

Pro-face

GP2000H Series

User Manual

(Pro-Designer Compatible)

Preface

Thank you for purchasing the Pro-face GP2000H Series programmable operator interface (hereby referred to as “GP unit”).

The GP2000H Series units are the “Handy” type GP units that are hand-held operable. The GP2000H Series units allow you to use the CF Card without attaching separately sold expansion units.

Please read this manual carefully as it explains, step by step, how to use the GP2000H correctly and safely.

Also, in this manual’s examples, the Mitsubishi MELSEC-AnA Series PLC is used whenever possible, connected in a one-to-one relationship with a GP2000H unit.

< Note >

1. It is forbidden to copy the contents of this manual, in whole or in part, except for the user’s personal use, without the express permission of Digital Electronics Corporation of Japan.
2. The information provided in this manual is subject to change without notice.
3. This manual has been written with care and attention to detail; however, should you find any errors or omissions, contact Digital Electronics Corporation and inform them of your findings.
4. Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses, or third party claims arising from any uses of this product.

All Company/Manufacturer names used in this manual are the registered trademarks of those companies.

© Copyright 2002 Digital Electronics Corporation

TABLE OF CONTENTS

PREFACE	1
TABLE OF CONTENTS	2
ESSENTIAL SAFETY PRECAUTIONS	4
GENERAL SAFETY PRECAUTIONS	9
GP2000H SERIES MODELS	11
UL/C-UL (CSA) APPLICATION NOTES	11
CE MARKING NOTES	11
PACKAGE CONTENTS	12
REVISION INFORMATION	13
DOCUMENTATION CONVENTIONS	13

CHAPTER 1 INTRODUCTION

1.1 System Design	1-1
1.1.1 GP2000H Series System Design	1-1
1.2 Accessories	1-4

CHAPTER 2 SPECIFICATIONS

2.1 General Specifications	2-1
2.1.1 Electrical	2-1
2.1.2 Environmental	2-2
2.1.3 Structural	2-2
2.2 Functional Specifications	2-3
2.2.1 Display	2-3
2.2.2 Memory	2-3
2.2.3 Clock	2-4
2.2.4 Touch Panel Switches	2-4
2.2.5 Interfaces	2-5
2.3 Interface Specifications	2-6
2.3.1 External Interfaces	2-6
2.4 Part Names and Functions	2-12
2.5 Dimensions	2-14
2.5.1 GP-2301H Series / GP-2401H Series External Dimensions	2-14
2.5.2 CF Card Interface Guard	2-15
2.5.3 Emergency Switch Guard	2-15

CHAPTER 3 HANDLING AND WIRING

3.1 Handling the GP2000H	3-1
3.1.1 Wall Mount Adapter / Swivel Mount Arm	3-1
3.1.2 Hand Strap	3-2
3.1.3 Neck Strap	3-3
3.2 Interface / Switch Guards	3-4
3.2.1 CF Card Interface Guard	3-4
3.2.2 Emergency Switch Guard	3-5
3.3 Wiring Cautions	3-6
3.3.1 Wiring	3-6
3.3.2 Cable Installation	3-7
3.3.3 Setting Operation Switches Enabled	3-8
3.3.4 Switching DOUT Output Current Direction	3-10
3.4 Tool Connector	3-12
3.5 CF Card Installation and Removal	3-13
3.5.1 CF Card Handling	3-15
3.5.2 CF Card Access Switch	3-15

CHAPTER 4 SETTINGS

4.1 Types of Settings	4-1
4.1.1 Offline	4-3
4.1.2 System	4-5

CHAPTER 5 TROUBLESHOOTING

5.1 Troubleshooting Checklists	5-1
5.1.1 No display	5-2
5.1.2 Connected devices cannot be used	5-2
5.2 SELF TEST	5-3
5.2.1 SELF TEST item list	5-3
5.2.2 SELF TEST - details	5-4

CHAPTER 6 MAINTENANCE

6.1 Regular Cleaning	6-1
6.1.1 Cleaning the Display	6-1
6.2 Periodic Check Points	6-1
6.3 Replacing the Backlight	6-2

Essential Safety Precautions

This manual includes procedures that must be followed to operate the GP correctly and safely. Be sure to read this manual and any related materials thoroughly to understand the correct operation and functions of the GP unit.

■ Safety Symbols

Throughout this manual, the following icons identify GP operation procedures that require special attention. These icons provide essential safety information for the following levels of danger:



Indicates situations that may result in major machine damage, severe bodily injury, or death if the instructions are not followed.



Indicates situations that may result in damage to the machinery, or minor bodily injury if the instructions are not followed.



WARNINGS

System Design

- **Do NOT make switches using the switches on the touch panels, which may cause operator injury and machine damage. To prevent major accidents caused by an output remaining either ON or OFF, set up circuits (such as limiters) that will monitor vital output signals. To prevent accidents caused by incorrect output or malfunction, design switches used by separate devices to perform important operations.**
- **Do NOT use GP touch panel switches to perform safety-related or important accident-prevention operations. These operations should be performed by separate hardware switches to prevent operator injury and machine damage.**
- **To prevent any possibility of bodily injury or material damage, design your system so that equipment will not malfunction due to a communication fault between the GP unit and its host controller.**



WARNINGS

- Do NOT use the GP as a warning device for critical warning alarms that can cause serious operator injury, machine damage, or production stoppage. Use stand-alone hardware and/or mechanical interlocks to design alarm indicators and their control/activator units.
- The GP is NOT appropriate for use with aircraft control devices, medical life-support equipment, central trunk data transmission (communication) devices, or nuclear power control devices, due to their inherent requirements of extremely high levels of safety and reliability.
- When using the GP with transportation vehicles (trains, cars, and ships), disaster and crime prevention devices, various types of safety equipment, and medical devices that are not life-support related, use redundant and/or failsafe system designs to ensure proper reliability and safety.
- The Emergency Switch and the 3-Position Enable Switch do NOT guarantee the operator's complete personal safety. Be sure to design your system so that it ensures the operator's complete personal safety.
- After the GP unit's backlight burns out, the touch panel is still active. If the operator fails to notice that the backlight is burned out and touches the panel, a potentially dangerous malfunction can occur. Your backlight is burned out if:
 - 1) When the backlight burnout feature is not set, and the screen has gone blank, your backlight is burned out.
 - 2) When the backlight burnout feature is set, and the screen has gone blank, if touching the screen does not cause the backlight to turn ON, your backlight is burned out.

It is recommended to use the feature that disables the device operation to prevent accidental machine misoperation when a backlight burnout is detected automatically.



WARNINGS

Installation Warnings

- High voltage runs through the GP unit. To prevent an electrical shock, do NOT disassemble the GP for any reason other than to replace the backlight.
- Do NOT modify the GP unit. Doing so may cause a fire or an electrical shock.
- Do NOT use the GP in an environment where flammable gases are present, to prevent explosions from occurring.

Wiring Warnings

- To prevent electrical shock or equipment damage, unplug the GP unit's power cord from the power supply prior to installing or wiring the GP.
- Do NOT use power levels with the GP that are higher or lower than the GP unit's specified power range. Doing so may cause a fire or electrical shock.

Operation and Maintenance Warnings

- The GP uses a lithium battery to back up its internal clock and to control memory data. If the battery is incorrectly replaced (reversed positive [+] and negative [-] ends), the battery may explode. Therefore, Pro-face recommends that you contact your local GP distributor for instructions before replacing or changing the battery.



CAUTIONS

Installation Cautions

- To reduce the risk of incorrect input or output signals, be sure that any data cables attached to the GP unit's connector make full contact with the connector pins.

General Wiring Cautions

- To prevent electrical shocks or malfunctions, be sure the cable's FG (earth) wire is grounded as follows:
 - (1) maximum grounding resistance: 100 Ω
 - (2) minimum grounding wire diameter: 2 mm²
- The GP unit's wiring should be checked to confirm that both the operating voltage and wiring terminal locations are correct. If either the voltage or the wiring terminal location is incorrect, it can cause a fire or accident.
- Be sure that metal filings or wiring remnants do not fall inside the GP, since they can cause a fire, accident, or malfunction.

GP Operation and Maintenance Cautions

- The liquid crystal panel contains a powerful irritant. If, for any reason, the panel is damaged and this liquid enters your eyes, flush your eyes for 15 minutes with running water and contact a physician immediately.
- Prior to inserting or removing a CF Card, and to prevent damage to or loss of the CF Card's internal data, turn the GP unit's CF Card Access Switch OFF, and make sure that the ACCESS lamp is not lit.
- While a CF Card is being accessed, NEVER:
 - turn OFF the GP
 - reset the GP
 - insert a CF Card
 - remove a CF Card



CAUTIONS

Prior to performing these operations, create and use a special GP application screen that will prevent access to the CF Card.

- Use Pro-face's CF Cards. Other manufacturers' CF Cards are not compatible with the specifications.

GP Unit Disposal Cautions

- The GP unit should be disposed of in a manner appropriate to, and in accordance with, the user country's industrial machinery disposal standards.

General Safety Precautions

■ About the Operation Environment

- Do NOT strike the touch panel with a hard or pointed object, or press on the touch panel with too much force, since it may damage the touch panel or the display.
- Do NOT install the GP where the ambient temperature can exceed the allowed range. Doing so may cause the GP to malfunction or shorten its operation life.
- Do NOT restrict or limit the GP unit's naturally-occurring, rear-face ventilation, and do NOT store or use the GP in overheated areas.
- Do NOT store or use the GP unit in areas where large, sudden temperature changes can occur. These changes can cause condensation to form inside the unit, which can cause possible unit malfunctions.
- Do NOT allow water, liquids, metals, or charged particles to enter inside the GP unit's outer casing, since they can cause either a GP malfunction or an electrical shock.
- Do NOT store or use the GP in direct sunlight, or in excessively dusty or dirty environments.
- Do NOT store or use the GP in an environment where shaking or excessive vibration can occur.
- Do NOT store or use the GP where chemicals (such as organic solvents and acids) can evaporate, or in environments where chemicals and acids are present in the air.
 - Corrosive chemicals: acids, alkalines, liquids containing salt
 - Flammable chemicals: organic solvents
- Do NOT use paint thinner or organic solvents to clean the GP.
- Do NOT store or operate the LCD (Liquid Crystal Display) in areas that receive direct sunlight, since the sun's ultraviolet (UV) rays may cause the quality of the LCD to deteriorate.
- Storing this unit in areas at temperatures that are lower than is recommended in this manual's specifications may cause the LCD panel's liquid to congeal, which may damage the panel. Conversely, if the storage area's temperature becomes higher than the allowed level, the LCD panel's liquid will become isotropic, causing irreversible damage to the LCD. Therefore, be sure to store the panel only in areas where temperatures are within the ranges specified in this manual.
- Do not connect or disconnect the communication cable to the host machine while the power is ON.

Preface

■ About the Screen Data



Due to the possibility of unexpected accidents, be sure to back up the GP unit's screen data regularly.

■ About the GP Unit's Display Panel

- The data that is currently displayed on the GP unit's screen, the screen's brightness, and the GP unit's voltage^{*1} affect the screen's intensity of *Contouring* — wavelike pattern that is created when some parts of the screen are brighter than others.
- The minute, dark and light grid-points on the display panel's surface are part of the GP unit's design and are not defects.
- Extended shadows, or “crosstalk,” may appear on the sides of screen images. This is normal for an LCD panel.
- Sometimes the display area may look as if the display colors have changed. This is a common attribute of LCDs and is not a defect.
- Displaying a single image for long periods of time can cause an afterimage to remain when the screen display is changed.

To prevent this effect:

Do NOT display any single screen for a long period of time. Try to change the screen display periodically.

**1 The backlight's brightness may vary or its lighting may be delayed if the voltage provided is low — even if still within the range of rated voltage listed in the specifications.*

GP2000H Series Models

The GP2000H Series, in this manual, refers to the following GP unit model numbers:

Series Name		Model Name	Model Type	Comments
GP2000H Series	GP-2301H Series	GP-2301HL	GP2301H-LG41-24V	UL/c-UL (CSA) Approved,
		GP-2301HS	GP2301H-SC41-24V	
	GP-2401H Series	GP-2401HT	GP2401H-TC41-24V	CE Marked

UL/c-UL (CSA) Application Notes

The GP2301H-LG41-24V/GP2301H-SC41-24V/GP2401H-TC41-24V are UL/c-UL (CSA) listed products.

UL File No. E171486 (UL60950)

This unit conforms to the following product standards:

- **UL 60950** Third Edition (Standard for Safety of Information Technology Equipment)
- **CAN/CSA-C22.2 No. 60950-00** (Standard for Safety of Information Technology Equipment)
 - GP2301H-LG41-24V (UL Registration Model: 3080028-03)
 - GP2301H-SC41-24V (UL Registration Model: 3080028-02)
 - GP2401H-TC41-24V (UL Registration Model: 3080028-01)

CE Marking Notes

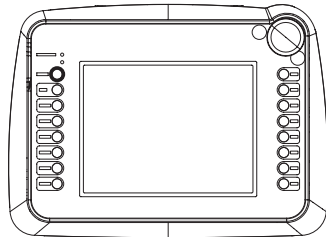
The GP2301H-LG41-24V/GP2301H-SC41-24V/GP2401H-TC41-24V are CE marked products that conform to EMC directives EN55011 Class A and EN61000-6-2. For detailed CE marking information, contact your local GP distributor.

Package Contents

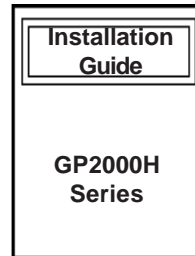
Please verify that the GP unit's packing box contains all the items listed below.

