

JY997D22801H



MITSUBISHI *Changes for the Better*

GT1155HS-QSBD, GT1150HS-QLBD

GT11 Handy GOT General Description

Manual Number	JY997D22801H
Date	Jul. 2011

GRAPHIC OPERATION TERMINAL
GOT1000

This manual describes the part names, dimensions, mounting, and specifications of the product. Before use, read this manual and manuals of relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions.
And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.
Registration
The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.



Effective Jul. 2011
Specifications are subject to change without notice.

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Safety Precaution (Read these precautions before using.)

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".

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

Depending on circumstances, procedures indicated by "CAUTION" may also be linked to serious results.

In any case, it is important to follow the directions for usage.

DESIGN PRECAUTIONS

- 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.
- 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 POWER LED flickers (green/orange) and the display section turns black and causes the monitor screen to appear blank, 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.
Note that the following occurs on the GOT when the backlight goes out.
 - The POWER LED flickers (green/orange) and the monitor screen appears blank

DESIGN PRECAUTIONS

- 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.
- Do not press the GOT display section with a pointed material as a pen or driver. Doing so can result in a damage or failure of the display section.
- Before connecting to GOT, turn ON the controller to enable the communication. When the communication of controller is not available, a communication error may occur in GOT.

MOUNTING PRECAUTIONS

- 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.
- Always turn off the power ON/OFF switch on the connector conversion box before connecting or disconnecting the GOT to it. Connecting or disconnecting the GOT with the power being turned on may result in damage to the unit or malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the relay cable onto/from the GOT.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the option function board on to/from the GOT. Not doing so can cause the unit to fail or malfunction.
- When installing the option function board or battery, or operating the reset switch, wear an earth band etc. to avoid the static electricity. The static electricity can cause the unit to fail or malfunction.

MOUNTING PRECAUTIONS

- 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.
- Never drop cutting chips and electric wire chips into the ventilation window of the Handy GOT when you drill screw holes or perform wiring. Otherwise, fire, failure or malfunction may be caused.
- Connect connection cables securely to the specified connectors while the power is turned OFF.
Imperfect connection may cause malfunction or failure.
- When connecting cables, pay attention to the contents described in this section. Especially, attach the rear cover so that PCBs inside the Handy GOT are not interfered with connection cables.
- Securely connect the option function board to the connector provided for the board.
- When inserting/removing a CF card into/from the GOT, turn the CF card access switch off in advance. Failure to do so may corrupt data within the CF card.
- When inserting a CF card into the GOT, push it into the insertion slot until the CF card eject button will pop out. Failure to do so may cause a malfunction due to poor contact.
- When removing a CF card from the GOT, make sure to support the CF card by hand, as it may pop out. Failure to do so may cause the CF card to drop from the GOT and break.

WIRING PRECAUTIONS

- Make sure to attach the back cover to the Handy GOT before turning on the power and starting operation after the installation or wiring work. Otherwise, electrical shock may be caused.
- 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 100 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.
- 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

- 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.
- 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

- 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, and changing the buffer memory current value), 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

- When power is on, do not touch the terminals. Doing so can cause an electric shock or malfunction.
- Connect the battery correctly. Do not discharge, disassemble, heat, short, solder or throw the battery into the fire. Incorrect handling may cause the battery to generate heat, burst or take fire, resulting in injuries or fires.
- 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.

Associated Manuals

The following manuals are relevant to this product. When these loose manuals are required, please consult with our local distributor.

Manual name	Contents	Manual Number (Model Code)
GT Designer2 Version2 Basic Operation/Data Transfer Manual (For GOT1000 Series) (sold separately) *1	Describes methods of the GT Designer2 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080529ENG (1D7M24)
GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 1/3, 2/3, 3/3 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer2	SH-080530ENG (1D7M25)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Fundamentals) 1/2, 2/2 (sold separately) *1	Describes methods of the GT Designer3 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080866ENG (1D7MB9)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Functions) 1/2, 2/2 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer3	SH-080867ENG (1D7MC1)
GT11 Handy GOT User's Manual (Hardware/Utility, Connection) 1/2, 2/2 (sold separately)	Describes the Handy GOT hardware-relevant content such as part names, external dimensions, mounting, power supply wiring, specifications, and introduction to option devices	JY997D20101 JY997D20102 (09R817)

*1 The manual in PDF-format is included in the GT Works2/GT Designer2/GT Works3/GT Designer3 products.

For details of a PLC to be connected, refer to the PLC user's manual respectively.

Bundled Items

Product Name	Model Name	Specifications
GOT	GT1155HS-QSBD	[320 x 240 dots], STN color LCD (256 colors), built-in battery and backlight
	GT1150HS-QLBD	[320 x 240 dots], STN monochrome LCD (black/white, 16 scales), built-in battery and backlight

STARTUP/MAINTENANCE PRECAUTIONS

- 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.
- Replace battery with GT11-50BAT by Mitsubishi electric Co. only. Use of another battery may present a risk of fire or explosion.
- Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

DISPOSAL PRECAUTIONS

- When disposing of the product, handle it as industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. (For details of the battery directive in EU member states, refer GOT User's Manual.)

TRANSPORTATION PRECAUTIONS

- When transporting lithium batteries, make sure to treat them based on the transport regulations. (Refer to User's Manual for details of the regulated models.)
- Before transporting the GOT, turn the GOT power on and check that the battery voltage status is normal on the Time setting & display screen (utilities screen). In addition, confirm that the adequate battery life remains on the rating plate. Transporting the GOT with the low battery voltage or the battery the reached battery life may destabilize the backup data unstable during transportation.
- 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.

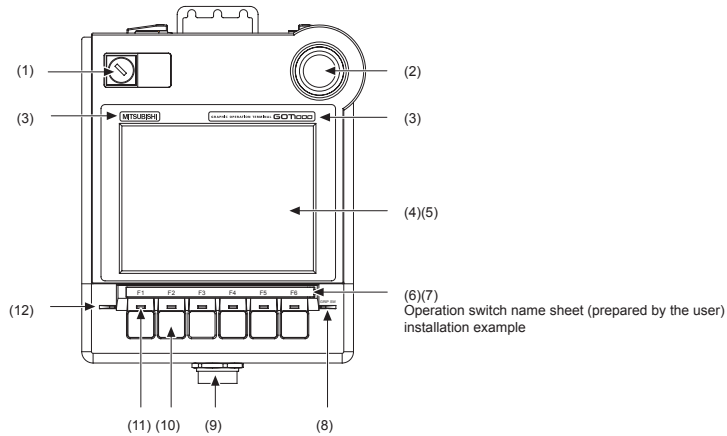
Bundled item	Quantity
Operation switch name character sheets	
1) OHP sheet	1) One sheet
2) Reference dimension sheet (switch name change sheet mount)	2) One sheet
Selector switch keys	2
GT11 Handy GOT General Description (This manual)	1

