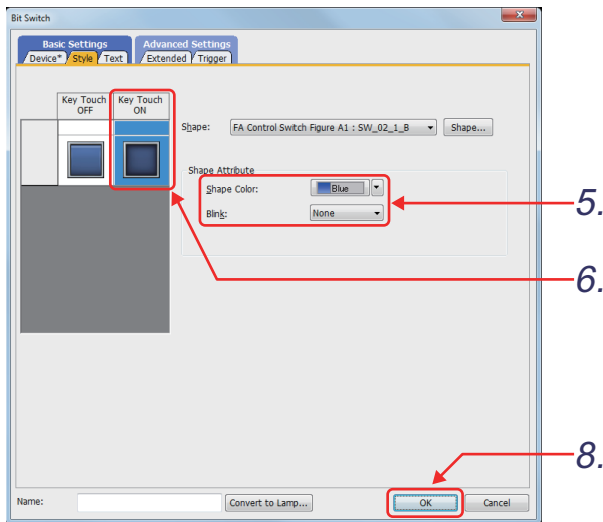
(Next page)

(From previous page)



3. As the [Image List] dialog box appears, select the figure "33 SW\_02\_0\_B".

4. After setting is completed, click the  button.



5. Set the shape attribute for the OFF state as follows.

Shape Color: Blue

6. Click the shape of the ON state to set the shape attribute for the ON state.

7. Set the shape attribute for the ON state as follows.

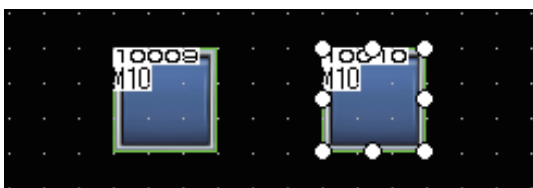
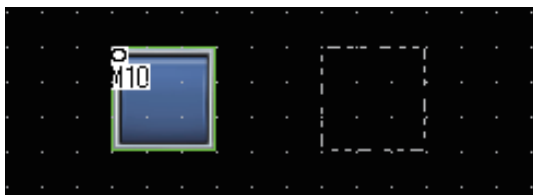
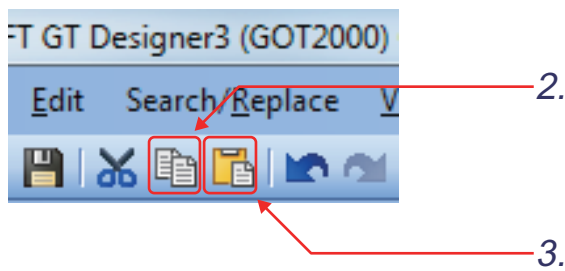
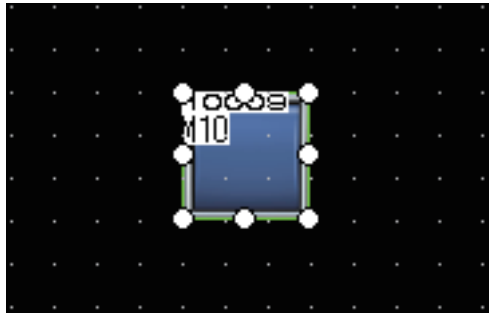
Shape Color: Blue

Blink: None


8. Click the  button.


#### (4) Creating other bit switches

Copy the touch switch created in (2) and paste the copy to create a new touch switch.  
The following shows how to copy and paste a touch switch.



1. Click the copy target touch switch to select it.

2. Click  on the toolbar. (Or Ctrl + C)

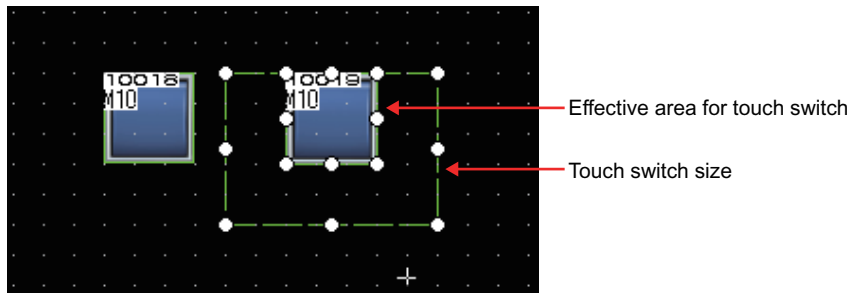
3. Click  on the toolbar. (Or Ctrl + V)

4. A display range frame appears. Move it to the desired position.

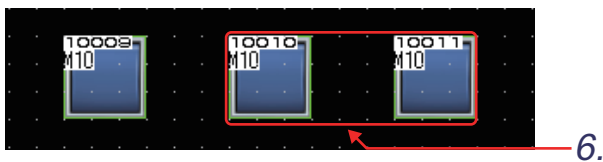
5. Click the frame to paste the copy of the touch switch.

**POINT**

To adjust the touch area of a touch switch according to the switch size, perform the following operations.



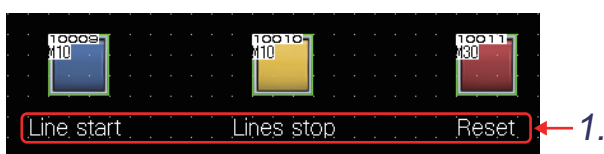
- (a) Right-click the mouse and select [Edit Touch Area] → [Manual Edit] from the menu.
- (b) Change the size of the touch switch effective area so that it overlaps the touch switch figure size. The touch switch effective area can be changed in one dot unit.



6. Create two switches as described in 5. above.
7. Change the settings of switch created by copying/pasting as follows:

Touch switch name	Setting item		Setting
Line stop switch	Switch action	Device	M10
		Operation setting	Bit reset
	Key touch OFF	Shape color	Yellow
		Key touch ON	Shape color
Reset switch	Switch action	Device	M30
		Operation setting	Bit set
	Key touch OFF	Shape color	Red
		Key touch ON	Shape color
	Blink		Disabled

**(5) Naming the switches**



1. Set the names of the three switches by placing text figures on the screen.

This completes the settings of the bit switch.

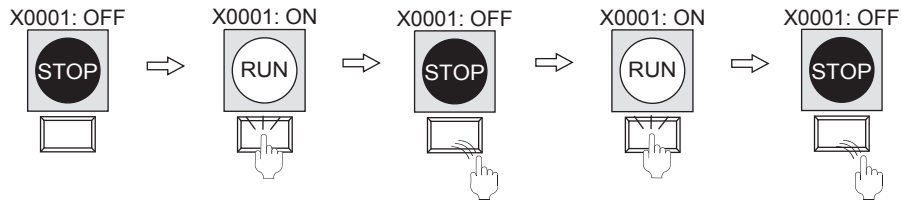


## 5.6.2 Bit switch actions

A bit switch turns on and off the bit device specified by the switch.  
The following shows the actions that can be set with bit switches.

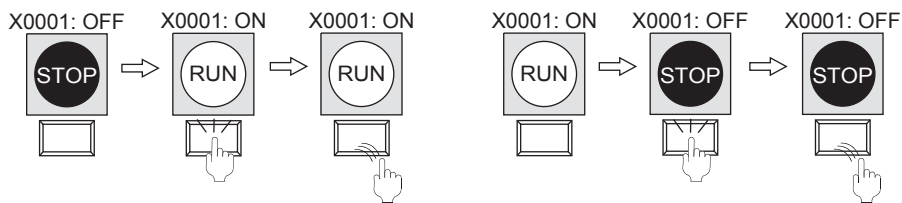
### (1) Bit momentary

Keeps a specified bit device on only while you touch the switch.



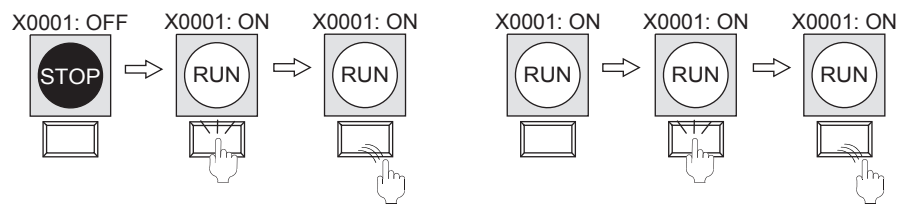
### (2) Bit alternate

Alternates the status of a specified bit device (ON $\leftrightarrow$ OFF) when you touch the switch.



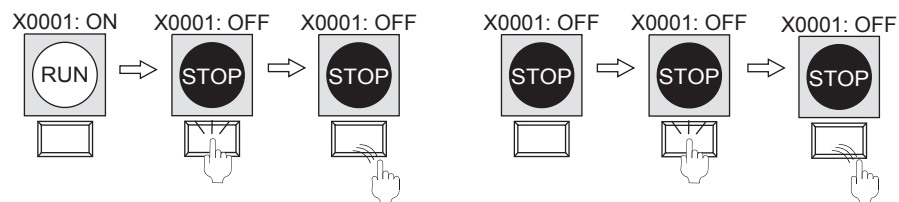
### (3) Bit set

Turns on a specified bit device when you touch the switch.



### (4) Bit reset

Turns off a specified bit device when you touch the switch.



## 5.7 Operation check 1

Select [Communication] → [Write to GOT] from the menu to display the screen for writing project data. Select data and a write mode, and then click the [GOT Write] button to write all data to the GOT.

Reset the PLC CPU using the RESET key switch, and then switch to RUN.

Check if each switch of the initial screen (No.1) functions properly here.

### (1) Test 1

Perform the following tests in screen No. 1.

Item		Test object	Planned operating time (numerical input)
		Touch operation	
Result of operation	Screen status	When a key window screen appears, enter the numeric value (15), and then press [Enter] of the key window.	
	Write device	D10	

### (2) Test 2

Perform the following tests in screen No. 1.

Item		Test object	Line start switch	RUN lamp	Operating time (numerical display)
		Touch operation*1		Touch	—
Result of operation	Screen status	The switch is pressed.	The lamp is on till the planned operating time.	Count up till the planned operating time.	
	Write device	M10: ON	—	D20	
	Read device	—	Y7A: ON	—	

\*1 The line will not start when the operating time exceeds the planned operating time.

### (3) Test 3

Perform the following tests in screen No. 1.

Item		Test object	Line stop switch	RUN lamp	Operating time (numerical display)
		Touch operation		It is touched while the operation lamp is on.	—
Result of operation	Screen status	The switch is pressed.	The lamp is off.	Count stops.	
	Write device	M10: OFF	—	—	
	Read device	—	Y7A: OFF	D20	

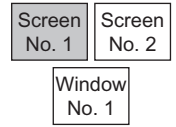
**(4) Test 4**

Perform the following tests in screen No. 1.

Item		Test object	Reset switch	RUN lamp	Operating time (numerical display)
Touch operation		Touch		—	—
Result of operation	Screen status	The switch is pressed.		The lamp is off.	The operating time becomes "0".
	Write device	M30: ON		—	—
	Read device		—	Y7A: OFF	D20

# 5.8 Comment display settings

Two types of messages (comments) are displayed depending on the condition of devices.



Describes the line operation (Y7B: ON/OFF) of comment display in the form of comment. With Y7B ON, "line in operation" is displayed. With Y7B OFF, "line stopped" is displayed.

1 WHAT IS THE GOT?

2 GOT OPERATION

3 ABOUT GT Designer3

4 FROM GOT SCREEN CREATION UP TO THE TEST

5 DRAWING FUNDAMENTALS

6 ABOUT DEBUG

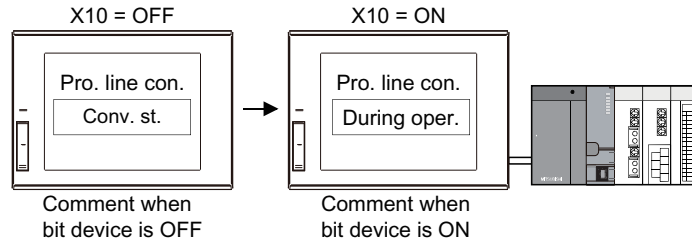
APPENDICES

## 5.8.1 About the comment display

There are the following three types of comment display.

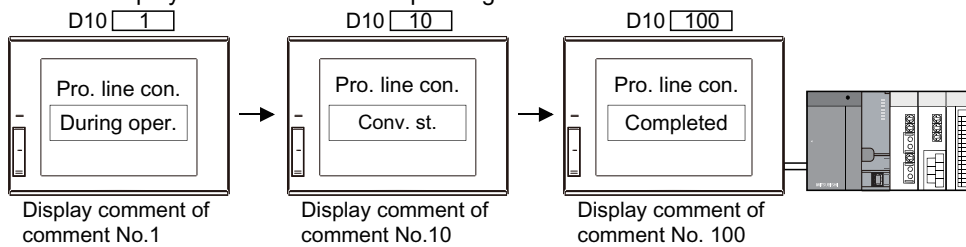
### (1) Comment display (bit)

It is the function to display the comment corresponding to the ON/OFF status of bit device.  
The following two comments are switched back and forth for displaying.



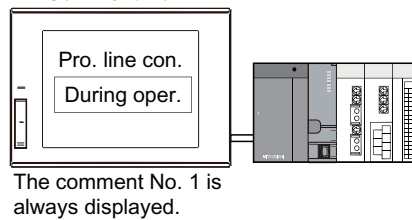
### (2) Comment display (word)

This function displays the comment corresponding to the value of a word device.



### (3) Comment display (simple)

This function displays comments without setting a device.  
Comment No. 1

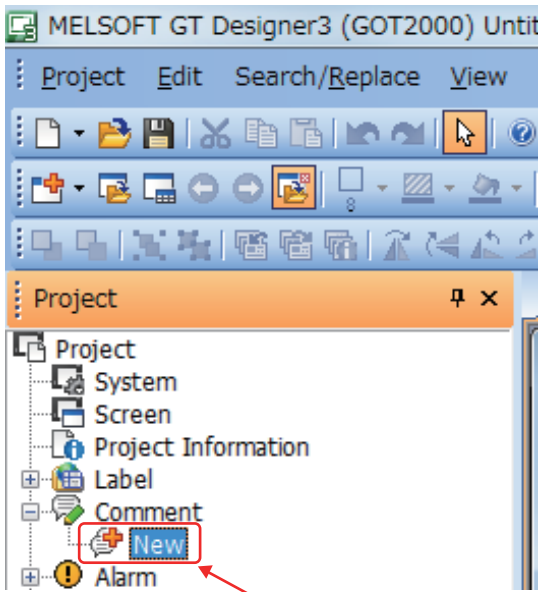


## Remark

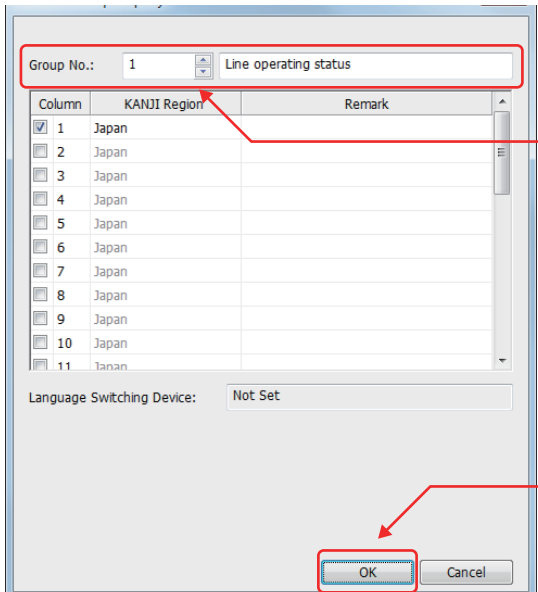
The comment to be displayed by comment display needs to be registered in advance.

## 5.8.2 Comment display settings by bit device

### (1) Registering comments

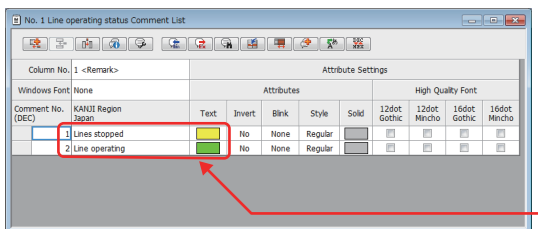


1. Double-click [New] of the [Comment] menu in the project tree.



2. When [Comment Group Property] appears, configure the setting as follows.  
Group No.: 1, Line operating status

3. Click the  button.



4. When the [Comment List] dialog appears, configure the settings as follows.

Comment No. 1  
Comment: "Lines stopped"  
Text: Yellow

Comment No. 2  
Comment: "Line operating"  
Text: Green

**POINT****Displaying multi-language comments (Language switching device)**

If you set multiple comment columns in a comment group, the comments can be registered in multiple languages for one comment No.

The comments registered in multiple languages can be switched by switching the comment column to be displayed with the language switching devices.

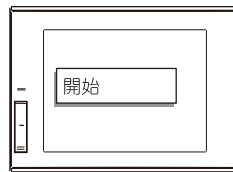
Example) Switching comments with the language switching device

Comment group No. 1

Comment No.	Column No.1	Column No.2
1	開始	Start
2	実行中	Running
3	完了	Done
:	:	:

Comment No. to be displayed: 1  
Language switching device: D500

• D500 = 1



Comment of the column No.1 is displayed.

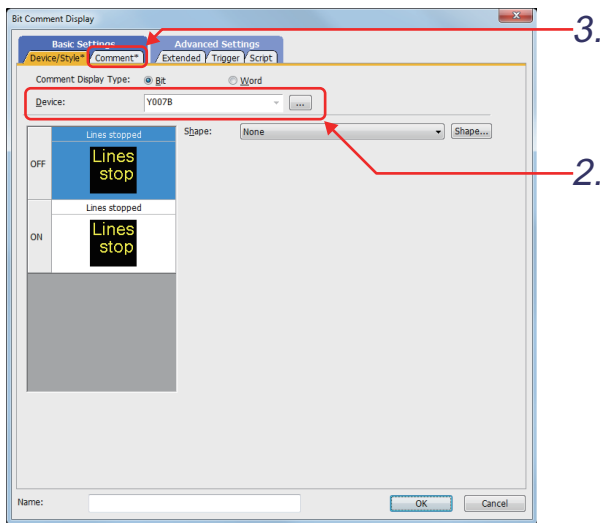
• D500 = 2




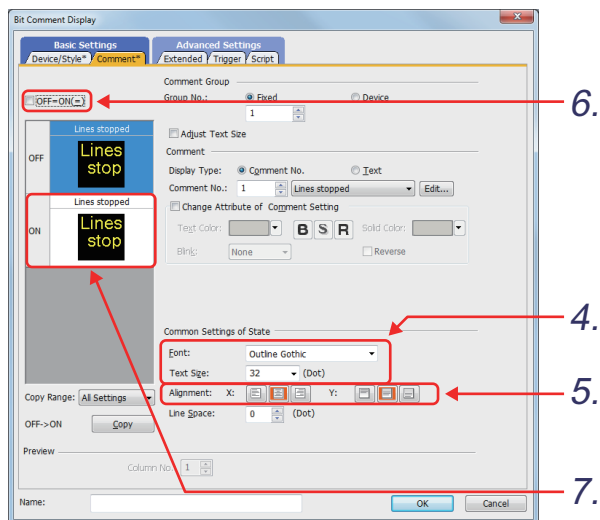
Comment of the column No.2 is displayed.

(2) Click  on the toolbar (Object) to place a comment on the object screen.

(3) Comment display setting



1. Double-click the comment display. The comment display (Bit) dialog box is displayed.
2. Click the  button to set the device to "Y007B".
3. Click the [Comment] tab.



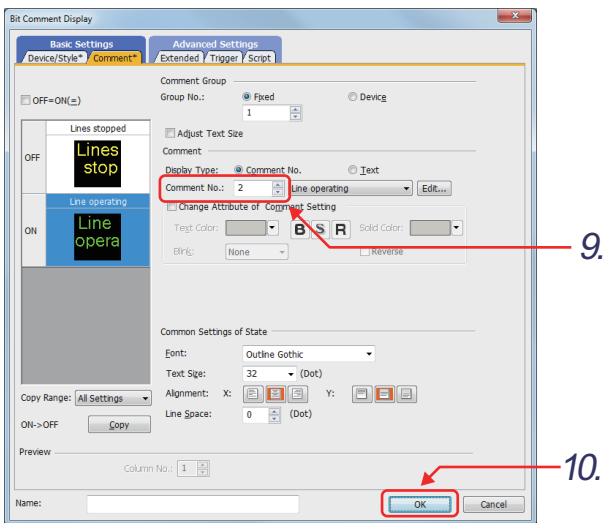
4. Set [Font] to "Outline Gothic" and [Text Size] to "32".
5. Set "Alignment" to "Center".
6. Deselect [OFF=ON].
7. Click the [ON] button.



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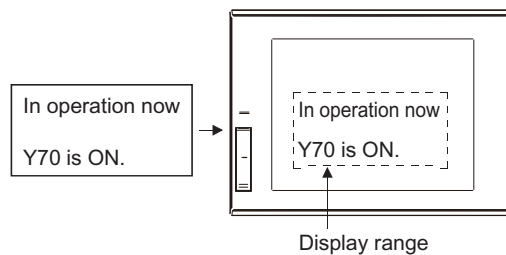
8. Set comments to be displayed when the device is ON.

9. Set [Comment No.] to 2.

10. Click the  button.

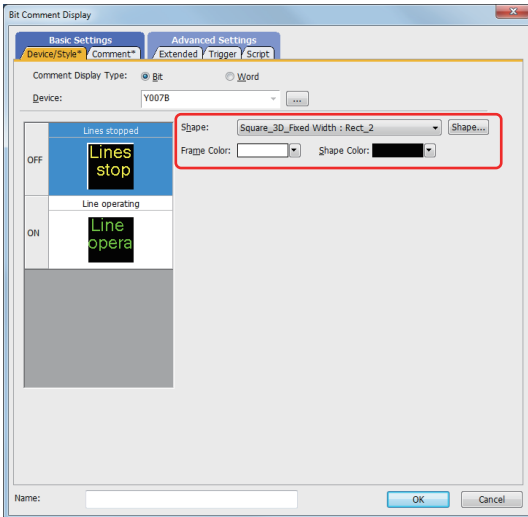
## POINT

- (1) A comment can be created with 1 to 1024 characters.
- (2) Comments can be created on multiple lines.  
Comments are displayed in the GOT as follows:



#### (4) Settings on object screen

Adjust the size of object frame so that all the comments are displayed.  
Create a frame for the comments.

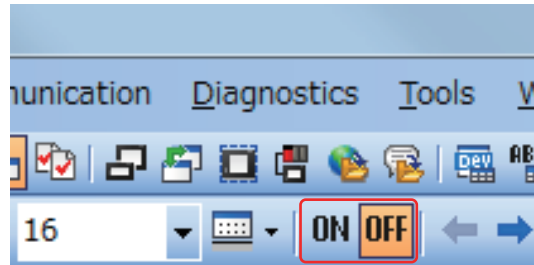


1. As the cursor changes to a re-sizing cursor when it is moved over to the handle, click the left mouse button and drag it to the desired size for displaying.
2. When the display area is determined, release the left mouse button.
3. Create a frame showing the comment display area by using a figure such as a rectangle. This completes the settings of the comment display by a bit device.

To create a frame showing the comment display area, set [Shape] on the [Device/Style] tab in the [Bit Comment Display] dialog.

## POINT

- The display condition for set comments can be displayed switching between ON and OFF by pressing the "ON/OFF of object function" button on the toolbar (Display setting).

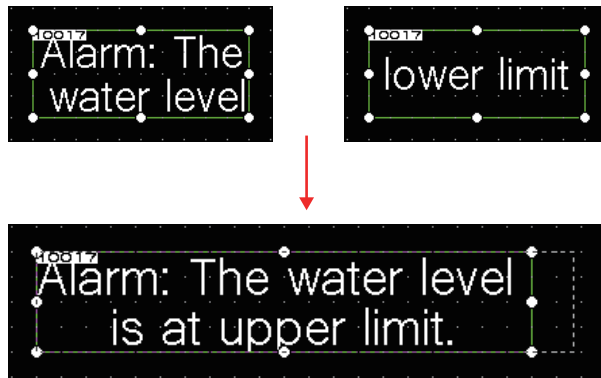


- Adjust the size of display area when the comments vary in length depending on its ON/OFF condition as follows:

(Example) In case of ON, [Alarm: The water level is at upper limit.].

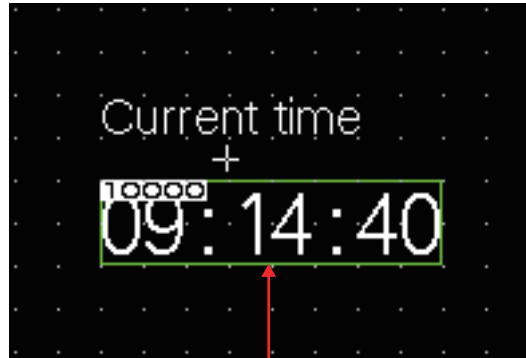
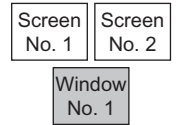
In case of OFF, [lower limit].

Adjust the size of display area to be able to display a longer comment by switching comment displays with the "ON/OFF of object function" button of toolbar (Display setting).



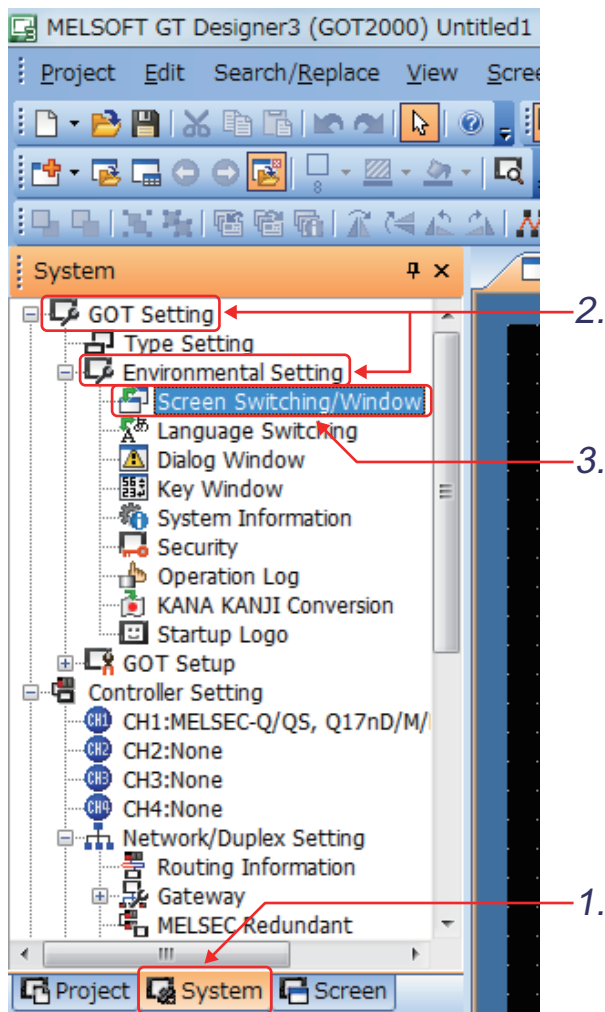
## 5.9 Window screen creation

Create a screen displayed over the base screen.  
Window screen No. 1 is displayed in Overlap window 1 here.



Displays the clock.

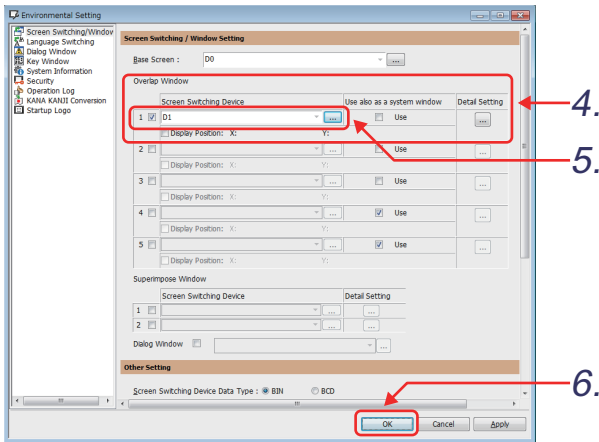
### (1) Making the settings of screen switch device



1. Click the docked [System] tab.
2. The system tree is opened. Double-click [GOT Setting] → [Environmental Setting].
3. Double-click [Screen Switching/Window].

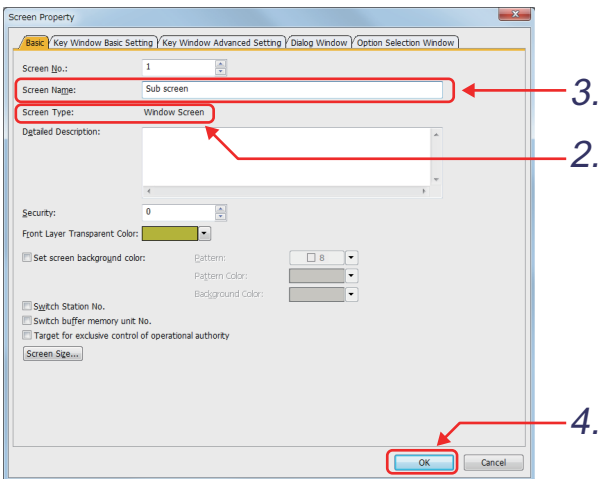
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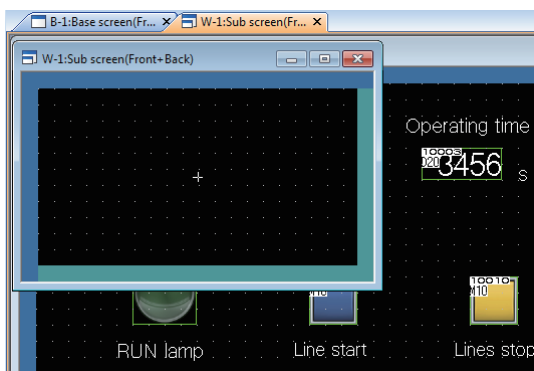


4. Check [Overlap Window1].
5. Click the button to set the device to "D1".
6. Click the button.  
This completes the settings of the screen switching device.

## (2) Creating window screen



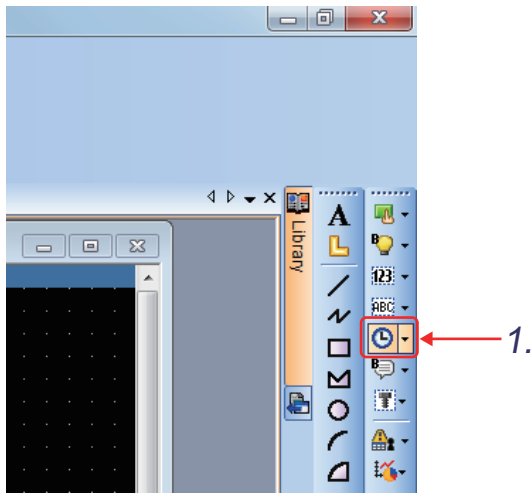
1. Select the [Screen] - [New] - [Window Screen] menu.
2. As a dialog box appears, check that the "Window Screen" is selected on [Screen Type].
3. Enter "Sub screen" for [Screen Name].
4. Click the button.




Window screen No. 1 is displayed on the screen.

### (3) Setting the time displayed on the window screen

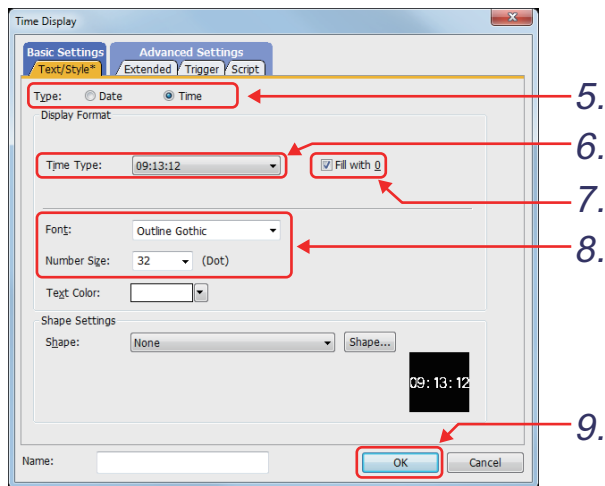
The current time is displayed on the GOT.