■ **GP Unit (1)**

GP2301H-LG41-24V
GP2301H-SC41-24V
GP2401H-TC41-24V



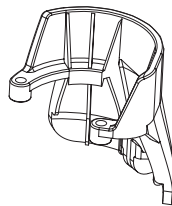
■ **Installation Guide (1)**



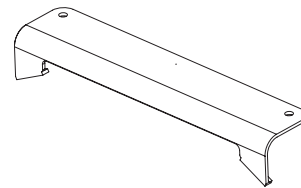
■ **Hand Strap**



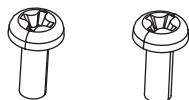
■ **Emergency Switch Guard (1)**



■ **CF Card Interface Guard (1)^{*1}**



■ **Emergency Switch Guard Attachment Screws (2)**



■ **CF Card Interface Guard Attachment Screws (2)**



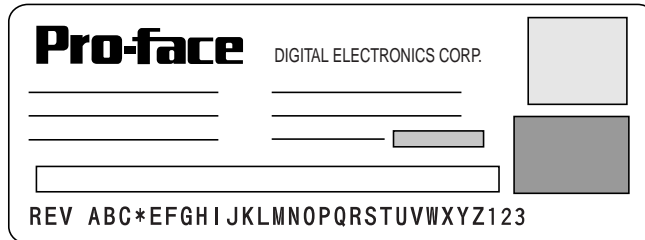
Special care and attention have been given to the packaging of this GP unit. However, if any of the items are damaged or missing, contact your local GP distributor immediately for prompt service.

**1 The CF Card Interface Guard is used in a NEMA#250 TYPE4X/12 environment.
Units that are Revision A or later correspond to a NEMA#250 TYPE4X/12 rating.
For a description of how to identify your unit's revision code, see Page 13.*

Revision Information




Revision information can be found on your GP unit's rear-face Pro-face label. The bottom-most [REV] row's asterisk (*) mark indicates the Revision character.

In the example shown below, the asterisk indicates that this unit's Revision character is 'D'.



Documentation Conventions

The list below describes the documentation conventions used in this manual.

Symbol	Meaning
	Indicates important information or procedures that must be followed for correct and risk-free software/device operation.
Screen Editor	Indicates the Pro-Designer (ver. 4.0 or higher).
PLC	Indicates Programmable Logic Controller (or sequencer)
*1	Indicates useful or important supplemental information.
	Provides useful or important supplemental information.
	Cross-references to useful or important supplemental information.

Some differences between GP-2301H Series and GP-2401H Series units can be seen in the external appearance, OFFLINE Mode screens, and functions available.

In this manual, the explanation of one model's interface (external appearance or OFFLINE Mode) rather than another is for the reader's convenience only. All functional differences between the GP-2301H and the GP-2401H will be clearly noted.

Memo

Chapter 1 Introduction

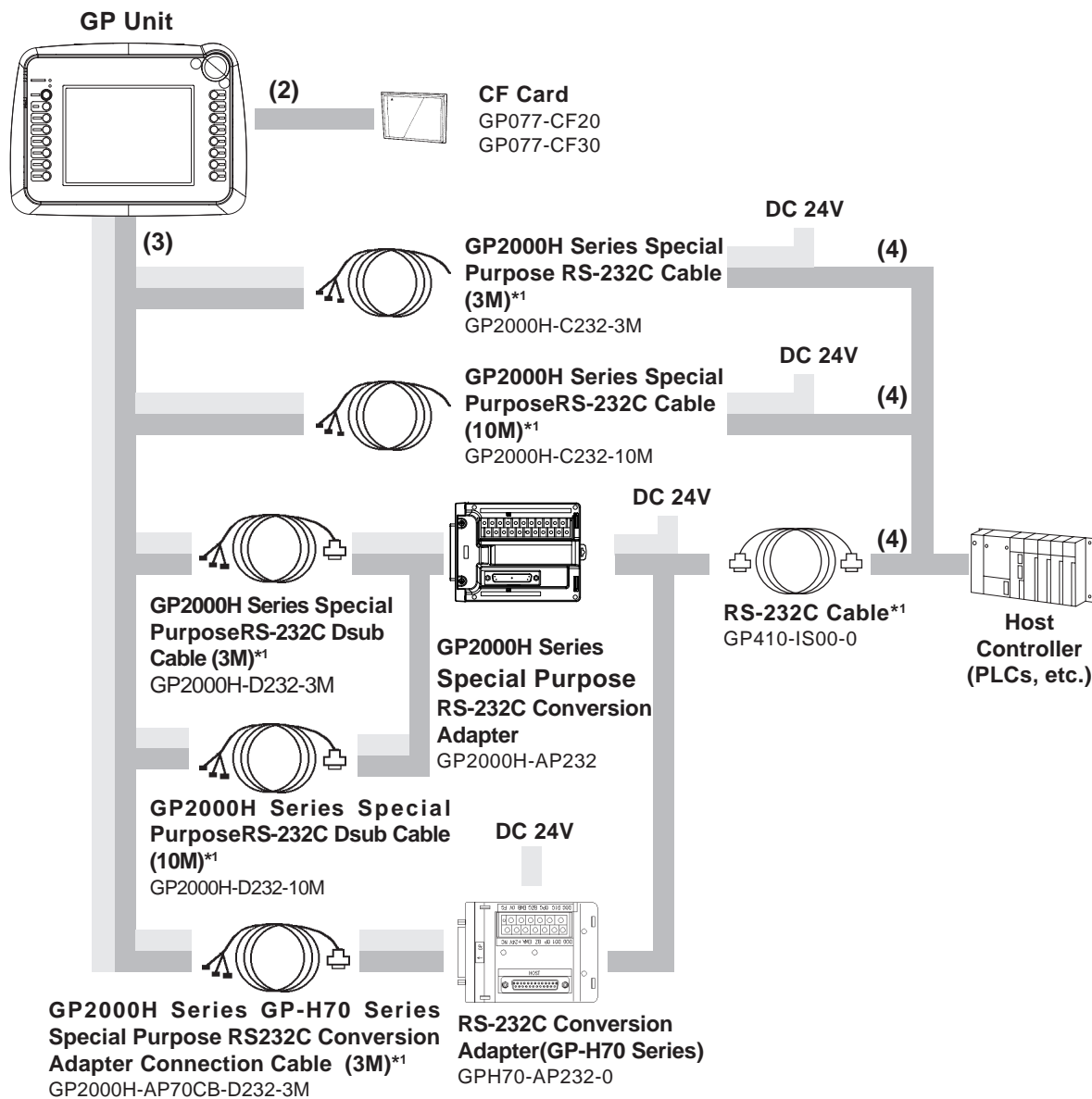
1. System Design
2. Accessories

1.1 System Design

1.1.1 GP2000H Series System Design

The following diagram represents the main selection of devices connectable to the GP.

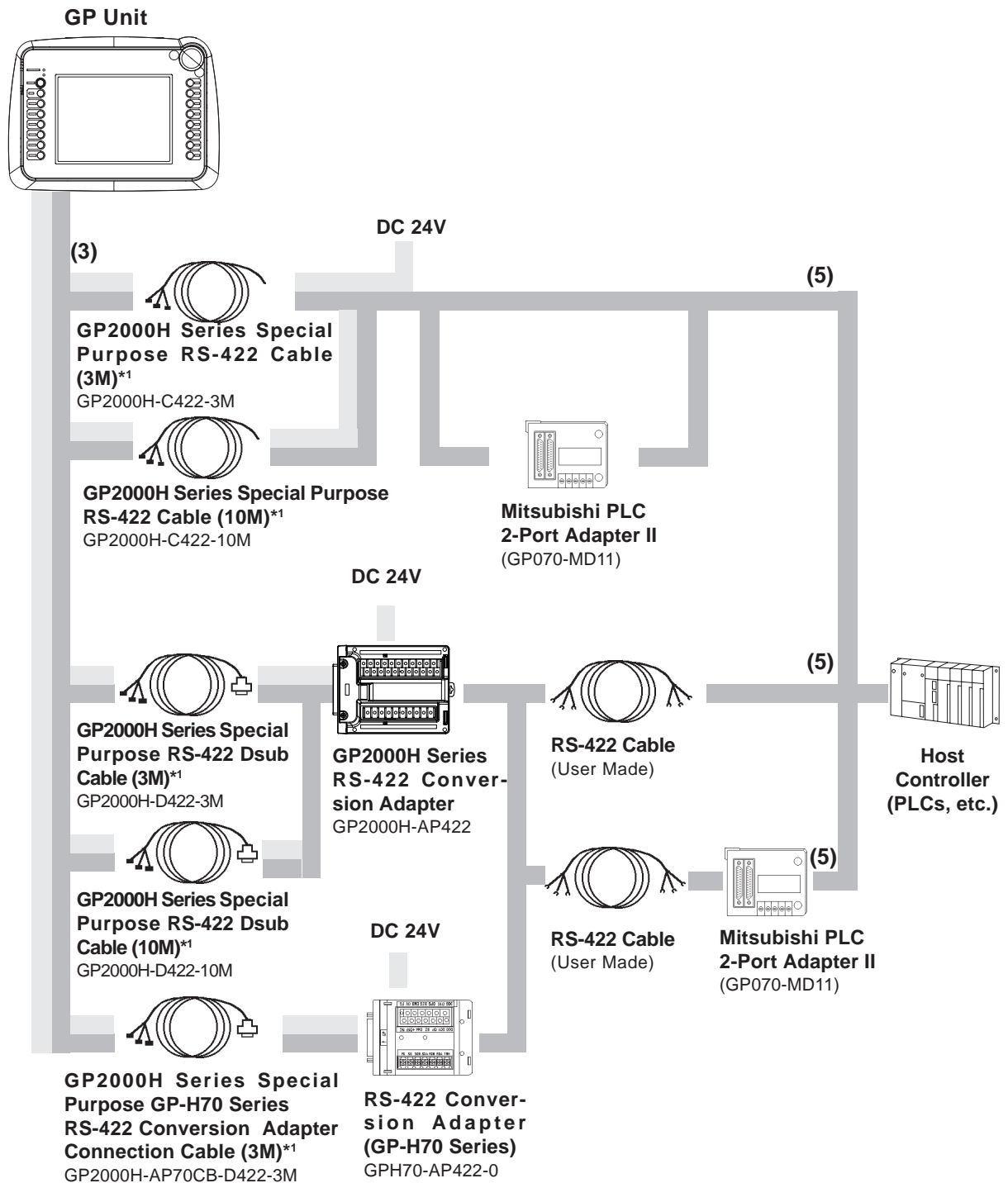
■ GP RUN Mode Peripherals



*1 For details on connectable PLC types and model connections:

Reference Refer to the Pro-Designer On-line Help.

Chapter 1 – Introduction

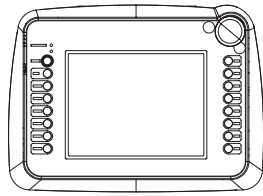


**1 Certain PLC types and models cannot be connected.*

Reference Refer to the Pro-Designer On-line Help.

■ GP Edit Mode Peripherals

GP Unit

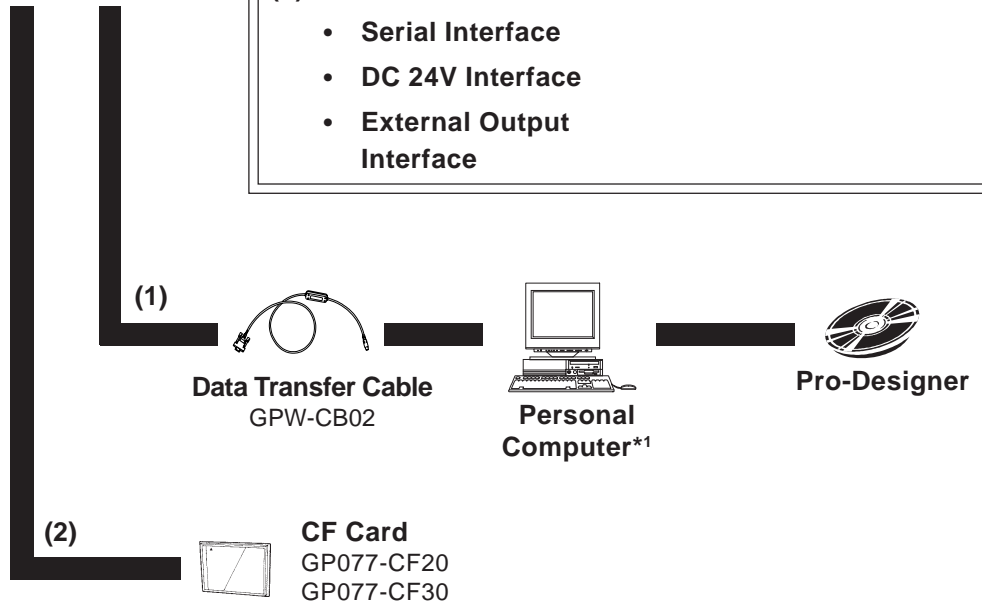


GP Interfaces

- (1) Tool Connector
- (2) CF Card Interface
- (3) External Interface
 - Serial Interface
 - DC 24V Interface
 - External Output Interface

PLC Interfaces

- (4) RS-232C Port
- (5) RS-422 Port



**1 Certain PCs cannot be used in this system. For details:*

Reference Refer to the Pro-Designer On-line Help.

1.2 Accessories

All optional equipment listed here is produced by Digital Electronics Corporation.

■ Available Software

Product Name	Model No.	Description
Pro-Designer Ver. 4.0 or later	PS-DWE01-V40	Software used with a personal computer to create the screen data.

■ Tool Connector

Product Name	Model No.	Description
Data Transfer Cable	GPW-CB02	Connects the GP to a personal computer. Transfers screen data and user programs.