1. Features

- Improved monitoring performance and connectivity to FA devices
 - Two types of display modes are provided: 256-color display and monochrome display. In the monochrome display, 16 scales are used to improve the display.
 - High speed monitoring through high speed communication at maximum of 115.2kbps.
 - Multiple languages are displayed using the Unicode2.1-compatible fonts and beautiful characters are drawn using the TrueType and high quality fonts.
 - High speed display and high speed touch switch response.
- More efficient GOT operations including screen design, startup, adjustment, management and maintenance works
 - The display screen of the display unit is created using a drawing software for PC (GT Designer2 Ver2.18U or later/GT Designer3 Ver1.01B or later).
 - The 3MB user memory is included as standard.
 - CF card interface is included as standard.
 - The USB connector interface is included as standard.
- Enhanced support of FA device setup tools
 - Transferring or monitoring the sequence programs using the personal computer connected to GOT is available, during direct connection to A, QnA, L, Q, or FX series PLC CPU (FA Transparent function).

2. Part Name

2.1 Front Panel



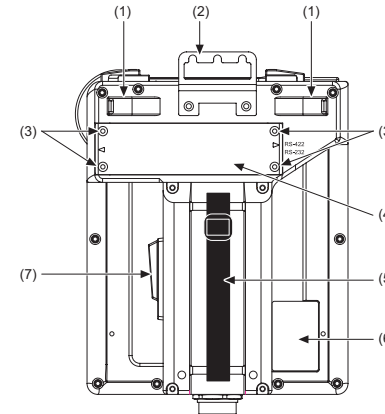
No	Name	Specifications
(1)	Keylock switch (2-position SW)	Switch for external direct wiring (independent contact)
(2)	Emergency stop switch	Switch for external direct wiring (independent contact)
(3)	Logo (2 places)	Removable
(4)	Display section	Displays the utility screen and the user creation screen.
(5)	Touch panel	For touch switch operation on the utility screen and the user creation screen.
(6)	Operation switch name sheet installation place	Place (concave shape) where the operation switch name sheet (created by user) is installed.
(7)	Operation switch name sheet cover	Transparent cover to fix the operation switch name sheet (created by user) (removed when a sheet is inserted).
(8)	Display LED for grip switch	Display LED for grip switch (green) (lighting control from display section)
(9)	External interface connector	For external connection cable connection (for PLC, switch and power supply external wiring) (connector: round 32 pins, male)
(10)	Operation switch (6 switches)	Switch for external direct wiring (independent contact)
(11)	Display LED for operation switch (6 LEDs)	Display LED for operation switch (green) (lighting control from display section)
(12)	POWER LED	Lit in green : Power is correctly supplied. Lit in orange : Screen saving and backlight not lit. Blinks in orange/green : Blown back light bulb. Not lit : Power is not supplied.

For the PC connection, refer to the following.

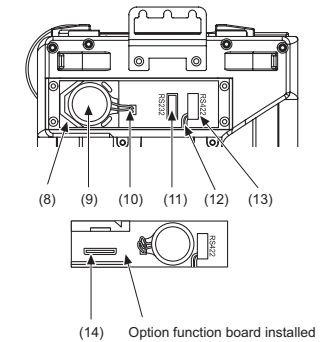
→ GT11 Handy GOT User's Manual

2.2 Back Panel

Environmental protection back cover closed



Environmental protection back cover opened



No	Name	Specifications
(1)	Hook for mounting a neck strap	Hook for mounting a neck strap (must be prepared by the user)
(2)	Hook for hanging on walls	Hook when the Handy GOT is used hanging on walls.
(3)	Environmental protection back cover screw	For opening and closing the environmental protection back cover (drop prevention screw)
(4)	Environmental protection back cover	Opened and closed when the PLC communication type is changed (RS-422 ↔ RS-232, before shipping: RS-422), the option function board is mounted, or the battery is replaced.
(5)	Hand strap	Used to hold the Handy GOT in hand by putting a hand under the strap. Length adjustable.
(6)	Rating plate	Model, consumption current, serial No., Hardware/ Firmware version is indicated.
(7)	Grip switch	Switch for external direct wiring (independent contact)

No	Name	Specifications
(8)	Battery holder	GT11-50BAT type battery holder
(9)	Battery	GT11-50BAT type battery. For storing clock data, alarm history and recipe data.
(10)	Connector for battery connection	For GT11-50BAT type battery connection
(11)	RS-232 interface	Connector for PLC communication using RS-232
(12)	Cable connector for PLC communication	Interface cable connector for PLC communication Connector for either (11) or (13) and for selection of the PLC communication type. (Connected to RS-422 before shipping.)
(13)	RS-422 interface	Connector for PLC communication using RS-422
(14)	Connector for option function board	Connector for mounting the GT11-50FNB type option function board

For the connection to the controller, microcomputer board or PC, refer to the following.

→ GT11 Handy GOT User's Manual

3. Specifications

3.1 General Specifications

Item		Specifications				
Operating ambient temperature	Display section	0 to 40°C				
	Other than Display section	0 to 40°C				
Storage ambient temperature		-20 to 60°C				
Operating ambient humidity		10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)				
Storage ambient humidity		10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)				
Vibration resistance	Conforms to JIS B3502 and IEC61131-2	Under intermittent vibration	Frequency	Acceleration	Half-amplitude	Sweep Count
			5 to 9Hz	--	3.5mm	
		Under continuous vibration	9 to 150Hz	9.8m/s ²	--	10 times each in X, Y and Z directions
			5 to 9Hz	--	1.75mm	
		9 to 150Hz	4.9m/s ²	--		
Shock resistance		Conforms to JIS B3502, IEC 61131-2 (147 m/s ² , 3 times each in X, Y and Z directions)				
Operating atmosphere		Must be free of lamp black, corrosive gas, flammable gas, or excessive amount of electro conductive dust particles and must be no direct sunlight. (Same as for saving)				
Operating altitude ¹		2000 m (6562 ft) max.				
Overvoltage category ²		II or less				
Pollution degree ³		2 or less				
Cooling method		Self-cooling				

¹ Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction. When the air inside the control panel is purged by pressurization, the surface sheet may be lifted by high pressure. As a result, the touch panel may be difficult to press, and the sheet may be peeled off.

² 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 rated voltage of 300 V is 2500 V.