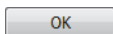


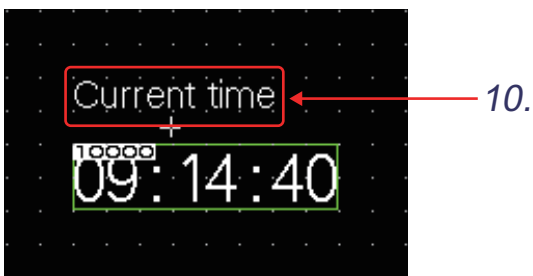
1. Click  on the toolbar (Object).



2. Click on the upper left portion of the screen to place a time display.
3. Double-click the placed time display.



4. The [Time Display] dialog appears.
5. Select "Time" for [Type].  
Hour:Minute:Second 09:13:12
6. Set [Time Type] to "Hour:Minute:Second".  
The current time is displayed in the "Hour: Minute: Second" format.
7. Select [Fill with 0].
8. Set [Font] to "Outline Gothic" and set [Number Size] to "32".
9. Click the  button.



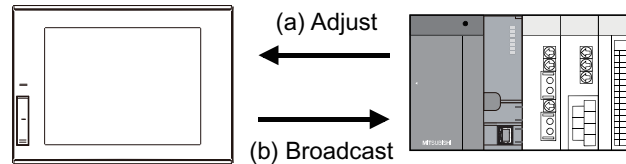
10. Enter "Current time" above the time display.

## POINT

### (1) Date and time displayed by time display function

The time display function represents the date and time of the GOT maintained by the internal clock function. The clock function sets the clock to be used as standard for adjusting the time between the GOT and PLC CPU.

The way of adjusting the time between the GOT and PLC CPU differs as follows depending on the clock to be used as standard:



(a) Using the time of clock data in PLC CPU as standard (time adjustment)  
Set the clock data of GOT to the time of clock data in PLC CPU.

(b) Using the time of clock data in GOT as standard (broadcast)  
Set the clock data of PLC CPU to the time of clock data in GOT.

A battery is required for the clock data to be maintained while the power to GOT is off.

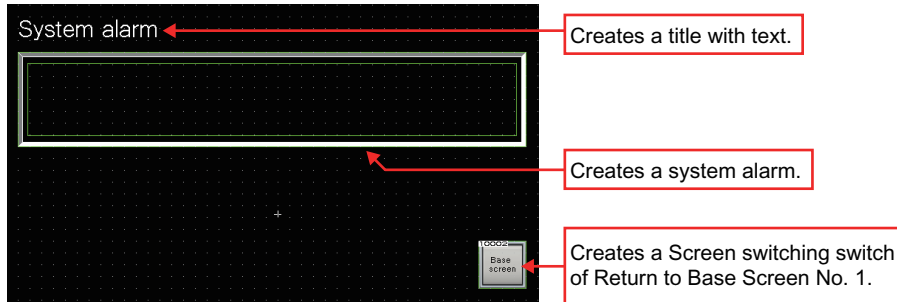
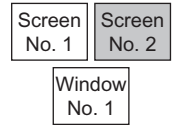
### (2) Change in settings of clock function

The settings of clock function can be changed using the clock setting function provided in GT Designer3 or Utility function.

For the details of the time display function, refer to the GT Designer3 (GOT2000) Screen Design Manual.

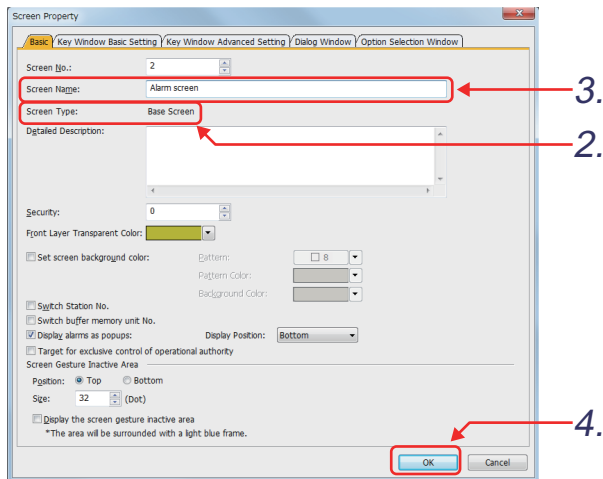
## 5.10 System alarm settings

Create Base Screen No. 2 and set the system alarm.  
Refer to section 4.5.1 for details for system alarms.  
The following screen will be created in Base Screen No.2.



### 5.10.1 System alarm settings

#### (1) Creating Base Screen No.2

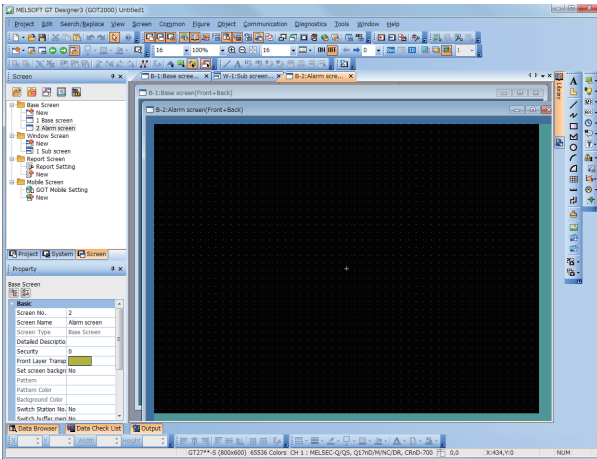


1. Select the [Screen] - [New] - [Base Screen] menu.
2. As a dialog box appears, check that the "Base Screen" is selected on [Screen Type].
3. Enter "Alarm screen" for [Screen Name].
4. Click the  button.

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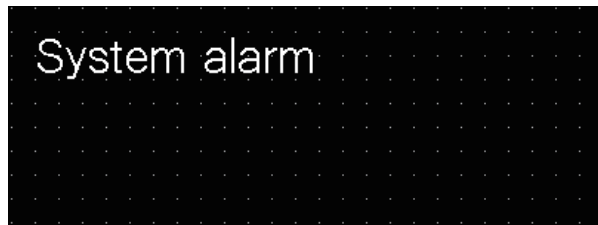


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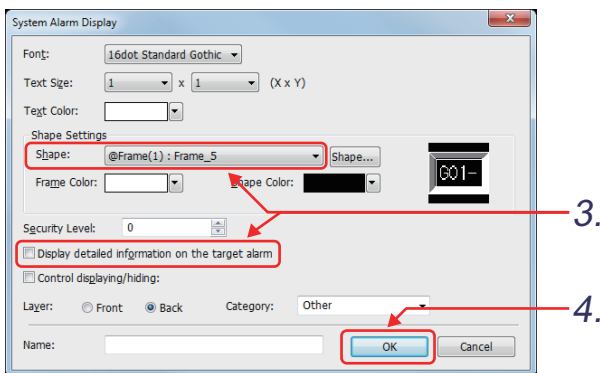
Window screen No. 2 is displayed on the screen.

**(2) Creating a title text for the system alarm**  
Enter "System alarm" in Text.



**(3) Setting a system alarm.**

1. Select Object- Alarm Display- System Alarm Display.  
Click on the screen to place a system alarm display.



2. Double-click the system alarm which has been placed.  
The [System Alarm Display] dialog appears.

3. Configure the system alarm display settings.  
Shape: @Frame(1): Frame\_5  
Display detailed information on the target alarm: Deselected

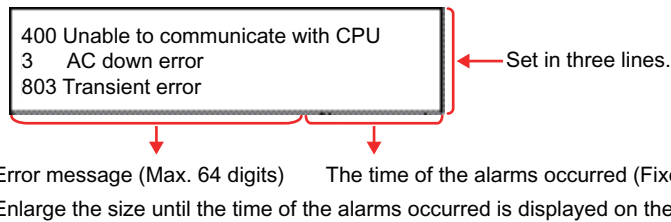
4. Click the  button.



5. Adjust the size of system alarm so that all the system alarms are displayed.  
Position the cursor over the handle, click and drag it to the desired size for displaying the system alarm.
6. When the object and shape are adjusted, adjustment is completed.

## POINT

An adjustment of display area is required as illustrated below to keep part of alarm message from dropping out of the frame.



- When "Display detailed information on the target alarm" is selected, the alarm messages containing the information to identify devices, objects, or functions that caused alarms are displayed.
- If alarm messages are not displayed entirely even though the display range has been adjusted, set [Display Alarm] to [System Alarm] and set [Display Type] to [Flow] in the [Alarm Popup Display] dialog. (As the error codes used for the GOT2000 series have been increased, system alarm messages are not displayed entirely in VGA resolution.)

## Remark

### Size change of object with shape

#### (1) Method of changing size

- (a) Select the object to be changed in size.
- (b) Position the cursor over the sizing handle, click and drag it to change the desired size.

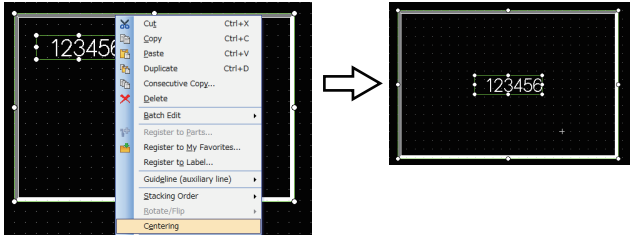




### Misalignment of object and figure

#### (1) Centering the object in the figure

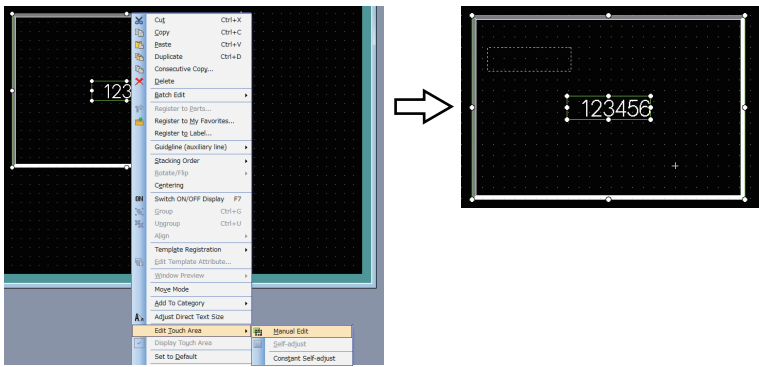
Right click on the object to be realigned.



Right-click the mouse and select [Centering] in menu.

#### (2) Moving the object to any position within the figure

The position of object and shape can be changed separately as instructed below.

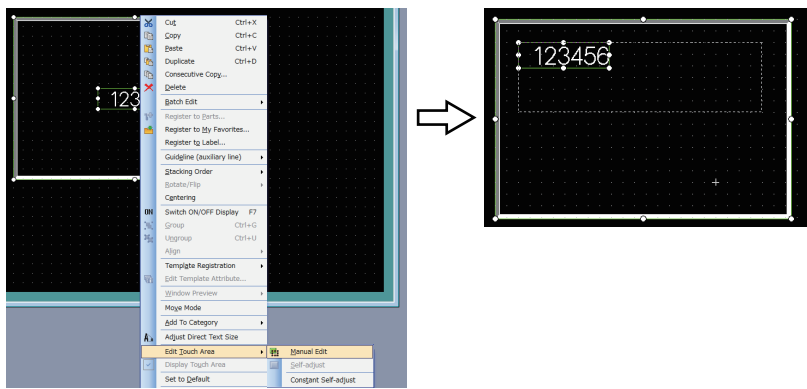


Right-click the mouse and select [Edit Touch Area] → [Manual Edit] from the menu.

Move the object to change the position.

#### (3) Moving the object to any position within the figure

The position of object and shape can be changed separately as instructed below.



Right-click the mouse and select [Edit Touch Area] → [Manual Edit] from the menu.

Drag the object to change its size.

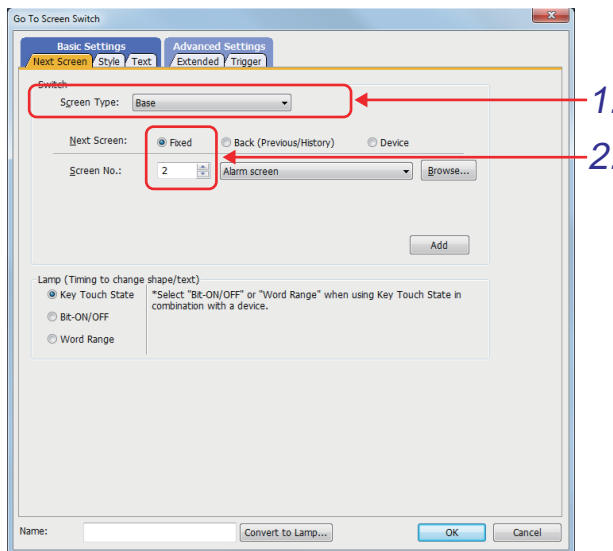
## 5.10.2 Go To Screen Switch setting

Create a switch which can switch a base screen to another or display a window screen by touch operation.

### (1) Placing a Go To Screen Switch.



### (2) Setting operation of Go To Screen Switch.



1. Display Base Screen No. 1.
2. Select the [Object] - [Switch] - [Go To Screen Switch] menu.
3. Move the cursor to the position where the Go To Screen Switch is placed, and click the mouse button.
4. Double-click the placed Go To Screen switch.

1. Check that "Base" is selected in [Screen Type].
2. Set [Next Screen]. The specified screen is displayed when the Go To Screen switch is touched.

"Fixed":

switch to the Base Screen whose screen No. is specified.

"Back (Previous/History)":

switch to previously displayed Base screen.

Up to 10 screens can be switched according to the history.

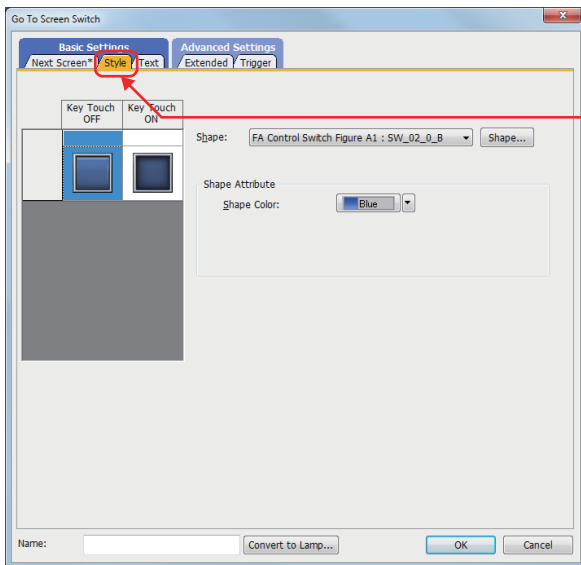
"Device":

switch to the Base Screen whose screen No. is specified depending on the ON/OFF condition of the specified bit device.

(this is useful for returning to the previously displayed screen)

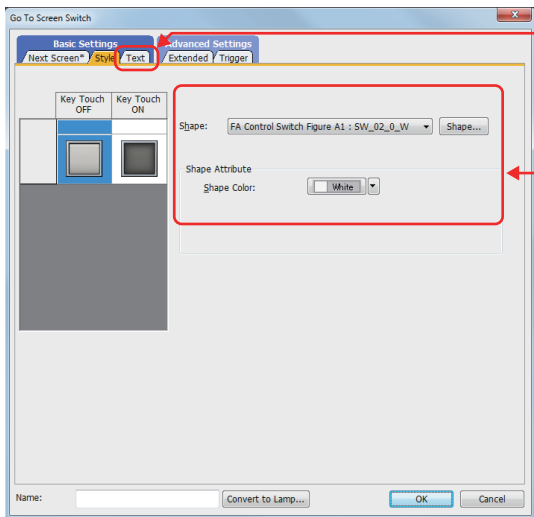
Here select "Fixed", and set "2" to switch to Base Screen No. 2.

### (3) Setting the display (figure, color) of Go To Screen Switch.



1. Click the [Style] tab.

1.



2. Set the Display Style of Go To Screen Switch as follows:

"Shape": FA Control Switch Figure  
A1:SW\_02\_0\_W (specified in  
Shape...)

<Shape attribute for [Key Touch OFF]>  
[Shape Color]: White

<Shape attribute for [Key Touch ON]>  
[Shape Color]: White  
[Blink] : None

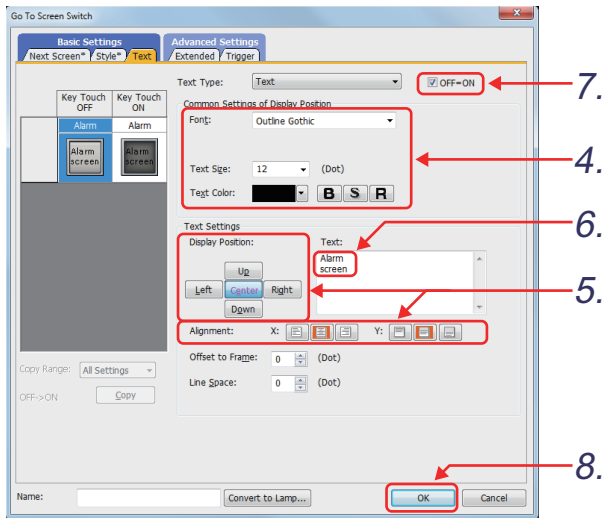
2.

3. Click the [Text] tab.



(Next page)

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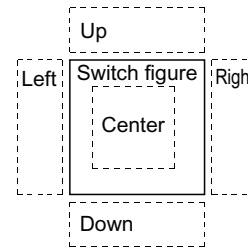
4. Set the text to be displayed in the switch as follows:

[Font] : Outline Gothic  
 [Text Size] : 12  
 [Text Color] : Black

5. Set the display position of text as follows:

[Display Position]: Center  
 [Alignment]: X: Y:

The position of the texts used for switches and lamps can be selected among the following display positions:



6. Enter the following to [Text].  
"Alarm screen"
7. Check that [OFF=ON] is selected.
8. Click the button to complete the settings.

**(4) Create Go To Screen Switch which displays Window Screen No. 1.**

Copy and paste the Go To Screen Switch to Base Screen No. 2 created above.  
 Make the settings of display and operation for the copied Go To Screen Switch as follows:

Setting item		Setting
Next Screen tab	Screen Type	Overlap window 1
	Next Screen	Fixed
	Screen No.	1
Text tab	Text	Sub screen

When setting is done, click the [OK] button.

**(5) Create Go To Screen Switch for Window Screen No. 2.**

Copy and paste the Go To Screen Switch created for Base Screen No. 1 on to Base Screen No. 2.  
 Make the settings of display and operation for the pasted Go To Screen Switch as follows:

Setting item		Setting
Next Screen tab	Next Screen	Fixed
	Screen No.	1
Text tab	Text	Base screen

When setting is done, click the [OK] button. The Go To Screen Switch setting has been configured.

## 5.11 Operation check 2

Display the screen for writing a project, and then write data to the GOT.  
 Reset the PLC CPU using the RESET key switch, and then switch to RUN.  
 Check if the comment display in screen No. 1 is properly displayed, and that the overlap window (Window Screen No. 1) appears correctly here.

### (1) Test 1

Perform the following tests in screen No. 1.

Item		Test object	Planned operating time (numerical input)
		Touch operation	Touch the numerical input area.
Result of operation	Screen status	When a key window screen appears, enter the numeric value (15), and then press Enter of the key window.	
	Write device	D10	

### (2) Test 2

Perform the following tests in screen No. 1.

Item		Test object	Line start switch	Comment display
		Touch operation	Touch	
Result of operation	Screen status	The switch is pressed.	Comment "Line operating" appears.	
	Write device	M10: ON	—	
	Read device	—	Y7B: ON	

### (3) Test 3

Perform the following tests in screen No. 1.

Item		Test object	Line stop switch	Comment display
		Touch operation	It is touched while the operation lamp is on.	
Result of operation	Screen status	The switch is pressed.	Comment "Line stopped" appears.	
	Write device	M10: OFF	—	
	Read device	—	Y7B: OFF	

**(4) Test 4**

Perform the following tests in screen No. 1.

Item		Test object	Alarm screen switch
1) Touch operation			Touch
Result of operation	Screen status		Switch to Base Screen No. 2.
	Write device		2→D0
	Read device		—

**(5) Test 5**

Perform the following tests in screen No. 2.

Item		Test object	System alarm
1) Operations in the training machine			Power off the Q series training machine (After confirming Test 5, power back ON the Q series training machine.)
Result of operation	Screen status		The following alarm message appears: "402 Communication timeout. Confirm communication pathway or modules."
	Write device		—
	Read device		—

**(6) Test 6**

Perform the following tests in screen No. 2.

Item		Test object	Base screen switch
1) Touch operation			Touch
Result of operation	Screen status		Switch to Base Screen No. 1.
	Write device		1→D0
	Read device		—

**(7) Test 7**

Perform the following tests in screen No. 1.

Item		Test object	Sub screen switch
1) Touch operation			Touch
Result of operation	Screen status		Window screen No. 1 displayed.
	Write device		1→D1
	Read device		—



**(8) Test 8**

Perform the following tests in screen No. 1.

Test object		Window screen
Item		
1) Touch operation		Touch x in the upper right corner.
Result of operation	Screen status	Window screen No. 1 closes.
	Write device	0→D1
	Read device	—

# 5.12 Training device list and sequence program

## (1) Training device list

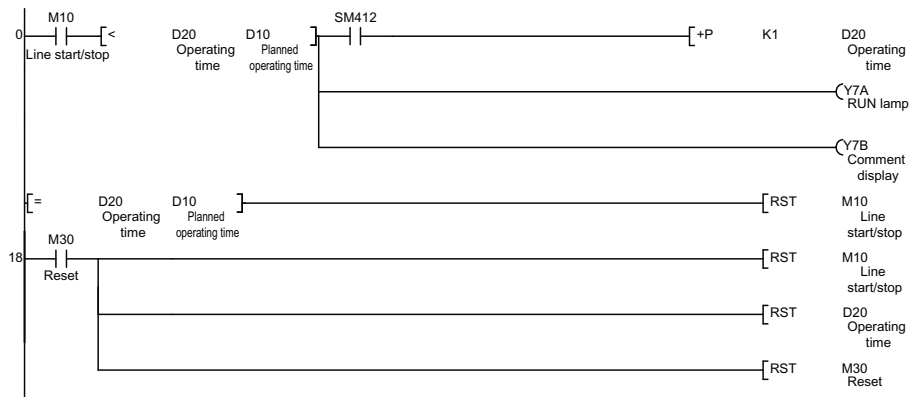
Device	Signal name	GOT operation	Device	Signal name	GOT operation
M10	Line start/stop	W	D10	Numerical input	W
M30	Reset	W	D20	Numerical display	R
Y7A	RUN lamp	R	D0	Base screen switching	W
Y7B	Comment display	R	D1	Window screen switching	W

R: Reading W: Writing

### POINT

To identify the device used for the project data being edited, the Device List function of GT Designer3 will be useful. Refer to section section 5.13 of this text for details.

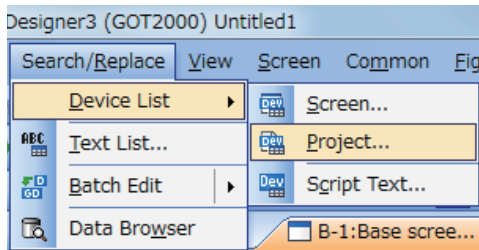
## (2) Training sequence program



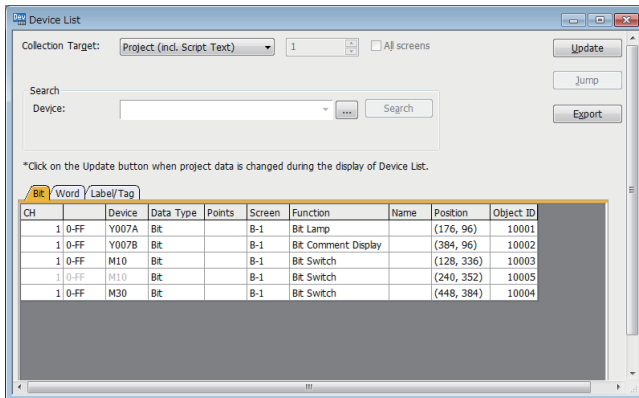
\* SM412 is a special relay that makes turn ON/OFF the CPU module OS at the interval of one second.

## 5.13 How to check the devices used in the created project

To check the devices used in the created project, use the device list on GT Designer3.  
Display the list of the devices used in the project which has been created in this training.

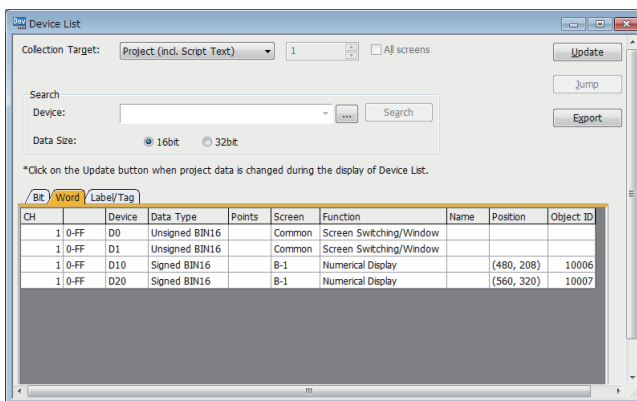


Click the [Search/Replace] - [Device List] - [Project] menu.



The Device List dialog box is displayed.  
As a list of bit devices is shown right after the Device List dialog box appears, check which bit devices are included in the list.

Click the tab to see a list of word devices or labels.



A list of word devices or labels is displayed.

### POINT

When the desired device is not shown in the list, click the Search button to specify the appropriate device.  
For the details of the setting in this section, refer to the GT Designer3 (GOT2000) Screen Design Manual.

# 6. About debug

This chapter describes the debug function used for troubleshooting and maintenance of the PLC system.

## 6.1 Extended function

To use extended functions, install the extended system applications on the GOT.

### (1) List of extended functions

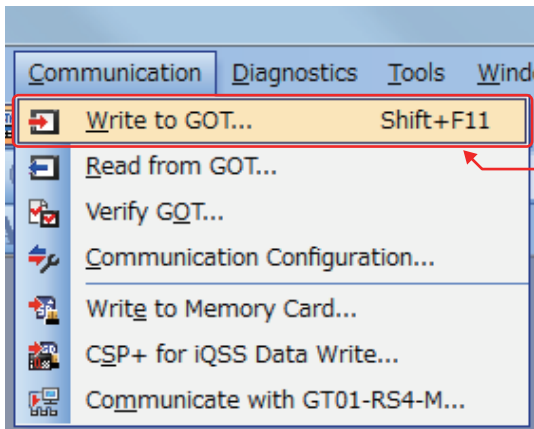
Function name	Reference	
Graphic acceleration driver	GT Designer3 (GOT2000) Screen Design Manual	
Standard font		
Outline font		
KANA-KANJI conversion		
Wireless LAN		
SoftGOT-GOT link function	GT SoftGOT2000 Version1 Operating Manual	
System launcher	GOT2000 Series User's Manual (Utility)	
iQSS utility	GOT2000 Series User's Manual (Monitor)	
Sequence program monitor		
FX ladder monitor		
Backup/Restore		
Gateway		
Barcode		
RFID		
Remote personal computer operation (Serial)		
Remote personal computer operation (Ethernet)		
VNC server		
Video/Multimedia	GT Designer3 (GOT2000) Screen Design Manual	
External I/O / Operation panel		
Report		
Printer		
Sound output		
GOT network interaction		
GOT Mobile function		
Device data transfer		
MES interface		GOT2000 Series MES Interface Function Manual for GT Works3 Version1
Device monitor		GOT2000 Series User's Manual (Monitor)
Network monitor		
Log viewer		
Intelligent module monitor		
Servo amplifier monitor		
Drive recorder		
R motion monitor		
Q motion monitor		
CNC monitor		
CNC data I/O		
CNC machining program edit		
CNC monitor 2		
Motion program editor		
Motion program I/O		
Motion SFC monitor		
FX list editor		
CC-Link IE Field Network diagnostics		

Function name	Reference
Recipe operation	GT Designer3 (GOT2000) Screen Design Manual
Recipe display (record list)	
Operation log screen image	
Operator authentication	
File manager	GOT2000 Series User's Manual (Utility)
Document display	GT Designer3 (GOT2000) Screen Design Manual
MELSEC-L troubleshooting function	GOT2000 Series User's Manual (Monitor)
GOT platform library	GT Designer3 (GOT2000) Screen Design Manual
GOT function expansion library (additional/MELSEC iQ-R)	

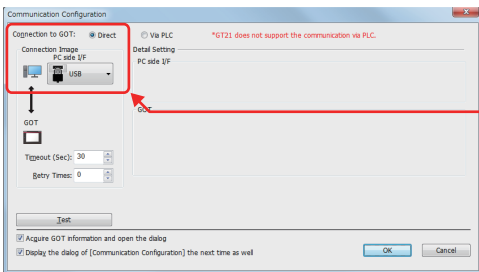
## (2) Writing the extended functions

The following explains the procedure for writing the extended functions.

In this section, the sequence program monitor (ladder) and device monitor for training in section 6.3 and section 6.4 are written.

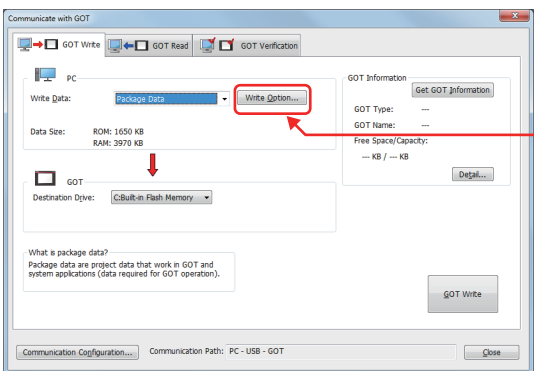


1. Click [Communication] - [Write to GOT] from the menu.

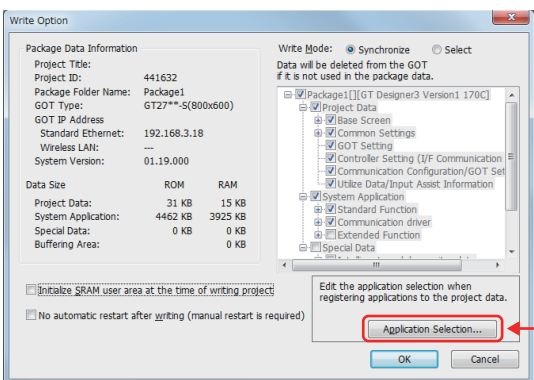


2. When the Communication Configuration dialog appears, select the settings as follows and click the **OK** button.

Connection to GOT: Direct  
PC side I/F: USB



3. When the Communicate with GOT dialog appears, click the **Write Option...** button.

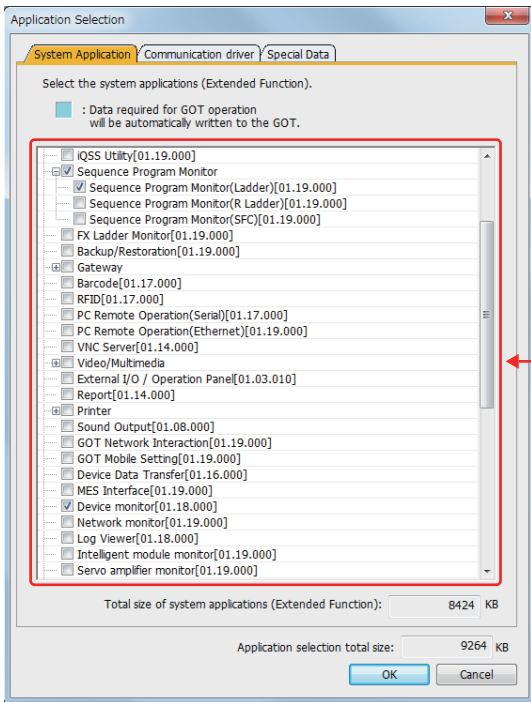


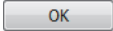
4. When the [Write Option] dialog appears, click the **Application Selection...** button.



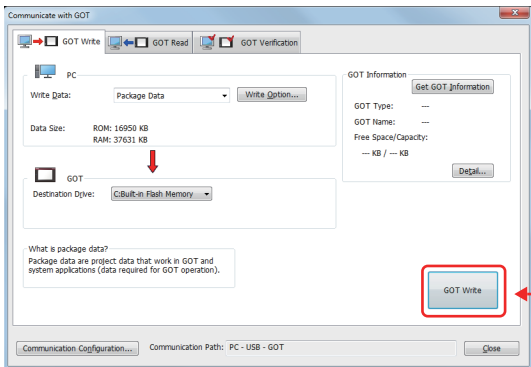
(Next page)

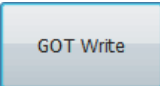
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5. Select [Extended Function] - [Sequence Program Monitor(Ladder)] and [Device monitor] from the tree view, and click the  button.