■ External Interfaces

Product Name	Model No.	Description
GP2000H Series Special Purpose RS-232C Cable (3M) ^{*1}	GP2000H-C232-3M	Interface cables between the host (PLC) and the GP unit.
GP2000H Series Special Purpose RS-422 Cable (3M) ^{*1}	GP2000H-C422-3M	
GP2000H Series Special Purpose RS-232C Cable (10M) ^{*1}	GP2000H-C232-10M	
GP2000H Series Special Purpose RS-422 Cable (10M) ^{*1}	GP2000H-C422-10M	
GP2000H Series Special Purpose RS-232C Dsub Cable (3M) ^{*1}	GP2000H-D232-3M	Connects the GP2000H Adapter and GP2000H
GP2000H Series Special Purpose RS-422 Dsub Cable (3M) ^{*1}	GP2000H-D422-3M	
GP2000H Series Special Purpose RS-232C Dsub Cable (10M) ^{*1}	GP2000H-D232-10M	
GP2000H Series Special Purpose RS-422 Dsub Cable (10M) ^{*1}	GP2000H-D422-10M	
GP2000H Series Special Purpose GP-H70 Series RS-232C Conversion Adapter Connection Cable (3M) ^{*1}	GP2000H-AP70CB-D232-3M	Connects the GP-H70 Adapter and GP2000H
GP2000H Series Special Purpose GP-H70 Series RS-422 Conversion Adapter Connection Cable (3M) ^{*1}	GP2000H-AP70CB-D422-3M	
RS-232C Cable ^{*1}	GP410-IS00-0	Connects the RS-232 Adapter and Host (PLC)

^{*1} For details about the range of connectable PLCs:

Reference Refer to the Pro-Designer On-line Help.

■ External Interfaces (cont.)

Product Name	Model No.	Description
Mitsubishi A Series Programming Port I/F Cable	GP430-IP10-0	Connects directly to Mitsubishi's PLC I/F Programming Console. Simultaneous use of program console, however, is not possible.
Mitsubishi FX Series Programming Port I/F Cable	GP430-IP11-0	
GP2000H Series RS-232C Conversion Adapter	GP2000H-AP232	Conversion adapter to convert serial data to RS-232C Dsub format.
GP2000H Series RS-422 Conversion Adapter	GP2000H-AP422	Conversion adapter to convert serial data to RS-422 Dsub format.

■ CF Card Items

Product Name	Model No.	Description
CF Cards	GP077-CF20	GP Series CF Card (16MB)
	GP077-CF30	GP Series CF Card (32MB)
CF Card Adapter	GP077-CFAD10	CF Card Adapter for standard PC Card Slot.

■ Optional Items

Product Name	Model No.	Description
Screen Protection Sheet (5 sheets/set)	GP2000H-DF10	Disposable protective, dirt-resistant sheet for the GP unit's screen. The GP unit's touch panel can be used with this cover sheet attached.
Neck Strap	GP2000H-ST RAP11	Strap used to hang GP unit from neck while operating.
Wall Mount Adapter	CA1-WMALRG-01	Fasteners used to mount the GP2000H Series unit on a stand or wall

■ Maintenance Items

They are available separately as optional maintenance items.

Product Name	Model No.	Description
Hand Strap	H70-HS00-MS	Strap used to hold the GP unit.
Emergency Switch Guard	GP2000H-EMGD11	Cover used to prevent the Emergency Switch from be accidentally pushed.
CF Card Interface Guard	GP2000H-CFGD11	NEMA standard ^{*1} type fasteners used to prevent the CF Card cover from being accidentally opened or closed.

**1 The CF Card Interface Guard is used in a NEMA#250 TYPE4X/12 environment.*

*Units that are Revision A or later correspond to a NEMA#250 TYPE4X/12 rating. For a description of how to identify your unit's revision code, see the **Preface - Page 13**.*

Memo

Chapter

2 Specifications

1. General Specifications
2. Functional Specifications
3. Interface Specifications
4. Part Names and Functions
5. Dimensions

2.1 General Specifications

2.1.1 Electrical

Rated Voltage	DC 24V
Rated Voltage Range	DC 19.2V to DC 28.8V
Allowable Voltage Drop	10ms max.
Power Consumption	15W max.
In-Rush Current	30A max.
Voltage Endurance	AC 500V 20mA for 1 minute (between charging and FG terminals)
Insulation Resistance	20M Ω or more at DC 500V (between charging and FG terminals)

Chapter 2 – Specifications

2.1.2 Environmental

Ambient Operating Temperature (Internal Panel and Display Screen)	0°C to +40°C
Storage Temperature	-20°C to +60°C
Ambient Humidity	10%RH to 90%RH (non-condensing, wet bulb temperature: 39°C max.)
Storage Humidity	10%RH to 90%RH (non-condensing, wet bulb temperature: 39°C max.)
Air Purity (Dust)	0.1mg/m ³ max. (non-conductive levels)
Pollution Degree	Level 2
Atmosphere	Free of corrosive gasses
Atmospheric Endurance (GP Operation Altitude)	800hPa to 1,114hPa (2000 meters max.)
Vibration Resistance	IEC61131-2 (JIS B 3502) compliant When Vibration is NOT Continuous 10Hz to 57Hz 0.075mm, 57Hz to 150Hz 9.8m/s ² When Vibration is Continuous 10Hz to 57Hz 0.035mm, 57Hz to 150Hz 4.9m/s ² 10 times (80 min.) for each (X, Y, Z) direction
Shock Resistance	IEC61131-2 (JIS B 3502) compliant 147m/s ² Release Time: 11ms Twice for each (X, Y, Z) direction.
Drop Resistance	IEC61131-2 (JIS B 3502) compliant 1.0 meter drop - 2 times.
Noise Immunity (via noise simulator)	Noise Voltage: 1000Vp-p Pulse Duration: 1μs Rise Time: 1ns
Electrostatic Discharge Immunity	Contact Discharge Method 6kV (complies with IEC 61000-4-2 Level 3)

2.1.3 Structural

Grounding	100Ω max., or your country's applicable standard
Ratings	Equivalent to IP65f (JEM 1030) NEMA#250 Type4X/12* ¹
External Dimensions	W253mm x H185mm x D58mm [9.96 in. x 7.28 in. x 2.28 in.] (excluding projections)
Weight	1.2 kg [2.65 lb] max.* ²
Cooling Method	Natural air circulation

*¹ When using the CF Card Interface Guard Attachment Screws (included in the package). The CF Card Interface Guard is used in a NEMA#250 TYPE4X/12 environment. Units that are Revision A or later correspond to a NEMA#250 TYPE4X/12 rating. For a description of how to identify your unit's revision code, see **Preface - Page 13**.

*² Not including the CF Card Interface Guard Attachment Screws or the Emergency Switch Guard.

2.2 Functional Specifications

2.2.1 Display

		GP2301H-LG41-24V	GP2301H-SC41-24V	GP2401H-TC41-24V
Type (LCD)		Monochrome	STN Color	TFT type Color
Resolution		320 x 240 pixels		640 x 480 pixels
Effective Display Area		W115.2mm x H86.4mm [4.54 in. x 3.40 in.]		W132.5mm x H99.4mm [5.22 in. x 3.91 in.]
Colors		Black and White: 1- speed Blink	64 Colors: 3-speed Blink	256: No Blink / 64: 3- speed Blink* ¹
Backlight		CFL (Service Life: 50,000 hrs. min. at 25°C and 24-hour operation)		
Contrast Control		Eight (8) levels of adjustment available via touch panel.		
Brightness Control		Four (4) levels of adjustment available via touch panel.		
Language Fonts		ASCII: (Code page 850) Alphanumeric (incl. Eur. chars.) Chinese: (GB2312 80 codes) simplified Chinese fonts Japanese: ANK 158, Kanji: 6962 (JIS Standards 1 & 2) Korean (KSC5601 1992 codes): Hangul fonts Taiwanese (Big 5 codes): traditional Chinese fonts		
Text	Text Sizes	8X8 dot, 8X16 dot, 16X16 dot, and 32X32 dot fonts		
	Font Sizes	Both high and width can be expanded 1, 2, 4 or 8 times.		
Char. Resolution	8x8 dots	40 char. x 30 rows		80 char. x 60 rows
	8x16 dots	40 char. x 15 rows		80 char. x 30 rows
	16x16 dots	20 char. x 15 rows		40 char. x 30 rows
	32x32 dots	10 char. x 7 rows		20 char. x 15 rows

*1 Changing the Colors setting to “256 Colors” will disable the blink feature on all screens in your project. If you wish to use the blink feature, select “64 Colors.”

2.2.2 Memory

	GP-2301H Series	GP-2401H Series
Application	4MB FLASH EPROM ^{*1}	6MB FLASH EPROM ^{*1}
Data Backup	128KB SRAM	
	[uses a lithium battery] ^{*2}	

*1 Pro-Designer and GP-PRO/PBIII (C-Package02) each use application memory differently.

*2 A Lithium battery's lifetime is:

- 10 years when the battery's ambient temperature is 40° C max.
- 4.1 years when the battery's ambient temperature is 50° C max.
- 1.5 years when the battery's ambient temperature is 60° C max.

When used for backup:

- Approximately 60 days, with a fully charged battery
- Approximately six (6) days, with a half-charged battery

Chapter 2 – Specifications

2.2.3 Clock

	GP-2301H Series	GP-2401H Series
Clock Accuracy	±65 seconds/month (at room temperature)	



Note:

The GP unit's internal clock has a slight error. At normal operating temperatures and conditions, with the GP unit operating from its lithium battery, the degree of error is 65 seconds per month. Variations in operating conditions and battery life can cause this error to vary from -380 to +90 seconds per month. For systems where this degree of error will be a problem, the user should be sure to monitor this error and make adjustments when required.

Reference See 4.1.2 System ■ Date/Time

2.2.4 Touch Panel Switches

	GP2301H Series	GP-2401H Series
Touch Panel	16 x 12 keys/screen 1- or 2-point push selectable	32 x 24 keys/screen 1- or 2-point push selectable
Function Switches	total of 11	total of 15
Operation Switch	Function Switch (OP.) key Push-type switch on front (top-left) of GP2000H unit	
Emergency Switch	Push-lock Switch Compliant Standard: ISO 13850, EN418, JIS B 9703 IEC 60947-5-1, EN60947-5-1, JIS C 8201-5-1 UL508 (Recognized) CSA C22.2 No.14 (Recognized) Applicable Standard ^{*1} : ISO 13849-1, EN954-1, JIS B 9705-1	
3-Position Enable Switch	GP2000H Rear-face Switch 3-Position Output Compliant Standard: IEC 60947-5-1, EN60947-5-1 JIS C 8201-5-1 ANSI/RIAR15.06-1999 UL508 (Recognized) CSA C22.2 No.14 (Recognized) Applicable Standard ^{*1} : ISO 13849-1, EN954-1, JIS B 9705-1	

**1 Overall system may not meet these standards if implemented outside these parameters. Be sure to follow these standards when designing the system.*

2.2.5 Interfaces

■ GP-2301H / GP-2401H Series Units

Serial Interface	Asynchronous Transmission: RS232C/RS422 Data Length: 7 or 8 bits Stop Bit: 1 or 2 bits Parity: None, Odd or Even Data Transmission Speed: 2,400 to 115,200 bps	
Tool Connector	Asynchronous TTL level nonprocedural command interface Used for transferring data between Screen Editor and the GP.	
CF Card Interface	1 slot	
External Output I/F	DOUT Output	Open Collector Output: 2 points (F1, F2) Rated Voltage: DC 24V Rated Current: 300mA/point max.
	Operation Output	Open Collector Output: 1 point Rated Voltage: DC 24V Rated Current: 300mA max.
	External Buzzer Output	Not available (Pro-Designer does not support this output.)
	Emergency Switch Output	2 Contacts (NC) Rated Voltage: DC 30V Rated Current: 1A max. (Applicable Load: 1mA DC 5V min.) Open Collector Output: 1 point Rated Voltage: DC 24V Rated Current: 300mA max.
	3-Position Enable Switch Output	2 Contacts (NO) Rated Voltage: DC 24V Rated Current: 300mA max. (Applicable Load: 4mA DC 24V min.)

2.3 Interface Specifications

This section describes the specification of each GP2000H unit interface. The external interface is located on the board, at the rear of the GP unit, where the cable cover is opened.



- **Pin #7 (VCC) DC 5V Output is not protected. Use only the designated level of current.**
- **Use Digital’s GP2000H Series connection cable to connect a serial interface.**

2.3.1 External Interfaces

■ Serial Interface

This interface can be either RS-232C or RS-422. Connects the GP unit to the host (PLC).

Pin Assignments	Pin #	Signal Name	Condition
	1	RS	Request to Send (RS-232C)
	2	SD	Send Data (RS-232C)
	3	CS	Clear to Send (RS-232C)
	4	RD	Receive Data (RS-232C)
	5	CD	Carrier Detect (RS-232C)
	6	ER	Enable to Receive (RS-232C)
	7	VCC	DC 5V ±5% Output 0.25A
	8	SG	Signal Ground
	9	NC	Not Connected (Reserved)
	10	NC	Not Connected (Reserved)
	11	NC	Not Connected (Reserved)
	12	NC	Not Connected (Reserved)
	13	RDA	Receive Data A (RS-422)
	14	RDB	Receive Data B (RS-422)
	15	SDA	Send Data A (RS-422)
	16	SDB	Send Data B (RS-422)
	17	CSA	Clear to Send A (RS-422)
	18	CSB	Clear to Send B (RS-422)
	19	ERA	Enable to Receive A (RS-422)
	20	ERB	Enable to Receive B (RS-422)

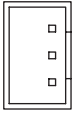


- **Pin #7 (VCC) DC 5V Output is not protected. Use only the designated level of current.**
- **Use Digital’s GP2000H Series connection cable to connect a serial interface.**
- **The GP unit’s serial port is not isolated. If the unit the GP will be connected to is also not isolated, be sure to connect the SG (#8) terminal. If this is not done, the RS-422 circuit could be damaged.**

Reference To confirm your PLC unit’s connection specifications, refer to the Pro-Designer On-line Help.

■ DC 24V Interface

This interface is used for DC 24V input.