³ This index indicates the degree to which conductive material 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	
	GT1155HS-QSBD	GT1150HS-QLBD
Display section ¹	Type	STN color liquid crystal
	Screen size	5.7"
	Resolution	320 × 240 dots
	Display size	W115(4.53) × H86(3.39)[mm](inch)
	Display character	16-dot standard font: 20 characters × 15 lines, 12-dot standard font: 26 characters × 20 lines
	Display color	256 colors
	Display angle	Left/Right: 55 degrees, Top: 65 degrees, Bottom: 70 degrees (Horizontal format)
	Contrast adjustment	16-level adjustment
	Intensity of LCD only	380[cd/m ²](Adjustable in 8 levels)
	Life	Approx. 50,000h. (Time for display intensity to become 1/5 at operating ambient temperature of 25°C)
Backlight	Cold cathode fluorescent tube (irreplaceable by a user) backlight shutoff detection function is included. Backlight off/screen saving time can be set.	
	Life ²	Approx. 75,000h or longer (Time for display intensity reaches 50% at the operating ambient temperature of 25°C)
Touch panel	Number of touch keys	300 keys/screen (Matrix structure of 15 lines × 20 columns)
	Key size	Minimum 16 × 16 dots (per key)
	Number of points touched simultaneously	Maximum of 2 points
	Life	1 million times or more (operating force 0.98N max.)
Memory	C drive ³	Flash memory (Internal), for storing project data (3Mbytes) and OS
	Life (Number of write times)	100,000 times
	D drive	SRAM (Internal), 512kbytes (battery backup)
Internal clock	Accuracy	-45 seconds, +45 seconds per month
Buzzer output		Single tone (tone length adjustable)
Switch	Operation switch	6 switches (6 contacts/common), N/O contact, Maximum rating 10mA/24VDC, Life: 1,000,000 times
	Grip switch	1 switch (single wiring) (IDEC HE3B-M2PB), Enable switch (deadman switch) 3-position system of OFF ↔ ON ↔ OFF 2 N/O contacts, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
	Emergency stop switch	1 switch (single wiring) (OMRON A165E-S-02) 2 N/C contacts, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
	Keylock switch (2-position switch)	1 switch (single wiring) (IDEC AS6Q-2KT1PB) 2-notch type (Manual stop at each position/A key can be inserted and removed on only the left side./On the right side, a key cannot be removed./Two keys are provided.) 2-position, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
LED	POWER LED	1 LED Lit in green: Power is correctly supplied. Lit in orange: Screen saving and backlight not lit. Blinks in orange/green: Blown back light bulb. Not lit: Power is not supplied.
	LED for operation switch display	6 LEDs, green (lighting control from the display section)
	LED for grip switch display	1 LED, green (lighting control from display unit part)
Battery	Type	GT11-50BAT lithium battery
	Backup target	Magnesium manganese dioxide lithium primary battery
	Life	Clock data, alarm history and recipe data Approx. 5 years (Operating ambient temperature of 25°C), Guaranteed: 1 year
Built-in interface	RS-422/RS-232	RS422/RS232 1ch Transmission speed : 115,200/57,600/38,400/19,200/9,600/4,800bps Connector shape : Round 32 pins (male) Application : PLC communication (Select either RS-422 or RS-232 when used)
	RS-232	RS232 1ch Transmission speed : 115,200/57,600/38,400/19,200/9,600/4,800bps Connector shape : MINI-DIN 6 pin (Female) Application : PC communication (Project data upload/download, OS installation, transparent function)
	USB	USB (Full Speed 12Mbps) 1ch Connector shape: Mini-B Application : PC communication (Project data upload/download, OS installation, transparent function)
	CF card	Conforming to PCMCIA, compact flash slot, 1ch Connector shape : Dedicated for TYPE I Application : Data transfer, data storage
	Option function board ⁴	For mounting the option function board, 1ch
Environmental protective structure ⁵	Equivalent to IP65F (excluded on the relay connector side of external cable valid when the external cable is connected)	

Item	Specifications	
	GT1155HS-QSBD	GT1150HS-QLBD
External dimensions	W176 (6.93) × H220 (8.67) × D93(3.67) [mm] (inch)	
Weight	1.0kg (Handy GOT main unit only)	
Compatible software package	GT Designer2 Version2.15R or later/GT Designer3 Version1.01B or later	

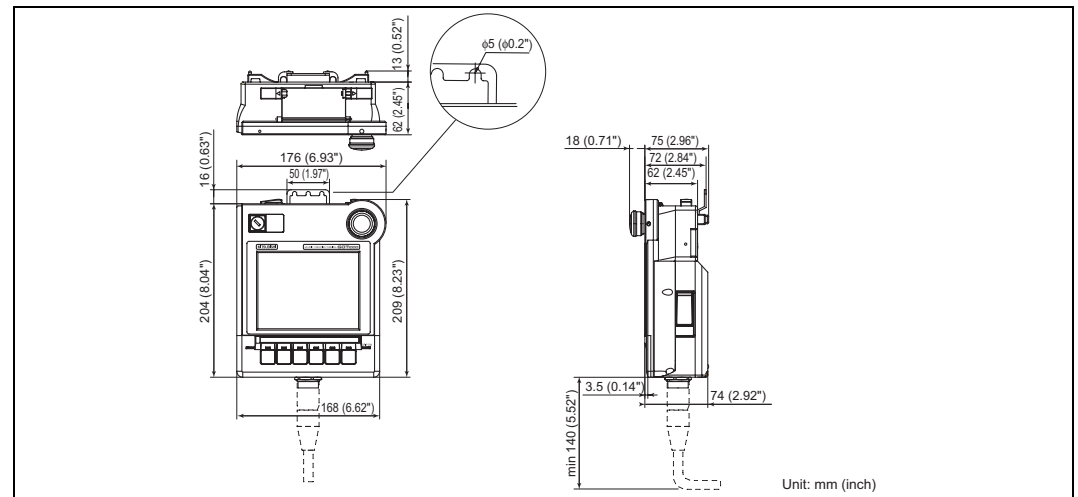
- ¹ - Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. Flickers may be observed depending on the display color. Please note that these dots appear due to its characteristic and are not caused by product defect.
- Flickers and partial discoloration may be generated on the liquid crystal display panel due to the display contents or the contrast adjustment. However, please note that these phenomena appear due to its characteristic and are not caused by product defect.
 - There is a difference in the display brightness and the color tones between liquid crystal display panels. When using multiple liquid crystal display panels, please note that there is an individual difference between them.
 - A crosstalk (shadow as an extension of the display) may appear on the liquid crystal display panel. Please note that it appears due to its characteristic.
 - When the display section is seen from the outside of the display angle, the display color seems like it has changed. Please note that it is due to its characteristic. Please note that the response time, brightness and color of the liquid crystal display panel may vary depending on the usage environmental temperature. Especially in the low temperature environment, the display response becomes slow due to the characteristics of the STN liquid crystal. Please check the display response in advance for using this product.
 - When the same screen is displayed for a long time, an incidental color or partial discoloration is generated on the screen due to heat damage, and it may not disappear. To prevent heat damage, the screen saver function is effective. For details on the screen saver function, refer to the following.
→ GT11 Handy GOT User's Manual
- ² Using the GOT Backlight OFF function can prolong the life of the backlight. For details on the Backlight OFF function, refer to the following.
→ GT11 Handy GOT User's Manual
- ³ ROM in which new data can be written without deleting the written data.
- ⁴ Necessity of mounting the option function board may differ depending on the hardware version. Refer to the following for details.
→ GT11 Handy GOT User's Manual
- ⁵ Note that this does not guarantee all user's operation environment. The protection is not applied when the interface environment protection cover or environment protection back cover is removed. In addition, the product may not be used in environments under exposition of oil or chemicals for a long period of time, or in environments filled with oil-mist.