5.



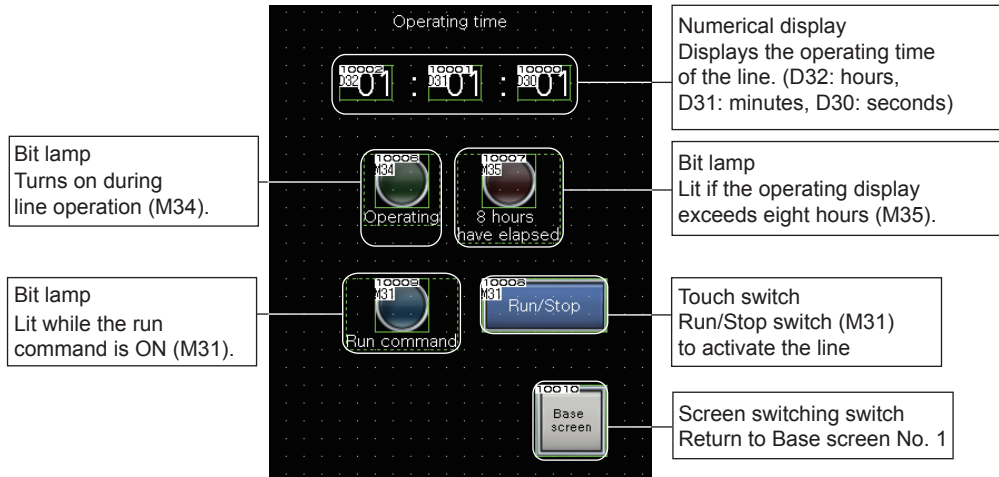
6. Click the  button.

6.

## 6.2 Training screen creation

Add the following Base Screen No. 3 to the screen created in chapter 5.

Base Screen No. 3

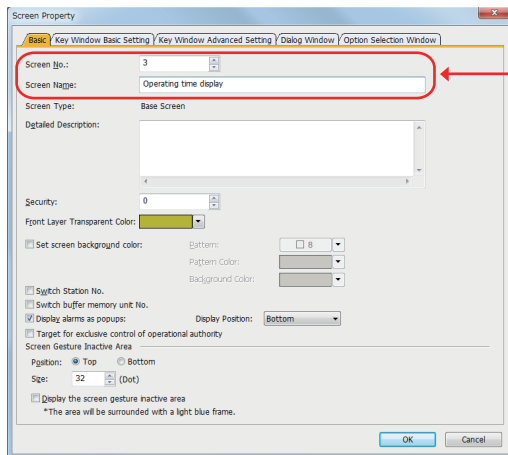


[Operation of Base Screen No. 3]

1. When the [Run/Stop] switch turns ON, the operation will start, and the lamp will be lit.
2. As the operation gets started, the operating time starts counting. When the operation time is over eight hours, the lamp turns ON.

### 6.2.1 Screen creation training

#### (1) Creating and setting Base Screen No. 3



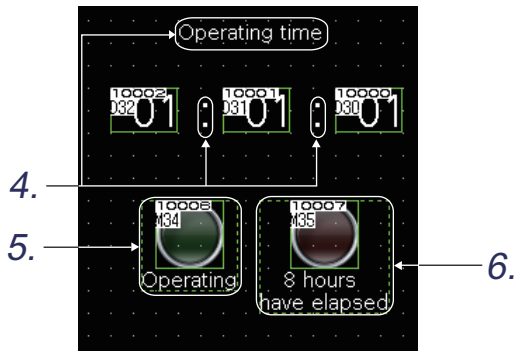
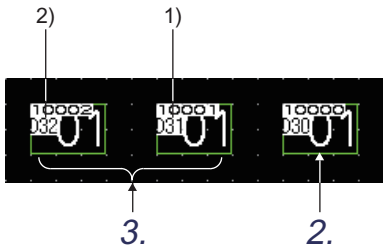
↓  
(Next page)

1. Create a base screen as follows:

Screen No. : 3  
Screen Name: Operating time display



(From previous page)



(Next page)

2. Place the numerical display, and make the settings as follows:

[Device] tab

Device: **D30**

Font: Outline Gothic

Number Size: 32

Digits (Integral): 2

Select [Fill with 0].

3. Copy and paste the numerical display created in 2., and make the settings as follows:

1) Device "**D31**"

2) Device "**D32**"

4. Create characters with text.

5. Select [Object] - [Lamp] - [Bit Lamp] from the menu, and then click on the screen to place a bit lamp. Configure the following settings for the placed bit lamp.

[Device/Style] tab

Device: **M34**

Shape : FA Control Lamp Figure

A1:L\_01\_0\_G

Lamp color (when it is ON): Green

[Text] tab

Font: Outline Gothic

Text Size: 16

Display Position: Down

Text: Operating

Select OFF=ON.

6. Copy and paste the lamp created in 5., and make the settings as follows:

[Device/Style] tab

Device: **M35**

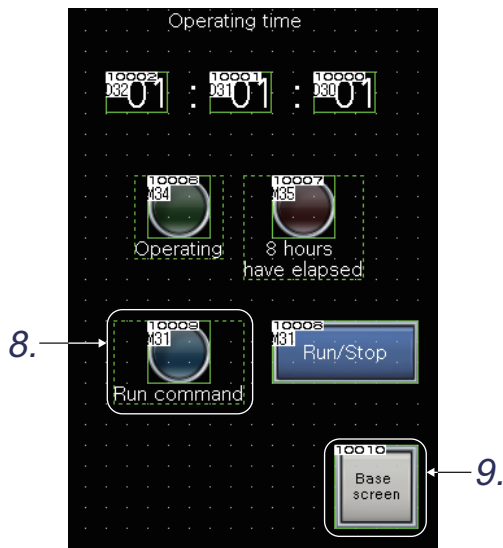
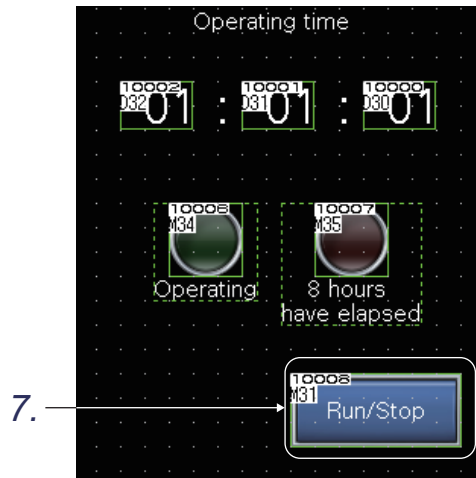
Lamp color (when it is ON): Red

[Text] tab

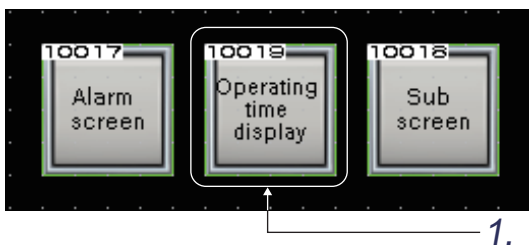
Text: 8 hours have elapsed

Select OFF=ON.

(From previous page)



## (2) Setting Base Screen No.1



7. Select [Object] - [Switch] - [Bit Switch] and click a desired position on which a bit switch is to be placed.  
Change the width of the switch and configure the settings as follows.

[Device] tab

Device: **M31**

Action: Alternate

[Style] tab

Shape: FA Control Switch Figure A1

Shape Color (ON): Red (100 SW\_04\_1\_R)  
(OFF): Blue (97 SW\_04\_0\_B)

[Text] tab

Font: Outline Gothic

Text Size: 16

Text: Run/Stop

Select OFF=ON.

8. Copy the lamp created in 5. , paste the copy on the screen, and configure the settings as follows.

[Device/Style] tab

Device: **M31**

Shape Color (ON): Cyan

[Text] tab

Text: Run command

Select OFF=ON.

9. Copy the Go To Screen switch (control screen) of Base Screen No. 2, paste the switch on the screen, and configure the settings as follows.

[Text] tab

Text: Base screen

Select OFF=ON.

1. Copy the Go To Screen Switch (alarm) of Base Screen No. 1, and change the settings as follows:

[Next Station] tab

Screen Type: Base

Screen No.: 3, Operating time display

[Text] tab

Text: Operating time display

Select OFF=ON.

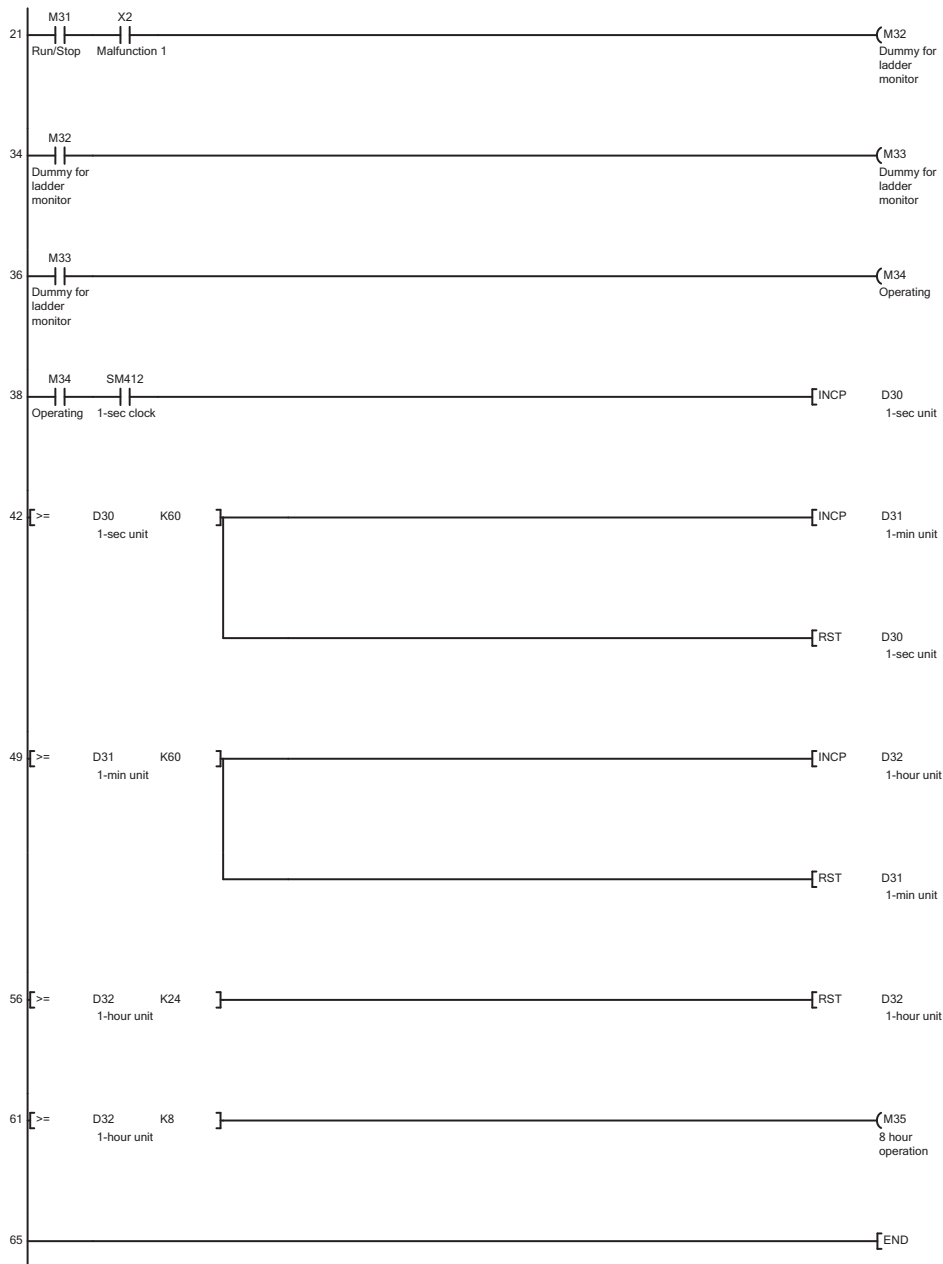
## 6.2.2 Writing a project

Display the screen for writing the project and write all data to the GOT.  
Reset the PLC CPU using the RESET key switch, and then switch to RUN.

## 6.2.3 Training sequence program



To identify the device used for the project data being edited, the Device list function of GT Designer3 will be useful. Refer to section 5.13 of this textbook for details.



## 6.3 Sequence program monitor (Ladder)

### 6.3.1 Sequence program monitor (Ladder)

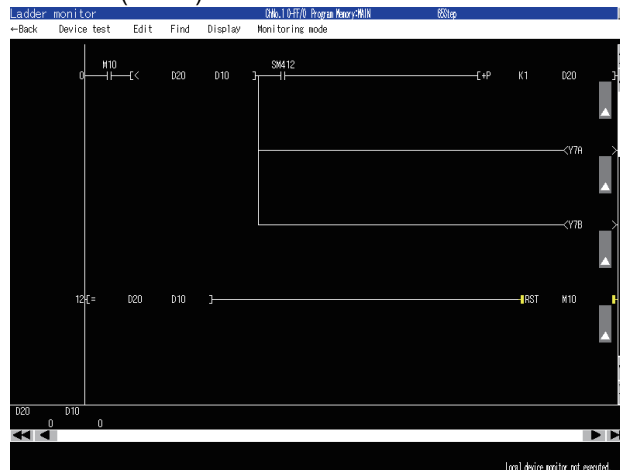
#### (1) Features

With the sequence program monitor (ladder) function, you can use the GOT to monitor or edit the sequence program of a controller in the ladder diagram format and change the current device values.

This function supports the display switching (decimal or hexadecimal format), the display of the device comments written to a PLC CPU, and the display language switching.

It is also possible to search for a contact causing a malfunction, which may lead to a reduction of factor analysis time.

Screen of the sequence program monitor (ladder)



#### (2) Functions available on the ladder monitor screen

Function	Description	
Edit	Edit a ladder program, such as adding or deleting a ladder block.	
Search operation	Device search	Displays a ladder block containing the specified device.
	Contact point search	Displays a ladder block containing the specified contact.
	Coil search	Displays a ladder block containing the specified coil.
	Step search	Displays a ladder block with the specified step number.
	Ladder end search	Displays the last ladder block of sequence program.
	Defect search	Searches the ladder for conductive/non-conductive status of the contact point that turned on or off the coil on the ladder.
	Touch search	Searches for coils of the same device when the contact shown on the screen of ladder monitor function is touched, and for contacts of the same device when the coil is touched.
Display switching	Changes displays of decimal number, and hexadecimal number for word device, and displays of device comment.	
Test operation	Changes device values, etc.	
Hard copy	Saves screens of ladders in the BMP or JPEG format.	

**(3) Required extended system application**

The following extended system applications are required.

- Sequence program monitor
- GOT platform library
- GOT function expansion library

**(4) Required hardware**

The following hardware is required.

Hardware
Data storage (SD card, USB memory, and etc)

## 6.3.2 Operation check (1)

Perform the following operation checks for screen No.3 created in section 6.2.

### (1) Test

Perform the following tests in screen No. 3.

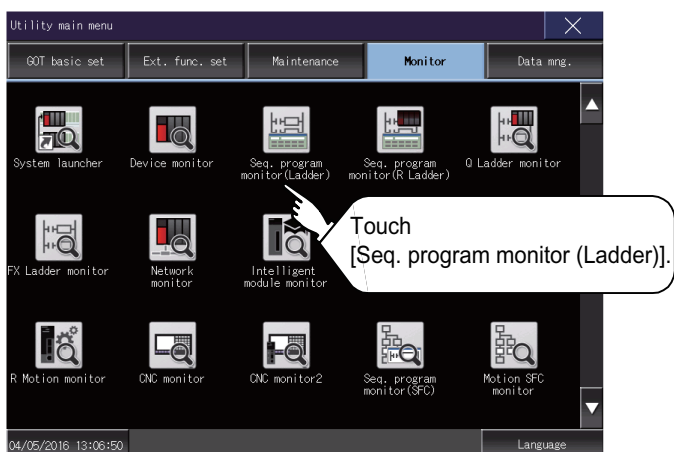
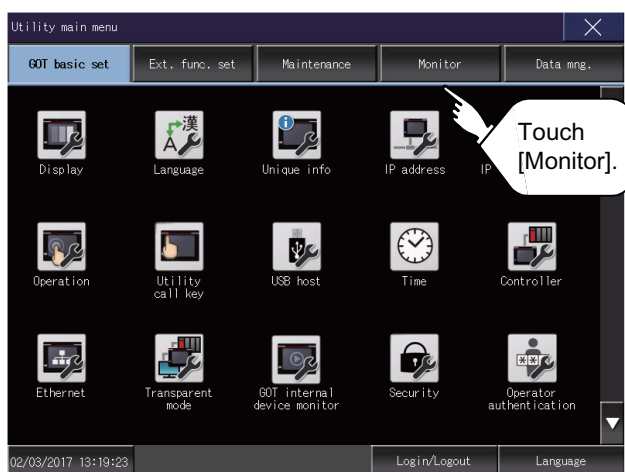
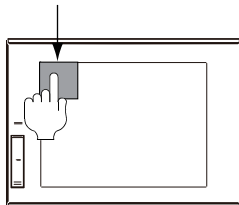
Item		Test object	Operation
1) Touch operation			Touch Run/Stop.
Result of operation	Screen state		(Under normal conditions) The Operating lamp turns ON, and the operating time starts counting.
			(Current operations) The Operating lamp does not turn ON, and the operating time does not start counting.

Screen No. 3 is not working properly.

Use the sequence program monitor (ladder) to diagnose the cause of the error.

### 6.3.3 Startup procedure of sequence program monitor (Ladder)

Utility call key  
Hold down the upper left corner  
for two seconds.



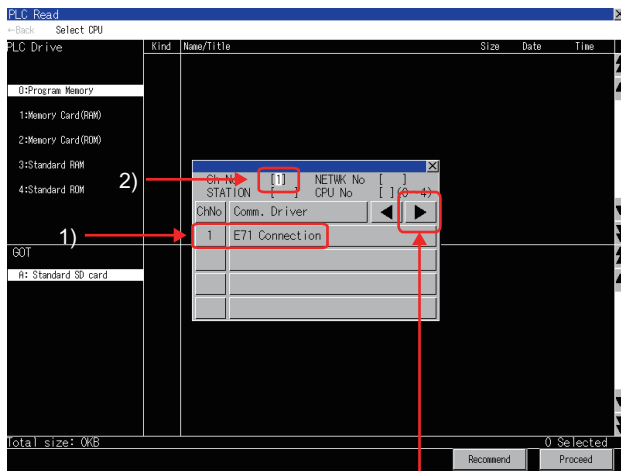
(Next page)

1. Hold down the upper left corner of the GOT monitor screen for two seconds.

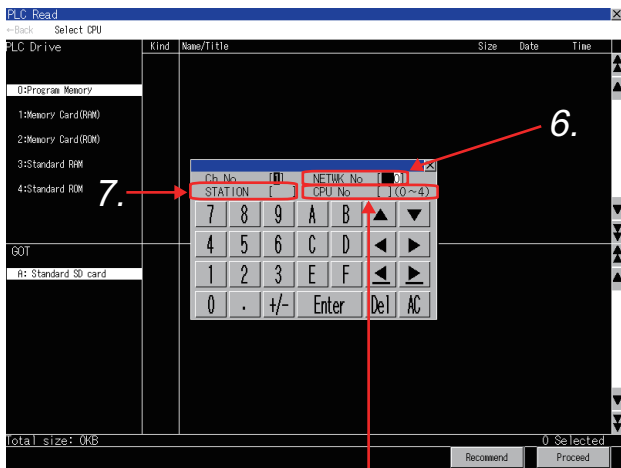
2. Touch [Monitor] tab.

3. Touch [Seq. program monitor (Ladder)].

(From previous page)



5.




8.



(Next page)

4. The communication setting window appears.
  - 1) The names of the communication drivers installed on the GOT are displayed.
  - 2) The channel No. is fixed to "1".

5. Touch  to move the cursor to network No. [ ].

6. Set the network No. to [0].

7. Set the station No. to [FF], and touch the [Enter] key.

8. Set the CPU No. to [0], and touch the [Enter] key.

[DEL] key: Used to delete a character of the entered information.

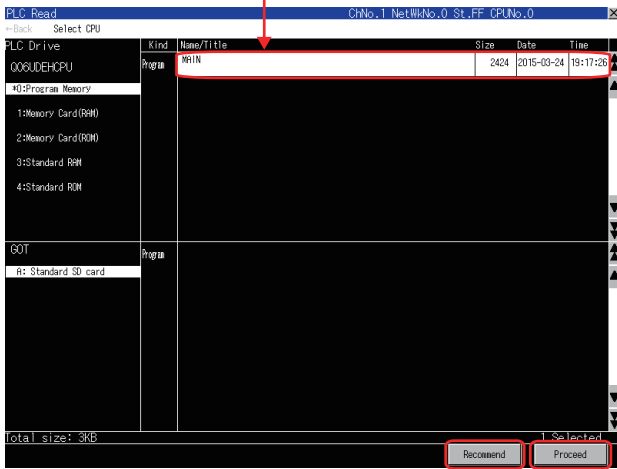
[AC] key: Used to delete all characters indicated by the cursor.



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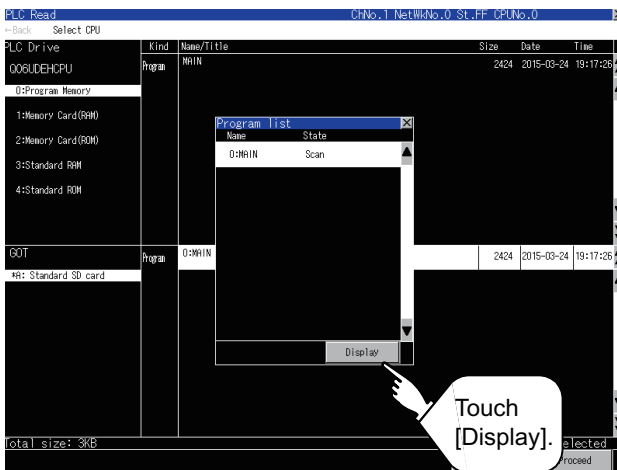


9.



10.

11.



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9. On the [PLC Read] screen, select [Program Memory] from the target drive list of [PLC Drive] to list the files stored in the drive.

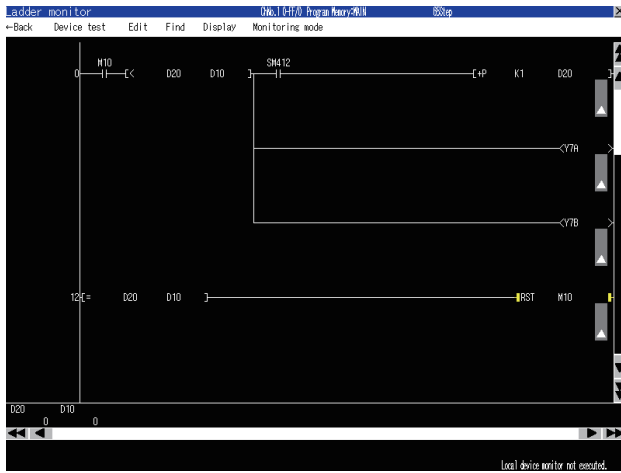
10. Touch the **Recommend** key to select the sequence program displayed in the file list.

11. Touch the **Proceed** key to write the sequence program to the data storage device selected in the target drive list of [GOT].

12. The reading of the sequence program is completed.  
The [Program list] window appears.

13. Touch the **Display** key.

(From previous page)

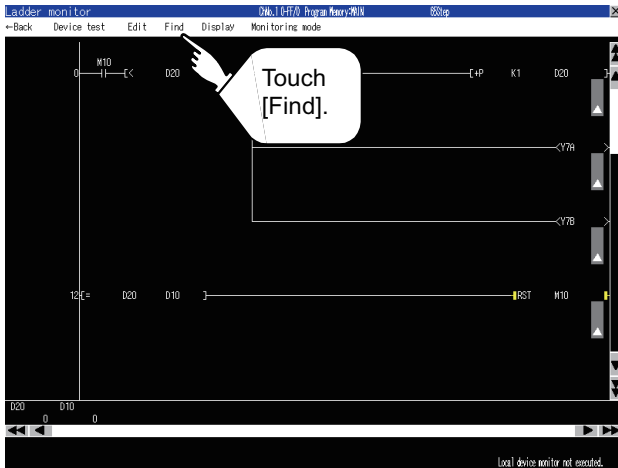


14. The sequence program file selected in the list of files (connection destination) is displayed in the ladder monitor screen, and functions including the device search can be used.

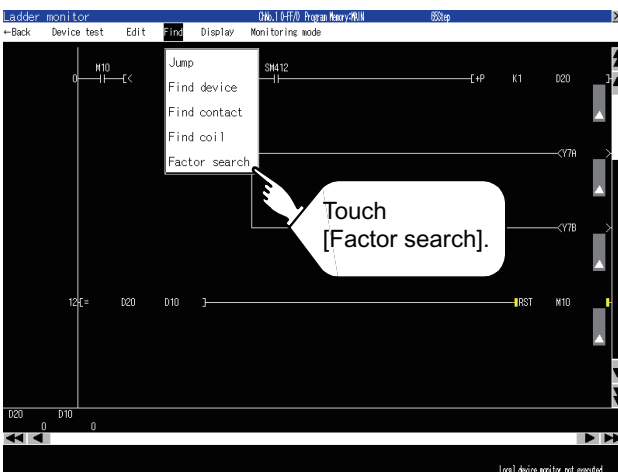
### 6.3.4 Method for factor search operation

The factor search function searches the ladder blocks for the conductive/non-conductive status of the contact that turns on or off a specific coil when the sequence program monitor (ladder) is performed. This section explains the operation procedures.

1. Touch [Find].

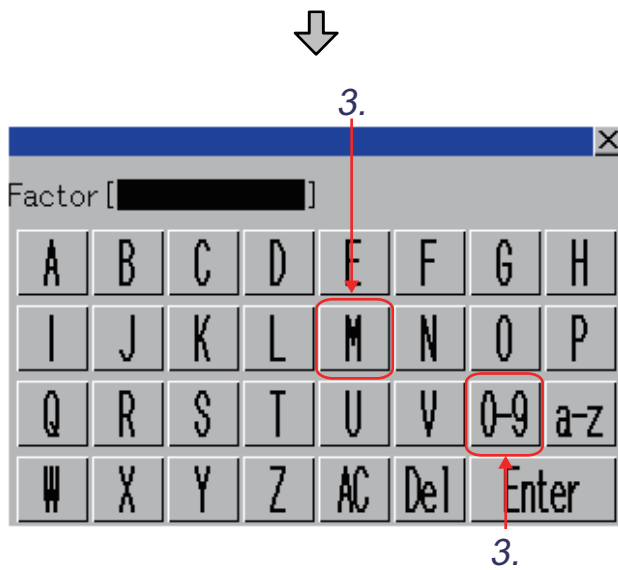


2. Touch [Factor search] to display the factor search window.

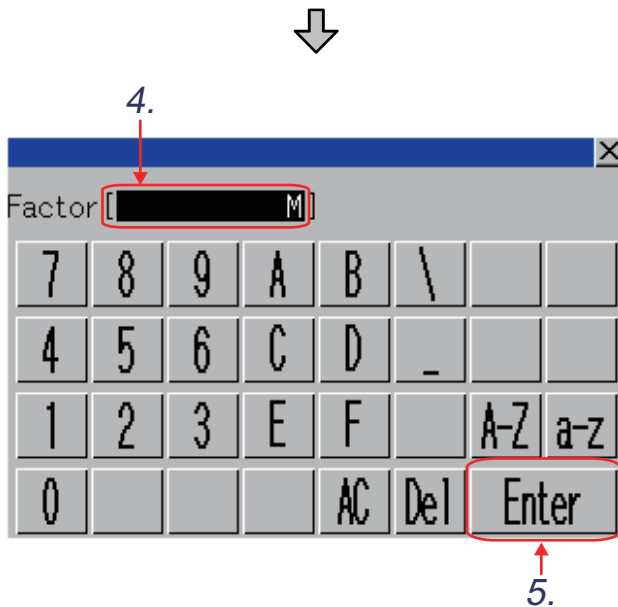


(Next page)

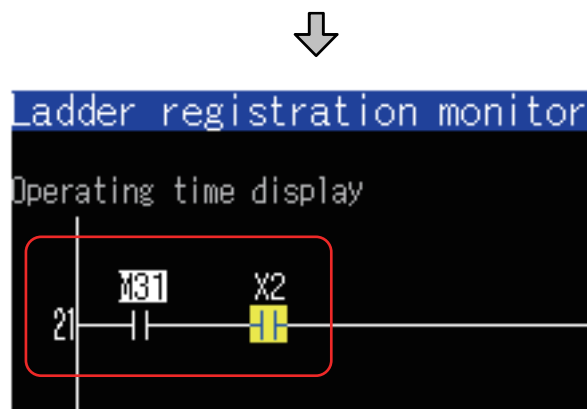
(From previous page)



3. Touch the [M] key to enter "M" into [Factor], and touch [0-9] to display the number keys.



4. Set the device number to "34".
5. Touch the [Enter] key.



6. The block containing the specified device is displayed, and the device is enclosed in a green frame.

To cancel a factor search, touch the [Esc] key. (During a factor search, all key operations except [Esc] and [Exit] keys are invalid.)

<Factor search Result>

The reason why M34 does not turn on is because X2 is not turned on.

## 6.3.5 Operation check (2)

Display the screen for writing a project, and then write data to the GOT.  
Reset the PLC CPU using the RESET key switch, and then switch to RUN.

### (1) Test

Perform the following tests in screen No. 3.

Item		Test object	Operation
1) Touch operation			Turn on X2, and touch Run/Stop.
Result of operation	Screen state		The Operating lamp turns ON, and the operating time starts counting.
2) Touch operation			Touch Running/Stop.
Result of operation	Screen state		The Operating lamp turns OFF, and the operating time stops.

Check the Operating lamp turns ON, and that the operating time counts up.

# 6.4 Device monitor function

## 6.4.1 About the device monitor function

### (1) Features

The device monitor function monitors and changes the devices of a PLC CPU or an intelligent module. With this function, you can troubleshoot the system and streamline maintenance.

### (2) Monitoring method available with system monitor function

Monitoring method	Description
Entry monitor	Registers devices to be monitored in advance and monitors only the registered devices.
Batch monitor	Collectively monitors the devices starting from the user-specified one.
TC monitor	Monitors timers (T) and counters (C) only. Monitors the current values, set values, contacts, and coils of timers, counters, and retentive timers of a PLC CPU in a batch.
BM (buffer memory) monitor	Monitors the buffer memories of a special function module. Monitors the buffer memories of an intelligent module in a batch.

### (3) Test operations

With the device monitor function, the following data changes are possible by performing test operations.

- Testing a bit device  
A device specified by the user is turned ON and OFF.
- Testing a word device  
A specified value is written to a device specified by the user. (Real number data is not allowed.)
- Testing a timer/counter  
Specified values are written as the present and set values of a device specified by the user.
- Testing buffer memory  
A specified value is written to buffer memory specified by the user.

Test menu screen

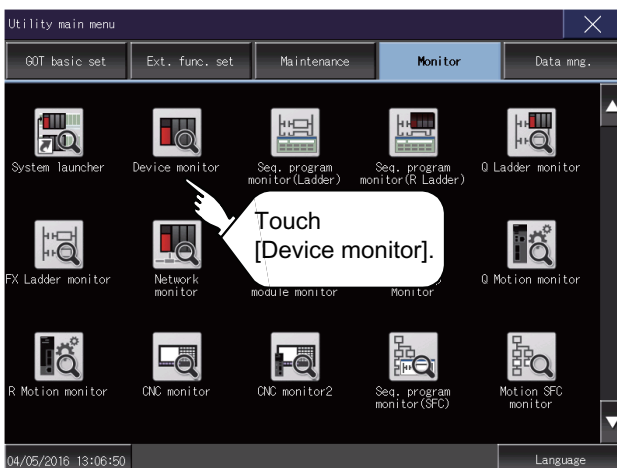
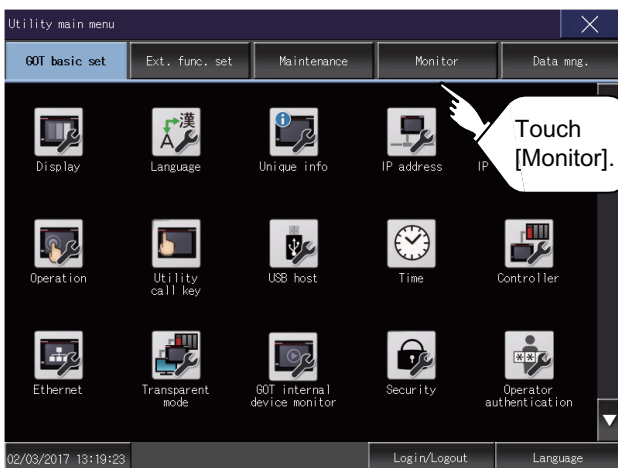
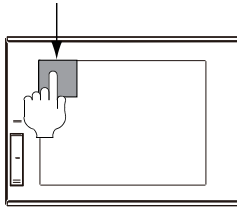


- (4) Required extended system application**  
The following extended system application is required.

