MITSUBISHI

GRAPHIC OPERATION TERMINAL
GOT

GRAPHIC OPERATION TERMINAL

GOT1000

GT10 User's Manual

● SAFETY PRECAUTIONS ●

(Always read these precautions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product.
In this manual, the safety precautions are ranked as "DANGER" and "CAUTION".

DANGER	**Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.**
CAUTION	**Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.**

Note that the ⚠ caution level may lead to a serious accident according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- Some failures of the GOT or cable may keep the outputs on or off.
  An external monitoring circuit should be provided to check for output signals which may lead to a serious accident.
  Not doing so can cause an accident due to false output or malfunction.
- If a communication fault (including cable disconnection) occurs during monitoring on the GOT, communication between the GOT and PLC CPU is suspended and the GOT becomes inoperative.
  A system where the GOT is used should be configured to perform any significant operation to the system by using the switches of a device other than the GOT on the assumption that a GOT communication fault will occur.
  Not doing so can cause an accident due to false output or malfunction.
- Do not use the GOT as the warning device that may cause a serious accident.
  An independent and redundant hardware or mechanical interlock is required to configure the device that displays and outputs serious warning.
  Failure to observe this instruction may result in an accident due to incorrect output or malfunction.

[DESIGN PRECAUTIONS]

DANGER

- Incorrect operation of the touch switch(s) may lead to a serious accident if the GOT backlight is gone out.
  When the GOT backlight goes out, the monitor screen turns black, while the input of the touch switch(s) remains active.
  This may confuse an operator in thinking that the GOT is in "screensaver" mode, who then tries to release the GOT from this mode by touching the display section, which may cause a touch switch to operate.

CAUTION

- Do not bundle the control and communication cables with main-circuit, power or other wiring.
  Run the above cables separately from such wiring and keep them a minimum of 100mm (3.94in.) apart. Not doing so noise can cause a malfunction.

[MOUNTING PRECAUTIONS]

DANGER

- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the GOT to/from the panel.
  Not doing so can cause the unit to fail or malfunction.

CAUTION

- Use the GOT in the environment that satisfies the general specifications described in this manual.
  Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT to the control panel, tighten the mounting screws in the specified torque range.
  Undertightening can cause the GOT to drop, short circuit or malfunction.
  Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or the GOT.

[WIRING PRECAUTIONS]

DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring.
  Failure to do so may result in an electric shock, product damage or malfunctions.
- Please make sure to ground FG terminal of the GOT power supply section by applying 100Ω or less which is used exclusively for the GOT.
  Not doing so may cause an electric shock or malfunction.
- Correctly wire the GOT power supply section after confirming the rated voltage and terminal arrangement of the product.
  Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or the GOT.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT.
  Not doing so can cause a fire, failure or malfunction.

CAUTION

- Plug the communication cable into the connector of the connected unit and tighten the mounting and terminal screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

[TEST OPERATION PRECAUTIONS]

DANGER

- Before performing the test operations of the user creation monitor screen (such as turning ON or OFF bit device, changing the word device current value, changing the settings or current values of the timer or counter), read through the manual carefully and make yourself familiar with the operation method.
  During test operation, never change the data of the devices which are used to perform significant operation for the system.
  False output or malfunction can cause an accident.

[STARTUP/MAINTENANCE PRECAUTIONS]

DANGER

- When power is on, do not touch the terminals.
  Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
  Not switching the power off in all phases can cause a unit failure or malfunction.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

CAUTION

- Do not disassemble or modify the unit.
  Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the unit directly.
  Doing so can cause a unit malfunction or failure.
- The cables connected to the unit must be run in ducts or clamped.
  Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the unit, do not hold and pull the cable portion.
  Doing so can cause the unit or cable to be damaged or can cause a malfunction due to a cable connection fault.
- Before touching the unit, always touch grounded metal, etc. to discharge static electricity from human body, etc.
  Not doing so can cause the unit to fail or malfunction.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of the product, handle it as industrial waste.

[TRANSPORTATION PRECAUTIONS]

CAUTION

- Make sure to transport the GOT main unit and/or relevant unit(s) in the manner they will not be exposed to the impact exceeding the impact resistance described in the general specifications of this manual, as they are precision devices.
  Failure to do so may cause the unit to fail.
  Check if the unit operates correctly after transportation.

REVISIONS

The manual number is given on the bottom left of the back cover.

Print Date	Manual Number	Ver.	Revision
Nov., 2006	JY997D24701	A	First edition

INTRODUCTION

Thank you for choosing the Mitsubishi Graphic Operation Terminal.
Before using the equipment, please read this manual carefully to use the equipment to its optimum.

OUTLINE PRECAUTIONS

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

  Note: the term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.
- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.
- When using this product combining other products, please confirm the standard and the code, or regulation which a user should suit. Moreover, please confirm the compatibility of this product to the system, machine, and apparatus with which a user is used for user itself.
- If in doubt at any stage of the installation of the product always consult a professional electrical engineer who is qualified and trained to the local and national standards. If in doubt about the operation or use, please consult the nearest Mitsubishi Electric distributor.
- Since the example indicated by this manual, technical bulletin, the catalog, etc. is reference, please use it after confirming the function and safety of equipment and system when employing. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.
- About this manual content, specification etc. may be changed without a notice for improvement.
- The information in this manual has been carefully checked and is believed to be accurate; however, you have noticed a doubtful point, a doubtful error, etc., please contact the nearest Mitsubishi Electric distributor.

CONTENTS

ABOUT MANUALS

The following manuals are also related to this product.
In necessary, order them by quoting the details in the tables below.

Related Manuals

Manual Name	Manual Number (Model Code)
GT Designer2 Version2 Basic Operation/Data Transfer Manual (For GOT1000 Series) Describes methods of the GT Designer2 installation operation, basic operation for drawing and transmitting data to GOT1000 series (Sold separately) *1	SH-080529ENG (1D7M24)
GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 1/3 GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 2/3 GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 3/3 Describes specifications and settings of the object functions used in GT Designer2 (Sold separately) *1	SH-080530ENG (1D7M25)
GOT1000 Series Connection Manual (1/3, 2/3, 3/3) Describes system configurations of the connection method applicable to GOT1000 series and cable creation method (Sold separately) *1	SH-080532ENG (1D7M26)

*1 The manual in PDF-format is included in the GT Works2 and GT Designer2 products.

ABBREVIATIONS AND GENERIC TERMS IN THIS MANUAL

Abbreviations and generic terms used in this manual are described as follows.

■ GOT

Abbreviations and generic terms			Description
GOT1000 Series	GT SoftGOT1000		Abbreviation of GT SoftGOT1000
	GT1595	GT1595-X	Abbreviation of GT1595-XTBA, GT1595-XTBD
	GT1585	GT1585V-S	Abbreviation of GT1585V-STBA
		GT1585-S	Abbreviation of GT1585-STBA, GT1585-STBD
	GT157□	GT1575V-S	Abbreviation of GT1575V-STBA
		GT1575-S	Abbreviation of GT1575-STBA, GT1575-STBD
		GT1575-V	Abbreviation of GT1575-VTBA, GT1575-VTBD
		GT1575-VN	Abbreviation of GT1575-VNBA, GT1575-VNBD
		GT1572-VN	Abbreviation of GT1572-VNBA, GT1572-VNBD
	GT156□	GT1565-V	Abbreviation of GT1565-VTBA, GT1565-VTBD
		GT1562-VN	Abbreviation of GT1562-VNBA, GT1562-VNBD
	GT155□	GT1555-Q	Abbreviation of GT1555-QTBD, GT1555-QSBD
		GT1550-Q	Abbreviation of GT1550-QLBD
	GT15□□, GT15		Abbreviation of GT1595, GT1585, GT157□, GT156□, GT155□
	GT1155-Q		Abbreviation of GT1155-QSBD
	GT1150-Q		Abbreviation of GT1150-QLBD
	Handy GOT	GT1155HS-Q	Abbreviation of GT1155HS-QSBD
		GT1150HS-Q	Abbreviation of GT1150HS-QLBD
	GT11□□, GT11		Abbreviation of GT1155-Q, GT1150-Q, GT11 Handy GOT
	GT10	GT1020	Abbreviation of GT1020-LBD, GT1020-LBD2, GT1020-LBL
GOT900 Series			Abbreviation of GOT-A900 series, GOT-F900 series
GOT800 Series			Abbreviation of GOT-800 series

■ Communication unit

Abbreviations and generic terms	Description			
Bus connection unit	GT15-QBUS, GT15-75QBUSL,	GT15-QBUS2, GT15-75QBUS2L,	GT15-ABUS, GT15-75ABUSL,	GT15-ABUS2, GT15-75ABUS2L
Serial communication unit	GT15-RS2-9P,	GT15-RS4-9S,	GT15-RS4-TE	
RS-422 conversion unit	GT15-RS2T4-9P,	GT15-RS2T4-25P		
Ethernet communication unit	GT15-J71E71-100			
MELSECNET/H communication unit	GT15-J71LP23-25,	GT15-J71BR13		
MELSECNET/10 communication unit	GT15-75J71LP23-Z*1,	GT15-75J71BR13-Z*2		
CC-Link communication unit	GT15-J61BT13,	GT15-75J61BT13-Z*3		
Interface converter unit	GT15-75IF900			

*1 A9GT-QJ71LP23 + GT15-75IF900 set

*2 A9GT-QJ71BR13 + GT15-75IF900 set

*3 A8GT-J61BT13 + GT15-75IF900 set

■ Option unit

Abbreviations and generic terms	Description
Printer unit	GT15-PRN
Video input unit	GT15V-75V4
RGB input unit	GT15V-75R1
Video / RGB input unit	GT15V-75V4R1
RGB output unit	GT15V-75ROUT
CF card unit	GT15-CFCD

■ Option

Abbreviations and generic terms		Description			
Memory card	CF card	GT05-MEM-16MC, GT05-MEM-128MC,	GT05-MEM-32MC, GT05-MEM-256MC	GT05-MEM-64MC,	
Memory card adaptor		GT05-MEM-ADPC			
Option function board		GT15-FNB, GT15-QFNB48M,	GT15-QFNB, GT11-50FNB	GT15-QFNB16M,	GT15-QFNB32M,
Battery		GT15-BAT,	GT11-50BAT		
Protective Sheet		GT15-90PSCB, GT15-80PSCB, GT15-70PSCB, GT15-60PSCB, GT15-50PSCB, GT11-50PSCB, GT11H-50PSC, GT10-20PSGW	GT15-90PSGB, GT15-80PSGB, GT15-70PSGB, GT15-60PSGB, GT15-50PSGB, GT11-50PSGB, GT10-20PSCB,	GT15-90PSCW, GT15-80PSCW, GT15-70PSCW, GT15-60PSCW, GT15-50PSCW, GT11-50PSCW, GT10-20PSGB,	GT15-90PSGW, GT15-80PSGW, GT15-70PSGW, GT15-60PSGW, GT15-50PSGW, GT11-50PSGW, GT10-20PSCW,
USB environmental protection cover		GT15-UCOV,	GT11-50UCOV		
Stand		GT15-90STAND, GT05-50STAND	GT15-80STAND,	GT15-70STAND,	A9GT-50STAND,
Attachment		GT15-60ATT-97,	GT15-60ATT-96		
Backlight		GT15-90XLTT, GT15-70VLTN,	GT15-80SLTT, GT15-60VLTT,	GT15-70SLTT, GT15-60VLTN	GT15-70VLTT,
Multi-color display board		GT15-XHNB,	GT15-VHNB		
Connector Conversion Box		GT11H-CNB-37S			
Emergency Stop Switch Guard		GT11H-50ESCOV			

■ Software

Abbreviations and generic terms	Description
GT Works2 Version☐	SW☐D5C-GTWK2-E, SW☐D5C-GTWK2-EV
GT Designer2 Version☐	SW☐D5C-GTD2-E, SW☐D5C-GTD2-EV
GT Designer2	Abbreviation of screen drawing software GT Designer2 for GOT1000/GOT900 series
GT Converter2	Abbreviation of data conversion software GT Converter2 for GOT1000/GOT900 series
GT Simulator2	Abbreviation of screen simulator GT Simulator 2 for GOT1000 / GOT900 series
GT SoftGOT1000	Abbreviation of monitoring software GT SoftGOT1000
GT SoftGOT2	Abbreviation of monitoring software GT SoftGOT2
GX Developer	Abbreviation of SW☐D5C-GPPW-E(-EV)/SW☐D5F-GPPW-E type software package
GX Simulator	Abbreviation of SW☐D5C-LLT-E(-EV) type ladder logic test tool function software packages (SW5D5C-LLT (-EV) or later versions)
Document Converter	Abbreviation of document data conversion software Document Converter for GOT1000 series

■ License key (for GT SoftGOT1000)

Abbreviations and generic terms	Description
License	GT15-SGTKEY-U, GT15-SGTKEY-P

■ License key (for GT SoftGOT2)

Abbreviations and generic terms	Description
License key	A9GTSOFT-LKEY-P (For DOS/V PC)
License key FD	SW5D5F-SGLKEY-J (For PC CPU module)

■ Others

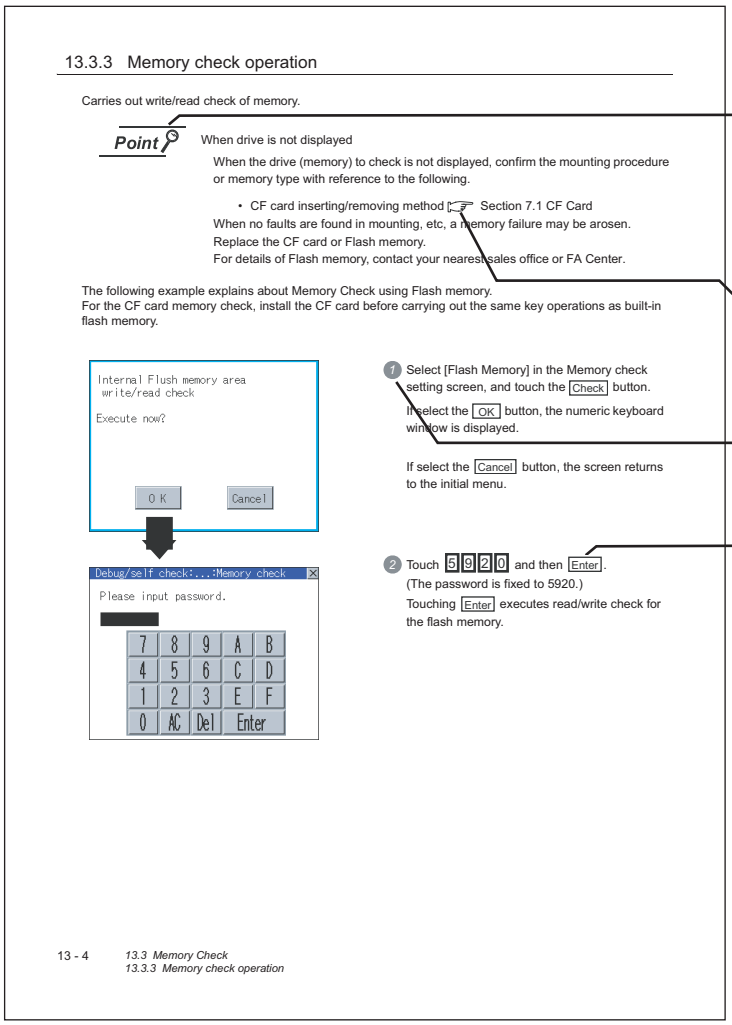
Abbreviations and generic terms		Description
Omron PLC		Abbreviation of PLC manufactured by OMRON Corporation
KEYENCE PLC		Abbreviation of PLC manufactured by KEYENCE
Sharp PLC		Abbreviation of PLC manufactured by SHARP Corporation
JTEKT PLC		Abbreviation of PLC manufactured by JTEKT Corporation
Toshiba PLC		Abbreviation of PLC manufactured by TOSHIBA CORPORATION
HITACHI IES PLC		Abbreviation of PLC manufactured by Hitachi Industrial Equipment Systems Co., Ltd.
HITACHI PLC		Abbreviation of PLC manufactured by Hitachi, Ltd.
FUJI FA PLC		Abbreviation of PLC manufactured by Fuji Electric FA Components & Systems Co., Ltd.
Matsushita PLC		Abbreviation of PLC manufactured by Matsushita Electric Works, Ltd
Yaskawa PLC		Abbreviation of PLC manufactured by YASKAWA Electric Corporation
Yokogawa PLC		Abbreviation of PLC manufactured by Yokogawa Electric Corporation
Allen-Bradley PLC		Abbreviation of PLC manufactured by Allen-Bradley
SIEMENS PLC		Abbreviation of PLC manufactured by SIEMENS
Temperature controller	OMRON temperature controller	Abbreviation of temperature controller manufactured by OMRON
	SHINKO indicating controller	Abbreviation of temperature controller manufactured by Shinko Technos Co., Ltd.
	FUJI SYS temperature controller	Abbreviation of temperature controller manufactured by Fuji Electric Systems Co., Ltd.
	YAMATAKE temperature controller	Abbreviation of temperature controller manufactured by YAMATAKE
	YOKOGAWA temperature controller	Abbreviation of temperature controller manufactured by Yokogawa Electric Corporation
	RKC temperature controller	Abbreviation of temperature controller manufactured by RKC
GOT (server)		Abbreviation of GOTs that use the server function
GOT (client)		Abbreviation of GOTs that use the client function
Windows® font		Abbreviation of TrueType font and OpenType font available for Windows® (Differs from the True Type fonts settable with GT Designer2)
Intelligent function module		Indicates the modules other than the PLC CPU, power supply module and I/O module that are mounted to the base unit.

1 Functions

This manual describes functions available for the GT Designer2 Version2.43V.
For the added functions by the product version upgrade, refer to the list of functions added by GT Designer2 version upgrade in Appendices.

2 Symbols

Following symbols are used in this manual.


13.3.3 Memory check operation

Carries out write/read check of memory.

Point

When drive is not displayed

When the drive (memory) to check is not displayed, confirm the mounting procedure or memory type with reference to the following.

• CF card inserting/removing method ☞ Section 7.1 CF Card

When no faults are found in mounting, etc, a memory failure may be arosen.
Replace the CF card or Flash memory.
For details of Flash memory, contact your nearest sales office or FA Center.

The following example explains about Memory Check using Flash memory.
For the CF card memory check, install the CF card before carrying out the same key operations as built-in flash memory.

1 Select [Flash Memory] in the Memory check setting screen, and touch the Check button.
If select the OK button, the numeric keyboard window is displayed.

If select the Cancel button, the screen returns to the initial menu.

2 Touch 5 9 2 0 and then Enter.
(The password is fixed to 5920.)
Touching Enter executes read/write check for the flash memory.

13 - 4 13.3 Memory Check
13.3.3 Memory check operation

Point Refers to the information required.

Remark Refers to the supplementary explanations for reference.

Indicates the items in which the detailed explanation is described (manual, chapter, section, item of the manual).

1 → 2 → 3 · · · ·
Indicates the operation steps.

Menu and items are differentiated with parentheses.

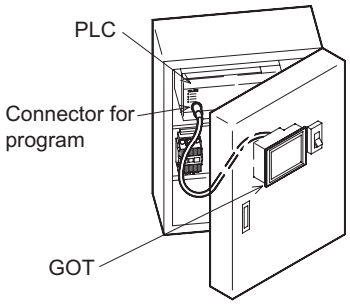
[ ] : refers to the menu of GOT utility.

[ ] : refers to the button in the dialog box of GOT utility.

1. OVERVIEW

1 About GOT

A GOT is installed on the panel surface of a control panel or operating panel and connects to the PLC within the control panel. The GOT carries out switch operation, lamp display, data display, message display, etc.



For the display screen, two kinds of screens are available : user screen and utility screen.

(1) User screen

The user screen is a screen drawn by GT Designer2.
The objects "Touch switch", "Lamp display", "Comment display", and "Numeric display" can be arditrarily arranged on the display.
A "horizontal format" or "vertical format" may be selected for displaying a user's project.
Moreover, multiple screens created within GT Designer2 can be individually selected or overlapped for the display.

For details, refer to the following.

☞ GT Designer2 Version□ Basic Operation/Data Transfer Manual
GT Designer2 Version□ Screen Design Manual

(2) Utility Screen

The utility screen is a factory drawn horizontal screen that cannot be edited.
The utility screen has options for "Contrast ", "Buzzer volume ", etc, and the format is horizontal only.

For details, refer to the following.

☞ Chapter 9 to Chapter 15

2 About Manual

The following manuals related to GOT 1000 series are available. Refer to each manual in accordance with the intended use.

(1) Installation of the software programs → Drawing → Data transfer
For operations from creating project data to transferring data to GOT, refer to the following manuals.

Purpose	 GT Designer2 Version □ Basic Operation/Data Transfer Manual*1	 GT Designer2 Version □ Screen Design Manual*1
Installing product on PC	Detailed	
Creating projects	Detailed	
Creating screens	Detailed	
Drawing figures	Detailed	
Making Common Settings	Overview	Detailed
Placing/Setting objects	Overview	Detailed
Transferring data to GOT	Detailed	

*1 Stored in the GT Works 2/GT Designer2 in PDF format.

(2) Installing a GOT → connection to a PLC

For the operations from installing a GOT to communicating with a PLC CPU, refer to the following manuals.

Purpose	(Included) GT15 General Description GT 11 General Description GT 10 General Description	GT15 User's Manual GT11 User's Manual GT10 User's Manual	GOT1000 Series Connection Manual*1
Confirming part names and specifications of the GOT	Overview	Detailed	
Confirming the GOT installation method	Overview	Detailed	
Confirming the mounting method for communication units or option devices		Detailed	Overview
Confirming the PLC connection method			Detailed
Confirming the utility operation method		Detailed	
Confirming error codes (system alarm) displayed on the GOT		Detailed	

*1 Stored in the GT Works2/GT Designer2 in PDF format.

(3) Other manuals

The following manuals are also available.

The following manuals are stored in the GT Works2/GT Designer2 in PDF format.

(a) GOT1000 Series Extended/Option Functions Manual

Describes how to use the ladder monitoring function, system monitor function and list editor for MELSEC-A.

(b) GOT1000 Series Gateway Functions Manual

Describes how to use the gateway function.

(c) GT Simulator 2 Version□ Operation Manual

Describes how to simulate the created project data with GT Simulator2.

(d) GT Converter2 Version□ Operating Manual

Describes how to use the GT Converter2.

1.1 Features

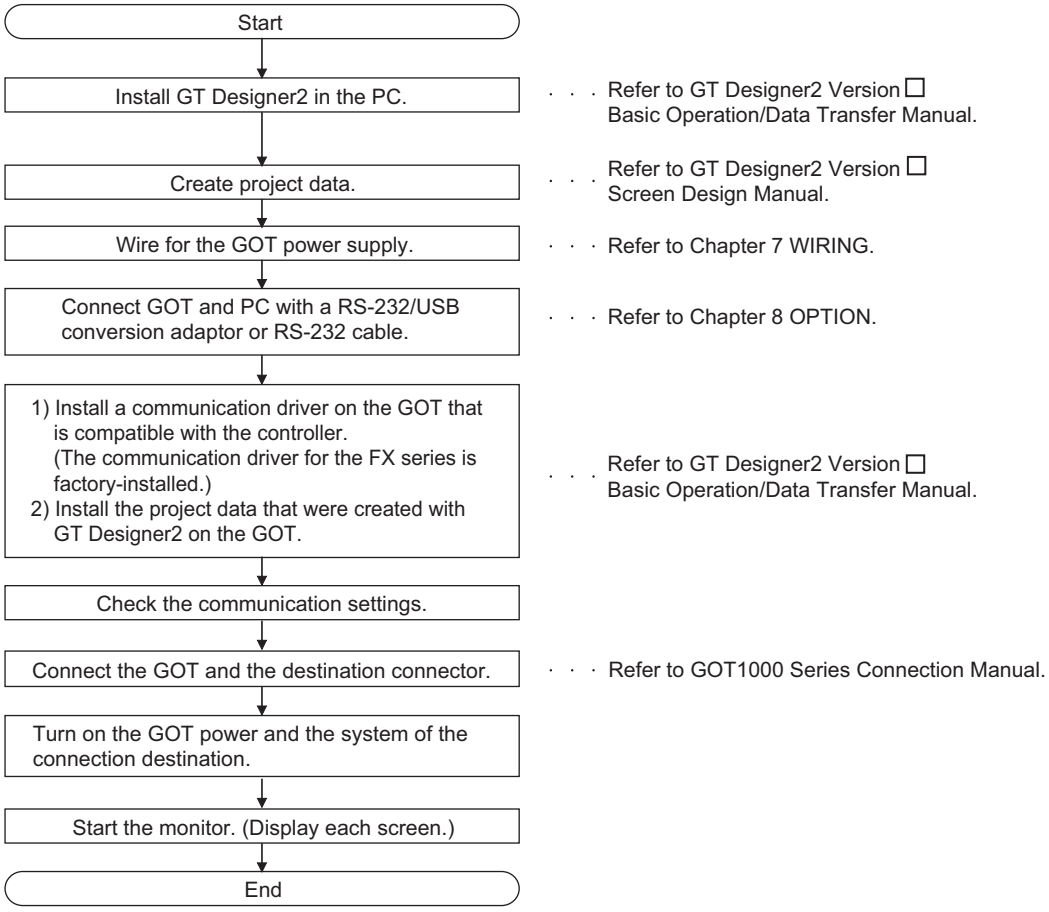
(1) Improved monitoring performance and connectivity to FA devices
- Multiple languages are displayed using the Unicode2.1-compatible fonts and beautiful characters are drawn using the TrueType and high quality fonts
- 3 backlight status display colors (green, red, orange) to choose from
- Improved layout design flexibility with the analog touch panel
- High speed monitoring through high speed communication at maximum of 115.2kbps
- High speed display and high speed touch switch response

(2) More efficient GOT operations including screen design, startup, adjustment, management and maintenance works
- Recipe function is standard installed (option function board not required)
- Factory-installed OS on the GOT
- LED-type backlight (requires no replacement)

(3) Enhanced support of FA setup tools
- Transferring or monitoring the sequence programs using the personal computer connected to GOT, during direct connection to A, Q, QnA, or FX series PLC CPU (Transparent function)
- Allows the connection of multiple GOT units via the serial interface when connected directly to the CPU on the A, Q, QnA, or FX series of PLC

1.2 Rough Pre-operation Procedure

The outline procedure before operating GOT is shown.

