

F930

F930GOT-BWD-E

HARDWARE MANUAL [Main Body Instruction Manual]



JY992D83301B

We appreciate it very much that you have purchased our GOT (graphic operation terminal). Please read the manual of the programmable controller (PLC) main body and the F930GOT Users Manual together with this manual, sufficiently understand the specifications of the F930GOT, then correctly use the F930GOT.
Please see to it that this manual is delivered to the end user.

Cautions on Safety (Make sure to read this paragraph before using the F930GOT.)

Thoroughly read this manual and all documents offered together with the PLC connected to the F930GOT and other related units before installing, operating and inspecting/maintaining the F930GOT, and correctly use the F930GOT.


Sufficiently learn all of the knowledge of the units, the information on safety and cautions. In this manual, cautions on safety are classified into two levels, "DANGER" and "CAUTION".

-  If the unit is incorrectly handled, the situation may become dangerous and the possibility of death or serious injury is postulated.
-  If the unit is incorrectly handled, the situation may become dangerous, the possibility of medium or slight injury is postulated, and generation of only physical damages is postulated.

Even an item classified as "CAUTION" may lead to a serious result depending on the situation. Make sure to observe the contents classified into both "DANGER" and "CAUTION". Make sure that instruction manuals offered together with the units are securely stored so that they can be referred to at any time upon necessity, and that they are delivered to the end user.

Cautions on design

If a communication error (including disconnection of a cable) occurs while the F930GOT is monitoring the operation status, communication between the F930GOT and the CPU in the PLC is aborted and the F930GOT is disabled.
When constructing a system including the F930GOT, make sure that switches which actuate significant operations in the system are provided in any unit other than the F930GOT so that a communication error in the F930GOT does not cause problems. If such switches are provided in the F930GOT, accidents may be caused by erroneous output or malfunction.

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 - Never put control cables and communication cables near the main circuit. Never bind such cables together with power cables. Keep such cables off the main circuit and power cables by 100 mm or more. Otherwise, noise may cause malfunction.
 - Make sure to use your hand to press touch switches on the screen. If an excessive force is applied on touch switches or a hard or sharp object is used to press them, malfunction may be caused.

1. Introduction

The F930GOT comes supplied with the following manuals.

- F930GOT Hardware Manual (this manual)
Describes the outline, installation, wiring, specifications, etc. of the F930GOT.
- F930GOT Users Manual (separate manual)
Describes the operating procedures, the display function, etc. of the F930GOT.
- FX-PCS-DU/WIN-E Operation Manual (separate manual)
Describes the operating procedures of the software to create screens.
- SW□D5C-GOTR-PACK-E Operation Manual
Describes the operating procedures of the software to create screens. (Refer to the HELP file of the software.)

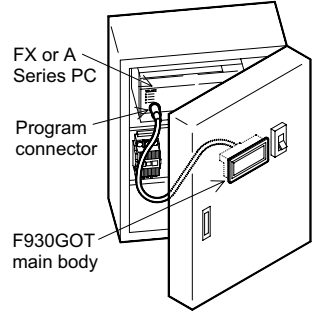
2. Outline

The F930GOT is designed to be mounted on the outside surface of a control or operation panel and connected to the programming port of an FX or A Series PLC (excluding A0J2 PLC) housed inside the panel. The F930GOT can be directly connected to the CPU, a PLC other than in the MELSEC Series or a micro computer board by means of a computer link connection.

Monitoring and changing data devices in the PLC is possible using the F930GOT.