3.3 Power Supply Specifications

Item	Specifications	
	GT1155HS-QSBD	GT1150HS-QLBD
Input power supply voltage	24V DC (+10% -15%), ripple voltage 200mV or less	
Fuse (built-in, not exchangeable)	1.0A	
Power consumption	9.84W (410mA/24V DC) or less	9.36W (390mA/24V DC) or less
At backlight off	4.32W (180mA/24V DC) or less	
Inrush current	15A or less (26.4V) 2ms	
Permissible instantaneous power failure time ¹	Within 5ms	
Noise immunity	Noise voltage: 1000Vp-p, Noise width: 1μs (by noise simulator of 30 to 100Hz noise frequency)	
Dielectric withstand voltage	500V AC for 1 minute (across power supply terminals and earth)	
Insulation resistance	10MΩ or larger by insulation resistance tester (across power supply terminals and earth)	

- ¹ 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.

3.4 External Dimensions



4. Maintenance and Inspection

The GOT does not include consumable components that will cause the shorten life. However, note that battery life is 5 years and LCD life is 50,000 hours. The life of backlight in GT1155HS-QSBD is 75,000 hours and that in GT1150HS-QLBD is 54,000 hours. It is recommended to replace the battery periodically. (For the replacement of the liquid crystal screen and backlight, please consult your nearest sales office or FA Center.)

4.1 Daily Inspection

Daily inspection items

No.	Inspection Item	Inspection Method	Criterion	Action	
1	Connection status	Loose terminal screws	Retighten screws with screwdriver	Not loose	Retighten terminal screws
		Proximate solderless terminals	Visual check	Proper intervals	Correct
2	Usage status	Loose connectors	Visual check	Not loose	Retighten connector fixing screws
		Dirt on protection sheet	Visual check	Not outstanding	Replace with new one
2	Usage status	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.

→ GT11 Handy GOT User's Manual

4.2 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	0 to 40°C	For use in control panel, temperature inside control panel is ambient temperature
		Ambient humidity	Measure corrosive gas	10 to 90%RH	
		Atmosphere	Measure corrosive gas	No corrosive gas	
2	Power supply voltage check	24V DC Measure voltage across terminals.	20.4 to 26.4V DC	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
		Proximate solderless terminals	Visual check	Proper intervals	Correct
		Loose connectors	Visual check	Not loose	Retighten connector fixing screws
5	Battery	Check the system alarm (error code: 500) report on the Alarm Information screen	(Preventive maintenance)	Replace with new battery when the current battery has reached the specified life span, even if battery voltage is not displayed.	

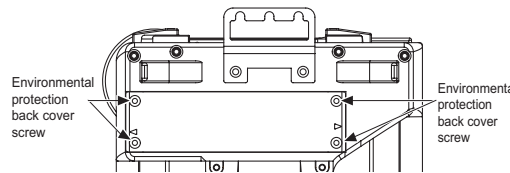
4.3 Battery Replacement

The battery backs up clock data, alarm history and recipe data. Screen data is stored in the flash memory and data is retained even if the battery is dead.

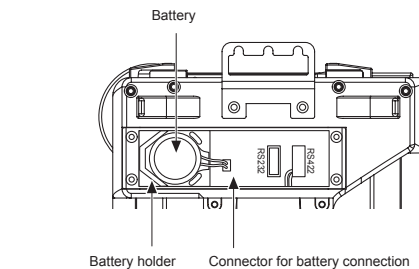
- Battery model name
Handy GOT is shipped with the following battery.

Product name	Model name
Battery	GT11-50BAT

- Battery replacement procedure
 - Turn the GOT power off.
 - Loosen the environmental protection back cover screws at four points on GOT rear face to remove the cover.

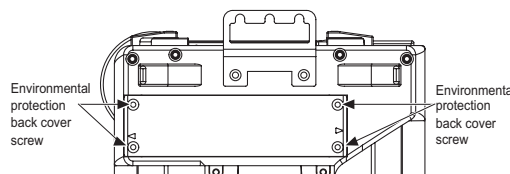


- Remove the old battery from the holder.
- Disconnect the old battery connector and insert the new battery connector within 30s.
- Insert the battery into the holder.

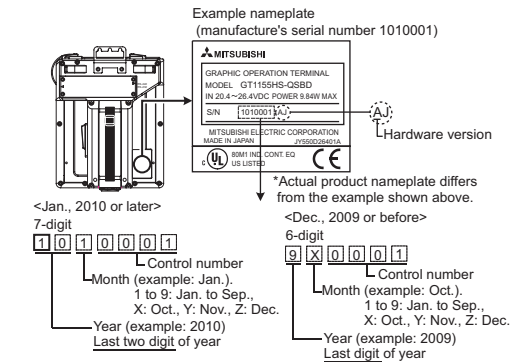


- Attach the environmental protection back cover and tighten the screws. Tightening torque: 36 to 48 N•cm
- Turn the GOT power on.
- Check if the battery condition is normal with the utility. Refer to the following for the details of battery status display.

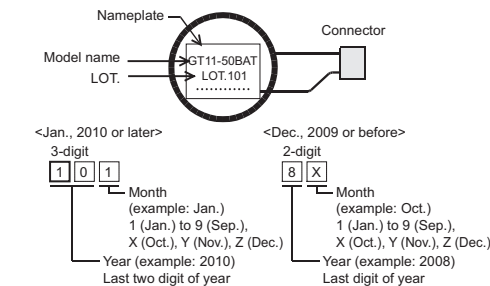
→ GT11 Handy GOT User's Manual



- How to confirm production year and month
The production year and month of the battery built in the purchased GOT can be confirmed by the production No. (S/N) marked on the GOT main unit.



The production date of the optional replacement battery can be confirmed by the lot No. marked on the nameplate (label) affixed on the battery.



- Battery life
Approximate battery life:
5 years (ambient temperature: 25°C)
Battery replacement: In 4 to 5 years

Approximate life is 5 years, but life may be shorter depending on the ambient temperature, therefore, note that the battery must be replaced in 4 to 5 years. Make sure to purchase a new battery as needed as it self-discharges.