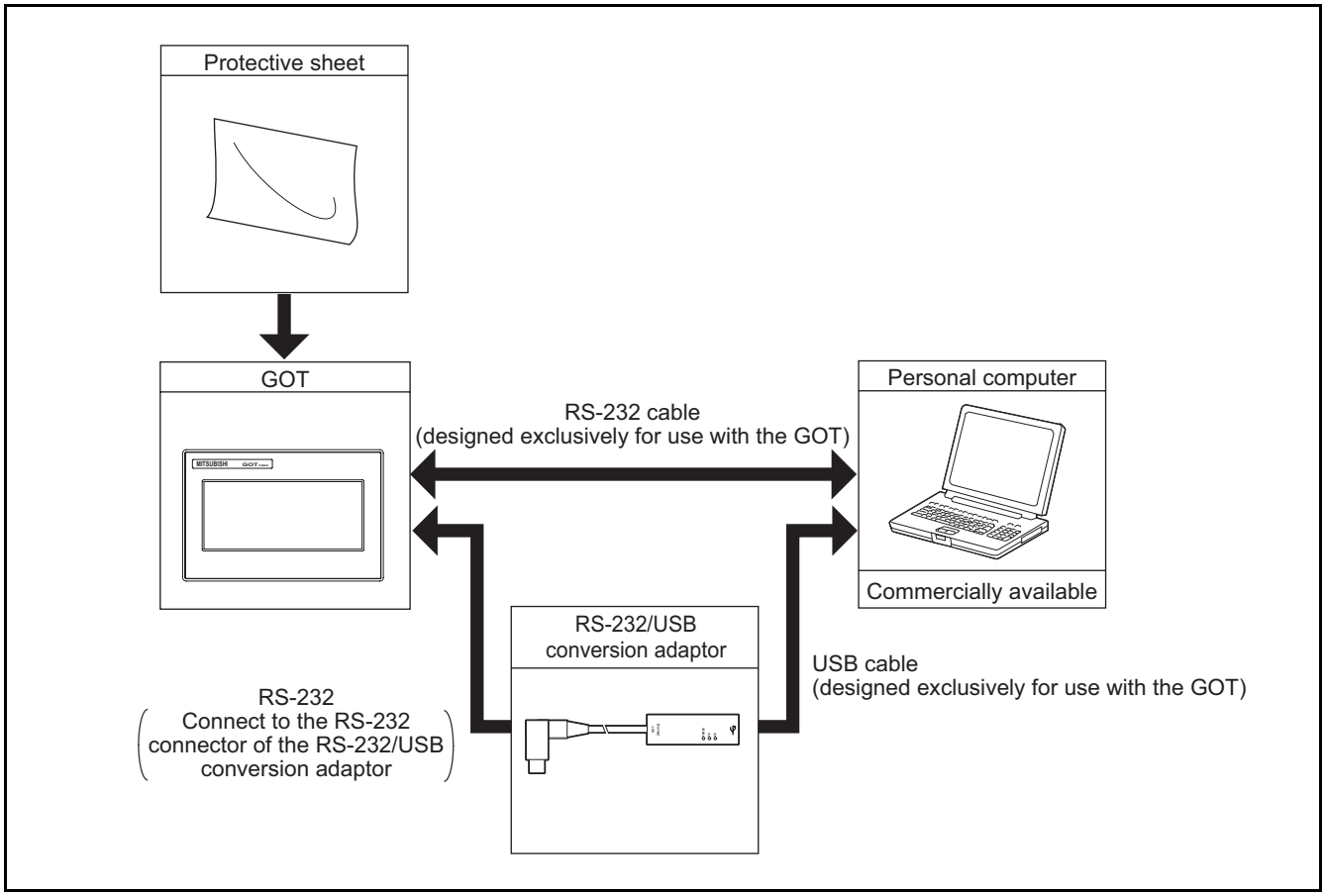


2. SYSTEM CONFIGURATION

2.1 Overall Configuration

The overall configuration of GOT is as follows.
For the connection methods applicable to GOT1000 series and cable, refer to the following.

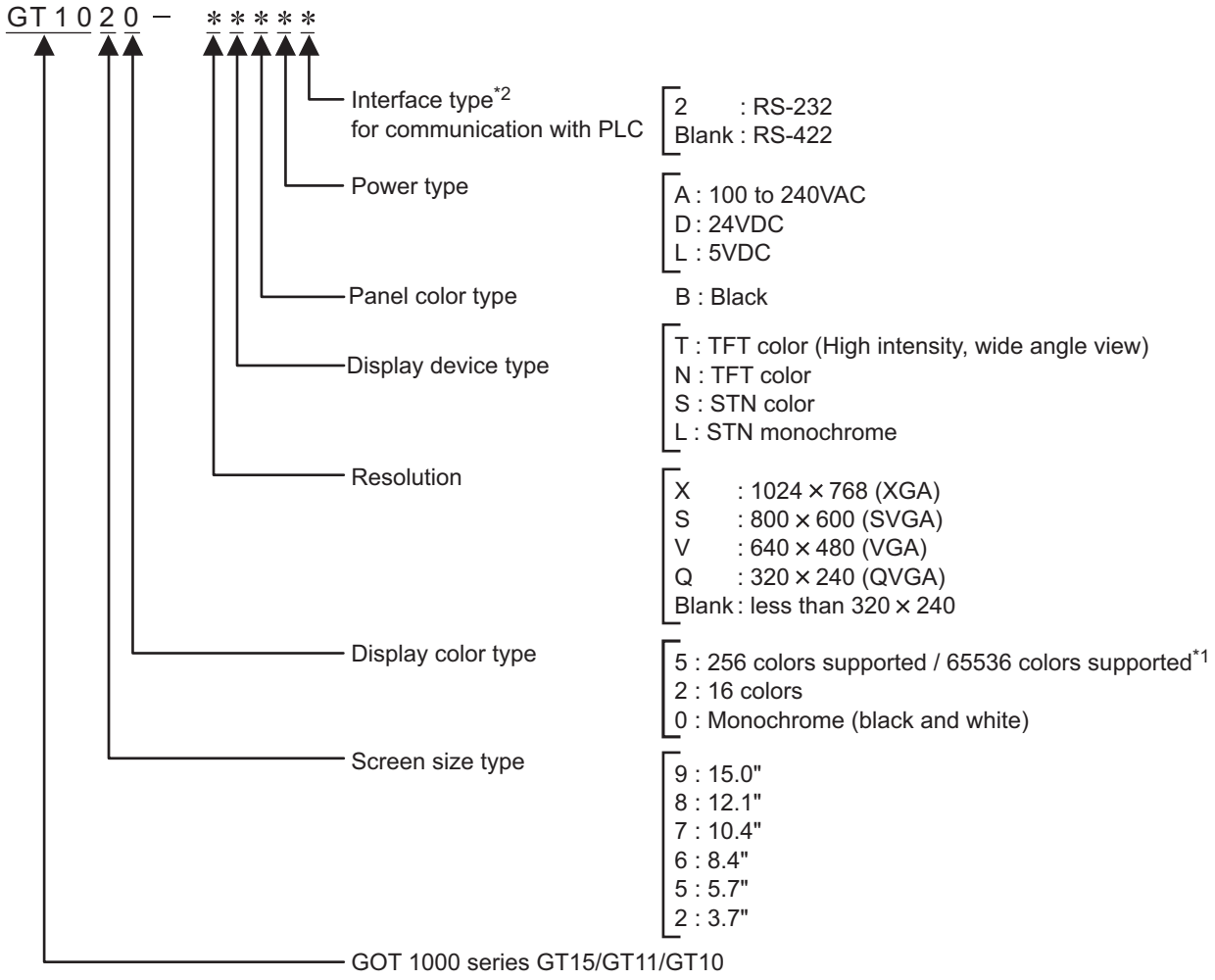
☞GOT1000 Series Connection Manual



- GT10☐☐ cannot be connected to bar code readers or printers.

2.2 Component List

(1) Explanation of the GOT model name

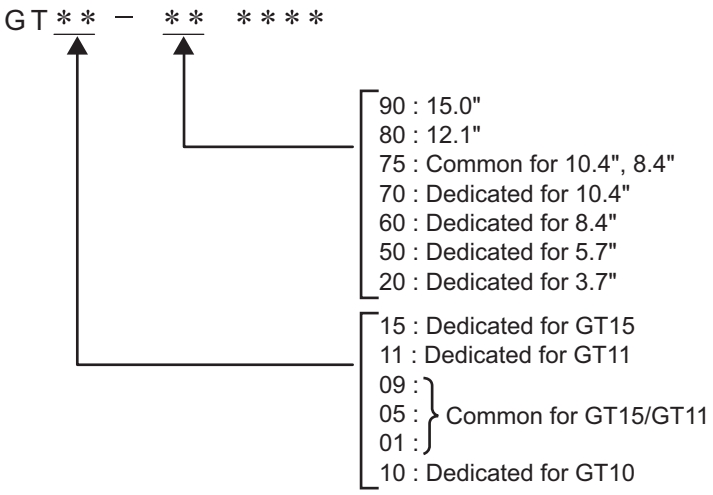


*1: For GT15 that can display 65536 colors, refer to following.

☞ GT15 User's Manual

*2: Dedicated for GT10

(2) Explanation of the option model name



2.2.1 GOT (GT10)

Product name	Model name	Specifications
GOT	GT1020-LBD	3.7" [160 × 64 dots], STN monochrome (black and white) liquid crystal, 3 colors (green/red/orange) LED backlight, 24VDC, PLC connection interface: RS-422
	GT1020-LBD2	3.7" [160 × 64 dots], STN monochrome (black and white) liquid crystal, 3 colors (green/red/orange) LED backlight, 24VDC, PLC connection interface: RS-232
	GT1020-LBL	3.7" [160 × 64 dots], STN monochrome (black and white) liquid crystal, 3 colors (green/red/orange) LED backlight, 5VDC, PLC connection interface: RS-422

2.2.2 Option (Optional components for GT10)

PLC connection cable (Sold separately)

Product name		Model name	Cable length	Contents
RS-422 Cable	FXCPU direct connection cable, FX expansion board connection cable	GT10-C10R4-8P	1m	For connecting FXCPU (MINI DIN 8 pins connector) and GOT, For connecting FXCPU expansion board (MINI DIN 8 pins connector) and GOT
		GT10-C30R4-8P	3m	
		GT10-C100R4-8P	10m	
	QnA/A/FXCPU direct connection cable, computer link connection cable	GT10-C30R4-25P	3m	For connecting QnA/A/FXCPU (D-sub 25 pins connector) and GOT, For connecting serial communication unit (AJ71QC24(N)-R4) and GOT
		GT10-C100R4-25P	10m	
RS-232 Cable	QCPU direct connection cable	GT10-C30R2-6P	3m	For connecting QCPU (MINI DIN 6 pins) and GOT

Protective sheet (Sold separately)

Product name	Model name	Contents	
Protective sheet	GT10-20PSGB	3.7" protective sheet	Display section antiglare (Frame: transparent) 5 sheets
	GT10-20PSCB		Display section clear (Frame: transparent) 5 sheets
	GT10-20PSGW		Display section antiglare (Frame: white), With a logo 5 sheets
	GT10-20PSCW		Display section clear (Frame: white), With a logo 5 sheets

Drawing software (Sold separately)

Product name	Model name	Contents
GT Designer2	SW □ D5C-GTD2-E (□ indicates the version)*1	Drawing software for GOT1000/GOT900 series

*1: The □ is assigned with an integer 2 or more.

PC connection cable (Sold separately)

Product name		Model name	Cable length	Contents
For connection to the RS-232 port on the PC	Data transfer cable	GT01-C30R2-6P	3m	For connecting PC (drawing software) (D-sub 9 pins: female*2) and GOT
For connection to the USB port on the PC	RS-232/USB conversion adaptor for data transfer	GT10-RS2TUSB-5S	–	RS-232/USB conversion adaptor for data transfer (RS-232/USB conversion adaptor and PC are connected with a GT09-C30USB-5P cable.)
	Data transfer cable	GT09-C30USB-5P*3	3m	For connecting PC (drawing software) (USB) and RS-232/USB conversion adaptor

*2: Connector shape on the cable is shown in ( ).

*3: GT09-C30USB-5P is a product of Mitsubishi Electric System Service.

Cable for multiple GOT connections (Sold separately)

Product name	Model name	Cable length	Contents
Data transfer cable	GT10-C30R2-6P	3m	For connecting GOT interface for connection to PC (RS-232) and GOT interface for connection to PLC (RS-232)*4

*4: When multiple GT10 units are connected, use a GT1020-LBD2 for the second GOT unit.

3. SPECIFICATIONS

3.1 General Specifications

<table>
<tr><th colspan="2">Item</th><th colspan="6">Specifications</th></tr>
<tr><td rowspan="2">Operating ambient temperature</td><td>Display section</td><td colspan="6">0 to 50℃</td></tr>
<tr><td>Other than display section</td><td colspan="6">0 to 55℃ (when horizontally installed), 0 to 50℃ (when vertically installed)</td></tr>
<tr><td colspan="2">Storage ambient temperature</td><td colspan="6">-20 to 60℃</td></tr>
<tr><td colspan="2">Operating ambient humidity*1</td><td colspan="6">10 to 90% RH, non-condensing</td></tr>
<tr><td colspan="2">Storage ambient humidity*1</td><td colspan="6">10 to 90% RH, non-condensing</td></tr>
<tr><td colspan="2" rowspan="5">Vibrationresistance</td><td rowspan="5">Conforms to JIS B3502 and IEC61131-2</td><td></td><td>Frequency</td><td>Acceleration</td><td>Half-amplitude</td><td>Sweep Count</td></tr>
<tr><td rowspan="2">Under intermittent vibration</td><td>5 to 9Hz</td><td>-</td><td>3.5mm</td><td rowspan="4">10 times each in X, Y and Z directions</td></tr>
<tr><td>9 to 150Hz</td><td>9.8m/s^2</td><td>-</td></tr>
<tr><td rowspan="2">Under continuous vibration</td><td>5 to 9Hz</td><td>-</td><td>1.75mm</td></tr>
<tr><td>9 to 150Hz</td><td>4.9m/s^2</td><td>-</td></tr>
<tr><td colspan="2">Shock resistance</td><td colspan="6">Conforms to JIS B3502, IEC 61131-2 (147 m/s^2, 11 ms, Sine half-wave pulse, 3 times each in the X, Y, and Z directions)</td></tr>
<tr><td colspan="2">Operating atmosphere</td><td colspan="6">Must be free of lamp black, corrosive gas, flammable gas, or excessive amount of electroconductive dust particles.</td></tr>
<tr><td colspan="2">Operating altitude*2</td><td colspan="6">2000 m (6562 ft) max.</td></tr>
<tr><td colspan="2">Installation location</td><td colspan="6">Inside control panel</td></tr>
<tr><td colspan="2">Overvoltage category*3</td><td colspan="6">II or less</td></tr>
<tr><td colspan="2">Pollution degree*4</td><td colspan="6">2 or less</td></tr>
<tr><td colspan="2">Cooling method</td><td colspan="6">Self-cooling</td></tr>
</table>

*1 : The wet bulb temperature is 39℃ or less.

*2 : Do not use or store the GOT under pressures higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction.

*3 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge voltage withstand level for up to the raged voltage of 300 V is 2500 V.

*4 : This index indicates the degree to which conductive pollution is generated in the environment where the equipment is used.
In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

3.2 Performance Specifications

Item		Specifications		
		GT1020-LBD	GT1020-LBD2	GT1020-LBL
Display section*1	Type	STN monochrome (white/black) liquid crystal		
	Screen size	3.7"		
	Resolution	160 × 64 dots (Horizontal format)		
	Display size	W86.4(3.4) × H34.5(1.35) [mm](inch) (Horizontal format)		
	Display character	16-dot standard font: 20 characters × 4 lines (Horizontal format)		
	Display color	Monochrome (white/black)		
	Display angle	Left/Right: 30 degrees, Top: 20 degrees, Bottom: 30 degrees (Horizontal format)		
	Contrast adjustment	16-level adjustment		
	Intensity of LCD only	200 [cd/m^2] (in green)		
	Life*2	Approx. 50,000h. Guaranteed: 1 year (Time for display intensity to become 1/5 at operating ambient temperature of 25℃)		
Backlight		LED with 3 available colors (green, red, orange) (no replacement required), Backlight status (colors, ON/BLINK/OFF) control, Adjustable screensaver activation time Setting the system information enables*3 PLC to control the backlight status.		
Touch panel	Number of touch keys	Maximum 50 keys/screen (Analog resistive film touch panel)		
	Key size	Minimum 2 × 2 dots (per key)		
	Simultaneous pressing of two (or more) areas (2-point press)	Not supported (Simultaneous pressing of two or more areas on the screen may activate the switch between those areas.)		
	Life	1 million times or more (operating force 0.98N max.)		
Memory	User memory*4	Flash memory (Internal), for storing project data (512 Kbytes or less), OS, Alarm history and Recipe data		
	Life (Number of write times)	100,000 times		
Built-in interface	PLC communication	Conforming to serial RS-422 standard, 1ch Transmission speed: 115,200/57,600/38,400/ 19,200/9,600/4,800bps Connector shape: Connector terminal block 9 pins Application: PLC communication	Conforming to serial RS-232 standard, 1ch Transmission speed: 115,200/57,600/38,400/ 19,200/9,600/4,800bps Connector shape: Connector terminal block 9 pins Application: PLC communication	Conforming to serial RS-422 standard, 1ch Transmission speed: 115,200/57,600/38,400/ 19,200/9,600/4,800bps Connector shape: Connector terminal block 9 pins Application: PLC communication
	PC communication	Conforming to serial RS-232 standard, 1ch Transmission speed : 115,200/57,600/38,400/19,200/9,600/4,800bps Connector shape : MINI DIN 6 pins (Female) Application : PC communication (Project data upload/download, OS installation, transparent function)		
Buzzer output (a buzzer that sounds when touch keys are pressed)		Single tone (LONG/SHORT/OFF adjustable)		
Environmental protective structure*5		Equivalent to IP67 (JEM1030) (front section) (Horizontal format)		
External dimensions		W113(4.44) × H74(2.91) × D27(1.06) [mm](inch) (Horizontal format)		
Panel cutting dimensions		W105(4.13) × H66(2.59) [mm](inch) (Horizontal format)		
Weight		0.2kg (Excluding mounting fixtures)		About 0.18kg (Excluding mounting fixtures)
Compatible software package		GT Designer2 Version2.43V or later		

*1: Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. Flickers may be observed depending on the display color.
Please note that these dots appear due to its characteristic and are not caused by product defect.

*2: The GOT screen saving from becoming permanently etched on the display screen.

*3: For the details of system information, refer to the following.

☞ GT Designer2 Version□ Screen Designer Manual

*4: ROM in which new data can be written without deleting the written data.

*5: Note that this does not guarantee all users' operation environment.

3.3 Power Supply Specifications

Item	Specifications		
	GT1020-LBD	GT1020-LBD2	GT1020-LBL
Input power supply voltage	24VDC (+10% -15%), ripple voltage 200mV or less		5VDC (±5%), supplied from the PLC
Fuse (built-in, not exchangeable)	0.4A		–
Power consumption	1.9W (80mA/24VDC) or less		1.1W (220mA/5VDC) or less
At backlight off	1.2W (50mA/24VDC) or less		0.6W (120mA/5VDC) or less
Inrush current	13A or less (26.4VDC) 1ms		–
Permissible instantaneous power failure time	Within 5ms		–
Noise immunity	Noise voltage : 1000Vp-p Noise width : 1μs (by noise simulator of 30 to 100Hz noise frequency)		
Dielectric withstand voltage	500VAC for 1 minute (across power supply terminals and earth)		–
Insulation resistance	10MΩ or larger by insulation resistance tester (across power supply terminals and earth)		–
Grounding	Class D grounding (100Ω or less), To be connected to the panel when grounding is not possible		–

Remark

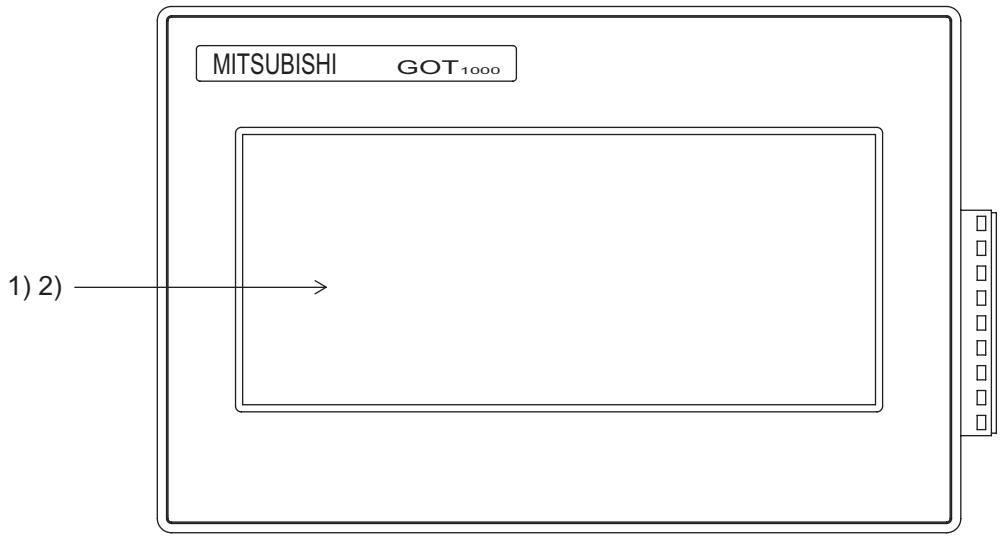
Operation at momentary power failure

The GOT continues to operate even upon 5ms or shorter instantaneous power failure.

The GOT stops operating if there is extended power failure or voltage drop, while it automatically resumes operation as soon as the power is restored.