Display screens can be created, using either of the following:

- Screen creation software for GOT-A and F900 Series SW□D5C-GOTR-PACK-E (Ver. H or later, manufactured in May, 1999 or later) ("□" indicates "1" or larger.)
- Screen creation software for DU and F900 Series FX-PCS-DU/WIN-E (Ver. 2.20 or later, manufactured in October, 1999 or later)



3. Additional Products and Options

Options

Product name	Model name	Specifications
Battery	FX2NC-32BL	To back up current time and alarm history
Backlight	F9GT-30LTB	Replacement backlight for F930GOT LC Display
Screen protection sheet	F9GT-30PSC	Transparent protective sheet (for F930GOT, without logo), five sheets in one set

Connection cables

Product name	Model name	Cable length	Specifications	
Connection cables: F930GOT to PLC	FX-50DU-CAB0	3m	For direct connection between F930GOT and FX0S / FX0N / FX2N / FX2NC PLC	
	FX-50DU-CAB0-1M	1m		
	FX-50DU-CAB0-10M	10m		
	FX-50DU-CAB0-20M	20m		
		FX-50DU-CAB0-30M	30m	For direct connection between F930GOT and FX / FX2c / A / QnA PLC
		FX-40DU-CAB	3m	
		FX-40DU-CAB-10M	10m	
		FX-40DU-CAB-20M	20m	
Data transfer cable F930GOT and personal computer	FX-40DU-CAB-30M	30m		
	F2-232CAB-1	3m	D-Sub 9 pin female to D-Sub 25 pin female	
	FX-232CAB-1	3m	D-Sub 9 pin female to D-Sub 9 pin female	
	FX-232CAB-2	3m	D-Sub 9 pin female to Half pitch 14 pin	

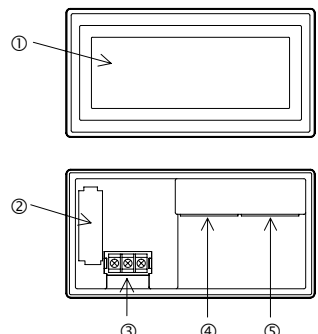
Software

Product name	Model name	Specifications
Screen creation software	SW1D5C-GOTR-PACK-E	CD-ROM Ver. H or later for Windows95 / Windows98 / Windows NT 4.0
	FX-PCS-DU/WIN-E	3.5-inch FD for system startup Ver. 2.20 or later for Windows95 / Windows98 / Windows NT 4.0

4. Component Names

The name of each component of the F930GOT is described below.

- Front panel
 - ① Display
For details, refer to "8. Specifications".
- Rear panel
 - ② Battery FX2NC-32BL to back up alarm history and current time
For details, refer to "7. Maintenance (Replacement of battery)".
 - ③ Power terminals: 24V DC, for grounding
 - ④ RS-422 interface
D-sub, 9-pin, female connector
Used for communication with PLC
 - ⑤ RS-232C interface
D-sub, 9-pin, male connector
Used to transfer screen data and for computer link connection



5. Installation



Cautions on installation

- Do not mount the F930GOT in an environment that contains dust, soot corrosive or conductive dust, corrosive or flammable gas, or expose the unit to high temperatures, dew condensation, rain and wind or impact and vibration.
If the F930GOT is used in such a place, electrical shock, fire, malfunction, damages or deterioration may be caused.
- Never drop cutting chips and electric wire chips into the ventilation window of the F930GOT when drilling screw holes or performing wiring. Such chips may cause fire, failure or malfunction.
- Make sure that the power is turned off, before securely connecting any cables. Poor connection may cause malfunction.

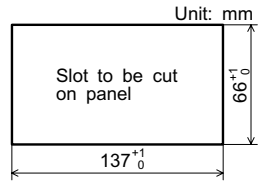
The F930GOT is designed to be mounted in a panel. Install it using the following procedure.

1) Preparing the panel surface.

On the panel surface, cut a rectangular mounting slot of the dimensions shown on the right.

At this time, space of 10 mm is required at each of the top and the bottom of the slot, inside the panel for metal fixtures as shown in "(4) Dimensions required inside the panel for installation".

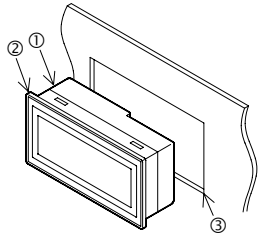
* Make sure that the thickness of the panel surface is no thicker than 5 mm.