Battery status can be confirmed on a GOT utility screen. For details of battery status or how to output alarm, refer to the following:
→ GT11 Handy GOT User's Manual

5. Cautions on Using Emergency Stop Switch

- When using the emergency stop switch in the handy GOT, judge the validity to use the emergency stop switch in accordance with the risk assessment in your system.
- When using the parallel circuit (which disables the emergency stop status while the handy GOT is removed), the system may not conform to the safety standards. Check the safety standards required in the system, and then judge the validity to use the emergency stop switch.

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- 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.

JY997D22801H

MITSUBISHI *Changes for the Better*

GT1155HS-QSBD, GT1150HS-QLBD

GT11 Handy GOT General Description

Manual Number	JY997D22801H
Date	Jul. 2011

GOT1000

This manual describes the part names, dimensions, mounting, and specifications of the product. Before use, read this manual and manuals of relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions.

And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

Effective Jul. 2011
Specifications are subject to change without notice.

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Safety Precaution (Read these precautions before using.)

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.

Depending on circumstances, procedures indicated by "CAUTION" may also be linked to serious results.

In any case, it is important to follow the directions for usage.

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.
- 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 POWER LED flickers (green/orange) and the display section turns black and causes the monitor screen to appear blank, 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. Note that the following occurs on the GOT when the backlight goes out.
 - The POWER LED flickers (green/orange) and the monitor screen appears blank

DESIGN PRECAUTIONS **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 may cause a malfunction.
- Do not press the GOT display section with a pointed material as a pen or driver. Doing so can result in a damage or failure of the display section.
- Before connecting to GOT, turn ON the controller to enable the communication. When the communication of controller is not available, a communication error may occur in GOT.

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.
- Always turn off the power ON/OFF switch on the connector conversion box before connecting or disconnecting the GOT to it. Connecting or disconnecting the GOT with the power being turned on may result in damage to the unit or malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the relay cable onto/from the GOT.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the option function board on to/from the GOT. Not doing so can cause the unit to fail or malfunction.
- When installing the option function board or battery, or operating the reset switch, wear an earth band etc. to avoid the static electricity. The static electricity 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.
- Never drop cutting chips and electric wire chips into the ventilation window of the Handy GOT when you drill screw holes or perform wiring. Otherwise, fire, failure or malfunction may be caused.
- Connect connection cables securely to the specified connectors while the power is turned OFF. Imperfect connection may cause malfunction or failure.
- When connecting cables, pay attention to the contents described in this section. Especially, attach the rear cover so that PCBs inside the Handy GOT are not interfered with connection cables.
- Securely connect the option function board to the connector provided for the board.
- When inserting/removing a CF card into/from the GOT, turn the CF card access switch off in advance. Failure to do so may corrupt data within the CF card.
- When inserting a CF card into the GOT, push it into the insertion slot until the CF card eject button will pop out. Failure to do so may cause a malfunction due to poor contact.
- When removing a CF card from the GOT, make sure to support the CF card by hand, as it may pop out. Failure to do so may cause the CF card to drop from the GOT and break.

WIRING PRECAUTIONS **DANGER**

- Make sure to attach the back cover to the Handy GOT before turning on the power and starting operation after the installation or wiring work. Otherwise, electrical shock may be caused.
- 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 100 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.
- 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**

- 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.
- 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, and changing the buffer memory current value), 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.
- Connect the battery correctly. Do not discharge, disassemble, heat, short, solder or throw the battery into the fire. Incorrect handling may cause the battery to generate heat, burst or take fire, resulting in injuries or fires.
- 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.

Associated Manuals

The following manuals are relevant to this product. When these loose manuals are required, please consult with our local distributor.

Manual name	Contents	Manual Number (Model Code)
GT Designer2 Version2 Basic Operation/Data Transfer Manual (For GOT1000 Series) (sold separately) *1	Describes methods of the GT Designer2 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080529ENG (1D7M24)
GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 1/3, 2/3, 3/3 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer2	SH-080530ENG (1D7M25)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Fundamentals) 1/2, 2/2 (sold separately) *1	Describes methods of the GT Designer3 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080866ENG (1D7MB9)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Functions) 1/2, 2/2 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer3	SH-080867ENG (1D7MC1)
GT11 Handy GOT User's Manual (Hardware/Utility, Connection) 1/2, 2/2 (sold separately)	Describes the Handy GOT hardware-relevant content such as part names, external dimensions, mounting, power supply wiring, specifications, and introduction to option devices	JY997D20101 JY997D20102 (09R817)

*1 The manual in PDF-format is included in the GT Works2/GT Designer2/GT Works3/GT Designer3 products.

For details of a PLC to be connected, refer to the PLC user's manual respectively.

Bundled Items

Product Name	Model Name	Specifications
GOT	GT1155HS-QSBD	[320 × 240 dots], STN color LCD (256 colors), built-in battery and backlight
	GT1150HS-QLBD	[320 × 240 dots], STN monochrome LCD (black/white, 16 scales), built-in battery and backlight

STARTUP/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.
- Replace battery with GT11-50BAT by Mitsubishi electric Co. only. Use of another battery may present a risk of fire or explosion.
- Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

DISPOSAL PRECAUTIONS **CAUTION**

- When disposing of the product, handle it as industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. (For details of the battery directive in EU member states, refer GOT User's Manual.)

TRANSPORTATION PRECAUTIONS **CAUTION**

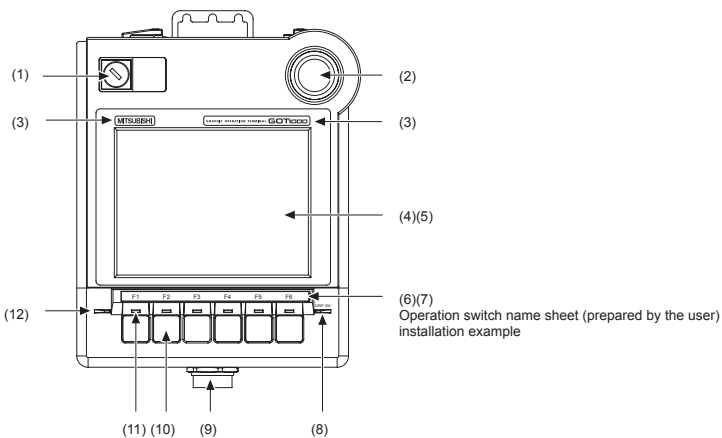
- When transporting lithium batteries, make sure to treat them based on the transport regulations. (Refer to User's Manual for details of the regulated models.)
- Before transporting the GOT, turn the GOT power on and check that the battery voltage status is normal on the Time setting & display screen (utilities screen). In addition, confirm that the adequate battery life remains on the rating plate. Transporting the GOT with the low battery voltage or the battery the reached battery life may destabilize the backup data unstable during transportation.
- 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.