System application
Device monitor GOT platform library

## 6.4.2 Method for starting the system monitor

Utility call key  
Hold down the upper left corner  
for two seconds.



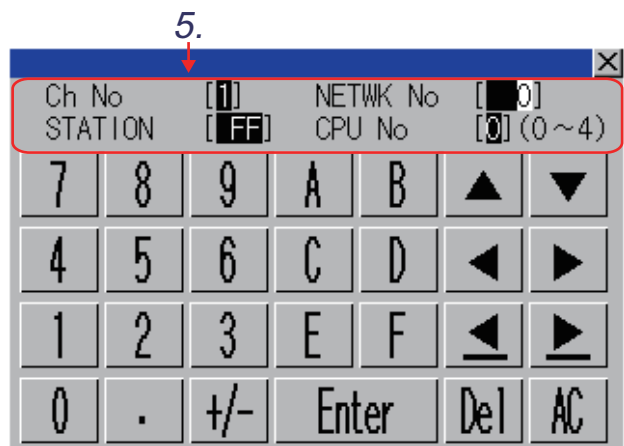
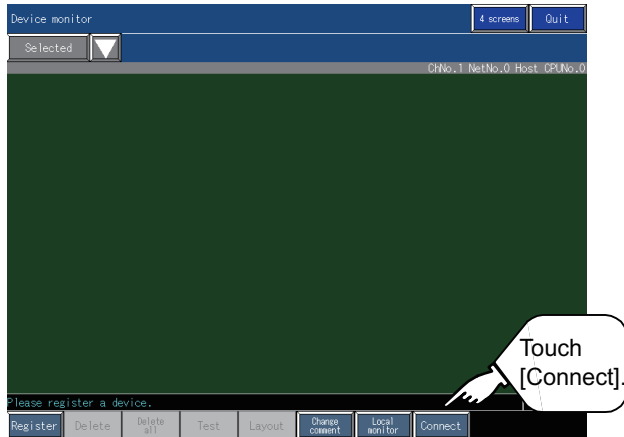
(Next page)

1. Hold down the upper left corner of the GOT monitor screen for two seconds.

2. Touch [Monitor] tab.

3. Touch [Device monitor].

(From previous page)



4. The Device monitor screen appears. Touch the [Connect] key.

5. The communication setting window appears. Configure the settings as follows.

<CH No. input status window>

Ch No : 1 (Set a number using the channel No. selection keys.)

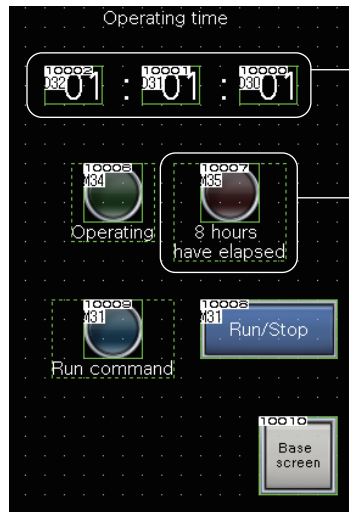
<Network No./station No./CPU No. input status window>

NETWK No : 0  
STATION : FF  
CPU No : 0



### 6.4.3 Operation check (device monitor operation)

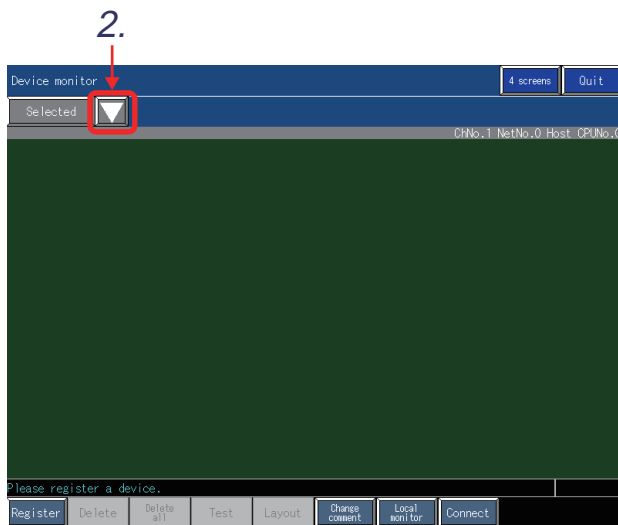
In this section, the following operation checks are performed regarding the training screen created in section 6.2 using the device monitor of the system monitor function.



Numerical display  
Displays the operating time of the line.  
(D32: hours, D31: minutes, D30: seconds)

Bit lamp  
Lit if the operating display exceeds eight hours  
(M35).

#### (1) Device registration procedure for device monitor

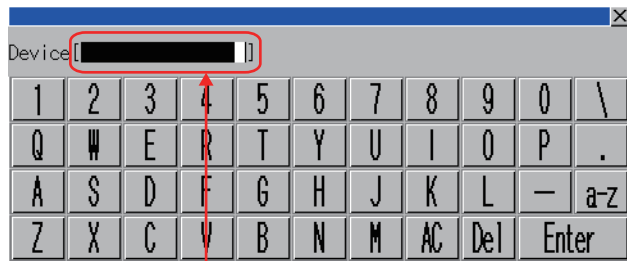
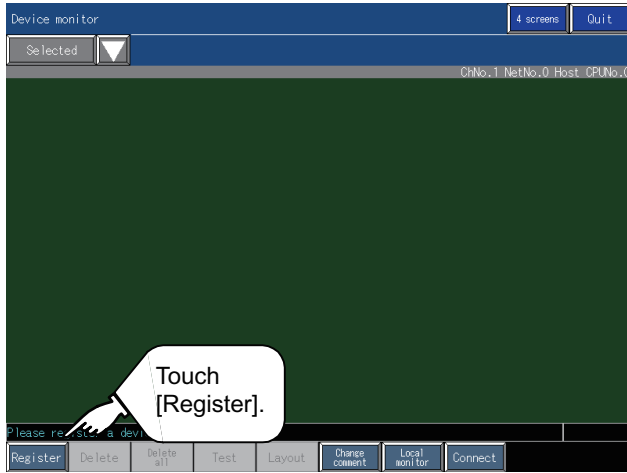


1. Display the device monitor screen by using the procedure described in section 6.4.2.
2. Touch the monitor category change key to select to [Selected] when other than [Selected] is selected.

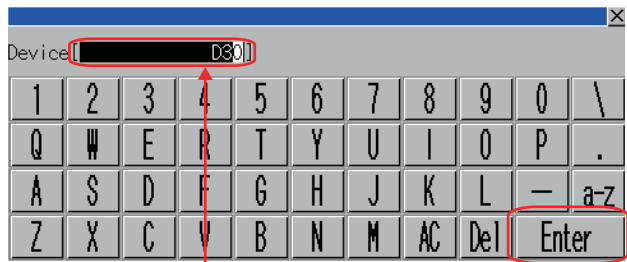


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4.



5.

6.



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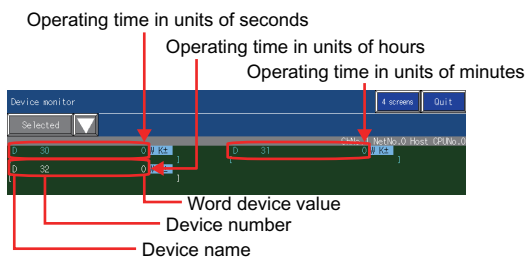
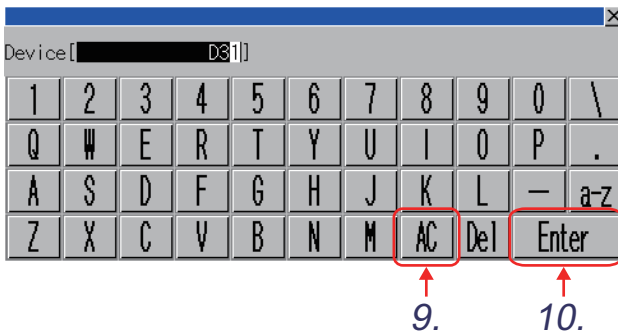
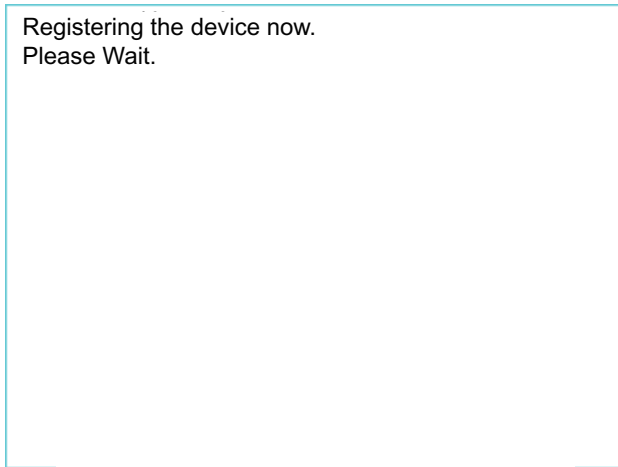
3. The entry monitor screen appears. Touch the [Register] key.

4. The device registration window appears. Touch the device display area.

5. Set the device number to "D30".

6. Touch the [Enter] key.

(From previous page)



7. Register the device.

8. When registration is complete, return to the device registration screen.

9. Touch the [AC] key to clear the device value.

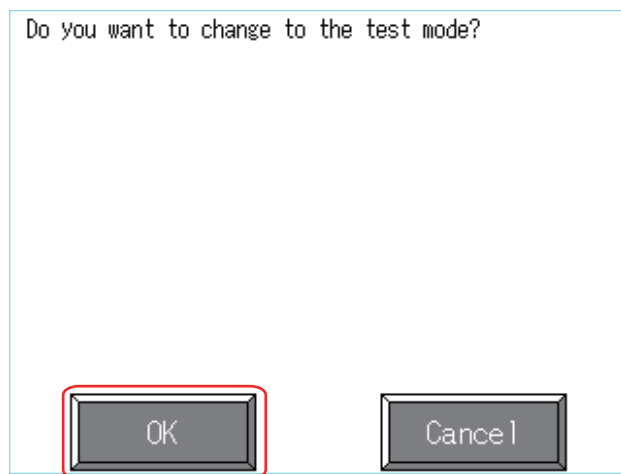
10. Set the device number to "D31" and touch the [Enter] key to register the device.

11. Repeat the procedures for device "D32".

12. When registration is complete, touch [X] to exit the device registration screen.

13. Go back to the device monitor screen, and the monitor just registered is being monitored.

## (2) Operation procedure for test operation



2.



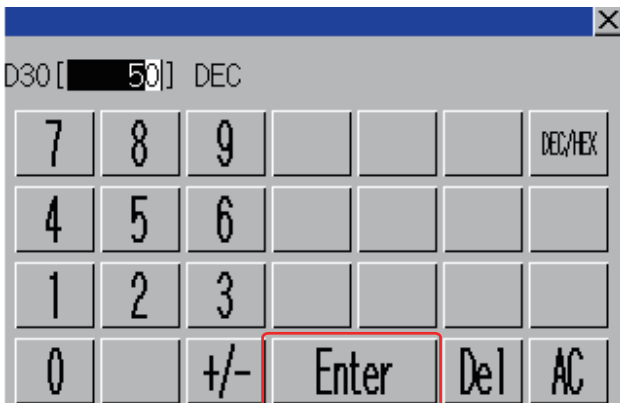
(Next page)

1. Touch the [Test] key on the device monitor screen.

2. The confirmation dialog is displayed. Touch the [OK] key to switch to the test mode.

3. Touch a device targeted for the test operation.

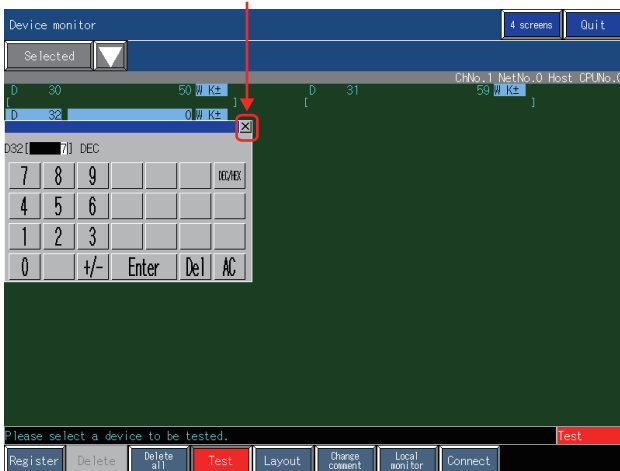
(From previous page)



4.



5.



(Next page)

4. The device value setting window appears. Set the device value as follows and touch the [Enter] key.

D30: Device value = **50**

5. After the setting has been completed, touch [X] to exit the device value setting window. Set the following devices in the same manner.

D31: Device value = **59**

D32: Device value = **7**

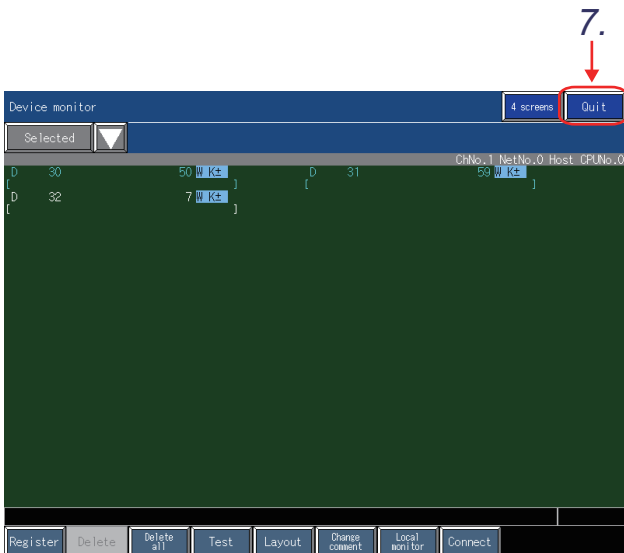
6. Check that the above set values have been reflected to the devices on the entry monitor screen.

(From previous page)

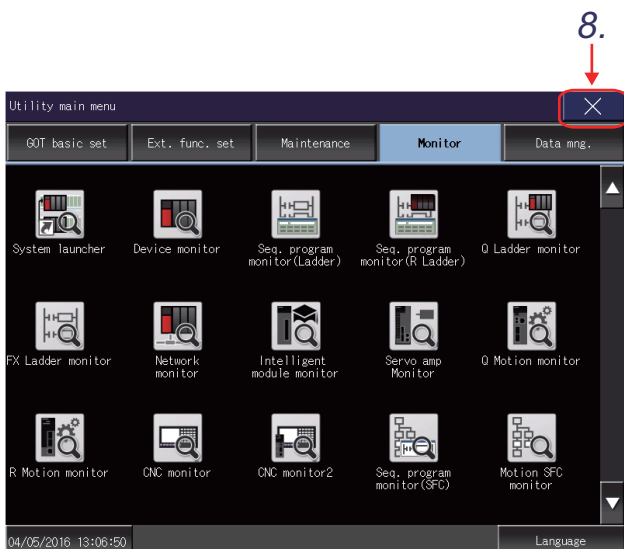


7. Touch the [Test] key again to end the test mode.  
Touch the [Quit] key on the Device monitor screen.

7.

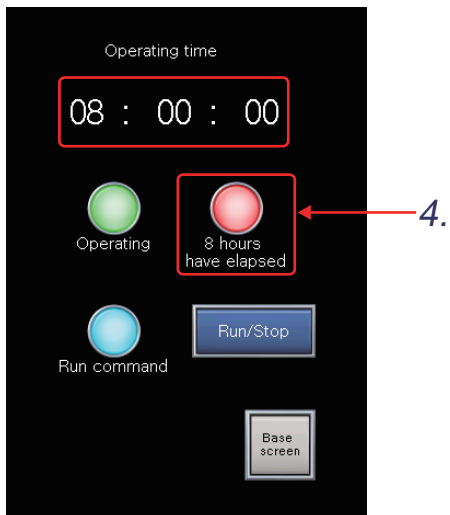


8.



8. When the Main menu screen appears, touch [X].

### (3) Operation check



1. Display Base screen No. 3.
2. Check that the operating time indicates 7:59:50.
3. Turn on X2, and touch the [Run/Stop] switch to start counting the operating time.
4. When the operating time exceeds eight hours, check if the lamp turns ON.

# Appendices

## Appendix.1 Alarm

### Appendix.1.1 About the alarm

The alarm display function displays the user-created comments as alarm messages, or displays the error codes and messages of the GOT, controllers, or networks.

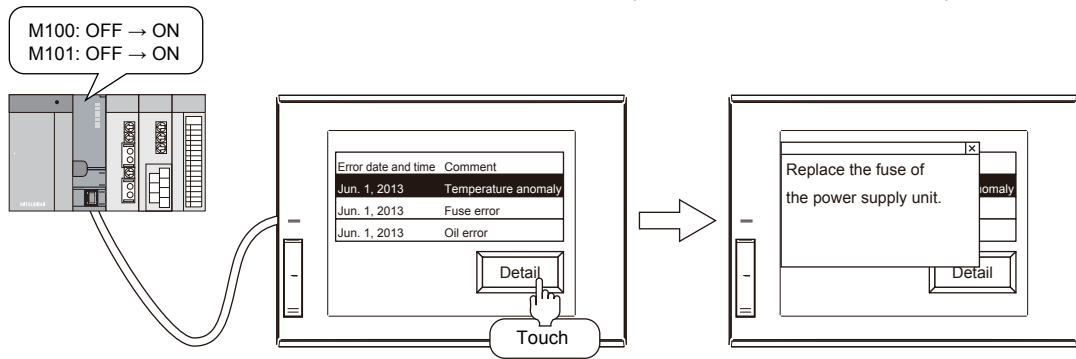
This function monitors the devices, GOT, controllers, and networks, and collects alarm data from them. This chapter explains the functions that display following alarms.

#### (1) Alarm types

The following types of alarms are collected.

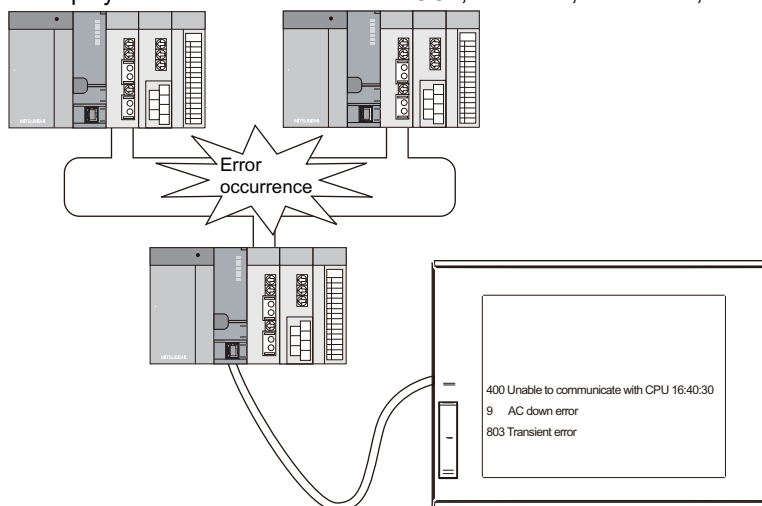
##### (a) User alarm

The function that displays the user-created comments as alarm messages when an alarm occurs. Suitable for the case in which the alarm, which is created by the user, needs to be displayed.



##### (b) System alarm

An error code and message are displayed when an error occurs in the GOT, controller, or network. To display the error information of the GOT, controller, or network, use system alarms.





## (2) Available functions in the alarm

The GOT collects and displays alarms as follows.

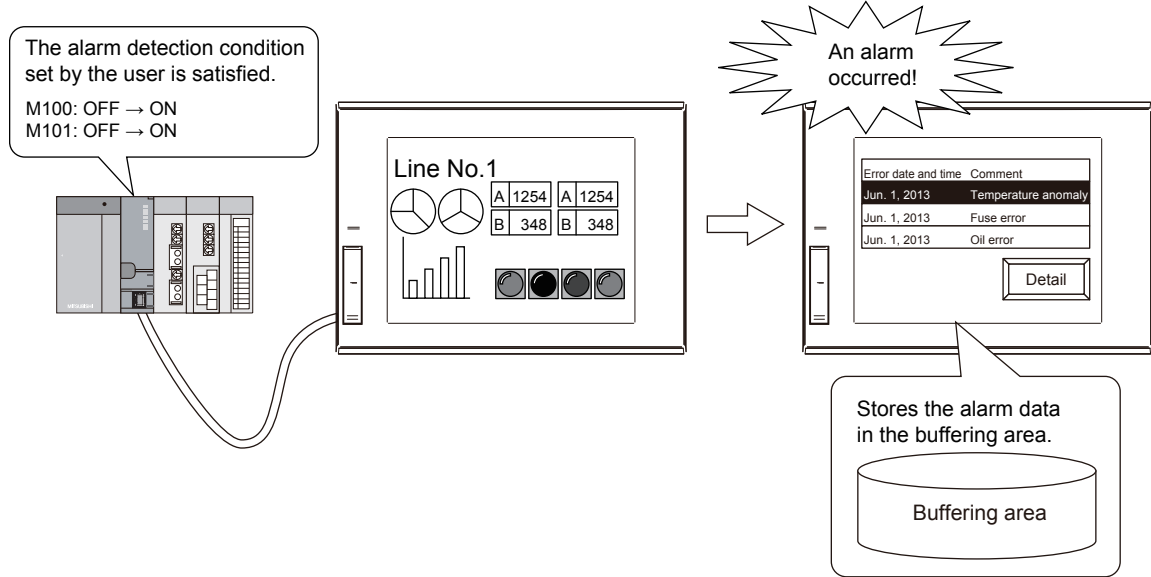
Available functions in the alarm	Description	Remarks	
Displaying the comment set previously at the alarm occurrence	You can register any comment for the user alarm.	The following display methods are available: <ul style="list-style-type: none"> <li>• Displaying comments by level in the hierarchy</li> <li>• Displaying the comment by switching the language</li> </ul>	
Checking the working status of the equipment by displaying the alarm information	View the displayed alarm information to check on the operating status of the equipment and diagnose the cause of a productivity slowdown.	The alarm function displays the following items: <ul style="list-style-type: none"> <li>• Occurred time</li> <li>• Comment</li> <li>• Restored time</li> <li>• Checked time</li> <li>• Cum. Time</li> <li>• Frequency</li> <li>• Alarm status</li> <li>• Down Time</li> <li>• Level</li> <li>• Group</li> </ul>	
Operating the display contents	Changing the display order by the setting	Set the display order for the displayed alarms.	You can sort the displayed alarms in ascending order or descending order of each condition.
	Operating the alarm display by device	<ul style="list-style-type: none"> <li>• Displaying or hiding the alarm You can display or hide the alarm by the device.</li> <li>• Narrowing the display contents You can narrow the display contents by the device.</li> </ul>	To narrow down the display contents, classify alarms into different levels and groups. Thus, the display contents can be narrowed by level or group. Two or more items can be set as narrowing criteria.
	Setting a display color for the alarm contents	By displaying different character colors for each alarm, you can distinguish the alarm type visually.	The character color can be set only for the alarm popup display.
	Displaying the alarm only at the alarm occurrence	By using the alarm popup display, you can display the alarm only at the alarm occurrence without arranging the alarm display object.	When an object is placed on the alarm display position, the alarm is displayed. Touching the alarm popup display on the screen switches a screen or level in the hierarchy, or displays the detail display.
	Scrolling comment display	The comments at the alarm occurrence are displayed by scrolling across the screen from right to left.	This function displays whole comments even when the display area is narrow.
	Writing the alarm information to devices	You can write the touched alarm information to a device.	The detail message of the selected alarm can be displayed in the comment display. In addition, the contents that cannot be displayed due to a narrow screen can be written to the device.
	Setting any alarm monitor device	The alarm monitor device can be set by the user.	Set the monitor device (alarm monitor) and the alarm display in different screens.
	Storing the alarm data (power failure backup)	By storing the alarm data as alarm log files, the alarm histories can be stored even when the GOT is powered off.	The following storage methods are available: <ul style="list-style-type: none"> <li>• Storing the alarm data in data storage</li> <li>• Storing the alarm data in SRAM user area</li> </ul>
	Utilizing the stored data	The stored alarm log files can be displayed and edited in a personal computer, and displayed in a graph in the GOT.	The following shows the utilization examples. <ul style="list-style-type: none"> <li>• Outputting the alarm log files to a Unicode text file or a CSV file</li> <li>• Converting the alarm log file stored in the data storage</li> </ul>



For the details of each function, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## Appendix.1.2 Collecting alarms by monitoring devices

In a user alarm monitor, the time when set conditions of devices set as the alarm detection are satisfied or comments as the user alarm data history to a built-in memory of the GOT.



For the screen setting, refer to the advanced course manual.

## ■ Specifications of the user alarm observation

### (1) Alarm detection condition and range

- (a) Detection condition
- Rising (OFF to ON) or falling (ON to OFF) of the bit device
  - Word device value
- (b) Collection cycle (monitoring cycle)  
 The user alarms can be collected and updated to a buffering area of the GOT in a cycle set by the user regardless of a displayed screen.  
 The setting range of the cycle is 100 ms to 3600 seconds.
- (c) Setting range
- Alarm points  
 The alarm points are the monitorable device points.  
 Up to 32767 points of devices can be monitored.
  - Alarm ID  
 Each user alarm observation setting has an alarm ID number.  
 The alarm ID numbers range from 1 to 32767.  
 However, up to 255 user alarm observation settings can be set.

### (2) Setting example

Alarm detection conditions, collection cycles (observation cycle), and number of alarms for each alarm ID  
 Alarm ID: Up to 255 (The number for the alarm ID is 1 to 32767.)  
 Number of alarms: Up to 32767 (Total number of alarms set for each alarm ID)

Alarm ID: 10 (An alarm for the maintenance)

D10 > 40 [Supply oil]
D20 > 500 [Supply fuel]
.
.
.

Setting

Alarm detection condition:	Values of word devices
Watch cycle	: 3600 seconds
Alarm points	: 50

Alarm ID: 50 (An alarm for an emergency)

M10: OFF → ON [LineA abnormal stop]
M20: OFF → ON [LineB abnormal stop]
M30: OFF → ON [LineC abnormal stop]
M40: OFF → ON [LineD abnormal stop]
.
.
.

Setting

Alarm detection condition:	Bit devices
Watch cycle	: 2 seconds
Alarm points	: 4

Alarm ID: 900

M80: OFF → ON [Check a battery]
M81: OFF → ON [Check the hydraulic pressure]
M82: OFF → ON [Check the internal pressure]
M83: OFF → ON [Check a fuse]

Setting

Alarm detection condition:	Bit devices
Watch cycle	: 60 seconds
Alarm points	: 4

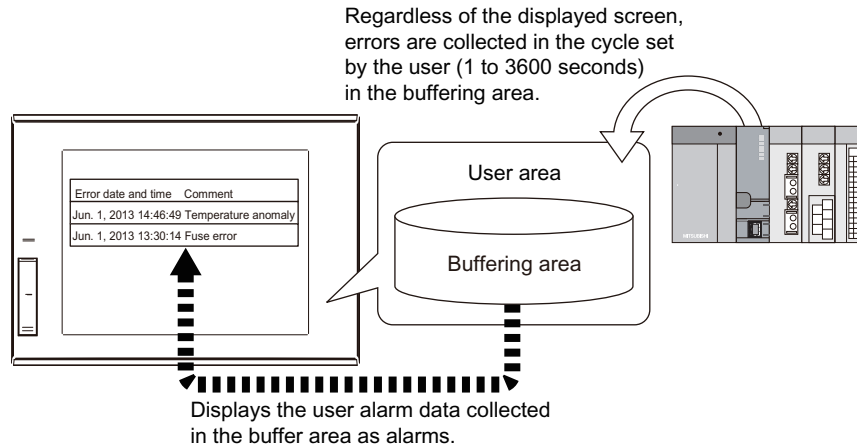
## ■ How to use the user alarm observation

### (1) Alarm collecting procedure and alarm history collecting method


#### (a) Alarm collecting procedure

The user alarms are collected to a buffering area of the user area in a cycle (1 to 3600 seconds) set by the user regardless of a displayed screen.

The buffering area stores the collected user alarms as histories temporarily, and displays them on the GOT as alarms.



- For how to delete the data in the buffering area, refer to the following.

 (2) Deleting the collected user alarm data

- The data to be stored in the buffering area of the user area differ depending on the history collecting method.

(b) Alarm history collecting method

The following shows the alarm history collecting method.

- History mode  
Adds the alarm contents to the user area of the GOT for each alarm occurrence.
- Cumulative mode  
Collects the latest alarm status and the alarm counts or time together for each alarm.
- Only the current alarm  
Displays only the alarm in occurrence, and deletes the display after the alarm restoration.

Depending on the collecting method, the types of information collected differs.

Example) Alarm Display (User)

Error date and time	Comment	Alarm status	Restored	Checked	Frequency	Cum. Time	Down Time	Level	Group
Jun. 1, 2013 20:00	Power supply unit error	-	-	-	1	-	-	1	2
Jun. 1, 2013 18:30	Hydraulic pressure failure	Checked	-	18:50	2	-	-	1	1
Jun. 1, 2013 16:10	Drive module error	Checked	16:30	16:20	2	00:40	00:20	2	1

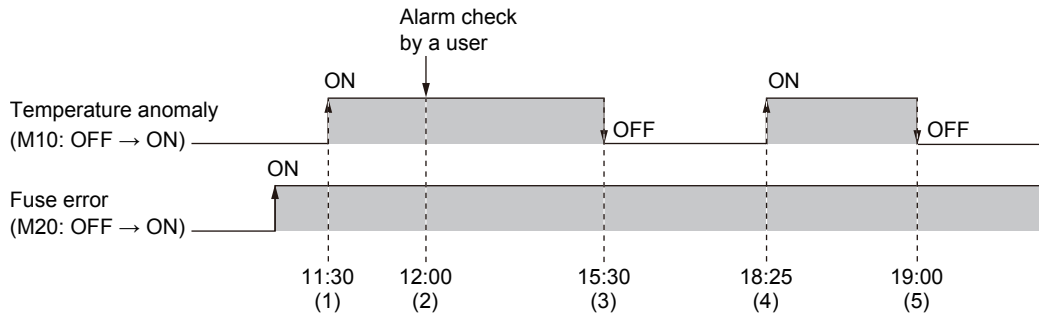
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)

Displayed information	Description														
	History mode	Cumulative mode	Alarms in the "Occurred" status only												
(1) Date of occurrence	Displays the date and time when an alarm occurs.														
(2) Comment	Displays the comment assigned to the alarm at the alarm occurrence.														
(3) Alarm status	Displays the alarm status that is currently displayed. <ul style="list-style-type: none"> <li>• Occurred: The alarm has occurred. (The occurrence of the alarm has not been checked.)</li> <li>• Checked: The occurrence of the alarm has been checked.</li> <li>• Restored: The monitor target already recovered from the alarm.</li> </ul>														
(4) Restored	Displays the date and time when the monitor target recovered from the alarm.														
(5) Checked	Displays the date and time when an alarm occurrence has been checked. Check the occurrence of the alarm with a touch switch for the alarm check. <div style="text-align: center; margin-top: 10px;"> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr><td>Comment</td><td>Restored</td><td>Checked</td></tr> <tr><td>Power supply unit error</td><td>-</td><td>-</td></tr> </table> <span style="font-size: 2em;">→</span> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 0 10px;">Checked</div> <span style="font-size: 2em;">→</span> <table border="1" style="display: inline-table;"> <tr><td>Comment</td><td>Restored</td><td>Checked</td></tr> <tr><td>Power supply unit error</td><td>-</td><td>19:00</td></tr> </table> </div> <p style="text-align: center; margin-top: 5px;">Key code: FFB4h or FFB5h</p>			Comment	Restored	Checked	Power supply unit error	-	-	Comment	Restored	Checked	Power supply unit error	-	19:00
Comment	Restored	Checked													
Power supply unit error	-	-													
Comment	Restored	Checked													
Power supply unit error	-	19:00													
(6) Frequency	-	Displayed only for the cumulative mode. Displays the number of error occurrence.	-												
(7) Cum.time	-	Displayed only for the cumulative mode. Displays the total time of alarm occurrence including the past alarm occurrence time. <div style="text-align: center; margin-top: 10px;"> <p style="font-size: small; text-align: center;">                         Alarm occurrence status (M10) vs Time. Three ON pulses are shown. Below each pulse is a 'Down time' (A, B, C). A bracket above the entire sequence is labeled 'Cum. Time'.                     </p> </div>	-												
(8) Down time	-	Displayed only for the cumulative mode. Displays the time from the alarm occurrence to the alarm restoration.	-												

Displayed information	Description		
	History mode	Cumulative mode	Alarms in the "Occurred" status only
(9) Level	Displays the levels set for alarms. The alarms can be classified into the level according to the alarm importance. You can display the alarm with higher level preferentially or display the alarms with specific level only.		
(10) Group	Displays the groups set for alarms. The alarms can be classified into groups according to the alarm contents. You can display the alarms in order of the group or display the alarms with specific group only.		