4. PART NAME

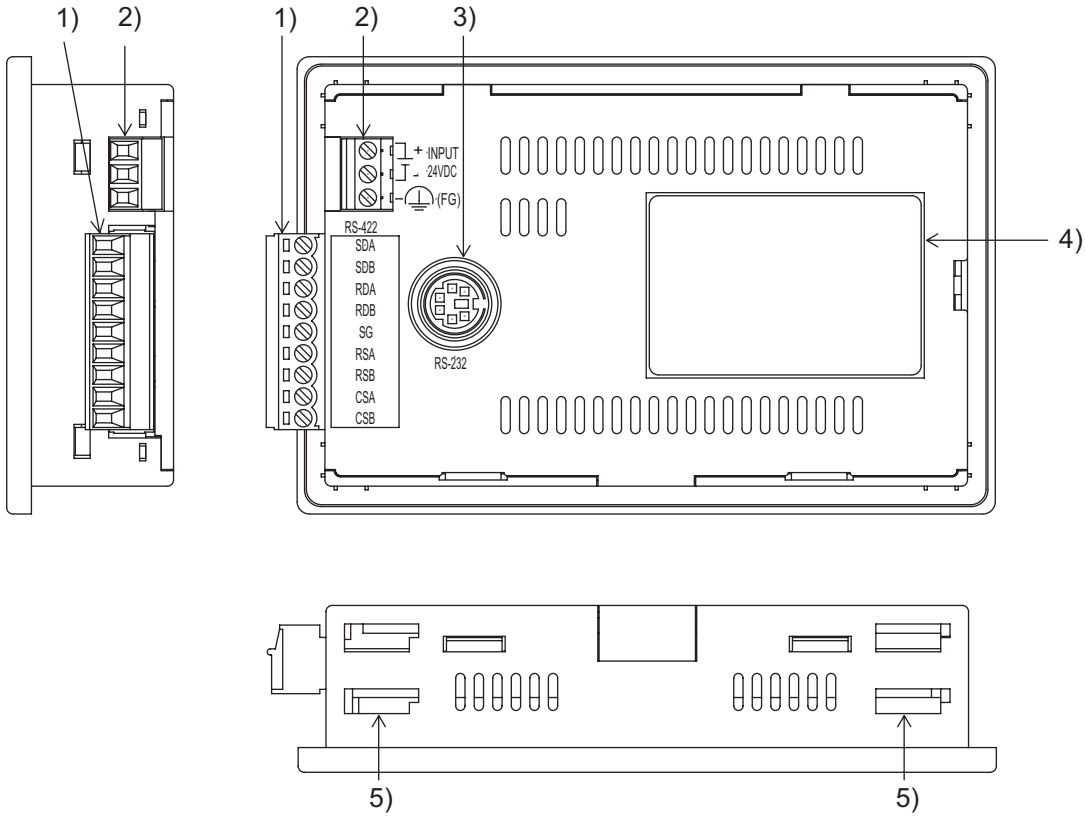
4.1 Front Panel



No.	Name	Specifications
1)	Display screen	Displays the utility screen and the user creation screen. 160 × 64 dots, STN monochrome (white/black) liquid crystal
2)	Touch key	For operating the touch switches in the utility screen and the user creation screen

4.2 Back Panel

4.2.1 GT1020-LBD

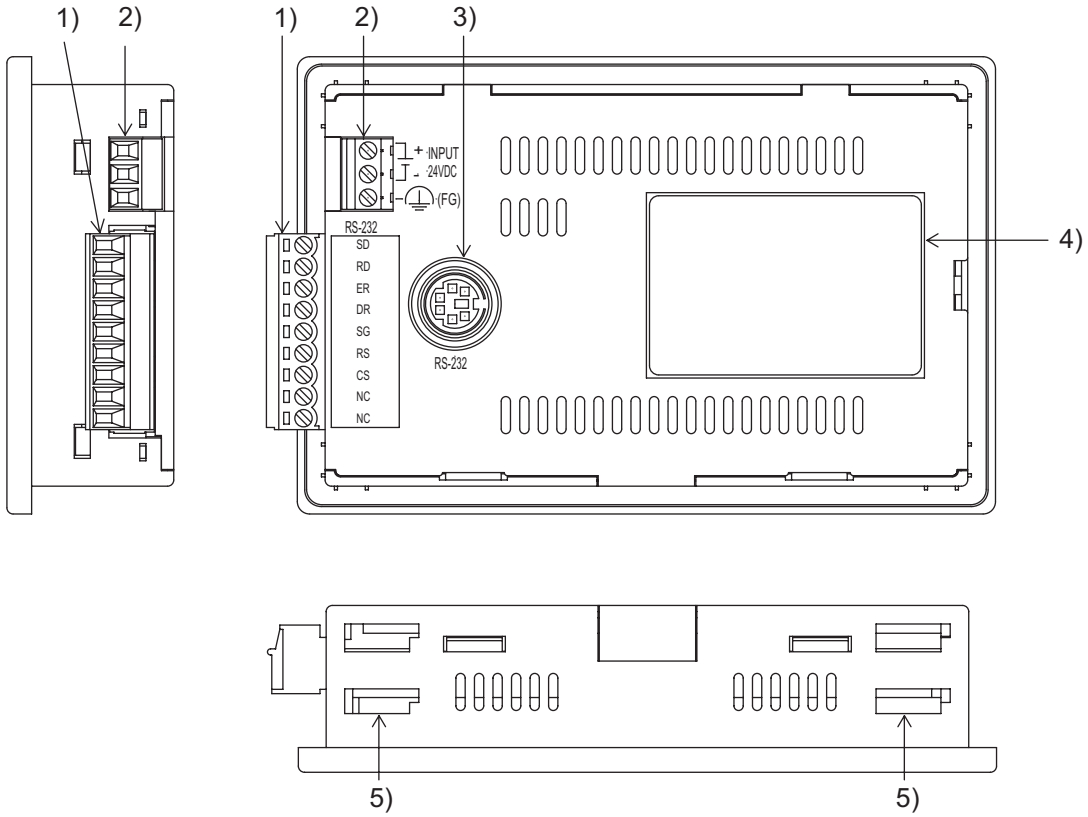


No.	Name	Specifications
1)	PLC connection interface (RS-422)	For connection to a controller (PLC) (9-pin connector terminal block)
2)	Power terminal	24VDC (+10% -15%)
3)	PC connection interface (RS-232)	For PC connection (OS installation, Project data, download, transparent) (MINI-DIN 6 pins, female)
4)	Rating plate (nameplate)	–
5)	Hole for unit installation fitting	Hole for mounting fitting (supplied) to mount the GOT on the panel (4 holes at the top and bottom)

For the connection to the controller (PLC) or PC, refer to the following.

☞GOT 1000 Series Connection Manual

4.2.2 GT1020-LBD2

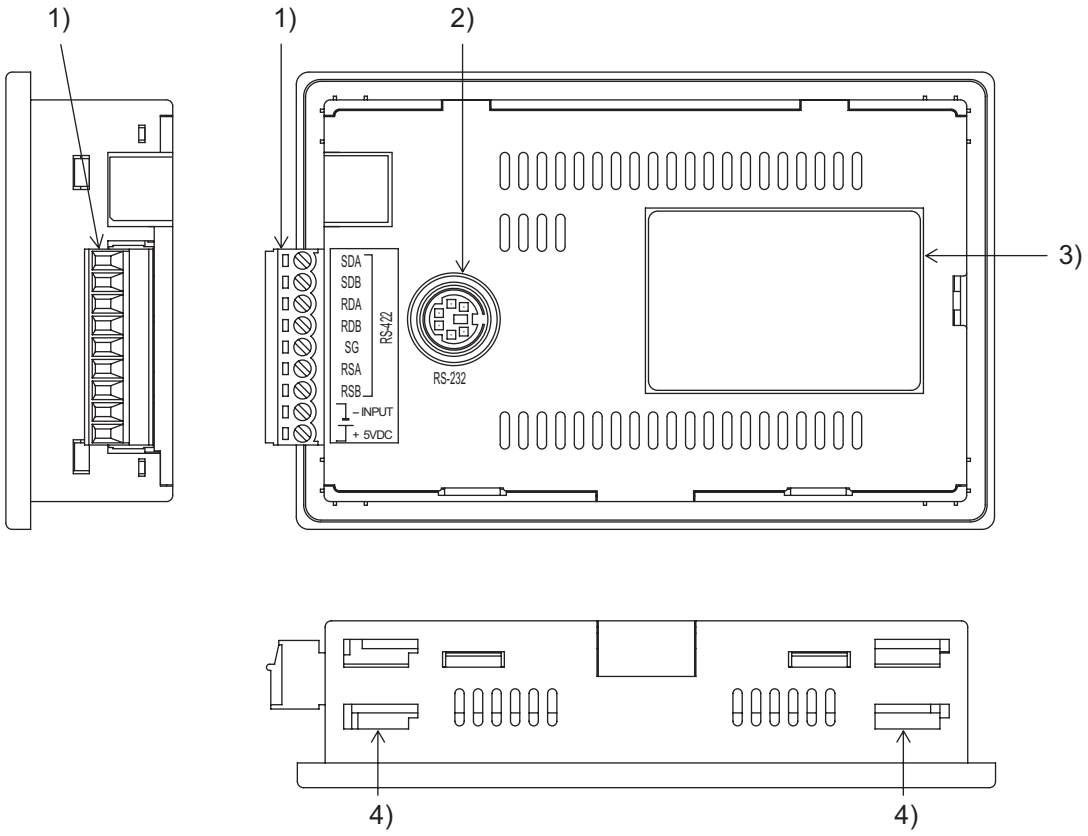


No.	Name	Specifications
1)	PLC connection interface (RS-232)	For connection to a controller (PLC) (9-pin connector terminal block)
2)	Power terminal	24VDC (+10% -15%)
3)	PC connection interface (RS-232)	For PC connection (OS installation, Project data, download, transparent) (MINI-DIN 6 pins, female)
4)	Rating plate (nameplate)	–
5)	Hole for unit installation fitting	Hole for mounting fitting (supplied) to mount the GOT on the panel (4 holes at the top and bottom)

For the connection to the controller (PLC) or PC, refer to the following.

☞ GOT 1000 Series Connection Manual

4.2.3 GT1020-LBL



No.	Name	Specifications
1)	PLC connection interface (RS-422)	For connection to a controller (PLC) (9-pin connector terminal block)
2)	PC connection interface (RS-232)	For PC connection (OS installation, Project data download, transparent) (MINI-DIN 6 pins, female)
3)	Rating plate (nameplate)	–
4)	Hole for unit installation fitting	Hole for mounting fitting (supplied) to mount the GOT on the panel (4 holes at the top and bottom)

For the connection to the controller (PLC) or PC, refer to the following.

☞GOT 1000 Series Connection Manual

5. EMC DIRECTIVE (GT1020-LBD, GT1020-LBD2, GT1020-LBL)

For the products sold in European countries, the conformance to the EMC Directive, which is one of the European Directives, has been a legal obligation since 1996. Also, conformance to the Low Voltage Directive, another European Directives, has been a legal obligation since 1997.
Manufacturers who recognize their products must conform to the EMC required to declare that their products conform to these Directives and put a "CE mark" on their products.

Point Products that the EMC Directive applies to are marked with the CE mark logo.

5.1 Requirements for Conformance to EMC Directive

The EMC Directive specifies that products placed on the market must "be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity)".
The applicable products are requested to meet these requirements.
The sections 5.1.1 through 5.1.3 summarize the precautions on conformance to the EMC Directive of the machinery constructed using the GOT.
The details of these precautions has been prepared based on the requirements and the applicable standards control. However, we will not assure that the overall machinery manufactured according to these details conforms to the above-mentioned directives. The method of conformance to the EMC Directive and the judgment on whether or not the machinery conforms to the EMC Directive must be determined finally by the manufacturer of the machinery.

5.1.1 Standards applicable to the EMC Directive

The following products have shown compliance through direct testing (to the identified standards) and design analysis (forming a technical construction file) to the European Directive for Electromagnetic Compatibility (89/336/EEC) when used as directed by the appropriate documentation.

Type : Programmable Controller (Open Type Equipment)

Standard		Remark
EN61131-2 : 2003 Programmable controllers - Equipment, requirement and tests	EMI	Compliance with all relevant aspects of the standard. (Radiated Emissions)
	EMS	Compliance with all relevant aspects of the standard. (ESD,RF electromagnetic field, EFTB, Surge, RF conducted disturbances and Power frequency magnetic field)

For more details please contact the local Mitsubishi Electric sales site.

5.1.2 About models applicable to the EMC Directive

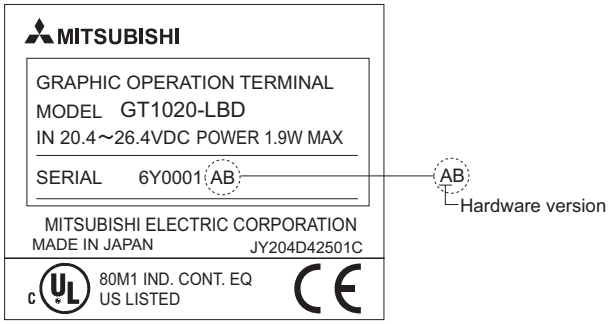
The following table lists the modules compliant with the EMC Directive.

○ : Compliant with EMC Directive × : Not compliant with EMC Directive

Item	EMC Directive	Hardware version
GT1020-LBD	○	A
GT1020-LBD2	○	A
GT1020-LBL	○	A

Point

Please use the GOT whose hardware version is later than that described.
Confirm the hardware version with the products rating plate.
(Products that the EMC Directive applies to are marked with the CE mark logo.)



5.1.3 About the cable used

1 General notes on the use of communication cables

Any device which utilizes a data communication function is susceptible to the wider effects of local EMC noise. Therefore, when installing any communication cables care should always be taken with the routing and location of those cables. The GOT units identified on the previous page are compliant with the EMC requirement when the following communication cables are used.

GOT Unit	Existing Cables
GT1020-LBD, GT1020-LBL	GT10-C30R4-8P (For Melsec FX series PLC)
GT1020-LBD2	GT10-C30R2-6P (For Melsec Q series PLC)

2 General notes on the use of the power cable

The GT1020-LBD and GT1020-LBD2 unit demand that the cable for the power supply is 10m or less.

6. INSTALLATION

MOUNTING PRECAUTIONS **DANGER**

- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the GOT to/from the panel.
  Not doing so can cause the unit to fail or malfunction.

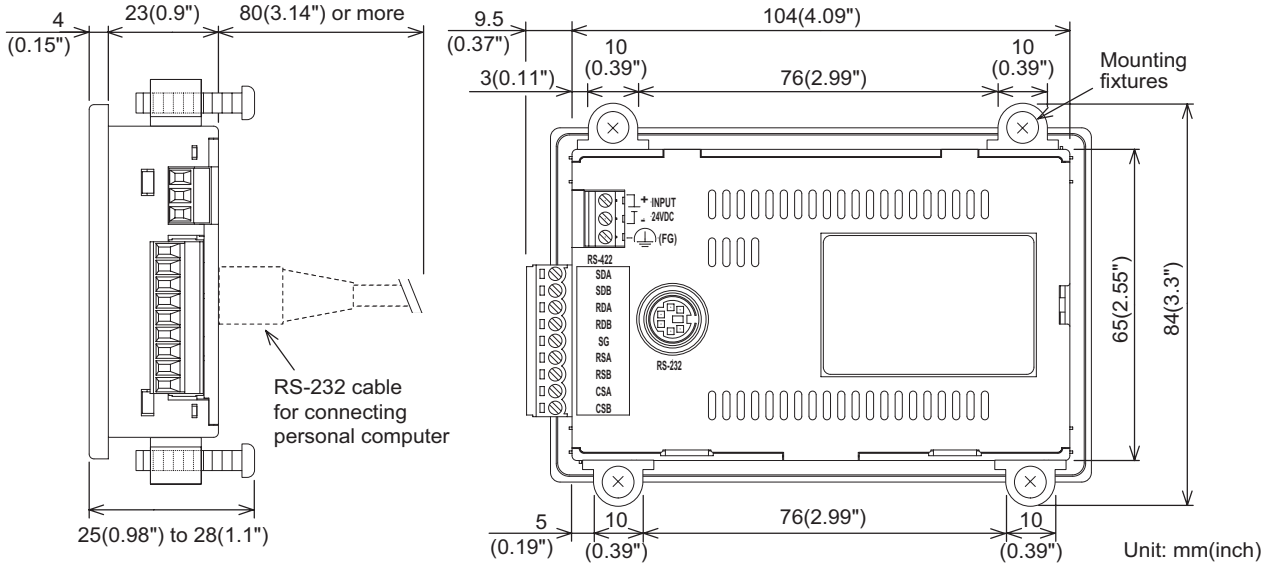
MOUNTING PRECAUTIONS **CAUTION**

- Use the GOT in the environment that satisfies the general specifications described in this manual.
  Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT to the control panel, tighten the mounting screws in the specified torque range.
  Undertightening can cause the GOT to drop, short circuit or malfunction.
  Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or the GOT.

6.1 Control Panel Inside Dimensions for Mounting GOT

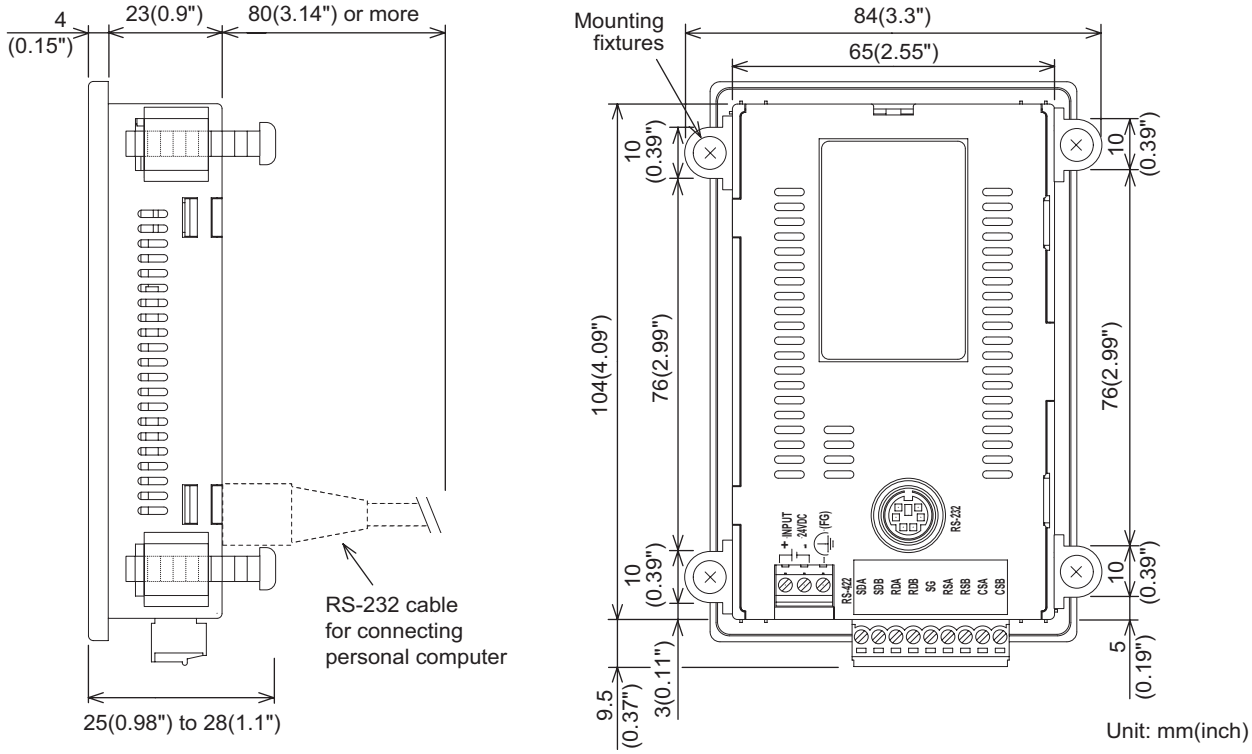
Mount the GOT onto the control panel while considering the following control panel inside dimensions.

Horizontal format



Vertical format

(If the vertical format is selected, the dimension, which is rotated 90 degrees clockwise looking from the display section side, is required.)



Point

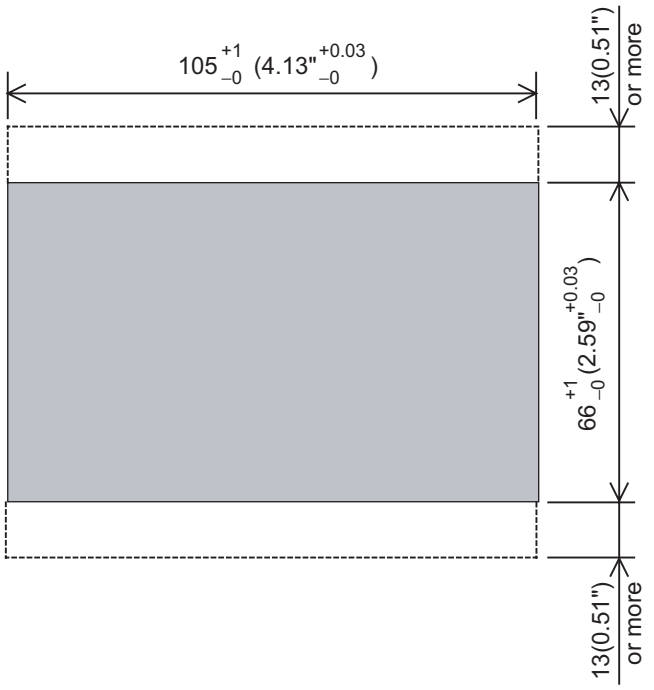
Applicable cable

Some cables may need to be longer than the specified dimensions when connecting to the GOT.
Therefore, consider the connector dimensions and bending radius of the cable as well for installation.

6.2 Panel Cutting Dimensions

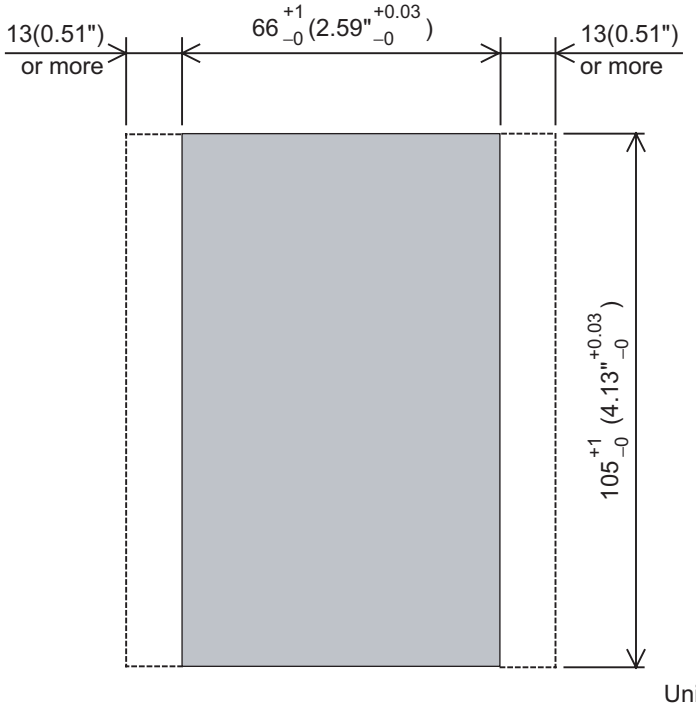
Cut holes in the following dimensions on the panel.
A space of at least 13 mm (0.51”) at the top and bottom is required to allow for the attachment of mounting fixtures.

Horizontal format



Unit: mm(inch)

Vertical format
(In the case of vertical format, the height and the width of the panel cut dimensions are reversed.)



Unit: mm(inch)

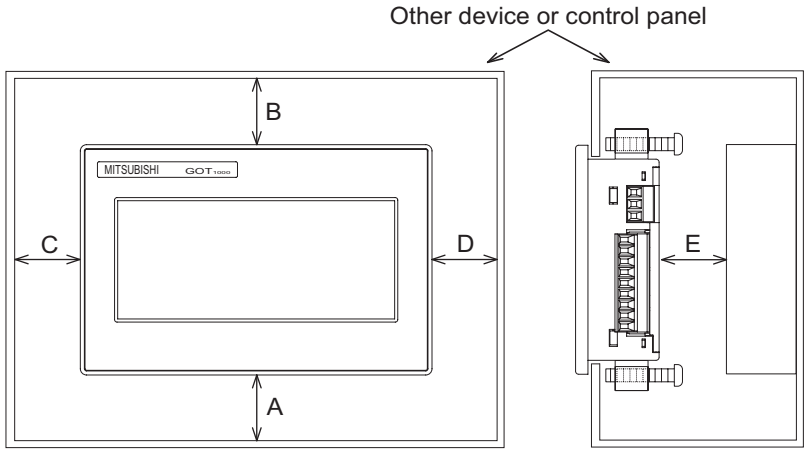
6.3 Mounting Position

When mounting the GOT, the following clearances must be maintained from other structures and devices.