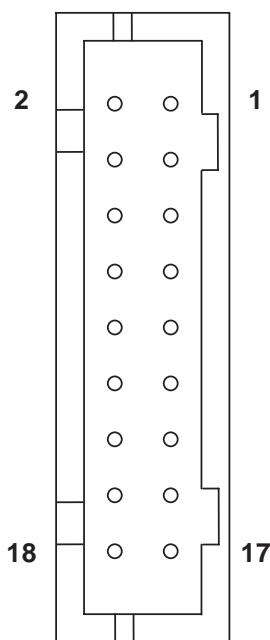
Pin Assignments	Pin #	Signal Name	Condition
 1 2 3	1	DC 24V	Power Input: +24V
	2	0V	Power Input: 0V
	3	FG	Frame Ground



- **Be sure to connect the FG terminal to an earth. Otherwise, the cable may be influenced by noise.**
- **Use Digital's GP2000H Series connection cable to connect a DC 24V Interface.**

Chapter 2 – Specifications

■ External Output Interface

Pin Assignments	Pin #	Signal Name	Condition
	1	NC	Not Connected (Reserved)
	2	DOUT0.C	DOUT0 Output Open Collector DC 24V 300mA
	3	NC	Not Connected (Reserved)
	4	DOUT1.C	DOUT1 Output Open Collector DC 24V 300mA
	5	OP.GND	OP. Ground
	6	OP.C	OP. Output Open Collector DC 24V 300mA
	7	DOUT.GND	DOUT Ground
	8	RESERVE	Reserved
	9	EMG0B	Emergency Switch 0B (Operates like A Contact)
	10	EMG0A	Emergency Switch 0A (Operates like A Contact) (Open Collector: DC 24V 300mA)
	11	EMG1B	Emergency Switch 1B (B Contact)
	12	EMG1A	Emergency Switch 1A (B Contact) Rated Voltage: DC 30V 1A (Min. applicable load: DC 5V 1mA)
	13	EMG2B	Emergency Switch 2B (B Contact)
	14	EMG2A	Emergency Switch 2A (B Contact) Rated DC30V 1A (Min. applicable load: DC5V 1mA)
	15	ENB0B	3-Position Enable Switch 0B (A Contact)
	16	ENB0A	3-Position Enable Switch 0A (A Contact) Rated Voltage: DC 24V 300mA (Min. applicable load: DC 24V 4mA min.)
	17	ENB1B	3-Position Enable Switch 1B (A Contact)
	18	ENB1A	3-Position Enable Switch 1A (A Contact) Rated Voltage: DC 24V 300mA (Min. applicable load: DC 24V 4mA min.)



- Pin #7 (DOUT.GND) is used as a common ground with #2 (DOUT0.C) and #4 (DOUT1.C).
- Use Digital's GP2000H Series connection cable to connect an external output interface.

■ Emergency Switch

When the Emergency Switch is pressed, the external output interface pin energized states are as follows. #9 (EMG0B) and #10 (EMG0A), #11 (EMG1B) and #12 (EMG1A), and #13 (EMG2B) and #14 (EMG2A) .

Pin #	Release	Lock
9–10 (EMG0)	0	1
11–12 (EMG1)	1	0
13–14 (EMG2)	1	0

■ 3-Position Enable Switch

The 3-Position Enable Switch has three positions: a raised position, a mid-level position, and a depressed position.

When the 3-Position Enable Switch is pressed, the external output interface pins' energized states are as follows. #15 (ENB0B) and #16 (ENB0A), and #17 (ENB1B) and #18 (ENB1A).

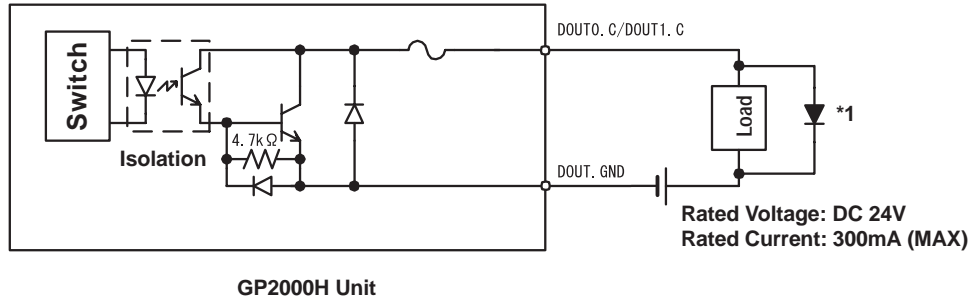
Pin #	Raised	Mid-level	Depressed
15–16 (ENB0)	0	1	0
17–18 (ENB1)	0	1	0

Chapter 2 – Specifications

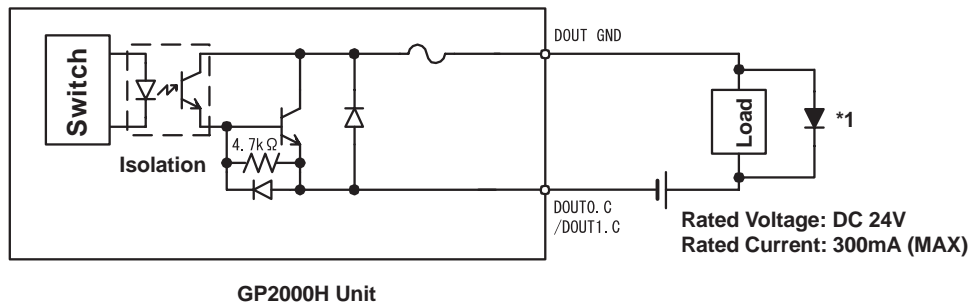
■ External Output I/F Circuit

◆ Pin #2 (DOUT0. C), Pin #4 (DOUT1. C), Pin #7 (DOUT. GND) Circuit

SINK Type

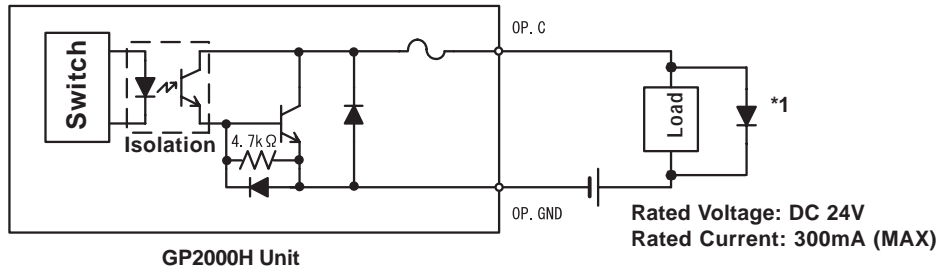


SOURCE Type

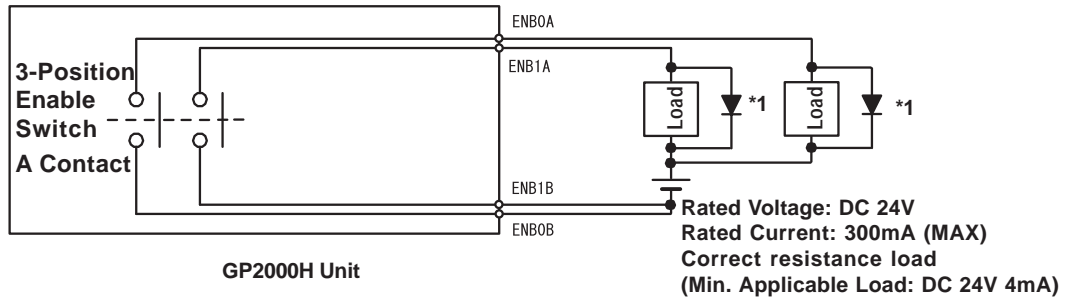


**I When the load changes to induced load, install a surge protector on the load side.*

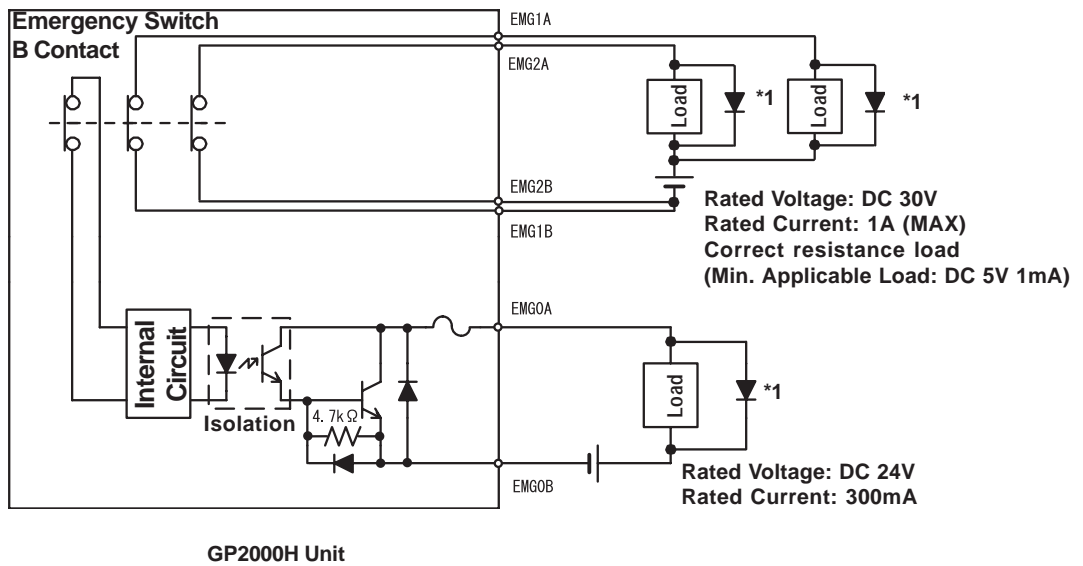
◆ Pin #5 (OP. GND) and Pin #6 (OP. C) Circuit



◆ Pin #15 (ENB0B), Pin #16 (ENB0A), Pin #17 (ENB1B), and Pin #18 (ENB1A) Circuit



◆ Pin #9 (EMG0B), Pin #10 (EMG0A), Pin #11 (EMG1B), Pin #12 (EMG1A), Pin #13 (EMG2B), and Pin #14 (EMG2A) Circuit



*1 When the load changes to induced load, install a surge protector on the load side.

2.4 Part Names and Functions

This section describes the name and function of each part of the GP unit. (The GP-2401H is used for the Front diagram. This unit's display panel size and number of function switches differ from those of the GP-2401H unit.)

A: Display Panel

Displays user-created screens and corresponding host (PLC) data.

GP-2301HL Monochrome LCD

GP-2301HS STN type color LCD

GP-2401HT TFT type color LCD

B: Touch Panel

Enables the user to perform screen change operations or input data.

C: Status LED

LED	GP Status
Not Lit	Power is OFF
Green	Normal operation
Orange	Backlight is burned out.

D: Operation LED

LED	GP Status
Green	Indicates the Operation Switch or the 3-Point Enable Switch is ON.
Not Lit	Conditions other than the above.

E: Operation Switch

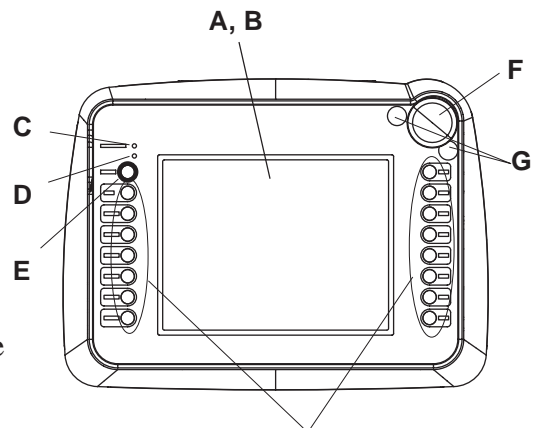
F: Emergency Switch

G: Emergency Switch Guard Hole Covers

H: Function Switches

GP-2301H: 11 switches

GP-2401H: 15 switches



H
Front (GP-2401H)

I: CF Card Access LED

When the CF Card Access Switch is turned ON, the LED lamp turns ON.

When the CF Card Access Switch is turned OFF, the LED lamp turns OFF. However, the lamp is ON while the GP unit is accessing the CF Card.

J: CF Card Cover

K: Cable Cover

L: 3-Position Enable Switch

M: Hand Strap Attachment Slot

N: CF Card Access Switch

The CF Card can be accessed when it is turned ON.

O: CF Card Interface

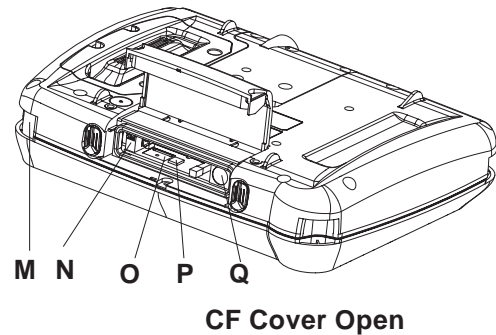
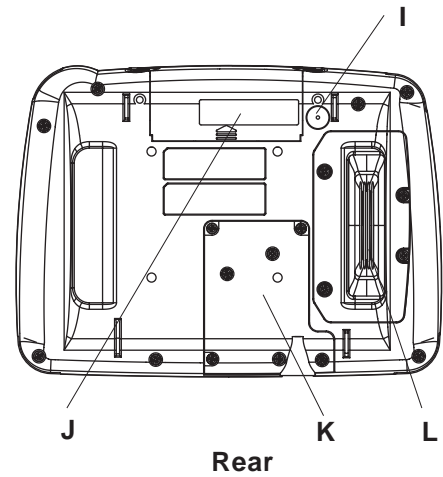
Insert the CF Card in this slot.

P: CF Card Start Switch

When this is turned ON, the tool program in the CF Card will run when the GP unit is started.

Q: Tool Connector

Connect the data transfer cable here.