(c) Alarm display example

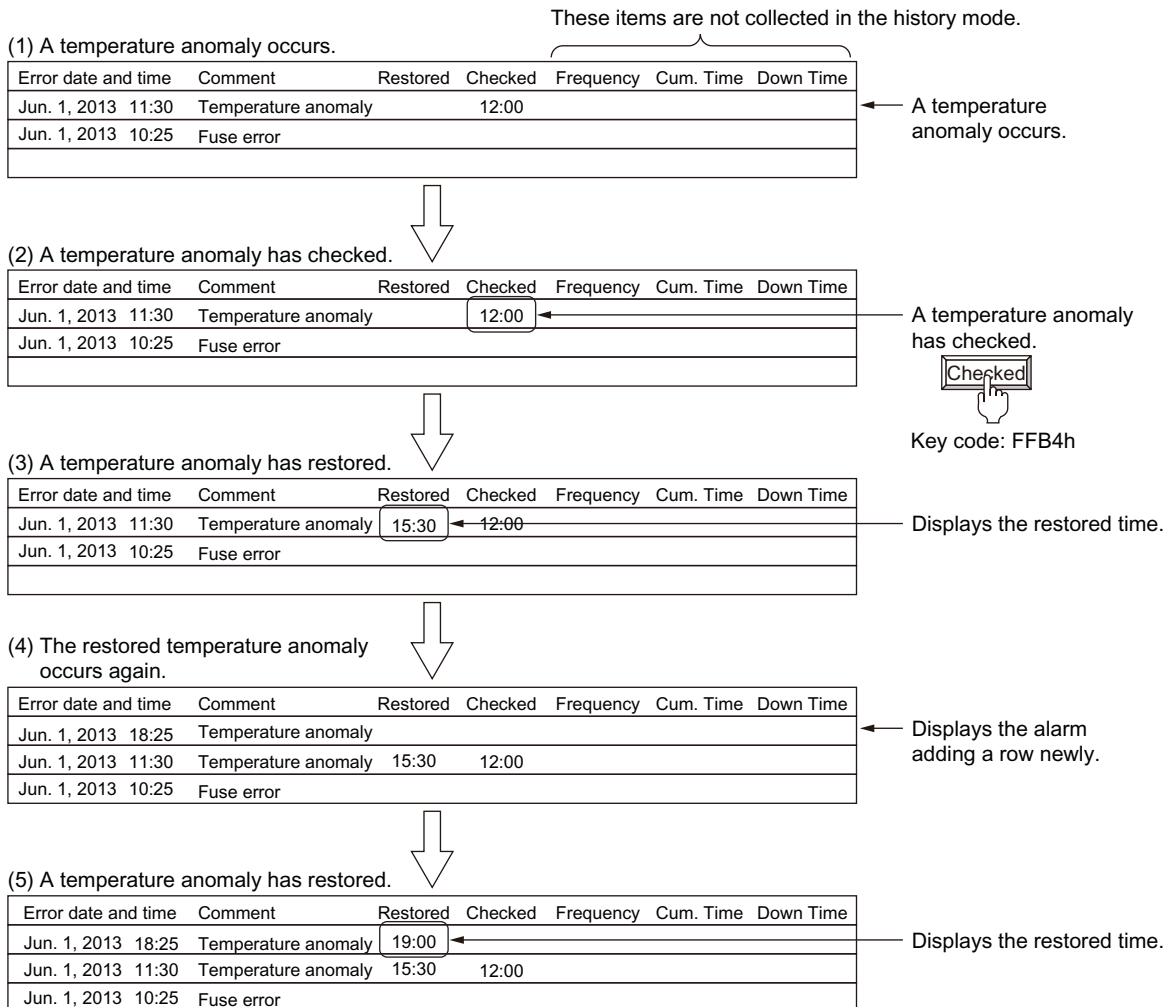
The following shows the examples for displaying alarms with the alarm display (user) for each alarm collecting method.



- History mode

Collects the alarm occurrence status as histories.

The history is added every time an alarm occurs.



- Cumulative mode

Collects the latest alarm status, the alarm counts, and the time together for each alarm.

(1) A temperature anomaly occurs.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 11:30	Temperature anomaly			1	00:00	
Jun. 1, 2013 10:25	Fuse error			1	00:00	

← A temperature anomaly occurs.



(2) A temperature anomaly has checked.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 11:30	Temperature anomaly		12:00	1	00:00	
Jun. 1, 2013 10:25	Fuse error			1	00:00	

← A temperature anomaly has checked.

Checked



Key code: FFB4h



(3) A temperature anomaly has restored.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 11:30	Temperature anomaly	15:30	12:00	1	04:00	04:00
Jun. 1, 2013 10:25	Fuse error		12:00	1	00:00	

← Displays the restored time, the down time, and the cumulative time.



(4) The restored temperature anomaly occurs again.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 18:25	Temperature anomaly			2	04:00	
Jun. 1, 2013 10:25	Fuse error		12:00	1	00:00	

← Displays the alarm occurred time of the alarm that occurred again in the same line, and frequency is added by one.



(5) A temperature anomaly has restored.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 18:25	Temperature anomaly	19:00		2	04:00	12:00
Jun. 1, 2013 10:25	Fuse error		12:00	1	00:00	

← The restored time and the down time are displayed. The time while the alarm was occurring is displayed in Cum. Time.



- Alarms in the "Occurred" status only  
Collects the alarms that are currently occurring only.  
The histories of the alarms that have been recovered are not stored.

Not collected if only the alarms in the "Occurred" status are displayed.

(1) A temperature anomaly occurs.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 11:30	Temperature anomaly		12:00			
Jun. 1, 2013 10:25	Fuse error					

← A temperature anomaly occurs.



(2) A temperature anomaly has checked.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 11:30	Temperature anomaly		12:00			
Jun. 1, 2013 10:25	Fuse error					

← A temperature anomaly has checked.

Checked



Key code: FFB4h



(3) A temperature anomaly has restored.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 10:25	Fuse error					

Deletes the restored alarms.



(4) The restored temperature anomaly occurs again.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 18:25	Temperature anomaly					
Jun. 1, 2013 10:25	Fuse error					

← Displays alarms that has occurred again



(5) A temperature anomaly has restored.

Error date and time	Comment	Restored	Checked	Frequency	Cum. Time	Down Time
Jun. 1, 2013 10:25	Fuse error					

Deletes the restored alarms.

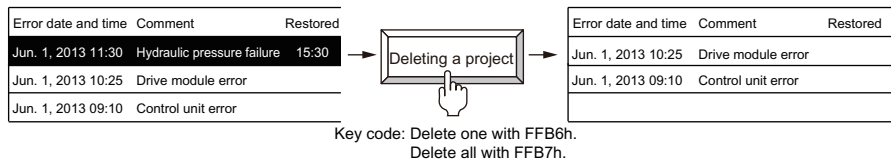
## (2) Deleting the collected user alarm data

The user alarm data are stored in the buffering area in the user area of the GOT.  
The stored user alarms are deleted at the following timing.

- Powering off or resetting the GOT
- Configuring the controller setting of the GOT basic setting with the utility.
- Writing a system application or the project data, deleting the user alarm data by the drive information of formatting a drive
- By user setting or operation

The history of alarms that have been restored can be deleted by the user.

- Deleting with a device  
Turn on [Buffering Data Clear Trigger Device] set in the [Basic] tab of the [User Alarm Observation] dialog to delete all alarms that have been restored.
- Deleting with a touch switch  
The touch switch deletes one or all restored alarms.



### Remark

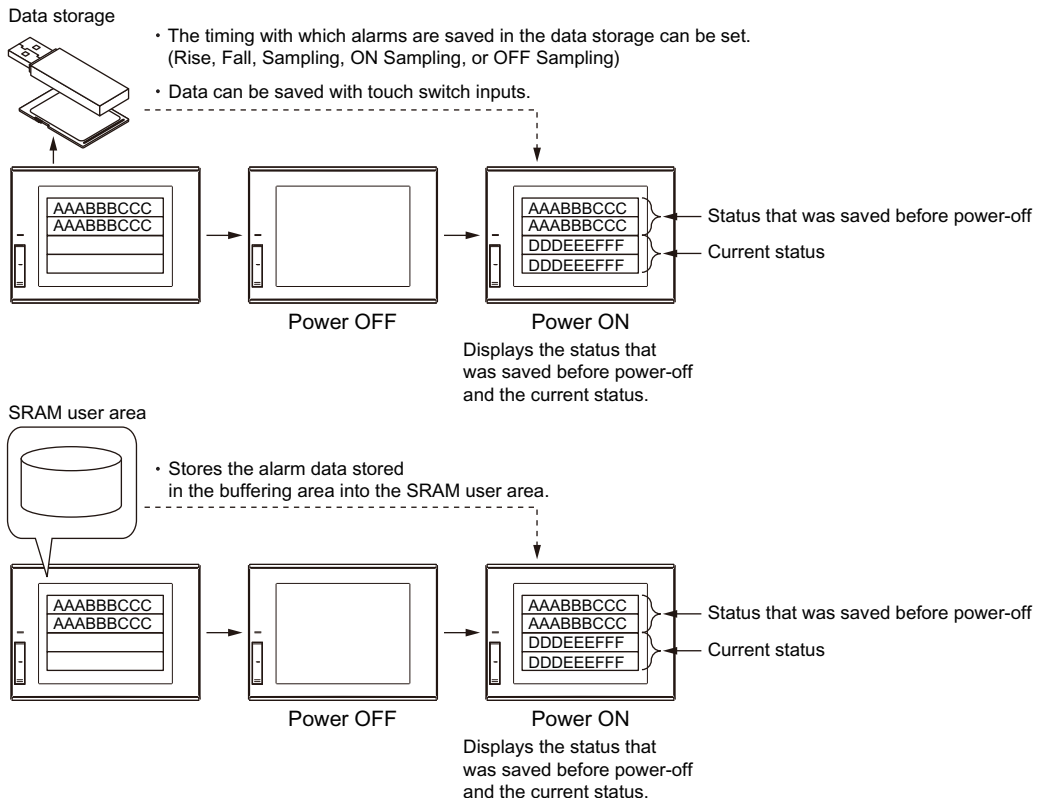
For the details of the user alarm observation, refer to the Chapter 9 in the GT Designer3 (GOT2000) Screen Design Manual.

## (3) Holding the collected user alarm data

- Overview of the power failure backup

Once the user alarm data are stored in the data storage or the SRAM user area as the alarm log file, the user alarm data are held even when the GOT is powered off.

When the alarm log file is stored in the data storage or the SRAM user area when the GOT is powered on, the alarm log file is read automatically and the user alarm history before the power-off is restored.



- Precautions for starting the GOT

When reading and restoring the user alarm from the data storage, install the data storage on the GOT before powering-on the GOT.

After powering-on the GOT, the data in the data storage cannot be restored.

In addition, when the data storage is installed after the power-on, the user alarm data in the data storage are overwritten when other user alarm data are stored in the data storage.

- (b) Performing the power-failure backup

To hold the data in the data storage, configure the setting in the [File Save] tab of the [User Alarm Observation] dialog, and use either of the following methods.

- Storage by the store trigger device
- Storage by the touch switch
- Storage by the Buffer Flash Forced Saving signal (GS520.b0)

To hold the data in the SRAM user area, configure the setting in the [Basic] tab of the [User Alarm Observation] dialog.

- Saving data to the SRAM user area

- (c) Information to be stored

The information in the alarm log file to be stored in the data storage and the SRAM user area differ depending on the alarm collecting method.

- (d) File name and storage timing

You can set any file name for each alarm ID.

You can set triggers (rise or fall) to perform the file save.

- (e) Available memory capacity

The memory capacity used to retain the user alarms at power failure can be checked in the [Basic] tab of the [User Alarm Observation] dialog.

- (f) Backing up the alarm log file stored in the data storage

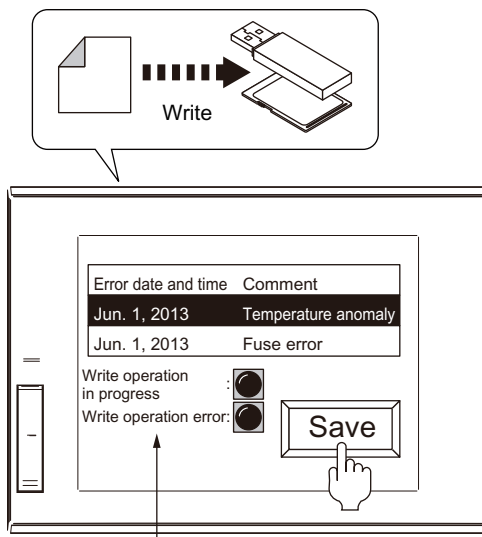
Select [Automatically backup at the time of saving] in the [File Save] tab of the [User Alarm Observation] dialog to store the alarm log file as a backup file when the alarm log file is saved.

- (g) Backing up/restoring the data stored in the SRAM user area

Backup or restore the data stored in the SRAM user area by using the [SRAM control] of the utility.

- (h) Monitoring the writing status

You can monitor the status during the user alarm data writing and a writing error by using a device.



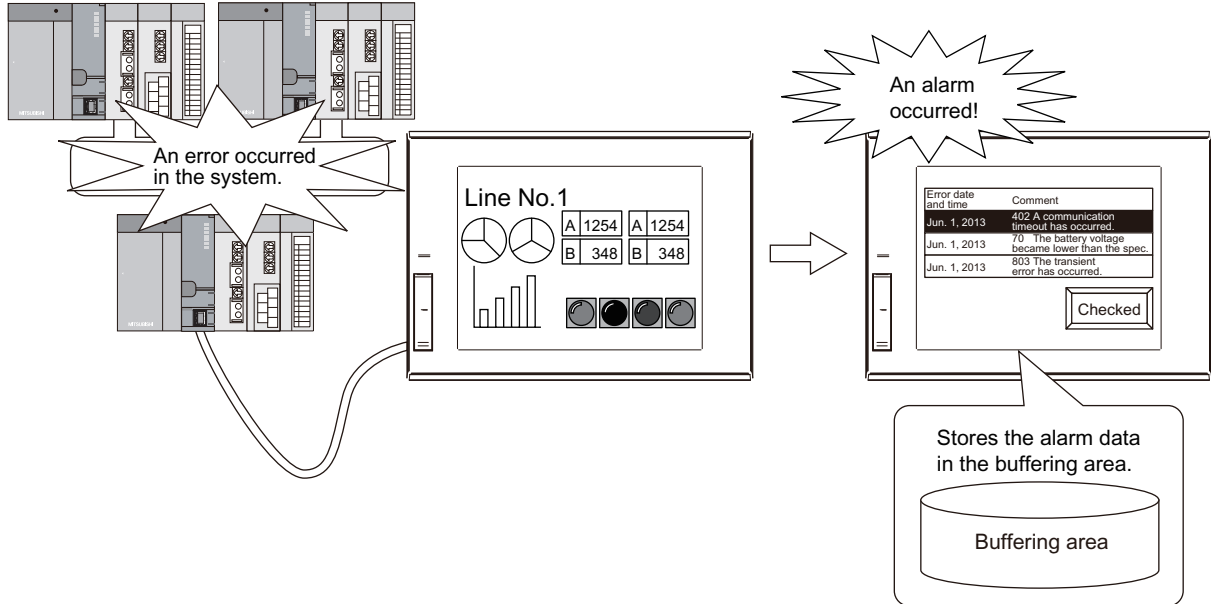
The status of write operations can be monitored.



For the details of the user alarm holding, refer to the GT Designer3 (GOT2000) Screen Design Manual.

## Appendix.1.3 Collecting alarms by monitoring the GOT, controllers, and networks

With system alarm monitors, system alarm data is stored as histories in the built-in memory of the GOT when errors of the GOT, a controller, or network occurs.



### ■ Specifications of the system alarm observation

#### (1) Types of the alarms which can be monitored and necessary settings

##### (a) Alarm type

As system alarms, the following alarms can be monitored.

- CPU error  
Displays an error of a controller as an alarm.
- GOT error  
Displays a GOT error as an alarm.
- Network error  
Displays a network error as an alarm.

The type of the alarm to be monitored is selected by setting.

Because only a specified alarm type can be displayed, alarm information can be quickly checked.

##### (b) Required settings for using the system alarm

To use the system alarm, select [Use System Alarm] in the [Basic] tab of the [System Alarm Observation] dialog and set a monitor target.

For system alarm monitors, set the type of the alarms to be collected and the collecting method of the alarms.

## ■ How to use the system alarm observation

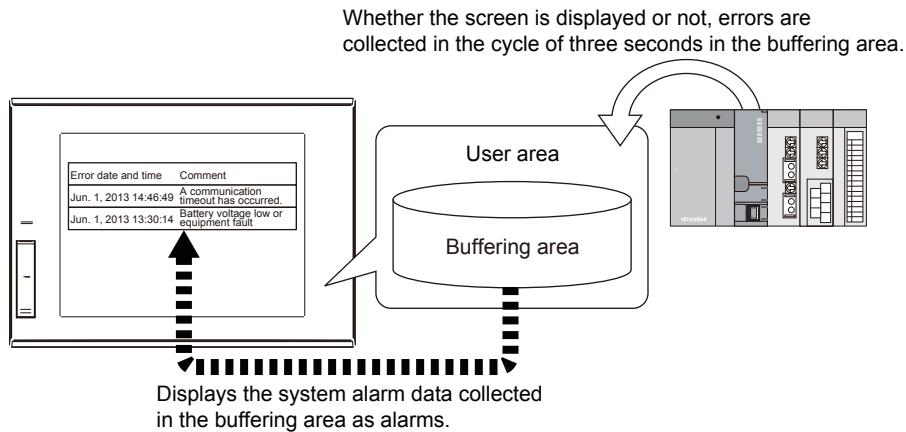
### (1) Alarm collecting procedure and alarm history collecting method

#### (a) Alarm collecting procedure

- CPU errors, network errors

CPU errors and network errors are collected in the cycle of three seconds in the buffering area in the user area of the GOT, regardless of the screen being displayed.

The buffering area stores the collected system alarms as histories temporarily, and displays them on the GOT as alarms.



- GOT error  
GOT errors are collected in the buffering area in the user area when alarms occur.
- For how to delete the data in the buffering area, refer to the following.

#### ☞ (2) Recovery from alarms

- The data to be stored in the buffering area of the user area differ depending on the history collecting method.

(b) Alarm history collecting method

The following shows the alarm history collecting method.

- History mode  
Adds the alarm contents to the user area of the GOT for each alarm occurrence.
  - Only the current alarm  
Displays only the alarm in occurrence, and deletes the display after the alarm restoration.
- Depending on the collecting method, the types of information collected differs.

Example) Alarm Display (system)

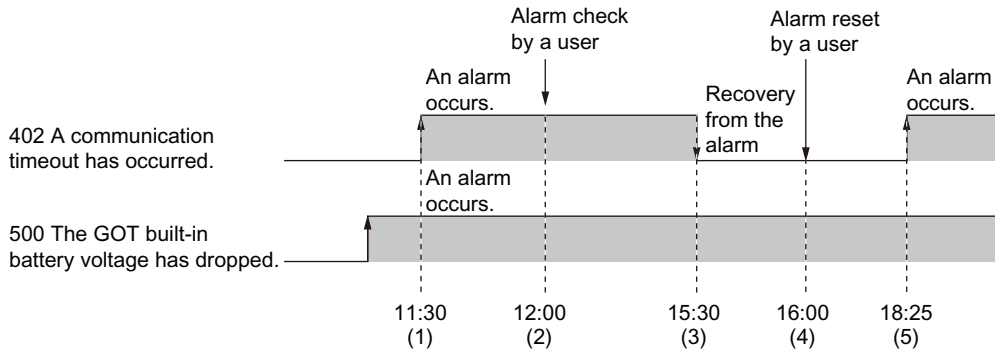
Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 20:00	402 Communication timeout.	-	-	-
Jun. 1, 2013 18:30	70 Battery voltage low or equipment fault	Checked	-	18:50
Jun. 1, 2013 16:10	803 Transient error	Checked	16:30	16:20

(1)
(2)
(3)
(4)
(5)

Displayed information	Description													
	History mode	Alarms in the "Occurred" status only												
(1) Date of occurrence	Displays the date and time when an alarm occurs.													
(2) Message	Displays an error code and message when an alarm occurs. For error codes and the corrective actions, refer to the following. Messages registered in the GOT beforehand are displayed as alarm messages.													
(3) Alarm status	Displays the alarm status that is currently displayed. <ul style="list-style-type: none"> <li>• Occurred: The alarm has occurred. (The occurrence of the alarm has not been checked.)</li> <li>• Checked: The occurrence of the alarm has been checked.</li> <li>• Restored: The monitor target already recovered from the alarm.</li> </ul>													
(4) Restored	Displays the date and time when the monitor target recovered from the alarm.	-												
(5) Checked	Displays the date and time when an alarm occurrence has been checked. Check the occurrence of the alarm with a touch switch for the alarm check. <div style="text-align: center; margin-top: 10px;"> <table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th>Comment</th> <th>Restored</th> <th>Checked</th> </tr> </thead> <tbody> <tr> <td>402 A communication timeout has occurred.</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> </tr> </tbody> </table> <span style="font-size: 24px;">→</span> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 0 20px;">Checked</div> <span style="font-size: 24px;">→</span> <table border="1" style="display: inline-table;"> <thead> <tr> <th>Comment</th> <th>Restored</th> <th>Checked</th> </tr> </thead> <tbody> <tr> <td>402 A communication timeout has occurred.</td> <td style="text-align: center;">-</td> <td style="text-align: center;">19:00</td> </tr> </tbody> </table> </div> <p style="text-align: center; margin-top: 5px;">Key code: FFB4h or FFB5h</p>		Comment	Restored	Checked	402 A communication timeout has occurred.	-	-	Comment	Restored	Checked	402 A communication timeout has occurred.	-	19:00
Comment	Restored	Checked												
402 A communication timeout has occurred.	-	-												
Comment	Restored	Checked												
402 A communication timeout has occurred.	-	19:00												

(c) Alarm display example

The following shows the examples for displaying alarms with the alarm display (system) for each alarm collecting method.



- History mode  
Collects the alarm occurrence status as histories.  
The history is added every time an alarm occurs.

(1) Occurrence of a communication timeout

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Occurred		
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

← A communication timeout has occurred.



(2) Communication timeout check

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked		12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

← The communication timeout error has already been checked.



Key code: FFB4h



(3) Communication timeout restoration

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked		12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

← The alarm status of the GOT does not turn "Restored".



(4) Alarm reset

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked	16:00	12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

← The alarm was reset.



Key code: FFB4h



(5) The reset communication timeout occurs again

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 18:25	402 A communication timeout has occurred.	Occurred		
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked	16:00	12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

← The alarm status of the GOT turns "Restored" and the recovery time is displayed.

← Displays the alarm adding a row newly.

- Alarms in the "Occurred" status only  
Only the latest GOT error, CPU error, and network error are collected.  
The histories of the alarms that have been recovered are not stored.

Not collected if only the alarms in the "Occurred" status are displayed.

(1) Occurrence of a communication timeout

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Occurred		
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

A communication timeout has occurred.



(2) Communication timeout check

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked		12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

The communication timeout error has already been checked.



Key code: FFB4h



(3) Communication timeout restoration

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 11:30	402 A communication timeout has occurred.	Checked		12:00
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

The alarm status of the GOT does not turn "Restored".



(4) Alarm reset

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

After the alarm status turns "Restored", the alarm is deleted.



(5) The reset communication timeout occurs again

Error date and time	Comment	Alarm status	Restored	Checked
Jun. 1, 2013 18:25	402 A communication timeout has occurred.	Occurred		
Jun. 1, 2013 10:25	500 The GOT built-in battery voltage has dropped.	Occurred		

Displays the alarm that has occurred.

(2) Recovery from alarms

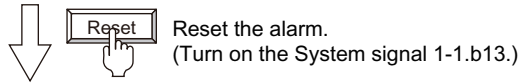
The following shows the procedure for turning the alarm status of each error to "Restored".

- CPU errors**  
Eliminate all the alarm causes of the CPU error.  
The alarm status of the system error caused by the CPU error turns "Restored" by eliminating all the alarm causes.  
When the multi-channel function is used, the alarm status of all the channels turns "Restored" by eliminating the alarm causes of all the channels.
- Network errors**  
Eliminate all the alarm causes of the network error.  
The alarm status of the system error caused by the network error turns "Restored" by eliminating all the alarm causes.
- GOT errors**  
Eliminate all the alarm causes of the GOT error.  
Otherwise the same alarm occurs again after the alarm status is turned from "Occurred" to "Restored".



Example) When the alarm of error code 460 occurs and the alarm is reset before the cause is eliminated

Error date and time	Comment	Alarm status
Jun. 1, 2013 11:30	803 Transient error	Occurred
Jun. 1, 2013 10:25	460 Communication unit error	Occurred



Error date and time	Comment	Alarm status
Jun. 1, 2013 11:30	803 Transient error	Occurred
Jun. 1, 2013 10:25	460 Communication unit error	Restored

The status of the GOT error turns "Restored".

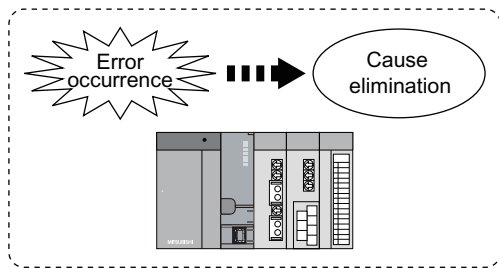


Error date and time	Comment	Alarm status
Jun. 1, 2013 12:00	460 Communication unit error	Occurred
Jun. 1, 2013 11:30	803 Transient error	Occurred
Jun. 1, 2013 10:25	460 Communication unit error	Restored

After the reset, the same alarm occurred again.

The date and time of occurrence displayed show the date and time when the alarm was detected again after the reset.

The alarm status of GOT errors does not turn "Restored" even after the alarm causes are eliminated. To turn the status to "Restored", execute any one of the following operations.

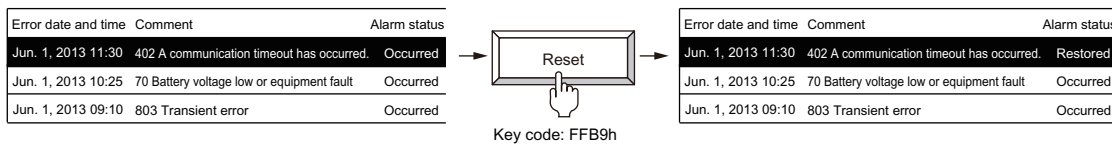


Eliminate the cause of the alarm of the GOT, a controller, or a network.

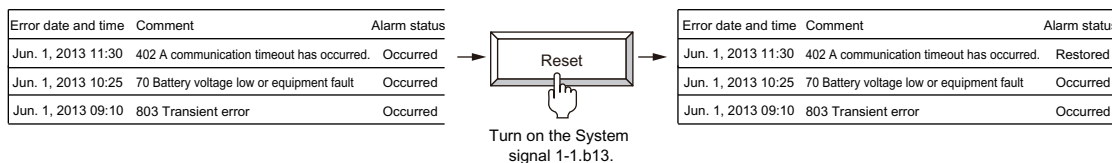
Error date and time	Comment	Alarm status
Jun. 1, 2013	402 A communication timeout has occurred.	Occurred
Jun. 1, 2013	70 Battery voltage low or equipment fault	Restored
Jun. 1, 2013	803 Transient error	Restored

The alarm status of the GOT error remains "Occurred" even if the cause of the alarm is eliminated.

- Turning the alarm status of a selected error to "Restored"  
Using a touch switch, turn the alarm status of an selected error to "Restored".



- Using the system information, turning the alarm status of all the GOT errors to "Restored"  
By turning on the GOT Error Reset signal (System signal 1-1.b13), turn the alarm status of all the GOT errors to "Restored".



- Using a utility, turning the alarm status of all the GOT errors to "Restored"  
Using the alarm display (system) utility, turn the alarm status of all the GOT errors from "Occurred" to "Restored".

### (3) Deleting alarm

Alarms in the "Restored" status can be deleted from the history.

To delete alarms, turn the alarm status from "Occurred" to "Restored".

#### (2) Recovery from alarms

To delete alarm data, execute any one of the following operations.

(a) Powering off or resetting the GOT

Delete alarm displays by powering off or resetting the GOT.

However, when the system alarm data is stored in the SRAM user area or a data storage device, the system alarm data is retained even after the GOT is powered off.

(b) Configuring the controller setting of the GOT basic setting with the utility.

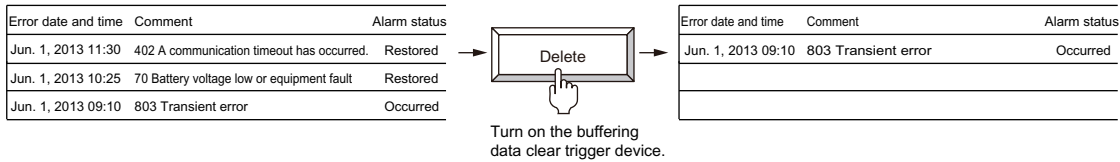
(c) Writing a system application or the project data, deleting the user alarm data by the drive information of formatting a drive

(d) By user setting or operation

The history of alarms that have been restored can be deleted by the user.

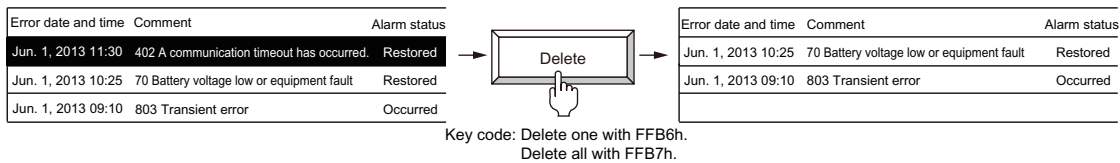
- Deleting with a device

Turn on [Buffering Data Clear Trigger Device] set in the [Basic] tab of the System Alarm Observation dialog to delete all the alarm data in the "Restored" status.



- Deleting with a touch switch

The touch switch deletes one or all restored alarms.