2) Inserting the F930GOT into the panel surface

Attach the packing seal to the F930GOT, and insert the F930GOT from the front face of the panel surface.

- ① F930GOT
- ② Packing seal
- ③ Mounting slot



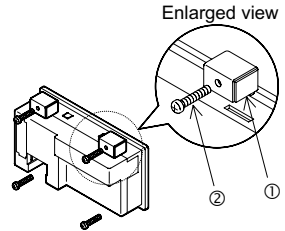
3) Fixing the F930GOT

Put hooks of the metal fixtures (supplied) in to the mounting hook holes in the F930GOT. Tighten mounting bolts (also supplied) until the F930GOT is securely fixed.

Fix mounting bolts in all four positions, above and below the GOT.

- ① Metal fixture
- ② Clamping bolt

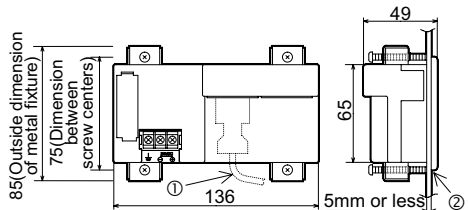
* Make sure to tighten the clamping bolts with a torque of 0.3 to 0.5 N·m.



4) Dimensions required inside the panel for installation

When installing the F930GOT, make sure that the inside dimensions shown on the right are available.

- ① PLC connection cable
- ② Packing seal



6. Wiring



Cautions on wiring

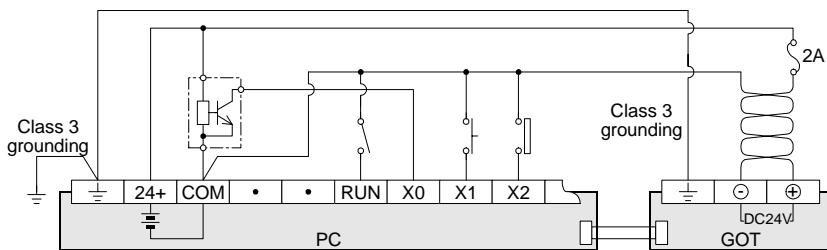
- Make sure the unit is 'powered down' before starting installation or wiring.
Damage or personal injury may otherwise be caused
- Insure correct termination of DC power source, incorrect connection may result in unit failure or the F930GOT being burnt.
- Attach a fuse of 2 A to the 24V DC power supply.
- Perform Class 3 grounding with an electric wire of at least 1.25 mm².
Never perform common grounding of the F930GOT and a strong power system.



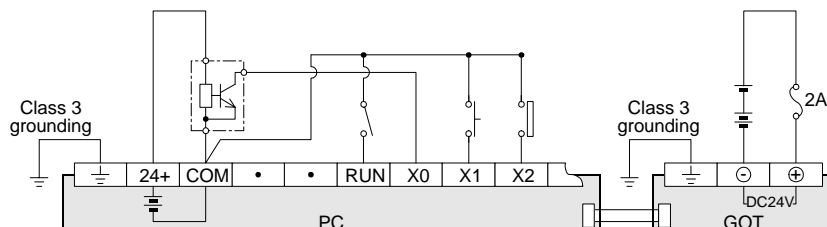
The power can be supplied to the F930GOT from the PLC or an external power supply.

• Connection examples

- 1) When the power is supplied from the FX Series PLC
Connect the power terminals provided on the rear face of the F930GOT to the 24V DC service power supply of the PLC base unit or an extension unit.



- 2) When the power is supplied from an external power supply
Connect the power terminals provided on the rear face of the F930GOT to the 24V DC terminals of an external power supply.



Cautions on connection

The current consumption of the F930GOT is 200 mA / 24V DC.

If the power is supplied to the F930GOT from the 24 VDC service power supply of the FX Series PLC base unit or an extension unit, take into account the total current supplied to proximity switches and extension blocks. If the total current exceeds the capacity of the 24V DC service power supply, an external power supply must be used.