Horizontal format

Installation Environment	A	B	C	D	E
In the presence of radiated-noise or heat-generating equipment nearby	50 mm (1.97") or more	50 mm (1.97") or more	50 mm (1.97") or more	50 mm (1.97") or more	80 mm (3.14") or more
In the absence of radiated-noise or heat-generating equipment nearby	20 mm (0.79") or more*1	20 mm (0.79") or more	20 mm (0.79") or more		20 mm (0.79") or more*2

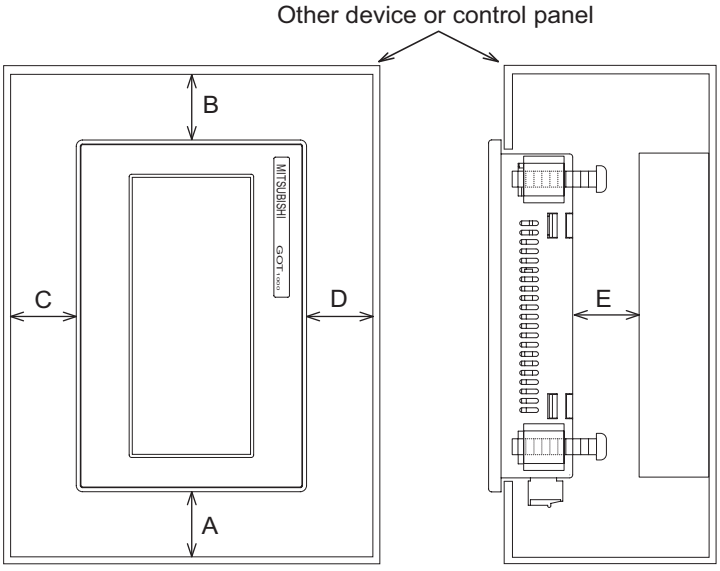
*1 50 mm (1.97") or more if an RS-232/USB conversion adaptor is used.
*2 80 mm (3.14") or more if a PC connection cable is used or if an RS-232 interface for PC is used to connect multiple GOT units.
50 mm (1.97") or more if an RS-232/USB conversion adaptor is used and is connected to the RS-232 interface for PC.



Vertical format

Installation Environment	A	B	C	D	E
In the presence of radiated-noise or heat-generating equipment nearby	50 mm (1.97") or more	50 mm (1.97") or more	50 mm (1.97") or more	50 mm (1.97") or more	80 mm (3.14") or more
In the absence of radiated-noise or heat-generating equipment nearby		20 mm (0.79") or more	20 mm (0.79") or more*1	20 mm (0.79") or more	20 mm (0.79") or more*2

*1 50 mm (1.97") or more if an RS-232/USB conversion adaptor is used.
*2 80 mm (3.14") or more if a PC connection cable is used or if an RS-232 interface for PC is used to connect multiple GOT units.
50 mm (1.97") or more if an RS-232/USB conversion adaptor is used and is connected to the RS-232 interface for PC.

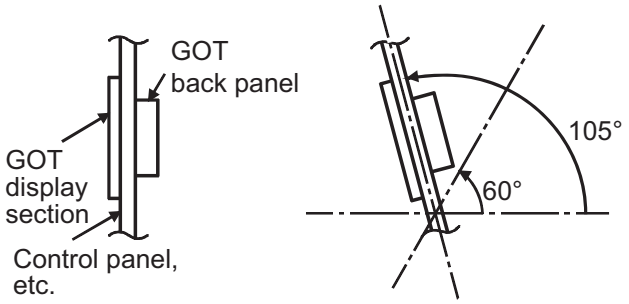


6.4 Control Panel Temperature and Mounting Angle

When mounting the main unit to a control panel or similar fixture, set the GOT display section as shown below.

1 Horizontal installation

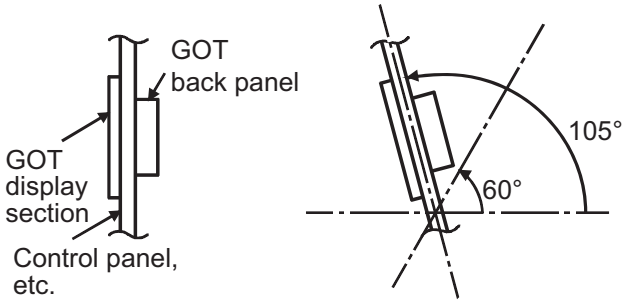
When the temperature inside the control panel is 40 to 55℃ , the mounting angle should be in the range from 60 to 105 degrees.



- The GOT will have a longer lifetime if used within the mounting angles shown above.
  Ideally, the temperature inside the control panel should not exceed 0 to 40℃

2 Vertical installation

When the temperature inside the control panel is 40 to 50℃, the mounting angle should be in the range from 60 to 105 degrees.



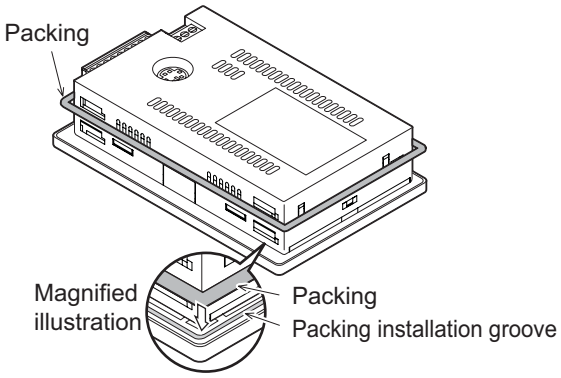
- The GOT will have a longer lifetime if used within the mounting angles shown above.
  Ideally, the temperature inside the control panel should not exceed 0 to 40℃.

6.5 Installation Procedure

The GOT is designed to be embedded into a panel.
Mount the GOT by following the procedure below.
For panel cutting dimensions, refer to Section 6.2.
Note that the panel thickness should be within 1 to 4mm.

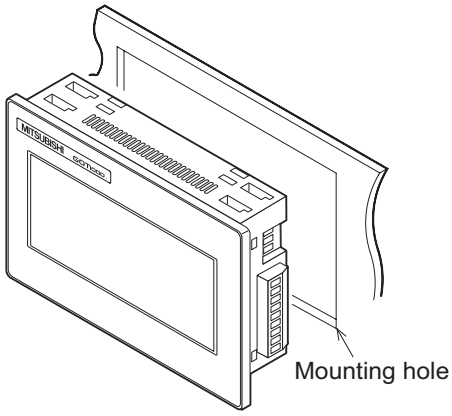
1 Installing the packing

Install packing to the packing installation groove on the back panel of the GOT.



2 Inserting into the panel face

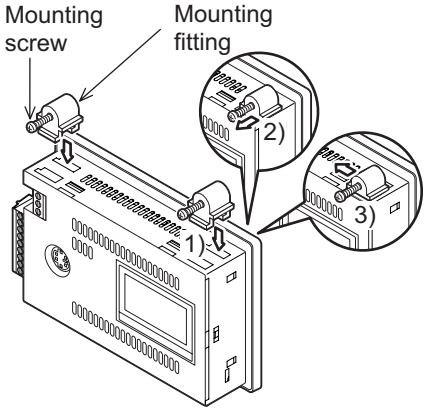
Insert the GOT from the front side of the panel.
(Right drawing is the example of lateral format.)



3 Fixing the GOT

1) Insert the hooks on the mounting fittings (supplied) into the mounting holes on the GOT unit.
2) Slide the mounting fittings to the back end.
3) Slide them to the left to lock them in place, and then fix them with the mounting screws (supplied).

The GOT will be fixed in 4 upper/lower parts.
Tighten the mounting screw with the specified torque.
(Failure to do so may distort the panel and make a surface waviness on the protective sheet.)



Tightening torque	0.20 to 0.25 N•m

4 A protection film is attached on the display section of GOT prior to shipment.
Remove the film when the installation is completed.

7. WIRING

WIRING PRECAUTIONS

DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring.
  Failure to do so may result in an electric shock, product damage or malfunctions.
- Please make sure to ground FG terminal of the GOT power supply section by applying 100Ω or less which is used exclusively for the GOT.
  Not doing so may cause an electric shock or malfunction.
- Correctly wire the GOT power supply section after confirming the rated voltage and terminal arrangement of the product.
  Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or the GOT.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT.
  Not doing so can cause a fire, failure or malfunction.

WIRING PRECAUTIONS

CAUTION

- Plug the communication cable into the connector of the connected unit and tighten the mounting and terminal screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

This chapter describes the wiring to the GOT power supply section.

(1) For the connection with a PLC, refer to the following.

☞GOT1000 Series Connection Manual

Remark

General preventive measures against noise

There are two kinds of noises: Radiated noise that is transmitted into the air and Conductive noise that is directly transmitted along connected lines.
Countermeasures must be taken considering both kinds of noises and referring to the following 3 points.

(1) Protecting against noise
  (a) Keep signal lines away from noise sources such as a power cable or a high-power drive circuit.
  (b) Shield the signal lines.

(2) Reducing generated noise
  (a) Use a noise filter, etc. to reduce the level of the noise generated due to a source such as a high-power motor drive circuit.
  (b) Attach surge killers to the terminals on the no fuse breakers (NFB), electromagnetic contactors, relays, solenoid valves, and generators to suppress noise interference.

(3) Releasing noise to the ground
  (a) Make sure to connect the ground cable to the ground.
  (b) Use a short and thick cable to lower its ground resistance.
  (c) Ground the power system and the control system separately.

7.1 Power Supply Wiring

Connect the power supply to the power terminals on the back panel of the GOT.
Use a specified size power supply wire to prevent voltage drop, and tighten the terminal screws firmly to a specified torque.
Do not exceed the number of wires that are allowed to be connected.
Secure the wires to prevent stress from being directly applied to the terminal block or wire connections.
In the case of GT1020-LBL, GOT power is supplied via the communication cable.

7.1.1 Cable types and wire end processing

Process the end of the electrical wire (solid or stranded), or attach a ferrules with plastic sleeve to the wire end.

1 Electrical wire size

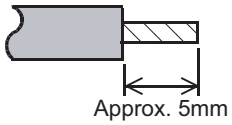
No. of wire per terminal	Electrical wire size		
	Solid wire	Stranded wire	Ferrules with plastic sleeve
1	0.14 to 1.5mm^2 AWG26 to AWG16	0.14 to 1.0mm^2 AWG26 to AWG16	0.25 to 0.5 mm^2 AWG24 to AWG20
2	0.14 to 0.5mm^2 AWG26 to AWG20	0.14 to 0.2mm^2 AWG26 to AWG24	–

2 Wire end processing

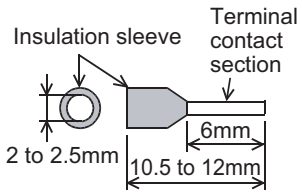
(1) Connecting the wire directly

(a) Twist the end of the stranded wire. Make sure there are no wire whiskers.

(b) Do not solder the wire end.



(2) Using a ferrules with plastic sleeve to connect the wire
A wire with a too thick of a wire sheath may not fit the insulation sleeve.
Refer to the outline drawing for how to select the proper size wire.

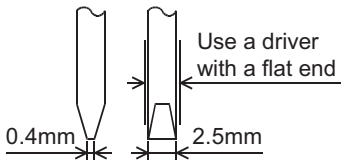


Manufacturer	Model name	Crimper type
Phoenix Contact Inc.	AI 2.5-6BU (AWG24)	CRIMPFOXZA3
	AI 0.34-6TQ (AWG22)	
	AI 0.5-6WH (AWG20)	

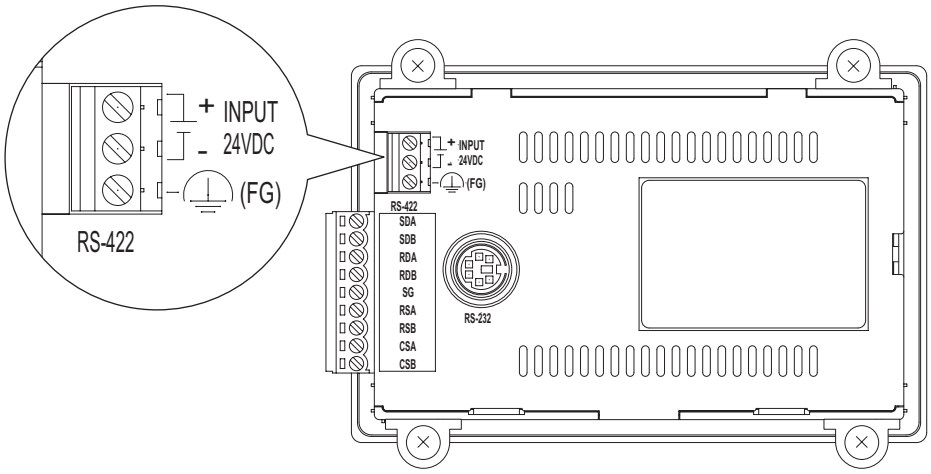
7.1.2 Tools

Use a small driver with a straight, untapered blade as shown on the right to tighten the power terminals.

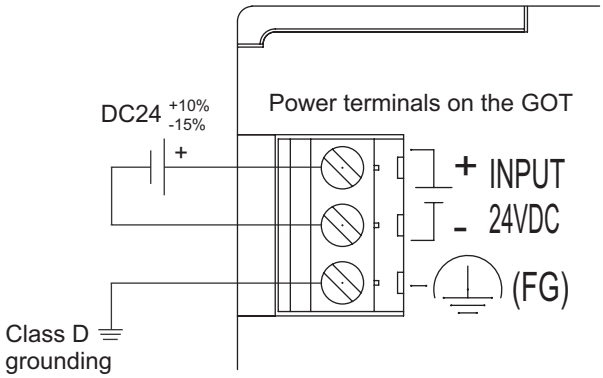
Manufacturer	Model name
Phoenix Contact Inc.	SZS 0.4 × 2.5



7.1.3 Terminal name



7.1.4 Power supply wiring

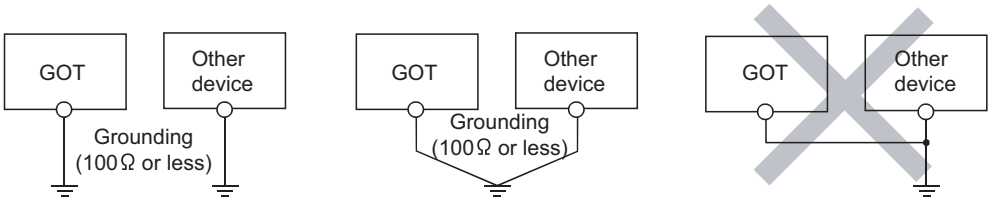


Tightening torque for the power terminals	0.22 to 0.25 N•m

1 Grounding the GOT and other devices

Make sure to carry out the followings for grounding.

- Carry out the independent grounding if possible.
  Provide class D (class 3) grounding. (Ground resistance must be 100Ω or less.)
- If the independent grounding is impossible, carry out the shared grounding as shown in fig.2) below.



(1) Independent ground ..... Best condition

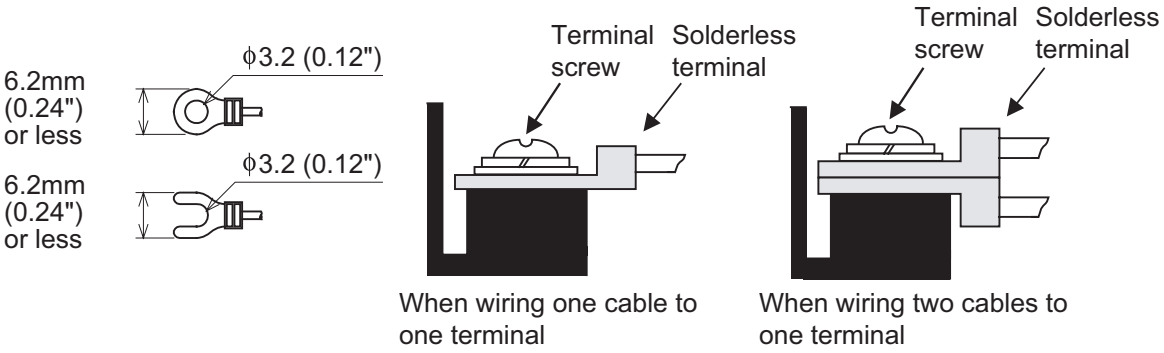
(2) Shared grounding ..... Good condition

(3) Common grounding ..... Not allowed

- Set the grounding point closer to the GOT to make the grounding cable short as possible.
  Provide grounding using a single grounding wire. Refer to the table below to select the proper size grounding wire.

Ground wire size		
Solid wire	Stranded wire	Ferrules with plastic sleeve
1.5mm^2, AWG16	1.0mm^2, AWG16	0.5mm^2, AWG20

2 Recommended terminal shape



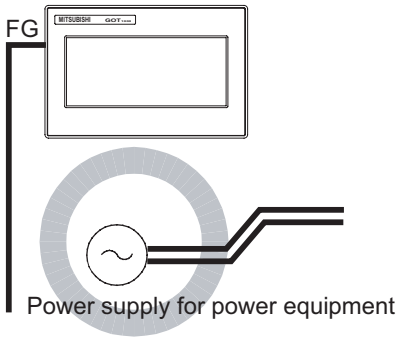
Cable size	For power supply: 0.75mm^2 min. For grounding: 2mm^2 min.
Solderless terminal	M3 solderless terminal (applicable solderless terminal: RAV 1.25-3, V2-N3A and FV2-N3A)
Tightening torque	0.5 to 0.8N•m

7.1.5 The cause of malfunctions related wiring/Remedy

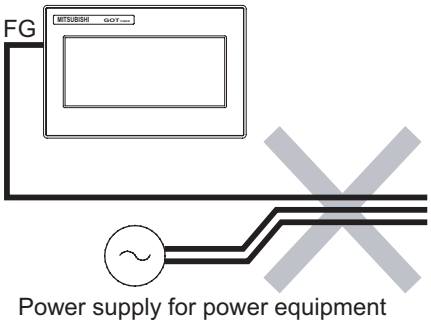
Grounding of the GOT may cause electric potential difference and noise interference, which may result in GOT malfunctions.
These problems may be resolved by taking the following measures.

1 Wiring path of the GOT's ground cable and power line

Bundling the GOT's ground cable and power line together can cause interference noise, which may result in malfunctions.
Keeping the GOT's ground cable and power line away from each other will help minimize noise interference.



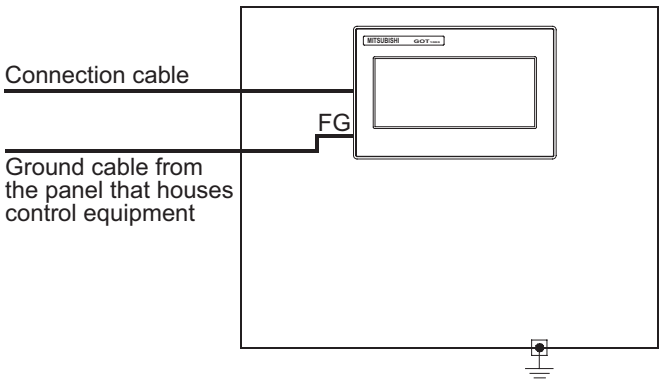
Good: Wiring the ground cable away from the power cable



Bad: Bundling the ground cable and the power cable

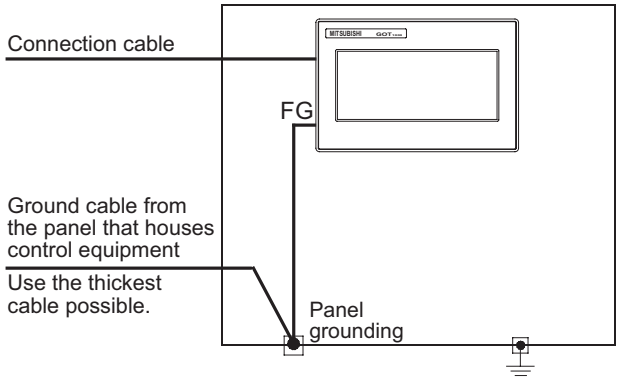
2 Connecting the ground cable from the panel that houses control equipment to the panel to which the GOT is grounded

When running a single ground cable from the panel that houses such piece of control equipment as a sequencer to the panel to which the GOT is grounded, the ground cable may have to be directly connected to the terminal on the GOT.

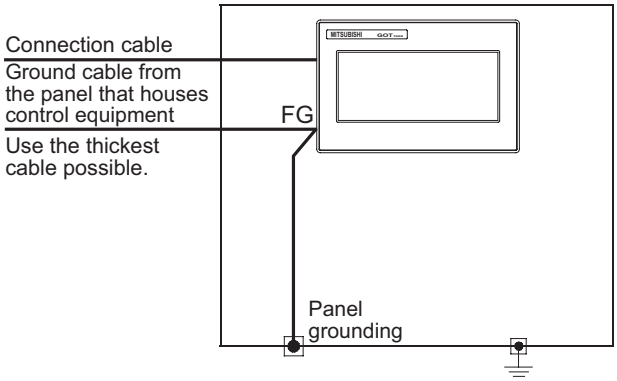


If electric potential difference between the ground points created by it causes malfunctions, lowering the voltage as shown in Remedy 1 below may solve the problem.

- Remedy 1 (Refer to the figures Remedy 1-1 and 1-2 below.)
  If the electric potential difference between the ground cable and the panel that houses the GOT is creating problems, connect the ground cable to the panel also.
  If the wiring method as shown in Remedy 1-1 is not feasible, follow Remedy 1-2.



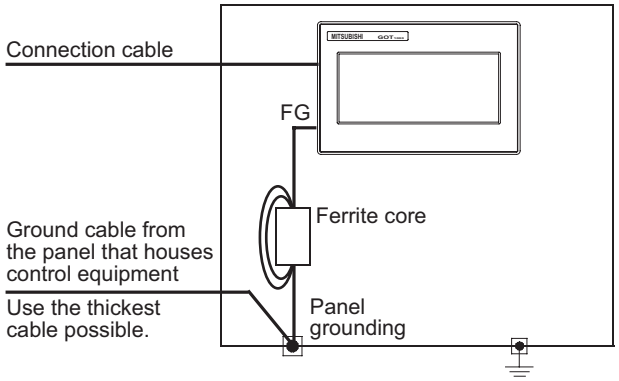
Remedy1-1



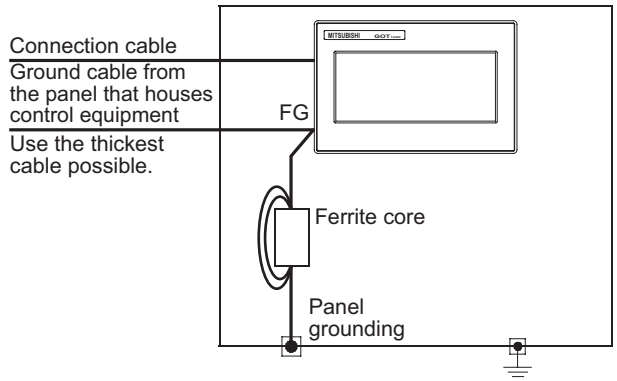
Remedy1-2

If taking Remedy 1 worsens noise interference, taking Remedy 2 may alleviate it.

- Remedy 2 (Refer to the figures Remedy 2-1 and 2-2 below.)
  Attach a ferrite core to the cable if noise from the GOT panel has adverse effects on the GOT when Remedy 1 is taken.
  Wind the wire around the ferrite core several times (approx. 3 times), if a ferrite core is used.
  If the wiring method as shown in Remedy 2-1 is not feasible, follow Remedy 2-2.