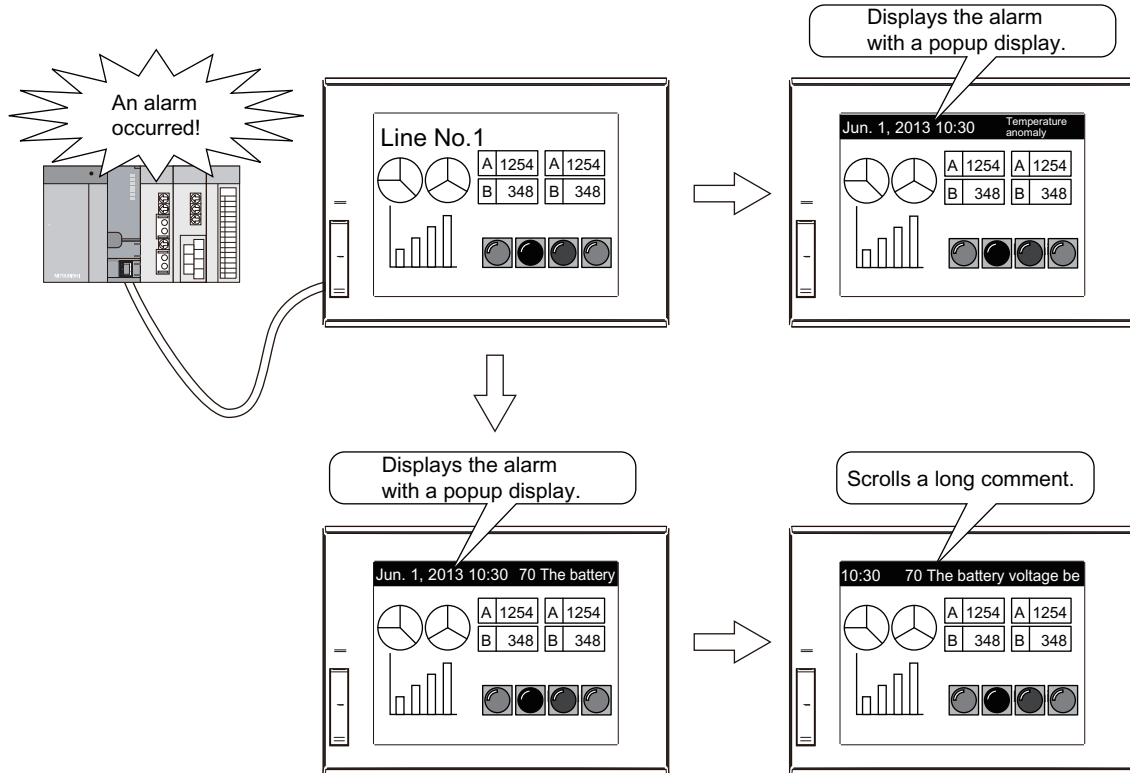
### Remark

For the details of the system alarm observation, refer to the Chapter 9 in the GT Designer3 (GOT2000) Screen Design Manual.

## Appendix.1.4 Enabling the popup display for when an alarm occurs

In the alarm popup display, the GOT displays alarms whether or not the target object for the alarm popup display is placed.

Even a long comment can be displayed in the alarm popup display by scrolling across the screen from right to left.



### ■ Specifications of the alarm popup display

#### (1) Types of alarms which can be displayed and necessary settings

##### (a) Alarm type

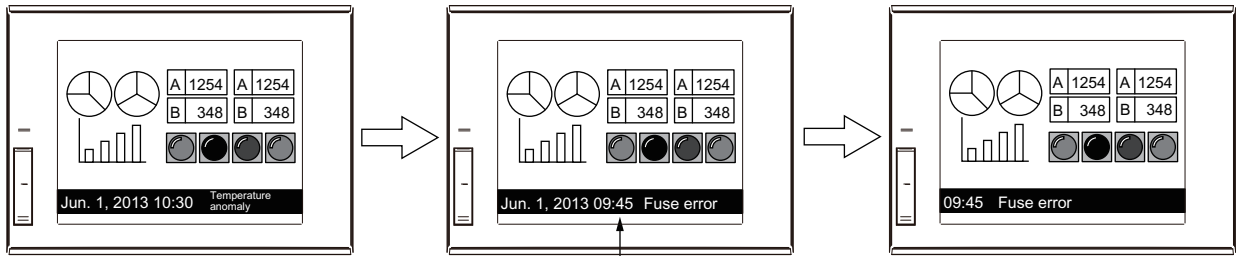
User alarms and system alarms can be displayed in the alarm popup display.

- Setting the alarm popup display  
Set the alarms to be displayed in the alarm popup display.
- Auxiliary settings for each screen  
For each base screen, set the position of the alarm popup display and whether to display or not.  
Set the alarm popup display in the [Screen Property] dialog.
- When the display position overlaps with other objects  
Place the alarm popup display where it does not overlap with objects. Objects hidden under the display cannot be operated.
- Switching the display position with touch operations  
Touch the far left of the alarm popup display area to switch the display position.

(b) Float

Comments displayed when alarms occur are displayed by scrolling from right to left. When multiple alarms occur, the alarms are displayed in order.

When a temperature anomaly and the fuse error occur

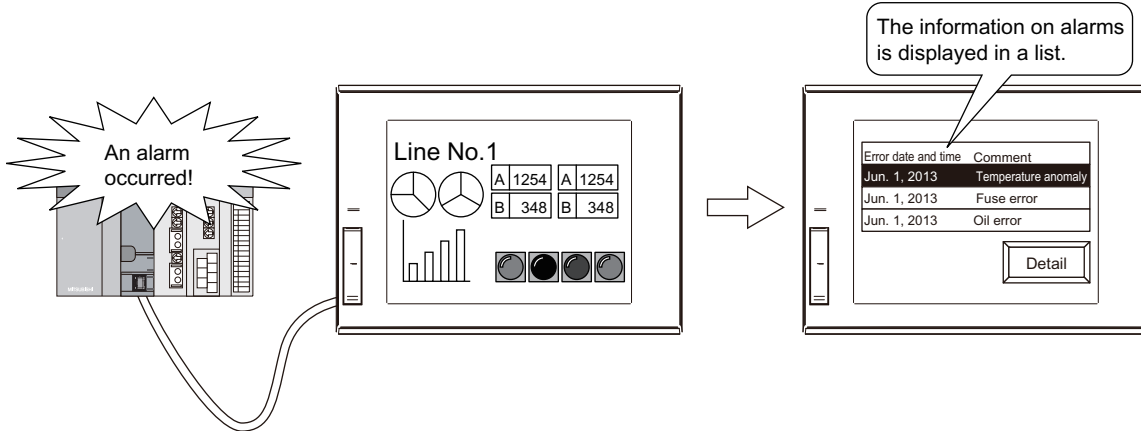


Displays alarms that have occurred by scrolling from right to left.

- When multiple alarms occur
- When setting a comment using multiple rows  
After the part of the comment in the first row is displayed, the parts in the second and the following successive rows are displayed by scrolling.

## Appendix.1.5 Viewing the collected alarms

In the alarm display, either of user alarms or system alarms can be displayed in a list.



For the screen setting, refer to the advanced course manual.

### ■ Specifications of the alarm display

**(1) Maximum number of objects arrangeable on one screen**

Up to 33 alarm displays (user) and 9 alarm displays (system) can be placed on each base/window screen.

**(2) Alarm type to be displayed**

Select alarms to be displayed from the following two types.

- All Alarm  
When this item is set, the history of alarms including past alarms is displayed.
- Generating Alarm  
When this item is set, only the existing alarms are displayed.

Display example) Alarm display (user)

Alarm status			
(Occurred)	(Comment)	(Restored)	(Checked)
Jun. 1, 2013 12:10	Temperature anomaly	-	-
Jun. 1, 2013 11:45	Fuse error	-	12:25
Jun. 1, 2013 11:30	Oil error	12:05	11:50
Jun. 1, 2013 10:47	Fuel error	-	10:55
Jun. 1, 2013 09:30	Internal pressure error	10:14	09:48
Jun. 1, 2013 08:58	Light error	09:45	09:15

[All Alarm]

Error date and time	Comment	Restored	Checked
Jun. 1, 2013 12:10	Temperature anomaly		
Jun. 1, 2013 11:45	Fuse error		12:25
Jun. 1, 2013 11:30	Oil error	12:05	11:50
Jun. 1, 2013 10:47	Fuel error		10:55
Jun. 1, 2013 09:30	Internal pressure error	10:14	09:48
Jun. 1, 2013 08:58	Light error	09:45	09:15

The history of alarms including past alarms is displayed.

[Generating Alarm]

Error date and time	Comment	Restored	Checked
Jun. 1, 2013 12:10	Temperature anomaly		
Jun. 1, 2013 11:45	Fuse error		12:25
Jun. 1, 2013 10:47	Fuel error		10:55

Because the oil error, internal pressure error, and light error have been eliminated, the alarms of the errors are deleted.

## ■ How to use the alarm display

### (1) Display method of comments

- Fixed  
The comments to be displayed at the occurrence of an alarm are not scrolled in the display.
- Float  
The comments to be displayed at the occurrence of an alarm are displayed by scrolling from right to left. In the scrolling display, the part of a comment that extends off the display area, and the second and the following successive rows of a comment that involves multiple rows are not displayed.

Display example) Alarm display (user)

When display type is [Flow]

Error date and time	Comment	Restored	Checked
Jun. 1, 2013 12:10	A temperature		
Jun. 1, 2013 11:45	Check the hyd	12:25	
Jun. 1, 2013 11:30	Motor error	12:05	11:50

Comments are displayed by scrolling from right to left.



Error date and time	Comment	Restored	Checked
Jun. 1, 2013 12:10	power supply unit.		
Jun. 1, 2013 11:45	raulic pressure.	12:25	
Jun. 1, 2013 11:30	Motor error	12:05	11:50



Error date and time	Comment	Restored	Checked
Jun. 1, 2013 12:10	unit. Check the		
Jun. 1, 2013 11:45	Check the	12:25	
Jun. 1, 2013 11:30	Motor error	12:05	11:50

For a comment with multiple lines, the subsequent lines are also displayed.

Displayed comments

Comment No. 1 (comment group)

A temperature anomaly has occurred in the power supply unit. Check the fuse.



Comment with multiple rows

Comment No. 2 (comment group)

Check the hydraulic pressure.

Comment No. 3 (comment group)

Motor error

## (2) Display order of alarms

Set the display order of alarms as follows.

1. Specify an item for sorting the display of alarms.  
The display of alarms is sorted according to the specified item.

Display example) Displaying user alarms in the chronological order

Sorting user alarms in the chronological order

Error date and time	Comment	Alarm status	Restored	Checked	Frequency	Cum. Time	Down Time	Level	Group
Jun. 1, 2013 20:00	Power supply unit error	Occurred	-	-	1	-	-	1	2
Jun. 1, 2013 18:30	Hydraulic pressure failure	Checked	-	18:50	2	00:20	-	1	1
Jun. 1, 2013 16:10	Drive module error	Checked	16:30	16:20	5	04:10	00:20	2	1
Jun. 1, 2013 14:00	Motor error	Checked	15:00	14:10	4	02:30	01:00	2	1
Jun. 1, 2013 13:30	Light error	Checked	14:30	13:50	1	01:00	01:00	2	1

Setting example) Configure the setting in the [Style] tab of the [Alarm Display (User)] dialog as follows.

Set [Occurred] as an item for sorting alarms.

Set [Reverse chronological] as the display direction.

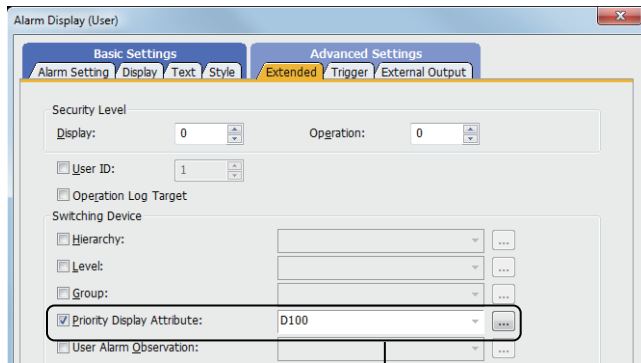
2. You can change the item for sorting the display of alarms.

Display example) Sorting user alarms in the descending order of frequency of occurrences

Sorting user alarms according to the frequency of occurrences (in the descending order)

Error date and time	Comment	Alarm status	Restored	Checked	Frequency	Cum. Time	Down Time	Level	Group
Jun. 1, 2013 16:10	Drive module error	Checked	16:30	16:20	5	04:10	00:20	2	1
Jun. 1, 2013 14:00	Motor error	Checked	15:00	14:10	4	02:30	01:00	2	1
Jun. 1, 2013 18:30	Hydraulic pressure failure	Checked	-	18:50	2	00:20	-	1	1
Jun. 1, 2013 20:00	Power supply unit error	Occurred	-	-	1	-	-	1	2
Jun. 1, 2013 13:30	Light error	Checked	14:30	13:50	1	01:00	01:00	2	1

Setting example) Configure the setting in the [Extended] tab of the [Alarm Display (User)] dialog as follows.



Switching device D100 9

The sort criteria can be changed according to the value in the switching device (priority display attribute).

- 0: Without specification  
(sorting by the occurrence date and time)
- 1: Occurred
- 2: Restored
- 3: Checked
- 4: Comment (comment No.)
- 5: Level
- 6: Group
- 7: Status  
(Ascending: Checked → Restored → Occurred)  
(Descending: Occurred → Restored → Checked)
- 9: Frequency
- 10: Cum. Time
- 11: Down Time

- When both [Display Order] in the [Display] tab and [Priority Display Attribute] in [Switching Device] in the [Extended] tab are set, the display order set in [Priority Display Attribute] has priority.



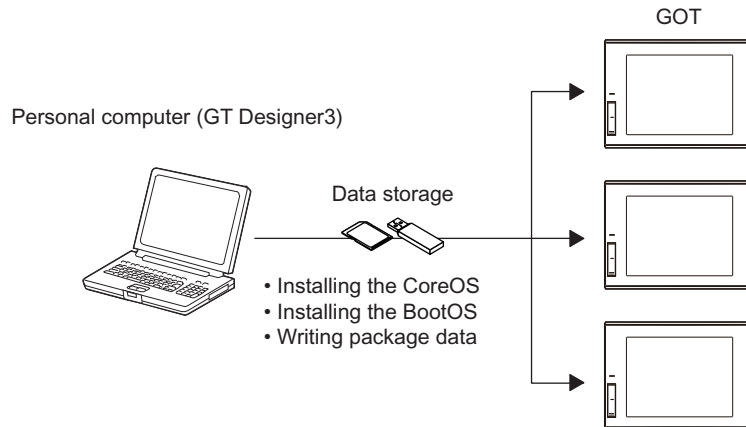
## Appendix.2 Data transfer to the GOT with the data storage

---

Screen data, BootOS, or CoreOS can be written to the GOT from a data storage where the CoreOS, BootOS, or package data has been written.

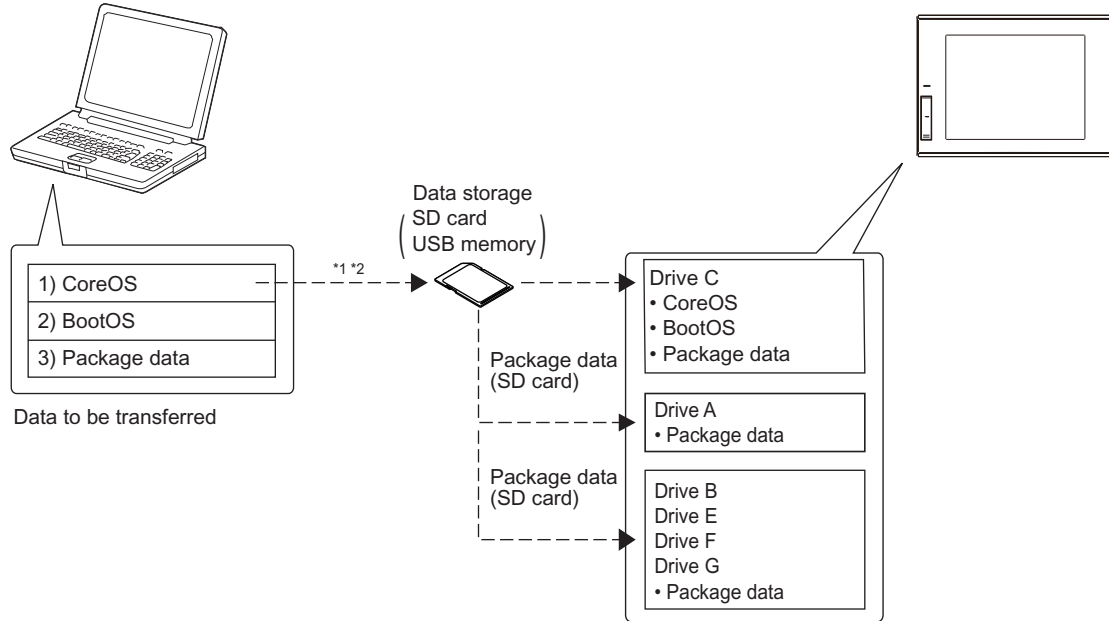
When the package data is written to multiple GOTs, using the data storage eliminates the need to carry a personal computer or cables, enhancing your convenience.

In addition, the GOT can be started using the package data stored in the data storage.



## Appendix.2.1 Overall procedure

This section describes the overall procedures for data transfer to the GOT using a data storage.



\*1 BootOS and package data cannot be transferred to the same memory card.

\*2 Check the available space of the data storage.

The available space of BootOS and system applications can be checked in [Write to Memory Card] or [Write Option] of GT Designer3.

### 1. Personal computer → Data storage

Write each type of data (CoreOS, BootOS, or package data) installed in a personal computer to a data storage with GT Designer3.

For how to write each type of data to the data storage, refer to the GT Designer3 (GOT2000) Screen Design Manual.

### POINT

To directly open the package data from the data storage, select [Directly from the memory card] for [GOT Startup Method] tab on the [Memory Card Write] of the Communicate with Memory Card dialog.

For how to directly open the package data from the data storage, refer to the GT Designer3 (GOT2000) Screen Design Manual.

### 2. Data storage → GOT

The following two methods are available for installing or writing each data (CoreOS, BootOS, or package data) to the GOT.

- How to install while the GOT is powered ON  
For the installation method, refer to the GT Designer3 (GOT2000) Screen Design Manual.
- How to install package data using the utility (data control function) of the GOT  
For the installation method, refer to the GOT2000 Series User's Manual (Utility).

## POINT

---

### Precautions for data transfer

#### (1) Memory card

Do not store any other data in a data storage where each type of data (CoreOS, BootOS, or package data) is to be written.

When the data is written, the other data is deleted.

CoreOS, BootOS, and package data cannot be stored in the same memory card.

#### (2) Data stored in GOT

When CoreOS, BootOS, or package data is written, all the data in the GOT are deleted.

When the data in the GOT is required, read the data in advance.

#### (3) Precautions for operations while CoreOS, BootOS, or package data is being written

Writing CoreOS, BootOS, or package data cannot be interrupted.

Note that the GOT may become non-functional if one of the following is performed during writing:

- Power off the GOT.
  - Press the reset button of the GOT.
  - Open the SD card interface cover.
  - Remove the data storage.
-

## Appendix.3 About the FA transparent function

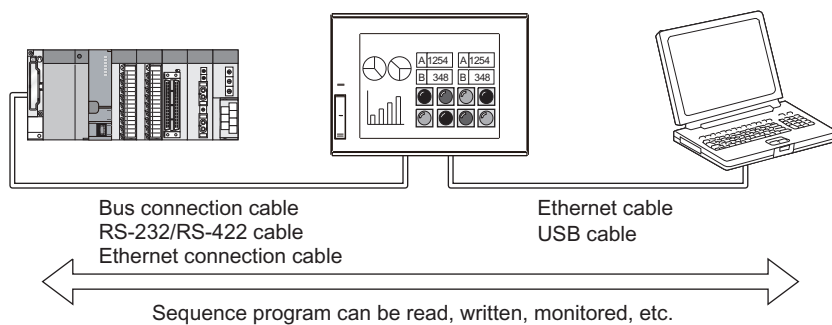
The FA transparent function allows the sequence programs of the Mitsubishi PLC to be read, written and monitored via GOT when the GOT is connected both to Mitsubishi GOT and to a personal computer. Debugging, starting up, and adjustment of the sequence program can be carried out through the USB port equipped in front of GOT, which requires no cumbersome steps like panel opening or reconnection of cables.

### Remark

For the details, refer to the GT Designer3 (GOT2000) Screen Design Manual.

### Appendix.3.1 System configuration

System configuration for the FA transparent function is shown below.

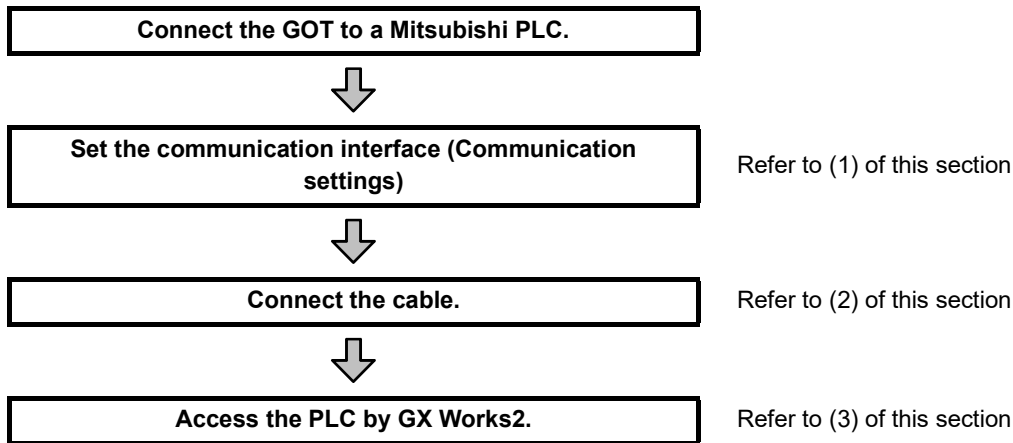


## Appendix.3.2 Procedures up to accessing

This section describes the system configurations using the following connection examples:

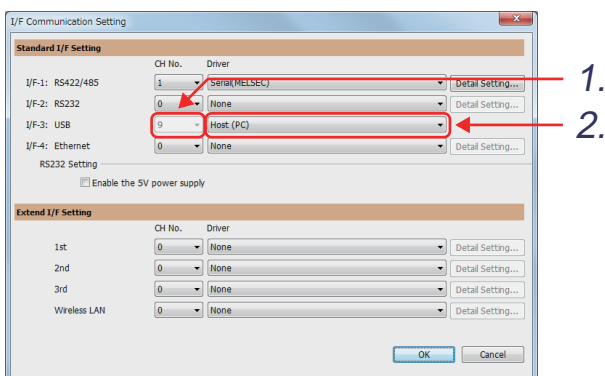
- Connection between the personal computer and GOT: USB connection
- Connection between GOT and PLC: Ethernet connection

The following shows the procedure before accessing.



### (1) Setting communication interface (Communication settings)

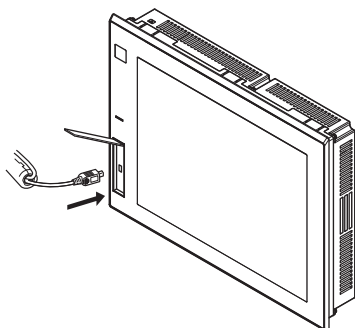
Set the communication interface of the GOT at [I/F Communication Setting] in GT Designer3.



1. Set [CH No.] of [Standard I/F-3] to "9".
2. Set [Driver] of [Standard I/F-3] to "Host (PC)".

### (2) Cable connection

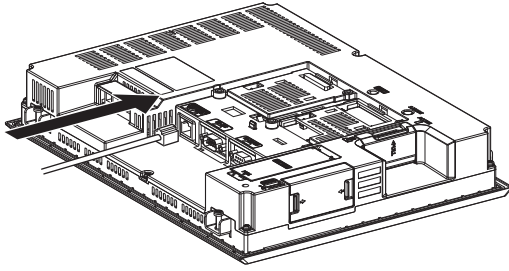
(a) Connection method for USB cable



Connect the USB cable to the USB interface on the GOT.

(b) Connection method for the Ethernet connection cable

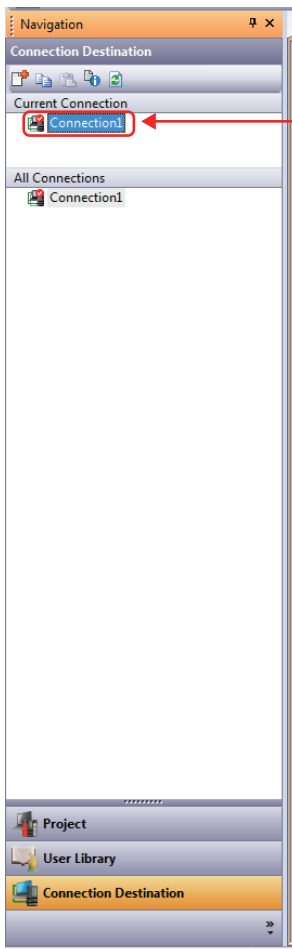
Connect the Ethernet connection cable to the GOT.



(3) Access the PLC by GX Works2.

The following describes the procedures for monitoring the PLC by GX Works2 using the FA transparent function. Refer to the GX Works2 Operating Manual for details on operation procedures for GX Works2.

(a) Connecting to PLC

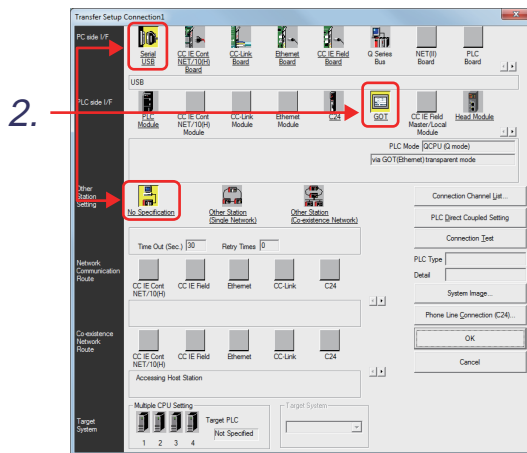


1. In the [Navigation] window of GX Works2, select [Connection Destination] - [Current Connection] and double-click [Connection1].



(Next page)

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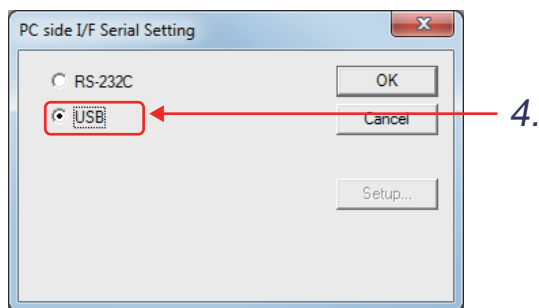


2. Set [Transfer Setup].

PC side I/F: Serial USB

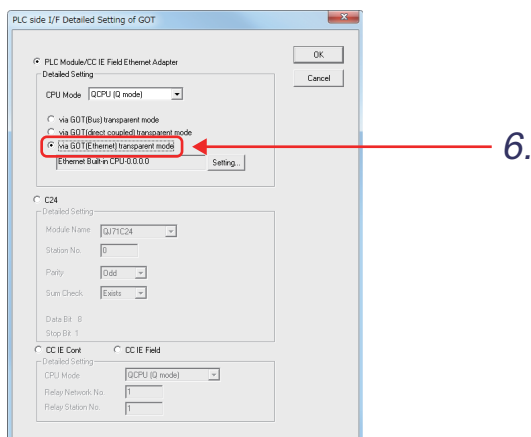
PLC side I/F: GOT

Other Station Setting: No specification



3. Go back to [Transfer Setup], double-click [Serial USB] of [PC side I/F] to display [PC side I/F Serial Setting].

4. Check [USB] in [PC side I/F Serial Setting] and click the [OK] button.



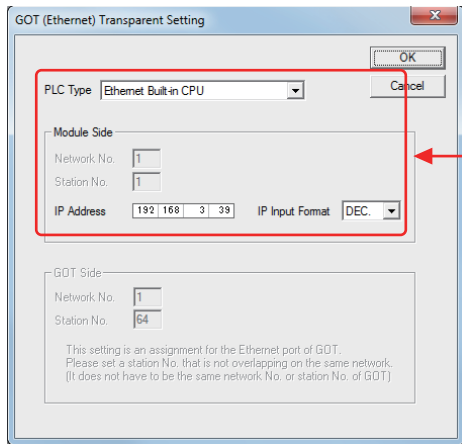
5. Double-click [GOT] of [PLC side I/F] to display [PLC side I/F Detailed Setting of GOT].

6. Check [via GOT (Ethernet) transparent mode] in [PLC side I/F Detailed Setting of GOT] and click [Setting...].



(Next page)

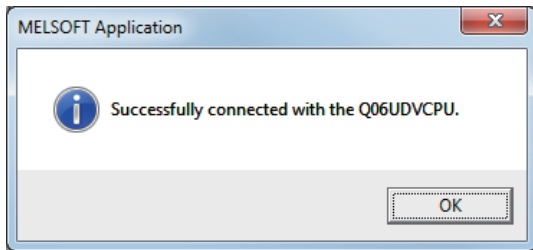
(From previous page)



7.

7. Configure the setting in [GOT (Ethernet) Transparent Setting].

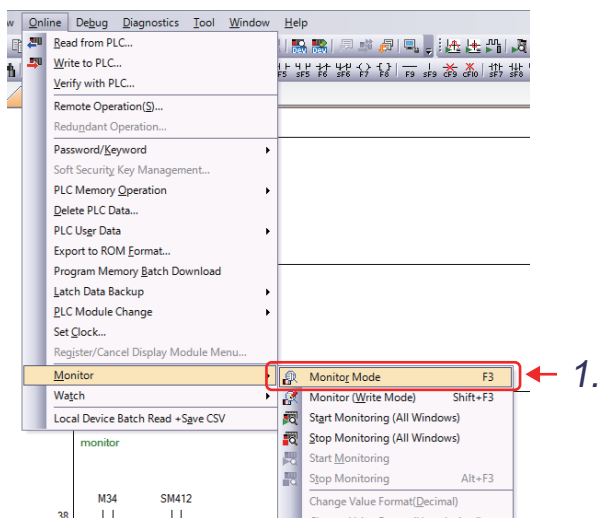
PLC Type: Ethernet Built-in CPU  
IP Address: IP Address set for Built-in Ethernet port QCPU



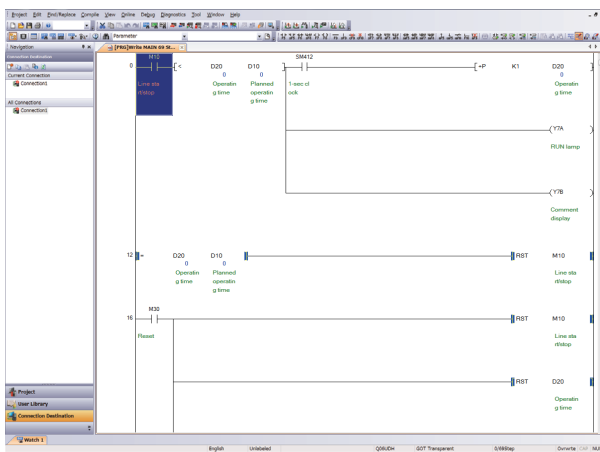
8. Go back to [Transfer Setup], click the Connection Test button, and check that the connection to QCPU is established.



## (b) Monitoring PLC by GX Works2



1. In GX Works2, select the [Online] → [Monitor] → [Monitor Mode] menu.



2. Monitoring of PLC starts.

## Appendix.3.3 About the restrictions

This section describes the restrictions of the FA transparent function.

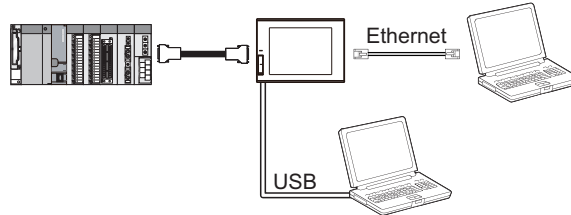
Refer to the GOT2000 Series Connection Manual (Mitsubishi Products) for details on the specifications and cautions in using the FA transparent function.

### (1) GOT interface required to use the FA transparent function

Connect the personal computer, to which GX Works2 or any other relevant software has been installed, to the USB interface or Ethernet interface of the GOT.

When performing the FA transparent function, use either USB interface or Ethernet interface of the GOT.

Using both of them to perform the FA transparent function concurrently is not allowed.



### (2) When the FA transparent function is used in Ethernet connection

#### (a) Functions of GX Developer and GX Works2

When the FA transparent function is used in Ethernet connection, the following GX Developer or GX Works2 functions cannot be executed.

The message [The executed function is not supported. Please check the manual and other documentation.] appears on GX Developer or GX Works2.