1. Features

- Improved monitoring performance and connectivity to FA devices
 - Two types of display modes are provided: 256-color display and monochrome display. In the monochrome display, 16 scales are used to improve the display.
 - High speed monitoring through high speed communication at maximum of 115.2kbps.
 - Multiple languages are displayed using the Unicode2.1-compatible fonts and beautiful characters are drawn using the TrueType and high quality fonts.
 - High speed display and high speed touch switch response.
- More efficient GOT operations including screen design, startup, adjustment, management and maintenance works
 - The display screen of the display unit is created using a drawing software for PC (GT Designer2 Ver.2.18U or later/GT Designer3 Ver.1.01B or later).
 - The 3MB user memory is included as standard.
 - CF card interface is included as standard.
 - The USB connector interface is included as standard.
- Enhanced support of FA device setup tools
 - Transferring or monitoring the sequence programs using the personal computer connected to GOT is available, during direct connection to A, QnA, L, Q, or FX series PLC CPU (FA Transparent function).

2. Part Name

2.1 Front Panel



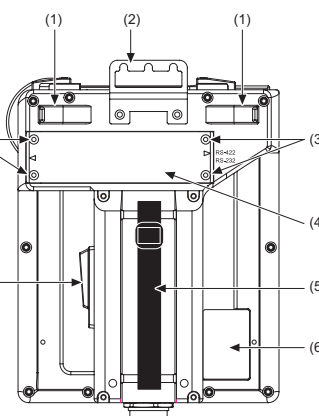
No	Name	Specifications
(1)	Keylock switch (2-position SW)	Switch for external direct wiring (independent contact)
(2)	Emergency stop switch	Switch for external direct wiring (independent contact)
(3)	Logo (2 places)	Removable
(4)	Display section	Displays the utility screen and the user creation screen.
(5)	Touch panel	For touch switch operation on the utility screen and the user creation screen.
(6)	Operation switch name sheet installation place	Place (concave shape) where the operation switch name sheet (created by user) is installed.
(7)	Operation switch name sheet cover	Transparent cover to fix the operation switch name sheet (created by user) (removed when a sheet is inserted).
(8)	Display LED for grip switch	Display LED for grip switch (green) (lighting control from display section)
(9)	External interface connector	For external connection cable connection (for PLC, switch and power supply external wiring) (connector: round 32 pins, male)
(10)	Operation switch (6 switches)	Switch for external direct wiring (independent contact)
(11)	Display LED for operation switch (6 LEDs)	Display LED for operation switch (green) (lighting control from display section)
(12)	POWER LED	Lit in green : Power is correctly supplied. Lit in orange : Screen saving and backlight not lit. Blinks in orange/green : Blown back light bulb. Not lit : Power is not supplied.

For the PC connection, refer to the following.

→ GT11 Handy GOT User's Manual

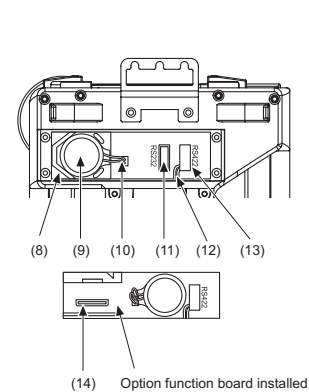
2.2 Back Panel

Environmental protection back cover closed



No	Name	Specifications
(1)	Hook for mounting a neck strap	Hook for mounting a neck strap (must be prepared by the user)
(2)	Hook for hanging on walls	Hook when the Handy GOT is used hanging on walls.
(3)	Environmental protection back cover screw	For opening and closing the environmental protection back cover (drop prevention screw)
(4)	Environmental protection back cover	Opened and closed when the PLC communication type is changed (RS-422 ↔ RS-232, before shipping; RS-422), the option function board is mounted, or the battery is replaced.
(5)	Hand strap	Used to hold the Handy GOT in hand by putting a hand under the strap. Length adjustable.
(6)	Rating plate	Model, consumption current, serial No., Hardware/Firmware version is indicated.
(7)	Grip switch	Switch for external direct wiring (independent contact)

Environmental protection back cover opened



No	Name	Specifications
(8)	Battery holder	GT11-50BAT type battery holder
(9)	Battery	GT11-50BAT type battery. For storing clock data, alarm history and recipe data.
(10)	Connector for battery connection	For GT11-50BAT type battery connection
(11)	RS-232 interface	Connector for PLC communication using RS-232
(12)	Cable connector for PLC communication	Interface cable connector for PLC communication (Connector for either (11) or (13) and for selection of the PLC communication type. (Connected to RS-422 before shipping.)
(13)	RS-422 interface	Connector for PLC communication using RS-422
(14)	Connector for option function board	Connector for mounting the GT11-50FNB type option function board

For the connection to the controller, microcomputer board or PC, refer to the following.

→ GT11 Handy GOT User's Manual

3. Specifications

3.1 General Specifications

Item	Specifications	
Operating ambient temperature	Display section 0 to 40°C	
	Other than Display section 0 to 40°C	
Storage ambient temperature	-20 to 60°C	
Operating ambient humidity	10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)	
Storage ambient humidity	10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)	
Vibration resistance	Conforms to JIS B3502 and IEC61131-2	
	Frequency	5 to 9Hz
	Acceleration	9.8m/s ²
	Half-amplitude	3.5mm
Sweep Count	Under intermittent vibration	10 times each in X, Y and Z directions
	Under continuous vibration	10 times each in X, Y and Z directions
Shock resistance	Conforms to JIS B3502, IEC 61131-2 (147 m/s ² , 3 times each in X, Y and Z directions)	
Operating atmosphere	Must be free of lamp black, corrosive gas, flammable gas, or excessive amount of electro conductive dust particles and must be no direct sunlight. (Same as for saving)	
Operating altitude ¹	2000 m (6562 ft) max.	
Overvoltage category ²	II or less	
Pollution degree ³	2 or less	
Cooling method	Self-cooling	

*1 Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction. When the air inside the control panel is purged by pressurization, the surface sheet may be lifted by high pressure. As a result, the touch panel may be difficult to press, and the sheet may be peeled off.

*2 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 rated voltage of 300 V is 2500 V.