Remedy2-1



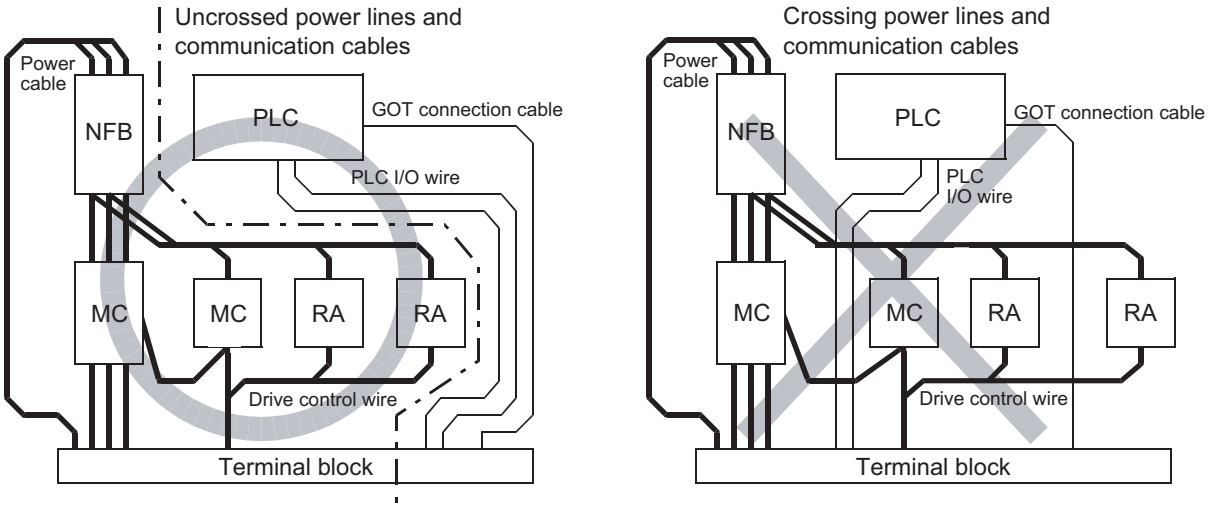
Remedy2-2

7.2 Wiring inside and outside the panel

7.2.1 Wiring inside

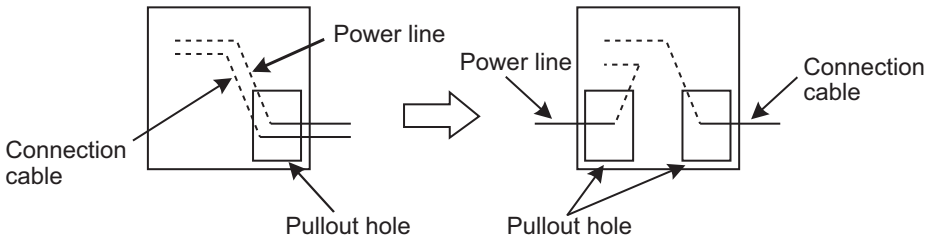
Run power lines, servo amplifier drive wires, and communication cables so that they do not cross each other. Noise interference that is generated by cables that cross each other may cause malfunctions.
Surge suppressors are an effective way to filter out surge noise that is generated from no fuse breakers (NFB), electromagnetic contactors (MC), relays (RA), solenoid valves, and induction motors.
Refer to the section to follow for surge killers.

☞ 7.2.3 Attaching surge killers to control equipment

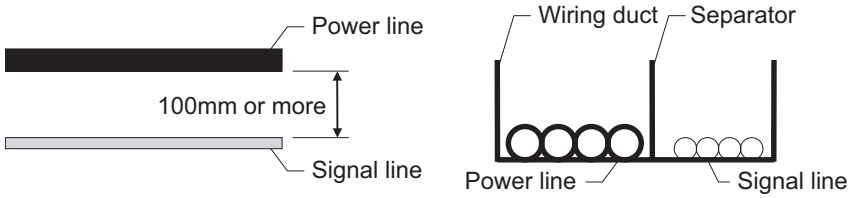


7.2.2 Outside the panel

To pull the power line and communication cable out of the panel, make two pullout holes away from each other and pull the cables through.
Putting both cables through the same pullout hole will increase noise interference.



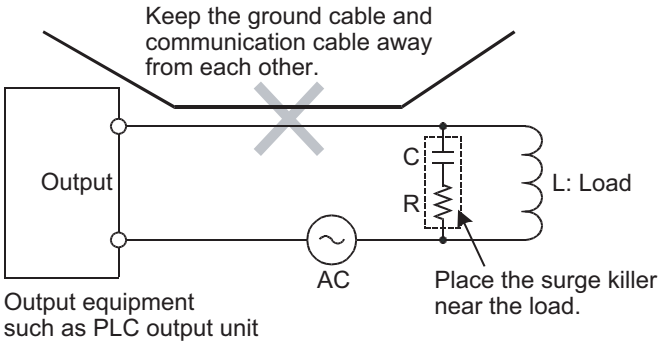
Keep the power line and communication cable inside the duct at least 100 mm away from each other.
If that is not possible, the use of a metal separator inside the duct can reduce noise interference.



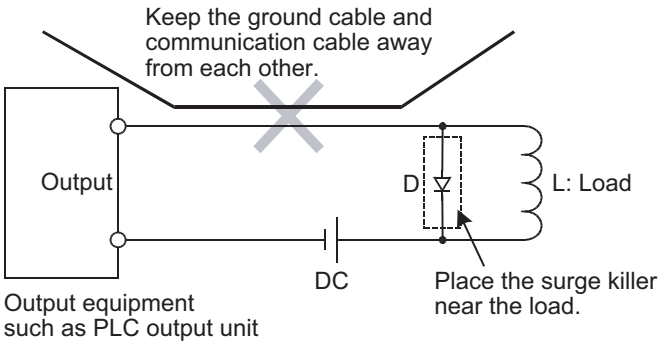
7.2.3 Attaching surge killers to control equipment

If communication errors happen in synch with the on/off signals from certain control equipment (referred to as "load" hereafter) such as no fuse breakers, electromagnetic contactors, relays, solenoid valves, and induction motors, surge noise interference is suspected.
If this problem happens, keep the ground cable and communication cable away from the load.
If that is not possible, an installation of a surge killer will help reduce noise interference.
Place the surge killer as close to the load as possible.

Remedy for AC inductive load



Remedy for DC inductive load



8. OPTION

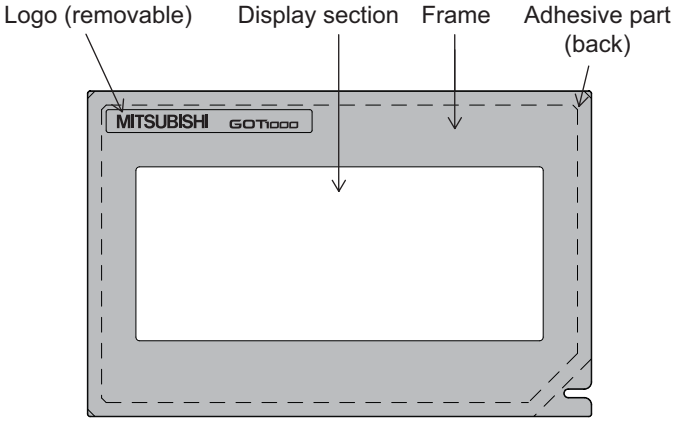
8.1 Protective Sheet

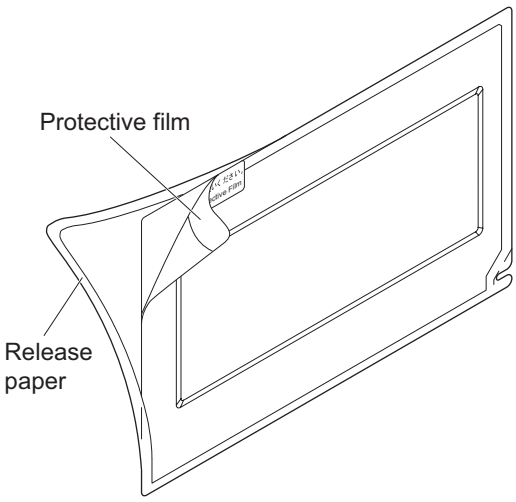
The protective sheet is used to protect the operation surface from damage or dirt when the touch key of GOT display section is operated.

8.1.1 Applicable protective sheet

The following protective sheets are applicable for GT10□□.

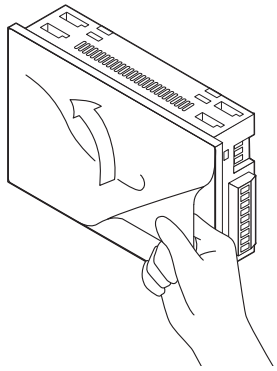
Product name	Model	Contents	
Protective sheet	GT10-20PSGB	3.7" protective sheet	Display section antiglare (Frame: transparent) 5 sheets
	GT10-20PSCB		Display section clear (Frame: transparent) 5 sheets
	GT10-20PSGW		Display section antiglare (Frame: white), With a logo 5 sheets
	GT10-20PSCW		Display section clear (Frame: white), With a logo 5 sheets



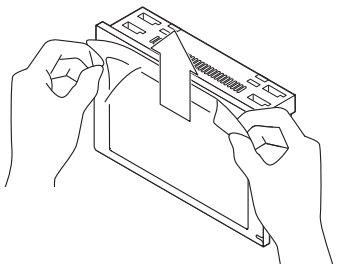


8.1.2 Installing procedure

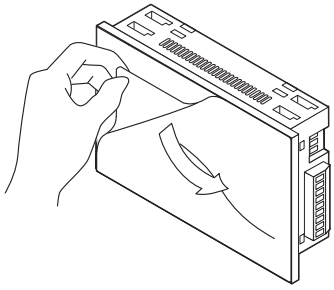
1 If a protective sheet is on the GOT, peel off the protective sheet from the bottom-right corner of the GOT display section, and clean the GOT surface.



2 Peel the release paper from the back of the new protective sheet, and attach its adhesive side to the GOT display section.
When attaching the protective sheet, make sure to fit it on the display section closely without leaving any clearance between them.



3 Peel off the protective film on the protective sheet.

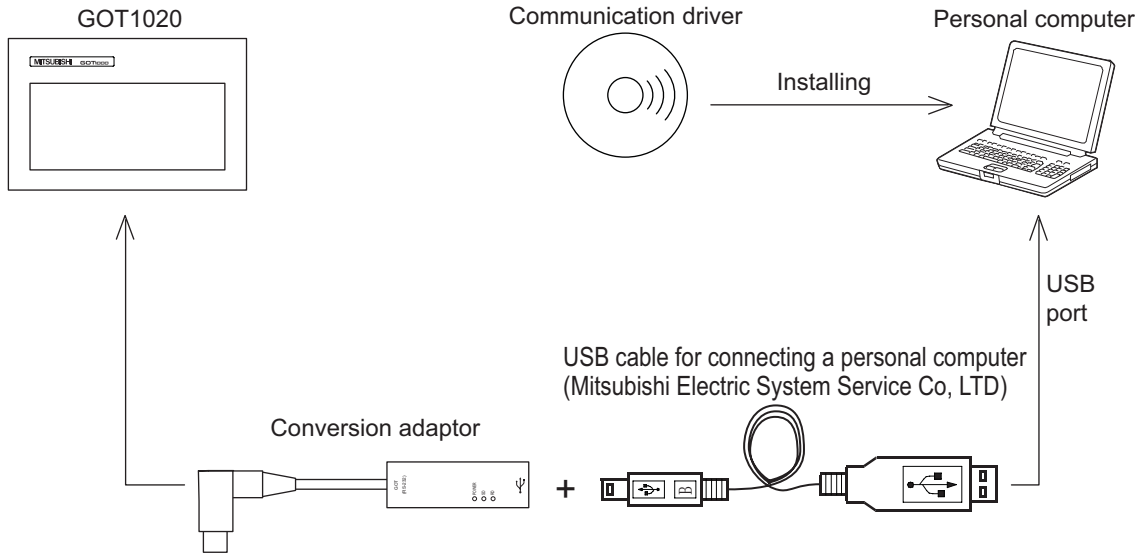


Remark Replacement time of protective sheet

Check the status of the protection sheet visually by to the daily inspection. The visibility becomes worse when there is too much dirt and cracks, causing malfunction. Proceeds replacement promptly.

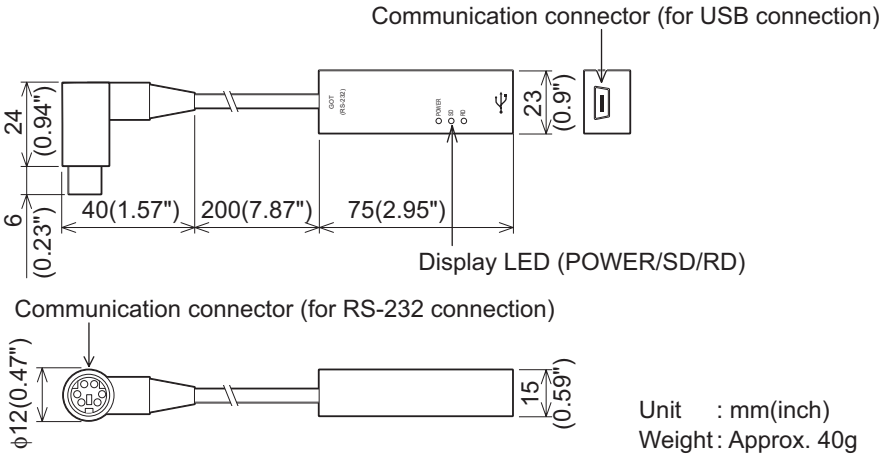
8.2 RS-232/USB conversion adaptor

GT10-RS2TUSB-5S RS-232/USB conversion adaptor is an adaptor that converts the RS-232 interface for communication with PC on the GOT to the USB interface.
It is used with a GT09-C30USB-5P USB cable.
The use of a GT10-RS2TUSB-5S RS-232/USB conversion adaptor requires an installation of the USB driver that is supplied with the package.



8.2.1 Shape, Dimensions, and Names of Adaptor Components

The shape, dimensions, and names of the RS-232/USB conversion adaptor are shown in the figures below.



Name	Specifications
Communication connector (for RS-232 connection)	MINI-DIN 6 pins (male): For connection to the interface for communication with PC on the GOT
Communication connector (for USB connection)	USB MINI: For connection to the GT09-C30USB-5P USB cable
Display LED (POWER)	Green : Lit when the power is properly supplied (Lit when connected to the PC with a USB cable)
Display LED (SD)	Red: Lit while sending data (GOT → PC)
Display LED (RD)	Red: Lit while receiving data (PC → GOT)

8.2.2 Installing procedure

1. Turn off the GOT power.
2. Connect the USB mini connector on the GT09-C30USB-5P USB cable to the RS-232/USB conversion adaptor.
3. Connect the RS-232 connector on the RS-232/USB conversion adaptor to the GOT.
4. Connect the USB connector on the GT09-C30USB-5P USB cable to the PC.
5. Turn on the GOT power.
6. Turn on the PC power.
7. Confirm that the POWER LED (POWER) on the RS-232/USB conversion adaptor is lit.
   (Lit POWER LED on the RS-232/USB conversion adaptor indicates that the power is properly supplied from the PC.)

8.2.3 Driver installation

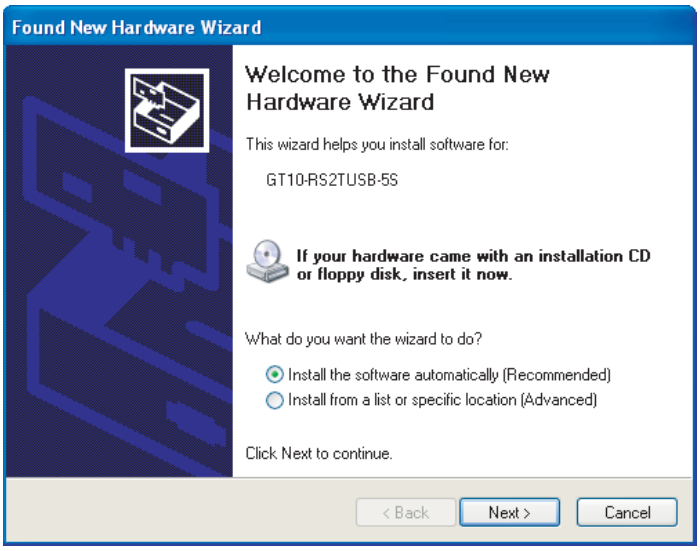
Procedure for installing the driver is explained below.
Windows® XP installation follows.

- Windows® 98, Windows® 98SE, Windows® Millennium Edition, and Windows® 2000, the installation method will vary.

Installation of the driver is canceled during the following process, the installation is not carried out correctly.
If the installation is canceled, uninstall the driver and install again.
Please refer to Section 8.2.4 for instructions on uninstalling the driver.

Please install the driver with the following procedure.

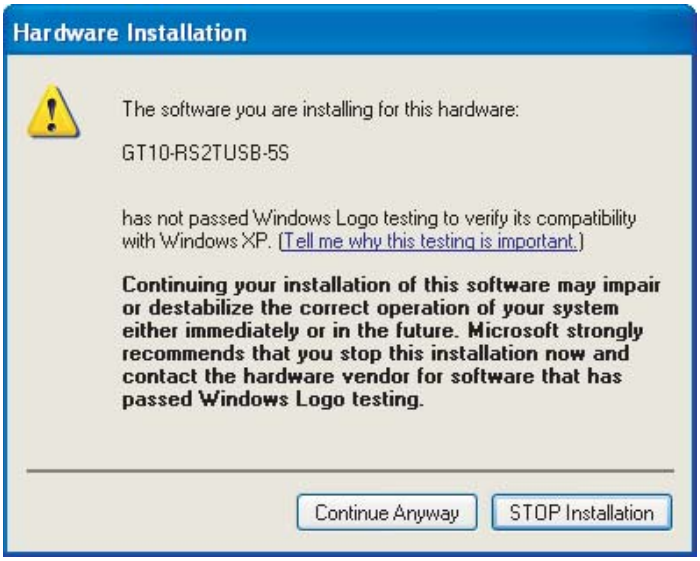
1. When the USB cable is connected to the personal computer, the following screen is displayed. (Installation of the software for USB driver)



Insert the included CD-ROM into the personal computer's CD-ROM drive.
Click [Next >].
The installation of the USB driver software will begin.

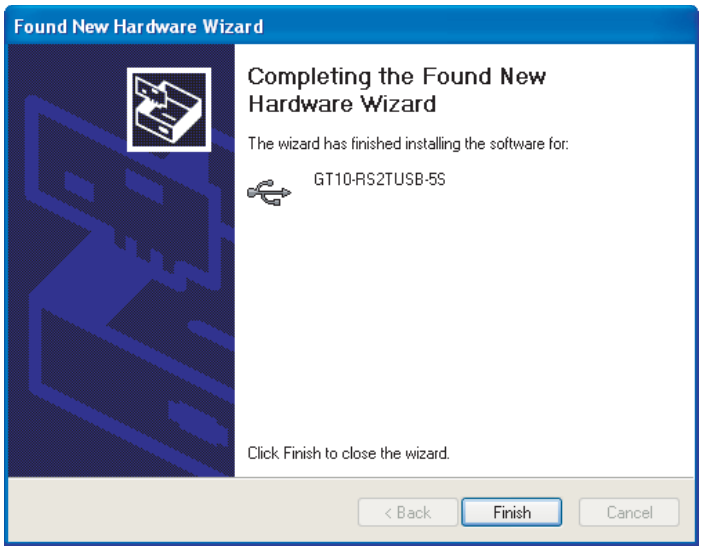
- If using Windows® 98, Windows® 98SE, Windows® Millennium Edition, and Windows® 2000, a window to select the location of the installation files.
  Please select the CD-ROM drive.

2. The following screen is displayed. (Only in Windows® XP)



Click [Continue Anyway].

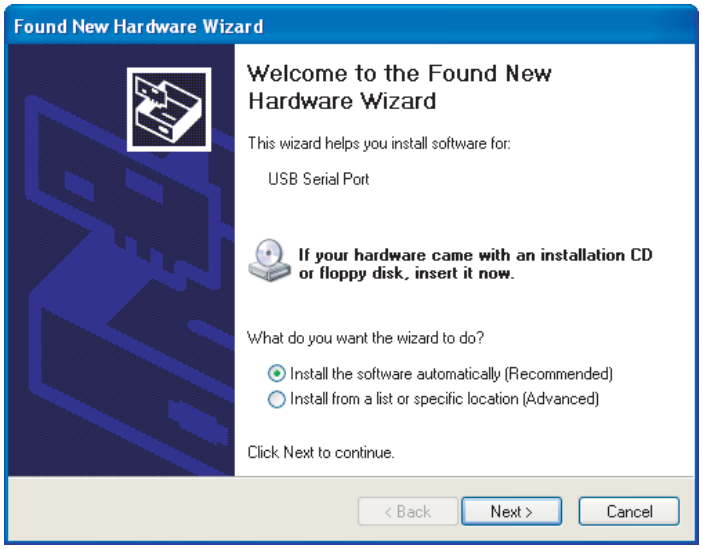
3 The following screen is displayed.



Click [Finish].
The installation of the USB driver software will finish.

- If Windows® 98, Windows® 98SE or Windows® Millennium Edition is used, installation of the USB Serial Port software begins, and ends automatically.
  The CD-ROM can be removed from the personal computer at this time.
- If using Windows® 2000 or Windows® XP, proceed to step 4.

4 The following screen is displayed.

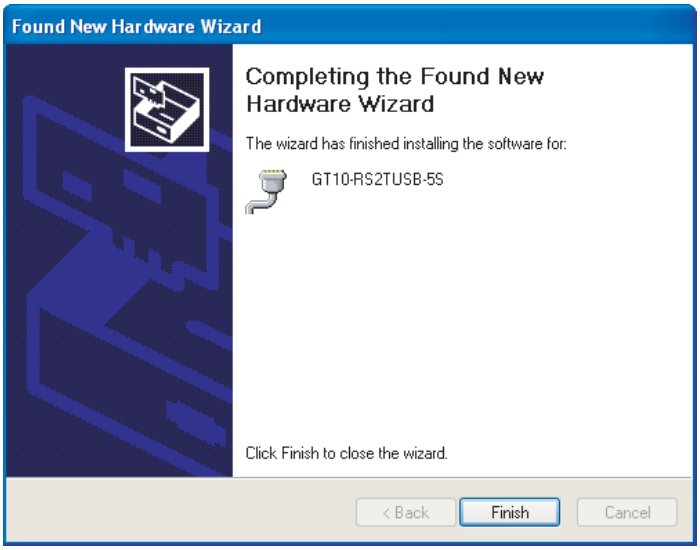


Click [Next >].
The installation of the USB Serial Port software will begin.

- If using Windows® 2000, a screen to select the location of the installation files is displayed.
  Please select the CD-ROM drive.

5 The screen of 2 is displayed. (Only in Windows® XP)
Click [Continue Anyway].

6 The following screen is displayed.



Click [Finish].
The installation of the USB Serial Port software will finish.
The CD-ROM (USB driver software) can be removed from the personal computer at this time.

8.2.4 Method for Uninstalling Driver

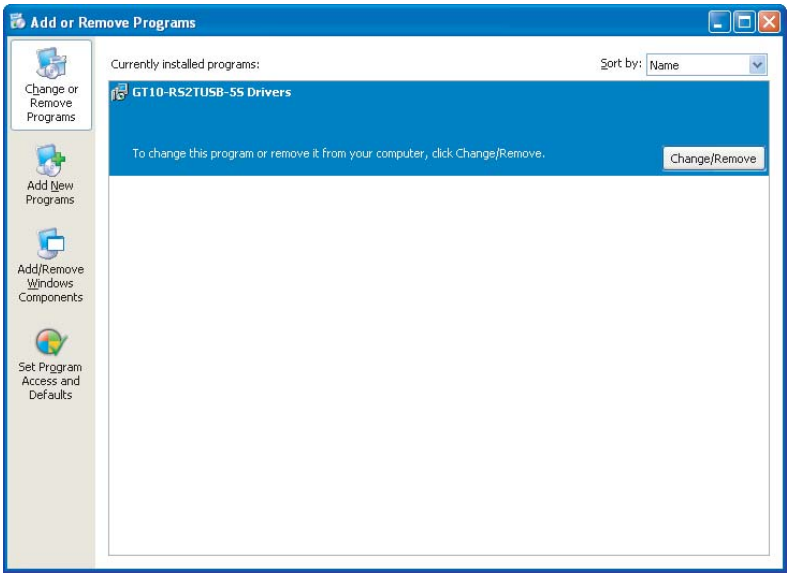
The procedure for uninstalling the driver is explained below.
A Windows® XP example follows.

Point

When the driver softwares for FX-USB-AW/FX3U-USB-BD and GT10-RS2TUSB-5S are installed, uninstalling one of these driver softwares may cause the other not to function properly.
When this happens, reinstall the driver software.

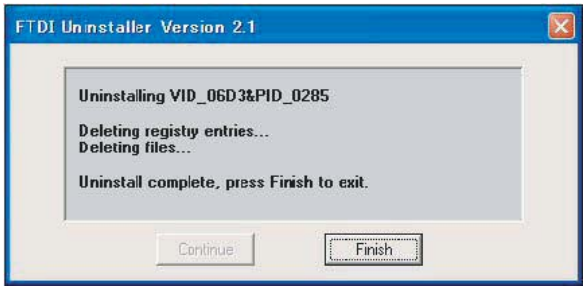
1 Detach the USB cable from the personal computer.
Click [Start] → [Control Panel] → [Add or Remove Programs] in the menu of the personal computer, the window below will be displayed.

- In case of Windows® Me of Windows® 98 and Windows® 98SE, Windows® 2000
  A screen that is equivalent to the one below is displayed by clicking [My Computer] → [Control Panel] → [Add/Remove Programs] in the menu of the personal computer.



Click [Change/Remove].