Unsupported functions	Remarks
<ul style="list-style-type: none"> <li>• Remote reset</li> <li>• Remote system reset</li> </ul>	—
<ul style="list-style-type: none"> <li>• Remote RUN</li> <li>• Remote STOP</li> <li>• Remote PAUSE</li> <li>• Remote STEP-RUN</li> <li>• Remote latch clear</li> <li>• Write clock data</li> <li>• Clear malfunction log</li> </ul>	Inexecutable only when all stations/groups has been specified.
<ul style="list-style-type: none"> <li>• Remote password function</li> <li>• MELSECNET diagnostics</li> <li>• CC IE Control diagnostics</li> <li>• CC IE Field diagnostics</li> <li>• Ethernet diagnostics (PING test/loopback test with the Ethernet module (Q series))</li> </ul>	-

#### (b) GOT station monitoring function

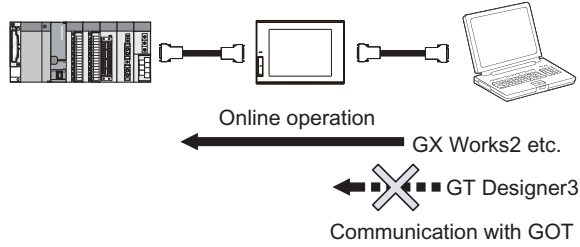
When the FA transparent function is used in Ethernet connection, GOT station monitoring function does not work.

Therefore, in the cases of [no connection target], [PLC power OFF], etc., the monitoring of the GOT delays for the timeout time.

**(3) Software available on one personal computer**

When multiple kinds of software are activated on one personal computer, only one of them is available for communications using the FA transparent function.

Do not concurrently perform any communications using the FA transparent function. (Offline operation with each software is available.) Do not communicate with the GOT from GT Designer3 (including writing package data) while another MELSOFT application is using the FA transparent function.

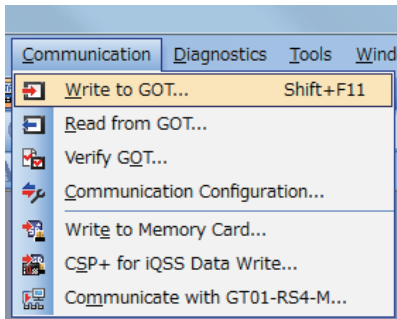


# Appendix.4 Installing the BootOS

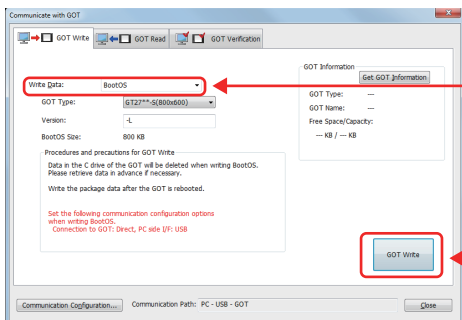
This section explains how to install the BootOS to the GOT.

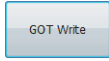
## POINT

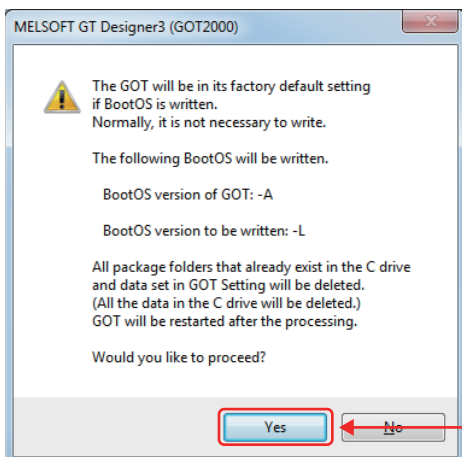
- (1) Since the BootOS has been installed to the GOT at factory shipment, installing BootOS is not usually necessary.**  
However, the BootOS needs to be upgraded (newly installed) to use a function which the BootOS of the GOT does not support, such as an upgraded function of GT Designer3.  
To initialize the GOT to the factory shipment condition, install the BootOS.
- (2) When the BootOS is installed, the existing package data is automatically deleted.**  
If backing up the project data is required, read the project data to a personal computer or a data storage before installing the BootOS.

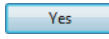


1. Click [Communication] - [Write to GOT] from the menu.



2. The Communicate with GOT dialog appears. Select [BootOS] in [Write Data].
3. Click the  button.



4. Click the  button to install the BootOS.
5. After the BootOS has been installed, click [Close] to close the dialog.

## POINT

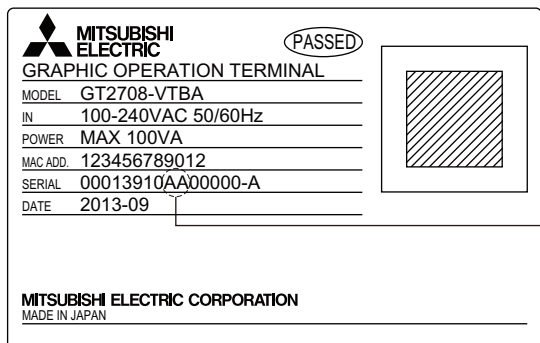
### How to check the version of BootOS and package data

To check if the BootOS or package data needs to be upgraded, the current version of the BootOS or package data can be displayed.

(1) **BootOS installed on the GOT**

For the version of the standard system application, check [OS information] of the utility.

(2) **For the factory default version of the BootOS installed on the GOT, check the rating plate on the GOT rear face.**



AA

BootOS version  
(When the BootOS version is two digits,  
only the first digit is described.)

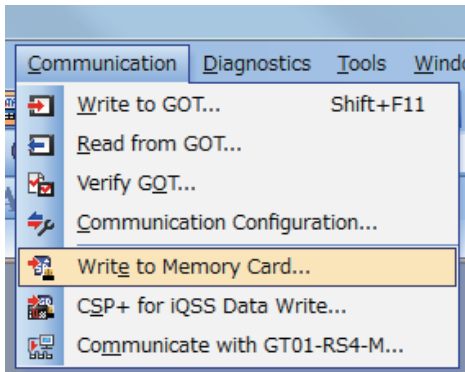
# Appendix.5 Installing the CoreOS

This section explains how to install the CoreOS to the GOT.  
Use the data storage to install the CoreOS to the GOT.

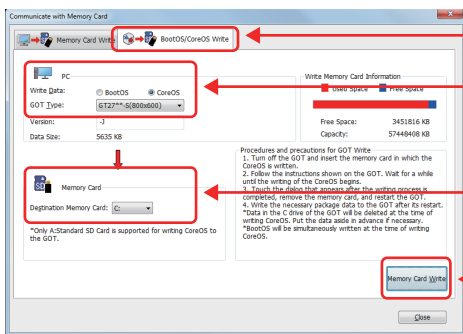
## POINT

- (1) **Canceling writing the package data**  
When writing the package data is canceled during the process, the data in the GOT may be corrupt.  
When writing the package data has been canceled during the process, write the package data again.
- (2) **Data in the GOT before the CoreOS is installed**  
When the CoreOS is installed, all the data in the GOT are deleted.  
When the data in the GOT is required, read the data in advance.
- (3) **Precautions for installing the CoreOS**  
The data storage of when the CoreOS is installed supports only the drive A (standard SD card).  
When the CoreOS is installed, all the data in the memory card are deleted.
- (4) **Precautions for the utilize data and the input assist information**  
When [Utilize data/Input assist information] is excluded from the package data at writing, the project read from the GOT operates as follows.
  - The accumulated input assist information return to the initial status.
  - The project data is not searched for when a new project is to be created using another project.

### (1) Writing the CoreOS to the data storage



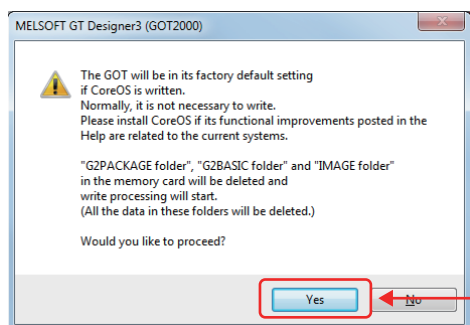
1. Click [Communication] - [Write to Memory Card] from the menu.



2. The Communicate with Memory Card dialog appears. Click the [BootOS/CoreOS Write] tab.
3. Configure the following setting in [PC].  
Write Data: CoreOS  
GOT Type: **GT27\*\*-S(800×600)**
4. Check the CoreOS version to be installed in [Version].
4. Set the drive name of the data storage for [Destination Memory Card].
5. Click the **Memory Card Write** button.

(Next page)

(From previous page)



6. Click  button to install the CoreOS.

7. After writing to the data storage is completed, remove the data storage from the personal computer. Refer to the following to install the CoreOS to the GOT.

## (2) Installing the CoreOS to the GOT from the data storage

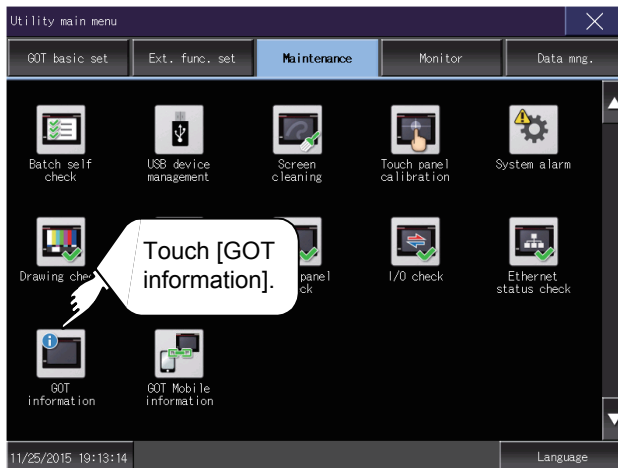
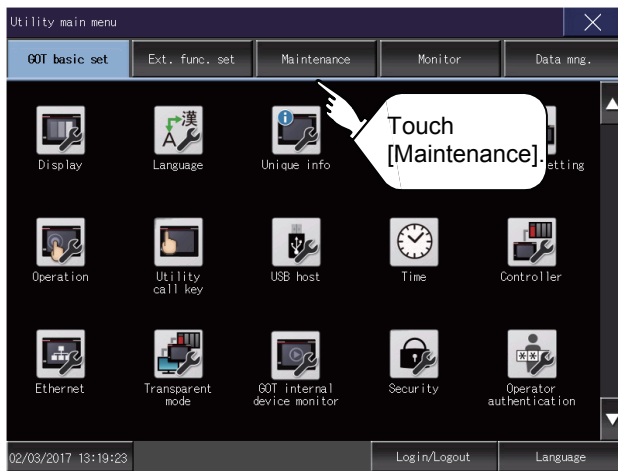
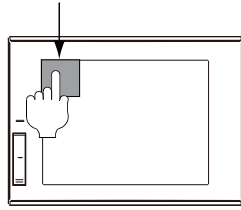
1. Install the data storage that has been removed from the personal computer to the GOT.
2. Power on the GOT.
3. The confirmation message for installing the CoreOS appears. To install the CoreOS, touch the screen for two seconds or longer. To abort the installation of the CoreOS, power off the GOT.
4. When the installation of the CoreOS is completed, the completion message appears. Touch the screen to restart the GOT.
5. Write the required package data to the restarted GOT.

### POINT

- When installing the CoreOS from the SD card, close the SD card cover properly after inserting the card to start the installation.
- When using the SD card as a drive A, in which the CoreOS has been installed, delete the CoreOS in the SD card or format the SD card before use.

### (3) Checking the CoreOS version

Utility call key  
Hold down the upper left corner  
for two seconds.



(Next page)

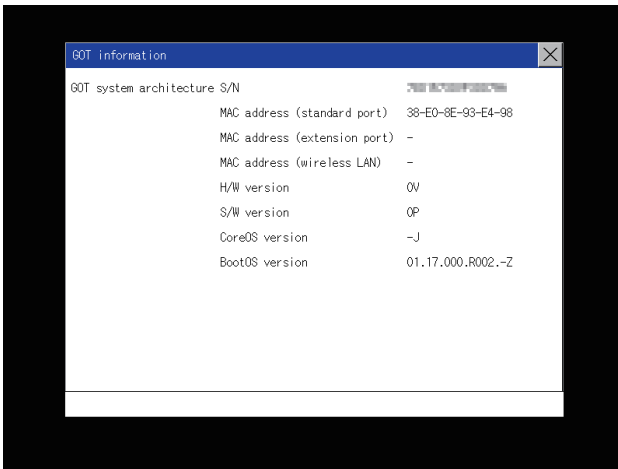
1. Hold down the upper left corner on the GOT monitor screen for two seconds.

2. Touch the [Maintenance] tab.

3. Touch [GOT Information].



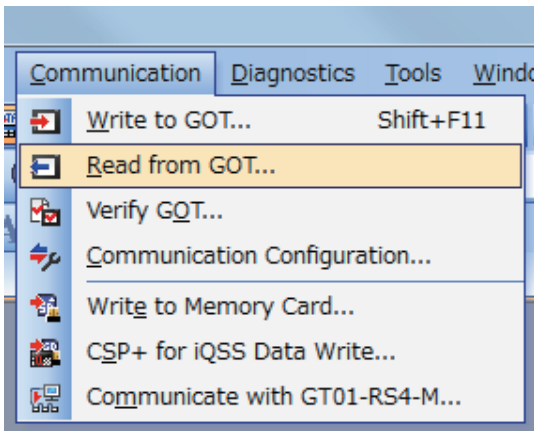
(From previous page)



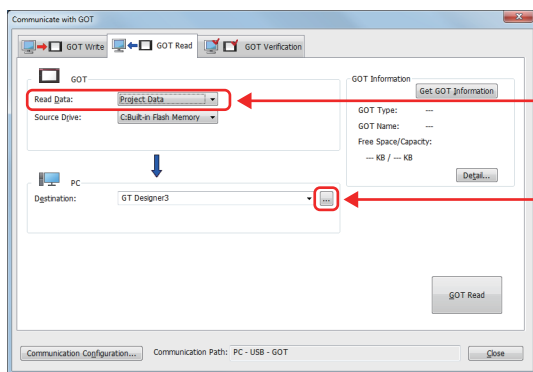
4. The [GOT information] window appears. Check the CoreOS version.

# Appendix.6 Reading the project data

This section explains how to save the project data as a file for GT Designer3 from built-in memory of the GOT.

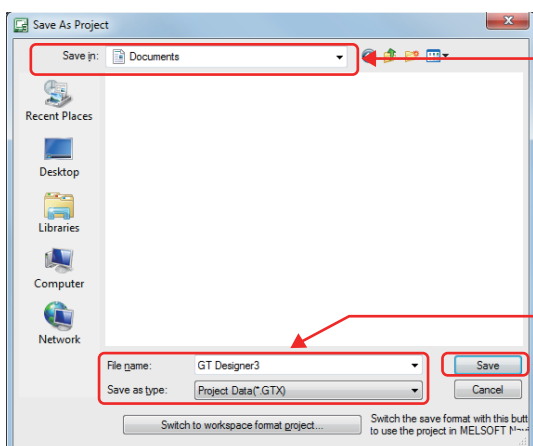


1. Click [Communication] - [Read from GOT] from the menu.



2. The Communicate with GOT dialog appears. Select Project Data in [Read Data].
3. Set the storage destination of the project data to be read.

Click the  button.



4. The [Save As Project] dialog appears. Select [My Documents].

5. Set the file name of the project to be saved as follows.

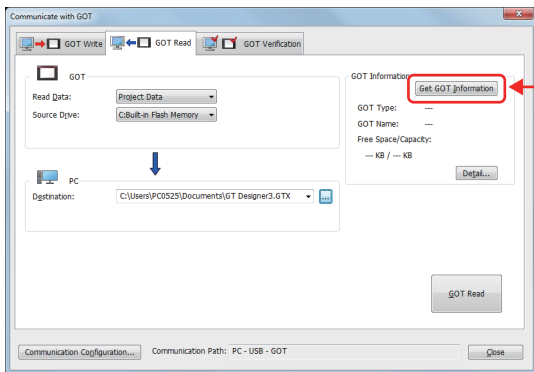
File name : "GT Designer3"  
Save as type : Project Data(\*.GTX)

6. Click the  button.



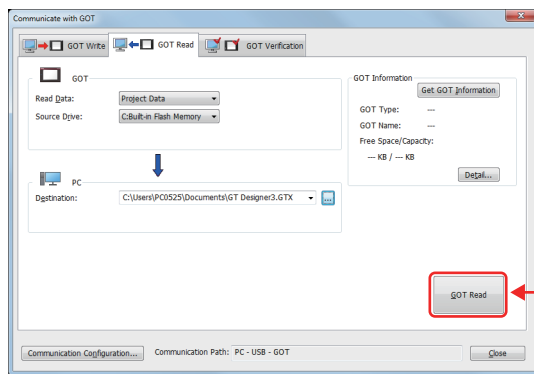
(Next page)

(From previous page)

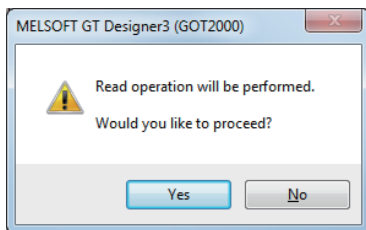


7. Click the **Get GOT Information** button.

8. The confirmation message that the drive information was acquired appears. Click **Yes**.



9. Click the **GOT Read** button.



10. Click the **Yes** button to read the project data.

When the read is completed, confirm the data in "My Document".

## Appendix.7 Checking operations (simulator)

### Remark

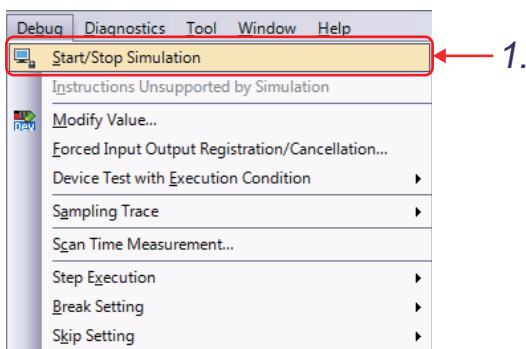
This section explains the simulations connected to a sequence program (GX Simulator2).  
(For the details of simulations connected to the PLC CPU and description not indicated in this section, refer to the GT Designer3 (GOT2000) Screen Design Manual.)

#### (1) Preparing a sequence program

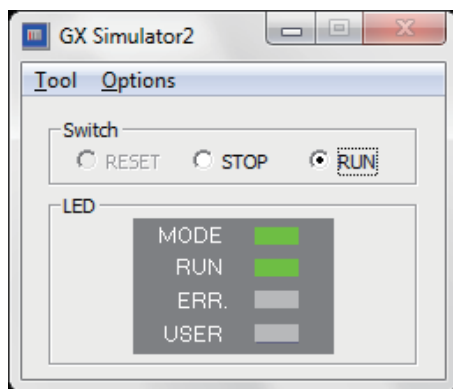
Open a sequence program to be monitored using simulators from GX Works2.

#### (2) Starting the simulator for the PLC

Start GX Simulator2 from GX Works2.



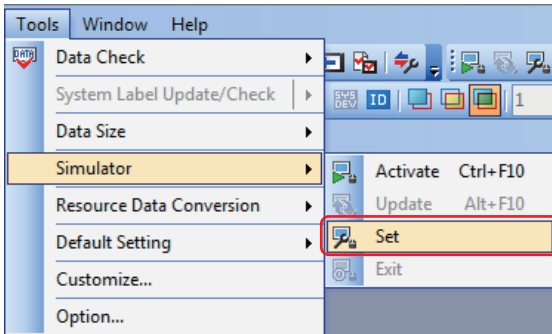
1. Select [Debug] → [Start/Stop Simulation] from the menu bar of GX Works2.



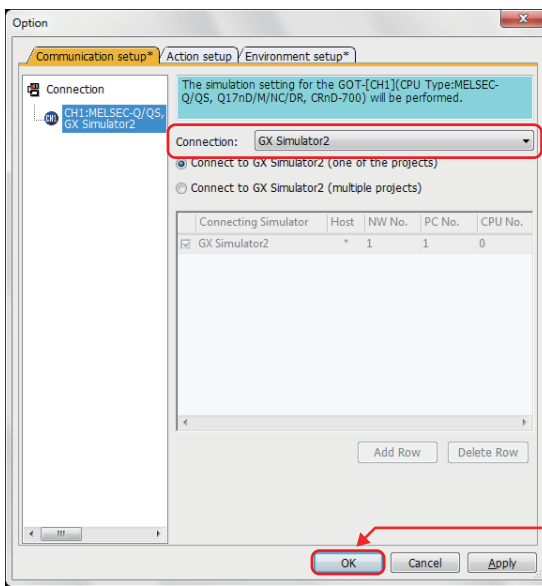
2. GX Simulator2 starts.

### (3) Starting the simulator for the GOT to check the created screen

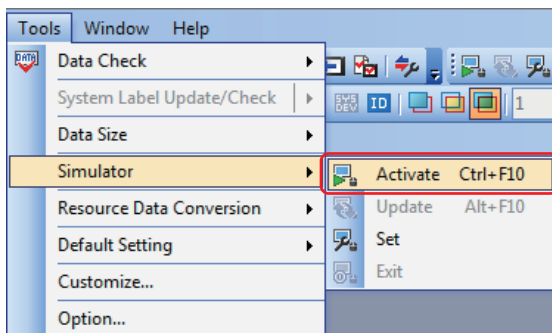
Start GT Simulator3 from GT Designer3 (GOT2000) to check the created screen.



1. Select [Tools] → [Simulator] → [Set] from the menu bar of GT Designer3 (GOT2000).



2. When the dialog shown left appears, select GX Simulator2 for Connection.
3. Click the [OK] button to complete the settings.



4. Select [Tools] → [Simulator] → [Activate] from the menu bar of GT Designer3 (GOT2000). Debug the program after starting the GT Simulator3.

## POINT

**(1) Functions not available in GT Simulator3**

Some functions are not available in GT Simulator3.

Check the GOT for the functions that cannot be simulated and actual GOT display.

**(2) How to reflect an editing project to GT Simulator3**

Select [Tools] → [Simulator] → [Update] from the menu bar of GT Designer3 (GOT2000).

When reflecting the editing project to the GOT, perform "GOT Write" separately after connecting the GOT.

**(3) Precautions when exiting the simulator**

GX Simulator2 cannot be exited while GT Simulator3 is running.

After exiting GT Simulator3 by selecting [Tools] → [Simulator] → [Exit] from the menu bar of GT Designer3 (GOT2000), select [Debug] → [Start/Stop Simulation] from the menu bar of GX Works2 to exit GX Simulator2.

# Appendix.8 GOT function

The GOT has various functions useful on sites.  
This section introduces some of the functions.

## Lamp, switch

### Lamp display

Changes the color of a lamp.



### Bit switch

Touch the switch to turn on or off a bit device.



### Word switch

Touch the switch to change the value of a word device.



### Special function switch

Touch the switch to switch the screen to the utility screen or other screens.



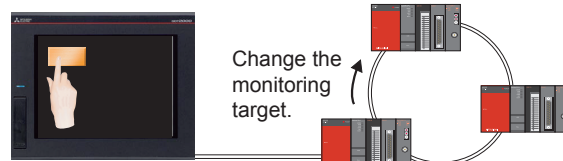
### Go to screen switch

Touch the switch to switch the base and window screens.



### Change station No. switch

Touch the switch to switch the station number of the controller to be monitored.



### Key code switch

This switch can be used as a key for entering numerical values or text.



### Key window display switch

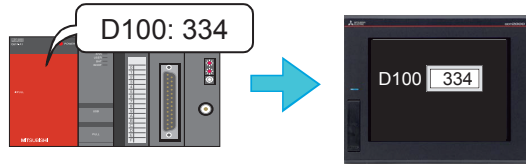
Displays a specified key window at a specified position, or displays a cursor on a specified object.



# Numerical and text display

## Numerical display

A device value is displayed with a numerical value.



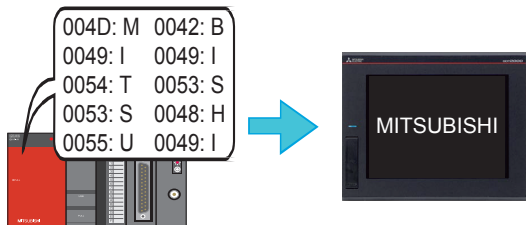
## Numerical input

Values are written into devices.



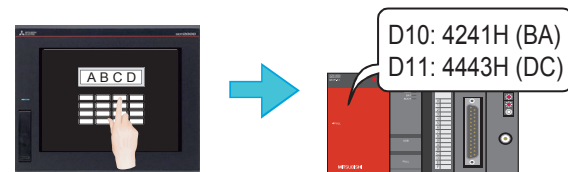
## Text display

A device value is displayed with a character.



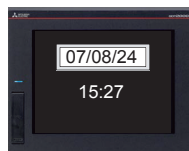
## Text input

Character codes are entered to a device.



## Clock display

The date and time are displayed.



## Comment display

A comment is displayed.

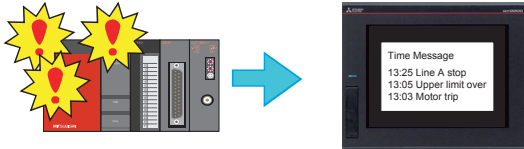




# Alarm

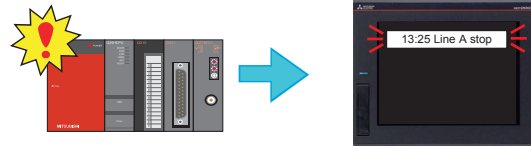
## Alarm display

Displays GOT errors, communication errors, the message created by users as history when an alarm occurs.  
Alarms are displayed hierarchically.



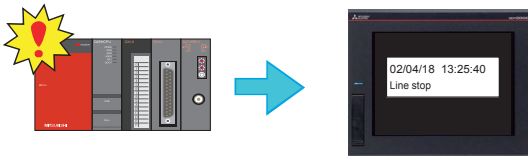
## Alarm popup display

Displays GOT errors, communication errors, messages created by users with pop-up windows when an alarm occurs.



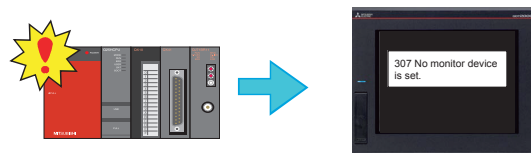
## Simple alarm display

Displays a message created by users when an alarm occurs.



## System alarm display

Displays GOT errors and communication errors when an alarm occurs.



# Parts

## Parts display

Displays registered parts.



## Parts movement

Displays movements of parts.

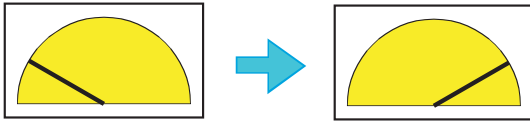


# Graph, meter

\* These are just some examples. Other functions are also provided.

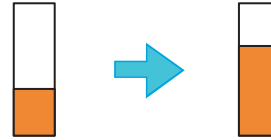
## Panel meter display

A device value is displayed with a meter.



## Level display

A device value is displayed with the percentage of total.



## Statistics graph display

Multiple device values are displayed in a graph with the percentages of total.

### Pie graph

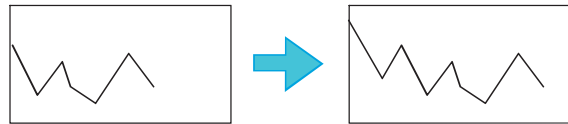


### Bar graph



## Historical trend graph display

Data including past and present data collected using the logging function is displayed with a trend graph.



# Slider

## Slider

Use the slider to set continuous values to the device within any setting range. The value of the destination where you stop the knob is input to the device.

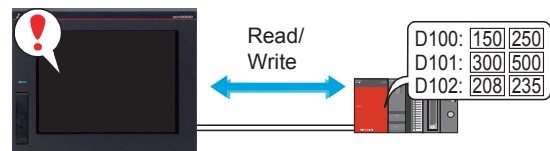


Changing the set output with the slider

# Recipe

## Recipe function

The status of devices is monitored, and the device values are read or written when conditions are satisfied. Multiple values can be set for one device. Device values can be read and written using the utility.

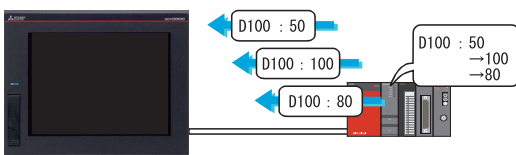


# Condition → Operation

\* These are just some examples. Other functions are also provided.

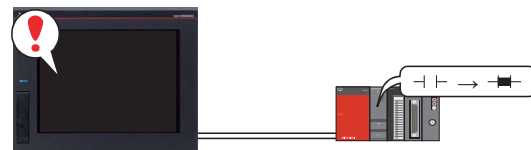
## Logging function

Device values are collected and stored.



## Time action function

Devices can be written on a specified date and time.

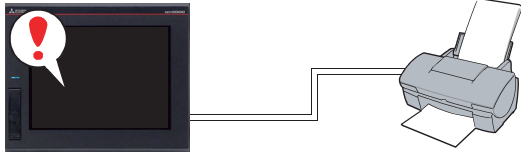


## External I/O

\* These are just some examples.  
Other functions are also provided.

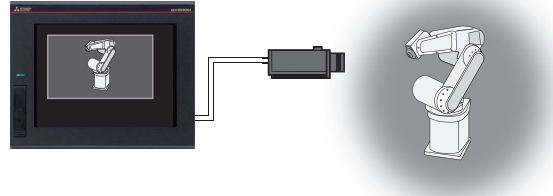
### Report

Collects data such as production management and production status and prints the collected data.



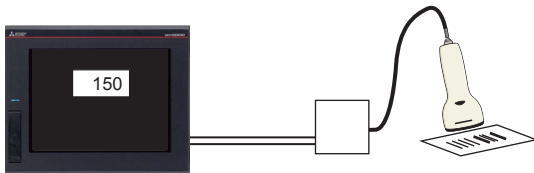
### Video display

Displays video images.



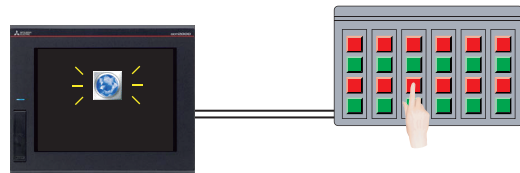
### Barcode

Data read with the barcode reader is written to devices.



### Operation panel

Devices are written by operating the operation panel.

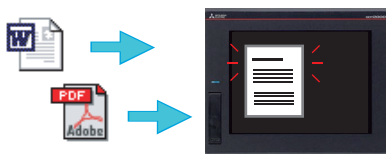


## Others

\* These are just some examples.  
Other functions are also provided.

### Document display

Document data can be displayed on the GOT.



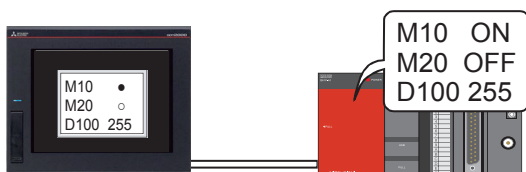
### Language switching

Multiple languages can be switched to display an appropriate one.



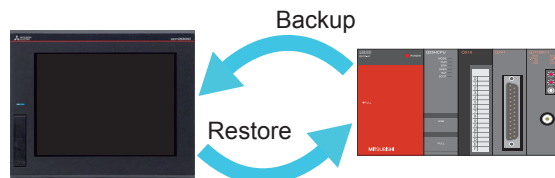
### Device monitor

Monitors the status of the PLC devices.



### Backup/Restore

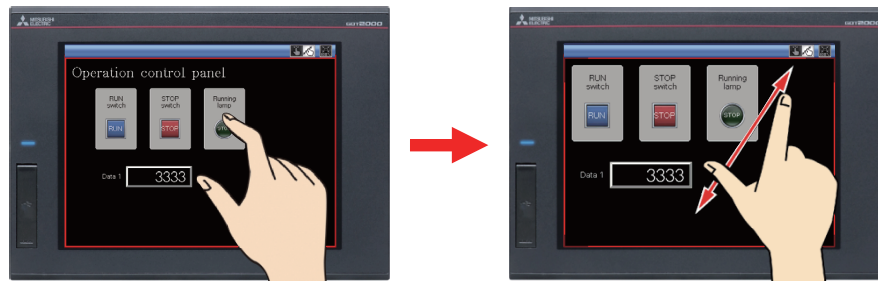
The settings of the controller can be backed up or restored from the GOT.



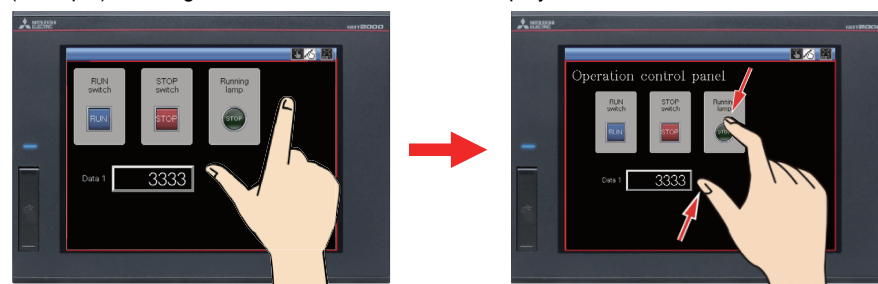
# Appendix.9 Screen gesture function

This function enables zooming and scrolling the monitor screen of the GOT. The displayed contents of the objects can be scrolled or zoomed in and out touching directly the GOT screen by gestures such as pinching out and in.