*3 This index indicates the degree to which conductive material 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	
	GT1155HS-QSBD	GT1150HS-QLBD
Display section ¹⁾	Type	STN color liquid crystal
	Screen size	5.7"
	Resolution	320 × 240 dots
	Display size	W115(4.53) × H86(3.39)[mm](inch)
	Display character	16-dot standard font: 20 characters × 15 lines, 12-dot standard font: 26 characters × 20 lines
	Display color	256 colors
	Display angle	Left/Right: 55 degrees, Top: 65 degrees, Bottom: 70 degrees (Horizontal format)
	Contrast adjustment	16-level adjustment
	Intensity of LCD only	380[cd/m ²](Adjustable in 8 levels)
	Intensity adjustment	8-level adjustment
Backlight	Life	Approx. 50,000h. (Time for display intensity to become 1/5 at operating ambient temperature of 25°C)
	Life ²⁾	Approx. 75,000h or longer (Time for display intensity reaches 50% at the operating ambient temperature of 25°C)
Touch panel	Number of touch keys	300 keys/screen (Matrix structure of 15 lines × 20 columns)
	Key size	Minimum 16 × 16 dots (per key)
	Number of points touched simultaneously	Maximum of 2 points
Memory	C drive ³⁾	Flash memory (Internal), for storing project data (3Mbytes) and OS
	Life (Number of write times)	100,000 times
	D drive	SRAM (Internal), 512kbytes (battery backup)
Internal clock	Accuracy	-45 seconds, +45 seconds per month
Buzzer output		Single tone (tone length adjustable)
Switch	Operation switch	6 switches (6 contacts/common), N/O contact, Maximum rating 10mA/24VDC, Life: 1,000,000 times
	Grip switch	1 switch (single wiring) (IDEC HE3B-M2PB), Enable switch (deadman switch) 3-position system of OFF ↔ ON ↔ OFF 2 N/O contacts, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
	Emergency stop switch	1 switch (single wiring) (OMRON A165E-S-02) 2 N/C contacts, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
	Keypad switch (2-position switch)	1 switch (single wiring) (IDEC AS6Q-2KT1PB) 2-notch type (Manual stop at each position/A key can be inserted and removed on only the left side./On the right side, a key cannot be removed./Two keys are provided.) 2-position, Maximum rating 1A/24VDC (resistance load), Maximum rating 0.3A/24VDC (induction load), Life: 100,000 times
LED	POWER LED	1 LED Lit in green: Power is correctly supplied. Lit in orange: Screen saving and backlight not lit. Blinks in orange/green: Blown back light bulb. Not lit: Power is not supplied.
	LED for operation switch display	6 LEDs, green (lighting control from the display section)
Battery	LED for grip switch display	1 LED, green (lighting control from display unit part)
	Type	GT11-50BAT lithium battery
Built-in interface	Type	Magnesium manganese dioxide lithium primary battery
	Backup target	Clock data, alarm history and recipe data
	Life	Approx. 5 years (Operating ambient temperature of 25°C), Guaranteed: 1 year
	RS-422/RS-232	RS422/RS232 1ch Transmission speed : 115,200/57,600/38,400/19,200/9,600/4,800bps Connector shape : Round 32 pins (male) Application : PLC communication (Select either RS-422 or RS-232 when used)
	RS-232	RS232 1ch Transmission speed : 115,200/57,600/38,400/19,200/9,600/4,800bps Connector shape : MINI-DIN 6 pin (Female) Application : PC communication (Project data upload/download, OS installation, transparent function)
Option function board ⁴⁾	USB	USB (Full Speed 12Mbps) 1ch Connector shape: Mini-B Application : PC communication (Project data upload/download, OS installation, transparent function)
	CF card	Conforming to PCMCIA, compact flash slot, 1ch Connector shape: Dedicated for TYPE I Application : Data transfer, data storage
Environmental protective structure ⁵⁾		Equivalent to IP65F (excluded on the relay connector side of external cable valid when the external cable is connected)

4. Maintenance and Inspection

The GOT does not include consumable components that will cause the shorten life. However, note that battery life is 5 years and LCD life is 50,000 hours. The life of backlight in GT1155HS-QSBD is 75,000 hours and that in GT1150HS-QLBD is 54,000 hours. It is recommended to replace the battery periodically. (For the replacement of the liquid crystal screen and backlight, please consult your nearest sales office or FA Center.)

4.1 Daily Inspection

Daily inspection items

No.	Inspection Item	Inspection Method	Criterion	Action	
1	Connection status	Loose terminal screws	Retighten screws with screwdriver	Not loose	Retighten terminal screws
		Proximate solderless terminals	Visual check	Proper intervals	Correct
		Loose connectors	Visual check	Not loose	Retighten connector fixing screws
2	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.
→ GT11 Handy GOT User's Manual

4.2 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	0 to 40°C	For use in control panel, temperature inside control panel is ambient temperature
		Ambient humidity	Measure corrosive gas	10 to 90%RH	
		Atmosphere		No corrosive gas	
2	Power supply voltage check	24V DC Measure voltage across terminals.	20.4 to 26.4V DC	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
		Proximate solderless terminals	Visual check	Proper intervals	Correct
		Loose connectors	Visual check	Not loose	Retighten connector fixing screws
5	Battery	Check the system alarm (error code: 500) report on the Alarm Information screen	(Preventive maintenance)	Replace with new battery when the current battery has reached the specified life span, even if battery voltage is not displayed.	

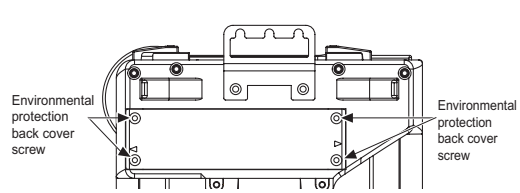
4.3 Battery Replacement

The battery backs up clock data, alarm history and recipe data. Screen data is stored in the flash memory and data is retained even if the battery is dead.

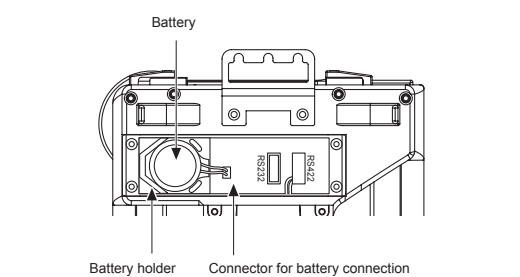
- Battery model name
Handy GOT is shipped with the following battery.

Product name	Model name
Battery	GT11-50BAT

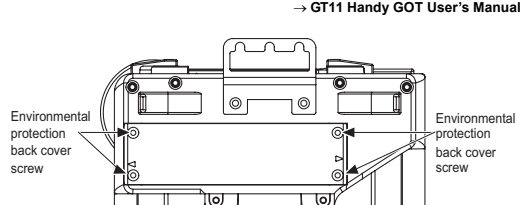
- Battery replacement procedure
- Turn the GOT power off.
 - Loosen the environmental protection back cover screws at four points on GOT rear face to remove the cover.



- Remove the old battery from the holder.
- Disconnect the old battery connector and insert the new battery connector within 30s.
- Insert the battery into the holder.