2 The following screen is displayed.
Click [Continue].



3 The following screen is displayed.
Click [Finish].

9. UTILITY FUNCTION

The utility functions allow the user to confirm the settings for communication interface, screen display, operation methods, and clock data as well as OS information.
GT10☐☐ is factory-installed with the Standard monitor OS and BootOS.
(An installation of the Standard monitor OS or BootOS is not required to use the utility functions.)

9.1 Utility Function List

The items in the following list can be set/operated on the utility screens.

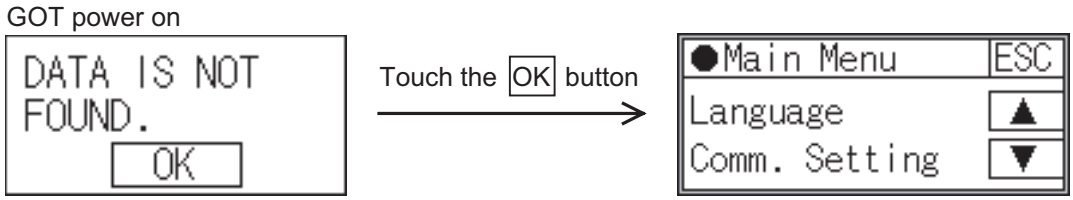
Item		Functions overview
Language		Switches the display language for the utility functions (Japanese/English)
Standard I/F		Displays the detailed information about the communication method and communication driver
Data transfer		Displays the screen for transferring project data between the PC and GOT (If any device other than the PC is allocated to the interface for communication with PC, the GOT will not be able to communicate with the PC, except when the Data transfer window is on the screen.)
Communication monitor		Displays the communication status of each communication port
Screen save	Time	Sets the screensaver activation time (from the last time the screen was touched) Setting range: 0 to 60 min. (Screensaver is disabled when it is set to 0 minute.) Default : 0 min.
	Backlight	This setting is used to decide whether to turn the backlight on or off when the screensaver comes on Default : OFF
Contrast		Adjusts the contrast on the liquid crystal display (16 level adjustment, 0 to 15) Default : 10
Buzzer volume		Changes the buzzer settings (OFF/SHORT/LONG) Default : SHORT
Calibration		Calibrates the touch panel sensitivity
Time setting		Sets the clock (clock data) on the PLC
Data	OS information	Displays the OS (Standard monitor OS, BootOS) and communication driver versions
	Clear data	Clears the project data and resource data on the GOT

9.2 Utility Display

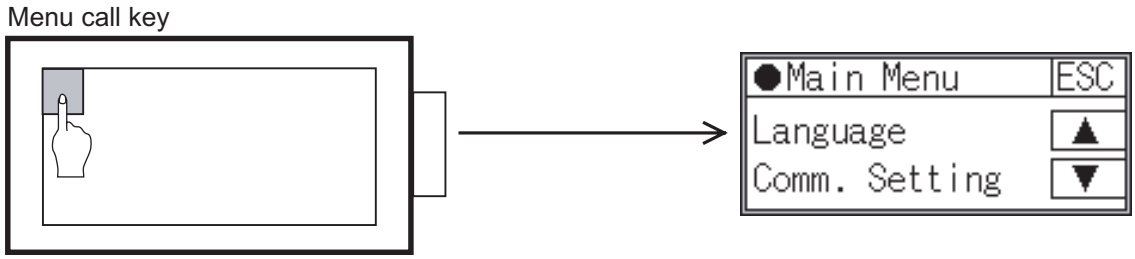
9.2.1 Display operation of main menu

The following three types of operation can display the main menu.
(The utility function windows appear in the horizontal format, and this format cannot be changed.)

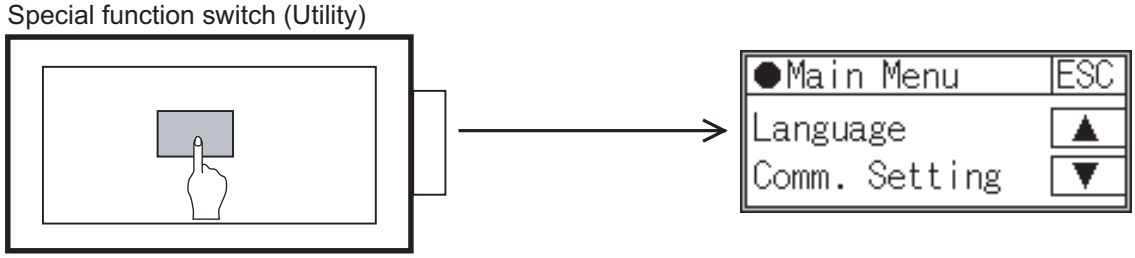
(1) When project data is undownloaded
After the GOT is turned on, a dialog box for notifying of absence of project data is displayed.
After the dialog box is displayed, touch the OK button to display the main menu.



(2) When touching menu call key
If you touch the menu call key while user-created screen is displayed, the main menu is displayed.
The menu call key can be set by GT Designer2.
(At factory shipment, it is set in the top left corner of the GOT screen.)



(3) When touching special function switch
If you touch the special function switch (utility) while user-created screen is displayed, the main menu is displayed.
The special function switch (utility) can be set as a touch switch that is displayed on a user-created screen by GT Designer2.
(When the utilities menu is assigned to the special function switch, the main menu appears when the switch is touched.)



For the details of the special function switch, refer to the following.

☞ GT Designer2 Version□ Screen Design Manual
Section 6.2 Touch Switch

Remark

Lock the utility display by password.

When a password is set on the GOT using GT Designer2, a password dialog box is displayed when trying to access the main menu of the utility display.
(The password setting option in GT Designer2 is located in the common menu.)
Enter the password that has been set.

(1) Input operation of password

1) Input the password after touching [0] to [9], [A] to [F] key.

2) Define the password by touching [Enter] key, after inputting password.

3) To correct the input character, touch [Del] key to delete the correcting character and then reinput/retype the new character.

(2) Password input cancel operation

When [ESC] button is touched, the screen returns to the monitor screen.
Refer to the following for details on setting passwords.

☞GT Designer2 Version□ Screen Design Manual

Section 3.5 Password Setting

(3) If an invalid password is entered

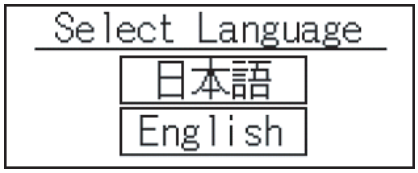
If an invalid password is entered, the error message will appear.

Touching the [OK] button will take the screen back to the monitor screen.

Point

When starting the GOT without selecting any language (At factory shipment)

The following screen will be displayed at the initial startup of GOT.
Touching the button of a desired language restarts the GOT and the language is switched to the selected one.

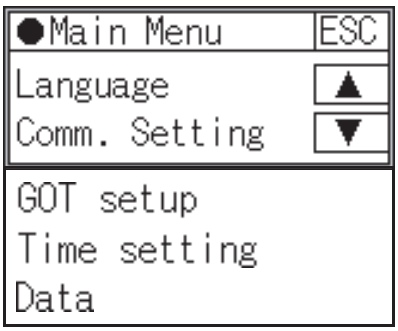


9.2.2 Utility basic configuration

The basic configuration of the screen is as follows.

1 Main Menu

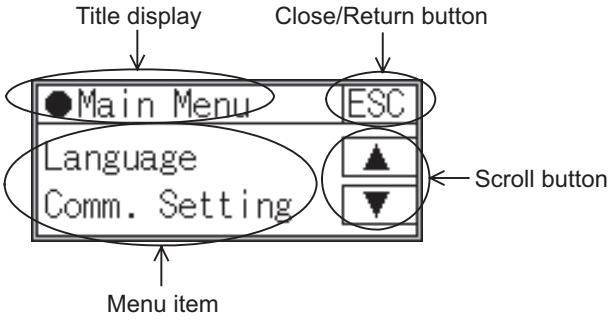
The menu items that can be selected from the GOT utility are displayed.



1 Use the ▲, ▼ buttons to select an item from the menu.

2 Touching a menu item in the main menu will display the setting screen or following selection screen for the item.

3 Touching the ESC button will take the screen back to the user screen.



(1) Title display
The screen title name is displayed in title display part.

(2) Close/Return button

When a middle screen of the layers is displayed, if the ESC (Close/return) button in the right corner of screen is touched, returns to the previous screen.
If this button is touched when directly displayed from monitor screen, the screen is closed and returns to monitor screen.

(3) Scroll button
For screens in which the content does not fit on one screen page, there is a right or down scroll button on the screen.

▲▼ Scroll one line/window

10. LANGUAGE SETTING (Language)

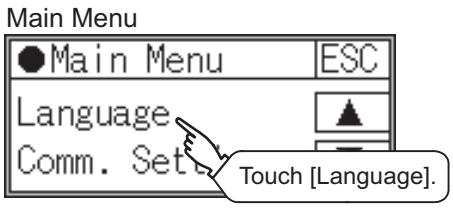
10.1 Display language setting

10.1.1 Display language setting function

This function allows display language selection.
The items which can be set are shown below.

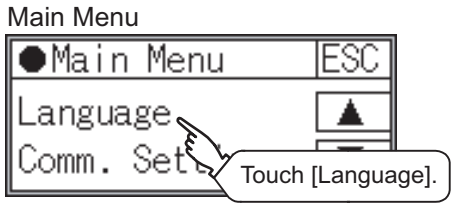
Item	Contents	Setting range
Language	Display language in which the utility functions and dialog windows are displayed can be selected or confirmed in this menu	Japanese/English <At factory shipment: Japanese>

10.1.2 Language display operation

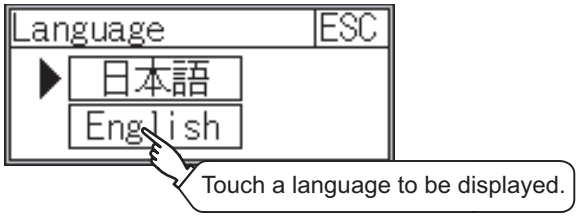


10.1.3 Language setting operation

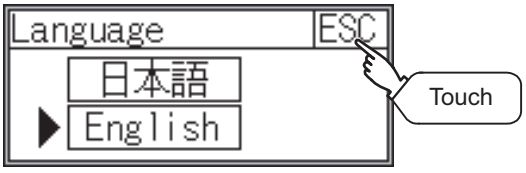
1 Language



1 Touch [Language] to bring up the set up screen.



2 Select a display language by touching the corresponding button.



3 Touch the ESC button to save the setting and close the window.

11. COMMUNICATION INTERFACE SETTING (COMMUNICATION SETTING)

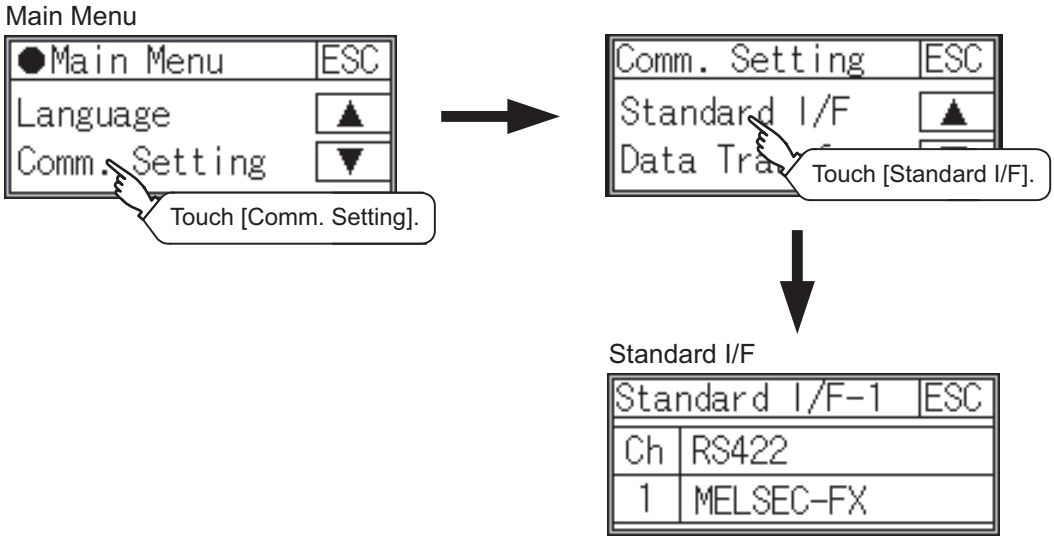
The [Communication Setting] menu has the [Standard I/F], [Data Transfer], and [Communication Monitor] menus.
The [Standard I/F] menu displays the information about the channel numbers, controller name, and detailed settings of the communication parameters that are allocated to the communication interfaces by GT Designer2.
The [Data Transfer] menu displays the screen for transferring project data between the PC and GOT.
The [Communication Monitor] menu displays the communication status of each communication port.

11.1 Standard I/F Setting

11.1.1 Standard I/F functions

Function	Contents
Channel no. display	Displays the channel number (CH No) that has been assigned by GT Designer2
Communication driver display	Displays the communication driver that has been assigned by GT Designer2
Communication parameters display	Displays the communication parameters of the controllers that has been assigned by GT Designer2

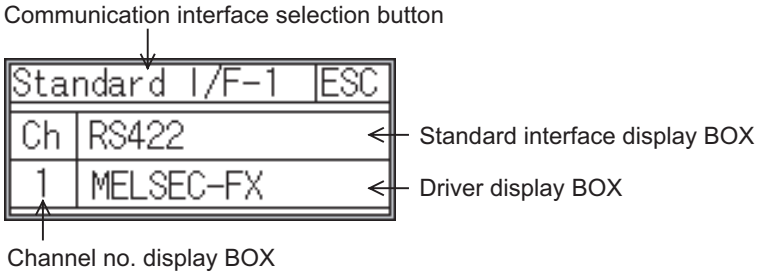
11.1.2 Standard I/F display operation



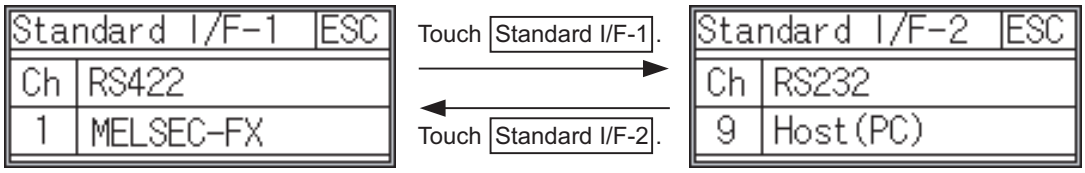
11.1.3 Display contents of standard I/F

Described below are the display items on the standard I/F setting menu and their functions.

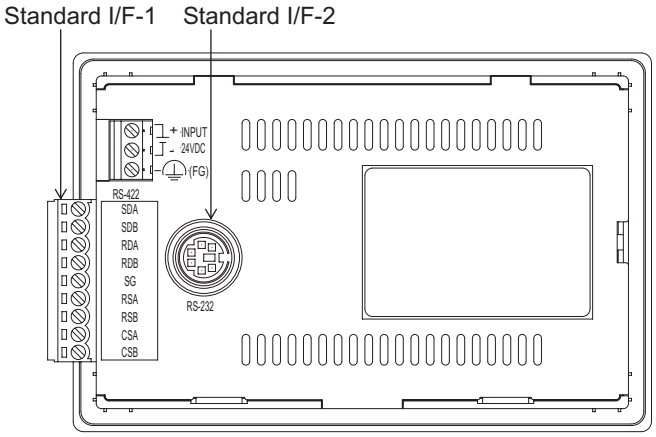
1 Display item column



(1) Communication interface selection button
Select the communication interface to be displayed.



The standard interface includes the following two types.
Standard I/F-1: For communication with PLC and microcomputer
Standard I/F-2: For communication with PC (GT Designer2), transparent



(2) Standard interface display BOX
Displays communication interface.
Whether an RS-422 or an RS-232 interface (Standard I/F-1) for communication with PLC is used depends on the GOT model.

- GT1020-LBD/LBL: RS-422 fixed
- GT1020-LBD2 : RS-232 fixed

The type of the interface (Standard I/F-2) for connection to PC is always RS-232.

(3) Channel no. display BOX

0: Set when the communication interface is not used.
1: Set when connecting to PLC.
(settable only for the interface (Standard I/F-1) for communication with PLC)
9: Set when connecting to PC (GT Designer2).

• Setting is not allowed for 2 to 8, *.

(4) Driver display BOX

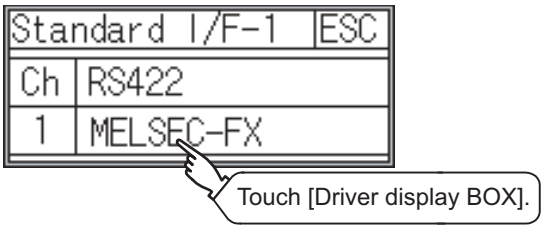
The name of the communication driver for which a channel number is assigned is displayed.
"None" is displayed in the driver display box in the following cases :

• The communication driver is not installed. (☞ Section 14.2 OS Information)

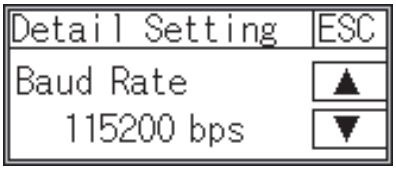
• "0" is set in the channel number specification menu box.

[*****] will appear when the communication driver that was installed on the GOT from GT Designer2 and the controller setting that was downloaded on to the GOT from Designer2 do not match.
When setting the channel number to "9", the communication driver "Host (PC)" is automatically assigned.
When the driver display box is touched, the screen jumps to the detail information screen and the communication parameter appears.

2 Detail information display operation



1 Touch Standard I/F-1 driver display box in the Standard I/F setting window.



2 The screen jumps to the detailed information screen and the communication parameter will appear.

Use the ▲, ▼ buttons to toggle through the items when there are multiple items to be set.

(The ▲, ▼ buttons will not work when no other items are available.)

3 Touch the ESC button to close the detail setting screen.

The types of items that are in the communication parameter setting menu depend on the type of communication driver that is installed on the GOT in use.
Refer to the section below for the setting contents of various drivers.

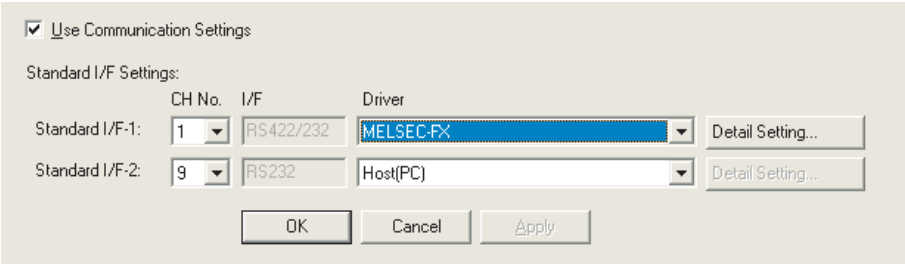
☞ GT Designer2 Version□ Screen Design Manual
Section 3.7 Communication Interface Setting (Communication Settings)

Point

Precautions for communication between GOT and connected devices

(1) Installing [Communication driver] and downloading [Communication Settings]
To perform communication with the connected device, the following actions are necessary.
1) Installing [Communication driver] (Up to 1, OS installation)
The driver for [MELSEC-FX] is factory-installed. Install the communication driver to connect a controller other than a MELSEC-FX.
2) Assigning channel number and communication driver to communication interface (Communication Setting)
3) Downloading [Communication Settings] (project data) assigned in step 2)

Perform 1), 2) and 3) with GT Designer2.



To change the communication parameter setting after downloading project data, change the setting at GT Designer2 again.

For [Communication Settings], refer to the following manual.

☞GT Designer 2 Version□ Screen Design Manual
Section 3.7 Communication Interface Setting (Communication settings).

For installation of [Communication driver] (OS) and download of project data, refer to the following manual.

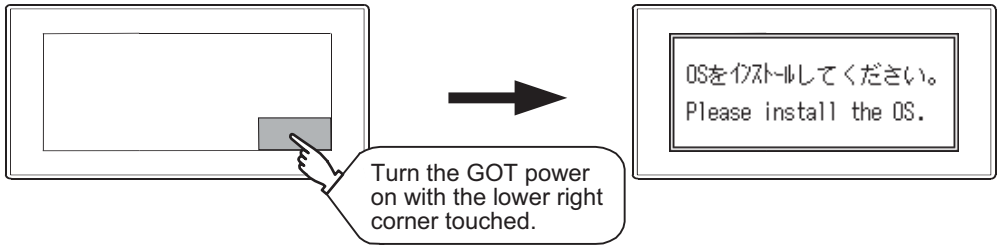
☞GT Designer 2 Version□ Basic Operation/Data Transfer Manual
Chapter 8 TRANSFERRING DATA

(2) When [Communication Settings] has not been downloaded using GT Designer2
When [Communication Settings] has not been downloaded, the GOT automatically assigns the installed communication driver as the standard I/F-1.

11.1.4 Installing of communication driver

GT10☐☐ is factory-installed with the driver for MELSEC-FX.
An installation of the communication driver is required when connected to a controller other than a MELSEC-FX.
When installing communication driver onto the GOT, power on the GOT in the OS transmission mode.

(Operating of transmission mode)



Refer to the chapter below for detailed information on the OS installation screen of the GOT.

☞Chapter 15. OS INSTALLATION

Refer to the chapter below for how to install the communication driver from GT Designer2.

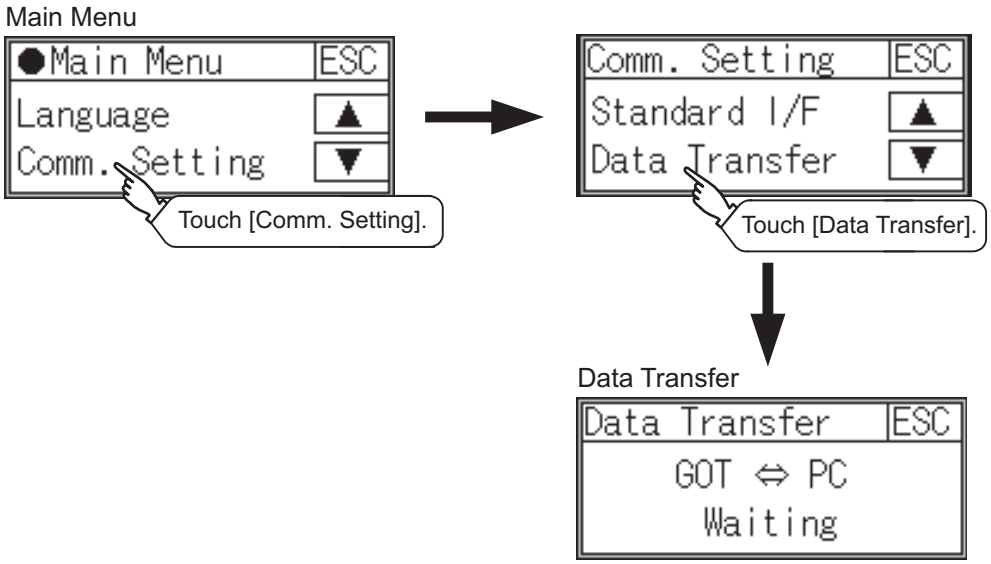
☞GT Designer 2 Version☐ Basic Operation/Data Transfer Manual
Chapter 8. TRANSFERRING DATA

11.2 Data Transfer

11.2.1 Data transfer functions

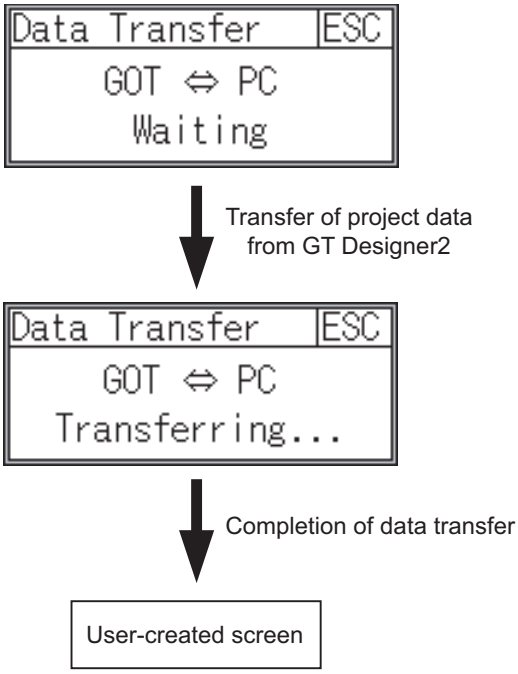
Function	Contents
Data transfer screen display	Displays the screen for transferring project data between the PC and GOT. If any device other than the PC is allocated to the interface for communication with PC, the GOT will not be able to communicate with the PC, except when the Data transfer window is on the screen.