(Example) Pinching out the screen to zoom in the displayed contents

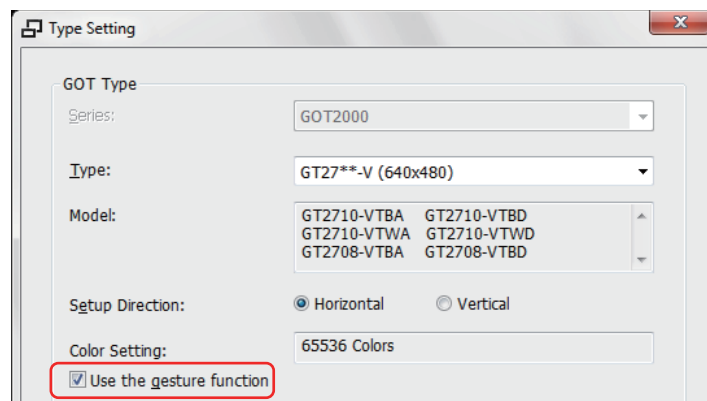


(Example) Pinching in the screen to zoom out the displayed contents



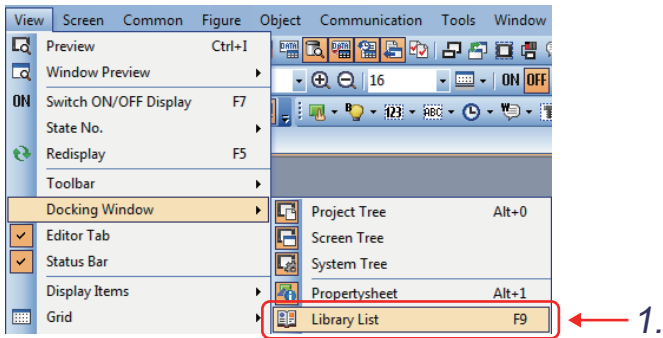
## POINT

The screen gesture function is enabled by default. If the screen gesture function is disabled, configure the setting according to the following procedure. Select [Common] → [GOT Type Setting] from the menu bar to display the [Type Setting] dialog. Select [Use the gesture function] and click the [OK] button. The screen gesture function is enabled.

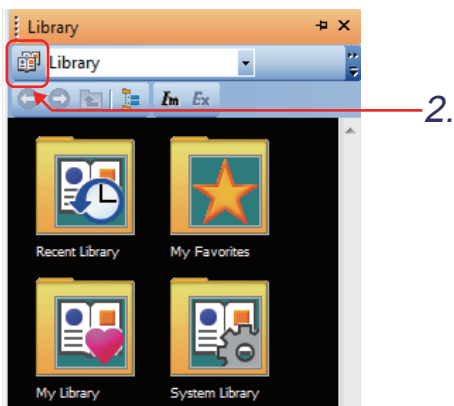



### (1) Creating an object for the screen gesture

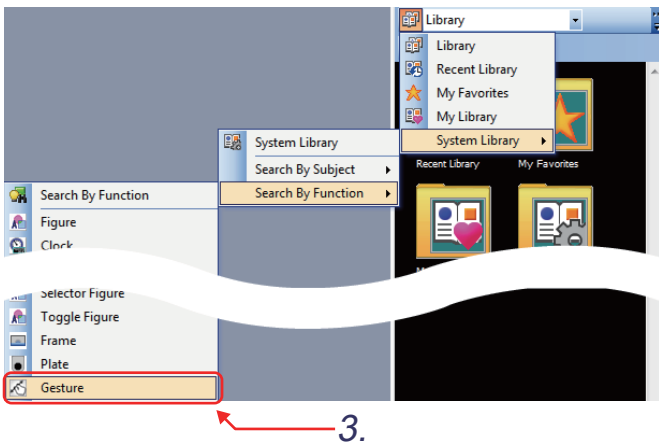
Place the switch for switching to the screen gesture mode.



1. Select [View] → [Docking Window] → [Library List] from the menu bar.



2. Click the  icon on the [Library List] window.

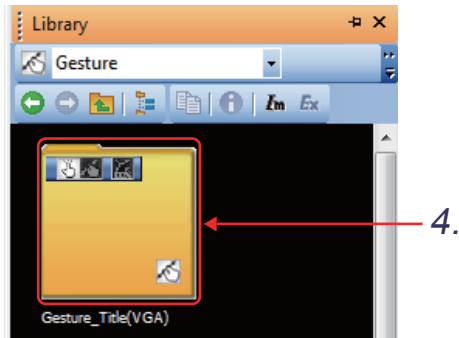


3. Select [System Library] → [Search By Function] → [Gesture] from the displayed pull-down menu.

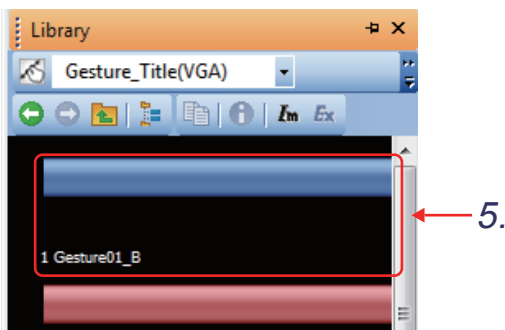


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4. Double-click [Gesture\_Title(VGA)].



5. The registered styles are displayed in a list. Click [1 Gesture01\_B].



6. Move the cursor to the screen editor, and click the top left of the screen. (The broken line that indicates the size of the object appears.)



The object for the screen gesture is placed.

## POINT

---

### Functions of the object for the screen gesture

- Switching to the screen gesture mode  
Touching the following icon switches to the screen gesture mode.



- Canceling the screen gesture mode  
Touching the following icon during the screen gesture mode cancels the screen gesture mode.

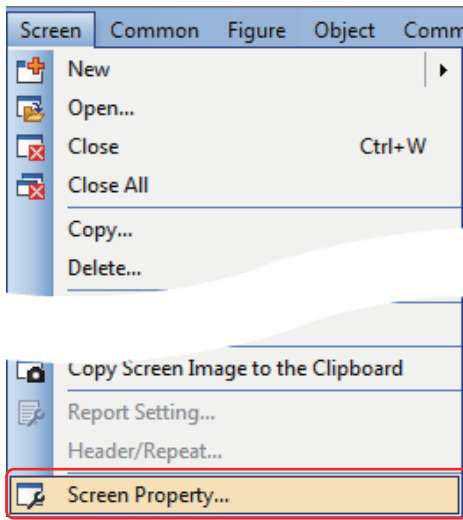


- Full scale display (100%)  
Touching the following icon resizes the screen enlarged using the gesture function to the actual size (100%).

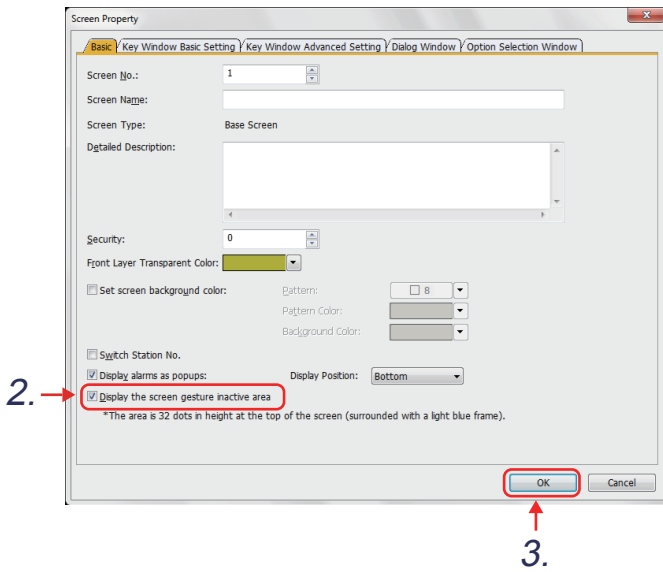


## (2) Displaying the screen gesture inactive area

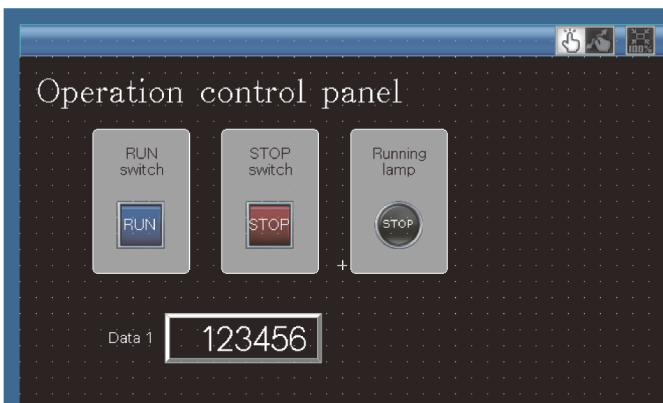
The screen gesture inactive area, the area for 32 dots from the top of the screen, is not the target to be zoomed in and out and scrolled during the use of the gesture function.



1. Select [Screen] → [Screen Property] from the menu bar.



2. Select [Display the screen gesture inactive area].
3. Click the [OK] button.

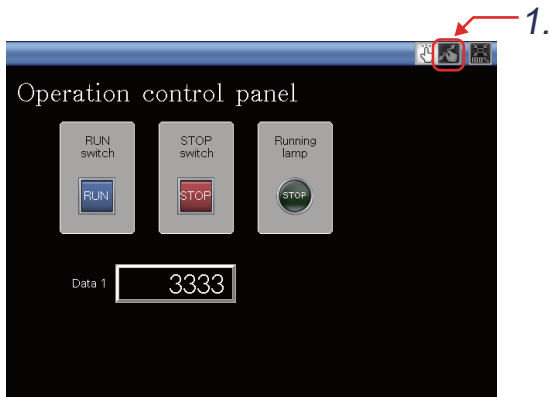


4. Setting the screen gesture function is completed.



### (3) Using the screen gesture function

The monitor screen can be zoomed in and out by using the screen gesture function.



1. Touch the switch for switching the screen gesture mode.



2. A red line indicating the area that can be zoomed in and out appears.

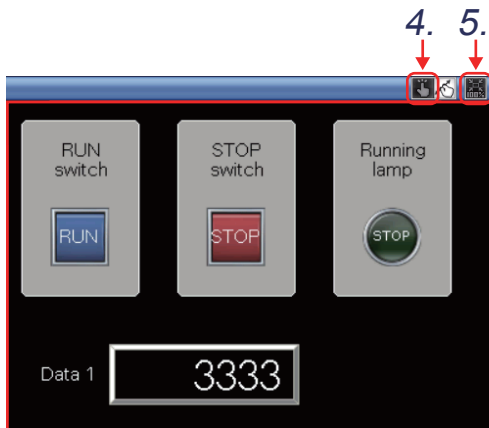


3. The screen can be zoomed in and out by pinching out and in this area.



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4. To cancel the screen gesture mode, touch the switch for switching the screen gesture mode. The screen gesture mode is canceled and the screen display remains enlarged.
5. To change the display to the full scale, touch the full scale display (100%) switch. When the screen display is changed to the full scale during the screen gesture mode, the screen gesture mode is canceled and the screen is displayed in the full scale.

## Appendix.10 Glossary

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This glossary explains the terms used in this document.

### — A —

#### Access key

A key used instead of selecting menu items for GT Designer3 or other applications.  
The underlined letter in a menu item shows its access key.

#### Address

A position in memory.  
The PLC has various devices, including data registers (D) and internal memory (M). The positions in these memories are called addresses.  
Addresses are expressed in decimal or hexadecimal format.  
Hexadecimal format: X, Y, B, W  
Decimal format: All addresses other than the above

#### Alignment

The figures and objects in the selected area are aligned with the specified method.  
Besides up/down/left/right and center, there is also top-justified or left-justified alignment.  
With top-justified alignment, all the figures including the most upper left and the most right bottom figures in the alignment area are justified. This is useful for uniform-interval layout of numbers in tables and other objects.

#### Attribute (change)

The polyline/fill pattern/text status are called attributes. Changing the status of an attribute is called attribute change.

- Polyline: Line style/line width/color
- Pattern: Line style/color
- Text: Font, vertical magnification ratio/horizontal magnification ratio/direction/style/background color/color

### — B —

#### Backlight

This is a fluorescent lamp that shines light from the rear of an LCD in order to display with the LCD.

#### Base screen

The screen displayed over the entire GOT display area.

#### Bit device

Located in the PLC device, and transmits information with one bit.  
In a GOT, each bit of a word device can be used as a bit device.

#### Bit map (BMP)

This is a file format for storing pixel images and is indicated with the extension (.BMP).  
In a GOT, bit maps can be used as figure or part data.  
BMP files can be output with image scanners or commercially available graphics software.

#### Blink

Makes the display go on and off repeatedly and cyclically.

#### BootOS

The BootOS is used to activate the GOT.  
It is installed on the GOT by factory default.

#### Buffer memory (G)

Memory unique to PLC special function module it can be read and written directly from a GOT.

## C

### Cascade (menu)

When a GT Designer3 menu is selected, the menu is selected is displayed lined up from top to bottom.  
When an item in this vertical menu is selected, a horizontal menu is displayed on the left. This state is called cascade display.

### Click

Moving the cursor to the desired position on the screen, then pressing the mouse button once is called clicking.  
Pressing the mouse button twice in a row quickly is called double clicking.  
Moving the mouse cursor to the desired position holding down the mouse button, then releasing the mouse button is called dragging.

### Communication driver

This is one of system applications for communicating with a PLC.  
A dedicated communication driver is provided for each communication format such as the bus connection and direct CPU connection.

### CoreOS

The CoreOS is used to activate the GOT.  
It is installed on the GOT by factory default.

### Counter (C)

This is a device that counts how many times the input came ON and switches the contact ON when the set value is reached.  
To clear a counter value, it is necessary to reset the counter with a reset command.

### Cyclic communication

This is a function for data communication between stations on the same network with MELSEC.  
This function uses the link relay (B), link register (W), link input (X), and link output (Y) devices.  
A GOT directly connected to MELSECNET/H, CC-Link IE Controller Network can use B and W as its own station devices.

## D

### Data register (D)

This is a PLC register for storing numbers. It is also called a D register.  
A data register can handle 16-bit or 32-bit data.  
With some PLC types, the data registers can handle not only integers, but real numbers as well.  
The GOT has dedicated GD registers.

### Data storage (SD card and USB memory)

Storing screen data in a data storage enables a high-speed copy when the screen data is copied to another GOT.  
If alarms have been stored under the alarm observation, the previous data can be displayed even when the GOT is turned off.

### Default value

This is the initial value.

### Device

This is the general name for memory in the PLC CPU.  
There are various devices, such as input (X), output (Y), and data register (D), for various applications.

### Display conditions

Only when the specified condition is satisfied, an object is displayed.  
The condition type can be set to "Ordinary", "ON", "OFF", "Rise", "Fall", "Rise/Fall", "Sampling", "Range", "Bit Trigger", "ON Sampling", and "OFF Sampling".

### Display Method

The display color, operations, etc. can be changed for each specified range.  
The display area corresponding to monitor device value is specified by a comparison expression.

## — E —

### Edge trigger

A trigger that updates the data display when the rising or falling edge of the specified bit is detected. Even if the trigger is not generated, the data can be forcibly displayed ON at the first time after the screen is switched.

### Edit Vertex

This is an editing function for changing the position of vertices of polygons or consecutive straight lines after drawing.

### EN Standard

Indicates a product that conforms with EC directives.

The EN Standard is one standard in EC directives (laws).

There are three main relevant EC directives: EMC directives, low-voltage directives, and mechanical directives.

The EN Standard is the standard used for products meeting these directives. (example safety)

### Ethernet connection

This is a connection method using typical network standards for personal computers.

A PLC and a GOT are connected using the Ethernet cable.

### Extended system application

Application that is required for using some functions, such as the system monitor function and the logging function.

### Extension cable

This cable connects the PLC extension base (basic base) and the GOT when the PLC and GOT are connected with a bus connection.

### Extension file register (R)

These are file register extension registers in the PLC memory cassette.

The extension file register capacity is set with parameters.

The capacity that can be set depends on the CPU used and the memory cassette capacity.

Indicated with R with MELSEC-A.

Indicated with R and ZR with MELSEC-QnA.

Indicated with R and ZR with MELSEC-QnU.

## — F —

### Falling (trigger)

This is the status when the device goes from ON to OFF.

With a GOT, the condition established just once at the fall is called a falling trigger.

Be aware that after the device falls, if the time until it comes ON is short, sometimes the fall cannot be detected and display is not possible.

When [Display objects immediately after the screen is switched regardless of display conditions] is selected, data can be displayed even if the trigger condition is not satisfied when the screen is switched.

### File register (R)

These are extension registers for when data registers (D) are insufficient.

The file register capacity is set with parameters.

The capacity that can be set depends on the CPU used and the memory cassette capacity.

### Free location touch switch

Free location touch switches are so called because they are touch switches with a minimum of 2-by-2 dots, and they can be located freely per dot.

The enabled/disabled area can be specified and the switch can also be protected conditionally.

## — G —

### Graphic operation terminal

The name of the Mitsubishi Electric display unit.

The name GOT is an acronym for Graphic Operation Terminal.

## H

### Handle

This is the small filled square displayed on the rectangle surrounding a figure when a figure is selected. Moving the mouse cursor here changes the shape of the cursor.

If the mouse is moved with the left mouse button held down, the figure size can be changed.

By holding down **Shift** key while the above operation, the figure size can be changed while maintaining the aspect ratio.

## I

### Icon

In Windows, a picture selected (by double-clicking it with the mouse) in order to execute an application such as GT Designer3.

### Install

To register application software on a personal computer.

### Instantaneous power failure

A power failure of extremely short duration.

The PLC/GOT do not treat a power failure lasting less than 20 ms as a power failure.

A power failure lasting longer than this results in initial processing the same as when the power is first switched ON.

### Interlock

This is a block that prevents the system from shifting to the next operation until the operation being executed is completed. Interlocks are used to prevent devices from going out of control or being destroyed.

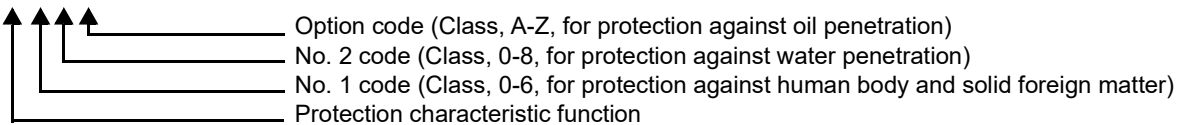
Normally, interlocks are put in place using bit devices.

Such signals are called interlock conditions.

### IP67F

IP is the abbreviation for International Protection; this indicates a product that conforms with IEC standard 529.

#### IP 6 7 F



The degree of IP67 protection

No. 1 code = 6: No dust penetrates.

No. 2 code = 5: Is not harmed by direct spraying of water, for example at locations cleaned periodically.

Option code = F: Is not harmed by oil drops or application of oil, for example at locations cleaned periodically.

### ISO9001

ISO9000 covers a series of standards from the International Standard Organization. These are international standards prescribing quality system requirements with the objective of assuring quality to customers.

ISO9000 covers four standards: ISO9001, ISO9002, ISO9003, and ISO9004.

## J

### JPG

This is a file format for storing pixel images and is indicated with the extension (.JPG). In a GOT, JPG format files can be used as figures or part data.

JPG format files can be output with image scanners or commercially-available graphics software.

## — K —

### Key window

This is a window for inputting numerical values and characters which are used for objects including numerical input and text input.

The type of the standard key window to be displayed changes automatically according to the data type of the input area (hexadecimal number, decimal number, octal number, binary number, or character string).

## — L —

### Layer

This is a function that divides a single screen into two structures, the front screen and the back screen, making it possible to set objects for each layer separately.

Objects set for the front screen layer and back screen layer respectively can also be displayed overlaid.

### Layer processing

Name of operation processing for screen switching.

Since the screen switching is layered, it can be executed automatically without setting the layer structure.

### Level trigger

A trigger that always updates the data display timing only when the specified bit is ON or when it is OFF.

### Library

A library comprises figures and objects and is a group of information having one meaning.

The individual group information becomes a template.

A screen can be created by pasting the templates on the screen in the appropriate combination.

## — M —

### Maximize button

The maximize button is at the right of the window title bar. Clicking this button expands the GT Designer3 or other application to be displayed over the entire screen (maximized display).

### Maximize display

This is the act of displaying GT Designer3 or some other application over the entire screen or the state in which the application is so displayed.

### Menu bar

The menu bar is positioned one row beneath the application window title bar.

### Message display

Displays explanations of operations, functions, etc. for the processing (function) selected by the user.

### Momentary

This is a function that switches ON the specified bit device only during touch switch input.

This function can also switch ON specified bits of buffer memory or word devices.

### Multi-language type

A GOT supports about 26,000 different characters for the writing systems of various nations as standard, so it can be used in the nations of the world. For example, Japanese users can use the KANA-KANJI conversion function to input text.

### Multi-task real-time OS

A multi-task OS executes multiple tasks on a computer simultaneously.

Through the use of such an OS, a GOT can control communications, display, input, etc., all in real time.

## — N —

### Number keys

These are the keys for inputting numbers 0-9.

A GOT has system number key windows, so there is no need to set (create) the number keys on the screen.

## O

### Object

This is the general term for the targets which are placed on a screen and operate according to the PLC device memory (bit, word).

### Object gesture function

This is a function to scroll or zoom in and out the displayed contents of objects with gestures such as a flick.

### Operating ambient temperature

This is the operating ambient temperature range after the device power is switched ON.

Since the PLC is normally installed in a control panel, the temperature mentioned above means in the control panel.

Pay attention to the fact that part of the GOT is in the control panel and part is outside the control panel, and those parts have different operating ambient temperature. (See below.)

Display section: 0 to 50 °C

Other than display section: 0 to 55 °C

### Operating condition

Only when a setting condition is satisfied, an operation is performed.

The condition type includes "Ordinary", "ON", "OFF", "Range", and "Multiple Bit Trigger".

### Operating System (OS)

Generally, this means the basic software for computers, etc. This is the software for running programs created by the user.

In the PLC, the OS is for running the sequence programs and in the GOT, the OS is the program for operating the screen or touch switches as set and is supplied by Mitsubishi Electric.

### Ordinary trigger

A trigger that constantly updates the data display.

Output (Y)

This signal outputs PLC calculation results to external devices with ON/OFF.

The device name is expressed with Y.

The PLC output module has relays, triacs, and transistors.

### Ordinary write

To update the contents displayed when there is any change in the data, rather than using a trigger in the display or input state as the trigger for data display or input.

See "Trigger write".

### Overlap window

A pop-up screen that appears over the base screen.

Up to five overlap window screens can be displayed on one base screen.

## P

### Package data

This data consists of a project, standard system application, extended system application, communication driver, and special data.

### Parts

Parts comprise figures and are used with the "parts display" and "parts movement" functions.

The figures that can be used in parts include text and image data.

### Parts movement (locus display)

This operation erases the parts (figures) displayed just before, moves the parts to the specified new position (according to the coordinate device value), and displays it there.

With parts movement, it is also possible to remain the parts displayed just before the movement.

Such display is called parts locus display.

### Password

The GOT2000 has three types.

Screen security password

Functional operation security password

Data transfer security password



## PNG

This is a file format for storing pixel images and is indicated with the extension (.PNG). In a GOT, PNG format files can be used as figures or part data.

PNG format files can be output with image scanners or commercially-available graphics software.

## Project (file)

The collection of all the information displayed on a single GOT is called a project.

A project comprises screen information, parts information, etc.

This information (project) is created in one file.

---

## R

### Read

This is an operation to read project data from the GOT with GT Designer3.

The read project data can be re-edited before the retransfer (write) to the GOT.

### Recipe

The recipe function writes and reads the values of devices specified by the PLC CPU according to the specification conditions (device ON/OFF). The read data can be stored in a binary, Unicode text, or CSV file in a data storage. Thus, the data can be edited on a personal computer.

### Rising (trigger)

This is the status when the devices goes from OFF to ON.

With a GOT, the condition established just once at the rise is called a rising trigger.

Be aware that after the device rises, if the time until it goes OFF is short, sometimes the rise cannot be detected and display is not possible.

When [Display objects immediately after the screen is switched regardless of display conditions] is selected, data can be displayed even if the trigger condition is not satisfied when the screen is switched.

### RST (Reset)

To switch OFF the bit device or the specified bit of the word device of the PLC.

---

## S

### Screen

There are two types of screens: the base screen and the window screen.

The screen comprises objects and figures.

### Screen gesture function

This is a function to zoom and scroll a user-created screen while the screen is displayed on the GOT.

Even though many objects are placed on a screen, zooming the screen can prevent erroneous operations.

### Screen preview

This function can reproduce the screen display image or other displays on GT Designer3.

### Screen saver function

This is a function that turns off the display on the GOT display if it goes untouched for a certain period of time.

While the display is OFF, the display can be switched to ON by touching any on the screen.

In this case, the touch switch being pressed does not operate.

### Screen switching

This switches between the GOT base screen and window screen.

To switch between the screens, the word device for base and for window screen switching must be set.

In addition to the PLC word devices, GOT dedicated devices (GD) in the GOT can also be used.

### Script function

The script functions are functions designed to control the GOT display with the GOT's original programs.

Controlling the GOT display with the GOT side script drastically reduces the load on the system side (example PLC CPU, microcomputer) display.

### Self check

This is a function with which the GOT (CPU) detects its own errors.

This function tests the GOT hardware, communications, memory, display, etc.

### Serial communication

This is a method of communication that sends the data per bit along one line as the time goes by.

#### Serial communication unit

The module that provides the functions for connecting with the PLC and a computer (GOT or personal computer) and for reading/writing PLC devices.

Connect the serial communication module to the GOT built-in interface or the communication unit.

#### SET (Set)

To switch ON the bit device or the specified bit of the word device of the PLC.

The signal switched ON remains ON until it is reset.

#### Shift JIS code

Shift JIS is a Kanji-character encoding, which is commonly used and practically standardized for expressing Japanese characters in the personal computer.

#### Shortcut keys

Shortcut keys are keys or combinations of keys that allow operations without opening the menu.

Shortcut keys operate combining alphanumeric keys with **Ctrl** key or **ALT** key.

#### Special (D)/(SD)

These are registers with determined applications in the PLC.

A variety of information can be viewed, including PLC CPU information and MELSECNET information.

The QCPU and QnACPU have dedicated SD devices.

With the ACPU, these are D9000- .

#### Special internal relay (M)/special relay (SM)

These are internal relays (M) with determined applications in the PLC.

A variety of information can be viewed, including PLC CPU information and MELSEC information.

QCPU and QnACPU have dedicated SM devices.

With the ACPU, these are M9000- .

#### Standard System Application

The basic system application is used to operate the GOT and display the utility.

#### Status display bar

The status display bar is the bottom line of the GT Designer3 display. It displays guidance, cursor information, position information, etc.

#### Superimpose window

A window superimposed on a base screen and displayed as a part of the base screen.

Up to two (superimpose window 1 and 2) superimpose windows can be displayed simultaneously.

#### System information

This function transmits the GOT status (screen number being displayed, error number, etc.) to the PLC, and outputs information (GOT error resets etc.) from the PLC to the GOT. This function is set to a word device.

A read device reads information to the GOT.

A write device writes information from the GOT.

## T

#### Template

Templates are for easily saving and editing figures and objects.

#### Text Display

Character string data is input and displayed.

Character string data can be written to the word devices and the buffer memory in a special function module.

#### Text file

This is a file containing only letters, numbers, and symbols.

A comment can be output to a text file, edited with an editor, and the edited file can be input.

Since object settings and other GOT screen information can be output to a text file with the print function, it is also possible to read this file into a word processor and create an original document.

## TFT

A color liquid crystal display using TFTs (Thin Film Transistors).

Thin-film transistors are laid out at the intersection of transparent electrodes lined up vertically and horizontally.

This is an active-matrix type of LCD in which the liquid crystal is driven by these thin-film transistors so laid out.

The response is fast. For color display, there are three TFTs for each pixel, and the light from each TFT is passed through a red, green, or blue color filter.

Compared to simple matrix LCDs, there is no tendency to low contrast, and the number of scanning lines can be increased, and intermediate tone expression is also easy, so this type of LCD can display with high quality. On the other hand, the structure is complex, resulting in high cost.

On the GOT2000, display is 65536 colors.

## Timer (T)

This is a device that has the function of operating the timer coil after the specified time (timer setting value). The objective is to delay or hold an operation.

The timer has a variation range of 0.01 msec to 1000 msec.

The timer has a contact, coil, current value, and setting value. On the GOT monitor screen, all of these except the setting value can be monitored and written.

The setting value can be monitored/written with the system monitor function.

## Title

With GT Designer3, a project title and a screen title can be set.

Project title: Consists of title information, detailed information, and creator's name.

Screen title: Consists of title information and detailed information.

## Tool bar

This is a list of buttons etc. for menu items used relatively frequently.

The following types of GT Designer3 toolbars are available.

Tool bar (Standard)	: The standard group of functions such as New or Save
Tool bar (Window display)	: A group of functions for displaying or hiding windows
Tool bar (View)	: A group of functions for setting the display, such as screen zoom or grid color
Tool bar (Screen)	: A group of functions for creating a new screen or setting the display of a screen being edited
Tool bar (Edit)	: A group of functions for editing a selected figure
Tool bar (Figures)	: A group of functions for setting figures such as straight line or text
Tool bar (Objects)	: A group of functions for setting objects such as touch switches
Tool bar (Alignment)	: A group of functions for arranging the positions of figures and objects
Tool bar (Draw)	: A group of functions for setting display attributes such as the line style or pattern foreground color
Tool bar (Communications)	: A group of functions for data transfer between a GOT and personal computer card
Tool bar (Simulator)	: A group of functions for starting up and setting GT Simulator3
Tool bar (Coordinate/size)	: A group of functions for setting the coordinates of a selected figure
Tool bar (My favorites)	: A group of functions for displaying the registered favorite figures and objects in the [Library] window.

## Touch switch

By pressing the screen, screen switching or writing to a device can be performed.

The minimum size is a unit of 2-by-2 dots.

## Transparent function

When connecting a GOT and PLC CPU with direct CPU connection, a bus connection, or Ethernet connection, connecting a personal computer or other peripheral device allows the sequence programs of the CPU to be read, written and monitored.

## Trigger write

Operating (displaying or writing) only when the set conditions are met.

These conditions are called trigger conditions.

See "Ordinary write".

## U

### Unicode

Unicode is an international standard for character codes.

### USB connection

A personal computer and a GOT are connected using the USB cable.

## W

### Window screen

A pop-up screen that appears over the base screen.

To move a window screen to any other position on the base screen, touch the window title bar and then touch the desired position on the base screen within three seconds.

A window screen can be closed by touching the [×] button at the top right of the window screen.

If a touch switch on the base screen is overlaid by the window screen, that switch is disabled.

### Wireless LAN

This is a LAN (Local Area Network) that transfers data using a wireless distribution method.

To set up wireless LAN, a wireless LAN master device (access point) and a wireless LAN slave device (station) are required. When a wireless LAN communication unit is mounted on the GOT, wireless communication between a GOT and a personal computer via the access point is enabled using the wireless LAN communication unit as a station.

With the FA transparent function, wireless communication between a PLC and a personal computer is also enabled.

### Word device

Of the PLC devices, word devices are those that transmit information with 16 bits (one word).

With a GOT, word devices can be handled with 16 bits or 32 bits.

As data types, word devices support signed integers, unsigned integers, and real numbers.

### Word set

This is a function that writes the specified value to a word device when there is input at a touch switch.

The specification type can be selected from fixed value, value of another word device, and fixed value added to (or subtracted from) the current device value.

### Write

GOT package data is written to a GOT from GT Designer3.

This function is called "Write". To execute the function, select [Communication] - [Write to GOT] from the menu.

Although the data necessary for a package data is automatically written at the package data writing, only the data that the user requires can be written.



# Graphic Operation Terminal (GOT2000 Series) Basic Training Textbook (for GT Works3)

MODEL	SCHOOL-GOT2000-BSC-E
MODEL CODE	1D7MT6
SH(NA)-081926ENG-B (2203) MEE	

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