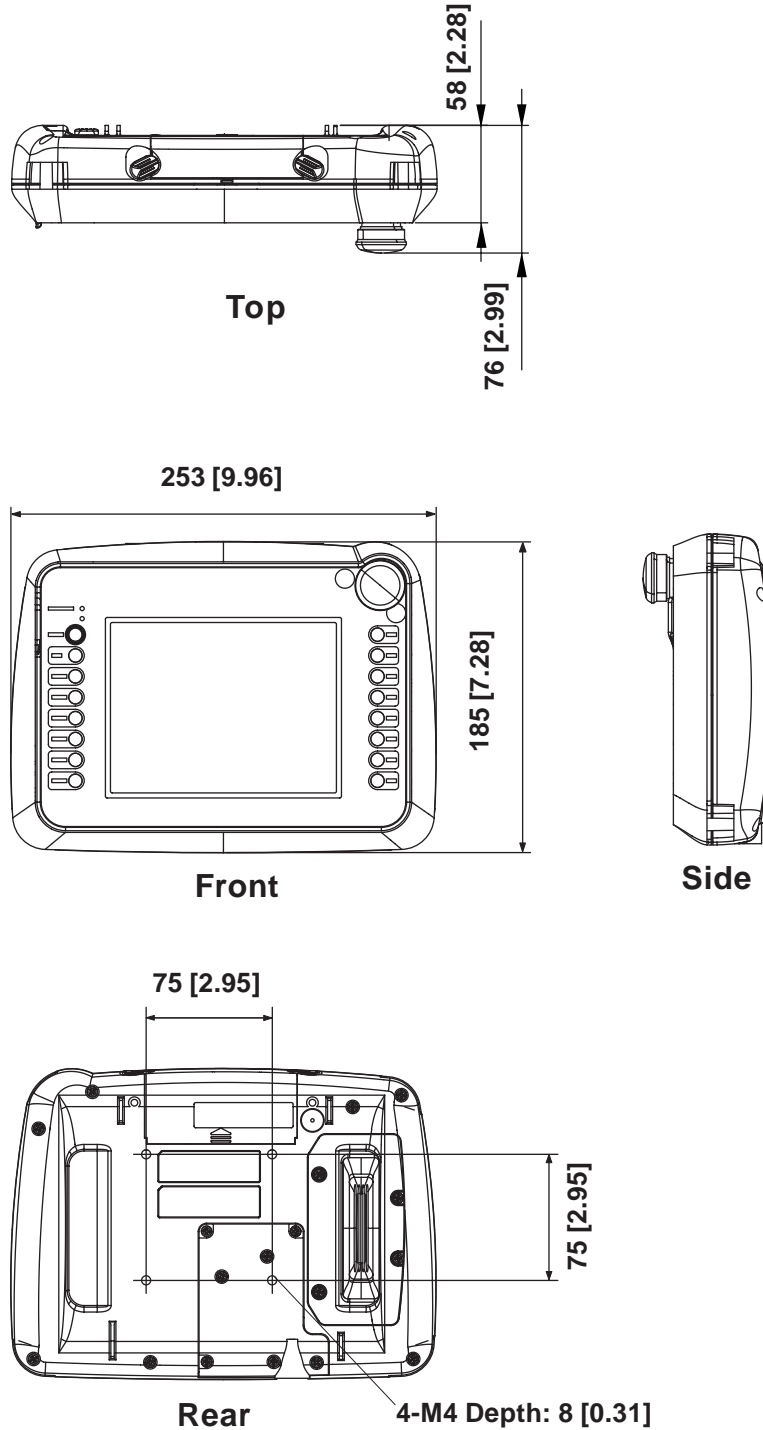


2.5 Dimensions

2.5.1 GP-2301H Series / GP-2401H Series External Dimensions

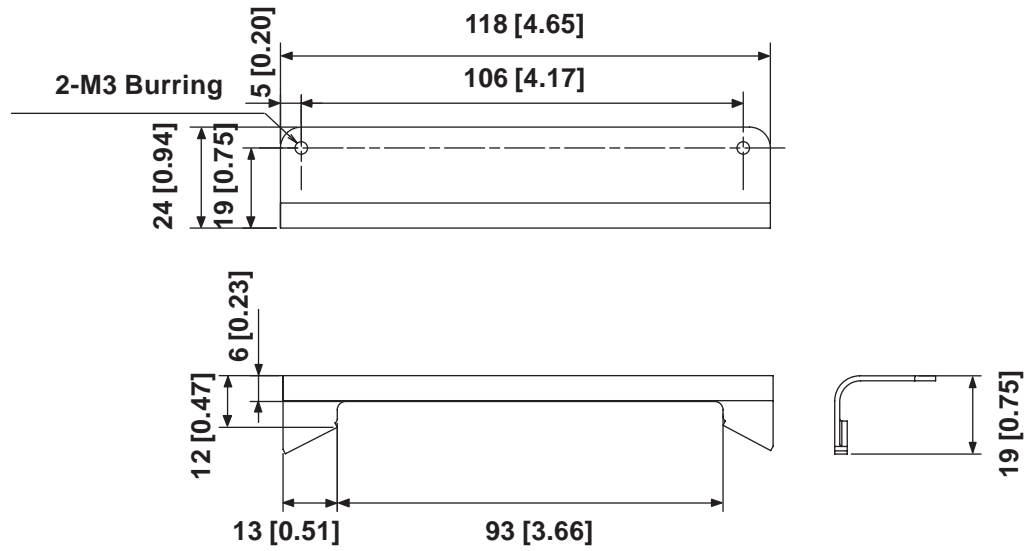
Even though only the GP2401H-TC41-24V is shown below, the dimensions of the GP2301H-LG41-24V and the GP2301H-SC41-24V are the same.

Unit: mm [in.]



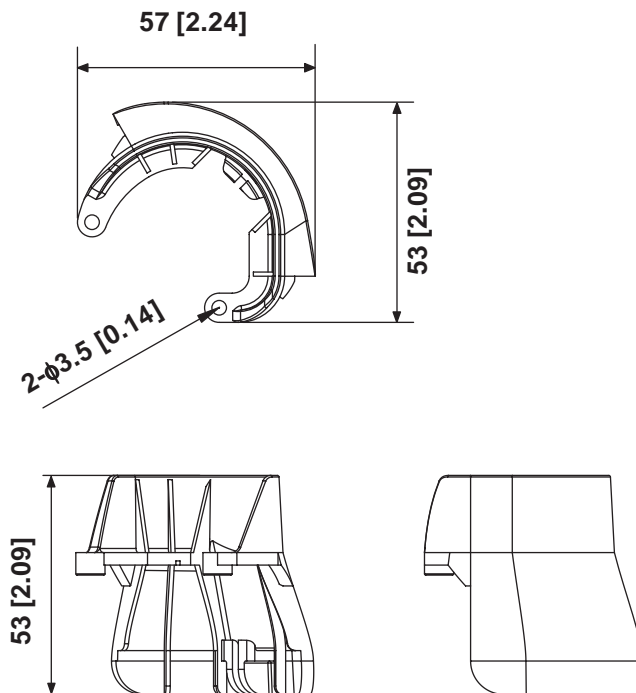
2.5.2 CF Card Interface Guard

Unit: mm [in.]



2.5.3 Emergency Switch Guard

Unit: mm [in.]



Memo

Chapter

3 Handling and Wiring

1. Handling the GP2000H
2. Interface / Switch Guards
3. Wiring Cautions
4. Tool Connector
5. CF Card Installation and Removal

3.1 Handling the GP2000H

This section explains cautions involved with handling the GP2000H Series units. Be sure to operate the GP unit only after securing it, using any of the following three methods.



CAUTIONS

Be sure to use the hand strap or neck strap, or attach the GP unit to a wall with the Wall Mount Adapter. Dropping the unit may result in injury to the user or damage to the unit.

3.1.1 Wall Mount Adapter / Swivel Mount Arm

The GP2000H Series unit can be attached to either a Wall Mount Adapter or a commercial arm, as follows:

■ **Attaching the GP2000H to the Wall Mount Adapter**

GP + Wall Mount Adapter (CA1-WMALRG-01)

■ **Attaching the GP2000H to a Swivel Mount Arm or Similar Device**

GP + commercial VESA compliant arm

The GP2000H unit can be attached to either a commercial, VESA FPMPMI-approved (75mm) swivel mount arm, or a similar wall-mount device.



VESA: Video Electronics Standards Association

FPMPMI: Flat Panel Monitor Physical Mounting Interface – physical standard specification (set by VESA) for attaching the liquid crystal display (LCD) to the arm or stand.

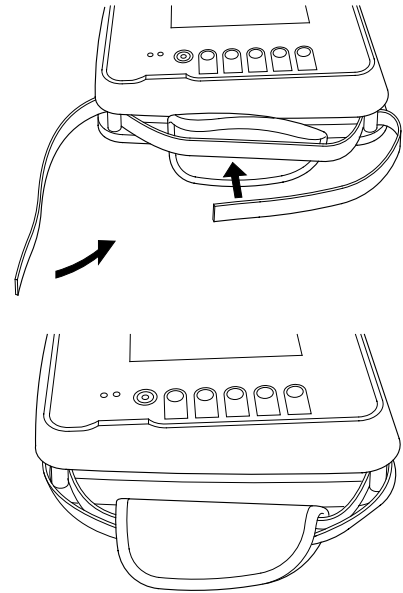
Chapter 3 – Handling and Wiring

3.1.2 Hand Strap

■ Attaching the Hand Strap

The hand strap that attaches to the GP2000H Series unit is used to hold the GP unit by hand, and to prevent it from dropping during use. Attach the hand strap using the following procedure (images of the GP-2301H are used, but the procedure is the same for the GP-2401H):

1. Insert the hand strap into the strap anchors on the sides of the GP unit, and fold back both ends.
2. Adjust the length of the hand strap, and secure the strap with the velcro strip.



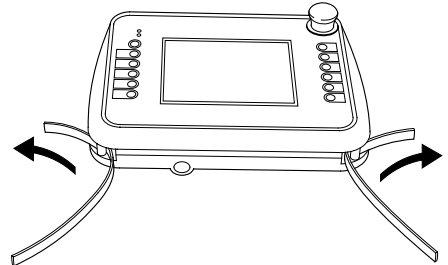
Be sure to keep your left hand through the hand strap when operating the GP unit.

3.1.3 Neck Strap

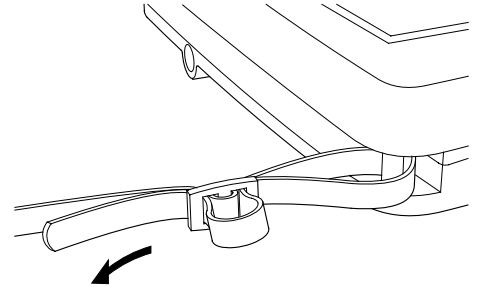
■ Attaching the Neck Strap

The neck strap that attaches to the GP2000H Series unit is used to hang the GP unit from the user's neck, and to prevent it from dropping during use. Attach the neck strap using the following procedure (images of the GP-2301H are used, but the procedure is the same for the GP-2401H):

1. Insert the neck strap into the strap anchors on the sides of the GP unit.



2. Adjust the length of the neck strap and secure the strap with the velcro strip.



Be sure to keep the neck strap around your neck when operating the GP unit.

3.2 Interface / Switch Guards

This section explains how to install the CF Card Interface Guard and Emergency Switch Guard included in the GP2000H Series unit's packing box.

3.2.1 CF Card Interface Guard

■ Attaching the CF Card Interface Guard

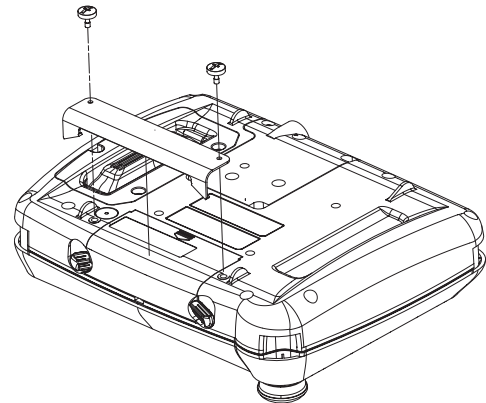
Attach the guard as follows, to meet the NEMA#250 TYPE4X/12*1 environment requirements. (Even if the CF Card Interface Guard is not attached, the protection level of the gasket will not deteriorate as long as the CF Card Cover is closed.)

1. Locate the two CF Card Interface Guard Attachment Screws (2 “Binding type” screws - M3 x 8).



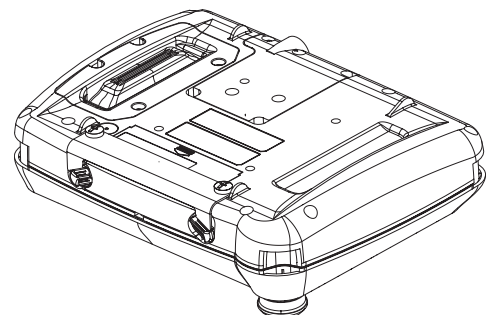
Do not confuse these screws with the Emergency Switch Attachment Screws.

2. Secure the CF Card Cover onto the rear of the GP unit. Position the CF Card Interface Guard with the two screw holes on the side of the CF Card Cover, then insert and tighten the screws. (The screws can be tightened or loosened with a screwdriver or the side of a coin.)



Do not use excessive force, which may damage the GP unit. Use a torque of only 0.5 N•m to tighten the screws.

The GP2000H unit with the CF Card Interface Guard attached will look like the diagram on the right.



*1 Units that are Revision A or later correspond to a NEMA#250 TYPE4X/12 rating. For a description of how to identify your unit's revision code, see **Page 13**.