- Even if instantaneous power interruption of less than 5 ms occurs, the F930GOT continues its operation. When power interruption for considerable period of time or voltage drop occurs, the F930GOT stops its operation. However, when the power supply is recovered, the F930GOT automatically restarts its operation. (The screen displayed just after recovery is determined by the working environment preliminarily set.)
- When wiring the power supply, use electric wires of 0.75 mm² or more so that voltage drop will not occur. As to crimp-style terminals, use those for M3. Securely tighten crimp-style terminals with a torque of 0.5 to 0.8 N·m so that errors will not occur.

7. Maintenance

Cautions on startup/maintenance

- Correctly connect the battery for memory backup. Never charge, disassemble, heat, burn or short-circuit the battery. If the battery is handled in such a way, bursting or fire may be caused.
- Always power down and remove the F930GOT from the panel before starting replacement of the backlight. If this is not the case, the backlight may drop and cause injury, or electrical shock may be sustained.
- Never disassemble or modify the F930GOT. Disassembly or modification may cause failure, malfunction or fire. * For repair, contact Mitsubishi Electric System Service.
- Make sure to turn off the power, then connect/disconnect cables.
If you connect/disconnect cables while the power is turned on, failure or malfunction may be caused.

Caution on disposal

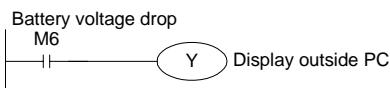
- When disposing of the F930GOT, treat it as industrial waste.

Replacement of battery

When the battery voltage drops, a control device (system information) set by the screen creation software turns ON. The control device interlocks with an auxiliary relay in the PLC. It is recommended to provide a lamp while utilizing the output of the PLC so that voltage drop can be monitored outside the F930GOT. For details of control devices, refer to the Users Manual.

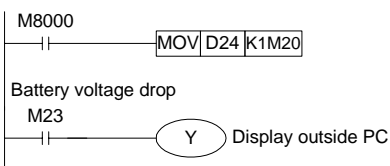
Example:

When the software FX-PLCS-DU/WIN-E is used
When the head No. of control devices is set to "M0"
M6: Battery voltage drop (Turns ON when the battery voltage drops.)
Use this device in a sequence program as shown on the right.

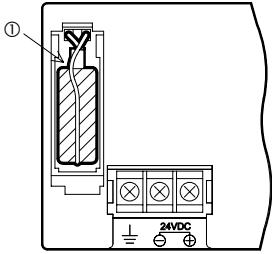


Example:

When the software SW-D5C-GOTR-PACK-E is used
When the system information write device is set to "D20"
D24 b3: Battery voltage drop (Turns ON when the battery voltage drops.)
Use this device in a sequence program as shown on the right.



For approximately one month after the control device for battery voltage drop turns ON, the battery backs up the alarm history and the current time. When the control device turns ON, replace the battery soon.



Product name

① Battery FX2NC-32BL

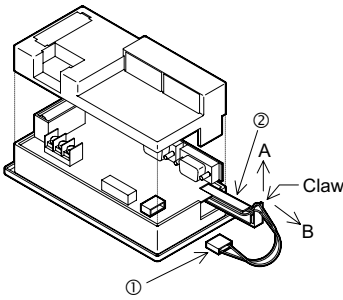
Replacement procedure

- 1) Turn off the power of the F930GOT and, remove the battery holder cover.
- 2) Remove the existing battery from the battery holder, and disconnect.
- 3) Within 30 seconds, connect a new battery.
- 4) Insert the new battery into the battery holder, and attach the cover.

* The battery backs up the alarm history and the current time. The screen data is stored in the flash memory. Accordingly, even if the battery is worn out, the screen data remains stored.

Replacement of backlight

Replace the backlight F9GT-30LTB using the following procedure.