11.2.2 Data transfer operation



11.2.3 Data transfer display

[Waiting] on the data transfer screen will change to [Transferring...] when project data are transferred from GT Designer2.
At the completion of data transfer, the user-created screen will appear.

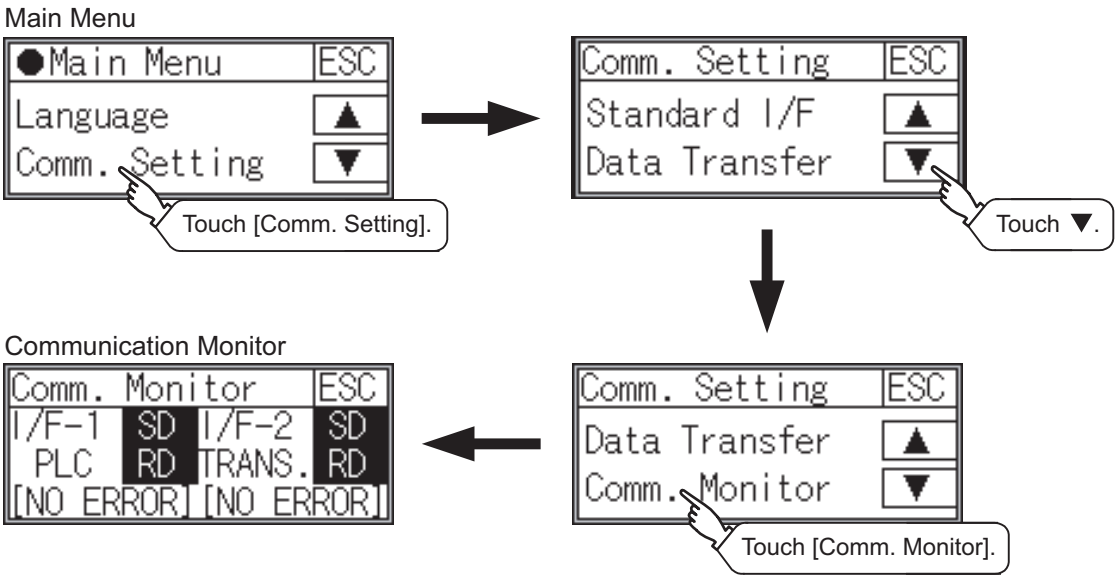


11.3 Communication Monitor

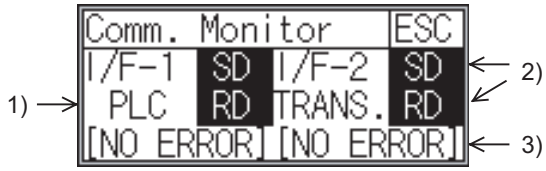
11.3.1 Communication Monitor functions

Function	Contents
Communication port-selection status display	Displays the connection status of Standard I/F-1 and I/F-2
Communication status display	Displays the communication status (SD: send, RD: receive)
Communication error status display	Displays an error message when a communication error occurs

11.3.2 Communication Monitor display operation



11.3.3 Screen display content



1) Connection status of the communication ports
Indicates the connection status of Standard I/F-1 and I/F-2.
Listed in the table below are display items and the connection status (channel number).

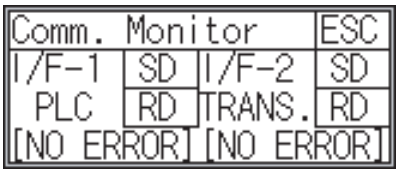
Display item	Channel number	Remarks
PLC	Ch1	"PLC" appears when connected to a controller (PLC or microcomputer)
TRANS.	Ch9	"TRANS." appears when the controller that is allocated to one of the communication ports supports the transparent mode "TRANS." automatically changes to "PC" when communicating with GT Designer2
PC	Ch9	"PC" appears when the controller that is allocated to one of the communication ports does not support the transparent mode

2) Communication status
Communication status of each communication port is displayed on this screen.
The SD and RD symbols appear in black on white (SD, RD) while data are being sent or received, and in white on black (SD, RD) at other times. They may appear lit depending on the communication status.

The SD and RD symbols on the screen indicate normal communication or cable disconnection.

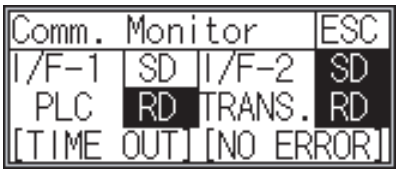
Port	Channel number	Controller type
I/F-1	Ch1	MELSEC-FX
IF-2	Ch9	–

[During normal communication (with connection to a device that supports the transparent mode)]



The SD and RD symbols for both I/F-1 and I/F-2 blink.

[When the connecting cable with the controller is disconnected]



Only the SD symbol next to I/F-1 blinks.

3) Communication error status

Communication error status of each port is displayed on this screen.

The table below summarizes the types and nature of the errors.

Display item	Action
NO ERROR	Communication is executed normally.
ERR Ovr.	The receive data is sent continuously with a short interval. Let the baud rate (communication speed) be equivalent between the GOT and counterpart equipment.
ERR Frm.	The communication frames of GOT and PLC are inconsistent. Confirm the communication settings of GOT and PLC, such as data length, stop bit and baud rate.
ERR Prt.	The parity check conditions of GOT and PLC are inconsistent. Let the parity check condition (odd or even) of GOT and PLC be consistent.
ERR Text	The sum data is inconsistent. Or the contents of the receive data are not consistent with the send command from the GOT. Let the communication settings and contents of data be consistent between the GOT and counterpart equipment. (If NAK is received while the GOT is connected to the micro computer board, a text error occurs.)
TIME OUT	Though receiving is started, receive data is not sent. Check the wiring between the GOT and its communication target. (When the GOT is connected to the micro computer board, confirm the terminator, CR, wiring, etc.)
ERR Line	The control line is not operating correctly. Confirm the wiring of the control line.
ERR Cmd.	A command contained in the receive data is not consistent with the send command from the GOT.

12. DISPLAY AND OPERATION SETTINGS (GOT SET UP)

Setting screen for display and setting screen for operation can be displayed from GOT setup.
In the setting screen for display and the setting screen for operation, the following settings can be set.

Screen	Description
Setting screen for display	Screen save time
	Screen save backlight
	Contrast
Setting screen for operation	Buzzer volume
	Calibration

12.1 Display Settings

12.1.1 Display setting functions

Setting regarding display is possible. The items which can be set are shown below.

Items	Contents	Setting range
Screen save time	The period from the user stops the touch panel operation till the screen save function starts can be set.	0 to 60 minutes <At factory shipment: 0 minutes> When set to 0, the function becomes invalid.
Screen save backlight	Whether turn ON or OFF the backlight simultaneously at the screen save function start can be specified.	ON/OFF <At factory shipment: OFF>
Contrast	Contrast can be adjusted.	16-level adjustment (0 to 15) <At factory shipment: 10>

Point

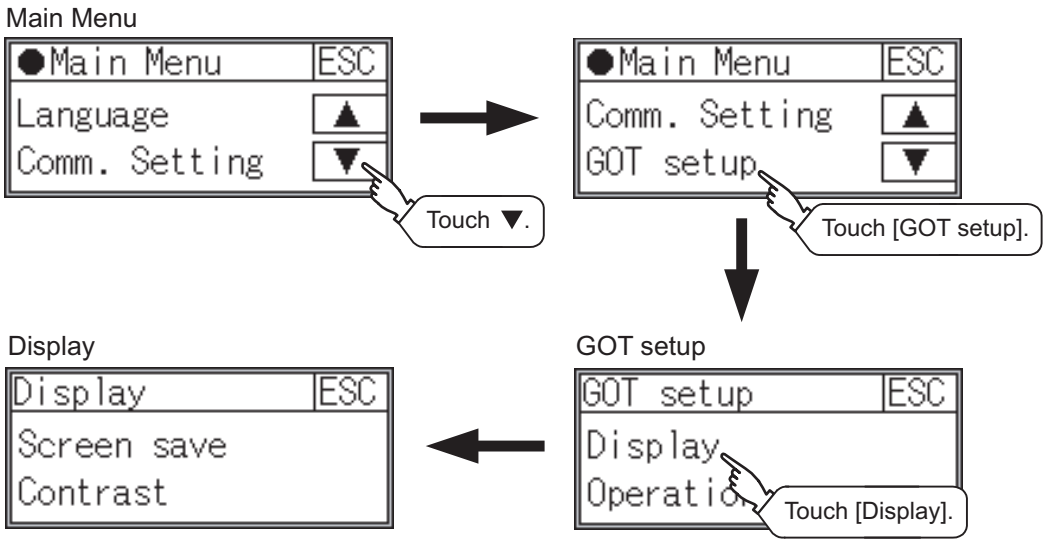
(1) Display setting by GT Designer2
Set title display period, screen save time and screen save backlight at [GOT set up] in [System Environment] of GT Designer2.
When change a part of the setting after downloading the project data, change the setting by [Display] screen of the GOT.

☞GT Designer2 Version □ Screen Design Manual
(Section 3.8 Setting of the GOT display and operation (GOT setup))

(2) Screen save and screen save backlight OFF function
When using the screen save and screen save back light OFF function, select valid/invalid by the system information reading device in [System Environment] of GT Designer2.
For system information details, refer the following.

☞GT Designer2 Version □ Screen Design Manual
(Section 3.6 Setting System Information)

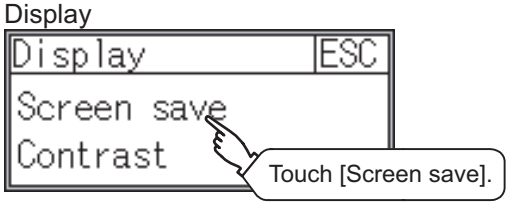
12.1.2 Display operation of display setting



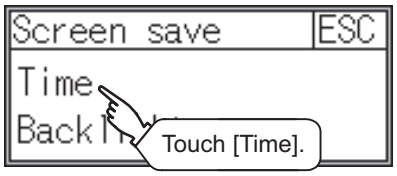
12.1.3 Display setting operations

1 Screen save time

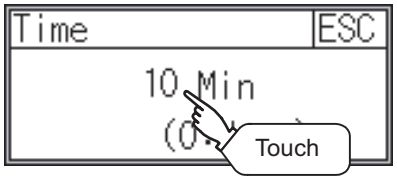
Display



1 Touch [Screen Save] to bring up the screensaver setting window.



2 Touch [Time] to bring up the time setting window.



3 Touch the time that appears on the time setting window to bring up the ten-key pad.

			10	ESC
7	8	9	0	AC
4	5	6	+/-	DEL
1	2	3	.	ENT

4 Enter the time using the ten-key pad.

"0" to "9" : Use these keys to enter numerical values. Enter "0" to disable the screensaver function

"ESC" : Closes the ten-key window without saving any value entered

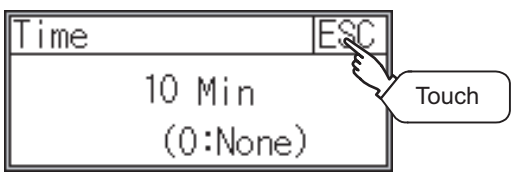
"AC" : Deletes the entire string of numerical characters that are being entered

"DEL" : Deletes a digit from a string of numerical characters that are being entered

"ENT" : Enters the value for the clock that has been entered and closes the ten-key pad window

"+ / –" : Switches between positive and negative values (Only positive values are valid for the clock setting.)

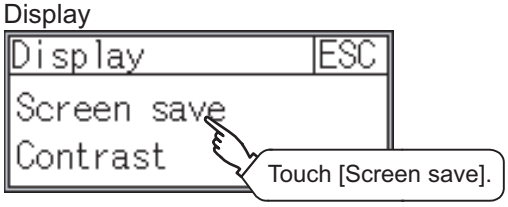
" . " : Invalid key (not used)



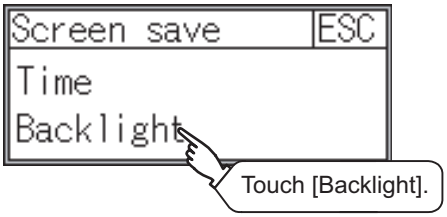
5 When all the settings have been made, touch the ESC button to close the setting window.

2 Screen save backlight

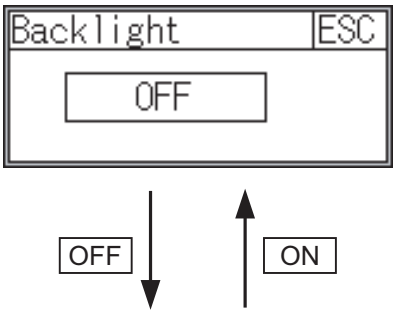
Display



1 Touch [Screen Save] to bring up the screensaver setting window.

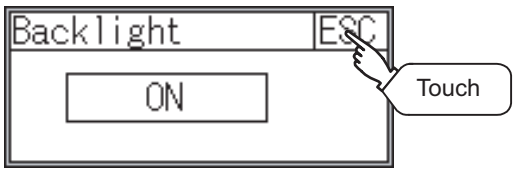


2 Touch [Backlight] to bring up the backlight setting window.



3 Touch the OFF / ON button to turn off/turn on the backlight.

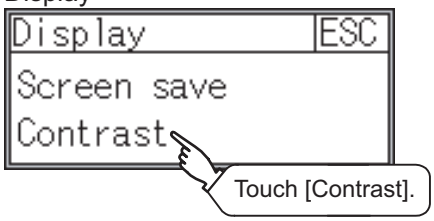
- OFF button: Screen save, Transferring..., Backlight, Unlit
- ON button: Screen save, Transferring..., Backlight, Lit



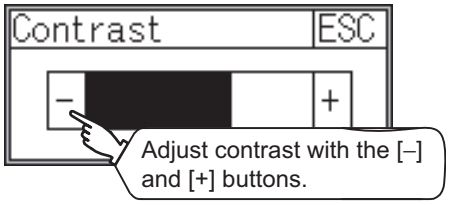
4 After changing the settings, touch the ESC button to save the changes and close the setting window.

3 Contrast

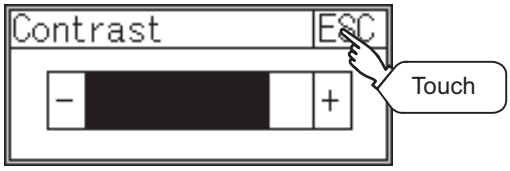
Display



1 Touch [Contrast] to bring up the setting window.



2 Touch the [–] and [+] buttons to adjust the contrast of the screen.



3 After changing the settings, touch the ESC button to save the changes and close the setting window.

12.2 Operation Settings

12.2.1 Operation setting functions

Setting regarding GOT operation can be set.
The items which can be set are described below.

Function	Contents	Setting range
Buzzer volume	Buzzer volume setting can be changed	OFF/SHORT/LONG <At factory shipment: SHORT>
Calibration	Touch panel sensitivity can be adjusted using this function	– <At factory shipment: already adjusted>

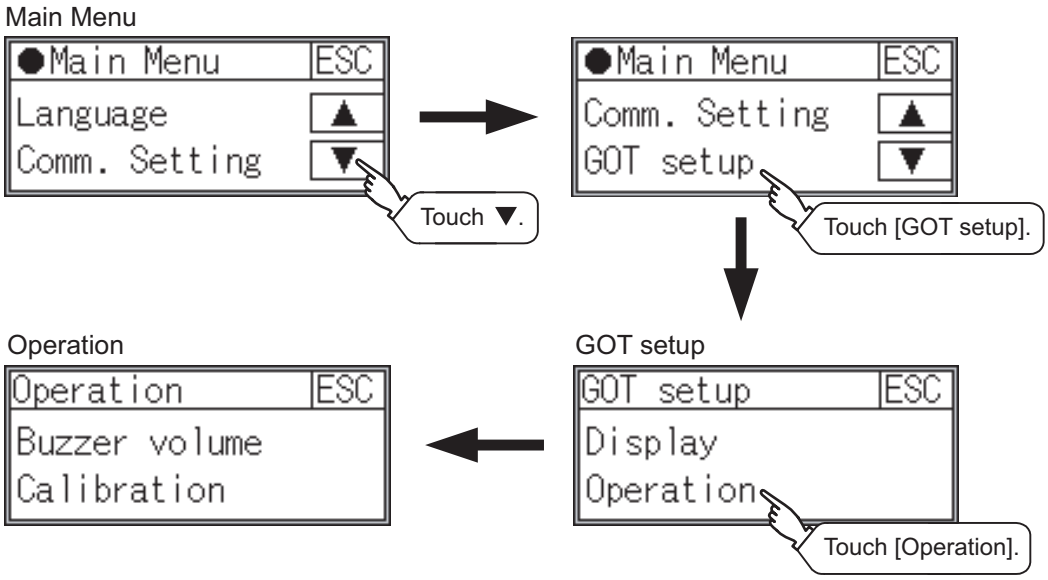
Point

Operation settings by GT Designer2

Set buzzer volume and window move buzzer volume by [GOT setup] in [System Environment] of GT Designer2.
When change a part of the setting, change the setting by the GOT display setting after downloading the project data.

☞GT Designer2 Version □ Screen Design Manual
Section 3.8 Setting of the GOT display and operation (GOT setup)

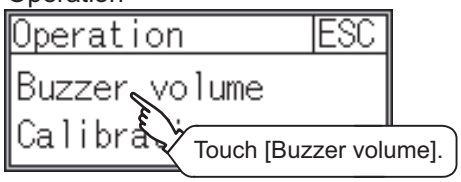
12.2.2 Display operation of operation setting

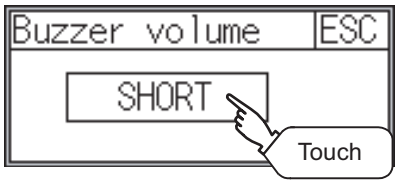


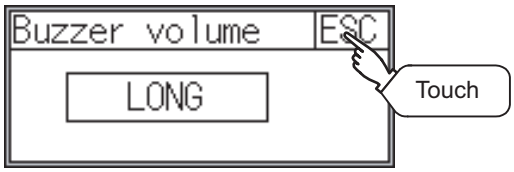
12.2.3 Setting operation of operation

1 Buzzer volume

Operation







1 Touch [Buzzer volume] to bring up the setting screen.

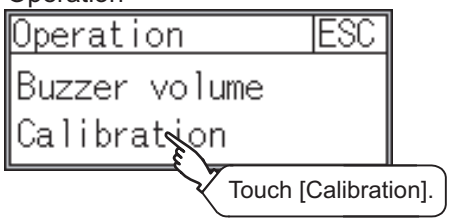
2 Touch a setting item to change the setting.

(Buzzer volume: SHORT ⇄ LONG ⇄ OFF)

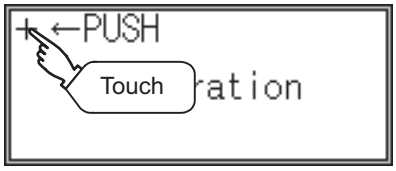
3 After changing the settings, touch the ESC button to save the changes and close the setting window.

2 Calibration

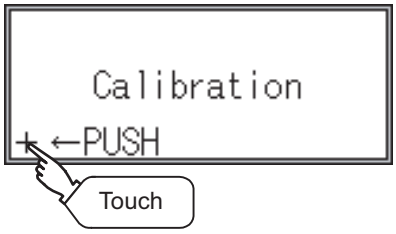
Operation



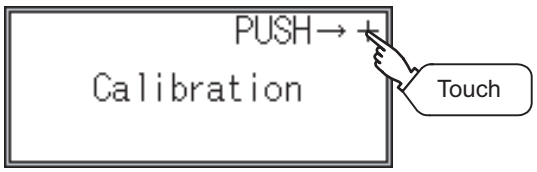
1 Touch [Calibration] to bring up the setting screen.



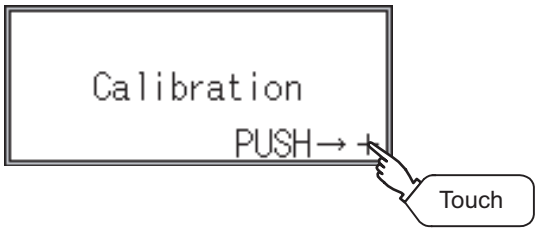
2 Touch the "+" symbol at the top left corner.



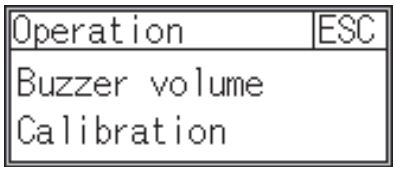
3 Touch the "+" symbol at the bottom left corner.



4 Touch the "+" symbol at the top right corner.



5 Touch the "+" symbol at the bottom right corner.

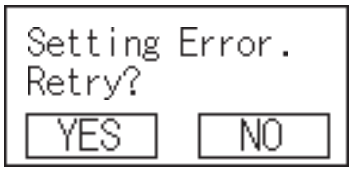


6 5 completes the calibration process, and the [Operation] window will reappear.

Point

Touch panel calibration error

If touch panel calibration results in inoperability of the panel, the following message will appear.



YES button: Returns to the touch panel calibration screen.

NO button: Aborts calibration without saving any changes to the touch panel setting.

13. CLOCK SETTING (TIME SETTING AND DISPLAY)

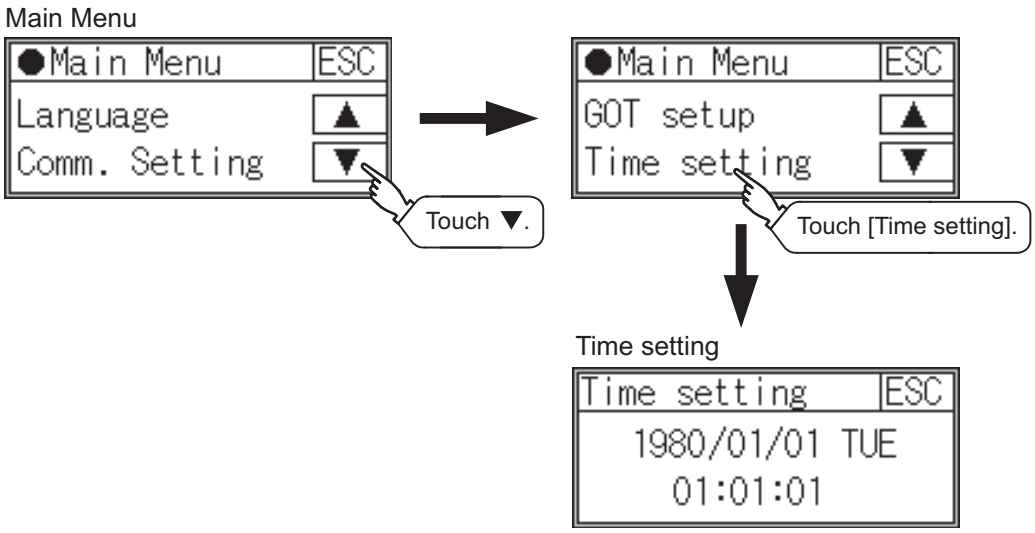
The clock data (date and time) are made in the clock setting menu.

13.1 Time Setting and Display

13.1.1 Time setting and display functions

Function	Contents
Clock display	Displays and sets up PLC CPU clock data

13.1.2 Clock display and setting operation



Point

When connecting with an external device which does not have clock function

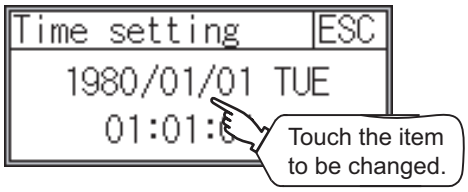
When connecting with an external device (PLC) which do not have clock function, the clock data will not be adjusted.
Refer to the following for the list of PLC installed with clock function.

☞ GT Designer2 Version☐ Screen Design Manual
(Section 2.4.3 PLC CPUs with clock function)

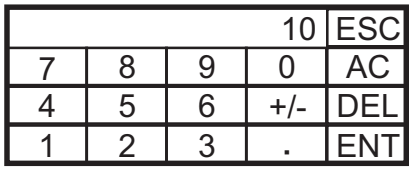
13.1.3 Clock setting operations

1 Clock display

Displays and sets up the clock data on the GOT.



1 Touch either the date or time to be changed.



2 Enter date or time on the ten-key pad.

The day of the week is displayed automatically according to the input date.