3.2.2 Emergency Switch Guard

■ Attaching the Emergency Switch Guard

Prevent the Emergency Switch from accidentally turning ON (for example, if the GP is dropped or placed upside down on a desk) by installing the Emergency Switch Guard, as follows:

1. Locate the two Emergency Switch Attachment Screws (2 “Binding type” screws - M3 x 8).



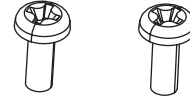
Note:

Do not confuse these screws with the CF Card Interface Guard Attachment Screws.

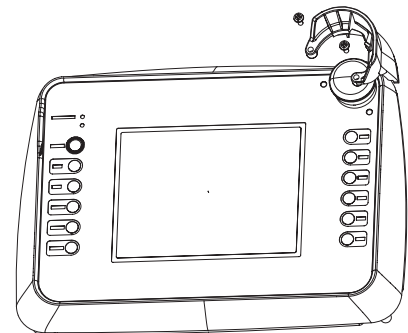
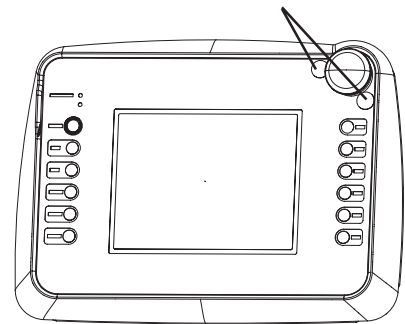
2. Peel off the two Emergency Switch Guard hole covers, located next to the Emergency Switch.

3. Align the screw holes of the Emergency Switch Guard with the two Emergency Switch holes.

4. Insert and tighten the attachment screws to attach the Emergency Switch Guard to the GP unit.



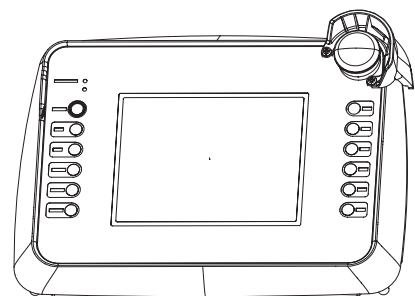
Emergency Switch Guard Hole Covers



Important

Do NOT use excessive force, which may damage the GP unit. Use a torque of only 0.5 N•m to tighten the screws.

The GP2000H unit with the Emergency Switch Guard attached will look like the diagram on the right.



3.3 Wiring Cautions

3.3.1 Wiring



WARNINGS

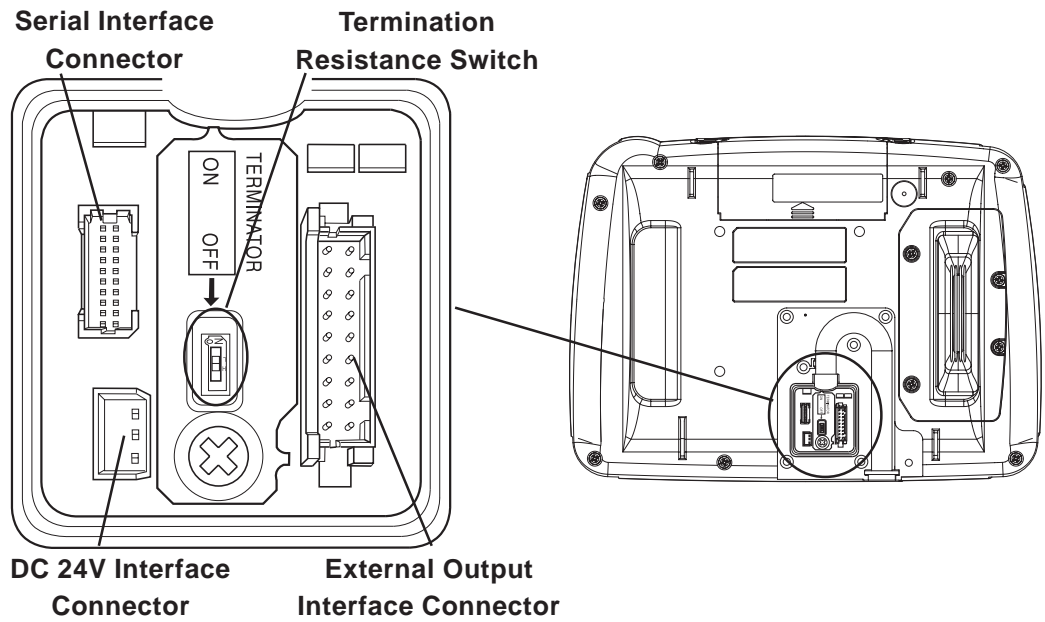
- To avoid an electric shock, be sure the power cord is unplugged from the power supply when connecting the power terminals to the GP unit.
- The GP2000H Series units use a DC 24V power supply. If the power supply is outside of the rated voltage range, both the power supply and the GP unit can be damaged.
- The GP2000H is not equipped with a power switch. Therefore, be sure to connect a breaker-type power switch to the GP unit's power cord.

Use the GP2000H Series connection cable to connect to serial interface, DC 24V interface, external output interface.

The connectable cables (sold separately) are listed below.

Cable Name	Model
GP2000H Series Special Purpose RS-232C Dsub Cable (3M)	GP2000H-D232-3M
GP2000H Series Special Purpose RS-232C Dsub Cable (10M)	GP2000H-D232-10M
GP2000H Series Special Purpose RS-232C Cable (3M)	GP2000H-C232-3M
GP2000H Series Special Purpose RS-232C Cable (10M)	GP2000H-C232-10M
GP2000H Series Special Purpose RS-422 Dsub Cable (3M)	GP2000H-D422-3M
GP2000H Series Special Purpose RS-422 Dsub Cable (10M)	GP2000H-D422-10M
GP2000H Series Special Purpose RS-422 Cable (3M)	GP2000H-C422-3M
GP2000H Series Special Purpose RS-422 Cable (10M)	GP2000H-C422-10M
GP2000H Series Special Purpose GP-H70 Series RS-232C Conversion Adapter Connection Cable (3M)	GP2000H-AP70CB-D232-3M
GP2000H Series Special Purpose GP-H70 Series RS-422 Conversion Adapter Connection Cable (3M)	GP2000H-AP70CB-D422-3M

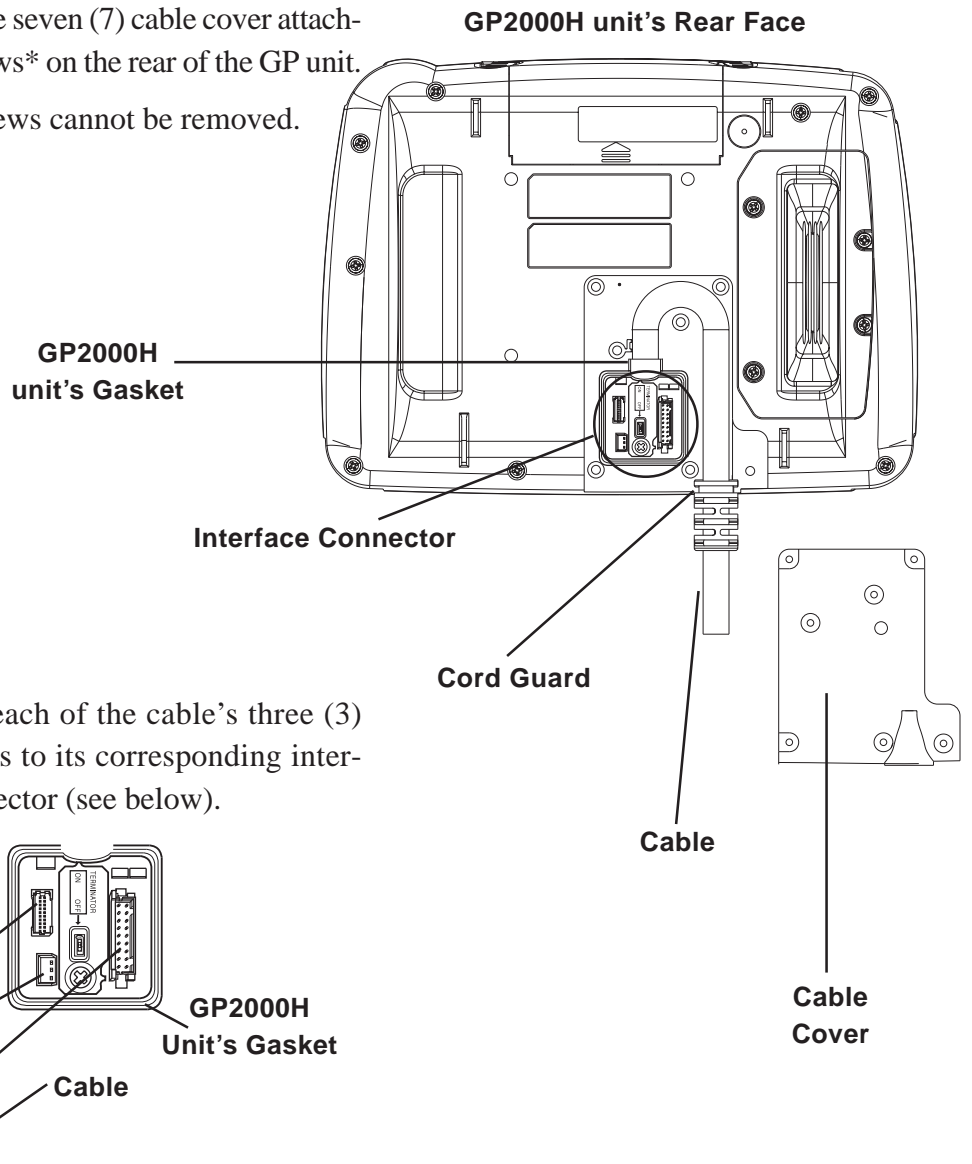
When the termination resistance needs to be set up, turn ON the dip switch beside the serial interface. The termination resistance of 100Ω enters between RDA and RDB. The default setting is OFF.



3.3.2 Cable Installation

1. Loosen the seven (7) cable cover attachment screws* on the rear of the GP unit.

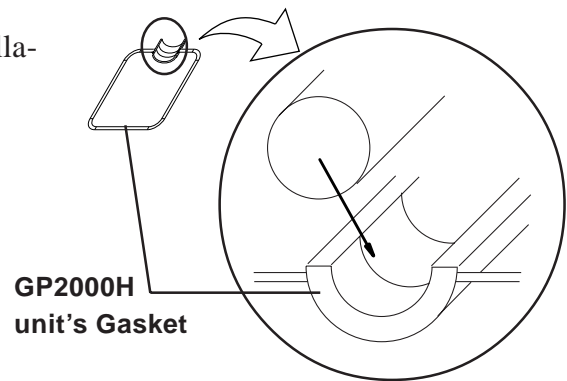
* These screws cannot be removed.



2. Connect each of the cable's three (3) connectors to its corresponding interface connector (see below).

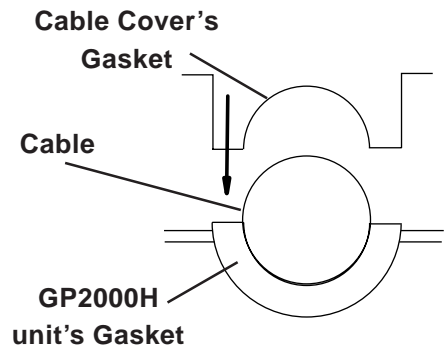
Chapter 3 – Handling and Wiring

- Securely attach the GP unit's installation gasket.



- Bend the cable to fit inside the GP unit's cable channel, and adjust the cord guard to fit securely into the GP unit's plastic casing.
- Replace the cable cover and securely tighten all seven (7) attachment screws. A torque of only 0.5 N•m is sufficient to tighten these screws.

To reattach the cable cover, securely fit the installation gasket around the cable, and fasten the cable cover to the GP unit (see diagram, right).

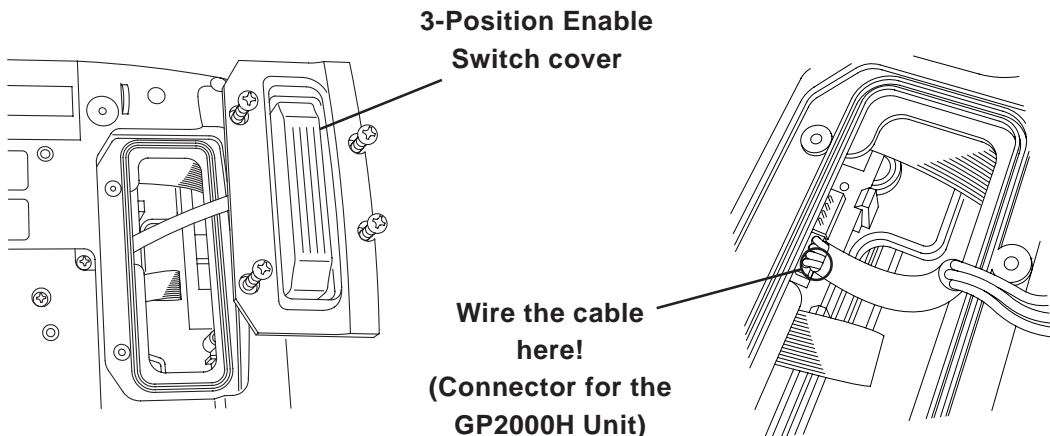


Be sure that the installation gasket and the cable cover are securely fastened. Incorrect alignment of these parts can lead to water leakage and may result in damage of the GP unit.

3.3.3 Setting Operation Switches Enabled

This setting can be done on Pro-Designer.

However, the cable must be wired as shown in the figure below to set it correctly. The factory setting is as the figure below.





WARNING

- **To prevent an electrical shock, be sure to unplug the GP unit's power cord from the main power supply prior to attaching or detaching any connectors to or from the GP unit.**
- **Be sure to attach the connector to the right connector position. The 3-Position Enable Switch will not function if the connector is attached to the wrong position.**

- * These are non-removable type screws.
- * To preserve this unit's airtight seal an installation gasket is used. To release the cover from the gasket, use a flat-bladed screwdriver or similar tool and insert the blade between the cover and the gasket to free the cover.
- * To prevent scratching the unit's case, wrap the driver's blade with cloth.