Product name

① Backlight connector

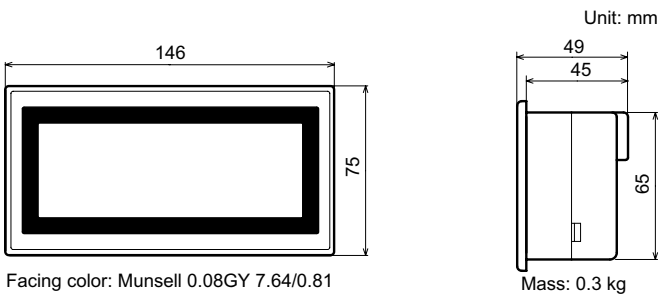
② Backlight F9GT-30LTB

Replacement procedure

- 1) Turn off the power of the F930GOT. Open the rear cover.
- 2) Disconnect the existing backlight connector ①.
- 3) While pushing the claw of the existing backlight ②, move it up in the direction A by approximately 10 mm.
- 4) Pull out the existing backlight ② in the direction B.
- 5) Attach a new backlight in the reverse order.

8. Specifications

Outside dimensions



Power supply specifications

Supply voltage	24V DC+10% to -15% (separately prepare service power supply of PLC or DC power supply)
Power ripple	200 mV or less
Current consumption (24V DC)	200 mA / 24V DC (Backlight turned off: 100 mA / 24V DC)
Fuse	Built-in fuse (Cannot be replaced.)
Allowable instant power interrupt	5 ms
Battery	Built-in lithium battery FX2NC-32BL

General specifications

Ambient temperature	While operating: 0 to +50 °C While stored: -20 to +60°C
Ambient humidity	35 to 80%RH (Dew condensation shall not be allowed.)
Working atmosphere	Please see section 5 "Installation"

Vibration resistance	In conformance to JIS B3501 and IEC 1131-2	Intermittent vibration	Frequency	Acceleration	Amplitude	10 times each in X, Y and Z directions (for 80 min)
			10 to 57Hz	—	0.075mm	
		Continuous vibration	57 to 150Hz	9.8m/s ²	—	
			10 to 57Hz	—	0.035mm	
		57 to 150Hz	4.9m/s ²	—		
Impact resistance	In conformance to JIS B3051 and IEC 1131-2 (147 m/s ² , 3 times in each of X, Y, and Z directions)					
Noise resistance	By noise simulator of 1,000 Vp-p in noise voltage, 1 μs in noise width and 30 to 100 Hz in frequency					
Withstand voltage	500V AC for 1 min (between all power terminals and ground terminal)					
Insulation resistance	5 MΩ or more by 500V DC megger (between all power ground terminal)					
Grounding	Class 3 grounding (May be omitted if impossible.)					
Protective structure	Equivalent to IP65F					

Performance specifications

Display device/display color	STN monochrome liquid crystal, two colors (blue and white)	
Resolution/effective display size	240 × 80 dots / 117 × 42 mm	
Display character (full-width)	15 characters x 5 lines	
Visible angle range	30° in left, right, up and downward directions	
Number of user screens	500 screens maximum	
Switch	Touch key (available quantity)	15 × 4 matrix (50 touch keys/screen)
Built-in memory type	For screen data	Flush memory / 256 KB
	For other data	RAM (to back up current time and alarm history)
Service life (average)	Display element	Approx. 50,000 hours or more at room temperature (25°C) and room humidity (Guarantee period: 1 year)
	Backlight	Cold cathode: 50,000 hours (Guarantee period: 1 year)
		Equipped with automatic 'OFF' function, (time set in PLC).

Guidelines for the safety of the user and protection of the F930GOT

- This manual has been written to be used by trained and competent personnel. This is defined by the European directives for machinery, low voltage and EMC.
- If in doubt at any stage during the installation of the F930GOT 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 of the F930GOT please consult the nearest Mitsubishi Electric distributor.
- Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
- All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.
- Owing to the very great variety in possible application of this equipment, you must satisfy yourself as to its suitability for your specific application.

Manual number : JY992D83301

Manual revision : B

Date : FEBRUARY 2000

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