"0" to "9": Use these keys to enter numerical values

"ESC" : Closes the ten-key window without saving any value entered for the date or time

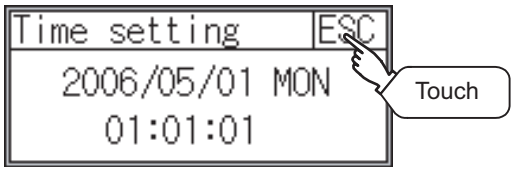
"AC" : Deletes the entire string of numerical characters that are being entered

"DEL" : Deletes a digit from a string of numerical characters that are being entered

"ENT" : Enters the value for the date or clock that has been entered and closes the ten-key pad window

"+ / –" : Switches between positive and negative values (Only positive values are valid for the date or clock setting.)

" . " : Invalid key (not used)



3 After changing the settings, touch the ESC button to save the changes and close the setting window.

14. FILE DISPLAY (DATA)

This function displays the version of the OS (Standard monitor OS, BootOS) and communication driver that are written to the GOT. Project data and resource data can be deleted with this function.

14.1 Data Storage Location

The following drive name (C drive) is assigned to the built-in Flash Memory on the GT1020.

Drive name	Allocation
C drive	Flash Memory (Internal)

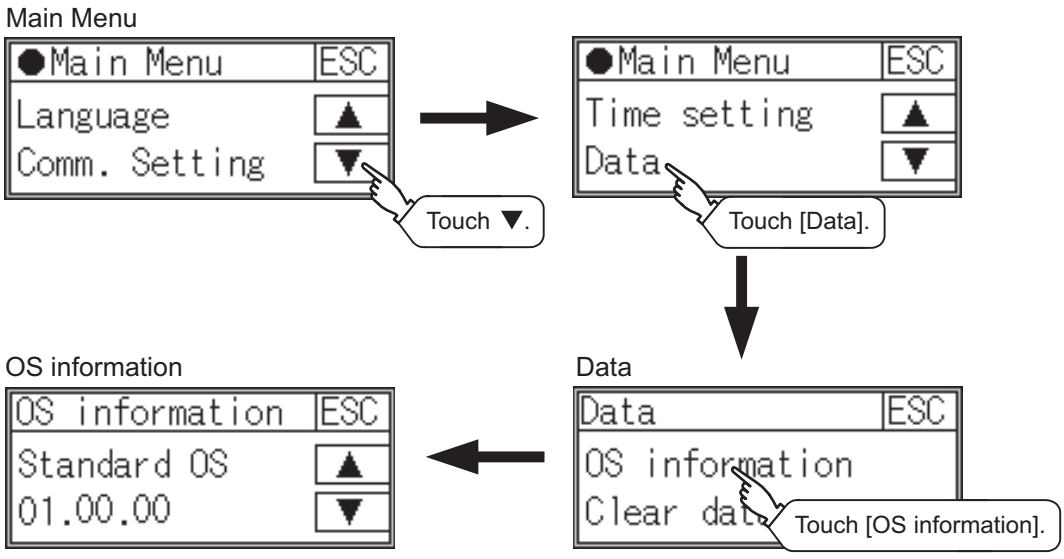
14.2 OS Information

14.2.1 Function of OS information

This function displays the version of the OS (Standard monitor OS, BootOS) and communication driver on the built-in flash memory (C drive).

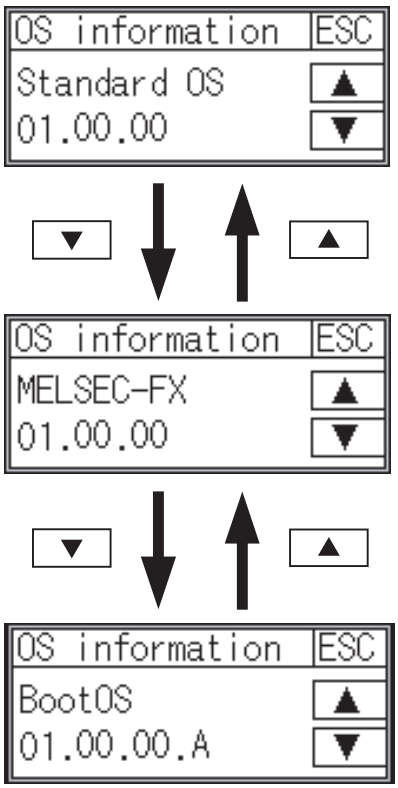
Function	Contents
OS information	Displays the version of the OS (Standard monitor OS, BootOS) and communication driver

14.2.2 Display operation of OS information screen



14.2.3 OS information operation

1 OS information display



1 Touch the ▼ and ▲ buttons to toggle through the version of the [Standard monitor OS], [Communication driver], and [BootOS].

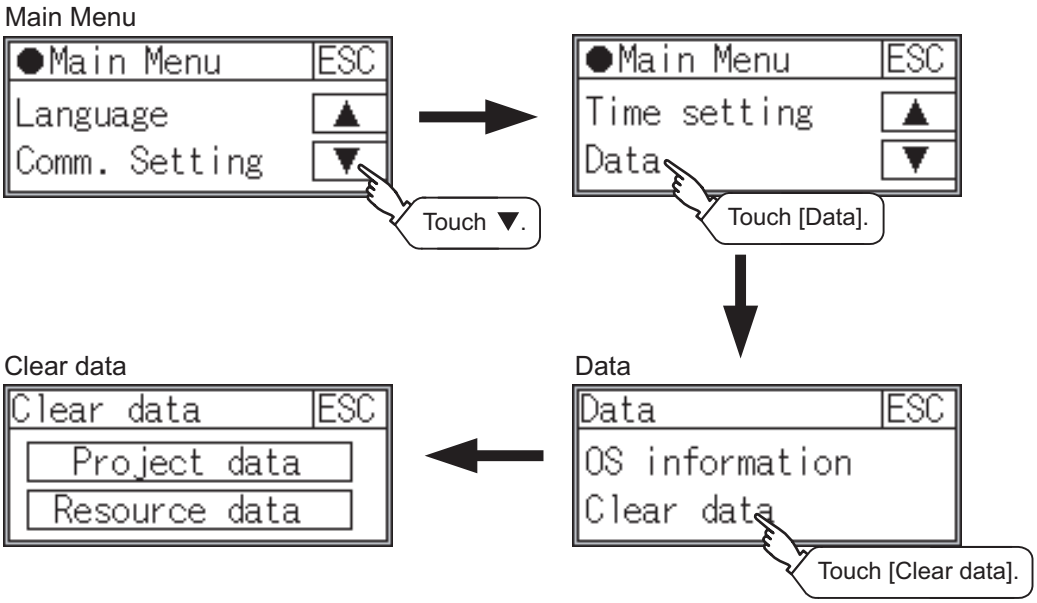
2 Touch the ESC button to close the screen.

14.3 Clear data

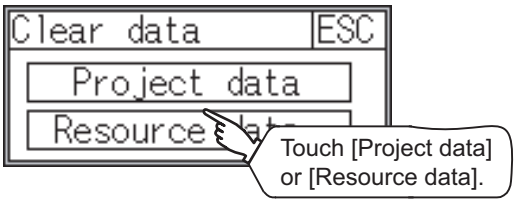
14.3.1 Clear data functions

This function deletes the project data and resource data that are written to the GOT.

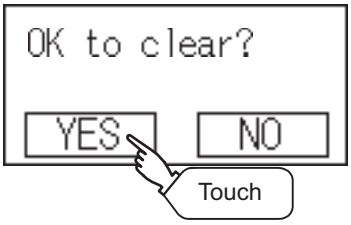
14.3.2 Clear data display



14.3.3 Clear data operation



1 Touch the type of data on the screen to be deleted.



2 The dialog mentioned left is displayed for confirmation.

Touch the YES button to delete the data, or the NO button to cancel.

Remark Canceling deletion

Data deletion cannot be cancelled once the YES button is pressed at the confirm deletion prompt. Double check before touching the YES button.

15. OS INSTALLATION

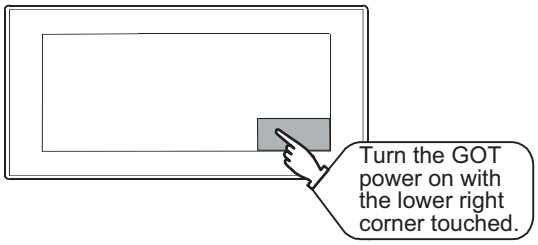
15.1 About the OS

GT10☐☐ is factory-installed with the BootOS, Standard monitor OS, and communication driver ([MELSEC-FX]).
Standard monitor OS is upgradeable from GT Designer2.
An installation of the communication driver is required when connected to a controller other than a MELSEC-FX.
(BootOS cannot be installed from GT Designer2.)

15.2 Standard monitor OS/ Communication Driver Installation

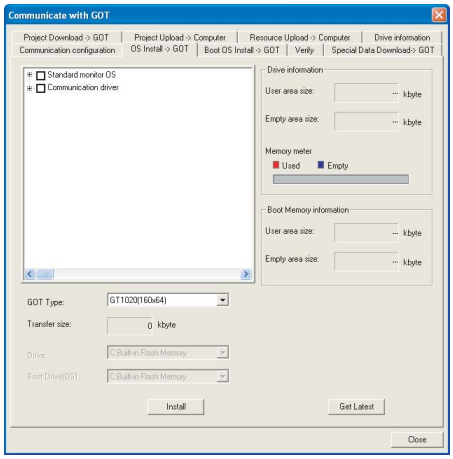
When installing the Standard monitor OS or communication driver, first bring up the OS installation screen on the GOT, and then install the communication driver from GT Designer2.

1 Operation on the OS installation screen



1 Turn on the power while pressing and holding the bottom right corner of the screen.

2 The OS installation screen will appear.



3 Install the Standard monitor OS and communication driver from GT Designer2.

Refer to the chapter below for how to install the Standard monitor OS and communication driver from GT Designer2.

☞ GT Designer2 Version☐
Basic Operation/Data Transfer Manual
(Chapter 8 TRANSFERRING DATA)

4 At the completion of Standard monitor OS/ communication driver installation, the GOT reboots itself and the user-created screen will appear.
If no project data exist, a dialog will appear indicating that no project data exist.

Point

Checking the communication driver version

Some versions of the Standard monitor OS and communication driver may not be compatible with each other, and the communication driver may not function properly. (e.g., The version of the Standard monitor OS is too old to recognize the newer version of the communication driver.)
The Standard monitor OS checks the version of the communication driver to see if it is compatible. If it is not compatible, a dialog that recommends Standard monitor OS update will appear.

Touching the [OK] button will take the screen back to the utility display screen.
Normal operation of the unit will require an update of the Standard monitor OS.

16. MAINTENANCE AND INSPECTION

STARTUP AND MAINTENANCE PRECAUTIONS

DANGER

- When power is on, do not touch the terminals.
  Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
  Not switching the power off in all phases can cause a unit failure or malfunction.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

STARTUP AND MAINTENANCE PRECAUTIONS

CAUTION

- Do not disassemble or modify the unit.
  Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the unit directly.
  Doing so can cause a unit malfunction or failure.
- The cables connected to the unit must be run in ducts or clamped.
  Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the unit, do not hold and pull the cable portion.
  Doing so can cause the unit or cable to be damaged or can cause a malfunction due to a cable connection fault.
- Before touching the unit, always touch grounded metal, etc. to discharge static electricity from human body, etc.
  Not doing so can cause the unit to fail or malfunction.

DISPOSAL PRECAUTIONS

CAUTION

- When disposing of the product, handle it as industrial waste.

The GOT does not include consumable components that will cause the shorten life.
However, liquid crystal screen has life length.
(For the replacement of the liquid crystal screen, please consult your nearest sales office or FA center.)

For the life of the LCD screen, refer to the following.

☞ Section 3.2 Performance Specifications

16.1 Daily Inspection

Daily inspection items

No.	Inspection Item		Inspection Method	Criterion	Action
1	GOT mounting status		Check for loose mounting screws.	Securely mounted	Retighten screws within the specified torque range
2	Connection status	Loose terminal screws	Retighten screws with screwdriver	Not loose	Retighten terminal screws
		Loose connectors	Visual check	Not loose	Retighten connector fixing screws
3	Usage status	Dirt on protection sheet	Visual check	Not outstanding	Replace with new one
		Foreign material attachment	Visual check	No foreign matter sticking	Remove clean

Refer to the following for the model names of the protection sheet or the replacement procedure.

☞ Section 8.1 Protective Sheet

16.2 Periodic Inspection

Yearly or half-yearly inspection items
The following inspection should also be performed when equipment has been moved or modified or the wiring changed.

No.	Inspection Item		Inspection Method	Criterion		Action
1	Surrounding environment	Ambient temperature	Make measurement with thermometer or hygrometer Measure corrosive gas	Display section	0 to 50°C	For use in control panel, temperature inside control panel is ambient temperature
				Other portions	0 to 55°C	
		Ambient humidity		10 to 90%RH		
		Atmosphere		No corrosive gas		
2	Power supply voltage check		24VDC Measure voltage across terminals.	20.4 to 26.4VDC		Change supply power
3	Mounting status	Looseness	Move module	Should be mounted firmly		Retighten screws
		Dirt, foreign matter	Visual check	No dirt, foreign matter sticking		Remove, clean
4	Connection status	Loose terminal screws	Retighten screws with screwdriver	Not loose		Retighten terminal screws
		Loose connectors	Visual check	Not loose		Retighten connector fixing screws

16.3 Cleaning Method

Use the GOT always in a clean condition.
To clean the GOT, wipe the dirty part with a soft cloth using neutral detergent.

Point

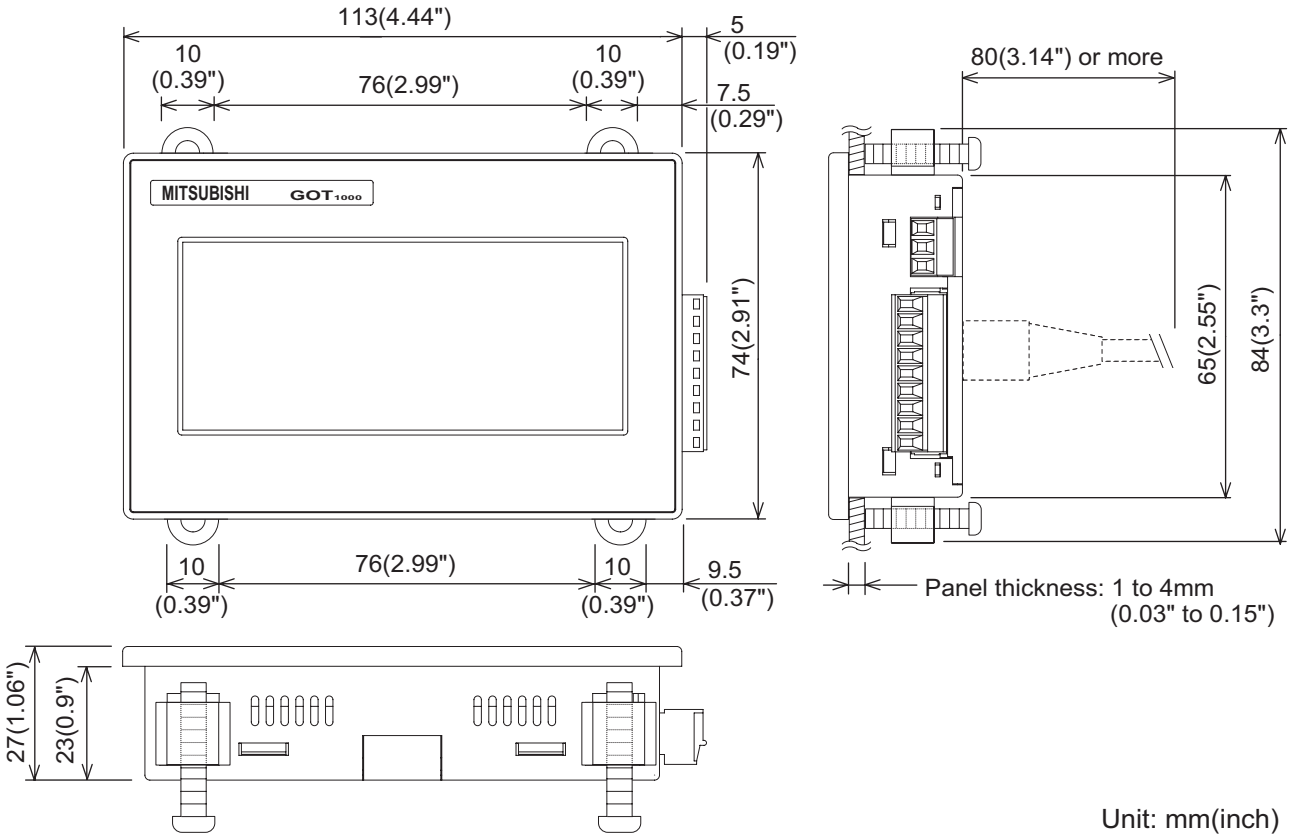
Precautions for cleaning

Do not use chemicals such as thinner, organic solvents and strong acids, since they may cause the protective sheet to be deformed or the dissolvable paint on the surface to peel off.
In addition, do not use spray solvents since they may cause the electrical failure of the GOT and peripheral devices.

APPENDICES

Appendix 1 External Dimensions

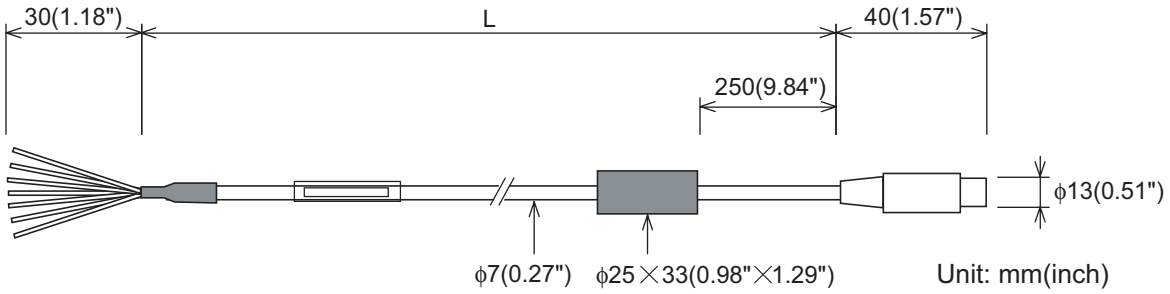
External dimensions of GT10□□



Unit: mm(inch)

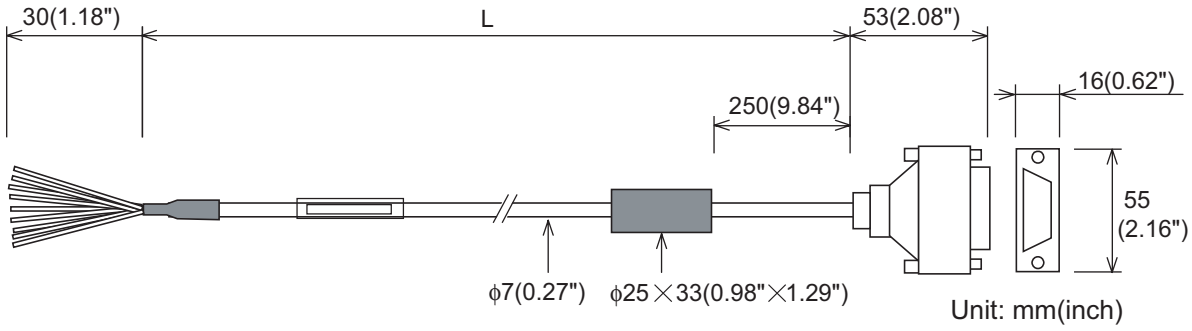
External dimensions of communication cable

GT10-C□□R4-8P



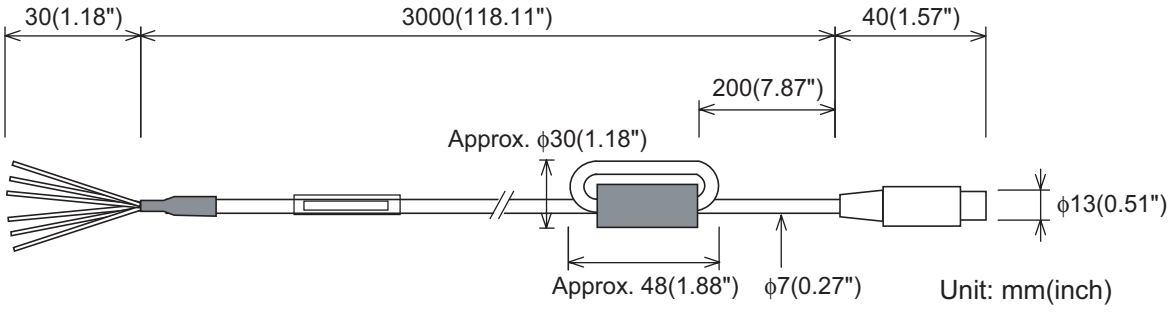
Model name	L (mm (inch))	Remarks
GT10-C10R4-8P	1,000 (39.37")	RS-422 cable for direct connection to FXCPU (8-pin MINI-DIN)
GT10-C30R4-8P	3,000 (118.11")	
GT10-C100R4-8P	10,000 (393.7")	

GT10-C□□R4-25P



Model name	L (mm (inch))	Remarks
GT10-C30R4-25P	3,000 (118.11")	RS-422 cable for direct connection to FXCPU and A/QnACPU (25-pin D-sub)
GT10-C100R4-25P	10,000 (393.7")	

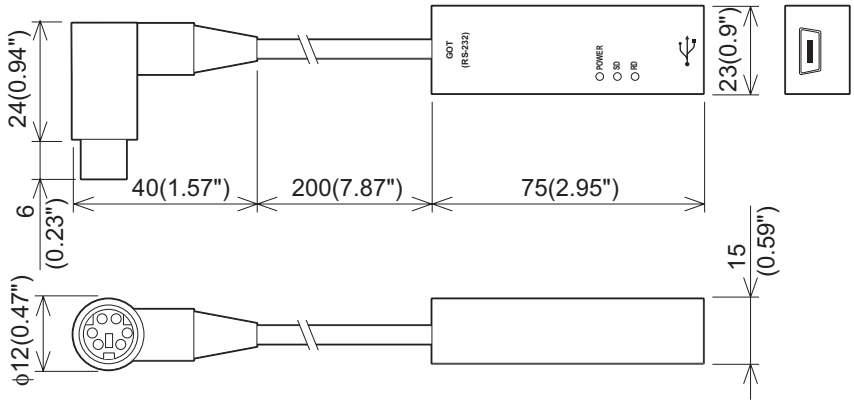
GT10-C30R2-6P



Model name	L (mm (inch))	Remarks
GT10-C30R2-6P	3,000 (118.11")	RS-232 cable for direct connection to QCPU (6-pin MINI-DIN)

External dimensions of RS-232/USB conversion adaptor

GT10-RS2TUSB-5S



Unit : mm(inch)
Weight : Approx. 40g

Appendix 2 Usage Condition of Utility Function

Different functions are available on the GOT and drawing software.

○ : Applicable × : N/A

Setting items		Function	GT10 (Utility)	Drawing Setting (GT Designer2)
Language		Message language switching (Japanese/English)	○	○
Connection settings	Standard I/F	Displays the channel number and communication driver that are allocated to the communication interface	×	○
		Communication parameter display	×	○
	Data Transfer	Displays the screen for transferring project data between the PC and GOT	○	×
	Communication Monitor	Displays the status of the communication ports	○	×
GOT Setup	Display	Screen save time setting	○	○
		Screen save backlight ON/OFF setting	○	○
		Liquid crystal brightness setting	○	×
	Operation	Buzzer volume setting	○	○
		Correcting touch position reading error	○	×
Time setting		Displaying the present time of the clock	○	×
		Setting the present time of the clock	○	×
Data	OS information	Displays the version of the OS (Standard monitor OS, BootOS) and communication driver	○	×
	Clear data	Deletes project data and resource data	○	×

Appendix 3 List of Functions Added by GT Designer2 Version Upgrade (For GOT1000 Series)

Appendix 3.1 GT10

GT10 is supported by GT Designer2 Version 2.43V and later.

1 Added GOT main unit

Target models	Version of GT Designer2	Version of OS
GT1020-LBD, GT1020-LBD2, GT1020-LBL	2.43V	Standard monitor OS [01.02.**]

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company. However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user or third person by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi graphic operation terminal, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the graphic operation terminal device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi graphic operation terminal has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the graphic operation terminal applications. In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the graphic operation terminal range of applications. However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

GRAPHIC OPERATION TERMINAL

GOT1000

GT10 User's Manual

MODEL	GT10-U-E
MODEL CODE	09R819
JY997D24701A	

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