Be sure that the 3-Position Enable Switch cover is securely fastened. Incorrect attachment of this cover can lead to water leakage and may result in damage of the GP unit.

If you change this setting, the touch panel's input operation will be changed as the following.

Operation Switch Setting	Front Operation Switch is not Pressed	Front Operation Switch is Pressed
Enabled	Touch Input Not Available	Touch Input Available
Disabled	Touch Input Available	Touch Input Available

Reference *For information about Pro-Designer setup, refer to the Pro-Designer On-line Help.*



- The rear 3-Position Enable Switch's position and the front Operation Enable Switch settings are NOT related.

Chapter 3 – Handling and Wiring

3.3.4 Switching DOUT Output Current Direction

GP2000H Series units can switch the direction of the DOUT output current. As shown below, each direction corresponds to either Sink output or Source output. The factory setting is for Sink type output.

GP 2000H Series units that can switch the current direction includes all units with Revision 2 marking (2A, 2B, 2C, etc.). For a description of how to identify your unit's revision code, see *Preface - Page 13*.

For Circuit drawings for the Output Sink type and Output Source type units,

Reference 2.3 Interfaces ■ External Output I/F Circuit

Output Sink Type

Provides current from pin 2 (DOUT0.C)/ pin 4 (DOUT1.C) to pin 7 (DOUT.GND)

Pin No.	Signal Name	GP Internal Current Direction	Pin No.	Signal Name
2	DOUT0.C		7	DOUT.GND
4	DOUT1.C			

Output Source Type

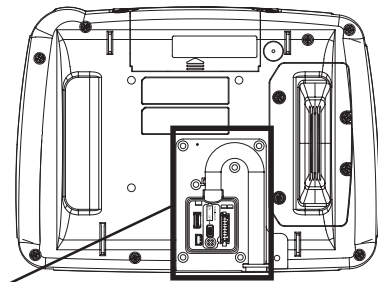
Provides current from pin 7 (DOUT.GND) to pin 2 (DOUT0.C)/ pin 4 (DOUT1.C)

Pin No.	Signal Name	GP Internal Current Direction	Pin No.	Signal Name
2	DOUT0.C		7	DOUT.GND
4	DOUT1.C			

■ Changing the Current Direction

1) Loosen the seven (7) Cable Cover Attachment Screws, and remove the cover.

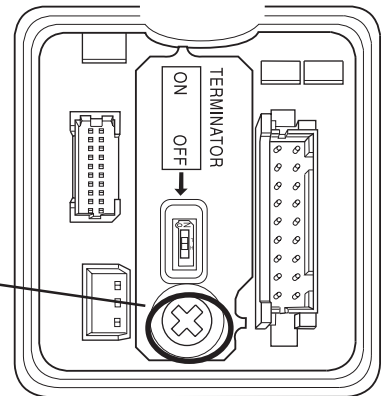
* These screws are the non-removable type.



Cable Cover

2) Loosen the Stopper's screw (1) and remove the Stopper.

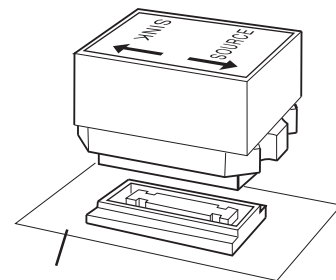
* This screw is the non-removable type.



Stopper Screw

Sink/Source Circuit Board

3) Remove the Output Sink/Source Switchover Circuit Board. Grasp the sponge section and pull the board directly up off the GP's circuit board.

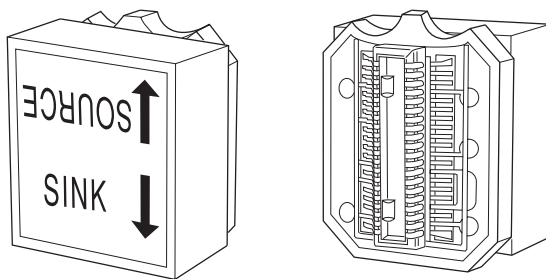


GP Circuit Board

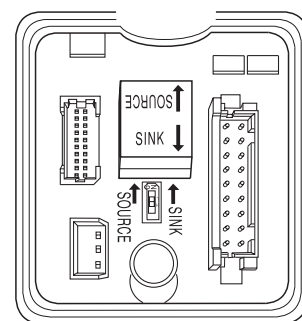
Output Sink/Source Circuit Board

Front

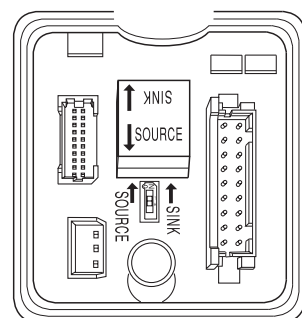
Rear



Output Sink Setting



Output Source Setting



4) As shown in the drawings on the right, the direction of the Output Sink/Source unit determines the direction of the current.

* You can use the words “SINK” and “SOURCE” on the main circuit board to orient/ check the Output Sink/Source unit.

5) Re-attach the Stopper and re-attach the Cable Cover.

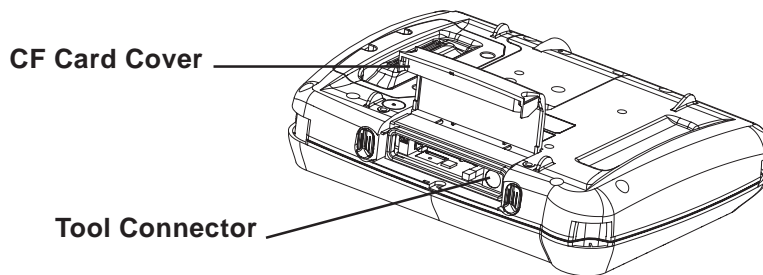
3.4 Tool Connector

A data transfer cable can be attached to the GP unit's tool connector. The GP unit's tool connector is located on the right side, inside the CF Card Cover.



WARNING

To prevent an electrical shock, be sure to unplug the GP unit's power cord from the main power supply prior to attaching or detaching any connectors to or from the GP unit.



3.5 CF Card Installation and Removal



CAUTIONS

When using the GP2000H unit and a CF Card, use the following precautions:

- Prior to inserting or removing a CF Card, turn the GP unit's CF Card Access Switch OFF, and confirm that the Access lamp is not lit, to prevent damage to or loss of the CF Card's internal data.
- When a CF Card is being accessed, NEVER:
 - turn OFF or reset the GP2000H unit
 - insert or remove the CF Card

Prior to performing these operations, create and use a special GP application screen that will prevent access to the CF Card.

Reference  Refer to the Pro-Designer On-line Help

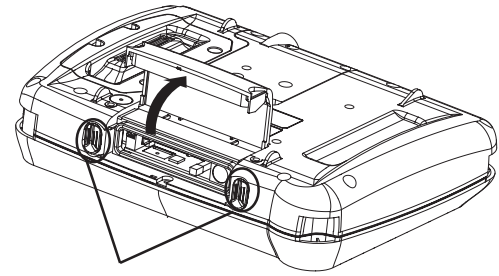
- Prior to inserting a CF Card, familiarize yourself with the CF Card's front-face and rear-face orientation, as well as with the CF Card connector's position. To prevent damage to either the CF Card's internal data or the GP unit, the CF Card must be correctly positioned when it is inserted into the multi-unit.
- Use only CF Cards manufactured by Digital Electronics Corporation. Otherwise, the CF Card data may be damaged.
- Lost GP data cannot be recovered. Since accidental data loss can occur at any time, be sure to back up all GP screen and CF Card data regularly.
- Be sure to follow the instructions given below to prevent the CF Card's internal data from being destroyed or a CF Card malfunction from occurring:
 - Do NOT bend the CF Card.
 - Do NOT drop or strike the CF Card against other objects.
 - Keep the CF Card dry.
 - Do NOT touch the CF Card connectors.
 - Do NOT disassemble or modify the CF Card.

Chapter 3 – Handling and Wiring

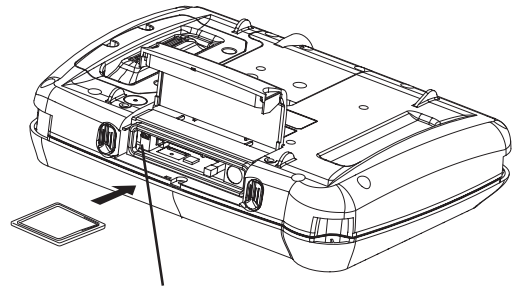
■ Inserting the CF Card

Use the following steps to insert the CF Card in the GP2000H unit.

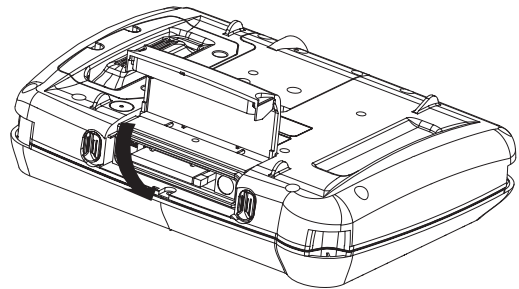
1. Unlock the CF Card Cover Lock on both sides, and then slide the CF Card Cover in the specified direction, and upwards, to open the cover.
2. Turn OFF the CF Card Access Switch and make sure the CF Card Access LED is turned OFF.
3. Insert the CF Card in the CF Card Slot, until the ejector button is pushed forward.
4. Turn ON the CF Card Access Switch.
▼Reference▲ See 3.5.2 – “CF Card Access Switch.”
5. Confirm that the CF Card Access LED turns ON.
6. Close the CF Card Cover in the direction opposite to that of the opening procedure.



CF Card Cover Lock



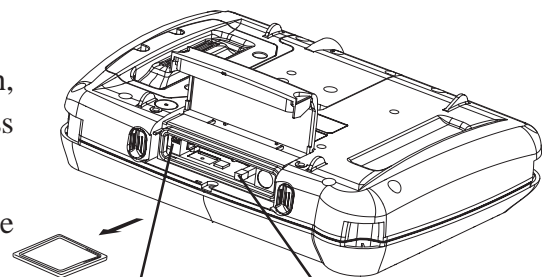
CF Card Access Switch



■ Removing the CF Card

To remove the CF Card, retrace the previous “Inserting the CF Card” steps.

1. Open the CF Card Cover.
2. Turn OFF the CF Card Access Switch, and make sure that the CF Card Access LED is turned OFF.
3. Press the ejector button to remove the CF Card.



Ejector Button

CF Card Access Switch

3.5.1 CF Card Handling

The CF Card has a data overwrite limit of approximately 100,000 times. Therefore, be sure to back up all CF Card data regularly to another storage media. (100,000 times assumes the overwriting of 500KB of data in DOS format.)

To view CF Card data on a personal computer, insert the CF Card into a CF Card Adapter, and then insert the adapter into your personal computer's PC card slot. In some cases, and depending on the model of personal computer you are using, the CF Card's data may not be read correctly.

If your personal computer is not equipped with a PC card slot, please use a standard type PC Card or CF Card reader. All of Digital's CF Card operation tests have been performed using the following equipment.

Manufacture Name	Model	Connection Type
I-O DATA DEVICE, INC.	CardDock-CF/P	Parallel Port

The connection between a personal computer and the CF Card reader has been tested using an IBM-compatible machine. This does not mean, however, that all IBM-compatible machines can be used to replicate the results.

Reference Please contact your PC or CF Card reader manufacturer for details.

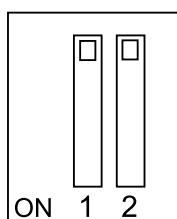
3.5.2 CF Card Access Switch

The CF Card Access Switch is a switch that the GP unit can use to access the CF Card. Because the factory setting is OFF, the GP unit cannot access the CF Card simply by inserting the CF Card.

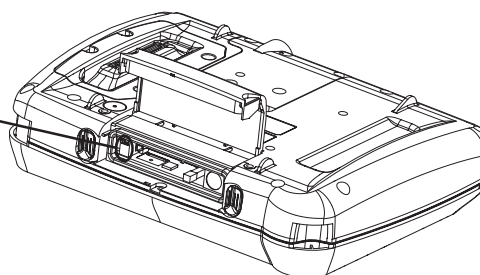
When using the CF Card, set the CF Card Access Switch **1** to ON.



Prior to inserting or removing a CF Card, turn the GP unit's CF Card Access Switch OFF, then confirm that the Access lamp is not lit, to prevent damage to or loss of the CF Card's internal data.



**CF Card Access Switch
(Default Settings)**



Dip Switch	1	2
Description	CF Card Access Setting	Reserved (Fixed to OFF)
OFF	CF Card Access Prohibited	–
ON	CF Card Access Permitted	–

Memo

Chapter 4 Settings

4.1 Types of Settings

The settings required for the GP unit, when starting Runtime or when in RUN mode, are found in the Settings Menu.

To call up this menu:

1. Connect the GP unit's power supply.



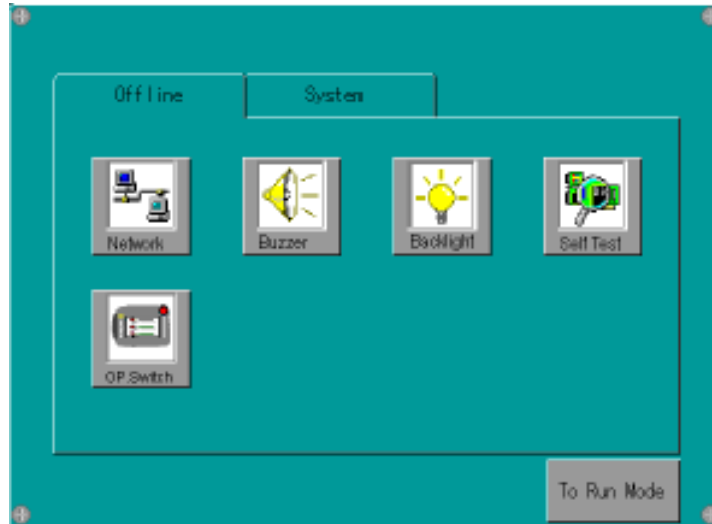
Pro-Designer Runtime must be installed. For installation instructions, refer to Pro-Designer ver. 4.0 or later software's On-line Help.