- Attach the environmental protection back cover and tighten the screws. Tightening torque: 36 to 48 N·cm
- Turn the GOT power on.
- Check if the battery condition is normal with the utility. Refer to the following for the details of battery status display.
→ GT11 Handy GOT User's Manual



Item	Specifications	
	GT1155HS-QSBD	GT1150HS-QLBD
External dimensions	W176 (6.93) × H220 (8.67) × D93(3.67) [mm] (inch)	
Weight	1.0kg (Handy GOT main unit only)	
Compatible software package	GT Designer2 Version2.15R or later/GT Designer3 Version1.01B 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.
- Flickers and partial discoloration may be generated on the liquid crystal display panel due to the display contents or the contrast adjustment. However, please note that these phenomena appear due to its characteristic and are not caused by product defect.
- There is a difference in the display brightness and the color tones between liquid crystal display panels. When using multiple liquid crystal display panels, please note that there is an individual difference between them.
- A crosstalk (shadow as an extension of the display) may appear on the liquid crystal display panel. Please note that it appears due to its characteristic.
- When the display section is seen from the outside of the display angle, the display color seems like it has changed. Please note that it is due to its characteristic.
- Please note that the response time, brightness and color of the liquid crystal display panel may vary depending on the usage environmental temperature. Especially in the low temperature environment, the display response becomes slow due to the characteristics of the STN liquid crystal. Please check the display response in advance for using this product.
- When the same screen is displayed for a long time, an incidental color or partial discoloration is generated on the screen due to heat damage, and it may not disappear. To prevent heat damage, the screen saver function is effective. For details on the screen saver function, refer to the following.
→ GT11 Handy GOT User's Manual

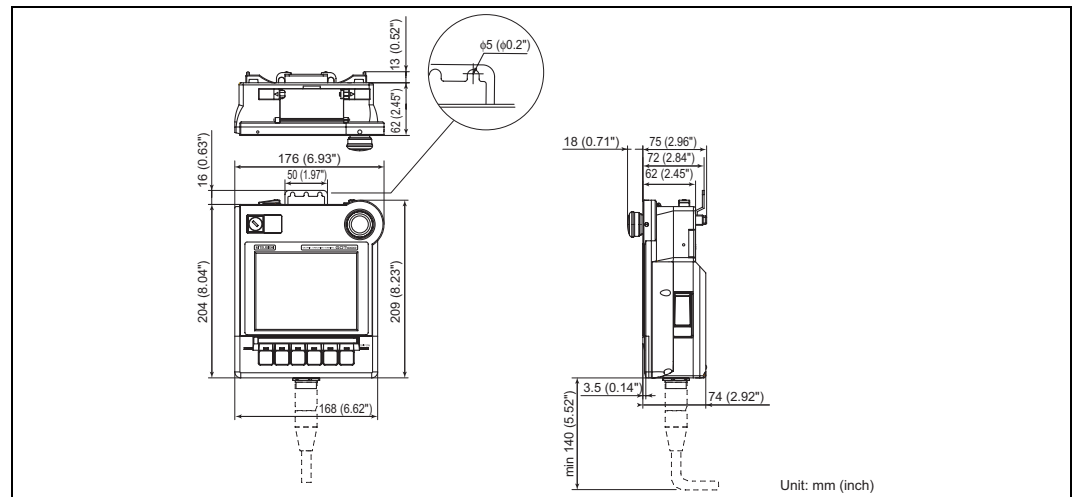
- ²⁾ Using the GOT Backlight OFF function can prolong the life of the backlight. For details on the Backlight OFF function, refer to the following.
→ GT11 Handy GOT User's Manual
- ³⁾ ROM in which new data can be written without deleting the written data.
→ GT11 Handy GOT User's Manual
- ⁴⁾ Necessity of mounting the option function board may differ depending on the hardware version. Refer to the following for details.
→ GT11 Handy GOT User's Manual
- ⁵⁾ Note that this does not guarantee all user's operation environment. The protection is not applied when the interface environment protection cover or environment protection back cover is removed. In addition, the product may not be used in environments under exposition of oil or chemicals for a long period of time, or in environments filled with oil-mist.

3.3 Power Supply Specifications

Item	Specifications	
	GT1155HS-QSBD	GT1150HS-QLBD
Input power supply voltage	24V DC (+10% -15%), ripple voltage 200mV or less	
Fuse (built-in, not exchangeable)	1.0A	
Power consumption	9.84W (410mA/24V DC) or less	9.36W (390mA/24V DC) or less
	At backlight off	4.32W (180mA/24V DC) or less
Inrush current	15A or less (26.4V) 2ms	
Permissible instantaneous power failure time ¹⁾	Within 5ms	
Noise immunity	Noise voltage: 1000Vp-p, Noise width: 1μs (by noise simulator of 30 to 100Hz noise frequency)	
Dielectric withstand voltage	500V AC for 1 minute (across power supply terminals and earth)	
Insulation resistance	10MΩ or larger by insulation resistance tester (across power supply terminals and earth)	

- ¹⁾ 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.

3.4 External Dimensions



- How to confirm production year and month
The production year and month of the battery built in the purchased GOT can be confirmed by the production No. (S/N) marked on the GOT main unit.

Example nameplate (manufacturer's serial number 1010001)

Control number: 1010001
Month (example: Jan.): 1 to 9: Jan. to Sep., X: Oct., Y: Nov., Z: Dec.
Year (example: 2010): Last two digit of year

Hardware version: A

*Actual product nameplate differs from the example shown above.

Control number: 9X0001
Month (example: Oct.): 1 to 9: Jan. to Sep., X: Oct., Y: Nov., Z: Dec.
Year (example: 2009): Last digit of year

The production date of the optional replacement battery can be confirmed by the lot No. marked on the nameplate (label) affixed on the battery.

Nameplate: Model name: GT11-50BAT, LOT: LOT.101

Control number: 101
Month (example: Jan.): 1 (Jan.) to 9 (Sep.), X (Oct.), Y (Nov.), Z (Dec.)
Year (example: 2010): Last two digit of year

Control number: 8X
Month (example: Oct.): 1 (Jan.) to 9 (Sep.), X (Oct.), Y (Nov.), Z (Dec.)
Year (example: 2008): Last digit of year

- Battery life
Approximate battery life:
5 years (ambient temperature: 25°C)
Battery replacement: In 4 to 5 years

Approximate life is 5 years, but life may be shorter depending on the ambient temperature, therefore, note that the battery must be replaced in 4 to 5 years. Make sure to purchase a new battery as needed as it self-discharges.

Battery status can be confirmed on a GOT utility screen. For details of battery status or how to output alarm, refer to the following:
→ GT11 Handy GOT User's Manual

5. Cautions on Using Emergency Stop Switch

- When using the emergency stop switch in the handy GOT, judge the validity to use the emergency stop switch in accordance with the risk assessment in your system.
- When using the parallel circuit (which disables the emergency stop status while the handy GOT is removed), the system may not conform to the safety standards. Check the safety standards required in the system, and then judge the validity to use the emergency stop switch.

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- 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.