2. After the GP starts up, touch the upper left corner of the screen within 10 seconds to call up the menu. You can also enter Setting mode at any time by simultaneously touching the upper right corner, bottom right corner, and bottom left corner of the screen. Pro-Designer Runtime will restart and the [Settings Menu] will appear.
3. In this mode, the two tabs, [Offline] and [System] are available. Simply touch the desired tab to bring up those settings.

The following screen shows the [Offline] area's selections. (The GP-2301H screen will look different, however, the features/selections are the same.)

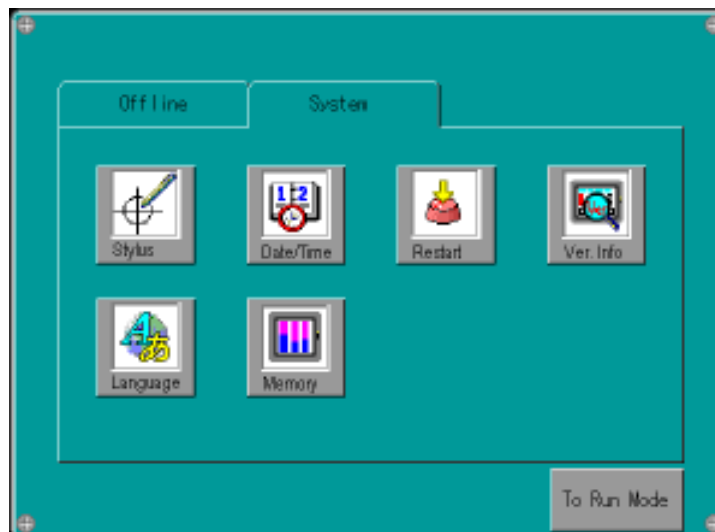
Chapter 4 – Settings

■ Offline



- Network
- Buzzer
- Backlight
- Self Test
- OP. Switch

■ System



- Stylus
- Date/Time
- Restart
- Ver. Info.
- Language
- Memory

4.1.1 Offline

■ Network

This cannot be set with GP2000H Series units.

■ Touch Buzzer

The following buzzer sound settings are available.

The factory setting is [Press Touch Object].

- [None] Selecting this will turn the buzzer off.
- [Press Touch Object] The buzzer will only sound when a Touch Object is touched.
- [Press Anyway On Panel] You cannot use this option with the GP units.

◆ Setting Procedure

1. In the [Settings] menu, touch the [Offline] tab.
2. Touch the [Buzzer] icon.
3. Touch/select the desired buzzer mode.

Chapter 4 – Settings

■ Backlight Control

Here, three selections (modes) are available.

- Wait

To preserve the GP unit's screen display elements and extend the life of the backlight, the backlight can be set to automatically turn off after a designated period of inactivity (idle time) elapses. The factory setting for this item is [OFF].

- Enable Touch if Backlight is OFF

This setting designates if the touch panel is enabled or disabled when a backlight burnout is detected. When this feature is set to OFF, touch panel touch input is ignored, thereby preventing touch panel operation errors. The factory setting is [OFF]. (Checkbox is not set.)



Backlight burnout detection is performed via monitoring of the backlight's current consumption. Therefore, certain types of backlight failures cannot be detected.

- Brightness

Four levels of brightness are available.

◆ Setting Procedure

1. In the [Settings] menu, touch the [Offline] tab.
2. Touch the [Backlight] icon.
3. Touch/select the desired backlight brightness.
4. To automatically turn the backlight off after a specified period of time, touch the [Wait] selection and set the “idle time” period.

■ Self Test

Performs the GP unit's self test. For details, see 5.2 Self Test.

■ OP. Switch

The following sets the operation switch “Enabled/Disabled”.

◆ Setting Procedure

1. In the [Settings] menu, touch the [Offline] tab.
2. Touch the [OP. Switch] icon.
3. Turn the [Enable Operation Switch] check box ON.

4.1.2 System

■ Stylus

This setting is not required for GP series units.

■ Date/Time

Sets the GP unit's date and time.

◆ Setting Procedure

1. In the [Settings] menu, touch the [System] tab.
2. Touch the [Date/time] icon.
3. Touch/select the Date or Time field to call up a data entry keypad. Use this keypad to enter all time settings.

■ Restart System

Restarts the GP.

◆ Setting Procedure

1. In the [Settings] menu, touch the [System] tab.
2. Touch the [Restart] icon.
3. Touch/select the [Restart] button to restart the GP unit.

■ Version Information

Calls up the Pro-Designer runtime version, and the version and build numbers for the current project.

◆ Setting Procedure

1. In the [Settings] menu, touch the [System] tab.
2. Touch the [Ver. Info] icon.

■ Language Selection

Designates the language used with System screens and User Applications.

◆ Setting Procedure

1. In the [Settings] menu, touch the [System] tab.
2. Touch the [Language] icon.
3. Touch/select the desired language for the [System] and [User Application] items.

Chapter 4 – Settings

■ Memory

Displays the total amount of memory, and the amount of memory currently being used.

◆ Setting Procedure

1. In the [Settings] menu, touch the [System] tab.
2. Touch the [Memory] icon.



Chapter 5 Troubleshooting

This section explains how to find and resolve GP unit problems.

The GP unit can be connected to a wide range of devices, including a host (PLC), however, this manual will not discuss every possible device, or problem. For problems not directly related to the GP unit, refer to that device's manual.

The main problems that occur during use of the GP unit are:

- 1) The panel display is blank.
- 2) Connected devices cannot be used.

5.1 Troubleshooting Checklists

When a problem occurs, be sure to first read each checklist item and follow the instructions given.

If this does not solve the problem, please contact your local GP distributor.

■ When a problem cannot be solved

For hardware and software problems, contact the distributor where you bought the GP unit.

Chapter 5 – Troubleshooting

5.1.1 No display

No.	Check Item/Operation	Y/N	Countermeasure
1	Are all Pro-Designer screens sent to the GP unit?		If not, send to the GP.
2	Is the [Initial Panel ID] set up correctly in Pro-Designer?		If not, enter the [Initial Panel ID] and re-send the screen data.
3	Is the GP unit's status LED lit?		If the LED is orange, the backlight is burned out. Please contact your local GP distributor.
4	Is the voltage level within the designated range?		See 2.1.1 Electrical
5	Turn the power supply OFF.		
6	Are the power cable terminals correctly connected?		If not, connect the terminals correctly. See 3.3 Wiring Cautions
7	Turn the power supply ON.		
8	Is the power lamp lit?		If not lit -> Hardware problem
9	Is the backlight lit?		If the backlight is burned out, please contact your local GP distributor.
	Did the above procedure correct the problem?		If not, -> Hardware problem

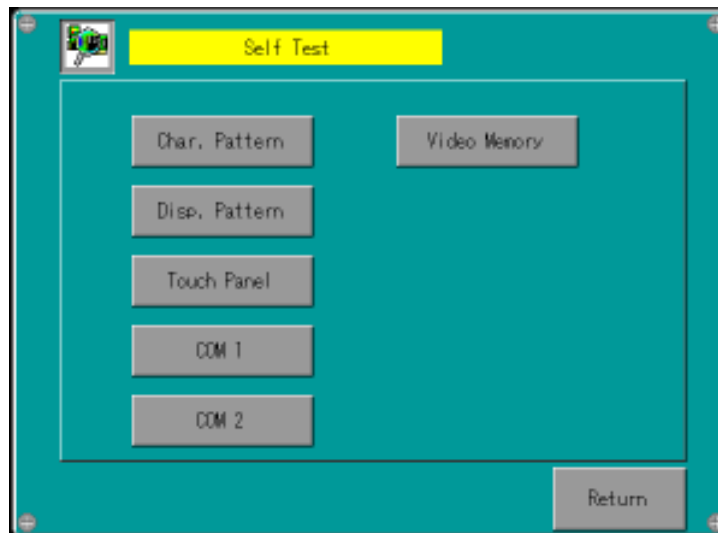
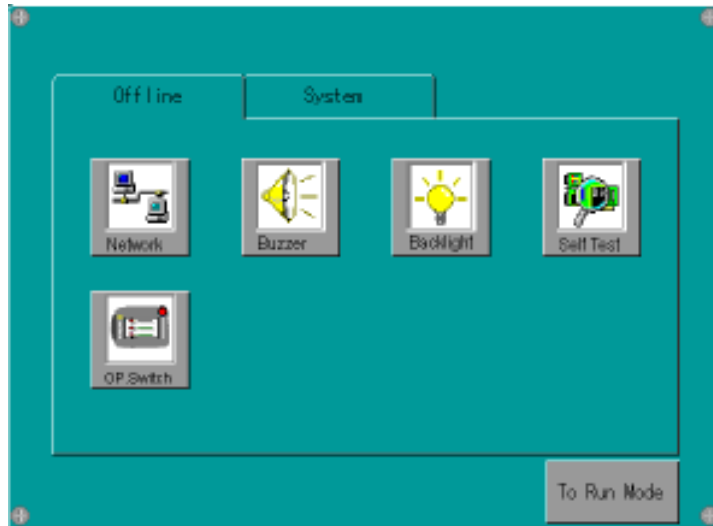
5.1.2 Connected devices cannot be used

No.	Check Item/Operation	Y/N	Countermeasure
1	Turn the power supply OFF.		
2	Are the power cable terminals correctly connected?		If not, connect the terminals correctly. See 3.3 Wiring Cautions
3	Is the correct Device/PLC protocol and driver information set up in Pro-Designer?		If not, enter the correct protocol and driver information.
4	Is the Device/PLC connection cable correctly connected?		Refer to the Device/PLC's manual and correctly connect the cable. See 3.3 Wiring Cautions
	Did the above procedure correct the problem?		If not, -> Hardware problem

5.2 SELF TEST

The GP unit is equipped with a number of self diagnosis features used to check its System and Interfaces for any problems.

5.2.1 SELF TEST item list



- Char. Pattern
- Disp Pattern
- Touch Panel
- COM 1*1
- COM 2*1*2
- Video Memory

*1 This item must be prepared by the user (cable, connector, etc.).

*2 Cannot be used with GP2000H Series units.

Chapter 5 – Troubleshooting

5.2.2 SELF TEST - details

This section explains the contents of SELF TEST.

■ Char.Pattern

Checks each font's pattern and kanji-characters'ROM. Used when kanji-characters do not display. If there is no error, the message [OK] will appear, if there is an error, the message [NG] will appear.

■ Disp Pattern

Used when the device contents will not display correctly to check the drawing function.

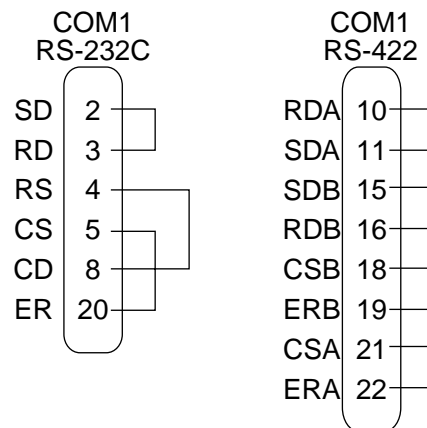
■ Touch Panel

Touch Panel check. Checks if each touch cell highlights when pressed.

■ COM 1, COM 2*1

Checks the RS-232C and RS-422 SIO lines for areas where communication problems develop. To run the check, connecting the SIO cable is necessary. If all is normal, OK displays; if there is a problem, an error message appears.

The SIO cable wiring is as shown below.



■ Video Memory

This item is used to check video memory (memory used for screen display). Use this feature when your screen display is not correct. This result of this test will be either [OK] (no problem) or [NG](problem).

*1 Cannot be used with GP2000H Series units.

Chapter 6 Maintenance

1. Regular Cleaning
2. Periodic Check Points
3. Replacing the Backlight

6.1 Regular Cleaning

6.1.1 Cleaning the Display

When the surface or the frame of the display gets dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly, and wipe the display.



- Do NOT use paint thinner, organic solvents, or strong acid compounds to clean the GP unit.
 - Do NOT use hard or pointed objects to operate the touch-screen panel, since they can damage the panel's surface.
-

6.2 Periodic Check Points

To keep your GP unit in its best condition, inspect the following points periodically.

GP Operation Environment

- Is the operating temperature within the allowable range (0° C to 40° C)?
- Is the operating humidity within the specified range (10%RH to 90%RH, wet bulb temperature of 39° C or less)?
- Is the operating atmosphere free of corrosive gasses?

Electrical Specifications

- Is the input voltage (DC 19.2V to DC 28.8V) appropriate?

Related Items

- Are all power cords and cables connected properly? Have any become loose?

6.3 Replacing the Backlight

The GP2000H Series unit backlights are NOT user replaceable.

If backlight replacement is required, please contact your local distributor.

When the unit's backlight burns out, the unit's status LED will turn orange. If the OFFLINE menu's USE TOUCH PANEL AFTER BACKLIGHT BURNS OUT feature is set to NO, the GP unit's touch panel will be disabled.*¹

GP2000H Series units use a CFL, long-life type backlight. The actual life of the backlight, however, depends on the GP unit's operating conditions, and replacement may be required. A GP2000H Series backlight has a life of 50,000 hours (approx. 5.7 years at 25° C and 24-hour operation) when the backlight is lit continuously. (The "life" of the backlight is the time it takes for the brightness to fall to half its normal level.)

**1 If the OFFLINE menu's FORCE RESET feature is set to NO, the touch panel operation is disabled.*
